

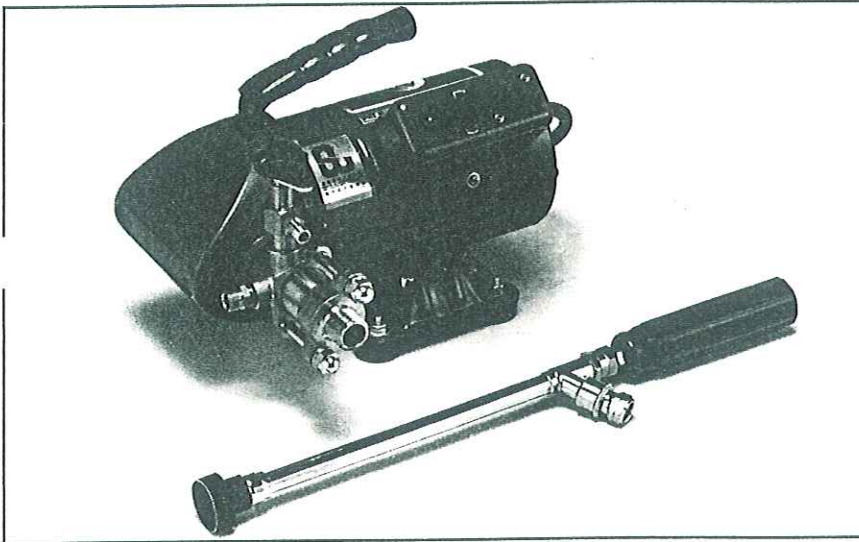


# MARUYAMA™

*The Very Best*

## ELECTRIC SPRAYER

### MODEL MS 027 M



- COMPACT, LIGHTWEIGHT DESIGN — CONVENIENT GRIP.
- VERSATILE, ALL-PURPOSE SPRAYER WITH ADJUSTABLE SPRAY WAND.
- PRESSURE REGULATOR FOR SETTING DISCHARGE RATES
- DURABLE, HIGH PRESSURE PISTON PUMP
- QUIET, HEAVY DUTY ELECTRIC MOTOR.

Item / Model

MS 027 M

PUMP TYPE	SINGLE PISTON
DISCHARGE - MAX	0.58 gpm
PRESSURE - MAX	500 psi
ELECTRIC MOTOR	115 VOLT, 60 hz
HOSE	32 FEET
WEIGHT	19 lbs.
LxWxH	9.4 in. x 9.3 in. x 8.3 in.

INCLUDES INLET HOSE & FILTER, BYPASS HOSE.

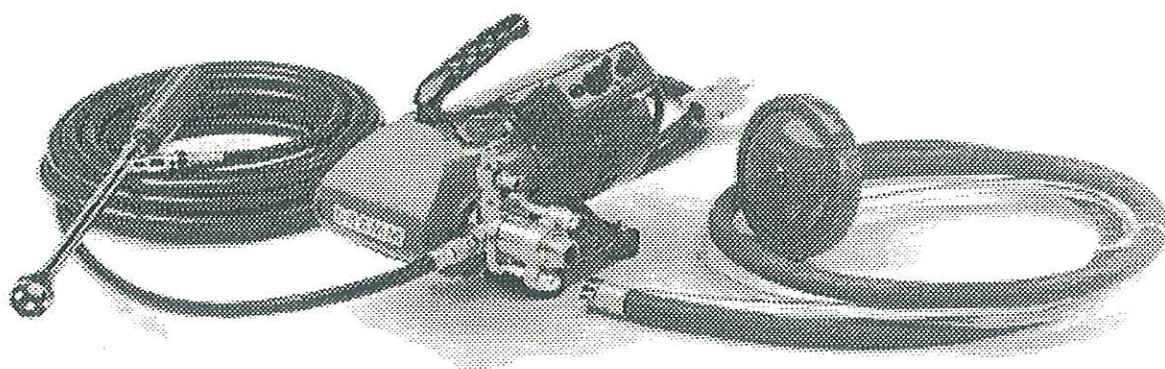
**Quality Equipment Since 1895**

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**MARUYAMA**

**THE VERY BEST**



**Heavy Duty Sprayer**

**Owners Manual**

**Model MS-O**

# WARNING

## Heavy Duty Sprayer Model: MS-O

- Use only 110-115 volt electrical outlets.
- Use only 3-pronged grounded extension cords and receptacle boxes.
- Keep all electrical connections away from liquids.
- Clean after every use with warm soapy water and then rinse with clean water.
- Wear protective clothing; respirator, hood, gloves and boots when mixing and spraying chemicals.
- Do not spray into the wind. Avoid the drift of solution sprays.
- Do not direct the spray or spray gun at yourself or anyone else.
- Be certain all hoses and connections are secure prior to using the Heavy Duty Sprayer.
- Avoid dry operation, since the spray solution acts as a pump lubrication.
- Relieve the pressure before removing the hoses or spray gun.
- Apply all chemicals according to EPA Guidelines.
- Store in a clean, dry location– away from children and unauthorized personnel.
- Remove all hoses and drain the pump prior to storage.
- Do not drag the hoses over sharp objects or bend excessively.
- Repair or replace all damaged or broken hoses before using the Heavy Duty Sprayer.
- Before servicing the unit, disconnect the Heavy Duty Sprayer from the power source.
- Do not store mixed chemicals. Use all of the chemical mixture immediately.
- Do not adjust the P.R.V. (Pressure Regulator Valve) over 500 PSI. The maximum operating pressure for the Heavy Duty Sprayer, model MS-O is 500 PSI.

## Assembly & Preparation

1. Install the suction hose (red – inlet), bypass hose (clear – outlet), discharge hose, and the spray gun. Use Teflon® tape on the discharge hose threads that connect to the spray gun. Make sure that the packings are not damaged or missing from the suction hose. Tighten all connections securely.

2. Loosen the Pressure Regulator Valve (P.R.V.) by rotating the large red knob on the pump housing counterclockwise. This lifts the spring tension off of the check valve, and allows all of the spray solution to bypass back into the chemical tank via the overflow hose.

3. Inspect the suction hose strainer for any debris that may have clogged the screen mesh.

4. Place the suction hose and overflow hose into the chemical tank.

5. Be sure the “ON/OFF” toggle switch is in the “OFF” position (DOWN).

6. Be sure the sprayer is placed on a level surface for operation so it is not likely to fall. The Heavy Duty Sprayer will vibrate, causing it to move about. Place the sprayer on the ground, floor or bolt it securely to the MS-12 Cart.

7. Connect the power cord to a suitable 110-115 V 60 HZ receptacle. Notice that the pilot lamp will be illuminated.

**NOTE:** If an extension cord is going to be used with the Heavy Duty Sprayer, the maximum length should be no longer than 100 feet (12 gauge, grounded).

**CAUTION:** Keep all electrical connections away from liquids. Use only three-pronged grounded receptacles and extension cords.

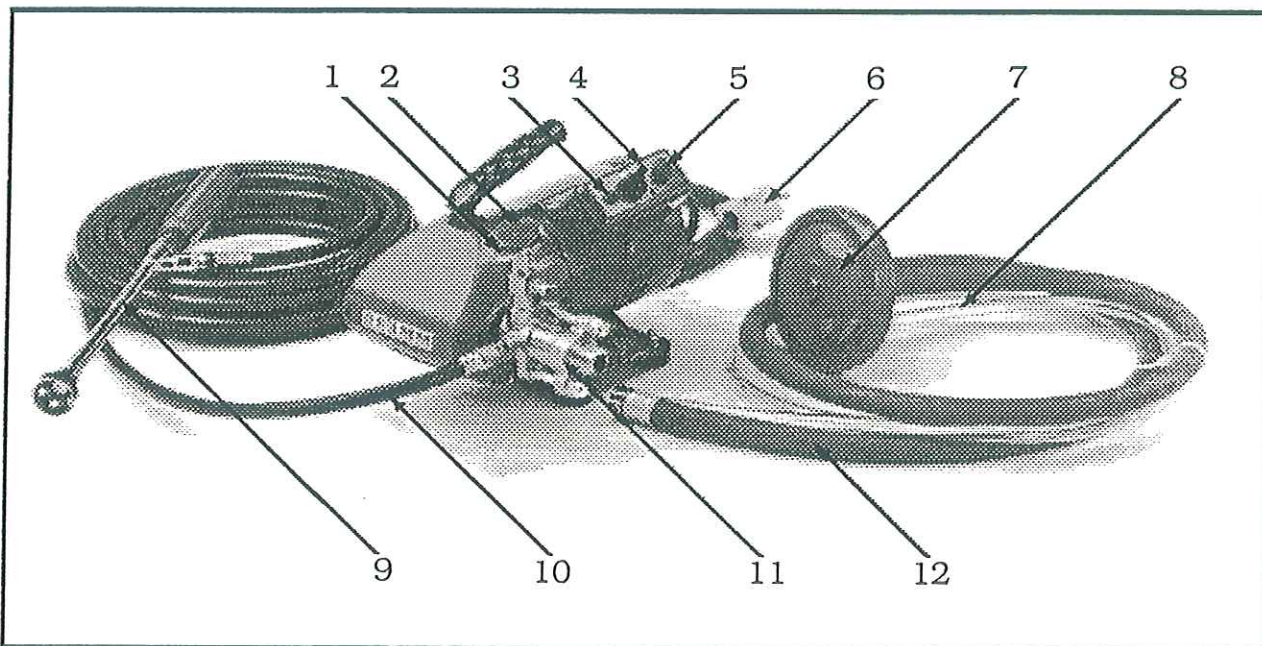


Figure A

- |                                      |                          |
|--------------------------------------|--------------------------|
| 1. P.R.V. Lock                       | 7. Suction Hose Strainer |
| 2. Pressure Regulator Valve (P.R.V.) | 8. By-Pass Hose (clear)  |
| 3. Pilot Lamp                        | 9. Spray Gun             |
| 4. ON/OFF Toggle Switch              | 10. Discharge Hose       |
| 5. Reset Switch                      | 11. Pump Body            |
| 6. Power Cord                        | 12. Suction Hose (red)   |

## Operation

1. After completing *Assembly and Preparation* flip the "ON/OFF" toggle switch to "ON" (UP).

2. Wait for the spray solution to return to the chemical tank through the overflow hose. Be sure all air bubbles are eliminated from the overflow hose.

**NOTE:** Spray solution preparation is very important. When using any detergents, wetting agents or chemicals, follow the labeled instructions on the product container. Mix the product thoroughly with water before spraying.

3. In case the spray solution does not return to the chemical tank through the overflow hose, check the following.

A.) Make sure that the suction hose packing is not damaged or missing. Tighten the suction hose securely.

B.) The suction valve may be stuck closed. Push the suction valve open with a small rod (remove suction hose first). **Figure B.**

C.) If these remedies do not work, pour a small amount of water down the suction hose (inlet) to prime the pump.

D.) Avoid dry operation as the spray solution also acts as a lubricant for the pump.

E.) Do not allow spray solution to contact the motor or pump.

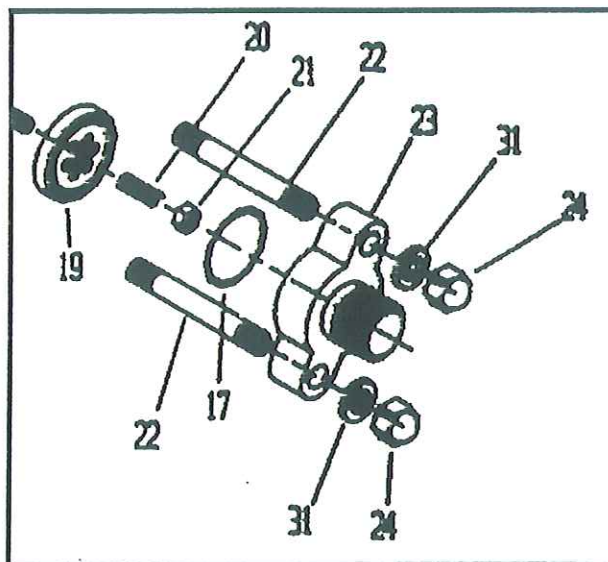
4. Slowly increase the operating pressure by turning the P.R.V. clockwise. This increases the tension on the check valve.

5. Open the spray gun by rotating the handle on the gun. As the handle is rotated, the spray pattern changes from a fine mist to a concentrated stream. Adjust the operating pressure as necessary while spraying.

6. When the spray solution has been emptied from the chemical tank close the spray gun and turn the machine "OFF". Avoid dry operation as the spray solution also acts as a lubricant for the pump.

7. Rotate the P.R.V. counterclockwise to release tension on the check valve.

8. If there is spray solution remaining and you wish to stop spraying for a short time, lift the suction hose and overflow hose out of the chemical tank and flip the "ON/OFF" toggle switch to "OFF" when all spray solution has been emptied into the chemical tank from the overflow hose.



**Figure B**

## Cleaning & Storage

1. Flush the pump and discharge hose with warm soapy water for a few minutes. This will clean the pump and discharge hose.

2. Unplug the electrical cord. Make sure the electrical cord is not damaged in any way.

3. Wipe off the motor and pump housing with a damp cloth so it is clean for the next operation.

4. Store the Heavy Duty Sprayer in a clean, dry, dust-free area. Protect the motor from moisture with a plastic covering.

**CAUTION:** Do not store the Heavy Duty Sprayer in areas where freezing temperatures may occur.

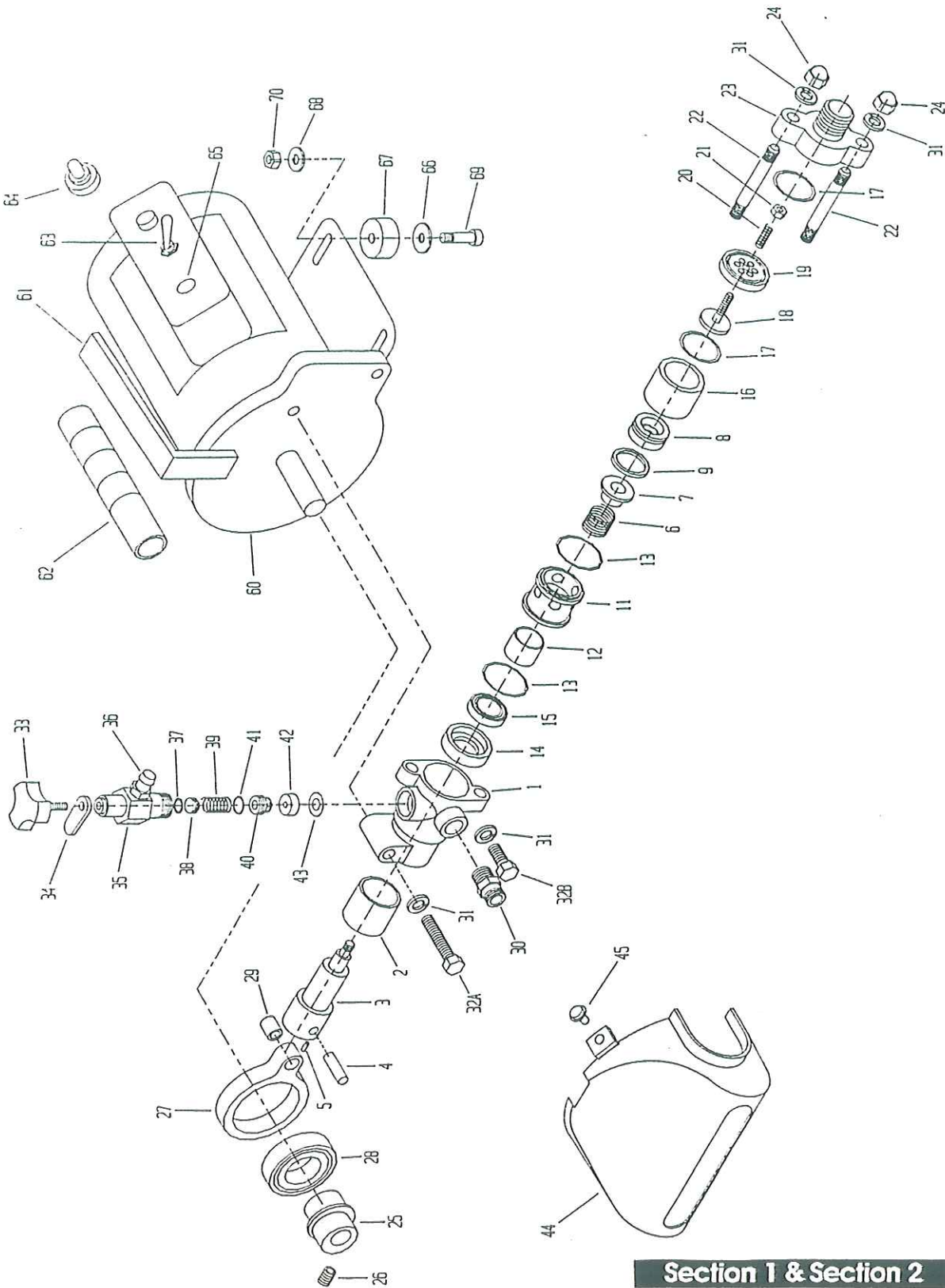
## Troubleshooting

Problem	Cause	Remedy
<ul style="list-style-type: none"> <li>•Sprayer will not turn on. Pilot lamp does not illuminate.</li> </ul>	<ul style="list-style-type: none"> <li>•Sprayer is not plugged in.</li> <li>•Pressure is too high for motor capacity.</li> <li>•Defective electric motor.</li> </ul>	<ul style="list-style-type: none"> <li>•Plug sprayer into a 110-115 volt electrical outlet.</li> <li>•Reduce the pressure setting. Turn the Pressure Regulator Valve counterclockwise.</li> <li>•Have the electric motor serviced by a qualified electrician or contact the Dramm Corporation Service Department at 800-258-0848.</li> </ul>
<ul style="list-style-type: none"> <li>•Sprayer pump will not draw up solution.</li> </ul>	<ul style="list-style-type: none"> <li>•Suction hose is not securely fastened to the pump or the suction hose packing is damaged.</li> <li>•Suction valve is stuck to suction valve seat.</li> <li>•Dry operation has pressurized the pump cylinder with air.</li> <li>•Suction hose strainer is clogged.</li> </ul>	<ul style="list-style-type: none"> <li>•Tighten the suction hose coupling to the pump or replace the hose packing.</li> <li>•Remove the suction hose and push the suction valve open with a small rod.</li> <li>•Remove the discharge hose to eliminate air from the pump.</li> <li>•Clean the strainer screen thoroughly. Replace if necessary.</li> </ul>
<ul style="list-style-type: none"> <li>•No pressure.</li> </ul>	<ul style="list-style-type: none"> <li>•P.R.V. is defective or damaged.</li> <li>•No spray solution returns through the overflow hose.</li> <li>•Clogged nozzle (poor spray pattern).</li> </ul>	<ul style="list-style-type: none"> <li>•Overhaul; replace valve and valve seat.</li> <li>•Replace spray gun nozzle orifice disk.</li> <li>•Clean nozzle thoroughly.</li> </ul>

## Troubleshooting

Problem	Cause	Remedy
<ul style="list-style-type: none"> <li>• Gradual pressure reduction with no recovery.</li> </ul>	<ul style="list-style-type: none"> <li>• Clogged suction hose or strainer.</li> <li>• P.R.V. is defective or damaged.</li> </ul>	<ul style="list-style-type: none"> <li>• Clean strainer screen thoroughly and replace if necessary.</li> <li>• Repair or replace Pressure Regulator Valve.</li> </ul>
<ul style="list-style-type: none"> <li>• Solution is leaking from the pump assembly.</li> </ul>	<ul style="list-style-type: none"> <li>• Damaged U-packing, part #512010015 (item #15 on the parts diagram).</li> </ul>	<ul style="list-style-type: none"> <li>• Replace damaged U-packings.</li> </ul>
<ul style="list-style-type: none"> <li>• Unstable pressure. Suction hose and discharge hose vibrate significantly.</li> </ul>	<ul style="list-style-type: none"> <li>• Air is being drawn into the pump.</li> <li>• Valves and valve seats are stuck together.</li> <li>• P.R.V. and valve seat are damaged.</li> </ul>	<ul style="list-style-type: none"> <li>• Tighten suction hose securely to the pump and check packing.</li> <li>• Check suction valve and discharge valve for damage. Clean or replace as necessary.</li> <li>• Replace damaged parts.</li> </ul>

# MS-O Pump & Electrical Parts Diagram

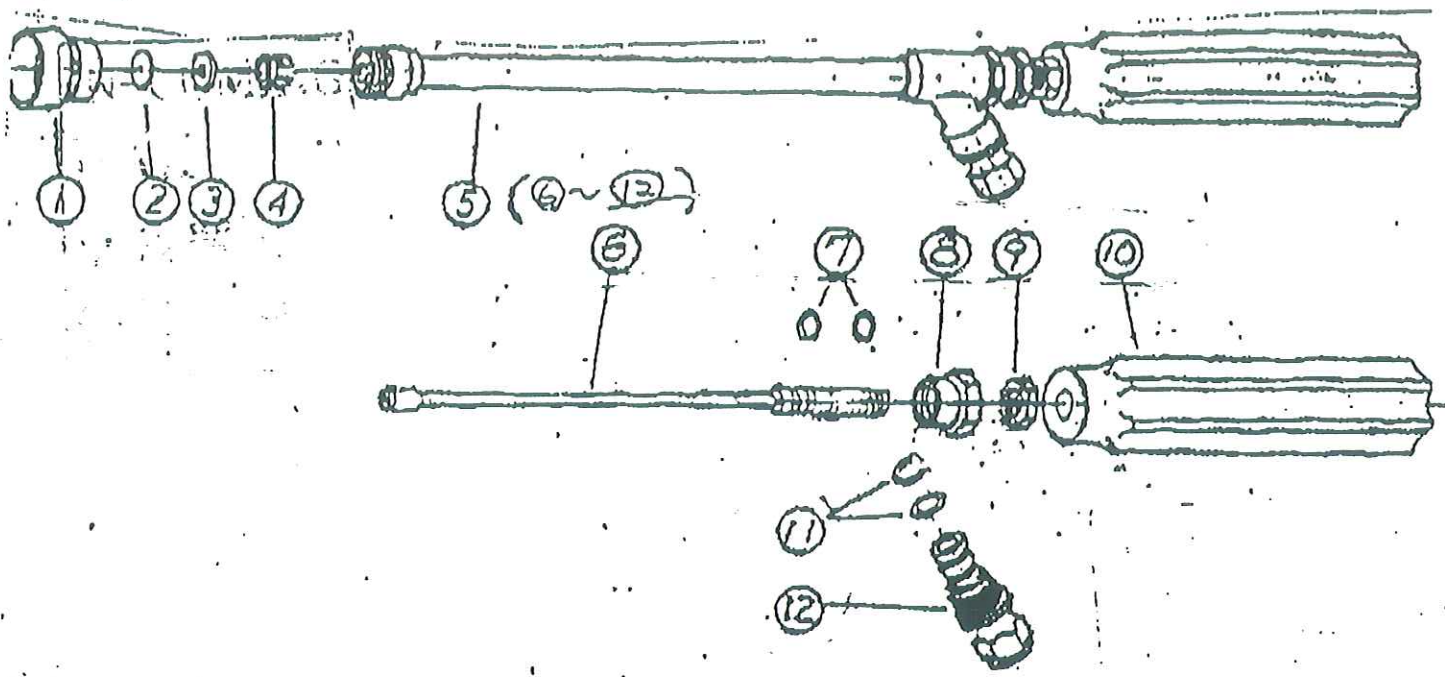


**Section 1 & Section 2**



PUMP PARTS LIST MS027M

REF	PART #	DESCRIPTION	QTY
1	573808	DISCHARGE PART	1
2	573809	BUSHING (LARGE)	1
3	573810	PLUNGER	1
4	573811	PIN	1
5	573812	BOLT (4.0mm X 4mm)	2
6	573813	SPRING	1
7	573814	DISCHARGE VALVE	1
8	573815	PISTON	1
9	573816	PISTON PACKING	1
10	573817	U-NUT (6.0mm)	1
11	573818	GUIDE RING	1
12	573819	BUSHING (SMALL)	1
13	573820	O-RING (S-28)	2
14	573821	SPACER	1
15	573822	U-PACKING	1
16	573823	CYLINDER	1
17	573824	O-RING	2
18	573825	SUCTION VALVE	1
19	573826	SUCTION VALVE SEAT	1
20	573827	SPRING	1
21	573828	U-NUT (5.0)	1
22	573829	STUD BOLT (8.0mm X60mm)	2
23	573830	SUCTION PORT	1
24	573831	BLIND NUT (8.0mmX 6.0mm)	2
25	573832	ECCENTRIC COLLAR	1
26	573833	BOLT(8.0mmX 10mm)	1
27	573834	CONNECTING ROD	1
28	573835	BALL BEARING(6005ZZ)	1
29	573836	NEEDLE MEDAL	1
31	573837	SPRING WASHER (8.0mm)	2
30		DISCHARGE FITTING	1
32-1	573838	BOLT(LONG-8.0mmX40mm)	1
32-2	573839	BOLT(SHORT-8.0mmX20mm)	1
33	573840	P.V.R. SCREW	1
34	573841	HEXAGON NUT (6.0mm)	1
35	573842	P.R.V. BODY	1
36	573843	HOSE JOINT	1
37	573844	O-RING (P-7)	1
38	573845	SPRING RETAINER	1
39	573846	SPRING	1
40	573847	PRESSURE REGULATOR VALVE	1
41	573848	O-RING (P-9)	1
42	573849	P.R. VALVE SEAT	1
43	573850	SEAT-PACKING	1
44	573851	PUMP COVER	1
45	573852	BOLT (5.0mmX8mm)	3
46	573853	WASHER (5.0mm)	3
80	573861	STRAINER	1
81-84	573862	SUCTION HOSE ASSEMBLY	1
85	573863	BY-PASS HOSE	1
60	573854	MOTOR ASSEMBLY	1
61	573855	HANDLE	1
62	573856	HANDLE COVER	1
63	573857	SWITCH	1
64	573858	SWITCH CAP	1
65	573859	PILOT LAMP	1
66-70	573860	BUFFER ASSEMBLY	4



PART#	DESCRIPTION
1	MINI NOZZLE
2	HOOD CAP
3	NOZZLE SEAT
4	PACKING
5	NOZZLE SEATPLATE
6	BODY ASS'Y(6-12)
7	ADJUSTING ROD
8	O-ING
9	GLAND
10	NUT
11	GRIP
12	O-ING
	SWIVEL JOINT

Notes

A series of horizontal dotted lines for taking notes.