

# ARBUS 270

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## Operator's Manual



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JACTO has an ongoing concern for the safe and effective use of chemicals.

This concern is indispensable, for the use of chemicals has become a necessary practice for obtaining a more productive and more economical harvest.

However, the improper application of chemicals is harmful to the human being, the environment and the cultivations themselves.

JACTO's aim is to prepare and guide the farmer on the proper use of the farm equipment manufactured by JACTO.

Therefore, read carefully and understand thoroughly this manual before operating this sprayer and keep it always at hand when handling this sprayer for quick consultation in case you are not quite sure of some operation or adjustment.

If you still have questions, contact your Jacto dealer.



### ¡ATTENTION!

The Jacto Arbus 270 equipment has been developed for the exclusive use of spraying chemicals. The Jacto Arbus 270 sprayer manual refers only to instructions for use and maintenance of parts and components made by Jacto.

Read it carefully and follow the recommendations contained herein. In case of doubt, please contact JACTO.

## Identification Plate



The machine model, serial number and lot (manufacturing month and year) are printed on the machine identification plate.

This information is important to enable us to keep records on modifications, if any, made to the material employed and construction characteristics of the machine.

When ordering replacement parts and maintenance services, it is essential to inform the machine model, number and lot in order to get an expeditious and efficient response.



JACTO is the registered trademark of MÁQUINAS AGRÍCOLAS JACTO S.A. MÁQUINAS AGRÍCOLAS JACTO S.A. implements a policy towards the ongoing enhancement of its products. Therefore, it reserves the right to change its products without prior notice and without incurring in any obligation whatsoever in connection with such changes.



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Chapter ‘Precautions’ is intended to guide the operator on the cautions to be taken during the operation, maintenance and storage of this equipment.

It is important to remind that this equipment has been carefully developed to provide optimum performance with cost savings, and ease of operation and safety.

For that purpose, be always mindful of the information contained in the instructions manual. If doubts arise at any time, please contact us.

The instructions in this manual may be accompanied by symbols having the following meanings:



**ATTENTION:** advises of potential accident hazard situations that require permanent operator’s attention.



**NOTE:** reminders or warnings.

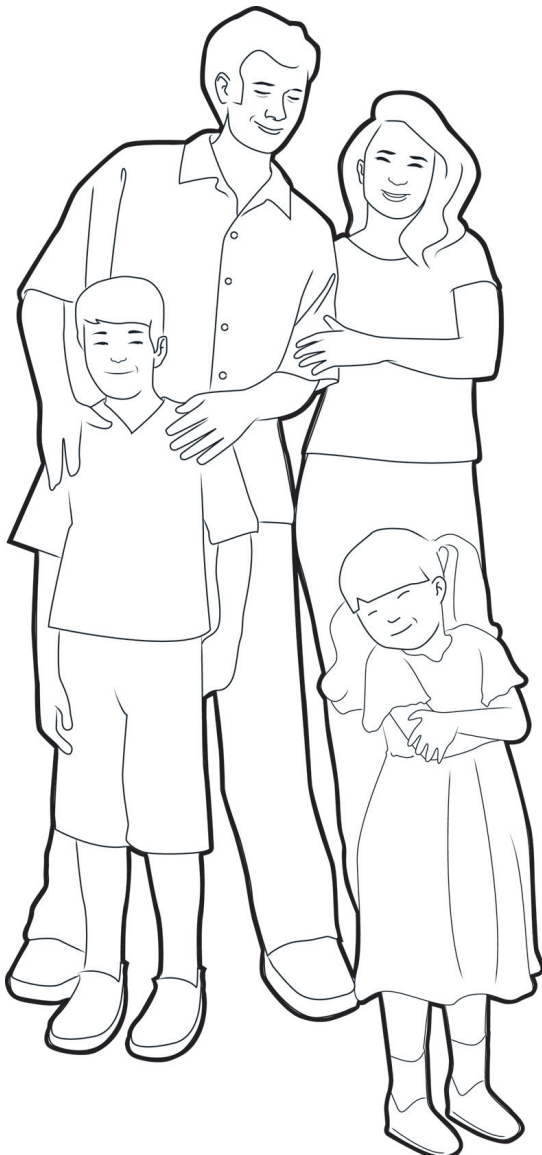


**OBSERVATION:** advises of or explains certain instructions/situations.



**ATTENTION!**

By disregarding the safety practices you are risking your life and the life of all people around you. This manual contains important safety warnings. Read it carefully and be aware of any possible personal accident.



According to the provisions in Directive NR31 – Directive on Safety and Health in Farming Labor, the farm equipment owner and operator shall contribute to the safe application of chemicals and other agro-chemicals, by observing the legal determinations outlined below.

#### Operator's responsibilities :

- Comply with the determination regarding safe manners for performing his/her activities;
- Operate the equipment within the operating limits and restrictions specified in this manual;
- Read this manual and make sure that all information and recommendations have been understood before putting this equipment in operation.

#### Owner responsibilities:

- The equipment owner shall keep the instructions manual at a place where the operator can have free to it whenever necessary.
- Whenever dictated by the kind of defensive to be sprayed, the employer has the obligation of providing the operator with the appropriate PPE – Personal Protection Equipment, see that the PPE is properly hygienized, train the employee and enforce and inspect the use of the PPE.
- The owner shall replace or repair components of the equipment whenever such components exhibit defects hindering the safe operation of the same.
- The owner or whoever in charge shall take responsibility for qualification of the equipment operators in order to guarantee the safe operation thereof.

**ATTENTION!**

It is responsibility of the sprayer owner and sprayer user/operator to comply with the laws and regulations in effect. The sprayer owner or the person responsible shall provide information to operators on environmental risks and how to care for the environment. Jacto recommends wearing approved and proper PPEs whenever operating the sprayer.

- It is responsibility of the sprayer owner to comply with the laws and regulations in effect.
- Waste such as contaminated parts, electrical and electronic components, and others when equipment (sprayer) is dismantled after rendering services, being serviced or at the end of their useful lives must be disposed of in a way that respects the environment, avoids air, water and soil pollution.
- If necessary, residues must be stored in proper places and later collected by trained and authorized employees or companies.
- Principles for environmental protection, recycling and proper disposal of equipment, its parts and components must be respected taking into consideration the legislation in effect (municipal, state and federal) as well as guidelines to dispose of parts, components or any other item of the equipment.
- Batteries must be properly disposed of in places which have been approved to collect such material. Legally speaking, places that sell new batteries can collect used ones and take them to recycling centers or to their manufacturers. If you are not sure how to dispose of batteries in an environmentally sound manner, JACTO suggest contacting their manufacturer for further information.
- JACTO recommends wearing proper and approved PPEs at all times when handling the equipment.

Safety and maintenance related decals have been affixed all over the equipment indicating any hazardous conditions that could cause damages or accidents affecting the operator or the equipment during operation.

Before operating your equipment, identify all decals and by reading these pages make sure that you have understood and are aware of the meaning of each such symbol.

Keep them in good repair, clean and legible. Re-plate them immediately in case of damage by or-dering them through the part numbers specified below.



P/N: 276220

*ATTENTION: Lubrication points.*



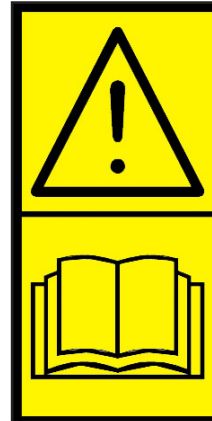
P/N: 379057

*WARNING: danger of serious injuries. Do not perform any action on the PTO shaft with the tractor PTO running.*



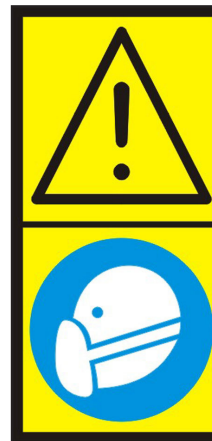
P/N: 379073

*WARNING: Hand washing water reservoir.*



RG: 379248

*WARNING: Read the instructions manual before beginning any action on the machine.*



P/N: 379115

*WARNING: mandatory use of protection mask.*



P/N: 379230

*WARNING: Read the instructions manual before beginning any action on the machine.*



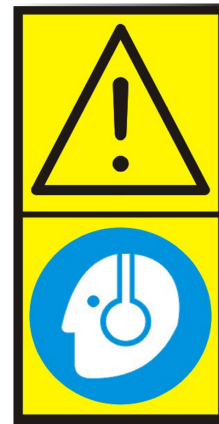
P/N: 379040  
**ATTENTION:** Risk of injuries. Keep away from the sprayer when it is running.



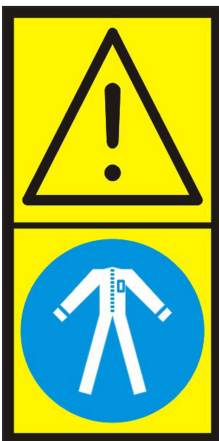
P/N: 379065  
**ATTENTION:** Risk of serious injuries. Keep all protection devices in its places.



P/N: 379008  
**ATTENTION:** Risk of serious injuries. Do not make any operation on the PTO shaft if the PTO is engaged.



P/N: 379123  
**WARNING:** mandatory use of ear protectors.



P/N: 379131  
**WARNING:** mandatory use of protective clothing.



P/N: 379214  
**ATTENTION:** Maximum speed allowed for the machine is 30 km/h.



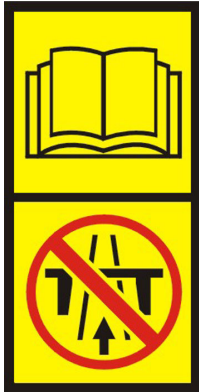
P/N: 039396  
**DANGER:** Keep away from PTO shaft when the machine is running.

NÃO FIQUE PRÓXIMO AO CARDÃO COM A MÁQUINA EM FUNCIONAMENTO.  
NO SE APROXIME DEL CARDAN CON LA MÁQUINA FUNCIONANDO.  
KEEP AWAY FROM PTO SHAFT WHEN THE MACHINE IS RUNNING.



P/N: 130633  
**ATTENTION:** Chemicals can be dangerous and harmful to health. (English)

• PRODUTOS QUÍMICOS PODEM SER PERIGOSOS E NOCIVOS À SAÚDE.  
- A ESCOLHA OU USO INADEQUADO PODE CAUSAR SÉRIOS DANOS ÀS PESSOAS, ANIMAIS, PLANTAS, SOLO OU AO MEIO AMBIENTE.  
- SEJA CUIDADOSO: ESCOLHA O PRODUTO QUÍMICO CERTO, MANUSEANDO-O COM O MÁXIMO CUIDADO.  
- SIGA RIGOROSAMENTE AS INSTRUÇÕES DOS RÓTULOS, DAS EMBALAGENS E AS RECOMENDAÇÕES TÉCNICAS OPERACIONAIS DO EQUIPAMENTO JACTO.  
JACTO



P/N: 379222

**WARNING:** highway transit of this machine is prohibited.

<b>ATENÇÃO</b> <b>ATTENTION</b> <b>ATENCIÓN</b>		
	CARRETAS B = 30 cm 3 PONTOS B = 5 cm	MONTAR OS GARFOS CONFORME INDICADO EM 'A'. CASO SEJA NECESSÁRIO, CORTAR AS BARRAS DO CARDAN DEIXANDO FOLGAS CONFORME INDICADO EM 'B'.
	TRAILER B = 30 cm 3 POINT B = 5 cm	MOUNT THE FORKS AS INDICATED IN 'A'. IF NECESSARY CUT THE PTO SHAFT AND SHIELD CAP LEAVING CLEARANCES AS SHOWN IN THE FIGURE.
	CARRETAS B = 30 cm 3 PONTOS B = 5 cm	MONTAR LAS HORQUILLAS SEGUN INDICADO EN 'A'. CASO SEA NECESARIO, CORTAR LAS BARRAS DEL CARDAN DEJANDO APLOGES CONFORME EN 'B'.

P/N: 428631

Instructions to connect the PTO shaft



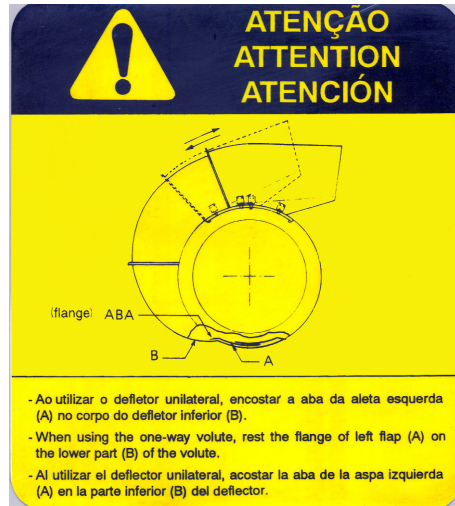
P/N: 169128

**Warning:** Never actuate the packaging washer valve unless the bottle is properly placed over the spraying nozzle.

**LIMPAR O FILTRO A CADA ABASTECIMENTO**  
**CLEAN FILTER WHENEVER FILLING TANK**  
**LIMPIE EL FILTRO A CADA ABASTECIMIENTO**

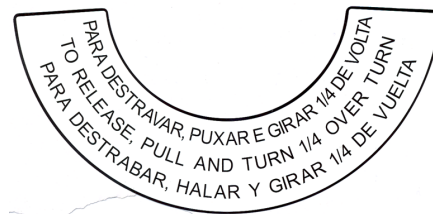
P/N: 515734

**ATTENTION:** Clean the filter whenever filling the tank.



P/N: 341040

Instruction to use the deflector.



P/N: 018705

Instructions to unlock the fan.



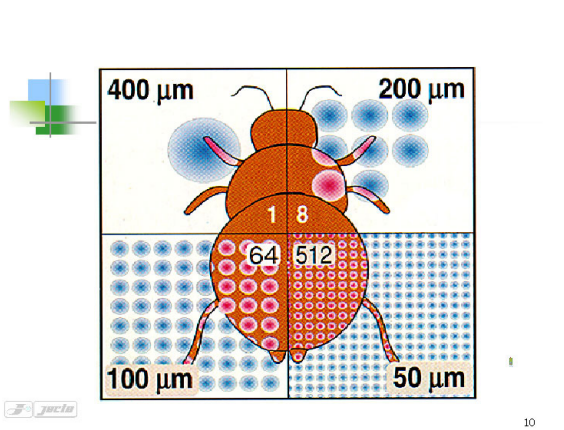
P/N: 379172

**WARNING:** Caution when opening the main reservoir cap.

<input type="text"/>		
<b>MÁQUINA:</b> <input type="text"/>		
<b>MODELO:</b> <input type="text"/>		
<b>LOTE:</b> <input type="text"/>	<b>PESO:</b> <input type="text"/>	<b>kg</b>
Máquinas Agrícolas Jacto S.A. - CNPJ: 55.064.562/0001-90 <b>MADE IN BRAZIL</b>		

P/N: 983932

Machine identification plate



- Only skilled and qualified operator and knowledgeable of the information contained in the manuals accompanying the product should operate the Jacto Arbus 270 sprayer;
- Before starting any operation, it is very important to learn about all information contain in this manual. In case of doubt, refer to Jacto's technical assistance.
- Do not ingest alcoholic beverages, tranquilizers or stimulating substances both before and during work.
- During manipulation of the setup, always use approved, recommended and appropriate PPEs such as: long-sleeve overalls, waterproof coat or apron, waterproof gloves, waterproof broad brim hat, boots and special protection masks provided with filters suitable for each kind of product. In case of doubts, read the chemical label or contact the manufacturer of the same.
- When checking the machine components that are in direct contact with the farm chemicals, use approved PPEs and according to the recommendation stated on the product label.
- If the tractor is of the cab type and provided with air cleaning system, clean your footwear and remove contaminated clothing. Keep the same outside the cab within a properly sealed container.
- If recommended by the tractor manufacturer, use ear protector.
- Use approved, recommended and suitable breathing mask if the label on the chemical requires such personal protection equipment.
- Redouble the precautions. Keep away from places where obstacles exist such as trees, stones, holes, erosion ditches, electric network, etc.

- Use under adverse and not recommended conditions can compromise the integrity of the equipment and components, entailing loss of warranty and disclaimer by the manufacturer for any accident and the resulting consequences.
- Avoid parking the equipment on slopes. If necessary, place chocks under the wheels when parking the equipment on upward or downward slopes.
- Keep the ladder, platform and hand-rail always clean; oils and greases can cause accidents.
- Do not use the equipment if some critical component needs to be repaired. Provide for the repair before.
- This equipment can cause accidents if used improperly or irresponsibly.
- Do not step on the machine while it is moving.



- Unloading shall take place at spots specifically created for unloading such type of equipment. Do not improvise for unloading the equipment.
- Wear the PPEs during removal of the ropes fastening the equipment to the cart. If the equipment is not new, make use of a combination of the mandatory PPEs for unloading the equipment (e.g., safety boots, gloves, hardhats, etc.) and mandatory PPEs for chemical spraying (e.g., masks, gloves, etc.) in order to reduce the risk of contamination and accidents.
- For unloading the equipment, use a tractor having the capability to carry out such task. Selection of the tractor shall take into account its drag capacity and spraying mechanism weight.
- Do not untie the mobile parts of the equipment, for instance: PTO shaft, before unloading the equipment down from the truck or cart and position it on a safe place.
- After placing the equipment on a safe place and far away from electric mainlines, reset the jack to its rest position and uncouple the equipment from the tractor.
- Require from the JACTO representative during the technical delivery of the sprayer that the proper instructions on assembly, maintenance, warranty be carefully explained.

### Precautions when coupling the equipment to the three points on the tractor

- Refer to the tractor instructions manual before carrying out this operation. The precautions listed below apply only for coupling the Jacto Arbus 270 to the tractor. Precautions related to the use and adjustments to tractor components are the responsibility of the tractor manufacturer and user.
- Information related to the proper adjustment of the three points and procedures for properly coupling the equipment will be outlined in chapter 2 “ASSEMBLY” of this manual.
- The operation for coupling the equipment to the three points may be performed by more than one individual. In such case, the people engaging in the operation shall be aware of the risks, be trained, qualified and skilled and possess the necessary experience in this kind of work.
- Avoid staying in the way of the tractor tires. If possible, carry out the coupling of the equipment by yourself.
- Before stepping down of the tractor for coupling the equipment, apply the parking brake. Shut down the diesel engine and remove the starting key from the contact keyhole.
- After the coupling, carry the equipment to the place where the components will be assembled thereon.

**ATTENTION!**

By disregarding the safety practices you are risking your own life and the life of all people around you.

This manual contains important safety warnings. Read it carefully and be on the alert to any possibility of personal accident. Keep all decals affixed to the machine and replace the same if necessary.

- The improper handling by untrained people can give rise to serious or fatal accidents.
- Do not perform adaptations or improvisations; they compromise your equipment and put your safety at risk.
- Do not allow children, aged people or animals to stand close to the equipment during use, maintenance or even with the equipment stored.
- Keep hands, feet, loose clothing and long hair away from moving parts.
- Before performing any kind of service, adjustment or maintenance to your equipment, switch off the power take-off and the tractor engine.
- If the equipment was used, even if it has been washed and looks quite clean, wear all PPEs recommended for handling the chemical.
- Do not touch PTO shafts, belts, fans or any other moving parts of the equipment with the PTO coupled of the tractor diesel engine running.
- When uncoupling the machine, hold it on firm and level ground; if the equipment is provided with parking brake, actuate the same!
- Do not operate the pump without liquid.
- Do not allow the power take-off to operate in excess of 540 rpm.
- Keep the machine in perfect upkeep at all times.
- Safety-related decals were applied across the equipment to orient on the risk of damage or accident that may occur to the operator or equipment.
- Request a JACTO representative during the technical delivery of the equipment for a proper assembly instructions, maintenance, warranty instructions to be carefully explained.
- Use of PTO shafts not provided with protection covering is strictly forbidden.
- Do not make maneuvers or brake abruptly.
- The transportation of people and any loads whatsoever in the sprayer is strictly prohibited in any circumstances.
- 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 30 km/h in the routes inside the farm and 12 km/h when spraying). The use of the sprayer above the limits mentioned is not approved by Jacto.

### Warning for adjusting and connecting PTO shaft to the tractor

- Refer to the tractor user manual before performing this operation.
- Turn off the tractor diesel engine, apply the parking brake and remove the starting key from the contact keyhole before coupling the PTO shaft to the tractor PTO.
- Try to couple the PTO shaft to the tractor PTO. If necessary to adjust the PTO shaft length, use the PPEs specific to this operation such as: goggles, gloves, boots, etc.
- When coupling the PTO shaft to the tractor, make sure that the safety pin is securely locked.
- Directions on how to properly adjust the PTO shaft length will be described in chapter 2 "ASSEMBLY" of this manual.
- After length adjustment, clean and lubricate the PTO shaft components. Wear safety gloves for this operation too.
- Never use a PTO shaft not fitted with shroud.
- The PTO shaft will be adjusted to its specific use on the Jacto Arbus 270 equipment. Use of the PTO shaft on any other equipment is not recommended.
- Do not perform adaptations for reutilization of the PTO shaft.
- Fasten the PTO shaft covering safety chain to the tractor; that chain will prevent the PTO shaft covering from turning together with the PTO shaft.
- Before actuating the tractor PTO, fill the main reservoir.

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### Fresh water tank for hand wash

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- The fresh water tank on this sprayer is for washing hands only. Only use clean water when filling this tank. The use of soap or solutions are prohibited.
- Do not in any circumstances use the water for drinking.
- It's extremely important to keep this tank always full.

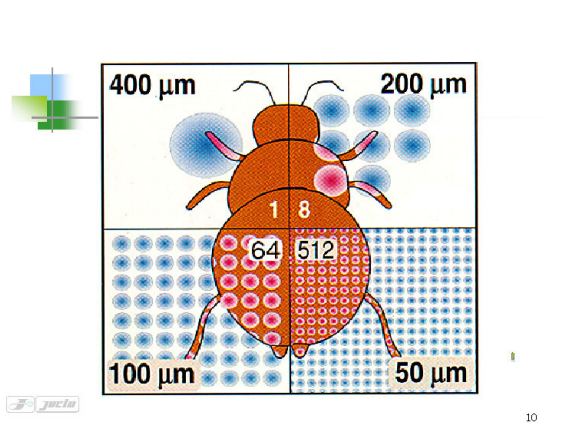
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### 270-liter reservoir

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There are two methods for supplying the 270-liter water reservoir. The instructions for this operation are described in chapter 4 "OPERATIONS AND ADJUSTMENTS" of this manual. Following are the precautions to be taken when supplying this reservoir:

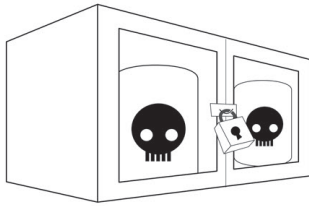
- During the 270-liter reservoir supply operation, it is extremely important that all those engaged in the operation be using the specified PPEs. It is very important to read the label of the chemical being used in the application. You will find on that label several information on the product and precautions to be adopted, etc.
- Before beginning to supply the 270-liter reservoir, make sure that the reservoir drain valve is shut.
- The setup residue remaining inside the supply hose shall be collected with a bucket and returned to the reservoir which the mixture was prepared in. Do not let this residue to drop on the ground.
- Do not contaminate water springs. Supply of the sprayer shall be carried out at places designed for that purpose.
- Avoid capturing water from sources such as rivers, lakes, dams, creeks, etc.
- By following these recommendations, you will be preserving the environment.



- READ the sprayer instructions manual. For an efficient spraying operation, it is necessary to know the sprayer employed in detail. Only thus will we prevent wasting chemical or improper use of the equipment, and the desired result will be achieved.
- USE the chemical products in agriculture only.
- READ and FOLLOW all instructions on the chemicals manufacturer's label.
- HANDLE the chemicals following recommendations of a technician.
- Proper SETTING of the sprayer is a simple operation. Only with the sprayer properly set will the best results be achieved.
- USE approved, recommended and suitable protection equipment (PPEs). During handling, setup of the mixture or spraying, use all protection equipment recommended by the chemical manufacturer.
- AFTER the spraying operation, take a shower and change clothing. The used clothing shall be immediately washed and segregated from the regular use clothing to eliminate the chemical residue. In case of contact with chemicals, wash the affected part with running water for at least 15 minutes. Remember: most contamination cases occur at the time of setup of the mixture, where the chemical is still concentrated, and gets in contact with the hands.
- DO NOT enter with or keep inside the tractor cab the personal protection equipment (PPEs) used during handling or setup of the mixture in order not to contaminate the place. When inside the tractor cab during operation of the machine and/or spraying operation, use only an ear protector. If noticing that contamination has occurred (if feeling chemical smell) caused by carelessness in working with the door open or

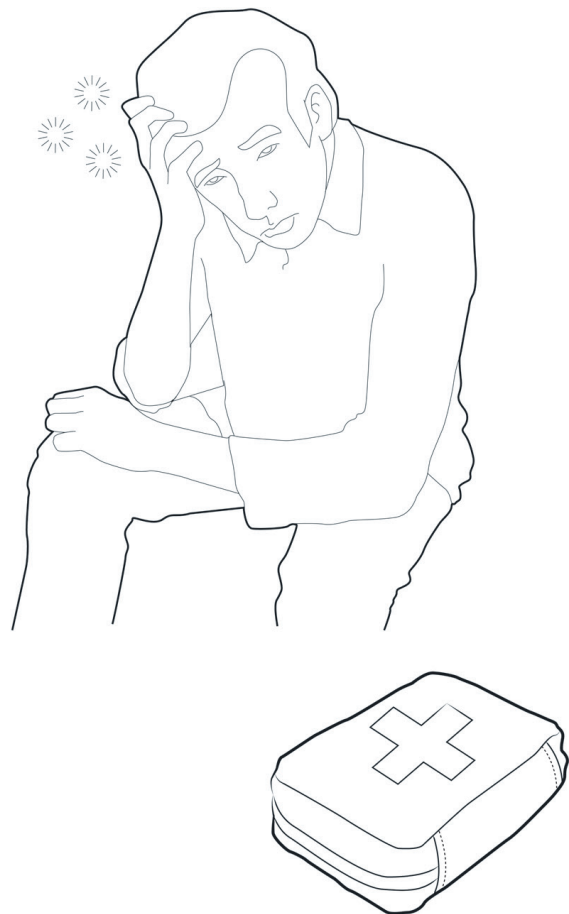
- letting contaminated materials coming in (e.g.: PPEs), use immediately an approved and suitable breathing mask and contact Jacto's Technical Assistance;
- IF the manufacturer of the product to be used recommends using a breather mask during application, use it!
- KEEP the sprayer in perfect condition: Make sure that no leaks exist. If detected, eliminate the same! Leaks not only represent chemical waste but also uneven application and contamination of the environment.
- USE the appropriate nozzle: There is an appropriate nozzle for each chemical to be applied. Climate conditions will also influence nozzle selection. The mixture volume varies from one chemical to another one. The chemical manufacturer should be consulted for the optimum nozzle option.
- DO NOT clear nozzles, vales or tubing with your mouth: Use protection gloves for this operation. Any spraying equipment contains chemical residue.
- NEVER let sprayer parts contact your mouth; this is the fastest means of contamination. If need arises to clear the nozzles, one may also employ a nylon bristle brush (toothbrush).
- DO NOT contaminate water sources: The spraying mechanism refill shall be performed at places designed for that purpose or by means of appropriate refilling vehicles (trucks, carts, etc.). Avoid capturing water from sources such as rivers, lakes, dams, creeks, etc. with the aid of the sprayer return system. PRESERVE THE ENVIRONMENT!
- DO NOT eat, drink or smoke: when handling the mixture or during application of the chemical, keep foodstuff far away from the treated areas.





- KEEP children away from the sprayed areas. Remove children, domestic animals and unprotected people from the treated areas. Do not allow children or other persons not necessary for the services to remain in the chemical handling and application areas.
- APPLY the recommended dosages: The dosages recommended by the manufacturers shall be followed. Any change to the dosage or calculation error may bring about serious consequences to the cultivation or the environment. Do not use chemicals in cultivations which the same have not been recommended for.
- DO NOT spray with strong winds blowing over the area: Excess wind can cause many problems. It will prevent the chemical from reaching its target, causing a poor distribution of chemical over the cultivation; it can also carry the sprayed mixture to water springs, wild animals and the entire environment. Do not spray if the wind velocity is higher than 10 km/h. Do not spray in the absence of winds. Such a situation can cause a thermal reversal. A good application can be obtained with winds blowing at 3 to 7 km/h velocity, temperature from between 7 and 30°C and relative air humidity over 55%. Do not spray against the direction of the wind or during the day warmest hours.
- WASH the packaging before disposing the same. When preparing the mixture, wash the used packaging for about 30 seconds.
- TO NOT reuse empty packaging; Even after several washing operations, chemical packaging still retain residue. Do not burn empty packaging material. After washing, render the same unusable (pierce the packaging bottom) and store it at a safe place until the same are picked up and recycled.

- NEVER fill the sprayer to the top. By doing so, you will prevent the mixture from overflowing and possible contamination of the operator and the environment. When supplying the reservoir, do it up to the maximum limit indicated in its graduated scale.
- When CARRYING chemicals: Never carry them close to foodstuff or animal feed. Never buy packaging exhibiting leaks. Never buy or use chemicals past their shelf life. Never carry chemicals inside the cab. If an accident occurs causing chemical spill, take steps towards preventing the chemical from running into lakes or rivers. Notify the authorities and the chemical manufacturer.
- STORING THE CHEMICAL: Build a brick-work storehouse for chemicals.
- LINE THE FLOOR with waterproof material. Do not rest the product piles on the floor or against walls. Use a footboard. Keep at the place a drum with sand to absorb leaks, if any. Install faucet and shower outside the storehouse for the chemical applicators.
- SYMPTOMS of intoxication: unconsciousness, anxiety, convulsions, weakness, headache, indisposition, dizziness, blurred vision, qualms of nausea, vomits, belly ache, diarrhea, urine with different color and consistency; eye, nose and throat irritation, cough and tears.
- FIRST aid: if the victim vomits, let him/her stay sitting. Never serve any alcoholic beverage or milk to intoxicated (poisoned) persons. Keep the victim calm and in a comfortable position. Find the chemical label. Call a doctor.





- Awareness of and compliance with the recommendations contained in this manual will reduce the maintenance costs and extend the service life of the equipment.
- The maintenance services shall be carried out by qualified and skilled professionals. Even if the equipment has been washed, it will be necessary to wear the following PPEs: long-sleeve overalls, waterproof coat or apron, waterproof gloves, goggles and boots and special protection masks provided with appropriate filters.
- Use original parts, for they warrant a perfect operation of the equipment.
- Maintenance services shall be performed with the equipment coupled to the tractor, with the tractor wheels chocked and the diesel engine and tractor PTO shut down.
- Do not make improvisations nor use inappropriate tools during maintenance to the equipment.
- Lubricating oil filters and oils shall be checked from time to time and changed whenever necessary or recommended.
- Every maintenance service on hydraulic tubing or hoses shall be performed after depressurization of the circuit. Redouble your warning during this kind of maintenance.
- The identification of spots exhibiting possible leaks shall be made with paper, never with the hands.
- With the equipment coupled to the tractor and the PTO, be careful and keep away from the moving parts of the equipment; these must be provided with their respective protections. In case of doubt, call the authorized technical assistance.
- In case that no possibility exists of providing maintenance service to the equipment with the diesel engine shut down and outside sheds, keep the shed doors and windows wide open to allow continuous circulation of air. Internal combustion engines running within closed environments cause toxic gases and can asphyxiate the operator within a few minutes.
- Performance of cleaning, lubrication and maintenance services with the machine running is forbidden, unless such running condition is indispensable for the performance of such operations, in which case special protection and signaling steps shall be taken against occupational accidents.
- Welding services on bars, chassis or other metal parts of the equipment may only be performed after removal of the tractor battery cables and after draining and washing of the chemical reservoir.
- Keep the machine decals in perfect repair at all times. They contain important notices and recommendations.
- The removable protectors shall only be removed for cleaning, lubrication and repair or adjustment operations. Once the service is completed, they shall be put back.
- The component lubrication work shall be carried by a skilled, qualified and authorized individual. Such procedure involves a number of risks such as slipping, contamination, etc. During the procedure, use of gloves, goggles, boots provided with antiskid sole is recommended. If the equipment has been used, use also approved and appropriate breather mask.
- Do not enter in the 600-liter reservoir. If necessary, call the specialized technical assistance.

**ATTENTION!**

Remove the boom when transporting the sprayer on trailers, trucks or tows.  
The boom lock system is designed for operations at low speeds.  
Lock the boom when moving the sprayer within the farm.  
Only unfold or fold the boom in areas free of obstacles such as electricity supply cables, trees, etc.

- Before starting transportation, it is very important that the path over which the equipment will pass be carefully studied and that the agencies regulating such method of transportation be consulted regarding the precautions and current legislation.
- All highways, roads, local roads, ways and streets whose utilization characteristics are influenced by natural factors (climate, growth of tree without man's actions, etc.) and construction (material employed, height of bridges, nearness of electric networks, roadway width, etc.). Such characteristics shall be carefully evaluated prior to transportation of the equipment.
- If in doubt, do not transport the equipment. Hire a company specialized in that kind of service.
- Make sure that the chemical circuit has been washed and that the chemical reservoir has been entirely drained after such washing. Spill of setup leftovers, although minimal, can endanger the life of people, animals and cause serious damages to the environment.
- Wash the equipment on the outside after its use. Even if it appears to be clean, the ropes employed for fastening the equipment shall not be used again for binding foodstuff; they may be contaminated and, accordingly, contaminate such foodstuff.
- Make use of the PPEs when tying the equipment. If necessary, make a combined use of the mandatory PPEs for tying the equipment and the mandatory PPEs for application of the chemicals. That combination will reduce the risks of contamination during fastening of the equipment.
- Equipment fastening to the cart or truck shall be performed by the tying points (see figure below). Any tying carried out at random, while appearing to be safe and secure, is extremely dangerous and can cause serious accidents. If in doubt, contact Jacto.

---

Choosing the tractor.....	2-29
Setting up the tractor.....	2-30
Mouting the sprayer to the tractor.....	2-32



The different working standards encountered by agricultural equipment leads us to comply with the following criteria when choosing a tractor for products of Jacto Arbus 270 line.

- Check the weight of the machine (kg) on the identification plate of the product.
- Check the capacity (in liters) of the backup reservoir.

Example:  
Empty machine weight = 181 kilograms  
Reservoir capacity = 270 liters

### Choosing the tractor considering the 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 = 11.9 HP

Tractor recommended: Minimum tractor nominal power = 22.6 HP

### Choosing the tractor according to the lift capacity of the hydraulic system

- Choose tractors whose gross mass is, at least, equal to the sum of the empty weight of the machine plus the weight equivalent to the capacity of the reservoir.

Example: Empty machine weight = 181 kilograms

Reservoir capacity = 270 liters (approximately 270 kilograms)  
Gross Machine Mass = 451 kilograms  
Recommended tractor: gross mass equal or greater than 451 kilograms.



#### **ATTENTION!**

The tractor recommended in this case should have minimum power of 22.6 HP.  
The recommended tractor should, in this case, at least have 451 kilograms gross mass.

## Adjusting the drawbar

ARBUS EXPORT

Fit the drawbar pin into the proper hole (1 or 2) to vary the distance between the PTO shaft and the hitch point (see figure A).

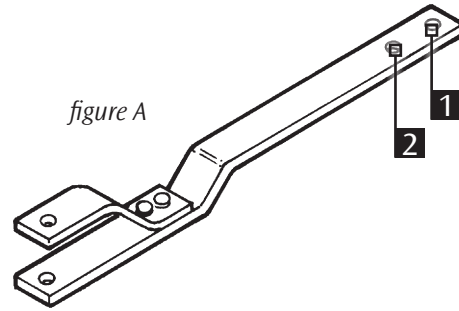
Hole	Distance between the PTO shaft and the hitch point	Maximum (static) load in lift
1	35 cm	455 kg
2	25 cm	590 kg



### NOTE:

The figures shown in above table were obtained on a 63 HP tractor. For explanation in detail, please consult the operator's manual of your tractor.

figure A



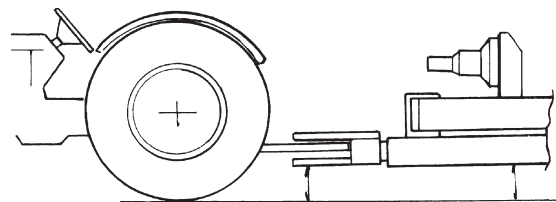
### OBSERVACIÓN:

For heavy load, the hole no. 2 is recommended (see figure A).

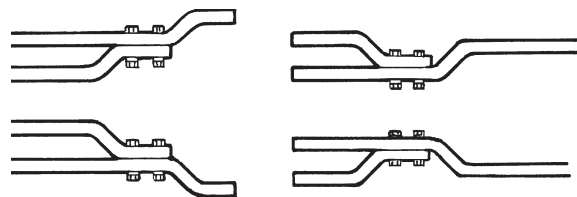
## Ajuste de la altura del equipo y de la barra de tracción

Ajuste de la altura del equipo:

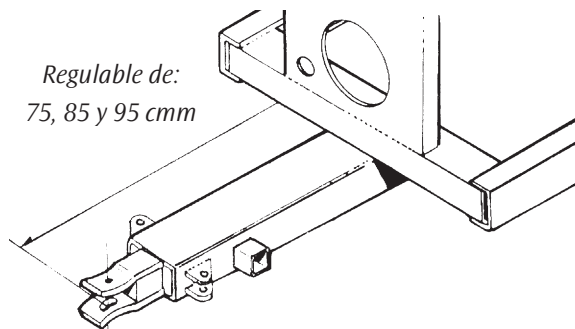
Coloque la barra de tracción del tractor de manera que, después de acoplado, el equipo trabaje nivelado (detalle B).



Invertir la barra de tracción para variar la altura del punto de enganche (detalle C).



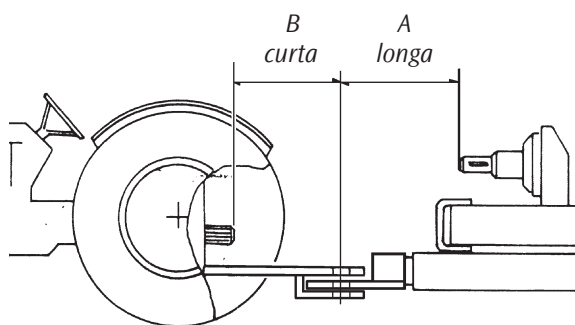
El enganche del equipo permite regulaciones en la faja de 75 a 95 cm, conforme muestra la figura al lado.



**NOTA:**

Para saber la carga ejercida sobre la barra de tracción de los tractores acoplados con los equipos de la línea ARBUS, basta sumar el peso del equipo con la capacidad del tanque. El valor obtenido debe ser multiplicado por 0,12, siendo que el resultado encontrado es el valor aproximado en kg depositado en la barra de tracción del tractor.

Cardán convencional (sin junta homocinética)



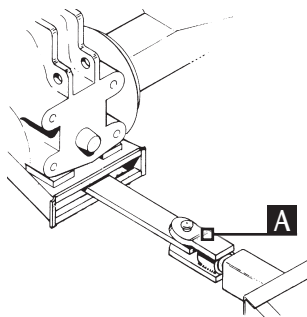
- Ajuste del largo de la barra de tracción en relación con la TDP.

Montaje ideal:

La distancia "A" debe ser igual a la distancia "B" o lo más próximo posible.

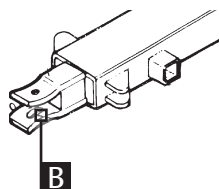
Ejemplo: Si la distancia "A" es igual a 40 cm, "B" debe ser igual a 35/45 cm.

- Acoplamiento del equipo al tractor



**NOTA:**

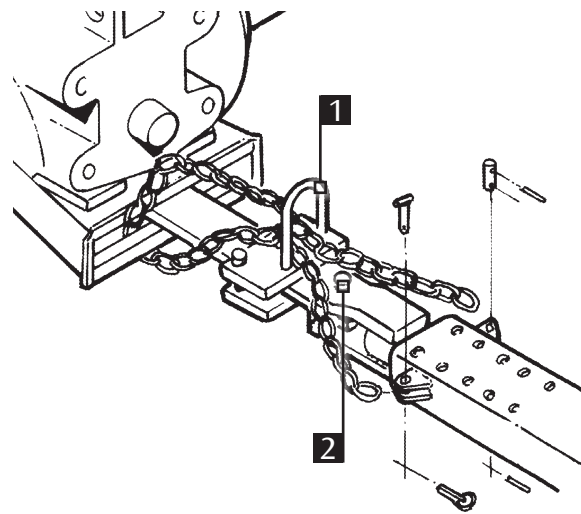
La ranura (A) existente en el acoplamiento debe permanecer hacia abajo.



## Instalación de la cadena de seguridad

ARBUS EXPORT

- Monte la cadena como muestra la figura.
- El soporte (nº 1) debe ser montado lo más próximo de la clavija de acoplamiento (Nº 2). Deje una holgura en la cadena permitiendo que el tractor haga las maniobras sin quedar estirada.

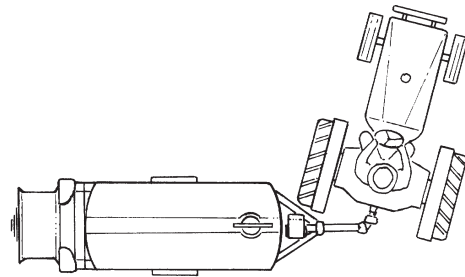


### NOTA:

La cadena debe ser sustituida si uno o más eslabones estuvieran estirados o con cualquier otro tipo de avería o deformación.

## Ajuste del largo de las barras macho y hembra del cardán

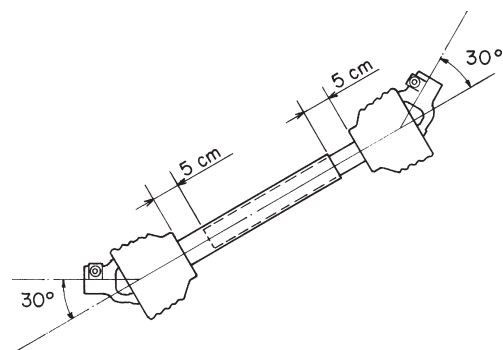
- Maniobre el tractor hasta que el neumático trasero se aproxime de la cabecera del equipo.
- Acople el cardán
- Ajuste el largo de las barras macho y hembra (Holgura recomendada 5 cm).



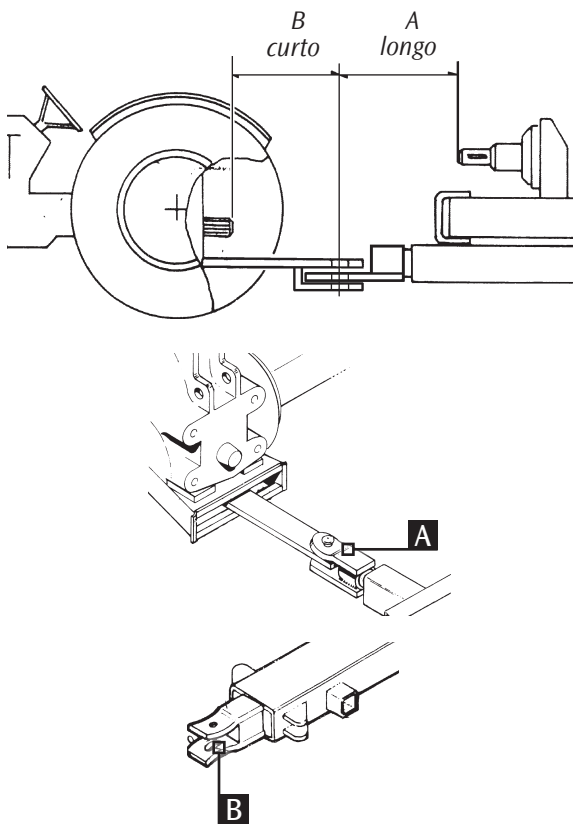
### NOTA:

Durante las maniobras, si posible, desconecte la TDP. Tome los cuidados necesarios para no apoyar el neumático en la cabecera del equipo evitando daños en la transmisión.

Antes de cortar el cardán, verifique todas las posibilidades de ajuste de la barra de tracción del tractor y también del acoplamiento del equipo. Verifique si la clavija de enganche está debidamente colocada.







- Ajuste del largo de la barra de tracción en relación con la TDP.

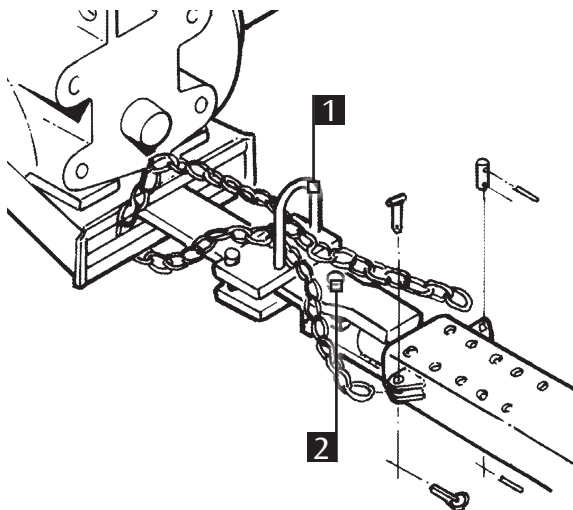
La distancia "A" debe ser lo más larga posible y la distancia "B" lo más corta posible. Ello permite un ángulo mayor en la articulación homocinética del cardán.

Lo ideal es trabajar con la distancia de "A" siendo el doble de la de "B".

**NOTA:**

O rasgo (B) existente no engate (A) deve permanecer voltado para baixo

### Instalación de la cadena de seguridad

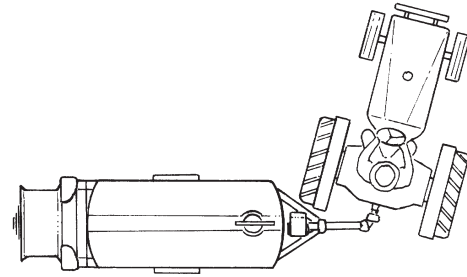


- Monte la cadena como muestra la figura.
- El soporte (nº 1) debe ser montado lo más próximo de la clavija de acoplamiento (Nº 2). Deje una holgura en la cadena permitiendo que el tractor haga las maniobras sin quedar estirada.

**NOTA:**

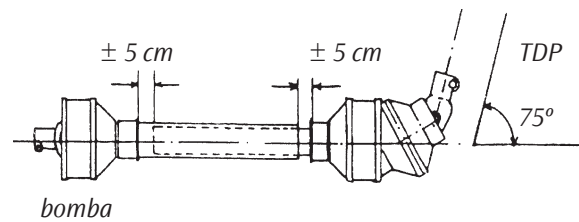
La cadena debe ser sustituida si uno o más eslabones estuvieran estirados o con cualquier otro tipo de avería o deformación.

- Maniobre el tractor hasta que el neumático trasero se aproxime de la cabecera del equipo.
- Acople el cardán
- Ajuste el largo de las barras macho y hembra (Holgura recomendada 5 cm).

**NOTA:**

Durante las maniobras, si posible, desconecte la TDP. Tome los cuidados necesarios para no apoyar el neumático en la cabecera del equipo evitando daños en la transmisión.

Antes de cortar el cardán, verifique todas las posibilidades de ajuste de la barra de tracción del tractor y también del acoplamiento del equipo. Verifique si la clavija de enganche está debidamente colocada.



Equipment presentation ..... 3-35

Technical Specifications ..... 3-36





- |                    |                                |
|--------------------|--------------------------------|
| 1. PTO Shaft       | 8. Lever of the package washer |
| 2. Suction filter  | 9. Clean water tank            |
| 3. Level indicator | 10. Adjustable flap            |
| 4. Belts tension   | 11. Pressure regulator         |
| 5. Fan             | 12. Gauge                      |
| 6. Nozzle branch   | 13. Chemical control           |
| 7. Tank            | 14. Pump                       |

Table 1: Technical Specifications Arbus 270

Model	ARBUS 270
Weight	
Empty machine weight	181 kg
Dimensions	
Total length	1.00 meters
Width	1.05 meters
Height	1.15 meters
Main reservoir	
Material	Polyethylene
Capacity	270 liters
Clean water reservoir	
Material	Polyethylene
Capacity	12 liters
Level gauge	Level indicator with graduated scale
Agitation	Through hydraulic return
Pump	
Model	JP-50
Pumping capacity	50 L/min.
Maximum working pressure	28 kgf/cm <sup>2</sup> / 400 psi
Power needed	3,2 HP at 540 rpm on the TDP
Pressure gauge	
Model	with extended scale
Control	
Model	Jacto model 8
Chemicals filter	
Model	FVS-100
Mesh	60
Nozzle holder	
Model	with valve
Quantity	10
Nozzle model	JA-2
Maximum pressure	14 kgf/cm <sup>2</sup> / 200 psi
Recommended working velocity	2 to 6 km/h kilometers per hour
Filler unit (optional)	
Model	EJ-250 L/min

Table 2: Fan

Specifications	ARBUS 270
Fan diameter (mm)	615
Pulley diameter (mm)	80
Rotation (rpm)	2000

Table 3: Fan performance

Performance	Plastic blades position	
	A*	B
Air speed (km/h)	134	120
Air volume (m <sup>3</sup> /s)	6.84	6.13
Power consumption (HP)	8,7	6,3

\* This sprayer is shipped with the blades set in the position "A".

Table 4: Total power consumption

Component	HP
Pump	3.2
Fan (plastic blades position A)	8.7
TOTAL	11.9





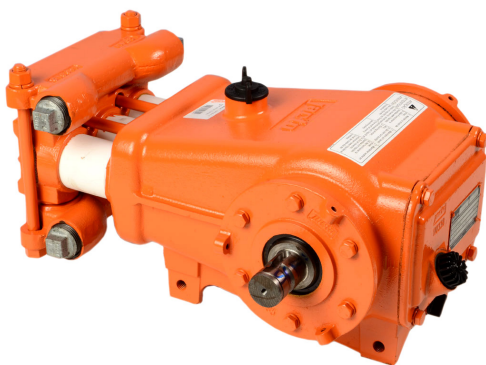
Chemical pump .....	4-41
Suction filter.....	4-41
Pressure regulator.....	4-42
Nozzles holders .....	4-43
PTO Shaft .....	4-44
Fan.....	4-45
Filler unit (Optional) .....	4-46
Spray gun (Optional).....	4-47
Flow bypass valve spray lance or gun (Optional) .....	4-48
Level indicator.....	4-49
Spray application technology.....	4-50
Spray calibration .....	4-52
Triple wash of chemical containers .....	4-60





- Positioned between deposit and the pump, the suction filter must retain all and any type of impurity before any reaches the backup pump.
- There is an accessible quick closing valve that prevents the flow of liquid during the filter cleaning, change of filter elements or pump maintenance operations.
- The filter valve should always remain open during the operation of the sprayer.
- Should it remain closed due to overheating, an abnormal noise on the pump will indicate an operational flaw which could damage the pump.

Chemical pump



- The pumps mounted to JACTO sprayers have flow rate ranging from 38 to 300 liters per minute.
- 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.

Table 5: Chemical pump

Chemical pump	Flow (liters/minute at 540 rpm)	Maximum working pressure	
		lbf/inch <sup>2</sup>	kgf/cm <sup>2</sup>
JP-50	50	500	35

## Pressure regulator

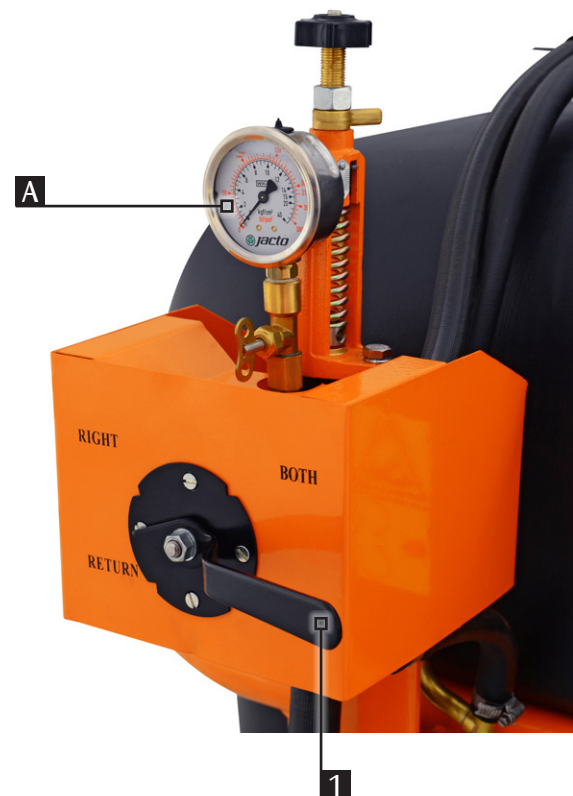
ARBUS 270

- The pressure regulator control provides adjustments ranging up to 28 kgf/cm<sup>2</sup> (400 psi), shown by the pressure gauge (A).
- 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.

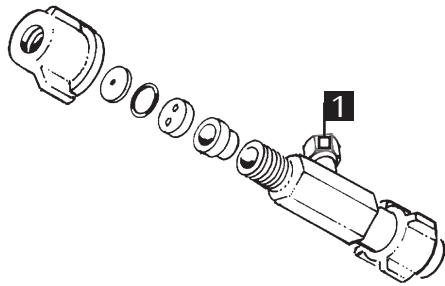


## Nozzles

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



Nozzle holder with valve



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

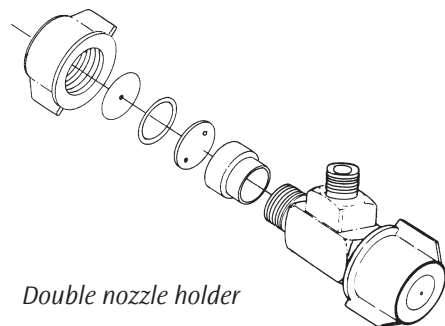
**OBSERVATION:**

To adjust the nozzle, loosen the nut (1), set it in the desired position and retighten the nut.

**ATTENTION!**

Do not overtighten the nut.

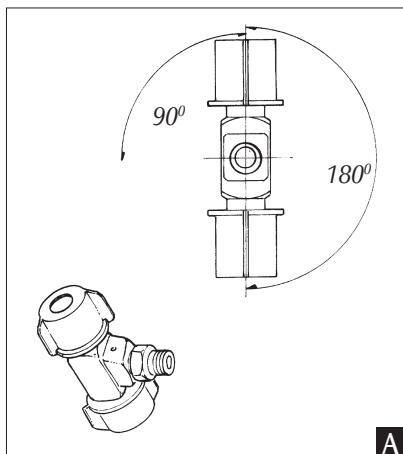
Double nozzle (Optional)



- 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.

## PTO Shaft

ARBUS 270

- The machine PTO shaft is assembled with a protection to increase the safety of the operator.
- This protection is made of a series of plastic components that envelop the PTO shaft and avoid contact with the operator and its clothing, decreasing the risk of accidents. Also avoiding damages o the harvests that can be caused by tangling.

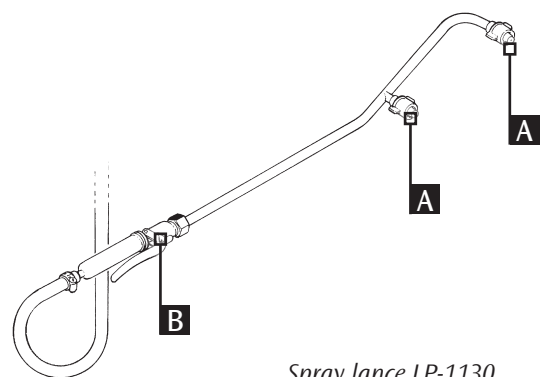


### NOTE:

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

## 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(A) (model JA-2) and trigger valve (B) for turning on and off the chemical flow, thus preventing wastage of agrochemicals..



Spray lance LP-1130

Table 6: Spray lance

Nozzle	Pressure psi	Flow rate (L/min)	
		Nozzle	Lance
JA-2	150	1.00	2.00
	200	1.16	2.32
	300	1.42	2.84
	400	1.64	3.28

*Pressureband not recommended.*



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.

In order to reach the fan locking device, it is necessary to use a universal key  $\varnothing 3$  (B)(provided together with the machine in the accessories box) which will open the access door (A).

To turn the fan off, pull the lock and give it a quarter turn. To turn it on, set the lock back. After these procedures, close the access door.

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.



*universal key  $\varnothing 3$*



### ATTENTION!

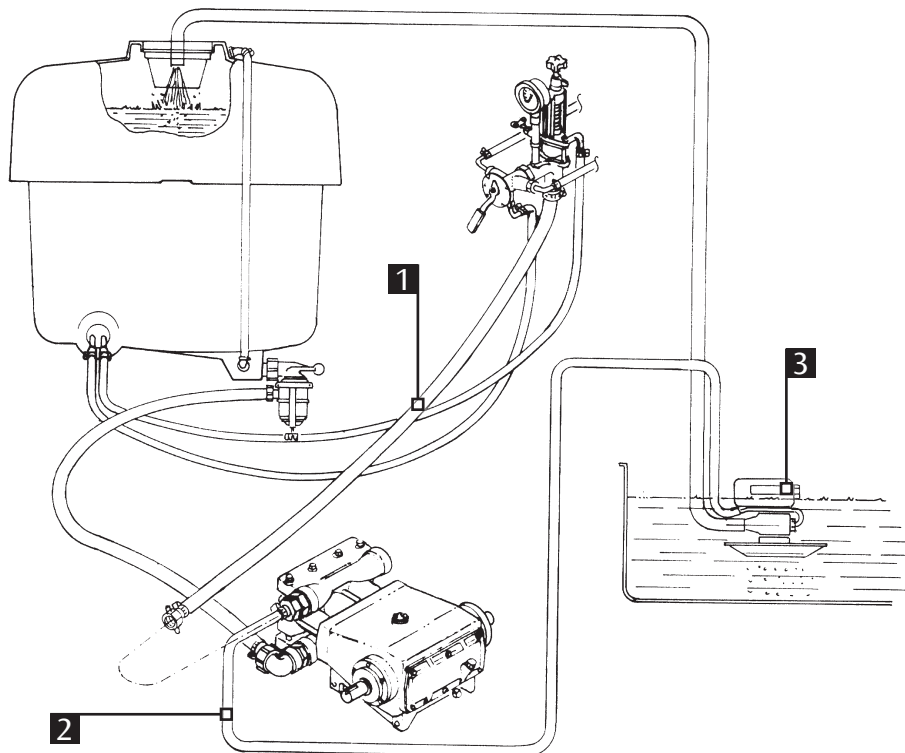
Always disengage the PTO and wait for the fan to stop completely before handling the lock or unlock.

The equipment shall never be used with the fan locking device access door opened. The access door shall never be opened with the tractor on and the PTO shaft engaged.

**ATTENTION!**

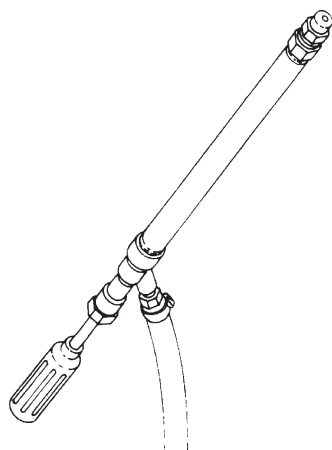
If using wettable powder, turn off the pump only after the tank mix is done in order to avoid product decantation.

- Pour 20 liters of clean water into the sprayer tank.
- Remove the hose (1) from the pump and connect the filler hose (2) in its place.
- Put the filler unit (3) in the water source and the end of the discharge hose (4) into the tank opening.
- Engage the PTO at 540 rpm.
- After finishing the filling operation, connect again the hose (1) to the pump.
- Run the sprayer for five minutes before starting to spray, so that the chemical mixture is homogeneous.

**ATTENTION!**

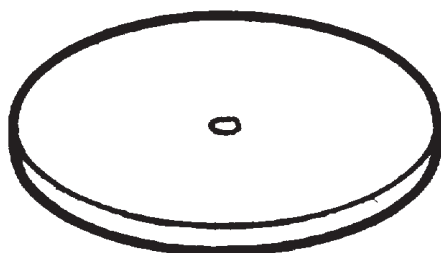
The sprayer filling operation must be done in places appropriate for this purpose or through appropriate vehicles (trucks, trailers, etc.). Never collect water from rivers, lakes, dams, streams, brooks, etc. by using the sprayer's return system.





- This is a component for spot spraying on big plants requiring high application rate.
- It is possible to have flow rate ranging from 5 to 45 liters 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 5 to 45 liters per minute.

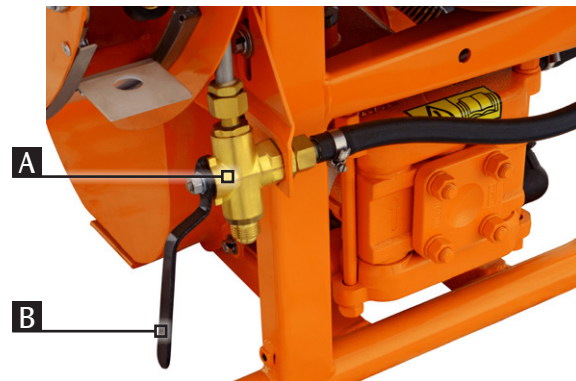
Table 7: Spray discs

RG dos bicos	Discos de pulverização	Pressão (lbf/pol <sup>2</sup> )				
		100	150	200	300	400
		Vazão da pistola (L/min)				
202275	D-5	5,20	6,00	7,00	8,00	9,50
202267	D-6	6,85	8,50	10,00	12,00	13,50
202811	D-7	9,35	10,90	12,50	14,75	17,00
202259	D-8	12,85	15,00	17,00	20,00	23,65
622829	D-9	14,20	17,64	20,72	25,40	29,40
114686	D-10	18,50	22,00	25,50	30,00	35,68
622837	D-11	21,00	24,75	29,35	37,00	45,00

## Flow bypass valve spray lance or gun (Optional)

ARBUS 270

- Located at the right side of the machine, this valve bypasses (A) the flow from the branches to the spray lance or gun.
- After fitting the spray lance or gun (B), set the lever flow bypass valve to the position indicated by the figure below.



## Clean water tank

- The water tank for handwashing (A) is a plastic recipient with a 12 liter capacity.
- Placed on an easily accessible configuration, this recipient should always be filled with water for hand sanitization and other body parts that may have had contact with chemicals during the handle of these products.



### ATTENTION!

Use the water in the deposit only to wash hands and body parts that came into contact with chemicals.



- Placed on the right side of the operator, the level gauge (A) has a graduated scale that facilitates the identification of the amount of mix in the reservoir.
- During pulverization, make sure that the level of chemicals mix in the reservoir is not below 50 liters so that the pump does not operate without water.

**NOTE:**

Avoid leaving chemicals leftovers in the reservoir or even storing them for too long. On the last application prepare a sufficient amount of mix to treat whatever harvests are left untreated.

Package washer



- The package washer is assembled at the reservoir's opening and provides a correct and safe discard of empty packages.
- Wash packages after use for 30 seconds, before the residues start to dry.
- Wash the packages three times.
- For more information, check the "Operation and Regulation – Procedures for using the package washer" item.

**ATTENTION!**

Activation of the package washer lever should only be done after placing a container over it. The package washer nozzle rotates, and auctioning the lever without having a package over it could sprinkle people near the machine.

- The success of an application not only depends of good equipment and correct use of chemicals. Depends also on field factors, such as specialized orientation.
- Among these factors, we consider some concepts that should be part of an evaluation criteria so that the positive results are reached within a chemical control program of biological agents (diseases, plagues and weeds).

Factors like:

- Right moment;
- Safety during application;
- Correct dosage;
- Good coverage;
- Operational conditions of the machine;
- Well trained operator.

### Right moment

---

Consists in choosing the ideal moment according to the characteristics of the chemicals and also field conditions, such as:

- Level of plague infestation, diseases or weeds;
- Estágio de infecção das doenças;
- Estágio de desenvolvimento das plantas daninhas;
- Condições climáticas.

### Safety during application

---

- The maintenance of safe conditions for people, animals and the environment is fundamental. The use of personal protective equipment is mandatory during the application of the chemicals.
- Avoid applying when temperatures are above 30° C (depending on the chemical product) and relative air humidity lower than 50%, winds with unpredictable speeds ( maximum velocity 10 km/hour) and direction.

### Correct dosage

---

- It is fundamental, for any type of application, the correct maintenance of the chemicals dosage for the duration of the spraying process.
- This is possible if good equipment is available and the chemicals is correctly calibrated before starting the application.
- The calibration can be obtained thru practical methods or via calculations (refer to the instructions regarding the sprayers calibration, which can be found on the "CALIBRATION OF SPRAY" page).

## Good coverage

- A good coverage consists of obtaining ideally sized drops to reach the target with good uniform distribution, with positive results during control and that do not cause damages to the environment.
- Unlike what a lot of people think, the application volume does not influence the treatment result, since the amount of solvent (water, oil, etc) per unit area only functions to dissolve, transport and facilitate the distribution of the active ingredient over the target surface, whether it is plants, soil, etc.
- This means that one could get the same coverage with different spraying volumes.
- In practice, different volumes have been used for the same ends due to operational as well as regional factors.



### ATTENTION!

Read and rigorously follow the instructions contained in label of the chemical products. Always follow the orientation of a technician or someone responsible for the operation during the handle and use of chemical products.

**ATTENTION!**

The safety and protection of people, animals and the environment depend upon the correct application of the chemicals, therefore, care must be taken during their use.

## During the manipulation of the chemicals:

- Pay attention to all instructions in the labels of the chemical products.
- Use the personal protection equipment;
- Do not eat, drink or smoke during handle;
- Handle chemicals only in well ventilated places;
- Wash with soap and water the areas of the body that have been exposed to chemicals.

## During handling of the equipment:

- Check the working conditions of the equipment;
- Do not unplug nozzles, valves or tubing with your mouth;
- Do not spray against the wind;
- Do not spray during the hottest hours of the day;
- Use personal protection equipment;
- Do not eat, drink or smoke during handle of chemical products.

Calculating the spraying volume through formula

- The calibration of sprayers can be obtained through calculations obtained according to formula below.
- The spraying volumes can be obtained according to the following:

Example:  
 Noozles flow rate = 10 L/min at 150 psi (10 x JA-2 nozzles)  
 Row spacing = 4 x 3 m  
 Working speed = 4,0 km/h  
 Plants per hectare = 833 plants

Spraying volume:

$$Q = \frac{q \times 600}{v \times f} \text{ (L/ha)}$$

Noozle flow:

$$q = \frac{Q \times v \times f}{600} \text{ (L/min)}$$

$$Q = \frac{q \times 600}{v \times f} \text{ (L/ha)}$$

$$Q = \frac{10 \times 600}{4 \times 4}$$

$$Q = \frac{6000}{16}$$

$$Q = 375 \text{ L/ha}$$

With:

- Q - Spray volume (L/ha)
- q - Total flow of noozles (L/min)
- f - Treated band (meters)
- v - Speed of tractor in km/h
- 600 - Unit conversion factor

Spray volume per plant:

$$\frac{375}{833} = 0,45 \text{ L/planta}$$



**ATTENTION!**

The values indicated on the example above are for illustration purposes. The correct adjustment should be done according to the recommendations of a trusted technician.

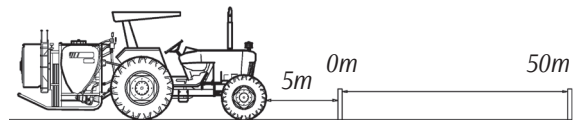
## Calibration of sprayer via practical method

Do a complete checkup of the equipment:

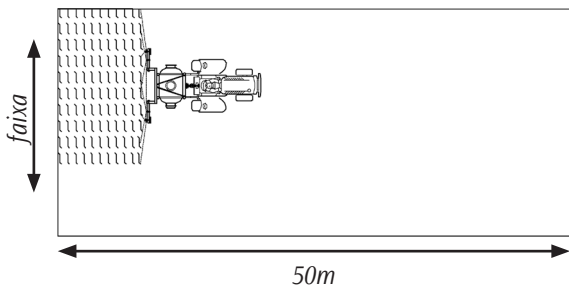
- Suction filter, line filter – cleaning.
- Hoses – check for holes or bents.
- Pressure regulator - components valve seat, valve and spring, if not worn or locked by impurities.
- Pump - check if there are no leaks and if there is enough lubricating oil.
- Nozzles - not worn down, don't differ in flow by more than 10% flow and if the nozzle filters are clean.

Once all items have been checked, sprayer calibration can begin.

1. Mark 50 meters on the terrain to be treated
2. Fill up the sprayer with clean water.
3. Position the machine at least 5 meters before the first mark.
4. Add TDP at 540 rpm.
5. Choose the working speed.
6. Through the chemicals control, start the spraying.
7. When the machine passes through the first peg, start the chronometer.
8. When the machine passes through the second peg, stop the chronometer.
9. Write down the time the sprayer took to go through the 50 meters.
10. In irregular terrains repeat this operation several times and make an average.







**ATTENTION!**

Should the spray volume is not the desired one, increase or decrease the flow, through the regulating valve, or increase or decrease the speed.

11. Measure the spray swath.
12. With the sprayer stopped on a leveled surface, preferentially where it was filled, complete the tank and measure the volume used.
13. Calculate the pulverization volume in Liter/hectares, using the formula:

$$Q = \frac{\text{Vol} \times 10000}{A}$$

Where:

Q = spraying volume in Liter/hectares  
 Vol = volume used on sprayed area (in liters)  
 A= sprayed area (50 meters x determined spray swath (f) =m<sup>2</sup>)

Example:

Vol = 5 liters  
 A = 50 m x 4 m (f) = 200 m<sup>2</sup>

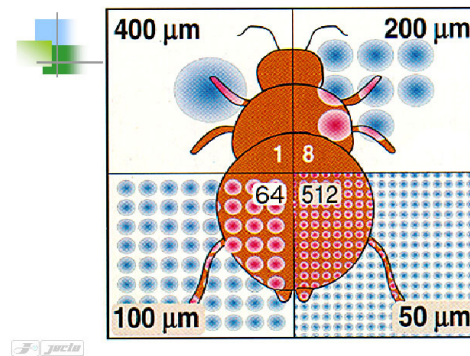
$$Q = \frac{5 \times 10000}{200} = (250) \quad \boxed{Q = 250 \text{ L/ha}}$$

**ATTENTION!**

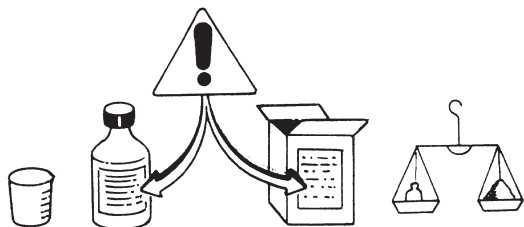
Working with the sprayer with less than 50 liters of water on the tank can cause serious damage to the pump. Never operate the sprayer for a prolonged time with less than 50 liters of water on the tank.

During chemical product handling, one must use the personal protection equipment, such as:

- Waterproof hat with large flaps;
- Glasses;
- Mask;
- Long sleeved apron;
- Waterproof gloves;
- Waterproof boots.



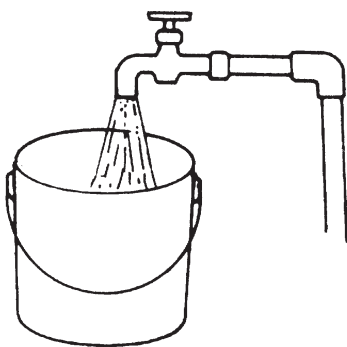
## Mix preparation



- Carefully read the chemical product leaflet.



- Put the product in a recipient with a little amount of water. Shake the mix.



- Add the amount of water that is needed to fill out the recipient.
- Shake until a homogenous mix is achieved.



- Add the mix prepared to the working recipient.
- Mount the lid of the working recipient and make sure it has no leaks.

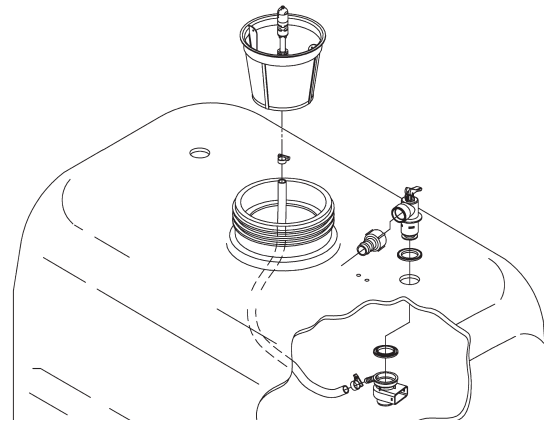
**ATTENTION!**

During handle and use of chemical products, always follow the technical guidelines.

## Chemical container rinse

ARBUS 270

- The chemicals are conditioned in appropriate packages for each type of product.
- After use, these should be discarded in a safe manner, in order not to intoxicate people nor contaminate the environment.
- It is very important that, BEFORE DISCARDING EMPTY PACKAGES, that the leftover product be removed AND, NEXT, THE PACKAGE SHOULD BE PUNCTURED SEVERAL TIMES, TO AVOID REUSE.
- The packages made from metal, plastic and glass should be washed in order to decontaminate them.
- To ease this important package washing operation, JACTO installed in its tractor sprayers a device that aids this operation. This device internally washes the package with pressurized water, eliminating most of the residues.



## Package rinsing

- Pot water into the package until reaching  $\frac{1}{4}$  of its capacity. Close the package and tighten to avoid leaking during shaking.
- Vigorously shake the package, in all directions (horizontal and vertical) for approximately 30 seconds, to remove the final product residues.
- Remove the package lid and carefully place water for washing in the sprayer tank.
- Maintain the package over the opening of the sprayer tank until its contents are empty.
- Next, punch hole into the package to avoid its reuse.
- Take care for preventing damages on the package label.



- Fill up the chemicals reservoir with approximately 90% its capacity.
- Place the chemicals in the reservoir.
- Activate the tractor power take-off.

**NOTE:**  
Lever 1 of the flow regulating valve should be positioned to allow the return of the mix to the reservoir (closed).

**ATTENTION!**  
Use the personal protective equipment recommended for this operation.

- Place the container over the package washer and activate the lever of the directional valve in order to internally clean the container.

**NOTE:**  
Rotate the package over the washer or 30 seconds, trying to completely clean the internal part of container with the water jet.

- Fill up the sprayer reservoir with water.

**ATTENTION!**  
Never activate the directional valve if there is no container over the package washer. After pressure wash, do the final package rinsing.

## Triple wash of chemical containers

ARBUS 270

After having washed the package contaminated by mix, it is necessary to do a **TRIPLE WASHING OF THE CONTAINERS**. For this, follow the instructions below:

- Use personal protective equipment – PPEs (gloves, apron, overalls, protective glasses, hat, boots, masks).



### NOTE:

This equipment does not have a backup reservoir for package washing.



- Fill out the package with approximately 1/4 of its volume with clean volume, place a lid over the package and tighten enough to avoid leaking during shaking.
- Vigorously shake the package in all directions for approximately 30 seconds, to remove the product residues that got stuck on the internal walls of the package.
- Remove the package lid and carefully place water for washing inside the package washer.
- Repeat this operation twice.
- Careful not to damage package label punch holes in the package in order to avoid its reuse. Avoid damaging package labels so that the chemicals can be identified after the package is no longer in use.



### ATTENTION!

After the package is no longer in use they can be temporarily stored in an appropriate place until they are placed at their final destination. Flexible packages should be stored and returned in specific bags designed for this function.

## Additional information



1. In the case of a medium sized package or large sized (50, 100 and 200 liters), after washing in an adequate volume, place a lid over the package roll it on the ground for approximately 30 seconds.
2. Complete the shaking by alternatively lifting the package extremities, while supporting the opposite side on the ground. This operation should last approximately 30 seconds.



Remove the water for washing the packages the same way the product was removed while placing it on the sprayer tank.

This operation should be repeated at least twice. Punch holes on the package at the end of the TRIPLE WASH in order to avoid its reuse.

Source: ANDEF - ASSOCIAÇÃO NACIONAL DE DEFESA VEGETAL





General recommendations .....	5 - 65
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Every day, after completion of the spraying operation, pour clean water into the reservoir, remove the nozzles and run the machine until all water runs out.

- Clean the nozzles and filters and reinstall.
  - Clean the main filter.
  - Wash the machine both inside and outside.
  - These procedures will prevent problems in the subsequent applications such as: clogging of filters, nozzles and ducts, in addition to extending the service life of your equipment.
- Remove the personal protection equipment pieces and wash them.
  - Wash the work clothing separately from all other clothing of your family.
  - Take a shower with plenty of soap and water and change clothing.

**ATTENTION!**

Never wash the sprayer or the personal protection equipment in rivers, lakes, creeks, etc. or even in the proximity of the same.

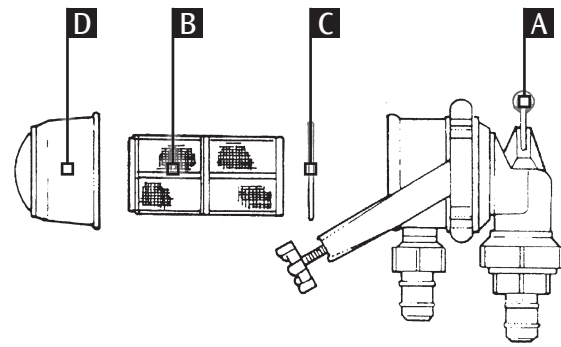
Any and every maintenance action shall be performed with the machine standing and the tractor engine shut down.

## Main filter

ARBUS 270

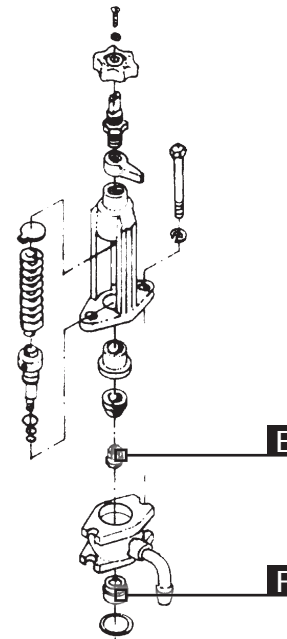
- The filter cleaning intervals depend on the quality of the water employed and the type of chemical used for that purpose.
- Clean the filters as necessary or every time you supply the sprayer with chemical.

The nozzle holder are mounted according to the figures: valve (A), filter element (B), ring (C) and filter cap (D).

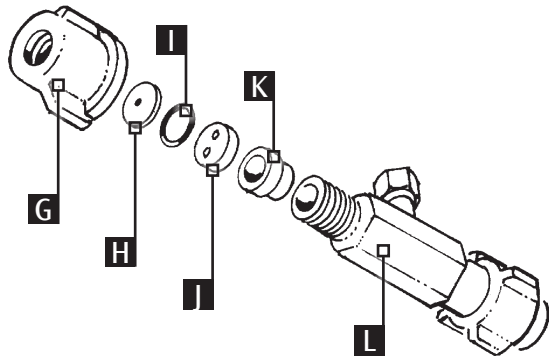


## Pressure regulator

- Disassemble the pressure regulator every 100 working hours.
- Check for wear on the valve seat (E) and patches (F). Replace the parts if necessary.

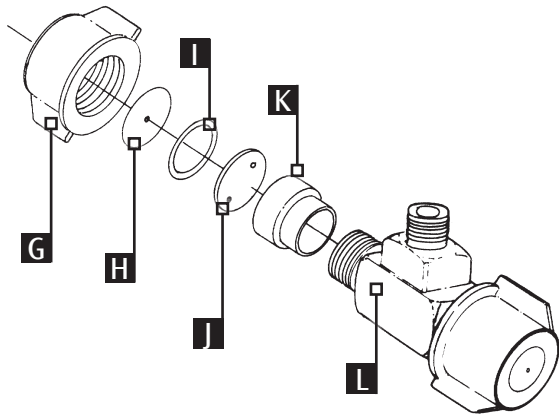


Nozzle holder with valve



- Clean the nozzle holders daily or when necessary.
- The nozzle holder are mounted according to the figures: cap (G), nozzle (H), ring (I), swirlcore (J), seat (K) e nozzle holder (L).

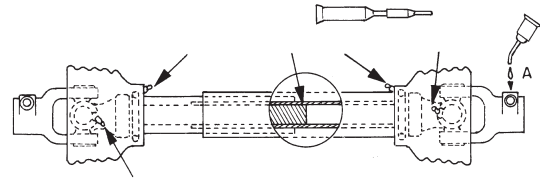
Double nozzle holder (optional)



## PTO shaft

- Lubricate every day.

Refer in this manual to page related to drive shaft maintenance.



### ATTENTION!

Before operating the equipment for the first time, clean and lubricate all drive shaft grease points as depicted in the above figure with lithium-based grease NGLI-2 (refer to the lubrication chart for detailed information on the specified greases).

## Chemical pump

- Lubricate the pump every day by using of the greases indicated in the lubrication chart.



### NOTE:

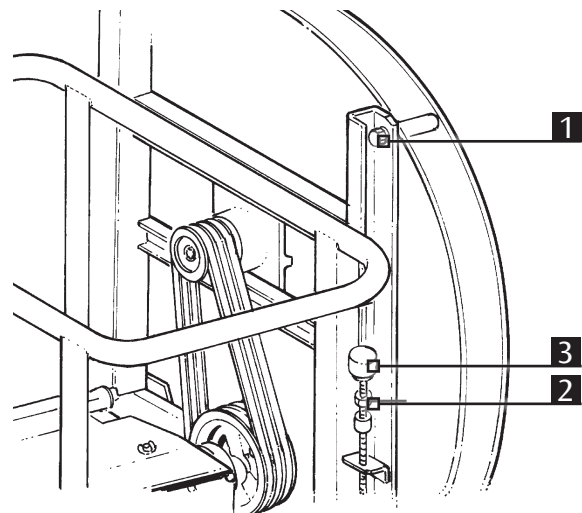
In case of need for a more detailed maintenance (replacement of piston cups, bearings, etc.), contact the nearest JACTO dealer.

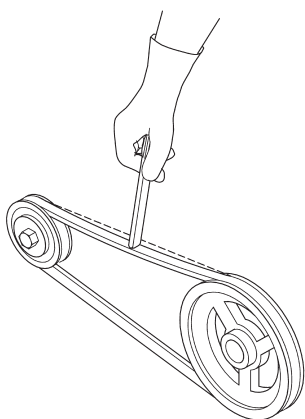


*Bomba JP - 50*

## Fan belts

- Loosen the four screws (1).
- Loosen the four nuts (2).
- Tighten by hand at the same time the two knobs (3) until obtaining the recommended tension.
- Retighten the nuts (2) and screws (1).





- Check the belt tension periodically as shown in the figure below. When pressed it should slack 10 to 15 mm. **Do not use sharp-ended or cutting tool.**

**ATTENTION!**

Always stop the sprayer and turn off tractor's engine before any kind of maintenance.

Table 8: Operation

Operation chart	Periodicity			
	when receiving the equipment	when using the equipment for the first time	whenever spraying	whenever filling the tank
Strictly follow the information contained in this instructions manual.	•			
Check all components for integrity.	•			
Check the accessory box components.	•			
Demand for assembly of components and accessories, operation and maintenance.	•			
Perform cleaning and lubricate all drive shaft grease points.		•		
Check whether the pins and cotter pins used at the three points are original parts.		•		
Make sure about the PTO shaft clearances.		•		
Check whether the coupling pins are properly provided with cotter pins.		•		
Remove the pull bar from tractor.		•		
Adjust commands to prevent the same from causing impacts on tractor during operations.		•		
Check the grease fittings for lubrication.		•		
Retighten the reservoir fastening nuts.		•		
Use personal protections equipment (PPEs).			•	
Do not travel at excess speeds.			•	
Do not spray chemical against the wind direction.			•	
Caution with electric networks.			•	
Do not smoke, eat or drink during the application.			•	
After the work, take off clothing and take a shower.			•	
Clean the suction filter.				•
Clean nozzles and their strainers.				•



Tabla 9: Operation

Operations chart	Periodicity					
	daily or at every 10h	first 30h	every 100h	at every 500h or every year	every 100h	at every 500h or every year
Clean nozzles and filters.	•					
Check grease fittings and link pins.	•					
Wash the sprayer both inside and outside.	•					
Lubricate the pump	•					
Check painting for scratches. Retouch affected part with paint.	•					
Check for chemical leaks; if existing, correct leak.	•					
Keep the equipment at a dry, sheltered and ventilated place.	•					
Retighten the reservoir fastening bolts.		•				
Dismantle the drive shaft covers, clean and wash parts.		•				
Change for the first time the pump oil.			•			
Tighten the belts			•			
Clean and revise the pressure regulator components.			•			
Wash the machine inside and outside and apply lubricating oil with a painting brush to the parts subject to oxidation.			•			
Change the oil of the pump.				•		
Perform the preventative maintenance to the pump.				•		
Replace the belts of the equipment.					•	
Replace the bearings if the drive transmission.						•
Replace the pressure gauge.						•

Table 10: Recommended lubricants and filters

Components	Type	Specification	Indication	Amount
Pump JP 50	Lubricating oil	All oils for internal combustion engines within this specification	API -SB or superior SAE-30	1,5 liters
PTO Shaft	Grease	Lithium-based NLGI-2	Multifak EP-2 (Texaco) MobilGrease 77 (Mobil Oil) Lubrax GMA-2 (Petrobrás) Beacon EP-2 (Esso) and similar	When necessary

**OBSERVATION:**

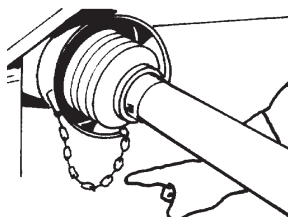
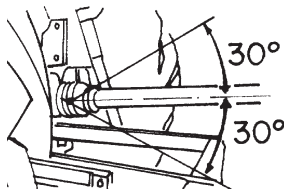
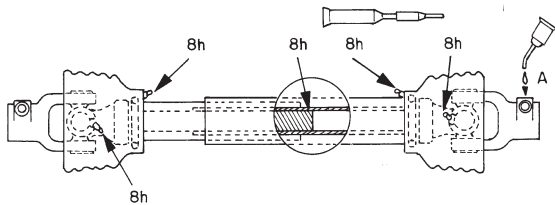
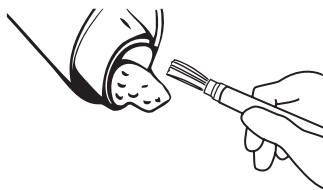
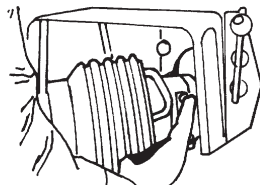
The order of presentation does not indicate any preference for brand or product.

Use, maintenance, disassembly and assembly of PTO shaft with protection



**ATTENTION!**

Only operate with the PTO shaft provided with safety guard. Every kind of maintenance to the PTO shaft shall be performed when wearing PPEs such as: protection gloves, boots, goggles, etc. These operations shall be carried out with the machine standing and the tractor engine shut down.



Use and Maintenance:

- Couple the PTO shaft to the power take-off.
- Adjust the length by cutting the bars and protection in matching proportion.



**OBSERVATION:**

File off and clean all burrs.

- Lubricate the male and female bars.
- Couple the drive shaft and install the safety chain.



**OBSERVATION:**

Install the chain making allowance for the angular movements.

- In too tight maneuvers, switch off the power take-off.

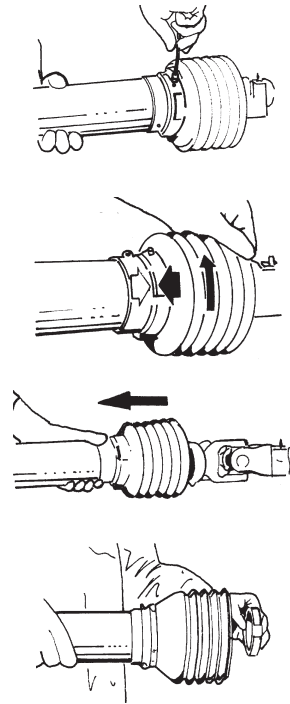


**ATTENTION!**

Only operate with the PTO shaft provided with safety protection.

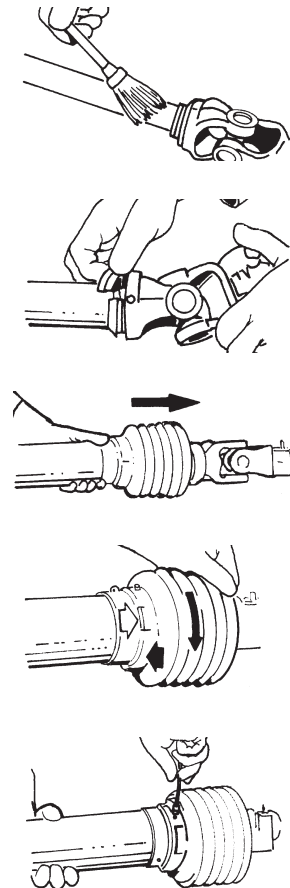
Disassembly:

1. Remove locking screw.
2. Turn the cone up to the indicated position.
3. Loosen the safety protection.
4. Remove the slide ring.



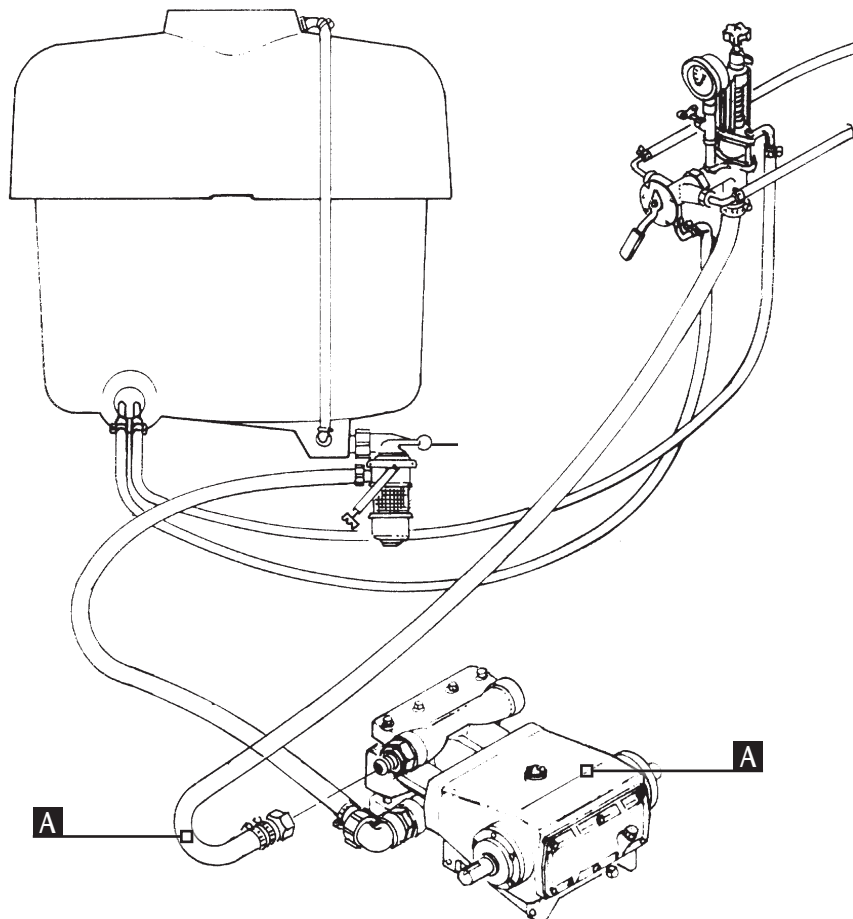
Assembly:

1. Clean and lubricate the PTO shaft bars.
2. Install the sliding ring into the recess with the grooves facing the bar.
3. Fit the safety protection.
4. Turn the cone until the indicated position.
5. Fasten the locking screw.



**ATTENTION!**

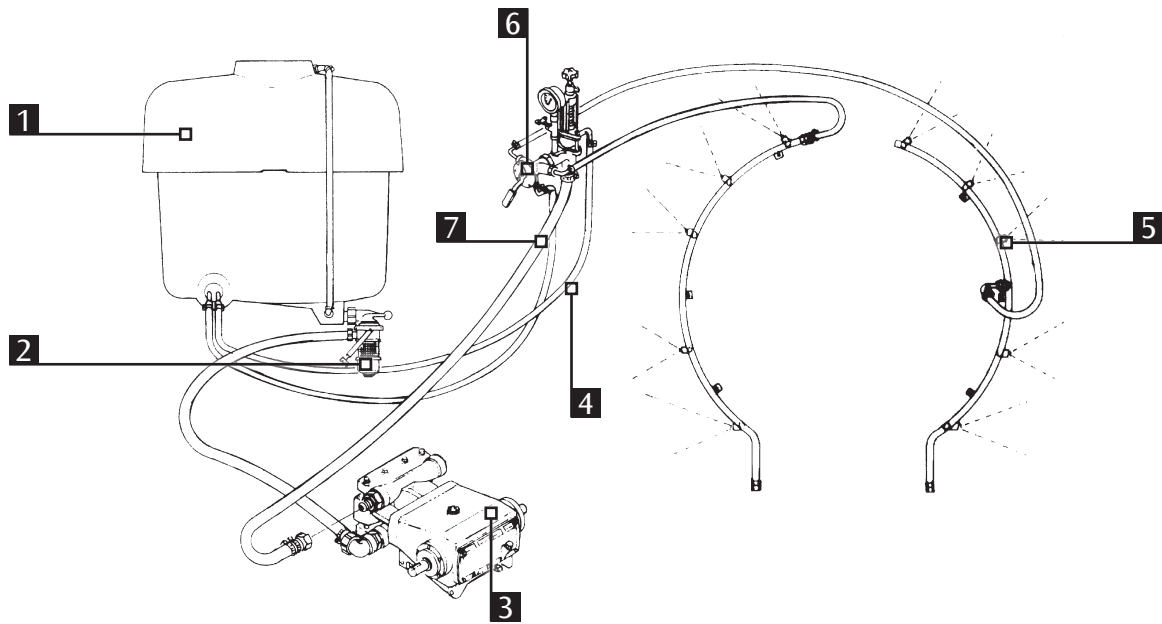
In regions where the temperature during wintertime drops to 0°C or below, some procedures are required to prevent damages, particularly to the chemical pump owing to the accumulation of water inside the pump.

**Procedures:**

- Drain the reservoir thoroughly, leaving the supply valve lever in the intermediate position.
- Disconnect the chemical hose (A) from the pump (B) (hose connecting the pump to the compensation chamber).
- Run the machine for approximately 30 seconds with the tractor engine speed between intermediate and low.
- Thereafter, install the components again on their due places.
- Repeat this operation at the end of every work day, during the wintertime period, and you will certainly prevent troubles in the next applications.

**NOTE:**

Do not operate the machine longer than the recommended time in order not to put pump components at risk.



- |                |                     |
|----------------|---------------------|
| 1. Tank        | 5. Nozzles          |
| 2. Main filter | 6. chemical control |
| 3. Pump        | 7. Pressure hose    |
| 4. Return      |                     |

**Problems, causes and corrections**

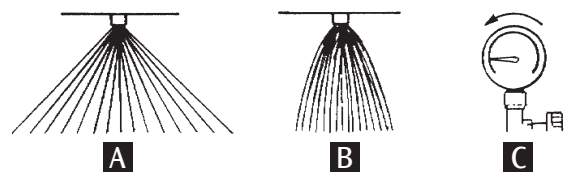
Whenever problems affect JACTO machines fitted with piston cup-type pumps, try to categorize the same within one the four groups listed below.

**a. Suction and boost deficiency**

- No liquid comes out from the nozzles;
- No liquid is flowing back to the reservoir;
- No pressure is indicated on the pressure regulator.

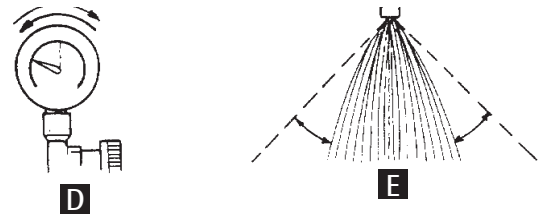
**b. Insuficiência de pressão (falta parcial de pressão)**

- The liquid is not sprayed at the proper pressure (A);
- The spraying angle is smaller than the specified angle (B);
- The gauge shows lower pressure (C).



**c. Pressure oscillation**

- The gauge pointer is oscillating (D);
- The jet spraying angle oscillates (E).



**d. Intermittence**

- The gauge pointer vibrates intensely (F);
- The pressure hoses vibrate intensely;
- The jet spraying angle exhibits pulsating variation (G).

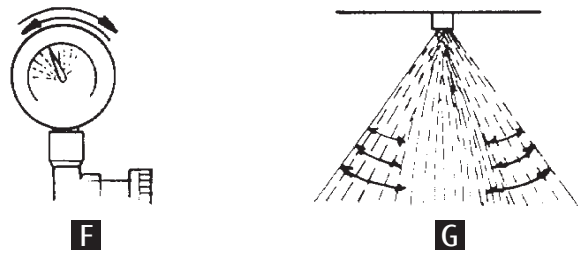


Tabla 11: Suction and boost deficiency (total lack of pressure)

Probable causes	Indications and corrections
1. Complete absence of power take-off revolution.	The machine shall be driven with the power take-off (PTO) running at 540 rpm. Visually check whether the pump is being driven.
2. Water missing on reservoir.	A minimum liquid is required for the chemical circuit operation; otherwise there will be no pressure.
3. Filter valve closed (quick shut-off)	Due to the quick shut-off valve construction characteristic, liquid will flow even in the shut position with the pump operating; however, the circulation of liquid will be insufficient.
4. Dirty filter.	The dirty filter will prevent free fluid flow. Clean the filter at the time of every refill or more frequently depending on the water quality and type of chemical.
5. Obstruction in intake hoses.	Check the hose connecting the filter to the pump for buckling. Check for obstruction inside the hoses connecting the reservoir to the filter. Fill the reservoir, open the valve and check whether there is plenty of water circulating.
6. Air intake.	Check the filter sealing ring. The filter sealing must be correct, with no leaks.
7. Pump is not suctioning.	Remove the suction valve cover. Check the repair condition of valves and, if necessary, replace.

Table 12: Pressure oscillation

Probable causes	Indications and corrections
1. Slack belts.	Incorrectly taut belts will not drive the pump properly.
2. Entry of air into the intake system.	Caused by a punctured hose, damaged filter sealing ring, etc. Check and mend liquid leaks if existing.
3. Pressure regulator.	Check the valve and valve seat to make sure of the proper adjustment of these components.



Table 13: Intermittence

Probable causes	Indications and corrections
1. Filter valve closed (quick shut-off).	Due to the quick shut-off valve construction characteristic, there will be circulation of liquid even in the closed position with the pump in operation, causing intermittent circulation of liquid.
2. Pump – poor operation of valves.	Valve exhibiting poor sealing due to impurities or seizing.
3. Pump head punctured on the inside.	Replace pump head.

Table 14: Insufficient pressure (partial lack of pressure)

Probable causes	Indications and corrections
1. Poor rpm on machine drive.	Rpm for driving the machine shall be 540 rpm at the power take-off (TDP).
2. Closed filter valve (quick shut-off).	Due to the quick shut-off valve construction characteristic, liquid will flow even in the shut position with the pump operating; however, the circulation of liquid will be insufficient.
3. Filter is partially clogged.	The filter must be clean to allow free circulation of liquid.
4. Intake hose is partially clogged.	The pump if not properly fed will cause a pressure drop. Check the hose connecting the filter to the pump for buckling. Check for obstruction the hoses connecting the reservoir to the filter. Fill up the reservoir, open the valve and check whether the water is flowing abundantly.
5. Air intake.	Check fittings and reservoir outlet sealing rings.
6. Pressure regulator.	Check valve seating and seat.
7. Excess flow (nozzle flow in excess of the recommended limit).	Check whether the nozzle flow rate is within the recommended limits (refer to flow rate chart). Replace nozzles with flow rate in excess of 20%. Use only the nozzle recommended by the manufacturer sprayer.
8. Pump with less boosting capability.	Disconnect the pressure hose from the command. Run the machine under 540 rpm at the PTO. Collect water for 1 minute. Meter the collected volume. The volume must be close to the pump rated value. JP - 402 = 40 L/min    JP - 100 = 100 L/min JP - 42 = 42 L/min    JP - 150 = 150 L/min JP - 75 = 75 L/min    JP - 300 = 300 L/min

### Precautions when using the equipment and chemicals

- Owners and users of the equipment are advised that the IMPROPER USE of this equipment and the chemicals applied by it may be harmful to people, animals and the environment.
- Carefully read this manual and the recommendations from the manufacturers of the products employed.
- Strictly follow the directions for use of the equipment and chemicals in order to obtain guaranties of safety and efficiency in the development of your farming activities.

### After completion of application



#### ATTENTION!

Avoid leaving chemical remnants in the storehouse or even storing the same for a long time. For the last application, prepare the mixture in amount enough to treat the small plantation portion left. Always follow the appropriate technical directions.

- Wash the equipment both inside and outside with clean water and detergent.
- Disassemble and clean each nozzle set by using, if necessary, fine-bristle brush, water jet or compressed air.
- Dry up, lubricate and keep the equipment in a dry and sheltered place.
- Retouch metal parts with paint such as to prevent corrosion from damaging the equipment.
- Apply lubricating oil to metal parts in order to protect from corrosion.
- Remove the personal protection equipment and wash them separately from all other ordinary use clothing.
- Thoroughly drain the sprayer reservoir at a safe place.
- Choose a site where washing the equipment would not give rise to risks of contamination of rivers, lakes, creeks, dams, etc.

- Once the work has been completed, pour clean water into the reservoir (50% of its holding capacity) and run the equipment until draining all water out in order to clean the chemical circuit. Clean the suction filter using clear water, neutral detergent and a nylon-bristle brush. These operations shall be performed using the personal protection equipment (PPEs) (gloves, masks, etc.) and at places where no risks of contamination exist to people, animals, water springs, houses, etc.
- Damages to painted parts shall be repaired in order to prevent corrosion.
- Wash the machine on the outside with clean water and perform such cleaning at places where no risk exists of contamination to the environment.
- Keep the machine in a sheltered, dry and ventilated place.
- Do not keep the machine within environments where foodstuff is kept for use by human beings or animals, lest such foodstuff may become contaminated.
- Do not keep the machine within environments where chemicals and fertilizers are already stored that could cause corrosion on the machine.
- Do not let children or animals to get close to the equipment.
- Do not apply whatever kind of solution on the plastic or rubber parts such as tires, nozzle holders, etc.
- Do all necessary repairs and maintenance actions to maintain the machine properly prepared and ready for use.
- After cleaning, keep the machine in a sheltered, dry and ventilated place.



Statement of limited warranty.....	6-83
Technical inspections registration.....	6-85
Product registration card .....	6-87



Máquinas Agrícolas Jacto S.A. will grant to the original buyer a warranty for parts and components that, in normal services and use, exhibit manufacturing or raw material defect duly substantiated by Jacto, subject to the following conditions:

- **Warranty period:** one (1) year from the purchase date by the original retail purchaser.
- **Warranty application:** the warranty will be extended by jacto free of charge; providing that the parts and components exhibit manufacturing or assembly defects demonstrated after conclusive factory analysis.
- It is understood that the replacement of complete components such as pumps, commands, engines, transmissions, hydraulic piston and the like will only be provided in the event that the defect cannot be remedied by replacing parts and portions of the component.

### Loss of Warranty

The occurrence of any of the events listed below shall entail the automatic cancellation and loss of this warranty:

- Use of the equipment in disagreement with the technical recommendations contained in the INSTRUCTIONS MANUAL, or misuse, work overload or accidents;
- Imperfect or improper preventative/corrective maintenance;
- Preventative/corrective maintenance by non-authorized persons.
- Utilization of parts and components not supplied by Jacto;
- Change to the equipment or any characteristic of the original design;
- Change to, destruction or loss of the product identification plate;
- Incorrect or incomplete filling in of the warranty claim.

Owing to their characteristics, the ITEMS listed below are not covered by the warranty:

- Parts regarded as regular maintenance parts such as filter elements, belts, hoses, nozzles, plungers, pressure gauges, etc., as well as services associated to routine maintenance, adjustments, retightening, lubricants, etc.
- Parts exhibiting regular wear and tear EXCEPT IF EXHIBITING MANUFACTURING, ASSEMBLY OR RAW MATERIAL DEFECTS.
- Defects arising out of accidents;
- Hydraulic fluids, lubricants, greases and the like;
- Bodily injuries or material damages to the user, owner or third parties;
- Removals and freight of equipment, parts and components for warranties not granted;
- Removals and mobilization of people and vehicles.

**General**

- Parts replaced under warranty will be the property of Jacto;
- Jacto will have the right to revise, modify or improve, discontinue or change the machine and its components at any time, as well as the conditions set forth herein without incurring in any liability or obligations to the buyer or third party.
- Warranty on replaced parts and components will expire concurrently with the equipment warranty period;
- Delays, if any, in the performance of the services will not grant to the owner any right to indemnity nor extension of the warranty period;
- Jacto shall have the right to make changes to or discontinue manufacture of the equipment.
- 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*

