



# Handheld Tank Sprayer

## *Operator's Manual*

**MODELS      MS - 20**  
**MS - 35**



### **WARNING DANGER**

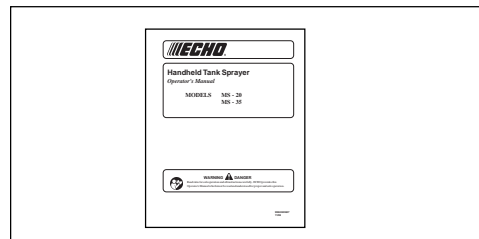
Read rules for safe operation and all instructions carefully. ECHO provides this Operator's Manual which must be read and understood for proper and safe operation.

## INTRODUCTION

Welcome to the ECHO family. This ECHO product was designed and manufactured to provide long life and on-the-job dependability. Read and understand this manual before operation. You will find it easy to use and full of helpful operating tips and SAFETY messages.

### THE OPERATOR'S MANUAL

Keep it in a safe place for future reference. Contains specifications and information for safety, assembly, operation, maintenance, storage, and troubleshooting specific to this product.



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## MANUAL SAFETY SYMBOLS AND IMPORTANT INFORMATION

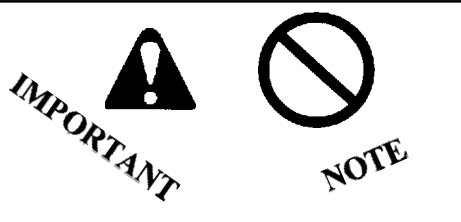
Throughout this manual and on the product itself, you will find safety alerts and helpful, information messages preceded by symbols or key words. The following is an explanation of those symbols and key words.



This symbol accompanied by the words **WARNING** and **DANGER** calls attention to an act or condition that can lead to serious personal injury to operator and bystanders.



The circle with the slash symbol means whatever is shown within the circle is prohibited.



### IMPORTANT

The enclosed message provides information necessary for the protection of the unit.

### NOTE

This enclosed message provides tips for use, care and maintenance of the unit.

## **SAFETY INSTRUCTIONS**

### **WARNING DANGER**

Carefully read and understand the Operator's Manual supplied with this unit prior to filling, using, and/or cleaning this sprayer. **DO NOT** use flammables in the sprayer. They can ignite and explode. Always wear splash goggles and all required protective gear and clothing when filling, using, cleaning, or performing maintenance on the sprayer. Failure to follow all instructions can result in fire, explosion, and serious injury.

- Always inspect your sprayer thoroughly before and after each use. Check to be sure hose is securely attached and in good condition before pressurizing the tank.
- Do not spray on or near electrical installations.
- Keep the work area clear of people and animals.
- Do not use sprayer when wind conditions cause spray to contact operator, plants, or other surfaces that may be harmed by spray solutions.
- Wear a mask or respirator when filling, using, and cleaning sprayer, if recommended by the spray material manufacturer.
- Oil the pump tube tank seal o-ring prior to first usage so the o-ring will seal properly.
- Tighten all connections before using the sprayer. Connections may have loosened during shipping and handling.
- Always release pressure in the tank prior to filling, cleaning, or servicing the sprayer.
- Before opening a container of pesticide or other spray material, carefully read, understand, and follow all instructions on the label.
- Never use caustic or corrosive chemicals which could damage the unit.
- Do not use hot liquids in sprayer. Maximum temperature 30° C, 85°F.
- Do not drop a tank that has been pressurized. If tank is dropped, inspect immediately, and stop using if damaged.
- In case of personal contamination: remove contaminated clothing and get professional help immediately. Consult chemical manufacturer's instructions for other important safety information.
- Never attempt to pressurize the unit by any other method than with the pump module provided. Never over-pressurize the unit.
- Do not eat, drink, or smoke while spraying.
- Wash face and hands with soap and water after spraying.
- Clean and rinse tank and spray gun/wand assembly after each use to prevent crystallizing, and clogging or chemical damage to the unit.
- Do not store sprayer under pressure, or with spray solution in tank.
- Do not transfer spray materials to other containers, especially food and/or drink containers.
- Keep spray materials locked up and out of reach of children and animals.
- Use only original manufacturer's replacement parts.

## SPECIFICATIONS

SPECIFICATIONS							
MODEL	MS-20	MS-35	MS-4	MS-40	MS-50	MS-100	SHR-2100
SPRAYER TYPE	Handheld	Handheld	Backpack	Backpack	Backpack	Backpack	Backpack
TANK CAPACITY (Gal.)	2.2	4	4	4	5.4	4.5	5
WEIGHT	6 lbs.	7 lbs.	9.8 lbs.	10.6 lbs.	12.2 lbs.	10.9 lbs.	17.1 lbs.
SEALS	Special Viton	Special Viton	Special Viton	Special Viton	Special Viton	Special Viton	Viton
TANK MOUTH	4.5"	4.5"	6"	6"	6"	6"	6"
PUMP TYPE	Piston	Piston	Diaphragm	Internal Piston	Internal Piston	Piston/ Diaphragm	Recirculating Rotary Pump
PRESSURE CHAMBER CAPACITY	N/A	N/A	40 oz.	25.4 oz.	27.4 oz.	40 oz.	N/A
WAND TYPE	16" Brass	16" Brass	20" Brass	16" Brass	20" Brass	20" Brass	24" Brass
FLOW CAPACITY AT NOZZLE	0.49 GPM	0.49 GPM	0.49 GPM	0.49 GPM	0.49 GPM	0.49 GPM	0.4 to 1.85 GPM
STANDARD NOZZLE	Adjustable	Adjustable	Brass Adjust/Fan	Fan	Fan	Brass Adjust/Fan	Two Head
PRESSURE RATING	15 TO 40 PSI	15 to 40 PSI	15 TO 70 PSI	15 TO 168 PSI	15 to 168 PSI	15 TO 150 PSI	85 to 145 PSI
RECOMMENDED APPLICATIONS							
CHLORINE BASE	X	X		X	X		
FERTILIZERS	X	X	X	X	X	X	X
HERBICIDES	X	X	X	X	X	X	X
INSECTICIDES	X	X	X	X	X	X	X
PESTICIDES	X	X	X	X	X	X	X
OIL-BASED SPRAY*	X	X	X	X	X	X	X
SOLVENT-BASED SPRAY*	X	X	X	X	X	X	X
STAINS/SEALERS*	X	X	X	X	X	X	X
DISSOLVABLE POWDERS	X	X	X**	X	X		X
* Check manufacturer's instructions for flammability information before applying with sprayer. ** When spraying dissolved powders, frequent agitation is necessary to prevent settling of mixed contents.							

## CONTENTS

- \_\_\_\_\_ Tank Assembly With Hose & Spray Gun
- \_\_\_\_\_ Spray Wand With Adjustable Nozzle
- \_\_\_\_\_ Shoulder Strap With Pad
- \_\_\_\_\_ Operator's Manual
- \_\_\_\_\_ Echo Limited Warranty and Warranty Registration forms

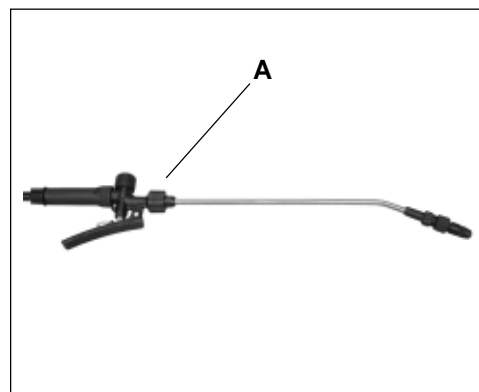
## DESCRIPTION



1. **PUMP HANDLE & TANK PUMP** - Pump handle up and down to pressurize tank. Turn handle counterclockwise to remove pump, clockwise to tighten. Handle locks in position when turned. Use to carry or lift unit when locked in position. Molded clip holds wand for convenient one-handed carrying of unit.
2. **SHOULDER STRAP** - Adjustable shoulder strap with cushioned pad supports sprayer for extended use.
3. **SPRAY WAND** - 16 in. heavy-duty brass design helps extend reach and directs flow for accurate spray delivery. Adjustable nozzle allows spray adjustment from fine mist to solid stream. Screw-on connector permits rapid assembly and removal for cleaning or replacement.
4. **SPRAY GUN** - Contains spray control lever and spray control valve. Provides secure hand grip for directing spray. Spray lever locks in "On" position for continuous spraying. Spray valve cap permits easy access to spray valve for cleaning. Accepts wide range of accessory spray wands - see "Accessories" section of manual.
5. **SPRAY HOSE** - Durable 4 ft. hose extends reach and provides easy maneuvering of spray gun and wand.
6. **TANK** - Durable corrosion-resistant tank features wide funnel mouth design for easy filling.

## ASSEMBLY

1. Attach spray wand connector (A) to spray gun. Position nozzle angle as desired, and tighten securely.
2. Hook the plastic clip attached to the shoulder strap into the square opening in the base of the unit.
3. Tighten all hose and spray gun connections before using the sprayer. Connections may have loosened during shipping and handling.



## OPERATION

1. Unscrew pump handle and remove pump from tank.
2. Mix spray solution in a separate container, following the chemical manufacturer's directions.
3. Pour pre-mixed solution through strainer into tank. Reinstall pump and tighten securely.
4. Turn pump handle counterclockwise to release handle from locked position.
5. Pressurize tank to desired pressure by pumping handle up and down. (Max. 35 to 40 times.)
6. Secure handle in down position by turning clockwise to locked position.
7. Adjust nozzle for desired spray pattern: Fine Spray - screw nozzle in clockwise. Stream - screw nozzle out counterclockwise.
8. Aim spray nozzle at desired area, and squeeze control lever to spray. For continuous spraying over large areas, control lever may be locked in spray position.
9. Maintain desired pressure while spraying by pumping handle.
10. Release tank pressure before removing pump to refill or clean tank, or to perform any maintenance.
11. To release tank pressure, turn unit upside down. Aim spray nozzle in a safe direction, and squeeze control lever until all air is released. Turn unit right side up, and unscrew pump.
12. Refill tank only with pre-mixed solution, and continue operation until spraying is completed.
13. When spraying is completed, release tank pressure as instructed above, and pour any remaining solution into a properly marked container. Seal container securely, and store out of the reach of children. Dispose of any excess solution according to chemical manufacturer's instructions. Clean unit immediately to prevent chemical deposits from forming.

### NOTE

A unit that has been used with herbicides should never be used to spray insecticides, unless the sprayer has been properly cleaned and all other chemicals neutralized. Failure to do this could cause you to kill plants that have been sprayed. Consult with the manufacturer of the chemicals in use to obtain proper instructions.

## CLEANING/STORAGE

1. Release tank pressure. Remove pump, and pour out remaining solution. Clean all parts thoroughly according to chemical manufacturer's instructions.
2. Add 1/2 gallon of fresh water to tank. Pressurize tank, and flush system by depressing trigger for at least two minutes. Drain all remaining water from tank, hose, spray gun, and wand.
3. Always store tank clean and empty in a dry, shaded location.

## TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Sprayer will not pressurize. Tank requires repeated pumping to maintain adequate pressure.	Loose pump. Pump tank o-ring dry or worn. Loose hose clamp. Spray hose loose at spray pistol handle. Spray gun grip connector loose. Spray gun lever locked "ON" Pump check valve o-rings worn. Pump check valve worn or broken. Pump plunger seal dry/worn. Pump tube cracked/broken. Tank cracked or damaged.	Tighten pump. Lubricate or replace pump tank o-ring. Tighten hose clamp at bottom of tank. Tighten spray hose connector. Tighten spray gun grip connector. Release lever. Replace check valve o-rings. Replace pump check valve. Lubricate/replace plunger seal. Replace pump tube. Replace unit.
Fluid leaks.	Loose connection. Damaged seal. Cracked connector. Cracked or damaged hose. Cracked tank.	Check connection and tighten as needed. Replace seal at leak location. Replace connector. Replace hose. Replace unit.
Spray valve pin sticks.	Spray valve o-rings damaged. Debris in spray valve area. Spring broken.	Replace o-rings. Clean spray valve area. Replace spring.
Spray doesn't shut off when spray lever is released.	Spray valve o-rings damaged. Debris in spray valve area. Spring broken.	Replace o-rings. Clean spray valve area. Replace spring.
Spray is weak.	Low tank pressure. Dirt or debris in hose or wand. Tank outlet plugged. Tank cracked or damaged.	Pressurize tank with pump handle. Clean unit. Clean tank outlet. Replace tank.
Sprayer nozzle adjustment doesn't work properly.	Nozzle dirty or damaged. Nozzle o-rings damaged or missing. Tank pressure low.	Clean or replace nozzle. Replace o-rings. Pressurize tank with pump handle.
Spray stream/mist doesn't reach desired area.	Area beyond spray capacity of wand.	Install longer wand - see accessory list.

## MAINTENANCE

### WARNING DANGER

Chemical contact hazard. Release tank pressure, empty tank, and wash unit before performing any maintenance procedures. Wear splash goggles and all required protective gear and clothing required by chemical manufacturer. Failure to follow all instructions may result in serious injuries.

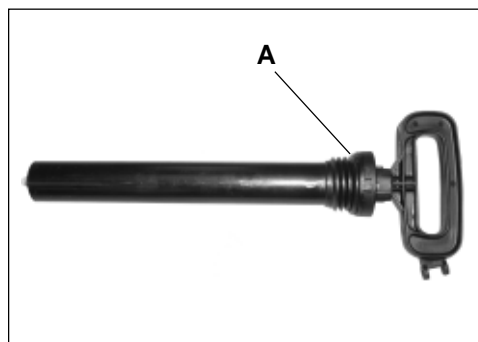
Consult parts catalog for part numbers of individual parts and repair kits. See "Servicing Information" section for instructions on obtaining a parts catalog.

### PUMP TUBE O-RING

Tools Required: None

Parts Required: Pump Tube O-ring, 10W Oil or Petroleum Jelly

1. Release tank pressure.
2. Unscrew pump from tank.
3. Remove o-ring (A) from under pump shoulder.
4. Install new o-ring
5. Lightly lubricate o-ring.
6. Install pump in tank and tighten securely.

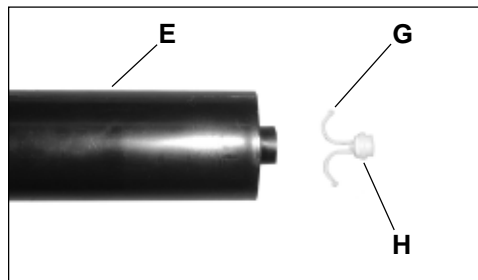
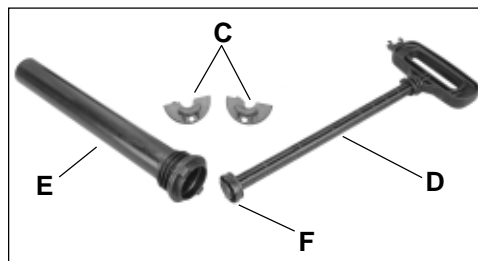
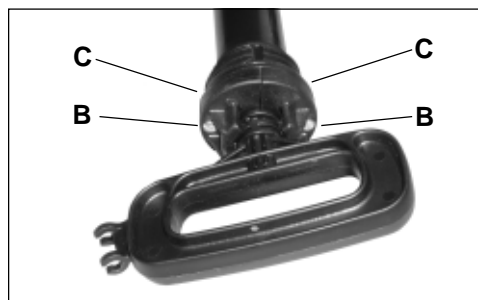


### PUMP

Tools Required: Screwdriver

Parts Required: Pump Plunger O-ring, Petroleum Jelly

1. Release tank pressure.
2. Unscrew pump from tank.
3. Unscrew two (2) pump cap screws (B), and remove pump caps (C).
4. Pull pump handle assembly (D) out of pump tube (E).
5. Pull check valve assembly (G) out of pump tube bottom.
6. Check parts for wear or damage, and replace as needed.
7. Lubricate pump plunger o-ring (F), inside of tube (E), and check valve o-ring (H) with petroleum jelly, and assemble parts in reverse order of removal. Pinch check valve prongs together at tips to insert check valve in pump tube.
8. Check pump for proper operation. Check valve should allow air to pass only on down stroke of pump handle.



#### NOTE

Lubricate pump plunger o-ring and inside of pump tube with a light coating of petroleum jelly every 8 - 10 hours of operation.

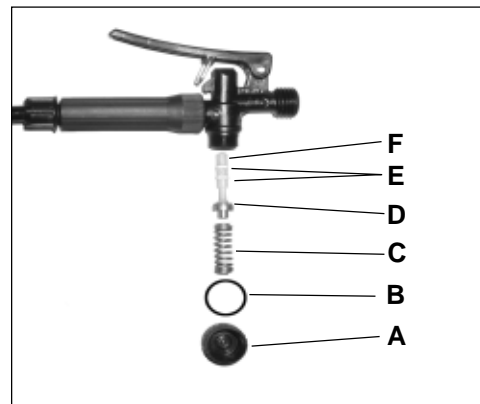


## SPRAY VALVE SPINDLE/O-RINGS

Tools Required: None

Parts Required: Spray Valve Spindle Assembly or O-Ring Kit,  
Petroleum Jelly

1. Release tank pressure and remove pump. Squeeze spray lever to allow fluid in hose and spray gun to drain back into tank, and empty tank.
2. Unscrew spray valve cap (A). Check cap o-ring (B) for damage, and replace if needed.
3. Remove valve spring (C) and spindle assembly (F) and check for wear or damage.
4. Replace spindle assembly, or install new seal (D) and o-rings (E) from o-ring kit. Lubricate spindle o-rings lightly with petroleum jelly.
5. Inspect valve seat area of spray gun for buildup of chemical deposits or debris, and clean as required.
6. Reassemble parts in reverse order of removal.
7. Tighten spray valve cap securely.
8. Check spray lever/spray valve for freedom of movement. Spray valve spindle must return to closed position when lever is released.
9. Add water to tank, and test unit for leaks and proper operation before adding spray solution.



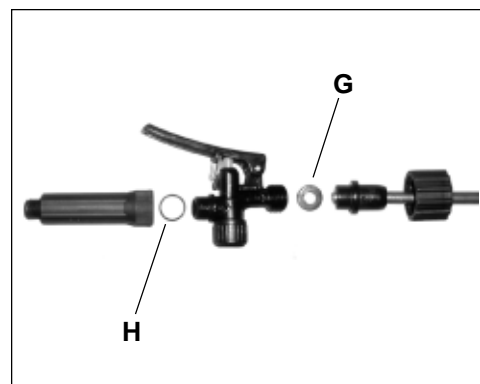
## SPRAY GUN CONNECTOR

### O-RING AND WASHER

Tools Required: None

Parts Required: Grip O-ring, Rubber Wand Washer

1. Release tank pressure and remove pump. Squeeze spray lever to allow fluid in hose and spray gun to drain back into tank, and empty tank.
2. Unscrew wand connector, and replace rubber wand washer (G).
3. Unscrew grip and replace grip o-ring (H).
4. Screw grip and wand connectors on tightly.
5. Add water to tank, and test unit for leaks and proper operation before adding spray solution



## SPRAY HOSE

Tools Required: Screwdriver

Parts Required: Spray Hose Assembly

1. Release tank pressure and remove pump. Squeeze spray lever to allow fluid in hose and spray gun to drain back into tank, and empty tank.
2. Unscrew spray hose connector (A) from spray gun.
3. Loosen spray hose clamp (B) at base of unit, and remove hose from tank outlet.
4. Attach new hose to outlet, and secure with hose clamp.
5. Screw hose connector to spray gun, and tighten securely.
6. Add water to tank, and test for leaks and proper operation before adding spray solution.

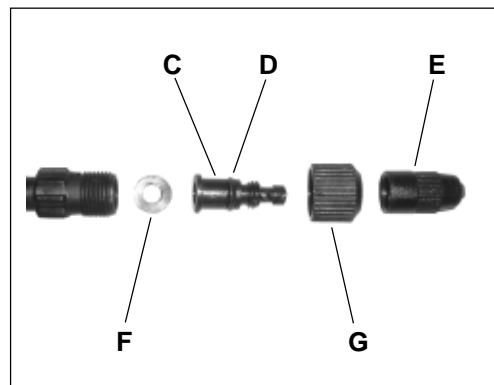


## ADJUSTABLE NOZZLE

Tools Required: Screwdriver, small diameter wire.

Parts Required: Nozzle Assembly or Nozzle O-ring Kit, Petroleum Jelly

1. Release tank pressure and remove pump. Squeeze spray lever to allow fluid in hose and spray gun to drain back into tank, and empty tank.
2. Unscrew nozzle tip (E) from wand.
3. Unscrew nozzle holder (G) and remove nozzle (C), and rubber washer (F).
4. Check nozzle, nozzle o-ring (D), and rubber washer for damage, and clean or replace parts as required. Lubricate o-ring (D) lightly with petroleum jelly.
5. If plugged, nozzle (C) can be cleaned by inserting a small piece of wire into the nozzle opening to clear buildup.
6. Reassemble parts in reverse order of removal.
7. Add water to tank, and test unit for leaks and proper operation before adding spray solution.



## **SPRAYER ACCESSORIES**

<b>NUMBER</b>	<b>DESCRIPTION</b>	<b>NUMBER</b>	<b>DESCRIPTION</b>
99944100220	66" Brass Wand	99944100370	Valve Regulator 21 psi
99944100240	26" Brass Wand	99944100380	Valve Regulator 29 psi
99944100080	Spray Shield - Small	99944100390	Valve Regulator 44 psi
99944100460	Spray Shield - Large	99944100400	Fiberglass Wand 20.5"
99944100310	16" Brass Wand	99944100410	Fiberglass Wand 39"
99944100320	Adjustable Plastic Nozzle	99944100420	Fiberglass Wand 60"
99944100330	Spray Gun Assembly	99944100430	Fiberglass Wand 78"
99944100340	Adjustable Brass Nozzle	99944100440	Telescoping Fiberglass Wand
99944100350	Fan Spray Nozzle (Decks)		22.8" - 37"
99944100360	Valve Regulator 14.5 psi	99944100470	Universal spray gun, 16"
			Brass wand and adjustable
			brass nozzle (For all 3/8"
			hose)

## SERVICING INFORMATION

### PARTS

Genuine ECHO Parts and ECHO REPOWER™ Parts and Assemblies for your ECHO products are available only from an Authorized ECHO Dealer. When you do need to buy parts, **always** have the Model Number of your unit with you. You can find this number on the tank. For future reference, write the model number in the space provided below.

Model No. \_\_\_\_\_

### SERVICE

Service of this product during the warranty period must be performed by an Authorized ECHO Service Dealer. For the name and address of the Authorized ECHO Service Dealer nearest you, ask your retailer or call: 1-800-432-ECHO (3246). Dealer information is also available on our Web Site. When presenting your unit for Warranty service/repairs, proof of purchase is required.

### ECHO CONSUMER PRODUCT SUPPORT

If you require assistance or have questions concerning the application, operation or maintenance of this product you may call the ECHO Consumer Product Support Department at 1-800-673-1558 from 8:30 am to 4:30 pm (Central Standard Time) Monday through Friday. Before calling, please know the model and serial number of your unit to help your Consumer Product Support Representative.

### WARRANTY REGISTRATION

You may register your Echo equipment using the warranty registration card or register online at [www.echo-usa.com](http://www.echo-usa.com). Registering provides a direct link between you and ECHO if we find it necessary to contact you.

### ADDITIONAL OR REPLACEMENT MANUALS

**Operator's and Parts Manuals** are available by:

- Downloading free from [www.echo-usa.com](http://www.echo-usa.com)
- Purchasing from your Echo Dealer.
- Sending a check or money order for \$2.00 per Parts Catalog or \$1.50 per Operator's Manual made payable to ECHO, INCORPORATED. State on a sheet of paper the model number of the ECHO unit you have, part number of the manual (if known), your name and address, and mail to the address below.

#### Available Parts Catalog

MS-20/MS-35

Part Number 99922203638

### DEALER?

Call

**1-800-432-ECHO**

or

**[www.echo-usa.com](http://www.echo-usa.com)**

### CONSUMER PRODUCT SUPPORT

**1-800-673-1558**

**8:30 - 4:30 Mon - Fri C.S.T.**



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