HANDLING AND SERVICING

HANDLING AND SERVICING

This section contains information on preventive maintenance. Refer to the **PA-34-200T Service Manual** for further maintenance procedures. Any complex repair or modification should be accomplished by a Piper Certified Service Center.

GROUND HANDLING

TOWING

The airplane may be moved by using an optional nose wheel tow bar available with the airplane, or by power equipment that will not damage or cause excess strain to the nose gear assembly. The tow bar is stowed aft of the fifth and sixth seats.

CAUTION

When towing with power equipment, do not turn the nose gear beyond its turning radius in either direction as this will result in damage to the nose gear and steering mechanism.

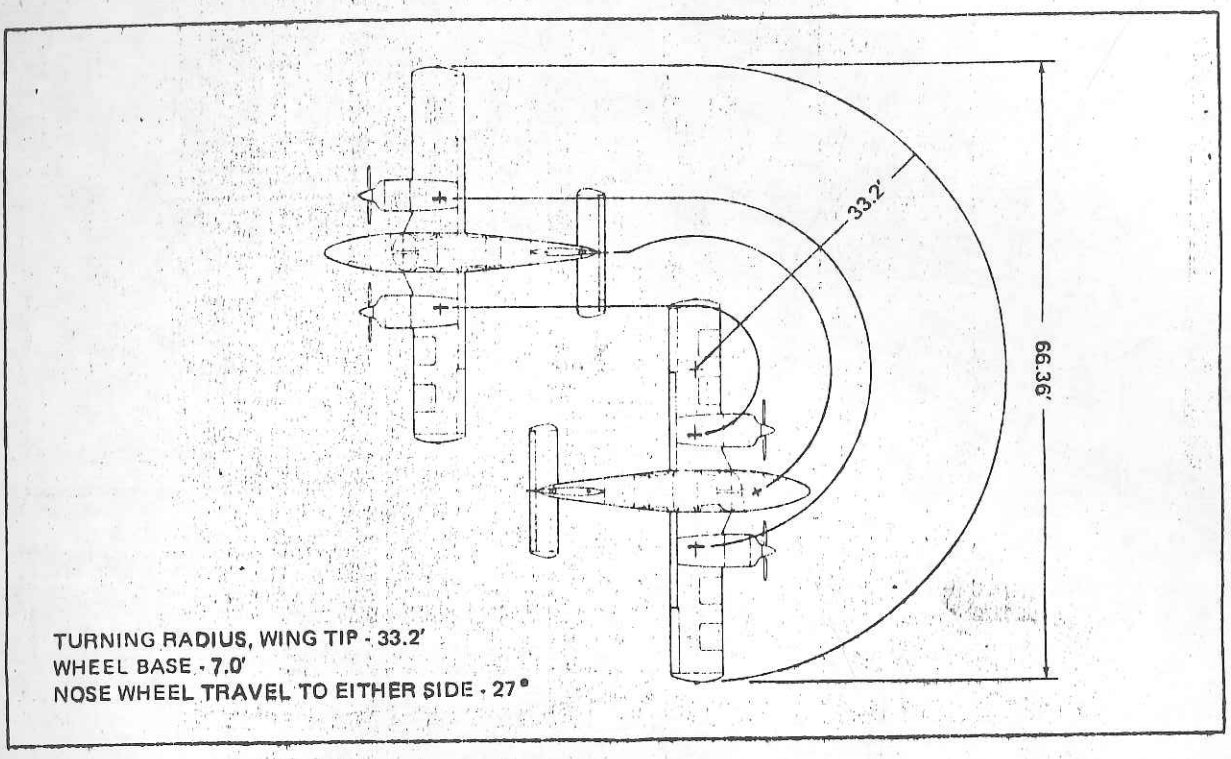
CAUTION

Do not tow the airplane when the controls are secured.

TAXIING

Before attempting to taxi the airplane, ground personnel should be instructed and approved by a qualified person authorized by the owner. Engine starting and shut-down procedures and taxiing techniques should be covered. When it is ascertained that the propeller back blast and taxi areas are clear, power should be applied to start the taxi roll and the following checks should be performed:

a. Taxi forward a few feet and apply the brakes to determine their effectiveness.
b. While taxiing, make slight turns to ascertain the effectiveness of the steering.
c. Observe wing clearances when taxiing near buildings or other stationary objects. If possible, station an observer outside to guide the airplane.
d. When taxiing on uneven ground, avoid holes and ruts.
e. Do not operate the engines at high RPM when running up or taxiing over ground containing loose stones, gravel, or any loose material that might cause damage to the propeller blades. Be sure alternate air is not being used.



Turning Radius

PARKING

When parking the airplane, be sure that it is sufficiently protected against adverse weather conditions and that it presents no danger to other aircraft. When parking the airplane for any length of time or overnight, it is suggested that it be moored securely.

a. To park the airplane, head it into the wind if possible.

b. Set the parking brake by pulling back on the brake lever and depressing the knob on the left side of the handle, To release the parking brake, pull back on the brake lever until the catch disengages; then allow the handle to swing forward.

CAUTION

Care should be exercised when setting brakes that are overheated or during cold weather when accumulated moisture may freeze a brake.

c. Aileron and stabilator controls may be secured with the front seat belt. Wheel chocks should be used if they are available.

MOORING

The airplane should be moored for immovability, security, and protection. The following procedures should be used for the proper mooring of the airplane:

a. Head the airplane into the wind, if possible.
b. Retract the flaps.
c. Immobilize the ailerons and stabilator by looping the seat belt through the control wheel and pulling it snug.
d. Block the wheels.
e. Secure tie-down ropes to the wing tie-down rings and to the tail skid at approximately 45 degree angles to the ground. When using rope of non-synthetic material, leave sufficient slack to avoid damage to the airplane should the ropes contract.

CAUTION

Use bowline knots, square knots, or locked slip knots. Do not use plain slip knots.

NOTE

Additional preparations for high winds include using tie-down ropes from the landing gear forks and securing the rudder.

f. Install a pitot head cover if one is available. Be sure to remove the pitot head cover before flight.
g. Cabin and baggage doors should be locked when the airplane is unattended.

CLEANING

CLEANING ENGINE COMPARTMENTS

Before cleaning an engine compartment, place a strip of tape over the magneto vents to prevent any solvent from entering these units.

a. Place a large pan under the engine to catch waste.
b. With the engine cowling removed, spray or brush the engine with solvent or a mixture of solvent and degreaser. In order to remove especially heavy dirt and grease deposits, it may be necessary to brush areas that were sprayed.

CAUTION

Do not spray solvent into the alternator, pressure pump, starter, air intakes, or alternate air inlets.

c. Allow the solvent to remain on the engine from five to ten minutes. Then rinse the engine clean with additional solvent and allow it to dry.

CAUTION

Do not operate the engines until excess solvent has evaporated or otherwise been removed.

d. Remove the protective tape from the magnetos.
e. Lubricate the controls, bearing surfaces, etc., in accordance with the Lubrication Chart in the **PA-34-200T Service Manual.**

CLEANING LANDING GEAR

Before cleaning the landing gear, place a cover of plastic or a similar waterproof material over the wheel and brake assembly.

a. Place a pan under the gear to catch waste.
b. Spray or brush the gear area with solvent or a mixture of solvent and degreaser. In order to remove especially heavy dirt and grease deposits, it may be necessary to brush areas that were sprayed.

CAUTION

Do not brush the micro switches.

c. Allow the solvent to remain on the gear from five to ten minutes. Then rinse the gear with additional solvent and allow it to dry.
d. Remove the cover from the wheel and remove the catch pan.
e. Lubricate the gear in accordance with the Lubrication Chart in the **PA-34-200T Service Manual.**

CLEANING EXTERIOR SURFACES

The airplane should be washed with a mild soap and water. Harsh abrasives or alkaline soaps or detergents could make scratches on painted or plastic surfaces or could cause corrosion of metal. Cover areas where cleaning solution could cause damage. To wash the airplane, use the following procedure:

a. Flush away loose dirt with water.
b. Apply cleaning solution with a sponge, a soft cloth, or a soft bristle brush.
c. To remove exhaust stains, allow the solution to remain on the surface longer.
d. To remove stubborn oil and grease stains use a cloth dampened with naphtha.
e. Rinse all surfaces thoroughly.
f. Any good automotive wax may be used to protect and preserve painted surfaces. Soft cleaning cloths or a chamois should be used to prevent scratches when cleaning or polishing. A heavier coating of wax on the leading surfaces will reduce the abrasion problems in these areas.

CLEANING DEICING EQUIPMENT*

Clean the deicer boots when the airplane is washed, using a mild soap and water solution. Boots should be waxed or coated with one of several available boot care products for proper operation in icing conditions.

In cold weather, wash the boots while the airplane is in a warm hangar if possible. If the cleaning is to be done outdoors, heat the soap and water solution before taking it to the airplane. If difficulty is encountered with water freezing on the boots, use a portable type ground heater to direct a blast of warm air along the area being cleaned.

Cleaning the boots with petroleum products such as benzol or nonleaded gasoline is not recommended, since such products are injurious to rubber. If such solvents are employed, they should be used sparingly and wiped off the surface with a clean dry cloth before the cleaner has time to soak into the rubber.

CLEANING WINDSHIELD AND WINDOWS

A certain amount of care is needed to keep the windows clean and unmarred. The following procedure is recommended:

a. Remove dirt, mud, and other loose particles from exterior surfaces with clean water.
b. Wash with mild soap and clean water or with aircraft plastic cleaner. Use a soft cloth or sponge in a straight back and forth motion. Do not rub harshly.
c. Remove oil or grease with a cloth moistened with kerosene.

CAUTION

Do not use gasoline, alcohol, benzene, carbon tetrachoride, thinner, acetone, or window cleaning sprays.

d. After cleaning plastic surfaces, apply a thin coat of hard polishing wax. Rub lightly with a soft cloth. Do not use a circular motion.
e. A severe scratch or mar in plastic can be removed by rubbing out the scratch with jeweler's rouge. Smooth both sides and apply wax.

CLEANING HEADLINER, SIDE PANELS AND SEATS

a. Clean headliner, side panels and seats with a whisk broom, dusting cloth, or a vacuum cleaner.
b. Soiled upholstery may be cleaned with a good upholstery cleaner suitable for the material. Carefully follow the manufacturer's instructions. Avoid soaking or harsh rubbing.

CAUTION

Solvent cleaners require adequate ventilation.

*Optional equipment

CLEANING CARPETS

To clean carpets, first remove loose dirt with a vacuum or a whisk broom. For soiled spots and stubborn stains use a noninflammable dry cleaning fluid. Floor carpets may be removed and cleaned like any household carpet.

POWER PLANT INDUCTION AIR FILTERS

The induction air filters must be cleaned at least once every 50 hours. Depending on the type of condition existing, it may be necessary to clean the filters more often.

REMOVAL OF INDUCTION AIR FILTER

a. Remove the right hand section of the cowling to gain access to the air filter box.
b. Turn the four studs and remove the air filter box cover.
c. Lift the air filter from the filter box.

CLEANING INDUCTION AIR FILTER

a. Tap filter gently to remove dirt particles. Do not use compressed air or cleaning solvents.
b. Inspect filter. If paper element is torn or ruptured or gasket is damaged, the filter should be replaced. The usable life of the filter should be restricted to one year or 500 hours, whichever comes first.

INSTALLATION OF INDUCTION AIR FILTER

a. Place filter in air box and install cover.
b. Secure cover by turning studs. Replace cowl.

BRAKE SERVICE

The brake system is filled with MIL-H-5606 (petroleum base) hydraulic brake fluid. This should be checked periodically or at every 50-hour inspection and replenished when necessary. The brake reservoir is located to the rear of the front baggage compartment. Remove the access panel marked "Brake Reservoir Behind" located at the top rear of the compartment. Keep the fluid level at the level marked on the reservoir.

No adjustment of brake clearance is necessary. Refer to the **PA-34-200T Service Manual** for brake lining replacment instructions.

LANDING GEAR SERVICE

Two jack points are provided for jacking the aircraft for servicing. One is located outboard of each main landing gear and one just aft of the nose gear. Before jacking, attach a tail support to the tail skid. Approximately 500 pounds of ballast should be placed on the tail support.

CAUTION

Be sure to apply sufficient support ballast; otherwise the airplane may tip forward, and the nose section could be damaged.

Landing gear oleos should be serviced according to instruction on the units. Under normal static load (empty weight of airplane plus full fuel and oil), main oleo struts should be exposed three and one half inches and the nose oleo strut should be exposed two and one half inches. Refer to **PA-34-200T Service Manual** for complete information on servicing oleo struts.

PROPELLER SERVICE

The gas charge in the propeller cylinder should be kept at the pressure specified on the placard located in the spinner cap. The pressure in the cylinder will increase about one-third psi for every degree Fahrenheit increase in temperature. This effect should be considered when checking pressure. The charge maintained must be accurate and free of excessive moisture since moisture may freeze the piston during cold weather. Dry nitrogen gas is recommended.

CHAMBER PRESSURE REQUIREMENTS
WITH TEMPERATURE FOR COUNTERWEIGHT TYPE PROPELLERS

Temp. ° F	Press. (psi)	Temp. ° F	Press. (psi)
100	86	30	72
90	84	20	70
80	82	10	68
70	80	0	66
60	78	-10	64
50	76	-20	62
40	74	-30	60
NOTE: Do not check pressure or charge with propeller in feather position.			

The spinner and backing plate should be cleaned and inspected for cracks frequently. Before each flight the propeller should be inspected for nicks, scratches, or corrosion. If found, they should be repaired as soon as possible by a rated mechanic, since a nick or scratch causes an area of increased stress which can lead to serious cracks or the loss of a propeller tip. The back face of the blades should be painted when necessary with flat black paint to retard glare. To prevent corrosion, all surfaces should be cleaned and waxed periodically.

OIL REQUIREMENTS

The oil capacity of the Teledyne Continental engines is 8 quarts per engine with a minimum safe quantity of 3 quarts per engine. It is recommended that oil be added if the quantity falls to 6 quarts. It is recommended that engine oil be drained and renewed every 100 hours, or sooner under unfavorable conditions. Full flow cartridge type oil filters should be replaced each 50 hours of operation. The following grades are required for temperatures:

Temperatures above 60° F	S.A.E. 50
Temperatures between 30° F and 90° F	S.A.E. 40
Temperatures between 0° F and 70° F	S.A.E. 30
Temperatures below 10° F	S.A.E. 20

FUEL SYSTEM

SERVICING FUEL SYSTEM

The fuel screens in the strainers require cleaning at 50 hour or 90 day intervals, whichever occurs first. The fuel gascolator strainers are located in the wing between the fuel selector valves and the auxiliary pumps in the nacelles. The fuel injector screen is located in the housing where the fuel inlet line connects to the injector. This screen should be cleaned every 50 hours of operation.

FUEL REQUIREMENTS

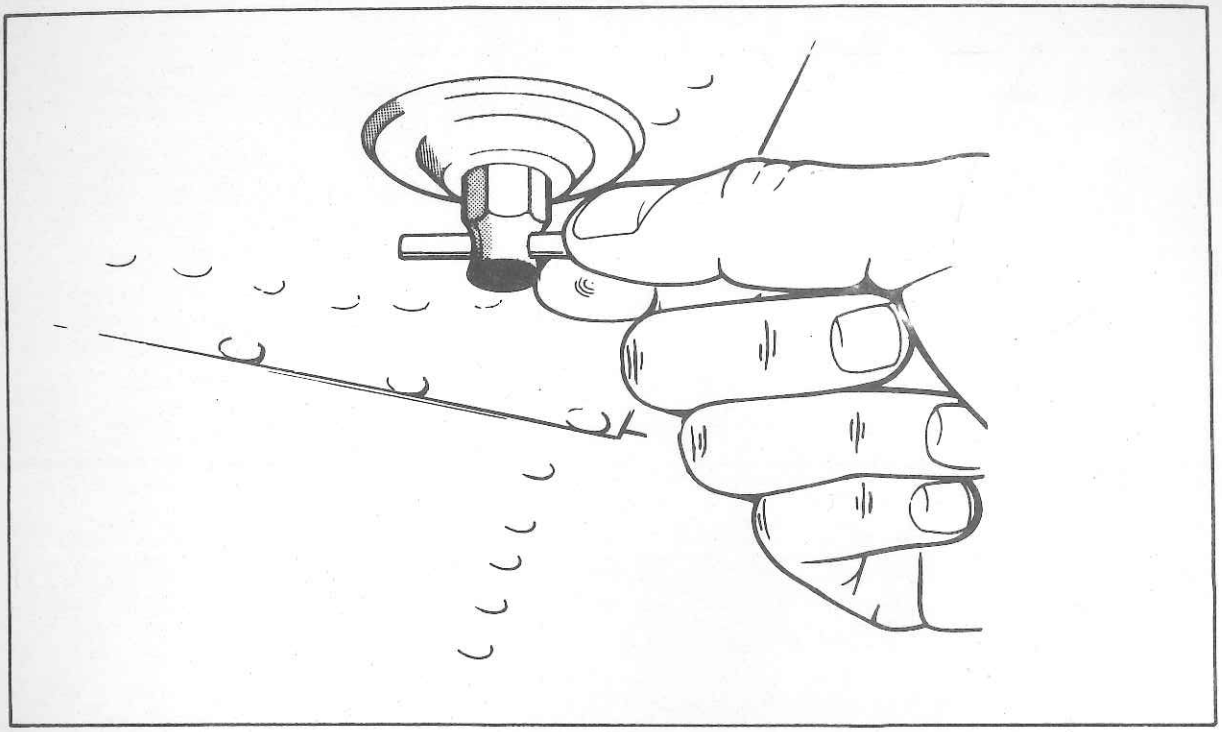
A minimum octane of 100/130 Aviation Grade fuel (light green) must be used in the Seneca II. Since the use of lower grades of fuel can cause serious damage in a short period of time, the engine warranty is invalidated by use of lower octanes.

FILLING FUEL TANKS

Observe all required precautions for handling gasoline. Fill the fuel tanks to the bottom of the filler neck with 100/130 octane fuel. Each wing holds a maximum of 49 gallons, giving a total of 98 gallons of fuel. With optional fuel tanks installed, the total fuel capacity is increased to 128 gallons.

DRAINING FUEL VALVES AND LINES

Each gascolator strainer is provided with a quick drain which should be drained before the first flight of the day or after refueling, to check for fuel contamination. If contamination is found, fuel should be drained until the contamination stops. If contamination persists after draining fuel for a minute, contact a mechanic to check the fuel system.



Fuel Drain

Each fuel tank is provided with a fuel quick drain to check for contamination. Each tank should be checked for contamination in accordance with the above procedure. Crossfeed drains are located on the bottom of the fuselage inboard of the right flap. The fuel drained at each quick drain should be collected in a transparent container and examined for contamination.

CAUTION

When draining fuel, be sure that no fire hazard exists before starting the engines.

DRAINING FUEL SYSTEM

The bulk of the fuel may be drained either by opening the valve at the inboard end of each tank or by siphoning. The remaining fuel in the lines may be drained through the gascolators and the two drains located on the bottom of the fuselage, inboard of the right flap.

CAUTION

Whenever the fuel system is completely drained and fuel is replenished it will be necessary to run the engine for a minimum of 3 minutes at 1000 rpm on each tank to ensure no air exists in the fuel supply lines.

TIRE INFLATION

For maximum service from the tires, keep them inflated to the proper pressures. The main gear tires should be inflated to 55 psi and the nose gear should be inflated to 31 psi.

Interchange the tires on the main wheels if necessary to produce even wear. All wheels and tires are balanced before original installation, and the relationship of the tire, tube, and wheel should be maintained if at all possible. Unbalanced wheels can cause extreme vibration on takeoff. In the installation of new components, it may be necessary to rebalance the wheel with the tire mounted.

When checking the pressure, examine the tires for wear, cuts, bruises, and slippage.

BATTERY SERVICE

Access to the 12-volt 35 ampere hour battery is gained through the nose baggage compartment. It is located under the floor panel of the nose baggage compartment. The battery container has a plastic drain tube which is normally closed off. This tube should be opened occasionally to drain off any accumulation of liquid.

The battery fluid level must not be brought above the baffle plates. It should be checked every 30 days to determine that the fluid level is proper and the connections are tight and free of corrosion. DO NOT fill the battery above the baffle plates. DO NOT fill the battery with acid - use distilled water only. A hydrometer check will determine the percent of charge in the battery.

If the battery is not properly charged, recharge it starting with a rate of 4 amperes and finishing with a rate of 2 amperes. Quick charges are not recommended.

The external power receptable, if installed, is located on the left side of the nose section. Be sure that master switch is off while inserting or removing a plug at this receptacle.

Refer to the **PA-34-200T Service Manual** for detailed procedures for cleaning and servicing the battery.

SERIAL NUMBER PLATES

The serial number plate is located on the left side of the fuselage near the leading edge of the stabilator. The serial number should always be used when referring to the airplane on service or warranty matters.

LUBRICATION

Lubrication at regular intervals is an essential part of the maintenance of an airplane. For lubrication instructions and a chart showing lubrication points, types of lubricants to be used, lubrication methods and recommended frequencies, refer to the **PA-34-200T Service Manual.**

WINTERIZATION

In winter operation a winterization kit is installed on the inlet opening of the oil cooler outboard chamber of the plenum chamber. This kit should be installed whenever ambient temperature is 50°F or less. When the kit is not being used it can be stowed in the nose cone compartment, left hand side, forward of the door, using the strap provided.

FACTS YOU SHOULD KNOW

The Federal Aviation Administration (FAA) occasionally publishes **Airworthiness Directives (ADs)** that apply to specific groups of aircraft. They are mandatory changes and are to be complied with within a time limit set by the FAA. When an AD is issued, it is sent to the latest registered owner of the affected aircraft and also to subscribers of the service. The owner should periodically check with his Piper dealer or A & P mechanic to see whether he has the latest issued AD against his aircraft.

Piper Aircraft Corporation takes a **continuing interest** in having the owner get the most efficient use from his aircraft and keeping it in the best mechanical condition. Consequently, Piper Aircraft from time to time issues Service Bulletins, Service Letters and Service Spares Letters relating to the aircraft.

Service Bulletins are of special importance and should be complied with promptly. These are sent to the latest registered owners, distributors and dealers. Depending on the nature of the bulletin, material and labor allowances are usually applicable.

Service Letters deal with product improvements and service hints pertaining to the aircraft. They are sent to dealers and distributors so they can properly service the aircraft and keep it up to date with the latest changes. Owners should give careful attention to the Service Letter information.

Service Spares Letters offer improved parts, kits and optional equipment which were not available originally and which may be of interest to the owner.

If an owner is not having his aircraft serviced by an **Authorized Piper Service Center**, he should periodically check with a Piper dealer or distributor to find out the latest information to keep his aircraft up to date.

Piper Aircraft Corporation has a **Subscription Service** for the Service Bulletins, Service Letters and Service Spares Letters. This service is offered to interested persons such as owners, pilots and mechanics at a nominal fee, and may be obtained through Piper dealers and distributors. A Service Manual and revisions are available from a Piper dealer.

Pilot's Operating Manual supplements are distributed by the manufacturer as necessary. These revisions and additions should be studied and put into the operating manual to keep it up to date. This manual contains important information about the operation of the aircraft and should be kept with the aircraft at all times, even after resale. Every owner, to avail himself of the Piper Aircraft Service Back-Up, should stay in close contact with his Piper dealer or distributor so that he can receive the latest information.

If the owner desires to have his aircraft modified, he must obtain FAA approval for the alteration. **Major alterations** accomplished in accordance with Advisory Circular 43.13-2, when performed by an A & P mechanic, may be approved by the local FAA office. Major alterations to the basic airframe or systems not covered by AC 43.13-2 require a Supplemental Type Certificate.

The owner or pilot is required to ascertain that the following Aircraft Papers are in order and in the aircraft.

a. To be displayed in the aircraft at all times:
   1. Aircraft Airworthiness Certificate Form FAA-1362B.
   2. Aircraft Registration Certificate Form FAA-500A.
   3. Aircraft Radio Station License Form FCC-404A, if transmitters are installed.

b. To be carried in the aircraft at all times:
   1. Aircraft Flight Manual.
   2. Weight and Balance data plus a copy of the latest Repair and Alteration Form FAA-337, if applicable.
   3. Aircraft equipment list.

Although the aircraft and engine log books are not required to be in the aircraft, they should be made available upon request. Log books should be complete and up to date. Good records will reduce maintenance cost by giving the mechanic information about what has or has not been accomplished.

PREVENTIVE MAINTENANCE

The holder of a Pilot Certificate issued under FAR Part 61 may perform certain preventive maintenance described in FAR Part 43. This maintenance may be performed only on an aircraft which the pilot owns or operates and which is not used in air carrier service. The following is a list of the maintenance which the pilot may perform:

1. Repair or change tires and tubes.
2. Service landing gear wheel bearings, such as cleaning, greasing or replacing.
3. Service landing gear shock struts by adding air, oil or both.
4. Replace defective safety wire and cotter keys.
5. Lubrication not requiring disassembly other than removal of non-structural items such as cover plates, cowling or fairings.
6. Replenish hydraulic fluid in the hydraulic reservoirs.
7. Refinish the exterior or interior of the aircraft (excluding balanced control surfaces) when removal or disassembly of any primary structure or operating system is not required.
8. Replace side windows and safety belts.
9. Replace seats or seat parts with replacement parts approved for the aircraft.
10. Replace bulbs, reflectors and lenses of position and landing lights.
11. Replace cowling not requiring removal of the propeller.
12. Replace, clean or set spark plug clearance.
13. Replace any hose connection, except hydraulic connections, with replacement hoses.
14. Replace pre-fabricated fuel lines.
15. Replace the battery and check fluid level and specific gravity.

Although the above work is allowed by law, each individual should make a self analysis as to whether he has the ability to perform the work. A Service Manual may be purchased for guidance in the performance of preventive maintenance.

If the above work is accomplished, an entry must be made in the appropriate log book. The entry should contain:

1. The date the work was accomplished.
2. Description of the work.
3. Number of hours on the aircraft.
4. The certificate number of pilot performing the work.
5. Signature of the individual doing the work.

REQUIRED SERVICE AND INSPECTION PERIODS

Piper Aircraft Corporation provides for the initial and first 50-hour inspection, at no charge to the owner. The **Owner Service Agreement** which the owner receives upon delivery of the aircraft should be kept in the aircraft at all times. This identifies him to authorized Piper dealers and entitles the owner to receive service in accordance with the regular service agreement terms. This agreement also entitles the transient owner full warranty by any Piper dealer in the world.

One hundred hour inspections are required by law if the aircraft is used commercially. Otherwise this inspection is left to the discretion of the owner. This inspection is a complete check of the aircraft and its systems, and should be accomplished by a Piper Authorized Service Center or by a qualified aircraft and power plant mechanic who owns or works for a reputable repair shop. The inspection is listed, in detail, in the inspection report of the appropriate Service Manual.

An **annual inspection** is required once a year to keep the Airworthiness Certificate in effect. It is the same as a 100-hour inspection except that it must be signed by an Inspection Authorized (IA) mechanic or a General Aviation District Office (GADO) representative. This inspection is required whether the aircraft is operated commercially or for pleasure.

A **Progressive Maintenance** program is approved by the FAA and is available to the owner. It involves routine and detailed inspections at 50-hour intervals. The purpose of the program is to allow maximum utilization of the aircraft, to reduce maintenance inspection cost and to maintain a maximum standard of continuous airworthiness. Complete details are available from Piper dealers.

A **spectographic** analysis of the oil is available from several sources. This system, if used intelligently, provides a good check of the internal condition of the engine. For this system to be accurate, oil samples must be sent in at regular intervals, and induction air filters must be cleaned or changed regularly.