

VIGTIGT

Denne manual er en integreret del af maskinen og skal ledsage maskinen i tilfælde af videresalg, indtil dens nedrivning.

SUPER

brugervejledning

DANSK

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INDHOLDSFORTEGNELSE

GENERELLE OPLYSNINGER OG SIKKERHEDSOPLYSNINGER	Hæfte 1
	Hæfte 4a
	Hæfte 4b

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GENERAL AND SAFETY INFORMATION

user manual

Serial number

Edition 4
09 - 2013

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PURPOSE OF THE MANUAL

The current manual is part of the machine and has been supplied by the manufacturer as an essential guide to those who will be involved with the machinery during its working life.

Any supplements added by the manufacturer must be stored with the manual and considered as an integral part of the same manual.

The instructions in this manual are for professional users, who must be aware of the machine modes of use and must be authorised and properly trained.

In addition to adopting good use techniques, the recipients must carefully read and strictly apply this information.

This information has been produced by the manufacturer in his own original language (Italian) and can be translated into other languages to satisfy legal and/or commercial requirements.

Time dedicated to reading this information will avoid personal safety, health risks and economic damages.

In the event that supplementary information to the actual machine set up is found in this manual it will not interfere with reading.

Please keep it in a safe, easily accessible place so that it will be handy for reference when required.

In case of transfer or sale of the machine, this manual must always come with it. If the manual is damaged or lost, please request a copy to the machine manufacturer or to the previous owner. The machine is an integral part of the machine.

Some of the pictures and pieces of information in this manual may not correspond perfectly to what you have. This does not however hinder operation. As the manufacturer is carrying out a policy of continuous product development and updating, he reserves the right to alter this document without the obligation of prior notice.

To better stress the importance of some passages or to indicate important specifics, symbols, whose meanings are described as follows, have been adopted.



Danger - Warning

Indicates critically dangerous situations that, if neglected, can result in serious personal safety and health hazards.



Caution - Warning

Indicates that suitable actions must be employed in order to avoid personal safety, health hazards and economic damages.



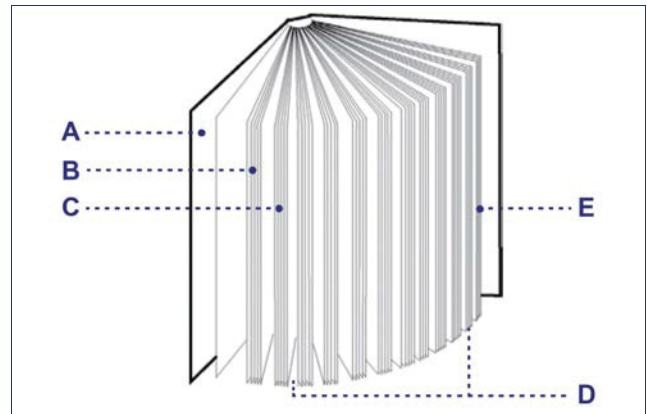
Important

Indicates particularly important technical information that should not be neglected.

COMPOSITION OF THE MANUAL AND METHOD OF REFERENCE

This instruction manual, barring any differences which do not affect the correctness of the information, consists only of the leaflets concerning the machine in question and the operating units which make it up. The illustration below shows the manual layout.

- A) Cover page:** indicates the model and the description of the machine including publishing and ID information. It also contains the list of leaflets relative to the components which can be installed. Some of these components may be missing from this machine.
- B) Leaflet 1 - General safety information:** contains the information necessary to identify the machine, use the manual as well as all the information regarding safety.
- C) Leaflet 2 - General description of the machine:** contains the basic principles as well as the manufacturing and operating philosophies.
- D) Leaflets 3, 4, 5, 6..... - Information on the operating units installed:** they contain all the information relative to each unit installed on the machine.



- E) Last leaflet - Technical modifications:** it contains any information on the modifications made to the manual over time.



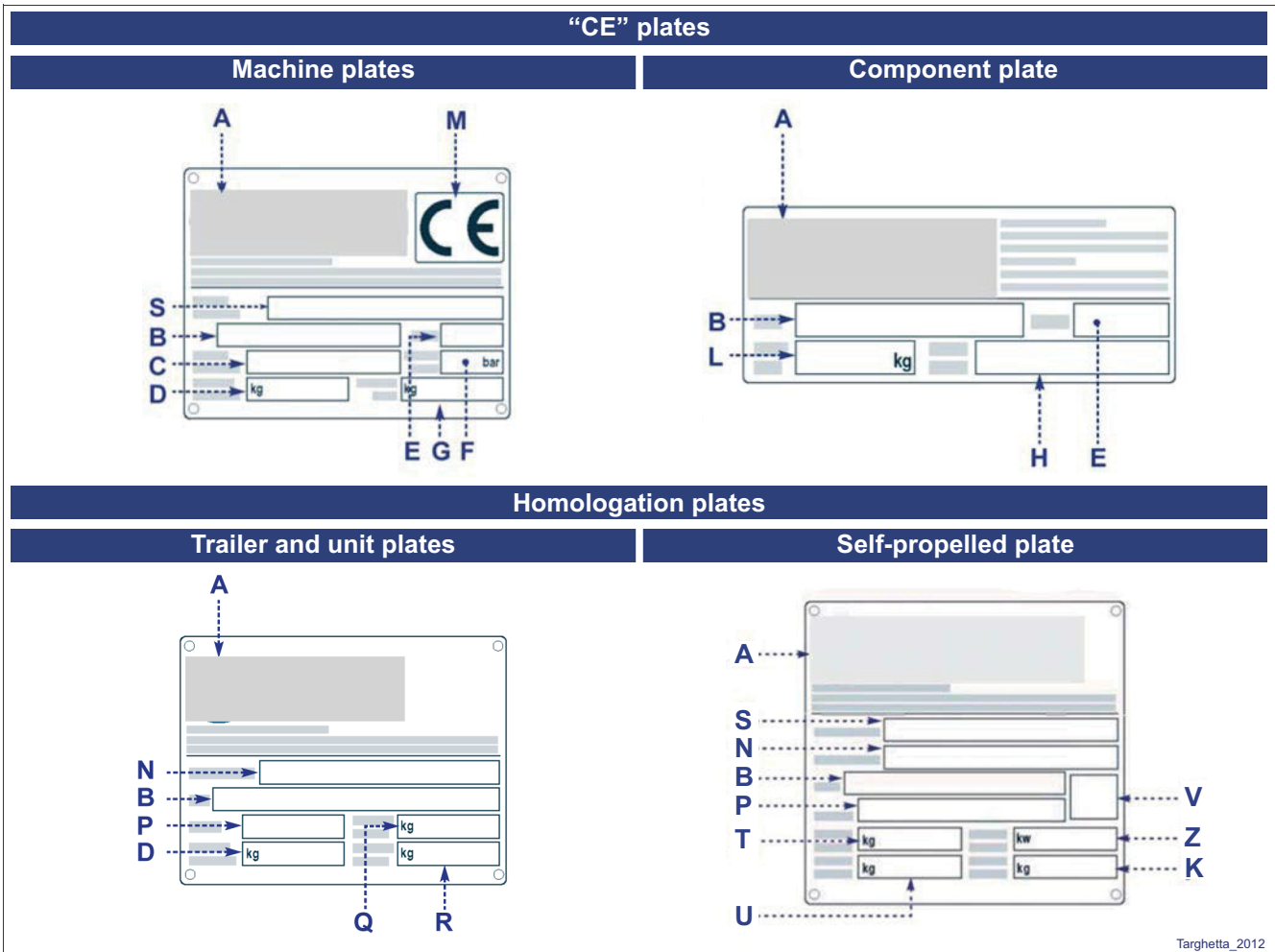
Important

Read this leaflet before the others since it contains more recent information compared to the manual herein.

MANUFACTURER AND MACHINE IDENTIFICATION

The ID plates shown are applied directly onto the machine.

It details references and all important operational safety requirements.



Targhetta_2012

- A) Manufacturer ID.
- B) Model
- C) Identification number
- D) Total weight of the maximum configuration
- E) Year of manufacture
- F) Water system maximum pressure (bar)
- G) Empty weight in the maximum configuration (Kg).
- H) Manufacturing order number
- K) Rear axle maximum mass (kg).
- L) Total weight (kg)

- M) EC conformity mark.
- N) Homologation number
- P) Frame number.
- Q) Eyelet maximum mass (kg).
- R) Axle maximum mass (kg).
- S) Assignment
- T) Overall maximum mass (kg).
- U) Front axle maximum mass (kg).
- V) Smoke grade index
- Z) Total power

SERVICE PROCEDURE

Please refer to the Manufacturer's service centres for any need.



Important

For every technical service request regarding the machine, please indicate the data found on the identification plate, the approximate hours of use and the type of fault detected.

DOCUMENTATION ENCLOSED

The following documentation is included with this manual.

- Wiring diagrams.
- Hydraulic system diagrams.
- Oleodynamic system diagrams.

- Documentation on commercial components (pumps, gearboxes, etc.).
- Warranty.
- Nozzle table
- If provided for by Machine Directive 2006/42/EC, the CE Declaration of Conformity is supplied with this manual.

GENERAL REGULATIONS

During the design and construction of the machine, the manufacturer has paid special attention to aspects that could place the personal safety and health of the people in charge of operating the machine at risk.

In addition to observing the specific laws in force, the manufacturer has adopted all "exemplary construction technique principles". The purpose of this information is to advise the operators to use extreme caution to avoid risks. However, discretion is invaluable. Safety is also entrusted to the staff who operate the machine.

Carefully read the instructions published in the supplied manual and found directly on the machine while strictly observing those concerning safety.

Time dedicated to reading will prevent unfortunate accidents; remembering what one was supposed to do when the damage is already done is always too late.

Pay attention to the meanings of the symbols on the applied stickers; their shape and colour are significant to safety ends. Keep them legible and observe the shown information.

Never tamper, dodge, eliminate or by-pass the safety devices installed on the machine. Neglect to respect this requirement may cause serious risk to personal safety and health.

The staff in charge of carrying out any work on the machine during its entire life must have special technical knowledge, particular skills and certified experience in the specific sector. Neglect to observe these requirements may prove hazardous to personal safety and health.

When operating the machine, only use appropriate protective clothing and/or accessories as indicated in the instructions for use provided by the manufacturer and as provided for by the current regulations in terms of safety in the workplace.

Some phases may require the help of one or more assistants. In these cases such persons should be suitably trained and informed on the type of activity being performed, so as not to cause damage to the health and safety of persons.

HANDLING AND LOADING SPECIFICATIONS

The equipment may only be loaded onto and transported by hoisting devices having sufficient carrying capacity, anchored at the points specified by the manufacturer.

The staff in charge of loading, unloading and moving the machine must have skills and experience acquired in the specific sector.

During manoeuvres, when using the machine directly, the operator must be informed on the procedures required to carry out these operations safely.

Lifting and transportation must be carried out using suitable means and anchoring the machine in the places provided by the manufacturer. Personnel who are authorised to perform these operations must possess specific skills and experience, to safeguard themselves and others involved.

Before moving the machine with vehicles, make sure that the machine and its components are suitably anchored to the vehicle and that their volume does not exceed the maximum allowable values. Place the required signals if necessary.

It may be necessary to move the machine frequently. To avoid sudden, uncontrolled movement make sure that all parts which could cause this have been safely locked before transportation.

Road transport is allowed **ONLY** to approved equipment and to tractor drivers who have the necessary requirements according to the laws in force.

In any case, before starting transportation, block the parts which could cause sudden unexpected movements and check that the volume does not exceed the maximum allowable values. If necessary, arrange proper signalling.

OPERATION AND USE REGULATIONS

The operator must be familiar with the use of the machine and be suitably qualified and experienced for this type of task.

After obtaining the necessary information, when using the machine for the first time, if necessary, the operator can simulate some manoeuvres to get used to the controls and their main functions, especially the starting and braking operations.

Only use the machine for the purposes expressly intended by the manufacturer. The improper use of the machine could place the personal safety and health of the staff at risk as well as cause economic damage.

The machine has been designed and constructed to satisfy all the operating conditions indicated by the manufacturer. Tampering with any device to achieve services other than those provided may be hazardous to personal safety and health and provoke economic loss.

Do not use the machine if the safety devices are not perfectly installed or in perfect operating condition. Failure to comply with this requirement could place the personal safety and health of people at risk.

During the preparation and use of all chemicals, appropriate measures must be taken in order to avoid placing people's health and safety at risk and damaging the environment.

Any chemical residue must be disposed of in accordance with the applicable waste disposal regulations in force.

Park the machine in a suitable area, where it does not represent an obstacle or danger to circulation, where access is restricted to authorised staff, with all the necessary measures for safety purposes.

Prevent strangers from approaching the working area when the machine is in use. Should it become necessary, stop it immediately and make the people found in the risk area move away.

ADJUSTMENT AND MAINTENANCE REGULATIONS

Keep the machine in perfect working order, performing maintenance as scheduled by the manufacturer. Good maintenance achieves the best machine performance, longer machine life and constant observance of the safety regulations.

Activate all of the security devices provided and evaluate the necessity to adequately inform personnel operating in the near vicinity before performing maintenance or adjustments on the machine. In particular, confine the neighbouring areas to impede access to the devices that could, if activated, produce unexpected danger conditions provoking hazards to personal safety and health.

All maintenance procedures that require precise technical competence or specific skills must be exclusively performed by qualified personnel with acquired certified experience in the specific field.

To perform maintenance in areas that are not easily accessible or dangerous, establish suitable safety conditions for operators and others according to the laws in force pertinent to work safety conditions.

When maintenance operations involve the access to machine parts that cannot be accessed from the ground, and in any case to positions that are higher than 1.50 m from the ground, use a ladder or platform complying with the regulations in force;

The maximum pressure of the compressed air used in the blowing and cleaning operations must amount to 2 bar. When performing operations with compressed air, protect you eyes with suitable safety goggles with side shields and a mask in order to avoid any personal injury caused by dust particles. The cleaning operations should be performed in ventilated areas;

Replace deteriorated parts with originals. Use oils and lubricants indicated in the manual. All these measures can ensure the preservation of the machine and foreseen safety level.

The hoses and pipes of the hydraulic system must be replaced periodically; the replacement interval depends on the maintenance status of the machine. In any case it shall not exceed 6 years;

Do not dispose of the product, the mixture or other pollutant in the environment. Disposal must be carried out in compliance with the regulations in force.

Disposal must be carried out in compliance with the regulations in force.

Avoid prolonged and repeated skin contacts with fuel, lubricants and liquids as these might cause skin irritation and other problems.

When performing the cleaning operations and when replacing the filters, make sure that the area is properly ventilated in order to prevent the accumulation of toxic vapours.

Do not weld in closed or non suitably ventilated areas.

Do not weld on painted surfaces or close to them in order to avoid the development of toxic vapours. Remove the paint with suitable products, wash the surfaces and let them dry.

Do not perform welding without having previously emptied and cleaned the spraying circuit and disconnecting the battery.

Pay special attention before removing the caps and covers from tanks, radiators or cylinders: rotate them carefully in order to discharge any possible residual pressure.

When discharging the pressure, keep away from the machine and always wear safety goggles. Slowly loosen the discharge screw by a few turns in order to allow the condensate or fluid to come out.

Discharge the pressure from the circuits before performing any operation.

Never use your hands to find out leaks of fluids under pressure.

The leaks of fluids under pressure can penetrate skin and eyes with extremely serious consequences.

Check every day the condition of pipes and fittings and if they show clear signs of wear (cracking, cuts, etc.) or mechanical damage (buckling or flattening), replace them immediately.

Check periodically the tightening of the bolts and nuts.

Before repairing the tank, clean and empty the spraying circuit.

Always keep the nozzles in good conditions and check periodically that they are free from cracks, obstructions and wear.

FIRE PREVENTION MEASURES

The machine is largely made up of materials obtained from oil. Moreover, the presence of different types of oil and of residues of chemical products makes these materials potentially flammable.

Keep a fire extinguisher with a suitable capacity on the tractor or machine and charge it periodically. Hand-held fire extinguishers can be used only by authorised personnel.

- The personnel using the vehicle should be trained on how to behave in the event of fire.
- All fuels and most lubricants and hydraulic fluids are flammable.

- Never use petrol additives and other flammable or toxic fluids to clean the mechanical parts. Use instead commercial approved additives that are non-flammable and non-toxic.
- Do not perform welding next to piping, tanks, electric cables and all types of flammable materials.
- If welding is to be performed, protect the flammable parts with shields.
- Clean the machine completely at least once a week when the machine is in use.

PLANT PROTECTION PRODUCTS

Spraying is a delicate operation and involves the risk of contamination of people, animals and the environment. For this reason the functionality of all machine components must be carefully ensured.

- The operator is always the most exposed person to the used chemical products and he/she must always adopt all the necessary measures for his/her personal safety at work. Refer to the danger indications on the labels of the products used.
- Always work in the correct weather conditions and follow the weather forecasts for the entire period of application.
- Dose the product to be poured into the tank correctly.
- Make sure that the chemical substances used are compatible with the construction materials of the machine.

- Never leave chemical substances on the tank for more than a few hours.
- Carefully follow the regulations concerning the possession and use of plant protection products and make sure that people and animals cannot access them.
- After each use carefully wash the containers of the mix and the dosing tools that have been used.
- Do not use the machine without hand washing tank or if it is not full.
- The machine should be cleaned in the same place where it is filled, i.e. an area where the water can be collected in a disposal manhole.
- Do not discharge the mixing residues to the water-courses, sewers and public areas.

GUIDELINES FOR ENVIRONMENTAL SAFETY

Each organisation is responsible for applying procedures that must be identified and evaluated and is to check the effect their activities (products, services, etc.) have on the environment.

The procedures to carry out to identify significant environmental impacts must take the following factors into consideration:

- Emissions to the atmosphere
- Liquid discharge
- Waste management
- Soil contamination
- Use of raw materials and natural resources
- Local problems concerning the environmental impact

For this purpose the manufacturer has provided some indications below, that must be taken into account by

all of those that, for any reason, work with the machine during its lifespan.

- All packaging components must be disposed of in accordance with the laws of the country where the disposal is made.
- During installation, make sure that there are sufficient changes in the ambient air to prevent concentrations that of air that is harmful for the operators.
- During operating and maintenance do not dispose of pollutants (oils, greases, etc.) into the environment, and dispose of the various products separately in compliance with current laws in this regard.
- When decommissioning the machine separate all the components according to their characteristics and dispose of them separately.

Security for the disposal of Waste Electrical and Electronic Equipment (WEEE Directive 2002/96)



Important

Do not scatter polluting materials in the environment, dispose of the same in compliance with current regulations on the matter.

In terms of the EEEW (Electrical and Electronic Equipment Waste) directive, when scrapping, the user is to separate the electrical and electronic components and dispose of them via authorised collection centres, or they must hand them over, still installed, to the seller when making a new purchase.

All the machines, which must be disposed of according to the WEEE Directive 2002/96, are marked by an appropriate symbol.

The illegal disposal of Waste Electrical and Electronic Equipment shall be punished with sanctions governed by the laws applicable in the territory where the infringement is ascertained.



Important

Electrical and Electronic waste may contain hazardous substances that may potentially be harmful to the environment and the health of people. We urge you to dispose of it in the correct manner.

SAFETY AND INFORMATION MARKINGS

Some of the following signals are placed on the machine, the correct position is shown in the para-

graph "signals position". Their meaning is explained below.



Danger: read the manual carefully before any intervention.



Danger to people walking through: make sure there are no unauthorised people in the machine's operating range.



Danger: turn the engine off and remove the key from the ignition before any operation.



Caution - risk of corrosion: suitable gloves must be worn when handling chemical products.



Danger: do not place any part of your body in the tank.



Caution - risk of falling: do not climb, only use suitable means to access the higher parts of the machine.



Danger: do not exceed the pressure shown.



Danger: fluid escaping under pressure: do not touch nor approach with any part of your body to avoid abrasions.



Danger: before inserting the cardan shaft check the direction of rotation and make sure the max. rpm doesn't exceed the indicated value.



Danger of amputation for upper limbs: do not put your hands in mechanisms with moving parts.



Danger - live wires: beware of the electrical wires when the bar is extended and retracted.



Danger: low temperature: disconnect the pressure gauge before winter storage.



Danger of trapping and dragging: do not put your upper limbs in mechanisms with moving parts.



Caution - danger to body: do not go near the moving components.



Danger of crushing upper limbs: do not access this area while parts are moving.



Danger of crushing upper limbs: be careful during tractor height adjuster hitching.



Danger: Hot surfaces: be careful of hot surfaces.



Danger of impact: be careful of protruding parts.



Prohibited use: do not spray water under pressure to avoid damaging parts.



No access to unauthorised people: do not stand in or walk through the machine's operating range.



Grip points: indicates the manual grip points.



Protective gear must be worn: protective earmuffs must be worn while operating the machine.



Mandatory use of fresh water: wash your hands after each contact with the chemicals used.



Mask must be worn: to protect the respiratory tract when handling and using chemicals.



Boots must be worn: to protect feet and legs when handling and using chemicals.



Gloves must be worn: to protect hands from abrasions.



Protective clothing must be worn: to protect the body when handling and using chemicals.



Mandatory reading of the User manual. The person in charge of the equipment operation shall read the manual in order to know the position and the function of controls as well as to familiarize with all information contained. Always keep the document within reach.



Clean water must be used: to fill up the clean water tank.



Height adjustment signal: this indicates the height adjustment points when using a fork-lifting device.



Height adjustment signal: this indicates the height adjustment points when using a lifting hook.

MOUNTED UNIT

user manual

Serial number

Edition 3
09- 2013**TABLE OF CONTENTS**

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IMPORTANT SAFETY NOTE

The information published in this booklet regards the pointed out with relevant symbols in order to safeguard operational aspects of the operator unit installed on the people from risks. Remember that prudence is irreplaceable. machine. It is however necessary that you carefully

read the Safety is also in the hands of all the operators who interact general safety regulations published in Booklet 1 and those with the machine.

TECHNICAL INFORMATION

EQUIPMENT GENERAL DESCRIPTION

The mounted sprayer, from now on called equipment, was designed and manufactured to be installed on other units in order to build up a sprayer for agricultural use and to spray chemicals (fertilisers, herbicides, pesticides, etc.) on grounds and crops.

This equipment must be connected to the lifting device of a tractor with suitable power and equipped with a driver's protection cabin.

The tractor must be equipped with power take off to transmit power to the pump sending the liquid to the spraying booms.

Each machine use that is different from those described above is to be considered forbidden and dangerous.

The descriptions of all the installed components, the indications concerning their position and the technical and performance specifications are in the enclosed booklet.

The information about the components that is not included in this manual is detailed in the relevant instruction manuals.



Important

All the technical descriptions of the equipment are in the 4B booklet.

IMPROPER USAGE

- Use of the equipment for purposes other than those concerning agriculture is not considered compliant with the manufacturer's instructions. Therefore, the manufacturer shall not be held responsible for any damage arising from such unsuitable use. Furthermore, any consequent damage caused to third parties is the sole responsibility of the user.



Danger - Warning

The use of products not specifically authorized for herbaceous crops is not allowed. Thoroughly read the instructions and warnings on the use of chemicals specified by the manufacturer on the container.

- To ensure proper use of the equipment, the user must keep to the instructions given regarding commissioning, working conditions and maintenance detailed in this manual, as well as the directions specified by the manufacturers of the chemical products employed, rules for safe road use and regulations for safety and accident prevention.

- Comply with all the regulations concerning crops protection.
- Follow the instructions provided for by the chemical manufacturer concerning the product mixing and distribution, as well as cleaning of the equipment.
- Do not disconnect hoses if pressurized.
- Only use hydraulic hoses that are able to stand a pressure four times higher than the maximum working pressure, as well as being resistant to chemical, mechanical or thermal stress.
- Maintenance inside the tank can be carried out only after cleaning carefully and using an appropriate protection mask. For safety reasons, a second person must be present outside the tank during maintenance.
- Prior to every use of the equipment, check that it can be moved and operated safely. Make sure that nobody is near the working area. Children and disabled persons must be kept at a distance!
- The user must wear tight-fitting clothes.
- To avoid risk of fire, keep the equipment clean.
- No passengers allowed while operating or moving the equipment.

PRODUCT USE RESTRICTIONS

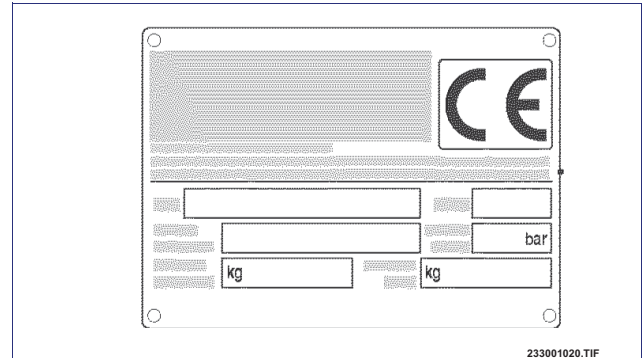
The manufacturer states that no reaction has been reported for any equipment component following its coming into contact with authorized chemicals.

It further declares that, to their knowledge, there is no rule requiring the implementation of specific tests to

check the reaction of equipment components to the chemicals authorized for spraying onto herbaceous crops.

IDENTIFICATION PLATE POSITION

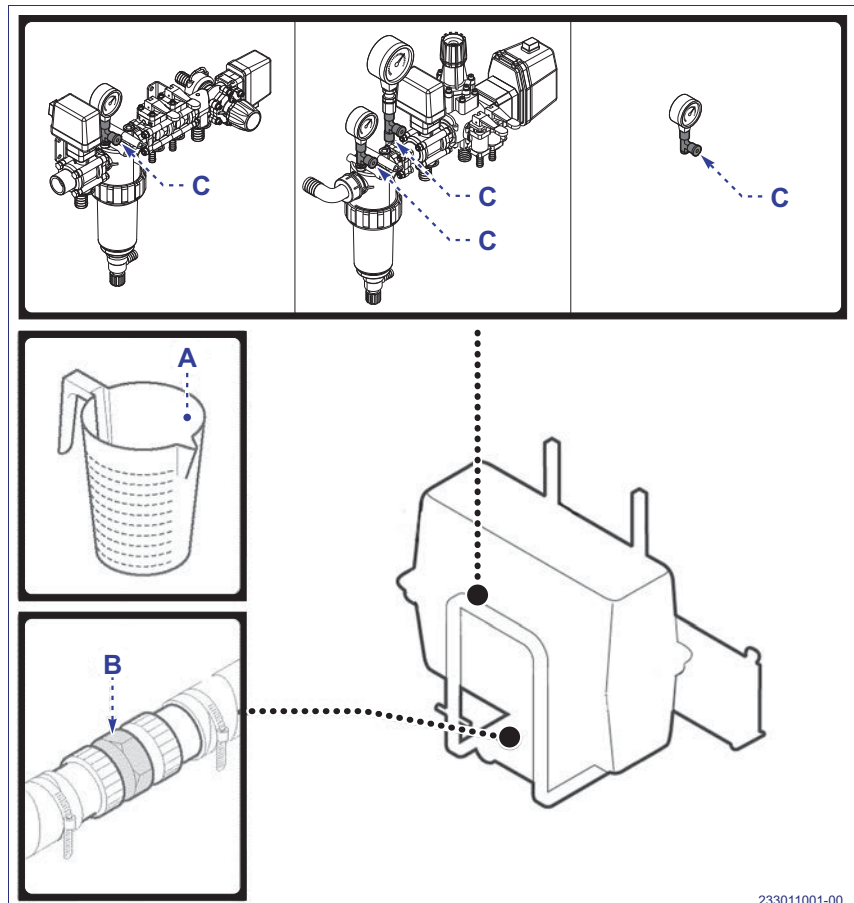
The identification plate is fastened to the frame in the lower side of the equipment near the pump.



EQUIPMENT FUNCTION CONTROLLER

The equipment can be fitted (on demand) with devices able to carry out a check of the main functions.

- A) Graduated container for nozzle flow check.
- B) Coupling (1' gas) for pump litre counter. It allows the installation of a flow meter to check the flow without damaging the hoses.
- C) Fitting for the attachment of the pressure control pressure gauge (1/4" Gas female).



Pump litre counter installation

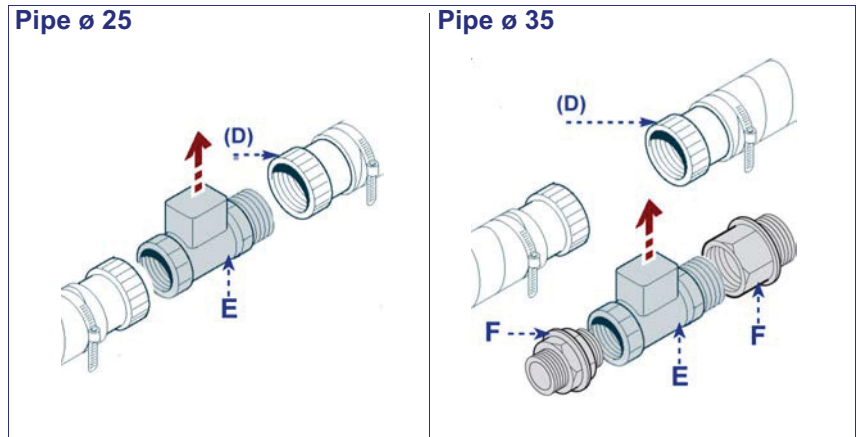
1 - Unscrew ring nut (D), positioned on the delivery pipe next to the pump in order to disconnect the pipe.

Version tube ø 25

2 - Install liter counter (E) and connect the hose again.

Version tube ø 35

2 - Install couplings (F), litre counter (E) and reconnect the pipe.



Nozzle spray check

Any difference between quantity of product to spray and effective quantity sprayed may depend on the following:

- wrong adjustment of tractor forward speed (see "Forward speed during spraying" page 12).
- wrong pressure adjustment (see "Spraying parameter setting" page 11).
- worn nozzles.

To double-check the cause of worn nozzles, proceed as follows:

1 - Start water supply.

2 - Place a graduated container under the nozzle to check.



Important

Use clean water during the inspection and not the product to be sprayed.

3 - Evaluate the actual quantity of product sprayed and repeat the procedure on at least three other nozzles.



Important

Check when first using the equipment and every time the nozzle malfunctions. Repeat the check annually.

INFORMATION ABOUT HANDLING AND INSTALLATION

TRANSPORTING

Loading and transporting can be carried out in different ways, according to the destination. In all cases the equipment must not be packaged.



Important

See 4B booklet.

INFORMATION ABOUT USE

INSTRUCTIONS FOR USE AND OPERATION

Accidents related to machine operating are caused by a number of factors which cannot always be prevented and checked. Some accidents are caused by unpredictable environmental factors, while others are caused by the behaviour of operators.

If necessary, users should first simulate some of the manoeuvres, as well as being authorised and provided with written information, so that they can better identify the main controls and functions.

DESCRIPTION OF CONTROLS

The equipment can be fitted with manual, electric or computerised controls. The instructions for use are in the specific booklets.

The equipment must be used solely for the purposes designed by the manufacturer, and none of the devices must be tampered with in any way to alter the machine's performance.

Before use, make sure that all security devices are properly and efficiently installed. As well as endeavouring to fulfil these requirements, users must apply all safety regulations and read the descriptions related to the controls and commissioning very carefully.

TRACTOR HITCHING



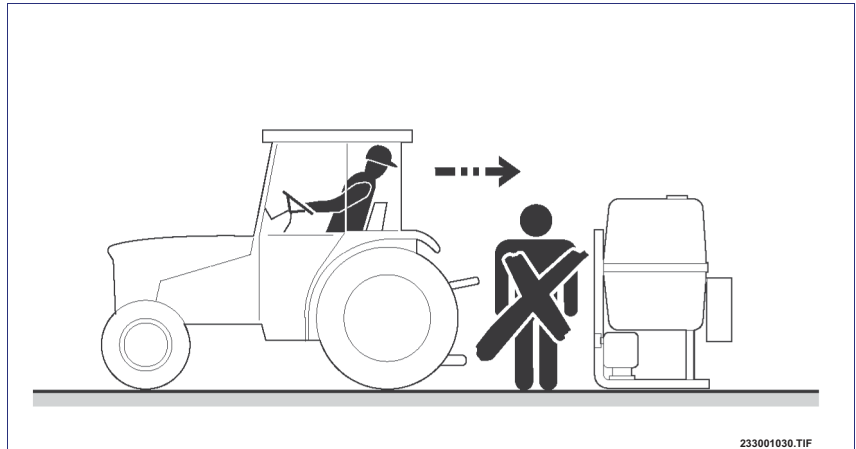
Caution - Warning

Before hitching the equipment, check that the tractor is able to deliver adequate power and is of a suitable size to ensure stability and proper functioning.



Caution - Warning

The total weight of the tractor and of the fully loaded equipment must be distributed on the tractor front axis by at least 20%.



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Proceed as follows.

1 - Connect the equipment to the tractor;



Danger - Warning

Do not step over the drawbar area, be the cardan shaft in motion or not.

- 2 - Insert the cardan shaft into the tractor power take-off while pressing the shear pin; release the shear pin and step forward with the cardan shaft until the shear pin is inserted into its seat. An audible "clack" is heard. If the pin does not snap, repeat the procedure. Connect the cardan shaft to the pump by following the same procedure. See chapter "First connection of the cardan shaft" (page 7) to check if the cardan shaft is suitable for the type of tractor and equipment to be connected.
- 3 - connect the electrical system (see "Electrical connection of position lights (if present)" page 8);
- 4 - connect the hydraulic system (see "Oleodynamic connection (if present)" page 8);
- 5 - Connect the equipment to the arms of the tractor lifting device (See 4B booklet).



Danger - Warning

Hitching and release of the equipment to the tractor must be carried out by one operator only, and in absolute safety.

FIRST CONNECTION OF THE CARDAN SHAFT

Danger - Warning

This operation must be performed in an equipped workshop, with adequate tools and by skilled and specialized technicians.

Check if the cardan shaft, during the maximum tilt, exceeds 30°. In this case a homocinetic cardan shaft should be installed. This is essential to perform this manoeuvre without damaging the joint.

Important

The cardan shaft must be long enough so that it does not jam at its minimum extension or slip out at maximum extension.

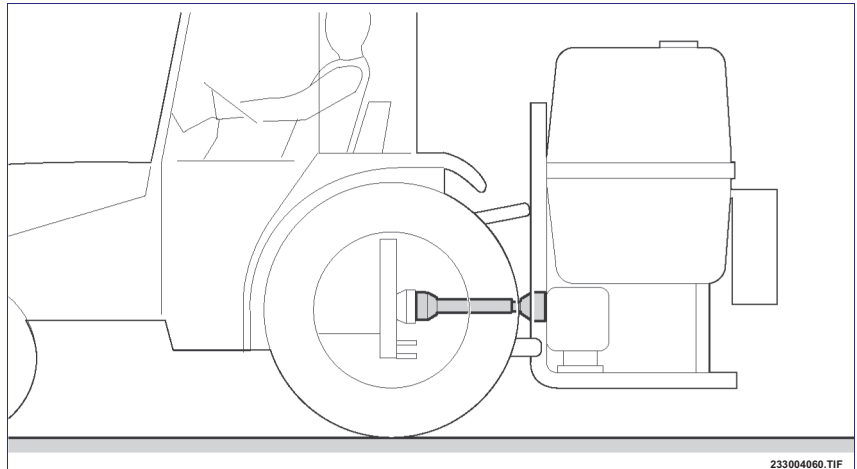
To determine the correct length of the cardan shaft, proceed as follows:

- 1 - Connect the equipment to the tractor);
- 2 - Align the pump shaft with the tractor PTO shaft, then calculate their distance (voir figure).
- 3 - Stop tractor, apply the parking brake and remove the key from the dashboard.
- 4 - Remove cardan shaft and place one end in the tractor PTO and the other in the pump shaft.
- 5 - Bring the two parts of the cardan shaft close together and check that there is a stroke of 15mm.
- 6 - If necessary, cut excess guard (B) and tube (C).

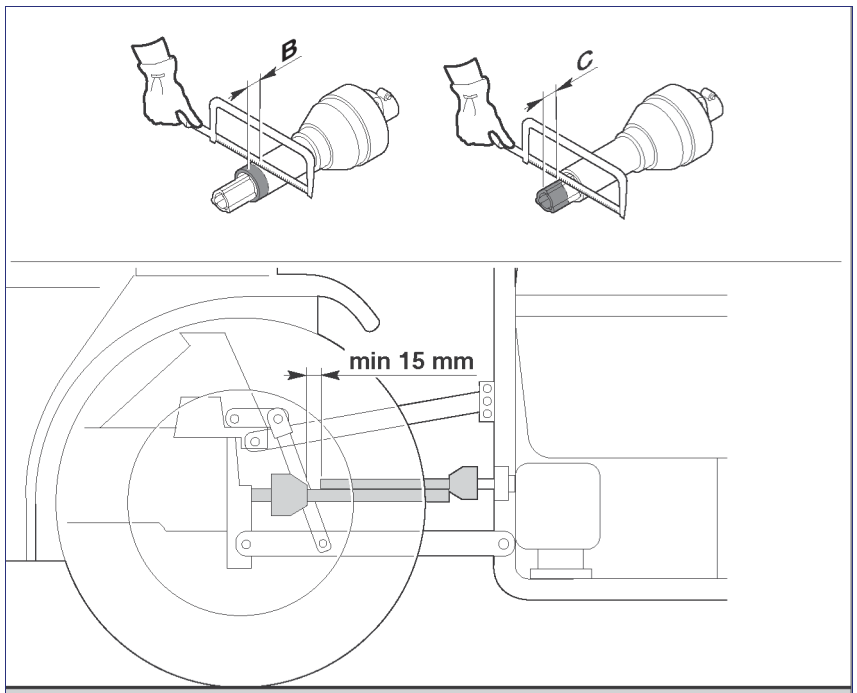
Important

During operation, the telescopic tubes must overlap for at least 1/3 of their length.

- 7 - Remove trimmings, oil the tubes and attach.
- 8 - Insert the cardan shaft into the tractor power take-off while pressing the shear pin; release the shear pin and step forward with the cardan shaft until the shear pin is inserted into its seat. An audible "clack" is heard. If the pin does not snap, repeat the procedure. Connect the cardan shaft to the pump by following the same procedure.



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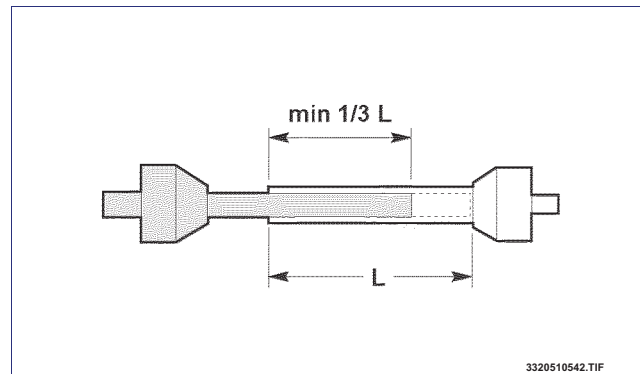
Caution - Warning

Carry out a test run to make sure that there are no snags at minimum and maximum extension and that the cardan shaft has enough room to move in.



Important

Consult the manufacturer's manual for further details concerning the cardan shaft.



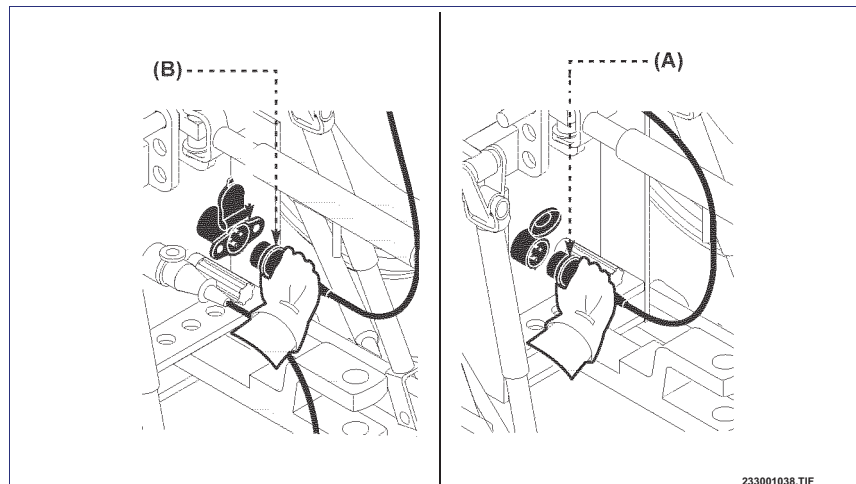
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ELECTRICAL CONNECTION OF POSITION LIGHTS (IF PRESENT)

- Connect connector (A) of the back lights and connector (B) of the electric controls, if present, to the tractor socket.

If the tractor is not fitted with electrical controls, install the ones supplied.

This operation should be carried out by a skilled technician.



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OLEODYNAMIC CONNECTION (IF PRESENT)

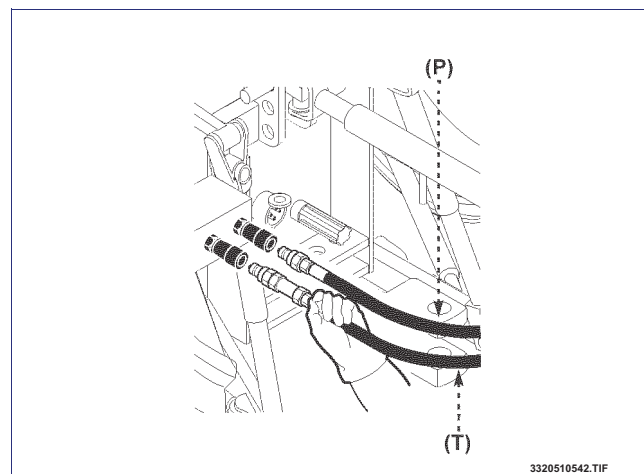
Connect the hydraulic hose (P) to the pressure intake and the hose (T) to the tractor return intake.

- **pressure line (P)**, it can be recognized by a red guard placed on the quick coupling;
- **return line (T)**, identifiable by a blue guard placed on the quick coupling and by a non-return valve (only fitted in electro-hydraulic systems).



Important

If the hydraulic intakes cannot be identified, use the control lever on the tractor in order to check the pressure and return positions.



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ROAD TRANSPORT

Road transport is allowed

ONLY to approved equipment and to tractor drivers who have the necessary requirements according to the laws in force.



Important

Road transport is allowed only when the equipment is completely empty.

In any case, before transport:

- lock the parts that may cause sudden and unexpected movements.
- make sure that the equipment does not exceed the maximum permitted overall dimensions.

- if necessary, provide the equipment with the special signals.
- Completely empty the tank.
- Make sure that the equipment is properly connected to the tractor.
- Make sure that the tractor power take-off is disconnected.
- Make sure that the boom is properly closed and positioned on its supports.
- Deactivate the control board



Important

Road transport requires the knowledge and the observance of the regulations contained in the manual "Road transport regulations".

ACCESS TO EQUIPMENT UPPER COMPONENTS

- 1 - Set up the platform (if present) for getting on the sprayer as shown in the specific document.
- 2 - Get on the equipment by using the special connecting points (Shown on the special plates).
- 3 - After leaving the equipment, close the platform (if present) and make sure that it has been blocked.

FILTERING ELEMENT SIZING

The efficacy of the filtering system depends on the correct sizing of the filter meshes in the different points of the circuit.

The following table gives an indication on the minimum filtration capacity requested for a filtration that is suitable for the treatment, load loss limits and reduced maintenance times and costs.

Installed nozzle	Quantity of product to be sprayed (8 Km/h - 3bar)	Filter mesh (number of yarns per inch) MESH		
		Suction	Delivery	Boom (if present).
ISO 11001 ÷ 11002	< 120 l/ha	50*	80*	100*
ISO 11003 ÷ 11006	120 ÷ 450 l/ha	32	50	80
ISO > 11008	> 450 l/ha	16	32	50

* Standard filter installed on the equipment.

FILTER CARTRIDGE COLOUR TABLE

The following table shows the filter cartridge colours according to the requirements of Standard ISO 19732:2007.

Colour	Filter mesh (number of yarns per inch) MESH
BROWN RED	16
RED	32
BLUE	50
YELLOW	80
GREEN	100
GRAY (not ISO)	120
OPRANGE	150
PINK	200

MACHINE CALIBRATION

For a correct selection of the product volume to be used, the user must be aware of the quantity of deliv-

ered mix per hectare and of the following important parameters.

Maximum limit of the concentration of the used plant protection product

This value is indicated on the pack of the plant protection product and is expressed in droplets per cm².

Coverage intensity

The coverage intensity is the optimal number of droplets on a cm².

Leaf area index

Leaf surface area and ground surface area ratio (LAI).

Spraying degree

The spraying degree is the size of the droplets created by the sprayer nozzles.

Knowing this parameter is very important: small drops borne in the air being able to change direction are necessary in order to cover the leaves on both sides of the vegetable mass. Small drops mean low volume mix per hectare and hence wider, more homogenous and persistent coverage. Fine drops (100-200 µm) adhere well to inclined surfaces, while coarse drops (400-500 µm) tend to separate, remove the product and create leaks to the ground.

Ultra-fine drops (< 50 µm) tend to be removed by light air currents.

The size of the drops is reduced with:

- wider aspersion angle;
- smaller nozzles (lower capacity);
- higher pressure.

If nozzles with fine jets are used, the leaf surface covered by the plant protection product can be increased remarkably.

Limit losses to the widest extent

The losses of plant protection product are mainly caused by:

- loss in the atmosphere caused by drift and evaporation of drops smaller than 100 µm;
- ground losses by dripping;
- Lack of homogeneity in the treatment caused by a wrong position or adjustment of the nozzles and conveyors;

- Lack of homogeneity in the treatment caused by the different concentration when the tank is emptied when paste or wettable powdery products are used;
- Lack of homogeneity in the treatment concerning the lack of proportionality between the forward speed and the capacity of the sprayers;
- Dosing errors in the preparation of the mix;
- Sprayer washing after the treatment.

Efficacy of the nozzles

Always make sure that the machine is equipped with nozzles that can create a fine and homogenous jet and that are in perfect working conditions.

Efficacy and direction of the air jet

The machine can be equipped with an air jet facing the area to be treated (Airassisted).

SPRAYING PARAMETER SETTING

Parameter setting is carried out according to the tractor forward speed (which is chosen considering the ground conditions), the quantity of product to spray in litre per hectare (see instructions printed on the box) and the type of nozzle used.

These parameters will help work out the working pressure by looking at the data indicated in the distribution table placed on the tank.

The table below is only for reference and is given as an example of how to look for the right values.

Distribution table

	ISO	bar	l/min	4 km/h	5 km/h	6 km/h	7 km/h	8 km/h	9 km/h	10 km/h	12 km/h	14 km/h	16 km/h	18 km/h	20 km/h
Yellow	11002	1,5	0,56	168	134	112	96	84	75	67	56	48	42	37	34
		2	0,66	198	158	132	113	99	88	79	66	57	50	44	40
		3	0,8	240	192	160	137	120	107	96	80	69	60	53	48
		4	0,91	273	218	182	156	137	121	109	91	78	68	61	55
		5	1,02	306	245	204	175	153	136	122	102	87	77	68	61
Blue	11003	1,5	0,85	255	204	170	146	128	113	102	85	73	64	57	51
		2	0,98	294	235	196	168	147	131	118	98	84	74	65	59
		3	1,2	360	288	240	206	180	160	120	120	103	90	80	72
		4	1,39	417	334	278	238	209	185	139	139	119	104	93	83
		5	1,55	465	372	310	268	233	207	155	155	133	116	103	93
Red	11004	1,5	1,13	339	271	226	194	170	151	136	113	97	85	75	68
		2	1,31	393	314	262	225	197	175	157	131	112	98	87	79
		3	1,6	480	384	320	274	240	213	192	160	137	120	107	96
		4	1,85	555	444	370	317	278	247	222	185	159	139	123	111
		5	2,07	621	497	414	355	311	276	248	207	177	155	138	124

Example of value search

Quantity to spray indicated on the product....151 litres per hectare (l/ha)
 Forward speed 9 km/h
 Nozzlered type 11004

The use of these values (see highlighted part of the table) will allow you to work out the correct pressure to apply, which, in this case, is 1.5 bars.



Important

The working pressure must always remain between 1.5 and 5 bars.

If the calculated pressure value is not included in the range indicated above, change the forward speed value or the type of nozzle used. Carry out a spraying test with clean water to check if the adjustment is correct.

FORWARD SPEED DURING SPRAYING

Calculate the forward speed as follows:

- 1 - determine the correct forward speed, according to the number of revolutions of the tractor engine over a short distance;

- 2 - drive on a previously marked 100m strip, at a chosen speed and with a constant engine rpm, taking care to note the time elapsed in seconds;
- 3 - look at the speed control table to know the forward speed reached according to the time elapsed.

Speed control table

Speed (km/h)	4	5	6	7	8	10	12
Time x 100 m (sec.)	90	72	60	51	45	36	30



NOZZLE SPRAY CHECK

After product spray parameters have been set, it is necessary to check that the value of the quantity sprayed matches that of the table.

Nozzle spraying test (l/min)

- 1 - Place a graduated container under a nozzle spraying clean water for exactly one minute at the preset pressure.
- 2 - Check that the quantity in the container matches the value indicated in the distribution table.
- 3 - Repeat this procedure on three or four nozzles.

Spraying test - litres per hectare (l/ha)

This is checked by carrying out a spray test using clean water on a 100m strip as follows:

- 1 - set the values for forward speed and working pressure (see "Spraying parameter setting" page 11);
- 2 - fill the tank completely;
- 3 - spray water with the boom unfolded on the 100-meter distance;
- 4 - fill the tank, paying careful attention to the number of litres used;
- 5 - in the distribution table, check that for the 100-meter test the value indicated in the space relevant to the quantity of product to spray (e.g. 200 l/h) and the boom length (e.g. 10 m) matches the number of litres used.

Measurement with “nozzle tester” (upon request)

- 1 - Connect tester (A) with adapter (B) to the central nozzle of every boom section.
- 2 - Read the quantity of l/m by means of the graduated scale.
- 3 - In the distribution table, check that for the 100-meter test the value indicated matches the number of litres used.

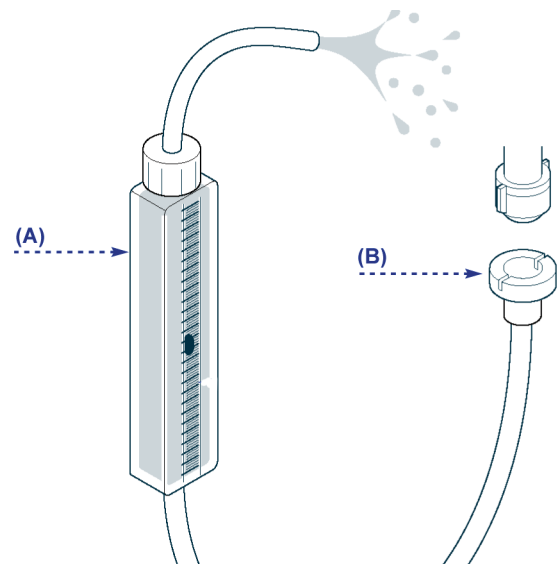


Table for spraying test carried out on a hundred meters

Quantity of product to spray in l/ha	boom lenght (m)												litresx100 m
	6	8	10	12	12,5	14	15	16	18	20	21	24	
100	6	8	10	12	12,5	14	15	16	18	20	21	24	
150	9	12	15	18	18,5	21	22,5	24	27	30	31,5	36	
200	12	16	20	24	25	28	30	32	36	40	42	48	
300	18	24	30	36	37,5	42	45	48	54	60	63	72	
400	24	32	40	48	50	56	60	64	72	80	84	96	
500	30	40	50	60	62,5	70	75	80	90	100	105	120	
600	36	48	60	72	75	84	90	96	108	120	126	144	

Quantity of product to spray in l/ha water would be five times the value shown in the table.
 If the test is carried out on a 500-meter distance, more accurate results will be obtained, but the quantity of

Formula to check the quantity of liquid sprayed - litres per hectare (l/ha)

$$\text{Quantity sprayed (l/ha)} = \frac{\text{Liquid per nozzle (l/min)} \times \text{constant 600}}{\text{Jet spacing (0.5 m)} \times \text{speed km/h}}$$

This formula can also be transformed to determine the required forward speed or the liquid quantity per nozzle.

$$\text{Speed km/h} = \frac{\text{Liquid per nozzle (l/min)} \times \text{constant 600}}{\text{Quantity sprayed (l/ha)} \times \text{jet spacing}}$$

$$\text{Liquid per nozzle l/min} = \frac{\text{Quantity sprayed (l/ha)} \times \text{jet spacing} \times \text{speed km/h}}{\text{Constant 600}}$$

CHEMICAL PRODUCT PREPARATION



Caution - Warning

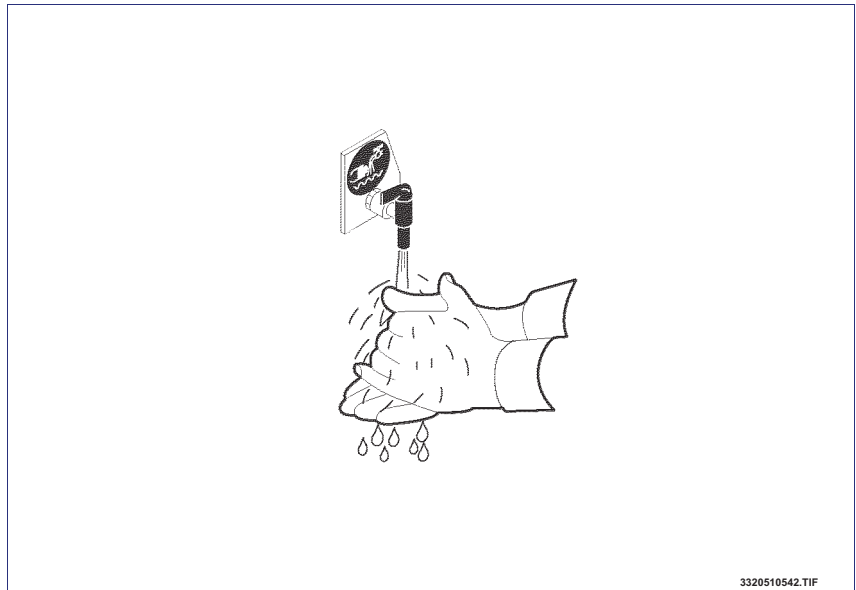
The use of products not specifically authorized for herbaceous crops is not allowed.

Thoroughly read the instructions and warnings on the use of chemicals specified by the manufacturer on the container.

Before handling the product, follow all the recommendations that aim at avoiding danger and risk of contamination to people, pets and the environment.

In particular:

- Wear protective clothing to avoid direct contact with parts of the body, especially in the presence of wounds.
- Wear personal protection equipment, such as rubber gloves, half-mask respirator, goggles and helmet, to protect head, face and hands.
- Do not use personal protection equipment that is not in perfect condition; in particular, check state of the filters fitted on the safety mask and cab.
- Keep chemicals out of the reach of unauthorized or unqualified people (such as children and disabled persons).
- Have all the equipment ready beforehand to handle both product and mixture for the following stages: preparation, filling, emptying, tank cleaning, spraying, adjustment, replacement, phytosanitary product change and add, and maintenance.
- Calculate the correct quantity to mix for the area to be worked and keep to phytosanitary product man-



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ufacturer's instructions. Do not mix different products.

- Should the chemical products or mixture come into contact with the skin accidentally, rinse immediately with clean water. If you do not feel well after using the product, seek immediate medical attention, presenting the product label.



Caution - Warning

Do not dispose of the product, mixture or other polluting materials in the environment. Dispose of them according to the local regulations in force.

LONG PERIOD OF INACTIVITY



Caution - Warning

Position the machine in a place protected from weather agents. Protect it in order to prevent it from being damaged and make sure that it can be accessed only by its operators. Make sure that the storage temperature is included between 0 °C and 50 °C.

- 1 - Perform scheduled maintenance
- 2 - Clean the water system thoroughly.
- 3 - Carefully clean all the equipment.
- 4 - Carefully empty all the tanks and tubes in order to prevent the components from breaking in case of

RE-COMMISSIONING

Before the machine is used again, after it has been inactive for a long period of time, the main components should be closely inspected to ensure that they are in perfect working order.

- 1 - Grease all the components provided with a grease nipple (see "Lubrication points diagram" Booklet 4B).
- 2 - Check overall condition of the equipment.
- 3 - Check that the controls are in working order.
- 4 - Check that main screws are fastened tightly.
- 5 - Check the efficiency of all safety devices.
- 6 - Check and replace worn or damaged parts.

very low temperatures (pump, control unit, filters, tubes, etc.).


- 5 - Disconnect the pipes from the pressure gauges and disassemble the filters. In case of extremely low temperatures pour a mix of water and anti-freeze liquid into the spraying circuit in order to protect the pump and all the other components in contact with the liquid (control units, nozzles and filters).
- 6 - Apply an anti-rust treatment on all non-painted parts;
- 7 - Grease all the components provided with a grease nipple.
- 7 - Check and reset the oil level in the pump, if necessary.
- 8 - Check any liquid leaks. For this purpose, pour clean water and start the spraying unit of the machine at its maximum pressure (10÷12 bar). If necessary, tighten all the hose clamps and joints and replace the worn parts.
- 9 - Make sure that the suction filter and the tank inside are clean and free from residues.
- 10- Check the correct operation of the pressure gauges because the quantity of the sprayed product depends on the correct pressure in the circuit.

INFORMATION ABOUT MAINTENANCE

MAINTENANCE INSTRUCTIONS

All maintenance work, except when otherwise stated, must be conducted while the engine is off, and with the key totally removed. Those authorised to carry out maintenance work must take all precautions to ensure the safety of all persons involved, in compliance with the requirements of current legislation pertaining to safety in the workplace. Replace worn components with original spare parts. Use oils and greases recommended by the manufacturer. This will ensure proper and safe running of the equipment. Pollutant liquids, old parts, residue substances and maintenance

rejects must be properly disposed of in compliance with current legislation.

 **Important**
Maintenance operations should be carried out after the inside and outside of the apparatus have been washed to remove product residue. These residues are highly inflammable, especially when welding. When welding is needed, disconnect the electric connector on the tractor and the electrical controls.

MAINTENANCE SCHEDULE TABLE

Interval	Component	Type of intervention	Operation	Reference
Each treatment	Suction filter	Cleaning		See 4B booklet.
	System washing and hand washing tank water level	Level check	Fill before starting a new treatment	See 4B booklet.
Each 4 emptying operations of the tank	Delivery filter	Cleaning		See 4B booklet.
Each working day	The whole equipment	Cleaning		See page 17
		Check	Check screw integrity and tightening.	
Every 40 hours	The whole equipment	Check	Touch up the damaged painted parts.	
		Check	Check the sliding surfaces. Grease if necessary	
Every 6 years and whenever damaged.	Hydraulic system pipes	Replace.		

ROUTINE CHECKS

Every month (if the equipment is used regularly) and at the beginning of every season, make the following checks:

- 1 - Check the sealing of all water system components while keeping the maximum working pressure.
- 2 - Check that the suction system works properly (pump suction hoses and control unit).

- 3 - Check that the devices affecting product distribution work properly (odometer, nozzles, flow meters and pressure gauges).

Every year, or at the intervals established by local regulations, perform the following checks:

Carry out a general inspection of the equipment and, in particular, contact the nearest authorized centre to have the product distribution system checked.

EQUIPMENT CLEANING



Caution - Warning

The equipment must be cleaned thoroughly at the end of each working day. Wear personal protection equipment, (rubber gloves, boots, goggles etc.), to avoid all contact with the product. Never leave chemical residues on the equipment. Special care should be taken to avoid polluting waterways and ground-water with chemical liquids. Product containers must be properly disposed of in compliance with current legislation. Keep product and/or residues out of reach of children.

Proceed as follows for spraying:

- 1 - Clean the system and drain the residue.
- 2 - Wash the Mixer and pipes (see Mixer booklet).
- 3 - Clean the delivery filter placed on the water control unit (if fitted).
- 4 - Clean the outside walls of the tank with a strong jet of water (use a high-pressure device).



Important

To avoid damage, do not direct water at electrical parts. When the equipment is fitted with an additional clear water tank, clean the system each time spraying is stopped for more than one hour.

UNSCHEDULED MAINTENANCE

Although the equipment is conceived and manufactured to work in very harsh weather conditions, it is necessary, after a few years of use, to carry out the foreseen unscheduled maintenance to keep it in good condition and safeguard the users' safety.

This kind of operation must be carried out by skilled and specialized technicians, at adequately equipped garages.



Caution - Warning

Before all unscheduled maintenance, empty the tank completely and deactivate all electrical/ electronic devices and the battery connection. Do not weld near flammable materials or electric and electronic components.

POLYETHYLENE TANK REPAIR

- 1 - Carefully clean the area near the break with a solvent.
- 2 - Using a cutter cut into the tank so that a V-shaped slot is made along the break. This slot is used for the material that will be melted for the repair.
- 3 - Put the rod next to the break and start heating with a hot air sealer (temperature of 400°C ÷ 450°C) until the rod starts melting. Follow this procedure along the length of the break.
- 4 - In order to make sure that the material is perfectly glued, the sides around the break must also achieve a temperature close to melting. Turn the rod during repair so that the melted material is removed.
- 5 - Repeat the same operation until the V-shaped slot around the break is totally filled with new material.

TROUBLESHOOTING

TROUBLES, CAUSES, REMEDIES

Troubles	Cause	Remedy
The pump does not pressurize control unit.	Suction filter clogged.	Disassemble filter and clean cartridge.
	Control unit pressurized filter partly clogged.	Disassemble filter and clean cartridge.
	Air intake in the pump intake circuit.	Check sealing of pump intake circuit couplings.
	One or more pump valves do not seal correctly.	Check valve seats and clean.
The pump pressurizes the control unit, but nozzle spraying is not constant.	Worn valves.	Replace valves and relevant seats, if necessary.
	Clogged line filters (if fitted).	Disassemble filters and clean cartridge.
	Clogged nozzles.	Disassemble nozzles and clean (use a soft bristle brush).
	Possible pipe clogging due to foreign matter.	Disassemble coupling and check that seals are in their seats. Blow air into the pipes.
The tank-filling device does not work.	Possible clogging of delivery PVC pipes due to their bending.	Bring the pipe BACK to its normal bending or replace the pipe.
	Air suction from tank-filling hose or 3-way valve (if fitted).	Check sealing of couplings on hose or 3-way valve, and check clamp tightening.
	One or more pump valves do not seal correctly.	Check valve seats and clean.
Control unit pressure gauge pointer moves in a jointing manner.	Suction filter is partly clogged.	Disassemble filter and clean cartridge.
	Air suction from pump.	Check sealing on intake circuit and clamp tightening.
	Pressure gauge is defective.	Replace pressure gauge.
	Inner tube is flat.	Check inner tube pressure (1/3 of working pressure).
The pump is noisy.	It sucks air.	Check sealing of intake circuit.
	Intake and/or delivery valve springs damaged.	Replace springs (see pump manual).
Pump tank oil has gone white or is leaking out.	One or more membranes are broken.	Disassemble the pump and heads. Replace all diaphragms after thoroughly washing the pump with fuel oil or diluent. Bring the oil back up to level (see pump manual).

INFORMATION ABOUT REPLACEMENTS

INSTRUCTIONS ON COMPONENT PART REPLACEMENT

Prior to any maintenance operation, enable all safety devices and consider whether it is necessary to properly inform the operator and the nearby staff. In particular, properly mark the surrounding areas and prevent anyone from accessing all those devices that, if activated, may cause unexpected risks to equipment safety and personal health.

If worn components must be replaced, use original parts only. The manufacturer cannot be held responsi-

ble for damages to persons or components arising from the use of non-original parts or for unscheduled maintenance that may modify the equipment safety requirements without the manufacturer's prior authorization.

To order spare parts, follow the instructions provided in the relevant catalogue.

DISPOSING OF THE EQUIPMENT

This operation must be made by expert operators, in the respect of safety norms on work and waste disposal. In order to avoid any injury to operators and the people nearby, do not leave the tools unattended in the working areas.

Before discarding the equipment, carefully clean it by washing it inside and outside.

The discharge of the washing residues to the environment without precautions is forbidden as it pollutes the water of the aquifers.

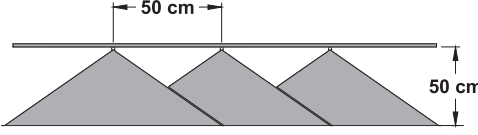

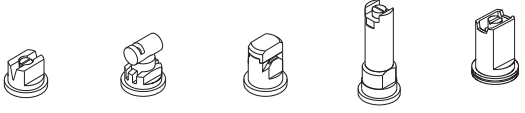




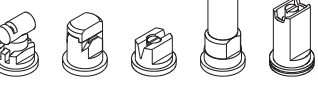
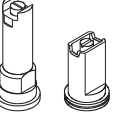




Do not throw away non-biodegradable products, such as lubricant oils, batteries and non-iron components (foam, PVC, resins etc.). These products must be disposed in the respect of environment protection laws.

Before giving the tools to the authorised personnel (waste collectors or dischargers), it is absolutely necessary to deposit the tools in zones closed to non-authorised personnel.

The used oil must be suitably recovered and must not be discharged to the environment. According to the current regulations, used oil is classified as hazardous waste material and as such it must be sent to the special collection centres.

The parts made up only of plastic, aluminium and steel can be recycled provided that they are collected by the special centres.

NOZZLE TABLE

																	
				bar		l/ha											
Ugelli Nozzle / Buses / Düsen				4	5	6	7	8	10	12	16	18	20	25	30	35	
		l/min	km/h	km/h	km/h	km/h	km/h	km/h	km/h	km/h	km/h	km/h	km/h	km/h	km/h	km/h	
 01 Arancione Orange Orange Orange	1,0	0,23	69,0	55,2	46,0	39,4	34,5	27,6	23,0	17,3	15,3	13,8	11,0	9,2	7,9		
	2,0	0,32	96,0	76,8	64,0	54,9	48,0	38,4	32,0	24,0	21,3	19,2	15,4	12,8	11,0		
	3,0	0,39	117	93,6	78,0	66,9	58,5	46,8	39,0	29,3	26,0	23,4	18,7	15,6	13,4		
	4,0	0,45	135	108	90,0	77,1	67,5	54,0	45,0	33,8	30,0	27,0	21,6	18,0	15,4		
	5,0	0,50	150	120	100	85,7	75,0	60,0	50,0	37,5	33,3	30,0	24,0	20,0	17,1		
	6,0	0,55	165	132	110	94,3	82,5	66,0	55,0	41,3	36,7	33,0	26,4	22,0	18,9		
 015 Verde Green Vert Grün	1,0	0,34	102	81,6	68,0	58,3	51,0	40,8	34,0	25,5	22,7	20,4	16,3	13,6	11,7		
	2,0	0,48	144	115	96,0	82,3	72,0	57,6	48,0	36,0	32,0	28,8	23,0	19,2	16,5		
	3,0	0,59	177	142	118	101	88,5	70,8	59,0	44,3	39,3	35,4	28,3	23,6	20,2		
	4,0	0,68	204	163	136	117	102	81,6	68,0	51,0	45,3	40,8	32,6	27,2	23,3		
	5,0	0,76	228	182	152	130	114	91,2	76,0	57,0	50,7	45,6	36,5	30,4	26,1		
	6,0	0,83	249	199	166	142	125	99,6	83,0	62,3	55,3	49,8	39,8	33,2	28,5		
	7,0	0,90	270	216	180	154	135	108	90,0	67,5	60,0	54,0	43,2	36,0	30,9		
	8,0	0,96	288	230	192	165	144	115	96,0	72,0	64,0	57,6	46,1	38,4	32,9		
 02 Giallo Yellow Jaune Gelb	1,0	0,46	138	110	92,0	78,9	69,0	55,2	46,0	34,5	30,7	27,6	22,1	18,4	15,8		
	2,0	0,65	195	156	130	111	97,5	78,0	65,0	48,8	43,3	39,0	31,2	26,0	22,3		
	3,0	0,79	237	190	158	135	119	94,8	79,0	59,3	52,7	47,4	37,9	31,6	27,1		
	4,0	0,91	273	218	182	156	137	109	91,0	68,3	60,7	54,6	43,7	36,4	31,2		
	5,0	1,02	306	245	204	175	153	122	102	76,5	68,0	61,2	49,0	40,8	35,0		
	6,0	1,12	336	269	224	192	168	134	112	84,0	74,7	67,2	53,8	44,8	38,4		
	7,0	1,21	363	290	242	207	182	145	121	90,8	80,7	72,6	58,1	48,4	41,5		
	8,0	1,29	387	310	258	221	194	155	129	96,8	86,0	77,4	61,9	51,6	44,2		
 025	2,0	0,81	243	194	162	139	122	97,2	81,0	60,8	54,0	48,6	38,9	32,4	27,8		
	3,0	0,99	297	238	198	170	149	119	99,0	74,3	66,0	59,4	47,5	39,6	33,9		
	4,0	1,14	342	274	228	195	171	137	114	85,5	76,0	68,4	54,7	45,6	39,1		
	5,0	1,28	384	307	256	219	192	154	128	96	85,3	76,8	61,4	51,2	43,9		
	6,0	1,40	420	336	280	240	210	168	140	105	93,3	84	67,2	56,0	48,0		
	7,0	1,51	453	362	302	259	227	181	151	113	101	90,6	72,5	60,4	51,8		
 03 Blu Blue Bleu Blau	1,0	0,68	204	163	136	117	102	81,6	68	51	45,3	40,8	32,6	27,2	23,3		
	2,0	0,96	288	230	192	165	144	115	96	72	64,0	57,6	46,1	38,4	32,9		
	3,0	1,18	354	283	236	202	177	142	118	88,5	78,7	70,8	56,6	47,2	40,5		
	4,0	1,36	408	326	272	233	204	163	136	102	90,7	81,6	65,3	54,4	46,6		
	5,0	1,52	456	365	304	261	228	182	152	114	101	91,2	73,0	60,8	52,1		
	6,0	1,67	501	401	334	286	251	200	167	125	111	100	80,2	66,8	57,3		
	7,0	1,80	540	432	360	309	270	216	180	135	120	108	86,4	72,0	61,7		
	8,0	1,93	579	463	386	331	290	232	193	145	129	116	92,6	77,2	66,2		
 04 Rosso Red Rouge Rot	1,0	0,91	273	218	182	156	137	109	91,0	68,3	60,7	54,6	43,7	36,4	31,2		
	2,0	1,29	387	310	258	221	194	155	129	96,8	86,0	77,4	61,9	51,6	44,2		
	3,0	1,58	474	379	316	271	237	190	158	119	105	94,8	75,8	63,2	54,2		
	4,0	1,82	546	437	364	312	273	218	182	137	121	109	87,4	72,8	62,4		
	5,0	2,04	612	490	408	350	306	245	204	153	136	122	97,9	81,6	69,9		
	6,0	2,23	669	535	446	382	335	268	223	167	149	134	107	89,2	76,5		
	7,0	2,41	723	578	482	413	362	289	241	181	161	145	116	96,4	82,6		
	8,0	2,58	774	619	516	442	387	310	258	194	172	155	124	103	88,5		
 05 Marrone Brown Marron Braun	1,0	1,14	342	274	228	195	171	137	114	85,5	76	68,4	54,7	45,6	39,1		
	2,0	1,61	483	386	322	276	242	193	161	121	107	96,6	77,3	64,4	55,2		
	3,0	1,97	591	473	394	338	296	236	197	148	131	118	94,6	78,8	67,5		
	4,0	2,27	681	545	454	389	341	272	227	170	151	136	109	90,8	77,8		
	5,0	2,54	762	610	508	435	381	305	254	191	169	152	122	102	87,1		
	6,0	2,79	837	670	558	478	419	335	279	209	186	167	134	112	95,7		
	7,0	3,01	903	722	602	516	452	361	301	226	201	181	144	120	103		
	8,0	3,22	966	773	644	552	483	386	322	242	215	193	155	129	110		
 06 Grigio Grey Gris Grau	1,0	1,37	411	329	274	235	206	164	137	103	91,3	82,2	65,8	54,8	47,0		
	2,0	1,94	582	466	388	333	291	233	194	146	129	116	93,1	77,6	66,5		
	3,0	2,37	711	569	474	406	356	284	237	178	158	142	114	94,8	81,3		
	4,0	2,74	822	658	548	470	411	329	274	206	183	164	132	110	93,9		
	5,0	3,06	918	734	612	525	459	367	306	230	204	184	147	122	105		
	6,0	3,35	1005	804	670	574	503	402	335	251	223	201	161	134	115		
	7,0	3,62	1086	869	724	621	543	434	362	272	241	217	174	145	124		
	8,0	3,87	1161	929	774	663	581	464	387	290	258	232	186	155	133		

					XR / LU 1,5 - 5,5 bar		TT 1,5 - 6 bar		TJ 2 - 4 bar		AI / ID 2 - 8 bar		AIRMIX 1,5 - 6 bar		
Ugelli Nozzle / Buses / Düsen	bar 	l/min	l/ha												
			4 km/h	5 km/h	6 km/h	7 km/h	8 km/h	10 km/h	12 km/h	16 km/h	18 km/h	20 km/h	25 km/h	30 km/h	35 km/h
08 Bianco White Blanc Weiss	1,0	1,82	546	437	364	312	273	218	182	137	121	109	87,4	72,8	62,4
	2,0	2,58	774	619	516	442	387	310	258	194	172	155	124	103	88,5
	3,0	3,16	948	758	632	542	474	379	316	237	211	190	152	126	108
	4,0	3,65	1095	876	730	626	548	438	365	274	243	219	175	146	125
	5,0	4,08	1224	979	816	699	612	490	408	306	272	245	196	163	140
	6,0	4,47	1341	1073	894	766	671	536	447	335	298	268	215	179	153
	7,0	4,83	1449	1159	966	828	725	580	483	362	322	290	232	193	166
	8,0	5,16	1548	1238	1032	885	774	619	516	387	344	310	248	206	177
10	1,0	2,28	684	547	456	391	342	274	228	171	152	137	109	91,2	78,2
	2,0	3,23	969	775	646	554	485	388	323	242	215	194	155	129	111
	3,0	3,95	1185	948	790	677	593	474	395	296	263	237	190	158	135
	4,0	4,56	1368	1094	912	782	684	547	456	342	304	274	219	182	156
	5,0	5,10	1530	1224	1020	874	765	612	510	383	340	306	245	204	175
	6,0	5,59	1677	1342	1118	958	839	671	559	419	373	335	268	224	192
	7,0	6,03	1809	1447	1206	1034	905	724	603	452	402	362	289	241	207
	8,0	6,45	1935	1548	1290	1106	968	774	645	484	430	387	310	258	221
15	1,0	3,42	1026	821	684	586	513	410	342	257	228	205	164	137	117
	2,0	4,83	1449	1159	966	828	725	580	483	362	322	290	232	193	166
	3,0	5,92	1776	1421	1184	1015	888	710	592	444	395	355	284	237	203
20	1,0	4,56	1368	1094	912	782	684	547	456	342	304	274	219	182	156
	2,0	6,44	1932	1546	1288	1104	966	773	644	483	429	386	309	258	221
	3,0	7,89	2367	1894	1578	1353	1184	1052	789	592	526	473	379	316	271
	4,0	9,11	2733	2186	1822	1562	1367	1093	911	683	607	547	437	364	312

MOUNTED UNIT

user manual

Serial number

Edition 4
09 - 2013**TABLE OF CONTENTS**

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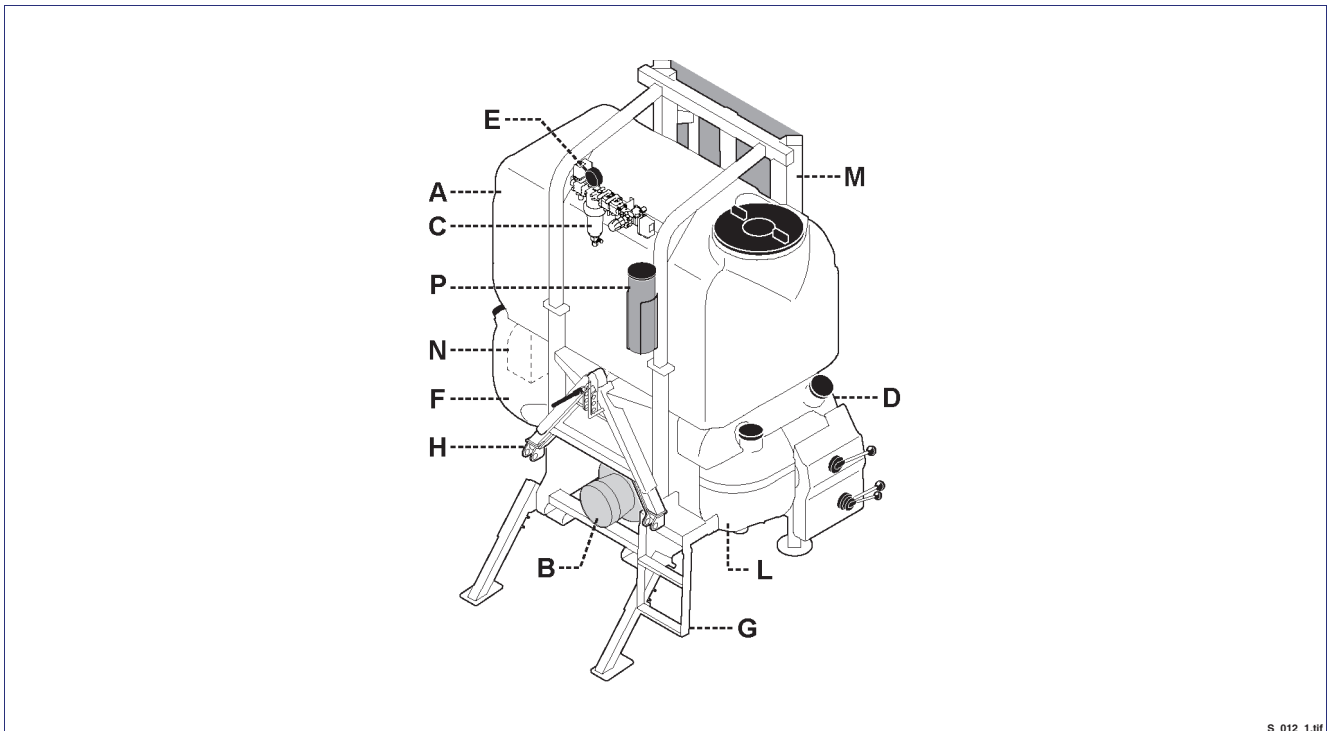
IMPORTANT SAFETY NOTE

The information published in this booklet regards the pointed out with relevant symbols in order to safeguard operational aspects of the operator unit installed on the people from risks. Remember that prudence is irreplaceable. machine. It is however necessary that you

carefully read the Safety is also in the hands of all the operators who interact general safety regulations published in Booklet 1 and those with the machine.

TECHNICAL INFORMATION

MAIN COMPONENTS



S_012_1.tif

- A) Spray product tank.
- B) Pump.
- C) Water control unit
- D) Clean water tank for hand washing.
- E) Pressure gauge to measure the working pressure
- F) Clean water tank for system washing.
- G) Platform for getting on the sprayer
- H) Automatic connection to the tractor
- L) Mixer
- M) Boom lifting device
- N) Container for clothes
- P) Document container: for the use and maintenance manual and for the document showing the name of the plant protection product contained in the tank

Information concerning components that is not included in this manual is detailed in the relevant instruction manuals.

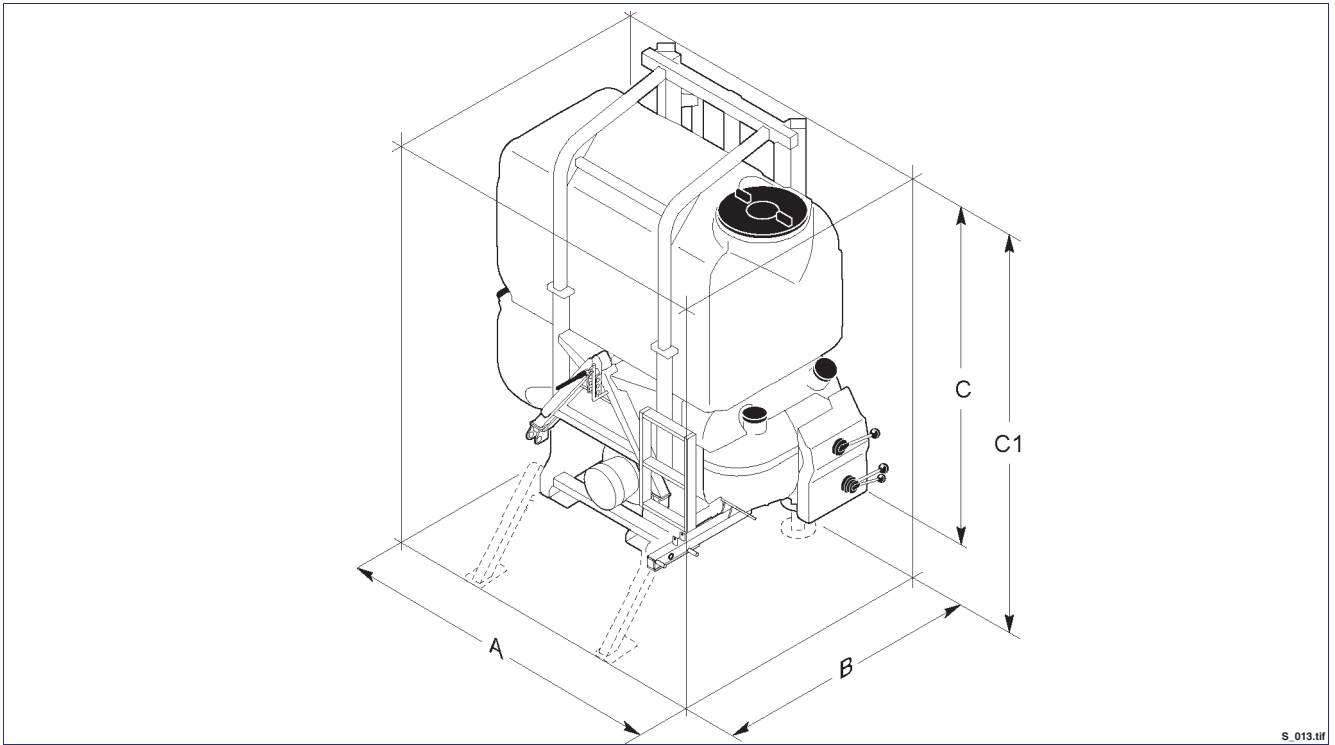
The information about the components that is not included in this manual is detailed in the relevant instruction manuals.

TECHNICAL SPECIFICATIONS

Models vary according to drawbar type and tank size.

Residual volume


The liquid volume that cannot be properly distributed (technical residue) does not exceed 0.5% of nominal volume plus 2 litres per boom meter.



S_013.tif

Model (Lt)	Capacity (Lt)	Size				Weight (kg)
1100	1000	1900	1300	2260	2600	950
1300	1200	1900	1300	2260	2600	965
1600	1500	1900	1300	2260	2600	985

Pump nominal capacity table (540 rpm)


	<i>Annovi Reverberi</i>	<i>Comet</i>
130/20	AR 135 bp 110 l/min	BP 125 110 l/min
160/20	AR 160 bp 145 l/min	BP 151 135 l/min
180/20	AR 185 bp 170 l/min	BP 171 155 l/min
250/20	AR 250 bp 240 l/min	BP 235 215 l/min

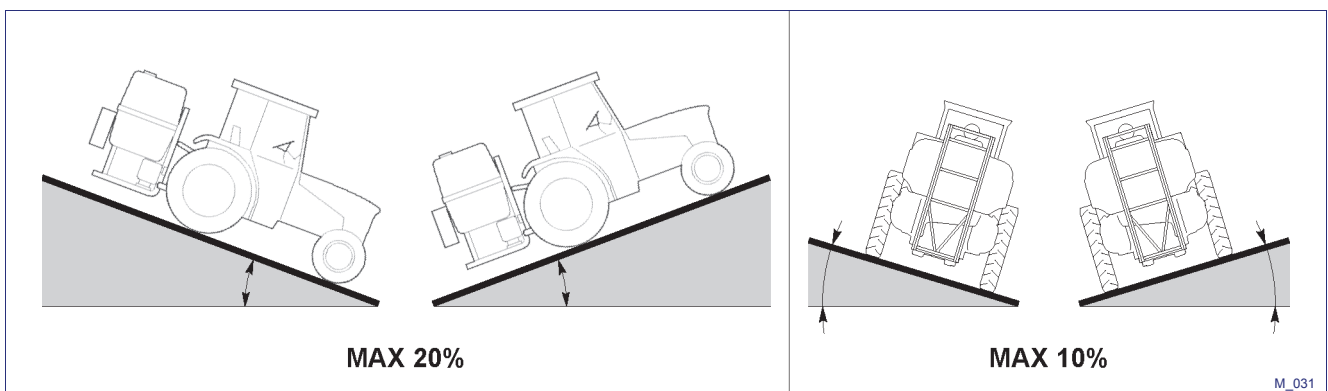
NOISE LEVEL

The equivalent pondered sound pressure level (Lpa) detected outside the equipment is below the legal limits.

ALLOWABLE SLOPES

The figure illustrates the maximum allowable slope on non-yielding, non-sagging land with the machine in operation and fully loaded.

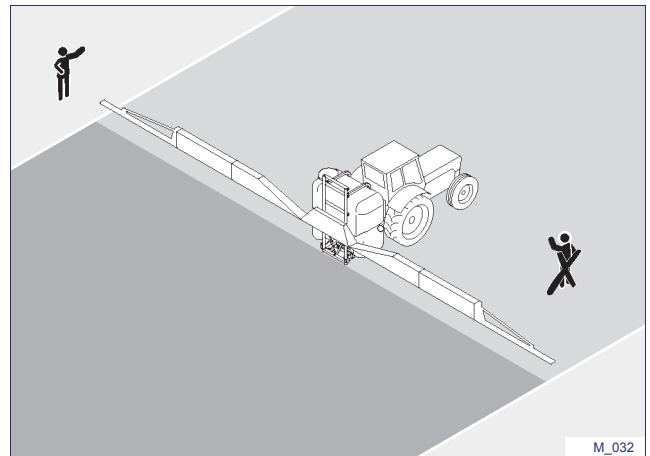
 **Important**
Read carefully the tractor use and maintenance manual; in case of more severe conditions follow the instructions of the tractor manufacturer.



M_031

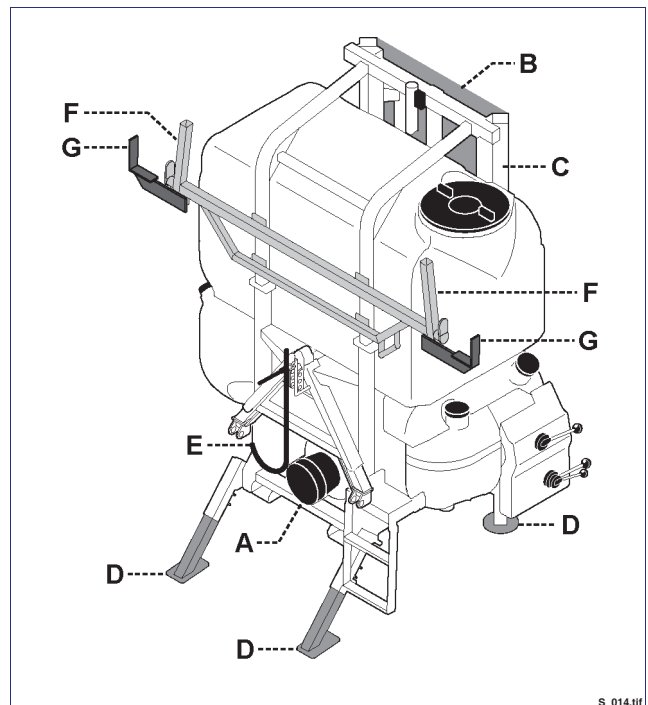
DANGER ZONE

The figure illustrates the danger zones where no-one should be when the machine is in use. It is the operator's duty to keep such zones out of bounds; if necessary, (s)he should turn the engine off and clear out the danger zone.



SAFETY DEVICES

- A) **Cardan shaft guard:** to avoid entanglement with parts of the body.
- B) **Stop valve:** device preventing the boom from dropping suddenly in the event of a leak in the hydraulic hose.
- C) **Fixed guard:** sliding frame protection.
- D) **Sprayer anti-overturn protection foot:** to avoid the overturn risk of the sprayer when it is disconnected from the tractor.
- E) **Cardan shaft support:** to support the shaft while disconnected from power take-off.
- F) **Arm mount for spraying boom:** to avoid accidental movement, used to lock boom in place during road transfer.
- G) **Extension opening blocking;** prevents the unintentional opening of the boom extensions during road circulation.



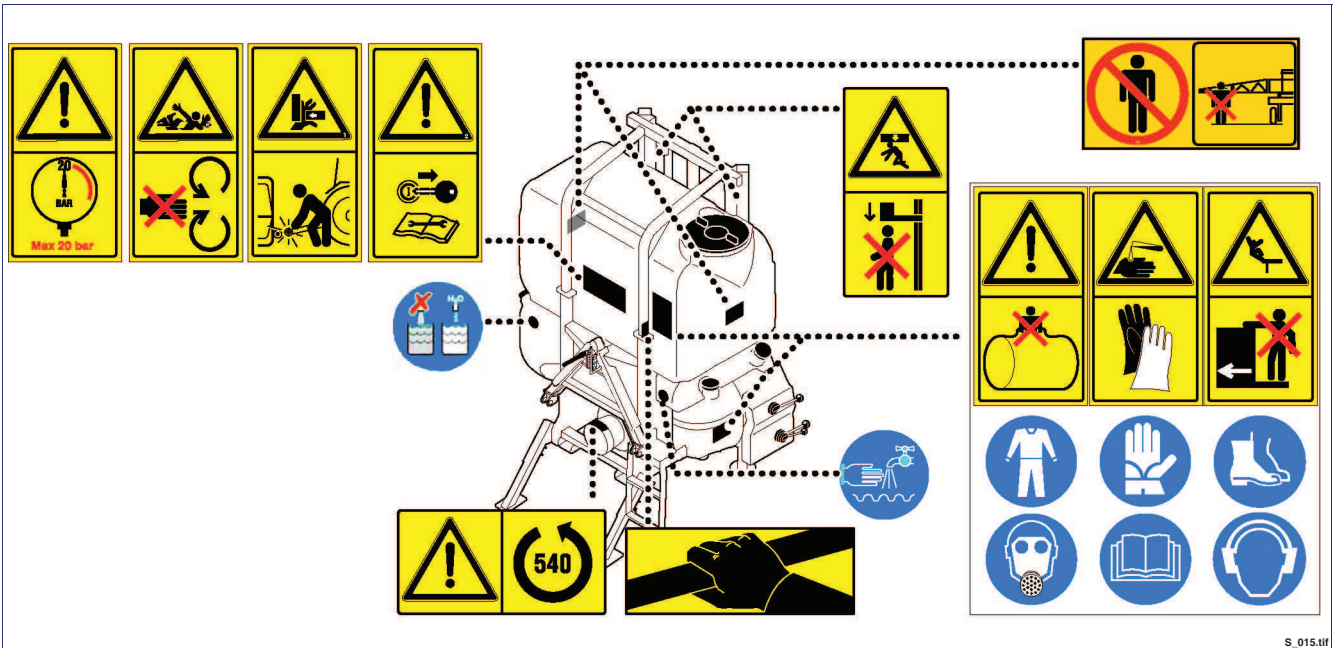
Caution - Warning

Check daily that all safety devices are correctly installed and in working order.

POSITION OF SIGNALS

The figure shows the location of all safety plates, while their meaning is explained in booklet 1.

i Important
Make sure that all plates are legible. If they are not, clean or replace, if necessary, ensuring the new ones are placed in the original position.



INFORMATION ABOUT HANDLING AND INSTALLATION

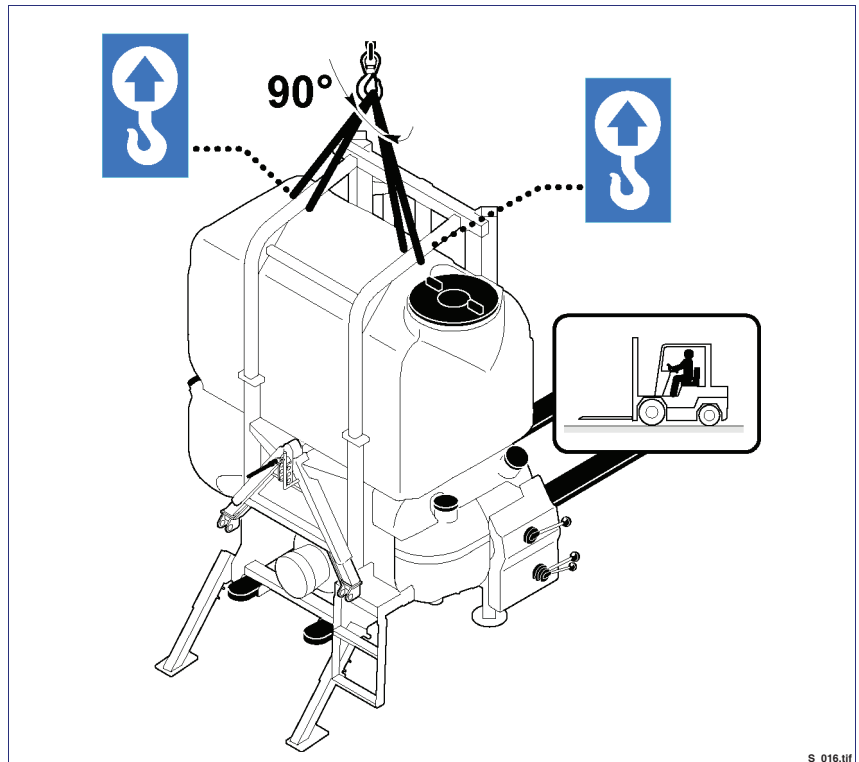
TRANSPORTING

Loading and transporting can be carried out in different ways, according to the destination. In all cases the equipment must not be packaged.

LOADING AND UNLOADING

! Danger - Warning
 Lifting and handling must be carried out with the tank empty and using appropriate equipment, by skilled staff specialized in this kind of operation.

- 1 - Prepare a lifting hook with an adequate loading capacity and connect as shown in the figure below.
- 2 - Lift slowly, move very gently and avoid all swinging.
- 3 - Load onto the vehicle and secure using ropes and chocks.



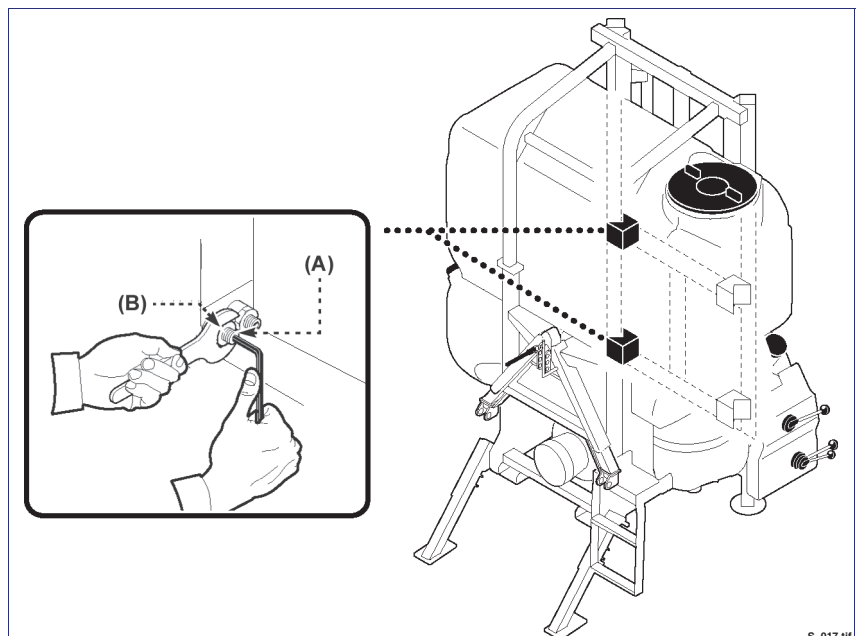
S_016.tif

INFORMATION ABOUT ADJUSTMENTS

ADJUSTMENT OF THE SLIDING GUIDES

Proceed as follows:

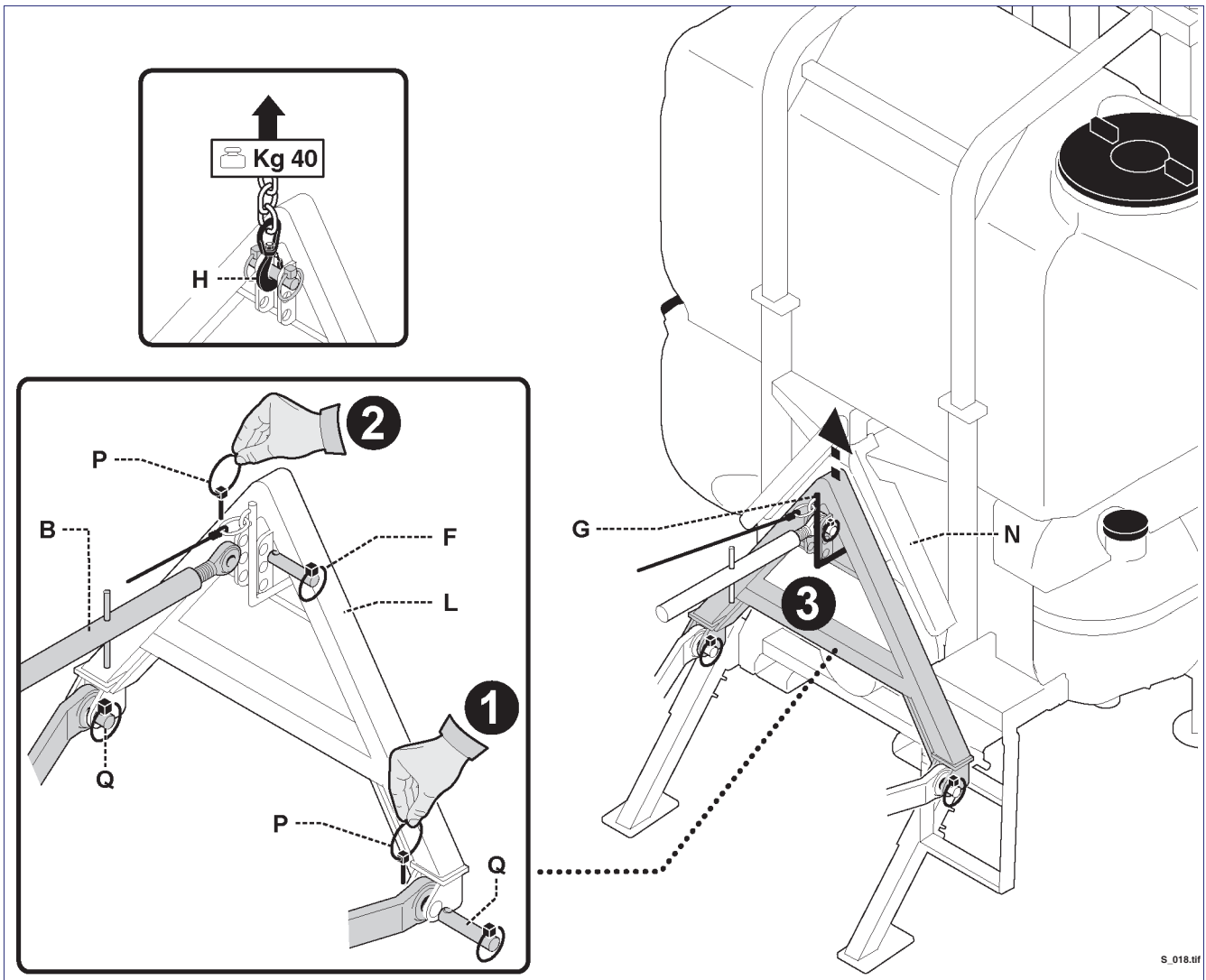
- 1 - Loosen lock nut (B).
- 2 - Adjust adjusting screw (A) to regulate the guides until you obtain a regular sliding with no excessive play.
- 3 - Tighten the lock nut (B) when the operation is completed.



S_017.tif

INFORMATION ABOUT USE

CONNECTING THE EQUIPMENT TO TRACTOR



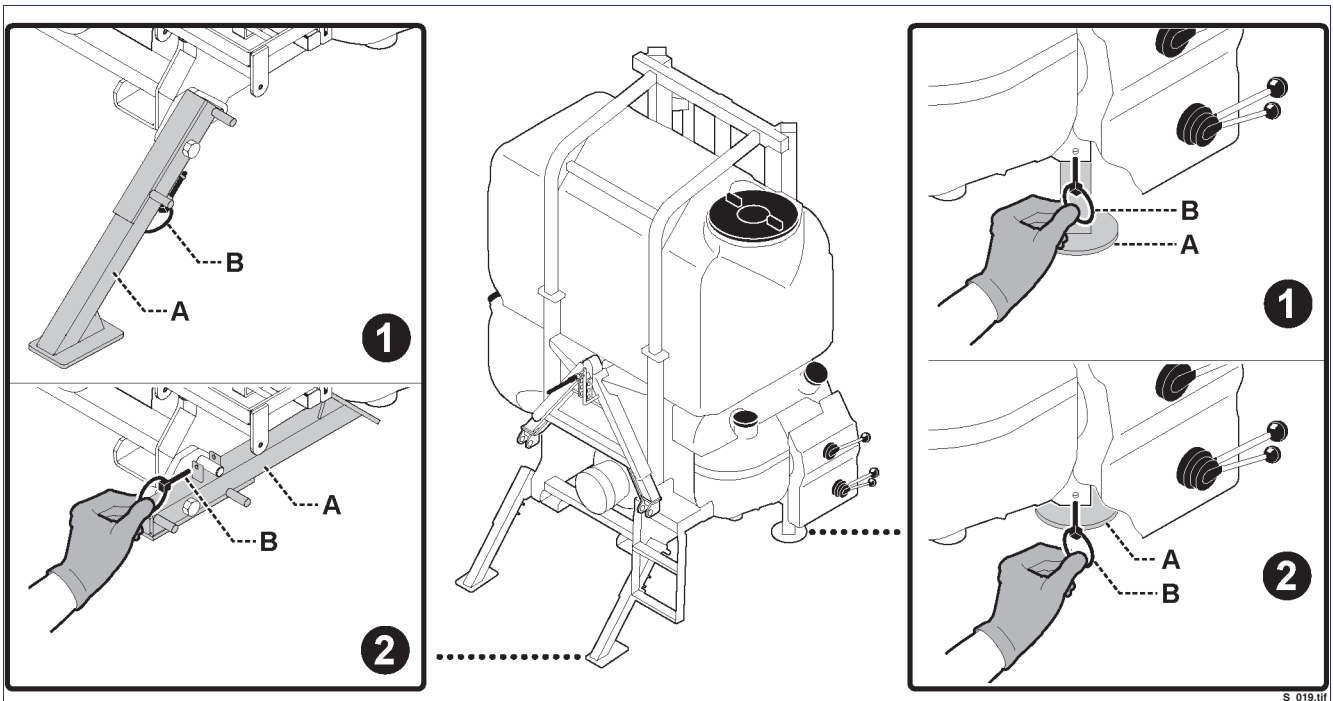
Proceed as follows:

- 1 - Position the lifting device (H) as shown in the figure.
- 2 - Remove coupling (L) from support (N) by operating lever (G).
- 3 - Insert boom (L) into the lower arms of the tractor, insert pins (Q) and insert the safety pins (P).
- 4 - Connect third point (B) by means of special pin (F) and insert safety pins (P).
- 5 - Position the lifting device of the tractor 10 cm lower than support (N).
- 6 - Move the tractor backward until coupling (G) reaches support (N) of the sprayer.
- 7 - Lift the lifting device until the equipment is connected.
- 8 - Switch off the motor, activate the parking brake and leave the tractor; remove and keep the ignition key.
- 9 - Adjust the length of third point (B) and fasten it to the equipment in the correct position by means of the special dowel and the special safety pin so that the machine is parallel to the ground during the working operations.

! Danger - Warning
 Make sure that all safety pins have been inserted in order to avoid the accidental disengagement of the pin arms. Use suitable pins only.

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SUPPORT LEGS



Support legs (A) keep the equipment at a suitable height, which allows for easy connection and disconnection from the tractor.



Important

During the working phase the support legs must be closed in position 2.

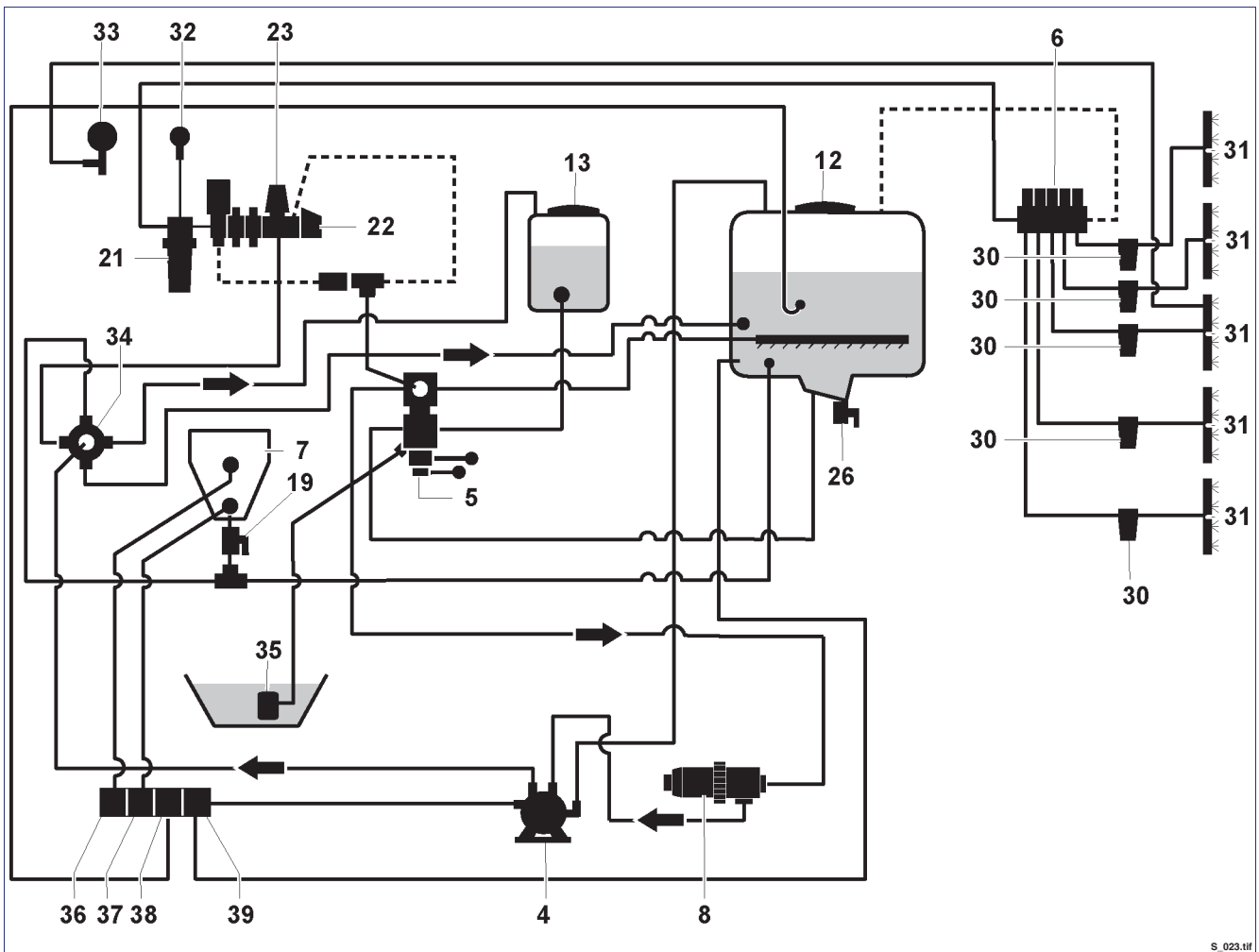
Position 1 - position of the support legs for the equipment parking phase.

Position 2 - position of the support legs for the equipment working phase.

- Remove pins (B) and place the legs to the desired position. Insert pins (B) after completing the adjustment.

SYSTEM DIAGRAMS

Water system plan with electric control unit, Mixer, and system washing unit with non-return valve



S_023.tif

Legend

- | | |
|---|---|
| 1 - Diaphragm pump | 31 - Stainless steel pipes |
| 2 - Cock unit | 32 - Pressure gauge |
| 3 - Solenoid valve assembly | 33 - Working pressure gauge |
| 4 - Mixer | 34 - 5 ways valve |
| 5 - Suction filter | 35 - Tank filling hose |
| 12 - Product tank | 36 - Container washing lever-operated control valve |
| 13 - Clear water tank (system cleaning) | 37 - Mixer filling lever valve |
| 19 - Valve for transfer | 38 - Tank inside washing lever valve |
| 21 - Control unit line filter | 39 - Agitator lever valve in tank |
| 22 - Main engine | |
| 23 - Pressure control engine | |
| 26 - Tank emptying valve | |
| 30 - Distribution line filters | |

TANK FILLING

The tank can be filled in two different ways:

- Water filling from the upper holes (page 11);
- Water filling through tank filling hose (page 12);



Important

When filling the tank, ensure that hand-washing tank (B) has been filled with clean water and filled it up, if necessary.

WATER FILLING FROM THE UPPER HOLES

Use an external water source or a tank that is located on a level higher than filling hole (A and C).

Fill tank (B) with hand-washing water



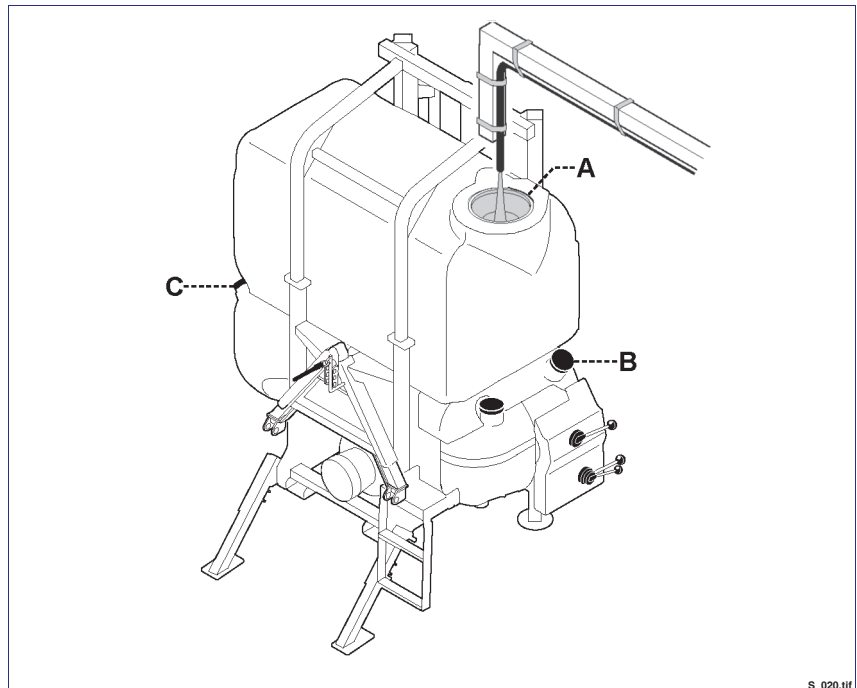
Important

Tank filling opening (A) must be equipped with the basket filter (mesh size 1 mm).



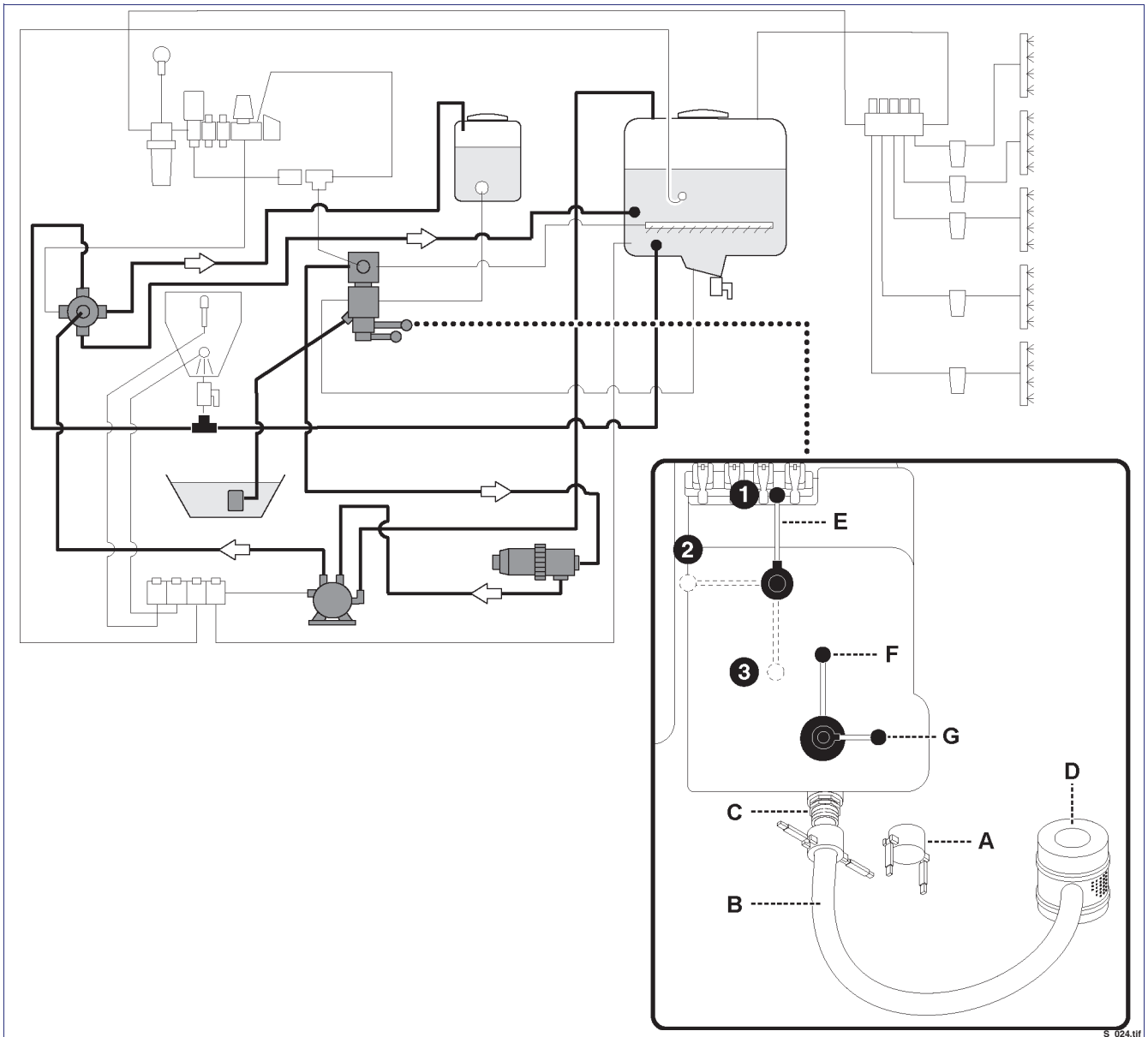
Important

The tank (B) must be filled with clean water.



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WATER FILLING THROUGH TANK FILLING HOSE



Caution - Warning

Make sure that no part of the tank-filling hose comes into contact with the chemical spray products, so that the water source does not become polluted.

- 1 - Plunge floating filter (D) into the water source (reservoir, external tank, ditch, etc).
- 2 - Remove the cap (A) from the coupling (C).
- 3 - Connect the tank-filling hose (B) to the coupling (C).
- 4 - Position the levers of valves (F - G) as shown in the figure.
- 5 - Place lever (E) to position 1, 2 or 3 according to the desired type of filling:
 - **Position 1:** product tank filling.

- **Position 2:** clean water filling for system washing.
- **Position 3:** product tank filling with water passage from mixer for product mixing.

- 6 - Connect the PTO.
- 7 - When filling is over, reduce the power take-off rpm.
- 8 - When the operation is over, disconnect the hose (B) and replace the cap (A). The machine is ready to start spraying.

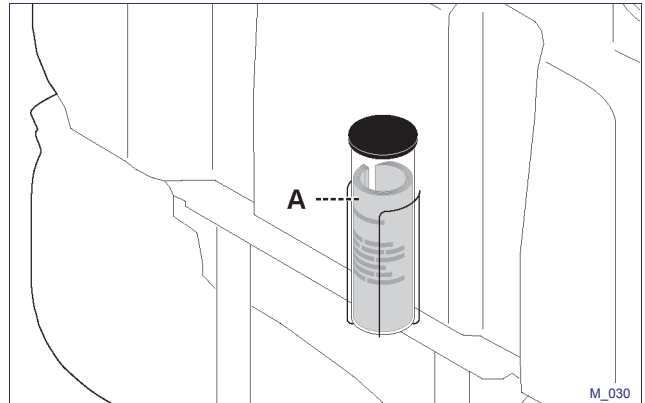
PRODUCT MIXING

Chemical product preparation



Important

Every time that a chemical product is poured into the tank for a treatment, the operator must insert a document in document container (A) that clearly shows the name of the plant protection product inside the tank. The name of the plant protection product must be made available in case of accidents, driver's fainting fit and/or contamination of watercourses.



M_030



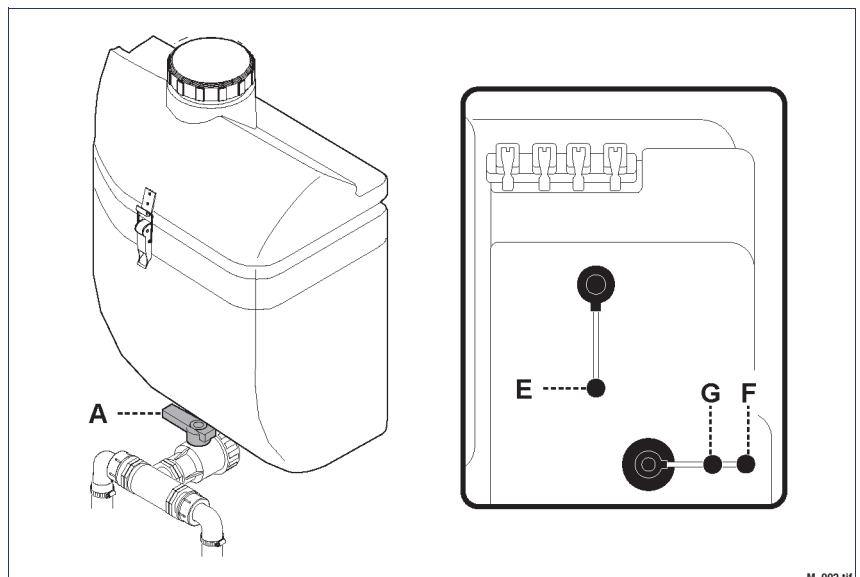
Caution - Warning

Before starting to handle the product, adopt all the necessary precautions in order to avoid the dangers and risks of contamination of people, animals and the environment (see brochure 4A).

Mixing with Mixer

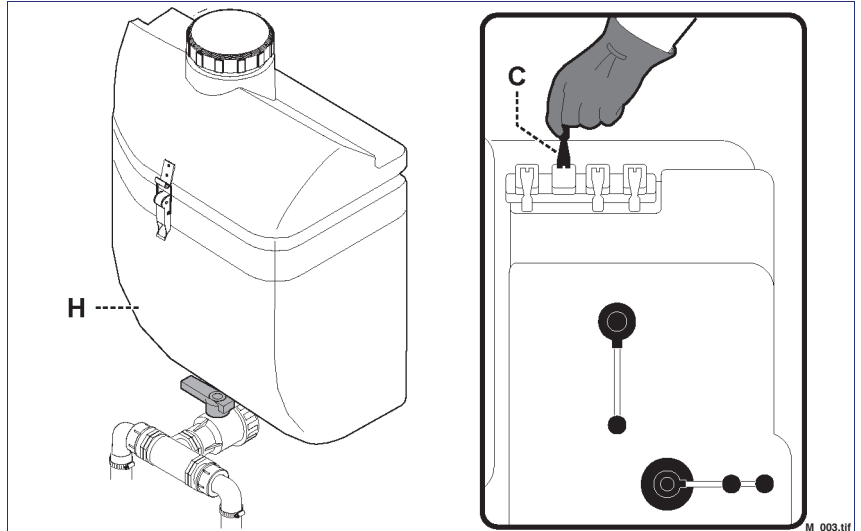
To mix the product, follow the procedure below:

- 1 - Make sure that the system is clean and pour the necessary water for the treatment into the main tank (see page 11, 12). If a sufficient water quantity is present in the main tank, pass to the next phases.
- 2 - Position the valve levers (A - G - F - E) as shown in the picture.
- 3 - Activate the pump.



M_002.tif

4 - Open valve (C) and pour 15 cm of water into tank (H).

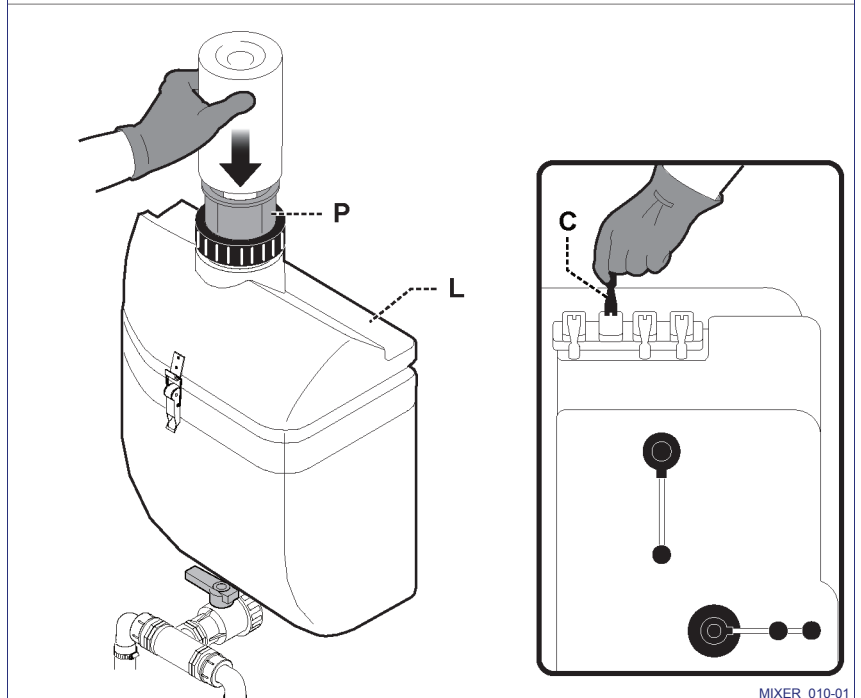
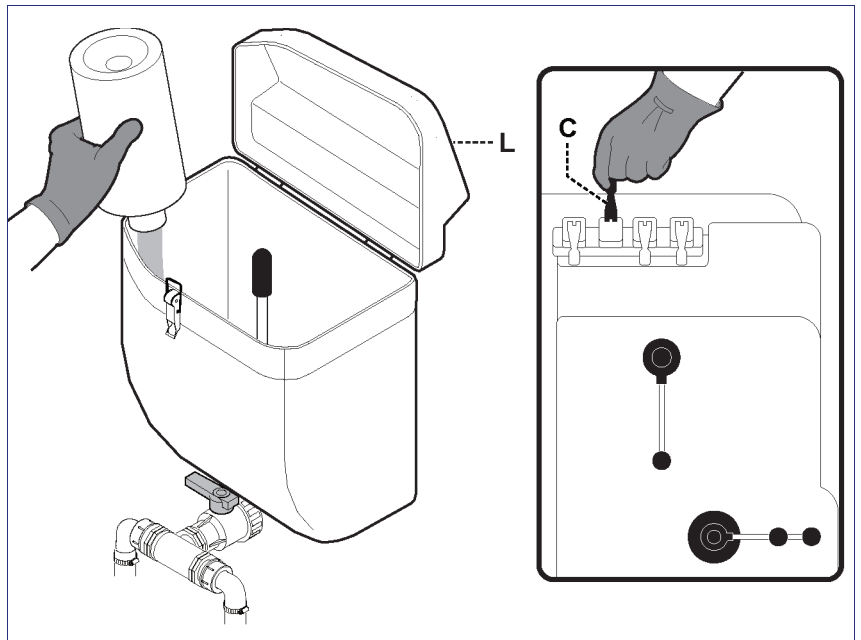


5 - Open the cover (L), with the valve (C) open and load the chemical product to be mixed.



Important

If the equipment is provided with a rapid action funnel (P), you will not need to open the cover (L); just load the chemical product as shown.



- 6 - If the equipment is fitted with rapid funnel (**P**), move switch (**Q**) to **ON** in order to start the container washing pump (the pilot light turns on).
- 7 - Position the container and exert pressure on it as shown in the figure in order to activate the washing nozzle.

**Important**

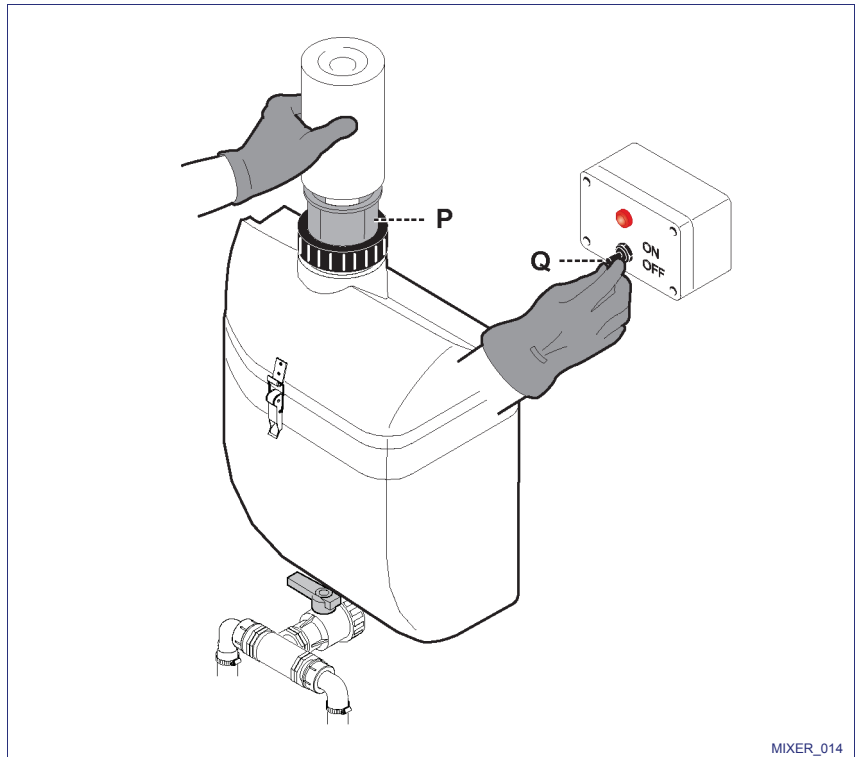
When the operation is completed, move switch (**Q**) to **OFF** (the pilot light turns off).

**Danger - Warning**

Do not pollute the environment with empty containers. Dispose of empty containers in accordance with the waste disposal regulations in force in the country of use.

**Important**

If the equipment is not fitted with a rapid funnel, clean and dispose of the container according to the regulations in force in the country of use.

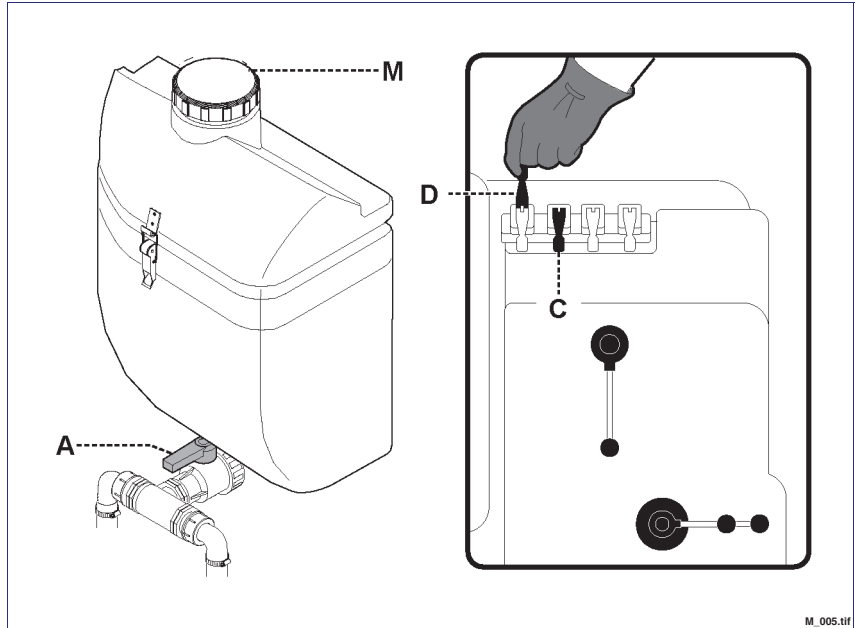


- 8 - Open the valve (A) to empty the tank.
- 9 - Shut off the valve (C).
- 10- Operate the valve lever (D) to rinse the equipment.



Danger - Warning

Keep the cover closed when you perform this operation, so as to avoid water spills that might hurt the operator.

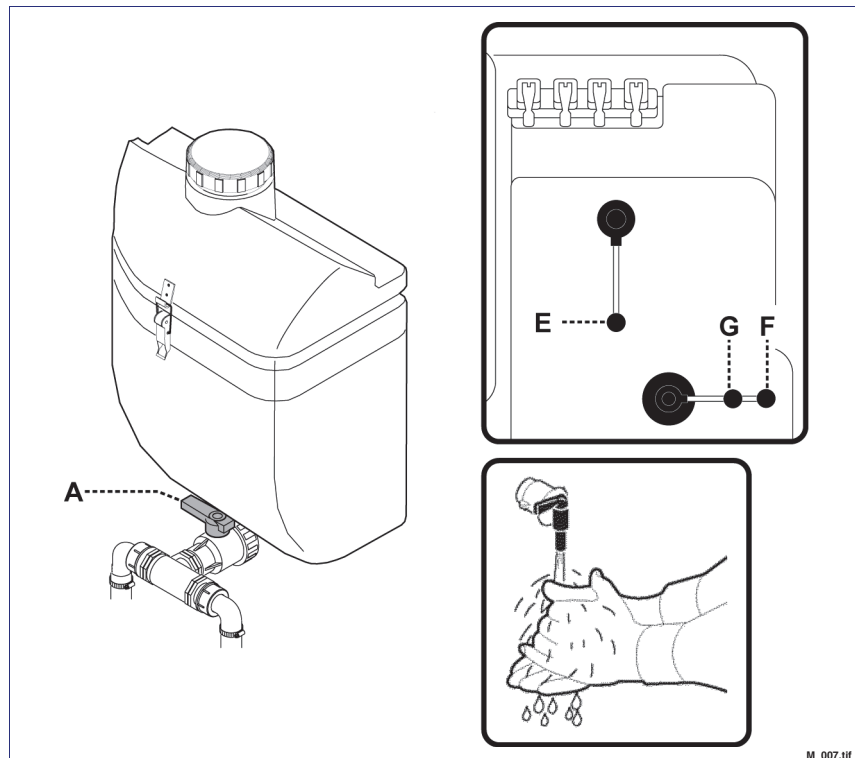


- 11- Close valve (A) and turn the levers of valves (G - F - E) to work position.

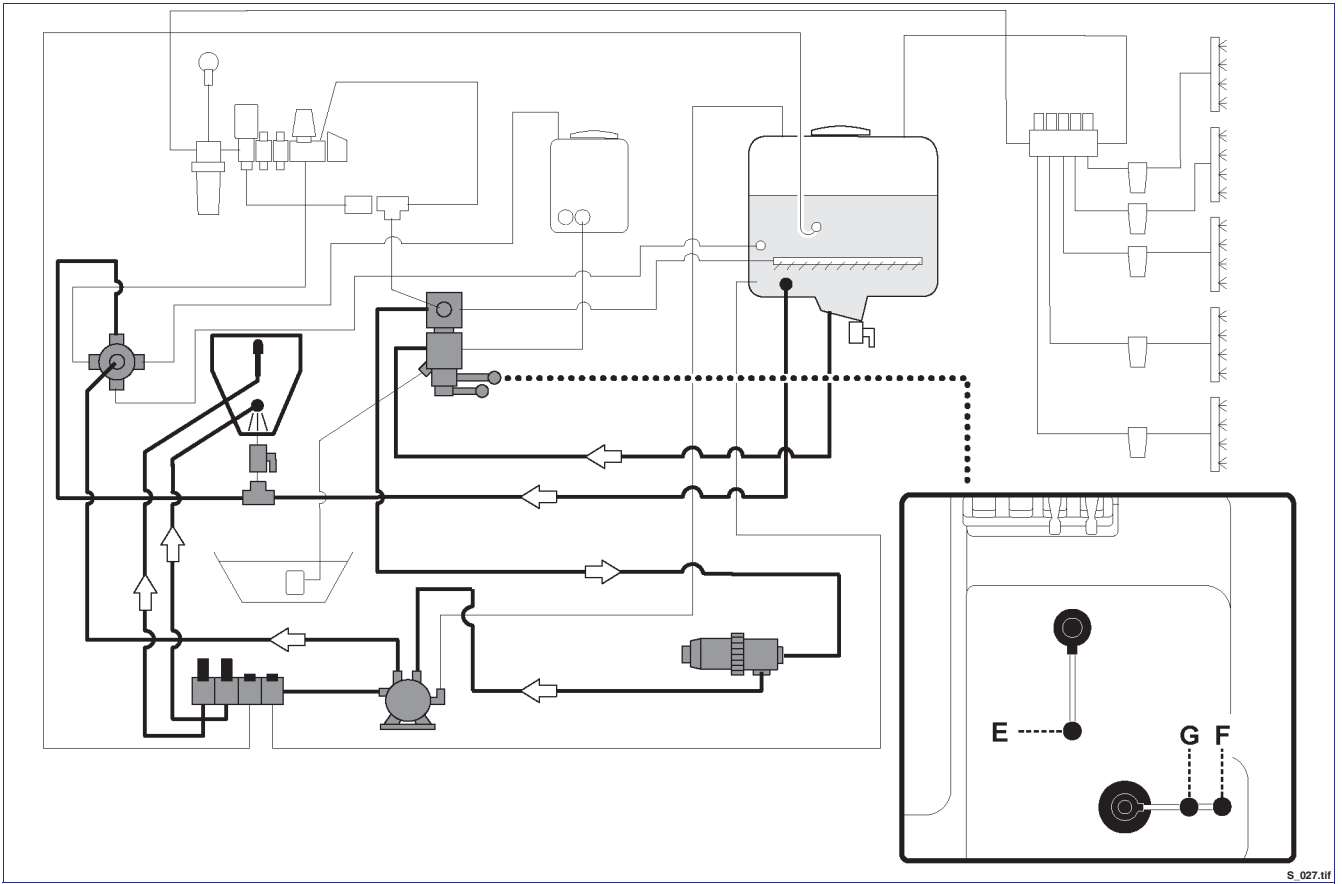


Important

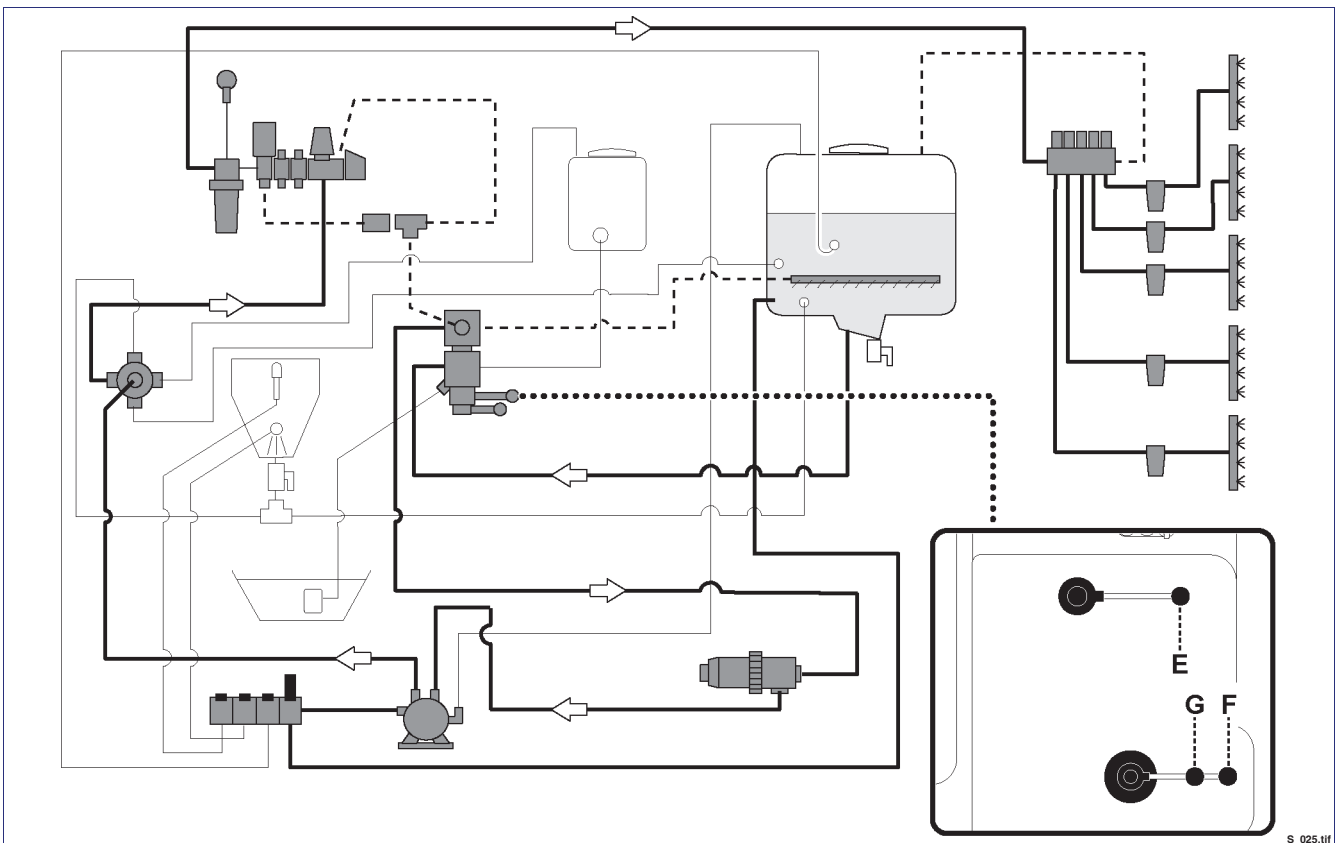
In case of accidental contact of the product or the mixture with skin, flush immediately with the fresh water contained in the hand-washing tank.



System diagram



SPRAYING





Important

The environment and field conditions of the area where you plan to operate have to be checked every time the equipment is set up for spraying.

Evaluate the following requirements.

- Make sure that the hand washing tank and the equipment washing tank are filled with clean water before starting any treatment.
- Check whether or not there are electric lines and assess the risks of contact with the spraying booms.
- Check the gradient of the land so as to evaluate the most suitable conditions for operating in safety. Always bear in mind the maximum gradients allowed.
- In the event of spraying while moving crosswise to the slope, follow the instructions extremely carefully:

Boom unfolding stage: always unfold the uphill boom first, and then the downhill boom.

Boom folding stage: always fold the downhill boom first, and then the uphill boom.

- Never leave the downhill boom alone unfolded.
- Keep the forward speed moderate
- (max. 8-10 km/h) to prevent the booms from swinging and to keep spraying even.

- Before you start spraying an area, make sure there is enough product in the tank.
- In the treatment period it is important to follow the weather forecasts. The wind speed must not exceed 5 m/sec, the temperature must not be excessive and the relative humidity must not be low.

Proceed as follows for spraying:

- 1 - Position the levers of valves (**F - G - E**) as shown in the figure.
- 2 - Connect the tractor PTO (max. 540rpm).
- 3 - Unfold the spraying boom.
- 4 - Select the sections of the boom that correspond to the area to be sprayed.
- 5 - Operate the levers of the water control unit in order to feed the boom and to start the tractor.



Important

If it is windy, (even below the maximum limit of 5 m/sec) to prevent the product from drifting, keep the boom low and increase the size of the droplets.



Danger - Warning

Prevent outsiders from approaching the working area when the equipment is in use. If necessary, stop spraying immediately and get the people in the risk area to move away.

SYSTEM WASHING AND EMPTYING OF RESIDUAL VOLUME

Important

Residual volume is the leftover liquid that cannot be suctioned up and remains on the bottom of the tank.

Caution - Warning

Pollutant substances must be properly disposed of in compliance with current legislation. Special care should be taken to avoid polluting waterways and groundwater with spraying chemicals. Keep product out of reach of children.

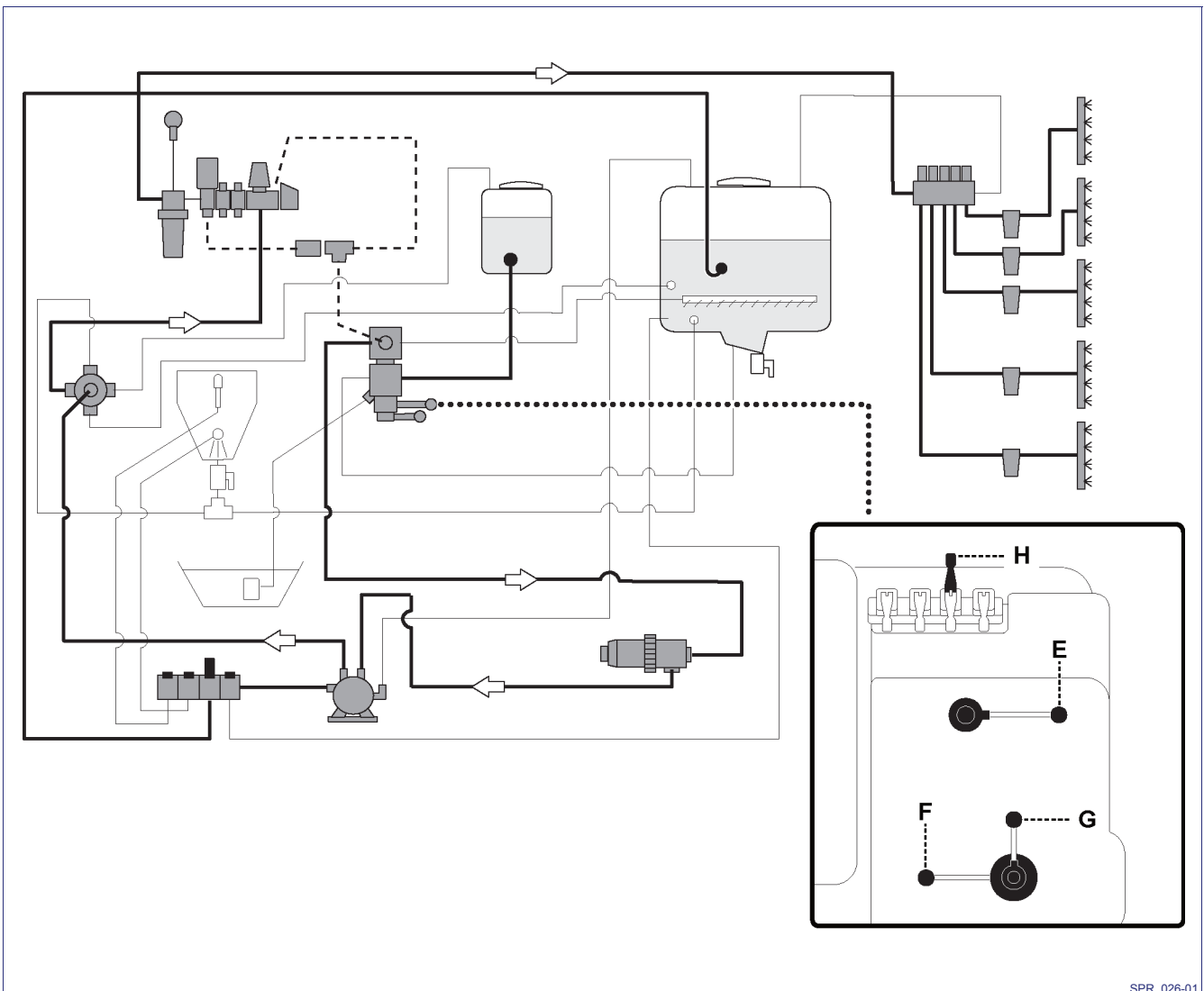
- 1 - Pour clean water into the tank, diluting residual product in a ratio of 1:10.
- 2 - Spray all the retrievable product onto a surface.
- 3 - Place valve levers (F - G - E) in the position shown.
- 4 - Start the power take-off and spray all the liquid that can be sucked onto the surface to be treated.

Without tank inside washing kit

- Switch off the motor, activate the parking brake and leave the tractor; remove and keep the ignition key.
- Remove the main lid of the tank and clean the walls with a jet of water.

With tank inside washing kit (upon request).

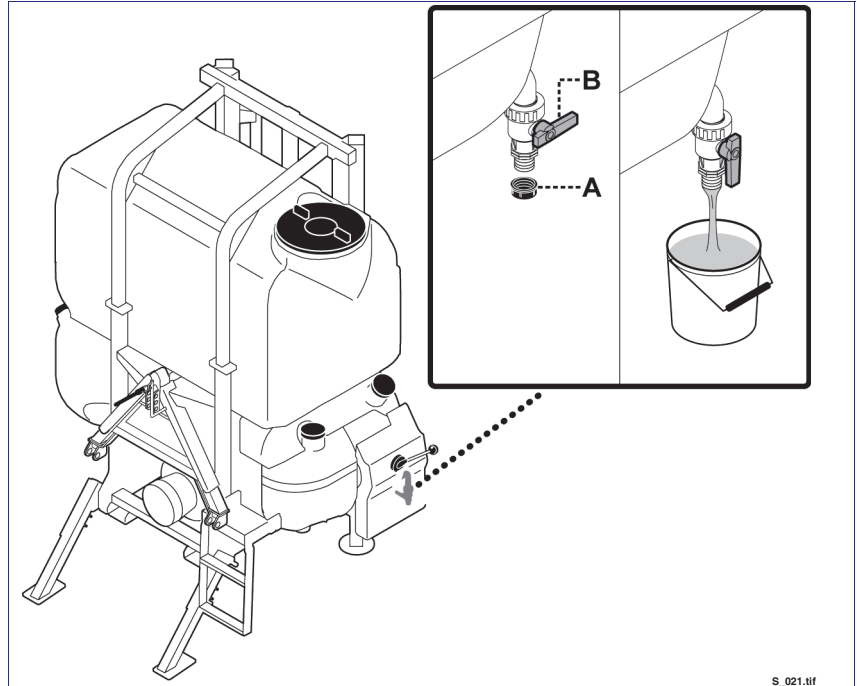
- Start washing by means of valve (H) on the control unit.



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- Place a receptacle beneath valve **(B)**, remove cap **(A)** and open the lever to drain off the residual liquid.
- Close the lever again **(B)** and replace the cap **(A)**.



EQUIPMENT EXTERNAL WASHING

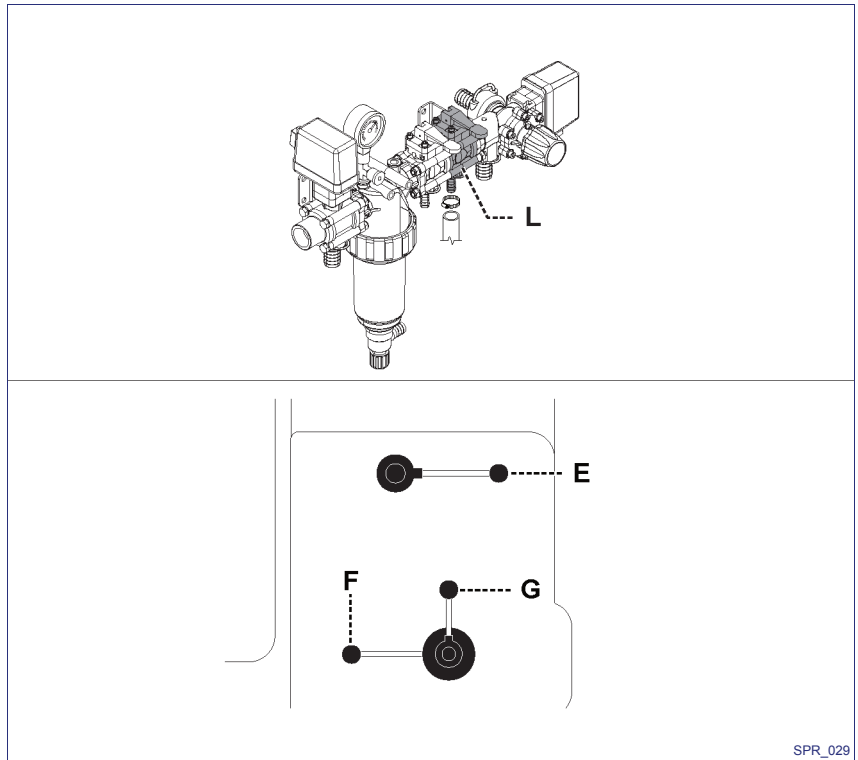
! Danger - Warning

The external washing of the equipment must be made only after the washing of the system and only with valve levers (E-F-G) in the position of system washing.

Without equipment washing kit

Proceed as follows.

- 1 - Connect the washing device (hoses and brush) to valve **(L)**.
- 2 - Make sure that clean water is in the tank (see “main parts” on page 2).
- 3 - Position the valve levers **(E-F-G)** as shown in figure.
- 4 - Start the power take-off.
- 5 - Wash the outside of the tanks and the areas in contact with the product with a water jet.



With equipment washing kit (on request)

Proceed as follows.

- 1 - Make sure that clean water is in the tank (see “main parts” on page 2).
- 2 - Position the valve levers **(E-F-G)** as shown in figure.

- 3 - Start the power take-off.
- 4 - Start washing by means of the special command on the control unit.

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INFORMATION ABOUT MAINTENANCE

FILTER CLEANING



Danger - Warning

Wear personal protective equipment to protect your face, head and hands, use rubber gloves, dust masks, safety glasses and helmet.

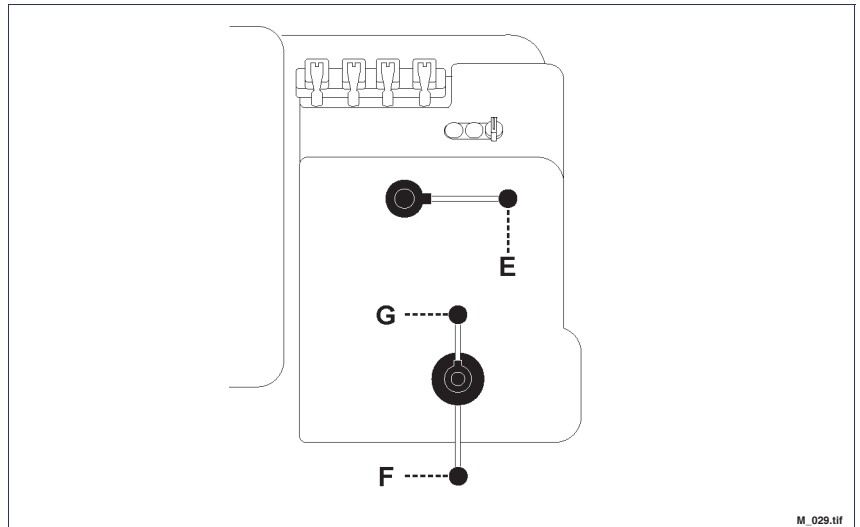
Proceed as follows.

- 1 - Position the valve levers (**E-F-G**) as shown in figure.
- 2 - Place a receptacle beneath the filter (**A**).
- 6 - Loosen the ring nut (**D**) and remove the filter cover (**E**).
- 7 - Blow high pressure air and water through the filter cartridge to clean it.
- 8 - Replace the cartridge (**F**) and tighten the ring nut (**D**).

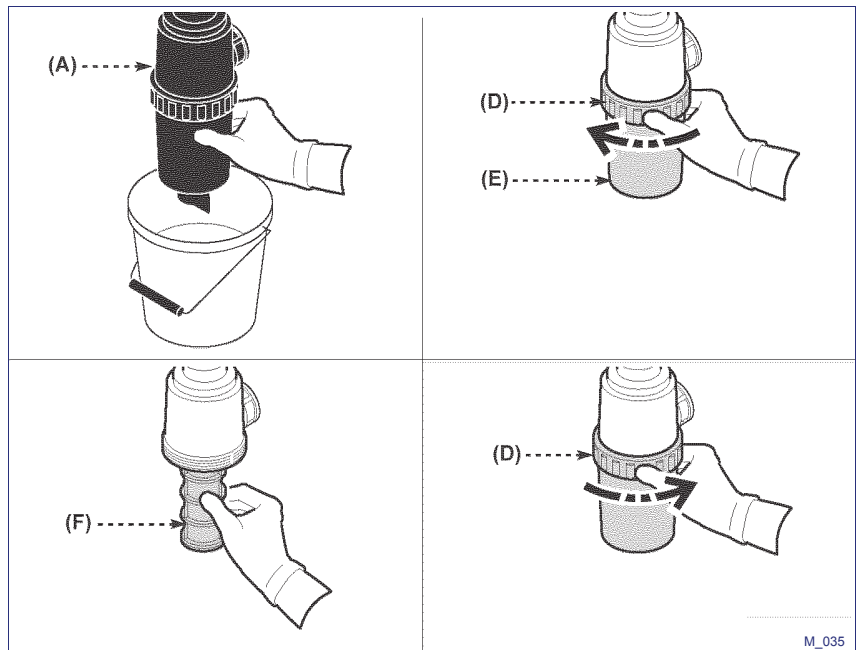


Important

Make sure the seal is properly inserted.



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LUBRICATION POINTS DIAGRAM

Oil all greasing points and sliding surfaces, particularly whenever the system is washed.

Use *PERSIAN POLIGREASE 2* grease



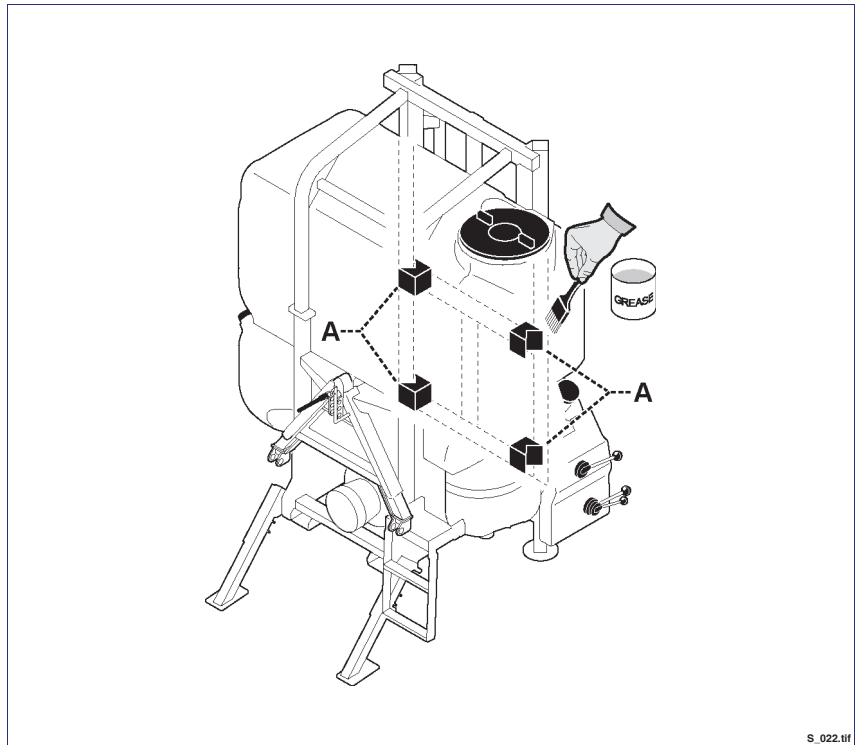
Important

When the lifting device slides with an excessive play, adjust sliding blocks (A) as shown on page 5.



Important

The replacement of sliding blocks (A), if it is necessary, shall be carried out only by personnel trained for this intervention.



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