

# **ECHO**®

# **Backpack Sprayer**

**Use and Care Manual**



**Model MS-53BPE**  
**5G/ 20L**

**⚠ WARNING ⚠**

**Carefully Read These Instructions Before Use**

013566 R0314

## **WARNING**

**WARNING: Improper use or failure to follow instructions can result in explosive failure causing serious eye or other injury.** For safe use of this product you must read and follow all instructions. Do not leave a pressurized sprayer in the hot sun. Heat can cause pressure build-up resulting in possible explosion. Do not store or leave solution in tank after use. Always wear goggles, gloves, long sleeve shirt, long pants and full foot protection when spraying. Never use any tool to remove pump if there is pressure in the pressure chamber. Never pressurize sprayer by any means other than the original pump. Do not attempt to modify this sprayer. Replace parts only with manufacturer's original parts. **Never spray flammable, caustic, acidic, chlorine, bleach or other corrosive solutions or heat, pressure, or gas producing chemicals. Always read and follow chemical manufacturer's instructions before use with this sprayer as some chemicals may be hazardous when used with this sprayer.**

SK 1158-1

**WARNING:** Handling the brass parts of this product will expose you to lead, a chemical known to the State of California to cause birth defects and other reproductive harm.

***Wash hands after handling.***

## **CAUTION**

- **PRE-USE CHECK:** Before each use check tightness of hose nut to be sure hose is securely attached to the shut-off assembly. Insure hose is securely attached to the pump outlet by tightening hose nut. Insure that all nozzle and wand connections are tight. Insure the three bolts (underside of base) used to attach the piston cylinder are tight.
- Do Not exceed a tank solution temperature of 120° F/ 49° C.

**NOTE:** The tank and hose may have residual water in it due to quality testing performed on the sprayer.

## APPLICATIONS & USE FOR YOUR SPRAYER

Avoid using a sprayer for general cleaning purposes if plant protection or herbicide chemicals have already been used in the sprayer. If a sprayer has been used for plant protection or as an herbicide, clean the sprayer completely (see cleaning section) before using.

**Plant Food:** Use different spray patterns for optimum foliage feeding or for fungicide and pesticide application.

**Herbicides:** Reduce weeds and unwanted plants but avoid using the same sprayer for plant feeding or protection without thoroughly cleaning (see cleaning section) the sprayer first.

**General Household Use:** Apply detergents, cleaning solutions, warm water (do not exceed 120°F/49°C) or nontoxic household cleaning chemicals for carpets, floors, walls, glass, counter tops and ceilings. DO NOT use sprayer that has been used with herbicides, pesticides or other toxic chemicals for household applications.

**General Outdoor Use:** Use the sprayer for cleaning windows or with a detergent for general purpose cleaning.

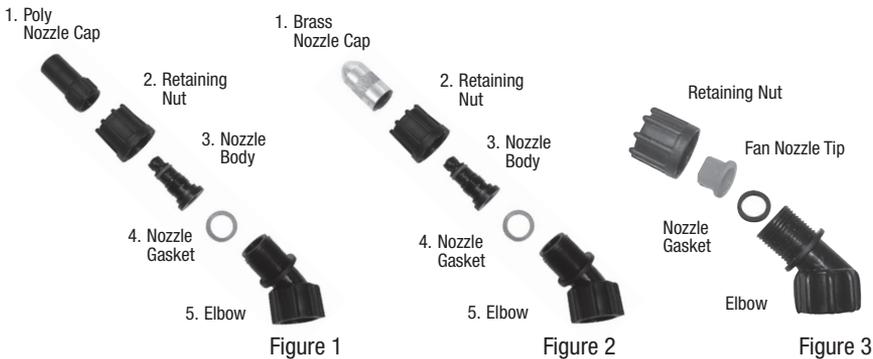
## NOZZLE ASSEMBLY

### Figure 1-2

Unscrew the nozzle cap (1) from the nozzle body (3) with retaining nut (2) fastened tightly to the elbow (5). Unscrew the retaining nut (2). Push the nozzle body (3) with the nozzle gasket (4) out of the retaining nut (2). To reinstall the nozzle, reverse the above instructions.

### Figure 3

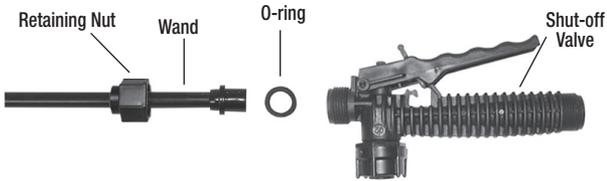
Unscrew the retaining nut from the elbow and push the fan nozzle tip and gasket out of the retaining nut. To reinstall the nozzle, reverse the above instructions.



## SPRAYER COMPONENTS & USE INFORMATION, Continued

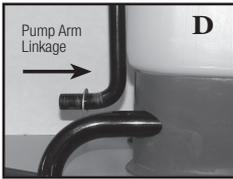
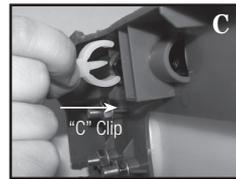
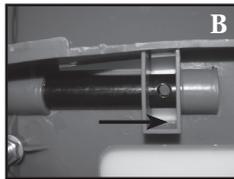
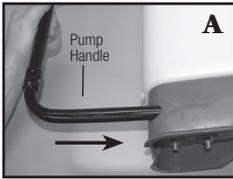
### WAND ASSEMBLY

1. Make sure the o-ring is installed on the end of the wand. Insert the wand into shut-off valve.
2. Turn and tighten the retaining nut clock-wise onto the shut-off valve.



### INSTALLING THE PUMP HANDLE

The sprayer includes all hardware necessary for installing the pump handle. Install the pump handle into the base (A). Center the hole in the handle between the cut-out on the bottom of the tank base (B). Push the "C" clip over the pump handle while aligning the nub on the clip with the hole in the handle (C). Slide washer over pump linkage (short end) (D). Slide pump arm linkage (short end) through pump handle at the bottom of the tank (D & E). Slide a second washer over the linkage and insert the cotter pin through the hole in linkage (E). Position ball over top of pump (F). The pump assembly can be rotated to orient the pump outlet into desired position (G). Rotate handle down until ball is seated in top of pump (F and G). Tighten pump retainer nut (F). Do not over tighten. Press boot over retainer nut (H). Insure pump locking nut is tight (G).



## SPRAYER COMPONENTS & USE INFORMATION, Continued

### INSTALLING THE SHOULDER STRAP

The backpack strap is provided with multiple features including shoulder strap and waist strap (figure 1). The top of the shoulder strap is attached to the top of the tank and is removable.

The strap attaches to the base of the sprayer by sliding the buttons into the slots until they snap into place (Figure 2).



Figure 1  
Strap Assembly

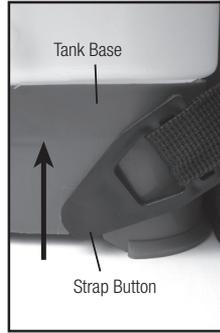


Figure 2

### WAND/PUMP HANDLE

The pump handle stores vertically and sets into the pump handle clip (Figure 1). The wand is stored in the wand clip (Figure 2).

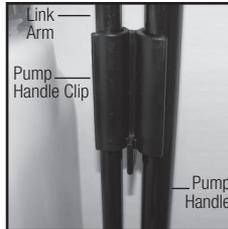


Figure 1

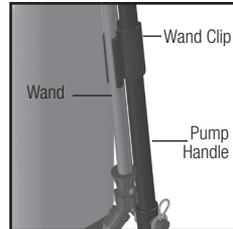


Figure 2

### FILLING THE SPRAYER

Make sure the filter basket is in place to keep debris from entering the tank.

Determine the amount of mixture needed for your application. Add the proper amount of water to the tank. Add the proper amount of chemical to the tank (check the chemical label for proper ratio of chemical). Stir mixture in tank with a clean utensil (like a paint stirrer). The tank will hold the 5-gallon (20L) capacity plus the chemical.

It is not necessary to completely fill the sprayer tank with each use. You can fill the tank with only the amount needed for each application.

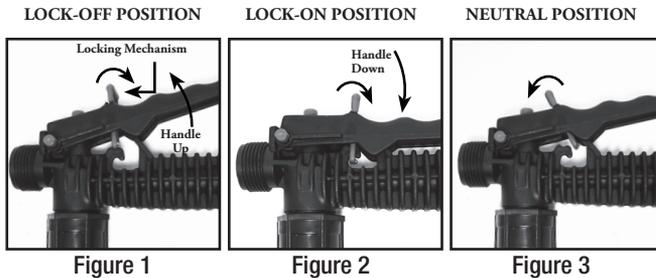
Always follow the manufacturer's instructions included on their product label.

## SPRAYER COMPONENTS & USE INFORMATION, Continued

### HELPFUL SPRAYING INFORMATION

Use RAPID pump strokes to prime the pump. You will know the pressure chamber is filling with liquid when you feel firm resistance from the pump handle. The air in the pressure chamber is compressed from repeated strokes. By pressing the hand lever on the shut-off, the valve opens. For safety lock-off feature (no-spraying), pull up on handle and move red locking mechanism into lock-off position as shown in fig. 1. To disengage, pull up on handle and return red locking mechanism to neutral position as in fig. 3. For lock-on feature (continuous spraying), push down on handle and move red locking mechanism into lock-on position as shown in fig. 2. To disengage, push down on handle and return red locking mechanism to neutral position as shown in fig. 3.

In the event that the handle becomes stuck in the lock-on (continuous spraying) position and the tank pressure needs to be relieved, carefully open the tank and place the wand inside the tank until the pressure is relieved.

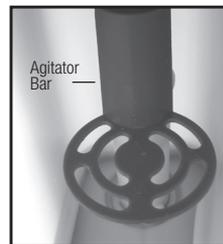


For easy pump action use the END of the pump handle. The amount of liquid delivered during spraying depends on the rate of pump stroke. The fan nozzle tip is rated at .4 gpm at 40psi. This is the nominal operating pressure of the sprayer..

### POWDER-BASED CHEMICALS

Powder-based chemicals (powder mixed with liquids to make the spraying agent) are usually abrasive and can cause wear. When you use a powder-based chemical in your sprayer, make sure it is thoroughly dissolved in the liquid solution. Thoroughly clean and flush the sprayer with water to extend the life of the sprayers parts.

This sprayer is equipped with an agitator bar which facilitates mixing as the pump is operated.



### CLEANING

- 1) Always empty the sprayer and clean the tank thoroughly after each use.
- 2) Pump the sprayer handle until all of the contents and air exit through the nozzle (minimum of 30 strokes).
- 3) Fill tank half way with water and pump the water out as explained in step 2 (repeat several times as necessary).

### Other Cleaning Hints:

- Improper spray distribution usually means the nozzle is clogged, remove the nozzle and clean it.
- Soap can be added to the water to clean the tank.
- Do not use strong cleaning agents or abrasives.
- If you use a chemical agent to clean the tank follow the manufacturer's recommendations for the disposal of the waste water.
- Follow the chemical manufacturers instructions for clean up.

## STORING / MAINTAINING YOUR SPRAYER

- The sprayer should be stored out of direct sunlight in a cool dry space.
- Before freezing weather make sure to drain all liquid in the tank, pump, pressure cylinder, hose, shut-off valve, wand and nozzle, to avoid liquid expansion and cracking in the sprayer components (See “Cleaning” section). Lock the shut-off valve in the “open” position.
- When service is required call your nearest dealer and always insist on original manufactured replacement parts.
- Inspect the hose, wand, pump, tank and shut-off valve for wear, damage or leaks on a regular basis and repair defects promptly.
- Every year prior to spraying remove felt gasket (see Pump Disassembly and Rebuild) and saturate with a light oil. Oil periodically thru out the season as needed.

## TROUBLE SHOOTING YOUR SPRAYER

Symptom	Possible Reason	Correction
Shut-off leaks	Connections loose	Tighten connection
	Worn or damaged shut-off	Rebuild or replace the shut-off valve
Wand assembly leaks	Connections loose	Tighten connection
	Damaged or worn o-ring/gasket	Replace o-ring/gasket
Nozzle assembly leaks	Connections loose	Tighten connection
	Damaged or worn o-ring/gasket	Replace o-ring/gasket
Hose leaking at shut-off	Connection loose	Tighten retaining nut
	Damaged or worn o-ring/gasket	Replace o-ring/gasket
Hose leaking at pump outlet	Connection loose	Tighten retaining nut
	Damaged or worn o-ring/gasket	Replace o-ring/gasket
Upward pumping action difficult	Inlet openings in bottom of piston cylinder clogged	Remove piston cylinder and clean openings (see section on Piston Cylinder Disassembly and Rebuild)
	Piston cylinder check valve stuck	Remove piston cylinder check valve cartridge- Clean, rebuild or replace (see section on Piston Cylinder Disassembly and rebuild)
Downward pumping action difficult	Pressure chamber check valve stuck	Remove piston cylinder check valve cartridge- Clean, rebuild or replace (see section on Piston Cylinder Disassembly and rebuild)
Decline in pump performance (cannot achieve pressure and/or doesn't hold pressure)	Dirt or debris or wear in one or both check valves	Remove both check valves and clean, rebuild or replace (see section on Piston Cylinder Disassembly and Rebuild and also section on Pump Disassembly and rebuild)
	Piston cylinder inside diameter surface worn	Remove piston cylinder and check inside diameter for wear- replace if necessary (see section on Piston Cylinder Disassembly and Rebuild)
	Plunger cup worn	Remove pump assembly and check plunger cup for wear- replace if necessary (see section on Pump Disassembly and Rebuild)
	Damaged pressure chamber housing	Remove pump assembly and replace pressure chamber housing (see section on Pump Disassembly and Rebuild)
	Incorrect Assembly of plunger and/or check valve components	Refer to section on Pump Disassembly and Rebuild and Piston Cylinder Disassembly and Rebuild

## PUMP DISASSEMBLY AND REBUILD

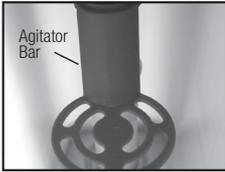


Figure 1

1) Insure the tank and pressure chamber contents are emptied and pressure has been released in the pressure chamber. To release pressure in the pressure chamber activate shut-off valve and release all pressure.

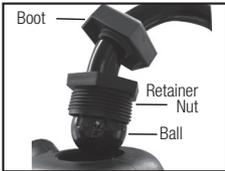


Figure 2

2) Reach into tank fill opening and remove agitator bar from pressure chamber body (Figure 1).

3) Disconnect linkage arm from the top of the pump assembly (see section covering Installing The Pump Handle). (Figure 2).



Figure 3

4) Loosen pump locking ring and remove entire pump assembly from tank (Figure 3).

### Check Valve

Remove check valve cartridge assembly from bottom of pressure chamber utilizing pump handle clip (clip has flat blade incorporated into end). Place flat blade into slot in bottom of cartridge and unscrew. Once cartridge has been removed it can either be replaced as an assembly or rebuilt. To rebuild disassemble two halves of cartridge and replace seal and/or ball (Figure 4 and 5). The seal mounts inside the larger of the two halves of the cartridge. The seal counterbore side mounts into the grooves in the cartridge half. Pump performance may be affected if this is not assembled correctly.

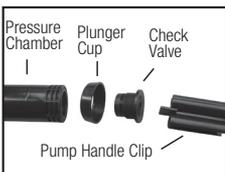


Figure 4

### Plunger Cup

Once the check valve has been removed the plunger cup can be replaced as the check valve housing holds the plunger cup in place to the bottom of the pressure chamber body. The bottom of the pressure chamber body has a groove in it to accept the raised ring on the plunger cup. It is important to insure that these two surfaces are aligned and mated before tightening the check valve. Pump performance may be affected if this is not assembled correctly.

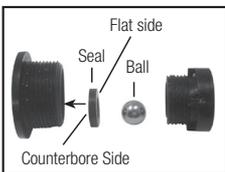


Figure 5

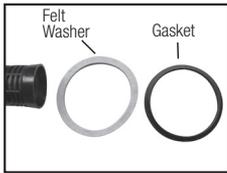


Figure 6

### Pressure Chamber Housing Gasket and Felt Washer

Slide both the gasket and felt washer off the pressure chamber body (Figure 6). Replace felt washer first taking care not to fold over washer as it is worked up the pump chamber and into the pump locking ring (figure 7). The felt washer is pre-lubricated to provide lubrication between the pressure chamber housing and pressure chamber housing gasket. Insure the felt washer is free of contamination before installing. Replace gasket into the pump opening in the tank insuring the flanged end is up (if this is assembled backwards leakage will occur) (Figure 8). Insure that the sides of the gasket are inside the tank pump opening and the flange is sitting level on the tank pump opening seal surface area.

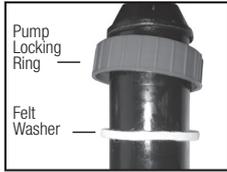


Figure 7

5) Replace pump assembly into tank and into the piston cylinder which is mounted on the bottom of the tank. Be careful not to damage the plunger seal as it seats into the piston cylinder. It is recommended that you view through the tank fill opening while performing this to achieve better alignment. If necessary you can also reach in and use your hand to guide the plunger seal into the piston cylinder.



Figure 8

6) Position the pump outlet (hose connection) in the desired position. Tighten the pump retaining ring onto the tank.

7) Reach into tank fill opening and attach agitator to pressure chamber body.

8) Connect linkage arm to the top of the pump assembly (see section covering Installing The Pump Handle).

## PUMP DISASSEMBLY AND REBUILD

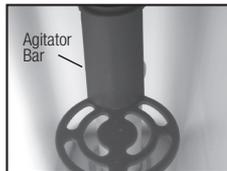


Figure 1

1) Insure the tank and pressure chamber contents are emptied and pressure has been released in the pressure chamber. To release pressure in the pressure chamber activate shut-off valve and release all pressure.

2) Reach into tank fill opening and remove agitator bar from pressure chamber body (Figure 1).



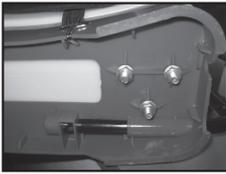
Figure 2

3) Disconnect linkage arm from the top of the pump assembly (see section covering Installing The Pump Handle). (Figure2).



Figure 3

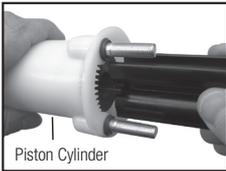
4) Loosen pump locking ring and remove entire pump assembly from tank ( Figure 3).



**Figure 4**

5) Remove the three bolts attaching the piston cylinder to the bottom of the tank (Figure 4).

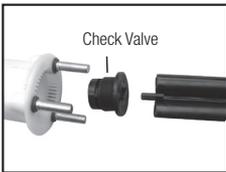
6) Reach in through the tank fill opening and remove the piston cylinder.



**Figure 5**

7) Remove check valve cartridge assembly from bottom of piston cylinder utilizing pump handle clip (clip has flat blade incorporated into end). Place flat blade into slot in bottom of cartridge and unscrew (Figure 5 and 6).

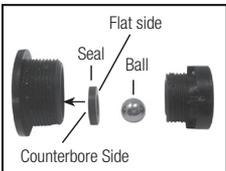
8) Once cartridge has been removed it can either be replaced as an assembly or rebuilt.



**Figure 6**

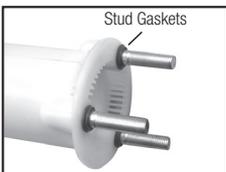
9) To rebuild disassemble two halves of cartridge and replace seal and/or ball. Replace cartridge (Figure 7). The seal mounts inside the larger of the two halves of the cartridge. The seal counterbore side mounts into the grooves in the cartridge half. Pump performance may be affected if this is not assembled correctly.

10) At this point the piston cylinder itself and/or piston cylinder stud gaskets can be replaced. The piston cylinder stud gaskets must be oriented correctly or leakage may result (Figure 8).



**Figure 7**

11) Reassemble piston cylinder using washers and bolts on the underside of the base.



**Figure 8**

12) Replace pump assembly into tank and into the piston cylinder which is mounted on the bottom of the tank (see important notes regarding gasket and felt washer in Pump and Disassembly and Rebuild section). Be careful not to damage the plunger seal as it seats into the piston cylinder. It is recommended that you look through the tank fill opening while performing this to achieve better alignment. If necessary you can also reach in and use your hand to guide the plunger seal into the piston cylinder.

13) Position the pump outlet (hose connection) in the desired position. Tighten the pump retaining ring onto the tank.

14) Reach into tank fill opening and attach agitator to pressure chamber body.

15) Connect linkage arm to the top of the pump assembly (see section covering Installing the Pump Handle)

## DISASSEMBLING AND REPAIRING THE SHUT OFF VALVE



Figure 1

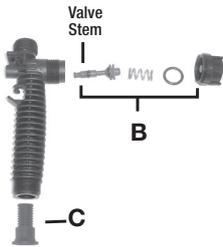
1) Assembled shut-off valve (Figure 1).



A

Figure 2

2) Remove the retaining pin (A) (Figure 2) place the notched end of the retaining pin on a hard surface and push down. Remove the retaining pin and slide the handle off the valve.



Valve Stem

B

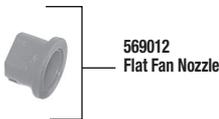
C

Figure 3

3) Remove the retaining nut (o-ring attached), spring, and valve stem (B) (Figure 3). Replace worn parts. Lubricate the O-rings and reassemble by reversing the steps above. Place the handle groove in the slotted area of the valve stem and make sure the locking clip is positioned in the neutral position (see “Helpful Spraying Information” section). Insert the retaining pin. Push down on the handle a few times to distribute the lubricant evenly. Check filter (C) in end of shut-off valve for debris. Remove filter and flush with water to clean out.

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## REPLACEMENT PARTS ORDER INFORMATION



569012  
Flat Fan Nozzle



569010  
Brass  
Adjustable  
Nozzle

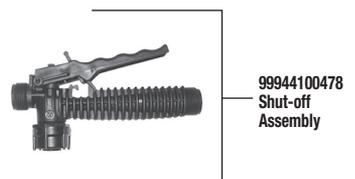
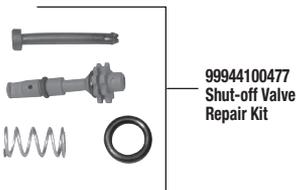
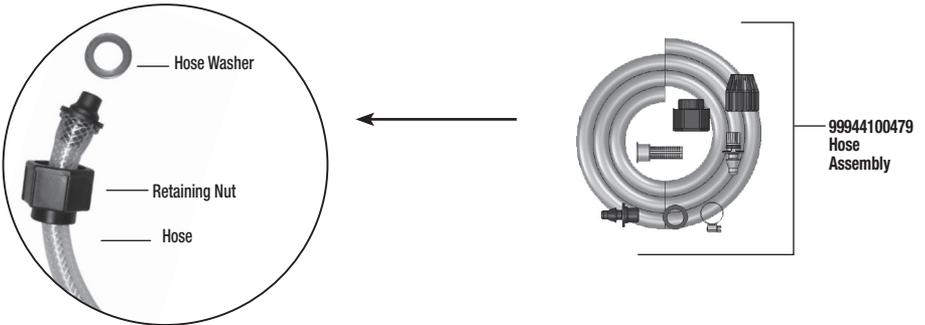
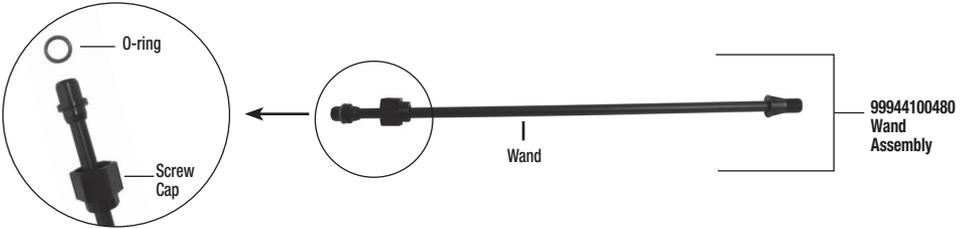


569011  
Poly  
Adjustable  
Nozzle

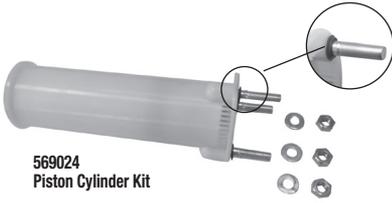


569013  
Nozzle kit

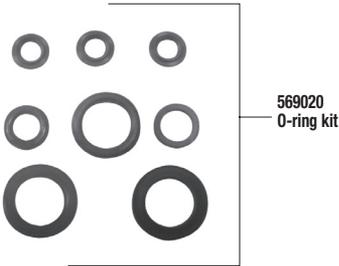
# REPLACEMENT PARTS ORDER INFORMATION



## REPLACEMENT PARTS ORDER INFORMATION



569021  
Pump Seal Kit



ECHO, INCORPORATED  
400 Oakwood Road, Lake Zurich, IL 60047  
[www.echo-usa.com](http://www.echo-usa.com)

**ECHO LIMITED WARRANTY STATEMENT FOR  
SPRAYERS SOLD IN USA AND CANADA BEGINNING 01/01/2010**

**ECHO'S RESPONSIBILITY**

ECHO Incorporated's Limited Warranty, provides to the original end user purchaser that this ECHO product is free from defects in material and workmanship. Under normal use and maintenance from date of purchase, ECHO agrees to repair or replace at ECHO's discretion, any defective product free of charge at any authorized ECHO servicing dealer within listed below application time periods, limitations and exclusions. **THIS LIMITED WARRANTY IS ONLY APPLICABLE TO ECHO PRODUCTS SOLD BY AUTHORIZED ECHO DEALERS. IT IS EXTENDED TO THE ORIGINAL END USER PURCHASER ONLY, AND IS NOT TRANSFERABLE TO SUBSEQUENT OWNERS.** Repair parts and accessories replaced under this warranty are warranted only for the balance of the original unit or accessory warranty period. Any damage caused by improper use, modifications, installation or maintenance is not covered by this warranty. All parts or products replaced under warranty become the property of ECHO, Inc. For a list of Authorized ECHO Dealers refer to WWW.ECHO-USA.COM or call 1-800-432-Echo.

**OWNER'S RESPONSIBILITY**

To ensure trouble free warranty coverage it is important that you register your Echo equipment on-line at WWW.ECHO-USA.COM or by filling out the warranty registration card supplied with your unit. Registering your product confirms your warranty coverage and provides a direct link if we find it necessary to contact you. The owner shall demonstrate reasonable care and use, and follow preventative maintenance and storage Instructions, as prescribed in the Use & Care Manual. Should a product difficulty occur, you must, at your expense, deliver or ship your ECHO unit to an authorized ECHO servicing dealer for warranty repairs (within the applicable warranty period), and arrange for pick-up or return of your unit after the repairs have been made. For your nearest authorized ECHO servicing dealer, call ECHO's Dealer Referral Center, at 1-800-432-ECHO or you can locate an ECHO servicing dealer at WWW.ECHO-USA.COM. Should you require assistance or have questions concerning ECHO's Warranty Statement, you can contact our Consumer Product Support Department at 1-800-432-ECHO or contact us through the web at WWW.ECHO-USA.COM.

**PRODUCT WARRANTY PERIOD**

**RESIDENTIAL APPLICATION**

• **5 YEAR WARRANTY** - All units for residential, or non-income producing use will be covered by this limited warranty for five (5) years from date of purchase.

**EXCEPTIONS:**

- Damage caused by:
- Failure to follow Use & Care Manual
- Failure to follow all chemical manufacturers' instructions included on their label or elsewhere
- Failure to follow Storing/Maintaining Your Sprayer section in Use & Care manual
- Use of powder based chemicals with or in a piston pump sprayer

Wear items including but not limited to: seals, gaskets, pistons, hoses, diaphragms, straps or any wear item. These items are covered for 90 days from date of purchase.

Any mis-use of product is not covered including but not limited to: using un-approved chemicals or parts, un-approved uses, using damaged or missing units/parts during operation, or modifying your sprayer in any manner.

**COMMERCIAL APPLICATION**

• **2 YEAR WARRANTY** - All units for commercial, institutional, agricultural, industrial, or income producing use will be covered by this limited warranty for two (2) years from the date of purchase.

**EXCEPTIONS:**

- Failure to read and follow Use & Care Manual
- Failure to follow all chemical manufacturers' instructions included on their label or elsewhere
- Failure to follow Storing/Maintaining Your Sprayer section in Use & Care Manual
- Use of powder based chemicals with or in a piston pump sprayer

Wear items including but not limited to: seals, gaskets, pistons, hoses, diaphragms, straps or any wear item. These items are covered for 30 days from date of purchase.

Any mis-use of product is not covered including but not limited to: using un-approved chemicals or parts, un-approved uses, using damaged or missing units/parts during operation, or modifying your sprayer in any manner.

**RENTAL APPLICATION - 90 DAYS WARRANTY**

• Units for rental use will be covered against defects in material and workmanship for a period of 90 days from the date of purchase except for any of the above listed EXCEPTIONS.

**PURCHASED REPAIR PARTS AND ACCESSORIES**

90-day residential or non-income producing warranty except for any one of the above listed EXCEPTIONS  
• 30-day commercial, institutional, agricultural, industrial, income producing, or rental application warranty except for any one of the above listed EXCEPTIONS

**YOUR RECEIPT OF PURCHASE INCLUDING DATE, MODEL AND SERIAL NUMBER MUST BE MAINTAINED AND PRESENTED TO AN AUTHORIZED ECHO SERVICING DEALER FOR WARRANTY SERVICE. PROOF OF PURCHASE RESTS SOLELY WITH THE CUSTOMER. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO YOU MAY ALSO HAVE OTHER SPECIFIC LEGAL RIGHTS WHICH VARY FROM STATE TO STATE. THIS LIMITED WARRANTY IS GIVEN BY ECHO INCORPORATED, 400 OAKWOOD RD., LAKE ZURICH, IL 60047.**

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