

## APPENDIX A LIGHT SOURCE

### GASOLINE LANTERN

One source of artificial light for the field kitchen is the gasoline lantern (NSN 6260-00-170-0430). It is a one-mantle lantern with a heat-resistant globe or globe quadrants. It will hold 1 1/2 pints of gasoline. The lantern can stay lighted for 8 to 10

hours on a full tank. The lantern can be carried or hung by the bail. The main parts of the lantern (Figures A-1, and A-2, page A-2) are the mantle, burner assembly, frame assembly, fuel valve and pump assembly.

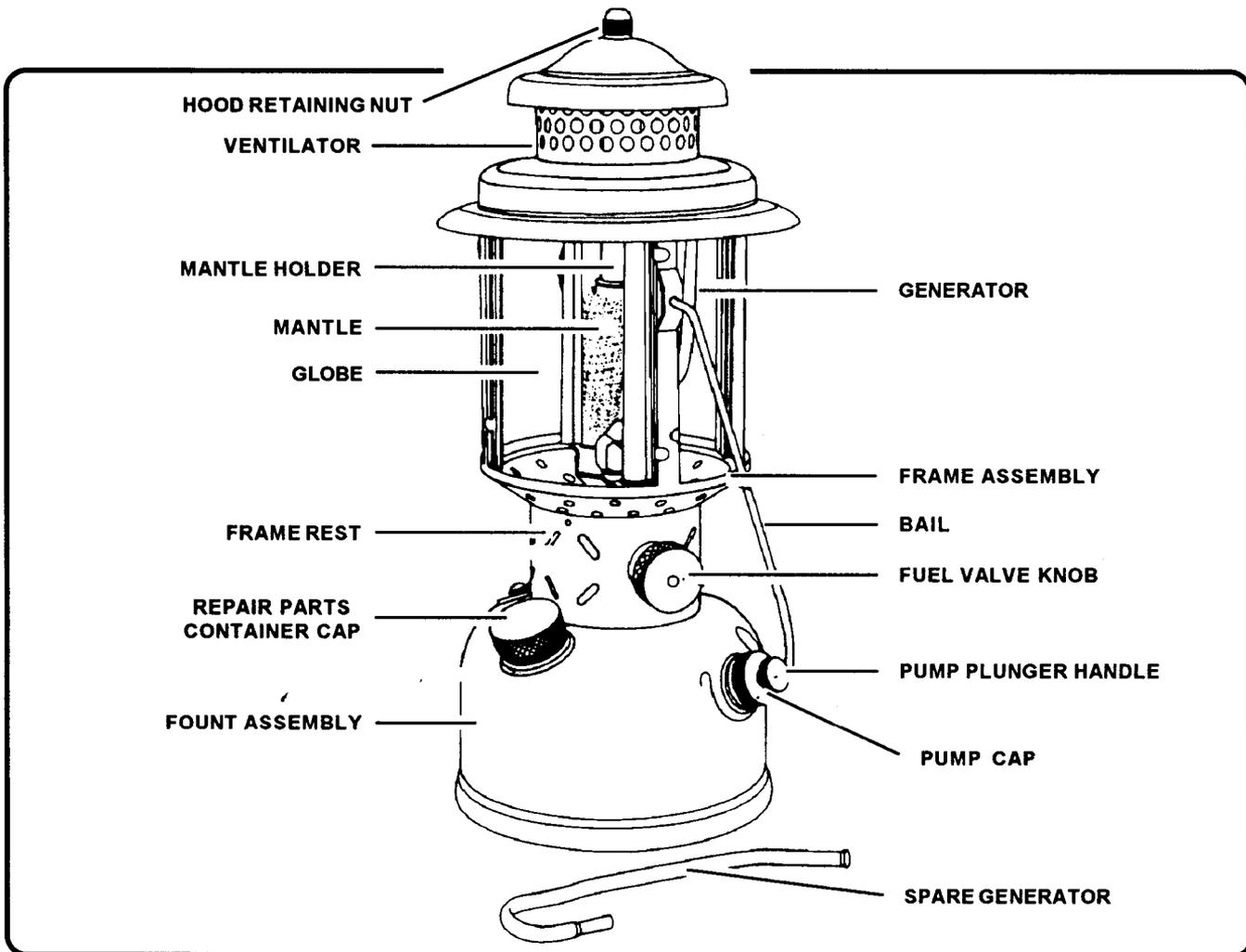


Figure A-1. Front view of gasoline lantern

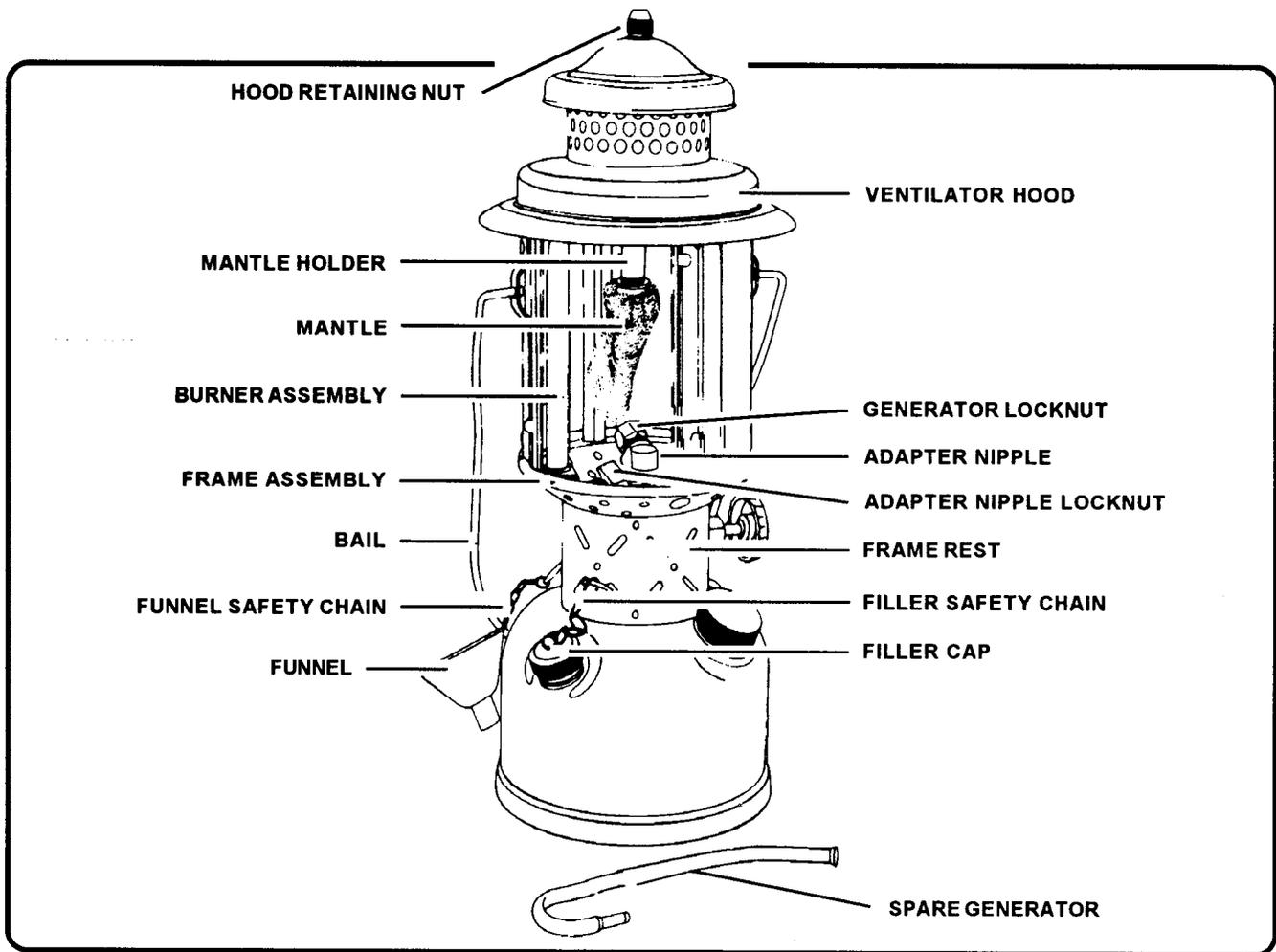


Figure A-2. Rear view of gasoline lantern

### Mantle

The mantle is a piece of rayon that acts as a wick. It must be handled carefully as jarring it or jabbing it with the finger or a match will break it. An excessive flow of gas vapor will also break it. (Usually this happens when you light the lantern.)

### Burner Assembly

The burner assembly mixes the fuel and air to start the combustion. One end of the fork-shaped burner tube is open. It serves as an air intake passage. When the generator is attached, the assembly is known as the burner-generator.

### Frame Assembly

The frame assembly is mounted on top of the frame rest. It is made up of the frame bars and frame bail bars which hold the globe quadrants in the lantern. The lighter hole is in the frame assembly.

### Fuel Valve

The fuel valve controls the flow of fuel from the lantern found to the generator. To open the valve, turn the knob counterclockwise. To close it, turn the knob clockwise. Most of the time the lantern is used with the fuel valve open all the way.

### Pump Assembly

The pump assembly (Figure A-3) is made up of the pump leather, cushion spring, plunger, and pump barrel. The pump barrel is built into the fount. The pump leather, cushion spring, and plunger are inside the pump barrel. The pump assembly builds up and keeps the necessary operating pressure on the fuel in the fount.

### FORMS AND REPORTS

The person who uses and maintains the gasoline lantern must complete various forms and reports. The forms and their uses are listed below.

#### DA Form 285

Complete this form if there is an accident with the lantern.

#### DA Form 2404

Use this form to record any shortcomings or deficiencies when the lantern is inspected.

#### DA Form 2407

Fill this form out to request maintenance from a direct support activity.

#### DD Form 314

Use this form to schedule and record regular inspection and services.

### SF 368

Fill out this form when a lantern is defective.

### RECEIPT OF THE LANTERN

You may receive used or new lanterns. If you receive a lantern that has defects or does not work properly, use SF 368 to return it to the source of supply. Follow these procedures when you receive a lantern.

### Uncrate

Open the carrying case and take out the extra generators from the upper tray of the case. Take out the upper tray and lift the lantern out of the carrying case. Be careful not to damage the globe.

### Remove Packaging

Take all seals, preservatives, masking tape and cushioning from around the lantern and extra generators. Take the special tools and repair parts from the repair parts compartment of the lantern (Figure A-1, page A-1) and from the wrapped box.

### Inspect

Inspect the new or used lanterns as follows:

**New lanterns.** Check the lantern for possible damage incurred in shipping or uncrating. Make sure that all parts are attached securely and assembled correctly. Check the tools and repair parts with the list of functional parts included.

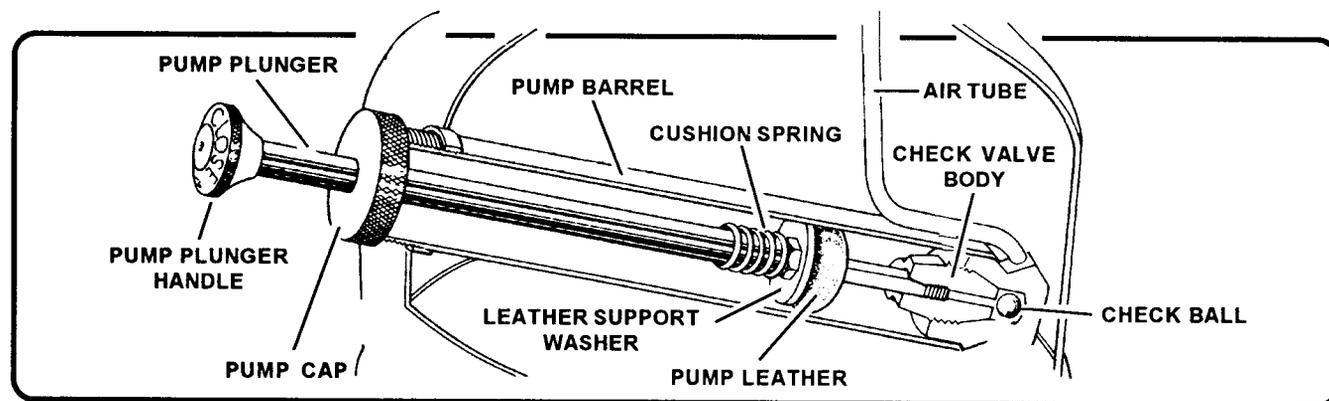


Figure A-3. Cutaway view of the pump assembly

**Used lanterns.** Check the globe for cracks, chips, or broken edges. Check the pump leather to be sure it is properly mounted and lubricated. Check the fuel valve assembly and the pump assembly for proper operation. Check all openings in the ventilator hood and the burner tubes to make sure they are clean and free of foreign matter. Make sure the fount is clean.

### Maintain and Test

When you receive a used lantern, you must perform before-operation services as outlined in the following paragraph. Also, fill the fount with gasoline and light the lantern to test it for proper operation.

#### BEFORE-OPERATION SERVICE

Before-operation service is primarily an inspection to make sure no one has tampered with the lantern since the last after-operation service. When you complete the service, report the findings to your supervisor. You should—

- Inspect the lantern for loose, damaged, or missing parts.
- Make sure the lantern is always placed where there is the least danger of damage from moisture, dust, or corrosion.
- Clean the lantern.
- Make sure the ventilator hood openings are clear.
- Make sure that the pump leather is properly lubricated and in good condition.
- Make sure the filler cap gasket is on and in good condition.
- Make sure that the fuel valve, pump plunger, and check valve are in good working condition.
- Tighten all nuts and caps finger tight.
- Make sure the generator is in good condition, dry and clear of dirt.

#### SAFETY

Gasoline is a very dangerous fuel. Death or severe burns may result if you fail to observe safety

precautions. To prevent injuries and fires, follow these safety rules when you use the lantern:

- Keep the lantern away from flammable material.
- Take off the protective cap that covers the tip and take out the screw in the flared end before you install a new generator.
- Tighten the generator locknut finger tight first. Then tighten it with the special wrench that comes with the lantern.
- Hold the lantern upright while you tighten the locknut to keep from twisting the generator out of shape.
- Pump the fount no more than 15 to 25 full strokes before you light the lantern.
- Carry the lantern upright to keep the mantle vertical.
- Keep the lantern in the cardboard carrying case when you move or store it. Do not jar the lantern. Cushion it with cloth, old inner tubes, or some other soft material when you have no case and must move it in a vehicle.
- Make sure there is good ventilation when you use the lantern.
- Keep a good gasket in the filler cap for a tight seal.
- Do not fill the lantern near an open flame.
- Take the globe or globe quadrants off before you light the lantern in an enclosed area.
- Do not let unburned vapor and air accumulate. They form an explosive mixture.
- Keep the lantern upright when you light it.
- Do not release pressure when the lantern is lighted or near an open flame. Let the lantern cool before you release pressure.
- Allow lantern to cool before releasing pressure and adding fuel.

#### OPERATION

Before you light the lantern, you must install the mantle and fill it. You must also service the lantern during operation and shut it off when you are finished with it. The steps you must

follow to operate, service, and shut off the lantern are discussed below.

### **Install the Mantle**

Follow the steps below to install the mantle:

- Unscrew the hood retaining nut on the top of the lantern. Remove the ventilator hood and globe from the frame of the lantern.
- Take off any remnants of the old mantle or string which may be attached to the mantle holder.
- Slip a new mantle over the end of the mantle holder. Distribute the mantle fabric evenly about the mantle holder so that the mantle touches no part of the lantern except at the point where it is attached.
- Tighten the drawstring firmly to the groove in the mantle holder and wrap it around itself one time. Tie the drawstring with a square knot. Cut off the excess string.
- Unscrew the filler cap partially from the lantern to release any pressure in the fount. Apply a match flame to the bottom of the mantle. Let the mantle burn until the rayon is burned off and only the white ash is left.
- Install the globe, ventilator hood, and hood retaining nut. After the mantle has burned, allow it to cool for two or three minutes. Tighten the filler cap finger tight.

### **Fill the Lantern**

Follow the steps below to fill the lantern:

- Unscrew the filler cap. Make sure that the gasket is on and in good condition.
- Make sure the lantern is cool before adding fuel.
- Turn the valve fully clockwise to close the fuel valve.
- Strain the gasoline through a clean cloth or a fine mesh strainer, if possible. Use a funnel and fill the fount with gasoline to about three-fourths full. (Leave space for air.)
- Put on the filler cap and tighten it. Do not use a wrench or pliers to tighten the cap.

### **Light the Lantern**

Follow the steps below to light the lantern:

- Let out any pressure in the fount by partially unscrewing the gasoline filler cap. When the air has been let out through the drilled hole in the edge of the filler cap, tighten the filler cap finger-tight.
- Make sure that the fuel valve is closed. Turn the pump plunger handle counterclockwise two full turns to open the air-check valve inside the pump barrel.
- Pump 15 to 25 full strokes into the fount to build up the air pressure. Hold your thumb firmly over the small hole in the end of the pump plunger handle on the downstroke. Lift your thumb on the upstroke.
- Push the pump plunger handle down as far as it will go so that the plunger returns to its normal place inside the pump barrel.
- Close the air-check valve by turning the plunger handle fully clockwise. Tighten the valve firmly with your fingers.
- Hold a lighted match under the mantle. If a globe is mounted on the lantern, put a lighted match through the large opening in the frame. When the lighted match is under the mantle, turn the fuel valve one-quarter turn counterclockwise to open the valve slightly. The mantle should light as soon as the gas vapor reaches it, which may take 15 seconds.
- After the mantle starts burning brightly, gradually open the fuel valve as far as possible, about three full turns counterclockwise.
- Pump several strokes to build the pressure if the light dims. You need to build up fuel pressure to keep the light bright.

### **Service the Lantern During Operation**

During operation, watch the lantern while it is lighted and check for signs of trouble. Stop using the lantern right away if you see something that may damage the equipment. Table A-1,

page A-7, is a troubleshooting chart you can use. Also, you should do the following:

- Check to make sure that the ventilator hood openings are clear.
- Visually inspect the lantern for loose, damaged, or broken parts.
- Keep the lantern away from flammable material.

### **Shut Off the Lantern**

When you shut off the lantern, follow the procedures below.

- Turn the fuel valve clockwise as far as it will go.
- Wait for the mantle to cool before you try to relight it.
- Let out the pressure on the fuel by partially unscrewing the gasoline filler cap. When the air has been let out through the drilled hole in the edge of the filler cap, retighten the filler cap finger tight.

### **AFTER-OPERATION SERVICE**

Service the lantern as soon as you finish using it. Inspect it for problems that may have developed while the lantern was being used. Correct the problems identified in the user maintenance paragraph. Also, follow the procedures given below:

- Clean the lantern.
- Make sure that the pump leather is properly lubricated and in good working condition.
- Inspect the lantern for loose, damaged, or broken parts.
- Make sure the filler cap gasket is on and in good condition.
- Make sure the fuel valve, pump plunger and check valve are working properly.
- Tighten all nuts and caps finger tight.
- Inspect the generator to see that it is in good condition, dry and clear of dirt.
- See that the lantern tools are in serviceable condition and that they are clean and stored properly.
- Store the lantern where there is the least danger of damage from moisture, dust or corrosion.

## **USER MAINTENANCE**

The user must keep the lantern in good working condition. You must maintain the pump plunger, pump leather, the burner assembly, the globe quadrant, the generator and the fuel valve. Maintenance of these components is discussed below.

### **Pump Plunger**

Replace the pump plunger (shown in Figure A-3, page A-3) when it is worn or defective. Follow the procedures below to replace the pump plunger.

- Unscrew the pump cap from its connection at the fount assembly and draw the plunger out from the pump barrel.
- Install the new pump plunger with the pump leather attached into the pump barrel. Make sure that the square chamber in the center of the plunger is keyed onto the air stem (square shaft).
- Push the plunger into the barrel as far as it will go and tighten the pump cap finger tight.

### **Pump Leather**

If the pump leather is cracked or brittle, place a few drops of light oil on it. If oil fails to soften the leather, replace it as described below.

- Tighten, finger tight, the pump plunger handle clockwise.
- Unscrew the pump cap from its connection at the fount and draw the pump plunger from the pump barrel.
- Unscrew the retaining nut from the end of the pump plunger and lift off the lower washer.
- Take off the damaged pump leather from the pump plunger and install the new pump leather.
- Replace the leather support washer and the retaining nut on the end of the pump plunger. Tighten the nut firmly. Place a few drops of light oil on the pump leather and knead the oil into the leather with your fingers.
- Insert the pump plunger into the pump barrel. Slide the plunger forward until the pump cap rests on the connection on the fount. Tighten the pump cap securely.

Table A-1. Troubleshooting chart for gasoline lanterns

PROBLEM	CAUSE	REMEDY
Dim light	Low air pressure Lack of fuel Generator tip clogged Generator tube clogged Burner tube clogged	Build up pressure Refill fount Clean tip Replace generator Clean out deposits
Loss of air pressure	Air check valve leak, check ball stuck Leak between fuel valve and fount Leak between fuel valve and adapter nipple Leak at generator locknut Leak at fillercap	Place a few drops of penetrating oil on check ball Tighten valve in fount Tighten adapter nipple Tighten locknut Tighten fillercap or replace fillercap gasket
Mantle burns yellow flame	Clogged burner tube	Clean tube or replace burner assembly
Unable to pressurize fount	Dry pump leather	Oil or replace pump leather

### Burner Assembly

The burner assembly gets clogged at times. This causes the lantern to burn with a dim, yellow flame. When this happens, the open, fork-shaped tube must be cleaned. To clean the burner assembly, follow the steps below.

- Take off the hood retaining nut (Figure A-1, page A-1) that holds the ventilator hood to the burner assembly and lift the hood off the burner assembly stud.
- Lift the globe from the frame assembly.
- Unscrew the locknut on the adapter nipple as far as the frame permits. Lift the burner assembly slightly until the square opening in the base fits the square portion of the adapter nipple.
- Unscrew the burner assembly by turning it counterclockwise. Do not apply pressure on the

two ends of the burner tube. Use the base of the burner assembly for leverage.

- Lift the burner assembly, with the generator attached, from the top of the fuel valve and out of the frame assembly.
- Unscrew the generator locknut that holds the generator to the adapter nipple. Lift the generator off the seat on the adapter nipple. Take the tip of the generator off from the top of the burner assembly.
- Clean the burner tube by inserting a soft wire up through the opening.
- Install the burner assembly by reversing the steps above.
- Light the lantern. If you still have trouble, replace the burner assembly.

## Globe Quadrant

The lantern may have either a single cylindrical globe or globe quadrants. If globe quadrants are broken or cracked, replace them. If a globe is broken or cracked, replace it with quadrants using the quadrant globe conversion kit. To replace any defective globe quadrants, follow the steps below.

- Take off the hood retaining nut and the ventilator hood.
- The damaged quadrants up and out of the channels.
- Clean all the quadrants with soapy water. Dry them with a clean, dry cloth.
- Slide the used or new quadrants down between the channels.
- Put on the ventilator hood and the hood retaining nut. Tighten the nut finger tight.

## Generator

As a rule, the generator will operate for 100 to 200 hours. Inspect it after 50 to 75 hours of operation and clean it if necessary. A gradual dimming of the lantern light usually means there is carbon in the generator or that there is a clogged tip. Normally only the generator tip will need cleaning. If the tube is badly clogged, install a new generator.

**Removal.** To remove the generator, follow the steps below.

- Unscrew the hood retaining nut and take off the ventilator hood and globe.
- Unscrew the generator locknut at the bottom of the generator with the special wrench that comes in the wrench assembly.
- Lift the generator from its seat on the adaptor nipple and slip the generator tip from the opening in the burner assembly. Slide the locknut over and off of the generator tip.

**Cleaning.** To clean the generator, follow the steps below.

- Unscrew the generator tip, using the special wrench that comes with the wrench assembly.

- Insert the pricker needle into the tiny hole at the front of the tip. Use care to keep from bending the needle. Blow through the tip from the back to remove carbon particles. Check to make sure that the tip is clean by looking through it toward a bright light. Screw the cleaned tip back on to the generator.

**Installation.** Reverse the steps in the removal procedure for the generator.

## Fuel Valve

If the fuel valve is not working correctly, follow the steps below.

**Test the fuel valve.** First, remove the generator. Make sure that pressure is in the fount. Then open the fuel valve one-fourth turn counterclockwise. Look at the opening at the top of the nipple when the fuel valve is working as it should. If you see no mist or vapor, open the fuel valve fully counterclockwise. If you see no mist or vapor with the valve fully opened, you should service or replace the valve.

**Replace the valve stem packing.** After extended use, the fuel valve stem packing on the lantern may shrink and cause a leak. To stop the leak, tighten the valve packing nut a few turns to hold the packing in firm contact with the valve stem. If this does not stop the leak, replace the packing according to the procedures below.

- Unscrew packing nut from connection on fuel valve body.
- Turn fuel valve knob counterclockwise as far as it will go and take out the valve stem.
- Remove knob screw that holds knob to stem and slip knob from valve stem.
- Slip packing nut off valve stem and slide off packing gland and packing.
- Slide new packing down against the retaining ring and put in the packing gland, packing nut and valve knob.
- Insert valve stem (assembled) into body of valve and turn valve knob clockwise as far as it

will go. Tighten packing nut on connection on valve body.

## UNIT MAINTENANCE

Operators must perform organizational maintenance on the gasoline lantern. Maintenance procedures for the burner-generator, the frame assembly, the globe and quadrant globe conversion kit, the fuel valve, the valve stem and the air-check valve are discussed below.

### Burner-Generator

If the burner-generator has been cleaned and still does not work properly, it must be replaced. Replace it as follows:

- Remove the hood retaining nut, hood and globe or globe quadrants. If the mantle is attached to the mantle holder, remove the mantle.
- Unscrew the locknut at the bottom of the generator. Lift the generator off the seat on the adapter nipple. Take off the top of the generator from the fuel-air mixing chamber on the burner assembly.
- Unscrew the locknut on the adapter nipple as far as the frame permits. Lift the burner assembly slightly until the square opening in the base fits the square opening portion of the adapter nipple.
- Unscrew the burner assembly by turning it counterclockwise. Do not apply pressure to the fork-shaped tube of the burner assembly. Use the base for leverage. Remove the burner assembly from the top of the fuel valve.
- Unscrew the locknut from the adapter nipple and remove the adapter nipple from the burner assembly.
- Take the preservative material from the new burner assembly. Examine the assembly for visible defects.
- Place the adapter nipple through the top opening in the burner frame and screw the locknut on the threaded end of the adapter nipple.
- Install the new burner assembly by reversing the steps for removing the burner.

### Frame Assembly

A bent or damaged frame may cause the globe or globe quadrants to break or to fit improperly or it may cause damage to other parts of the lantern. Replace the frame assembly as follows:

- Remove the hood retaining nut, hood and globe.
- Loosen the locknut on the adapter nipple and unscrew the adapter nipple from the top of the fuel valve. Lift the burner assembly from the frame assembly with the generator attached.
- Lift the frame assembly off the top of the frame rest.
- Install the new frame assembly by reversing steps for removing the assembly.

### Quadrant Globe Conversion Kit

If the single cylindrical globe is damaged, replace it with the quadrant globe conversion kit. The kit is made up of four globe channels and four globe quadrants. Install the kit as follows:

- Take off the hood retaining nut and hood. Lift the single cylindrical globe out of the frame assembly.
- Place the side of the channel which contains the tabs against the inside of the frame bars and frame bail bars.
- Crimp the tabs firmly around the frame bars and frame bail bars with pliers.
- Check all channels and tabs to make sure that they are mounted properly and securely.
- Place the globe quadrants into globe channels. Let them slide down and rest on the bottom of the frame assembly.
- Put on the ventilator hood and hood retaining nut after all quadrants have been placed. Tighten the nut finger tight.

### Fuel Valve

Follow the steps given on page A-8 to remove, service, and install the fuel valve. If the fuel valve has just been tested, skip this procedure.

### Valve Stem

Replace a worn or damaged valve stem as follows:

- Turn the valve knob counterclockwise as far as it will go.
- Remove the knob screw that holds the valve knob to the valve stem. Slide the knob off the stem.
- Unscrew the packing nut from the connection on the fuel valve body and slide the nut from the stem.
- Slide the valve stem from the fuel valve body.
- Slide the packing gland, packing and retainer ring from the valve stem.
- Remove the clamp ring from the valve stem.
- Install a new valve stem in the fuel valve by reversing the steps above.

### Air-Check Valve

Remove and service a worn or defective air-check valve as follows:

- Unscrew the pump cap from its connection and from the fount assembly. Draw the plunger out from the pump barrel.
- Unscrew the air stem (square shaft) from the air-check valve body. Remove the air stem from the pump barrel.

- Insert a screwdriver with a 1/2-inch blade down the pump barrel into the slotted opening of the air-check valve body. Turn the screwdriver counterclockwise until the air-check valve body is loose. Remove the air-check valve body from the pump barrel.

- Inspect the check ball in the air-check valve for proper operation. If the check ball is stuck, place a few drops of penetrating oil on the ball. This should loosen the ball.

- Install the air-check valve into the pump barrel. Tighten the valve securely.

- Insert the air stem into the pump barrel. Tighten the stem securely in the air-check valve.

- Install the pump plunger into the pump barrel. Make sure the square chamber in the center of the plunger is keyed onto the air stem. Push the plunger into the pump barrel as far as it will go and tighten the pump cap finger tight.

- Check the operation of the air-check valve. If air pressure is lost, remove the valve and install a new air-check valve.