

Operator's Manual

Trailed Field Sprayer

AMAZONE BBG

UX 4200

UX 5200



MG 969
SB 239.2 (GB) 06.04
Printed in Germany



Before starting operation,
please carefully read and
adhere to this instruction
manual and safety advice!
Keep for future users.



Reading the instruction

Manual and adhering to it should not appear to be inconvenient and superfluous as it is not enough to hear from others and to realise that a machine is good, to buy it and to believe that now everything should work by itself. The person concerned would not only harm himself but also make the mistake of blaming the machine for the reason of a possible failure instead of himself. In order to ensure good success one should go into the mind of a thing, make himself familiar with every part of the machine and to get acquainted with its handling. Only in this way, would you be satisfied both with the machine as also with yourself. To achieve this is the purpose of this instruction manual.

Leipzig-Plagwitz 1872. Rud. Sark.

Identification data

Manufacturer:	AMAZONEN-WERKE H. DREYER GmbH & Co. KG
Type:	UX 4200, UX 5200
Year of production:	

Address of manufacturer

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Information about spare parts

Spare parts online catalogue
www.amazone.de

Formal remarks to this instruction manual

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AMAZONEN-WERKE H. DREYER GmbH & Co. KG.

Preface

Preface

Dear Customer,

You decided to purchase one of our high quality machines from the comprehensive range of farm machinery produced by AMAZONEN-WERKE, H. DREYER GmbH & Co. KG. Thank you for your confidence.

Before the first operation, please read and adhere to this instruction manual and the safety advice. After having thoroughly read the instruction manual you can make fullest use of the advantages of your recently purchased machine.

Please ensure that this instruction manual is made available to and read by any operator before he or she starts to operate the machine.

In case of any questions or problems, please refer to this instruction manual or just call us.

Maintenance in regular intervals and the exchange of worn or damaged parts in time increases the life expectancy of your machine.

User's review

Dear reader,

Our instruction manuals are regularly updated. With your suggestions for improvement you will help to create an always user-friendly instruction manual. Please send your suggestions by fax.

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1 User advice

The chapter "User advice" provides information for dealing with the instruction manual.

1.1 Purpose of the document

The present operator's manual

- describes the operation and the maintenance for the machine,
- gives important hints for a safety conscious and efficient operation with the machine.
- is part of the implement and should be kept so that it is always to hand on the machine or in the towing vehicle.
- should be kept for future use.

1.2 Information about directions in this instruction manual

All information about direction in this instruction manual is to be understood in direction of travel.

1.3 Illustrations used

Operational action and reactions

The steps of operation to be carried out by the operational staff are described in a numbered list. Adhere to the sequence of the steps. The reactions on the individual operational step are marked with an arrow. Example:

1. Operational action step 1
→ Reaction of the machine on operational action step 1

Enumerations

Enumerations without indispensable sequence are described as a list with enumeration items. Example:

- Item 1
- Item 2

Item figures in illustrations

Figures in round brackets refer to position figures in illustrations. Example:

Part (1)

2 General safety advice

This chapter contains important hints for the safety conscious operation of the machine.

2.1 Obligations and liability

Observe the advice given in this operator's manual

The knowledge of the basic safety advice and safety regulations is the pre-condition for the safety conscious dealing with the machine and its trouble free operation.

Obligation of the user

The user commits himself to have the machine only operated by persons who

- are acquainted with the basic prescriptions regarding the operational safety and accident prevention.
- have been introduced to the machine.
- have read and understood this operator's manual.

Adhere to the requirements of the EC guideline for the use of operating tools 89/655/EEC and especially the accident prevention prescriptions VSG 1.1, VSG 3.1.

Obligation of the operator

Before commencing any operation all persons who are instructed to operate the machine commit themselves to:

- observe the basic regulations regarding the operational safety and accident prevention,
- to read and to adhere to the chapter "Safety" and the warning signs in this operator's manual.

In case of queries, please contact the manufacturer.

Danger when dealing with the machine

The machine has been manufactured according to the state of the art and the certified safety regulations. Nevertheless, the operation of the machine could cause danger and adverse effects on

- body and life of the operator or third parties,
- the machine itself,
- other tangible assets.

Only use the machine

- for the purpose it has been designed for.
- in a perfect safety engineering condition.

Immediately remedy all failures affecting the safety.

Warranty and liability

As a matter of principle our "General terms of sale and delivery" prevail. These will be made available to the user on the date of conclusion of contract at the latest. Warranty and liability claims for injury to life or property are rejected when they have been put down to one or several of the following causes:

- not designed use of the machine,
- improper fitting, putting into work, operation and maintenance of the machine,
- operating the machine with defective safety facilities or incorrectly fitted or non functioning safety devices and guards,
- not adhering to the operator's manual regarding putting into work, operation and maintenance,
- arbitrary changes on the machine,
- poor monitoring of the wearing parts of the machine,
- improper repair work,
- in an emergency due to alien elements and force majeure.

2.2 Illustration of safety advice

A symbol and a warning identify the safety advice. The warning describes the seriousness of the threatened danger. The individual symbols have the following meaning:



Danger!

Immediate imminent danger to life and health of persons (severe injuries or death).

Not adhering to this advice will cause severe damage to health with the possibility of life threatening injuries.



Warning!

Possible danger to life and health of persons.

Not adhering to this advice will cause severe damage to health with the possibility of life threatening injuries.



Caution!

Possible dangerous situation (slight injuries, material damage).

Not adhering to these warnings may cause slight injury or material damage.



Important!

Obligation of a particular behaviour or action for the appropriate handling of the machine.

Not adhering to these hints may cause trouble with the machine or the environment.



Hint!

Hint for use and particularly useful information.

These hints will help you to optimally make use of the function of the machine.

2.3 Designed use of the machine

The field sprayer is designed for the transport and application of plant protection agents (insecticides, fungicides, herbicides and others) in form of suspensions, emulsions and blends. Additionally it can also be used for the application of liquid fertilisers.

The field sprayer corresponds to the state of art. When used with the correct settings and accurate application the biological success is ensured, whereby the most economical spray agent consumption will be applied and the least environmental damage is achieved.

The field sprayer is for exclusive operation in agriculture only.

Operating on slopes is possible under the following conditions

- **When operating across slopes**

max. angle of machine in direction of travel to the left	15 %
max. angle of machine in direction of travel to the right	15 %
- **When operating up and down hill**

uphill	15 %
downhill	15 %

The designed use also includes:

- observing all hints in this operator's manual.
- adhering the service and maintenance work.
- the exclusive use of original -**AMAZONE**-spare parts.

Other use than that stipulated is prohibited and is no longer considered as designed use.

For damage resulting from not designed use

- the operator himself will carry the full risk,
- the manufacturer will not accept any responsibility.

2.3.1 Designed equipment of the field sprayer

The designed equipment of the field sprayer results from the combination of

- Basic implement and running gear
- Tyres
- Draw bar
- Pressure valve chest
- Pump equipment
- Sprayer booms
- Spray lines with part section valves and
- special options.

The individual machine types resulting from the combination of these individual components (unit assembly system) are listed up in the combination matrix. The individual types fulfil the requirements of the BBA (German Federal Biological Institute) – see features for spraying implements for surface cropping – BBA guideline VII 1-1.1.1.

The address of the Institute:

Biologische Bundesanstalt

Messeweg 11/12

D-38104 Braunschweig

2.4 Attention when using specific crop protection agents

At the date of manufacturing this field sprayer only a few crop protective agents are known to possibly cause damage to materials used on the field sprayer.

We would like to point out that these crop protection agents, known as, for example, Lasso, Betanal and Trammat, Stomp, Iloxan, Mudecan, Elancolan and Teridox may cause damage to pump diaphragms, hoses, spray lines and the tank if exposed for a prolonged period of time (20 hours) to such agents. There may be other crop protection agents that could cause damage and as so the list may not be taken as complete.

Care should also be taken against making non-permissible mixtures of two or more varying crop protection agents.

Materials which tend to freeze or glue may not be used for spraying.

In case of spraying such aggressive crop protection agents it is recommended to apply them onto the field immediately after the mixing with water and afterwards to carefully clean the entire system with water.

Viton diaphragms are available as spare parts for the pump. These Viton diaphragms are resistant to solvent containing crop protection agents. Their longevity, however, is limited when they are used at low temperatures (e.g. AUS at frost temperatures).

All materials and components used in **AMAZONE**-field sprayers are liquid fertiliser proof.

2.5 Organising measures

The operator must ensure the availability of the personal protective equipment, e.g.:

- safety glasses,
- safety shoes,
- protective clothing,
- skin protecting agent, etc..



Important!

- **The operator's manual**
 - **should always be kept at the place where the machine is operated!**
 - **should always be available for the operator and the servicing staff!**
- **Regularly check all existing safety devices.!**

2.6 Safety devices and guards

Only operate the machine with all safety devices and guards fitted and properly functioning. Regularly check all safety devices and guards.

Defective safety devices

Defective or missing safety device and guards will cause dangerous situations.

2.7 Informal safety measures

Besides the safety advice in this operator's manual observe and adhere to the national, local and generally valid advice for operational safety, accident prevention and environmental care.

Please particularly observe the accident prevention prescriptions of your national authorised trade association.

Ensure that all safety and danger hints on the machine are clearly readable. If necessary replace damaged safety and danger hints.

2.8 Training of the staff

Only people who are trained and familiarised may operate with/on the machine. The responsibility of persons for operation and maintenance should clearly be prescribed. A trainee may only operate the machine under the supervision of a skilled person.

Personnel	Particularly trained persons	Instructed operator	Persons with specialist training (mechanics, electrical engineering)
Action			
Transport	X	X	X
Putting into operation	--	X	--
Installation, setting up	--	--	X
Operation	--	X	--
Maintenance	--	--	X
Searching for faults and remedy	X	--	X
Disposal	X	--	--

Legend:

X..allowed

--..not allowed

2.9 Safety measures and normal operation

Operate the machine only with all safety devices and guards properly functioning.

Check the machine at least once a day for externally recognisable damage and for function of the safety devices and guards.

2.10 Danger from residual power

Observe the incidence of mechanic, hydraulic, pneumatic, and electric/electronic residual power on the machine. Care for appropriate measures when instructing the operating staff. Detailed hints are again given in the relevant chapters of this operator's manual

2.11 Danger points in particular

In the coupling range between tractor and machine.
Under the lifted machine.
In the operational range of moving parts.
In the spray agent tank.

2.12 Maintenance and repair, remedy of faults

Carry out all prescribed setting-, maintenance and servicing work in due time.

Secure all operating systems like compressed air and hydraulics against unintended starting.

When exchanging larger components carefully affix them to the hoisting implement.

Check slackened screw joints for firm seating. After having finished maintenance work, carefully check all safety devices for proper function.

2.13 Constructional changes

Vehicles and devices and implements, connected with a vehicle with an official operating permit for road traffic according to the traffic law should correspond to the condition as stipulated by the relevant permit.

2.13.1 Alterations or changes

Never carry out any alterations or fittings or changes on the machine without approval of the **AMAZONEN-WERKE**. This also applies for welding work on bearing parts.

All fitting or alteration measures require the written approval of **AMAZONEN-WERKE**. Only use the conversion and optional parts approved by Messrs. **AMAZONEN-WERKE** so that the operating permit remains valid according to national and international regulations.



Important

Prohibited on principle is

- boring on the frame or the chassis.
- reboring existing holes on the frame or the chassis.
- welding on bearing parts.

2.13.2 Spare parts and wearing parts and auxiliary parts

Immediately exchange defective machine parts.

Only use original **-AMAZONE-** spare- and wearing parts or the parts approved by Messrs. **AMAZONEN-WERKE** so that the operating permit remains valid according to the national and international regulations. When using spare and wearing parts from other manufacturers it is not ensured that they have been designed and manufactured to fulfil the operational stress and safety demands.

The **AMAZONEN-WERKE** do not accept any liability for damage by using not approved spare or wearing parts or auxiliary parts.

2.14 Cleaning and disposal

Utilise agents and materials and dispose them in the appropriate manner particularly

- when working with greasing systems and devices and
- when cleaning with solvent agents.

2.15 Workplace of the operator

The machine may only be operated by one single person from the seat in the tractor cab.

2.16 Safety symbols and other identifications on the machine

Safety symbols

The following safety symbols on the machine warn about residual danger, which could not be remedied constructively. Explanations and relevant safety information for the safety symbols are stated in column **Picture No. and explanation**.



Important!

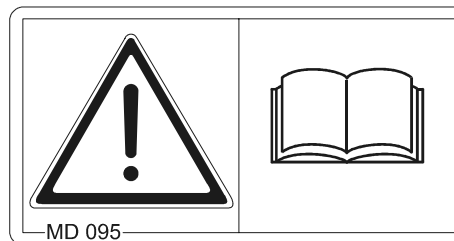
Always keep all safety symbols on the machine clean and in well readable condition! Replace not readable safety symbols. Ask your dealer for replacement safety symbols. The picture No. on the safety symbol is the order No.

Picture No. and explanation

MD 095

Before commencing operation carefully read and adhere to the operator's manual and safety advice!

Safety symbols

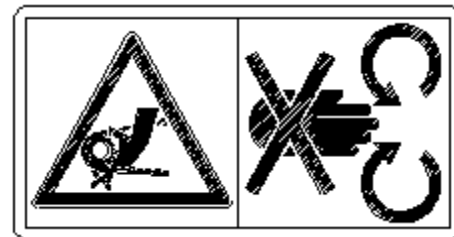


MD 076

Only start to operate the machine with all guards fitted.

Do not open or remove the guards whilst the engine is running.

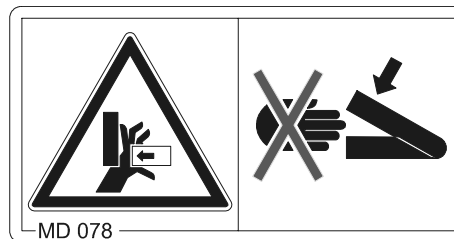
Before removing the guards disengage the universal joint shaft, stop the engine and remove the ignition key.



MD 078

Danger of squeezing on moving parts!

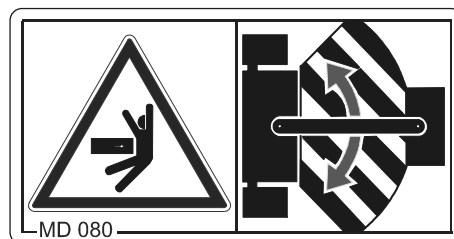
Never reach into this zone as long as parts are still moving.



MD 080

Danger of squeezing on the bending zone of the draw bar.

Standing of persons within the bending zone of the draw bar whilst the tractor engine is running is prohibited.

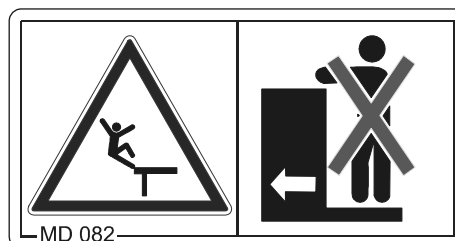


General safety advice

MD 082

Danger of falling down when riding on the trailed field sprayer.

On principle, riding on the trailed field sprayer is forbidden.



MD 084

Danger of injury within the pivot area of the boom!

Standing within the pivot area of the sprayer boom is prohibited.

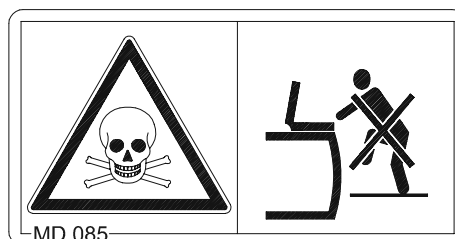
Advise persons to leave the danger zone.



MD 085

Danger of injury from poisonous fumes.

Never climb inside the spray agent tank.

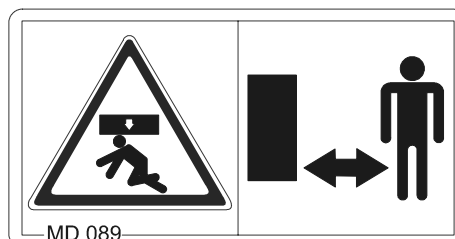


MD 089

Danger of injury from parts falling down.

Observe sufficient clearance distance to unsecured machine or to machine parts.

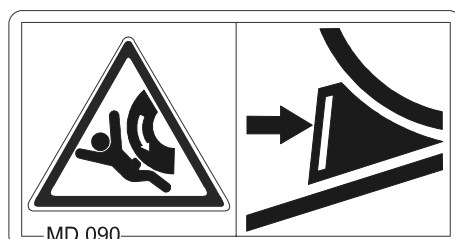
Observe sufficient clearance distance to unsecured machine or to machine parts.



MD 090

Danger of injury from unintended rolling away of the machine.

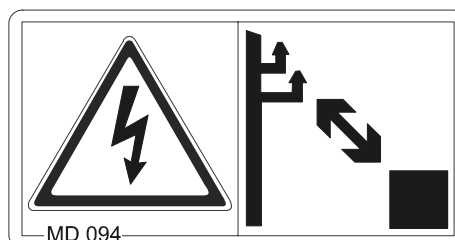
Before uncoupling from the tractor, secure the machine by using the chocks against unintended rolling away.



MD 094

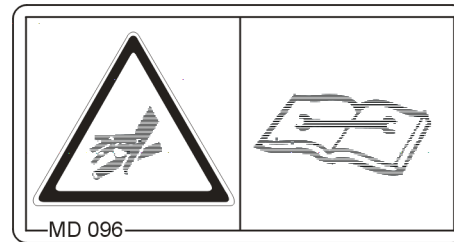
Danger of injury from contact with high voltage lines when folding in and out the sprayer boom.

When folding out and in the sprayer booms observe sufficient clearance distance to high voltage lines.



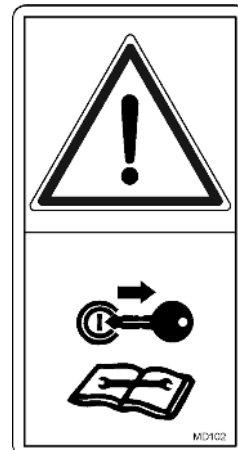
MD 096

Caution when liquids are leaking under high pressure. Observe the advice in the technical manual.



MD 102

Stop the engine.



MD 103

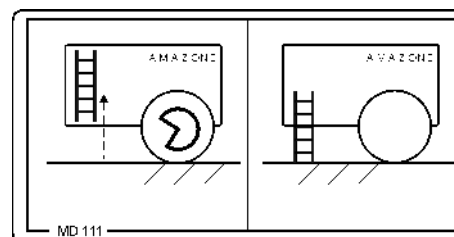
Water not for drinking!

The washing tank is made from non-food material.



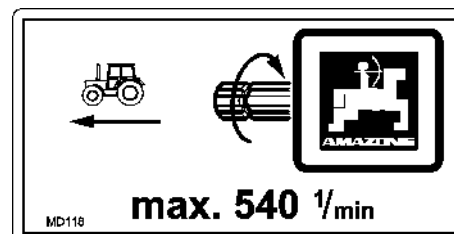
MD 111

Fold in the ladder during transport travel.



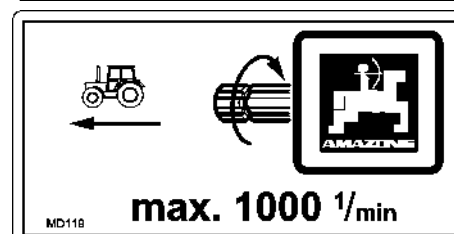
MD 118

Permissible max. drive speed
540 ¹/min.



MD 119

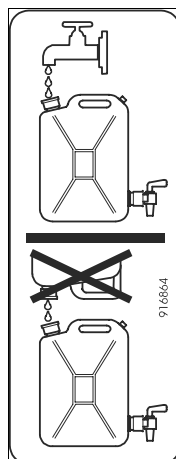
Permissible max. drive speed
1000 ¹/min.



General safety advice

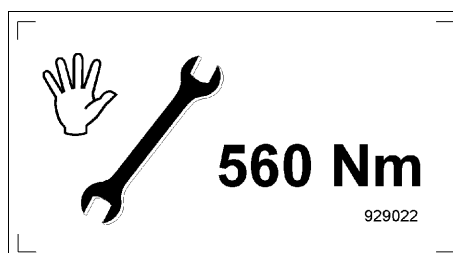
916 864

For clear water only! Never ever fill plant protection agent into the container.



929 022

Check wheel nuts in regular intervals.



911888

The CE-signs on the machine indicates the compliance with the valid EC guidelines.



2.17 Danger when not adhering to the safety advice

Not adhering to the safety advice

- may result in endangering persons, also the environment and also the machine itself.
- may result in the rejection of any claim for damage.

Not paying attention to the safety advice may cause the following risks:

- Danger to persons not excluded from operational areas.
- Failure of important functions within the machine.
- Failure of carrying out prescribed measures of maintenance and repair.
- Danger to persons through physical or chemical contact.
- Danger to the environment by leaking hydraulic oil.

2.18 Safety conscious operation

Besides the safety advice in this instruction manual additionally, the national, and generally valid operation safety and accident prevention advice of the authorised trade association are binding.

Adhere to the advice given on the warning signs to avoid danger.

When travelling on public roads observe the traffic regulations in force in your country.

2.19 Safety advice for the operator



Basic rule:

Before starting operation always check the machine and the tractor for traffic and operational safety.

2.19.1 General safety and accident prevention advice

- Adhere to the general rules of health- and safety precautions besides the advice in this operator's manual!
- The fitted warning- and advising decals give important hints for the safe operation. Adhering to them protects your own safety.
- When travelling on public roads observe the relevant legal traffic regulations in your country.
- Become acquainted with the machine controls and functions before beginning the operation. Doing this during operation would be too late.
- Wear close-fitting clothes. Do not wear loose-fitting clothes
- Keep the machine clean to avoid any risk of fire.
- Before beginning to move, check surrounding area (children etc.)! Ensure sufficient visibility.
- During travel, riding or any transport on the machine is prohibited.
- When coupling tractor and implement only use the prescribed tools.
- Special care should be taken when coupling and uncoupling implement and tractor.

- When attaching or removing the machine bring any parking or storing devices into the corresponding position (standing safety)!
- Attach weights in the appropriate manner on the fixing points provided.
- Observe the permissible axle loads, total weights and transport dimensions.
- Before any transport travel ensure that the required transport device is correctly fitted on the machine, as, e.g. traffic lights, warning devices, guards.
- The release ropes for quick coupler should hang freely and in the low position must not release the quick coupling by themselves.
- Never leave the tractor cab during travel.
- The manoeuvrability, the steering and braking are influenced by mounted or trailed implements and ballast weights. Ensure sufficient steering and braking.
- When lifting the three-point linkage implement the front axle load of the tractor varies, depending on its size. Ensure sufficient front axle load (20 % of the tractor's empty weight).
- When driving round bends observe the width and/or gyrating mass of the machine.
- Only start the machine with all guards fitted and in serviceable condition.
- The standing of persons within the operational range of the machine is prohibited.
- Standing of persons within the pivot and swivel area of the boom is prohibited.
- Hydraulic folding frames may only be actuated when persons observe sufficient clearance to the machine.
- On all hydraulically actuated pivoting parts exists danger of injury by bruising and trapping.
- Before leaving the tractor lower the machine to the ground, stop the engine and remove the ignition key.
- The standing of persons between tractor and implement is allowed only when the vehicle is secured against unintended rolling away. Make use of the parking brake and/or chocks.
- Lock the sprayer boom in the transport position.
- When filling the tank do not exceed the maximum nominal volume.
- Only use the steps for filling. Riding on them during operation is prohibited.

2.19.2 Operating devices

- Before starting to travel, check function of brakes.
- Choose a lower gear when driving down hill.
- Immediately stop the tractor when function faults are noted on the brake system. Care for immediate remedy of the function fault.

2.19.3 Mounted implements/trailed implements

- Before hitching implements on to the three-point hydraulics secure the control lever against any unintended lifting or lowering.
- When fitting the machine to the tractor three point linkage the mounting categories on the tractor and the implement must coincide or should be matched.
- Danger of injury exists when coupling the implement on and off the tractor.
- Secure the trailed implement against rolling away (parking brake, chocks).
- Danger of injury by squeezing or shearing within the operational range of the three point linkage arms.
- Standing of persons between tractor and implement is prohibited unless the vehicle is secured against rolling away by using chocks.
- When coupling tractor and implement, only use the prescribed tools.
- Do not exceed the max. permissible load for the coupling ring or hitch coupling.
- Ensure sufficient manoeuvrability of the draw bar on the hitching point.
- Couple the trailed implement in the appropriate manner. Check the brake system of the trailed implement for proper function. Observe the prescriptions of the manufacturer.
- Before starting any transport travel with the trailed implement switch off the single wheel braking (lock the pedal).
- Before starting to travel on public roads get all devices into the transport position.
- When driving round bends note the width of the mounted or trailed machine and the gyrating mass of the machine.
- Before any transport travel secure swivelling parts by using the provided safety devices.
- Danger of squeezing or shearing exists when the supports are activated.
- Only an authorised workshop is allowed to carry out the adjustment of the draw bar height on straight draw bars.
- With one-axle machines observe the relief of the tractor front axle. The steering is affected by support load.
- Safely park the mounted/trailed implement.
- As a matter of principle carry out repair-, maintenance- and cleaning work and remedy functions faults with the tractor engine stopped and removed ignition key.
- Ensure that all guards are fitted and always properly functioning.

2.19.4 Operation with PTO shafts

- Only use PTO shafts, which are designed for the implement by the manufacturer and which are equipped with all legally requested guards.
- Guard tube and guard cone of the PTO shaft must not be damaged and the guard of the tractor- and implement universal joint shaft must be fitted and in a proper condition.
- On PTO shafts always ensure the tube has sufficient overlap in transport- and operating position. (Observe instruction manual of the PTO shaft manufacturer).
- Attach or remove the PTO shaft only when the tractor engine is stopped and the ignition key removed.
- Always ensure the correct fitting and securing of the PTO shaft.
- Secure the PTO guard against spinning by fixing the provided chains.
- Before engaging the universal joint shaft ensure that the universal joint shaft speed of the tractor and the permissible speed of the implement coincide.
- When using the ground-related PTO take note that the PTO speed is related to the forward speed and that the sense of rotation reverses when backing up.
- Before engaging the universal joint shaft advise people to leave the danger zone.
- Never ever engage the universal joint shaft when the motor is stopped.
- Before engaging the universal joint shaft ensure that no persons are within the danger area of the spinning universal joint shaft or the PTO shaft.
- Always stop PTO when it is not needed or when the shaft is in an adverse position.
- Attention! Danger of injury. After switching off the PTO the mounted implement may continue to run by its dynamic masses. During this period never come too close to the implement. Begin work on the implement only after it has come to a full standstill.
- Clean and grease the universal joint shaft and the PTO driven implement only after the universal joint shaft and the engine have been stopped and remove the ignition key.
- Deposit removed PTO shaft on the provided carrier.
- When travelling in curves mind the permissible angling and sliding length.
- After removal of the PTO shaft cover the universal joint shaft stud with the guard.
- Remedy any possible fault before starting to operate with the implement.
- When using wide angle PTO shaft always attach the wide angle joint on to the pivot point.

2.19.5 Hydraulic system

- The hydraulic system is under high pressure.
- When connecting hydraulic rams and motors ensure the correct connection of the hydraulic hoses.
- When fitting the hydraulic hoses to the tractor hydraulic sockets always ensure that the hydraulic system on the tractor as well as on the implement is without pressure.
- To avoid wrong hydraulic connection of tractor and implement, the sockets and plugs should be marked. This helps to prevent contrary function, e.g. lifting instead of lowering. Danger of accident.
- All hydraulic hoses must be checked for their operational safety by a skilled person before the first operation of the machine and then at least once a year. In case of damage or ageing replace the hydraulic hoses. The replacement hoses must correspond to the technical demands of the implement manufacturer.
- When searching for leaks appropriate aids should be used because of the danger of injury!
- Liquids leaking under high pressure (hydraulic oil) can penetrate the skin and cause severe injury. When injured see a doctor immediately. Danger of infection.
- Before starting to do repair work to the hydraulic system release the pressure, lower machine to the ground and stop tractor engine.
- The period of use of any hose circuit should not exceed six years including a possible storing period of two years maximum. Also when stored and used properly hoses and hose circuits do age. Therefore their longevity and period of use is limited. Deviations from the above may be accepted by the Health- and Safety Authorities depending on the experience they have had and the danger potential. For hoses and hose circuits made of thermoplasts other guidelines may prevail.

2.19.6 Electric outfit

- When working on the electric system always disconnect the battery (negative pole).
- Use prescribed fuses only. When using too strong fuses the electric circuit may be damaged - danger of fire.
- Make sure the polarity is correctly fitted. First connect positive pole and then negative pole. - When disconnecting vice versa.
- Always provide plus pole with supplied cover. At accidental earth contact there is danger of explosion.
- Avoid sparks and open fire near the battery!

2.19.7 Brake system

- Check brakes for proper function before starting to travel.
- The brake system must be carefully checked in regular intervals!
- Only authorised workshops or brake services are allowed to carry out adjustment or repair work on the brake system.
- As a matter of principle switch off the single wheel braking (lock the pedal) before starting any transport travel.

2.19.8 Bolted joints, tyres

- Repair work on the tyres must only be carried out by skilled persons with appropriate fitting tools.
- Before carrying out any work on the wheels ensure that the trailed sprayer has been parked safely and that it is secured against rolling away (chocks).
- Danger of explosion exists if the air pressure in the tyres is too high.
- Check air pressure in regular intervals.
- Retighten all fixing bolts and nuts according to the prescriptions of the manufacturer.
- Retighten bolts and nuts after any wheel change.

2.19.9 Maintenance-, repair- and care

- As a matter of principle carry out maintenance-, repair- and care work only with the drive disengaged and stopped engine. Remove the ignition key.
- Check nuts and bolts for firm seating in regular intervals. Retighten if necessary.
- Before conducting any electric welding on the tractor and the mounted implements remove the cable from generator and tractor battery.
- Any spare parts fitted must, as a minimum meet with the implement manufacturers' fixed technical standards! Using original - **AMAZONE**- spare parts for example ensures this.

2.19.10 Plant protection implements for surface cropping

- Observe the recommendations of the plant protective agent manufacturer.
 - Protective clothing!
 - Warnings.
 - Metering-, application and cleaning prescriptions.
- Observe the hints given in the plant protection law.
- Never open hoses or tubes which are pressurised.
- If spare hoses are to be fitted, use only original - **AMAZONE**-hoses (hydraulic hoses 290 bar), which resist the chemical, mechanical and thermal strain. In principle, when fitting hoses or tubes only use hose clamps made from stainless steel (V2A) (for prescriptions for the identification and fitting of hoses, please refer to "Guide lines for liquid sprayer").
- Repair work inside the spray agent tank should only be started after thorough cleaning and by wearing a protective breathing mask. For safety reasons a second person should watch the work from outside the tank.
- The following should be noted when repairing sprayers which have been used for liquid fertilising with Ammonium Nitrate Urea solutions:

Residue of Ammonium-Nitrate-Urea solutions can produce salt by evaporation of the water both outside and inside the machine. Hereby pure Ammonium Nitrate and urea is developed. In pure form Ammonium Nitrate in conjunction with an organic material, e. g. urea can react explosively if during repair operations (e. g. welding, grinding, filing) the critical temperatures are reached. The salt of the Ammonium Nitrate Urea solution is water soluble, i. e. by thoroughly washing down the implement or the part to be repaired with water this danger is remedied. Therefore, before starting any repair work conduct a thorough cleaning of the implement with water.
- When filling the tank do not exceed the nominal volume.
- **When handling spray agent always wear the correct protective clothing as e. g. gloves, overall, protective glasses etc.**
- **In tractor cabs with ventilation fans exchange the fresh air filters for active carbon filters.**
- **Consider the compatibility of spray agents and materials of the machine.**
- **Do not spray any materials which tend to glue or to solidify.**
- **For safeguarding men, animal and environment, crop sprayers must never be filled from open sources.**
- **From the public water network crop sprayers may only be filled in free fall.**



Important

3 Description of product

This chapter provides you with a comprehensive survey about the design of the field sprayer. Read this chapter in close vicinity to the field sprayer. In this way you will get optimally acquainted to the field sprayer.

The field sprayer consists of the main components

- Basic implement and chassis
- Tyres
- Draw bar
- Pressure valve chest
- Pump equipment for drive speed 540 1/min or 1000 1/min
- Sprayer boom
- Spray lines with boom part width section valves

Overview – Assembly groups

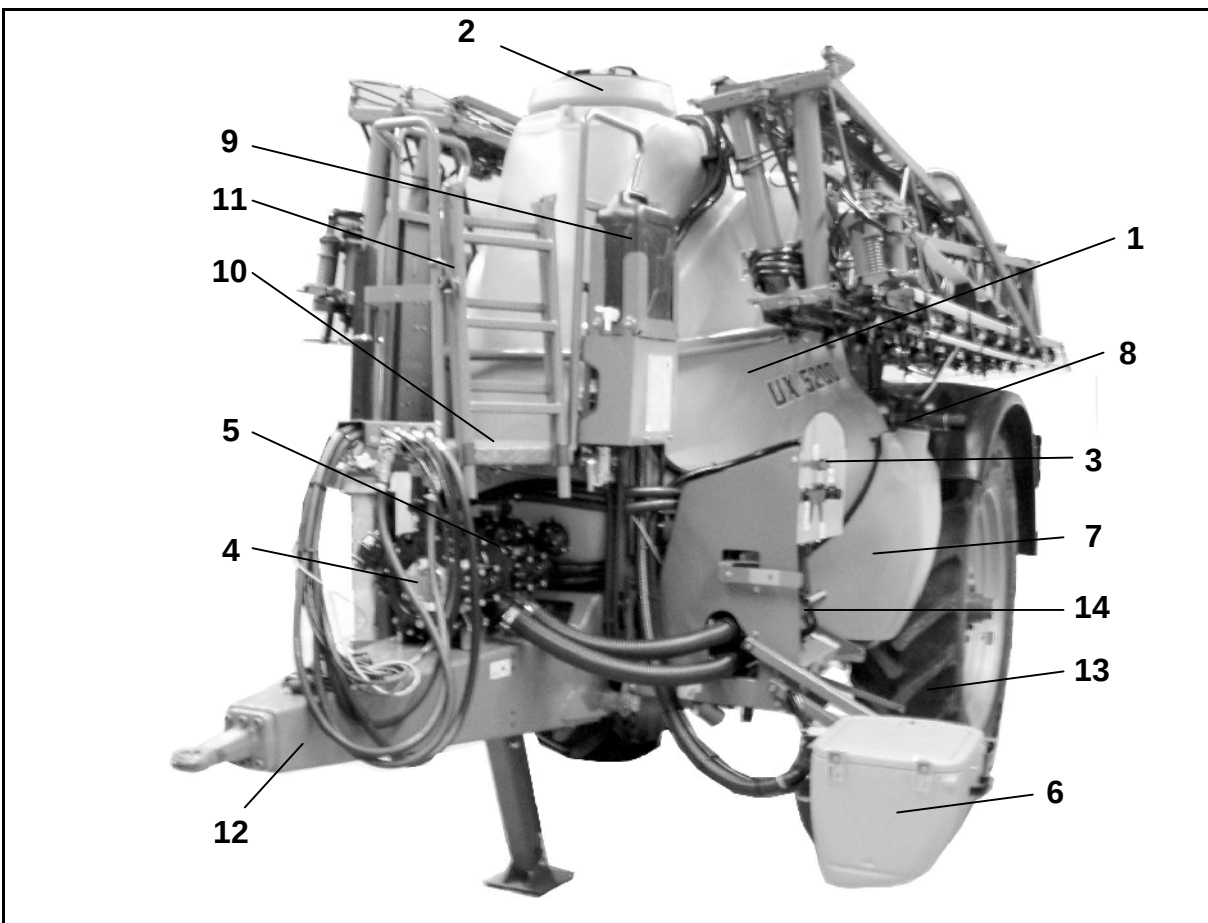


Fig. 1

- | | |
|---|---------------------------------|
| (1) Spray agent tank | (10) Platform |
| (2) Filling dome of spray mixture tank | (11) Ladder – swivels downwards |
| (3) Pressure valve chest | (12) Draw bar |
| (4) Spray pump | (13) Tyres |
| (5) Agitator pump | (14) Control panel |
| (6) Swivel induction bowl (in filling position) | |
| (7) Fresh water rinse tank 1 | |
| (8) Filling port fresh water rinse tank 1 | |
| (9) Hand wash tank | |

Overview – Assembly groups - continued

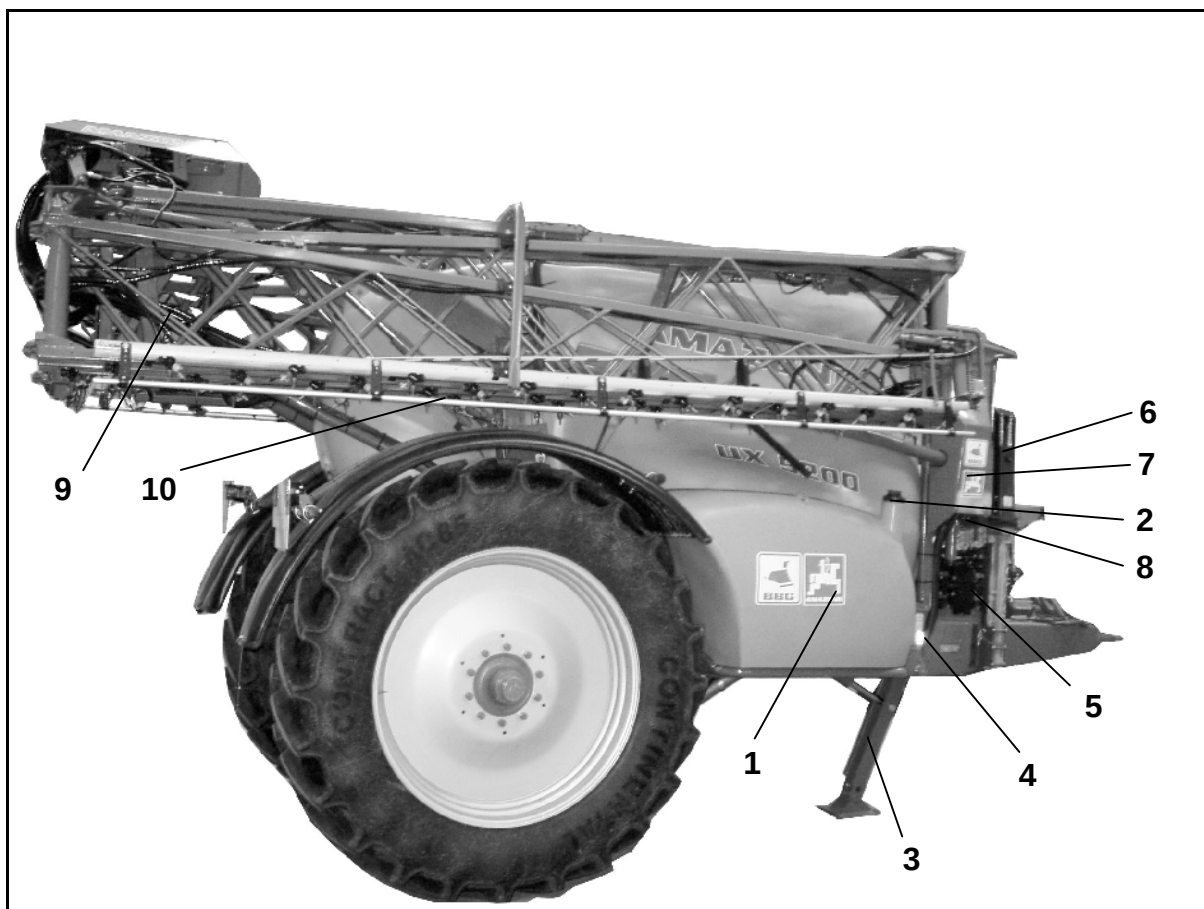


Fig. 2

- (1) Fresh water rinse tank 2
- (2) Filling port fresh water rinse tank 2
- (3) Hydraulic jack
- (4) Parking brake
- (5) Pump equipment
- (6) Chocks
- (7) Hydraulic block with system setting screw,
job computer
- (8) Oil filter with indication of possible dirt
- (9) Parallel guided boom carrier
- (10) Hydro reservoir

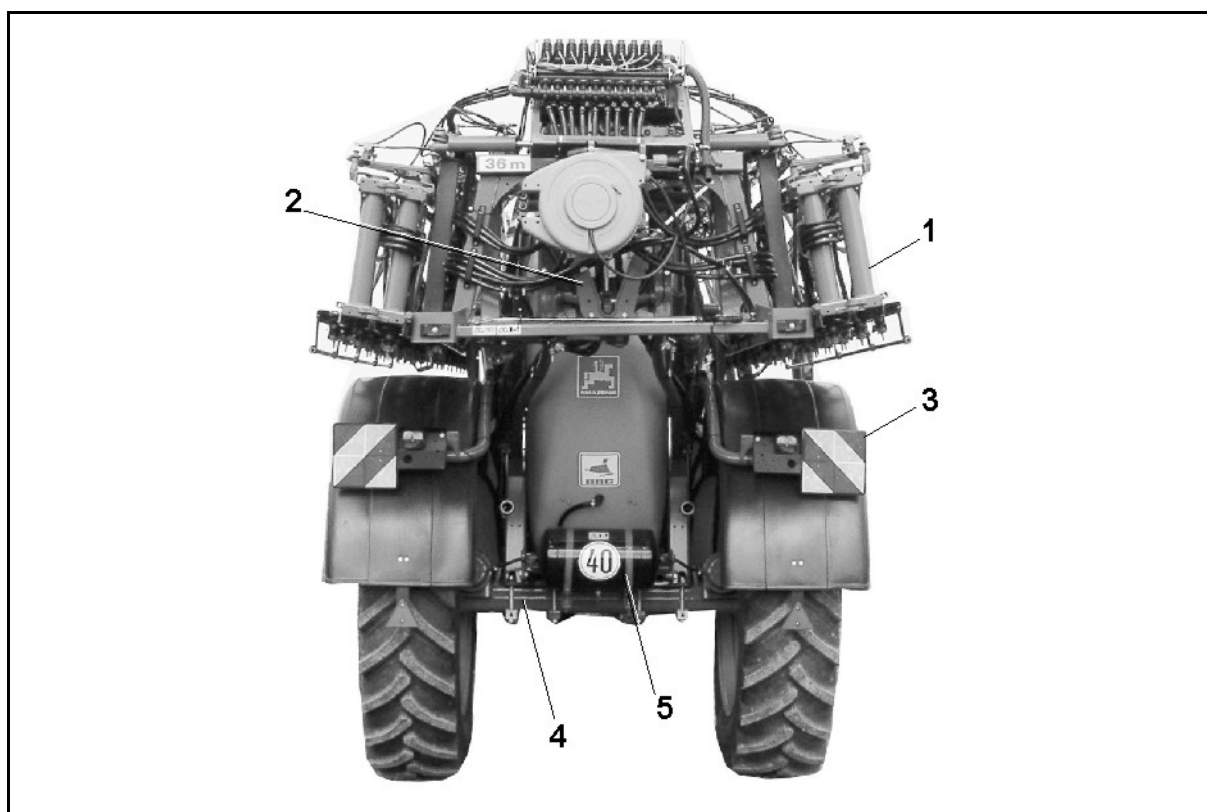


Fig. 3

- (1) Sprayer boom with spray lines
- (2) Swing compensation – can be locked and unlocked
- (3) Traffic light kit and warning plates
- (4) Axle and brakes
- (5) Air reservoir of dual circuit air brake
- (6) Pressurized connection for spray pressure gauge
- (7) Flow meter for the determination of the spray rate [l/ha]
- (8) Return flow meter for the determination of the spray mixture returned to the spray mixture tank
- (9) Motor valves for activating the boom part width sections
- (10) Bypass - valve
- (11) Pressure relief
- (12) Pressure sensor

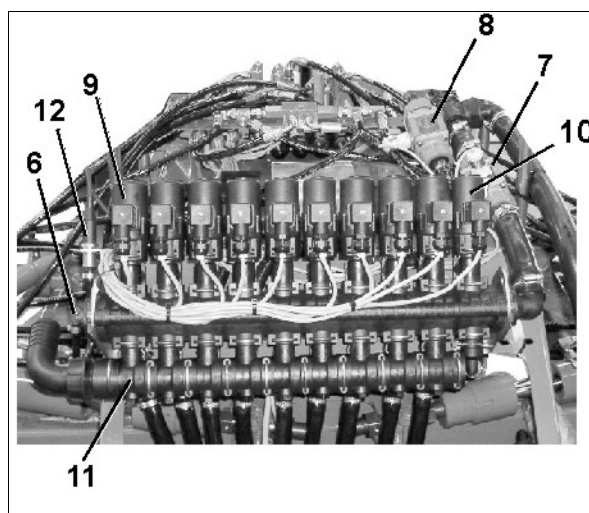


Fig. 4

Overview – Assembly groups - continued

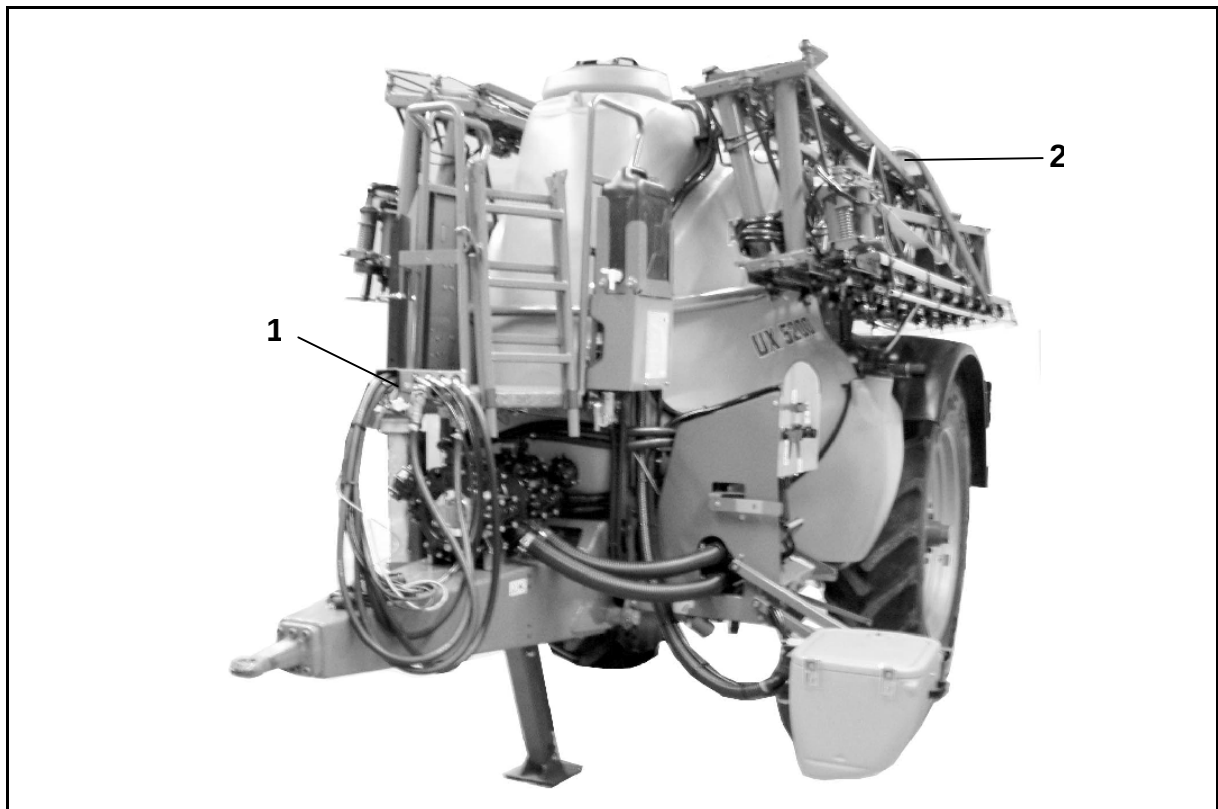


Fig. 5

- 1 Supply lines
 - Brake hose with coupling claw yellow
 - Second hose with coupling claw red
 - Electric cable for traffic lights
 - Hydraulic hose line (Pressure hose line P) for hydraulic connection with a single acting control valve
 - Hydraulic hose line (return flow line N) for the connection with a hydraulic hose with a pressure free return flow
 - Implement cable with implement plug for the connection of the job computer and **AMATRON+**
 - Dummy couplings for brake hose and second hose
 - Parking retainer for hydraulic hose lines
- 2 Transport locking device to lock the folded sprayer boom in the transport position against unintended folding out.

Central actuation of the functions for the field sprayer on the control panel via the different control elements

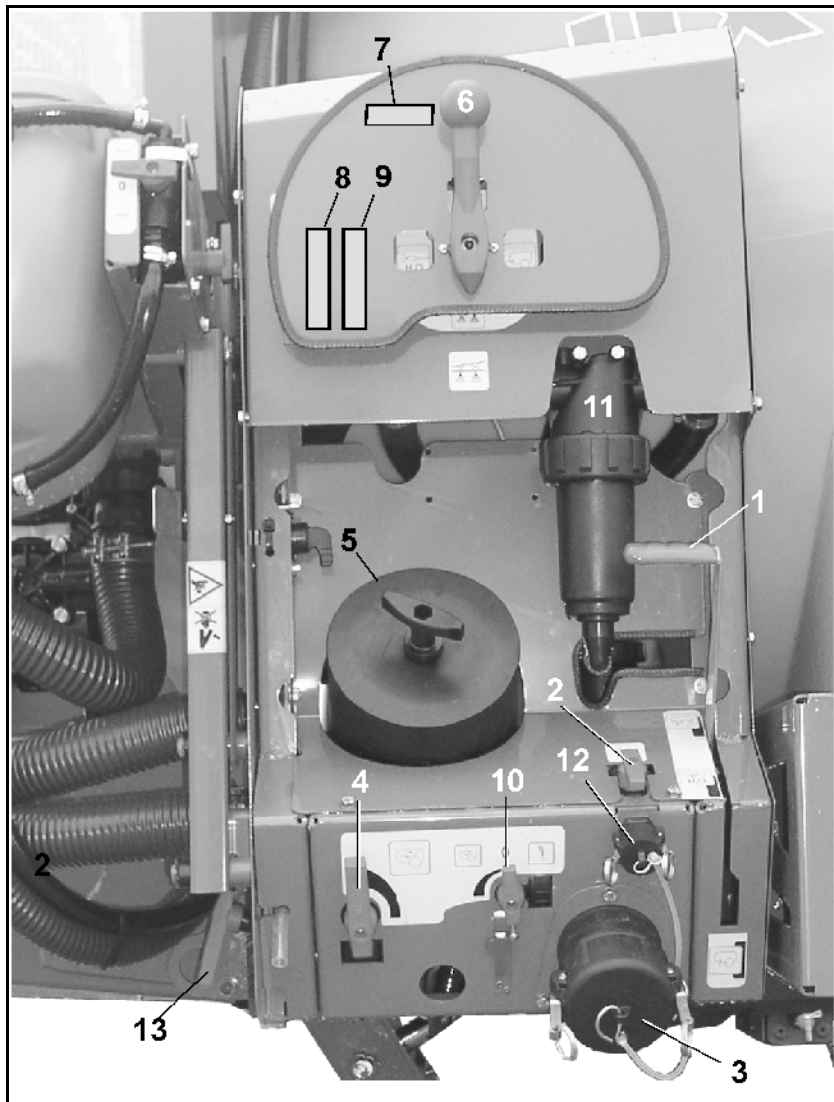


Fig. 6

- (1) Lever - suction control -E
- (2) Switch tap filling port fresh water rinse tank - J
- (3) Filling port of suction device for suction hose
- (4) Setting tap main agitator -H
- (5) Suction filter
- (6) Lever – pressure control -A
- (7) Switch tap injector -D
- (8) Switch tap spray cleaning of mixture tank - B
- (9) Switch tap exterior cleaning -C
- (10) Setting tap additional agitator / drain off residual amount - I
- (11) Pressure filter
- (12) Filling port fresh water rinse tank
- (13) Drain tap for spray mixture tank - K

3.1 Function

Fig. 7/...

Via the suction device (E), the suction line (M) and the suction filter (N) the spray pump (L) sucks

- The spray mixture from the spray mixture tank (O).
- Fresh water from the fresh water rinse tank (U)
The fresh water of the two fresh water rinse tanks (U) is used for cleaning the spraying system.
- Fresh water via the external suction port (V).

Via the pressure line (P) the sucked liquid is delivered to the pressure control (A) and in this way

- via the self cleaning pressure filter to the part width section valves (Q). The boom part width section valves distribute the spray mixture in the individual spray lines.
The agitation intensity of the spray mixture is increased via the step tap additional agitator (I) on the pressure filter.
- to the injector and induction bowl.
To prepare the spray mixture fill the required spray mixture for one tank filling into the induction bowl (T) and then suck it into the spray mixture tank.
- directly into the spray mixture tank (O)
- for interior- (B) or exterior (C).

The agitator pump (R) provides for the main agitator (S) in the spray mixture tank. The main agitator being switched on provides a homogeneous spray mixture in the spray mixture tank. The agitation intensity can be set on the step tap (H) main agitator.

3.2 Explanation for the valve chest actuation

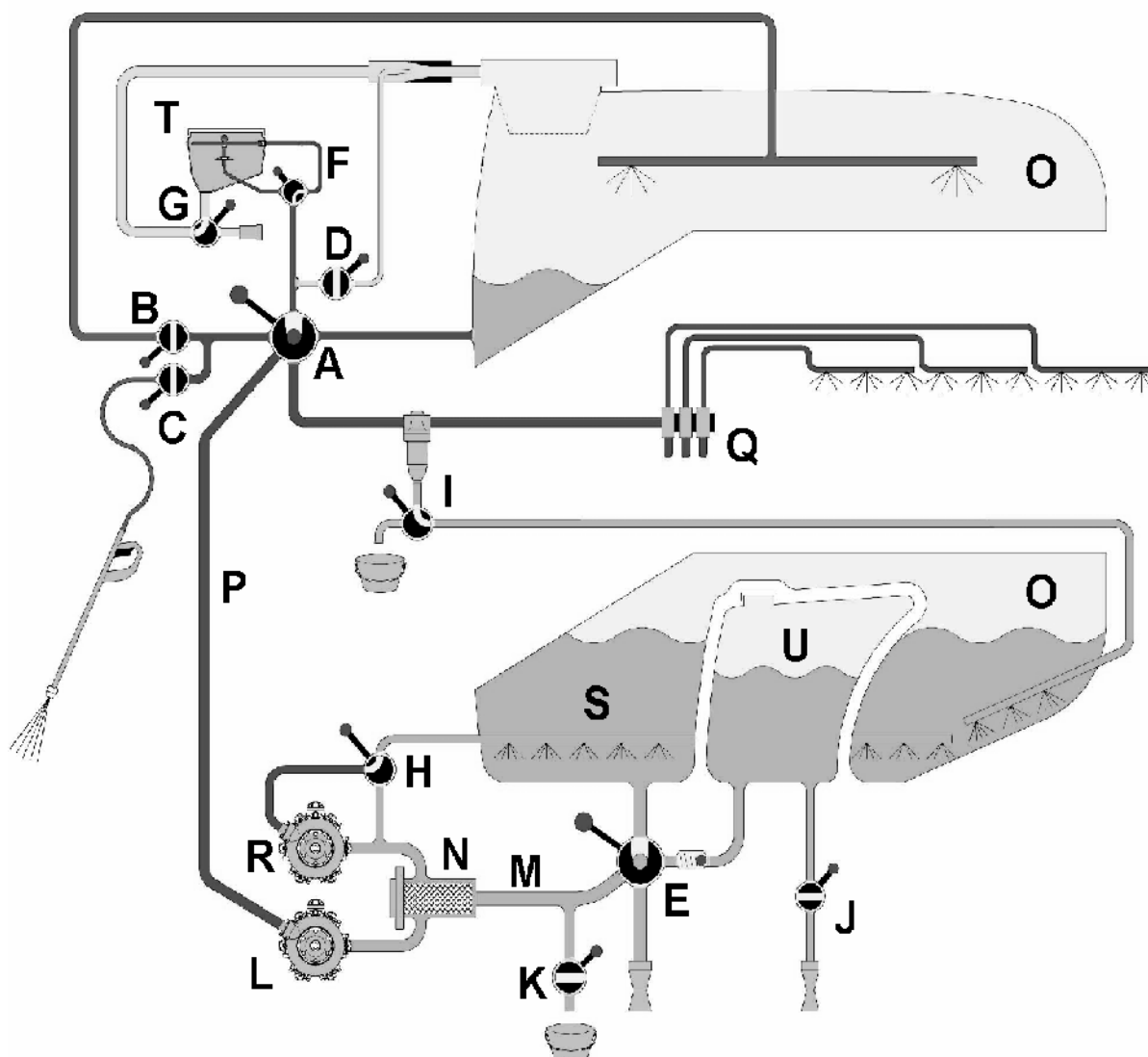


Fig. 7

- **A** – Pressure device actuation

-  Spraying
-  Cleaning
-  Injection
-  Filling the spray mixture tank

- **B** – Step tap – spray mixture tank cleaning
- **C** – Step tap exterior cleaning
- **D** – Step tap injector

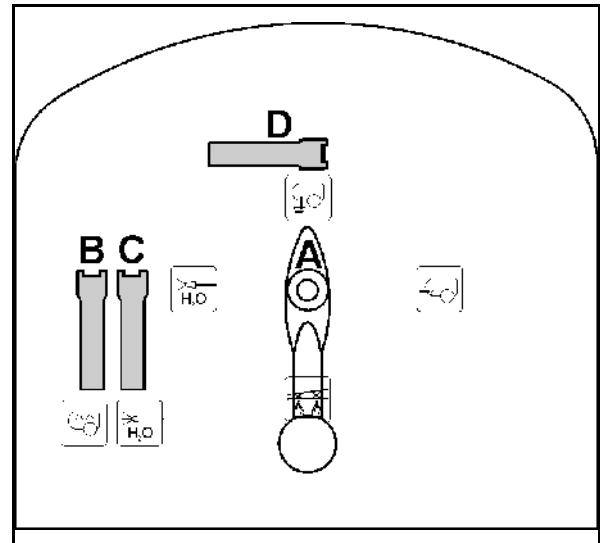


Fig. 8

- **E** – Lever suction device

-  Sucking from the spray mixture tank
-  Sucking from the fresh water rinse tank
-  Sucking via the suction hose

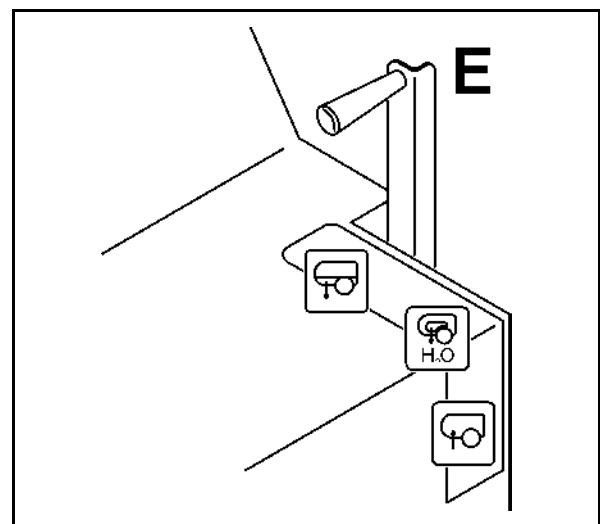


Fig. 9

- **F** – Reversing tap circuit line / canister flushing

- **0** zero position
-  Circuit line
-  Canister flushing

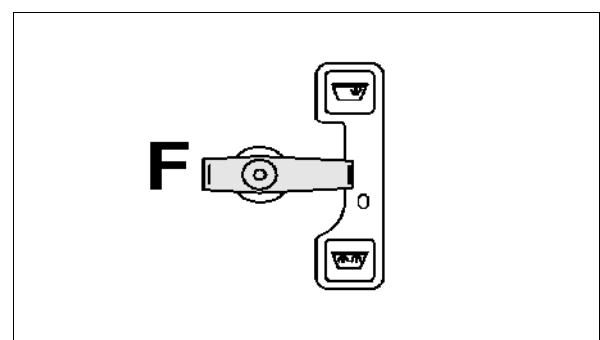
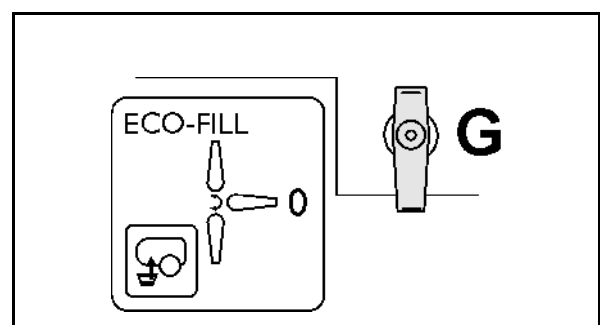


Fig. 10

- **G** – Reversing tap sucking off the induction bowl / ECOFILL

- **0** Zero position
-  Sucking off the induction bowl
- **ECO-FILL** filling port for spray mixture tank



Description of product

- **H** – Step tap main agitator
- **I** – Step tap additional agitator

-  Draining off residual amount

Fig. 11

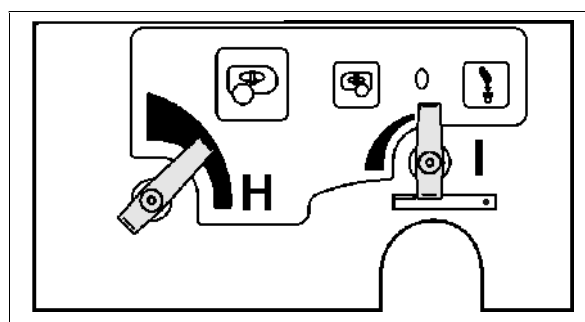


Fig. 12

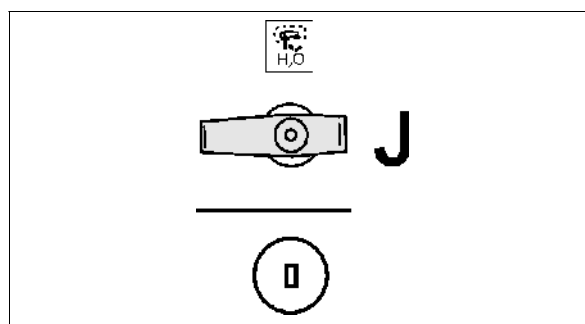


Fig. 13

- **K** – Drain tap spray mixture tank

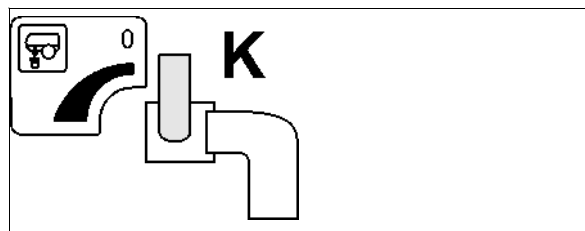


Fig. 14

3.3 Danger zones

Danger zones exist:

- between tractor and field sprayer, particularly when hitching on or off.
- within the operational range of moving parts
- on the moving machine.
- within the pivoting range of the sprayer boom.
- inside the spray mixture tank by poisonous fumes.
- underneath lifted, not secured machines or machine parts.
- when folding in and out the sprayer booms within the range of high voltage lines by touching them.

Within these zones permanently existing danger or unexpectedly arising danger exist. Safety symbols identify these danger zones. Here, particular safety advices are valid. Please refer to chapter "General safety advice", page 17.

3.4 Positioning of safety symbols and other identifications

Safety symbols

The following illustrations show the arrangement of the safety symbols.

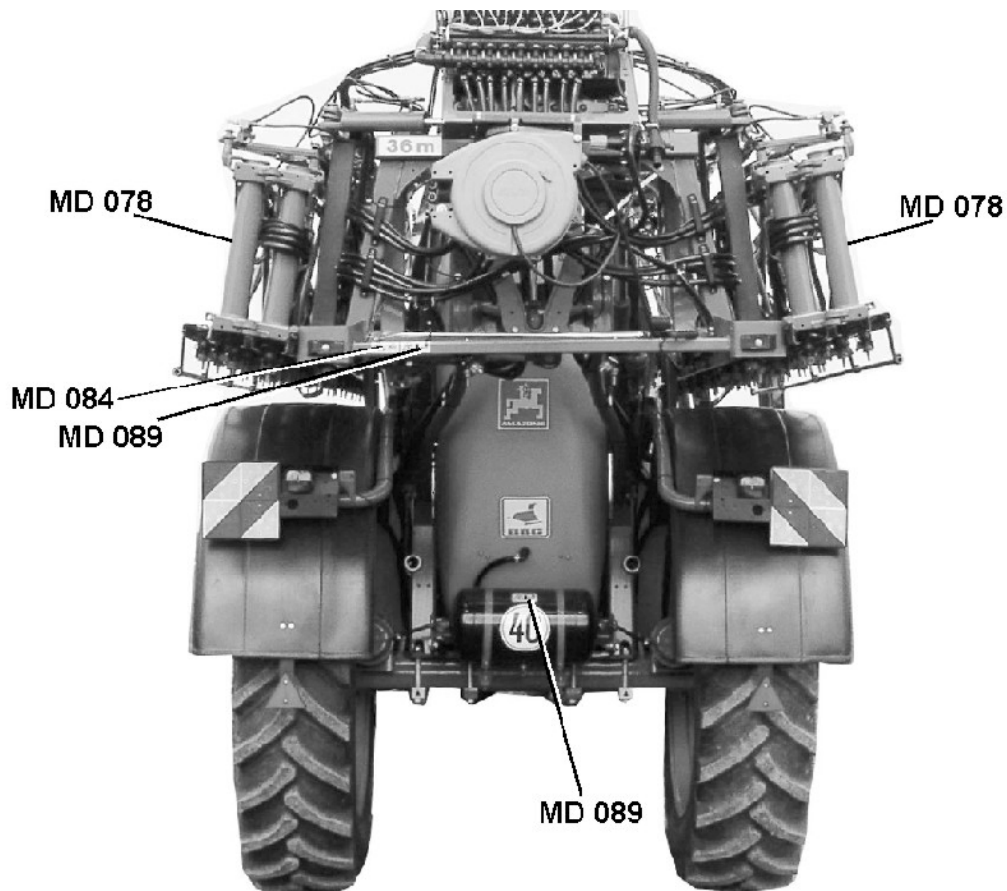


Fig. 15

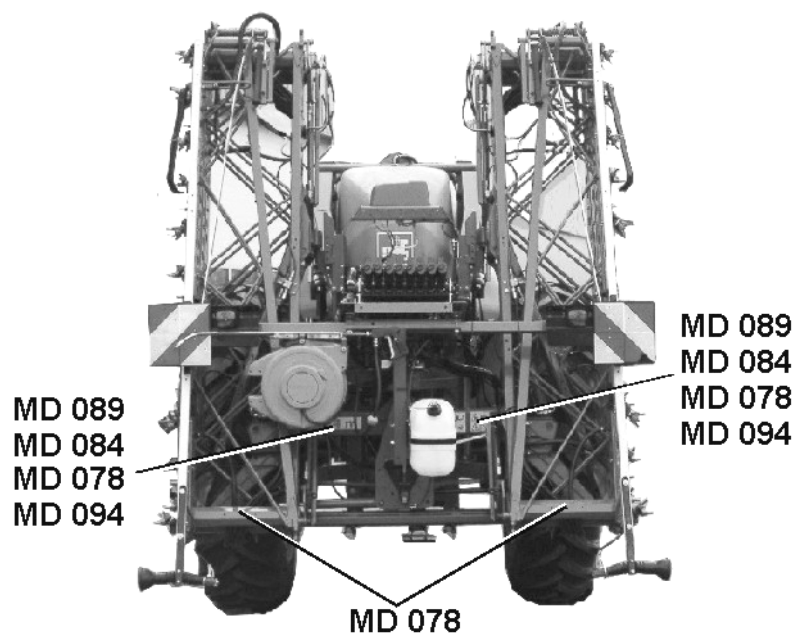


Fig. 16

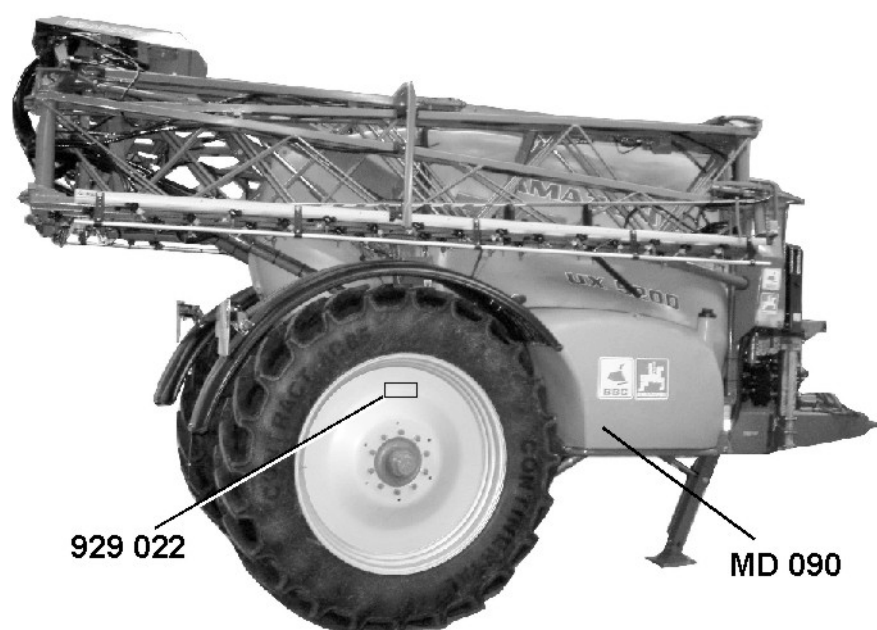


Fig. 17

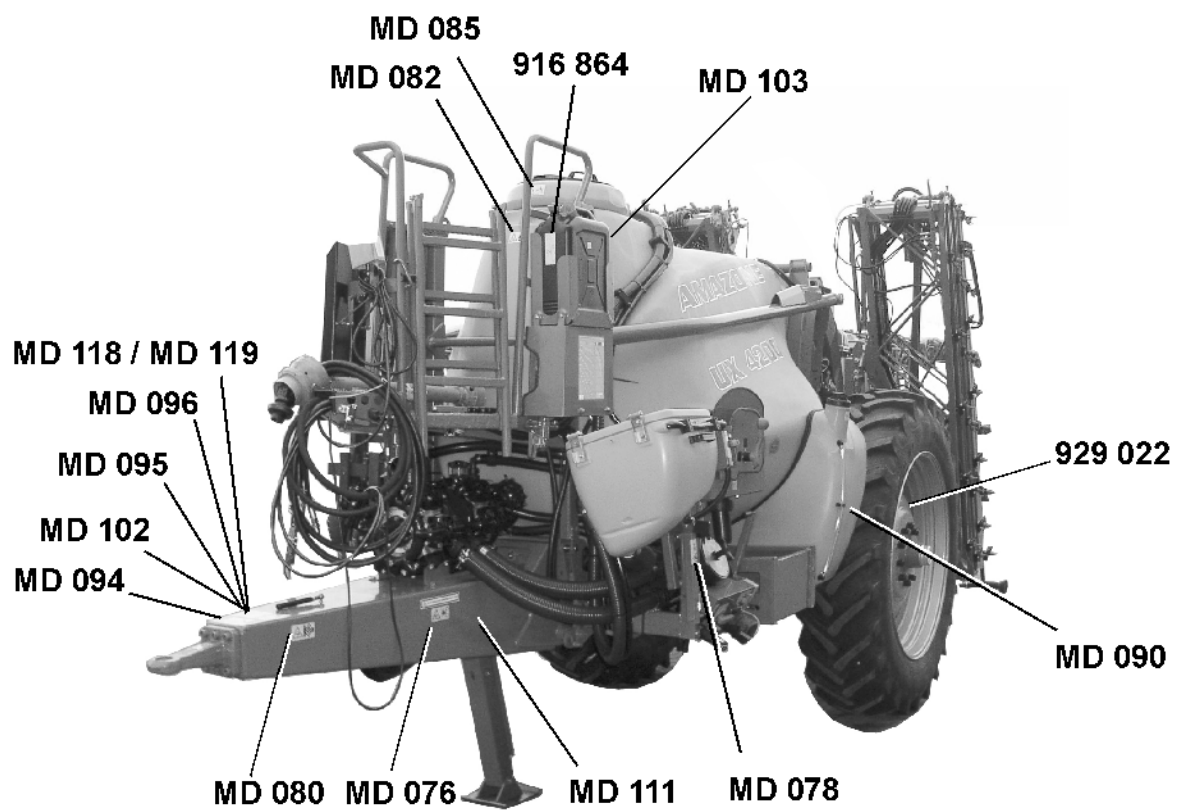


Fig. 18

Description of product

Type plate and CE-declaration

The type plate for the basic machine (Fig. 19/1) and the CE-declaration (Fig. 19/2) are located on the front right hand side of the frame (Fig. 19/3).

Details on the type plate:

- Mach.-Ident-No.:
- Type
- Permissible system pressure bar
- Year of construction
- Factory
- Power kW
- Basic weight kg
- Permissible total weight kg
- Axle load rear kg
- Axle load front support load kg

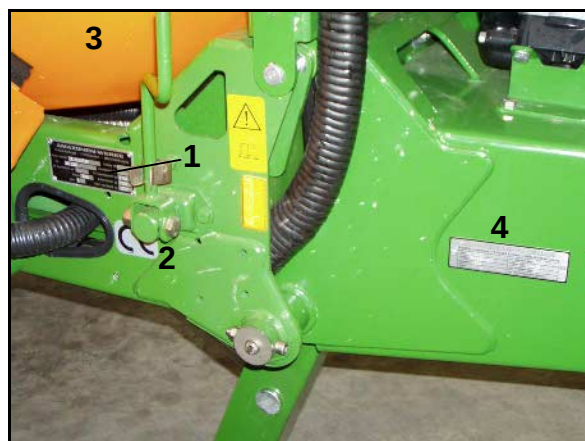


Fig. 19

The type plate of the drawbar is located on the right hand side of the drawbar. (Fig. 19/4).

3.5 Conformity declaration

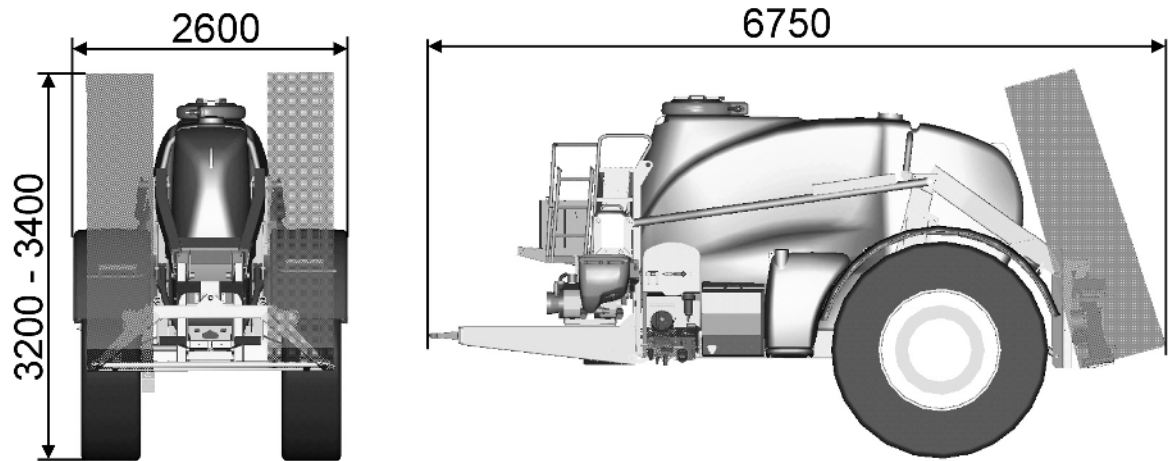
Name of guide line

The trailed field sprayers UX 4200 and UX 5200 fulfil the:

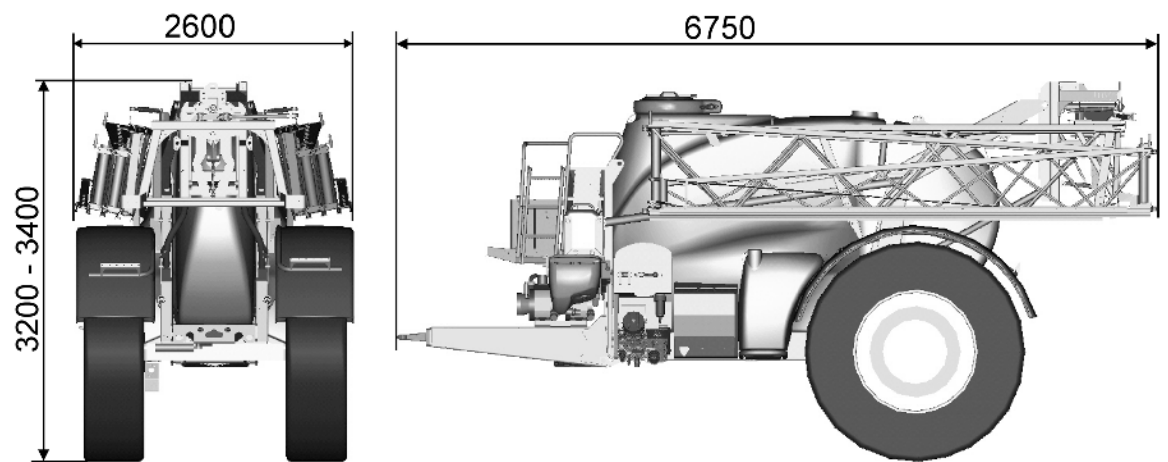
- Machine guide line **98/37/EG**
- EMV-guide line **89/336/EWG**

3.6 Technical data

3.6.1 Overall dimensions UX with Super-S sprayer boom



3.6.2 Overall dimensions UX with L sprayer boom



(The total heights depend on the tyre size.)

Description of product

3.6.3 Data sheet

Type UX		4200	5200
Basic weight	[kg]	3200-3800	3300-3900
Spray mixture tank			
Actual volume	[l]	4450	5460
Nominal volume		4200	5200
Filling height			
• from the ground	[mm]	2060	2260
• from the platform		1080	1400
Permissible system pressure	[bar]	10	10
Technical residual amount incl. Pump			
• on level ground		23	23
• when operating across slopes			
• 15% in driving direction to the left hand	[l]	23	23
• 15% in driving direction to the right hand		23	23
• when operating up and down hill			
• 15% up hill		37	37
• 15% down hill		30	30
Centre control		Electric, coupling of part section valves	
Spray pressure adjustment		elektrical	
Spray pressure setting range	[bar]	0,8 – 10	
Spray pressure indication		Pressure gauge 0-8 / 25 bar expanded Ø 100 mm liquid fertiliser proof and digital spray pressure gauge	
Pressure filter		50 (80) mesh	
Agitator		Infinitely variable setting	
Spray rate control		Speed related via the job computer	
Nozzle height	[mm]	500 - 2500	

The permissible total weight depends on the tyres – see chapter 4.2.3.

The empty weight results from the sum of the weights according to chapter 3.6.4 and chapter 3.6.5

3.6.4 Weights basic implement, axles and tyres

Type UX		4200	5200
Basic weight	[kg]	1625	1671
Axle			
Axle rigid	[kg]	360	
Axle steering	[kg]	550	
Axle steering track 1500	[kg]	560	
Tyres			
300/95 R52	[kg]	566	
340/85 R48	[kg]	524	
520/85 R42	[kg]	690	
520/85 R38	[kg]	652	

3.6.5 Weights sprayer booms

Super-S-boom:

Working width	[m]	18	20	21	21/15	24	27	28
Weight	[kg]	519	631	634	629	651	690	691

L-boom:

Working width	[m]	24	27	28	30	32	33	36
Weight	[kg]	862	932	936	964	1008	1012	1032

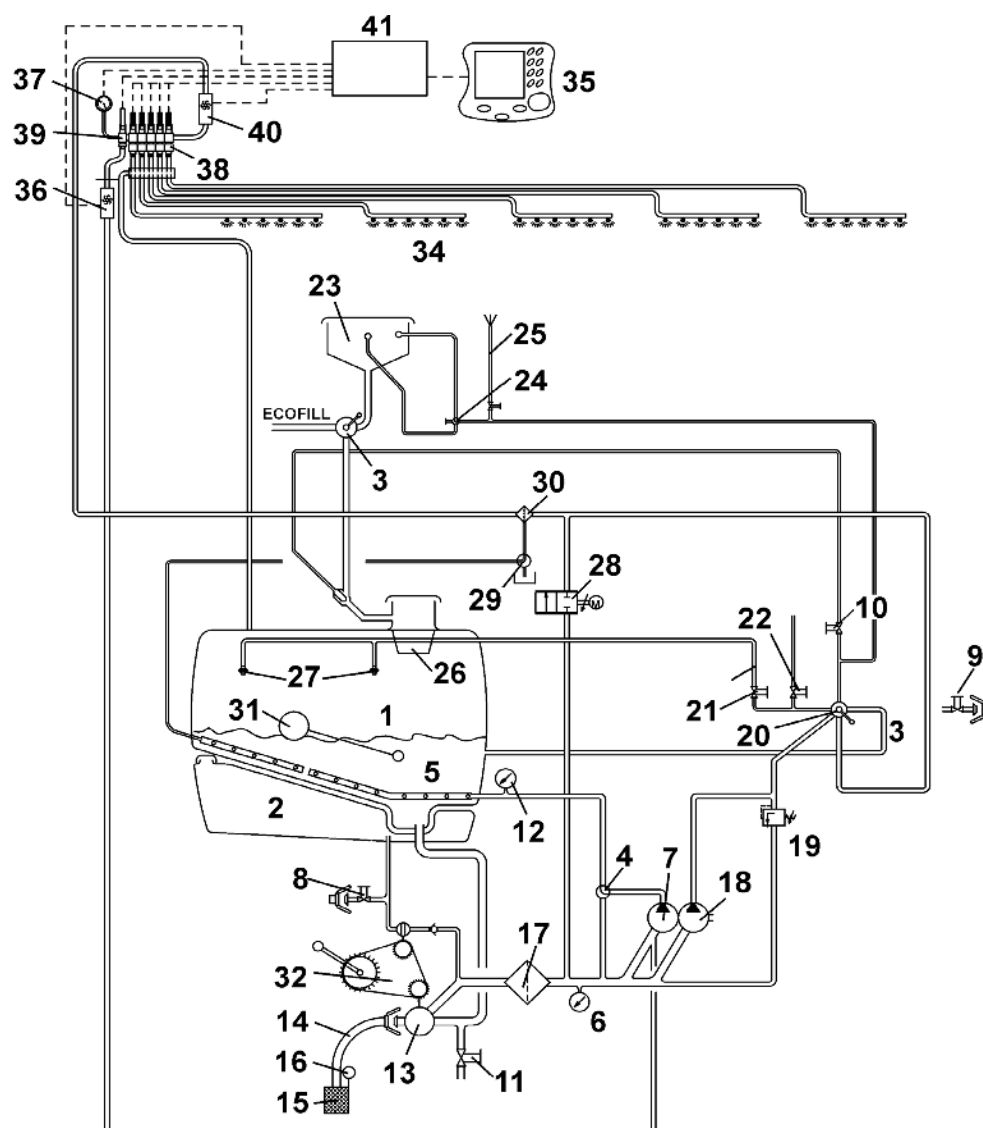
3.6.6 Details about noise level

The tractor operator seat related emission value is 74 dB (A), measured when operating with closed tractor cab at the ear of the tractor operator.

Measuring implement: OPTAC SLM 5.

The height of the noise level mainly depends on the vehicle used.

3.7 Liquid circuit



- | | | |
|--|---|---|
| 1. Spray mixture tank | 15. Filter in the suction hose | 29. Step tap additional agitator / drain off residual amount |
| 2. Fresh water rinse tank | 16. Float body | 30. Pressure filter |
| 3. Filling tap | 17. Suction filter | 31. Filling level indicator |
| 4. Setting tap main agitator | 18. Spraying pump | 32. Suction tap combination spray mixture / suction hose / flushing water |
| 5. Agitator | 19. Safety valve spray pump | 33. Reversing tap |
| 6. Vacuum sensor suction hose | 20. Tap pressure device | 34. Spray lines |
| 7. Agitator pump | 21. Reversing tap internal cleaning | 35. AMATRON+ |
| 8. Filling tap flushing water | 22. Reversing tap external cleaning | 36. Return flow meter |
| 9. Quick emptying (Option) | 23. Induction bowl | 37. Spray pressure sensor |
| 10. Step tap injector | 24. Reversing tap circuit line / can-ister flushing | 38. Part section valves |
| 11. Drain tap spray mixture tank | 25. Cleaning hose induction device | 39. By-Pass-valve |
| 12. Pressure indicator agitator (Option) | 26. Filling sieve | 40. Flow meter |
| 13. Quick coupler suction hose | 27. Cleaning nozzles | 41. Implement computer |
| 14. Suction hose | 28. Pressure regulating valve | |

4 Assembly and function

4.1 Hydraulic system



Hint

- Required on the tractor:
 - 1 hydraulic connector with one single acting control valve for fitting on the hydraulic block for pressure line P.
 - 1 hydraulic connector with pressure free return flow for fitting on to the hydraulic block for return flow line N.
- Control of all hydraulic functions from the tractor cab with the aid of electro solenoid valves via the **AMATRON +**.
- 1 double acting control valve for the connection of the hydraulic jack.



Important

During spraying operation lock the control device for the hydraulic block on the tractor in order to make full use of all hydraulic functions.



Danger!

Transport travel with locked control device is prohibited. For any transport travel ensure that the control device on the tractor is in the neutral position.

Hitching on

- Hydraulic hose line (pressure hose P) (Fig. 21/1) connected to a hydraulic joint with one single acting control valve.
 - Hydraulic hose line (return flow hose N) (Fig. 21/2) connected to a hydraulic joint with pressure free return flow
 - Connect the hydraulic hoses (Fig. 21/3) for the hydraulic jack to one double acting control valve.
1. Swivel the lever on the tractor control unit into the float position (neutral position).
 2. Check the hydraulic plugs for cleanliness.
 3. Clean dirty hydraulic plugs.
 4. Insert the relevant hydraulic plug of the hydraulic hose line into the relevant hydraulic joint until the hydraulic plug noticeably locks in the hydraulic socket.

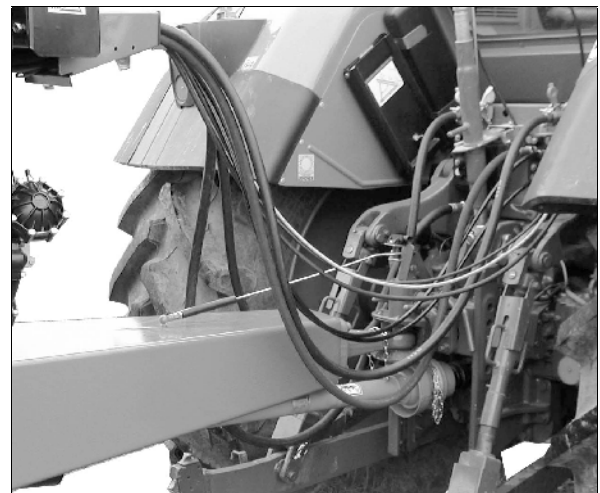


Fig. 20

Hitching off

1. Swivel the lever on the tractor control unit into the float position (neutral position).
2. Remove the relevant hydraulic plug from the hydraulic socket and insert the hydraulic plugs into the dummy couplings.

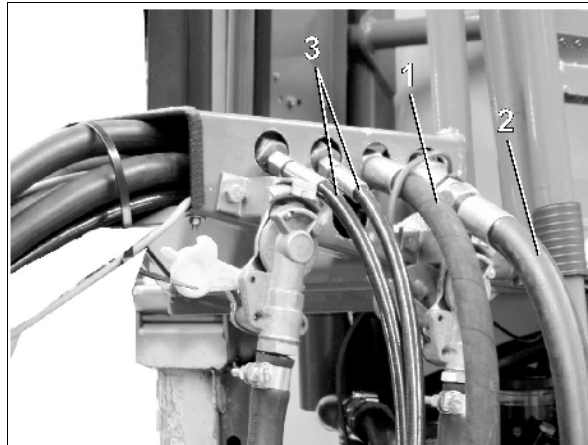


Fig. 21

4.1.1 Setting the system setting screw on the hydraulic block



Important

Implicitly adjust the setting of the system setting screw to the hydraulic system of your tractor. Increased hydraulic oil temperatures result from the incorrect setting of the system setting screw, caused by the permanent strain on the pressure relief valve of the tractors' hydraulic system.

The prevailing tractor hydraulic system determines the adjustment of the system setting screw on the hydraulic block (Fig. 22/1). Depending on the tractor hydraulic system proceed as follows:

- **drive out** the system setting screw until its stop (set by the factory) on tractors with
 - open-centre-hydraulic system (constant flow system, gear pump hydraulics).
 - Load-Sensing-hydraulic system (pressure and electrically powered controlled setting pump) oil supply via control unit.
- **drive in** the system setting screw until its stop (contrary to the factory's setting) on tractors with (
 - Closed-Centre-hydraulic system (constant pressure system, pressure controlled setting pump).
 - Load-Sensing-hydraulic system (pressure and electrically powered controlled setting pump) with direct load-sensing pump connection.

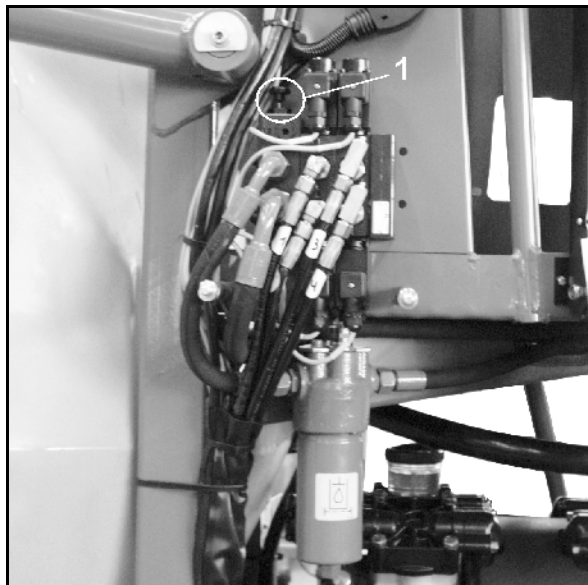


Fig. 22

4.1.2 Oil filter

The oil filter (Fig. 23/1) with its dirt indication (Fig. 23/2) checks the cleanliness of the hydraulic oil.



Important!

- Check the dirt indication (Fig. 23/2) in regular intervals to ensure the proper functioning of the hydraulic system and its parts.
- Immediately exchange the oil filter (Fig. 23/1) when a red ring is visible instead of the green ring.



Danger

Only exchange the oil filter (Fig. 23/1) when the hydraulic system is pressure free. Danger of injury by hydraulic oil leaking under high pressure.

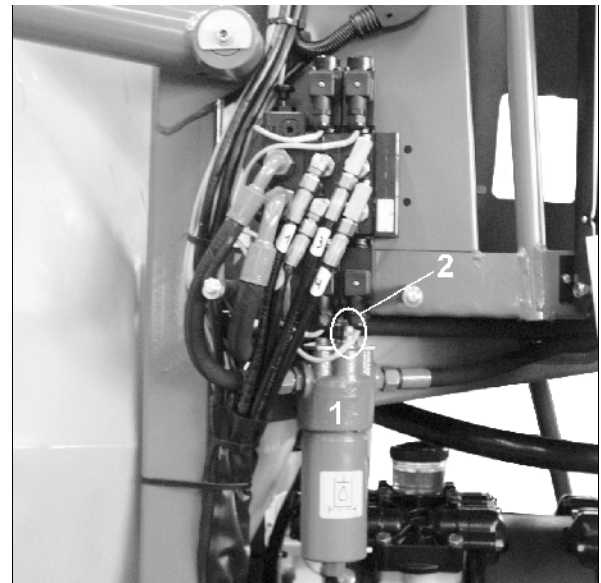


Fig. 23

4.1.3 Hydraulic pump drive

Connect the hydraulic hose pressure line to a hydraulic joint with one single acting control valve.



Hint!

The hydraulic hose line return flow pump is coupled with the return flow line N.

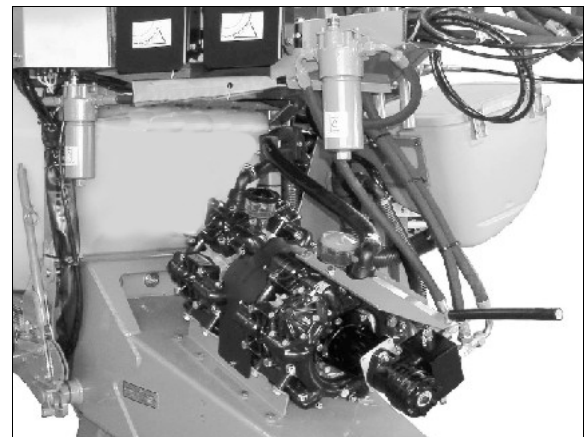


Fig. 24

4.2 Running gear and tyres

The permissible total weight and the forward speed are determined by

- the type of axle (unbraked or braked).
- the tyres.

4.2.1 Running gear with unbraked axle

The following restrictions result for trailed sprayers with unbraked axle:

- | | |
|------------------------------|---|
| • permissible forward speed: | 25 km/h |
| • permissible total weight: | Total 3000 kg (2600 kg axle load and 400 kg support load) |

4.2.2 Running gear with braked track following steering axle

The running gear is equipped with a braked track following steering axle for the automatic, almost track true following of the trailed sprayer.

The track following steering axle is provided with two independently working brake systems (service brake system and parking brake).

The service brake system is a dual circuit air brake system with either a manually adjustable brake pressure regulator or a hydraulic brake (not allowed for Germany).

The applied parking brake works independently from the service brake system and secures the uncoupled trailed field sprayer against unintended rolling away.

4.2.2.1 Track following steering axle

On the track following steering axle (Fig. 26/1) for the automatic, almost true track following Trail-Tron (Fig. 25/1) registers the angular position of the draw bar (Fig. 25/2) in relation to the tractor's direction of travel. In case the draw bar position deviates from the mean position of the tractor (draw bar in alignment with the tractor) the hydraulic rams (Fig. 26/2) of the track following steering axle are activated until the mean position is reached again.

Turning circle diameter $d_{wk} > 18 \text{ m}$.

In addition the track following steering axle for the true track following can be re-adjusted, e.g. in case the field sprayer would skid when operating on steep slopes.



Danger

Transport travel with activated Trail-Tron is prohibited.



Important!

Pre-condition for the correct functioning of the hydraulically actuated track following steering axle is the prior accurate Trail-tron calibration.

Carry out a Trail-tron calibration

- prior to the initial operation.
- in case of deviations between the access of the track following steering axle shown on the display and the actual access of the track following steering axle.



Important!

For machines with track widths larger/smaller than 1800 mm or tyre width larger than 500 mm:

Set the stop screw (Fig. 27/1) in the brake drum in such a way, that the wheels do not collide at an max. steer angle.

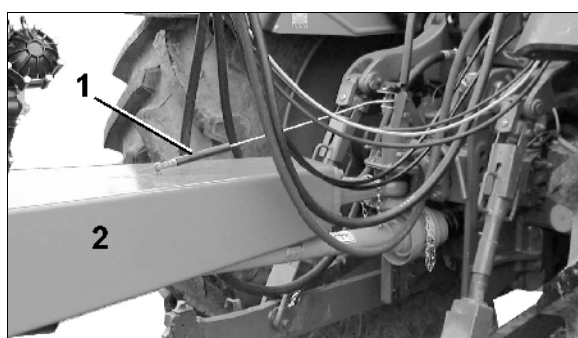


Fig. 25

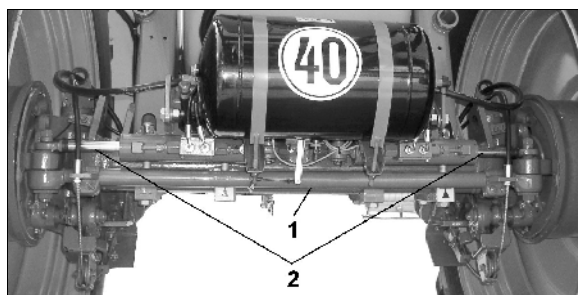


Fig. 26

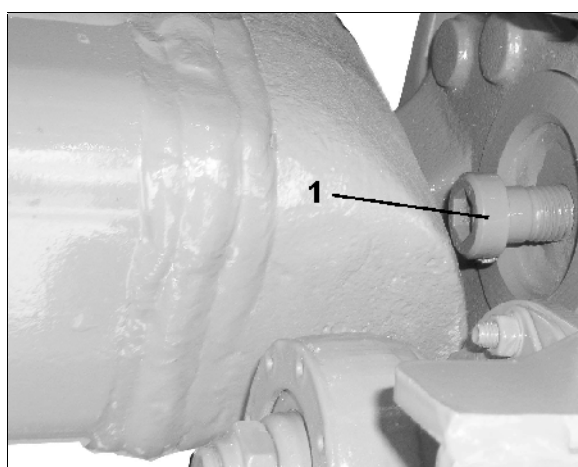


Fig. 27

4.2.2.2 Dual circuit air brake system

The access of the dual circuit air brake system requires a dual circuit air brake system on the tractor as well.

- Brake valve of the trailed implement with manually adjustable brake pressure regulator.
- Brake pressure regulator with hand lever for the manual adjustment of the braking power. The setting of the braking power is done in 4 steps, depending on the load of the trailed sprayer.
 - Sprayer filled = full load
 - Sprayer partly filled = $\frac{3}{4}$, $\frac{1}{2}$, $\frac{1}{4}$
 - Sprayer empty = empty

Fig. 28/...

(1) Hand lever for setting the braking power steps.

(2) Release valve with control button (3).

(3) Control button;

- press in until the stop and the service brake system will release, e.g. when manoeuvring the uncoupled trailed field sprayer.
- pull out until the stop and the trailed sprayer will be braked again by the supply pressure coming from the air reservoir.

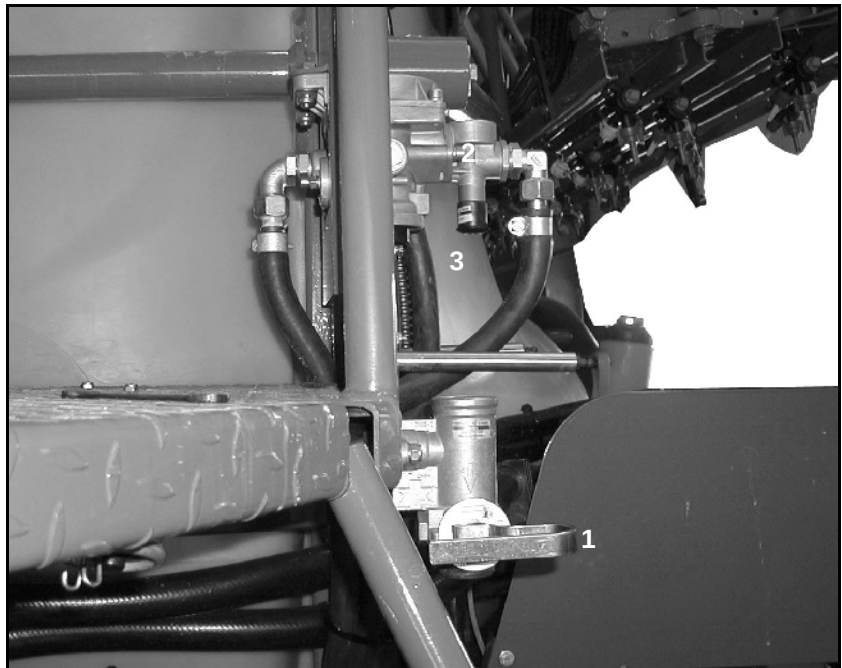


Fig. 28

Air reservoir

- (1) Air reservoir.
- (2) Draining valve for condensation.

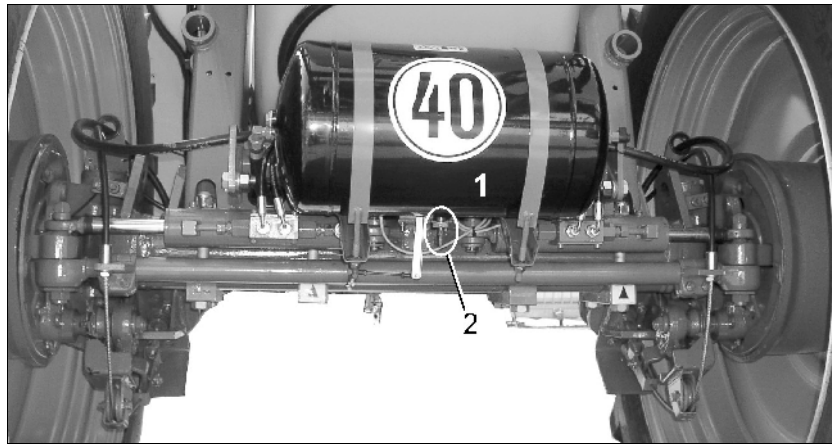


Fig. 29

Coupling the brake hose and the second hose



Important!

When coupling the brake and the second hose, ensure that

- the seal rings on the coupling claws are clean.
- the seal rings on the coupling claws are perfectly tight.
- you first connect the coupling claw of the brake hose (yellow) and then the coupling claw of the second hose (red).

Implicitly replace defective seal rings immediately.

When connecting the second hose (red) with the tractor the supply pressure coming from the tractor will automatically drive out the control button for the release valve on the brake valve of the trailed implement.

Before starting the first daily travel, drain the air reservoir.

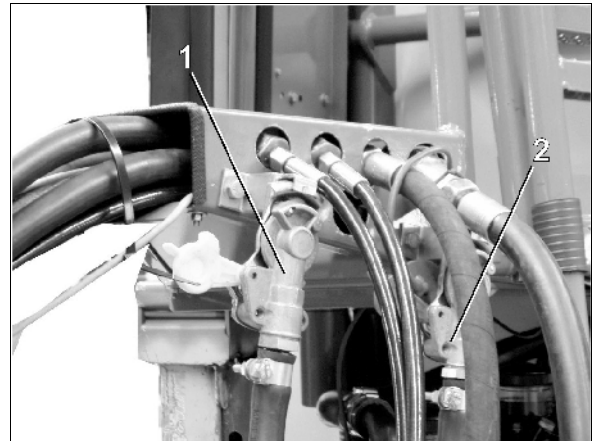


Fig. 30

1. Take the coupling claw of the brake hose (yellow) (Fig. 30/1) out of the dummy coupling.
2. Check the seal rings on the coupling claw for damage and cleanliness.
3. Clean dirty seal rings or replace defective seal rings.
4. Attach the coupling claw of the brake hose (yellow) (Fig. 30/1) as prescribed to the yellow marked coupling on the tractor.
5. Take the coupling claw of the second line (red) Fig. 30/2) out of the dummy coupling.
6. Check the seal rings on the coupling claw for damage and cleanliness.
7. Clean dirty seal rings or replace defective seal rings.
8. Attach the coupling claw of the second hose (red) (Fig. 30/2) as prescribed to the red marked coupling on the tractor.
9. Release the parking brake.

Removal of second hose and brake hose



When uncoupling the brake hose and second hose proceed as follows:

- Important**
- First remove the coupling claw of the second hose (red) and then remove the coupling claw of the brake hose (yellow). Implicitly observe this order as otherwise the service brake system would release and the unbraked trailed sprayer could roll away.
 - When the trailed sprayer is uncoupled or torn off the second hose to the brake valve of the trailed implement bleeds and the brake valve automatically switches over and activates the service brake system in relation to adjustment of the brake pressure regulator.

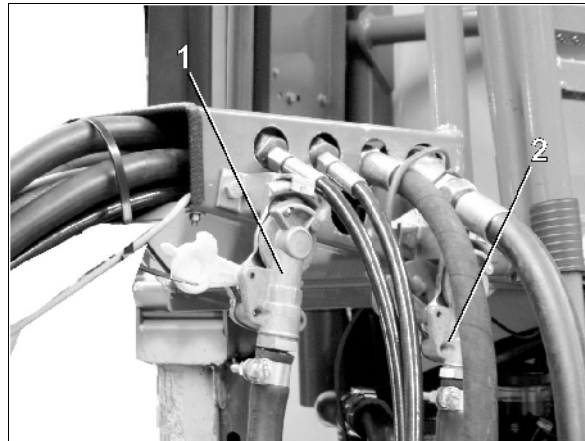


Fig. 31

1. Apply the parking brake and in addition secure the trailed sprayer against unintended rolling away utilising the chocks.
2. Remove the coupling claw of the second hose (red) (Fig. 31/2).
3. Remove the coupling claw of the brake hose (yellow) (Fig. 31/1).
4. Hook the coupling claws into the dummy couplings.
5. Close the lids of the coupling claws on the tractor.

4.2.2.3 Parking brake

The applied parking brake secures the uncoupled trailed sprayer against unintended rolling away. The parking brake is activated by turning the crank via spindle and cable.

-crank, locked in neutral position (Fig. 32).

-crank in actuating position (Fig. 33).



Fig. 32



Fig. 33

Release of the parking brake

1. Swivel the crank from the neutral position by 180° into the adjustment position.
2. Turn the crank in counter clockwise direction until the cable is slackened.
→ The parking brake is released.
3. Turn the crank into the neutral position..

**Important****Hint**

Check guidance of cable. It must never rest or rub on strange parts.

When the parking brake is released, the cable should slightly sag.

Actuating the parking brake

**Important**

Correct the setting of the parking brake if the when insufficient tensioning of the cable is noted.

1. Swivel the crank from the neutral position by 180° into the adjustment position.
2. Turn the crank in clockwise direction and apply the parking brake via the cable (the starting power of the parking brake is approx. 40 kg hand power).
→ The parking brake is released.
3. Swivel the crank back into the neutral position. .

Assembly and function

4.2.2.4 Hydraulic brake system

The access of the hydraulic brake system requires a hydraulic brake system on the tractor (not allowed in Germany). The max. permissible forward speed is 25 km/h for the trailed sprayer with hydraulic brake system.

Coupling:

Connect the hydraulic hose line of the hydraulic brake (Fig. 34/1) to the joint of the hydraulic tractor brake.

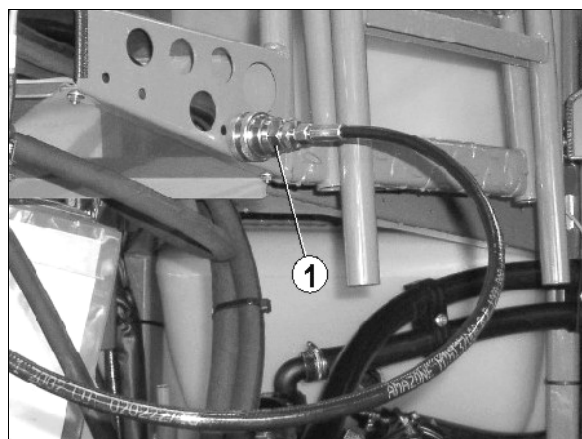


Fig. 34

Attach the pulling rope (Fig. 35/2) of the parking brake (Fig. 35/1) on to a fix point on the tractor.

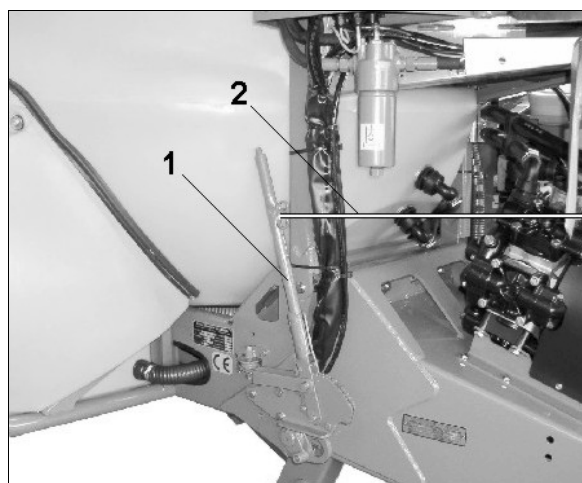


Fig. 35

4.2.3 Tyres

The forward speed and the permissible total weight of the trailed sprayer depend on the tyre type. The following table shows the required tyres for the various permissible total weights and forward speeds.

Tyres	UX 4200			UX 5200		
	Support load 2000 kg			Support load 2.000 kg		
	Permissible total weight-kg at an air pressure of bar			Permissible total weight-kg at an air pressure of bar		
	km/h					
	25	40	50	25	40	50
300/95R52 (12,4R52) LI 148 A8	8900 3,6	8300 3,6	- -	- -	- -	- -
340/85R48 (13,6R48) LI 148 A8	9600 3,6	8900 3,6	- -	9600 3,6	8900 3,6	- -
460/85R46 (18,4R46) LI 155 A8	10000 2,0	9750 2,1	9000 2,1	10000 2,0	9750 2,1	9000 2,1
460/85R46 (18,4R46) LI 155 B/158 A8	10000 2,0	10000 2,4	9700 2,4	10000 2,0	10000 2,4	9700 2,4
520/85R42 (20,8R42) LI 155 A8	10000 1,4	9750 1,6	9100 1,6	10000 1,4	9750 1,6	9100 1,6
520/85R42 (20,8R42) LI 157 B	10000 1,4	10000 1,6	10000 1,6	10000 1,4	10000 1,6	10000 1,6
520/85R38 (20,8R38) LI 155 A8 / 152 B	10000 1,4	9750 1,6	9100 1,6	10000 1,4	9750 1,6	9100 1,6

4.3 Draw bars

4.3.1 Straight draw bar and hitch draw bar

The straight draw bar is attached to the tractor hitch coupling.



Important

After coupling check the safe connection on automatic hitch couplings. On not automatic hitch couplings interlock insert the coupling pin and ensure interlocking.



Fig. 36

Hook the hitch draw bar into the tractor hitch hook.

4.4 Hydraulic jack

The hydraulically actuated jack (Fig. 37/1) supports the uncoupled trailed field sprayer. The actuation is done via a double acting control valve.



Danger

When parking the machine on the hydraulic jack observe that the jack does not deviate more than 30° from the vertical position.



Important

Never park the sprayer with the tank completely filled.



Important

For actuating the jack step on the clutch of the tractor and release the pin of the pulling eye / hitch.



Important

The red mark (Fig. 38/1) on the jack indicator is visible when the machine is parked on the hydraulic jack.

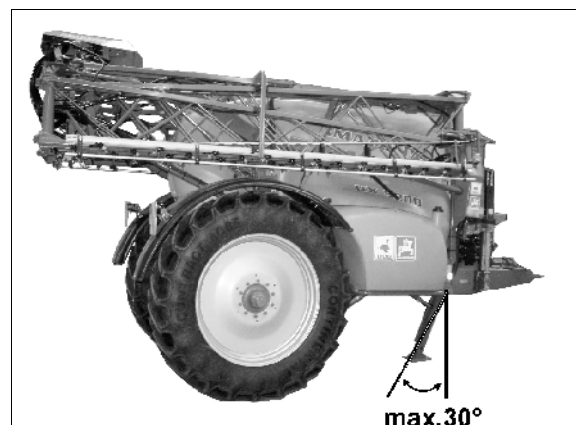


Fig. 37

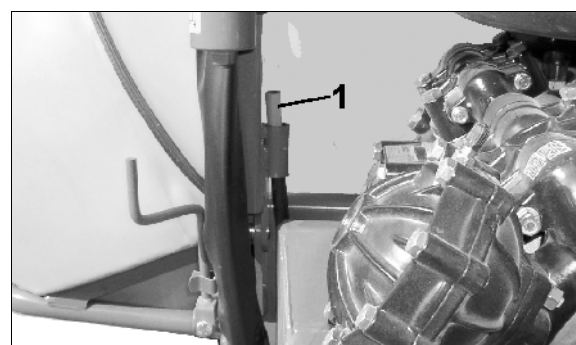


Fig. 38

4.5 Mechanic jack

- Jack raised during operation or transport (Fig. 39).
- Jack lowered (Fig. 40) with machine uncoupled.

To actuate the jack, proceed as follows:

- Slacken the linch pin (Fig. 39/2) .
- Pull out the pin (Fig. 39/3).
- Use the handles (Fig. 39/4) to lift / lower the jack.
- Lock the jack by using the pin and secure with the aid of the linch pin.
- Use the hand crank (Fig. 39/5) to further lowering / lifting the jack. .



Fig. 39

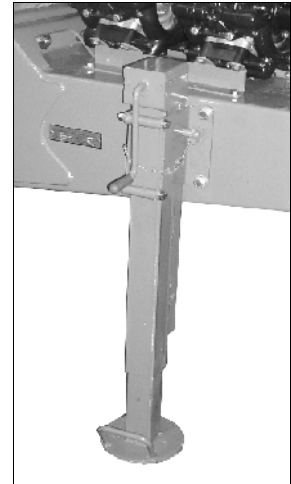


Fig. 40

4.6 Working platform

Working platform with swivel ladder for the access of the filling dome.



Danger



Important

- **Never climb into the spray mixture tank.**
Danger of injury from poisonous fumes.
- **As a matter of principle forbidden: riding on the field sprayer during transport.**
Danger of falling down when riding on the sprayer.
- **Implicitly observe that the ladder is located in its catching hooks when it is in the transport position.**

Fig. 41/...

- (1) Ladder folded upwards, secured in transport position.
- (2) Safety elements hold the catch hooks (3) and secure the ladder in the transport position against unintended folding out.
- (3) Catch hooks for carrying the safety elements. (2).



Fig. 41

4.7 Agitators

The field sprayer is equipped with the main agitator and the auxiliary agitator. Both agitators are designed as hydraulic agitators. The auxiliary agitator is simultaneously combined with the pressure filter flushing for the self cleaning pressure filter.

The main agitator is provided with an agitator pump of its own. The supply of the auxiliary agitator is carried out by the service pump.

The agitators, being switched on, mix the spray agent in the spray mixture tank and in this way provide a homogenous spray mixture. Infinitely variable setting of the agitation intensity.

Setting of the agitation intensity

- for the main agitator on the setting step tap (Fig. 42/1).
- for the auxiliary agitator on the setting step tap (Fig. 42/2).

When the step tap is in the 0 position the relevant agitator is switched off. The highest agitation intensity is achieved in position (Fig. 42/3).

Safety for the drainage function of the pressure filter (Fig. 42/4).

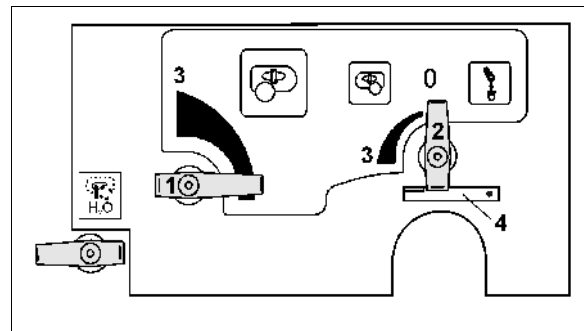


Fig. 42

4.8 Pump equipment

All components which come into contact with plant protection agents are made from injection moulded plastic coated aluminium or entirely from plastic. As far as we are aware these pumps are suitable for the application of all commercially available crop protection agents and liquid fertiliser.



Never exceed the maximum pump speed – depending on the pump equipment – of 550 1/min or 1000 1/min!



When using the pump drive with 1000 1/min the nominal pump speed of 540 1/min is achieved with the aid of the reduction gear.

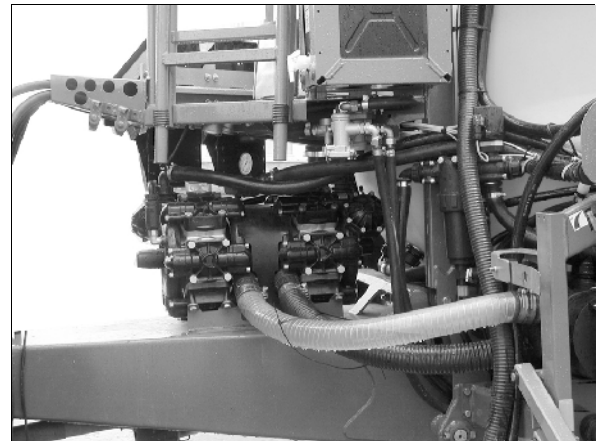


Fig. 43

Technical data pump equipment

Pump equipment			AR 250	AR 280
Capacity at nominal speed	[l/min]	at 0 bar	250	280
		at 10 bar	235	265
Power requirement	[kW]		4,6	5,1
Design			6-ram piston diaphragm pump	
Pulse damping			Pressure reservoir	

4.9 Filter equipment



Important

- Utilise all provided filters of the filter equipment. Clean the filters in regular intervals (for this, please refer to chapter "Cleaning", page 188). A trouble free operation of the field sprayer is achieved only by the perfect filtering of the spray mixture. The perfect filtering considerably influences the success of treatment of the plant protection measure.
- Observe the permissible combinations of filters and mesh widths. The mesh widths of the self cleaning pressure filter and the nozzle filters should always be smaller than the nozzle opening of the nozzles used.
- When using 80 or 100 mesh/inch pressure filter inserts it is possible that with some plant protection agents active substances are filtered off. In case of queries, please contact the crop protection agent manufacturer.

4.9.1 Filling sieve

The filling sieve (Fig. 44/1) prevents the spray mixture from dirt when filled into the spray mixture tank via the filling dome.

Mesh width: 1,00 mm

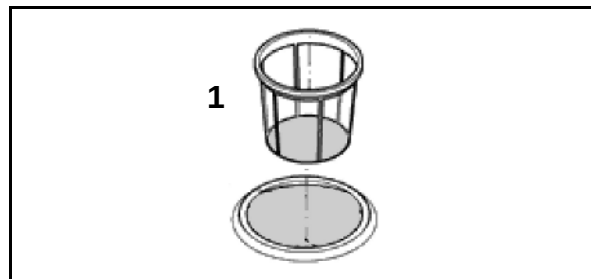


Fig. 44

4.9.2 Suction filter

The suction filter (Fig. 45/1) filters

- the spray mixture during spraying operation.
- the water when filling the spray mixture tank via the suction hose.

Mesh width: 0,60 mm

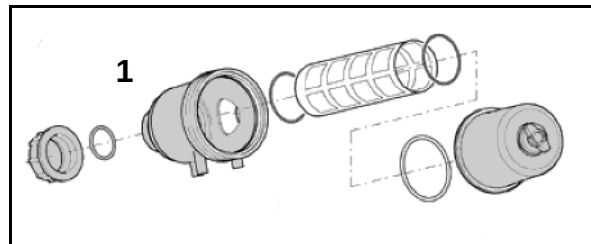


Fig. 45

4.9.3 Self cleaning pressure filter

The self cleaning pressure filter (Fig. 46/1)

- prevents the blockage of the nozzle filters in front of the spraying nozzles.
- has a bigger number of mesh/inch than the suction filter.

When the auxiliary agitator is switched on the inner surface of the pressure filter insert is continuously flushed and not diluted spray mixture and dirt particles are returned into the spray mixture tank.



Fig. 46

Overview pressure filter insert

- Pressure filter insert with 50 mesh/inch (standard), for nozzle size '03' and bigger
Filter surface: 216 mm²
Mesh width: 0,35 mm
Order No.: ZF 150
- Pressure filter insert with 80 mesh/inch, for nozzle size '02'
Filter surface: 216 mm²
Mesh width: 0,20 mm
Order No.: ZF 151
- Pressure filter insert with 100 mesh/inch for nozzle size '015' and smaller,
Filter surface: 216 mm²
Mesh width: 0,15 mm
Order No.: ZF 152

4.9.4 Nozzle filters

The nozzle filters (Fig. 47/1) prevent blockage of the spraying nozzles.

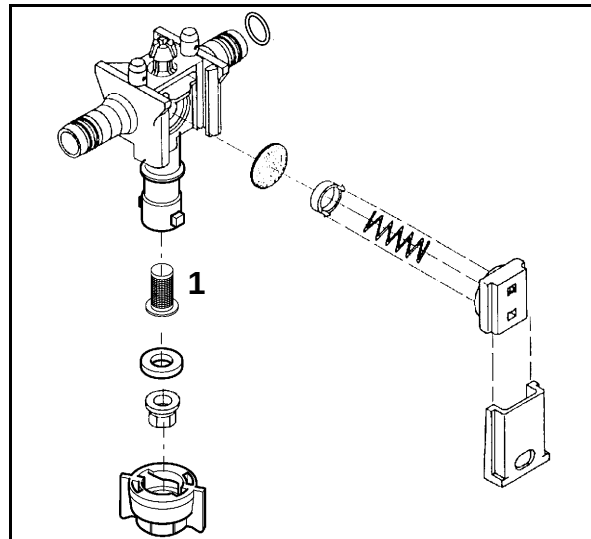


Fig. 47

Overview nozzle filters

- Nozzle filters with 24 mesh/inch,
for nozzle size '06' and bigger
Filter surface: 5,00 mm²
Mesh width: 0,50 mm
Order No.: ZF 091
- Nozzle filters with 50 mesh/inch (standard),
for nozzle size '02' to '05'
Filter surface: 5,07 mm²
Mesh width: 0,35 mm
Order No.: ZF 091
- Nozzle filters with 100 mesh/inch,
Filter surface: 5,07 mm²
Mesh width: 0,15 mm
for nozzle size '015' and smaller
Order No.: ZF 169

4.9.5 Bottom sieve in the induction bowl

The bottom sieve (Fig. 48/1) in the induction bowl protects from sucking lumps and foreign particles.

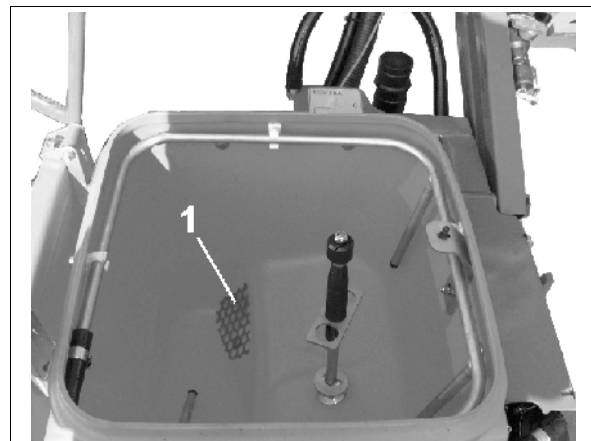


Fig. 48

4.10 Fresh water rinse tank

Clear water is transported in the interconnected fresh water rinse tanks (Fig. 49/1 and Fig. 50/1). This water is used for

- diluting the residual amount in the spray mixture tank after having finished the spraying operation.
- Cleaning (flushing) of the entire field sprayer in the field.
- Cleaning the suction device and the spray lines with filled spray mixture tank.

Fig. 49 / Fig. 50

- (2) Screw lid with venting valve for the filling port.
(3) Filling level indicator on the fresh water rinse tank, left hand side



Only fill clear water into the fresh water rinse tank.

Important



Before filling the fresh water rinse tanks unscrew both lids. Uneven filling would damage the tanks.

Important

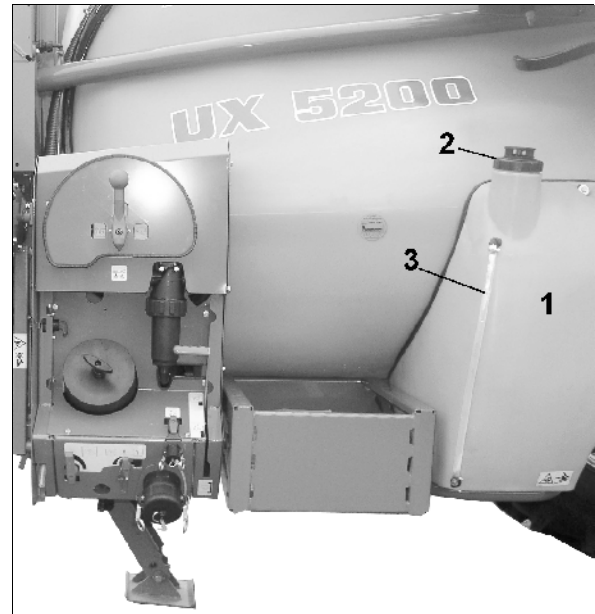


Fig. 49



Fig. 50

Filling port (Fig. 51/1) for both fresh water rinse tanks.

- Attach the filling hose.
- Remove the lids of both fresh water rinse tanks.
- Open the stop tap.
- Fill the fresh water rinse tanks (observe the filling level indicator)
- Close the stop tap.
- Screw on lids

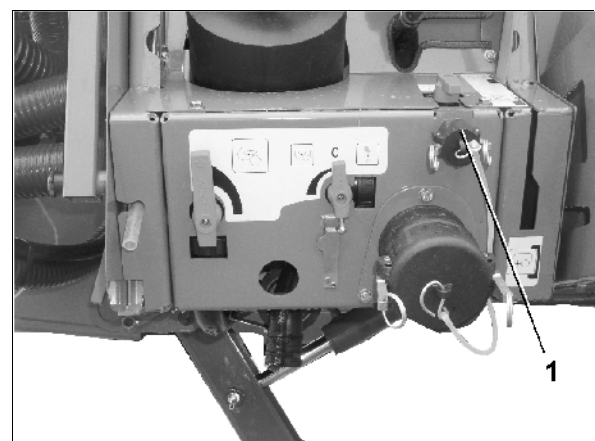


Fig. 51

4.11 Induction bowl with filling port ECOFILL and canister flushing

Fig. 52/...

- (1) Swivelable induction bowl for pouring in, diluting and sucking of plant protection agents and urea..
- (2) Folding lid
- (3) Handle for swivelling the induction bowl.
- (4) Parallelogram arm for swivelling the induction bowl from the transport into the filling position.
- (5) Reversing tap ring line / canister flushing.
- (6) Reversing tap induction bowl sucking / filling port ECOFILL.
- (7) Filling port ECOFILL.
- (8) Hose with actuation facility for exterior cleaning.

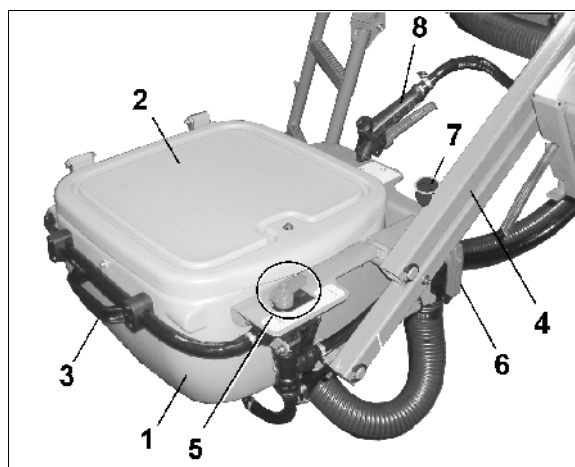


Fig. 52

Fig. 53/ ...

Transport safety to secure the induction bowl in the transport position against unintended lowering.

For swivelling the induction bowl into the filling position proceed as follows

1. Hold the handle with your left hand.
2. With your right hand push the transport safety to the side.
3. Swivel the induction bowl downwards.

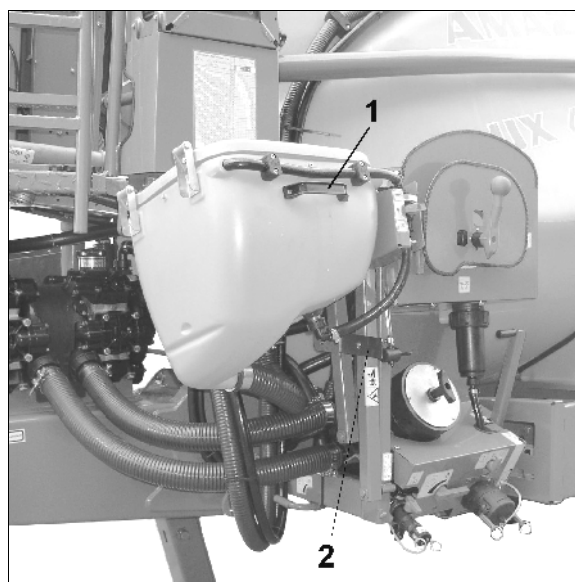


Fig. 53

Fig. 54/...

- (1) Bottom sieve
- (2) Rotating canister flushing nozzle for flushing canisters or other containers.
- (3) Pressure plate.
- (4) Ring line for diluting and inducing of plant protection agent and urea.



Hint

Water leaks from the canister flushing nozzle (Fig. 54/2) if

- the pressure plate (Fig. 54/3) is pressed downwards.
- the closed folding lid (Fig. 52/2) presses the canister flushing nozzle downwards.

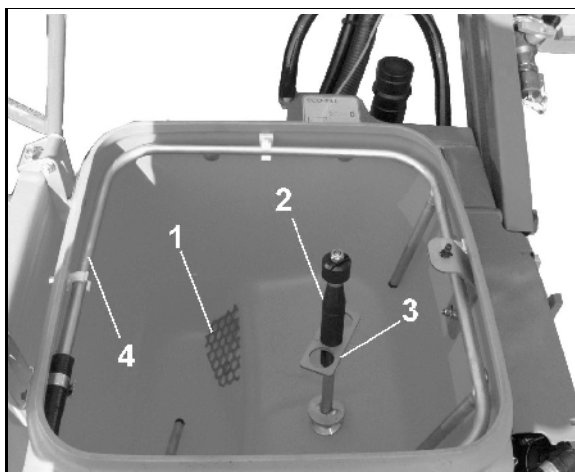


Fig. 54



Warning!

Close the folding lid (Fig. 52/2), before starting to flush the induction bowl.

4.12 Hand wash tank

Clear water hand wash tank (Fig. 55/1) for cleaning the hands with hose (Fig. 56/2) and drain tap (Fig. 56/1).



Only fill the hand wash tank with clear water.

Important



Never ever drink the water in the hand wash tank. The materials of the hand wash tank are not food

Warning grade materials.



Fig. 55

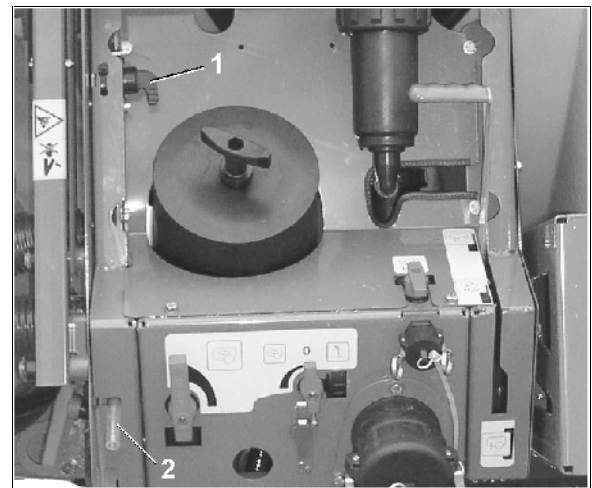


Fig. 56

4.13 Sprayer boom

The application accuracy of the spray mixture is considerably influenced by the proper condition of the sprayer boom as well as its mounting. By correctly setting up the sprayer boom height above the crop a perfect overlapping of nozzles is achieved. The boom's nozzles are fitted at a spacing of 50 cm.



Danger

Observe sufficient clearance distance to high voltage lines when folding out and in the sprayer booms. The contact with high voltage lines may cause fatal injury.



Caution

- As a matter of principle lock the boom swing compensation in the transport position (Fig. 57, Sprayer boom locked)
 - for transport travel.
 - when folding or unfolding the booms.!



Fig. 57



Caution

- Before folding the booms in or out, advise all persons to leave the folding area of the sprayer booms.
- Never ever fold the booms in or out whilst travelling with the sprayer.
- Avoid any crushing and bruising points on all the hydraulically actuated folding sections.



Important

- Set the sprayer boom height (height between the nozzles and the crop) according to the spray rate table.
- Align the sprayer boom parallel to the ground. Only then the prescribed spraying height on every nozzle will be achieved.
- Carry out all settings on the sprayer booms with great care.



Hint

- An even lateral distribution of the spray mixture will only be achieved with
 - the swing compensation unlocked
 - and the boom side sections symmetrically folded out.

4.13.1 Sprayer boom with Profi folding (I, II and III)

Profi folding provides the following functions:

- Folding and unfolding the sprayer boom,
- hydraulic height adjustment,
- hydraulic boom tilt,
- one side boom folding (only Profi folding I and II),
- one side, individual angling of the sprayer boom ends (only Profi-folding II and III).



Hint

All hydraulic functions are controlled via the **AMATRON+** in the tractor cab. For this lock the control unit on the tractor during operation.

The individual symbols on the **AMATRON+** display inform about the actual selected functions.

4.13.2 Super-S-boom

- (1) Sprayer boom with spray lines (in this case folded boom packages).
- (2) Parallel frame for the height adjustment of the sprayer boom.

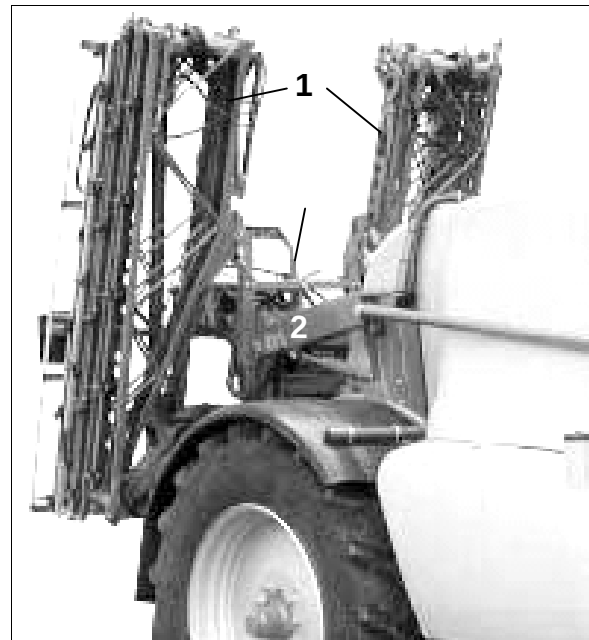


Fig. 58

Assembly and function

- (1) Spacer
- (2) Swivelable boom carrier

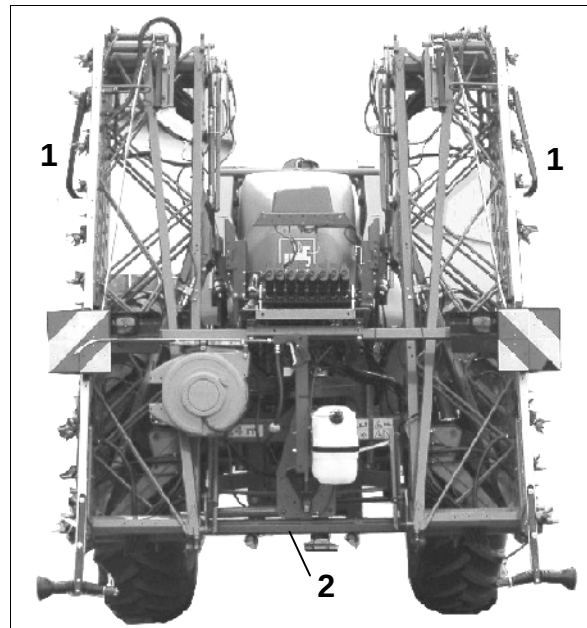


Fig. 59

Transport safety for booms with locating sockets (Fig. 60/1) transport latches (Fig. 60/1).

The transport latches retain the locating sockets when locking the boom packages in the transport position against unintended folding out.



Fig. 60



Hint

Align the sprayer boom utilising the tilt adjustment in case the transport latches do not retain the locating pockets.

4.13.3 L-Boom

- (1) Sprayer boom with spray lines (in this case folded boom packages).
- (2) Parallel frame for the height adjustment of the sprayer boom.
- (3) Transport safety shackle
With the aid of the transport safety shackles the boom packages are locked in the transport position against unintended folding out.
- (4) Spacer.

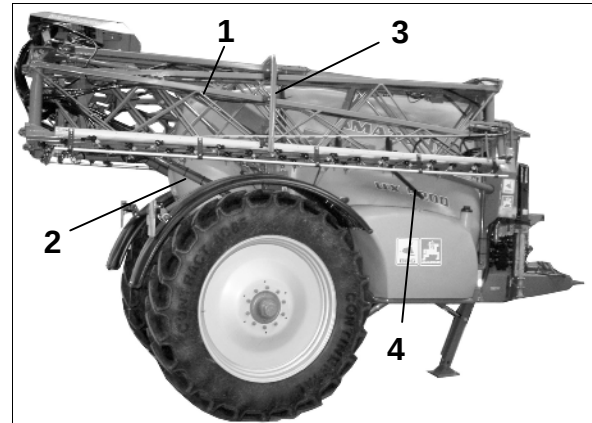


Fig. 61

Boom end securing device

The boom safety release protects the sprayer boom from damage when the outer boom hits firm obstacles. The plastic trips allow giving way of the outer boom sections into or against the driving direction pivoting around the hinge point whereby booms will automatically return to the operating position.

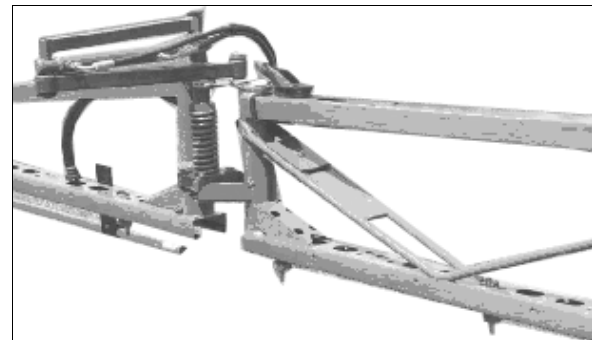


Fig. 62

4.13.3.1 Setting the hydraulic throttle valves

Factory set are the actuation speeds of the individual hydraulic functions on the relevant hydraulic throttle valves from the valve block (fold up and down folded boom packages, fold in and out sprayer booms, lock and unlock swing compensation etc.). Depending on the tractor type a re-adjustment of the pre-set speeds may be necessary.

By crewing in or out the Allen screw on each throttle valve the speed for actuating the hydraulic function allocated to the relevant pair of throttle valves can be altered.

- Reducing the actuating speed = screw in the Allen screw.
- Increasing the actuating speed = screw out the Allen screw.



Important

For correcting the actuating speed always alter both throttle valves of the relevant hydraulic function equally.

Profi folding "I"

Fig. 63/...

- (1) Throttle valve – folding in the right hand boom.
- (2) Throttle valve – folding out the right hand boom.
- (3) Throttle valve – locking the swing compensation.
- (4) Throttle valve – transport safety.
- (5) Hydraulic joints – tilt adjustment (the throttle valves are located on the hydraulic ram of the tilt adjustment).
- (6) Throttle valve – folding in left hand boom.
- (7) Throttle valve – folding out left hand boom.

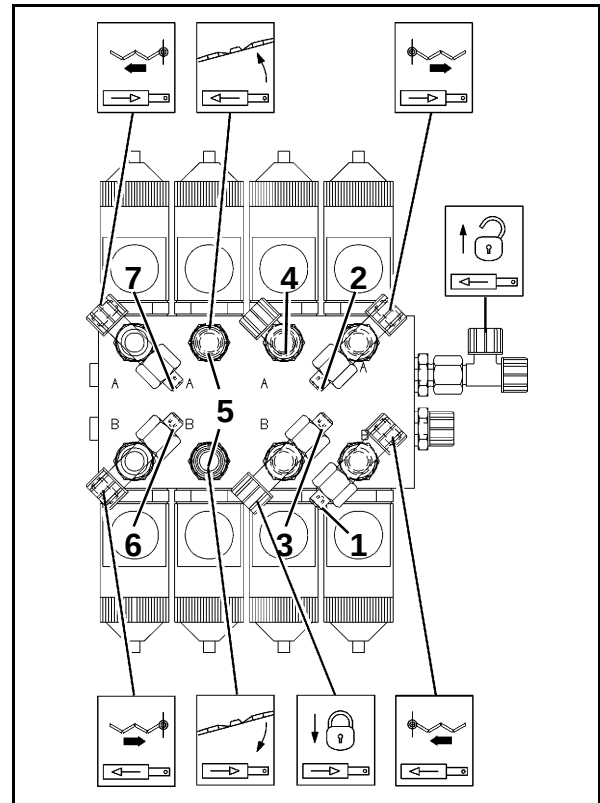


Fig. 63

Profi folding "II"

Fig. 64/...

- (1) Throttle valve – angling down right hand boom.
- (2) Throttle valve – angling up right hand boom.
- (3) Throttle valve – folding in right hand boom.
- (4) Throttle valve – folding out right hand boom.
- (5) Throttle valve – locking swing compensation.
- (6) Throttle valve – transport safety.
- (7) Hydraulic joints – tilt adjustment (the throttle valves are located on the hydraulic ram of the tilt adjustment).
- (8) Throttle valve – folding in left hand boom.
- (9) Throttle valve – folding out left hand boom.
- (10) Throttle valve – angling down left hand boom.
- (11) Throttle valve – angling up left hand boom.

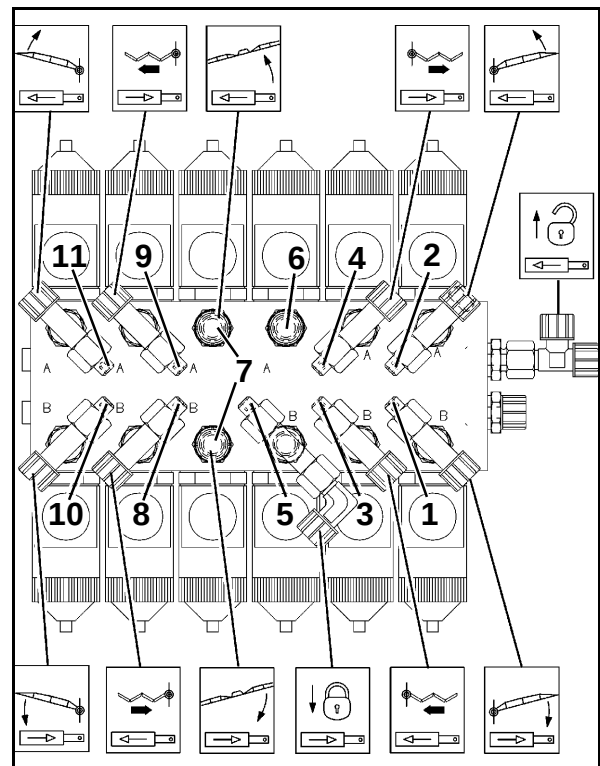


Fig. 64

Profi folding "III"

Fig. 65/...

- (1) Throttle valve – angling down right hand boom.
- (2) Throttle valve – angling up right hand boom.
- (3) Throttle valve – locking swing compensation.
- (4) Throttle valve – transport safety.
- (5) Hydraulic joints – tilt adjustment (the throttle valves are located on the hydraulic ram of the tilt adjustment).
- (6) Throttle valve – folding in the right and left hand boom.
- (7) Throttle valve – folding out the right and left hand boom.
- (8) Throttle valve – angling down left hand boom.
- (9) Throttle valve – angling up left hand boom.

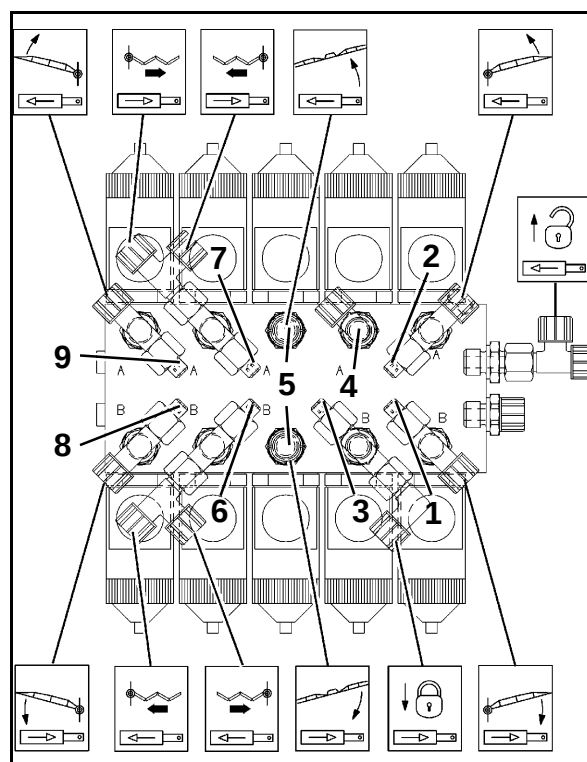


Fig. 65

4.14 Spray lines

The sprayer booms can be equipped with different spray lines. On the other hand these spray lines can be equipped with single or multiple nozzles, depending on the prevailing operational conditions.

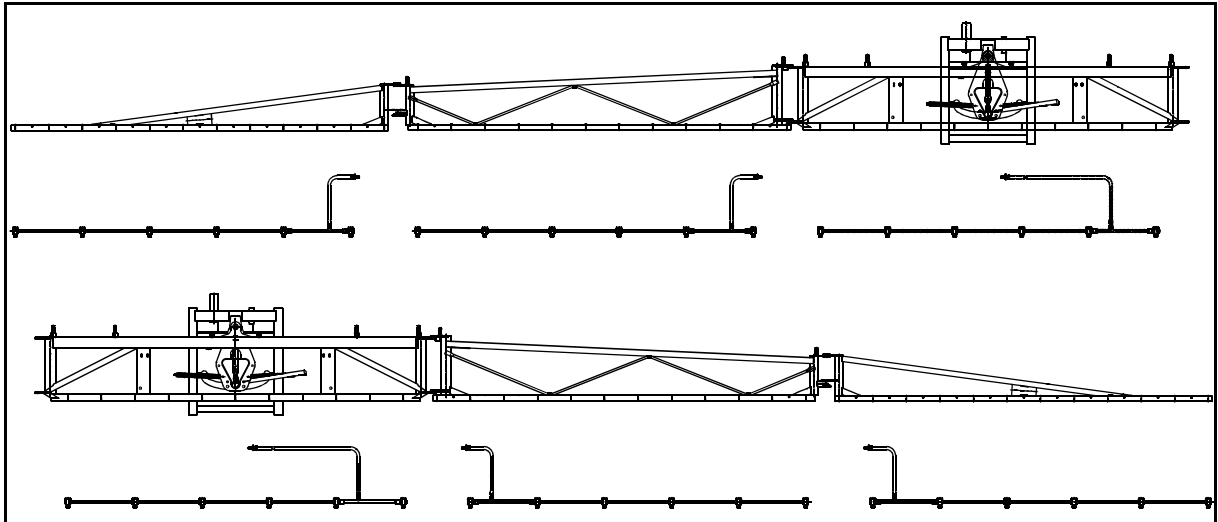


Fig. 66

4.14.1 Technical data



Important

Observe that the residual amount in the spray line will be sprayed in undiluted concentration. Implicitly spray these residual amounts on a not treated area. The residual amount of the spray line depends on the working width of the boom.

Required distance covered [m] for spraying the undiluted residual amount in the spray line for all working widths:

100 l/ha 45 m	250 l/ha 18 m
150 l/ha 30 m	300 l/ha 15 m
200 l/ha 23 m	400 l/ha 11 m

Example:

For an application rate 200 l/ha the distance covered for emptying the individual spray line is approx. 23 m.

Spray line Super S-boom with single or multiple nozzles

Working width	[m]	18	20	21	21/15	24	27	28
Number of boom part sections		5		5	7		9	7 9
Number of nozzles per boom part section		6-8-8-8-6	8-8-8-8-8	9-8-8-8-9	6-6-6-6-6-6-6	6-6-8-8-8-6-6	9-6-8-8-8-6-9	8-8-8-8-8-8-8 7-6-6-6-6-6-6-6-7
Residual amount								
• dilutable		4,5		5,0		5,5		5 5,5
• undilutable		8,0	8,5	9	10,0	11,5	12,5	13 17,5
• total		12,5	13,0	13,5	15,0	16,5	17,5	18 23
Residual amount at pressure circulation system (DUS)	[l]							
• dilutable		13,5	14,5		16,0	17,5	18,5	19 24
• undilutable		1,0		1,5		2,0		
• total		14,5	15,5	16	17,5	19,0	20,5	21 26
Weight	[kg]	13	15		20	22	23	23 30

Spray line L-sprayer boom with single or multiple nozzles

Arbeitsbreite	[m]	24	27		28		30	32	33	36
Number of boom part sections		7	7	9	7	9			9	
Number of nozzles per boom part section		6-6-8-8 8-6-6	7-8-8-8 8-8-6-7	6-6-6-6-6 6-6-6-6-6	8-8-8-8 8-8-8	7-6-6-6-6 6-6-6-7	8-7-6-6-6 6-6-7-8	8-6-7-7-8 7-7-6-8	7-8-7-7-8 7-7-8-7	9-9-7-7-8 7-7-9-9
Residual amount incl. Valve chest										
• dilutable		5,0	5,0	5,5	5,0	5,5	5,5	5,5	5,5	5,5
• undilutable		11,5	12,5	17,5	13,0	17,5	18,0	18,5	19,0	19,5
• total		16,5	17,5	23,0	18,0	23,0	23,5	24,0	24,5	25,0
Residual amount at pressure circulation system (DUS) incl. valve chest	[l]									
• dilutable		17,5	18,5	24,0	19,0	24,0	24,0	24,5	25,0	25,5
• undilutable		1,5	2,0	2,0	2,0	2,0	2,5	2,5	2,5	3,0
• total		19,0	20,5	26,0	21,0	26,0	26,5	27	27,5	28,5
Weight spray line	[kg]	22	23	29	23	30	32	34	35	38

4.14.2 Single nozzles

Fig. 67/...

- (1) Nozzle body with bayonet connector (standard).
- (2) Diaphragm. If the pressure in the spray line drops below approx. 0.5 bar the spring loaded plunger (3) presses the diaphragm against the diaphragm seat (4) inside the nozzle body. In this way the drip free nozzle switching off on the switched off sprayer boom is achieved..
- (3) Spring loaded plunger.
- (4) Diaphragm seat.
- (5) Slide –holds the complete diaphragm valve inside the nozzle body.
- (6) Nozzle filter; **standard 50 mesh/inch**, fitted into the nozzle body from below. Please refer to chapter "Nozzle filter".
- (7) Rubber sealing.
- (8) Nozzle; **standard LU-K 120-05**.
- (9) Bayonet connector.
- (10) Bayonet cap, coloured.
- (11) Spring loaded plunger housing.

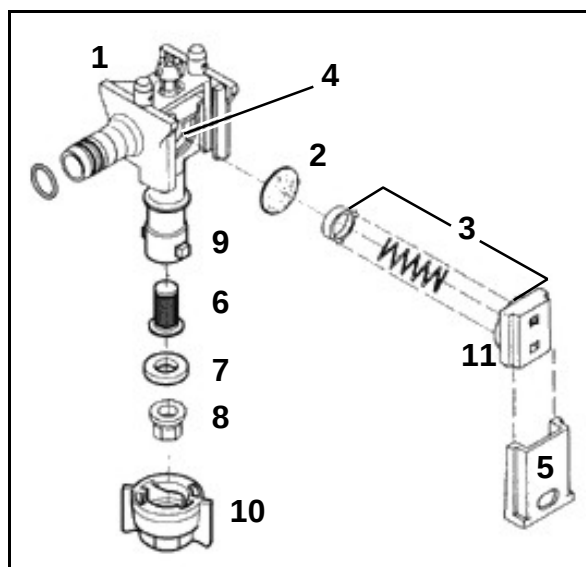


Fig. 67

4.14.3 Multiple nozzles

Special option

Order No.:

When utilising different nozzles the use of multiple nozzles shaped as triple nozzle heads (Fig. 68) is of advantage. Feeding to the vertically positioned nozzle.

By revolving the triple nozzle head (Fig. 68/1) in counter clockwise direction, another nozzle is put into operation.

The triple nozzle head is switched off in the intermediate positions. This allows a reduction of the sprayer boom working width.



Flush the spray lines before revolving the triple nozzle head to another nozzle type.

Important

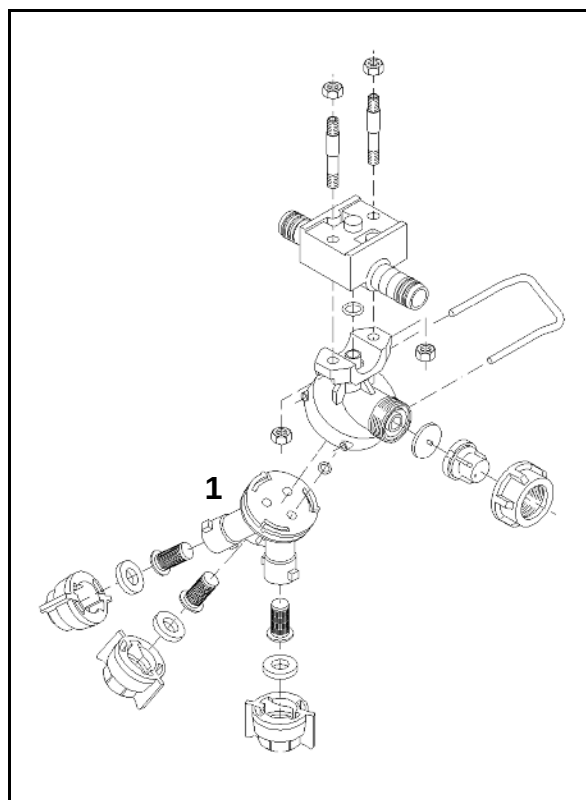


Fig. 68

Fig. 69/...

- (1) Nozzle carrier.
- (2) Triple nozzle head.
- (3) Diaphragm. If the pressure in the spray line drops below approx. 0,5 bar the spring loaded plunger (4) presses the diaphragm against the diaphragm seat (5) in the 3-way nozzle carrier. In this way the drip free nozzle switching off on the switched off sprayer boom is achieved.
- (4) Spring loaded plunger.
- (5) Diaphragm seat.
- (6) Clamping nut, holds the complete diaphragm valve in the 3-way nozzle carrier.
- (7) Nozzle filter; **standard 50 mesh/inch.**
- (8) Rubber sealing.
- (10) Bayonet connector.
- (11) Bayonet cap red.
- (12) Bayonet cap green.
- (13) Bayonet cap black.
- (14) Bayonet cap yellow.
- (15) O-Ring.
- (16) O-Ring.

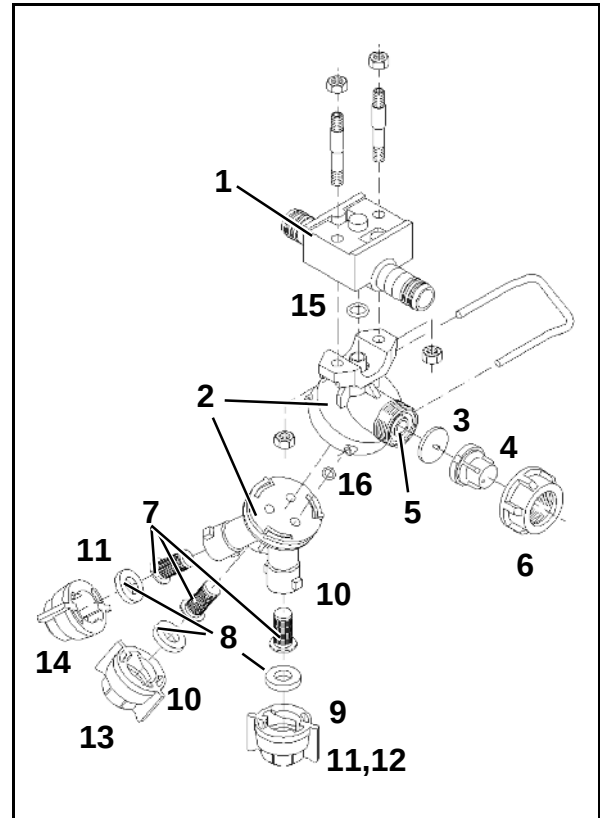


Fig. 69

5 Special optional equipment

This chapter provides you with a comprehensive overview for the special options available.

5.1 Special options for liquid fertilising

At the moment two main liquid fertiliser types are available for liquid fertilising:

- Ammonium Nitrate Urea solutions (AUS) with 28 kg N per 100 kg AUS.
- A NP-solution 10-34-0 with 10 kg N and 34 kg P₂O₅ per 100 kg NP-solution.



Important

For liquid fertilising via flat ray nozzles multiply the relevant values from the spray rate table for the application rate l/h for AUS with 0.88 and for NP solutions with 0.85 as the stated application rates l/ha are only valid for water.

Basic principle:

Apply liquid fertiliser in coarse droplets to avoid scorching of plants. If the droplets are too large they will roll off the leaf and too small droplets would enforce the magnifying glass effect. Also too high application rates may cause scorching of the leaves – due to the salt concentration of the fertiliser.

Basically no higher rates of liquid fertiliser should be applied as e.g. 40 kg N (please also refer to "Conversion table for the spraying of liquid fertiliser"). Re-fertilising of AUS with nozzles should in any case be terminated in the EC growth stage 39 as otherwise scorching the ears would result in considerable damage. "

5.1.1 3-ray nozzles

Should the liquid fertiliser predominantly be absorbed by the roots instead by the leaves of the plant the use of the 3-ray nozzles is of advantage for liquid fertiliser application.

An integrated metering aperture inside the nozzle produces a nearly pressure less, coarse droplet distribution of the liquid fertiliser via three openings. This helps to prevent the production of an undesirable spraying mist and the production of small droplets. The coarse droplets produced by the 3-ray nozzle rain gently on the plant and roll off its surface. **Even though in this way scorching damage is avoided as far as possible the 3-ray nozzles should not be used for late top dressing and instead drag hoses should be used.**

For the following listed 3-ray nozzles the black bayonet nuts should be used exclusively.

Various 3-ray nozzles and their range of use

3-ray - yellow,	50	-	105 l	AUS/ha, Order No.: 798 900
3-ray - red	80	-	170 l	AUS/ha, Order No.: 779 900
3-ray - blue,	115	-	240 l	AUS/ha, Order No.: 780 900
3-ray - white,	155	-	355 l	AUS/ha, Order No.: 781 900

5.1.2 5- and 8-hole nozzles

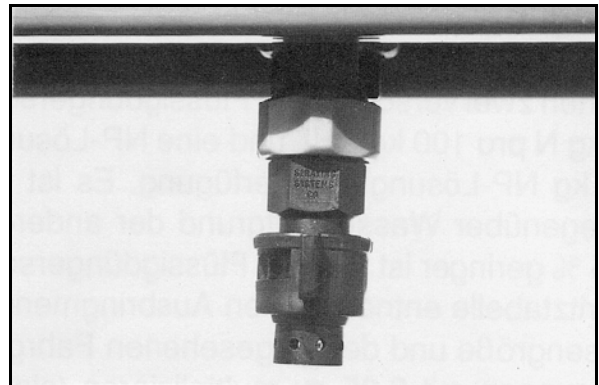


Fig. 70

Preconditions for the use of the 5- and 8-hole nozzles are the same as for the 3-ray nozzles. Contrary to the 3-ray nozzles the jet openings at the 5- and 8-hole nozzle (Fig. 70) are not directed downwards but sideways. This results in the production of very large droplets raining even more gently on the plants.



Hint

- The metering discs determine the spray rate [l/ha].
- The metering discs used determine the spray height to be set (for this, please refer to chapter "Spraying table 5- and 8-hole nozzles" page 162).

The following nozzles are available

5-hole nozzle cpl., black (with metering disc No. 4916-45);

Order No.: 911 517

5- hole nozzle cpl., grey (with metering disc No. 4916-55);

Order No.: 911 518

8- hole nozzle cpl. (with metering disc No. 4916-55);

Order No.: 749 901

The following metering discs are available

4916-39	ø 1,0	60	-	115 l	AUS/ha, Order No.: 722 901
4916-45	ø 1,2	75	-	140 l	AUS/ha, Order No.: 723 901
4916-55	ø 1,4	110	-	210 l	AUS/ha, Order No.: 724 901
4916-63	ø 1,6	145	-	280 l	AUS/ha, Order No.: 725 901
4916-72	ø 1,8	190	-	360 l	AUS/ha, Order No.: 726 901
4916-80	ø 2,0	240	-	450 l	AUS/ha, Order No.: 729 901

The metering discs can be combined with the nozzles as follows

Nozzle type	Metering disc No.					
	4916-39	4916-45	4916-55	4916-63	4916-72	4916-80
5-hole nozzle - black	x	x				
5-hole nozzle - grey			x	x	x	
8-hole nozzle	x	x	x	x	x	x

5.1.3 Drag hose equipment for Super-S-boom

Drag hose equipment with metering discs (No. 4916-39) for late top dressing with liquid fertiliser



Fig. 71

- (1) The drag hose sections have a 25 cm nozzle and hose spacing.
The drag hose sections are numbered whereby No. 1 is placed to the outer left hand if looking in driving direction, No. 2 next etc.
- (2) Wing nuts are used for fixing the drag hose kit.
- (3) For coupling the drag hoses sleeve plug connections are used.
- (4) Metal weights for stabilising the position during operation.



Hint

The metering discs determine the spray rate [l/ha].

The following metering discs are available

4916-26	ø 0,65	50	-	135 l	AUS/ha, Order No.: 720 901
4916-32	ø 0,8	80	-	210 l	AUS/ha, Order No.: 721 901
4916-39	ø 1,0	115	-	300 l	AUS/ha, Order No.: 722 901 (standard)
4916-45	ø 1,2	150	-	395 l	AUS/ha, Order No.: 723 901
4916-55	ø 1,4	225	-	590 l	AUS/ha, Order No.: 724 901

Please refer to chapter "Spray rate table for drag hose equipment", page 164.

5.2 Spray pistol, with 0.9 m long spray tube, without pressure hose

5.2.1 Pressure hose up to 10 bar, e.g. for spray pistol



Important

Use the spray pistol only for cleaning. It is not possible to spray accurately crop protective agents because of the manual handling.

Pressure hose made from fibre enforced PVC (nominal width/inside: 13 mm; outside: 20 mm; wall gauge: 3,5 mm).

Connect the pressure hose of the spray pistol to a single tap of the pressure device. Set the spraying pressure as usual.

5.3 Traffic lights



Important

- The traffic regulations advise the use of lighting units on agricultural and forest tractor mounted and trailed implements. The vehicle owner as well as the operator are responsible for adhering to the legal rules and regulations of the traffic law.
- Mounted and trailed implements should be equipped as follows:
 - to the front and to the rear with warning plates and limiting or tail lights if they protrude sideways more than 400 mm over the utmost point of the illuminated areas of the tractor's limiting lights.
 - with warning plates and lights when the tail lights of the tractor are covered or their outer end protrudes more than 1000 mm beyond the tail lights of the tractor to the rear.

5.3.1 Traffic lights

L-boom:

- Traffic lights to the rear and to the front complete.

Order No.: 733 010 13

S-booms:

- Traffic lights to the rear (Fig. 72/ 1), Order No.: 916 253
Consisting of:
Light combination right and left hand, parking warning plates, licence plate carrier and connecting cable.
- Limiting lights to the front,
Order No.: 917 649
Consisting of:
Parking warning plates according to DIN 11 030 with limiting lights right and left hand and connecting cable.

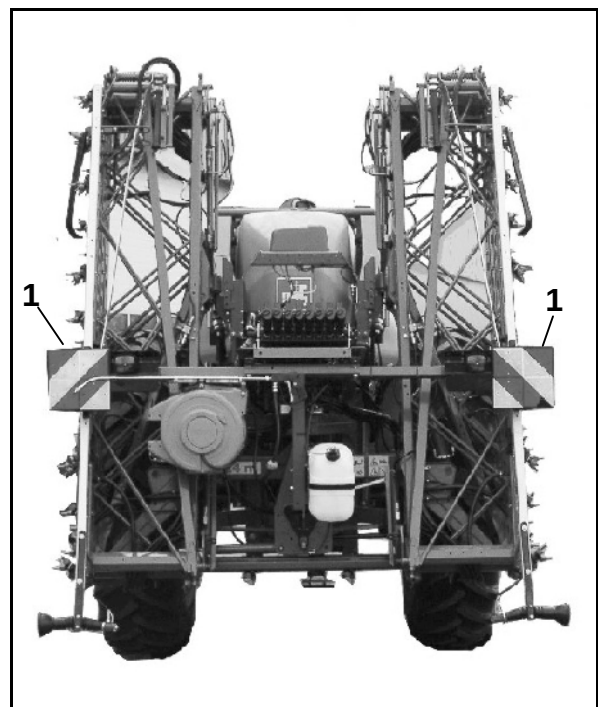


Fig. 72

5.4 Foam marker

The **foam marker** (Fig. 73/1) which can be retro-fitted at any time, allows the **accurate driving for the next bout** when treating fields **without marked tramlines**.

The marks are formed by **foam bubbles**. The foam bubbles are applied in adjustable spacings of approx. 10 – 15 m so that a **clear control line can be noted**. After some time the foam bubbles will dissolve without any residue.

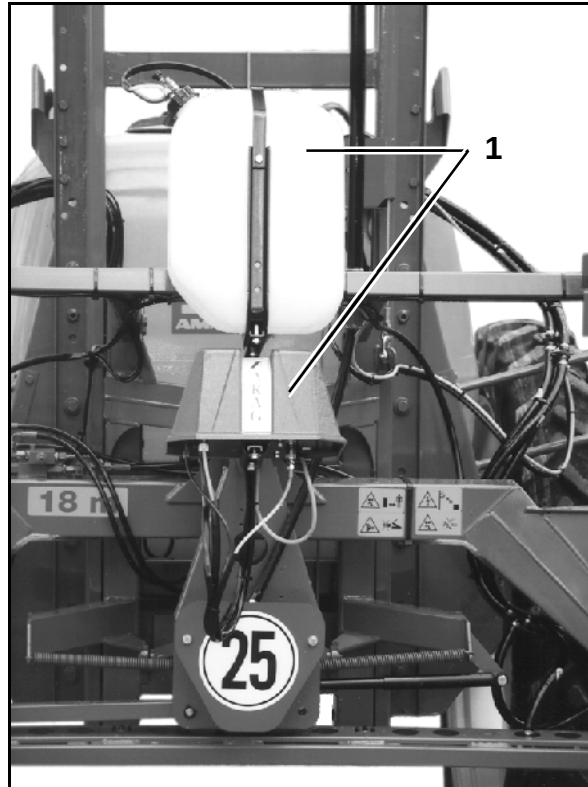


Fig. 73

Fig. 74/ ...

- (1) Container
- (2) Compressor
- (3) Fixing bracket
- (4) Slotted head bolt

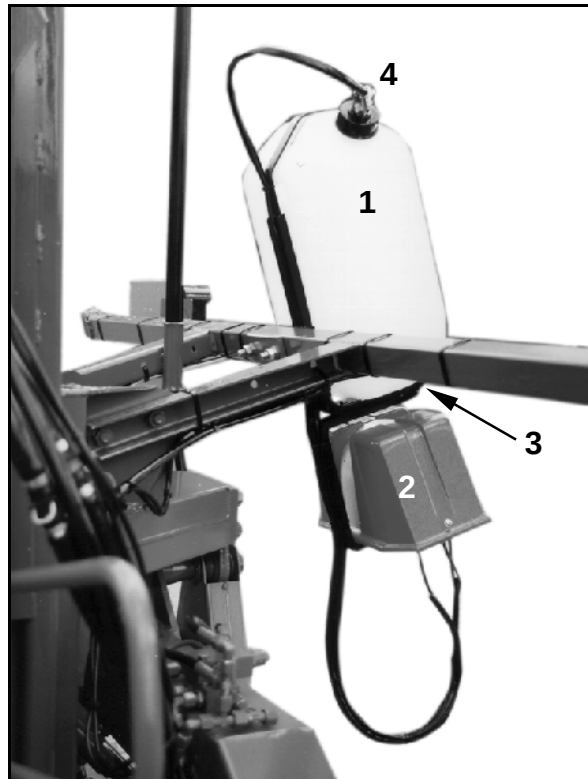


Fig. 74

Fig. 75/ ...

- (1) Air and liquid mixer
- (2) Flexible plastic nozzle

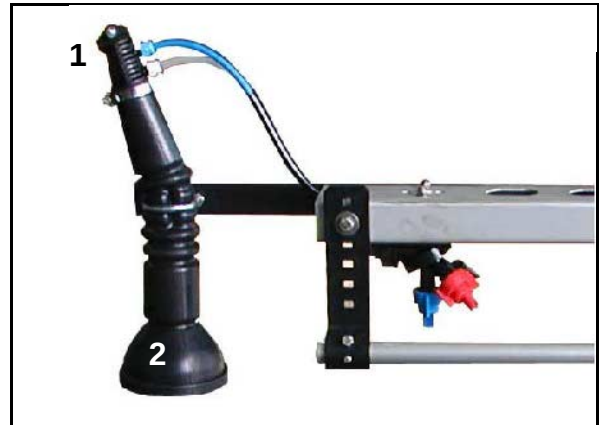


Fig. 75

Set the **spacing between the individual foam bubbles** on the slotted head bolt (Fig. 76/4) as follows:

- turn right – spacing is getting larger,
- turn left – spacing is getting smaller.

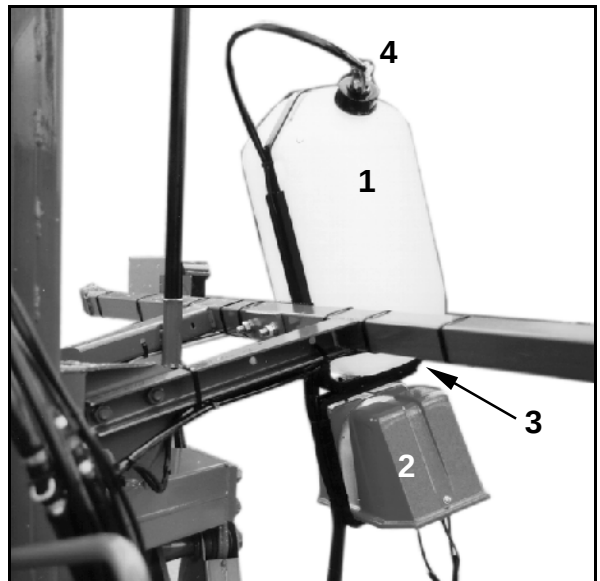


Fig. 76

5.5 Permanent working width reduction on the Super S boom

- Reduction from 24 m to 18 m working width, Order No.: 911814
- Reduction from 24 m to 12 m working width, Order No.: 914380

5.6 Pressure circulation system (DUS)



Important

- For spraying operation always switch on the pressure circulation system.
- When using drag hoses always switch off the pressure circulation system.

The pressure circulation system

- allows the permanent liquid circulation in the spray line when the pressure circulation system is switched on. For this every boom part width section is provided with a flushing hose (Fig. 77/1).
- can be operated at random with spray mixture or flushing water.
- reduces the undiluted residual amount to 2 l for all spray lines.

The permanent liquid circulation

- allows an even spray pattern right from the beginning as immediately after switching on the sprayer boom the spray cocktail is available at all spraying nozzles without any delay.
- prevents blockage of the spray line.

The main components of the pressure circulation system are:

- one hose for the flushing connection (Fig. 77/1) per boom part width section.
- the DUS-reversing tap (Fig. 78/1).
- the DUS-pressure relief-valve (Fig. 78/2). The DUS-pressure relief-valve is provided with a fixed adjustment in the factory and reduces the pressure in the pressure circulation system to 1 bar.

When the DUS reversing tap is in position (Fig. 78/1), the pressure circulation system is switched on.

When the DUS reversing tap is in position (Fig. 78/3), the pressure circulation system is switched off.

When the DUS reversing tap is in position (Fig. 79/1), liquid can be drained off the field sprayer

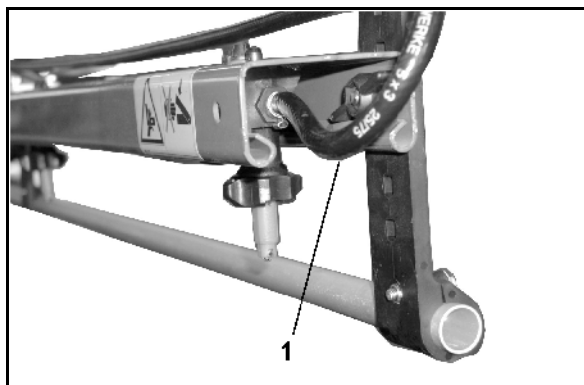


Fig. 77

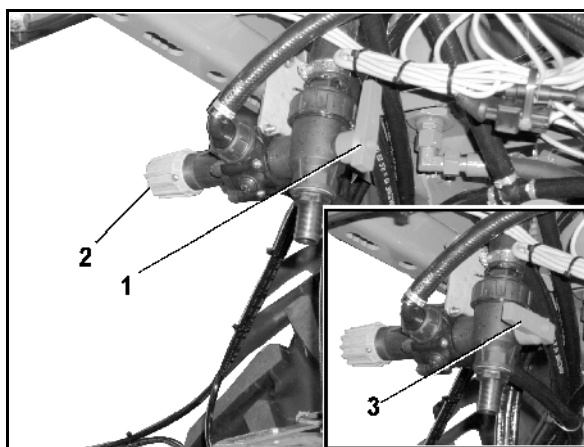


Fig. 78

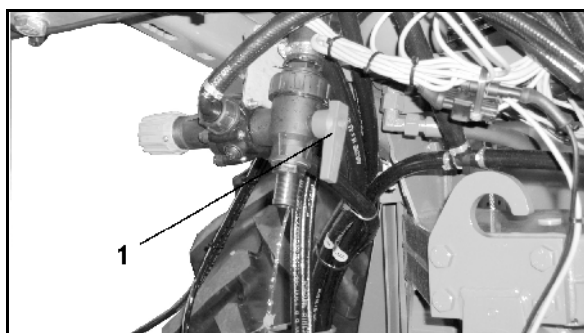


Fig. 79

5.6.1 Hose filters for spray lines

Order No.: 916 204

The hose filter (Fig. 81/1)

- is fitted to each boom part width section in the spray lines.
- is an additional measure to prevent dirt in the spray nozzles.

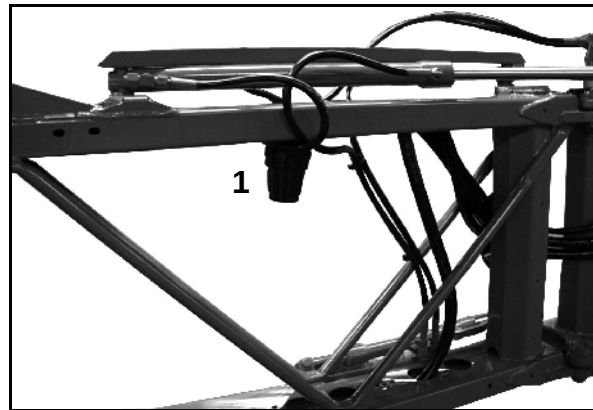


Fig. 81

Overview – filter inserts

- Filter insert with 50 mesh/inch (standard, blue), Best.-Nr. ZF379
- Filter insert with 80 mesh/inch (grey), Order No. ZF380
- Filter insert with 100 mesh/inch (red), Order No. ZF381

5.6.2 Urea filter

Order No.: 707 400

When filling in urea, the urea filter (Fig. 82/1) prevents that undiluted fertiliser particles reach the suction range and possibly block the suction filter.

Fitting the urea filter:

1. Remove the plug of the screw-in opening in the spray mixture tank sump.
2. Screw the urea filter into the bottom.

Filter surface: 415 mm²

Mesh width: 0,32 mm

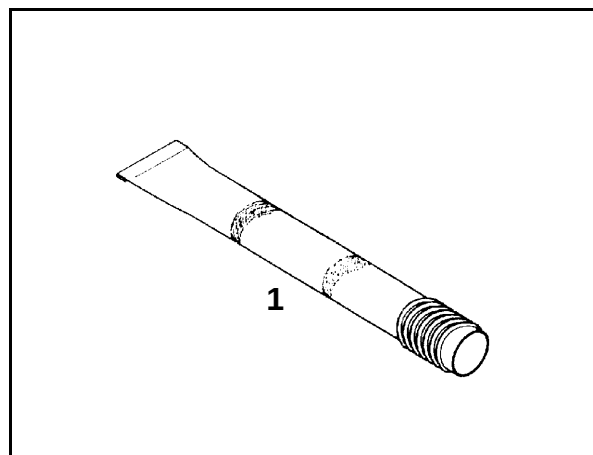


Fig. 82

6 **AMATRON+** operator terminal

AMATRON+ can be used for

- Input of machine specific data.
- Input of job related data.
- Access of the field sprayer to change the spray rate during spraying operation.
- Control of all functions on the sprayer boom.
- Control of special functions.
- Monitoring the field sprayer during the spraying operation.

The **AMATRON+** accesses the implement computer. Hereby the implement computer receives all necessary information and takes over the area related control of the spray rate [l/ha] depending on the entered spray rate (required rate) and the actual forward speed [km/h].

The **AMATRON+** determines:

- the actual forward speed in [km/h].
- the actual spray rate in [l/ha] or [l/min].
- the remaining distance [m] until the spray mixture tank has been sprayed empty. .
- the actual spray mixture tank-contents in [l].
- the spray pressure.
- the PTO shaft rev. speed (only with signal socket and NE 629).

The **AMATRON+** stores for a started order:

- the sprayed daily and total amount of the spray mixture [l].
- the worked daily and total area in [ha].
- the daily and total spraying period in [h].
- the average operational output [ha/h].

The **AMATRON+** consists of the main menu and the additional 4 sub menus: order, implement data, setup and operation.

7 Overview valve chest operation

7.1 Spraying operation

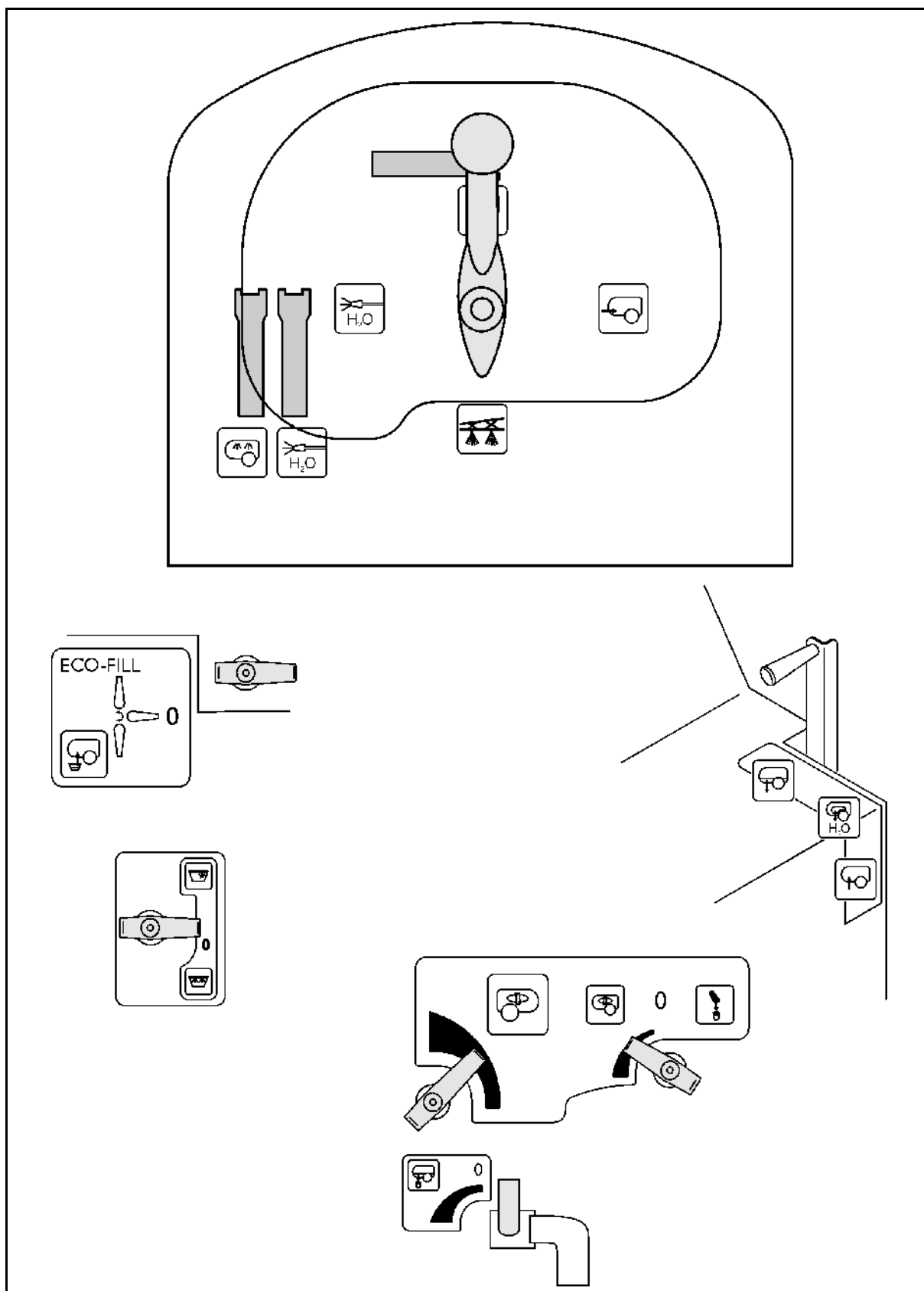


Fig. 83

7.2 Sucking off induction bowl

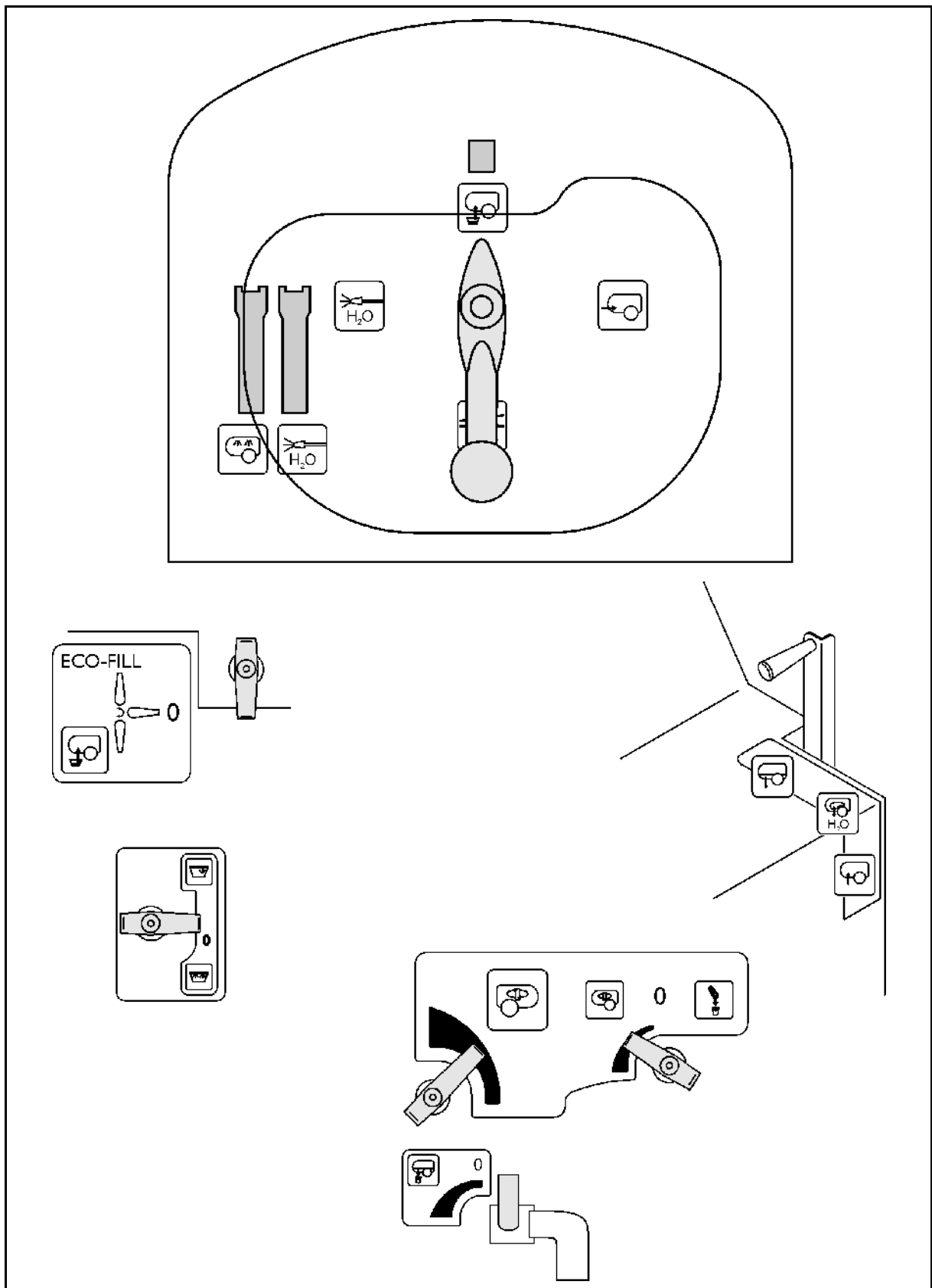


Fig. 84

7.3 Diluting urea in the induction bowl and sucking off

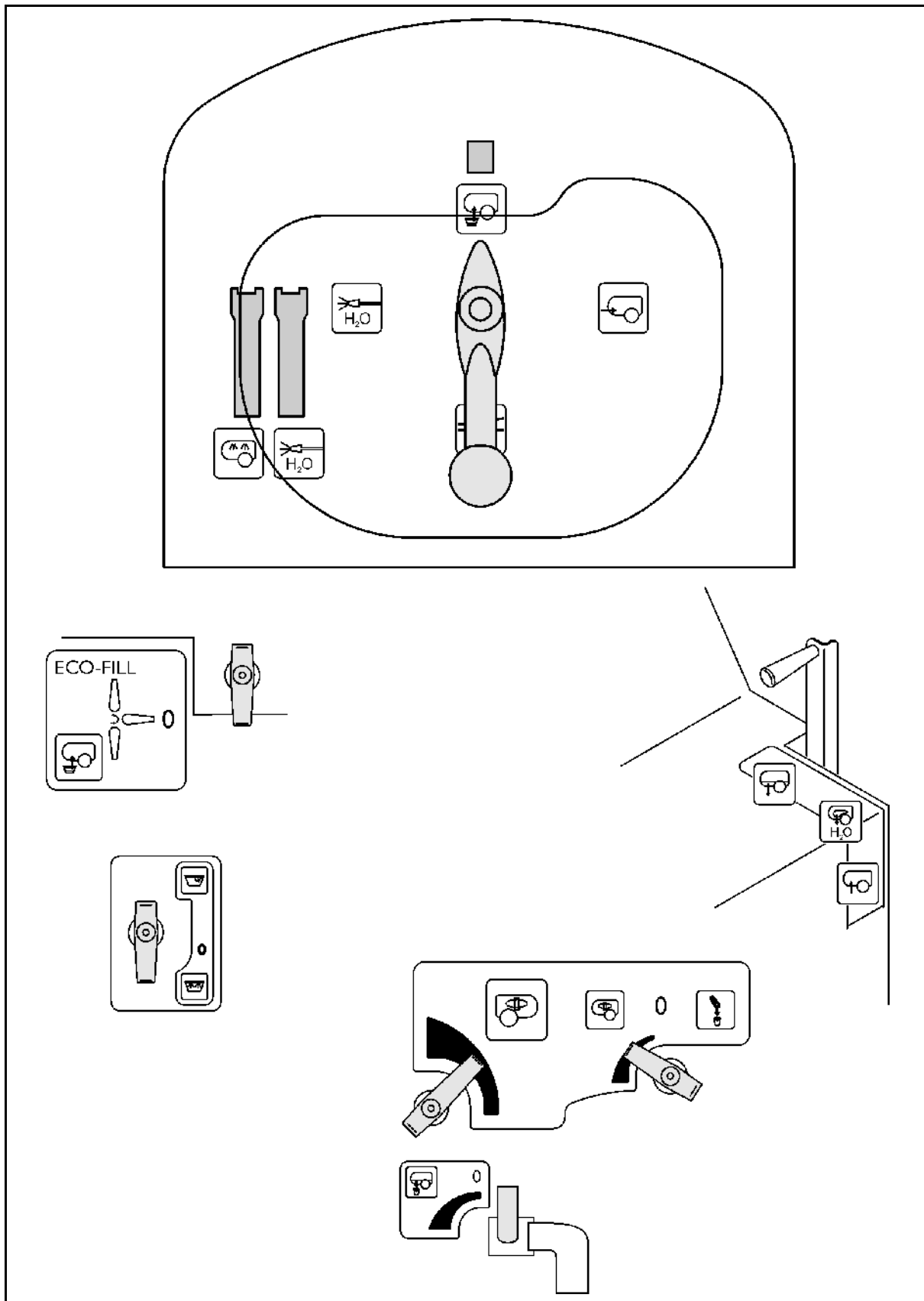


Fig. 85

7.4 Pre-cleaning the canister using the spray mixture

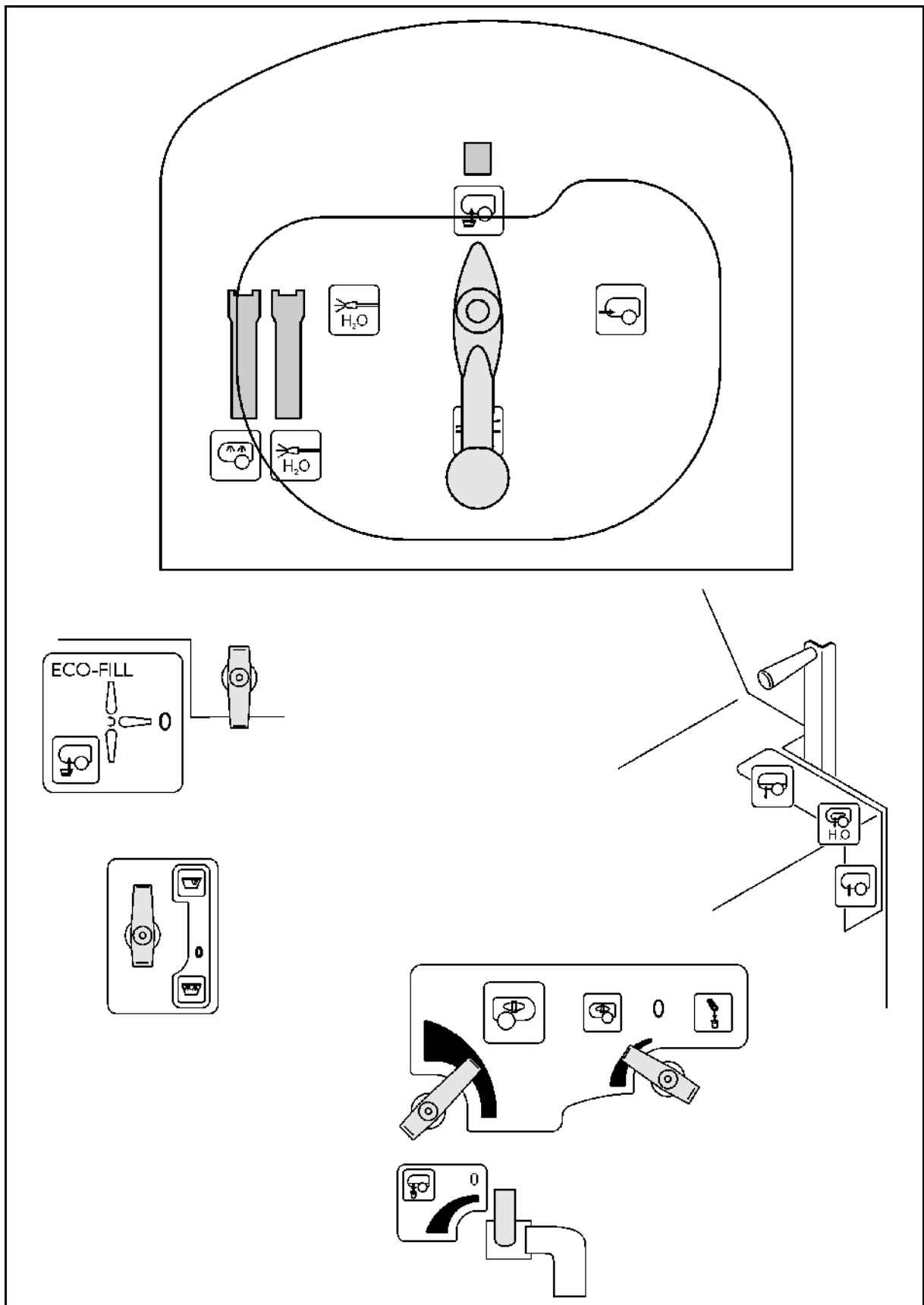


Fig. 86

7.5 Diluting the residual amount in the spray mixture tank

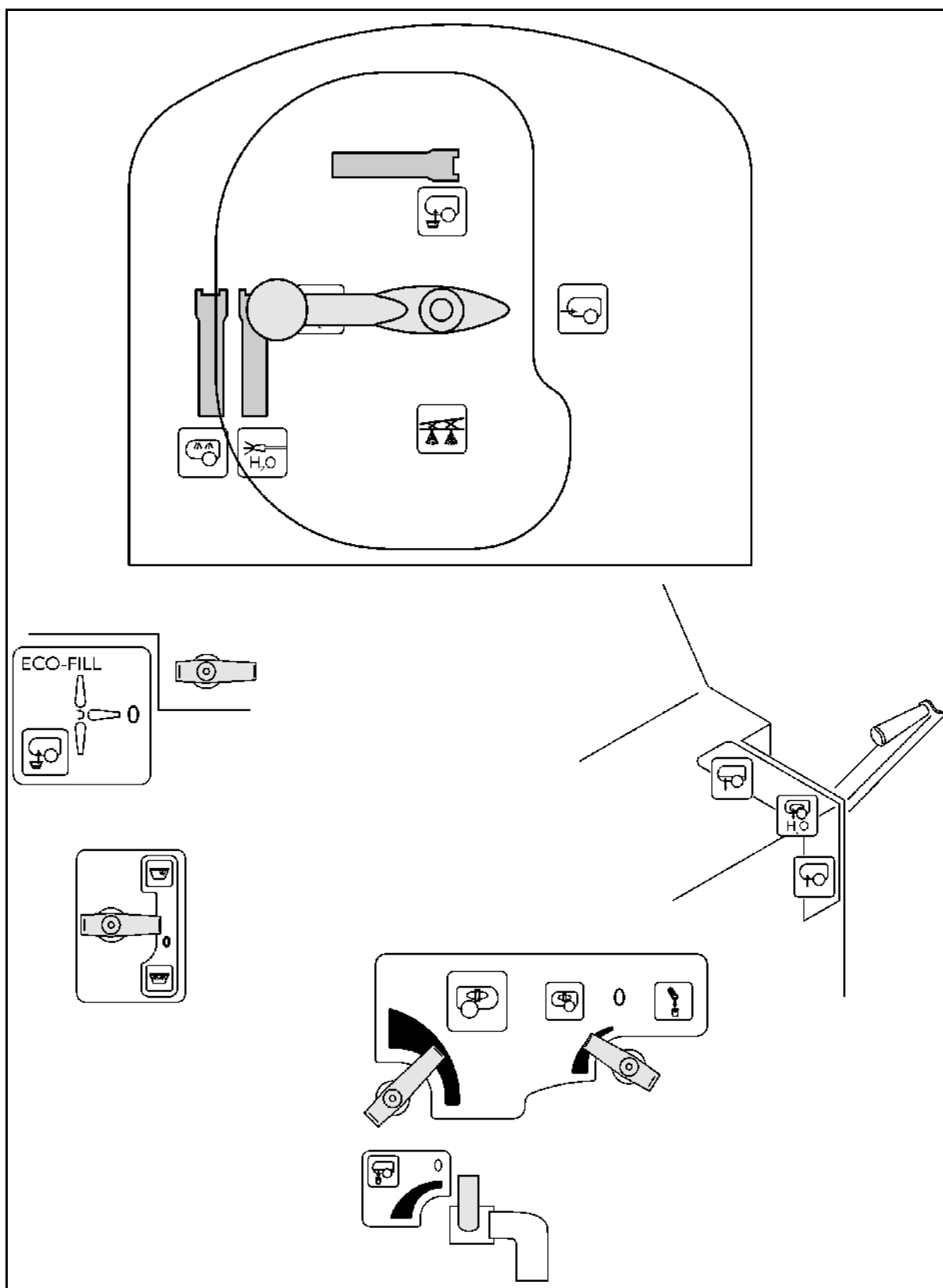
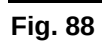


Fig. 87

1. Suction device (suction filter, pump, pressure governor) and cleaning the spray lines



Overview valve chest operation

2. Drain residual amount off the suction device and the spray lines

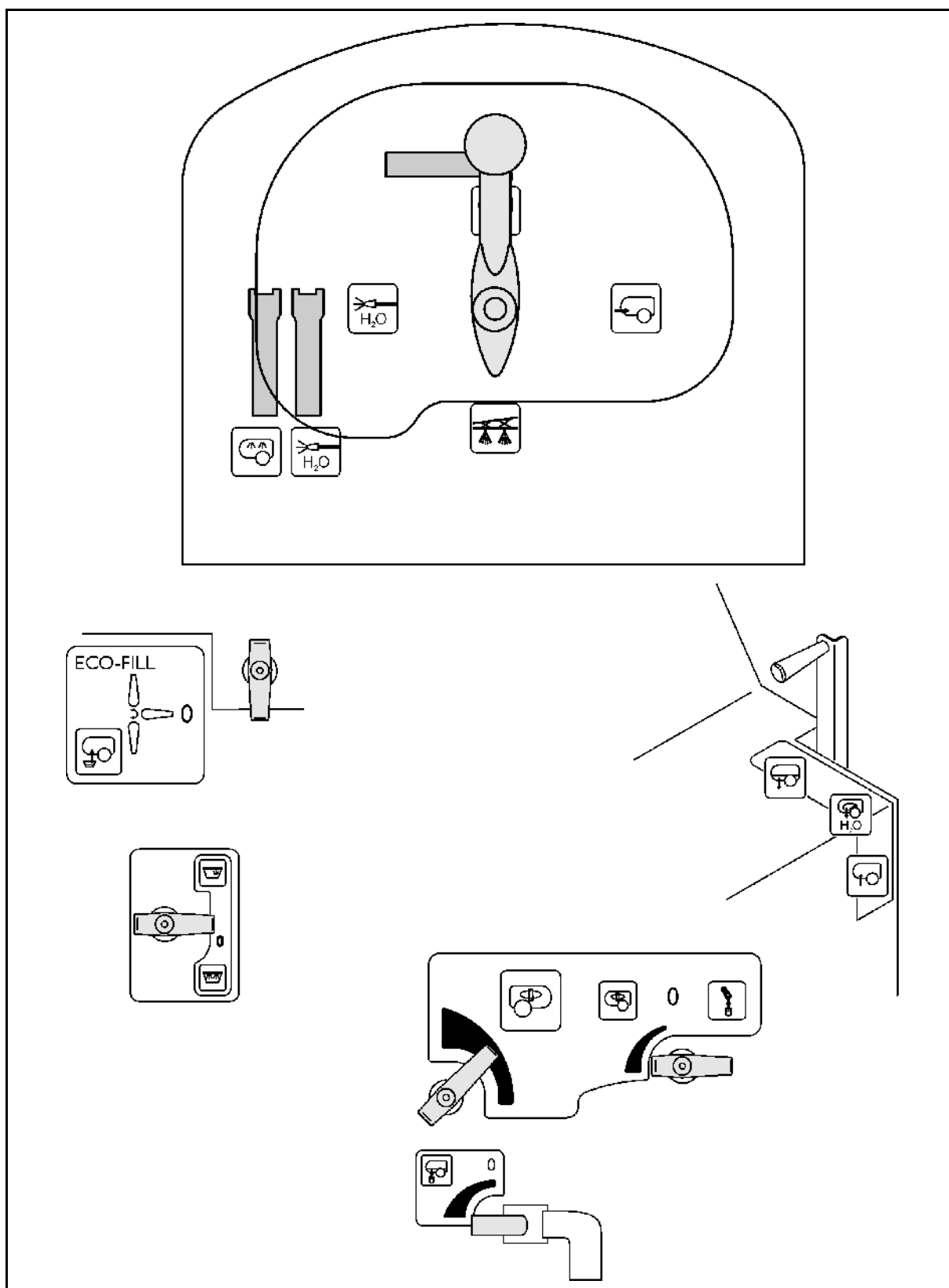


Fig. 89

7.7 Filling via suction hose on the filling port



Caution

For the filling procedure implicitly open the lid of the spray mixture tank.

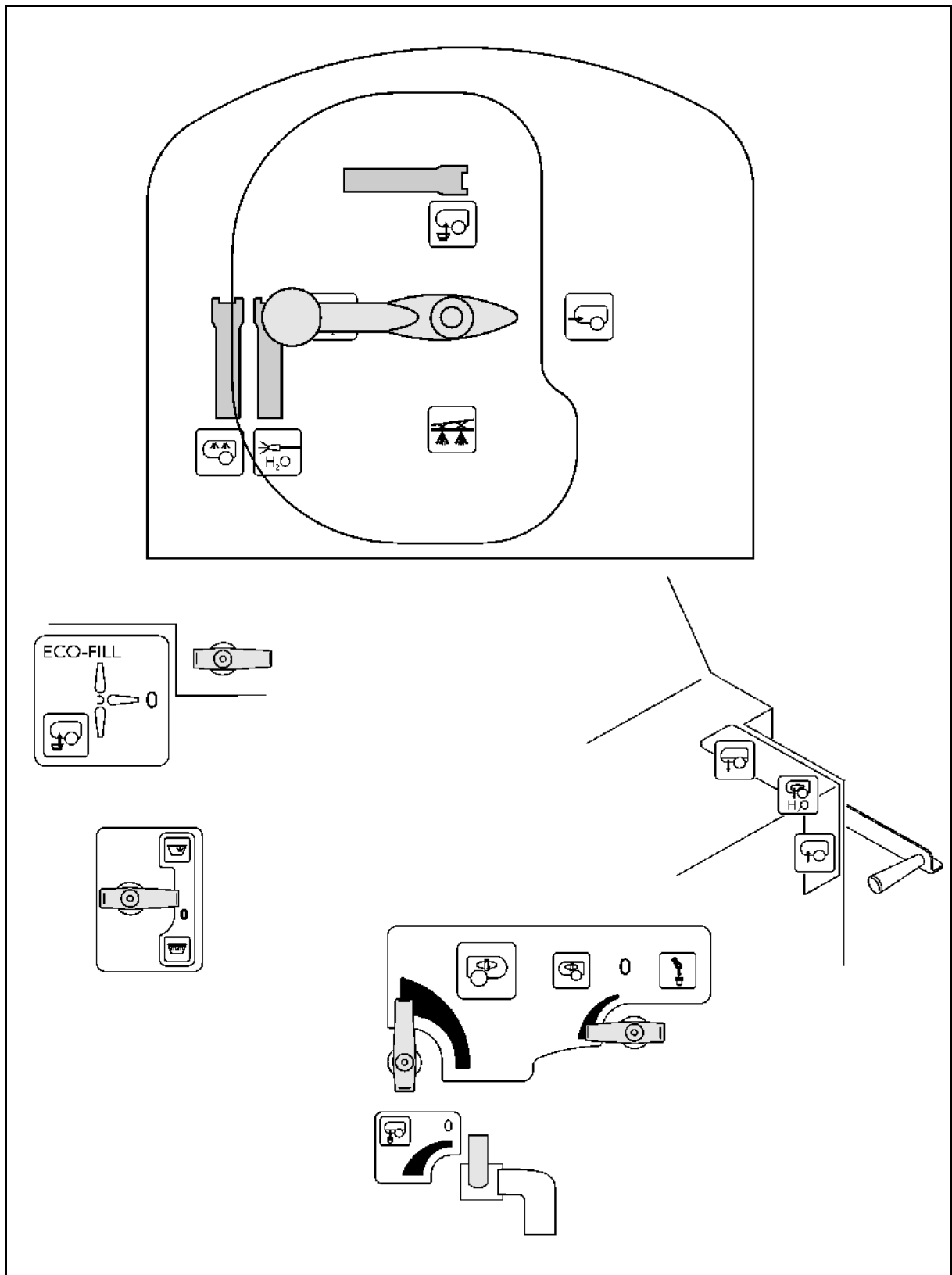


Fig. 90

7.8 Tank interior cleaning

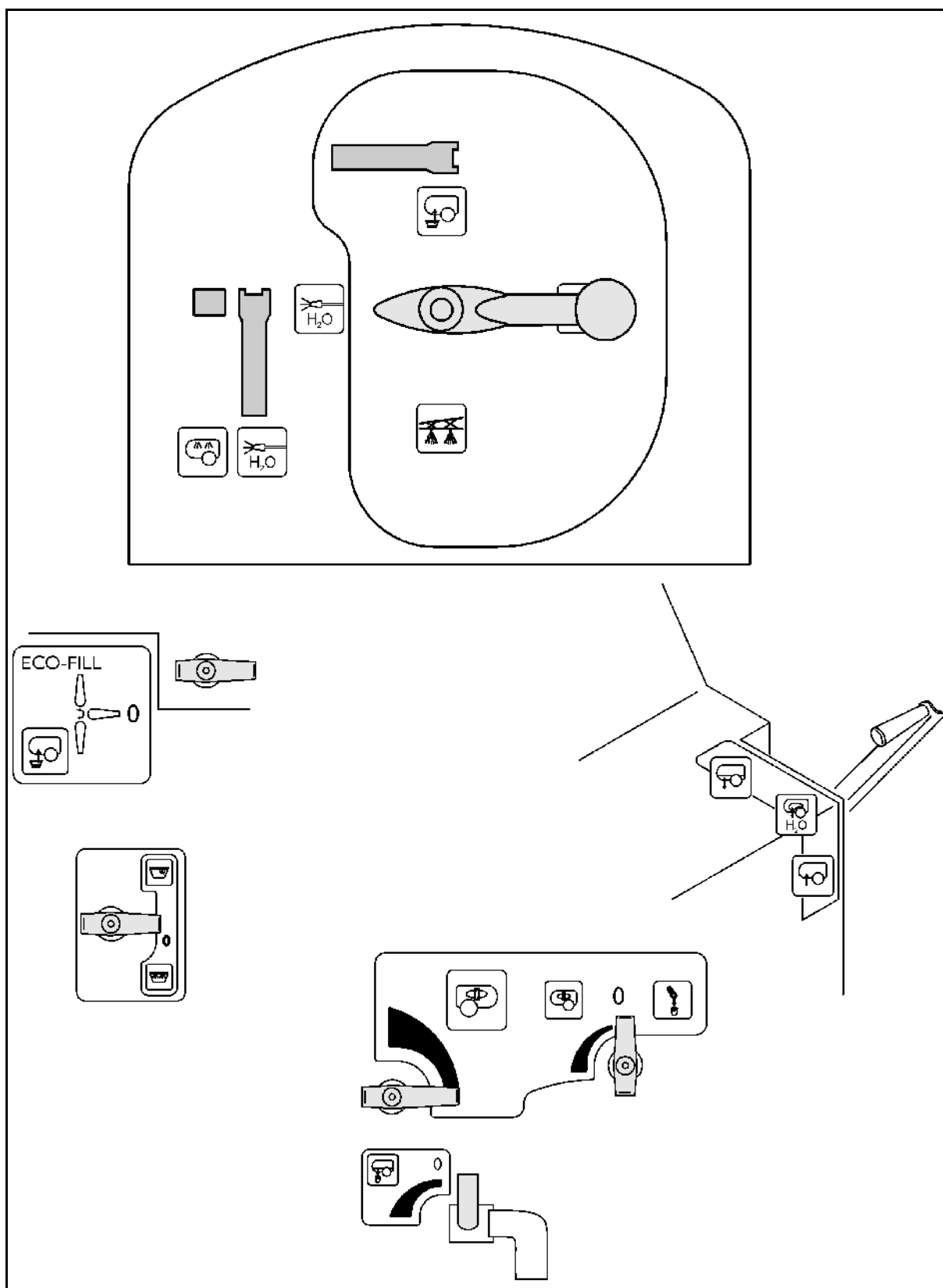


Fig. 91

7.9 Exterior cleaning

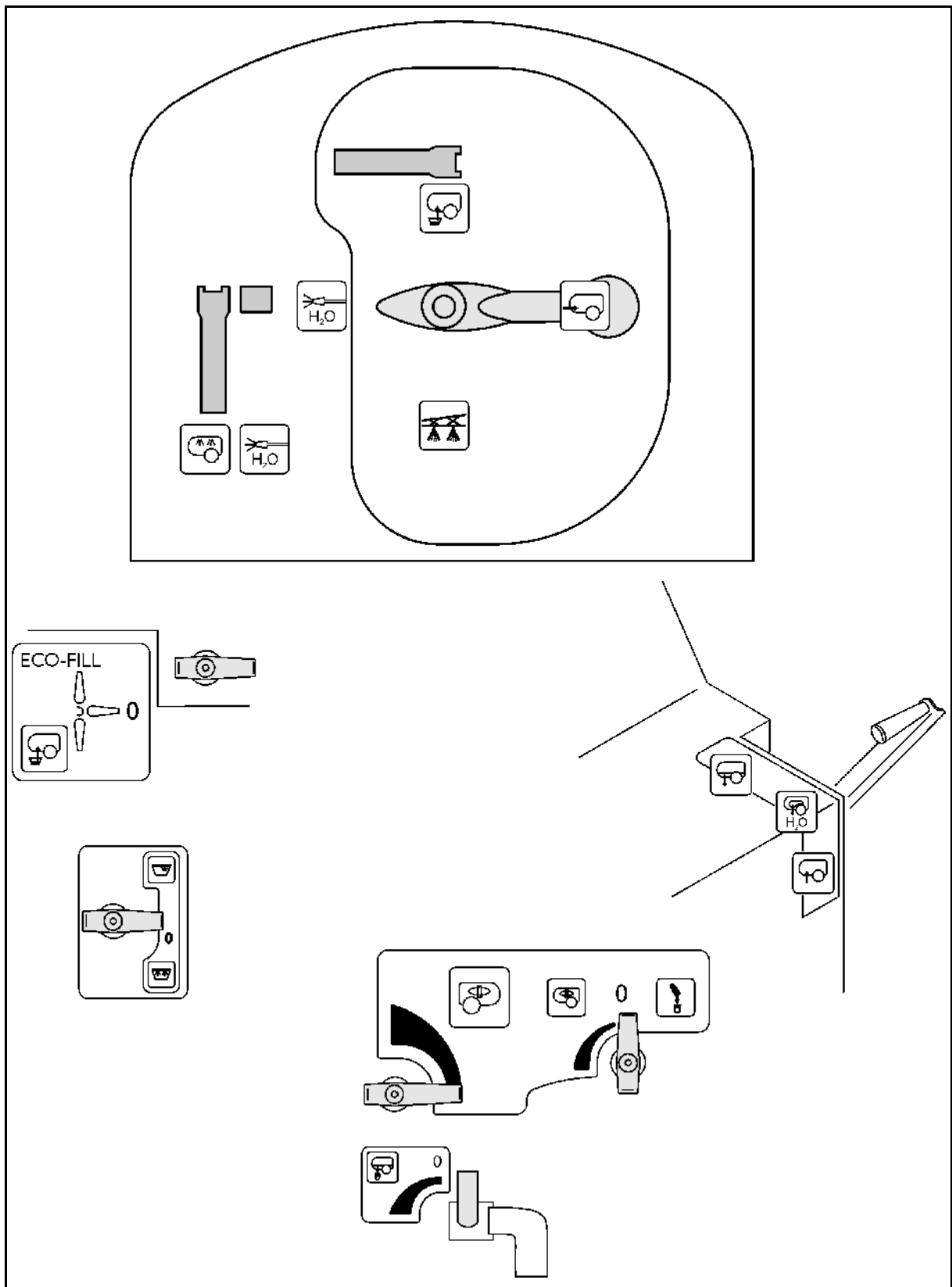


Fig. 92

8 Putting into operation

This chapter provides you with information for putting your machine into operation.



Danger

- Before starting to operate the machine the operator must have read and understood the operator's manual.
- When hitching the machine on and off, observe the chapter "Safety advice for the operator", page 23.
- Mounted or trailed implements and ballast weights affect the driving behaviour as well as the steering and braking of the tractor. For this reason always ensure the correct steering and braking of your tractor.
- The tractor front axle load must be at least 20 % of the tractor's net weight in order to ensure a sufficient steering. If necessary, use front weights.
- The tractor must provide the prescribed brake lag for the loaded combination.
- Ensure that tractor and machine correspond to the legal prescriptions of the relevant national traffic law.
- The traffic lights must correspond to the legal prescriptions of the relevant national traffic law.
- Both, the vehicle owner and operator are responsible for adhering to the legal traffic rules.
- Observe the max. payload of the mounted or trailed machine and the axle loads of the tractor. If necessary travel with only partly filled spray mixture tank.
- For road transport secure the control lever for the three point hydraulics against unintended lowering when the trailed machine is attached to the three point hydraulics.



Important



Hint

When driving on public roads and ways observe the national legal traffic rules.

- In Germany implements (e.g. the trailed sprayer) with a total weight of more than 3 tons require a legal approval. You should clarify this according to the relevant national traffic law.
- Regarding possible national prescriptions for the identification of the trailed sprayer, contact the local authorities.

8.1 Initial operation

8.1.1 Calculation of the payload

$$\text{Payload [kg]} = \text{permissible total weight [kg]} - \text{empty weight [kg]}$$

The empty weight depends on the relevant equipment of the trailed sprayer. The empty weight of the complete trailed sprayer is determined by the empty weight of the base machine (please see type plate) and the weights of the individual components (see "technical data").

Example:

UX 4200 with rigid brake axle (40 km/h) and two circuit air brake system, tyres 460/85/R38, straight draw bar, pump equipment 420 l/min, Super-S-boom 27m.

Permissible total weight: 7500 kg

- Base machine
- Tyres 460/85/R38
- Straight draw bar
- Pump equipment 420 l/min
- Super-S-boom 27m
- Spray line 27m 9-fold



Warning

Exceeding the permissible payload is prohibited. Exceeding the payload would cause a not allowed exceeding of the tyre carrying capacity. This would result in unstable driving behaviour.

Carefully determine the payload and thus the permissible filling of your trailed sprayer. Not all equipment versions allow the complete filling of the spray mixture tank with liquid fertiliser (AUS).

8.1.2 PTO shaft



Important

- Only use the supplied PTO shaft Walterscheid WWE 2280. This PTO shaft is suited for driving bends in the field without stopping the spraying operation (observe the max. PTO shaft angling advice of the manufacturer).
- Maintain the permissible PTO shaft rev. speed of 540 or 1000 R.P.M.
- To avoid damage engage the universal joint shaft at low tractor engine speed.
- Attach the wide angle joint of the PTO shaft on to the pump on the implement side when
 - the trailed sprayer is equipped with a tracking draw,
 - the trailed sprayer is equipped with a straight draw bar (rigid) and hydraulic draw bar steering.
- Always attach the wide angle joint of the PTO shaft on to the pivot point of the draw bar when the trailed sprayer is equipped with a universal draw bar.
- Attach the wide angle joint of the PTO shaft on to the tractor when the trailed sprayer is equipped with a straight draw bar (rigid).



Danger

- Only start to operate with fully guarded drive. PTO shaft with complete guard and additional guard on tractor and implement. Exchange defective guards immediately.
- Also observe the manufacturer's fitting and maintenance advice attached to the PTO shaft.
- Prevent PTO guard from spinning by fixing the provided chains.
- Before switching on the universal joint shaft observe the safety advice for PTO shaft operation in chapter "Safety advice for the operator", page 24.

1. Clean and grease the universal joint shaft stud.
2. Attach the PTO shaft halves on to the universal joint shaft joint of the tractor and the universal joint shaft stud of the machine in the prescribed direction of fitting. **Matching up the PTO shaft is required at the initial fitting or when changing the tractor type.**

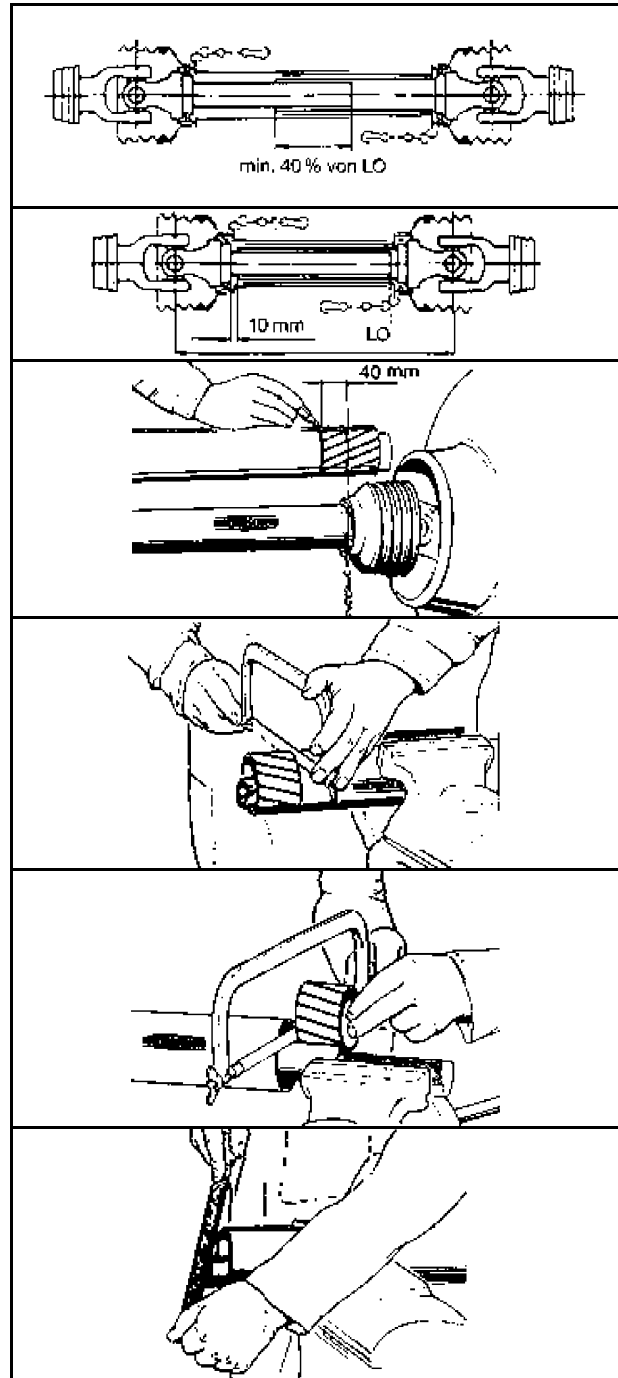
8.1.2.1 First fitting and matching the PTO shaft



Important

At the initial coupling match the PTO shaft to the tractor according to Fig. 93. Any matching up refers to only this one type of tractor. When changing the tractor the length of the universal joint shaft should be checked again.

1. Attach the PTO shaft halves on to the universal joint of the tractor and the universal joint stud of the implement (in the prescribed direction of fitting).
2. Check whether the **overlapping of the PTO shaft's profile tube** is in **any position** of the sprayer behind the tractor at a **minimum of 40 % LO** (LO = length in the totally retracted position) by holding the two PTO shaft tubes next to one another.
3. In shortest position the PTO shaft tubes must never hit the universal yokes. Allow a safety spacing of **at least 10 mm**.
4. To match the length of the PTO shaft halves hold them in shortest operational position next to one another and mark them.
5. Shorten inner and outer guard tube equally.
6. Shorten inner and outer profile tube by the same amount.
7. Round off the cut edges and carefully remove any metal filings.



Putting into operation

8. Apply grease to the sliding profiles and slide them into each other.
9. Affix the stop chain in such a way that a sufficient manoeuvrability of the PTO shaft is allowed in all normal operational positions.
10. Operate always with all guards completely fitted:
PTO shaft with complete guard tubes and cones as well as guards around the tractor and implement.

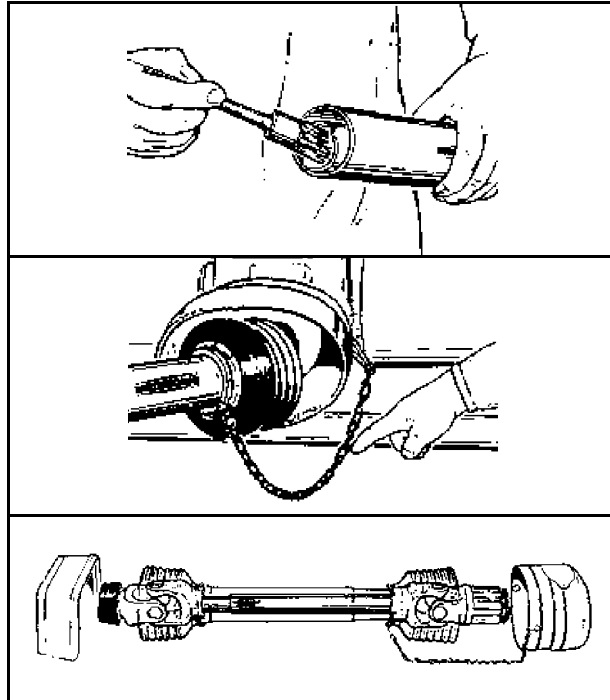


Fig. 93

8.2 Hitching up



Danger



Important

- Allow nobody to stand between tractor and implement while the tractor is backing up.
Any assistants may only stay at the side of the tractor and the trailed sprayer and help to direct it. Only when the vehicles have come to a full standstill they are allowed to step between them for the actual coupling procedure.
- Observe the max. permissible support load.
- For hitching up and travelling on public roads and ways observe the national legal traffic rules.
- For hitching up the trailed sprayer use the provided tools in the appropriate manner.
- When attaching the second hose (red) on to the tractor the actuated release valve on the brake valve of the trailed implement must switch over into the driving position.
- Couple trailed implement and tractor in such a way that the frame of the trailed sprayer is always aligned parallel to the ground.
- Check the routing of the coupled supply hoses. The supply hoses
 - must have a sufficiently large range of movement when travelling in curves to prevent any tensioning, kinking or rubbing.
 - must never rub against foreign parts.

Couple the trailed sprayer as follows

Ensure that the uncoupled field sprayer is secured against rolling away

- on **level ground** with the aid of the parking brake **or** chocks.
- on **very undulated** terrain or on slopes with the aid of the parking brake **and** chocks.

Draw bar

1. Back up the tractor and couple the draw bar on to the tractor and secure.

PTO shaft



Important

2. Slide the PTO shaft on to the tractor's universal joint shaft.
When first attaching the machine to the tractor check the length of the PTO shaft and match it.
3. Prevent the PTO guard from spinning by fixing the provided chains.

Putting into operation

Supply lines between tractor and trailed sprayer

4. Couple the supply lines between tractor and trailed sprayer.

Brake axle with air brake system

- 4.1 Coupling claw of brake hose (yellow).
- 4.2 Coupling claw of second hose (red).



Important

Before coupling the brake or second hoses ensure that the seal rings of the coupling claws are in perfect condition. The sealings must always be clean and undamaged.

Brake axle with hydraulic brake system

- 4.1 Brake hose sleeve of the hydraulic brake hose.



Important

Clean the brake hose sleeve and the hydraulic joint of the hydraulic tractor brake before screwing up the parts.

Traffic lights

- 4.3 Power cable for the traffic light kit.

Hydraulic system

- 4.4 Hydraulic hose line P (pressure hose) on to a hydraulic joint with single acting control valve.
- 4.5 Hydraulic hose line N (return flow line) on to a hydraulic joint with a pressure free return flow.
- 4.6 Hydraulic hoses for jack on to a hydraulic joint with one double acting control valve.

AMATRON +



Important

Switch off the power supply on the **AMATRON +** before connecting the **AMATRON +** and the job computer via the connecting cable.

- 4.7 Connect the **AMATRON +** and the job computer via the connecting cable.

Various

5. Before the first daily travel drain the air reservoir.
6. Remove chocks, deposit in the retainers and secure.
7. Release the parking brake.



Important

Not releasing the parking brake would cause damage on brakes and/or tyres and a dangerous driving behaviour.

8. Lift the jack.
9. Check the brake system and the traffic lights for proper function.

8.3 Unhitching



Danger

- As a matter of principle unhitch and park the trailed sprayer with empty tank on level, firm ground (danger of tipping over).
- Before unhitching the trailed sprayer
 - apply the parking brake.
 - secure the trailed sprayer against rolling away by using the chocks.



Hint

When the trailed sprayer is unhitched or tears off the supply line vents towards the brake valve of the trailed implement. The brake valve of the trailed implement will switch over automatically and activates the service brake system in relation to the braking power adjusted on the brake pressure regulator.

1. Lower the jack.
2. Secure the trailed sprayer against rolling away.
 - on **level ground** by applying the parking brake **or** chocks.
 - on **very undulated terrain** or on slopes by applying the parking brake **and** chocks.
3. Uncouple the supply lines between tractor and trailed sprayer.
 - 2.1 Hydraulic hose lines.
 - 2.2 Power supply cable for the traffic light kit.
 - 2.3 Connecting cable between the **AMATRON +** and the job computer.
 - 2.3 Coupling claw of the second hose (red).
 - 2.4 Coupling claw of the brake hose line (yellow).



Important

- **Always uncouple first the red coupling claw (second line) and then the yellow coupling claw (brake hose). Implicitly follow this order as otherwise the service brake system would release and the unbraked trailed sprayer would roll away.**
 - **Attach the uncoupled supply lines in the relevant dummy couplings.**
4. Close the coupling claws on the tractor with the relevant coupling claw lid.
 5. Remove the PTO shaft from the tractor universal joint shaft and locate in the retainer.
 6. Uncouple the draw bar and pull the tractor forward.

8.3.1 Manoeuvring with the unhitched trailed sprayer

Air brake system



Danger

Special care is imperative when manoeuvring with released service brake as only the towing vehicle would now brake the field sprayer.

Ensure that the trailed sprayer is connected with the towing vehicle before activating the release valve on the brake valve of the trailed implement.

The towing vehicle must be braked.



Hint

The service brake system cannot be released via the release valve if the air pressure in the air reservoir drops below 3 bar (e.g. by repeated actuating the release valve or in case of leakage in the brake system).

Proceed as follows to release the service brake system

- **fill the air reservoir.**
 - **completely bleed the brake system on the drain valve of the air reservoir.**
1. Connect the trailed sprayer with the towing vehicle.
 2. Brake the towing vehicle.
 3. Remove the chocks and release the parking brake..
 4. Press the control button on the release valve until the stop (for this, please see chapter "Two circuit air brake system", page 50).
→ The service brake system releases and allows for manoeuvring the trailed sprayer.
 5. When the manoeuvring procedure is finished pull out the control button on the release valve until the stop..
→ The pressure in the air reservoir again brakes the trailed sprayer.
 6. Brake the towing vehicle.
 7. Firmly apply parking brake again and use the chocks to secure the trailed sprayer against rolling away.
 8. Unhitch the trailed sprayer and the towing vehicle.

Hydraulic brake system



Danger

Special care is imperative when manoeuvring as only the towing vehicle would now brake the field sprayer.

Ensure that the trailed sprayer is connected with the towing vehicle before releasing the parking brake.

The towing vehicle must be braked.

1. Connect the trailed sprayer with the towing vehicle.
2. Brake the towing vehicle.
3. Remove the chocks and release the parking brake.
4. Brake the towing vehicle again when the manoeuvring procedure is finished.
5. Firmly apply parking brake again and use chocks to secure the trailed sprayer against rolling away.
6. Unhitch trailed sprayer and towing vehicle.

8.4 Initial operation with the service brake system



Important

Carry out a brake test with the empty and loaded trailed field sprayer to check the braking behaviour of tractor and coupled field sprayer.

For an optimum braking behaviour and a minimum wear of the brake lining, we recommend the re-adjustment of the coupled tractor and trailed sprayer by an authorised workshop (please see chapter "Maintenance").

8.5 Checks prior to any travelling



Important

- **Advice for the operator:**
 - Before any shift check the functioning of all control and safety devices.
 - During the shift check the condition of the trailed sprayer for obvious defects.
 - Inform the person in charge and the operator of the next shift about any defect noticed.
- **Only start driving with the coupled trailed sprayer when the pressure gauge on the two circuit air brake system in the tractor indicates an air pressure of 5 bar.**

Before starting to travel

- check the correct connection of the supply lines.
- check the correct coupling of the trailed sprayer on to the tractor.
- ensure that the parking brake is completely released.
- check the correct air pressure and the perfect condition of the tyres.
- check the wheel bolts for firm seating (please observe the torques for the wheel bolts in the chapter "Maintenance").
- check the brake and hydraulic system for obvious defects.
- check the traffic lights for damage, function and cleanliness.
- check whether the chocks are there.

8.6 Checks after any travel



Important

Advice for the operator:

- check the brake drums and wheel hubs for overheating.
- stop operation in case of defects which might affect the operational safety.

8.7 Preparing spraying operation



Important

- Pre-condition for an appropriate application of plant protective agents is a trouble-free operation of the field sprayer. The field sprayer should be regularly checked on the test bed. Remedy possibly existing faults immediately.
- Use all designed filters. Clean filters regularly. The trouble free operation of the field sprayer is only achieved by a perfect filtering of the spray agent. The perfect filtering has a considerable effect on the success of the plant protection measure.
- Please observe the permissible combinations of filters or mesh widths. The mesh widths of the self cleaning pressure filter and of the nozzle filters should always be smaller than the nozzle opening of the nozzles used.
 - The mesh width of the as standard fitted pressure filter insert of the self cleaning pressure filter is 0.3 mm at a mesh number of 50 mesh/inch. This pressure filter insert is suitable for nozzle sizes from '03'.
 - For "02" nozzles the 80 mesh/inch pressure filter insert is required (special option).
 - For "015" and "01" nozzles the 100 mesh/inch pressure filter insert is required (special option).
 - Please observe that the use of pressure filter inserts with 80 or 100 mesh/inch may cause agent filtering off with some plant protection agents. If necessary contact the plant protective agent manufacturer.

Please refer to chapter "Filter equipment", page 60.

- As a matter of principle clean the field sprayer before applying an other plant protective agent.
- Flush the nozzle pipe
 - at every nozzle change.
 - before fitting other nozzles.
 - before turning the triple nozzle head on to another nozzle.

Please refer to chapter "Cleaning"

8.7.1 Preparing the spray mixture



Warning



Important

Implicitly wear protective gloves and relevant protective clothing. The highest risk to be contaminated by the spray agent prevails when mixing the spray agents.

- Besides the general hints listed up here, please also adhere to the product specific procedures, described in the instructions for the plant protective agent.
- Take the prescribed water and agent rates from the instructions for the plant protective agent.
- Read the instructions for the agent and observe the mentioned precaution measures.
- Accurately determine the required filling or refilling quantities for the spray agent. This helps to avoid spray agent surplus amounts.

For this see "Determining the filling or refilling amounts", page 110.

We recommend that you visit our Homepage

www.Wirkstoffmanager.de in the Internet. Here, you may have calculated your filling and refilling quantities by a relevant program.

- Carefully determine the required filling or re-filling amount to avoid surplus amounts when having finished the spraying operation. The environmental saving disposal of surplus amounts is difficult.
 - For determining the required refilling amount for the previous spray agent tank filling use the "Filling table for residual areas". Deduct the technically undiluted quantity of liquid within the sprayer boom from the calculated refilling quantity.
- Filling table for residual areas" page 111.
- When agitating the spray mixture adhere to the advice by the spray agent manufacturer.
- Carefully flush empty spray agent containers (e.g. with the aid of the can flushing device) and pour the rinse water into the spray mixture.

Procedure

1. The instructions on the spray agents provide you with the necessary information about the rates of water and spray agent quantities.
2. Determine the filling or refilling amounts for the area to be treated.
3. Fill spray mixture tank half with water.
4. Switch on the agitation.
5. Add the calculated quantity of spray agent.
6. Fill in remaining water quantity.
7. Agitate the spray mixture according to the spray agent manufacturer's advice before spraying.

8.7.1.1 Calculating the filling or refilling quantities



Important

For the calculation of the required refilling amount for the previous spray agent tank filling, use the table "Filling table for left over areas", page 111.

Example 1:

Known data:

Nominal tank volume	1000 l
Residual amount in tank	0 l
Required amount of water	400 l/ha
Spray agent requirement per ha	
Agent A	1,5 kg
Agent B	1,0 l

Question:

How many litres of water, how many kg of agent A and how many litres of agent B are required for an area of 2.5 ha to be sprayed?

Answer:

Water:	400 l/ha	x	2,5 ha	=	1000 l
Agent A:	1,5 kg/ha	x	2,5 ha	=	3,75 kg
Agent B:	1,0 l/ha	x	2,5 ha	=	2,5 l

Example 2:

Known data:

Nominal tank volume	1000 l
Residual amount in tank	200 l
Required amount of water	500 l/ha
Recommended concentration	0,15 %

Question 1:

How many litres or kg spray agent must be used for one tank filling?

Question 2:

What is the size in hectare of the area to be treated which can be sprayed with one tank filling when the tank can be emptied up to a surplus quantity of 20 litres?

Calculation formula and reply to question 1:

$$\frac{\text{Water - refilling quantity [l]} \times \text{Concentrate [\%]}}{100} = \text{Agent induction [l or kg]}$$

$$\frac{(1000 - 200) \text{ [l]} \times 0,15 \text{ [\%]}}{100} = 1,2 \text{ [l or kg]}$$

Calculation formula and reply to question 2:

$$\frac{\text{Available spray mixture [l]} - \text{residual amount [l]}}{\text{Required rate of water [l/ha]}} = \text{Area to be sprayed [ha]}$$

$$\frac{1000 \text{ [l]} (\text{tank nominal volume}) - 20 \text{ [l]} (\text{residual amount})}{500 \text{ [l/ha]} \text{ required rate of water}} = 1,96 \text{ [ha]}$$

8.7.1.2 Filling table for finishing off remaining field areas



Important

For the calculation of the required refilling quantity for the previous spray mixture tank fill, please refer to the "Filling table for remaining areas". Deduct the surplus amount in the spray line from the calculated refilling quantity. Please refer to chapter "Spray lines", page 73.



Hint

The indicated refilling quantities are valid for an application rate of 100 l/ha. For all other spray rates the refilling quantity has to be increased by a multiple.

Travel distance [m]	Refilling quantities [l] for sprayer booms in working widths of									
	18 m	20 m	21 m	24 m	27m	28m	30m	32m	33m	36m
10	2	2	2	2	3	3	3	3	3	4
20	4	4	4	5	5	6	6	6	7	7
30	5	6	6	7	8	8	9	10	10	11
40	7	8	8	10	11	11	12	13	13	14
50	9	10	11	12	14	14	15	16	17	18
60	11	12	13	14	16	17	18	19	20	22
70	13	14	15	17	19	20	21	22	23	25
80	14	16	17	19	22	22	24	26	26	29
90	16	18	19	22	24	25	27	29	30	32
100	18	20	21	24	27	28	30	32	33	36
200	36	40	42	48	54	56	60	64	66	72
300	54	60	63	72	81	84	90	96	99	108
400	72	80	84	96	108	112	120	128	132	144
500	90	100	105	120	135	140	150	160	165	180

Fig. 94

Example:

Remaining left over distance (travelled distance): 100 m
 Spray rate: 100 l/ha
 Working width: 21 m
 Number of boom part section feed controls: 5
 Residual amount spray line: 5,2 l

1. Determine the refilling quantity with the aid of the filling table. For this example, the refilling quantity is 21 l.
2. Deduct the residual amount in the spray line from the calculated refilling quantity.

Necessary refilling quantity: 21 l – 5,2 l = 9,8 l

8.8 Filling with water



Important

When filling observe the permissible payload of your field sprayer. When filling your field sprayer carefully bear in mind the different specific weights [kg/l] of the individual liquids.



Caution

When filling via the suction port (chapter 7.7) implicitly open the lid of the spray mixture tank.

Specific weights of the individual liquids

Liquid	Water	Urea	AUS	NP-solution
Dichte [kg/l]	1	1,11	1,28	1,38



Important

- Before any filling check the field sprayer, e.g. for leaking tanks and hoses and for correct position of all control elements. For this see chapter "Explanation of the control elements for spraying operation", page 35.
- During the filling procedure never leave the field sprayer unattended.
- Ensure that there is never a direct connection between the filling hose and the spray mixture inside the tank so that a back suction of spray mixture into the water supply network is prevented.
- Fix the end of the filling hose at minimum 20 cm above the filling opening of the spray agent tank. The resulting free run out provides the utmost safety against spray agent flowing back into the pipe circuit.
- Avoid formation of foam. When filling do not allow foam to escape from the tank. A funnel with large diameter which reaches right down to the spray agent tank bottom effectively prevents the formation of foam.
- Fill the spray agent tank only with inserted filling sieve.



Hint

The preferred method of filling is on the field's edge from a bowser (if possible make use of natural height differences). Depending on the spray agent used this type of filling may not be permitted in water protection zones. In any case check with the appropriate authorities.

1. Determine the accurate water filling amount (for this see chapter "Calculation of filling or refilling quantity", page 110).
2. Fill the spray agent and clear water tank **via the filling port from the water pipe in "free run out"**.
3. Observe the tank contents on the tank fill indicator.
4. Close the filling ports with the aid of folding or screw on lid.

8.9 Inducting spray agents



Warning



Hint



Important

For inducting spray agents wear the protective clothing prescribed by the plant protective agent manufacturer.

- Usually the agitation remains engaged from the time of filling until termination of the spraying operation. Please observe the advice of the spray agent manufacturer.

Put in water soluble plastic bags directly into the spray mixture tank while the agitator is engaged

Induct the relevant **spray agent via the induction bowl** (Fig. 95/1) into the water of the spray mixture tank. A difference is made here between the inducting of liquid and powdery agents or urea.

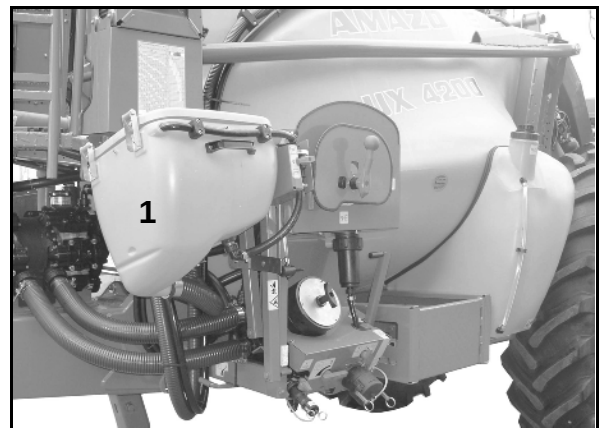


Fig. 95

Empty spray agent containers



Important

- Carefully flush empty spray agent containers, make them unusable, collect them and dispose in the appropriate way. Never use them for other purposes.
- If there is only spray mixture available for rinsing the spray mixture tank, just use it for a pre-cleaning. Conduct the careful cleaning when clear water is available, e.g. before preparing the next spray mixture tank-filling or when diluting the residual amount of the previous spray cocktail tank-fill.

8.9.1 Inducting liquid agents

1. Fill the spray cocktail tank half with water.
2. Open induction bowl lid.

3. Suction device lever **E** in position



4. Pressure device control **A** in position



5. Reversing tap **F** in position **0**.



6. Reversing tap **G** in position
(the suction capacity can be adjusted between **0** and max. opened).

7. Drive pump, adjust pump speed of 400 R.P.M. and switch on the agitator **H**.
If necessary, increase the agitation intensity.

8. Fill the agent or urea quantity calculated and measured for the tank filling into the induction bowl (max. 60 l).

9. Open switch tap **D** and suck the contents entirely off the induction bowl.

10. Close switch tap **D** again.

11. Fill in remaining quantity of water.

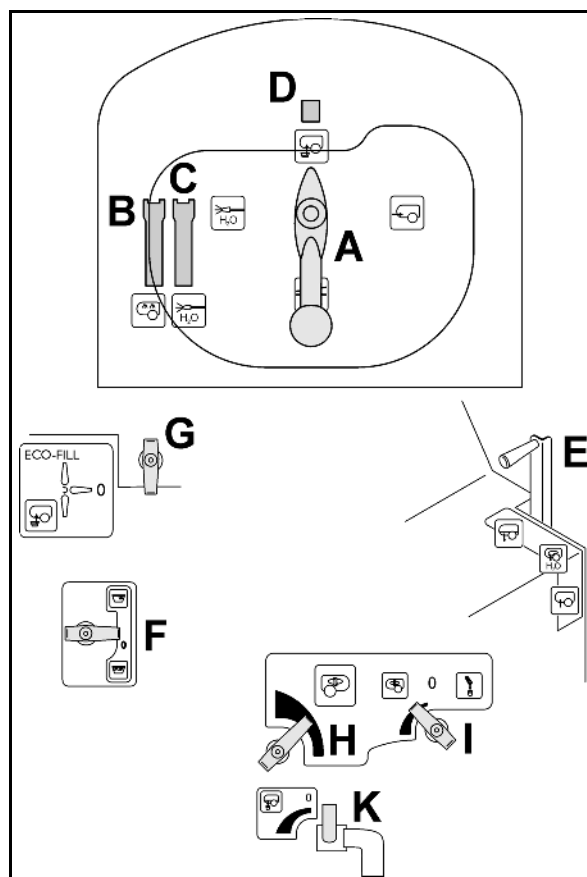


Fig. 96

8.9.2 Inducting powdered agents and urea



Important

Before starting spraying operation dilute urea completely by pumping the spray cocktail around the tank. When diluting larger amounts of urea the spray mixture's temperature will be drastically lowered so that the urea dilutes slower. The warmer the water is the faster and better the urea is diluted..

1. Fill spray mixture tank half with water.
2. Open the lid of the induction bowl.
3. Suction device lever **E** in position .
4. Pressure device control **A** in position .
5. Reversing tap **F** in position .
6. Reversing tap **G** in position  (the suction capacity can be adjusted between 0 and max. opened).
7. Drive pump. Set pump speed of 400 R.P.M. and switch on agitator **H**.
If necessary increase agitation intensity.
8. Fill the agent or urea quantity calculated and measured for the tank filling into the induction bowl (max. 60 l).
9. Open switch tap **D** and suck the contents entirely off the induction bowl.
10. Close switch tap **D** when the contents filled in is fully diluted.
11. Reversing tap **G** in position **0**.
12. Fill in the remaining quantity of water.

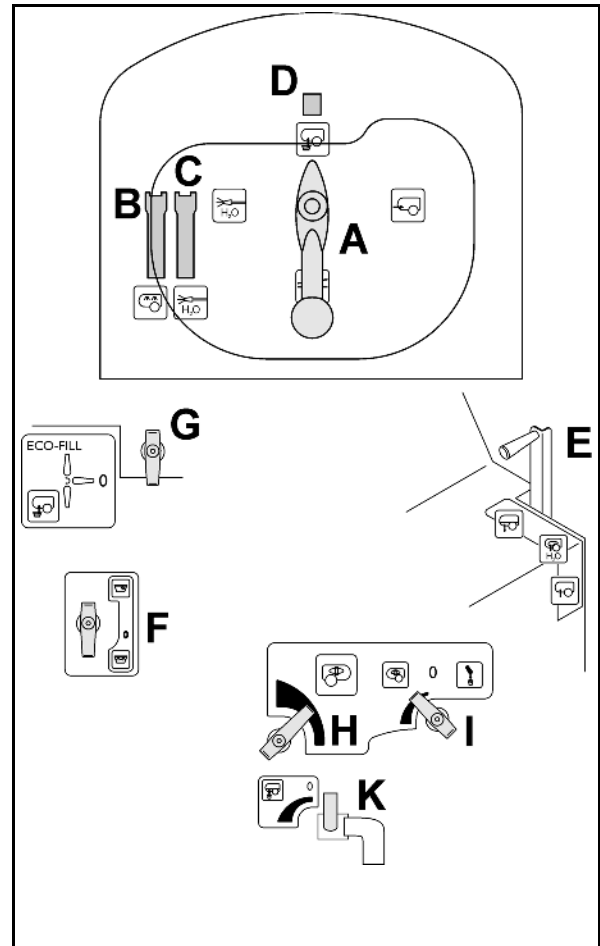


Fig. 97

8.9.3 Inducting with ECOFILL

1. Fill the spray mixture tank half with water en.

2. Suction device lever **E** in position



3. Pressure device control **A** in position



4. Open switch tap **D**.

5. Reversing tap **F** in position **0**.

6. Reversing tap **G** in position **ECO-Fill**.

7. Drive the pump. Set the pump speed of 400 R.P.M. and switch on agitator **H**.
If necessary increase agitating intensity.

8. Reversing tap **G** in position **0**, when the desired quantity has been sucked off the ECO-Fill-container.

9. Close switch tap **D**.

10. Refill the remaining quantity of water.

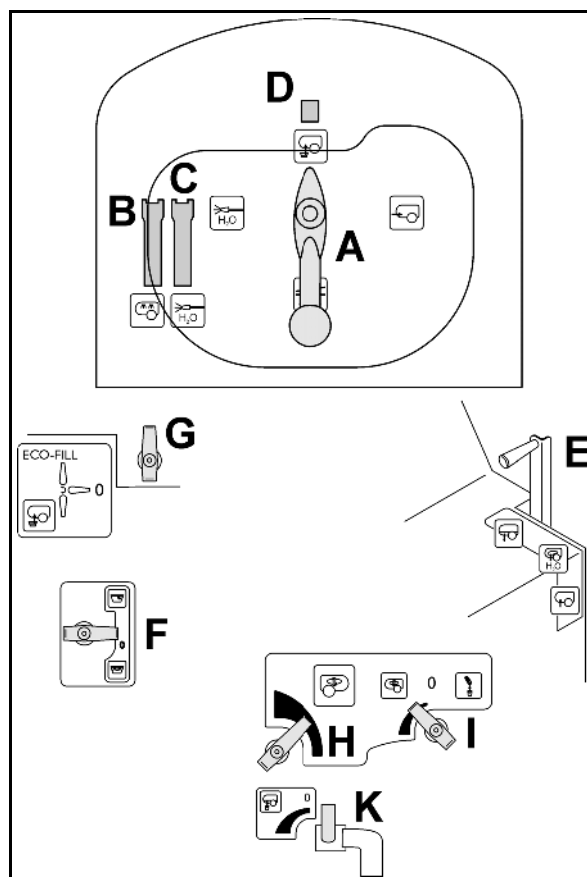


Fig. 98

8.9.4 Pre-cleaning the canister with the spray mixture

1. Suction device lever **E** in position .
2. Pressure device control **A** in position .
3. Reversing tap **F** in position .
4. Open switch tap **D**.
5. Reversing tap **G** in position .
6. Drive the pump. Set the pump speed of 400 R.P.M.
7. Open induction bowl lid.
8. Slide the canister or another container over the canister flushing and press downwards for at least 30 seconds.
9. Reversing tap **G** in position **0**.
10. Close switch tap **D**.

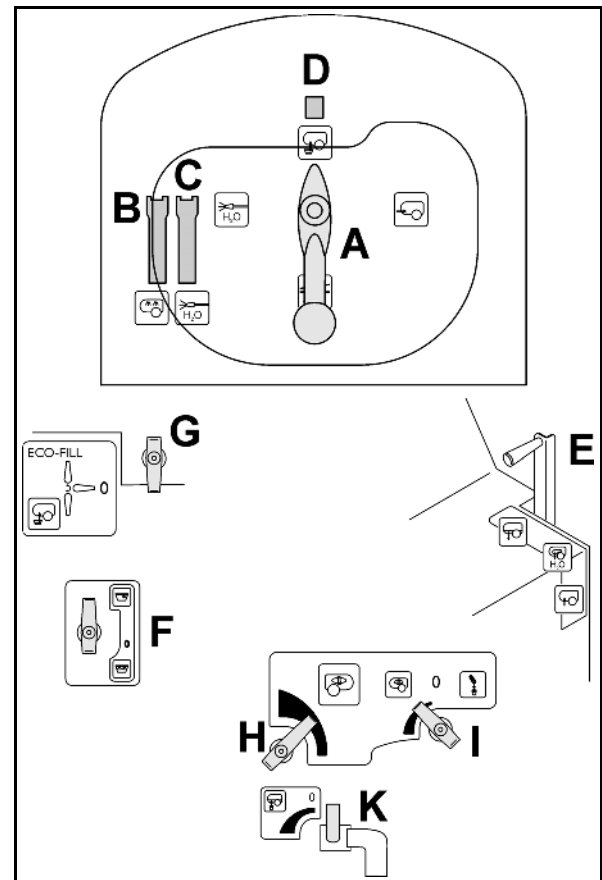


Fig. 99

8.9.5 Clean canister with rinse water

1. Suction device lever **E** in position .
 2. Pressure device control **A** in position .
 3. Reversion tap **F** in position .
 4. Reversion tap **G** in position .
 5. Drive pump. Set the pump speed to 400 R.P.M.
 6. Open the lid of the induction bowl.
 7. Slide the canister or another container over the canister flushing and press downwards for at least 30 seconds.
- If beforehand another spray mixture has been sprayed, it will last some time until the rinse water is available at the nozzle..**

1. Suction device lever **E** in position .
2. Open switch tap **D** and suck the contents entirely off the induction bowl.
9. Reversing tap **G** in position **0**.
10. Close switch tap **D**.

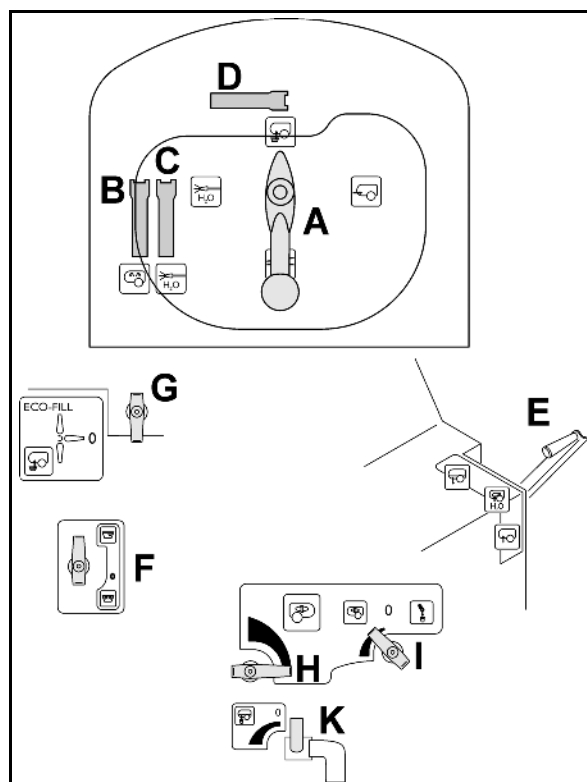


Fig. 100

8.10 Spraying operation

Special hints for the spraying operation



Important

- Check your field sprayer by carrying out a calibration
 - prior to starting operation in the season.
 - in case of deviations between the actual spray pressure and the spray pressure required according to the spray rate chart.
- Before commencing the spraying operation accurately determine the required spray rate following the instructions of the plant protective agent manufacturer (please refer to chapter "Preparing the spray mixture", page 109).
 - Before starting the spraying operation, please enter the necessary spray rates (required rate) into **AMATRON +**.
The **AMATRON +** sends a fault message and an audible alarm signal if the necessary spray rates is not maintained during the spraying operation.
- Accurately maintain necessary spray rates [l/ha] during the spraying operation,
 - in order to achieve the optimum success of your plant protective measures.
 - in order to avoid unnecessary harm to the environment.
- Prior to the spraying operation choose the required nozzle type from the spray rate chart - considering
 - the intended operational speed,
 - the required spray rate and
 - the required spraying characteristics (fine, medium or coarse droplets) for the crop protection agent used for the plant protective measure.
Please refer to chapter "Spray rate charts for flat fan-, anti drift-, injector-, and airmix nozzles", page 158.
- Prior to the spraying operation choose the necessary nozzle size from the spray rate chart – considering
 - the intended forward speed,
 - the required spray rate and
 - the intended spraying pressure.
Please refer to chapter "Spray rate charts for flat fan-, anti drift-, injector-, and airmix nozzles", page 160.
- Choose a slow forward speed and a low spray pressure to avoid drifting loss.
Please refer to chapter "Spray rate charts for flat fan-, anti drift-, injector-, and airmix nozzles", page 160.
- Take additional measures for drift reduction at wind speeds of 3 m/s (Please refer to chapter "Measures for drifting reduction", page 124)!



Important

- Discontinue the spraying operation at average wind speeds of above 5 m/sec. (leaves and thin branches are moving).
- Please only switch on and off the sprayer boom only whilst driving in order to avoid over metering.
- Avoid over metering by overlapping in case of not accurate driving of the next bout from spray path to spray path and/or when driving in curves on the headlands with the sprayer boom switched on.
- Never exceed the maximum pump speed of 550 R.P.M. when increasing the forward speed.
- During the spraying operation constantly check the actual spray mixture consumption in relation to the treated area.
- Calibrate the flow meter in case of deviations between the actual and the indicated spray rate.
- Calibrate the forward speed sensor (impulses per 100m) in case of deviations between the actual and the indicated travelled distance, see chapter 6 **AMATRON +**.
- Implicitly clean the suction filter, the pump, the valve chest and the spray lines in case of weather induced interruption of the spraying operation. Please refer to page 129.



Hint

- Spray pressure and nozzle size influence the droplet size and the spray rate. The higher the spray pressure the smaller the droplet diameter of the sprayed spray mixture gets. Smaller droplets are more susceptible to an unwanted drift.
- If the spray pressure is increased, the spray rate is increased as well.
- If the spray pressure is reduced, the spray rate is reduced as well.
- If the forward speed is increased at the same nozzle size and spray pressure, the spray rate is reduced.
- If the forward speed is reduced at the same nozzle size and spray pressure, the spray rate is increased.
- Forward speed and pump drive speed can be chosen at random due to the automatic, area related spray rate control via the **AMATRON +**.
- Choose the pump (between 350 and 550 R.P.M.), so that a sufficient volume flow to the sprayer booms and for the agitator is available. Implicitly bear in mind that at a high forward speed and a high spray rate more spray liquid must be supplied.
- Usually the agitation remains engaged from the time of filling until termination of the spraying operation. Maßgebend sind hierbei die Angaben der Präparat-Hersteller.
- The spray mixture tank is empty when the spray pressure suddenly clearly drops.
- Suction or pressure filter are blocked when the spray pressure drops at otherwise unchanged conditions.

8.10.1 Inputting job related data into the **AMATRON +**



Important

Before commencing the spraying operation enter the job related data into the **AMATRON +**. Chapter 6 **AMATRON +**.

8.10.2 Spraying crop protection liquid



Important

- Couple the field sprayer to the tractor as prescribed
- Connect the cable of the implement computer with the **AMATRON +**.
- Before starting the spraying operation check the following implement data in the **AMATRON +**:
 - percentage application rate increase.
 - the values for the permissible spray pressure-range of the nozzles fitted to the sprayer boom.
 - the value "Impulses per 100m".
- Take the relevant measures if during the spraying operation a fault message appears on the display of the **AMATRON +** and at the same time an audible alarm signal sounds. Please refer to chapter "Fault message and audible alarm", page 124.
- Check the indicated spray pressure during the spraying operation.

Ensure that the indicated spray pressure by no means deviates more than $\pm 25\%$ from the intended spray pressure taken from the spray rate chart, e.g. when changing the spray rate via the plus/minus keys. Bigger deviations from the intended spray pressure do not allow any optimum success of your plant protective measures and will cause environmental pollution.



Important

Reduce or increase the forward speed until you return to the permissible spray pressure range for the intended spray pressure.

- Never empty the spray mixture tank entirely (this is not applicable when finishing the spraying operation). Refill the spray mixture tank at a filling level of approx. 50 litres at the latest.
- After having finished the spraying operation, at a filling level of approx. 50 litres,
 - the reversing tap spraying operation / flushing in position "Flushing".
 - switch off the agitation.

Example:

Necessary spray rate:	250 l/ha
Intended forward speed	8 km/h
Nozzle type	LU/XR
Nozzle size	'05'
Permissible pressure range of the spray nozzles fitted	min. pressure 1 bar max. pressure 5 bar
Intended spray pressure	2,3 bar
Permissible spraying pressures:	2,3 bar min. 1,7 bar and max. 2,9 bar $\pm 25\%$

1. Mix up the spray mixture according to instructions and agitate according to instructions from the spray agent manufacturer. Please refer to chapter "Preparing the spray mixture" page 109.
2. Adjust the agitation intensity (infinitely variable setting). Please refer to chapter "Agitator", page 58.
3. Switch on the **AMATRON +**.
4. Fold out the sprayer booms.
5. Set the height of the spray boom (height between the nozzles and the crop) according to the spraying table in regard of the nozzles used.
6. Check in the **AMATRON +** the value "percentage application rate increase" for the proportional change of the spray rate by once pressing the plus- / minus-key.
7. Check in the **AMATRON +** the value "Impulses per 100m".
8. Check in the **AMATRON +** the values "max. pressure" and "min. pressure" for the permissible spraying range of the spray nozzles fitted in the sprayer boom.
9. Enter the value "required rate" for the necessary spray rate into the **AMATRON +** or check the stored value.
10. Engage the PTO shaft and drive the pump with a nominal speed (540 R.P.M.).
11. Select the suitable tractor gear and start moving.
12. Switch on the spraying operation via the **AMATRON +**.

8.10.3 Spraying operation

1. Drive the pump, pump drive speed 540 R.P.M.
2. Suction device lever **E** in position .
3. Pressure device control **A** in position .
4. Switch on agitators **H, I**.
Infinitely variable setting of the agitation intensity.

 **Hint** At lower spray rates the pump re. Speed can be reduced, saving energy.

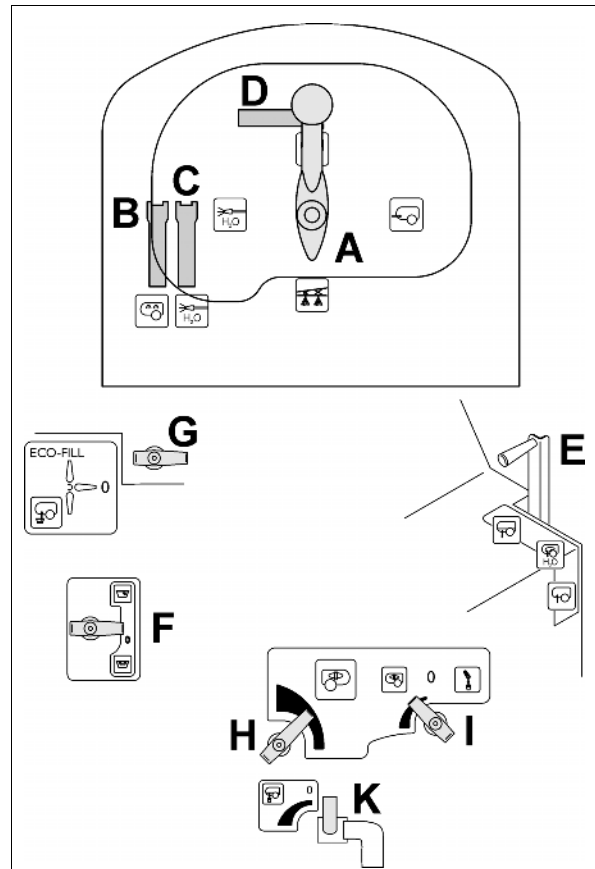


Fig. 101

Travelling to the field with agitator engaged

1. Switch off the **AMATRON +**.
2. Switch on the universal joint shaft.
3. Set the desired agitation intensity.



Important

If this agitation intensity deviates from what was used before, do not forget to reset the agitation before recommencing the spraying operation.

8.10.3.1 Fault messages and audible alarm signals



Hint

A fault message appears on the display of the **AMATRON +** and an audible alarm sounds simultaneously,

- if the necessary entered spray rate is not achieved.
- if the permissible spray pressure range of the spray nozzles fitted to the sprayer boom is left.

The necessary spray rate is not achieved

This fault message appears on the display of the **AMATRON +** and an alarm signal sounds simultaneously if at high forward speed and low pump drive speed the required spray rate is not achieved.

Remedy:

1. Reduce the forward speed and increase the pump drive speed until the fault message and the audible alarm signal expire.

Leaving the permissible spray pressure range of the nozzles fitted to the sprayer boom

This fault message appears on the display of the **AMATRON +** and simultaneously an alarm signal sounds if the permissible spray pressure range of the nozzles fitted to the sprayer boom is left.

Remedy:

1. Change the forward speed to return to the intended forward speed range which you have pre-determined for the spraying operation.

8.10.4 Measures for drift reduction

- Choose the early morning or the evening for carrying out the treatment (usually less wind).
- Choose larger nozzles and higher water rates.
- Reduce the spray pressure.
- Maintain the correct boom operational height as with increased nozzle spacing the danger of drift increases.
- Reduce the forward speed (to below 8 km/h).
- Fit nozzles with a high proportion of coarse droplets, such as so-called anti drift (AD)-nozzles or injector (ID)-nozzles (nozzles with a high percentage of coarse droplets).
- Observe the distance requirements for the relevant crop protection agents.

8.11 Residual amounts

You may encounter two kinds of surplus amounts of spray mixture:

- Residual amount in the spray mixture tank after concluding the spraying operation.
- Technical residual amount, which still remains in the spray mixture tank, the suction device and the spray line in case of a clear spray pressure drop. The suction device consists of the components suction filter, pumps and pressure regulator. Take the values for the technical surplus amounts of the individual components from the chapter "Technical data", page 41. The residual amounts of the individual components have to be added.

8.11.1 Removal of residual amounts



Important

- Observe that the residual amount in the spray line will be sprayed in undiluted concentration. Implicitly spray these residual amounts on a not treated area. Take the required travel distance for spraying this undiluted residual amount from chapter "Technical data – spray lines", page 73. The residual amount of the spray line depends on the sprayer boom working width.
- For emptying the spray cocktail tank switch off the agitation if the residual amount in the spray mixture tank is only 100 litres. With the agitation switched on the technical residual amount would increase compared with the indicated values.
- Measures for personal protection are valid when emptying surplus amounts. Please observe the advice of the crop protection agents-manufacturer and wear appropriate protective clothing.
- Dispose of the collected spray mixture-residual amount according to the valid legal prescriptions. Collect spray mixture residual amounts in suited containers. Let the spray mixture residual amounts dry up. Put the spray mixture residuals to the prescribed waste disposal.

Diluting the residual amount in the spray agent tank and spraying the diluted residual amount after having finished the spraying operation



Important

After having finished the spraying operation carry out the diluting and spraying of the residual amount in intermittent procedure.

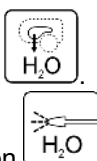
Proceed as follows:

1. Dilute the residual amount in the spray mixture tank 80 litres rinse water.
2. At first spray the undiluted residual amount in the spray line on to an untreated leftover area.
3. Then spray the diluted residual amount also on to an untreated leftover area.
4. Again dilute the residual amount in the spray cocktail tank with 80 litres rinse water.
5. Again spray this diluted residual amount on to an untreated leftover area.

Putting into operation

1. Switch off spraying operation in the **AMATRON+.**
2. Drive the pump, pump nominal rev. speed 540 R.P.M. ,
3. Agitator(s) **H, I** in pos **0**.

4. Suction device lever **E** in position



5. Pressure device control **A** in position Cleaning.

6. Open switch tap **B**.

7. Again close the switch tap **B** after 15 seconds.

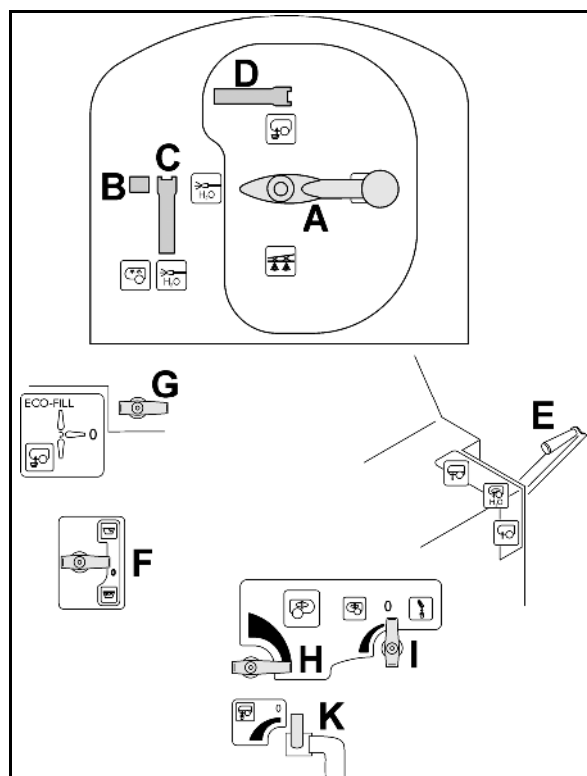
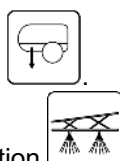


Fig. 102

8. Suction device lever **E** in position



9. Pressure device control **A** in position

10. At first spray the undiluted residual amount in the spray line on to an **untreated leftover area**.

11. Then spray the diluted residual amount also on to an **untreated leftover area**.

12. Switch the agitator(s) **H, I** to position **O**, when the residual amount in the spray mixture tank is only 100 litres.

13. Repeat the steps 1 to 13 for a second time (if necessary for a third time).

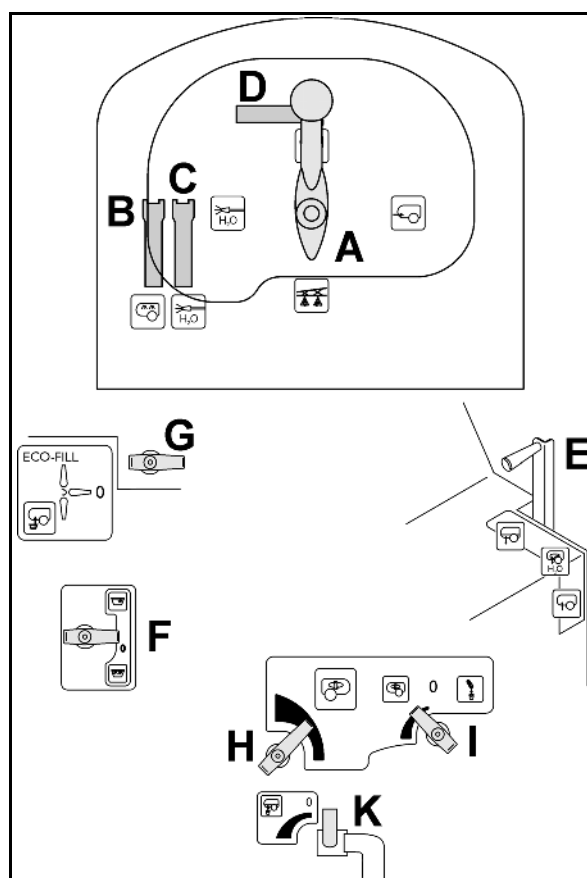


Fig. 103

Drain off the technical residual amounts

14. Place a suited collecting container underneath the outlet opening of the suction device.
15. Suction device lever **E** in position .
16. Agitator lever **I** in position .
17. Open stop tap **K** and drain the technical residual amount off into a suited collecting container.

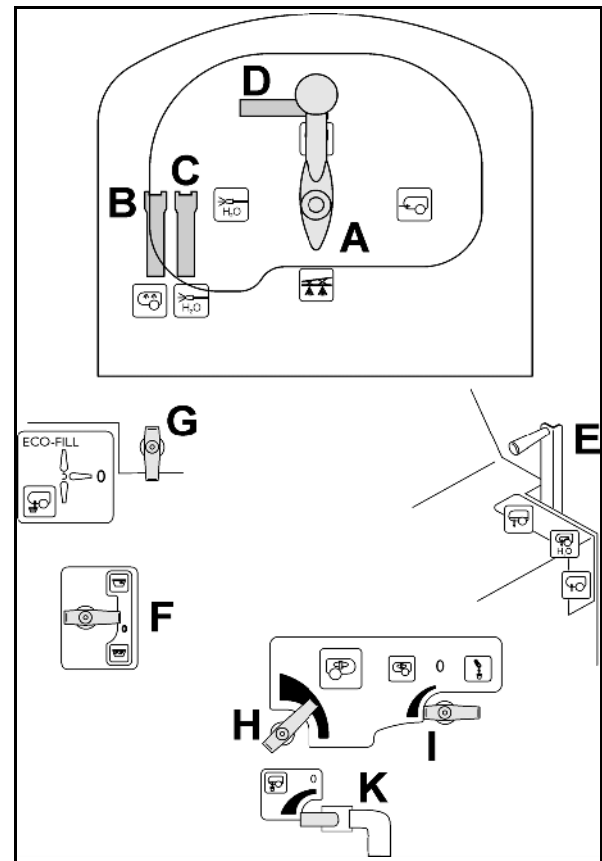


Fig. 104

8.12 Cleaning



Important

- Let the materials react for as short as possible, e. g. by daily cleaning after finishing spraying. The spray mixture should not be left unnecessarily for any length of time in the sprayer tank, e. g. not over night.
Life span and reliability of the field sprayer considerably depends on the period of contact of the crop protection agents with the materials of the field sprayer.
- As a matter of principle, clean the field sprayer before spraying another crop protection agent.
- Dilute the residual amount in the spray mixture tank and spray the diluted residual amount (for this, please refer to chapter "Residual amounts", page 125).
- Before carrying out the thorough cleaning of the field sprayer pre-clean the field sprayer still in the field.
- After every cleaning the sprayer dispose of any cleaning residues environmentally correctly.
- Remove the spraying nozzles at least once in a season. Check the removed spraying nozzles for cleanliness, if necessary, clean them with a soft brush (Please refer to para "Maintenance"). Flush the spray lines without spray nozzles.

1. Fill the spray mixture tank with approx. 400 l water.
2. Drive the pump, set pump rev. speed to 400 R.P.M.
3. Switch on agitator(s) **H, I**.

4. Suction device lever **E** in position



5. Pressure device control **A** in position



6. Open switch tap **B**.

7. Again close the switch tap **B** after 15 seconds.

8. Suction device lever **E** in position



9. Pressure device control **A** in position



10. At first spray the undiluted residual amount in the spray line on to an **untreated leftover area**.

11. Then spray the diluted residual amount also on to an **untreated leftover area**.

12. Switch off the agitator(s) **H, I**, when the residual amount in the spray mixture tank is only 100 litres.

13. Repeat the steps 1 to 12 for a second time (if necessary for a third time).

14. Clean the suction filter. Please refer to chapter "Cleaning the suction filter", chapter 8.12.3.

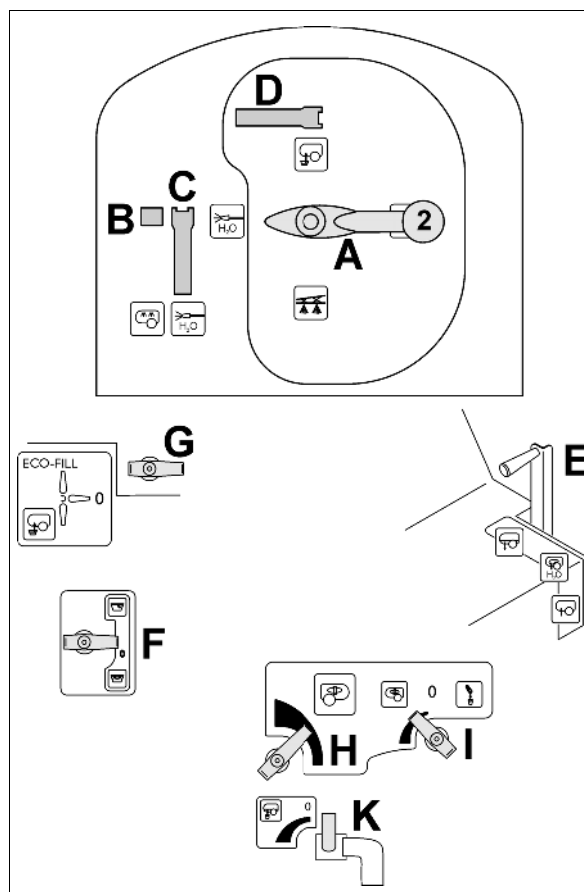


Fig. 105

8.12.1 Cleaning the sprayer with a filled tank



Important

- Implicitly clean the suction device (the suction filter, pumps, pressure governor) and the spray lines in case of weather induced interruption of the spraying operation. Cleaning in the field with clear water from the rinse water tank.
- Bear in mind, that the residual amount in the spray line is still sprayed in undiluted concentration. This residual amount must implicitly be sprayed onto an area that has not yet been treated. Take from chapter "Technical data – spray line", page 73" the required travel distance for spraying this undiluted residual amount.

1. Switch off spraying on the **AMATRON+**.
2. Switch off agitator **H** and **I**.
3. Suction device control **E** in position 
4. Pressure device control **A** in position 
5. Drive pump, set the pump rev. speed 400 R.P.M.
6. At first spray the undiluted residual amount in the spray line on to an untreated leftover area.
7. Then spray the residual amount which has been diluted with water from the rinse water tank from the suction filter, the pump, the suction device and the spray line also on to an untreated area.
8. For cleaning the agitator lines briefly switch on the agitator **H**.
Only for a short time – otherwise the tank contents would be diluted.

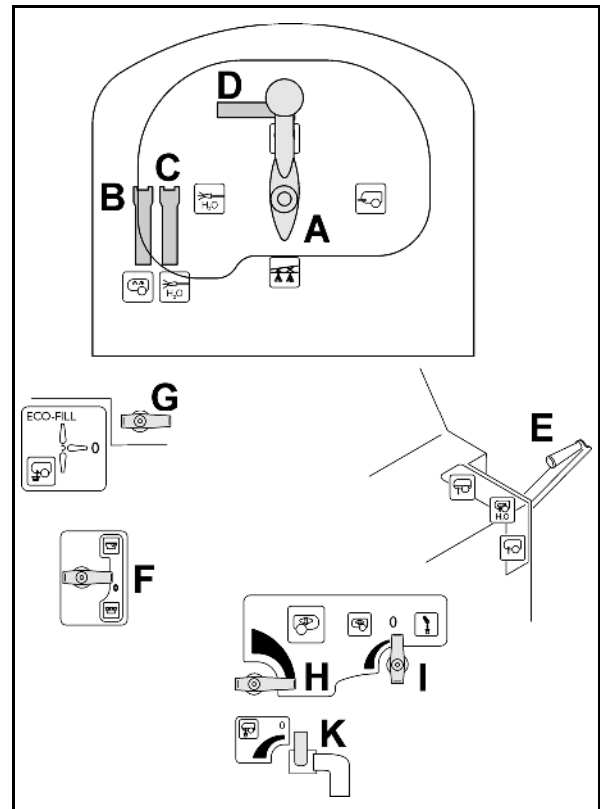


Fig. 106

8.12.2 Storing over winter or prolonged standstill

1. Clean the field sprayer thoroughly before storing over winter.
2. Drive the pump with a PTO shaft speed of 300R.P.M. and let it "pump air" when the rinsing work is finished and no liquid escapes from the spraying nozzles.
3. Change on the suction side control several times between the positions **"Emptying spray mixture tank"** and **"Spraying operation"**.
4. Change on the pressure side control several times between the positions **"Tank cleaning"** and **"Spraying operation"**.
5. On each boom part width section remove one diaphragm valve from one nozzle body to allow the nozzle hoses to run out.
6. Switch off the PTO shaft if, after repeated change of the positions on the pressure device, no liquid will escape anywhere from the nozzle hoses.
7. Remove and clean the suction filter. Please refer to chapter "Cleaning the suction filter".



Store the removed suction filter until the next use inside the filling sieve of the field sprayer

Important

8. Remove the pressure hose of the pump so that the remaining quantity of water can run out the pressure hose and the pressure device.
9. Once more change several times among all switching positions of the pressure device.
10. Again switch on the universal joint shaft and drive the pump for approx. ½ minute until no liquid will escape from the pressure side of the pump.



Assemble the pressure hose only when starting the next operation.

Important

11. Cover the open pressure outlets of the pump to prevent them becoming dirty.
12. Grease the universal joints of the PTO shaft and apply grease to the profile tubes before storing for an extended period.
13. Change the oil in the pump before storing the pumps over winter.



- When putting the piston diaphragm pumps into operation at temperatures of below 0°C, drive pumps by hand first to prevent any remains of ice from damaging the diaphragms.
- Store the pressure gauge and electronic options free from frost

8.12.3 Cleaning the suction filter



Important

Clean the suction filter (Fig. 107) daily after the spraying operation.

1. Drive the pump, set the pump speed 300 R.P.M.
2. Suction device control **E** in position .
Attention: Ensure that the Kamlock-coupling is fitted on to the suction port.
3. Pressure device control **A** in position .
4. Switch off agitator(s) **H, I** (position 0).
5. Slacken the thumb nut on the suction filter (Fig. 107/1).
6. Remove the lid (Fig. 107/2).
7. Pull out the filter insert (Fig. 107/3) and clean with water.
8. Check the O-rings (Fig. 107/4) for damage.
9. Re-assemble the suction filter in reverse order.

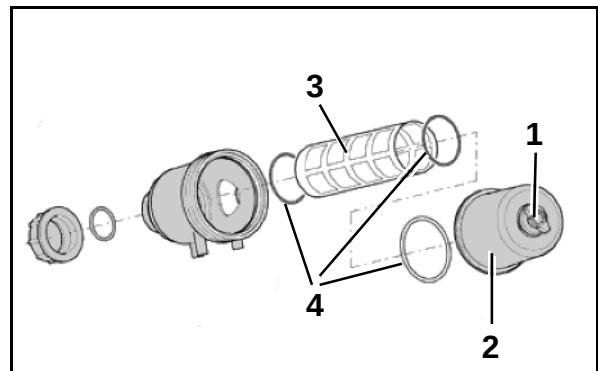


Fig. 107



Ensure the correct fitting of the O-rings (Fig. 107/4).

Important

10. Suction device lever **E** in position .
11. Check the suction filter for tightness.

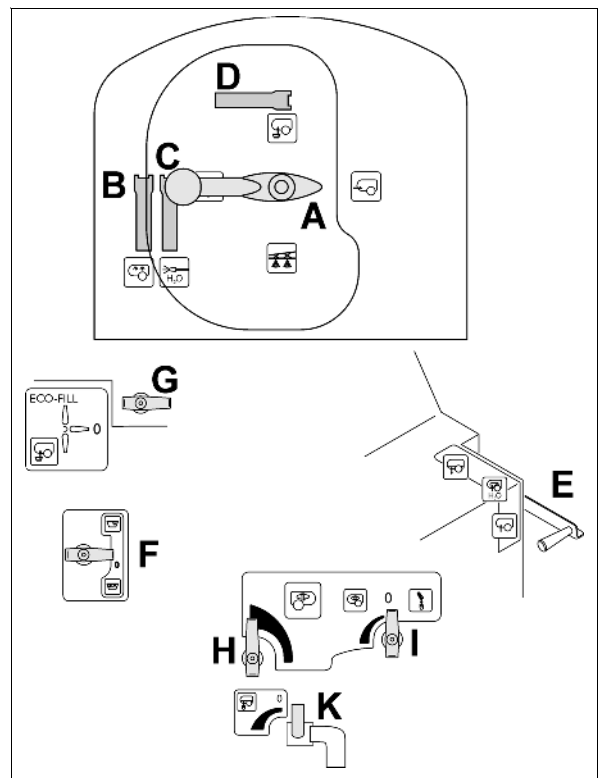


Fig. 108

9 Maintenance, repair and care work

The following will provide you with information regarding cleaning, maintenance and repair work on the trailed sprayer. Precondition for the efficient operation of the trailed sprayer is carrying out maintenance work in regular intervals according to the check list maintenance work.



Danger

- When carrying out maintenance, repair and care work observe the safety advice, particularly chapter "Plant protection implements for surface cropping", page 27!
- Maintenance or repair work below lifted moving machine parts must only be carried out when these machine parts have been secured against unintended lowering by means of appropriate tools.



Important

- Regular and proper maintenance will keep your field sprayer in operational condition for a long time and will prevent early wear. The regular and appropriate maintenance is the pre-condition for our regulations for guarantee.
- Only use original-**AMAZONE**-spare parts (please refer to chapter "Spare parts and wearing parts and auxiliary parts ", page 16).
- Only use original-**AMAZONE**-hoses and for fitting in principle hose clamps made from stainless steel (V2A).
- Special knowledge is the pre-condition to carry out checking and maintenance work. This knowledge is not given within this operator's manual.
- Observe environmental care when carrying out cleaning and maintenance work.
- Observe the legal prescriptions when disposing of greasing systems, as e.g. oil and grease. Also parts which have been in contact with these materials are subject to these legal prescriptions..
- Never exceed a greasing pressure of 400 bar when using high pressure grease guns.
- As a matter of principle remove all implement cables and the electric power cable from the **AMATRON +** when carrying out care and maintenance work.



Important

- Prohibited on principle is
 - boring on the frame or the chassis.
 - reboring existing holes on the frame or the chassis.
 - welding on bearing parts.
- Take all necessary safety measures, e.g. coverage of lines or dismantling lines on especially critical places
 - for welding, boring and grinding work.
 - when working with cutter wheels near plastic lines and electric cables.
- Before any repair work the sprayer should thoroughly be cleaned with water.
- Repair work on the field sprayer should principally only be conducted with the pump stopped.
- Repair work inside the spray agent tank may only be conducted after a thorough cleaning. Never climb into the spray mixture tank.
- Remove the **AMATRON +** from the tractor before carrying out any welding work on the tractor or on the field sprayer.

9.1 Cleaning



Important

- The regular cleaning of the trailed sprayer is the pre-condition for the appropriate maintenance and eases the operation the sprayer.
- Regularly check the field sprayer for corrosion. Monitor brake-, air- and hydraulic hoses with special care.
- Grease the trailed sprayer after any cleaning work, particularly after cleaning with a high pressure / steam jet cleaner or fat soluble agents.
- Observe the legal prescriptions for the handling and disposal of cleaning agents.



Important

- Never ever treat brake-, air- and hydraulic hoses with petrol, benzole, paraffin or mineral oils.

Cleaning by using a high pressure cleaner / steam jet



Important

Implicitly observe the following advice when using a high pressure cleaner / steam jet for cleaning work:

- Do not clean any electrical components.
- Do not clean any chromium-plated components.
- Never point with the cleaning jet of the cleaning nozzle of the high pressure cleaner / steam jet directly at grease or bearing points.
- Always ensure a minimum distance of 300 mm between the cleaning jet of the high pressure cleaner or steam jet and parts of the trailed sprayer.
- Observe the legal safety advice for operating with high pressure cleaners.

9.2 Lubricants

Depending on the operational conditions, different lubricants will be used:

Usual operational conditions:

- regular operation
- surfaced roads
- occasional travel with full load
- central European climatic conditions

Extreme operational conditions:

- prolonged times of stand still
- not surfaced roads
- permanent travelling with full load
- extreme climate

For lubrication work use lithium saponified multipurpose grease with EP additives

Manufacturer	Name of lubricant	
	Usual operational conditions	Extreme operational conditions
ARAL	Aralub HL 2	Aralub HLP 2
FINA	Marson L2	Marson EPL-2
ESSO	Beacon 2	Beacon EP 2
SHELL	Ratinax A	Tetinax AM

9.2.1 Overview – greasing points

Greasing point	Number of greasing points	Kind of greasing
Tracking steering axle	6	Grease via the grease nipples
Rigid axle	4	
Lifting rams	Je 2	
Jack	2	
Draw bar	2	
Parking brake	1	Apply grease to ropes and deflection pulley. Grease the spindle using the grease nipples.

9.3 Draw bars



Warning

- Immediately replace a damaged draw bar by a new one – for traffic safety reasons.
- Only the manufacturer is allowed to carry out repair work.
- For safety reasons forbidden: welding and boring on the draw bar.



Important

Grease the draw bar in regular intervals.

Straight draw bar

On a new straight draw bar the coupling ring diameter is 40 or 50 mm.

The wear of the coupling ring which increases the coupling ring diameter of up to 1.5 mm can be tolerated.

In case of more wear, replace the wearing bushing of the coupling ring in good time.

Hitch draw bar



Important

The wear of the coupling ring which increases the coupling ring diameter of up to 1.5 mm can be tolerated.

In case of more wear, replace the ball coupling of the ring in good time.

9.4 Axle and brake system



Important

After an appropriate run in time of the service brake system we recommend that you carry out a re-adjustment of the hitched tractor and trailed sprayer to achieve an optimum braking behaviour and a minimum wear of the brake linings. This work should be done in an authorised workshop.

Run in times:

- At prevailing travels on public roads after approx. 1000 to 2000 km.

The indicated run in times are experience values.

In case excessive wear is noted on the brake linings have this re-adjustment of the hitched vehicles carried out before these experience values have been reached..

In order to avoid any difficulties with the brake system adjust all vehicles according to the EC guide line 71/320 EU.



Warning

- Repair work and settings on the service brake system must only be carried out by skilled persons.
- Special care is required when carrying out welding-, soldering and boring work near brake hoses.
- As a matter of principle carry out a brake test after any setting and repair work on the brake system.

General visual inspection



Warning

Carry out a general visual inspection of the brake system. Observe and check the following criterion:

- On the surface, hose lines and coupling claws must not be damaged or rusty.
- Hinges, e.g. on yokes, should be secured in the appropriate manner, smooth running and not worn out.
- Cables and bowden cables
 - should be perfectly routed.
 - must not show any obvious tear.
 - must not be knotted.
- Check the piston stroke on the brake cylinders, re-adjust if necessary.

The air reservoir must

- not move within the tensioning belts.
- not be damaged.
- not show any corrosion on the surface..

9.4.1 Lubrication

- Fig. 109: Tracking axle
- Fig. 110: Standard axle

	Lubrication with BPW –special long life grease ECO- LI 91	after the first travel under stress	after 40 opera- tional hours	every 200 opera- tional hours	every 1000 operat- ional hours (annually)
1	Steering knuckle bearing upper and lower		X		
2	Locating cylinder heads on steering axle			X	
3	Brake shaft bearing outer and inner			X	
4	Slack adjustment				X
5	Automatic slack adjust- ment ECO-Master				X
6	Exchange grease in the wheel hub bearing, Taper roller bearings when worn				X

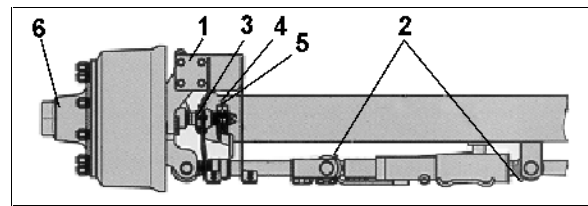


Fig. 109

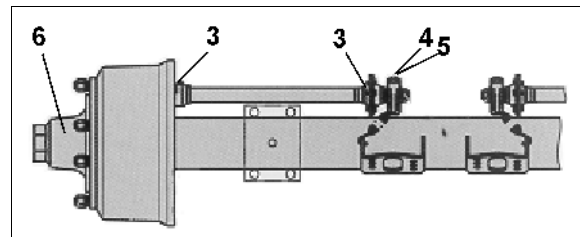


Fig. 110

Locating cylinder heads on the steering axles

In addition to these lubricating work observe that the locating cylinder and the lead are always vented.

Brake shaft bearing, outer and inner

Caution! Ensure that no grease or oil will get into the brake. Depending on the design the cam bearing is not sealed at the brake side. Only use lithium saponified grease with a drop point above 190° C.

Automatic slack adjuster ECO-Master

Whenever the brake lining is replaced

- Remove rubber seal cap.
- Grease (80g) until fresh grease escapes from the setting screw.
- Use the ring spanner to turn back the setting screw by approx. one turn. Manually actuate the brake lever repeatedly.
- Ensure a smooth automatic re-adjustment. If necessary, repeat for several times.
- Apply seal cap again. Grease once more.

Exchanging grease of the wheel hub bearings

- Safely jack up the vehicle and release the brake.
- Remove wheels and rod caps.
- Remove the split pin and unscrew the axle nut.
- Use a suited gear puller to remove the wheel hub with brake drum, the taper roller bearings and the seals from the stub axle.
- Mark the removed wheel hubs and bearing cages to ensure that they are not mixed up then fitted again.
- Clean the brake, check for wear, ensure that it is in ordinary condition and check for function, replace worn parts.
- Keep the interior of the brake free from grease and dirt.
- Carefully clean the wheel hubs inside and outside. Completely remove the old grease. Carefully clean bearings and seals (diesel oil) and check for reusability.
- Before mounting the bearings slightly grease the bearing seating and assemble all parts in the opposite order. Carefully drive the parts on the force fits without tilting and damage by using tube bushings.
- Before fitting apply grease to the bearings, the wheel hub hollow space between the bearings and the dust cap. The grease should fill in about one quarter up to one third of the hollow space in the fitted hub.
- Mount the axle nut and adjust bearings and brakes. Finally carry out a function check and a test travel and remedy possible faults.
- For greasing the wheel hub bearings only use BPW special long life grease with a drop point above 190°C.
- Wrong grease and too much grease would cause damage.
- Mixing of lithium saponified and sodium saponified grease may cause damage due to incompatibility.

9.4.2 Maintenance work

- Fig. 111: Tracking axle
- Fig. 112: Standard axle

	Maintenance work	after the first travel under stress	Daily	Every 200 operational hours	Every 1000 operat. hours (once a year)
1	Check wheel nuts for tightness, retighten if necessary, torque 560 Nm.	X			
2	Check wheel hub bearing clearance, readjust if necessary	X		X	
3	Brake lining check			X	
4	Check brake adjustment on the slack adjuster, readjust if necessary			X	
5	Check the brake adjustments on the automatic slack adjuster, readjust, if necessary				X
6	Function check on automatic slack adjuster				X
7	Drain air reservoir		X		
8	Check two circuit air brake system			X	

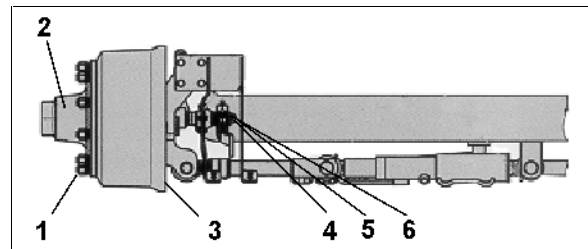


Fig. 111

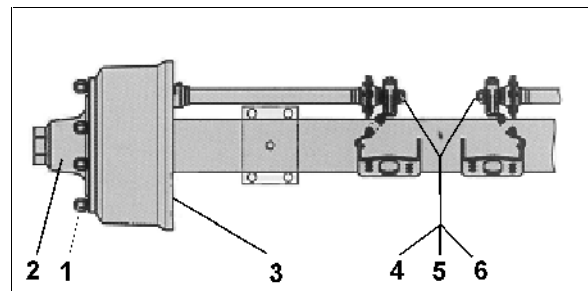


Fig. 112

Checking the wheel hub bearing clearance

For checking the wheel hub bearing clearance lift the axle until the tyres get free. Release the brake. Insert lever between tyre and ground and check the clearance..

When a bearing clearance is noticeable:

Readjust the bearing clearance

- Remove the dust cap or hub cap.
- Remove the split pin from the axle nut.
- Turn the wheel and simultaneously tighten the wheel nut until the run of the wheel hub is slightly braked.
- Turn the axle nut back to the next possible hole. In case of congruence until the next hole. (max. 30°).
- Insert split pin and bend up slightly.
- Fill in some long time grease and hammer or bolt the dust cap into the wheel hub.

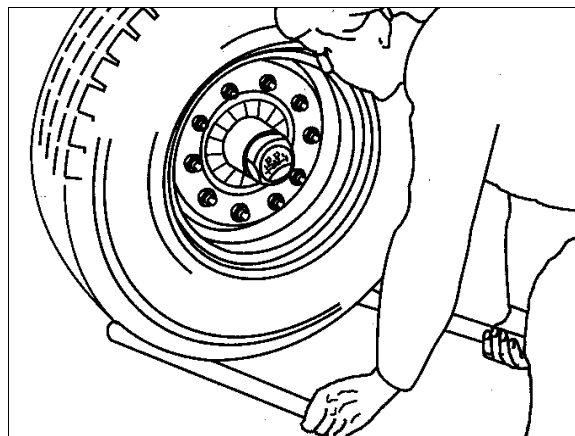


Fig. 113

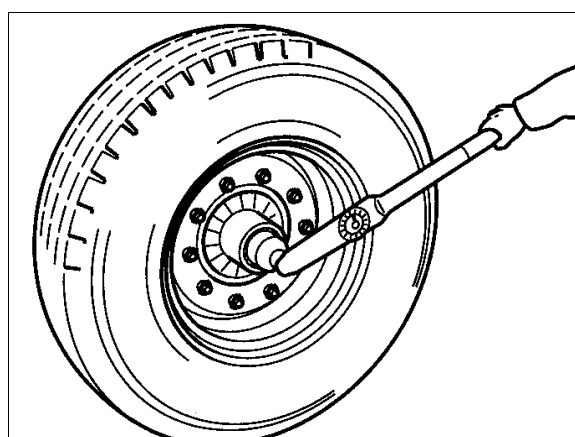


Fig. 114

Inspection of brake linings

Open the inspection hole (Fig. 115/1) by pulling out the rubber plug (if existing).

At a remaining lining thickness of

a: riveted linings 5 mm
(N 2504) 3 mm

b: bonded linings 2 mm

replace the brake lining.

Reinsert the rubber strap.

Adjustment of the brake

Check the wear and function of the brakes in regular intervals and re-adjust if necessary. The utilisation of approx. 2/3 of the max. piston stroke at a full braking requires a re-adjustment. For this, jack up the axle and secure against unintended movement.

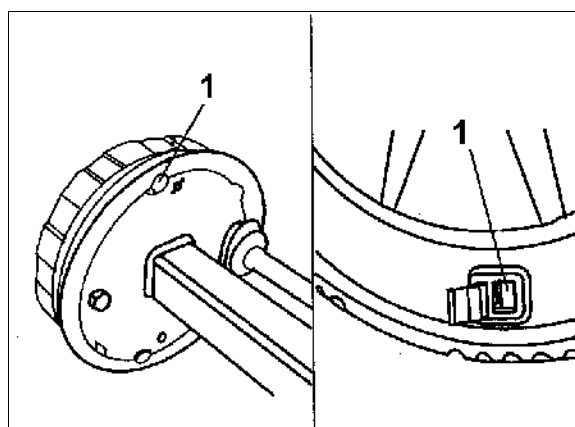


Fig. 115

Settings on the slack adjuster

Manually actuate the slack adjuster in direction of pressure. Re-adjust the wheel brake if a dead range of max. 35 mm on the long stroke diaphragm cylinder pressure bar is noticeable.

The setting is carried out on the hex. adjusting screw of the slack adjuster. Set the dead range "a" to 10 – 12 % of the connected brake lever length "B",
e.g. lever length 150 mm = dead range 15 – 18 mm..

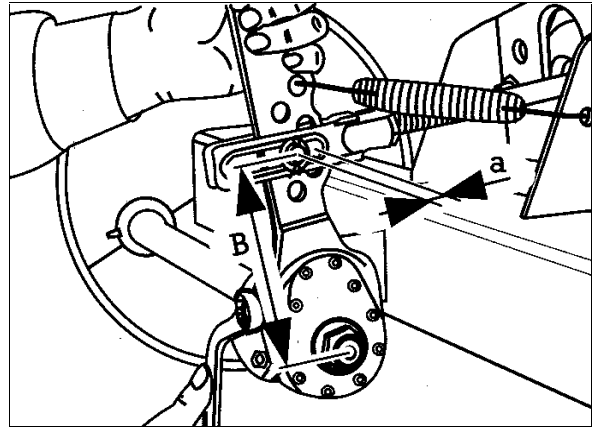


Fig. 116

Setting on the automatic slack adjuster

The basic setting is carried out according to the instructions given for the standard slack adjuster. Automatic re-adjustment at a cam turning of approx. 15°.

The ideal lever position (cannot be influenced, due to the cylinder fixing) is approx. 15° prior to its right angling in direction of actuation.

Function check for automatic slack adjuster

Remove the rubber seal cap.

Use the ring spanner to turn back the setting screw (arrow) by about ¾ turn in counter clockwise direction. A dead range of at least 50 mm at a lever length of 150 mm is required.

Repeatedly actuate the brake lever by hand. Care for a smooth automatic re-adjustment with an audible catching of the denture clutch. At the return stroke the setting screw slightly turns in clockwise direction.

Mount the seal cap. Lubricate by using BPW-special long-term ECO_Li91.

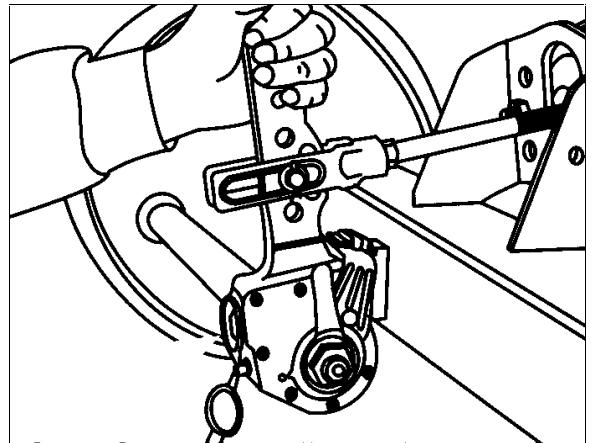


Fig. 117

Air reservoir



Important

Daily drain the air reservoir.

Fig. 118/...

- (1) Air reservoir.
- (2) Tensioning straps.
- (3) Drain valve.
- (4) Inspection port for pressure gauge.

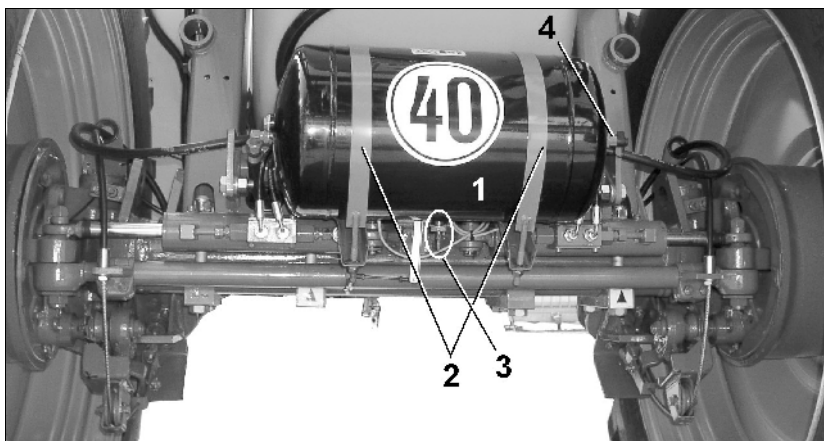


Fig. 118

- 1. Pull the drain valve (3) via the ring to the side until no water will run out of the air reservoir (1) any more.
→ Water runs out of the drain valve (3).
- 2. Remove the drain valve (3) from the air reservoir and clean the air reservoir in case dirt is noted.

Inspection advice for two circuit service brake system

1. Leak test

- 1. Check all connections, tubes, hose and bolted connections for tightness.
- 2. Remedy leaks.
- 3. Remedy rubbing points on tubes and hoses.
- 4. Replace porous and defective hoses
- 5. The two circuit service brake system is regarded as tight, when the pressure drop is not more than 0.15 bar within 10 minutes.
- 6. Tighten the leaking points or replace leaking valves

2. Checking the pressure in the air reservoir

- 1. Connect a pressure gauge with the inspection port of the air reservoir.
Required value 6,0 to 8,1 + 0,2 bar

3. Checking the brake cylinder pressure

- 1. Connect the pressure gauge with the inspection port of the brake cylinder.
Required values: brake not applied 0,0 bar

4. Visual inspection of the brake cylinders

1. Check the dust collars or the bellows (Fig. 118/5) for damage.
2. Replace defective parts.

5. Joints on brake valves, brake cylinders and brake linkages

Ensure the smooth running of all joints on brake valves, brake cylinders and brake linkages, if necessary grease or slightly apply oil.

9.5 Parking brake



Important

On new machines the brake cables of the parking brake could lengthen.

Re-adjust the parking brake,

- if three quarters of the way of elongation of the spindle are required to apply the parking brake firmly.
- if the brakes are equipped with new linings.

Re-adjustment of parking brake



Important

When the parking brake is released the brake cable should slightly sag. The cable must not rest or rub on other vehicle parts.

1. Slacken the cable clamps.
2. Shorten the brake cable as far as necessary and retighten the cable clamps firmly.
3. Check the applied parking brake for proper function.

9.6 Tyres / wheels



Important

- Check in regular intervals
 - the firm seating of the wheel nuts.
 - Tyre pressure (please refer to chapter 9.6.1).
- Only use tyres and rims prescribed by us. See chapter 4.2.3.
- Repair work on the tyres must only be carried out by skilled persons with appropriate fitting tools.
- Fitting tyres requires sufficient knowledge and appropriate tools.
- Only apply the jack at the places indicated.

9.6.1 Tyre air pressure



Hint

- The required air pressure in the tyres depends on
 - the tyre size.
 - the tyre carrying capacity.
 - the forward speed.



Important

- The lifespan of tyres is reduced by
 - overload.
 - too low a tyre air pressure.
 - too high a tyre air pressure.
- Check the tyre air pressure with cold tyres, so before starting to travel, in regular intervals.
- The air pressure difference in the tyres of one axle must not exceed 0.1 bar.
- The tyre pressure may increase by 1 bar after a fast travel or warm weather. By no means reduce the tyre air pressure, as it would be too low when the tyre cools down.

9.6.2 Fitting wheels



Important

- Before mounting a new / other tyre remove any corrosion on the tyre bearing surface of the rims. Corrosion may cause damage on the rims when travelling.
- When mounting new tyres always use new tubeless valves or tubes.
- Always screw valve caps with inserted sealing on to the valves.

9.7 Hydraulic system



Danger

- Only an authorised workshop is allowed to carry out repair work on the hydraulic system.
- The hydraulic system is under high pressure.
- When searching for leaks, appropriate aids should be used.
- Before starting and work on the hydraulic system, relief the system from pressure.
- Under high pressure any fluids (such as hydraulic oil) may penetrate the skin and cause serious injury. Immediately call for a doctor. There is danger of infection.
- When connecting hydraulic hoses to the tractor hydraulic system ensure that the hydraulic system on the tractor and on the trailed implement is at zero pressure.
- All hydraulic hoses must be checked for their operational safety by a skilled person
 - before the initial operation of the trailed.
 - at least once a year.
- Dispose of old oil as prescribed. In case of problems contact your oil supplier.
- Hydraulic oil must not get into the earth or water.
- Store hydraulic oil out of reach of children.



Important

- Ensure the correct connection of the hydraulic hoses.
- Check all hydraulic hoses and connections for damage and cleanliness in regular intervals.
- Replace damaged and aged hydraulic hoses. The exchange hydraulic hoses must correspond to our technical demands.
- The period of use of any hose circuit should not exceed six years, including a possible storing period of two years maximum. Also when stored and uses properly hoses and hose circuits do age. Therefore their longevity and period of use is limited. Deviations from the above may be accepted depending on the experience and the danger potential. For hoses and hose circuits made from thermoplasts other guide lines may prevail.

Identification of hydraulic hoses

Hose identification:

- (1) Identification of the manufacturer/supplier.
- (2) Product identification of the manufacturer / supplier.
- (3) Hydraulic hose standard.
- (4) Max. permissible operating pressure.
- (5) Nominal diameter.
- (6) Date of production of hoses.

Identification of fittings:

- (7) Identification of the maker.
- (8) Max. permissible operational pressure.
- (9) Date of production of the hydraulic hose line.

Maintenance intervals

After the first 10 operating hours and thereafter every 50 operating hours

1. Check all components of the hydraulic system for leaks.
2. If necessary retighten the joints

Prior to any putting to operation

1. Check the hydraulic hose circuits for obvious defects.
2. Remedy any rubbing points on hydraulic hoses and tubes.
3. Exchange worn or defective hydraulic hoses immediately.

Inspection criterion of hydraulic hoses



Important

Please adhere to the following inspection criterion. This serves your own safety.

Replace the hydraulic hoses if the following inspection criterion are noticed:

- Defects from the casing to the inner lining (e.g. rubbing points, cuts, tears).
- Check whether the hose casing is brittle (tears in the hose material).
- Check hose for deformation which deviate from the common shape of the hose or which do not correspond to the hose circuit. This applies both to the pressure free and the pressurised condition or when bending the hose (e.g. separation of layers, bubbles, buckling, squeezing).
- Leakages.
- Damage or deformation of the hose fitting (tightness is affected).
- Movement of the hose out of the fitting.
- Corrosion on the fitting which affects function and strength.
- Demands on the assembly not observed.
- The permissible period of use of 6 years is exceeded.
Decisive is the date of production of the hydraulic hose on the fitting plus 6 years. If the date of production on the fitting is "2002" the operational life will end in February, 2008. For this, please refer to "Identification of hydraulic hoses".

9.8 Electric traffic lights

Exchange of bulbs:

1. Remove the protecting glass.
2. Remove defective bulb.
3. Insert replacement bulb (observe the correct voltage and watt number).
4. apply protecting glass and screw on.

9.9 Pump - Maintenance and remedy in case of malfunction

9.9.1 Checking the oil level



Important

- Always use only quality oil 20W30 or multipurpose oil 15W40.
- Pay attention to a correct oil level. Too low or too high an oil level would be harmful.

1. Check whether the oil level at the mark (Fig. 119/1) is visible with running pump in horizontal position.
2. Remove the lid (Fig. 119/2) and top up oil if the oil is not visible at the mark (Fig. 119/1).

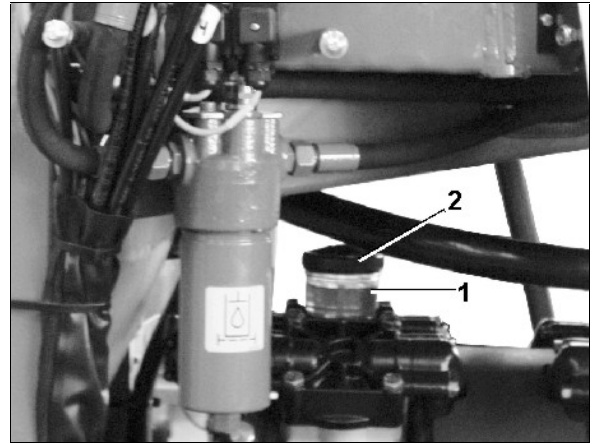


Fig. 119

9.9.2 Oil change



Important

- Conduct an oil change every 400 to 450 hours of operation, at least, however, once a year.
- Check the oil level after a few hours of operation and refill oil if necessary.

1. Take off pump.
2. Take off the lid (Fig. 119/2).
3. Drain off oil.
 - 3.1 Turn pump upside down.
 - 3.2 Spin drive shaft by hand until the old oil is fully drained off. However, oil can remain in the pump for which reason we recommend the procedure mentioned above.
4. Place the pump on a level surface.
5. Turn the drive shaft alternating to the right- and left hand side and slowly fill in new oil. The correct oil quantity has been filled in when the oil is visible on the markings (Fig. 119/1).

9.9.3 Pump drive

9.9.3.1 Checking the belt tensioning / adjustment

Power for checking $F_e = 75\text{N}$

For pump nominal speed of 540 1/min.:

→ – max. permissible deflection 14 mm

For pump nominal speed of 1000 1/min.:

→ – max. permissible deflection 16 mm

In case the max. deflection is exceeded increase the belt tensioning by increasing the axle spacing via the slotted holes.

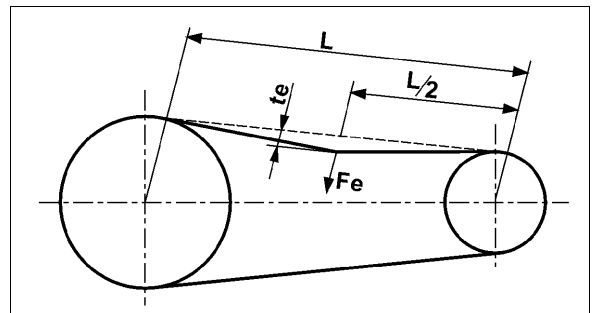


Fig. 120

9.9.3.2 Exchanging drive belts

Exchange worn drive belts.

Proceed as follows:

- Release the belt tensioning via the slotted holes on the lower belt pulley
- Remove upper belt guard
- Remove one pump
- Exchange the belt

9.9.3.3 Cleaning



Important

Thoroughly clean the pump after every operation by letting it pump clean water for a few minutes.

9.9.4 Remedy in case of malfunction

Fault	Cause	Remedy
Pump does not suck	Stoppage on the suction side (Suction filter, Filter insert, Suction hose).	1. Remove the stoppages.
	The pump draws air	1. Check the hose connection for the suction hose (special option) on the suction joint for leakage.
Pump does not function properly	Suction filter, filter insert dirty	1. Clean suction filter, filter insert
	Jammed or damaged valves.	1. Exchange the valves.
	Pump draws air, can be noted by air bubbles in the spray mixture tank.	1. Check hose joint on suction hose for leakage.
Knocking of the spraying cone	Uneven delivery of pump.	1. Check suction- and pressure-side valves and replace if necessary (please refer to page 149).
Oil-spray agent mixture in the oil filler or clearly noticeable oil consumption	Pump diaphragm defective.	1. Exchange all 6 diaphragms (please refer to page 151).

9.9.4.1 Check and exchange suction- and pressure-side valves



Important

- Pay attention to the fitting position of the suction- and pressure-side valves, before you remove the valve groups (Fig. 121/5).
- When refitting watch that the valve guide (Fig. 121/9) will not be damaged. Damage could lead to blockage of valves.
- Implicitly tighten bolts (Fig. 121/1) diagonally with the torque stated. Inaccurately tightened bolts will cause tensioning and thus leakage.

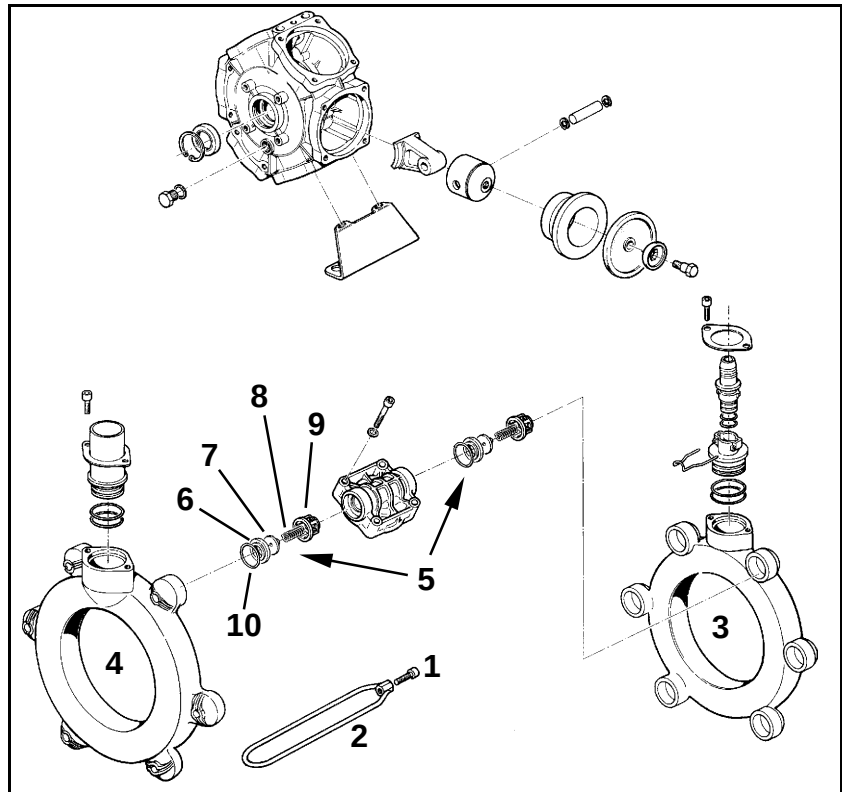


Fig. 121

1. Remove the pump.
2. Slacken bolts (Fig. 121/1) and remove tensioning clamp (Fig. 121/2).
3. Take off suction- and pressure channel (Fig. 121/3 and Fig. 121/4).
4. Take off valve groups (Fig. 121/5).
5. Check for damage or wear of the valve seat (Fig. 121/6), valve (Fig. 121/7), valve spring (Fig. 121/8) and valve guide (Fig. 121/9).
6. Remove the O-ring (Fig. 121/10).
7. Exchange any faulty parts.
8. Mount the valve groups (Fig. 121/5) after checking and cleaning.
9. Fit new O-rings (Fig. 121/10).
10. Re-install suction (Fig. 121/3) and pressure channel (Fig. 121/4) to the pump housing and refit the tensioning clamp (Fig. 121/2).
11. Tighten the bolts (Fig. 121/1) always diagonally with a torque of **11 Nm**.

9.9.4.2 Checking and exchanging the piston diaphragms



Important

- Check the piston diaphragms (Fig. 122/1) for their perfect condition at least once a year by dismantling.
- Before removing the valve groups (Fig. 122/5) bear in mind the position of the suction and pressure side valves.
- In case of checking and exchanging the piston diaphragms it is recommended to conduct this work for each piston individually. Start to dismantle the next piston only after having completely reassembled the checked one.
- Always bring the piston to be checked in the upper position so that any oil inside the pump housing is not draining out.
- As a matter of principle exchange all 6 piston diaphragms (Fig. 122/6) even if only one piston diaphragm is swollen, broken or porous.

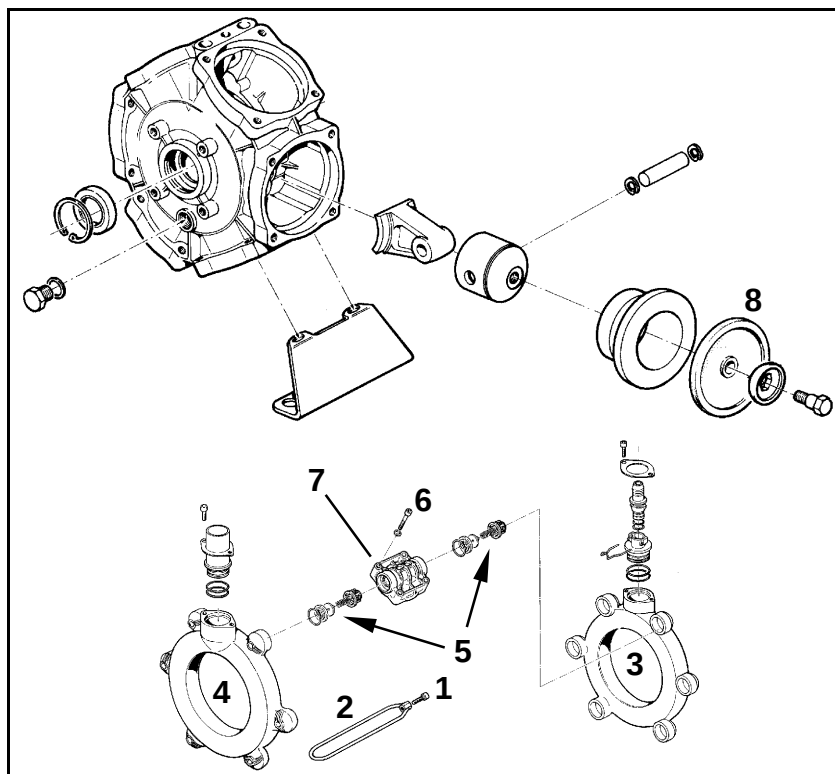


Fig. 122

Checking the piston diaphragms

1. Remove the pump.
2. Slacken bolts (Fig. 122/1) and remove tensioning clamp (Fig. 122/2).
3. Take off suction and pressure channel (Fig. 122/3 and Fig. 122/4).
4. Take off valve groups (Fig. 122/5).
5. Remove the bolts (Fig. 122/6).
6. Take off the cylinder head (Fig. 122/7).
7. Check the piston diaphragm (Fig. 122/8).
8. Exchange defective any piston diaphragm (Fig. 122/8).

Exchanging the piston diaphragm



Important

- Take care for the correct position of the cut outs or bores in the rams.
- Fasten the piston diaphragm (Fig. 123/2) in such a way with the retaining disc (Fig. 123/3) and bolt (Fig. 123/1) to the piston (Fig. 123/4), so that the edge (Fig. 123/14) shows towards the cylinder head side (Fig. 123/6).
- Implicitly tighten bolts (Fig. 123/13) diagonally with the torque stated. Inaccurately tightened bolts will cause tensioning and thus leakage.

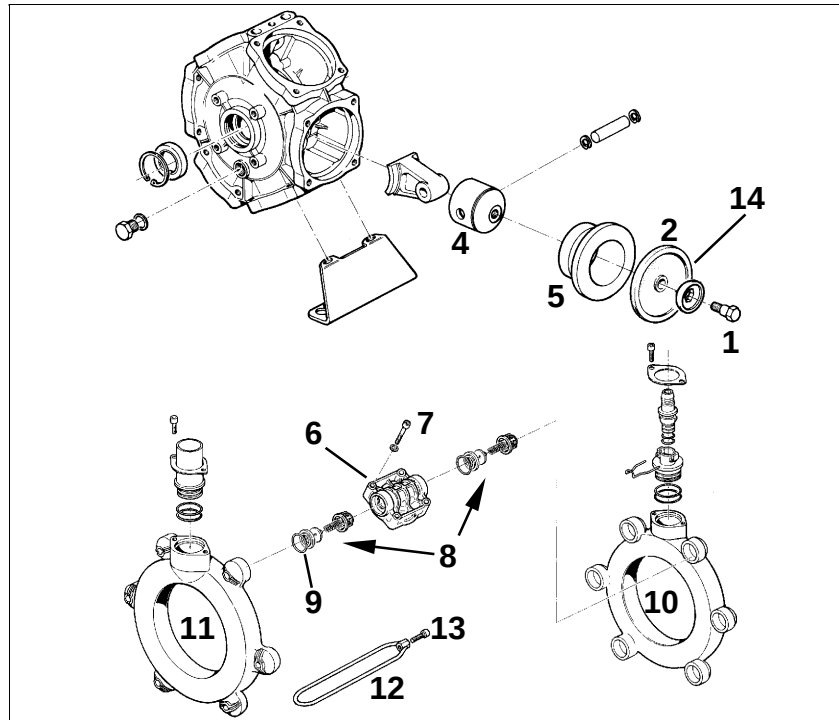


Fig. 123

1. Slacken the bolt (Fig. 123/1) and remove the piston diaphragm (Fig. 123/2) together with the retaining disc (Fig. 123/3) from the piston (Fig. 123/4).
2. Drain off the oil spray liquid mixture from the pump housing, if the piston diaphragm is broken.
3. Remove the cylinder (Fig. 123/5) from the pump housing.
4. Flush pump housing thoroughly. Use Diesel-oil or Paraffin for flushing.
5. Clean all sealing surfaces.
6. Re-insert the piston (Fig. 123/5) into the pump housing.
7. Fit the piston diaphragm (Fig. 123/2) n.
8. Fit cylinder head (Fig. 123/6) to pump housing and tighten bolts (Fig. 123/7) cross wise and equally.
9. After checking and cleaning fit the valve groups (Fig. 123/8).
10. Insert new O-rings (Fig. 123/9).
11. Fit the suction channel (Fig. 123/10) and the pressure channel (Fig. 123/11) on to the pump housing and fit the tensioning clamp (Fig. 123/12).
12. Tighten the bolts (Fig. 123/13) always diagonally with a torque of **11 Nm** an.

9.10 Calibrating the flow meter



Important

- Calibrate the flow meter(s) at least once a year.
- Calibrate the flow meter(s):
 - after removal of the flow meter.
 - after a prolonged period of operation as there may be deposits of spray agent residue.
 - in case of deviations between the required and the actual spray rate.
- When you intend to start driving with the field sprayer to determine the applied amount of water, note the indicated value "impulses". The indicated impulse value will get out when the field sprayer is transported.



Important

Important

- Align the return flow meter and the flow meter at least once a year.
- Align the return flow meter with the flow meter:
 - after calibration of the flow meter.
 - after removal of the return flow meter.
- Switch off "spraying operation" in the menu operation. The alignment can only be carried out when now liquid is delivered to the sprayer booms.

9.11 Nozzles

1. From time to time check seat of tapered slide (Fig. 124/7). For this push the slide into the nozzle body (Fig. 124/2) as far as it is possible with slight pressure of your thumb. By no means push the slide into the nozzle body until its stop when it is new.

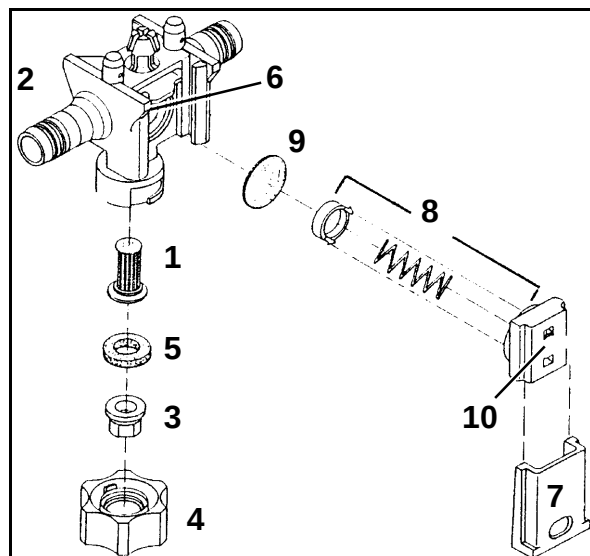


Fig. 124

9.11.1 Fitting the nozzles

1. The nozzle filter (Fig. 124/1) is placed from below into the nozzle carrier (Fig. 124/2).
2. Insert the nozzle (Fig. 124/3) into the bayonet cap (Fig. 124/4).



Hint

For quick identification of the various nozzles a variety of coloured bayonet caps is available.

3. Place the rubber seal ring (Fig. 124/5) above the nozzle.
4. Press the rubber sealing ring into the seating of the bayonet cap.
5. Place the bayonet cap onto the joint of the nozzle carrier.
6. Turn the bayonet cap until the stop.

9.11.2 Dismantling the diaphragm valve in case of dripping nozzles

Cause for **dripping** of the nozzles at a shut off boom feed is residue on the diaphragm seating (Fig. 124/6). Therefore the corresponding diaphragm should be cleaned as follows:

1. Pull the slide (Fig. 124/7) out of the nozzle carrier (Fig. 124/2) in direction of the bayonet cap.
2. Remove the spring element (Fig. 124/8) and the diaphragm (Fig. 124/9).
3. Clean the diaphragm seating (Fig. 124/6).
4. The assembly is done in vice versa order.



Important

Pay attention to the correct fitting directions of the spring elements. The edges on the spring element housing (Fig. 124/10) are offset on the right and left hand side and should rise in direction of the boom profile when fitting.

9.12 Hose filters

- Clean the hose filters (Fig. 125/1) depending on the operational conditions approx. every 3 – 4 months.
- Exchange defective filter inserts.



Important

1. Press together the two straps of the seal plug.
2. Remove the seal plug with O-ring, pressure spring and filter insert.
3. Clean the filter insert with petrol or dilution (wash out) and dry with air pressure.
4. When reassembling in the reverse order ensure that the O-ring does not tilt in the guide slit.

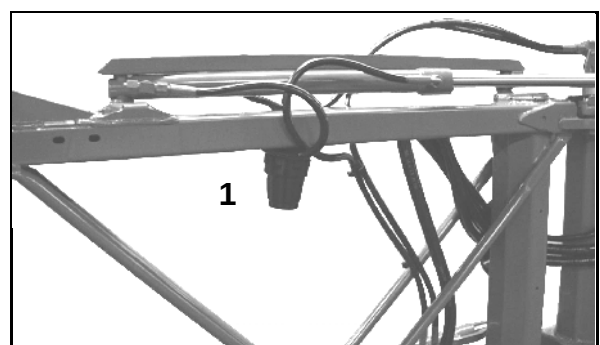


Fig. 125

9.13 Hints for checking the field sprayer



Important

- Only authorised persons may carry out the field sprayer check.
- Legally prescribed is the field sprayer check:
 - at least 6 months after first operation (if not carried out at the moment of buying), then
 - every 2nd year thereafter.

Check-Set-field sprayer: (special optional equipment), Order No.:919 872

Fig. 126/...

- (1) Turned socket 1"x30
- (2) Plug
- (3) Blank cap
- (4) Flow meter connection
- (5) Pressure gauge connection

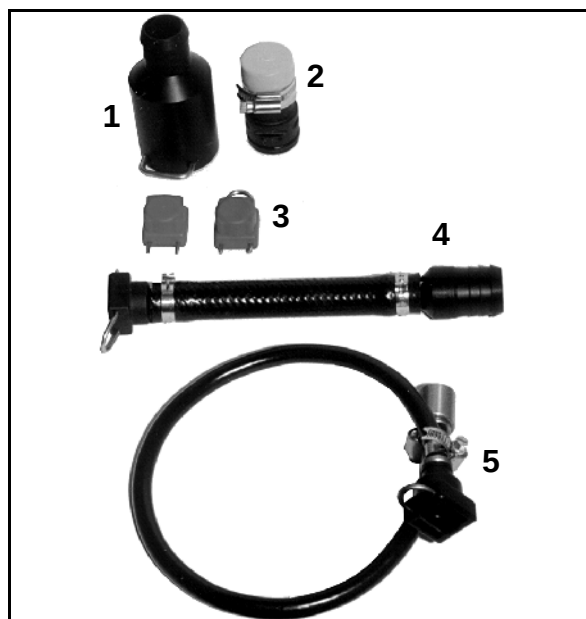


Fig. 126

Pump checking – Check of pump capacity (delivery capacity, pressure)

1. Remove the pressure hose on the pump to be checked.
2. Connect 1 ¼ " inspection port with the pump.
3. Pressure device control in position "Filling the tank".

Checking the flow meter

1. Pull all spray hoses off the part width section valves.
2. Connect the flow meter joint (Fig. 126/4) with a part section valve and connect to the checking instrument.
3. Close the joints of the remaining part section valves with blanks (Fig. 126/3).
4. Switch on spraying.

Checking the pressure gauge

1. Pull one spray line off a part width section valve.
2. Connect the pressure gauge connection (Fig. 126/5) with the aid of the turned socket with the part width section valve.
3. Bolt the checking pressure gauge into the inner thread 1/4 inch.

9.14 Check list for maintenance work

9.15 Daily

Component	Maintenance work
Pumps	• Check oil level • Clean or flush
Oil filter on the Super S-boom	• State check
Spray mixture tank	• Clean or flush
Suction filter	
Self cleaning suction filter	
Hose filter in the nozzle lines (if existing)	
Fittings	
Spraying nozzles	• vent / drain
Air reservoir	
Hydraulic hoses	• check for damage • check for tightness
Electric traffic lights	• Exchange of any defective bulbs
Straight draw bar	• Grease
Hitch-draw bar	
Tracking steering axle	
Wheels	• Check wheel nuts for firm seating. • Check air pressure.
Parking brake	• Check braking power with the parking brake applied.

Monthly

Pump pressure reservoir	• Check the air pressure
-------------------------	--

Quarterly

Two circuit service air brake system	• Check for tightness • Check of pressure in the air reservoir • Check of brake cylinder pressure • Visual inspection of brake cylinder • Joints on brake valves, brake cylinders and brake linkage • Brake settings on the slack adjuster • Check of brake linings
Pumps	• Check drive • Adjust belt tensioning
Wheels	• Check clearance of wheel hub bearings

Annually

Pumps	- Oil change every 400 to 450 operational hours, however, at least once a year - Check piston diaphragm, exchange if necessary - Check valves, exchange if necessary
Oil filters	Exchange
Flow meter and return flow meter	- Calibrate the flow meter - Align the return flow meter
Nozzles	Calibrate the field sprayer and check the lateral distribution, if necessary replace worn nozzles
Automatic slack adjuster	- Brake settings - Function check

9.16 Bolt torques

Thread	Spanner size	Torques [Nm] depending on bolt / nut quality		
		8.8	10.9	12.9
M 8	13	25	35	41
M 8x1		27	38	41
M 10	17	49	69	83
M 10x1		52	73	88
M 12	19	86	120	145
M 12x1,5		90	125	150
M 14	22	135	190	230
M 14x1,5		150	210	250
M 16	24	210	300	355
M 16x1,5		225	315	380
M 18	27	290	405	485
M 18x1,5		325	460	550
M 20	30	410	580	690
M 20x1,5		460	640	770
M 22	32	550	780	930
M 22x1,5		610	860	1050
M 24	36	710	1000	1200
M 24x2		780	1100	1300
M 27	41	1050	1500	1800
M 27x2		1150	1600	1950
M 30	46	1450	2000	2400
M 30x2		1600	2250	2700

10 Spray rate chart

10.1 Spray rate chart for flat fan-, anti drift-, injector- and airmix nozzles, spraying height 50 cm



Hinweis!

- All rates (l/ha) were determined with water. For the conversion to AUS multiply the indicated spray rates by 0l.88 and for the conversion to NP solvents by 0,85.
- The Fig. 127 serves for selecting the correct nozzle type. The nozzle type is determined by
 - the intended forward speed,
 - the required spray rate and
 - the required spraying characteristic (fine, medium or coarse droplets) of the plant protective agent for the intended plant protection measure.
- The Fig. 128 serves for
 - the determination of the nozzle size.
 - the determination of the required spray pressure.
 - determination of the required individual nozzle output for the calibration of the field sprayer.

Permissible pressure ranges of the individual nozzle types and nozzle sizes

Nozzle type	Nozzle size	Permissible pressure range [bar]	
		min. pressure	max. pressure
LU / XR-nozzles	'015'	1	1,5
	'02'	1	2,5
	'0,3'	1	3,0
	'0,4' to '0,8'	1	5,0
AD / DG / TT	All sizes	1,5	5
AI	All sizes	2	7
ID	All sizes	3	7
Airmix-nozzles	All sizes	1	5

Spray rate chart

Selection of nozzle type

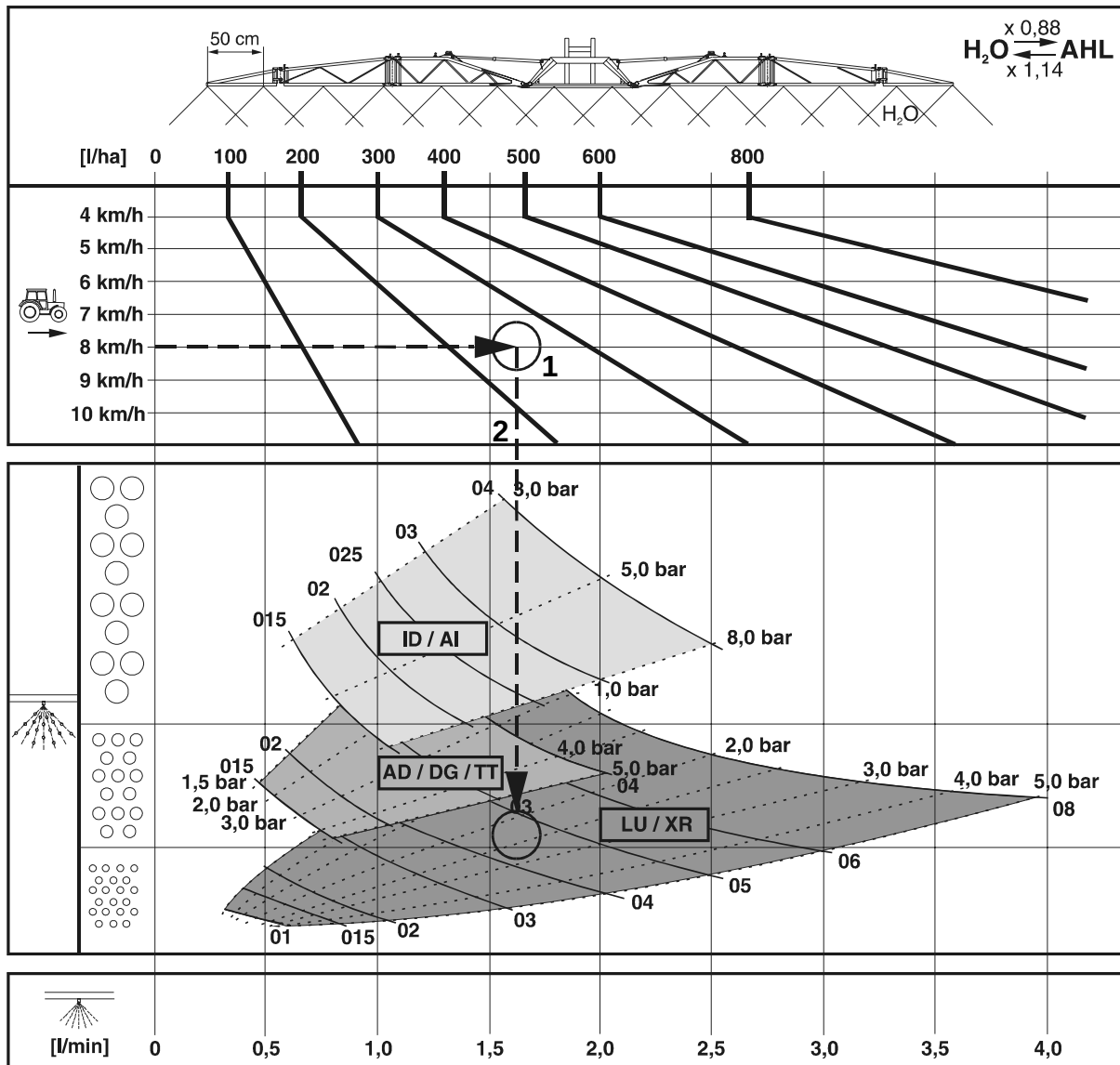


Fig. 127

Example:

Required spray rate	250 l/ha
Intended forward speed	8 km/h
Required spraying characteristic for the intended plant protection measure:	Fine droplets
Required nozzle type	?
Required nozzle size	?
Required spraying pressure	? bar
Required individual nozzle output for the calibration of the field sprayer	? l/min

Determination of nozzle type, nozzle size, spray pressure and individual nozzle output

1. Determine the operational point (Fig. 127/1) for the required spray rate (**250 l/ha**) and the intended forward speed (**8 km/h**).
2. Plump at the operational point (Fig. 127/1) a vertical line (Fig. 127/2) downwards. Depending on the position of the operational point this line crosses the input/output maps of the different nozzle types.
3. Choose the optimum nozzle type according to the required spraying characteristic (fine, medium or coarse droplets) for the intended plant protection measure.
Chosen for the example mentioned above:
Nozzle type: LU /XR
4. go over to the spraying table (Fig. 128).
5. Find the column with the intended forward speed (**8 km/h**) the required spray rate (**250 l/ha**) or a spray rate which is nearest to the required spray rate (in this case, e.g. **255 l/ha**).
5. In the line with the required spray rate (**255 l/ha**)
 - read the possible nozzle sizes. Choose a suitable nozzle size (e.g. **'05'**).
 - in the point of intersection with the chosen nozzle size read the required spray pressure (z.B. **2,3 bar**).
 - read the necessary individual nozzle output (**1,7 l/min**) for the calibration of the field sprayer.

Required nozzle type:	LU /XR
Required nozzle size:	'05'
Required spraying pressure	2,3 bar
Required individual nozzle output for calibration of the field sprayer:	1,7 l/min

Spray rate chart

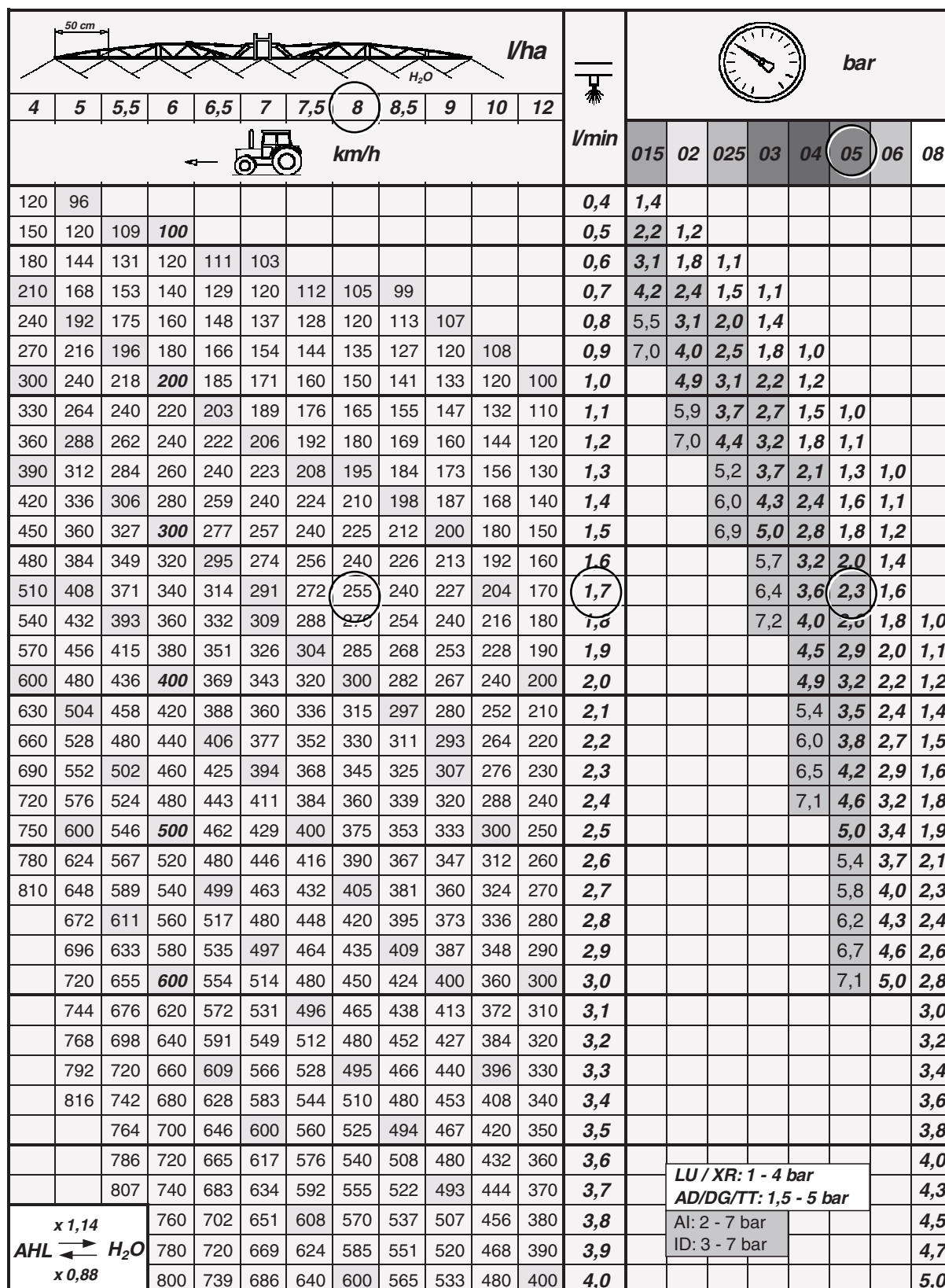


Fig. 128

10.2 Spray rate table for 3-ray nozzles, spraying height 120 cm

AMAZONE - Spray rate table for 3-ray nozzles (yellow)

Pres- sure (bar)	Nozzle output		Spray rate AUS (l/ha)								
	Water (l/min)	AUS	5	5,5	6	6,5	7	7,5	8	8,5	9 (km/h)
1,0	0,36	0,32	77	70	64	59	55	51	48	45	43
1,2	0,39	0,35	83	75	69	64	60	55	52	49	47
1,5	0,44	0,39	94	85	78	72	67	62	59	56	53
1,8	0,48	0,42	102	93	85	78	73	67	64	60	57
2,0	0,50	0,44	106	96	88	81	75	70	66	62	59
2,2	0,52	0,46	110	100	92	85	78	73	69	65	62
2,5	0,55	0,49	118	107	98	91	84	78	74	70	66
2,8	0,58	0,52	124	112	103	95	88	82	77	73	69
3,0	0,60	0,53	127	115	106	98	91	85	80	75	71

AMAZONE - Spray rate table for 3-ray nozzles (red)

Pres- sure (bar)	Nozzle output		Spray rate AUS (l/ha)								
	Water (l/min)	AUS	5	5,5	6	6,5	7	7,5	8	8,5	9 (km/h)
1,0	0,61	0,54	129	118	108	100	93	86	81	76	72
1,2	0,67	0,59	140	128	118	109	101	94	88	83	78
1,5	0,75	0,66	158	144	132	122	114	105	99	93	88
1,8	0,79	0,69	165	151	138	127	119	110	104	97	92
2,0	0,81	0,71	170	155	142	131	122	114	107	100	95
2,2	0,84	0,74	176	160	147	136	126	118	111	104	98
2,5	0,89	0,78	186	169	155	143	133	124	117	109	104
2,8	0,93	0,82	196	177	163	150	140	130	122	114	109
3,0	0,96	0,84	202	183	168	155	144	134	126	118	112

AMAZONE - Spray rate table for 3-ray nozzles (blue)

Pres- sure (bar)	Nozzle output		Spray rate AUS (l/ha)								
	Water (l/min)	AUS	5	5,5	6	6,5	7	7,5	8	8,5	9 (km/h)
1,0	0,86	0,76	182	166	152	140	130	122	114	107	101
1,2	0,94	0,83	198	181	166	152	142	133	124	117	110
1,5	1,05	0,93	223	203	186	171	159	149	140	132	124
1,8	1,11	0,98	234	213	196	180	167	177	147	139	131
2,0	1,15	1,01	242	220	202	186	173	162	152	143	135
2,2	1,20	1,06	254	231	212	196	182	170	159	150	141
2,5	1,26	1,12	269	244	224	207	192	179	168	158	149
2,8	1,32	1,17	281	255	234	216	201	187	176	165	156
3,0	1,36	1,20	288	262	240	222	206	192	180	169	160

Spray rate chart

AMAZONE - Spray rate table for 3-ray nozzles (white)

Pres- sure (bar)	Nozzle output		Spray rate AUS (l/ha)								
	Water (l/min)	AUS (l/min)	5	5,5	6	6,5	7	7,5	8	8,5	9 (km/h)
1,0	1,16	1,03	247	225	206	190	177	165	155	145	137
1,2	1,27	1,12	267	244	224	207	192	179	168	158	149
1,5	1,42	1,26	302	275	252	233	217	202	190	178	168
1,8	1,56	1,38	331	301	277	255	237	221	207	194	184
2,0	1,64	1,45	348	316	290	268	249	232	217	204	193
2,2	1,73	1,54	369	335	307	284	263	246	230	216	204
2,5	1,84	1,62	390	355	325	301	279	260	244	229	216
2,8	1,93	1,71	410	373	342	316	293	274	256	241	228
3,0	2,01	1,78	427	388	356	329	305	285	267	251	237

10.3 Spray rate table for 5- and 8-hole nozzles (permissible pressure range 1-2 bar)

AMAZONE Spray rate table for metering disc 4916-39, (ø 1,0 mm) spraying height 100 cm for 5-hole nozzle (black) and 8-hole nozzle

Pres- sure (bar)	Nozzle output per metering disc		Spray rate AUS (l/ha)								
	Water (l/min)	AUS (l/min)	5	5,5	6	6,5	7	7,5	8	8,5	9 (km/h)
1,0	0,43	0,38	91	83	76	70	65	61	57	54	51
1,2	0,47	0,42	100	91	83	77	71	67	62	59	55
1,5	0,53	0,47	113	102	94	87	80	75	70	66	63
1,8	0,58	0,51	123	112	103	95	88	82	77	72	68
2,0	0,61	0,54	130	118	108	100	93	86	81	76	72

AMAZONE Spray rate table for metering disc 4916-45, (ø 1,2 mm) spraying height 100 cm for 5-hole nozzle (black) and 8-hole nozzle

Pres- sure (bar)	Nozzle output per metering disc		Spray rate AUS (l/ha)								
	Water (l/min)	AUS (l/min)	5	5,5	6	6,5	7	7,5	8	8,5	9 (km/h)
1,0	0,56	0,50	120	109	100	92	86	80	75	71	67
1,2	0,62	0,55	132	120	110	102	94	88	83	78	73
1,5	0,70	0,62	149	135	124	114	106	99	93	88	83
1,8	0,77	0,68	163	148	136	126	117	109	102	96	91
2,0	0,80	1,71	170	155	142	131	122	114	106	100	95

AMAZONE Spray rate table for metering disc 4916-55, (ø 1,4 mm) spraying height 100 cm for 5-hole nozzle (grey) and 8-hole nozzle

Pressure (bar)	Nozzle output per metering disc		Spray rate AUS (l/ha)								
	Water (l/min)	AUS	5	5,5	6	6,5	7	7,5	8	8,5	9 (km/h)
1,0	0,86	0,76	182	166	152	140	130	122	114	107	101
1,2	0,94	0,83	199	181	166	153	142	133	124	117	111
1,5	1,04	0,92	221	201	184	170	158	147	138	130	123
1,8	1,14	1,01	242	220	202	186	173	162	152	143	135
2,0	1,21	1,07	257	233	214	198	183	171	161	151	143

AMAZONE Spray rate table for metering disc 4916-63, (ø 1,6 mm) spraying height 75 cm for 5-hole nozzle (grey) und 8-hole nozzle

Pressure (bar)	Nozzle output per metering disc		Spray rate AUS (l/ha)								
	Water (l/min)	AUS	5	5,5	6	6,5	7	7,5	8	8,5	9 (km/h)
1,0	1,10	0,98	235	214	196	181	168	157	147	138	131
1,2	1,21	1,07	257	233	214	198	183	171	161	151	143
1,5	1,36	1,20	288	262	240	222	206	192	180	169	160
1,8	1,49	1,32	317	288	264	244	226	211	198	186	176
2,0	1,57	1,39	334	303	278	257	238	222	208	196	185

AMAZONE Spray rate table for metering disc 4916-72, (ø 1,8 mm) spraying height 75 cm for 5-hole nozzle (grey) und 8-hole nozzle

Pressure (bar)	Nozzle output per metering disc		Spray rate AUS (l/ha)								
	Water (l/min)	AUS	5	5,5	6	6,5	7	7,5	8	8,5	9 (km/h)
1,0	1,45	1,28	307	279	256	236	219	205	192	181	171
1,2	1,60	1,42	341	310	284	262	243	227	213	200	189
1,5	1,77	1,57	377	343	314	290	269	251	236	222	209
1,8	1,94	1,72	413	375	344	318	295	275	258	243	229
2,0	2,05	1,81	434	395	362	334	310	290	272	256	241

AMAZONE Spray rate table for metering disc 4916-80, (ø 2,0 mm) spraying height 75 cm for 8-Hole nozzle

Pressure (bar)	Nozzle output per metering disc		Spray rate AUS (l/ha)								
	Water (l/min)	AUS	5	5,5	6	6,5	7	7,5	8	8,5	9 (km/h)
1,0	1,80	1,59	382	347	318	294	273	254	239	224	212
1,2	1,92	1,70	408	371	340	314	291	272	255	240	227
1,5	2,19	1,94	466	423	388	358	333	310	291	274	259
1,8	2,43	2,15	516	469	430	397	369	344	323	304	287
2,0	2,54	2,25	540	491	450	415	386	360	337	318	300

Spray rate chart

10.4 Spray rate table for drag hose equipment (permissible pressure range 1-4 bar)

AMAZONE Spray rate table for metering disc 4916-26, (ø 0,65 mm)

Pressure (bar)	Nozzle output per metering disc		Spray rate AUS (l/ha)								
	Water (l/min)	AUS (l/min)	5	5,5	6	6,5	7	7,5	8	8,5	9 (km/h)
1,0	0,20	0,18	85	77	71	65	61	57	53	50	47
1,2	0,22	0,19	93	85	78	72	67	62	58	55	52
1,5	0,24	0,21	102	93	85	78	73	68	64	60	57
1,8	0,26	0,23	110	100	92	85	79	74	69	65	61
2,0	0,28	0,25	119	108	99	91	85	79	74	70	66
2,2	0,29	0,26	123	112	103	95	88	82	77	72	68
2,5	0,31	0,27	132	120	110	101	94	88	82	77	73
2,8	0,32	0,28	136	124	113	105	97	91	85	80	76
3,0	0,34	0,30	144	131	120	111	103	96	90	85	80
3,5	0,36	0,32	153	139	127	118	109	102	96	90	85
4,0	0,39	0,35	166	151	138	127	118	110	104	97	92

AMAZONE Spray rate table for metering disc 4916-32, (ø 0,8 mm)

Pressure (bar)	Nozzle output per metering disc		Spray rate AUS (l/ha)								
	Water (l/min)	AUS (l/min)	5	5,5	6	6,5	7	7,5	8	8,5	9 (km/h)
1,0	0,31	0,27	132	120	110	101	94	88	82	77	73
1,2	0,34	0,30	144	131	120	111	103	96	90	85	80
1,5	0,38	0,34	161	147	135	124	115	108	101	95	90
1,8	0,41	0,36	174	158	145	134	124	116	109	102	97
2,0	0,43	0,38	183	166	152	141	130	122	114	107	101
2,2	0,45	0,40	191	174	159	147	137	127	119	112	106
2,5	0,48	0,42	204	185	170	157	146	136	127	120	113
2,8	0,51	0,45	217	197	181	167	155	144	135	127	120
3,0	0,53	0,47	225	205	188	173	161	150	141	132	125
3,5	0,57	0,50	242	220	202	186	173	161	151	142	135
4,0	0,61	0,54	259	236	216	199	185	173	162	152	144

AMAZONE Spray rate table for Metering disc 4916-39, (ø 1,0 mm) (standard)

Pres- sure (bar)	Nozzle output per metering disc		Spray rate AUS (l/ha)								
	Water	AUS	5	5,5	6	6,5	7	7,5	8	8,5	9 (km/h)
	(l/min)										
1,0	0,43	0,38	183	167	153	141	131	123	114	107	101
1,2	0,47	0,41	200	182	167	154	143	134	124	117	110
1,5	0,53	0,47	224	204	187	172	160	150	141	132	126
1,8	0,58	0,51	244	223	204	188	175	164	154	144	137
2,0	0,61	0,53	259	236	216	200	185	172	162	152	144
2,2	0,64	0,56	272	248	227	210	194	181	170	160	151
2,5	0,68	0,59	288	263	240	222	206	191	180	169	160
2,8	0,71	0,62	302	274	251	232	215	201	189	177	168
3,0	0,74	0,64	315	286	262	243	224	209	197	185	175
3,5	0,79	0,69	336	305	280	258	236	224	210	197	186
4,0	0,85	0,74	362	329	302	280	259	240	226	212	201

AMAZONE Spray rate table for metering disc 4916-45, (ø 1,2 mm)

Pres- sure (bar)	Nozzle output per metering disc		Spray rate AUS (l/ha)								
	Water	AUS	5	5,5	6	6,5	7	7,5	8	8,5	9 (km/h)
	(l/min)										
1,0	0,57	0,50	242	220	202	186	173	161	151	142	135
1,2	0,62	0,55	263	239	219	203	188	176	165	155	146
1,5	0,70	0,62	297	270	248	229	212	198	186	175	165
1,8	0,77	0,68	327	297	273	252	234	218	204	192	182
2,0	0,81	0,72	344	313	287	265	246	229	215	202	192
2,2	0,86	0,76	365	332	304	281	261	244	228	215	203
2,5	0,92	0,81	391	355	326	301	279	261	244	230	217
2,8	0,96	0,85	408	371	340	314	291	272	255	240	227
3,0	1,00	0,89	425	386	354	327	303	283	266	250	236
3,5	1,10	0,97	467	425	389	359	334	312	292	275	260
4,0	1,16	1,03	492	448	411	379	352	329	308	290	274

AMAZONE Spray rate table for metering disc 4916-55, (ø 1,4 mm)

Pres- sure (bar)	Nozzle output per metering disc		Spray rate AUS (l/ha)								
	Water	AUS	5	5,5	6	6,5	7	7,5	8	8,5	9 (km/h)
	(l/min)										
1,0	0,86	0,76	365	332	304	281	261	244	228	215	203
1,2	0,93	0,82	395	359	329	304	282	263	247	232	219
1,5	1,05	0,93	446	405	372	343	319	297	278	262	248
1,8	1,15	1,02	489	444	407	376	349	326	305	287	271
2,0	1,22	1,08	518	471	432	399	370	346	324	305	288
2,2	1,27	1,12	539	490	450	415	385	360	337	317	300
2,5	1,35	1,19	573	521	478	441	410	382	358	337	319
2,8	1,43	1,27	607	552	506	467	434	405	380	357	337
3,0	1,47	1,30	624	568	520	480	446	416	390	367	347
3,5	1,59	1,41	675	614	563	520	482	450	422	397	375
4,0	1,69	1,50	718	653	598	552	513	479	449	422	399

10.5 Conversion table for spraying liquid fertiliser Ammonium Nitrate - Urea suspension (AUS)

(Density 1,28 kg/l, i.e. approx. 28 kg N for 100 kg liquid fertiliser or. 36 kg N for 100 litres liquid fertiliser at 5 - 10 °C)

N kg	Sol. N l	Sol. N kg	N kg	Sol. N l	Sol. N kg	N kg	Sol. N l	Sol. N kg	N kg	Sol. N l	Sol. N kg	N kg	Sol. N l	Sol. N kg
10	27,8	35,8	52	144,6	186,0	94	261,2	335,8	136	378,0	485,0			
12	33,3	42,9	54	150,0	193,0	96	266,7	342,7	138	384,0	493,0			
14	38,9	50,0	56	155,7	200,0	98	272,0	350,0	140	389,0	500,0			
16	44,5	57,1	58	161,1	207,3	100	278,0	357,4	142	394,0	507,0			
18	50,0	64,3	60	166,7	214,2	102	283,7	364,2	144	400,0	515,0			
20	55,5	71,5	62	172,3	221,7	104	285,5	371,8	146	406,0	521,0			
22	61,6	78,5	64	177,9	228,3	106	294,2	378,3	148	411,0	529,0			
24	66,7	85,6	66	183,4	235,9	108	300,0	386,0	150	417,0	535,0			
26	75,0	92,9	68	188,9	243,0	110	305,6	393,0	155	431,0	554,0			
28	77,8	100,0	70	194,5	250,0	112	311,1	400,0	160	445,0	572,0			
30	83,4	107,1	72	200,0	257,2	114	316,5	407,5	165	458,0	589,0			
32	89,0	114,2	74	204,9	264,2	116	322,1	414,3	170	472,0	607,0			
34	94,5	121,4	76	211,6	271,8	118	328,0	421,0	175	486,0	625,0			
36	100,0	128,7	78	216,5	278,3	120	333,0	428,0	180	500,0	643,0			
38	105,6	135,9	80	222,1	285,8	122	339,0	436,0	185	514,0	660,0			
40	111,0	143,0	82	227,9	292,8	124	344,0	443,0	190	527,0	679,0			
42	116,8	150,0	84	233,3	300,0	126	350,0	450,0	195	541,0	696,0			
44	122,2	157,1	86	238,6	307,5	128	356,0	457,0	200	556,0	714,0			
46	127,9	164,3	88	242,2	314,1	130	361,0	465,0						
48	133,3	171,5	90	250,0	321,7	132	367,0	471,0						
50	139,0	178,6	92	255,7	328,3	134	372,0	478,0						



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