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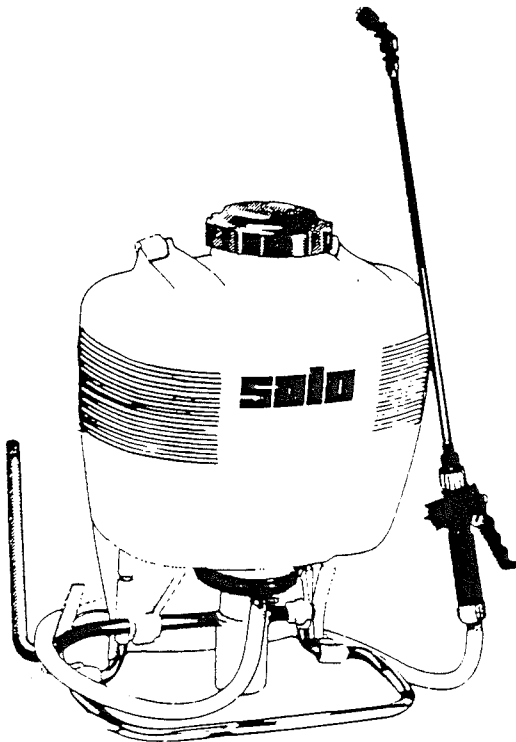
Solo™

SERVICE

Service Manual

Solo Backpack Sprayers 425,435,475,485 Series

Solo Compression Sprayers 454,456,457 Series



OPERATING DESCRIPTION

Compression Sprayer

454,456,457

During the upward stroke, the o-ring on the plunger moves to the fluted side of the o-ring groove and allows air to be drawn past the o-ring and into the pump cylinder. On the downward stroke, the o-ring presses against the solid side of the o-ring groove and blocks air from escaping past the o-ring. As the downward stroke continues, air is compressed in the pump cylinder and is expelled past the check valve on the bottom of the cylinder and into the tank. As more air is pumped into the tank, the pressure is increased. Pressure in excess of 45 PSI is released through the spring-loaded pressure relief valve.

When the shut-off valve is opened, liquid is forced through a pick-up tube in the spray tank. From the pick-up tube, the liquid travels through the hose, shut-off valve and finally out the nozzle.

OPERATING DESCRIPTION

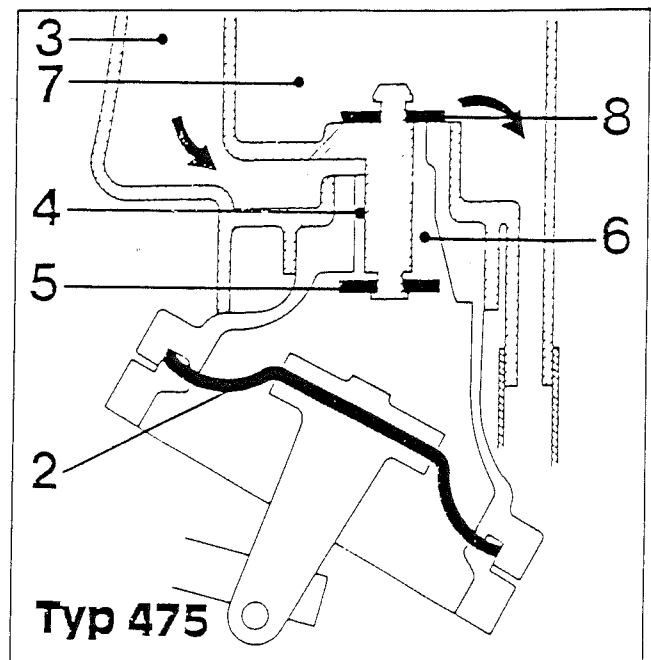
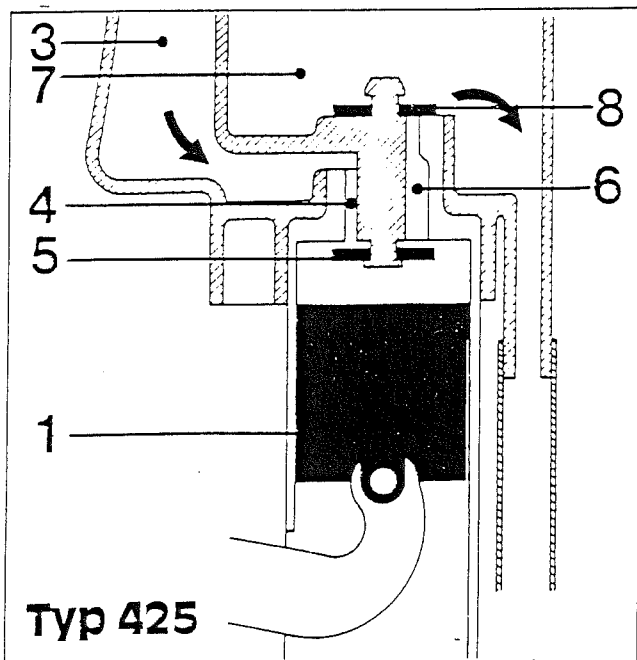
Backpack Sprayers

425,435,475,485

During the upward stroke of the handle on either the piston (1) or diaphragm (2), liquid is drawn from the formula tank (3) through the intake channel (4) into the space above the pump. The lower valve plate (5) opens the intake channel (4) while the upper valve plate (8) closes the transfer ports (6). During subsequent upward stroke of piston or diaphragm, the previously siphoned liquid is forced through the four transfer ports (6) and into the pressure cylinder (7). During this compression phase, the upper valve plate (8) opens the transfer ports and the lower valve plate closes, sealing the intake channel (4). The transfer ports cannot be sealed by the lower valve plate.

Through repetition of these piston or diaphragm strokes, the air present in the pressure cylinder is being slowly compressed by the forced-in liquid. A prerequisite for this condition is a closed shut-off valve. These pumping strokes can be carried out so long until the required pressure is reached.

After opening the shut-off valve, continue to pump slowly and steadily in order to achieve a consistent rate of discharge.



Leaks Inside Cylinder (425)	<ul style="list-style-type: none"> • Damaged/Dirty Collar or Piston 	<ul style="list-style-type: none"> • Clean or Replace Collar and Possibly Cylinder If Worn
Leaks Outside Cylinder (425)	<ul style="list-style-type: none"> • Damaged O-Ring on Cylinder • Damaged O-Ring on Pressure Cylinder 	<ul style="list-style-type: none"> • Replace O-Ring • Replace O-Ring
Leaks on Diaphragm Pump (475)	<ul style="list-style-type: none"> • Damaged Diaphragm • Damaged O-Ring on Diaphragm Housing • Damaged O-Ring on Pressure Cylinder 	<ul style="list-style-type: none"> • Replace Diaphragm • Replace O-Ring • Replace O-Ring
Leaks From End of Spray Wand	<ul style="list-style-type: none"> • Worn or Damaged Shut-off Valve 	<ul style="list-style-type: none"> • Inspect and Rebuild Shut-off Valve

- 4) To disconnect the piston from the connecting rod, pry the two (2) halves of the connecting rod apart with a flathead screwdriver. (See Figure 4).

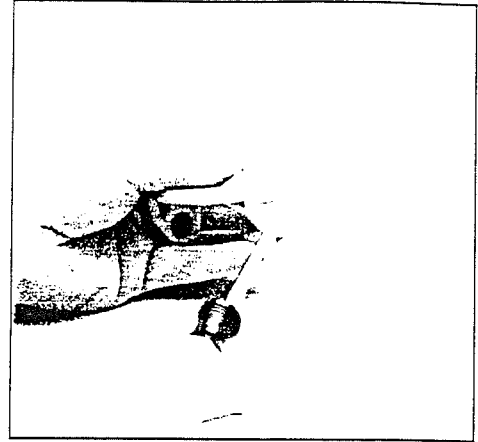


Figure 4

- 5) With a new piston, line up the connecting rod on the posts inside the piston and on the lever. Snap the connecting rods together. (See Figure 5).

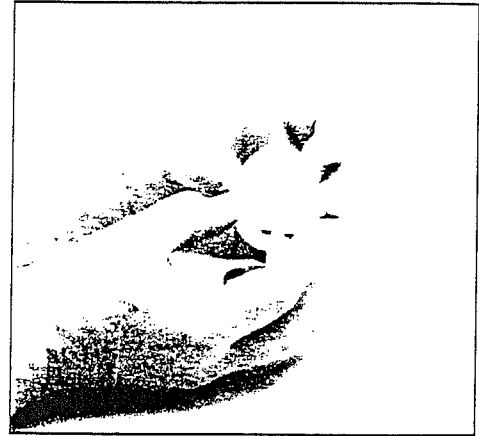


Figure 5

- 6) To replace the Viton® collar, push it off with the top of the piston with your thumb. The new one is simply pushed over the piston crown into the form fitted sides. (See Figure 6).

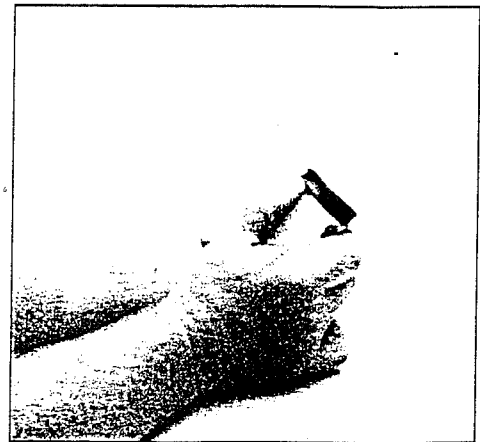


Figure 6

- 9) Apply a non-water soluble grease (petroleum jelly works well) around the outside edge of the Viton® collar before installing the piston into the pump cylinder. (See Figure 11). Carefully insert piston into the pump cylinder. (See Figure 12). Re-connect the lever to the pump rod.

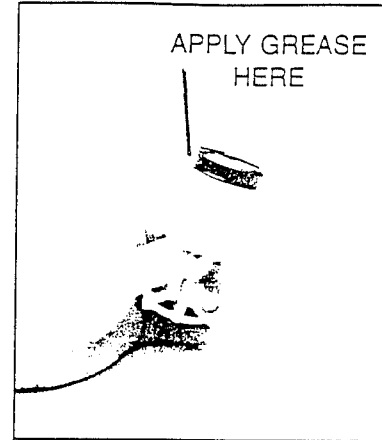


Figure 11

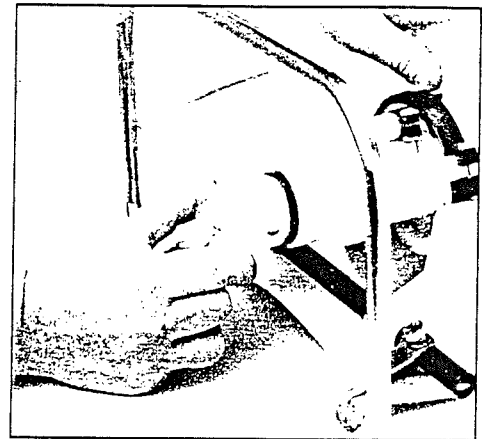


Figure 12

- 5) To replace the diaphragm, remove the connecting rod (G) from the backing plate by removing the retaining screw. Replace the diaphragm and reassemble. (See Figure 16).

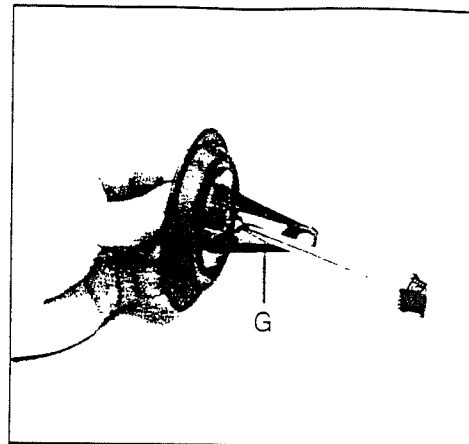


Figure 16

- 6) The valve assembly (H) is removed using a locally produced special tool (See drawing for measurements). The valve unscrews counter-clockwise. (See Figure 17).

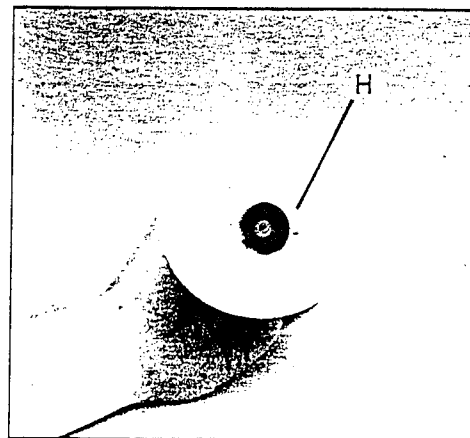
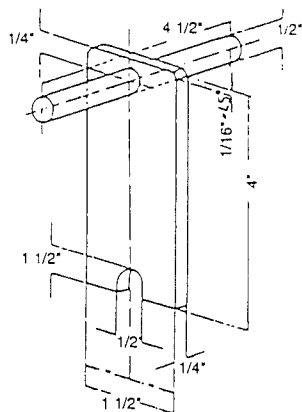


Figure 17

- 7) Once the valve assembly is removed, the valve plates and o-rings can be replaced. (See Figure 18).

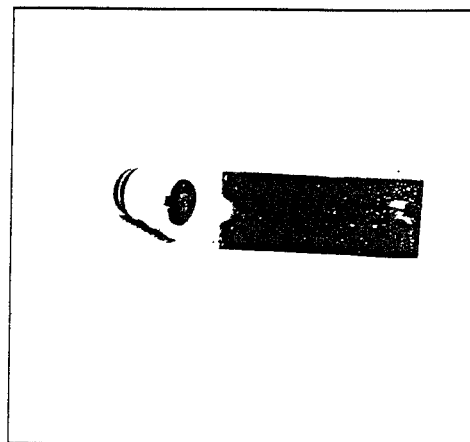


Figure 18

THE PRESSURE CYLINDER

- 1) With the large clamp at the bottom of the tank removed, the pressure cylinder will push out through the bottom of the tank. (See Figure 21).
- 2) Once the pump cylinder is removed, the large O-ring (A) can be replaced. (See Figure 21). Note: The new o-ring should be slid onto the pressure cylinder from the top to the recess. It should not be stretched over the flange at the bottom.

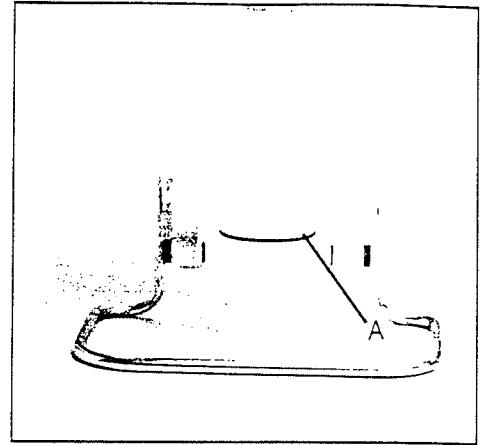


Figure 21

- 3) Remove the adjustment cap by depressing and turning counter-clockwise past the "1" setting. (See Figure 22).

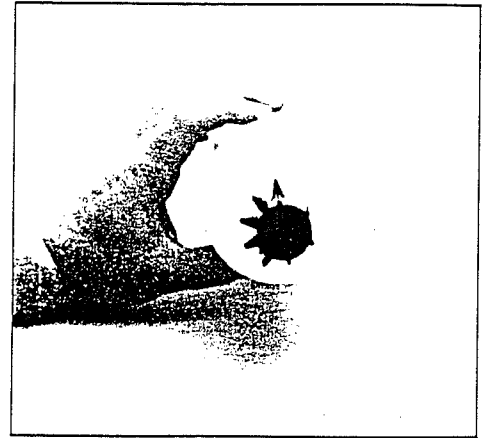


Figure 22

- 4) The adjustment piece is then removed by unscrewing it from the pressure cylinder. Once the O-rings are replaced, apply a small amount of grease to them and reassemble. (See Figure 23). Note: The adjustment piece has been painted white for clarity of the O-rings in photo.

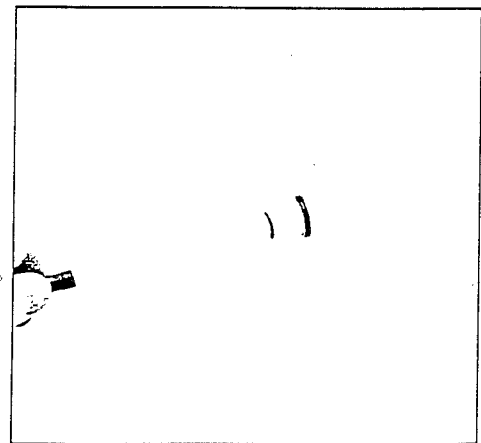


Figure 23

HANDHELD SPRAYER TROUBLE SHOOTING GUIDE

PROBLEM	CAUSE	SOLUTION
Difficulty in Moving Pump Handle	<ul style="list-style-type: none"> • Dirty Cylinder Wall • O-Ring on Piston Swollen (Not Cleaned Properly) • No Lube on Piston/Cylinder • Check Valve Not Sealing or Missing 	<ul style="list-style-type: none"> • Remove Piston, Clean and Replace • Replace O-Ring • Lubricate with Heavy Grease • Check & Replace if Necessary
Low Pressure & Resistance During Pumping	<ul style="list-style-type: none"> • Damaged O-Ring in Relief Valve • Worn or Damaged O-Ring on Piston • Tank Cap Not Tight • No lube on Piston Cylinder 	<ul style="list-style-type: none"> • Replace O-Ring • Replace O-Ring • Tighten Cap • Lubricate Piston, O-Ring and Cylinder
Leaks From End of Spray Wand	<ul style="list-style-type: none"> • Worn or Damaged O-Ring In Shut-Off Valve 	<ul style="list-style-type: none"> • Rebuild Shut-Off Valve
Leaks From Inside Cylinder	<ul style="list-style-type: none"> • Worn or Damaged O-Rings On Bottom of Cylinder 	<ul style="list-style-type: none"> • Replace O-Ring and Valve Cone
Leaks Under Cap	<ul style="list-style-type: none"> • Damaged or Missing Gasket • Screw Cap Not Tight 	<ul style="list-style-type: none"> • Replace Gasket • Pressurize Unit, Tighten Caps Until Leaks Stop
Leaks From Shut-Off Valve	<ul style="list-style-type: none"> • Worn, Damaged or Loose Fittings 	<ul style="list-style-type: none"> • Tighten Fittings and Replace Worn Parts
Leaks From Hose	<ul style="list-style-type: none"> • Worn, Damaged or Loose Fittings 	<ul style="list-style-type: none"> • Tighten Fittings and Replace Worn Parts
Pressure Release Valve Sticks	<ul style="list-style-type: none"> • Lack of Lubrication or Contaminated Release Valve Assembly 	<ul style="list-style-type: none"> • Clean and Lubricate Pressure Release Valve
Air Leak - Air Coming Out Between the Two Halves of the Pump Support	<ul style="list-style-type: none"> • Tank Cap Not Tight • Gasket Twisted • Tank Lip Damaged 	<ul style="list-style-type: none"> • Tighten Tank Cap • Straighten Gasket • Repair or Replace Tank

- 4) The pressure relief valve is removed by unscrewing it from the tank. Once removed, the lower housing pulls off to access the o-ring on the stem (A). When replacing this o-ring, make sure that it is seated in the recess on the stem. Lubricate before reassembly. (See Figure 30).

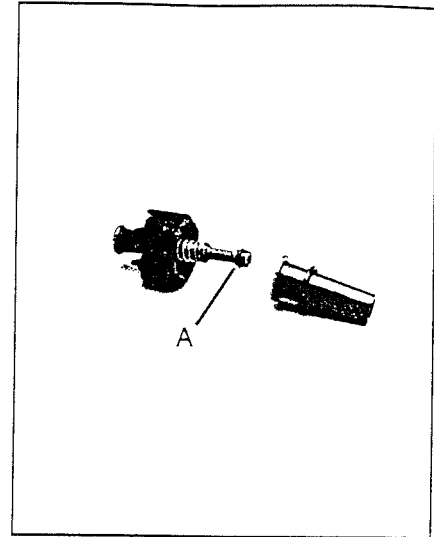


Figure 30

- 5) If the pump fails to offer resistance when pumping, check the valve cone (A) on the bottom of the cylinder to make sure that it is present and sealing. The valve cone is removed by pulling it out. The o-ring can then be replaced. The valve cone is replaced by pinching the two (2) ears together and inserting into the hole in the bottom of the cylinder. (See Figure 31).

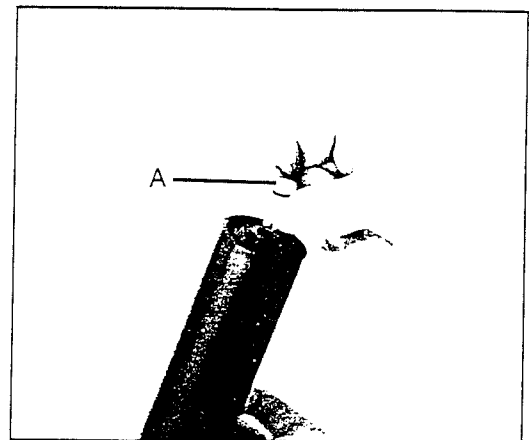


Figure 31

- 6) The pump piston is removed from the cylinder by pulling the two apart. The large gasket at the top of the cylinder will hold the cylinder in the red cap. Turning the cylinder counter-clockwise while holding the red cap and pulling may help separate the two. (See Figure 32).

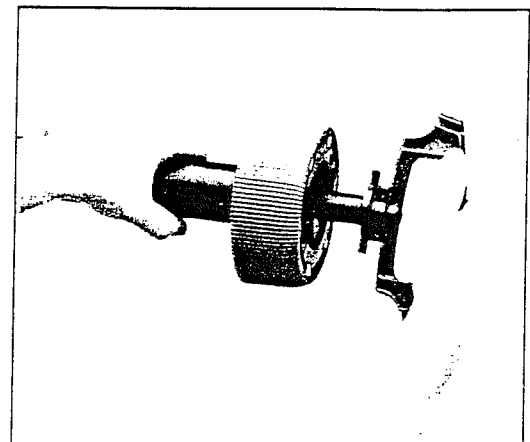


Figure 32

- 9) When reassembling the pump cylinder to the pump piston, make sure that the gasket (A) does not get twisted. This will cause the sprayer to leak. Note: The cylinder is shown removed from the tank cap for clarity. To ease the assembly, drop the cylinder into the neck of the sprayer tank and then screw the cap assembly on. (See Figure 36).

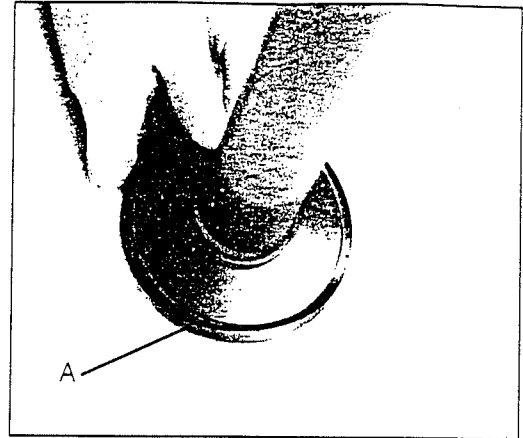


Figure 36

- 10) The o-ring at the connection between the hose and the shut-off valve is replaced by first removing the shut-off valve. The o-ring will then snap off and the new one can be pushed on. (See Figure 37).

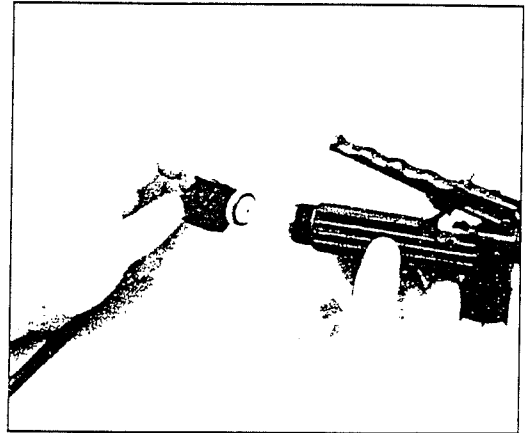


Figure 37