

ARBUS 200

English version - MI_USA-0310



WARNING

Read Operator's Manual before setting up, operating, or maintaining sprayer. Failure to follow safety precautions in this manual and in labels on the product could result in serious injury or death to the operator or bystanders.

Keep manual nearby for further reference. If manual is damaged or illegible, contact your Jacto dealer or Jacto at the address below for a replacement.

EDITION - 07/2011

CODE - 510883

Operator's Manual



JACTO INC.

19217 SW 119th Ave
Tualatin, Oregon 97062

Tel.: (503) 885-8723

Fax: (800) 511-3671

Toll Free: (800) 522-8610

E-mail: info@jacto.com

Home page: www.jacto.com

INTRODUCTION

The agrochemicals application is necessary to achieve higher and economical production.

Since applying agrochemicals can present risks to humans, the environment and to crops, Jacto wants to ensure the operator uses it in a proper, efficient, and safe manner.

Thoroughly read and understand this manual before operating this sprayer. Always keeps this manual on or near the sprayer at all times for quick reference for the proper operation, maintenance and adjustments to the sprayer.

If you have any questions, contact your Jacto dealer.



This equipment was developed exclusively for chemical spray application.
The sprayer manual refers only to instructions of use and maintenance of parts and components manufactured by Jacto.
Read it carefully and follow strictly the instructions.
If you have any questions, please contact your Jacto dealer.

IDENTIFICATION PLATE

Your sprayer has a plate showing the model, serial number of the machine and lot (month and year of manufacture).

This information is very important so that Jacto can keep records of eventual modifications made on the material used and on its construction characteristics.

In requesting replacement parts or maintenance, always specify the model, serial number and lot of your sprayer for prompt and efficient service.



Jacto and Arbus are trademarks registered by Máquinas Agrícolas Jacto S.A.

JACTO RESERVES THE RIGHT TO CHANGE SPECIFICATIONS AND DESIGN WITHOUT PRIOR NOTICE.

TABLE OF CONTENTS

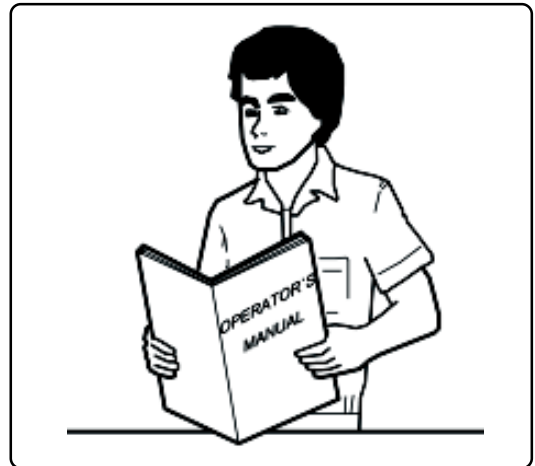
INTRODUCTION	
- Identification plate	03
SAFETY	
- Operator's and owner's responsibilities	05
- Cautions when operating agricultural sprayer	06
- Cautions on the maintenance and transportation	07
- Handling chemicals	08
- Safety decals	09
PRESENTATION OF SPRAYER	
- Arbus 200/540	11
- Arbus 200/1100	12
- Arbus 200/2000	13
MAIN COMPONENTS OF SPRAYER	
- Suction filter	14
- Pump	14
- Pressure regulator	14
- Nozzle	15
- Fan	16
- PTO Shaft	16
OPERATIONAL PROCEDURES	17
CHOOSING THE TRACTOR	18
SETTING UP THE TRACTOR	19
MOUNTING THE SPRAYER TO THE TRACTOR	
- Mounting the sprayer to the tractor	21
- Mounting the sprayer to the Agrale tractor	22
OPERATION AND ADJUSTMENTS	
- Spray application technology	24
- Available versions	25
- Vertical deflector - assembly	26
- Using the quickfitting connection	27
- Spray lance (optional)	27
- Spray gun (optional)	28
- Pressure regulator	29
- Flow rate	30
- Calibrating the sprayer	32
- Diluting the agrochemicals	33
- Pressure wash	34
- Clean water tank	35
MAINTENANCE	
- Guidelines	37
- Components	37
- Lubrication table	38
- Pump lubrication	39
- Belt	39
- PTO Shaft	40
- Winter storage	41
- Trouble-shooting	42
GENERAL CARE	
- Handling agricultural sprayers and chemicals	45
- After spraying	45
STATEMENT OF LIMITED WARRANTY	46

SAFETY

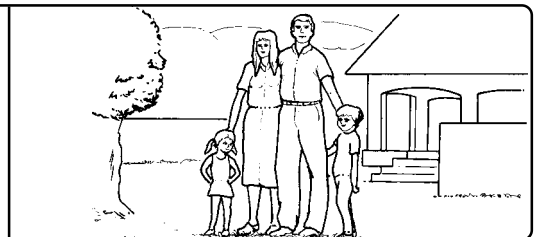
This sprayer was carefully designed and built so as to give you the maximum production, saving, easy operation and safety.

Therefore, you or anyone else who is going to operate, maintain and work around this sprayer must read and understand this manual thoroughly in order to be familiar with all the operating and maintenance procedures and safety information related to this sprayer. All accidents can be prevented if all the safety instructions are correctly followed.

Moreover, always keep this manual close at hand for quick review in case of doubt.



ATTENTION
FAILURE TO FOLLOW THE SAFETY
INSTRUCTIONS PROPERLY WILL RISK YOUR
OWN LIFE AS WELL AS THE LIFE OF PEOPLE
WORKING AND LIVING AROUND YOU.



ATTENTION: THIS SAFETY ALERT SYMBOL IDENTIFIES
IMPORTANT SAFETY MESSAGES. WHEN YOU SEE IT, BE ALERT
TO ANY POSSIBILITY OF PERSONAL INJURY OR DEATH.

OPERATOR AND OWNER'S RESPONSIBILITIES

According to the standard NR31 - Safety and Healthy Regulation Standard in the Agriculture Work, it is responsibility of the equipment's owner and operator to follow the chemical application safety guidelines.

OPERATOR'S RESPONSIBILITIES

- Always follow the safety procedures when operating the equipment.
- Always operate the equipment within the limits and restrictions indicated in this manual.
- Thoroughly read and understand this manual prior to using the equipment.

OWNER'S RESPONSIBILITIES

- The equipment's owner must keep the owner's manual on or near the equipment at all times for the operator's reference.
- It's the employer responsibility to provide, properly maintain and train the operator regarding the use and requirements for adequate IPE (Individual Protection Equipment).
- The employer must to replace or repair the equipment's components in the event of failure to ensure the safe operation of the sprayer.
- The employer will be responsible for the operator's training to ensure a safe application.

SAFETY

CAUTIONS WHEN OPERATING AGRICULTURAL SPRAYER

- **Before operating this sprayer, read carefully and understand thoroughly this manual.**
- **Only qualified operators that have thoroughly read and understood the owner's manual should operate this sprayer.**
- Do not ingest alcohol or drugs before or during the operation of this sprayer.
- Make sure that all the guards are in place before running the sprayer.
- Do not climb on or come down the sprayer when it is in motion.
- Turn the engine off before leaving the operator's place.
- **This sprayer was designed and manufactured to support operations in the crops and on roads, tracks, trails or paths inside farms within the speed limit recommended by Jacto (limit of 18 mph in the routes inside the farm and 4 mph when spraying). The use of the sprayer above the limits mentioned is not approved by Jacto.**
- This sprayer must be maneuvered in safe places, away from people, animals or any other situation that offers risks of personal injuries or material damages. Make sure there are no people near the sprayer before starting the engine.
- Do not make maneuvers or brake abruptly.
- The transportation of people and any loads whatsoever in the sprayer is strictly prohibited in any circumstances.

ATTENTION: Do not touch PTO shafts, belts, fans or any other moving part while the sprayer is running.



Keep away from moving parts and be very careful with hands, feet, loose clothes, long hair, etc.

If you have any doubts/questions, please request Jacto Technical Assistance.

- Keep away children, aged people and animals while operating, servicing this sprayer and even when the sprayer is stored.
- Do not run the pump dry.
- Do not exceed 540 rpm at the PTO.
- The PTO shaft ends must be securely locked to the PTO of the tractor and to the sprayer tongue.
- The PTO shaft guard must always remain in good repair and fastened by the safety chains. The PTO shaft must work freely in its interior.
- Make sure the drawbar and the sprayer end are properly connected/fastened.
- Check and change the worn or broken parts.
- Only unhitch the sprayer on firm and level ground.
- Remove the controls installed on the tractor before disconnecting the sprayer.
- **Fold the sprayer booms before unhitching it from the tractor.**

SAFETY

CAUTIONS IN THE MAINTENANCE AND TRANSPORTATION

- Activities of cleaning, lubrication, repair and adjustment should only be performed by qualified and trained professionals duly protected with the approved and proper PPE (Personal Protective Equipment) such as gloves, masks, goggles, safety boots, etc.
- **Before performing any type of service, adjustment or maintenance in your sprayer, always disengage the PTO shaft and turn off the tractor engine.**
- **It is prohibited to make cleaning, lubrication and maintenance services with the sprayer in operation, except if its very operation is essential to make these services. In this case, all the special protection and signalization measures must be taken in order to prevent accidents.**
- **The removable guards can only be removed for maintenance. Then, they must be obligatorily placed back in their original position.**
- Do not modify this sprayer in any way because this can impair its function and risk your safety.
- Keep your sprayer in thorough repair.
- For your and others' safety, remove the sprayer booms before transporting the sprayer on trailers or trucks.
- **Failure to comply with these warnings may result in personal injuries or death.**
- **The employ in adverse and not recommended conditions can cause damage to the sprayer and components and will make void the warranty as well as exempt the manufacturer from any obligation to any accident or consequences.**
- **For the displacement and transport of the sprayer, the use of trucks or flatbeds are recommended as long as measures for its perfect immobilization are taken in order to avoid accidents as result of improper accommodation.**
- Require from the JACTO representative during the technical delivery of the sprayer that the proper instructions on assembly, maintenance, warranty be carefully explained.

SAFETY INSTRUCTIONS

HANDLING CHEMICALS

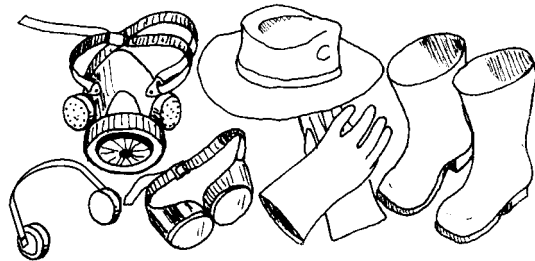
Chemical products are classified in four categories of toxicity. According to their toxicity level, there is a special recommendation of appropriate protective equipment.

As your safety concerns first, we list below all the protective equipment recommended for handling chemical products of the category 1 which includes high toxicity level chemicals.

This way, all the possibilities of serious illness and death are eliminated.

Obligatory individual protective equipment for handling and spraying chemicals:

- Long-sleeved working clothes
- Impermeable apron or coverall
- Impermeable gloves
- Impermeable wide-brimmed hat
- Boots
- Special protective masks equipped with appropriate filters for each type of product.



CHEMICAL PRODUCTS CLASSIFICATION

	TOXICITY LEVEL		LABEL COLOR CHEMICALS CONTAINER
	I	HIGH	RED
	II	MODERATE	YELLOW
	III	LOW	BLUE
	IV	LIGHT	GREEN

DIRECTIONS

- Read and follow all instructions on the chemicals manufacturer's label.
- Keep the chemical products closed and in a dry and ventilated place.
- Use the chemical products in agriculture only.
- Keep away children, untrained people and animals.
- Handle the chemicals following recommendations of a technician.
- Always handle chemicals in a ventilated place and equipped with individual protective equipment.
- Use the application rate as per instructions on the labels.
- Do not make spray applications in the wind or hot weather.
- Do not drink, eat or smoke while spraying or handling chemicals.
- Keep children, untrained people and animals away from the application areas.
- Never blow through nozzles strainers, valves or pipelines by mouth.
- Do not store or transport chemical products together with food, medicines, people, animals.
- Make sure rivers, lakes, etc. will not be contaminated when washing out the sprayer.
- After spraying, take off all protective clothing and take a shower.
- In case of intoxication, go see a doctor immediately and show him the chemical products label.
- Never medicine an unconscious person through mouth.
- **Do not re-use the chemical products containers for other purposes. Consult an agronomist on how to discard empty containers of chemical products.**

SAFETY INSTRUCTIONS

DECALS

Safety decals are placed on the equipment to reduce the risk of damages or accidents to the operator or to the equipment during the use.

Before operating the equipment, identify and understand the mean of all decals, through this page.

Keep them in good repair, clean and legible. Replade them immediately in case of damage by ordering them through the part numbers specified below.



ATTENTION: Lubrication point

P/N: 276220



ATTENTION: Read the operator's manual before operating the sprayer.

P/N: 379230



ATTENTION: Risk of injuries. Keep away from the sprayer when it is running.

P/N: 379040



ATTENTION: Risk of serious injuries. Keep all protection devices in its places.

P/N: 379065



Identification plate

P/N: 047035



ATTENTION: Read the operator's manual before operating the sprayer.

P/N: 379248



ATTENTION: Obligatory use of protective mask.

P/N: 379115



ATTENTION: Risk of serious injuries. Keep away and do not make any kind of maintenance while the fan is in motion and the PTO is engaged.

P/N: 379057



Final test of the equipment.

P/N: 013169

SAFETY INSTRUCTIONS



ATTENTION: Risk of serious injuries. Do not make any operation on the PTO shaft if the PTO is engaged.

P/N: 379008



ATTENTION: Obligatory use of hearing protector.

P/N: 379123



ATTENTION: Obligatory use of protective clothing.

P/N: 379131



ATENÇÃO: Não entre no reservatório principal da máquina.

RG: 380014



ATTENTION: Maximum speed allowed for the machine is 18.64 mph.

P/N: 379214



Procedures for fan belts tension.

P/N: 515601



ATTENTION: This machine is not allowed in highways.

P/N: 379222



Instructions to connect the PTO shaft

P/N: 428631



ATTENTION: Never operate the valve of the chemical rinse nozzle if the container is not duly positioned over the rinse nozzle.

P/N: 169128



Instructions to unlock the fan.

P/N: 018440



Decal " Arbus 200"

P/N: 156216

PRESENTATION OF SPRAYER

DESCRIPTION	ARBUS 200/540 rpm
VERSIONS	
Standard	with Deflector (plastic)
Standard	with Deflector (plate)
Standard	without Deflector
Complete	with the two types of Deflectors
DIMENSIONS	
Length (in)	49.20
Width without deflector (in)	39.36
Width with deflector (in)	72.48
Height (in)	45.24
Weight (lb) - empty / with deflector	410.06
Weight (lb) - empty / without deflector	374.78
TANK	
Capacity (gallons)	52.83
Drain system	By valve
Material	Polyethylene
AUXILIARY TANKS	
Clean water tank (gallons)	3.96
Material	Polyethylene
FILTER	
Model	FVS-100
Mesh (u)	60
PRESSURE REGULATOR CONTROL	
Model	CJ-42A control
Pressure gauge	Glycerin-filled
NOZZLES	
Model	JA-2/JA-4
Material	Ceramic
Working pressure (psi)	150 to 210
Flow rate (gpm at 150 psi)	JA-4= 0.50 gpm - JA-2= 0.26 gpm (150 psi)
Nozzle quantity with deflector	14
Nozzle quantity without deflector	16
Nozzle holder	Bijet (2 nozzles)
AGITATION	Hydraulic Agitator
FAN	
Diameter (in)	21.65
Rotation	2,035
Air volume (ft ³ /h)	723,950.7
Air speed (mph)	50.95
PUMP	
Model	JP-42 piston
Working rotation	800 rpm
Power consumption (HP)	1.9
Piston quantity	3
TUBING / NOZZLES BRANCHES	PVC flexible hose (pump conduction/tubes) - Quick fitting connection for gun or lance - Stainless steel tubes
SPRAYING ACCESSORIES	Polyethylene vertical deflector with bijet nozzle holder
POWER CONSUMPTION	
Maximum working rotation (rpm)	540
Fan power consumption	4.6
Pump power consumption	1.9
Total power consumption	6.5

PRESENTATION OF SPRAYER

DESCRIPTION	ARBUS 200/1100 rpm
VERSIONS	
Standard	with Deflector (plastic)
Standard	with Deflector (plate)
Standard	without Deflector
Complete	with the two types of Deflectors
DIMENSIONS	
Length (in)	49.20
Width without deflector (in)	39.36
Width with deflector (in)	72.48
Height (in)	45.24
Weight (lb) - empty / with deflector	410.06
Weight (lb) - empty / without deflector	374.78
TANK	
Capacity (gallons)	52.83
Drain system	By valve
Material	Polyethylene
AUXILIARY TANKS	
Clean water tank (gallons)	3.96
Material	Polyethylene
FILTER	
Model	FVS-100
Mesh (u)	60
PRESSURE REGULATOR CONTROL	
Model	CJ-42A control
Pressure gauge	Glycerin-filled
NOZZLES	
Model	JA-2/JA-4
Material	Ceramic
Working pressure (psi)	150 to 210
Flow rate (gpm at 150 psi)	JA-4= 0.50 gpm - JA-2= 0.26 gpm (150 psi)
Nozzle quantity with deflector	14
Nozzle quantity without deflector	16
Nozzle holder	Bijet (2 nozzles)
AGITATION	Hydraulic Agitator
FAN	
Diameter (in)	21.65
Rotation	1,580
Air volume (ft ³ /h)	494,405.3
Air speed (mph)	35.41
PUMP	
Model	JP-42 piston
Working rotation	800 rpm
Power consumption (HP)	1.9
Piston quantity	3
TUBING / NOZZLES BRANCHES	PVC flexible hose (pump conduction/tubes) - Quick fitting connection for gun or lance - Stainless steel tubes
SPRAYING ACCESSORIES	Polyethylene vertical deflector with bijet nozzle holder
POWER CONSUMPTION	
Maximum working rotation (rpm)	1,100
Fan power consumption	2.6
Pump power consumption	1.9
Total power consumption	4.5

PRESENTATION OF SPRAYER

DESCRIPTION	ARBUS 200/2000 rpm
VERSIONS	
Standard	with Deflector (plastic)
Standard	with Deflector (plate)
Standard	without Deflector
Complete	with the two types of Deflectors
DIMENSIONS	
Length (in)	49.20
Width without deflector (in)	39.36
Width with deflector (in)	72.48
Height (in)	45.24
Weight (lb) - empty / with deflector	410.06
Weight (lb) - empty / without deflector	374.78
TANK	
Capacity (gallons)	52.83
Drain system	By valve
Material	Polyethylene
AUXILIARY TANKS	
Clean water tank (gallons)	3.96
Material	Polyethylene
FILTER	
Model	FVS-100
Mesh (u)	60
PRESSURE REGULATOR CONTROL	
Model	CJ-42A control
Pressure gauge	Glycerin-filled
NOZZLES	
Model	JA-2/JA-4
Material	Ceramic
Working pressure (psi)	150 to 210
Flow rate (gpm at 150 psi)	JA-4= 0.50 gpm - JA-2= 0.26 gpm (150 psi)
Nozzle quantity with deflector	14
Nozzle quantity without deflector	16
Nozzle holder	Bijet (2 nozzles)
AGITATION	
Hydraulic Agitator	
FAN	
Diameter (in)	21.65
Rotation	2,050
Air volume (ft ³ /h)	572,097.6
Air speed (mph)	51.57
PUMP	
Model	JP-42 piston
Working rotation	800 rpm
Power consumption (HP)	1.9
Piston quantity	3
TUBING / NOZZLES BRANCHES	
PVC flexible hose (pump conduction/tubes) - Quick fitting connection for gun or lance - Stainless steel tubes	
SPRAYING ACCESSORIES	
Polyethylene vertical deflector with bijetnozzle holder	
POWER CONSUMPTION	
Maximum working rotation (rpm)	2000
Fan power consumption	3.5
Pump power consumption	1.9
Total power consumption	5.4

MAIN COMPONENTS OF SPRAYER

SUCTION FILTER

Located between the tank and pump, the suction filter is specifically designed to prevent dirt or impurities from reaching the pump.

It has a quick shut off valve which allows easy filter cleaning, filtering elements changing and/or pump maintenance.

This valve must always remain open while the sprayer is running. If it remains closed, you will hear an unusual noise in the pump.



PUMP

The pumps mounted to JACTO sprayers have flow rate ranging from 10.04 to 79.25 gallons per minute.

PUMP	FLOW RATE (gpm)	MAXIMUM PRESSURE	
		psi	kgf/cm ²
JP - 42	11.09	300	21

The ceramic liners ensure greater resistance to abrasion and agrochemicals' action.

Piston cup replacement becomes easier by removing the head assembly in a quick and simple operation with no need to remove the pump.



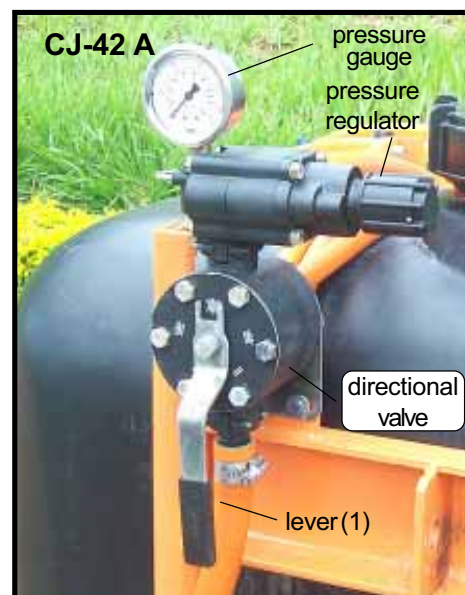
PRESSURE REGULATOR

The pressure regulator control provides adjustments ranging from 1 to 21 kgf/cm² (14 to 300 psi), shown by the pressure gauge.

The lever (1) turns on and off the chemical flow to both sides or to one only, making the spraying easier and with less waste of agrochemicals.

ATTENTION

In order to ensure longer life of the pressure gauge, close lever (1) after regulating the sprayer, thus releasing the pressure, and close the pressure gauge valve.



MAIN COMPONENTS OF SPRAYER

NOZZLES

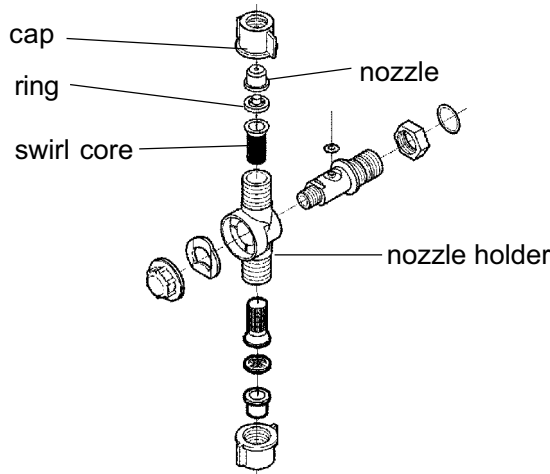
The nozzles have the job to generate droplets and distribute them uniformly over the surface being sprayed.

Flow, angle and droplet sizes vary according to working pressure. Operating with pressure over that recommended by the manufacturer will decrease the nozzles' life.

The nozzles holders with valve can be adjusted to desired angle and can be shut off individually.

This sprayer is equipped with alumina (ceramic) nozzles, very resistant to wear and to chemical action, and mounted as shown in the figures below.

DOUBLE NOZZLE HOLDER



DIRECTING THE NOZZLE

Loosen the nut (1) and set the desired nozzle at the mark (A) existing on the nozzle body.

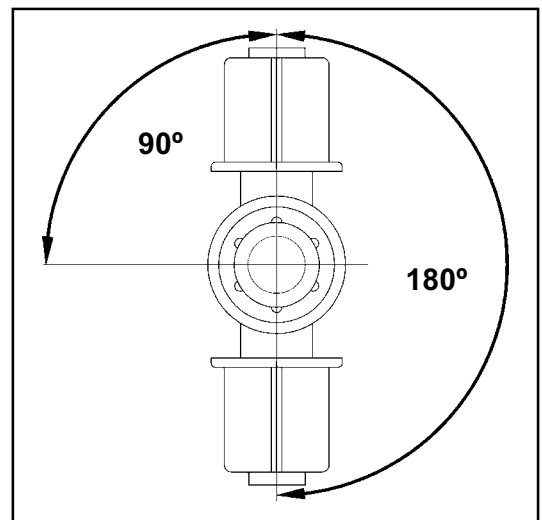
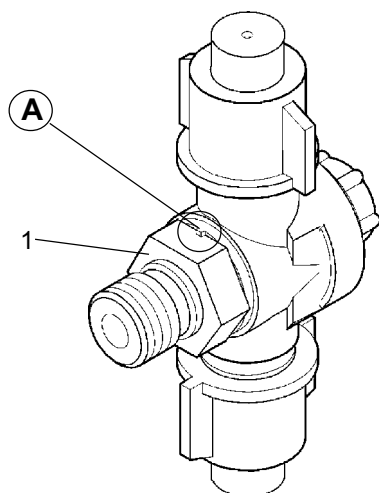
NOTE: This mark indicates the spray direction. So the nozzle at this mark is turned on.

CHANGING THE SPRAY VOLUME

With a simple 180° turn of the nozzle holder it is possible to turn off one nozzle and turn on the other.

SHUTTING THE FLOW

Just give the nozzle holder a 90° turn in relation to the mark (A) and the flow will be turned off.

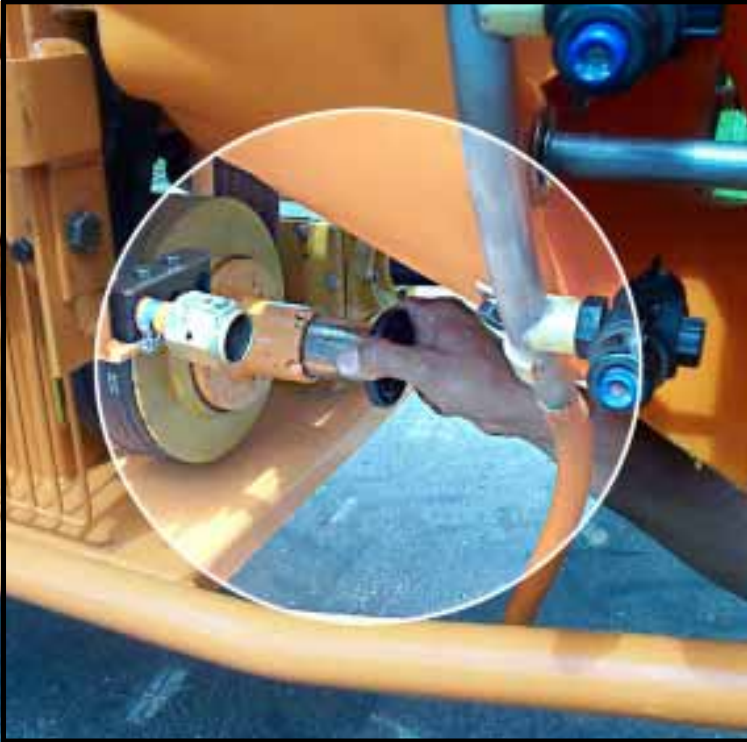


MAIN COMPONENTS OF SPRAYER

FAN

The fan has a locking device designed to be used during the tank filling, agitation of chemical mixture while spraying, as well as for spray lance application. The use of this device reduces power consumption in any of said operations.

To turn the fan off, pull the lock and give it a quarter turn. To turn it on, set the lock back.



Lock

(Always disengage the PTO and wait for the fan to stop completely before handling the lock).

ATTENTION:

For tractors with independent PTO, the following is recommended:

- Do not engage the PTO with the engine accelerated.
- With the engine idling, engage the PTO and gradually accelerate until reaching the recommended rpm.

CONVENTIONAL PTO SHAFT

The sprayer's PTO shaft is equipped with plastic protection guards to prevent the operator and his clothes from touching the PTO shaft and avoid damage to the crops.



NOTE:

For instruction in detail, refer to the section MAINTENANCE - PTO SHAFT.

OPERATIONAL PROCEDURES

Stage	Procedure	Sprayer type	
		Trailer	3 point
Spraying	Use individual protective clothing	X	X
	Do not work at high speeds	X	X
	Do not spray against the wind	X	X
	Do not travel with boom lifted or unlocked	X	X
	Take care with electricity supply cables	X	X
	Do not eat, drink or smoke while spraying	X	X
	After spraying, dispose of all protective clothing and take a shower	X	X
Receiving the sprayer	Check if all components are intact	X	X
	Check the components of accessories box	X	X
	Require trained person to instruct about assembling, operating and servicing components and accessories	X	X
Using the sprayer for the first time	Clean and lubricate every point of the PTO shaft	X	X
	Check if the hitch pin is original	X	-
	Check if the three-point hitch pins are original	-	X
	Check if the hitch pins have cotter pins		
	Check the overlaps of the PTO shaft	X	X
	Remove the tractor's drawbar	X	X
	Raise to the highest the tractor's hydraulic arms	-	X
	Adjust the control valve position to avoid impacts while turning .	X	X
	Check if the grease fittings are filled	X	-
	Check if the oil is on the level on the components	X	X
	Calibrate the tires	X	X
Retighten the tank nuts and lug nuts	X	-	
Whenever filling the tank	Clean the suction or line filters	X	X
	Clean nozzles and their strainers	X	X
Every day or every 10 hours	Clean nozzles, strainers and filters	X	X
	Check the grease fittings and joint pins	X	X
	Check the oil level on the pumps and gear box	X	X
	Wash the inside and outside of the sprayer	X	X
	Check for damage on the paint and repaint	X	X
	Check for oil leakage and stop it	X	X
	Store the sprayer in a dry, ventilated and indoor place	X	X
First 30 hours	Change for the first time the pump oil	X	X
	Retighten the bolts on the tank, axle and wheels	X	-
Every 100 hours	Change the oil of the pump and gearbox	X	X
	Tighten the belts	X	X
	Clean and check the pressure regulator components	X	X
	Clean the inside and outside of the sprayer, and paint the parts subject to corrosion with lubricating oil	X	X
Every 500 hours or annually	Service the pump	X	X
	Change hydraulic oil	X	-
	Change the oil of the gearbox	X	X
	Retighten the bolts of tank, wheels, axle, etc.	X	-
	Change the grease of the wheel hub	X	-
Every 1000 hours	Replace the belts of the equipment	X	X
Every 2000 hours	Replace the bearings of the drive transmission	X	X
	Replace the bearings of the driven transmission	X	X
	Replace the pressure gauge	X	X

CHOOSING THE TRACTOR

PROCEDURES

Different working conditions lead us to adopt the following criterion for choosing the tractor that will drive the Arbus 200 line sprayers.

- Check the sprayer weight on the identification plate.
- Check the tank capacity.
- Check in the specifications table the total power consumption of the sprayer at the PTO.

Example:

Sprayer weight = 410.06 lb

Tank capacity = 56.80 gallons

Total power consumption = 6.5 HP

CHOOSING THE TRACTOR CONSIDERING THE POWER CONSUMPTION AND THE LOAD TO BE TRANSPORTED

1st- POWER CONSUMPTION

The tractor should have power (HP) at least 90% higher than the power required to run the sprayer.

Ex.: Power required by the sprayer = 6.5 HP

Minimum tractor nominal power = 12.3 HP

2nd - LOAD TO BE TRANSPORTED

The tractor gross weight should be at least equal to the sprayer gross weight (sprayer net weight plus full tank weight).

Ex: Sprayer net weight = 410.06 lb

Filled up tank = approximately 474 lb (56.80-gallons tank)

Sprayer gross weight = 884.05 lb

Tractor gross weight = 884.05 lb or more



ATTENTION

In this case the recommended tractor should have minimal nominal power of 12.3 HP and weigh at least gross 884.05 lb.

SETTING UP TRACTOR

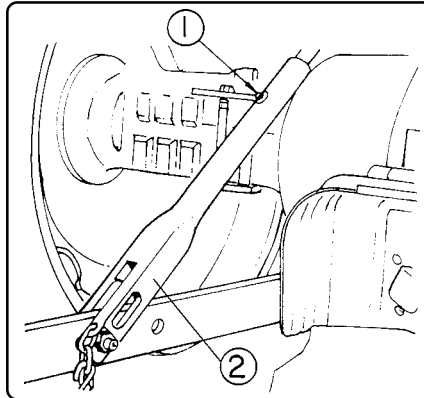
ADJUSTING PARTS TO HITCH TO THE TRACTOR'S THREE-POINT SUSPENSION

ATTENTION: The instruction below is an example of what should be done for properly hitching the sprayer to the tractor's three-point suspension. To exemplify we have used the Ford 4600 tractor. However, you should proceed as directed in the operator's manual of your tractor.

TIE ARM OF THE LEFT BAR

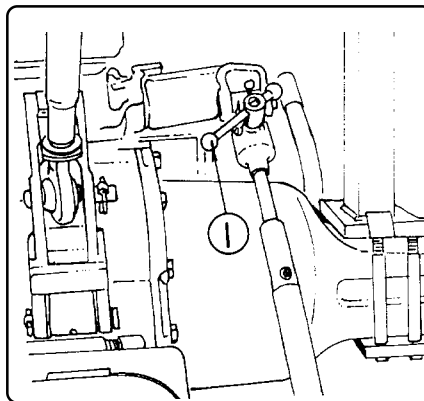
To adjust the length of the left lift arm to the proper position, loosen the pin and turn the lower half (2) of the lift arm.

NOTE: The grease fitting (1) should point up.



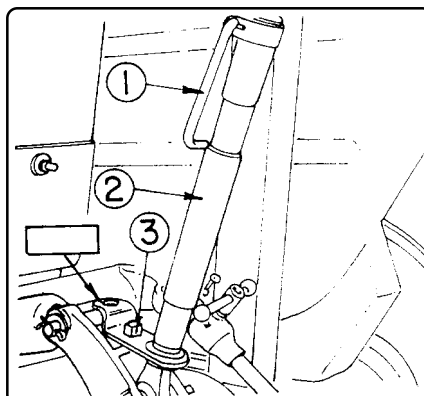
LEVELLING BOX

To adjust the transversal levelling of the sprayer, turn the crank (1) located on the levelling box.



ADJUSTING THE THIRD POINT

Release the lock (1) and turn the sleeve (2) to adjust the length of the third point arm. During transport, fasten the plate of the third point bar to the pin (3) of the frame.



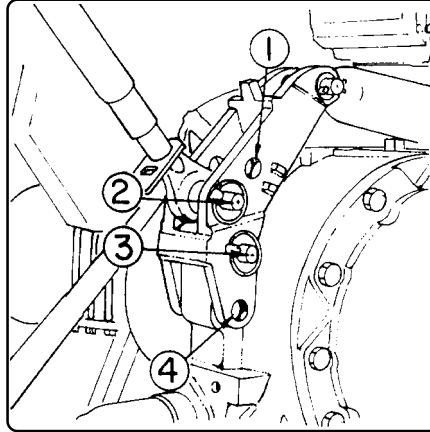
SETTING UP TRACTOR

ADJUSTING PARTS TO HITCH TO THE TRACTOR'S THREE-POINT SUSPENSION

THIRD POINT FRAME

The third point frame has two positions (1 and 2) to install the third arm and two positions (3 and 4) to install the frame lower pin.

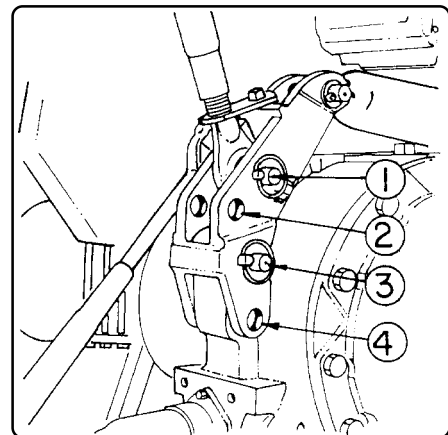
Thus there are four different positions for this assembly.



HOLES POSITION

The positions of the holes vary according to the duty to be done.

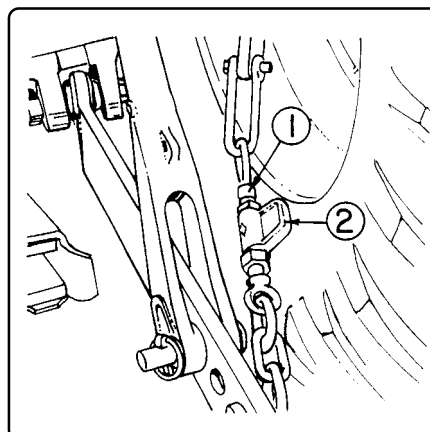
Third arm's position	Frame	Duty kind
N° 1	N° 4	Ultra-light
N° 1	N° 3	Light
N° 2	N° 4	Medium
N° 2	N° 3	Heavy



STABILIZING CHAINS

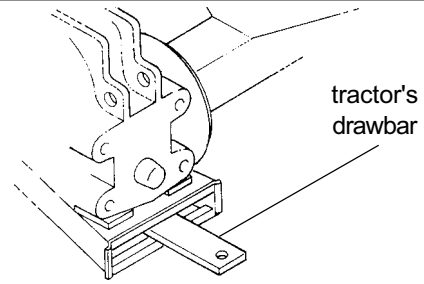
The stabilizing chains should be installed to limit the lateral movement of the sprayer hitched to the three-point system.

These chains should be adjusted according to the boom of the sprayer to be used. To adjust them, relieve the lock nut (1) and turn the adjusting nut (2), as necessary, and retighten the lock nut.

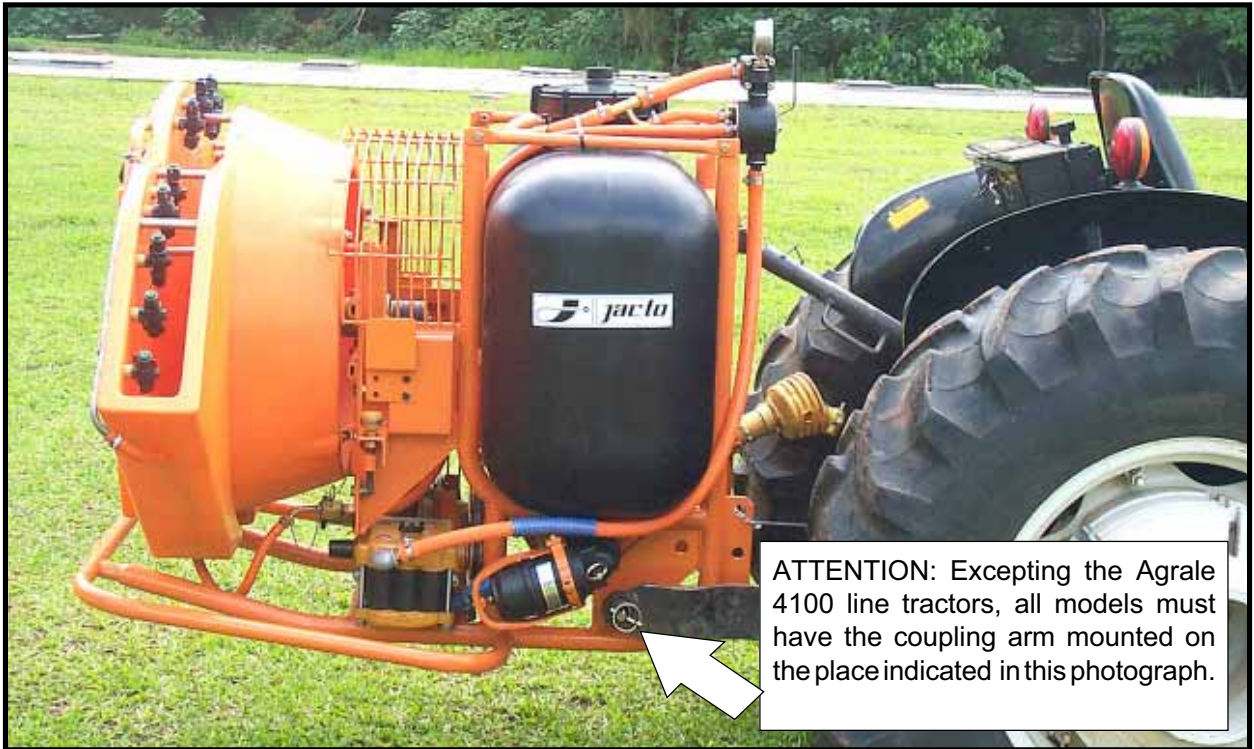


MOUNTING THE SPRAYER TO THE TRACTOR

- Remove or pull the tractor's drawbar aside.



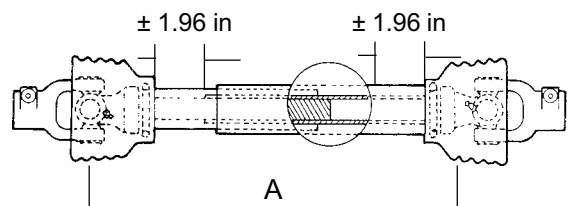
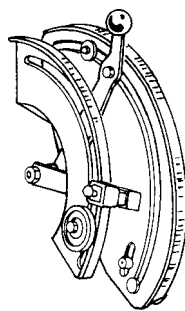
- Mount the sprayer to the tractor's three-point suspension and level it.



- Adjust the tractor's hydraulic lift lever so that the sprayer is not raised too high.

- Adjust the PTO shaft. If necessary, cut the male and female tubes so that, after connecting the sprayer, it has the overlaps recommended in the figure below.

height adjustment



NOTE: Align the forks as shown by "A".

ATTENTION

Before cutting the tubes, check for all possibilities of movement of the sprayer on the lift arms and third point.

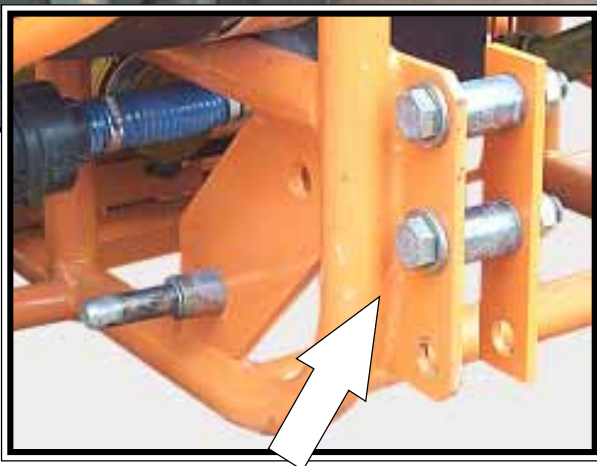
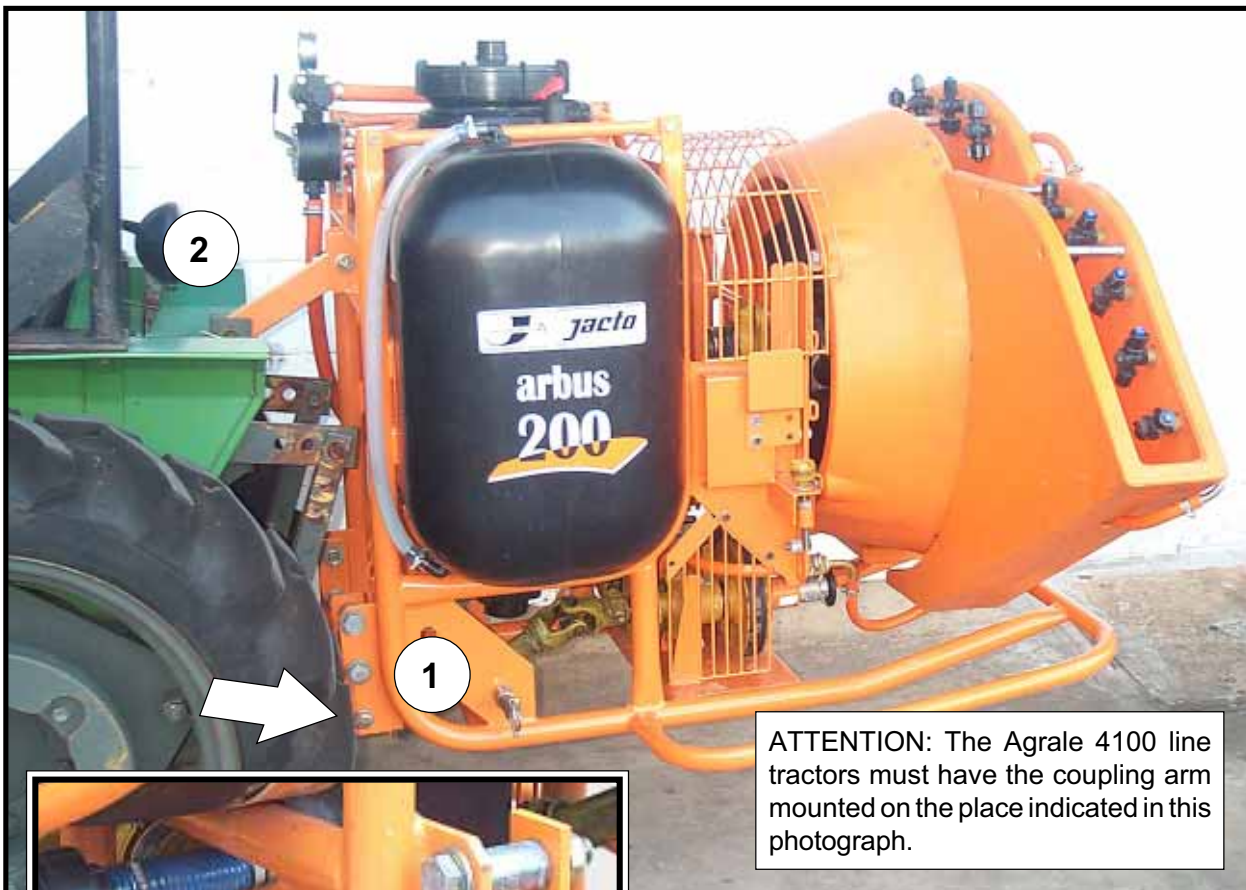
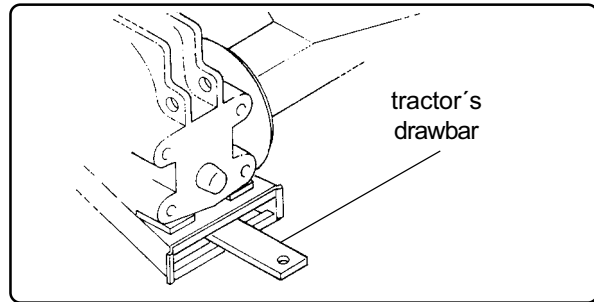
Make sure the hitch pins locks are correctly installed.

For instructions in detail, refer to the section MAINTENANCE - PTO SHAFT.

MOUNTING THE SPRAYER TO THE TRACTOR

MOUNTING THE SPRAYER TO THE AGRALE 4100 LINE TRACTORS

- Remove or pull the tractor's drawbar aside.
- Mount the sprayer to the tractor's three-point suspension and level it.



1 - The two screws indicated in the above photograph, as well as the steel plate, bushings, washers and nuts, are designed to maintain the tractor's hydraulic arms properly coupled to the sprayer.

The Agrale 4100 line tractor's hydraulic lift bars must be coupled to the place indicated in the photograph beside.



MOUNTING THE SPRAYER TO THE TRACTOR

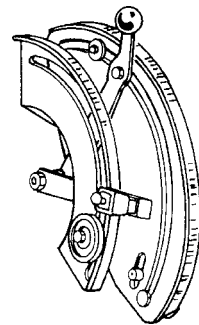
2 - The support installed on the third-point position has a "stop" on the tractor's side.

This "stop" limits the lift course of the sprayer in order to keep the chemical control from touching the tractor.

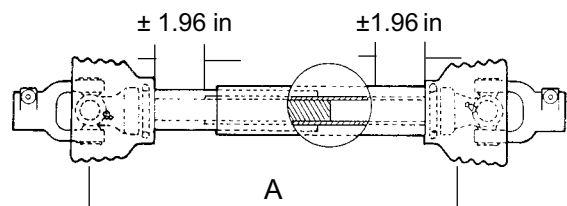


- Adjust the tractor's hydraulic lift lever so that the sprayer is not raised too high.

height
adjustment



- Adjust the PTO shaft. If necessary, cut the male and female tubes so that, after connecting the sprayer, it has the overlaps recommended in the figure beside.



NOTE: Align the forks as shown by "A".

ATTENTION

Before cutting the tubes, check for all possibilities of movement of the sprayer on the lift arms and third point.

Make sure the hitch pins locks are correctly installed.

For instructions in detail, refer to the section MAINTENANCE - PTO SHAFT.

OPERATION AND ADJUSTMENTS

SPRAY APPLICATION TECHNOLOGY

A successful spray application does not depend only on a good sprayer or correct use of the chemicals but also on factors to be determined in the field under specialized orientation.

Among these factors, some concepts should be part of a criterion of evaluation so that positive results may be attained within the pest control program.

- **Ideal time**
- **Safety**
- **Application rate**
- **Good coverage**

IDEAL TIME

The ideal time for spraying should be chosen according to the chemical product characteristics, as well as to the field conditions:

- Infestation level of pests, diseases and weeds;
- Infection level of diseases;
- Growing stage of weeds;
- Weather conditions.

SAFETY

When spraying your crops, you must make sure there will be no risk to people, animals and environment. Avoid spraying at hotter times, with humidity below 55% or under windy conditions. **Do not allow the operator to handle chemicals and spraying machinery without the proper individual protective clothing.**

CORRECT APPLICATION RATE

Any type of application requires that the rate be maintained during the whole spraying work. This will be possible when you have a good sprayer properly calibrated.

This calibration can be obtained through practical methods or formulas. Please refer to the section **OPERATION AND ADJUSTMENTS - CALIBRATING THE SPRAYER.**

GOOD COVERAGE

You have a good coverage when the whole target is sprayed with uniform distribution, with no risk to the environment and with good results in the pest control.

The application rate does not have influence on the treatment results. Therefore good coverages can be attained even with different rates, which may vary according to operational and regional factors.

IMPORTANT!

READ CAREFULLY AND FOLLOW STRICTLY THE INSTRUCTIONS ON THE CHEMICALS MANUFACTURER'S LABEL.

ALWAYS FOLLOW DIRECTIONS OF A TECHNICIAN WHEN HANDLING AND APPLYING CHEMICALS.

ALWAYS MAKE SURE THE SPRAYER IS IN GOOD OPERATIONAL CONDITIONS BEFORE STARTING THE SPRAYING JOB AND EMPLOY A WELL TRAINED OPERATOR.

OPERATION AND ADJUSTMENTS

ARBUS 200

This equipment is available in the versions:

- without vertical deflector



- with vertical deflector (plastic)



- with vertical deflector (plate)



OPERATION AND ADJUSTMENTS

VERTICAL DEFLECTOR - ASSEMBLY

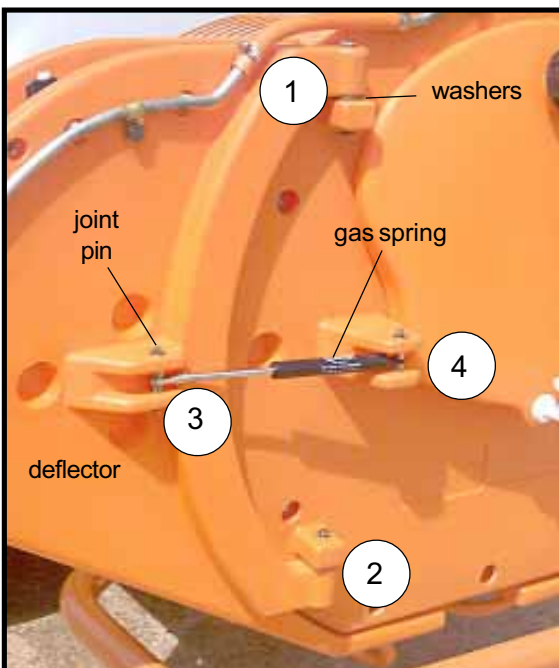
The vertical deflector is a component mounted on the side of the sprayer that allows to spray grape planted in trellis system.

The deflector has breakaway device to protect against frontal impacts.

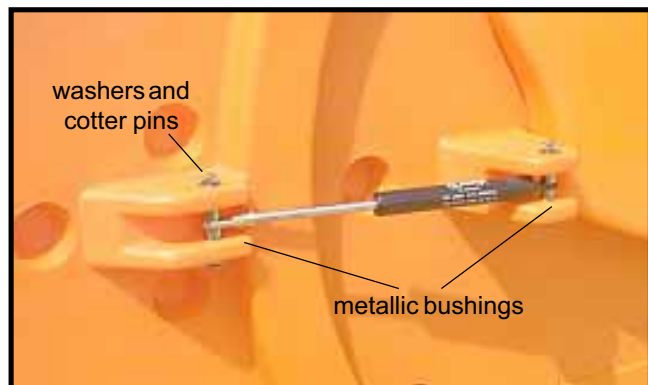


Procedures to assemble the deflector and the gas spring.

- Fit the washers between the plastic parts (1 and 2).
- Fit the joint pins on the points 1 and 2. After that, fit the smaller washers and lock them with the cotter pins.
- Fit the joint pin on the point 3 with the metallic bushings. Fit the washers and lock them with the cotter pins.



- Pull the gas spring to fit the bushings and the pins on the local indicated by no. 4.
- Fit the washers and lock them with the cotter pins.



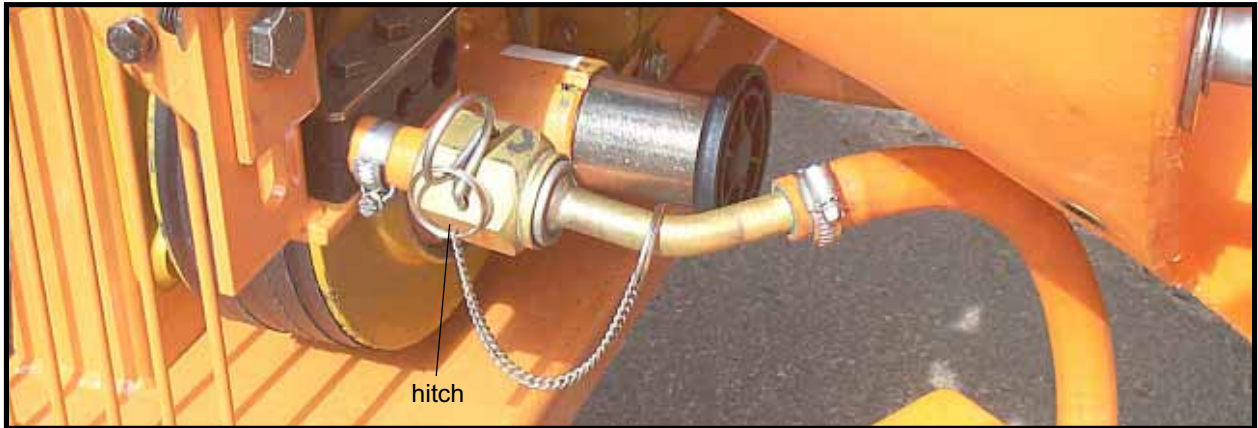
OPERATION AND ADJUSTMENTS

USING THE QUICK FITTING CONNECTION

This sprayer has a device that allows to use the pump for spot spraying with lance or gun (both optional).

Procedures:

With the tractor off, disengage the fan as described on the item "Fan".



IMPORTANT: To operate the fan locking device the tractor must be turned off or with the PTO disengaged.

Locate the quick fitting connection under the deflector and loosen the clip that connects the two parts of the hitch, separating them. Note that the hose end or spray gun is a male part similar to the part disconnected from the quick fitting connection.

Fit the gun or lance end on the quick fitting connection female part and fasten it with the clip. Turn on the tractor at the desired rotation and spray.

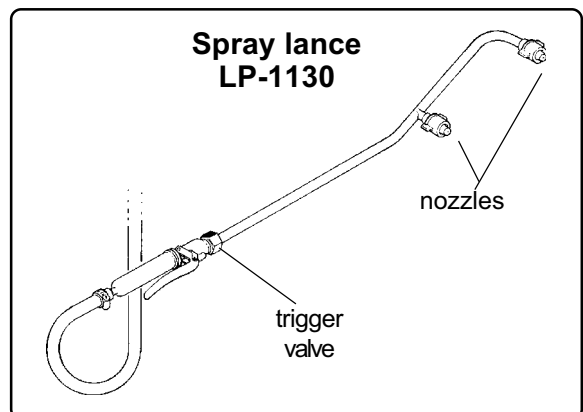
SPRAY LANCE (OPTIONAL)

This is an accessory for spot spraying, as well as for applications to difficult of access places.

It has two ceramic cone nozzles (model JA-2) and trigger valve for turning on and off the chemical flow, thus preventing wastage of agrochemicals.

Nozzle	Pressure psi	Flow rate (gpm)	
		Nozzle	Lance
JA - 2	150	0.26	0.52
	200	0.30	0.61
	300	0.37	0.75
	400	0.43	0.86

Pressure band not recommended

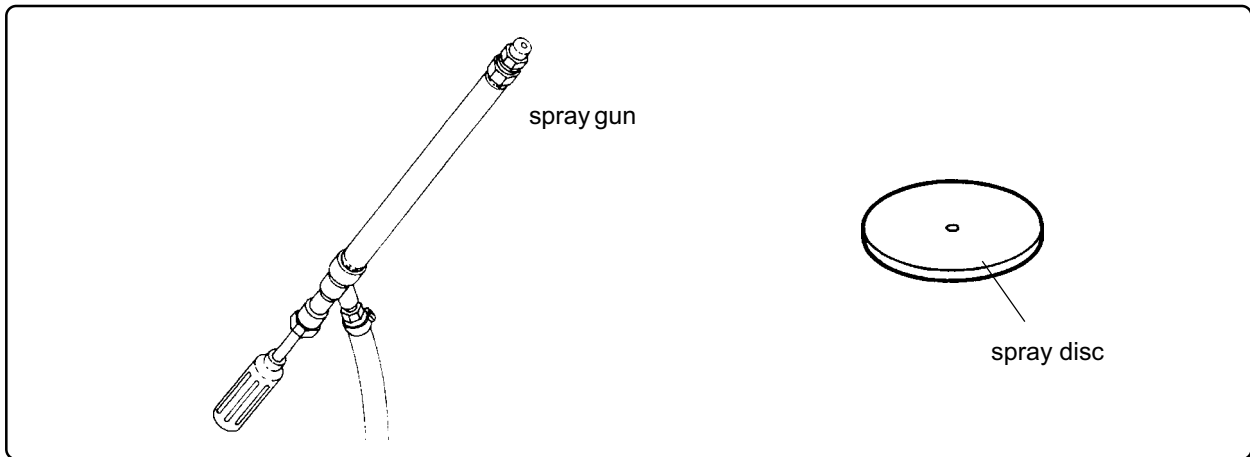


OPERATION AND ADJUSTMENTS

SPRAY GUN (OPTIONAL)

This is a component for spot spraying on big plants requiring high application rate.

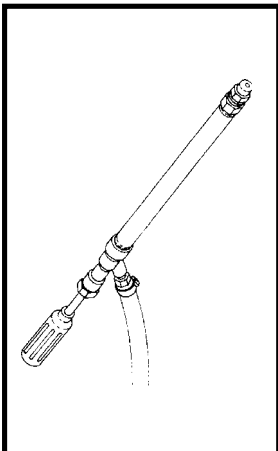
It is possible to have flow rate ranging from 1.30 to 11.88 gallons per minute by shifting the spray discs.



SPRAY DISCS - SERIES D

Made in stainless steel, these discs are designed to be used on the Jacto spray gun for spot spraying on fruit trees due to its large application range, as well as for cleaning sheds, warehouses and agricultural equipment.

The spray discs are available with flow rate ranging from 1.37 to 11.88 gpm.

FLOW RATE	DISC PART #	DISC MODEL	PRESSURE (psi)				
			100	150	200	300	400
			SPRAY GUN FLOW RATE (gpm)				
	202275	D - 5	1.37	1.58	1.84	2.11	2.50
	202267	D - 6	1.80	2.24	2.64	3.17	3.56
	202811	D - 7	2.47	2.87	3.30	3.89	4.49
	202259	D - 8	3.39	3.96	4.49	5.28	6.24
	622829	D - 9	3.75	4.65	5.47	6.70	7.76
	114686	D - 10	4.88	5.81	6.74	7.92	9.42
	622837	D - 11	5.54	6.54	7.75	9.77	11.88

OPERATION AND ADJUSTMENTS

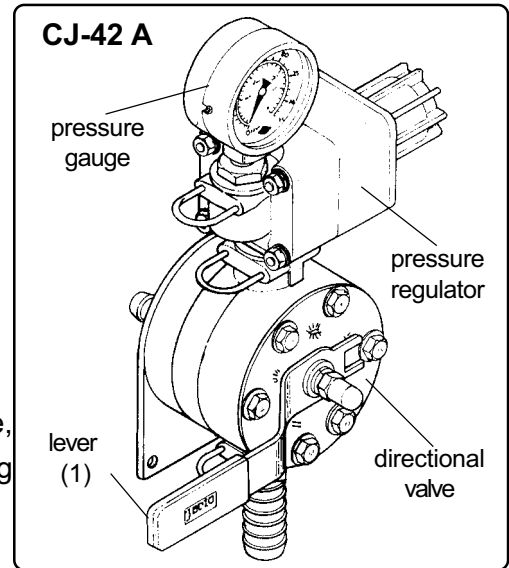
PRESSURE REGULATOR

This pressure regulator provides calibration ranging from 1 to 21 kgf/cm² (14 to 300 psi), indicated by the pressure gauge.

The lever (1) turns on and off the chemical flow to the right or left nozzles branches or to one only, making the spraying easier and with less wastage of agrochemicals.

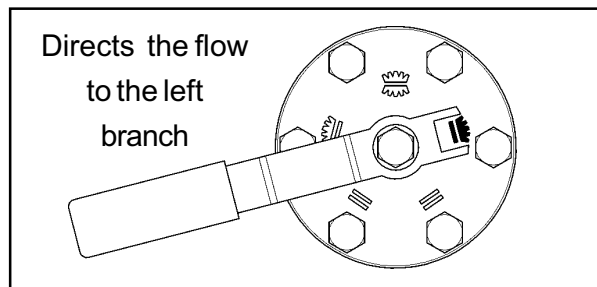
ATTENTION

In order to ensure longer life of the pressure gauge, close lever (1) after regulating the sprayer, thus releasing the pressure, and close the pressure gauge valve.

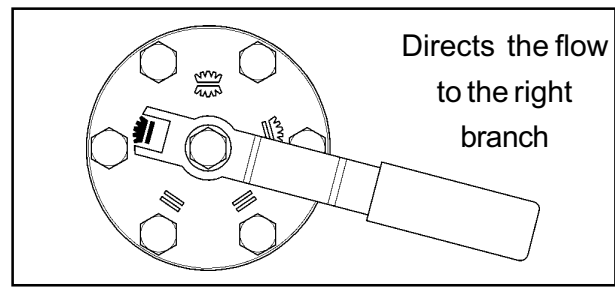


DIRECTIONAL VALVE

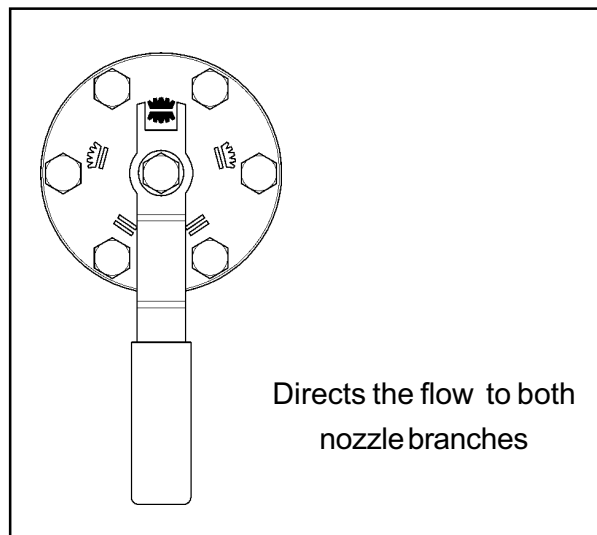
- This valve directs the chemical flow according to the user's need.



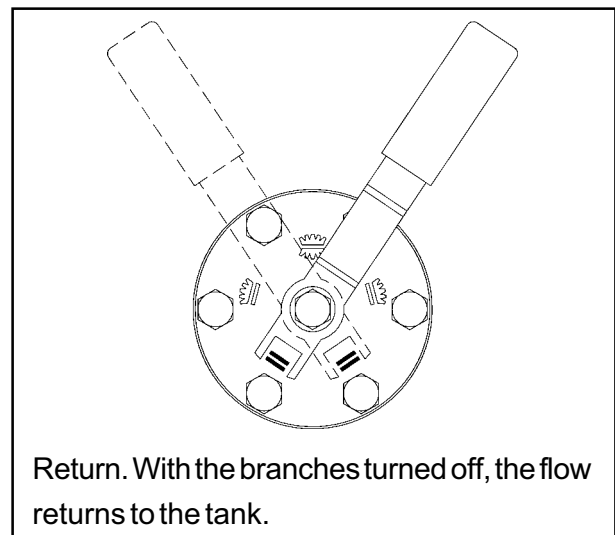
Directs the flow to the left branch



Directs the flow to the right branch



Directs the flow to both nozzle branches



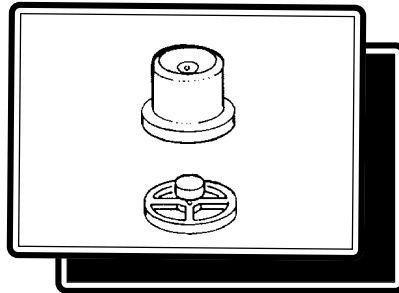
Return. With the branches turned off, the flow returns to the tank.

HYDRAULIC AGITATOR

During the displacement, set the directional valve to the return position and adjust the pressure around 200 psi to obtain a stronger chemical agitation.

OPERATION AND ADJUSTMENTS

HOLLOW CONE NOZZLE HIGH QUALITY CERAMIC SERIES JA



TECHNICAL CHARACTERISTICS

SPRAY PATTERN HOLLOW CONE
 SPRAY ANGLE 75 TO 80 DEGREES AT 150 PSI
 MANUFACTURING MATERIAL **SINTERED ALUMINA**
 FLOW RATE IDENTIFICATION NOZZLE COLOR AND DESCRIPTION

Series JA hollow cone nozzles are produced by processes developed for exacting markets of mechanical engineering, space and aerospace industries. A special mold injection process makes a perfect orifice on the nozzles, giving better quality to the surface finish than that achieved by machines. And the result is better coverage and more homogenous spraying.

These nozzles are approved by international quality standards, ensuring an outstanding spray cone uniformity and flow rate of nozzles.

The alumina-sintered nozzles are almost as hard as diamond and resist yet the most corrosive products. This provides perfect stability for long time concerning all requirements such as flow rate, coverage and droplet size.



TABLE 01 - FLOW RATE

Pressure (psi)	Nozzle model					
	JA - 1	JA-1.5	JA-2	JA-3	JA-4	JA-5
	Flow rate (gpm)					
30	0.06	0.08	0.12	0.16	0.24	0,31
45	0.07	0.10	0.14	0.20	0,29	0,36
60	0.08	0.11	0.17	0.23	0,33	0,42
90	0.10	0.14	0.20	0,28	0,39	0,51
120	0.11	0.15	0.22	0,31	0,45	0,58
150	0.13	0.17	0,26	0,35	0,50	0,64
180	0.14	0.18	0,27	0,38	0,54	0,70
210	0.145	0.20	0,29	0,41	0,58	0,75
240	0.15	0.21	0,32	0,44	0,61	0,85
270	0.16	0.22	0,33	0,46	0,63	0,90
300	0.19	0.23	0,37	0,48	0,67	0,94

NOZZLES STRAINERS: Use 50 or 60 mesh for all nozzle models.

OPERATION AND ADJUSTMENTS

Nozzle		Pressure (psi)	Flow rate (GPM)	Tractor speed (MPH)								
				2.5	3	4	4.5	5	5.5	6	6.5	7.5
Model	Color	Spraying volume (GPA)										
JA - 1	Blue	60	0.08	0.79	0.66	0.49	0.44	0.39	0.36	0.33	0.30	0.26
		90	0.10	0.99	0.82	0.62	0.55	0.49	0.45	0.41	0.38	0.33
		150	0.13	1.28	1.07	0.80	0.71	0.64	0.58	0.53	0.49	0.43
		210	0.14	1.38	1.15	0.87	0.77	0.69	0.63	0.58	0.53	0.46
JA - 1.5	Brown	60	0.11	1.09	0.91	0.68	0.60	0.54	0.49	0.45	0.41	0.36
		90	0.14	1.38	1.15	0.87	0.77	0.69	0.63	0.58	0.53	0.46
		150	0.17	1.68	1.40	1.05	0.93	0.84	0.76	0.70	0.64	0.56
		210	0.20	1.98	1.65	1.24	1.10	0.99	0.90	0.82	0.76	0.66
JA - 2	Black	60	0.17	1.68	1.40	1.05	0.93	0.84	0.76	0.70	0.65	0.56
		90	0.20	1.98	1.65	1.24	1.10	0.99	0.90	0.82	0.76	0.66
		150	0.26	2.57	2.14	1.60	1.43	1.29	1.17	1.07	0.99	0.86
		210	0.30	2.98	2.47	1.86	1.65	1.48	1.35	1.23	1.14	0.99
JA - 3	Orange	60	0.23	2.30	1.90	1.42	1.26	1.14	1.03	0.94	0.87	0.76
		90	0.28	2.77	2.31	1.73	1.54	1.38	1.26	1.15	1.06	0.92
		150	0.35	3.46	2.88	2.16	1.92	1.73	1.57	1.44	1.33	1.15
		210	0.41	3.96	3.38	2.54	2.25	2.03	1.84	1.69	1.56	1.35
JA - 4	Red	60	0.33	3.27	2.72	2.04	1.81	1.63	1.48	1.36	1.25	1.09
		90	0.40	3.96	3.30	2.47	2.20	1.98	1.80	1.65	1.52	1.32
		150	0.50	4.95	4.12	3.09	2.75	2.47	2.25	2.06	1.90	1.65
		210	0.59	5.84	4.87	3.65	3.24	2.92	2.65	2.43	2.24	1.94
JA - 5	Green	60	0.42	4.16	3.46	2.60	2.31	2.08	1.89	1.73	1.60	1.37
		90	0.51	5.05	4.20	3.15	2.80	2.52	2.29	2.10	1.94	1.68
		150	0.64	6.37	5.28	3.96	3.52	3.17	2.88	2.64	2.43	2.11
		210	0.75	7.42	6.19	4.64	4.12	3.71	3.37	3.09	2.85	2.47

Ordering: Specify nozzle model and part #. Ex.: nozzle JA-2, part # 000026.

Color	Blue	Brown	Black	Orange	Red	Green
Model	JA - 1	JA - 1,5	JA - 2	JA - 3	JA - 4	JA - 5
Part #	109744	454256	000026	454264	454272	454280

OPERATION AND ADJUSTMENTS

CALIBRATING THE SPRAYER

The safety of people, animals and environment depends on correct spray applications. Therefore, we list below some operational procedures.

WHEN HANDLING THE CHEMICALS

- Follow strictly the instructions on the labels.
- Use individual protective equipment.
- Do not eat, drink or smoke.
- Choose a ventilated place.
- Wash with water and soap the parts of the body touched by chemicals.

WHEN HANDLING THE SPRAYER

- Check for the proper working conditions of the sprayer.
- Do not blow by mouth nozzles, valves or tubes.
- Do not spray against the wind.
- Do not spray in hotter times.
- Use individual protective clothing recommended.
- Do not eat, drink or smoke.

REMEMBER

You are responsible for the success of the application.

PROCEDURE

The sprayer can be calibrated by obtaining the spraying volume through the following formula:

$$GPA = \frac{GPM \times 495}{MPH \times S}$$

Where:

GPA : Application volume in gallons per acre

GPM : Application volume in gallons per minute

MPH : Tractor speed in miles per hour

S : Row spacing width in feet

495 : Conversion factor

EXAMPLE:

Total nozzles flow rate: (14 x JA-2 nozzles & 16 x JA-4 nozzles at 150 psi) = 11.64 gpm

Row spacing: 9.84 x 16.40 (ft)

No. of trees per acre: 270 trees

Tractor speed: 2.5 mph

$$GPA = \frac{GPM \times 495}{MPH \times S} \quad GPA = \frac{11.64 \times 495}{2.5 \times 16.40} \quad GPA = 139 \text{ gallons per acre}$$

$$\text{SPRAYING VOLUME PER TREE: } \frac{139}{270} = 0.5 \text{ (gallons/tree)}$$

OPERATION AND ADJUSTMENTS

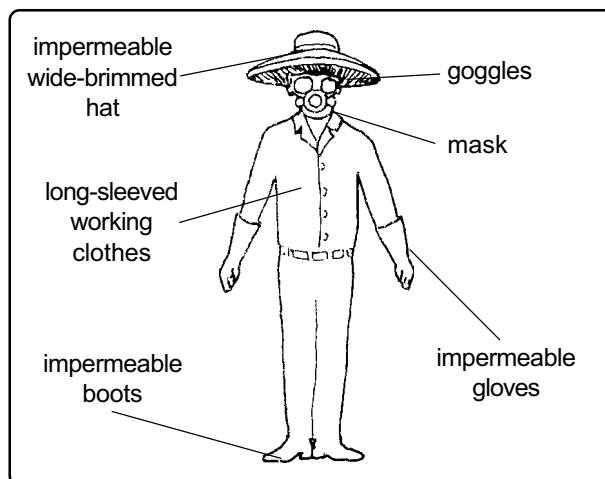
DILUTING THE CHEMICALS

ATTENTION

NEVER run the sprayer for with less than 50 liters of water in the tank to avoid damage to the pump.

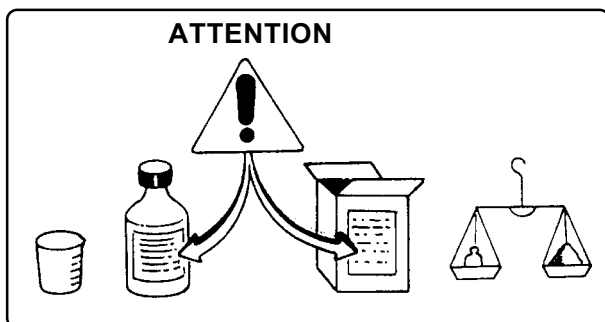
Always use the following individual protective clothing when handling chemicals:

- Impermeable wide-brimmed hat
- Goggles
- Mask
- Long-sleeved working clothes
- Impermeable gloves
- Impermeable boots

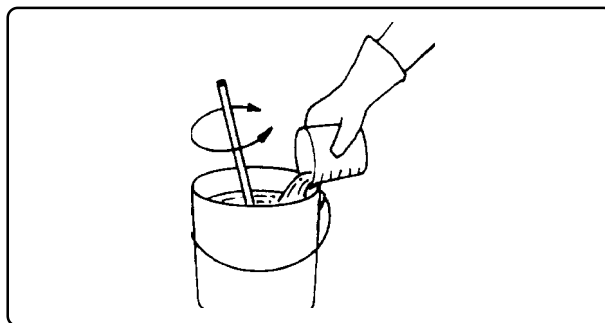


PREPARING THE CHEMICAL MIXTURE

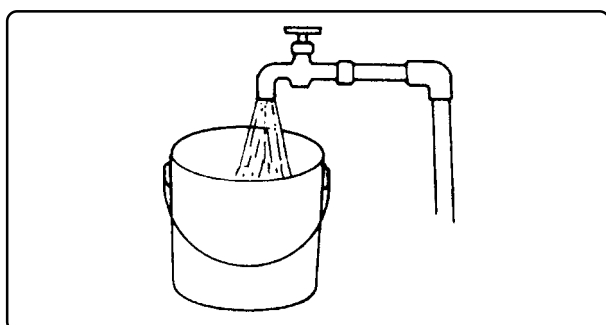
ATTENTION



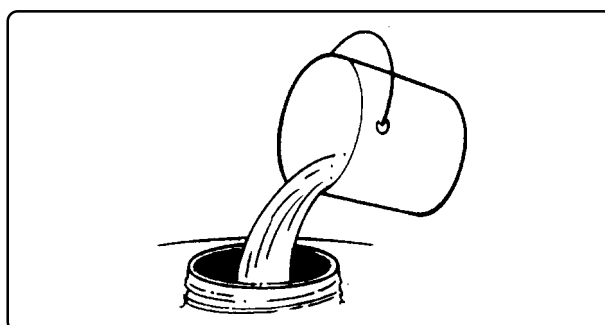
- Read carefully the chemicals manufacturer's label.



- Pour the chemicals into a bucket with little water and stir.



- Add water until filling the bucket up.
- Stir until the mixture is homogeneous.



- Pour the solution into the sprayer's tank.
- Install the tank lid and make sure there is no leakage.

ATTENTION
ALWAYS FOLLOW TECHNICAL RECOMMENDATIONS
WHEN HANDLING CHEMICALS.

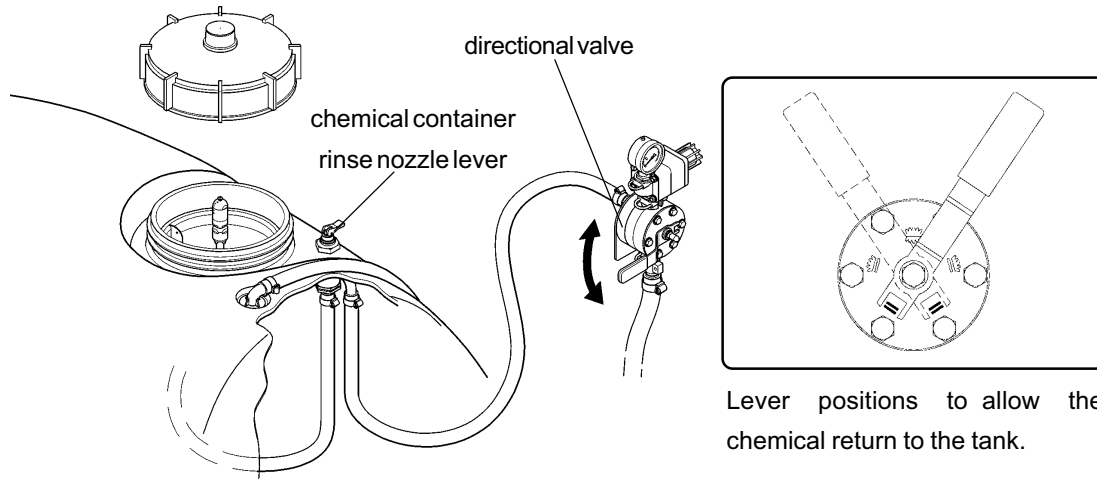
OPERATION AND ADJUSTMENTS

PRESSURE WASH

Procedures to use the container rinse nozzle:

- Fill the tank up to approximately 90% of its capacity.
- Pour the chemical into the tank.
- Engage the tractor's PTO

NOTE: The directional valve lever must be set to allow the chemical return to the tank (off).

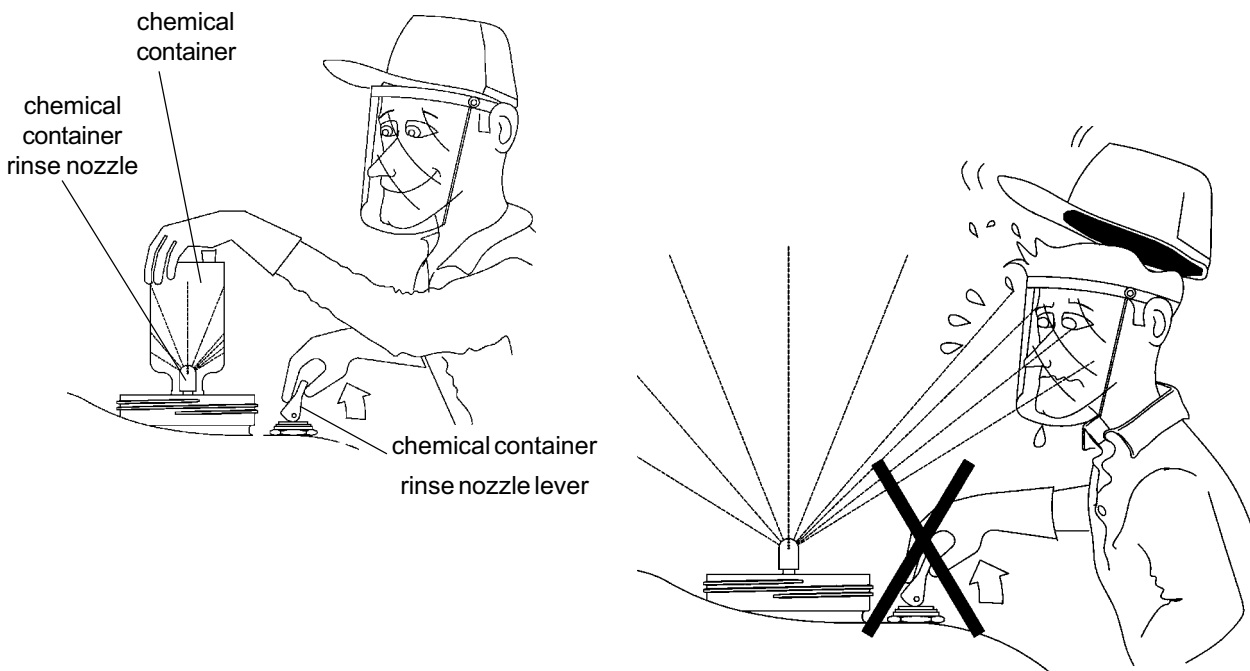


ATTENTION: USE THE RECOMMENDED PROTECTIVE CLOTHING FOR THIS OPERATION

- Hold the chemical container over the rinse nozzle and pull the lever to wash inside the container.

NOTE: With the chemical container over the rinse nozzle, make circular movements to reach all internal walls of the chemical container with the water jet for around 30 seconds.

- Fill up the sprayer tank with water.



ATTENTION

Never pull the lever without the chemical container over the container rinse nozzle.

After rinsing the chemical container, wash it for the last time, using clean water from the auxiliary tank.

OPERATION AND ADJUSTMENTS

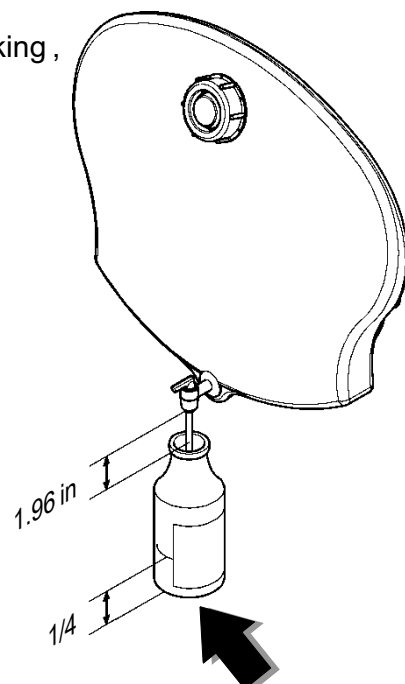
CLEAN WATER TANK

To assist in the operation of the PRESSURE-WASH, a clean water tank is also installed on the sprayers.

ATTENTION: The water from this tank is not fit for drinking, or even washing hands, face, tools, etc. It must be used only to fill the chemical containers for the final rinse.

NOTE:

To keep from contaminating the water and the auxiliary tank tap during the filling of the chemical container, hold the container at least 5 cm away from the tap, as shown.



1/4 = 25% of the chemical container capacity

WASHING THE CHEMICAL CONTAINER

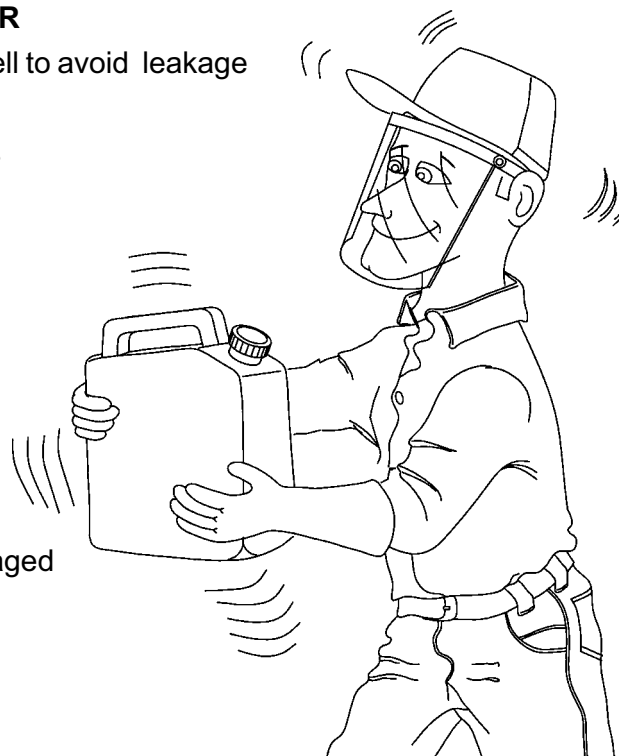
- Fit the container cap and tight it very well to avoid leakage during the agitation.

- 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.

- Take the container cap off and carefully pour the rinse water into the spray tank.

- Keep holding the container over the spray tank opening until the last drop.

- Next, make the container useless by piercing it. This way, their labels are not damaged for identification purposes.



OPERATION AND ADJUSTMENTS

CLEAN WATER TANK

The 15-liter clean water tank designed to wash the chemical containers for the last time is installed on the body of the deflector. The water from this tank is not fit for drinking, or even washing hands, face or tools.



MAINTENANCE

GUIDELINES:

Daily, after finishing the spray application, put clean water in the tank, remove the nozzles and run the sprayer till empty.

Clean and reinstall the nozzles.

Clean the main filter.

Rinse off the inside and outside of the sprayer.

ATTENTION

NEVER WASH SPRAYERS OR INDIVIDUAL PROTECTIVE EQUIPMENT IN OR CLOSE TO RIVERS, LAKES, STREAMS, BROOKS, DAMS, ETC.

Take off and wash the individual protective clothing separated from other clothes.

Take a shower with plenty of water and soap and change your clothes.

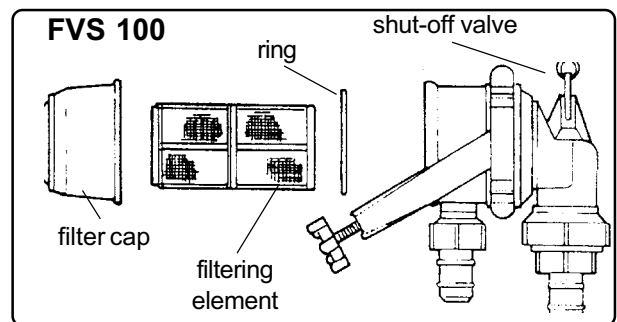
These procedures will avoid future problems caused by strainer, nozzle and tube obstructions and prolong the sprayer's life, as well as protect yourself.

COMPONENTS

MAIN FILTER

The frequency of filter cleaning will depend on the quality of water and type of agrochemicals applied.

Clean the filter whenever filling the tank or when necessary.



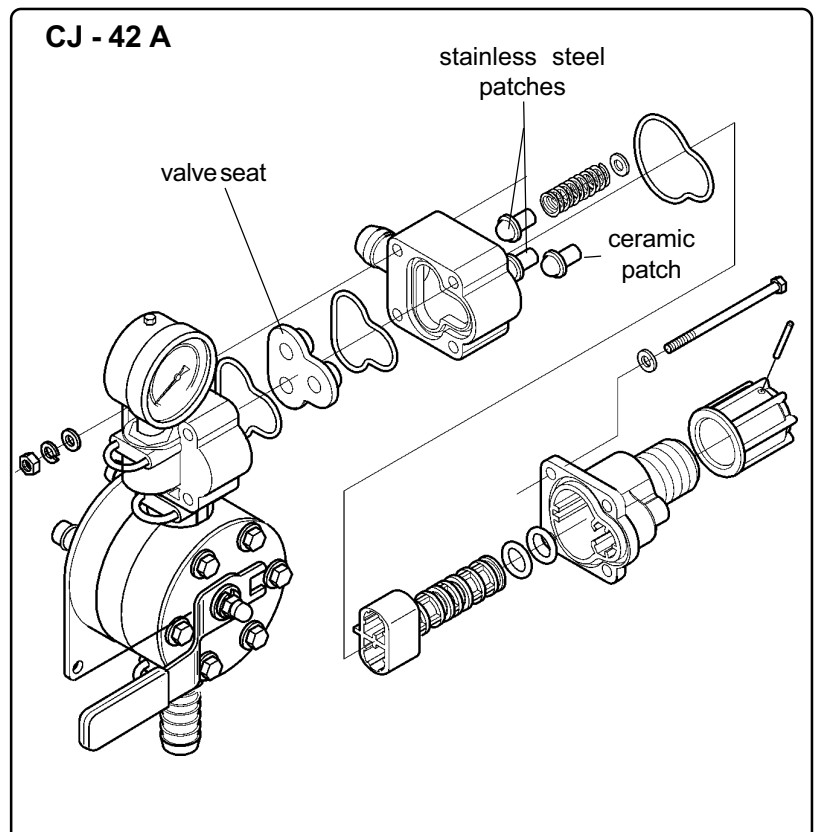
PRESSURE REGULATOR

- Disassemble the pressure regulator every 100 working hours.

- Check for wear on the valve seat and patches.

- Replace the parts if necessary.

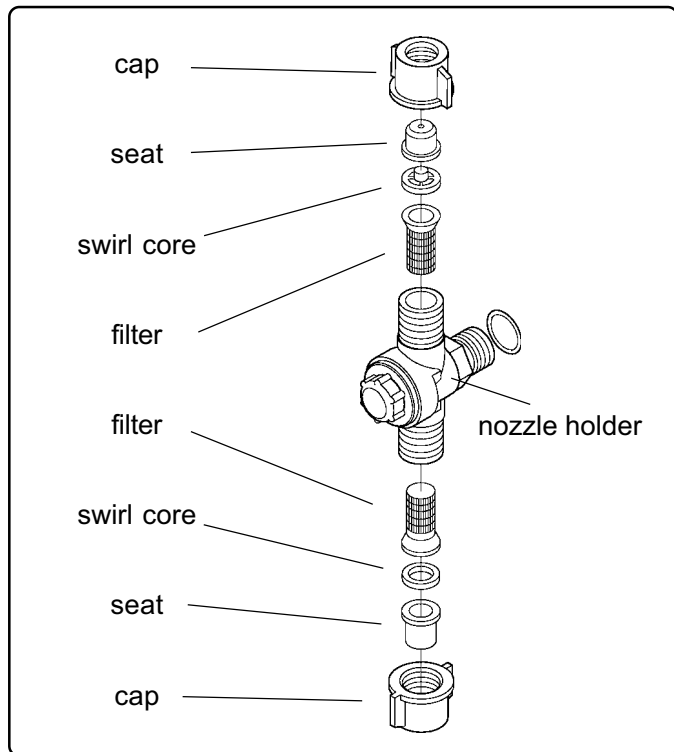
NOTE: There are two stainless steel patches and one ceramic patch.



MAINTENANCE

NOZZLE HOLDER

Clean the nozzle holders daily or when necessary.



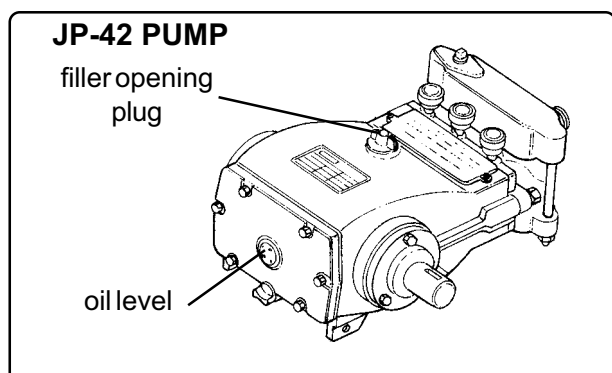
LUBRICATION TABLE

PRODUCT	LOCATION	QTY.	FREQ	SPECIFICATIONS	RECOMMENDED PRODUCTS
LUBRICATING OIL	JP-42 PUMP	0.24 gallons	1ST CHANGE: AFTER 30 HOURS FURTHER CHANGES: EVERY 100 HOURS	API - SB OR SUPERIOR SAE - 30	ALL OILS FOR INTERNAL COMBUSTION ENGINES WITHIN THIS SPECIFICATION
GREASE	PTO SHAFT	-	DAILY	LITHIUM BASE NGLI - 2	MULTIFAK EP - 2 MOBIL GREASE 77 LUBRAX GMA - 2 BEACON EP - 2 AND SIMILAR PRODUCTS

NOTE: The presentation order of recommended products does not imply any preference for any brand or product.

PUMP LUBRICATION

- Check the oil level of the pump and complete, if necessary.
- 1st change: with 30 working hours; further changes: every 100 working hours or when contaminating the oil.



MAINTENANCE

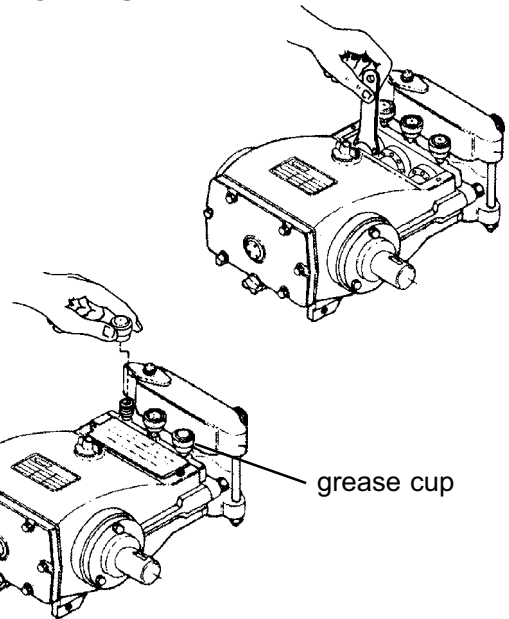
COMPONENTS LUBRICATION

GREASE

RETIGHTENING THE GASKETS

If there is leakage, proceed as follows:

- Remove the pistons guards.
- Take the tool (P/N: 520338) placed between the guard and the pistons and then tighten the gasket adjuster by turning 1/8 of a turn until it stops leaking.

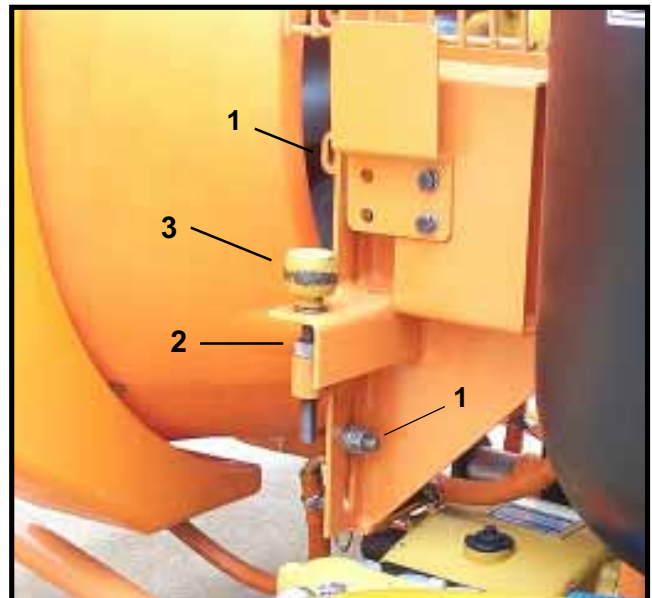


PISTONS AND GASKETS LUBRICATION

- Turn it completely every 4 working hours.
- Refill the grease cup if necessary.

FAN BELT

- Remove the fan guard screen.
- Loosen the four screws (1) enough to allow the frame to be moved.
- Loosen the two nuts (2).
- Hand-tighten equally the two knobs (3) until obtaining the recommended tension.
- Retighten the two nuts (2).
- Retighten the four screws (1).
- Put the fan guard screen.

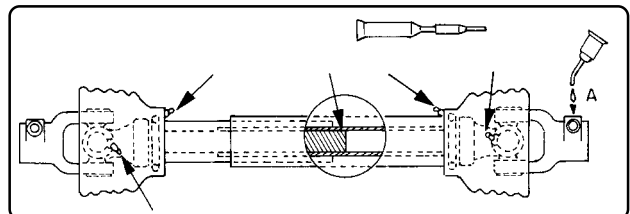


ATTENTION
ALWAYS STOP THE SPRAYER AND
TURN OFF THE TRACTOR ENGINE
BEFORE ANY KIND OF
MAINTENANCE.

PTO SHAFT

- Lubricate daily.

For instruction in detail, please refer to the section MAINTENANCE - PTO SHAFT.



ATTENTION

Before using the equipment for the first time, clean and lubricate every point of the PTO shaft, as shown in the picture above, with Lithium-based grease NGLI-2 (for further information about the greases, refer to the lubrication table).

MAINTENANCE

CONVENTIONAL PTO SHAFT

ATTENTION: ALWAYS STOP THE SPRAYER AND TURN OFF THE TRACTOR ENGINE BEFORE SERVICING THE PTO SHAFT. ALL KIND OF MAINTENANCE ON THE PTO SHAFT MUST BE DONE WITH THE USE OF APPROPRIATE PROTECTIVE CLOTHING, SUCH AS: GLOVES, BOOTS, GOGGLES, ETC.

01-CONNECTING

- Check the PTO shaft length.
- Adjust the length by cutting the tubes and protection guards proportionately.

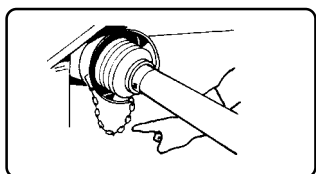
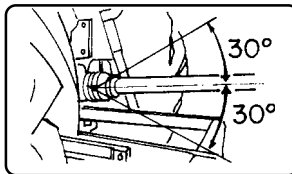
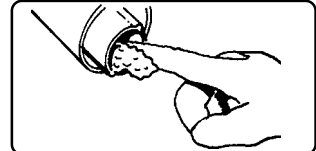
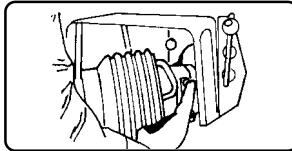
Note: File and remove all burrs.

- Connect the PTO shaft and install the safety chain.

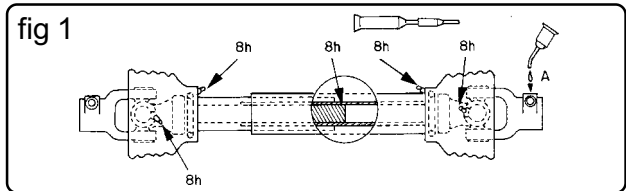
Note: Leave some slack on the chain considering angular movements.

- Disengage the PTO when making sharp turns.

ATTENTION
ONLY OPERATE WITH PTO SHAFT
EQUIPPED WITH PROTECTION GUARDS.



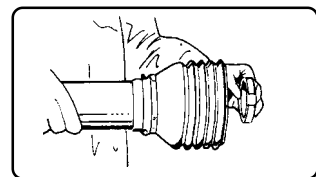
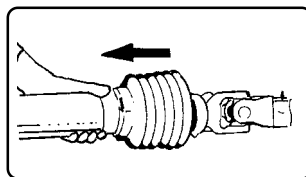
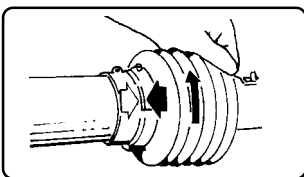
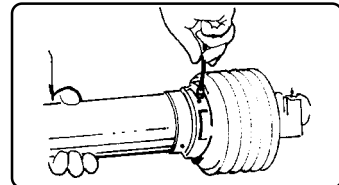
Lubricate the male and female tubes and further points as the figure 1.



02-SERVICING

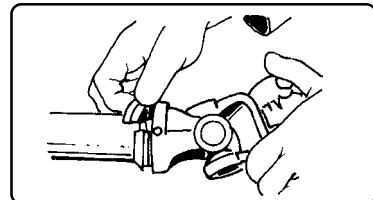
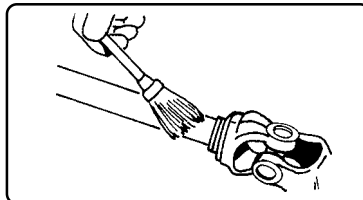
a) DISASSEMBLING

- 1- Remove the lock screw.
- 2- Turn the guard cone until the indicated position.
- 3- Pull the guard cone.
- 4- Remove the sliding ring.



b) ASSEMBLING

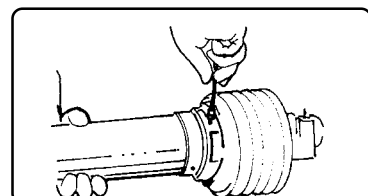
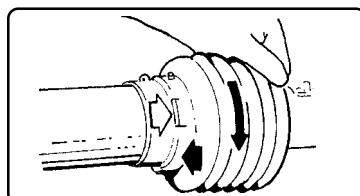
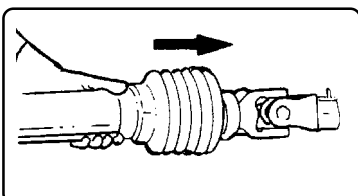
- 5- Clean and lubricate the male and female tubes.
- 6- Install the sliding ring into the fitting with the grooves pointing toward the tube.



- 7- Install the protection guards.

- 8- Turn the guard cone until the indicated position.

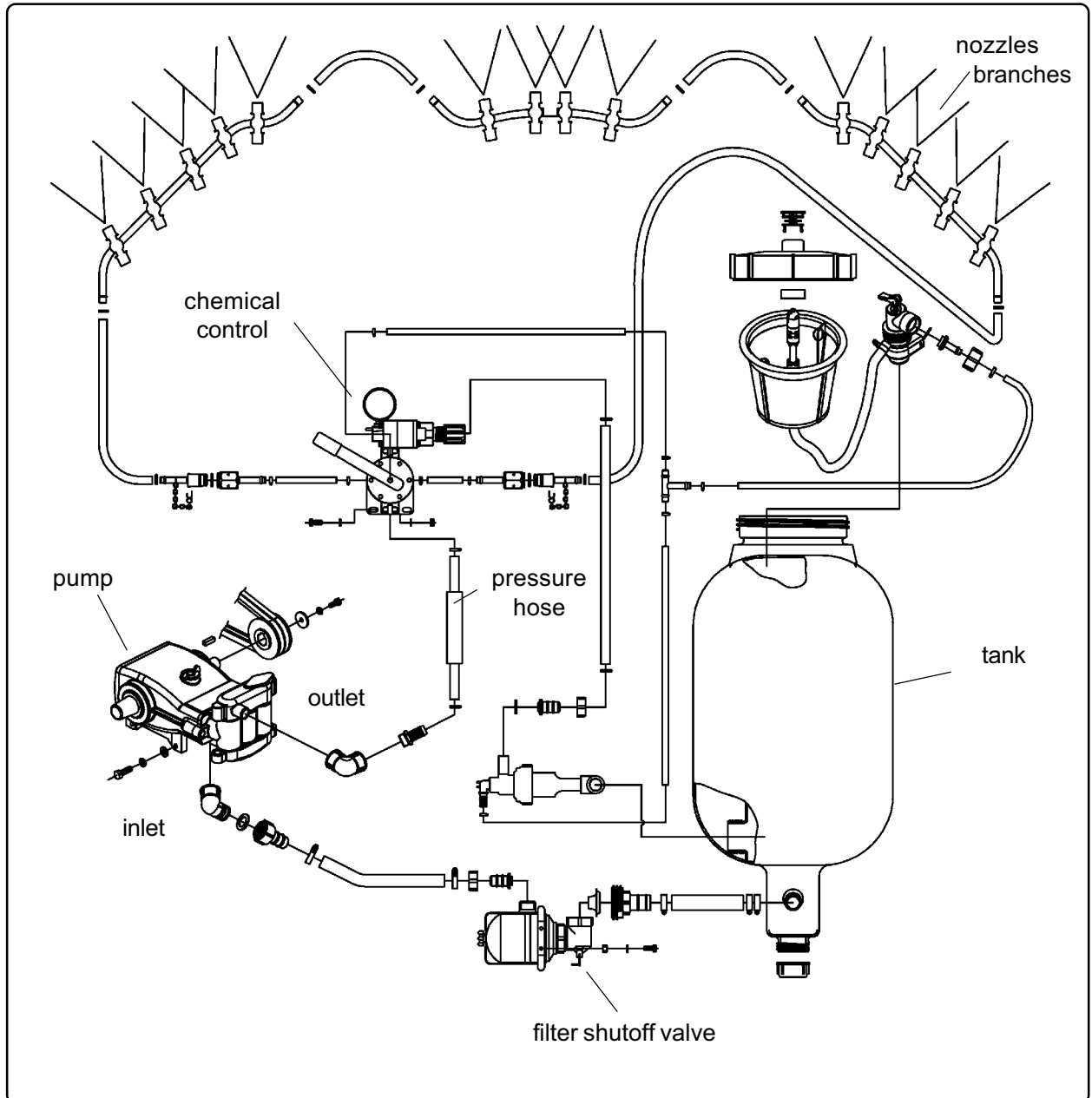
- 9- Install the lock screw.



MAINTENANCE

WINTER STORAGE

ATTENTION: In regions where temperatures drop to 0 degree Celsius or less, the water accumulated in the pump can freeze and cause serious damage.



PROCEDURES

- Empty the tank completely by removing the filter cap and opening the filter shut off valve.
- Disconnect the pressure hose from the pump or remove the plug from the valve cover.
- Run the sprayer for about 30 seconds at half speed.

NOTE: To avoid damage, do not run the sprayer over the recommended time.

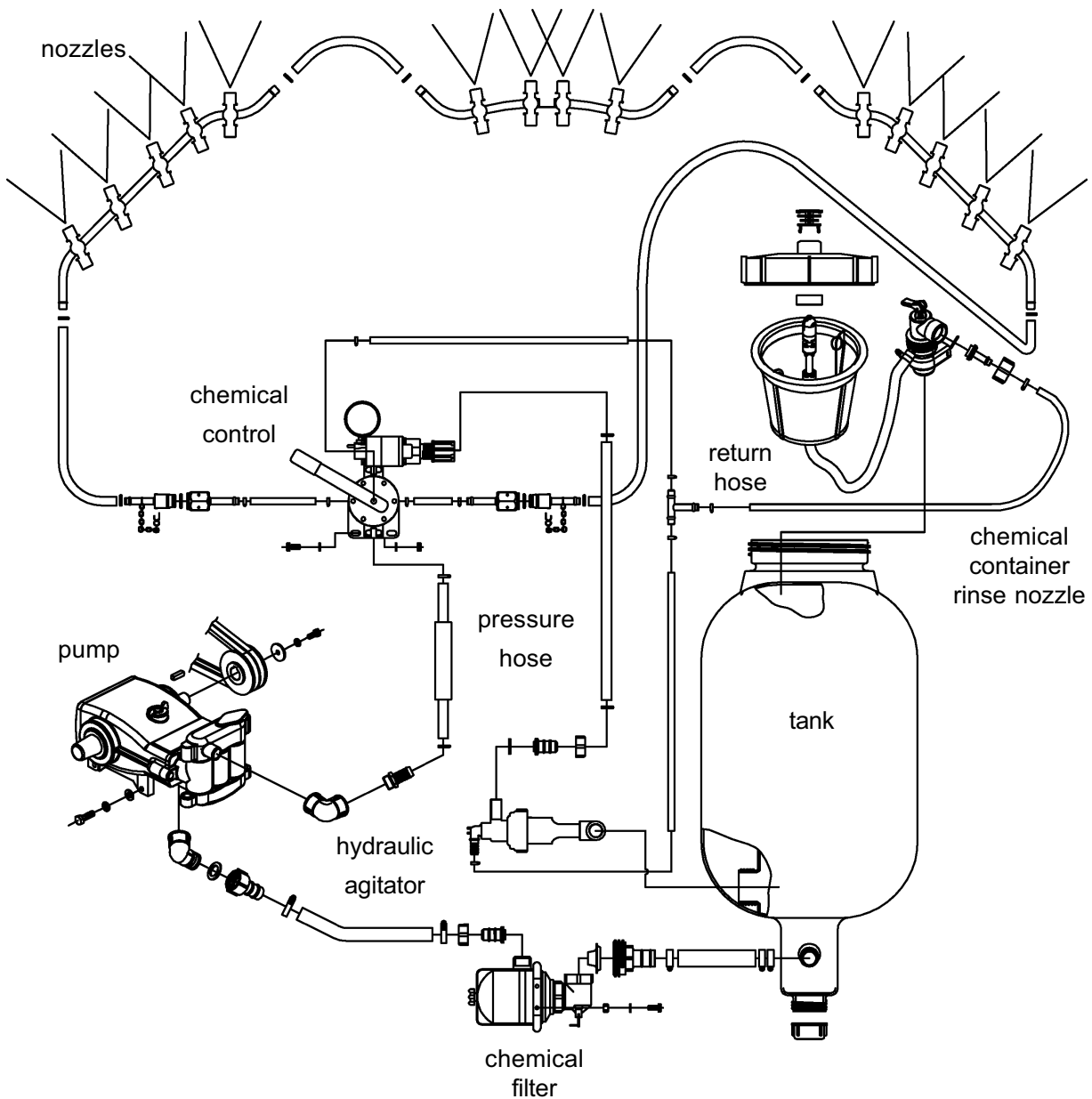
- Assemble the components again in their correct place.
- Repeat this operation at the end of each daily spraying job during the winter to avoid problems in future applications.

MAINTENANCE

TROUBLE-SHOOTING

COMPONENTS:

- Tank
- Pump
- Return hose
- Chemical filter
- Hydraulic agitator
- Chemical container rinse nozzle
- Chemical control
- Pressure hose
- Nozzles



PROBLEMS - CAUSES - SOLUTIONS

Whenever Jacto sprayers equipped with piston pumps present problems, try to classify them in one of the following four groups.

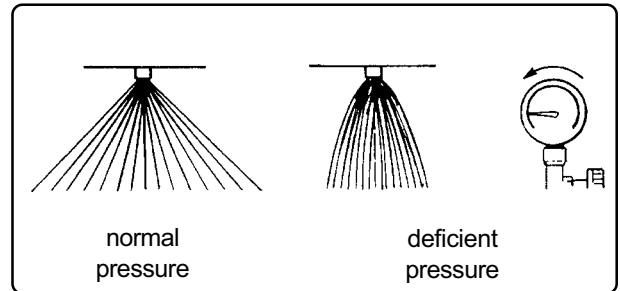
MAINTENANCE

a) LACK OF SUCTION AND PUMPING CAPACITY

No liquid flow through the nozzles.
 No return to the tank.
 Pressure gauge does not indicate pressure.

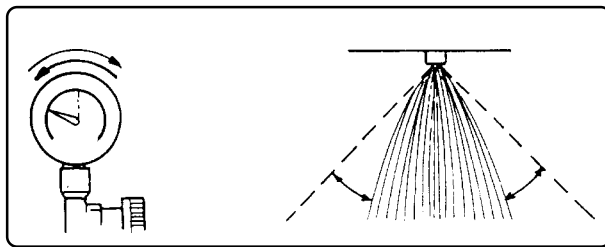
b) PRESSURE DEFICIENCY (PARTIAL LACK OF PRESSURE)

Desired pressure is not attained.
 Specified nozzle spraying angle is not attained.
 Pressure gauge shows lower pressure.



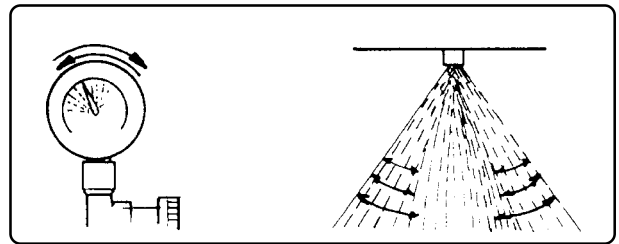
c) PRESSURE OSCILLATION

The pressure gauge needle oscillates.
 The nozzle spray angle oscillates.



d) INTERMITTENT PRESSURE

The pressure gauge needle vibrates with intensity.
 The pressure hoses vibrate with intensity.
 The nozzles spray angle varies.



a - LACK OF SUCTION AND PUMPING CAPACITY

PROBABLE CAUSES	SOLUTIONS
1- PTO not turning.	The sprayer should be run with 540 rpm at PTO. Check visually whether the pump is being run.
2- Lack of water in the tank.	To run the hydraulic system, it is necessary to contain a minimum quantity of liquid, otherwise there will be no pressure.
3- Filter shut off valve closed.	When the pump runs, liquid will pass through the valve even in the closed position, however it will be insufficient. Open it.
4- Dirty filter.	Impurities in the filter prevent a free liquid flow. Clean the filter whenever filling the tank, or with more frequency depending on the quality of the water and the type of product applied.
5- Obstruction in the intake hoses.	Check whether the hose connecting the filter to the pump is twisted. Check whether there is any obstruction in the hoses from tank to filter. Fill up the tank with water, open the valve and verify if it flows freely.
6- Air in the system.	Check the filter packing ring. The filter should not leak.
7- Insufficient pump suction.	Remove the cover of the suction valves. Check the condition of the valves and replace them if necessary.

MAINTENANCE

b - PRESSURE DEFICIENCY

PROBABLE CAUSES	SOLUTIONS								
1- Low PTO rpm.	The proper PTO rotation is 540 rpm.								
2- Filter shut off valve closed.	When the pumps runs, liquid will pass through the valve even in the closed position, however flow will be insufficient.								
3- Filter partially obstructed.	The filter should be clean to allow free liquid flow.								
4- Intake hose partially obstructed.	A deficient pump will cause depressurization. Check whether the hose connecting the filter to the pump is twisted. Verify whether there is any obstruction in the hoses connecting the tank to the filter. Fill the tank with water, open the valve and observe if it flows freely.								
5- Air in the system.	Check the connections and the o'rings of the tank outlet and the pump inlet.								
6- Pressure regulator.	Check the valve and valve seat.								
7- Worn nozzles.	Check whether the nozzle flow is within the recommended guidelines. Replace the nozzles when the flow rate exceeds 10% of the specified. Use only nozzles recommended by the sprayer manufacturer.								
8- Pump with lower flow rate.	Disconnect the pressure hose from the control valve. Run the sprayer at 540 rpm. Collect water for one minute and measure. The volume collected should approximate this shown below for each pump model: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">JP - 42 = 40 L /min</td> <td style="width: 50%;">JP - 100 = 100 L /min</td> </tr> <tr> <td>JP - 42 = 42 L /min</td> <td>JP - 150 = 150 L /min</td> </tr> <tr> <td>JP - 50 = 50 L/min</td> <td>JP - 300 = 300 L /min</td> </tr> <tr> <td>JP - 75 = 75 L /min</td> <td></td> </tr> </table>	JP - 42 = 40 L /min	JP - 100 = 100 L /min	JP - 42 = 42 L /min	JP - 150 = 150 L /min	JP - 50 = 50 L/min	JP - 300 = 300 L /min	JP - 75 = 75 L /min	
JP - 42 = 40 L /min	JP - 100 = 100 L /min								
JP - 42 = 42 L /min	JP - 150 = 150 L /min								
JP - 50 = 50 L/min	JP - 300 = 300 L /min								
JP - 75 = 75 L /min									

c - PRESSURE OSCILLATION

PROBABLE CAUSES	SOLUTIONS
1- Loose belts.	Check belt tension and tighten if necessary.
2- Air in the intake system.	Check for damaged hoses, filter packing rings, etc., and repair if necessary.
3- Pressure regulator.	Check the regulator components and clean or replace them if necessary.

d - INTERMITTENT PRESSURE

PROBABLE CAUSES	SOLUTIONS
1- Filter shut off valve closed.	When the pumps runs, liquid will pass through the valve even in the closed position, however flow will be insufficient.
2- Pump valve deficiency.	Valve with sealing deficiency or stuck due to impurities.
3- Pump head perforated internally.	Replace it.

GENERAL CARE

HANDLING AGRICULTURAL SPRAYERS AND CHEMICALS

We warn the owners and users that the UNREASONABLE USE of this sprayer and chemicals applied may cause damage to people, properties, animals and environment.

Read carefully and understand thoroughly this manual and the recommendations of the chemicals manufacturers.

Follow strictly the instructions for proper use of this sprayer and chemicals to ensure more safety and efficiency when spraying your crops.

AFTER SPRAYING

ATTENTION: Avoid leaving chemical mixture residues in the tank. For the last pass, prepare the chemical solution in enough quantity to spray the remaining of the crop.

- Empty completely the tank and wash thoroughly the sprayer in a proper decontamination place.
- Wash the inside and outside of the sprayer with clean water and detergent.
- Disassemble and clean each nozzle assembly with fine brush, water jet or compressed air.
- Dry, lubricate and store the sprayer in a dry and covered place.
- Repaint the damaged metallic parts to prevent corrosion.
- Spray the mettalic parts with lubricating oil to prevent corrosion.
- Take off and wash the individual protective clothing separately from other clothes.

DANGER

SAFETY OBSERVATION

**OPERATING THIS SPRAYER WITHOUT FOLLOWING THE INSTRUCTIONS
MAY RESULT IN SERIOUS INJURY OR DEATH.**

STATEMENT OF LIMITED WARRANTY

MÁQUINAS AGRÍCOLAS JACTO S.A. warrants the equipment described herein and agrees to repair or replace parts and components which, under normal operation and wear, following the technical recommendations, show DEFECTS IN MATERIAL OR WORKMANSHIP.

WARRANTY PERIOD:

- One (1) year from the purchase date by the original retail purchaser.

WARRANTY APPLICATION:

Jacto or its authorized representative shall honor this warranty, if any part or component shows confirmed defect in workmanship.

IT SHALL BE UNDERSTOOD THAT THE REPLACEMENT OF COMPLETE COMPONENTS SUCH AS PUMPS, CONTROL VALVES, ENGINES, TRANSMISSIONS, HYDRAULIC PISTONS AND SIMILAR ONES SHALL ONLY BE PERFORMED IN CASE THAT THE DEFECT CANNOT BE REPAIRED BY REPLACING PARTS AND/OR PIECES OF THE COMPONENT.

THIS WARRANTY IS NULL AND VOID IF:

- Equipment is not used in accordance with the INSTRUCTION MANUAL, overwork or accidents.
 - Improper preventive maintenance or performed by unauthorized people.
 - Modification of the equipment in any way from the original design.
 - Change, damage, or loss of the product identification plate.
 - Utilization of parts and components not supplied by JACTO.
- PRODUCT REGISTRATION CARD MUST BE COMPLETED BY THE ORIGINAL RETAIL PURCHASER, AND RETURNED TO JACTO DEALER WITHIN 30 DAYS OF PURCHASE DATE.

WARRANTY EXCLUSIONS:

- Parts considered as normal maintenance such as: filtering elements, belts, hoses, nozzles, pistons, pressure gauges, as well as usual maintenance, adjustments, retightening, lubrication and painting.
- Parts which show wear or tear due to use, UNLESS THEY SHOW DEFECTS IN WORKMANSHIP, ASSEMBLY OR MATERIAL.
- Hydraulic, lubricating oils and grease.
- Injuries of personal or material nature to the user, owner, or third parties.
- Additional charges resulting from paralyzation and repair of the equipment.
- Freight charges, pick up and delivery charges.
- Damages of any nature resulting from action of gases or liquids used in the equipment.

GENERAL INFORMATION:

- Defective parts replaced under warranty period shall be property of JACTO.
- Eventual delays in performing services do not confer to the owner the right to indemnity or to extension of the warranty period.
- JACTO reserves the right to change its products or to interrupt manufacturing the equipment.
- THIS LIMITED WARRANTY shall be understood by its expressed terms, and no one in anyway subject to JACTO shall be authorized to modify or amplify the conditions prescribed herein.
- In case of need for warranty request, call for the authorized dealer supplying all information required for a prompt compliance. Do not forget the identification of the equipment, total hours of work, and the noticed defect.

FOR THIS WARRANTY TO BECOME EFFECTIVE THE PRODUCT REGISTRATION CARD FOUND IN THE INSTRUCTION MANUAL MUST BE FILLED IN AND RETURNED TO YOUR JACTO DEALER. THIS CARD MUST BE SIGNED BY THE ORIGINAL RETAIL PURCHASER, INDICATING THAT HE HAS READ AND UNDERSTOOD ALL SAFETY AND OPERATIONAL INSTRUCTIONS IN THE MANUAL. FURTHER THE RETAILING DEALER HAS EXPLAINED TO THE ORIGINAL RETAIL PURCHASER ALL SAFETY INSTRUCTIONS. IN NO CASE WILL WARRANTY BE SUPPLIED UNTIL THIS CARD, PROPERLY COMPLETED AND SIGNED, IS ON FILE WITH JACTO RETAILING DEALER.



PRODUCT REGISTRATION CARD

Invoice number: _____ Date: ____/____/____

Retailing dealer: _____

Phone: _____ City: _____ State: _____

Sprayer: _____ Model: _____

Series: _____ Sprayer No.: _____ Pump No.: _____

Original retail purchaser: _____

Address: _____ Phone: _____

City: _____ State: _____

Purchase date by the original retail purchaser: ____/____/____

The warranty is in force as of this date: ____/____/____

Retail purchaser signature: _____

Copy Máquinas Agrícolas Jacto S. A. - Urgent respond with in 30 days first class postage required



PRODUCT REGISTRATION CARD

Invoice number: _____ Date: ____/____/____

Retailing dealer: _____

Phone: _____ City: _____ State: _____

Sprayer: _____ Model: _____

Series: _____ Sprayer No.: _____ Pump No.: _____

Original retail purchaser: _____

Address: _____ Phone: _____

City: _____ State: _____

Purchase date by the original retail purchaser: ____/____/____

The warranty is in force as of this date: ____/____/____

Retail purchaser signature: _____

Original retail purchaser's copy