

STATEMENT OF LIMITED WARRANTY

MÁQUINAS AGRÍCOLAS JACTO S.A. shall warrant the equipment described in this manual and shall repair or replace parts and components which, under normal operation and wear, in accordance with technical recommendations, show DEFECTS IN MATERIAL OR WORKMANSHIP, based on the following conditions.

WARRANTY PERIOD

- 01 (one) year from the date of sale to the original purchaser.

WARRANTY APPLICATION

- JACTO shall honour this warranty, free of charge, if any part or component shows defect in MATERIAL OR WORKMANSHIP, after final analysis at the factory.

THIS WARRANTY SHALL BE NULL & VOID IN CASE OF:

- Misuse of the equipment against specifications in the OPERATOR'S MANUAL, overwork or accidents.
- Preventive/remedial maintenance performed by unauthorized people.
- Use of parts and components not supplied by JACTO.
- Modification of the equipment or any characteristic of the original design.

THIS WARRANTY SHALL EXCLUDE:

- Parts which show wear and tear due to use, UNLESS THEY SHOW DEFECTS IN WORKMANSHIP, ASSEMBLY OR MATERIAL.
- Damages resulting from accidents.
- Transportation or freight of the equipment, parts and components in case such warranty is not approved.
- Transportation and mobilization of technicians.

GENERAL INFORMATION:

- Parts replaced within the warranty period shall be property of JACTO.
- The warranty on replaced parts and components shall expire together with the equipment warranty period.
- Eventual delays in performing services shall not give the owner right either to indemnity or to extension of the warranty period.
- JACTO reserves the right to modify its products or to interrupt the manufacture without prior notice.

BUSHRANGER

PLP - POWERUP LAWCARE PRODUCTS

A Division of Roy Gripske & Sons
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OPERATOR'S MANUAL X-15

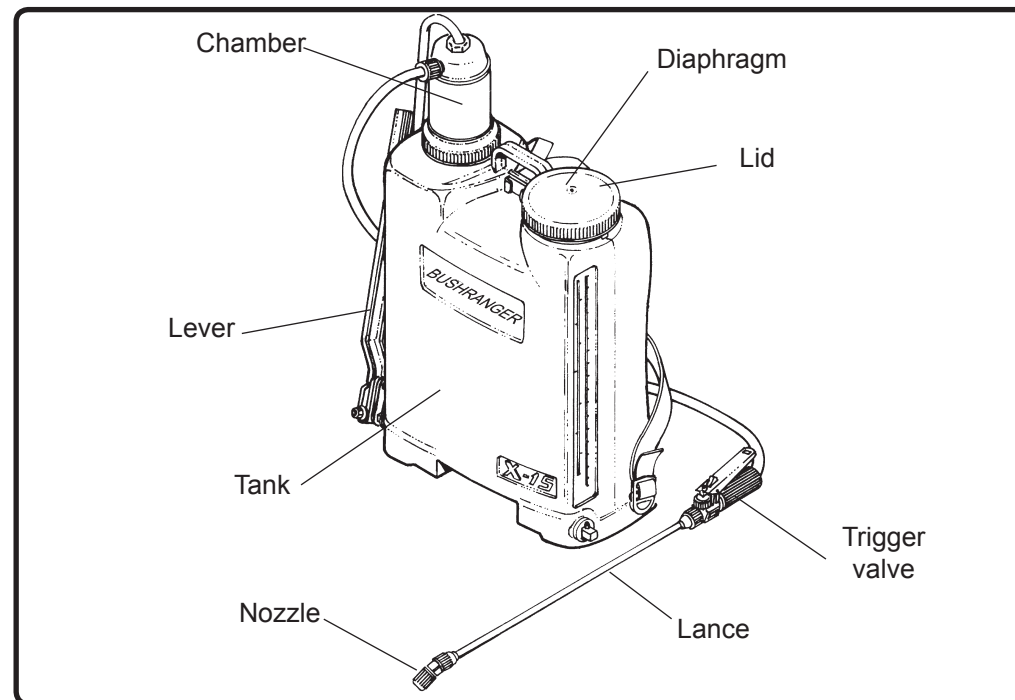
BUSHRANGER

1- INTRODUCTION

This manual contains information for the proper assembly, operation and care of your sprayer.

Carefully read and follow the instructions contained in this manual before using your sprayer.

2- SPRAYER VIEW

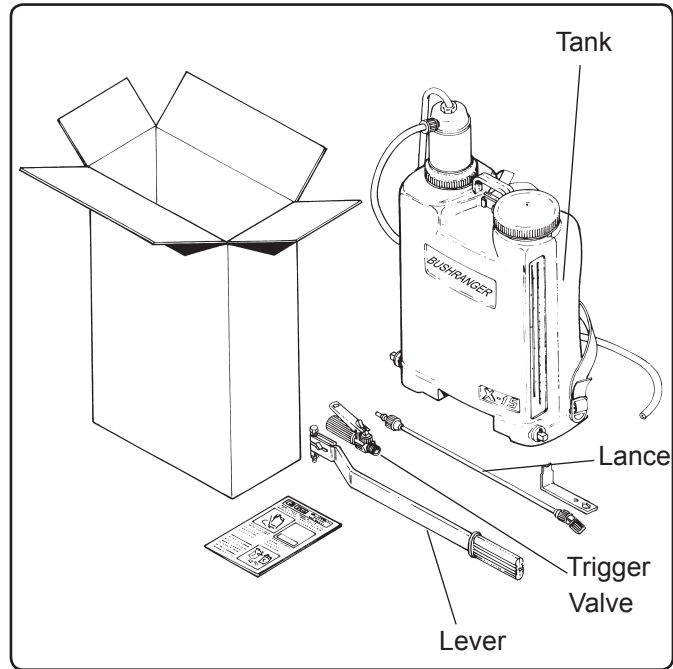


3- SPECIFICATIONS

Model.....	X-15	Pump	
Net weight.....	4.6 kg	- Type.....	Piston
Tank		- Material.....	Polyamide
- Capacity	15 liters	- Working pressure (max.) .	6 kgf/cm ²
- Material.....	Polyethylene (plastic)	Lance length.....	600 mm
- Fill opening Ø.....	115 mm	Hose length	1650 mm
		Nozzle fitted.....	Red adjustable cone nozzle

4- ASSEMBLY PROCEDURES

Take out of the sprayer carton the following parts.

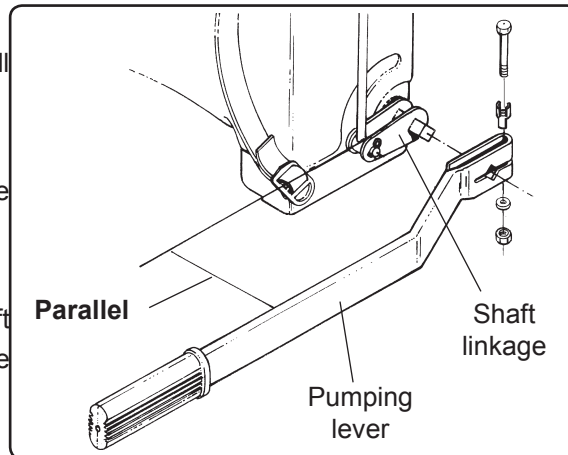


ATTENTION: Be careful when taking the sprayer out of the carton because the lever is loose and cause damage or personal injury.

5- INSTALL THE PUMPING LEVER

- Choose the appropriate side to install the pumping lever (right or left).
- Press the compensation chamber.
- Install the lever on the shaft linkage and tighten the bolt.

NOTE: As reference, use the shaft linkage that must be parallel to the pumping lever.

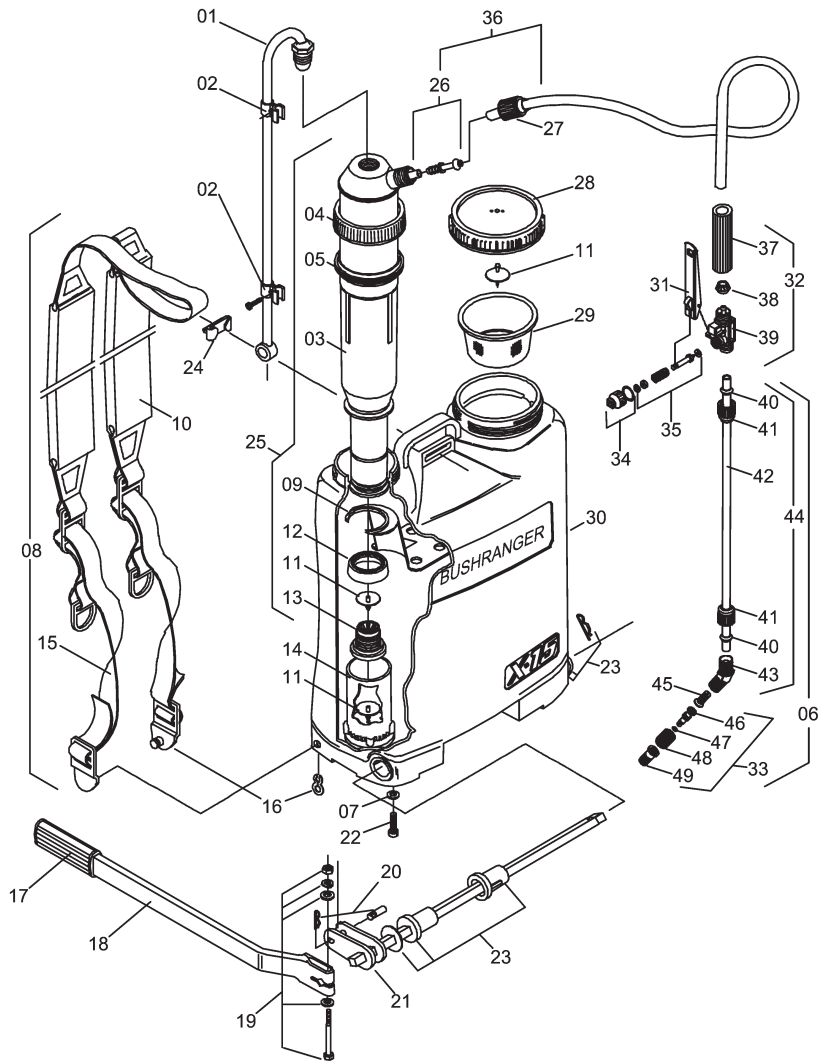


Item	Part no.	Description	Qty	Item	Part no.	Description	Qty
00		X-15	-		assembly	(includes: ref. 32 and 33)	01
01	214486	Pumpin rod assembly	01	36	048116	Dip tube with hose	01
02	925800	Lance holders set	01	37	909192	Trigger valve handle	01
03	417261	Chamber	01	38	920470	Lock	01
04	560672	Gasket holder	01	39	909283	Trigger valve body	01
05	560581	Gasket	01	40	909309	Cone packing	02
06	351619	Lance	01	41	915744	Screw cap	02
07	050195	Seal washer	02	42	904235	Tube	01
08	1175988	Strap assembly	01	43	635276	Elbow with cone packing	01
09	214619	Agitator	01	44	100131	Extension (includes: ref. 40, 41, 42, and 43)	01
10	964536	Shoulder pads	01	45	592139	Nozzle filter (40 mesh)	01
11	560573	Diaphragm	03	46	166611	Nozzle body	01
12	214585	Piston cup ø 45 x 12	01	47	940106	O-ring ORI-09	01
13	630749	Piston cup fastener with diaphragm	01	48	229724	Nozzle cap	01
14	630731	Cylinder with diaphragm	01	49	166637	Nozzle cap red	01
15	229971	Strap and handle	01				
16	229286	Lock and buckles	01				
17	002683	Handgrip	01				
18	630723	Lever (includes: ref. 17 and 19)	01				
19	925818	Bolt assembly	01				
20	925826	Pin with cotter pin	01				
21	214627	Lever shaft	01				
22	336503	Self-locking screw 14 x 7/8"	02				
23	630756	Bushings set	01				
24	214817	Strap catch	01				
25	357848	Chamber assembly	01				
26	071308	Dip tube assembly	01				
27	942193	Screw cap S-20 x 1.5	01				
28	654921	Lid with diaphragm	01				
29	942920	Strainer	01				
30	1175713	Tank (includes: ref. 4, 5, 9 28 and 29)	01				
31	105247	Trigger	01				
32	908889	Trigger valve assembly (includes ref. 31, 34, 35, 37, 38 and 39)	01				
33	015024	Red adjustable cone nozzle	01				
34	996058	Trigger valve cap	01				
35	105239	Trigger valve needle	01				

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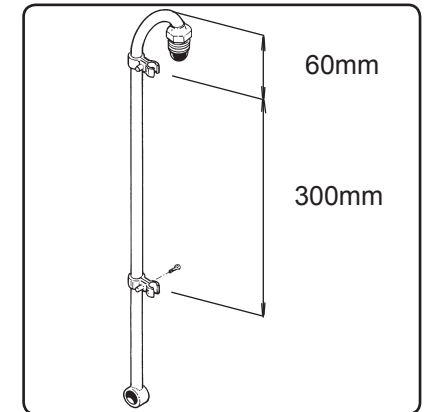
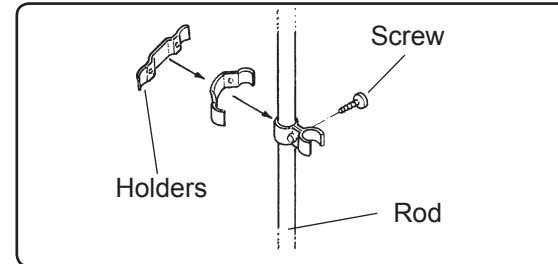
PARTS LIST

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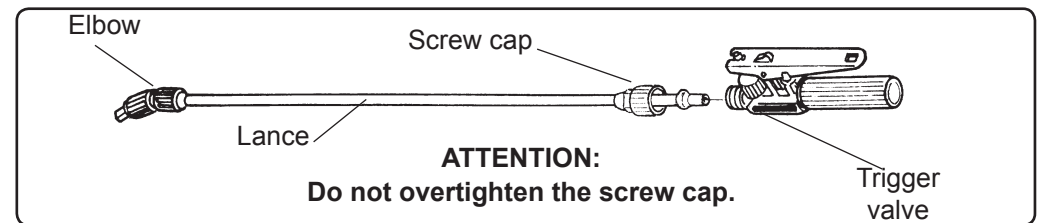
6- INSTALLING THE LANCE HOLDERS

- Secure the lance holders to the rod as shown below.



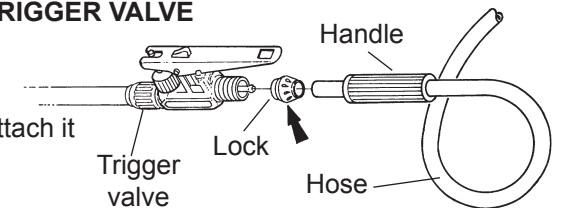
7- ATTACHING THE LANCE TO THE TRIGGER VALVE

- Push the lance into the trigger valve and secure it with the screw cap.



8- ATTACHING THE HOSE TO THE TRIGGER VALVE

- Unscrew the trigger valve handle.
 - Remove the lock.
 - Pass the hose through the lock and attach it to the trigger valve.
 - Screw the handle on the trigger valve.

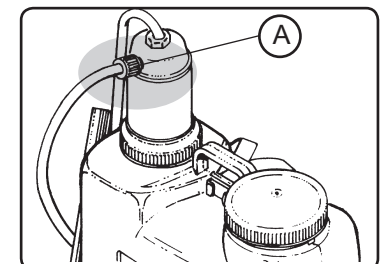


ATTENTION: Do not overtighten the handle.

9- TIGHTENING THE FASTENING NUT.

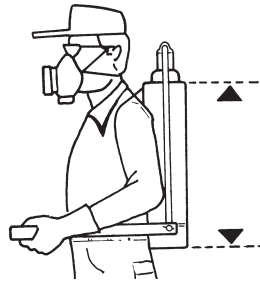
- Before using the equipment, tighten the fastening nut (A).

Important: This operation must be carried out with the hand. Never use any type of tool.



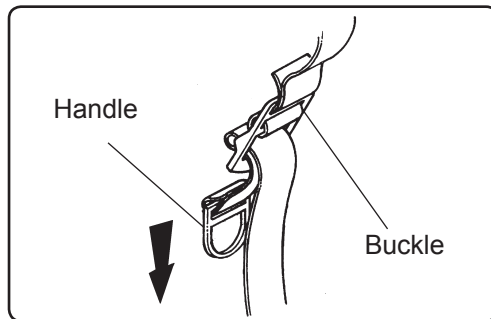
10- ADJUSTING THE STRAP

The tank is contoured for the operator comfort. The shoulder straps can be quickly adjusted to properly position the sprayer on the operator's back.



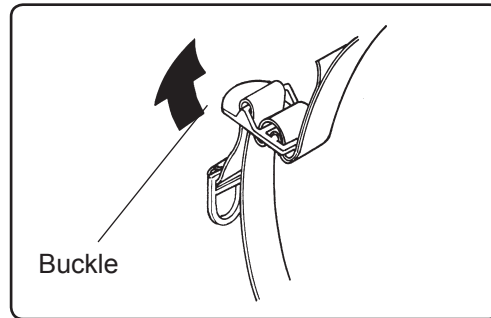
TIGHTENING

- Hold firmly the strap buckle with one hand and pull the handle downward with the other hand.



LOOSING

- Hold firmly the strap buckle with one hand and pull the strap backward with the other hand.



11- ATTENTION

After assembling the sprayer, fill the tank with clean water and check for leakage on the following parts:

- Cover diaphragm
- Tank bottom
- Wand
- Trigger valve

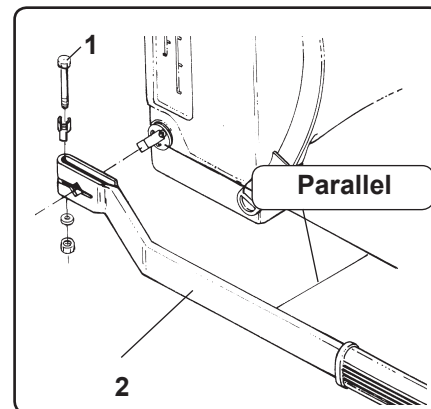
12- INVERT THE OPERATION SIDE

If it is necessary to invert the pumping lever side, proceed as follows:

- Remove the bolt (1).
- Remove the pumping lever (2).
- Install the pumping lever on the other side.

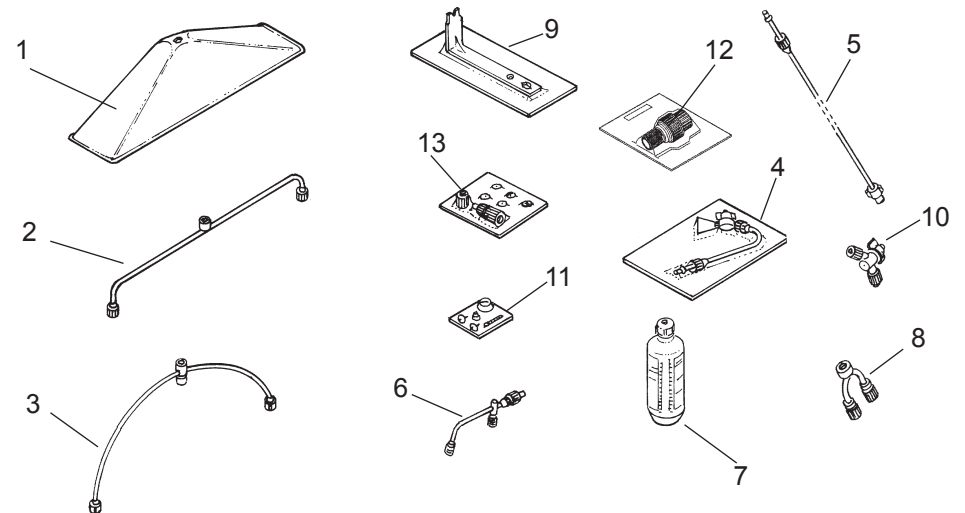
NOTE: On inverting the position of the lever, do not move the chamber so as not to install the lever improperly.

- Tighten the bolt.

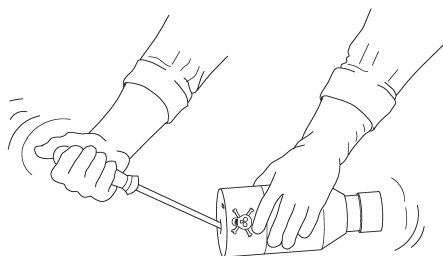
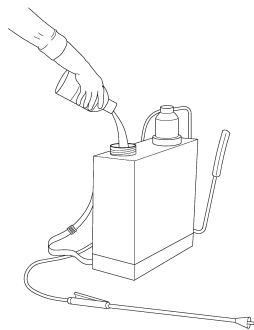


OPTIONAL ACCESSORIES FOR MANUAL KNAPSACK SPRAYERS

Item	Part no.	Use
01	761882	Spray guard: prevents nonselective herbicides from drifting.
02	902296	Boom 500: improves the coverage and increases the productivity.
03	907873	Pliable boom: holds the required shape for better coverage.
04	560409	Lance with valve: used for growth-deterrent application.
05	728139	Extension 600: increases the application reach.
06	100016	Extesion 160 - 2 nozzles: increases the coverage and penetration.
07	646901	Flow calibrator bottle: is used to calibrate the sprayer, thus reducing the waste.
08	336115	Nozzle Y: improves the coverage.
09	452284	Wrench for general maintenance.
10	565648	Non-drip valve: reduces the waste.
11	834382	X-15 basic repair kit. It contains: piston cup, diaphragm, trigger valve cap and needle assembly.
12	590513	ECOVALVE-Constant Pressure Valve (1; 1,5 and 2 kgf/cm ²) - ensures constant pressure without waste.
13	834390	Cone nozzles kit. It contains: discs 12 and 10, swirl core A and P, nozzle cap, red adjustable nozzle, nozzle strainer.



- Take the container cap off and carefully pour the rinse water into the spray tank.
- Keep holding the container over the spray tank opening for approximately 30 seconds to the last drop.
- REPEAT this operation twice more. This way, you complete the TRIPLE WASH.



- Next, make the plastic and metallic containers useless by piercing with a pointed instrument the containers bottom. This way, their labels are not damaged for identification purposes.

- The useless containers can be stocked temporarily in an appropriate place, until final destination.
- In the case of mid and large size container (50, 100 and 200 liters), after washing with the appropriate volume (1/4 of the total) and fitting the cap, roll it on the ground during approximately 30 seconds.
- Then in the upright position complete the agitation by moving back and forth for approximately 30 seconds.
- Then, empty the container by pouring the rinse water into the spray tank.
- REPEAT this operation twice more. In the last one, empty totally the container by pouring rinse the water in the spray tank.
- The least the quantity of rinse water that remains in the container, from one wash to the next, the most perfect and complete will be the decontamination.
- For the performance of the TRIPLE WASH, do not use a water volume either much lower or much higher than 1/4 of the container capacity.

-The TRIPLE WASH must be done IMMEDIATELY AFTER emptying the container, during the preparation of the solution

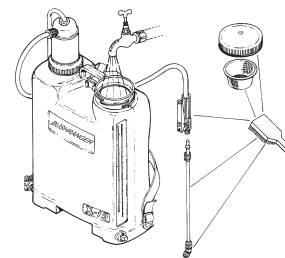
SOURCE - ANDEF (NATIONAL ASSOCIATION OF VEGETAL DEFENSE)

13- MAINTENANCE

CLEANING THE SPRAYER

- After finishing the spray application, clean and wash all equipment in an approved decontamination area.

Pump the lever until the discharge runs clear.

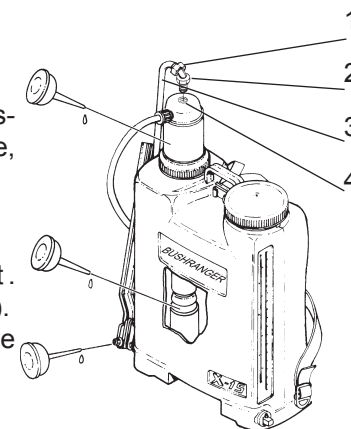


ATTENTION:
Remove all chemicals before storing the sprayer. Chemical products have different reactions and can damage the sprayer components as well as cause personal injury.

LUBRICATION

Periodically remove the chamber and lubricate the pistons. In sequence, clean and grease the rod linkage, as described :

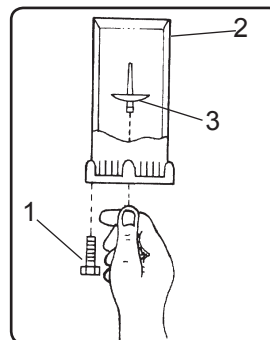
- Pull up the protector (1).
- Loosen the fastener (2).
- Remove the rod (3) from the hole of ball compartment. Clean and deposit the grease in this compartment (4).
- Proceed the assembling in reverse sequence of the disassembling.
- Lubricate the others components, as shown.



14- CYLINDER VALVE MAINTENANCE

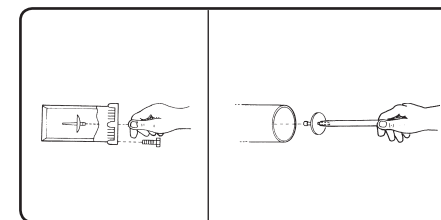
DISASSEMBLING

- Remove the chamber from the cylinder.
- Loosen both cylinder fastening bolts (1).
- Remove the cylinder (2).
- Remove the diaphragm (3).
- Wash or replace the diaphragm.



ASSEMBLING

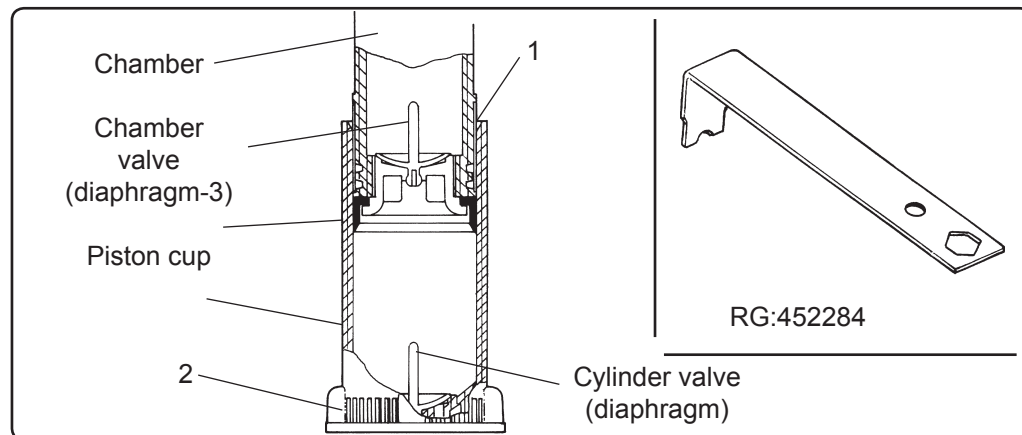
- Using a pen, install the diaphragm into the cylinder as shown in the figure below.
- Replace the cylinder on the sprayer and tighten the two bolts (1).
- Remount the chamber on the cylinder.



15- TROUBLESHOOTING

- Put about 2 liters of water in the tank.
- While operating the lever, look into the tank to see how the problem arises.
- Refer to the table and diagram below.

PROBLEM	CAUSES	CORRECTIONS
Leakage through the cylinder upper part (1).	Worn or dried out piston cup.	Replace or lubricate the piston cup.
After pumping and pressurizing the chamber, as you operate the lever it drops fast.	Cylinder valve (2) not sealing properly due to wear or impurities.	Clean or replace the valve.
After pumping and pressurizing the chamber, the lever rises slowly when released.	Chamber valve (3) not sealing properly due to wear or impurities.	Clean or replace the valve.
It is necessary great effort to act the lever and the spray stops rapidly.	Air leakage through the nut that fastens the hose to the chamber.	Drain all the liquid from the chamber. Tighten the nut.



TRIPLE WASH OF EMPTY AGROCHEMICALS CONTAINERS

Even the containers considered empty contain chemical residues.

Some publications show that somewhere around 0.3% of the chemicals remains in the container after being used.

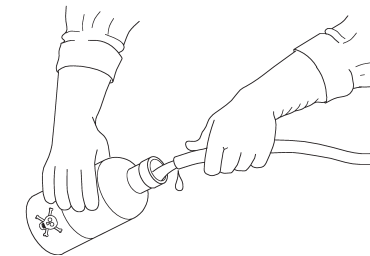
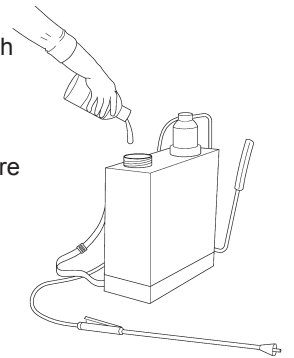
Therefore, discarding the containers without washing out the residues is extremely dangerous to man, animals and environment.

In the case of metal, plastic and glass chemical containers, each container must be rinsed three times to ensure the residues are completely removed.

This manual describes how to make the TRIPLE WASH in a correct, safe and effective way.

-During the TRIPLE WASH, you must use appropriate protective clothing, such as: gloves, apron, boots, goggles and protective masks with appropriate filters.

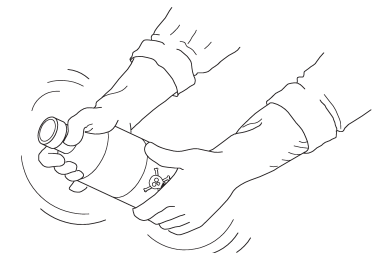
- IMMEDIATELY AFTER emptying the container, you must keep it with the opening upside down over the sprayer tank opening or over the bucket that you are using to prepare the chemical mixture for at least 30 seconds, until no residue is left in the container, when the drops are falling in long intervals.



- Next, hold the container in the upright position and fill it with water up to 1/4. For example: in a 20-liter container, put 5 liters of water.

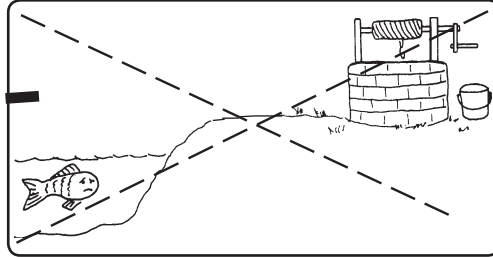
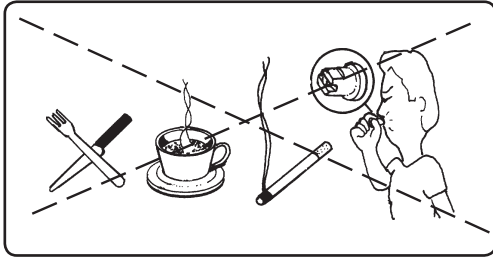
- Fit the container cap and tight it enough to avoid leakage during the agitation.

- Agitate the container strongly in all ways (horizontal and vertical), during approximately 30 seconds to remove the residues that are stuck to the container internal walls.

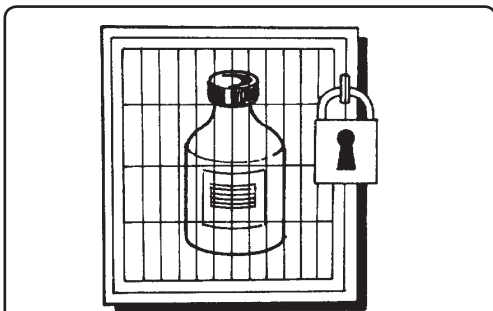
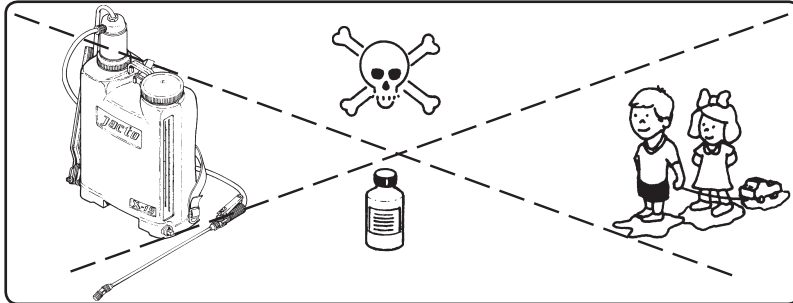


- Do not eat, drink or smoke while spraying.

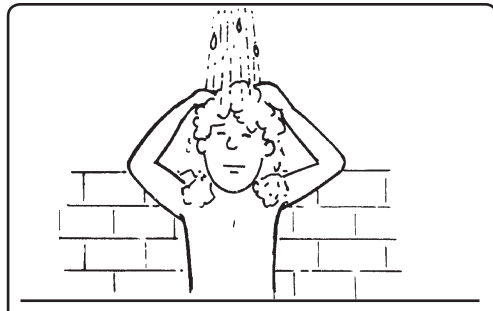
- Do not pollute the environment.



- Keep the products out of reach of children and animals.



- Lock up the chemical products to prevent untrained persons to handle them.



- After finishing the spray application, take a shower with plenty of water and soap.
- Put on clean clothes.

ATTENTION: The clothing used during the application must be washed separate from other clothes of ordinary use.

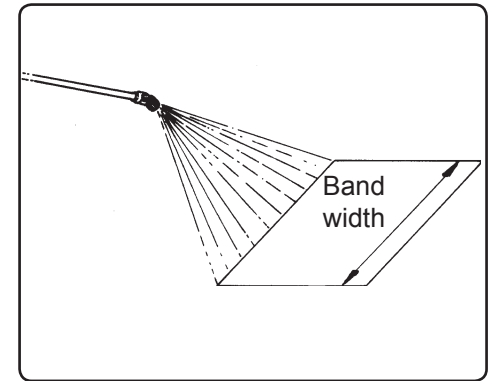
ATTENTION: In case of poisoning, see a doctor immediately and show him the chemicals manufacturer's label.

CALIBRATION OF MANUAL KNAPSACK SPRAYER

PROCEDURE

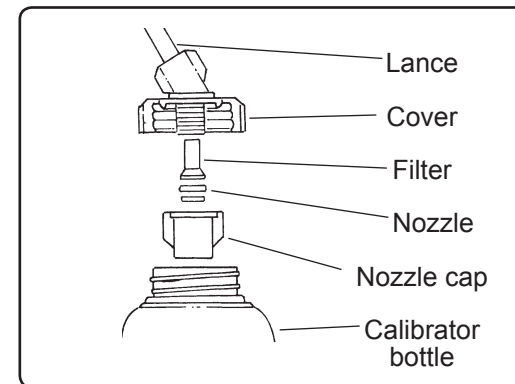
USING CALIBRATOR BOTTLE (OPTIONAL)

- Hold the lance at the working height and spray to measure the application band width.
- Based on the band width, calculate the total walking distance required to spray the desired area. Use the chart below.



Band width (m)	0.5	0.7	1.0	1.2	1.5
Distance to walk (m)	50.0	35.7	25.0	20.8	16.7

- Attach the calibrator bottle to the lance as shown:




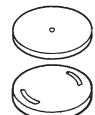


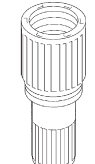
- A - Remove the cap, nozzle and filter.
- B - Mount the calibrator cover to the lance.
- C - Reinstall the filter, nozzle and cap.
- D - Screw the calibrator onto the cover.

- Hold the lance at the normal working height and spray into the bottle while walking the distance required to spray an area corresponding to 25 m².

- Place the bottle on a level surface and observe the liquid level visible through the side of the bottle. Match the liquid level to the corresponding scale on the calibrator bottle.

- Empty the bottle and repeat this operation to determine the average of two or more readings.

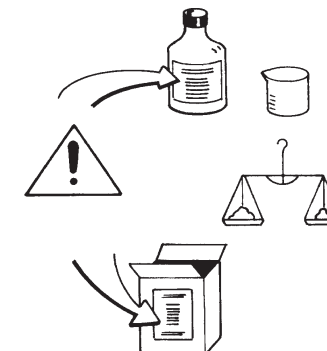
SPRAY NOZZLES

NOZZLE TYPE	IDENTIFICATION (Part no. - Description)	APPLICATION	PRESSURE (psi)	FLOW RATE (ml/min)
	454215 - 80EF015 Kematal (Green)	Herbicides	45	610
	454223 - 80EF02 Kematal (Yellow)		45	810
	454231 - 80EF03 Kematal (Blue)		45	1,250
	717942 - JD-10A (Stainless steel)	Agrochemicals and foliar fertilizers	45	300
	217174 - JD-12P (Stainless steel)		45	615
	457317 - HC-02 (Kematal)	Agrochemicals and foliar fertilizers	45	830
	457325 - HC-04 (Kematal)		45	1,680
	457333 - HC-05 (Kematal)		45	2,060
	457390 - DEF-04	Agrochemicals and foliar fertilizers	15	950
	457408 - DEF-05		15	1,200
	457416 - DEF-06		15	1,540
	323725 (Yellow)	Agrochemicals and foliar fertilizers. 90° cone and concentrated jet	45	315
	(*) 015024 (Red)		45	640
	325787 (Blue)		45	710

* **ATTENTION:** This sprayer is packaged with the Adjustable cone nozzle fitted in the lance. Other nozzles mentioned in this manual are optional, so they do not accompany this sprayer.

SAFETY PRECAUTIONS

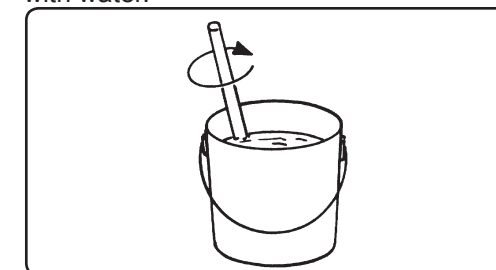
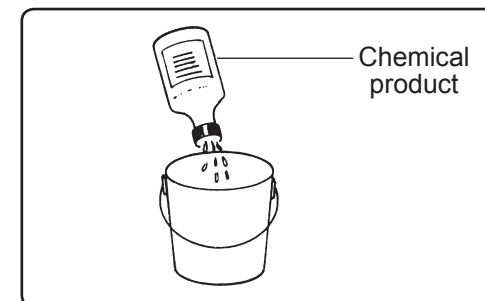
ATTENTION!
READ CAREFULLY
THE CHEMICALS
MANUFACTURER'S LABELS



- Put 5 liters of water in a bucket and add the chemical product.

- Stir until it becomes an homogeneous mixture.

- Pour the solution into the tank while filling with water.



ATTENTION

- Wash hands and other parts of the body that have touched chemicals before starting to spray.

- Read carefully the chemicals manufacturer's label.

- Use of individual protective clothing and safety equipment is obligatory.

