

# HUDSON®

The World Standard of Value

PROFESSIONAL DIVISION

## SERVICING AND TROUBLESHOOTING HUDSON® X-PERT® SPRAYER

### DISEASE VECTOR CONTROL SPRAYERS

# HUDSON N

Leader in Worldwide Disease Vector Control

[www.hdHUDSON.com](http://www.hdHUDSON.com)

<http://www.hudsonpublichealth.org>

INSTRUCTION PART #: 21000

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described.

Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

REMINDER: Keep your dated proof of purchase for warranty purposes! Attach it to this manual or file it for safekeeping.

## **⚠ CAUTION**

Read, understand, and follow this Guide for troubleshooting and servicing your Hudson® X-Pert® sprayer carefully. The sprayer operates with liquid under pressure. Failure to follow the directions, understand the **PRECAUTIONS**, and abide by the instructions in this Guide may result in damage to the sprayer or any other component and may result damage to the sprayer or personal injury. **DO NOT** exceed the recommended pressure when testing the sprayer. Doing so may result in damage to the sprayer and cause **SERIOUS INJURY** from forcible ejection of parts or high pressure and personal or environmental contamination as the result of catastrophic, accidental discharge of its contents.

### **ALWAYS KEEP SPRAYER AND SPRAY MATERIALS OUT OF REACH OF CHILDREN.**

#### **IMPORTANT!**

Use only appropriate and genuine Hudson® replacement parts. Improper or after-market parts may not fit correctly and/or may be weakened by spray chemicals and fail under pressure, resulting in **SERIOUS INJURY** from forcible ejection of parts or high-pressure discharge of spray material.

**Inspect** the sprayer inside and out and all components thoroughly before each use. *Do not attempt to pressurize the sprayer* if the tank is damaged, rusted, punctured or corroded, or if the hose is loose, damaged, or excessively stiff or soft.

**⚠ WARNING** **Make sure** *the hose is securely attached to the tank before pressurizing the sprayer. A loosely connected hose can detach while the sprayer is under pressure and cause **SERIOUS INJURY** and/or personal or environmental contamination.*

**⚠ WARNING** **Do not use** *your Hudson® X-Pert® sprayer to apply caustic (alkalis) or corrosive (acids) materials, bleach, or ammonia. Many of these materials can produce a violent chemical reaction with the sprayer, can corrode metal parts, or weaken hose, gaskets, or other components.*

**ALWAYS** empty, clean, and drain both tank and hose immediately after each use following the Progressive Rinse Method and at the end of the work week following the “How to Clean” instructions in this pamphlet.

## **⚠ CAUTION**

Failure to maintain a clean sprayer can result in damage, corrosion, weakening, or bursting of some parts when sprayer is under pressure and may affect the sprayer's calibration.

**Always Pressurize** the sprayer by hand. The use of mechanical devices like air compressors is not recommended as they can rapidly generate excessive and dangerous pressure.

**Always** remember to release the sprayer's internal pressure before:

1. Removing the pump.
2. Removing the extension tube, nozzle cap or other parts.
3. Trying to unclog nozzle or discharge line.
4. Attempting to service the sprayer in any way.
5. Or if the sprayer must be left out in the sun or warm place for an extended period.

**Do not pump or pressurize** the sprayer with your head or body directly over pump.

**Remember:** The label of the material you are planning on spraying **IS the LAW**. Always read and understand the directions, safety precautions, signs of contamination, and first aid recommendations written specific for that material before pressurizing the sprayer. Some materials may not be suitable for use in this sprayer. Follow mixing, application, and safety recommendations as stated on the label. Be sure to follow and wear all recommended personal protection equipment (PPE) stated on the label.

### **HOW TO RELEASE SPRAYER'S INTERNAL PRESSURE**

The pressure relief valve (PRV) is located on the fill cover. Twist the top portion of the PRV to release pressure. Twist again to close and reseal the PRV.

### **⚠ WARNING**

#### **California Proposition 65**

*This product can expose you to chemicals, including lead and/or Di(2-ethylhexyl)phthalate (EDHP), which are chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov). Wash your hands after handling this product.*

# SERVICING YOUR HUDSON® X-PERT® SPRAYER

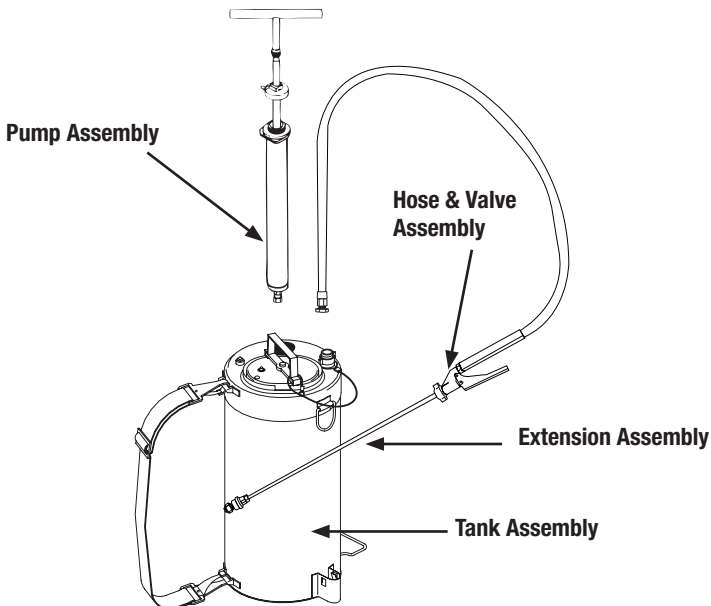
## How to use this Guide

The “Steps” in this Guide are designed to provide the user with clear directions to follow when servicing or troubleshooting a Hudson® X-Pert® sprayer. The directions are intended to be used by a trained technician or spray operator and are not meant as a substitute for proper training. Read and follow the instructions in each Step. When the Step is completed, proceed to the Step identified in the “GO TO Step X” at the end of each Step. If the text, explanation, or directions for that Step does not fit what you are examining, proceed to the next Step in the sequence.

Each sprayer should be marked with its own distinctive and sequential number. If not marked, do so. It will help you start a maintenance record and schedule on all sprayers in your inventory.

Numbers in the text refer to the numbers in the exploded diagrams above or below each Step unless otherwise stated.

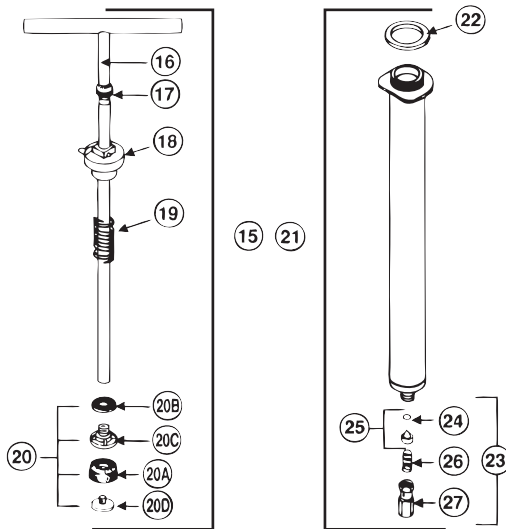
**Step 1.** Conduct a visual examination of your Hudson® X-Pert® sprayer. Sprayer has all components properly attached (see image below) and shows no visible signs of damage; GO TO Step 13.



**Step 2.** Sprayer has all components attached but has a perforation. GO TO Step 3.

**Step 3.** Disassemble the sprayer and place the components in individual boxes. They could be used as spare parts later. It might be possible to repair the sprayer following the directions provide elsewhere in this Guide. GO TO Step 4.

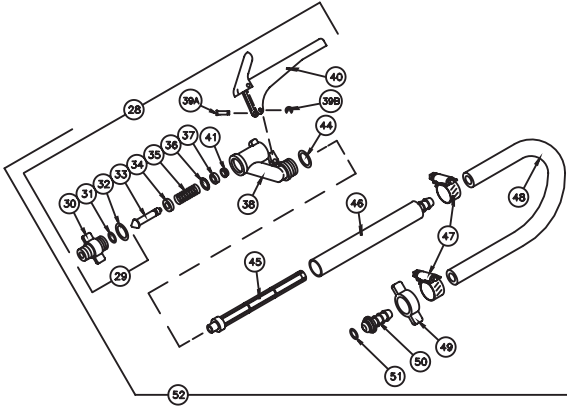
**Step 4.** Detach the pump assembly from the sprayer by loosening the pump cap assembly (#18 below) counterclockwise with a large wrench and rotate it by hand until it detaches from the sprayer. GO TO Step 5.



**Step 5.** Pull the plunger assembly (#15 above) up by its handle and remove it from the sprayer. Set aside in a separate box labeled “Plunger Assembly.” GO TO Step 6.

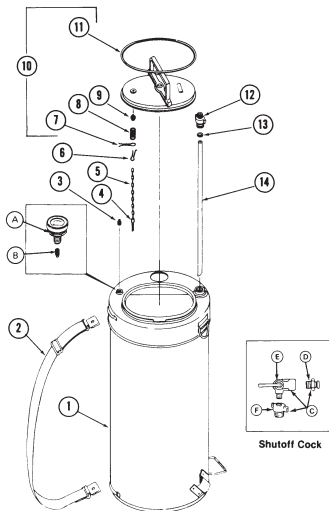
**Step 6.** Reach into the sprayer and remove the pump cylinder assembly (# 21 above) from the sprayer. Remove the pump cylinder gasket (#22). Set both aside in a separate box labelled “Pump Cylinder Assembly.” GO TO Step 7.

**Step 7.** Remove the hose by turning the nut (# 49 below) counterclockwise until the entire hose assembly (# 52 below) is detached from the sprayer. Set aside in a separate box in a separate box labelled “Hose assembly.” GO TO Step 8.



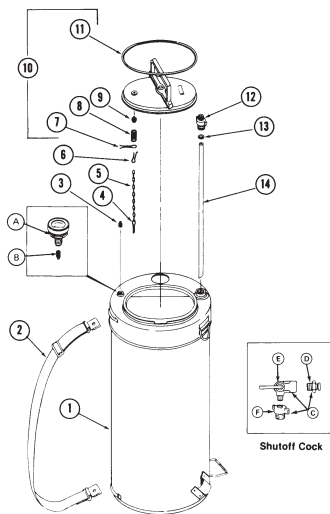
**Step 8.** Open the sprayer by removing the cover (#10). Reach in the sprayer following the chain or cable and locate cotter pin (#4 below) attached to the internal frame of the sprayer. Bend the ends so they are parallel and pull the “head” with pliers (spanners). Remove the cover.

Inspect all cover components (#5, #6, #7, #8 & #9 above) to make sure they are in place and show no visible signs of damage. Set cover aside in a separate box labelled “Cover assembly.” GO TO 9.



**Step 9.** Inspect the interior of the sprayer for any liquid remnants or foreign objects. Remove foreign matter and place in a safe container labeled “Contaminated.” GO TO Step 10.

**Step 10.** Locate the supply tube (#14 below) inside the sprayer. Turn the male fitting (#12 below) counterclockwise until it separates from the sprayer. Slide the supply tube upward manually from inside the sprayer checking that the “O” ring for dip tube (#13 below) is in place and shows no signs of damage. Replace with genuine Hudson® spare if brittle or cracked. Place the “Supply Tube,” “O” ring and male fitting in separate boxes each labelled accordingly. GO TO Step 11.



**Step 11.** Detach the shoulder strap (#2 above) and place it in a separate box labelled “Shoulder Strap.” GO TO Step 12.

**Step 12.** Set the body of the sprayer aside. Select another sprayer and return to Step 1.

**Step 13.** Test the sprayer to make sure it is not pressurized. If the Sprayer has green pressure release valve, GO TO Step 13.1. If the Sprayer has a brass pressure release valve, GO TO Step 13.2.

**Step 13.1.** Twist the top portion of the pressure release valve (PRV). Wait until all pressure is released and the cover can be easily inserted in the tank by hand. GO TO Step 14.

**Step 13.2.** Turn the lid handle slowly until its bottom frame reaches and presses on the metal nipple emerging through one side of the cover. Wait until all pressure is released and the cover can be easily inserted in the tank by hand. GO TO Step 14.

**Step 14.** Turn the lid handle slowly until lid can be inserted in the tank. Remove the lid assembly from the tank and place it on the sprayer. GO TO Step 15.

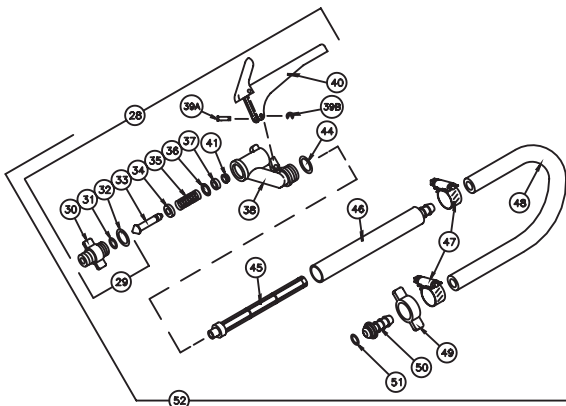
**Step 15.** Add about half (1/2) a liter of clean water to the sprayer. GO TO Step 16.

**Step 16.** Close the sprayer. Pull the cover up from inside the sprayer. Make sure it sits uniformly against the interior of the sprayer. Turn the handle (Fig. 2 below) until its frame sits firmly against the body of the sprayer. Make sure the handle does not make contact with the pressure release valve as you are closing the sprayer. GO TO Step 17.



**Step 17.** Check the condition of the hose and valve assembly. Make sure the hose is flexible, and has no cracks, kinks, unusual bulging, or bends, and is securely attached to the sprayer. GO TO Step 18.

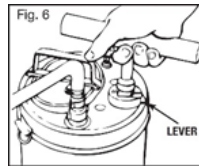
**Step 18.** Check the condition of the thrustless shutoff and strainer assembly (#52 below) by turning the strainer housing assembly (#46 below) gently by hand. If loose, tighten gently by hand only. Do not use a wrench or pliers. GO TO Step 19.



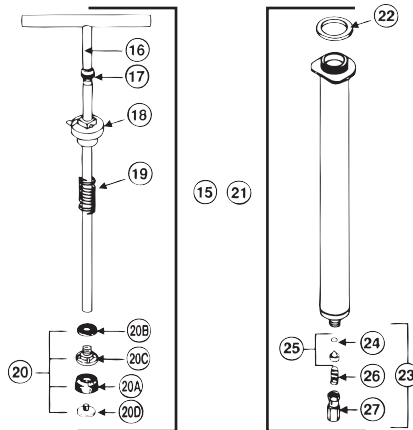


## Pressurizing the sprayer

**Step 19.** Unlock the pump plunger by turning the lever on the pump cap (Fig. 6 below). GO TO Step 20.



**Step 20.** Lift the plunger assembly (# 15 below) by pulling the assembly by its handle all the way up. Check the assembly for bends or cracks on the shaft. Make sure the bumper pad (# 17 below) is present. Check the condition of the pump cap assembly (#18 above) for any signs of excessive wear on the opening where the shaft travels through. GO TO Step 21.



**Step 21.** Using both hands, raise plunger all the way up to its up position immediately followed with a down stroke. Continue this action using full, even strokes -all the way up, and all the way down- until the pressure gauge (Fig 7 below) on the sprayer registers about 15 psi. GO TO Step 22.



Fig. 7

**Step 22.** Stop pumping and listen for any hissing noise that could indicate an unintentional release of pressure. If there is hissing, GO TO STEP 22.1. If no hissing noise is heard, GO TO Step 27.

**Step 22.1.** Pressure escapes from a small puncture or from one of the sprayer's seams or welding spots. GO TO Step 3.

**Step 22.2.** Pressure escapes at the cover assembly. Depressurize the sprayer and remove the cover assembly (go back to Step 13 if you need a reminder of do this). GO TO Step 23.

**Step 22.3.** Pressure escapes at the male fitting of the supply tube. Depressurize the sprayer and remove the cover assembly (go back to Step 13 if you need a reminder). GO TO Step 24.

**Step 22.4.** Pressure escapes at the plunger assembly. Depressurize the sprayer and remove the cover assembly (go back to Step 13 if you need a reminder). GO TO Step 25.

**Step 22.5.** Pressure escapes at the pressure gauge. Depressurize the sprayer and remove the cover assembly (go back to Step 13 if you need a reminder). GO TO Step 26.

**Step 23.** Remove the cover gasket with a flat head screwdriver and replace it with a genuine Hudson® spare. Should a genuine Hudson® replacement part not be available, place the cover gasket back in its place upside down. It may work until a genuine Hudson® replacement part is available. Do NOT attempt to use a plastic film instead of the genuine Hudson® replacement part. Doing so may damage the cover assembly. Close the sprayer and GO TO Step 19.

**Step 24.** Slide the supply tube upward manually from inside the sprayer checking that the "O" ring for dip tube (#13 below) is in place and shows no signs of damage. (See Step 10 for reminder.) Replace with genuine Hudson® spare if brittle or cracked. Reassemble the supply tube, close the sprayer and GO TO Step 19.

**Step 25.** Depressurize the sprayer and remove the cover assembly (go back to Step 13 if you need a reminder). Detach the pump assembly from the sprayer by turning the pump cap assembly counterclockwise with a large wrench and rotate it by hand until it detaches from the sprayer. Pull the plunger assembly up

by its handle and remove it from the sprayer. Make sure there is a pump cylinder gasket where the pump cylinder assembly passes through the skin of the sprayer. Replace with genuine Hudson® spare if brittle, cracked, or deformed, or insert if absent. Do NOT attempt to use a plastic film instead of the genuine Hudson® replacement part. Doing so may damage the cover assembly. Close the sprayer and GO TO Step 19.

**Step 26.** Depressurize the sprayer and remove the cover assembly (go back to Step 13 if you need a reminder). Remove pressure gauge with a fixed wrench or narrow pair of pliers. Replace with genuine Hudson® spare. Do NOT attempt to place a plastic film between the pressure gauge and the body of the sprayer. Close the sprayer and GO TO Step 19.

**Step 27.** Lift plunger assembly to its highest position. GO TO Step 28.

**Step 28.** Plunger handles remains in position. GO TO Step 30.

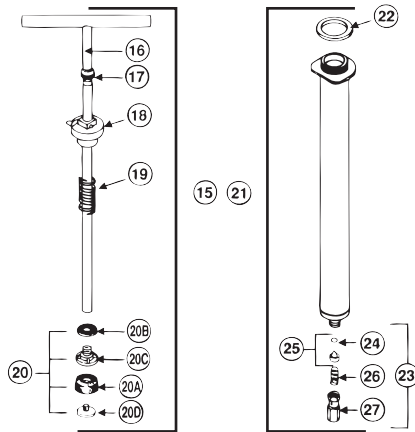
**Step 29.** Plunger handles drop without assistance. GO TO Step 29.1.

**Step 29.1.** Depressurize the sprayer and remove the cover assembly (go back to Step 13 if you need a reminder). GO TO Step 29.2.

**Step 29.2.** Detach the pump assembly from the sprayer by turning the pump cap assembly counterclockwise with a large wrench and rotate it by hand until it detaches from the sprayer. Pull the plunger assembly up by its handle and remove it from the sprayer. GO TO Step 29.3.

**Step 29.3.** Remove the pump cylinder assembly from the sprayer. Make sure there is a pump cylinder gasket remains in place. GO TO Step 29.4.

**Step 29.4.** Carefully open the pump cylinder check valve assembly (#23 below) with a wrench. Make sure it has a spring (#26). Be careful that it does not pop out. GO TO Step 29.5.



**Step 29.5.** Check for any foreign matter that may have entered the pump cylinder check valve assembly. Rinse with clean water and remove any debris. GO TO Step 29.6.

**Step 29.6.** Check the spring to make sure it is not deformed or compressed and check its resistance. It should bounce back. Replace with genuine Hudson® spare if compressed or deformed. Insert one if absent. GO TO Step 29.7.

**Step 29.7.** Check the condition of the O ring for the pump cylinder valve assembly (#24 above). Replace with genuine Hudson® spare if cracked, compressed, or deformed. Insert one if absent. GO TO Step 29.8.

**Step 29.8.** Reassemble the pump cylinder check valve assembly and place it back in the pump cylinder assembly. GO TO Step 29.9.

**Step 29.9.** Close and repressurize the sprayer. Go back to Step 19 if you need a reminder. GO TO Step 30.

**Step 30.** Pressurize the sprayer to its operating pressure (45 psi). GO TO Step 31.

**Step 31.** Point the sprayer's extension tube and nozzle assembly towards a large calibrated cylinder, container, or bucket. GO TO Step 32.

**Step 32.** While holding the hose with Thrustless™ shutoff and strainer assembly, squeeze the “trigger” to spray the contents into the container. GO TO Step 33.

**Step 33.** Liquid flows through the nozzle and no drips or leaks are noticed. GO TO Step 39.

**Step 34.** Liquid escapes from a small puncture or tear on the hose. GO TO Step 34.1.

**Step 34.1.** Close shut off cock -if installed- or depressurize the sprayer. GO TO Step 33.2.

**Step 34.2.** Remove hose by unscrewing hose clamps on either end of the hose and replace it with a genuine Hudson® hose. GO TO Step 30.

**Step 35.** Liquid escapes from a small crack at either end of the hose; where it connects to the sprayer or at the shutoff assembly connection. GO TO Step 35.1

**Step 35.1.** Close shut off cock -if installed- or depressurize the sprayer. GO TO Step 35.2.

**Step 35.2.** Remove hose by unscrewing hose clamps on either end of the hose and replace it with a genuine Hudson® hose. GO TO Step 35.3.

**Step 35.3.** Cut the hose just above the crack or puncture. GO TO Step 35.4.

**Step 35.4.** Insert the hose back into the hose clamps and assemble the sprayer by screwing the hose clamp(s) in place. GO TO Step 30.

**Step 36.** Liquid escapes from where the strainer housing assembly attaches to the hose or the extension tube. GO TO Step 36.1.

**Step 36.1.** Close shut off cock -if installed- or depressurize the sprayer. GO TO Step 36.2.

**Step 36.2.** Unscrew the strainer housing assembly from where it attaches to the hose by gently turning it counterclockwise by hand. GO TO Step 36.3.

**Step 36.3.** Unscrew the strainer housing assembly from where it attaches to the male fitting for the strainer housing. GO TO Step 36.4.

**Step 36.4.** Relace the strainer housing assembly with genuine Hudson® spare. Do NOT attempt to use a plastic film as a “washer.” Doing so seldom works and may damage the strainer housing assembly. Close the sprayer and GO TO Step 30.

**Step 37.** Liquid escapes from where the extension tube attaches to the strainer housing assembly. GO TO Step 37.1.

**Step 37.1.** Close shut off cock -if installed- or depressurize the sprayer. GO TO Step 37.2.

**Step 37.2.** Unscrew the extension tube from where it attaches to the strainer housing assembly by gently turning it counterclockwise by hand. GO TO Step 37.3.

**Step 37.3.** Inspect the attachment point of the extension tube to make sure the O ring gasket for the extension tube is present. Replace with genuine Hudson® spare if brittle, cracked or absent. GO TO Step 37.4.

**Step 37.4.** Reassemble the extension tube by screwing it clockwise back in place. GO TO Step 30.

**Step 38.** Liquid escapes from where the extension tube attaches to the nozzle assembly. GO TO Step 38.1.

**Step 38.1.** Close shut off cock -if installed- or depressurize the sprayer. GO TO Step 38.2.

**Step 38.2.** Unscrew the nozzle body cap from where it attaches to the extension tube by holding the extension tube firmly with a wrench and turning them the nozzle cap gently counterclockwise with another wrench by hand. GO TO Step 38.3.

**Step 38.3.** Inspect the attachment point to make sure there is a polyethylene nozzle gasket present. Replace with genuine Hudson® spare if brittle, cracked or absent. GO TO Step 38.4.

**Step 38.4.** Reassemble the extension tube by screwing it clockwise back in place. GO TO Step 30.

**Step 39.** Congratulations. Your sprayer is ready. Proceed to calibration.  
GO TO Step 40.

### **Calibrating the Sprayer**

**Step 40.** Open the sprayer, insert filter in filler opening, and add eight (8) to ten (10) liters of water. GO TO Step 41.

**Step 41.** Remove the filter from the filler opening and pressurize the sprayer to its operating pressure (45 psi). GO TO Step 42.

**Step 42.** Spray the contents into a calibrated cylinder for one (1) minute.  
GO TO Step 43.

**Step 43.** Measure the volume sprayed and compare that to the rating of the nozzle used. Record this figure. GO TO Step 44.

**Step 44.** Repeat Step 42 twice again. Once completed, GO TO Step 45.

**Step 45.** Measure the volume collected in Step 42. GO TO Step 46.

**Step 46.** Average the three readings. The figure should be less than 10% of the expected volume for the nozzle installed on the sprayer. The rated volume of a 8002 nozzle at 40 psi should be 0.02 US Fluid ounces per minute or 5.91 ml per minute. The volume 8001 nozzle at 40 psi should be 0.01 US Fluid ounces per minute or 9.96 ml per minute. GO TO Step 47.

**Step 47.** If the output of the sprayer does not exceed the recommended volume, test the nozzle to make sure it produces a uniform pattern. GO TO Step 48.

**Step 48.** Depressurize the sprayer, open it, and add a few drops of red food coloring. GO TO Step 49.

**Step 49.** Pressurize the sprayer to the normal operating pressure of 40 psi. GO TO Step 50.

**Step 50.** Spray over a white sheet of paper following the spraying recommendations. GO TO Step 51.

**Step 51.** Inspect the pattern produced for irregular bands or uneven coverage. Discard the nozzle if the pattern is uneven and install a new nozzle. GO TO Step 52.

**Step 52.** Congratulations! Your sprayer is ready.

## Soldering Minor Repairs

### Materials Needed

- Soft, 50% tin & 50% lead soldering alloy or equivalent.
- Liquid or paste soldering flux or equivalent.
- About one (1) liter of clean water for cleaning and removing excess flux.
- Medium grade sandpaper or emery cloth for cleaning areas to be soldered.
- Medium weight soldering iron about one (1) square inch (6.5 cm<sup>2</sup>) about 2.5 inches (6.35 cm) long.
- Sal ammoniac in bar (or equivalent) form for cleaning tip of soldering iron.
- Blow torch for pre-heating soldering iron and surface to be soldered.
- Small paintbrush for applying flux.

### How to soft solder

1. Place items to be soldered on a clean, dry, and flat surface.
2. Remove loose dirt and oil from area to be soldered with a clean rag.
3. Rub clean surfaces to be soldered with sandpaper.
4. Heat soldering iron with blow torch to the point where solder readily melts when it touches the tip of the soldering iron.
5. Brush liquid soldering flux over areas to be soldered.
6. Clean the tip of the soldering iron with sal ammoniac and tin the tip applying solder.
7. Heat the metal to be soldered with the soldering iron and apply a small amount of solder to the tip of the soldering iron.
8. As soon as the solder begins to unite with the metal, apply more solder to the tip of the soldering iron and move it slowly across the area to be soldered. Cover the area with sufficient solder while moving the iron slowly to allow the solder to flow evenly into the seam. *Do not accumulate solder.*
9. Remove soldering iron and allow the applied solder to harden completely without artificial cooling.
10. Once the solder is cool, wash the soldered area thoroughly to remove the excess flux.
11. Dry the area with a dry towel.



## Silver Brazing Minor Repairs

### Materials Needed

- About one (1) liter of clean water for cleaning and removing excess flux.
- Medium grade sandpaper or emery cloth for cleaning areas to be soldered.
- Small paintbrush for applying flux.
- Acetylene torch.

### How to Silver Braze

1. Place items to be soldered on a clean, dry, and flat surface.
2. Remove loose dirt and oil from area to be soldered with a clean rag.
3. Rub clean surfaces to be soldered with sandpaper.
4. Apply flux to the area to be silver-brazed.
5. Heat the area with the acetylene torch until the flux melts. Apply the silver brazing material and continue to heat the area until it the brazing material has melted at one point of the area to be repaired. Move the torch to another area to be brazed to keep the parent metal from reaching its melting temperature. It is very important to not overheat stainless steel to minimize carbide precipitation within the metal.
6. Once the brazing is completed, remove the torch and allow the area to cool until it is completely black. This is an indication that the temperature of the brazing material has lowered to the point where it has hardened.
7. Place a cloth saturated in water over the heated area to prevent the flux from hardening beyond the point where it is difficult to remove. Add more water to the cloth as needed.
8. Once the brazed has cooled enough to touch, remove the last traces of flux with sandpaper or emery cloth. It is very important to do this because the flux is very corrosive.

**Sign of the Best Buy**



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