

Instruction manual

Mounted sprayer

AMAZONE

UF 01

UF 1501

UF 1801



MG 890
DB 238.2 (GB) 07.04
Printed in Germany



Before starting operation
carefully read and adhere to
this instruction manual!
Please keep this instruction
manual for future use!



Reading the instruction

manual and to adhere 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 would 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 a good success one should go into the mind of a thing or make himself familiar with every part of the machine and to get acquainted with its handling. Only this way, you would 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

Machine-Ident-Nr.: _____

Type: _____

Permissible system pressure bar: _____

Year of construction: _____

Factory: Gaste

Power kW: _____

Basic weight kg: _____

Allowable total weight kg: _____

Address of manufacturer:

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D-49205 Hasbergen

When ordering spare parts please always state the serial number of your machine.

Formal remarks to this instruction manual

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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.

When receiving the machine, please check immediately that no damage has been caused in transit and that all parts are present. Please check whether all parts mentioned in the delivery note including the ordered optional equipment are present. Only the immediate reportage of damage will be considered for compensation.

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 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 instruction 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 are 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

Position figures in illustrations

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

Component (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 instruction manual

The knowledge of the basic safety advice and safety regulations are 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 instruction manual.

Adhere to the requirements of the EC guideline for the use of work equipment 89/655/EEG and particularly the accident prevention regulations 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 hints in this instruction 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 operation, operating and maintaining the machine,
- operating the machine with defect safety facilities or not properly fitted or not functioning safety devices and guards,
- not adhering to the instruction manual regarding putting into operation, 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

The safety advice are identified by a symbol and a signal word. The signal word describes the seriousness of the threatening danger. The individual symbols have the following meaning:



Danger!

Immediately imminent danger for life and health of persons (severe injuries or death).

Not adhering to this advice will cause severe damage to health up to life threatening injuries.



Warning!

Possibly danger for life and health of persons.

Not adhering to these hints may cause severe adverse health effects up to life threatening injuries.



Caution!

Possibly dangerous situation (slight injuries, material damage).

Not adhering to these hints may cause slight injuries or material damage.



Important!

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

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



Hint!

Hint for use and particularly useful information.

These hints will help you to optimally make use of the functions on your machine.

2.3 Designated 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 following conditions

- **When operating across slopes**
maximum angle of machine in the direction of travel to the left: 20 %
maximum angle of machine in the direction of travel to the right: 20 %
- **When operating up and down hill**
uphill 20 %
downhill 20 %

The declined use also includes:

- observing all hints in this instruction 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 Designated equipment of the field sprayer

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

- basic implement,
- pump equipment,
- sprayer booms,
- spray line and
- special options.

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.

It should be pointed 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 long 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.

There are Desmopan diaphragms available as spare parts for the pump. These Desmopan diaphragms are resistant to solvent containing crop protection agents. The longevity of these diaphragms is, however, 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 instruction 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 device 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 instruction 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. Undertake appropriate measures when instructing the operating staff. Detailed hints are again given in the relevant chapters of this instruction 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

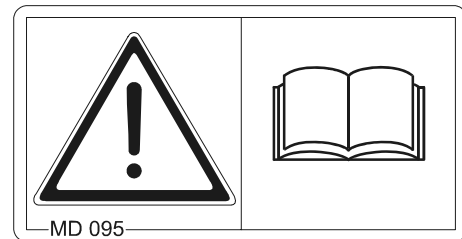


Important!

Picture No. and Explanation

MD 095

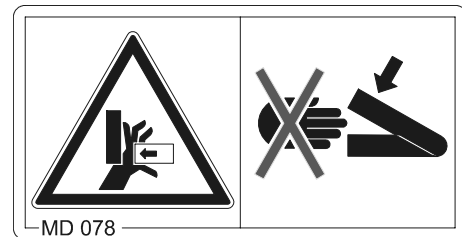
Before commencing operation read thoroughly operators manual and safety advice!



Safety symbols

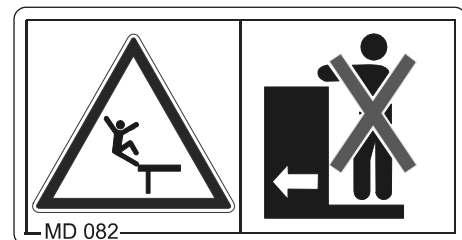
MD 078

Danger of squeezing on moving part!
Never reach into the zone as long as parts are still moving!



MD 082

Danger of falling when sitting or standing on the implement during transport!
As a matter of principle: Sitting or standing on the implement during operation is prohibited!



MD 084

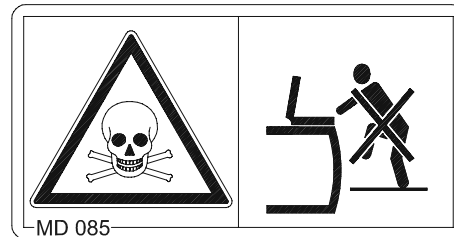
Danger of injury within the swivel area of the sprayer boom!
Never stay within the operating area of the folding/unfolding sprayer booms!
Advise people to leave the danger area!



General safety advice

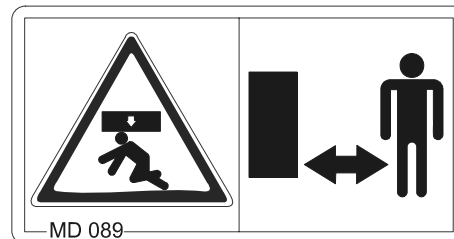
MD 085

Danger of injury from poisonous fumes!
Never climb inside the spray agent tank!



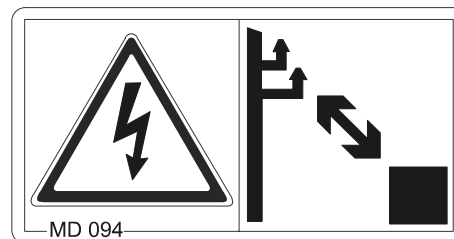
MD 089

Danger of injury from parts falling down!
Observe sufficient clearance distance to unsecured machine or to machine parts!



MD 094

Danger of injury from contact with high voltage lines when folding in and out the sprayer booms!
When folding out and in the sprayer booms observe sufficient clearance distance to high voltage lines!



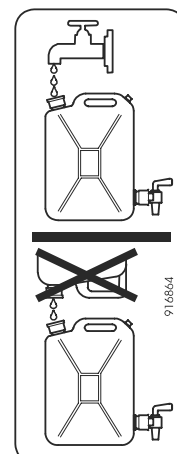
MD 103

Water not for drinking!
The materials of the wash down tank are not food grade!



916864

For clear water only! Never fill plant protective agent into the tank.



Other identifications

The following identifications are attached on to the mounted sprayer.

911888

The CE-sign on the machine indicates the compliance with the valid EC guide lines.



913071

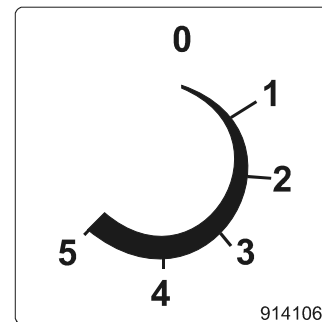
Permissible max. pump drive rev. speed 550 1/min

max. 550 1/min

913071

914106

Agitation intensity for agitator on the step tap

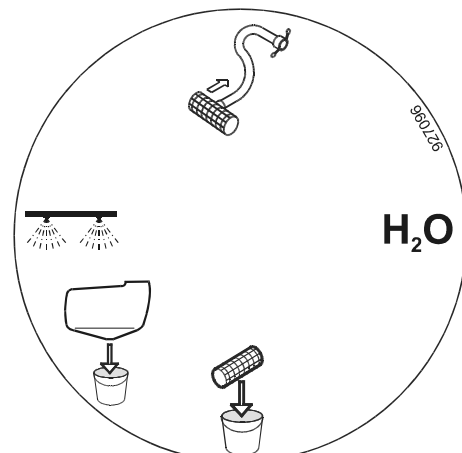


914106

Explanation for the following identifications you will find in chapter "Explanations for control elements for spraying operation", from page 168.

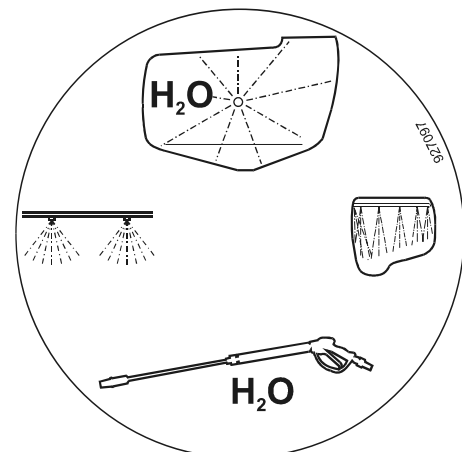
927096

VARIO-control-suction side



927097

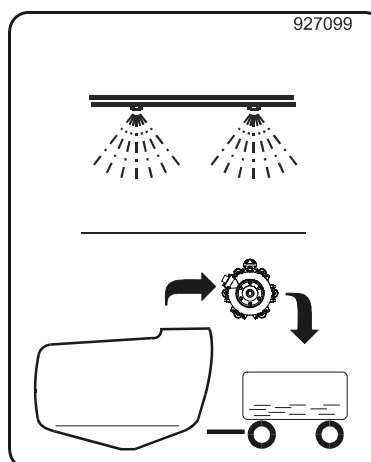
VARIO-control-pressure side



General safety advice

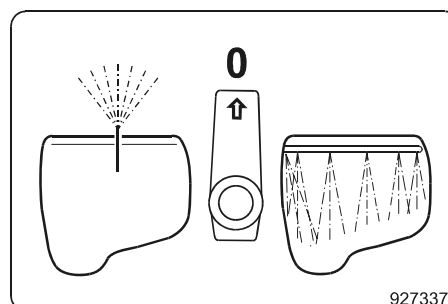
927099

Reversing tap spraying operation / Spray agent tank quick emptying



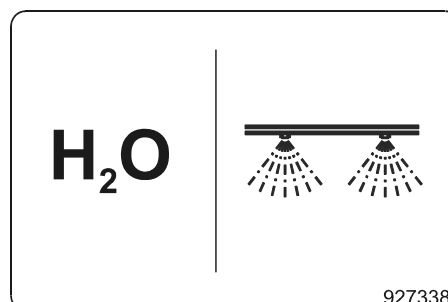
927337

Reversing tap Circuit line / Canister rinsing



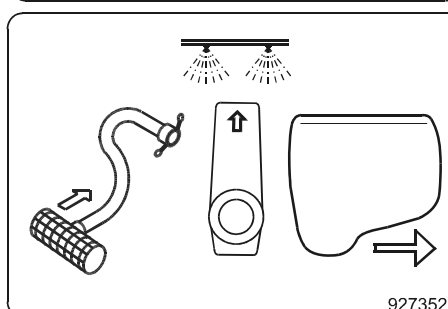
927338

Reversing tap Spraying operation / Flushing



927352

Reversing tap Suck off induction bowl / Suction joint for spray agent tank



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 persons, or 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. Especially VSG 1.1 and VSG 3.1.

Adhere to the safety advice on the decals on the machine.

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

2.19 Safety advice for the operator



Warning!

Basic principle:

Always check traffic and operational safety before putting the machine to operation!

2.19.1 General safety and accident prevention advice

- Adhere to the general rules of health- and safety precautions besides the advice in this instruction manual!
- The fitted warning- and advising decals give important hints for a safe operation. Adhering to them protects your own safety!
- When making use of public roads adhere to applicable traffic rules!
- Become acquainted with the machines controls and functions before beginning the operation. Doing this during operation would be too late!
- The operator should wear close-fitting clothes. Avoid wearing loose-fitting clothes!
- Avoid danger of fire by keeping the machine clean!
- Before beginning to move, check surrounding area (children etc.)! Ensure sufficient visibility!
- Sitting or standing on the implement during operation or during transport is not permissible!
- Attach implements as advised and only to the advised devices!
- Special care should be taken when the implement is coupled to or off the tractor!
- When attaching or removing the machine bring any parking or storing devices into the corresponding position (standing safety)!
- Fit weights always to the fixing points provided and as advised for that purpose!
- Adhere to the maximum permissible axle loads, total weights and transport dimensions!
- Fit and check transport gear, traffic lights, warnings and guards!
- The release ropes for quick coupling three point linkages should hang freely and in the lowered position must not release by themselves!
- During driving never leave the operator's seat!
- Moving behaviour, steer ability and braking are influenced by mounted implements, trailers and ballast weights. Therefore always ensure a sufficient steering and braking!
- When lifting a three-point-implement the front axle load of the tractor is reduced depending on its size. The sufficient front axle load (20 % of the tractor net weight) has to be observed)!
- When driving round bends note the width of the machine and/or the changing centre of gravity of the implement!
- Put implement into operation only when all guards are fixed in position!
- Never stay or allow anyone stay within the operation area of the machine!
- Never stay or allow anyone stay within the pivot and swivel area of the implement!
- Hydraulic folding frames should only be actuated if no persons are staying in the slewing area!
- On all hydraulically actuated pivoting parts exists danger of injury by bruising and trapping!
- Before leaving the tractor lower the machine to the ground. Ac-



- Engage the parking brake, stop the engine and remove ignition key!
- Allow nobody to stand between tractor and implement if the tractor is not secured against rolling away by the parking brake and/or by the supplied chocks!
- Secure sprayer booms in transport position!
- When filling the tank do not exceed the nominal volume!
- Use the platform only for filling. During use riding on the platform is not permissible!

2.19.2 Means for traffic safety

- Before starting to travel on public roads check function of brakes!
- Before travelling down hill put tractor in lower gear!
- Stop tractor immediately if any distortion in the function of the brakes is noticed. Repair faults without delay!



2.19.3 Mounted implements

- When fitting the machine to the three point linkage of the tractor bring all control levers into such a position that unintended lifting or lowering is impossible!
- When fitting to the three-point linkage the mounting categories at the tractor and the implement must be compatible!
- There is danger of injury when mounting implements!
- In the area of the three point linkage there is danger of injury by its crushing and shearing areas!
- Never allow anyone to stay between tractor and implement without having secured by stop wedges against rolling away!
- Attach implements only with the prescribed tools!
- Adhere to the manufacturer's advice!
- For travelling on public roads bring all devices into transport position!
- When driving in bends with trailed or mounted implements mind the wide protrusions and the dynamic forces of the implement!
- Before travelling in public roads secure all swivelling components against an endangering change of their position!
- When operating the supporting devices danger by crushing or shearing may occur!
- Mounted implements and ballast weights affect the driving behaviour as well as steering and braking of the 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!
- By mounting implements at the front or in the rear of a tractor, do not exceed
 - the permissible tractor total weight.
 - the permissible tractor axle loads.
 - the permissible tyre carrying capacity of the tractor tyres.
- The tractor must provide the prescribed brake lag for the load combination according to the national legal traffic regulations.
- Observe the maximum payload of the mounted implement and the permissible axle loads of the tractor!
- Before travelling with the mounted implement secure the control lever against unintended lowering!
- Ensure that the mounted implement is safely parked!
- As a matter of principle always remove ignition key before conducting any repair, maintenance and cleaning operation!
- Keep all guards fitted and always in serviceable condition!

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 tubes and cones of the PTO shaft as well as a tractor and implement side PTO guard must be fitted and kept 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)
- Fit and remove the PTO shaft only when engine is stopped and ignition key is removed.
- Ensure correct fitting and securing of the PTO support.
- Prevent PTO guard from spinning by fixing the provided chain to a nearby static part.
- Before switching on the PTO shaft ensure that the chosen PTO speed of the tractor corresponds to the allowable implement input speed.
- 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 switching on the PTO shaft nobody is allowed to stay in the danger zone of the implement.
- Never switch on the tractor PTO while the engine is stopped.
- When operating with a switched on PTO shaft nobody is allowed to stay near to the spinning PTO or universal joint shaft.
- Always stop PTO when it is not needed or when the shaft is in an adverse position.
- Attention! 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 PTO shaft and engine have been stopped and ignition key pulled out.
- Deposit removed PTO shaft on the provided carrier.
- When travelling in curves mind the permissible angling and sliding length.
- After removal of PTO shaft apply guard cap onto PTO stub.
- Immediately repair any damage before operation to avoid consequential problems!
- 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!
- Connect hydraulic hoses to the hydraulic rams and motors according to the advice in the instructions!
- 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, sockets and plugs should be marked (e.g. colour coded)! This helps to prevent contrary function (lifting instead of lowering or vice versa). 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 guide lines 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 Maintenance, repair- and care-work

- Repair-, maintenance- and cleaning operations as well as the remedy of function faults should principally be conducted with drive and engine stopped! Remove ignition key!
- Check nuts and bolts for tightness and retighten if necessary!
- Before conducting electric welding operations on tractor or on the mounted implement, remove cable from generator and 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!

2.19.8 Basic safety rules on crop protection equipment

- Adhere to the recommendations of the crop agent manufacturer!
 - Protective clothing!
 - Warning advice!
 - Metering-, using- and cleaning advice!
- Observe advice given in your national crop protective agent 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 use only hose fittings made of stainless steel (refer to health- and safety "Advice regarding fitting of hoses")!
- 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 like 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 safe guarding men, animal and environment, crop sprayers must never be filled from open sources!**
- **From the public water net work crop sprayers may only be filled in free fall.**



Important!



General safety advice

3 Product description

This chapter provides you with a comprehensive survey about the design of the field sprayer. Read this chapter at 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
- Pump equipment
- Sprayer booms
- Spray lines with part section valves

Overview – components

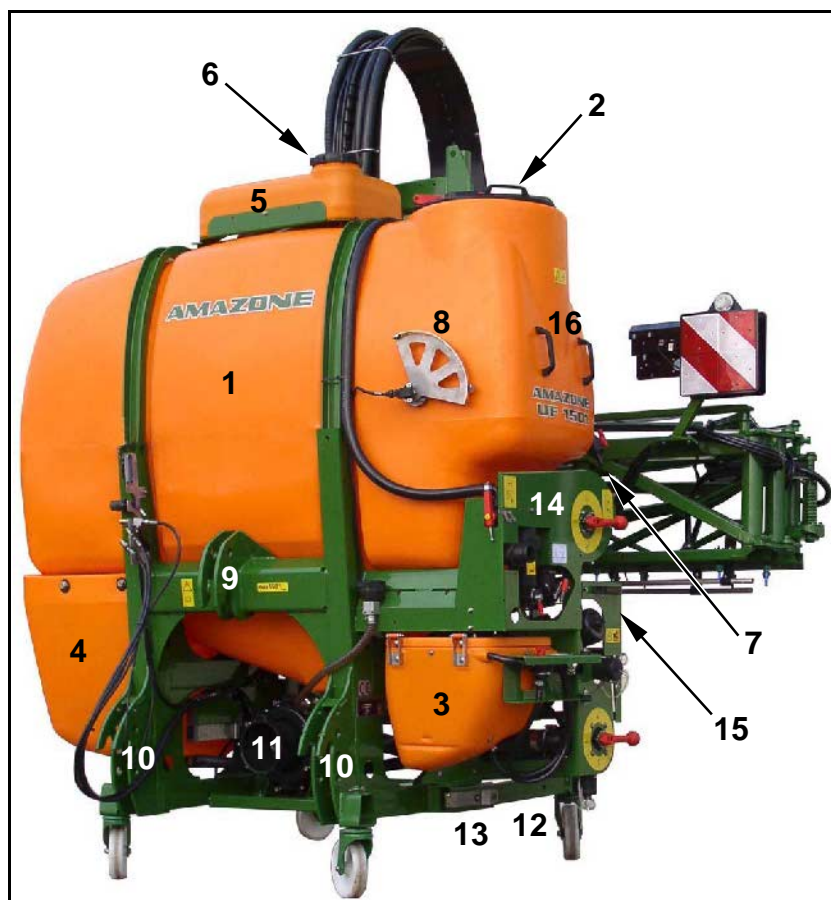


Fig. 1

- | | |
|---|---|
| (1) Spray cocktail tank | (10) Lower link arms-connection cat. II |
| (2) Filling port spray cocktail tank with folding lid and filling sieve | (11) Piston diaphragm pump |
| (3) Swivelable induction bowl | (12) Telescopic storing supports |
| (4) Fresh water flushing tank | (13) Securing device for the storing supports |
| (5) Hand washing tank | (14) Control panel |
| (6) Filling opening hand washing tank with screw lid | (15) Telescopic ladder |
| (7) Drain tap for hand washing tank | (16) Straps for the safe climbing |
| (8) Tank level indicator | |
| (9) Top link-connection with mounting pin cat. II (UF 1501) or cat. III (UF 1801) | |

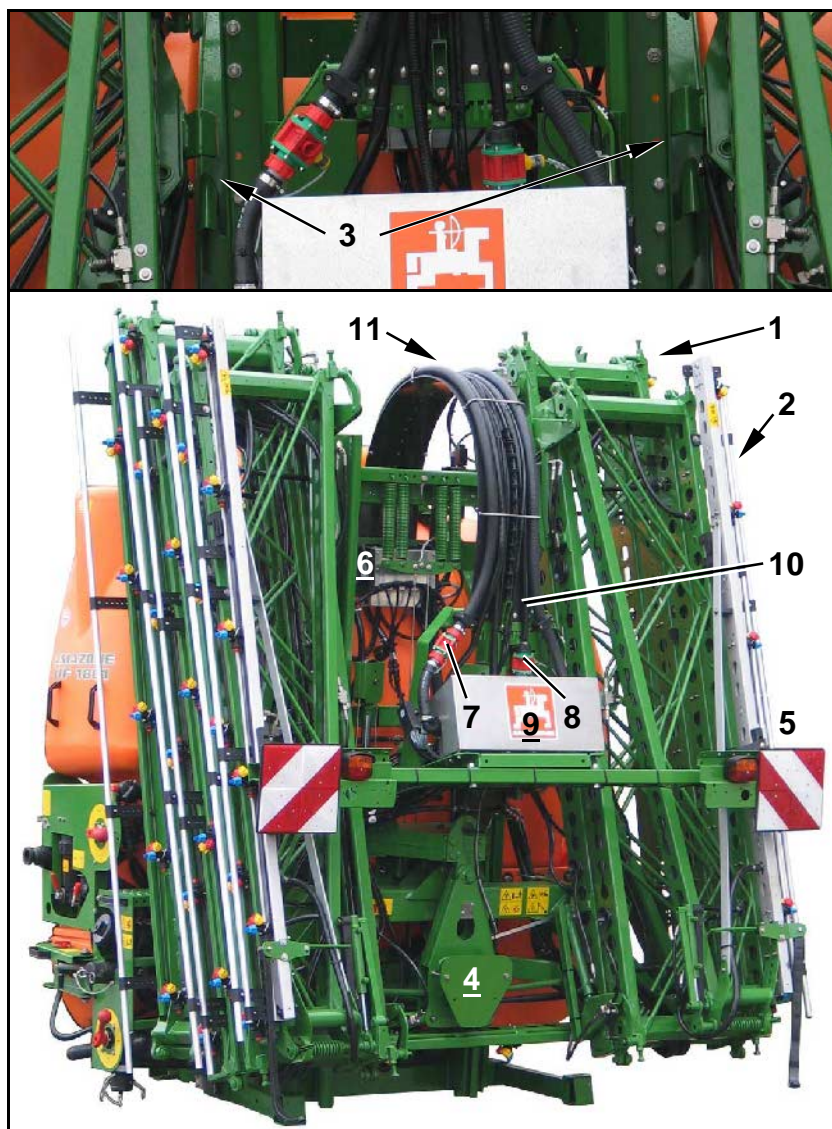


Fig. 2

- | | |
|--|--|
| (1) Sprayer booms - in this case Super-S-boom | (10) Part width shut off return flow returns the not required spray cocktail back into the spray cocktail tank |
| (2) Spray lines | (11) Hose package |
| (3) Transport locking device for locking the folded sprayer boom in transport position against unintended folding down – in this case unlocked | |
| (4) Unlock- and lockable swing compensation | |
| (5) Traffic lights and parking warning plates | |
| (6) Implement computer | |
| (7) Flow meter to determine the spray rate [l/ha] | |
| (8) Return flow meter for the determination of the spray cocktail which is redelivered to the spray cocktail tank | |
| (9) Motor valves for switching on and off the boom part width sections (Valve chest) | |

Overview – Supply pipes between tractor and field sprayer



Fig. 3

- (1) Hydraulic coupling (single acting) with block tap for height adjustment
- (2) Hydraulic couplings (double acting) for folding or unfolding the sprayer boom
- (3) Power cable for the traffic lights
- (4) Idle coupling for hydraulic hoses and power supply cable
- (5) Retainer for implement plug of the implement computer connecting cable

The actuation of the functions for the field sprayer is done via the control panel.



Fig. 4

- (1) VARIO-control-suction side
- (2) Outlet opening VARIO-control-suction side
- (3) Filling opening VARIO-control-suction side for suction hose
- (4) Suction filter
- (5) VARIO-control-pressure side
- (6) Drain tap for hand washing tank
- (7) Reversing tap Spraying operation / Flushing
- (8) Spray pressure-control
- (9) Self cleaning pressure filter
- (10) Step tap for agitator
- (11) Reversing tap Spraying operation / Spray cocktail tank quick emptying
- (12) Outlet opening for spray cocktail tank quick emptying
- (13) Guard plate against unintended opening of the outlet opening (12)

The components suction filter, piston diaphragm pump, spray pressure-control and self cleaning pressure filter with step tap set up the suction device.

Overview – Standard equipment

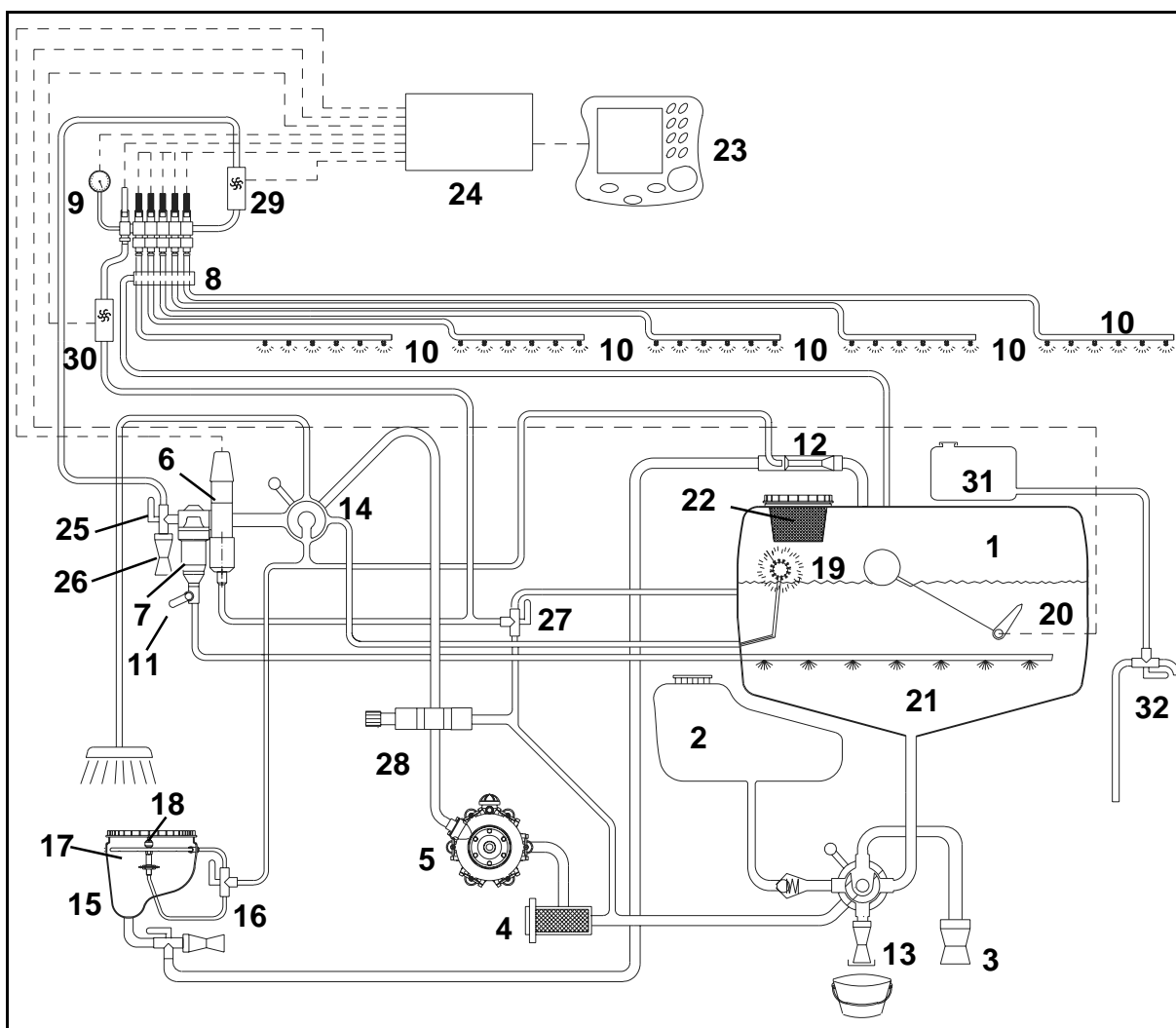


Fig. 5

- | | |
|---|--|
| (1) Spray cocktail tank | (20) Tank level indicator |
| (2) Fresh water flushing tank | (21) Agitation |
| (3) Filling port for suction hose | (22) Filling sieve |
| (4) Suction filter | (23) AMATRON+ |
| (5) Piston diaphragm pump | (24) Implement computer |
| (6) Spray pressure-control | (25) Reversing tap Spraying operation / Spray cocktail tank quick emptying |
| (7) Self cleaning pressure filter | (26) Outlet opening for spray cocktail tank quick emptying |
| (8) Boom sections-valves | (27) Reversing tap Spraying operation / Flushing |
| (9) Spray pressure-sensor | (28) Spray pressure-limiting-valve |
| (10) Spray lines | (29) Flow meter |
| (11) Step tap for agitator | (30) Return flow meter |
| (12) Injector for sucking liquid off the induction bowl | (31) Hand washing tank |
| (13) VARIO-control-suction side | (32) Drain tap for hand washing tank |
| (14) VARIO-control-pressure side | |
| (15) Induction bowl | |
| (16) Reversing tap Circuit line / Canister flushing | |
| (17) Circular pipe line | |
| (18) Canister flushing | |
| (19) Internal tank wash | |

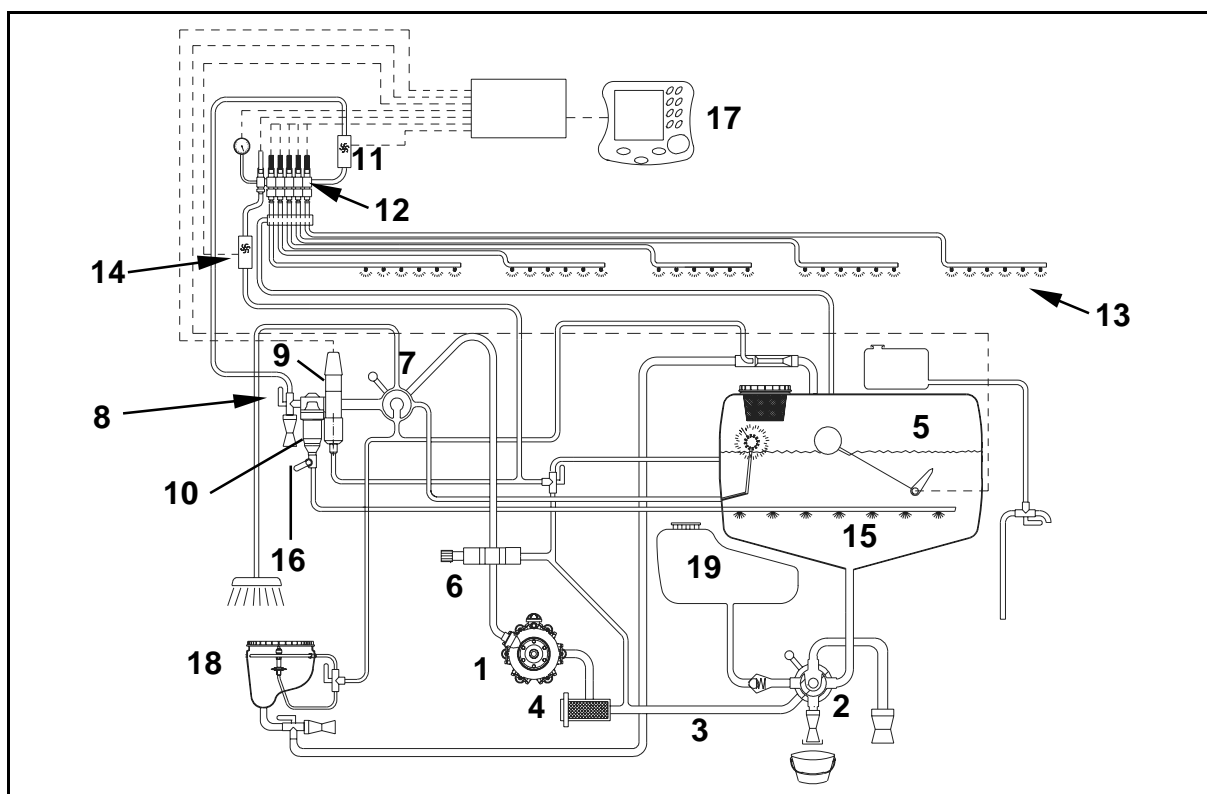


Fig. 6

The piston diaphragm pump (1) sucks the spray cocktail via the VARIO-control-suction side (2), the suction hose (3) and the suction filter (4) off the spray cocktail tank (5). The sucked spray cocktail is delivered via the pressure hose (6) to the VARIO-control-pressure side (7). Via the VARIO-control-pressure side (7) the spray cocktail gets into the pressure device (8). The pressure device (8) consists of the spray pressure-control (9) and the self cleaning pressure filter (10). With the aid of the pressure device (8) the spray cocktail is delivered via the flow meter (11) to the boom part section valves (12). The boom part width section valves (12) distribute the spray cocktail to the individual spray lines (13). At small spray rates, the return flow meter (14) determines the spray cocktail amount which is returned into the spray cocktail tank (5).

The agitator (15) being switched on provides a homogeneous spray cocktail in the spray cocktail tank (5). The agitation intensity can be set in 6 steps at the step tap (16).

Entry on the operator terminal **AMATRON+** (17)

- implement specific data.
- implement order related data.
- access of the field sprayer to change the spray rate during spraying operation.
- control of all functions on the sprayer booms.
- control of special functions.
- monitoring the field sprayer during the spraying operation.

For preparing the spray cocktail fill the required agent quantity for one spray cocktail tank filling into the induction bowl (18) and suck it into the spray cocktail tank (5).

The clean water in the clean water tank (19) is used for cleaning the spraying system.

3.1 Danger zones

Danger zones exist:

- between tractor and mounted sprayer, particularly when hitching on or off.
- within the operational range of moving parts.
- when climbing on to the machine.
- in the swivel range of the sprayer booms.
- inside the spray cocktail 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 19.

3.2 Positioning of safety symbols and other identifications

Safety symbols

The following illustrations show the arrangement of the safety symbols.

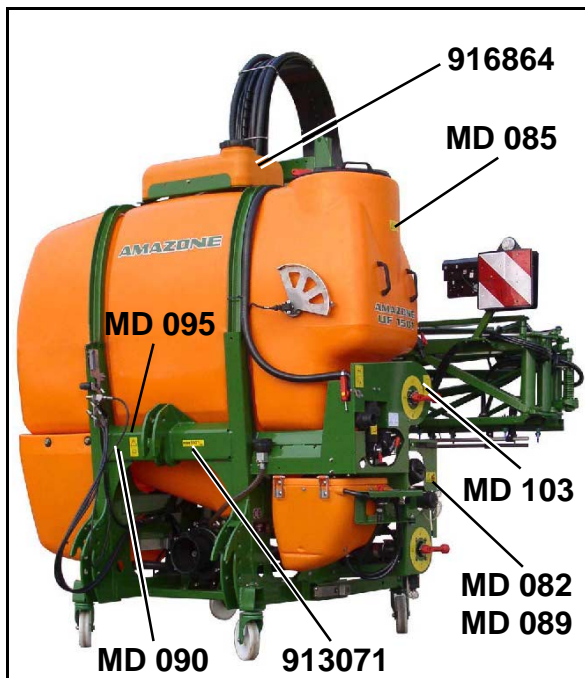


Fig. 7



Fig. 8

Product description

Identification on the control panel and the induction bowl

The following illustrations show the arrangement of identifications on the control panel and the induction bowl.



Fig. 9



Fig. 10

Type plate and CE declaration

The following illustrations show the arrangement of the type plate and the CE declaration.

The type plate (Fig. 11/1) and the CE declaration (Fig. 11/2) are located on the frame behind the induction bowl (Fig. 11/3).

On the type plate are mentioned:

- Machine-Ident-Nr.:
- Type
- Permissible system pressure bar
- Year of construction
- Factory
- Power kW
- Basic weight kg
- Allowable total weight kg
- Axle load rear kg
- Axle load front, support load. kg

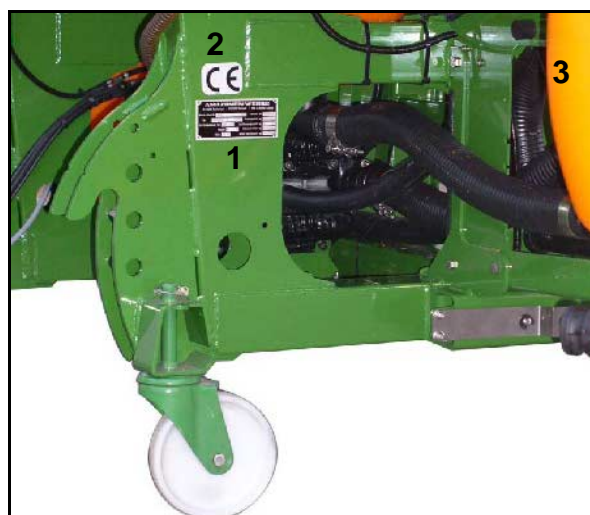


Fig. 11

3.3 Conformity

The mounted fields sprayer UF
..01 fulfils the:

Guide lines- / Standard terms

- Machine guide line **98/37/EG**
- EMV-guide line **89/336/EWG**
- EN 907
- EN 12761-1
- EN 12761-2

3.4 Technical data

The following tables show the technical data for the individual components. By combination of the individual components many model variations result. For determining the total implement weight, therefore, please add the individual weights of the components. All indicated weights and lengths are therefore to be understood as "additions".

3.4.1 Basic implement

Type UF		1501	1801
Spray cocktail tank			
Actual	[l]	1720	1980
Nominal		1500	1800
Basic weight	[kg]	433	454
Allowable total weight		3200	3600
Allowable pressure in system	[bar]	10	
Filling height			
• from the ground		2060	2260
• from the ladder		1280	1480
Length **	[mm]	950	
Width		2280	
Height		2280	2480
Three point linkage	cat.		II
Technical residual amount Suction device (Reversing tap Spraying operation / Flushing in Position "Flushing")			
• on level ground		9	
• When operating across slopes**			
• 20% in driving direction to the left hand	[l]	11	
• 20% in driving direction to the right hand		12	
• Dropping line**			
• 20% Up hill		10	
• 20% down hill		10	
Central control		Electric, coupling of part section valves	
Spray pressure-adjustment		electric	
Spray pressure-setting range	[bar]	0.8 – 10	
Spray pressure gauge		digital spray pressure gauge	
Pressure filter		50 (80) Mesh	
Agitation		can be set in 6 steps	
Spray rate control		Speed related via job computer	

* measured from lower link arms-connection

** Percent figure relates to the angle in the mentioned line



3.4.2 Q-plus-Sprayer booms, hydraulically foldable (including hydraulic height adjustment, swing compensation, hose routing and boom carrier frame)

Working width	[m]	12	12.5	15
Transport width	[mm]	2560	2560	2998
Length		850		
Height of machine placed on the ground		2460		
Nozzle height from/to		500 / 2100		
Weight *	[kg]	372	373	397

* increases if optional equipment is fitted

- with electric boom tilting by 7 kg.
- with Profi folding "I" by 24 kg.

3.4.3 Super-S-Sprayer booms, hydraulically foldable (including hydraulic height adjustment, swing compensation, hose routing and boom carrier frame)

Working width	[m]	15	16	18	20	21	21/15	24	27	28
Transport width	[mm]	2400								
Length		900							1000	
Height of machine placed on the ground		2900 (without rolling device)								
Nozzle height from/to		500 / 2100			500 / 2200					
Weight *	[kg]	547	555	561	673	676	671	693	732	733

* increases if optional equipment is fitted

- with electric boom tilting by 7 kg.
- with Profi folding "I" by 26 kg.
- with Profi folding "II" by 36 kg.

3.4.4 Power supply

electric	[V]	12
Hydraulic <ul style="list-style-type: none"> • max. operational pressure • Q-plus and Super-S-boom, fully hydraulic folding 	[bar]	220
		Required: <ul style="list-style-type: none"> • 1 single acting control valve for the boom height adjustment • 1 double acting control valve for folding booms in or out
		Required: <ul style="list-style-type: none"> • 1 single acting control valve • 1 pressure-free return socket

Product description

3.4.5 Centre of gravity distance

The centre of gravity distance is used for the calculation of the actual values for the tractor total weight, tractor axle loads and tyre carrying capacity and for the required minimum ballast. Please refer to page 151.

Type UF		1501	1801
		Distance between centre lower link arms-connection point and centre of gravity UF	
Q-plus-Sprayer booms	[mm]	650	
Super-S-Sprayer booms			

3.4.6 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 tractor used.

4 Assembly and function

The following chapter informs you about the assembly of the field sprayer and the functions of the individual components.

4.1 Tank level indicator

Tank volume [l] = indicated scale figure x 10

The tank level indicator (Fig. 12/1) indicates the contents [l] in the spray cocktail tank. Read the tank contents off the scale (Fig. 12/2) on the reading edge (Fig. 12/3) of the pointer.

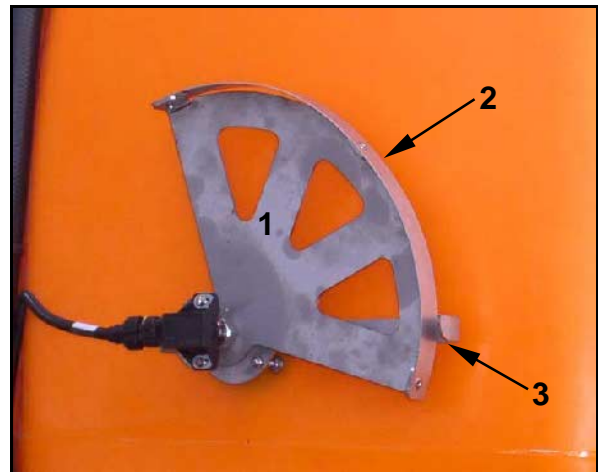


Fig. 12

4.2 Agitation

The engaged agitator mixes the spray cocktail in the spray cocktail tank and in this way provides a homogeneous spray cocktail. The agitation intensity is set with the aid of the step tap (Fig. 13/1).

The agitation intensity is adjusted in 6 steps "0, 1, 2, 3, 4, 5". In position "0" agitation is switched off. The highest intensity agitation is achieved in position "5". For spraying operation select agitation step "2".



Fig. 13

4.3 Pump equipment

At random available pumps with a capacity of 210 l/min. and 250 l/min.

All components which come into contact with spray agents have been 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 protective agents and liquid fertiliser.



Never exceed the maximum pump speed of 550 R.P.M.!

Important!

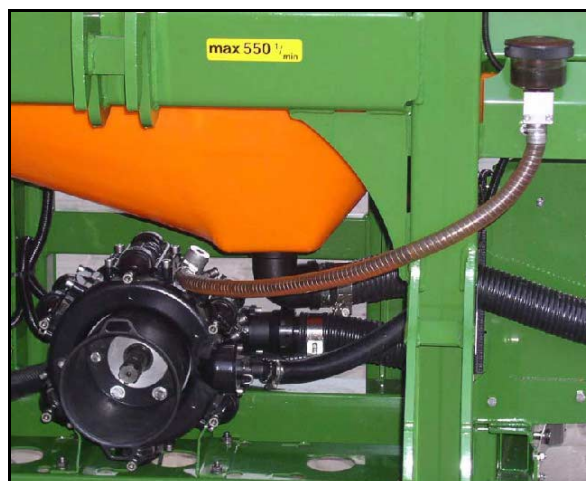


Fig. 14

Technical data pump equipment

Pump equipment			210 l/min	250 l/min
Type of pump			BP 235	BP 280
Pump capacity at 540 R.P.M.	[l/min]	at 2 bar	208	250
		at 20 bar	202	240
Power requirement	[kW]		8.4	9.8
Kind of pump			6-cylinder piston diaphragm pump	
Pulsing damping			Oil-damping	
Residual amount	[l]		6	6
Total weight Pump equipment	[kg]		34	40

4.4 Filter equipment



Important!

- Use all designed filters. Clean all filters regularly (please refer to chapter "Cleaning", page 203). 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.
- Observe the permissible combinations of filters or of the 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.
- When using 80 or 100 mesh/inch pressure filter inserts it is possible that with some chemicals, some active crop protection agents are filtered off. If necessary contact the plant protective agent manufacturer.

4.4.1 Filling sieve

The filling sieve (Fig. 15/1) prevents the spray agent from dirt when filled into the spray cocktail tank via the tank access lid.

Filter surface: 3750 mm²

Mesh width: 1.00 mm

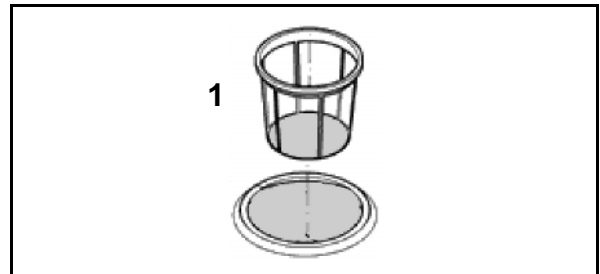


Fig. 15

4.4.2 Suction filter

The suction filter (Fig. 16/1) filters

- the spray cocktail during spraying operation.
- the water when filling the spray cocktail tank via the suction hose.
- the water during rinsing procedure.

Filter surface: 660 mm²

Mesh width: 0.60 mm

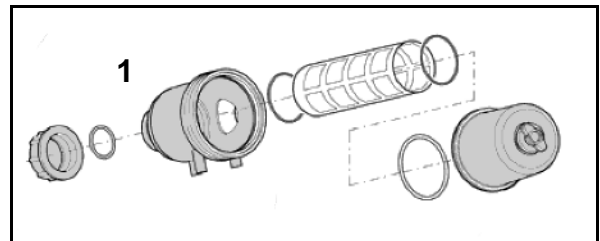


Fig. 16

4.4.3 Self cleaning pressure filter

The self cleaning pressure filter (Fig. 17/1)

- prevents the blockage of the nozzle filters in front of the spraying nozzles.
- has a larger number of meshes per inch than the suction filter.

When the agitation is switched on the inner surface of the pressure filter insert is continuously flushed and not diluted spray agent or dirt particles are sent back into the spray cocktail tank.

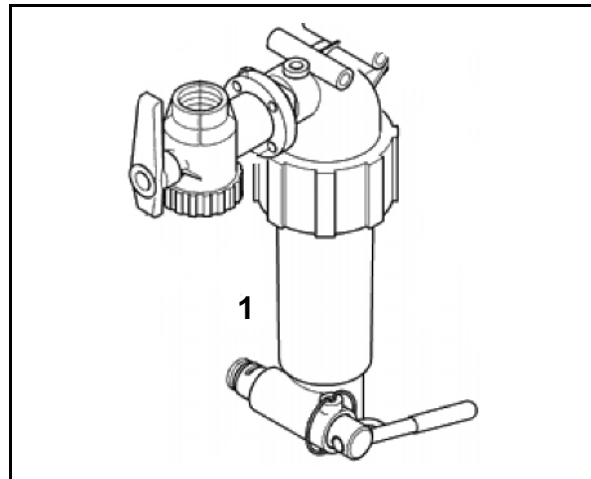


Fig. 17

Overview Pressure filter insert

- Pressure filter insert with 50 mesh/inch (standard),
for nozzle size '03' and larger
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

4.4.4 Nozzle filter up to

The nozzle filters (Fig. 18/1) prevent the blockage of the spraying nozzles.

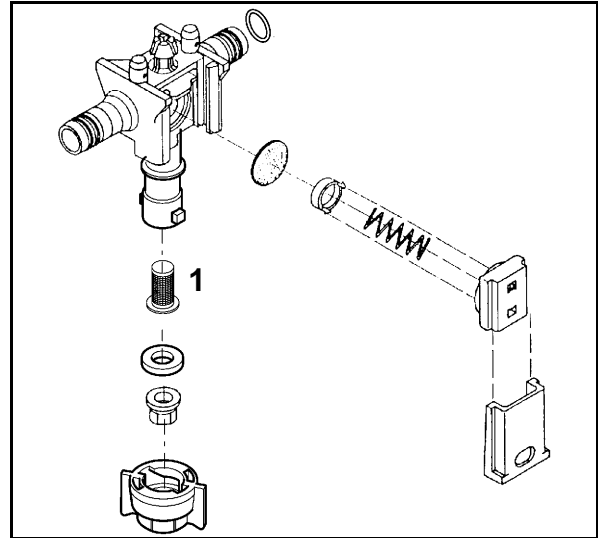


Fig. 18

Overview nozzle filter

- Nozzle filter with 24 mesh/inch, for nozzle size '06' and larger
Filter surface: 5.00 mm²
Mesh width: 0.50 mm
Order No.: ZF 091
- Nozzle filter with 50 mesh/inch (standard specification), for nozzle size '02' up to '05'
Filter surface: 5.07 mm²
Mesh width: 0.35 mm
Order No.: ZF 091
- Nozzle filter with 100 mesh/inch, for nozzle size '015' and smaller
Filter surface: 5.07 mm²
Mesh width: 0.15 mm
Order No.: ZF 169

4.4.5 Bottom sieve in the induction bowl

The bottom sieve (Fig. 19/1) in the induction bowl protects from sucking lumps and foreign particles.

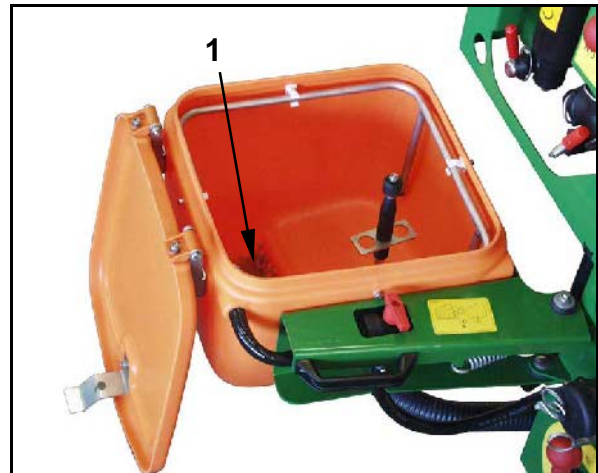


Fig. 19

Assembly and function

4.4.6 Urea filter

Special option

Order No.: 707 400

When filling in urea, the urea filter (Fig. 20/1) 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 cocktail tank sump.
2. Screw the urea filter into the bottom.

Filter surface: 415 mm²

Mesh width: 0.32 mm

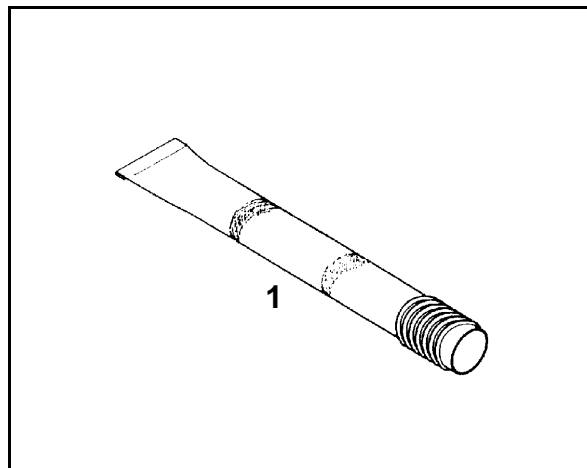


Fig. 20

4.5 Clean water tank

The clean water tank (Fig. 21/1) contains clear water without chemical contact. This water is used for

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

Fig. 21/...

- (2) Screw lid with venting valve for the filling opening.



Fig. 21

4.6 Induction bowl with injector and canister flushing

Fig. 22/...

- (1) Swivelable induction bowl for pouring in, diluting and sucking of crop protection agents and Urea.
- (2) Folding lid with spray rate chart (for using the spray rate chart please refer to chapter "Spray rate chart", page 219.
- (3) Folding lid locking.
- (4) Joint axle for swivelling the induction bowl from the transport into the operational position. The induction bowl catches in the relevant locking positions.
- (6) Reversing tap suck off induction bowl / Filling port.
- (7) Filling port induction bowl.
- (8) Suction hose of the induction bowl.



Fig. 22

Fig. 23/...

- (1) Reversing tap Circuit line / Canister flushing.
- (2) Bottom sieve.
- (3) Rotating canister flushing nozzle for rinsing canisters or other containers.
- (4) Pressure plate.
- (5) Circular pipe line for diluting and inducing crop protection agents and urea.
- (6) Folding lid.



Hint!

Water escapes from the canister flushing nozzle (Fig. 23/3) when

- the pressure plate (Fig. 23/4) is pressed downwards by the canister.
- the closed folding lid (Fig. 23/2) presses the canister flushing nozzle downwards.



Warning!

Close the folding lid (Fig. 23/6), before rinsing the induction bowl.

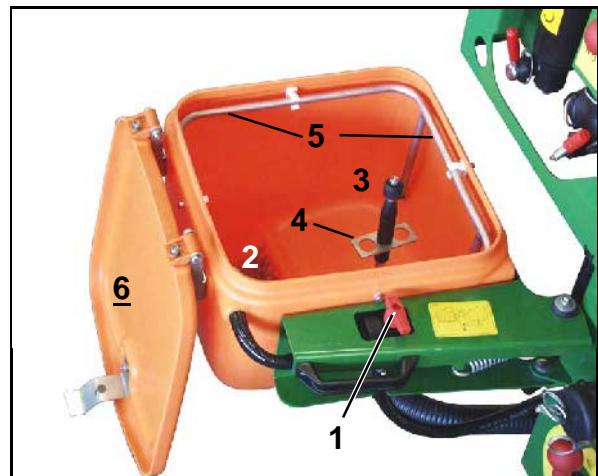


Fig. 23

4.7 Hand washing tank

Hand washing tank (Fig. 24/1) with clear water with drain tap for cleaning the hands (Fig. 24/2).



Only fill clear water in the hand washing tank.

Important!



Never ever drink the water in the hand washing tank! The materials of the hand washing tank are not food grade materials.

Warning!



Fig. 24

4.8 Ladder

Telescopic ladder for the access to the filling dome.



Danger!



Important!

- **Never ever climb into the spray cocktail tank.**
Danger of injury from poisonous fumes!
- **As a matter of principle forbidden is riding on the field sprayer!**
Danger of falling down when riding on the machine!
- **Implicitly ensure that the ladder when having been pushed in is locked in the relevant end positions (Fig. 26/3).**
- **Ensure that the ladder when having been pushed in (Fig. 25/1) catches at the transport locking pin (Fig. 26/4).**



Fig. 25

Fig. 25/...

- (1) Ladder being pushed in.
- (2) Straps for the safe climbing.



Fig. 26

Fig. 26/...

- (1) Pulled out, swivelled ladder.
- (2) Sprung suspended locking. The locking catches in the holes (3) and secures the climbing in the relevant end positions.
- (3) Holes for securing the climbing up in the relevant end positions.
- (4) Transport locking for the ladder being pushed in.

4.9 Operator terminal **AMATRON+**

Via the operator terminal **AMATRON+**

- implement specific data.
- implement order related data.
- access of the field sprayer to change the spray rate during spraying operation.
- control of all functions on the sprayer booms.
- 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] in dependence of the entered spray rate (required rate) and the actual forward speed [k.p.h].

The **AMATRON+** determines:

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

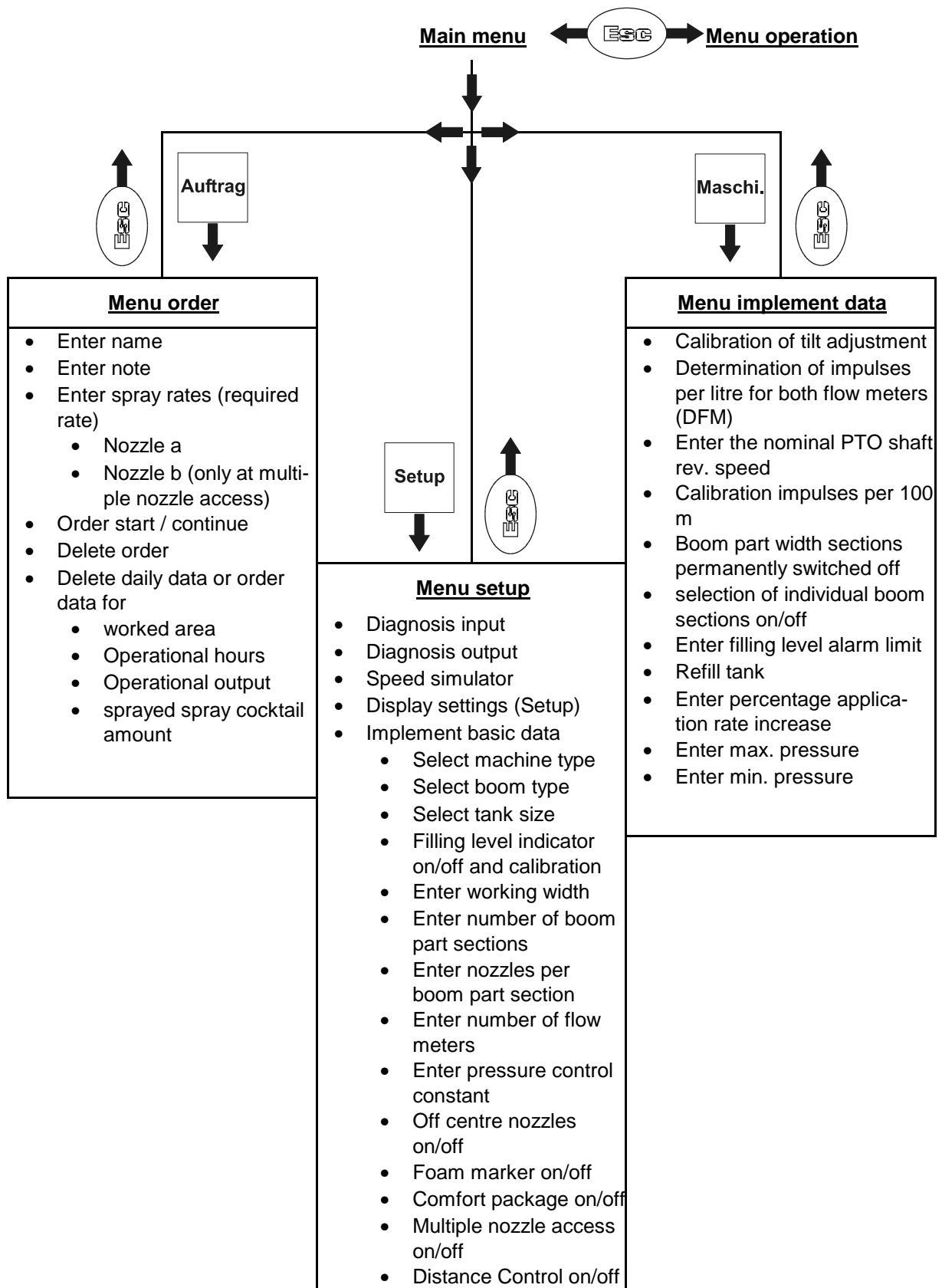
The **AMATRON+** stores for a started order:

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

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

- **Menu order**
In the **menu order** orders are created and the determined data of up to 20 jobs are stored. Please refer to chapter "Menu order", page 61.
- **Menu implement data**
In the **menu implement data** the implement specific settings are entered, dialled or determined via a calibration procedure. Please refer to chapter "Menu implement data", page 62.
- **Menu setup**
The **Menu setup** serves for input and output of diagnosis data and for dialling and entering of implement basic data. Please refer to chapter "Menu setup", page 78.
- **Menu operation**
During spraying operation the **menu operation** shows all necessary data. During the spraying operation the field sprayer is controlled from **the menu operation**. Please refer to chapter "Menu operation", page 85.

4.9.1 Hierarchy of **AMATRON+**



4.9.2 Description of operator terminal

4.9.2.1 Display and function keys

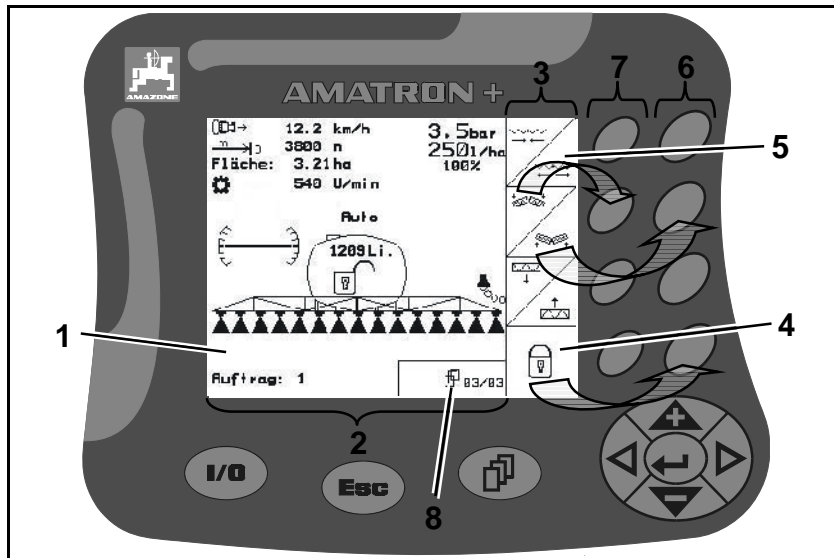


Fig. 27

Fig. 27/...

- (1) Display. The display consists of the operating display (2) and the functional fields (3).
- (2) Operating display. The operating display shows the actual chosen functions of the plant protection sprayer and the actual forward speed [k.p.h], the travelled distance [m], the worked area in [ha] and the actual PTO shaft rev. speed [R.P.M.].
- (3) The functional fields consist either of a square field (4) or a diagonally separated square field (5).



Hint!

The indicated functional fields depend on the machine type and the relevant machine equipment.

- (4) Square field. In case the functional field is a square field only the right hand row of functional keys (6) for the access of the function field are in action.
- (5) Diagonally separated square field. If the functional field is a diagonally separated square field,
 - the functional field on the top left is accessed or recalled via the left hand row of functional keys (7).
 - the functional field at the bottom right is accessed or recalled via the right hand row of functional keys (6).
- (6) Right hand row of functional keys.
- (7) Left hand row of functional keys.
- (8) Symbol paging. When the symbol paging appears in the display you may recall additional menu pages.

4.9.2.2 Keys on the implement front side

ON (I) / OFF (O) (Fig. 28). Via this key you switch the **AMATRON+** on and off.

When the **AMATRON+** is switched on, the display appears. When the **AMATRON+** is switched off, the display goes out.

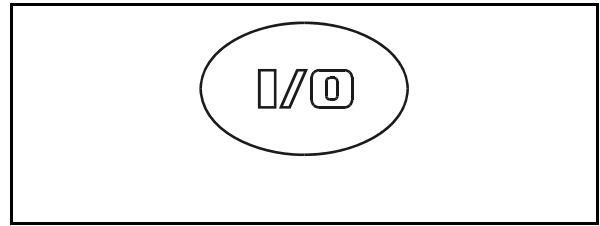


Fig. 28

This key has several functions:

- Back into the previous menu view.
- Change between the menu operation and the main menu.
Keep key pressed for at least 1 second to change to the menu operation.
- Stop entering.

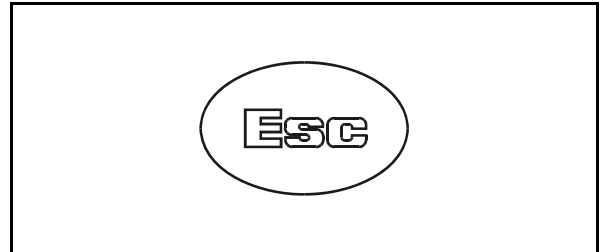



Fig. 29

Via this key you can recall additional menu pages when the symbol pageing appears in the display, e.g.  01/02 (page 1 of 2) (Fig. 27/8).

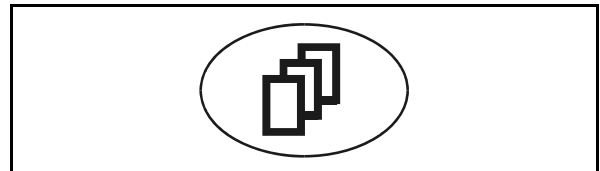


Fig. 30

Fig. 31/...

- (1) Cursor in display to the right.
- (2) Cursor in display to the left.
- (3)
 - Increase of spray rate during spraying operation by pre-selected percentage application rate (e.g. by 10%).
 - Cursor upwards
- (4)
 - Reduce spray rate during spraying operation by pre-selected percentage application rate (e.g. by 10%).
 - Cursor downwards.
- (5)
 - Entering of selected figures and letters.
 - Confirmation of critical alarm.
 - Reset spray rates to 100 % in the menu operation.

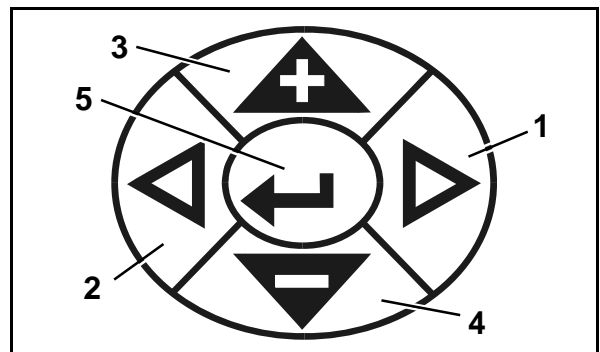


Fig. 31

Assembly and function

4.9.2.3 Keys on implement rear side

The shift key is located on the implement rear side (Fig. 32/1).



The shift key is active (1) only in the menu operation and in the menu order!

Hint!

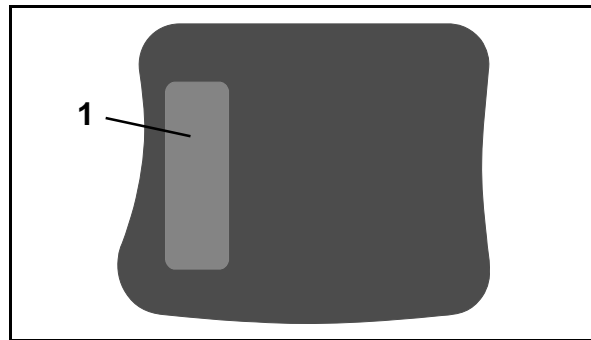


Fig. 32

When you press the shift key in the menu operation (Fig. 33/1), additional functional fields will appear on the display. At the same time the coverage of the functional keys will change also. With the shift key pressed the indicated functions can be acted via the relevant functional key.

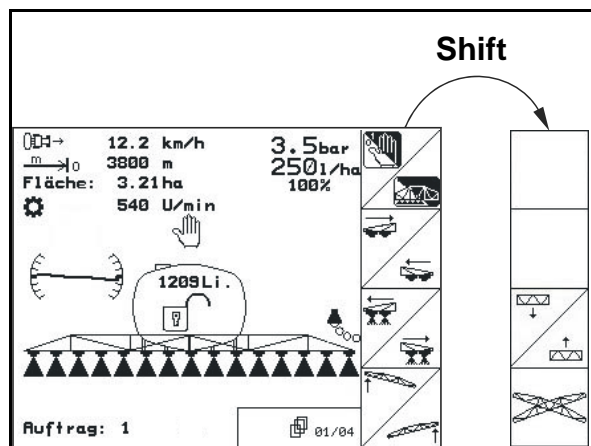



Fig. 33

4.9.3 **AMATRON** +switch on

1. Press key .
- When the implement computer is connected the start menu appears (Fig. 34) with the terminal version (in this case terminal version: 2.22). After approx. 2 seconds the **AMATRON** + automatically jumps into the main menu.

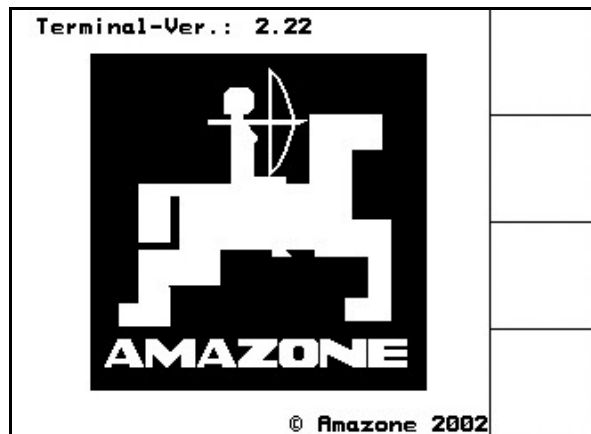


Fig. 34



Hint!

When the **AMATRON +** loads data from the implement computer, the opposite start picture appears (Fig. 35). New data are loaded when

- a new implement computer is used,
- a new **AMATRON +** terminal is used,
- after RESET the **AMATRON +**-terminal.



Fig. 35

4.9.4 Inputs on **AMATRON +**



Hint!

For operating the **AMATRON +** the relevant functional fields appear in this instruction manual. Press the relevant functional key for the functional field to carry out the indicated function.

Example: Functional field




Description:

Lift sprayer boom.

Action:

1. Press the relevant functional key (Fig. 36/1)

for the functional field , to lift the sprayer booms.

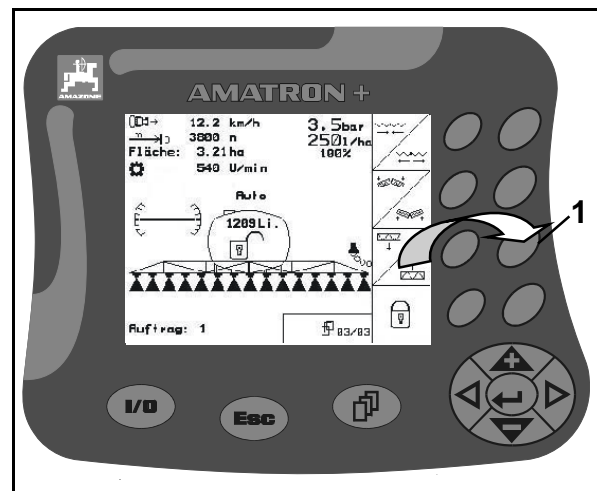







Fig. 36


4.9.4.1 Entering of text and figures

The entering of text (Fig. 37/1) appears on the display (Fig. 37/2), when the entering of text or figures in the **AMATRON +** is required.

In the selection field (Fig. 37/3) the individual letters or figures are chosen which shall appear in the input line (Fig. 37/4).


1. Choose the desired letter or the desired figure in the selection field (Fig. 37/3) with



the aid of the keys , ,  or . The change between capital and small letters is achieved via the key .


2. Press key , to take over the selected letter or the selected figure into the input line (Fig. 37/4).

→ The writing mark advances by one digit.

3. Repeat the steps 1 and 2 until the text for the input line is ready.

With key  you delete the entire input line.

The arrows   in selection field (Fig. 37/3) allow the movement of the writing mark within the input line (Fig. 37/4).

The arrow  in the selection field (Fig. 37/3) deletes the last input.


4. Actuate the functional field , to take over the finished input line into the **AMATRON +**.



Fig. 37

4.9.4.2 Selection of options

1. Position the selection arrow (Fig. 38/1) with the aid of the keys  or .

2. Press key , to take over the chosen option into the **AMATRON +**.



Fig. 38

4.9.4.3 Switching on/off of functions (Toggle function)

Switching on/off of functions, e.g. comfort package: on/off:

1. Press functional key (Fig. 39/1) once.
→ In the display appears "on" and the function "comfort package" is switched on.
2. Press functional key once again (Fig. 39/1).
→ In the display appears "off" and the function "comfort package" is switched off.



Fig. 39

4.9.5 Main menu

The main menu shows

- the selected machine type
- the job number of the started order
- the entered required rate for the spray rate in [l/ha].
- the impulses per litre of the flow meter.
- the size for the spray cocktail tank in litres.
- the entered working width for the sprayer boom in [m].

Via the functional field "Order" recall the menu order (please refer to chapter "Menu order", page 61).

Via the functional field "mesh" recall the menu implement data (please refer to chapter "Menu implement data", page 62).

Via the "Setup" recall the menu setup (please refer to chapter "Menu setup", page 78).

Recall the functional field "Aid" via the symbol



. In the aid window you may choose between

- aid for operation and
- aid for fault messages.

Maschinentyp:	UF klein	Auftrag
Auftrags-Nr.:	1	
Sollmenge:	250 l/ha	Maschi.
Impulse pro Liter:	665	
Behältergröße:	1801 Liter	
Arbeitsbreite:	24.00m	
	Hilfe	Setup

Fig. 40

4.9.6 Menu order

In the menu order

- you can create individual orders and start or continue.
- you may recall the stored order data. Max. 20 orders can be stored (Order No. 1 to 20).

When you recall the menu order, the data for the last started order will appear.




Hint!

When starting or continuing a new order the actual order is automatically ended and stored.

4.9.6.1 Create order / start or recall stored order data

1. Recall any order No. or a specific order No.

via the symbol .

2. Delete the order data via the functional field "deletion" when you intend to create a new order. Skip the steps 2 to 5, if you intend to continue the recalled order.
3. Recall functional field "name" and enter a name. Please refer to chapter "Entering of text and figures", page 59.
4. Recall functional field "note" and enter a note.
5. Recall functional field "l/ha" and enter the required rate for the spray rate.
6. Recall the functional field "start" and start the order or continue.

→ For this order are now determined and stored:

- the worked total area in [ha]
- the total spraying period in [h]
- the average operational output in [ha/h]
- the total amount of the spray cocktail sprayed [l]
- the daily worked area (ha/day) in [ha]
- the daily sprayed amount (amount/day) of the spray cocktail in [l]
- the daily period of spraying (hours/day) in [h]

7. Recall the functional field "delete daily data" and you delete the daily data for
 - the worked daily area (ha/day)
 - the sprayed daily amount (amount/day) of the spray cocktail
 - the daily spraying period (hours/day)

Auftrags-Nr.:	1 gestartet	Name
Name:	Betriebsanleitung	Notiz
Notiz:	Amazonen Werke	1/ha
Sollmenge:	250 l/ha	starten
fertige ha:	36.52 ha	löschen
Stunden:	3.6 h	Tages-
Durchschnitt:	10.05 ha/h	daten
ausgeb. Menge:	9130 Li.	löschen
ha/Tag:	3.21 ha	
Menge/Tag:	802 Li.	
Stunden/Tag:	0.3 h	
		1 / 20





Fig. 41

4.9.7 Menu implement data

In the menu implement data proceed as follows

- before the first putting into operation enter the implement specific data or settings, select them or determine by a calibration procedure.
- if necessary correct the implement specific data or settings, when the field sprayer does not operate properly.

01/03

1. Recall via the functional field  the display "tilt adjustment", please refer to chapter "Calibration of boom tilt adjustment", page 64.
2. Recall via the functional field  the display "Impulses per litre determine / enter (DFM 1 and DFM 2), please refer to chapter "Determine impulses per litre – flow meter or manual entering of impulses per litre – flow meter", please refer to chapter "Impulses per litre", page 66.
3. Recall via the functional field  the display "enter nominal PTO shaft rev. speed", please refer to chapter "Nominal PTO shaft rev. speed", page 68.
4. Recall via the functional field  the display "Value for impulses per 100 m" input or automatic calibration", please refer to chapter "Impulses per 100m", page 73.

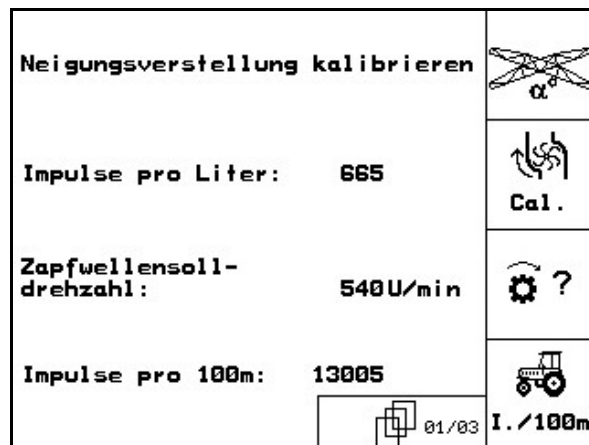




Fig. 42

02/03

5. Via the functional field  you can switch off permanently individual boom sections. The indicated figure (Fig. 43/1) informs about number of the permanently switched off boom sections (Figure 0 = no boom section switched off). Please refer to chapter "Permanently switching on/off the boom sections", page 74.
6. Via the functional field  the function "selection of individual boom sections" is switched on and off. Please refer to chapter "Explanations for function "selection of individual boom sections", page 75.
→ In the display appears either the word "on" (function switched on) or "off" (function switched off).

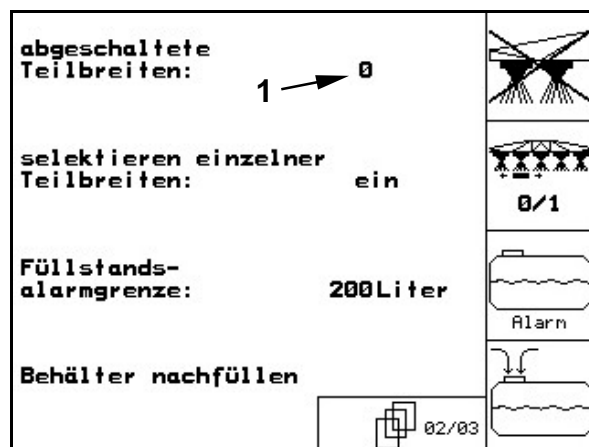


Fig. 43

Assembly and function








7. Via the function field recall  the entering for the filling level alarm limit. Enter the filling level alarm limit. Please refer to chapter "Entering of text and figures", page 59.
- During spraying operation an alarm signal sounds when the filling level in the spray cocktail tank drops beyond the filling level alarm limit (in this case 200 litres).
8. Recall via the functional field  the function "Tank refilling quantity". Please refer to chapter "Refill spray cocktail tank with water", page 76.



Fig. 44

03/03

9. Recall via the functional field  the entering for the percentage application rate increase. Enter the desired percentage application rate increase (in this case 10 %). Please refer to chapter "Entering of text and figures", page 59.
- If you press the keys  or  during spraying operation, the spray rate changes per key pressure by the entered percentage application rate increase (in this case by 10 % each).
10. Recall via the functional fields  and  the entering for the max. and min. permissible spray pressure for the nozzles fitted to the sprayer boom. Enter the values for the max. and min. permissible spray pressure for the spraying nozzles fitted to the sprayer boom.
- When during the spraying operation the permissible spraying pressures are exceeded or undercut an alarm signal sounds.

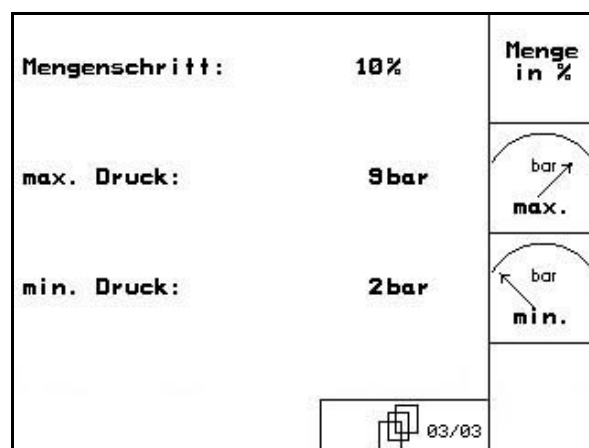


Fig. 45

4.9.7.1 Calibration of tilt adjustment





Hint!

Pre-condition for the flawless functioning of the electric or hydraulic tilt adjustment is the correct calibration of the tilt adjustment (tilt adjustment calibration).


Calibrate the tilt adjustment

- at the first operation.
- in case of deviations of the horizontal sprayer boom alignment shown in the display and the actual sprayer boom alignment.

1. Move into the horizontal position. For this


actuate the functional field  or  and align the sprayer boom in horizontal position to the ground.

2. Determine the horizontal position. For this


actuate functional field .

→ The horizontal position is determined.

3. Move to the right hand stop. For this actu-


ate the functional field  until the right hand spacer slightly touches the ground.

4. Determine right hand stop. For this actuate


functional field .

→ Right hand stop is determined.

5. Move to the left hand stop. For this actuate

the functional field  until the left hand spacer slightly touches the ground.

6. Determine the left hand stop. For this actu-

ate functional field .

→ The left hand Stop is determined.

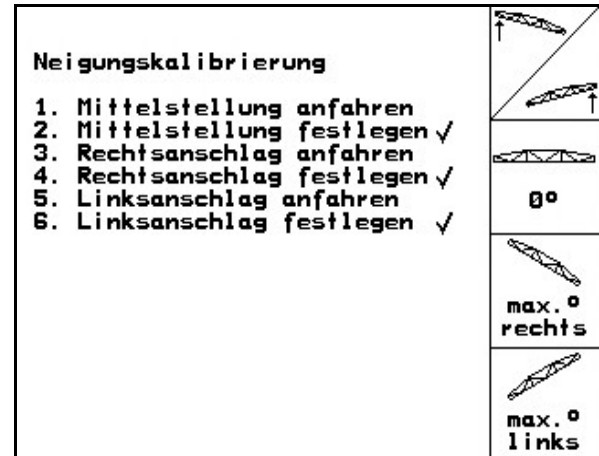


Fig. 46

4.9.7.2 Impulses per litre



Hint!



- The **AMATRON +** requires the calibration value "Impulses per litre" for the flow meter / return flow meter
 - for determination and control of the spray rate [l/ha].
 - for the determination of the daily and total amount of the sprayed spray cocktail [l].
- In case the calibration figure is not known you have to determine the calibration value "Impulses per litre" via a calibration of the flow meter /return flow meter.
- If the calibration figure is exactly known you can manually enter the calibration value "Impulses per litre" for the flow meter / return flow meter into the **AMATRON +**.



Important!

- For the accurate conversion of the spray rate in [l/ha] you would have to determine the calibration value "Impulses per litre" of the flow meter at least one a year.
- As a matter of principle determine the calibration value "Impulses per litre" of the flow meter:
 - after removal of the flow meter.
 - after a prolonged period of operation as there may be deposits of spray agent residue may in the flow meter.
 - in case of deviations between the required and the actually applied spray rate [l/ha].
- For the accurate conversion of the applied spray cocktail amount in [l] align the return flow meter with the flow meter at least once a year.
- Align the return flow meter with the flow meter:
 - after the determination of the calibration value "Impulses per litre" of the flow meter.
 - after removal of the flow meter.
- Take down the indicated value "Impulses" when you drive the field sprayer away from its position for the determination of the sprayed amount of water.

4.9.7.2.1 Determine the Impulses per litre - Flow meter

1. Fill the spray cocktail tank with clear water (approx. 1000 l) up to the filling mark on both sides of the spray cocktail tank.
2. Engage the PTO shaft and drive pumps with a nominal speed (e.g. 450 R.P.M.).
3. Actuate the functional field .
 - The calibration procedure starts.
4. Switch on sprayer booms and spray at least 500 l of water (see tank level indicator) via the sprayer booms.
 - The display shows the permanently determined value of the "Impulses" for the sprayed amount of water.
5. Disengage the sprayer boom feed and the PTO shaft.
6. Take down the indicated value "Impulses", in this case e.g. 365851.
7. Accurately determine the sprayed quantity of water by refilling the spray agent tank up to the filling marks on both sides of the spray cocktail tank
 - with the aid of a calibration container,
 - by weighing or
 - by a water meter.
8. Enter the value for the determined quantity of water, e.g. 550 l.
9. Press key  and the calibration procedure is finished.
 - The **AMATRON⁺** automatically calculates the calibration value "Impulses per litre" shows the calibration value and stores the calibration value.






<ul style="list-style-type: none"> - 1000 Liter klares Wasser einfüllen - Pumpennendrehzahl einstellen - Spritze einschalten - min. 500 Liter ausspritzen - Spritze ausschalten - ausgespritzte Liter eingeben 	
	DFM 1
	
Impulse: 365851	
aktuell eingestellt: 665 Impulse pro Liter	Cal. DFM 2

Fig. 47

4.9.7.2.2 Manually enter the Impulses per litre - Flow meter

1. Recall via the functional field  the entering "Enter the impulses for flow meter 1".
2. Enter the calibration value "Impulses per litre". Please refer to chapter "Entering of text and figures", page 59.
3. Recall the functional field .





<ul style="list-style-type: none"> - 1000 Liter klares Wasser einfüllen - Pumpennendrehzahl einstellen - Spritze einschalten - min. 500 Liter ausspritzen - Spritze ausschalten - ausgespritzte Liter eingeben 	
	DFM 1
	
Impulse: 365851	
aktuell eingestellt: 665 Impulse pro Liter	Cal. DFM 2

Fig. 48

4.9.7.2.3 Align return flow meter with flow meter

1. Change via the functional field  into the menu "Alignment Flow meter 2".




- 1000 Liter klares Wasser einfüllen	
- Pumpennendrehzahl einstellen	DFM 1
- Spritze einschalten	
- min. 500 Liter ausspritzen	Imp. DFM 1
- Spritze ausschalten	
- ausgespritzte Liter eingeben	Cal. DFM 2
Impulse: 365851	
aktuell eingestellt:	
665 Impulse pro Liter	

Fig. 49

2. Fill the spray cocktail tank with clear water (approx. 1000 l) up to the filling mark on both sides of the spray cocktail tank.
3. Engage the PTO shaft and drive pumps with a nominal speed (e.g. 450 R.P.M.).

4. Press key  and the alignment starts.



- 1000 Liter klares Wasser oder Spritzmittel einfüllen	Abgl. DFM 2
- Pumpennendrehzahl einstellen	starten
- Abgleich starten	
- min. 100 Liter durch 1. Durchflussmesser fließen lassen	Imp. DFM 2
- Abgleich beenden	
Impulse DFM 1: 665 Imp./Liter	
Durchfluss DFM 1: 0 Liter	
aktuell eingestellt:	
Impulse DFM 2: 0 Imp./Liter	


Fig. 50



When the opposite display appears the alignment is finished.

Hint!

5. Press key  and the alignment of the return flow meter is finished.
- The **AMATRON⁺** automatically calculates the calibration value "Impulses DFM 2", shows the calibration value and stores the calibration value.



- 1000 Liter klares Wasser oder Spritzmittel einfüllen	Abgl. DFM 2
- Pumpennendrehzahl einstellen	starten
- Abgleich beenden	
Imp. Du	Imp. DFM 2
ak	
Imp	
Ab	

Abgleich beendet

mit Eingabetaste bestätigen

Fig. 51

4.9.7.2.4 Manually enter impulses per litre – return flow meter

1. Recall via the functional field  the entering "Enter the impulses for flow meter 2".
2. Enter the calibration value "Impulses per litre". Please refer to chapter "Entering of text and figures", page 59.
3. Recall the functional field .

- 1000 Liter klares Wasser oder Spritzmittel einfüllen - Pumpennendrehzahl einstellen - Abgleich starten - min.100 Liter durch 1.Durchflussmesser fließen lassen - Abgleich beenden		Abgl. DFM 2 starten
Impulse DFM 1: 665 Imp./Liter Durchfluss DFM 1: 0Liter aktuell eingestellt: Impulse DFM 2: 0 Imp./Liter		Imp. DFM 2

Fig. 52



4.9.7.3 Nominal PTO shaft rev. speed



Hint!

- You can store for 3 tractors
 - the nominal PTO shaft ref. speeds. Please refer to chapter "Storage of the nominal PTO shaft rev. speeds for different tractors", page 69.
 - the impulses per PTO shaft rev. Please refer to chapter "Storage of impulses per PTO shaft rev.", page 70.
- When selecting an already computer stored tractor the relevant values for the PTO nominal rev. speed and the impulses per 100m are simultaneously taken over.
- The **AMATRON +** monitors the nominal PTO shaft rev. speed. During spraying operation an alarm signal sounds when the alarm limit is exceeded or falls short. Please refer to chapter "Store alarm limit for PTO shaft rev. speed", page 71.

4.9.7.3.1 Enter the nominal PTO shaft rev. speed

1. Recall via the functional field  the input "Please enter nominal PTO shaft rev. speed".
2. Enter the nominal PTO shaft rev. speed, e.g. 540 R.P.M.
Enter for the nominal PTO shaft rev. speed the value "0" when
 - no PTO shaft rev. speed sensor exists.
 - the rev. speed monitoring is not wanted.
 Please refer to chapter "Entering of text and figures", page 59.
3. Actuate the functional field .
4. Enter the alarm limit for the rev. speed monitoring. Please refer to chapter "Store alarm limit for PTO shaft rev. speed", page 71.







Zapfwellensoll-drehzahl:	540 U/min	 U/min
Impulse pro Zapfwellenumdrehung:	3 Impulse	 I./U.
Alarmgrenze: + 10% - 25%		Speicher 
		Speicher 
		+% Alarm
		-% Alarm

Fig. 53

Assembly and function

4.9.7.3.2 Enter the impulses per PTO shaft rev.

1. Recall via the functional field  the entering "Please enter impulses per rev. for the PTO shaft".
2. Enter the impulses per PTO shaft rev., e.g. 3 impulses.
3. Actuate the functional field .





Zapfwellensoll- drehzahl:	540 U/min	 U/min
Impulse pro Zapf- wellenumdrehung:	3 Impulse	 I./U.
		Speicher  Speicher
Alarmgrenze:	+ 10% - 25%	+% Alarm -% Alarm

Fig. 54

4.9.7.3.3 Storage of the nominal PTO shaft speeds for different tractors

1. Recall via the functional field  the entering "Please select tractor".







Zapfwellensoll- drehzahl:	540 U/min	 U/min
Impulse pro Zapf- wellenumdrehung:	3 Impulse	 I./U.
		Speicher  Speicher
Alarmgrenze:	+ 10% - 25%	+% Alarm -% Alarm

Fig. 55

2. Position the selection arrow (Fig. 56/1) with the aid of the keys  or  in front of the desired tractor.
3. Recall via the functional field  the input "Please enter nominal PTO shaft rev. speed".
4. Enter the nominal PTO shaft rev. speed for the selected tractor, e.g. 540 R.P.M. Enter for the nominal PTO shaft rev. speed the value "0" when
 - no PTO shaft rev. speed sensor exists.
 - the rev. speed monitoring is not wanted.
 Please refer to chapter "Entering of text and figures", page 59.




Bitte Schlepper wählen:	Schlepper ändern
→ Schlepper1 : 540 U/min Schlepper2 : 520 U/min Schlepper3 : 0 U/min	neue Umdreh- ungen
1	
	

Fig. 56


5. Actuate the functional field .



Hint!

Via the functional field  you can change the tractor name for the selected tractor.

4.9.7.3.4 Storage of the impulses per PTO shaft rev. for different tractors

1. Recall via the functional field  the entering "Please select tractor".









Zapfwellensoll- drehzahl:	540 U/min	 U/min
Impulse pro Zapf- wellenumdrehung:	3 Impulse	 I./U.
		Speicher  
Alarmgrenze:	+ 10% - 25%	+% Alarm -% Alarm

Fig. 57

2. Position the selection arrow (Fig. 58/1) with the aid of the keys  or  in front of the desired tractor.
3. Recall via the functional field  the entering "Please enter impulses per rev. for the PTO shaft".
4. Enter the impulses per PTO shaft rev. for the selected tractor, e.g. 2 Imp./rev.. Please refer to chapter "Entering of text and figures", page 59.
5. Actuate the functional field .



Bitte Schlepper wählen:	Schlepper ändern
→ Schlepper1 : 2 Imp./Undr. Schlepper2 : 6 Imp./Undr. Schlepper3 : 10 Imp./Undr.	neue Imp.
1	
	

Fig. 58



Hint!




Via the functional field  you can change the tractor name for the selected tractor.

4.9.7.3.5 Storage of the alarm limit for the nominal PTO shaft rev. speed



Hint!

An alarm signal sounds during spraying operation when the actual PTO shaft rev. exceeds or falls short the entered nominal PTO shaft rev. speed.

1. Recall via the functional field  the input "Please enter the max. deviation from the upper alarm of the PTO shaft".
2. Enter the max. permissible deviation from the nominal PTO shaft rev. speed, e.g. + 10 % (max. permissible PTO-speed: 540 R.P.M. + 10% = 594 R.P.M.).
3. Actuate the functional field .
4. Repeat the steps 1 to 3 for the functional field , e.g. - 25% (min. permissible PTO shaft rev. speed: 540 R.P.M. - 25% = 405 R.P.M.).





Zapfwellensoll- drehzahl:	540 U/min	 U/min
Impulse pro Zapf- wellenumdrehung:	3 Impulse	 I./U.
		Speicher  
Alarmgrenze:		+% Alarm - 25%

Fig. 59

4.9.7.4 Impulses per 100m



Hint!



- The **AMATRON +** requires the calibration value "Impulses per 100m" to determine the
 - actual forward speed [k.p.h].
 - travelled distance [m] for the actual order.
 - worked area.
- If the calibration value is accurately known you can manually enter the calibration value "Impulses per 100m" into the **AMATRON +**
- If the calibration value is not known you would have to determine the calibration value "Impulses per 100m" via a calibration travel.
- The **AMATRON +** can store the calibration values "Impulses per 100m" for 3 different tractors. Please refer to chapter "Storage of Impulses per 100m for different tractors", page 74. The **AMATRON +** takes over the stored calibration values of the selected tractor.



Important!

- For the accurate conversion of the actual forward speed in [k.p.h], the travelled distance [m] or the worked area in [ha] determine the calibration value "Impulses per 100 m" of the distance sensor.
- As a matter of principle determine the accurate calibration value "Impulses per 100m" via a calibration travel:
 - before the first operation.
 - when using another tractor or after changing the tractor tyre size.
 - in case of deviations between the determined and the actual forward speed / travelled distance.
 - in case of deviations between the determined and the actually worked area.
 - when different soil conditions prevail.
- Determine the calibration value "Impulses per 100m" in relation to the prevailing operational conditions in the field. When the spraying operation is carried out with switched on all wheel drive, switch on for the calibration value determination also the all wheel drive.

4.9.7.4.1 Manual entering of impulses per 100m

1. Recall via the functional field  the input "Please enter impulses per 100m".
2. Manually enter the calibration value "Impulses per 100m". Please refer to chapter "Entering of text and figures", page 59.
3. Recall the functional field  .

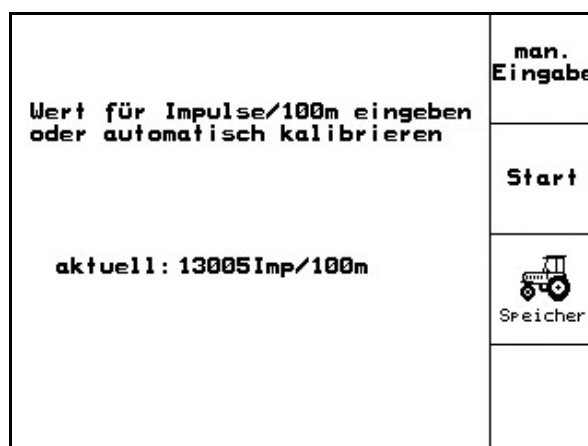


Fig. 60

4.9.7.4.2 Determination of impulses per 100m via a calibration travel

1. Accurately measure out in the field a calibration distance of 100m.
2. Mark the starting and the ending point (Fig. 61).

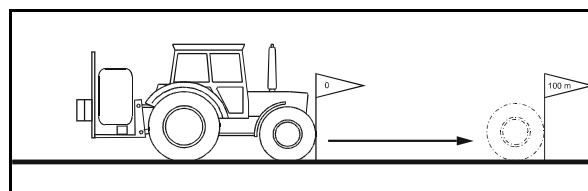




Fig. 61

3. Recall functional field  and start the calibration travel.
4. Travel accurately along the calibration distance from the starting to the ending point.
→ The display shows the continuously determined impulses.
5. Stop accurately at the ending point.
6. Press key  and the calibration procedure is finished.
→ The **AMATRON+** takes over the number of the determined impulses and automatically calculates the calibration value "Impulses per 100m" (in this case 13005 Imp/100m).

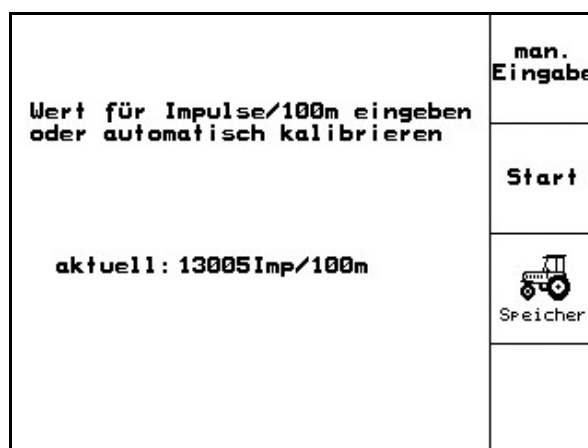







Fig. 62

4.9.7.5 Storage of impulses per 100m for different tractors

1. Recall via the functional field  the entering "Please select tractor."
2. Select the desired tractor. For this see "Selection of options", page 59.
3. Recall via the functional field  the input "Please enter tractor name". If necessary change the tractor name. Please refer to chapter "Entering of text and figures", page 59.
4. Recall the functional field .
5. Recall via the functional field  the input "Please enter impulses per 100m for this tractor".
6. Manually enter the calibration value "Impulses per 100m". Please refer to chapter "Entering of text and figures", page 59.
7. Recall the functional field .




Bitte Schlepper wählen: → Schlepper1 : 13005Imp/100m Schlepper2 : 532Imp/100m Schlepper3 : 2682Imp/100m	Schlepper ändern
	neue Imp.
	

Fig. 63

4.9.7.6 Permanently switch on / off the boom part width sections

1. Select the desired boom part width section which you intend to switch on or off. For this see "Selection of options", page 59.
2. Press key .
→ Opposite the selected part section the word "on" appears (boom section switched on) or "off" (boom section switched off).
3. Repeat the steps 1 and 2, if you intend to switch on/off additional boom sections.
4. Actuate the functional field .
→ The boom sections identified with "off" are permanently switched off during the spraying operation.


Mit den Pfeiltasten die Teilbreite auswählen und mit "Enter" ein- / ausschalten → Teilbreite 1: aus Teilbreite 2: ein Teilbreite 3: ein Teilbreite 4: ein Teilbreite 5: ein	
	


Fig. 64




Hint!

If you intend to operate with this boom section again, you have to switch on the permanently switched off boom section again!

4.9.7.7 Explanations for the function "Selection of individual boom sections"

If the function "Selection of individual boom sections" is switched on a horizontal bar (Fig. 65/1) will additionally appear underneath the boom section in the menu operation. The boom section identified by the horizontal bar (Fig. 65/1) (in this case switched on) can be switched on and off at random via the key , e.g. for spraying weed windows. You can switch on or off any desired

boom section via the key  when you move the horizontal bar (Fig. 65/1) accordingly via the

keys  and .

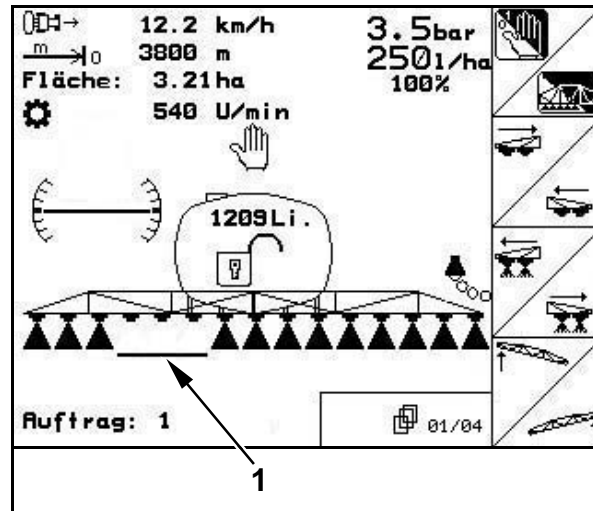




Fig. 65

4.9.7.8 Refill spray cocktail tank with water

With filling level indicator

1. Recall the opposite filling indication via the functional field  in the menu operation or in the menu implement data.
2. Determine the accurate amount of refilling water. Please refer to chapter "Filling with water", page 185.
3. Enter the alarm limit for the max. spray cocktail filling level to be refilled (in this case 1801 litres).
 - When refilling the spray cocktail tank an alarm signal sounds as soon as the spray cocktail filling level has reached this alarm limit. Monitoring the refilled amount of spray cocktail helps to avoid unnecessary residual amounts when you adapt the alarm limit accurately to the calculated refilling quantity.
4. Filling the spray cocktail tank via the filling port with water.
 - During the filling procedure the refilled quantity of water is determined and shown opposite the word "refilled:" (in this case 355 litres).
5. Finish the filling procedure at the latest when the alarm signal sounds.
6. Actuate the functional field , to take the value for the actual filling level in the spray cocktail tank over into the **AMATRON+** (in this case 1352 litres).
 - With this actual filling level the **AMATRON+** calculates the remaining distance with can be sprayed which the new tank filling.

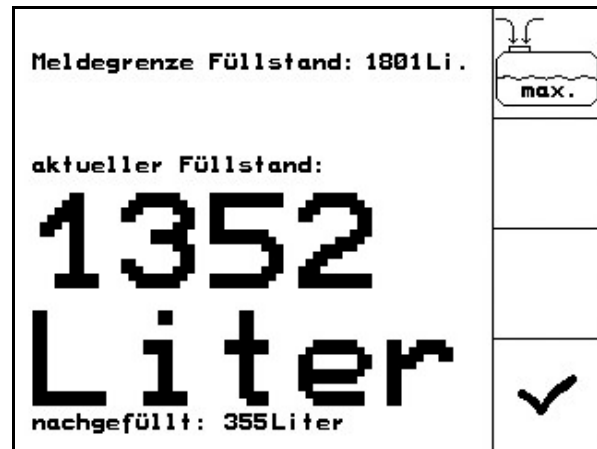




Fig. 66

Without filling level indicator

1. Recall the opposite filling indication via the functional field  in the menu operation or in the menu implement data.
 2. Determine the accurate amount of refilling water. Please refer to chapter "Filling with water", page 185.
 3. Fill the spray cocktail tank via the filling port with water.
 4. Read the actual filling level from the filling level indicator.
 5. Enter the value for the actual filling level. Please refer to chapter "Entering of text and figures", page 59.
 6. Actuate the functional field , to take the value for the actual filling level in the spray cocktail tank over into the **AMATRON +**.
- With this actual filling level the **AMATRON +** calculates the remaining distance with can be sprayed with the new tank filling.

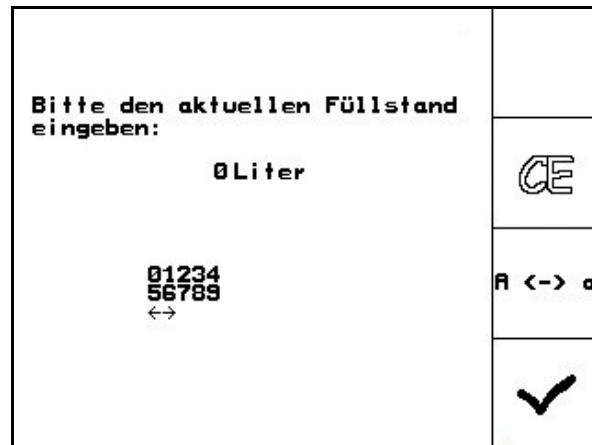
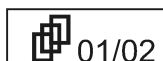


Fig. 67

4.9.8 Menu setup



The menu setup provides


- the input and output of diagnosis data for the service staff for maintenance or in case of troubles.
- the change of settings for the display.
- the recalling and entering of implement basic data or the switching on or off of special options (for the service staff only).





The first page shows the total data since the operation has been started for

- worked total area in [ha].
- totally sprayed spray cocktail in [litres].
- total spraying operation of the field sprayer in [h].

- The function fields  and  are provided for the input and output of diagnosis data and are reserved for the customer service only.

- Recall via the functional field  the input for a simulated speed "sim. k.p.h" in case of a defect distance sensor. Please refer to chapter "Entering simulated speed", page 79.

- Recall via the functional field  the sub-menu implement basic data. Please refer to chapter "Entering machine basic data", page 80.

- Recall via the functional field  the Terminal-Setup. Please refer to chapter "Terminal-Setup", page 84.




		→ 00110
		← 00110
Gesamt Daten seit Inbetriebnahme		km/h sim.
Gesamtfläche:	12368 ha	
Gesamtliter:	3695 Li.	
Gesamtspritzzeit:	1241 h	
sim.km/h:	0.0 km/h	
MHX-Version: 2.2.9 MHX-Version: 2.1.9 IOP-Version: 2.4.6 RM-Geste/RG-429		 
01/02		Setup

Fig. 68

Recall via the functional field  the function RESET. The actuation of the function RESET deletes all entered and determined data (orders, machine data, calibration values, Setup data). Resetting **AMATRON+** resets all settings to the factory settings.



Hint!

Please take down

- Impulses per litre.
- Impulses per 100m.
- Impulses per PTO shaft rev. speed.
- Order data.

Renewed enter all machine basic data.

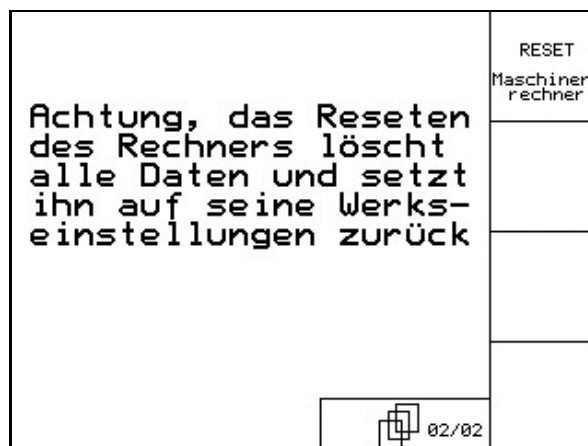





Fig. 69

4.9.8.1 Entering simulated speed (in case of defect distance sensor)



Hint!

The entering of a simulated speed allows to continue the spraying operation when the distance sensor is defect. As soon as the **AMATRON+** receives impulses from the distance sensor again, the **AMATRON+** uses these impulses for the forward speed / distance calculation.

1. Pull the signal cable off the tractor basic equipment.
2. Recall via the functional field  the input "Please enter simulated speed". Enter, e.g. a simulated speed of 8.0 k.p.h. Please refer to chapter "Entering of text and figures", page 59.
3. Recall the functional field .
→ The inverted speed symbol  appears in the operational menu.



Important!

Maintain this entered speed (e.g. 8.0 k.p.h) accurately for the spraying operation, because the spray rate control is always related to this entered speed.

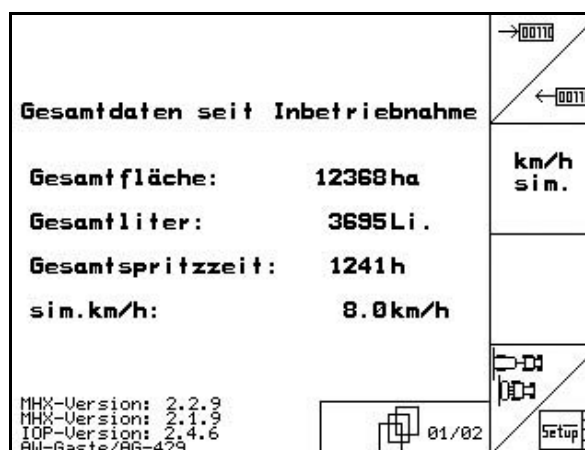







Fig. 70

4.9.8.2 Entering machine basic data

 01/04

1. Recall via the functional field  the function "Select machine type", please refer to chapter "Select machine type", page 82.
2. Recall via the functional field  the function "Select boom folding" please refer to chapter "Select boom folding", page 82.
3. Select the tank size via the functional field . The function key allows to select the tank sizes 1501 litres, 1801 litres, 4200 litres, and 5200 litres.
4. Recall via the functional field  the function "Configuration of filling level indicator", please refer to chapter "Configuration of filling level indicator", page 83.

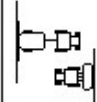









Maschinentyp:	UF klein	
Gestängety:	Profi II	 Typ
Behältergröße:	1801 Liter	
Füllstandsmelder konfigurieren		
		 01/04 konfig.

Fig. 71

 02/04

5. Recall via the functional field  the input "Please enter working width". Enter the working width of your sprayer boom. Please refer to chapter "Entering of text and figures", page 59.
6. Recall via the functional field  the input "Please enter number of boom sections". Enter the number of boom sections of your sprayer boom. Please refer to chapter "Entering of text and figures", page 59.
7. Recall via the functional field  the function "Nozzles per boom section", please refer to chapter "Entering nozzles per boom section", page 84.
8. Via the functional field  select the number of existing flow meters.
→ In the display either the figure "1" (1 flow meter) or the figure "2" (1 flow meter and 1 return flow meter) appears.








Arbeitsbreite:	24.00 m	 m
Anzahl der Teilbreiten:	5	 Anzahl
Düsen pro Teilbreite		Düsen pro Teilbreite
Anzahl der Durchflussmesser:	2	 n ?
		 02/04


Fig. 72


03/04

9. Recall via the functional field  the input "Please enter the value for the pressure control constant". Enter the value for the pressure control constant. Please refer to chapter "Entering of text and figures", page 59.


10. Via the functional field  the "Off centre nozzles" are switched on and off.
→ In the display appears either the word "on" (off centre nozzles existing and switched on) or "off" (no off centre nozzles existing or switched off).






11. Via the functional field  the "Foam marker" is switched on and off.

12. Via the functional field  the "Comfort package" is switched on and off.

13. Via the functional field  the "Multiple nozzle access" is switched on and off.


04/04

14. Via the functional field  the special optional equipment "Distance Control" is switched on and off.

Druckregelkonstante:	10.0	
Kantdüsen:	ein	
Schaummarkierung:	ein	
Komfortpaket:	aus	
Mehrfachdüsenansteuerung:	aus	

03/04



Fig. 73

Distance Control:	aus	
		Dist. Control

04/04

Fig. 74



4.9.8.2.1 Selection of machine type

1. Select the desired machine type. For this see "Selection of options", page 59.
2. Press key .
→ At the side of the selected machine type a tick appears (Fig. 75/1).
3. Actuate the functional field , to take the selected machine type over into the **AMATRON+**.

Maschinentyp auswählen und mit Eingabetaste übernehmen	
→ UF klein	✓
UG klein	
UX klein	
	1
	✓

Fig. 75


4.9.8.2.2 Selection of the boom folding


1. Select the existing boom folding. For this see "Selection of options", page 59.
2. Press key .
→ At the side of the selected boom folding a tick appears (Fig. 76/1).
3. Actuate the functional field , to take the selected boom folding over into the **AMATRON+**.

Gestängeklappung wählen und mit Eingabetaste übernehmen	
elektr. Neigungsv.	
Profi 0	
Profi I	
→ Profi II	✓
Profi III	
BBG I	
keine Neigungsv.	1
	✓

Fig. 76

4.9.8.2.3 Configuration of the tank filling level indicator

1. Via the functional field  the equipment "Filling level indicator" is switched on and off.
→ In the display appears either the word "on" (filling level indicator existing and switched on) or "off" (no filling level indicator existing or switched off).

2. Recall via the functional field  "Calibration filling level indicator", please refer to chapter "Calibration filling level indicator", page 83.

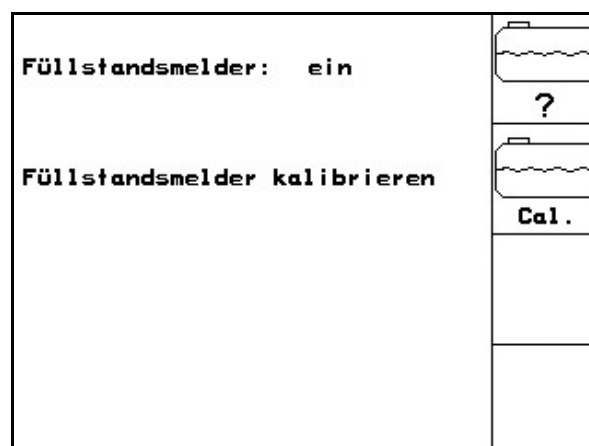



Fig. 77

4.9.8.2.4 Calibration filling level indicator

1. Fill an exactly defined quantity of water (min. 500 litres) into the spray cocktail tank.
2. Recall via the functional field  the input "Please enter the actual filling level". Please enter the accurate value for the quantity of water filled into the spray cocktail tank.

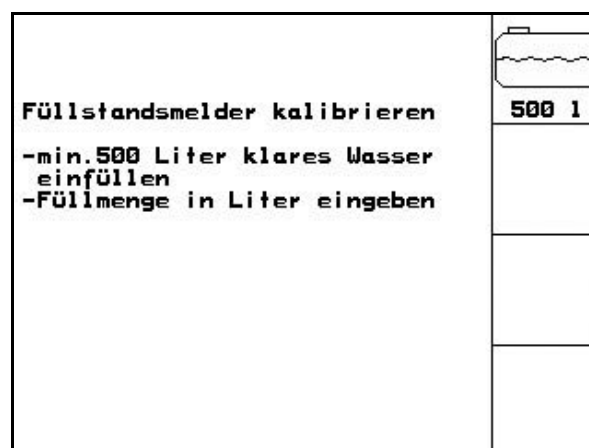


Fig. 78

4.9.8.2.5 Enter nozzles per boom part section



The numbering of the boom sections for the spray line is carried out from outer left hand side to outer right hand side. See Fig. 79.

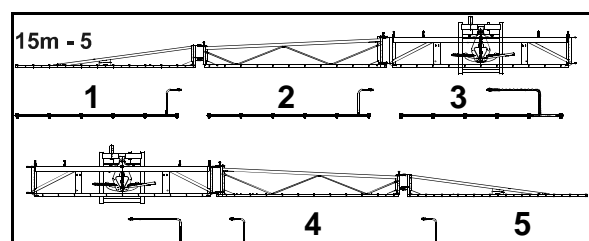




Fig. 79

1. Select the desired boom part width section.
For this see "Selection of options", page 59.
2. Press key .
→ The display changes to the entering "Please enter number of nozzles for boom section 1".
3. Enter the number of nozzles for boom section 1 for your spray line. Please refer to chapter "Entering of text and figures", page 59 and chapter "Spray lines", page 133.
4. Repeat the steps 1 to 3 until you have entered the number of nozzles for all boom sections.
5. Actuate the functional field , to take the number of nozzles for the individual boom sections over into the **AMATRON+.**

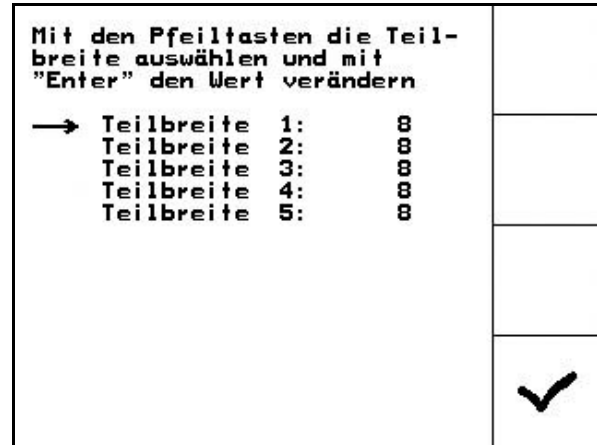



Fig. 80

4.9.8.2.6 Terminal-Setup

1. Recall via the functional field  the entering "Display settings".

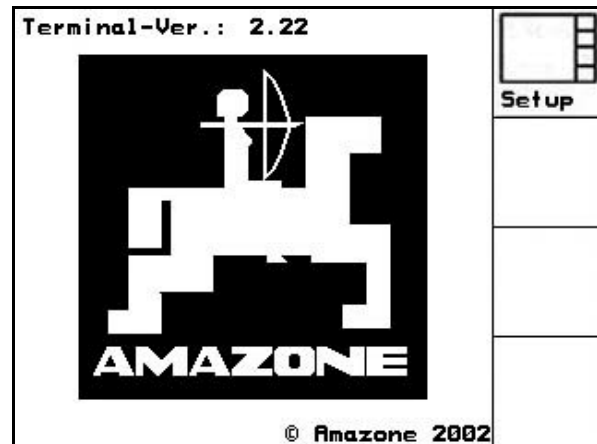









Fig. 81

Via the entering "Display setting" you can change:

- the contrast via the functional fields  or .
- the brightness via the functional fields  or .
- inverting the display black ← → white via the functional field .
- deletion of the stored data via the functional field . Please refer to chapter "Menu setup", page 79.
- the language of the operator terminal via the functional field .

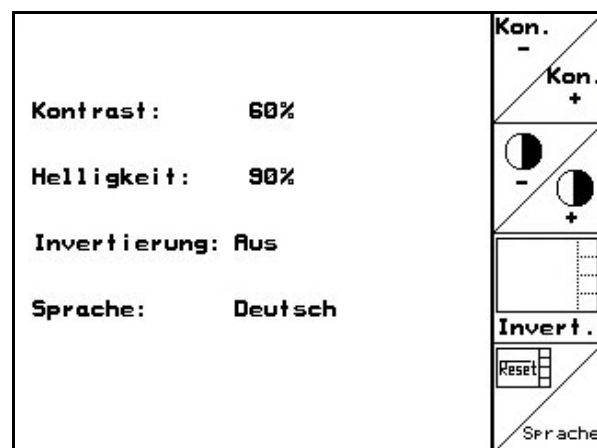


Fig. 82

Assembly and function



Important!

The actuation of the function Terminal-Reset resets all data of the terminal to the factory settings. No machine data get lost.

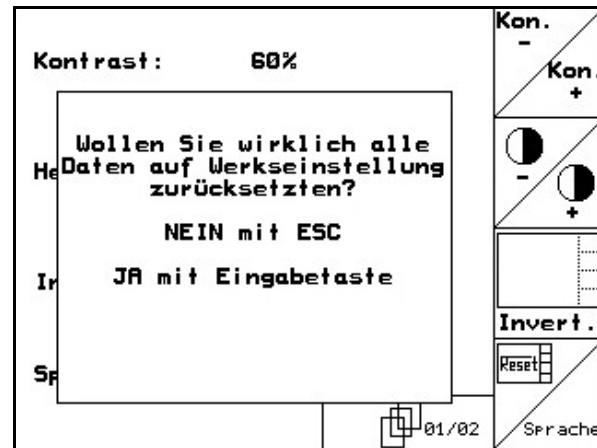


Fig. 83

4.9.9 Menu operation



Hint!

Fig. 84 explains the meaning of the individual symbols in the menu operation.

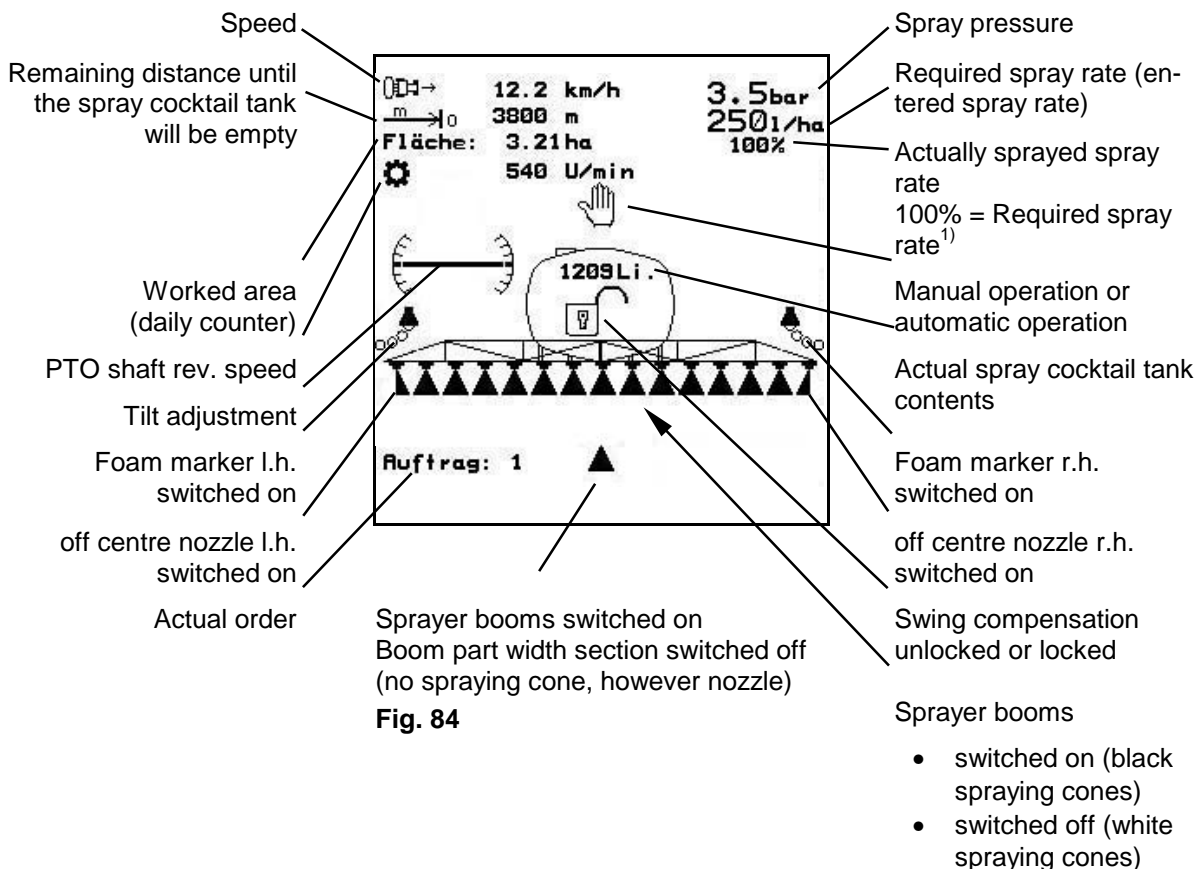


Fig. 84

¹⁾ If during spraying operation you change the spray rates via the keys or , this symbol informs you about the selected deviation from the required spray rate.

4.9.9.1 Explanation for the individual functional fields for the different sprayer boom types



Hint!



Depending on the selected sprayer boom type different functional fields for the sprayer boom actuation appear in the menu operation. The following chapters explain the individual functional fields for the different sprayer boom types.

4.9.9.1.1 Automatic or manual operation




Hint!

When the automatic operation is switched on the symbol "Auto" (Fig. 85/1) appears in the display. The implement computer controls the spray rates in relation to the actual forward speed.

When the manual operation is switched on the symbol "Hand" (Fig. 86/1) and in addition the indication [l/min] (Fig. 86/2) appears in the display. Manually control the spray rates by changing the spray pressure via the keys  or .

The manual operation is not suitable for the spraying operation but only for maintenance and cleaning work.

The function automatic or manual operation is set via the functional field .

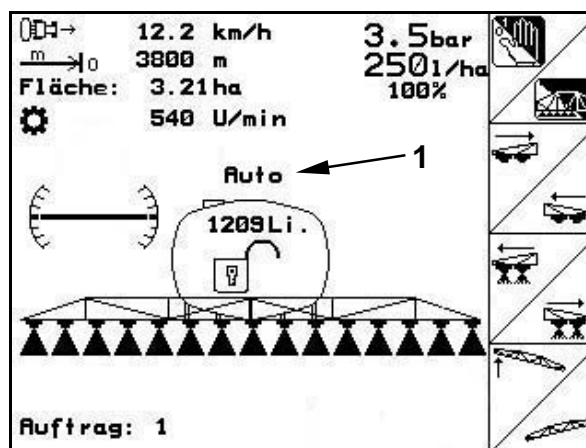


Fig. 85

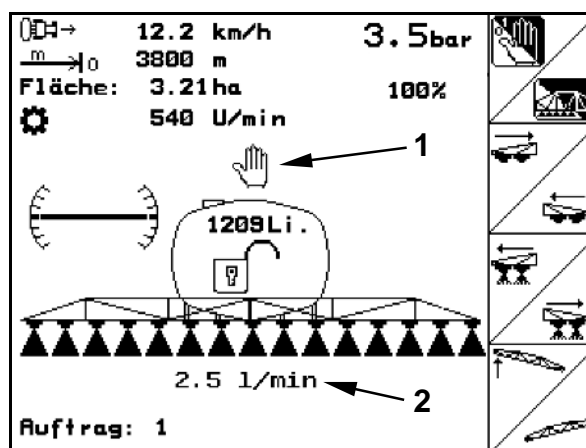


Fig. 86

Assembly and function

4.9.9.1.2 Sprayer booms with electric boom tilting

- Automatic- (Auto) or manual operation ().
- Sprayer booms switching on and off.
- Switch off boom part width sections beginning on the left hand side.
- Switch off boom part width sections beginning on the right hand side.
- Switch on boom part width sections beginning on the left hand side.
- Switch on boom part width sections beginning on the right hand side.
- Lift sprayer boom left hand side.
- Lift sprayer boom right hand side.

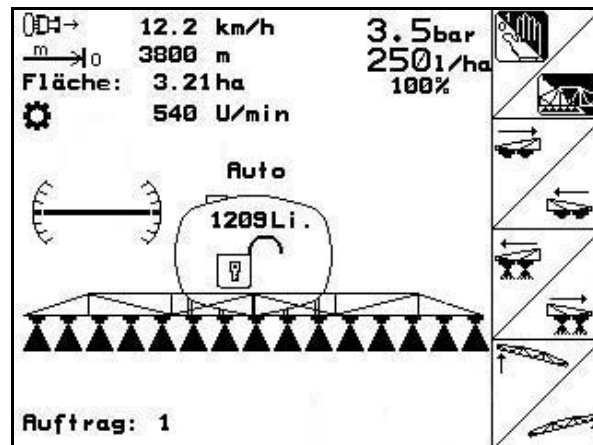


Fig. 87

Pressed shift key :

- Spray cocktail tank refilling quantity.
- Mirroring the tilt adjustment at the headlands (slope mirroring). Please refer to chapter "Mirroring tilt adjustment (slope mirroring)", Q-plus-boom - page 115 or Super-S-booms - page 127.

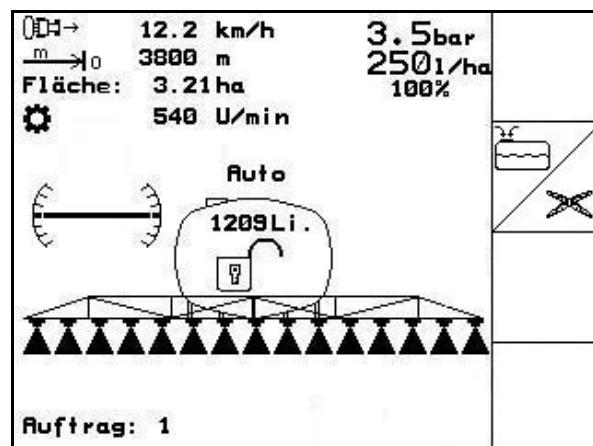











Fig. 88

4.9.9.1.3 Sprayer booms with boom folding Profi I

01/02

-  Automatic- (Auto) or manual operation ().
-  Sprayer booms switching on and off.
-  Switch off boom part width sections beginning on the left hand side.
-  Switch off boom part width sections beginning on the right hand side.
-  Switch on boom part width sections beginning on the left hand side.
-  Switch on boom part width sections beginning on the right hand side.
-  Lift sprayer boom left hand side.
-  Lift sprayer boom right hand side.

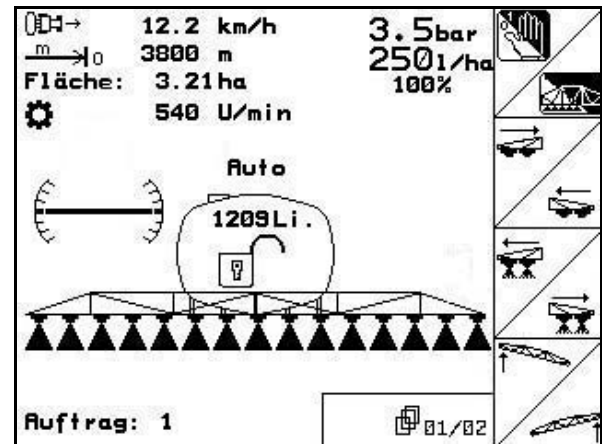





Fig. 89

Pressed shift key  :

-  Lower sprayer boom.
-  Lift sprayer boom.
-  Mirroring the tilt adjustment at the headlands (slope mirroring). Please refer to chapter "Mirroring tilt adjustment (slope mirroring)", Q-plus-boom - page 115 or Super-S-boom - page 127.

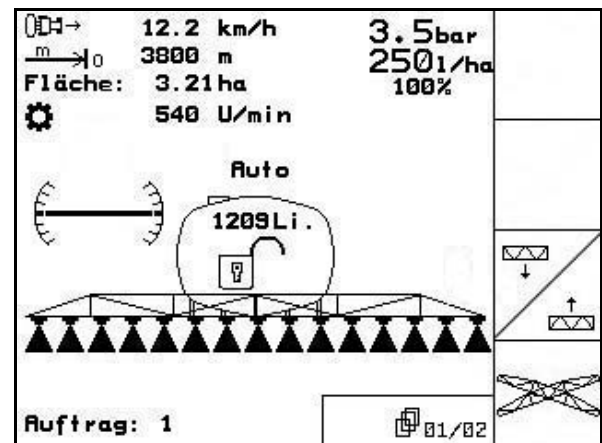








Fig. 90

02/02

- 
 Fold in both boom sides.
- 
 Fold out both boom sides.
- 
 Lower sprayer boom.
- 
 Lift sprayer boom.
- 
 Spray cocktail tank refilling quantity.
- 
 Locking and unlocking the boom swing compensation.

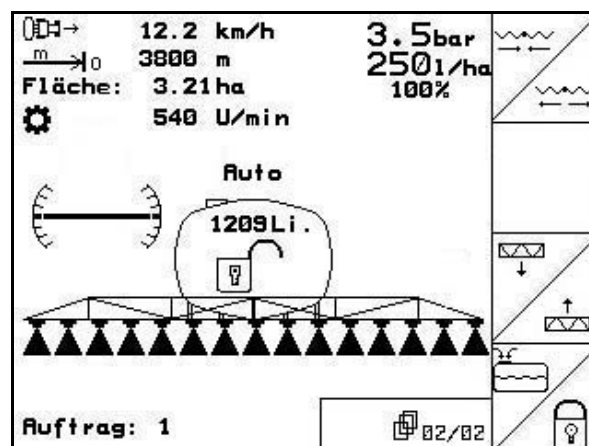







Fig. 91

Pressed shift key  :

- 
 Fold out left hand boom side.
- 
 Fold out right hand boom side.
- 
 Fold in left hand boom side.
- 
 Fold in right hand boom side.
- 
 Locking and unlocking the boom swing compensation.

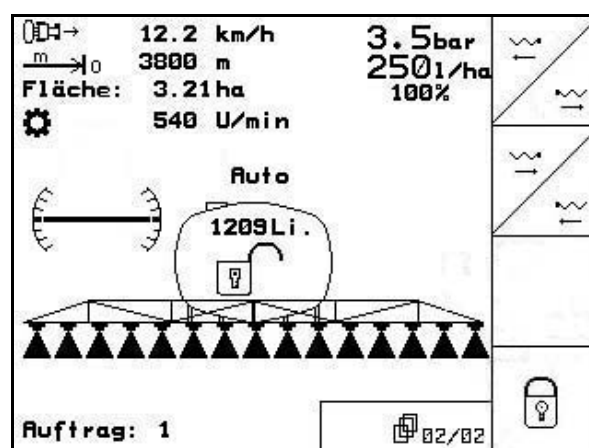












Fig. 92

4.9.9.1.4 Sprayer booms with boom folding Profi II

 01/03

-  Automatic- (Auto) or manual operation ().
-  Sprayer booms switching on and off.
-  Switch off boom part width sections beginning on the left hand side.
-  Switch off boom part width sections beginning on the right hand side.
-  Switch on boom part width sections beginning on the left hand side.
-  Switch on boom part width sections beginning on the right hand side.
-  Lift sprayer boom left hand side.
-  Lift sprayer boom right hand side.

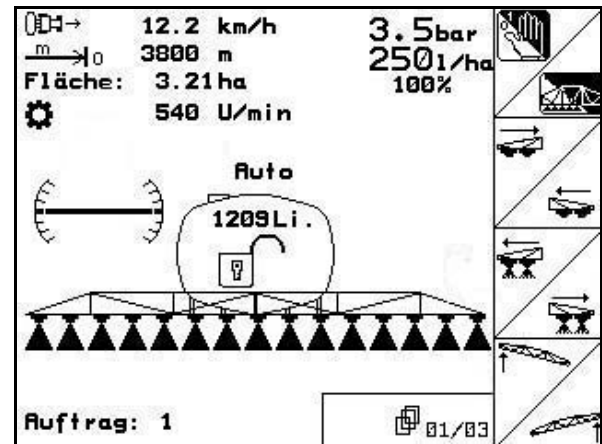





Fig. 93

Pressed shift key  :

-  Lower sprayer boom.
-  Lift sprayer boom.
-  Mirroring the tilt adjustment at the headlands (slope mirroring). Please refer to chapter "Mirroring tilt adjustment (slope mirroring)", page 127.

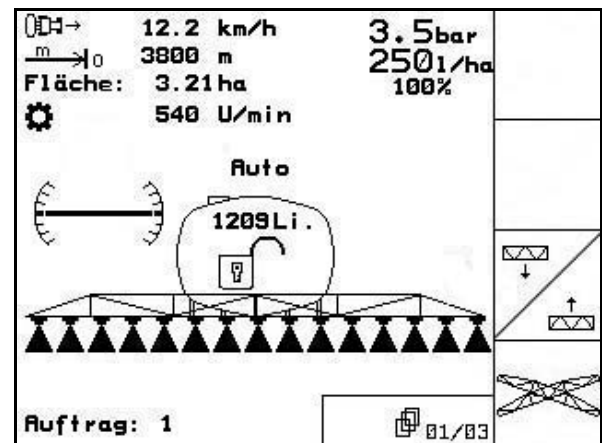










Fig. 94

-  Angle up left hand boom side.
-  Angle up right hand boom side.
-  Angle down left hand boom side.
-  Angle down right hand boom side.
-  Lower sprayer boom.
-  Lift sprayer boom.
-  Spray cocktail tank refilling quantity.
-  Locking and unlocking the boom swing compensation.

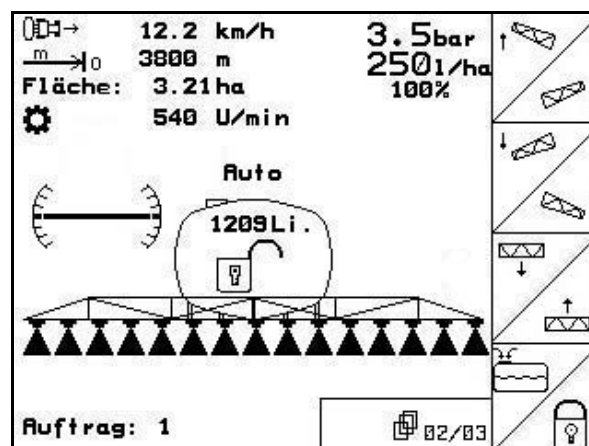







Fig. 95

Pressed shift key  :

-  Fold out left hand boom side.
-  Fold out right hand boom side.
-  Fold in left hand boom side.
-  Fold in right hand boom side.
-  Locking and unlocking the boom swing compensation.

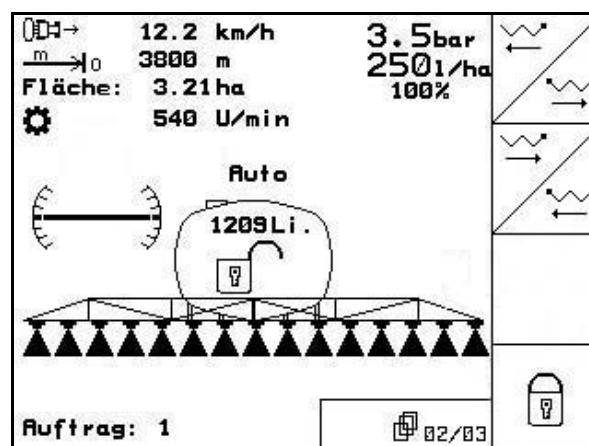










Fig. 96

 03/03

-  Fold in both boom sides.
-  Fold out both boom sides.
-  Angle down both boom sides.
-  Angle up both boom sides.
-  Lower the sprayer booms with the aid of the height adjustment.
-  Lift the sprayer booms via the height adjustment.
-  Locking and unlocking the boom swing compensation.

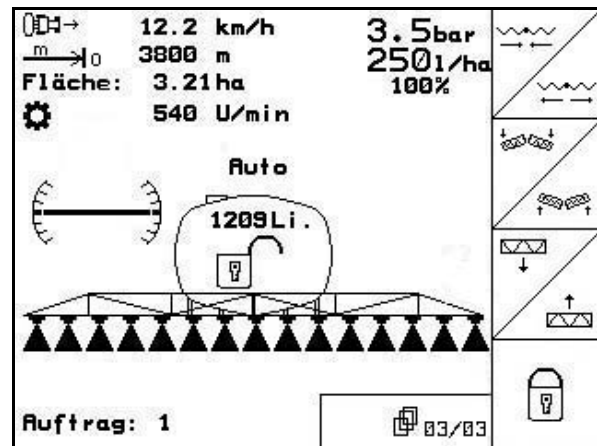


Fig. 97

Assembly and function

4.9.9.1.5 Sprayer booms with boom folding Profi III

01/02

- Automatic- (Auto) or manual operation ().
- Sprayer booms switching on and off.
- Switch off boom part width sections beginning on the left hand side.
- Switch off boom part width sections beginning on the right hand side.
- Switch on boom part width sections beginning on the left hand side.
- Switch on boom part width sections beginning on the right hand side.
- Lift sprayer boom left hand side.
- Lift sprayer boom right hand side.

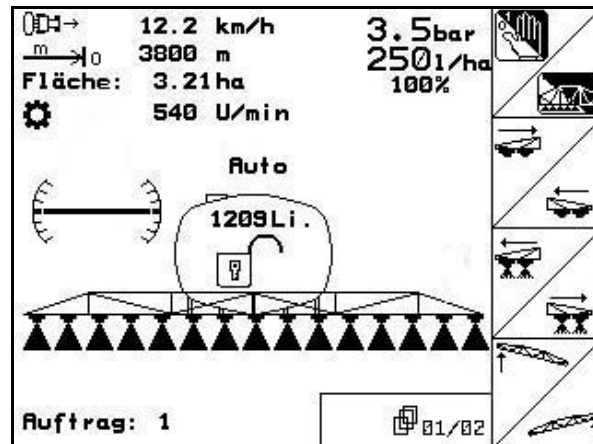


Fig. 98

Pressed shift key :

- Lower sprayer boom.
- Lift sprayer boom.
- Mirroring the tilt adjustment at the headlands (slope mirroring). Please refer to chapter "Mirroring tilt adjustment (slope mirroring)", page 127.

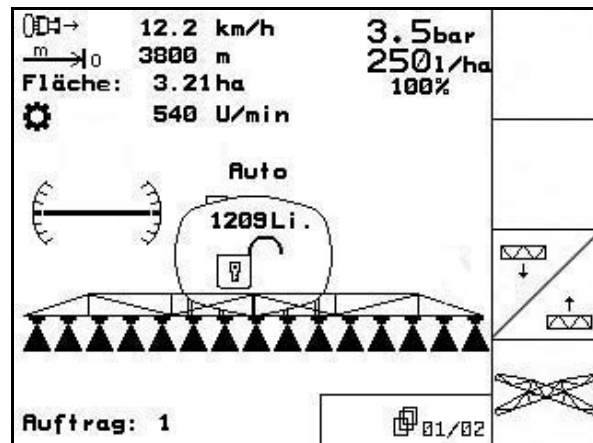











Fig. 99

 02/02

-  Angle up left hand boom side.
-  Angle up right hand boom side.
-  Angle down left hand boom side.
-  Angle down right hand boom side.
-  Lower sprayer boom.
-  Lift sprayer boom.
-  Spray cocktail tank refilling quantity.
-  Locking and unlocking the boom swing compensation.

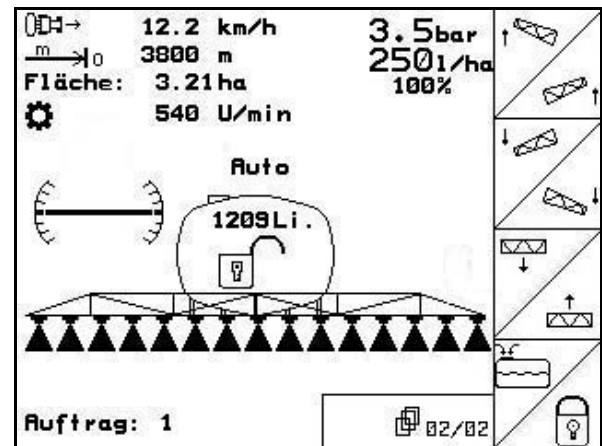








Fig. 100

Pressed shift key  :

-  Fold in both boom sides.
-  Fold out both boom sides.
-  Angle down both boom sides.
-  Angle up both boom sides.
-  Lower sprayer boom.
-  Lift sprayer boom.

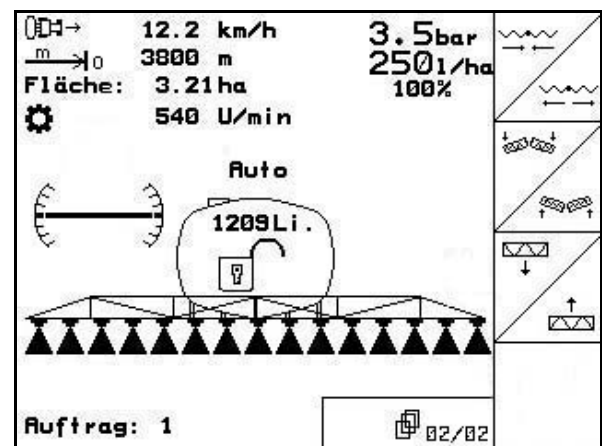


Fig. 101

4.10 Sprayer booms

The application accuracy of the spray liquid is considerably influenced by the proper condition of the sprayer boom as well as its mounting. By correctly setting up the spray 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!

- Lock the boom swing compensation in transport position
 - for transporting the sprayer!
 - when folding or unfolding the booms!
- Before folding the booms in or out all persons should leave the folding area of the boom!
- Never fold the boom in or out while moving!
- Avoid any crushing and bruising points at all the hydraulically actuated folding sections!



Important!

- 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.
- 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 will only be achieved with
 - the swing compensation unlocked
 - and the boom side sections symmetrically folded out.

4.10.1 Q-plus-boom up to 15 m working width, fully hydraulically folded (incl. boom swing compensation and hydraulic height adjustment)

Overview - Q-plus-boom

Fig. 102/...

- (1) Boom carrier frame for height adjustment of the sprayer boom.
- (2) Single acting hydraulic height adjustment ram; allow the setting of the spraying height of the boom (3).
- (3) Boom centre.
- (4) Lock/unlock on the swing compensation; is maintenance free and takes care of a steady boom ride.
- (5) Swivel arm.
- (6) Self-levelling tensioning springs for parallel boom alignment.
- (7) Shock absorber.
- (8) Automatic boom transport securing; locks the folded booms automatically when the boom is lowered down onto the stops.

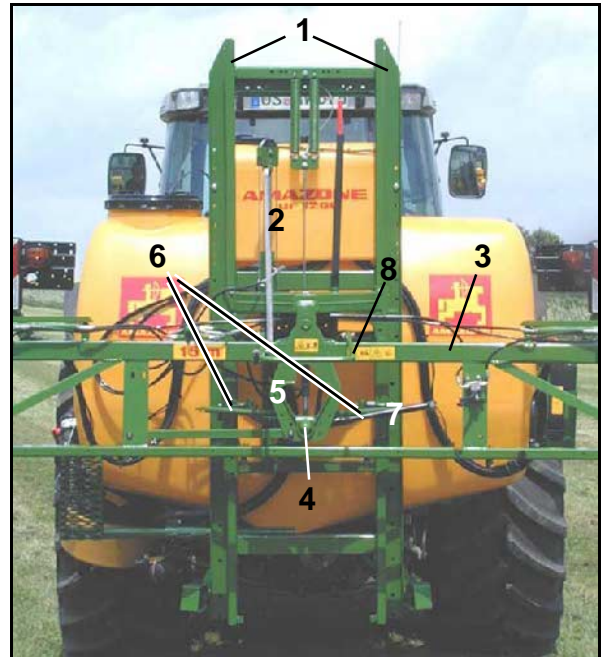


Fig. 102

Boom safety release at obstacles

The collision guard protects the sprayer boom from damage when the outer boom ends hit firm obstacles. The plastic trips (Fig. 103/1) allow the giving way of the outer boom sections into or against the driving direction pivoting around the hinge point (Fig. 103/2) and after clearing any obstacle the booms will automatically return to the operating position.

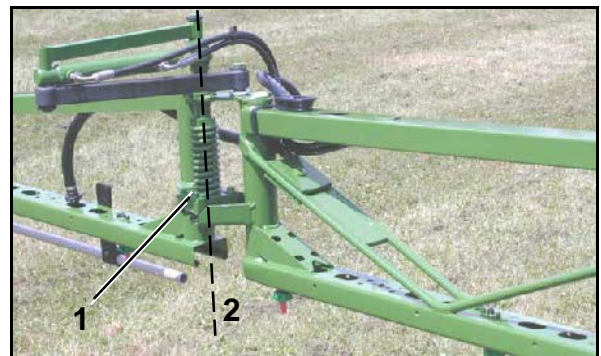


Fig. 103



Hint!

All operational speeds of the hydraulic functions can be set via the hydraulic throttle valves. Please refer to chapter "Setting the hydraulic throttle valves", page 106.

Fig. 104/...

- (1) Hydraulic hoses for boom folding in and out.
- (2) Hydraulic hose with block tap for the hydraulic height adjustment. The hydraulic height adjustment is lockable by the block tap at any height of the boom.

Required on tractor:

- 1 single acting control valve for the boom height adjustment.
- 1 dual acting control valve for folding booms in or out.



Important!

Shut the block tap on the height adjustment before coupling or uncoupling the plug from the tractor hydraulic socket!

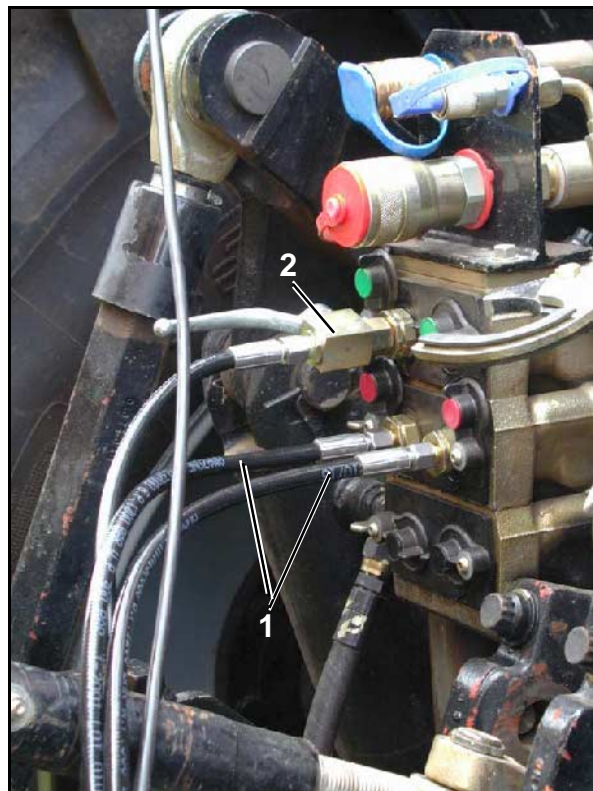


Fig. 104

4.10.1.1 Unlocking and locking the transport securing



Important!

Before any transport lock the folded boom package via the transport securing in the transport position!

Unlocking the transport securing

1. Open the block tap for the hydraulic height adjustment.
 2. Lift the folded boom package via the height adjustment until the automatic transport securing device (Fig. 105/1) releases the locked package (height approx. 2/3 of the boom carrier length).
- The transport securing device unlocks the sprayer boom from the transport position and the sprayer boom can be unfolded.

Fig. 105 shows the unlocked transport securing



Fig. 105

Locking the transport securing

1. Open the block tap for the hydraulic height adjustment.
 2. Lower the folded boom package via the height adjustment until the automatic transport securing (Fig. 106/1) locks the boom package (the distance from the lower edge of the boom carrier until the lower edge of the sprayer boom is only approx. 30 cm).
- The transport securing device locks the sprayer boom in the transport position and prevents an unintended unfolding of the folded boom package.
3. Shut off the block valve for the hydraulic height adjustment.
- In this way the height adjustment is locked and prevents an unintended unlocking of the transport securing device (Fig. 106/1).

Fig. 106 shows the locked transport securing



Fig. 106

4.10.1.2 Folding the sprayer booms in or out



Warning!

- When folding in and out the sprayer booms, implicitly observe the hints in the preface for chapter "Sprayer boom" on page 95.
- Never put the double acting control valve on the tractor that actuates the boom folding into the "float position".



Hint!

- The hydraulic rams used for the boom folding keep the boom in its corresponding final position (either in transport or working position).

Folding out the sprayer boom

The folded boom package is in the locked transport position

1. Open the block tap for the hydraulic height adjustment.
2. Unlock the transport securing device. Please refer to chapter "Unlocking the transport securing", page 98.
3. Hold the control lever of the dual acting control valve in position "folding out" until
 - the individual segments have been folded out entirely and
 - the swing compensation has been unlocked.



Hint!

- During the unfolding procedure, the right hand boom folds out first and then the left hand one.
- The swing compensation is unlocked when the green section on the unlock/lock tube can be seen.
- The corresponding hydraulic rams lock the boom in operation position.

4. Setting the sprayer boom height can then be done via the height adjustment ram.
5. Shut off the block valve for the hydraulic height adjustment.
→ Now the height adjustment is locked and the set sprayer boom height can be accurately maintained.

Folding in the sprayer boom

1. Open the block tap for the hydraulic height adjustment.
2. Lift the sprayer boom via the height adjustment into a medium height position.
3. Set boom tilt adjustment to pos. "0" (if available).
4. Hold the control lever of the double acting control valve in the position "fold in" until all the boom sections of the two booms are fully folded.



Hint!

- During the folding in procedure the left hand boom folds in first and then the right hand one.
- Before folding the booms automatically lock the swing compensation. When the swing compensation is locked the display of **AMATRON +** shows a closed lock. Please refer to chapter "Unlocking and locking the swing compensation", page 101.

-
5. Lock the transport securing. For this please refer to chapter "Locking the transport securing", page 98.

Assembly and function

4.10.1.3 Unlocking and locking the swing compensation

Unlocking the swing compensation (Fig. 107/1)



Hint!

- An even lateral distribution will only be achieved with the swing compensation unlocked.
- The swing compensation is unlocked (Fig. 107/1), when the display of **AMATRON+** shows the open lock symbol (Fig. 108/2).

1. During the unfolding procedure of the sprayer boom keep the actuation lever of the double acting control spool valve for approx. 5 seconds in position "unfold" after the boom has been unfolded entirely.

→ The swing compensation (Fig. 107/1) is unlocked and the unfolded sprayer boom can freely swing against the boom carrier. For better demonstration the guard of the swing compensation has been removed.



Fig. 107

When the swing compensation is unlocked the display of **AMATRON+** shows the open lock symbol (Fig. 108/1).

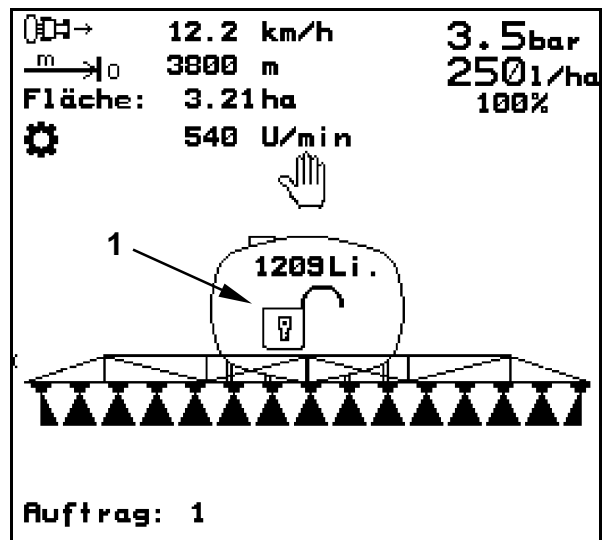


Fig. 108

Locking the swing compensation (Fig. 109/1)



Hint!

- The swing compensation is automatically locked before folding in the booms.
- The swing compensation is locked (Fig. 109/1), when the display of **AMATRON** + shows the closed lock symbol (Fig. 110/1).



Fig. 109

When the swing compensation is unlocked the display of **AMATRON** + shows the closed lock symbol (Fig. 110/1).

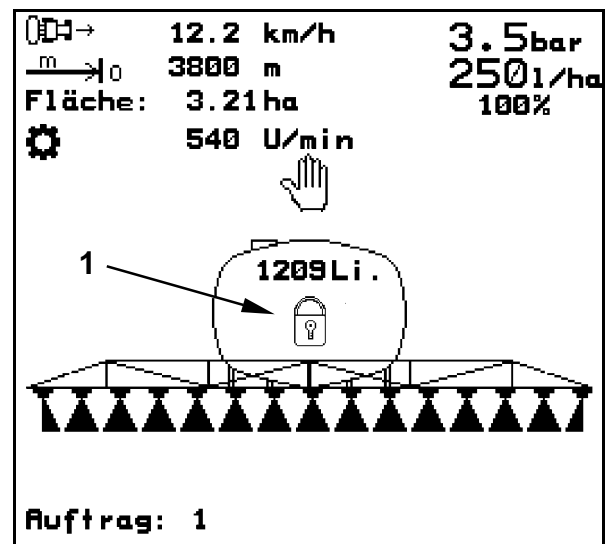


Fig. 110

4.10.1.4 Operation with one side folded out sprayer boom



Hint!

The operation with one side folded out sprayer boom is only permissible

- with the swing compensation locked.
- for the brief passing of obstacles (tree, pylon etc.).



Important!

- Lock the swing compensation before the one side boom folding.
When the swing compensation has not been locked the sprayer boom can swing to one side. If the unfolded boom hits the ground the sprayer boom might get damaged.
- During spraying operation clearly reduce the forward speed. In this way you avoid a swing build up and ground contact of the sprayer boom when the swing compensation is locked. At an uneven sprayer boom ride an even lateral distribution is no longer ensured.

Only folding out the right hand boom

The sprayer booms are completely folded out

1. Fold in the left hand boom completely.
To do this, keep the actuating lever of the double acting control device in position "folding in" until the individual segments of the left hand boom side are entirely folded in.



Hint!

Before folding in the left hand boom side lock the pendulum compensation.

2. Adjust the spraying height of the sprayer boom in such a way that the spacing between sprayer boom and ground surface is at least 1 m.
→ The automatic transport securing device locks the folded, left hand boom side.
3. Shut off the block valve for the hydraulic height adjustment.
4. Switch off the boom part width sections of the left hand side boom.
5. During spraying procedure clearly reduce the forward speed.
6. Unlock the automatic transport securing device again before you unfold the left hand side boom again. Please refer to chapter "Unlocking the transport securing", page 98.

Only folding out the left hand boom

The sprayer booms are completely folded out

1. Lift the sprayer boom via the height adjustment right up to the end position.
→ In this way the switching logic of the boom folding is changed.
2. Entirely fold in the right hand boom side.
To do this, keep the actuating lever of the double acting control device in position "folding in" until the individual segments of the right hand boom side are entirely folded in.

**Hint!****Before folding in the right hand boom side lock the pendulum compensation.**

-
3. Adjust the spraying height of the sprayer boom in such a way that the spacing between sprayer boom and ground surface is at least 1 m.
→ The automatic transport securing device locks the folded, right hand side boom.
 4. Shut off the block valve for the hydraulic height adjustment.
 5. Switch off the boom part width sections of the right hand side boom.
 6. During spraying procedure clearly reduce the forward speed.
 7. Unlock again the automatic transport securing device before you unfold again the right hand side boom. Please refer to chapter "Unlocking the transport securing", page 98.

**Important!****Before you entirely fold in the two boom sides into a package unfold again the one side folded right hand boom.**

4.10.1.5 Setting the hydraulic throttle valves

The speed for the actuation of the individual hydraulic functions (folding in and out the booms, locking and unlocking the swing compensation, etc.) on the relevant hydraulic throttle valves (Fig. 111 is factory set Fig. 112). However, depending on the tractor, it may be necessary to adjust this setting.

By screwing in or out the Allen key headed set 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 key headed set screw.
- Increasing the actuating speed = screw out the Allen key headed set screw.

Fig. 111/ ... or Fig. 112/ ...

- (1) Hydraulic throttle valve - folding out boom.
- (2) Hydraulic throttle valve - locking and unlocking the swing compensation.
- (3) Hydraulic throttle valve - fold in left hand boom.
- (4) Hydraulic throttle valve - fold in right hand boom.
- (5) Hydraulic connection - height adjustment (the throttle valve is located on the left hand hydraulic ram of the height adjustment).



Fig. 111



Important!

For correcting the actuating speed for boom folding, always alter all three hydraulic throttle valves (Fig. 111/1 and Fig. 111/3) equally.

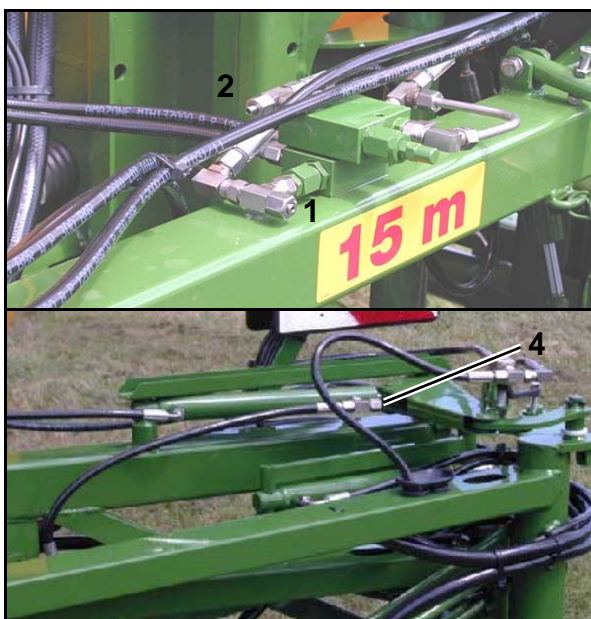


Fig. 112



4.10.1.6 Settings on the folded out boom

Alignment parallel with the ground

The sprayer boom, when folded out should be parallel with the ground and then all spraying nozzles should have the same parallel distance to the ground.

If this is not the case, fold out the boom, **unlock** the swing compensation and align the boom via the counter weights (Fig. 113/1). Attach the counter weights properly on the sprayer boom.

Horizontal alignment

Seen in driving direction all boom sections must be aligned.

A horizontal alignment may be necessary

- after a prolonged period of use
- or after a rough contact with the ground.

Inner boom section

1. Slacken the counter nut of the setting bolt (Fig. 114/1).
2. Revolve the setting screw against the stops until the inner boom section is in line with the boom centre section.
3. Retighten counter nut.

Outer boom section

1. Slacken the bolts (Fig. 113/2) on the bracket (Fig. 113/3). The alignment is achieved by adjusting the plastic claw (Fig. 113/4) via the slotted holes of the bracket.
2. Align the boom section.
3. Re-tighten bolts (Fig. 113/2).

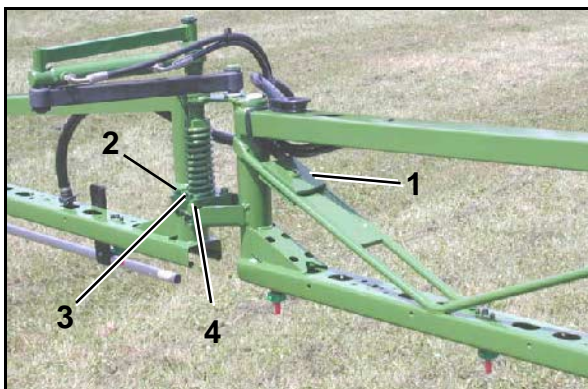


Fig. 113



Fig. 114

4.10.2 Q-plus-boom up to 15 m working width with Profi-folding (special option)

The Profi-folding offers the following functions:

- sprayer booms folding in and out,
 - hydraulic height adjustment,
 - hydraulic boom tilting,
 - one side sprayer boom folding,
 - unlocking and locking the swing compensation.
- **Control of all hydraulic functions follows over the **AMATRON +** from the tractor cab. During spraying operation lock the adjustment of the single acting control spool valve on the tractor in order to be able to carry out the hydraulic functions.**



Hint!

The individual symbols on the display of the **AMATRON +** inform you about the relevant selected functions.

- All operational speeds of the hydraulic functions can be set via the hydraulic throttle valves. Please refer to chapter "Setting the hydraulic throttle valves", page 117.

Overview – Q-plus-boom

Fig. 115/...

- (1) Boom carrier frame for height adjustment of the sprayer boom.
- (2) Single acting hydraulic height adjustment ram allow the setting of the spraying height of the boom (3).
- (3) Boom centre.
- (4) Unlock- and lockable swing compensation; is maintenance free and takes care of a steady boom ride.
- (5) Swivel arm.
- (6) Self-levelling tensioning springs for parallel boom alignment.
- (7) Shock absorber.
- (8) Automatic boom transport securing; locks the folded booms automatically when the boom is lowered down onto the stops.

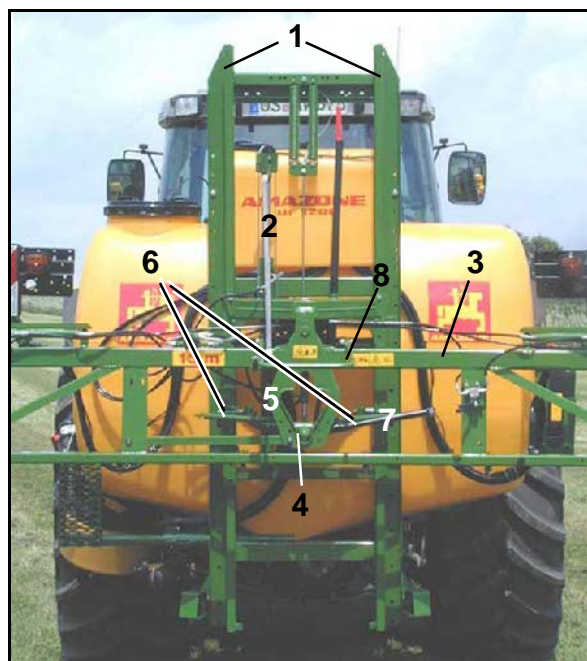


Fig. 115

Boom safety release at obstacles

The collision guard protects the sprayer boom from damage when the outer boom ends hit firm obstacles. The plastic trips (Fig. 116/1) allow the giving way of the outer boom sections into or against the driving direction pivoting around the hinge point (Fig. 116/2) and after clearing any obstacle the booms will automatically return to the operating position.

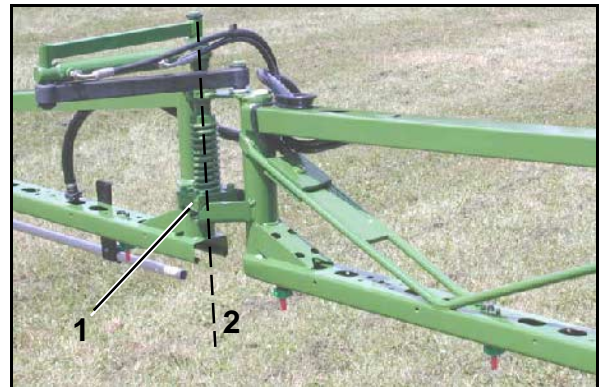


Fig. 116

Fig. 117/...

Required on tractor:

- 1 single acting control valve for connecting with the pressure hose (P) (Fig. 117/1).
- 1 pressure-free return flow for connecting with the return flow hose (N) (Fig. 117/2).

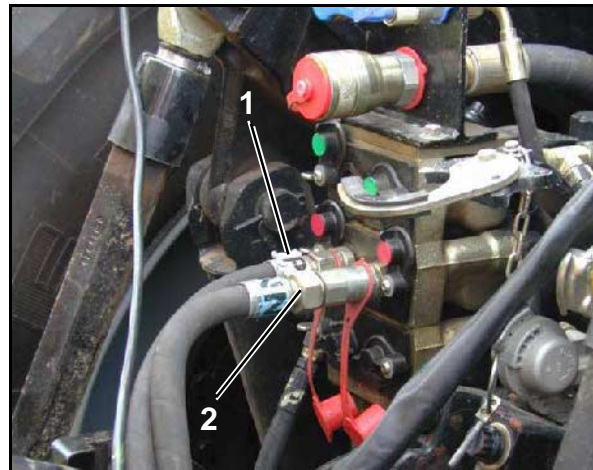


Fig. 117

4.10.2.1 Setting the system setting screw on the hydraulic valve block

The setting of the system setting screw (Fig. 118/1) on the hydraulic block (Fig. 118/2) depends on the tractor's hydraulic system. Depending on the hydraulic system the system setting screw

- should be driven out 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.
- should be driven in until its stop (in 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. 118

4.10.2.2 Unlocking and locking the transport securing



Important!

Before any transport lock the folded boom package via the transport securing in the transport position!

Unlocking the transport securing


1. Lift the folded boom package via the height adjustment until (functional field ) , the automatic transport securing device (Fig. 119/1) releases the locked boom package (height position about 2/3 of the boom carrier length).
- The transport securing device unlocks the sprayer booms from the transport position and the sprayer booms can be folded out.

Fig. 119 shows the unlocked transport securing



Fig. 119

Locking the transport securing


1. Lower the folded boom package via the height adjustment until (functional field ) , the automatic transport securing device (Fig. 120/1) locks the boom package (the distance between the lower edge of the boom carrier to the lower edge of the sprayer booms is only approx. 30 cm).
- The transport securing device locks the sprayer boom in the transport position and prevents an unintended unfolding of the folded boom package.


Fig. 120 shows the locked transport securing



Fig. 120

4.10.2.3 Unlocking and locking the swing compensation

Unlocking the swing compensation

1. Unlock the swing compensation via the functional field .
- In the Menu operation the opened lock symbol appears (Fig. 121/1). The folded out sprayer boom can freely swing against the boom carrier.

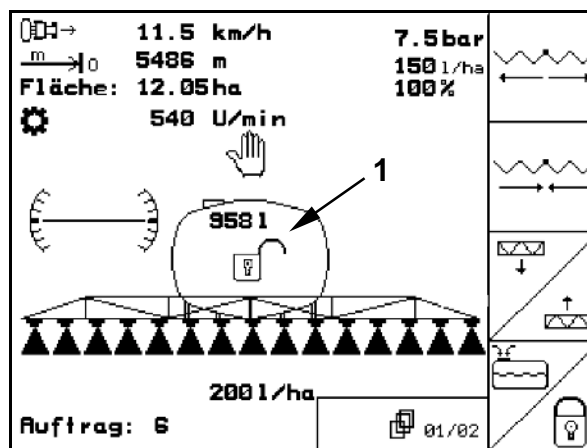



Fig. 121

Fig. 122 illustrates the swing compensation when unlocked.



Fig. 122

Locking the swing compensation

1. Lock the swing compensation via the functional field .
- In the Menu operation the closed lock symbol appears (Fig. 123/1). When the swing compensation is locked the sprayer booms cannot freely swing against the boom carrier.

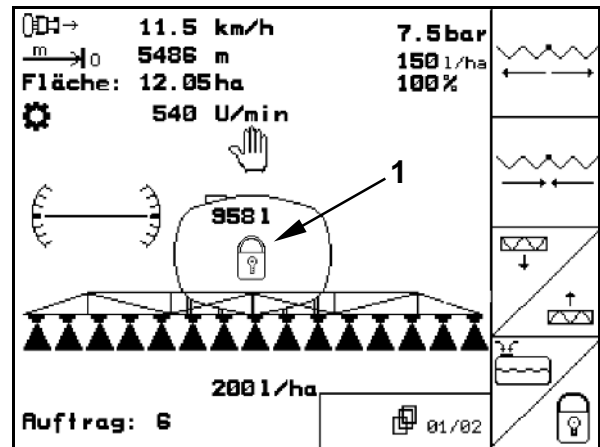


Fig. 123

Fig. 124 illustrates the swing compensation when locked.



Fig. 124

4.10.2.4 Folding the sprayer booms in or out



Warning!

- When folding in and out the sprayer booms, implicitly observe the hints in the preface for chapter "Sprayer boom" on page 95.




Hint!

- The booms do not always fold down symmetrically.
- The hydraulic rams used for the boom folding keep the boom in its corresponding final position (either in transport or working position).

Folding out the sprayer boom

The folded boom package is in the locked transport position

1. Unlock the transport securing device. Please refer to chapter "Unlocking and locking the transport securing", page 110.

2. Actuate the functional field  until the individual segments of both boom sides are folded out completely.


→ The sprayer booms are in operational position.


3. Actuate the functional field .


→ The swing compensation unlocks. For this please also refer to chapter "Unlocking and locking the swing compensation", page 111.

4. Adjust the spraying height according to the spray rate chart via the functional field  or .


Folding in the sprayer boom

1. Actuate the functional field  until the sprayer boom has been lifted to the medium height position.

2. Actuate the functional field once  and hydraulic boom tilting aligns the sprayer boom horizontally (0-Position).

3. Actuate the functional field  until the closed lock symbol appears in the Menu operation.

→ The swing compensation locks.

4. Actuate the functional field  until the individual segments of both boom sides have been folded out completely.

5. Lock the transport securing. Please refer to chapter "Unlocking and locking the transport securing", page 110.

4.10.2.5 Set the boom height above the ground



1. Actuate the functional field  or  until the hydraulic height adjustment (Fig. 125/1) has lifted or lowered the sprayer boom to the desired spraying height.



Fig. 125

4.10.2.6 Hydraulic boom tilting

When unfavourable field conditions prevail, e.g. in case of differently deep track marks or one side driving in a furrow, the sprayer booms can be aligned parallel to the ground or to the desired area to be treated via the hydraulic boom tilting.



Important!



Pre-condition for the proper functioning of the hydraulic tilt adjustment is an accurate calibration of the hydraulic tilt adjustment (tilt calibration). Please refer to chapter "Calibration of tilt adjustment", page 64.

Calibrate the tilt adjustment

- at the first operation.
- in case of deviations of the horizontal sprayer boom alignment shown in the display and the actual sprayer boom alignment.

Assembly and function

4.10.2.6.1 Align the sprayer booms via the tilt adjustment

1. Actuate the functional field  or  until the sprayer booms are aligned parallel to the area to be treated.
- In the Menu operation the symbol tilt adjustment (Fig. 126/1) shows the selected sprayer boom tilting. In this case the left hand side sprayer boom is lifted.

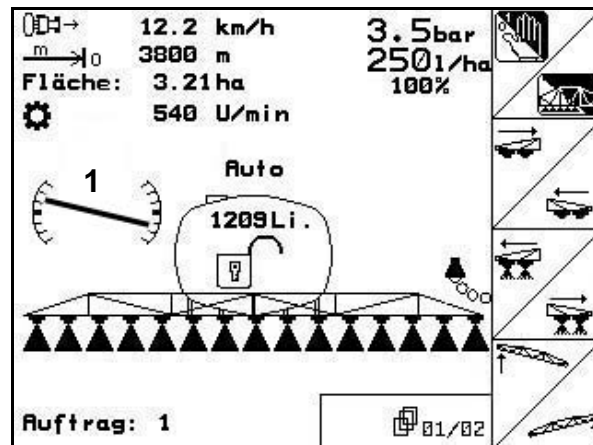



Fig. 126

4.10.2.6.2 Mirroring tilt adjustment (slope mirroring)

The selected sprayer boom tilting can simply be mirrored when turning at the headlands, e.g. during spraying operation when operating across slopes.

Start position: The left hand side sprayer boom is lifted.

1. Actuate the functional field once  and hydraulic boom tilting aligns the sprayer boom horizontally (0-Position).
- In the Menu operation the symbol tilt adjustment (Fig. 127/1) shows the horizontal alignment of the sprayer booms.
2. Carry out the turning manoeuvre at the headlands.

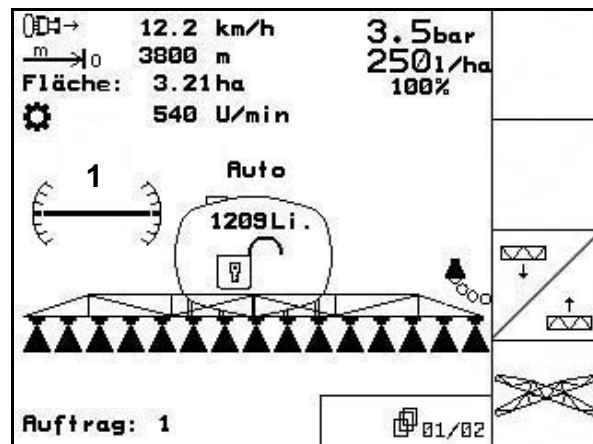



Fig. 127

3. Actuate the functional field once more  and die hydraulic boom tilting mirrors the earlier used sprayer boom tilting.
- In the Menu operation the symbol tilt adjustment (Fig. 128/1) shows the mirrored sprayer boom tilting. Now the right hand side sprayer boom is lifted.

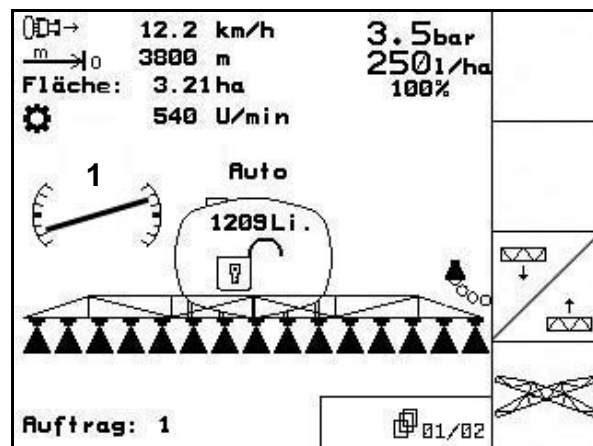


Fig. 128

4.10.2.7 Operation with one side folded out sprayer boom



Hint!



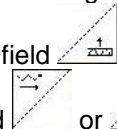
Important!

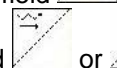

The operation with one side folded out sprayer boom is only permissible

- with the swing compensation locked.
- for the brief passing of obstacles (tree, pylon etc.).
- Lock the swing compensation before one sided folding in or out the sprayer boom.
When the swing compensation has not been locked the sprayer boom can swing to one side. If the folded out sprayer boom side hits the ground the sprayer booms could be damaged.
- During spraying operation clearly reduce the forward speed. In this way you avoid a swing build up and ground contact of the sprayer boom when the swing compensation is locked. At an uneven sprayer boom ride an even lateral distribution is no longer ensured.

The sprayer booms are completely folded out

1. Lock the swing compensation. Please refer to chapter "Unlocking and locking the swing compensation", page 112.
2. Lift the sprayer booms via the height adjustment into a medium

height position (functional field ).

3. Actuate the functional field  or .

→ The desired boom side folds in.

4. Align the sprayer booms via the tilt adjustment parallel to the area to be treated. Please refer to chapter "Hydraulic boom tilting", page 126.
5. Adjust the spraying height of the sprayer boom in such a way that the spacing between sprayer boom and ground surface is at least 1 m.
6. Switch off the boom sections of the boom side folded in.
7. During spraying operation drive with clearly reduced speed.

4.10.2.8 Setting the hydraulic throttle valves

The actuation speeds of the individual hydraulic functions have been adjusted in the factory on the relevant hydraulic throttle valves of the valve block (Fig. 129) (sprayer booms folding in and out, locking and unlocking swing compensation etc.). However, depending on the tractor, it may be necessary to adjust this setting.

By screwing in or out the Allen key headed set 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 key headed set screw.
- Increasing the actuating speed = screw out the Allen key headed set screw.



Important!

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

Fig. 129/...

- (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) Hydraulic connection - height adjustment (the throttle valve is located on the left hand hydraulic ram of the height adjustment).
- (5) Hydraulic connections - tilt adjustment (the throttle valves are located on the hydraulic ram of the tilt adjustment).
- (6) Throttle valve - folding in the left hand boom.
- (7) Throttle valve - folding out the left hand boom.

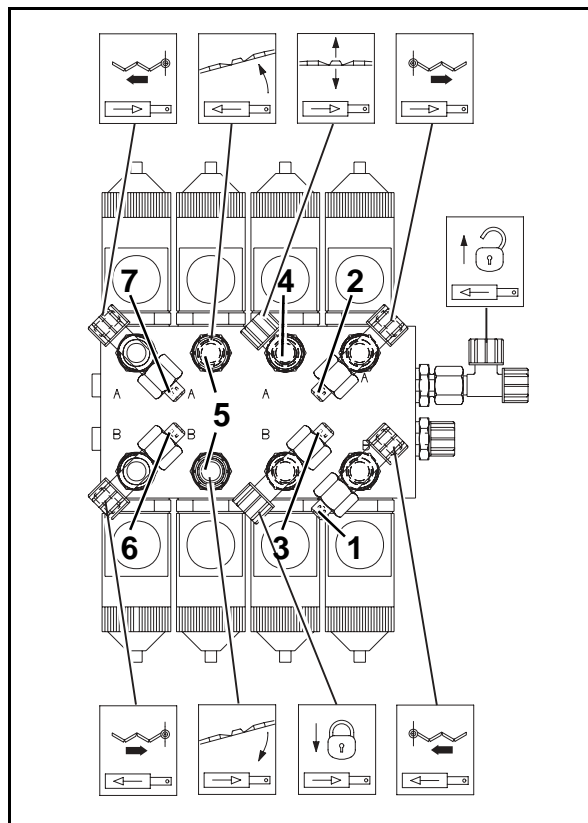


Fig. 129

4.10.3 Super-S-booms 15 to 28 m working width with Profi-folding (0, I, II and III)

The Profi-folding offers the following functions:

- Sprayer booms folding in and out,
- hydraulic height adjustment,
- hydraulic boom tilting,
- independent sprayer boom fold (only Profi-folding I and II until 24 m),
- one sided, individual angling of the sprayer booms (only Profi folding II and III).



Hint!

Control of all hydraulic functions follows over the **AMATRON +** from the tractor cab. During spraying operation lock the adjustment of the single acting control spool valve on the tractor in order to be able to carry out the hydraulic functions.

The individual symbols in the operational menu of the **AMATRON +** inform you about the selected functions.

Overview – Super-S-booms

- (1) Sprayer booms with spray lines (in this case folded boom packages).
- (2) Boom carrier frame for height adjustment of the sprayer boom.
- (3) Transport latches. The latches retain the locating sockets (4) when locking the boom package in the transport position against unintended folding down.
- (4) Locating sockets.
- (5) Unlock- and lockable swing compensation. The swing compensation is maintenance free and takes care of a steady boom ride.
- (6) Spacer.

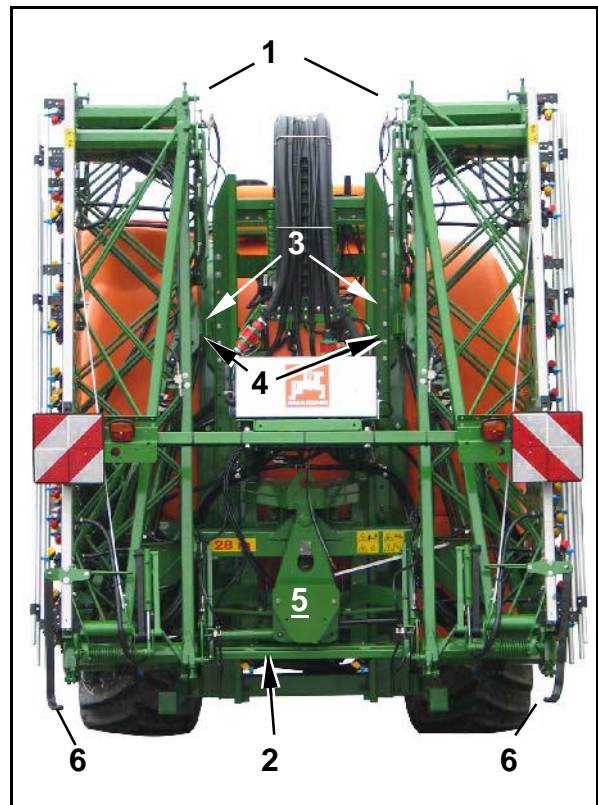


Fig. 130

Assembly and function

Boom safety release at obstacles

The collision guard protects the sprayer boom from damage when the outer boom ends hit firm obstacles. The plastic trips (Fig. 131/1) allow the giving way of the outer boom sections into or against the driving direction pivoting around the hinge point (Fig. 131/2) and after clearing any obstacle the booms will automatically return to the operating position.

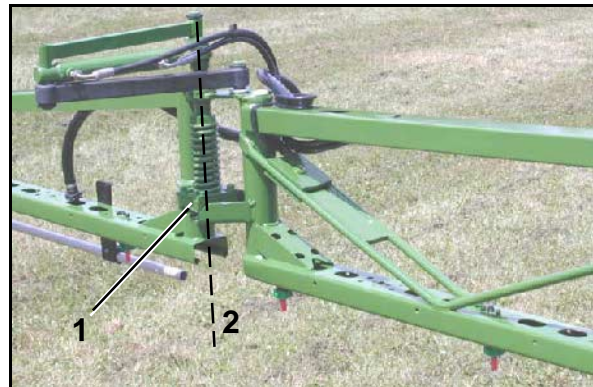


Fig. 131

Overview - hydraulic connections

Fig. 132/...

Required on tractor:

- 1 single acting control valve for connecting with the pressure hose (P) (Fig. 132/1).
- 1 pressure-free return flow for connecting with the return flow hose (N) (Fig. 132/2).

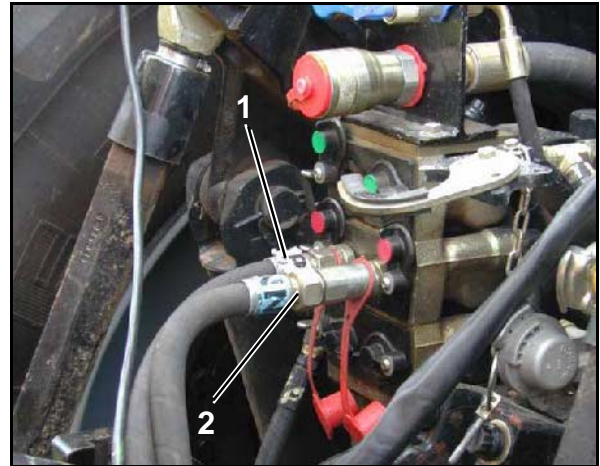


Fig. 132

4.10.3.1 Setting the system setting screw on the hydraulic valve block

The setting of the system setting screw (Fig. 133/1) on the hydraulic block (Fig. 133/2) depends on the tractor's hydraulic system. Depending on the hydraulic system the system setting screw

- should be driven out 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.
- should be driven in until its stop (in 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.

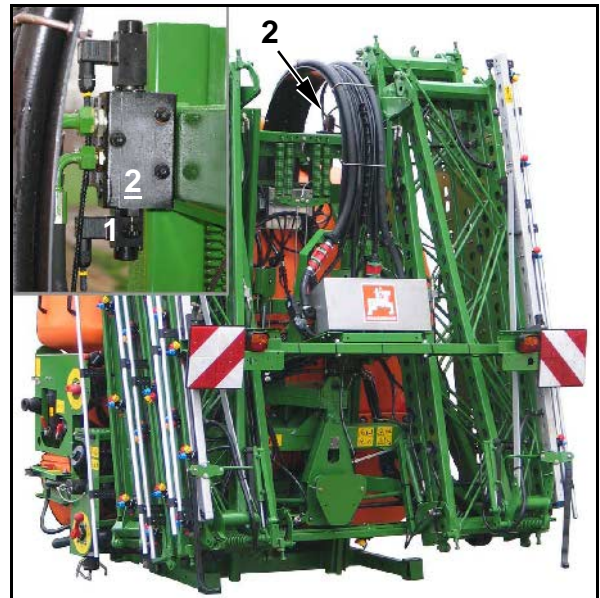


Fig. 133

Assembly and function

4.10.3.2 Unlocking and locking the transport securing

Unlocking the transport securing


1. Lift the sprayer booms via the height adjustment (functional field ) until the latches (Fig. 134/1) release the location pockets (Fig. 134/2).
- The transport securing unlocks the sprayer booms from the transport position.

Fig. 134 shows the unlocked sprayer booms

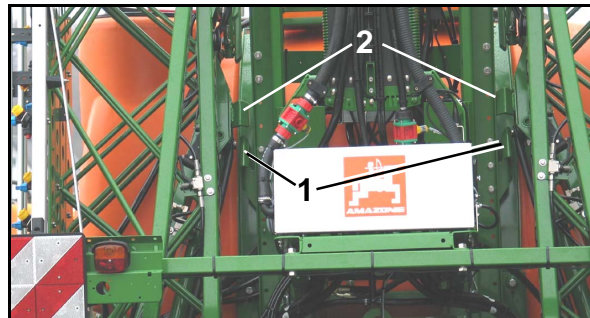


Fig. 134

Locking the transport securing


1. Entirely lower the sprayer booms via the height adjustment (functional field ) until the latches (Fig. 135/1) retain the location pockets (Fig. 135/2).
- The transport securing locks the sprayer booms in the transport position.

Fig. 135 shows the locked sprayer booms

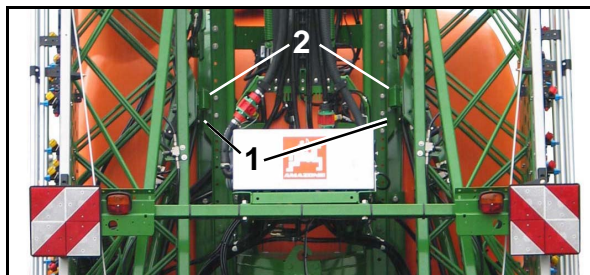


Fig. 135



Hint!

Align the sprayer booms via the tilt adjustment if the latches (Fig. 135/1) do not retain the location pockets (Fig. 135/2).

4.10.3.3 Unlocking and locking the swing compensation

Unlocking the swing compensation

1. Actuate the functional field and the swing compensation unlocks.
- In the operation menu the opened lock symbol appears (Fig. 136/1) when the swing compensation is unlocked.

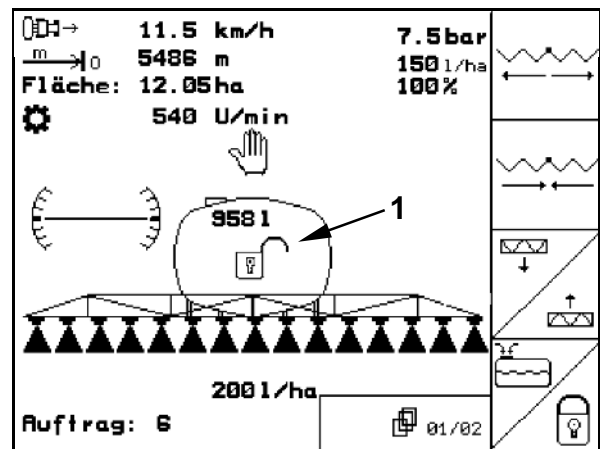


Fig. 136

Locking the swing compensation

1. Actuate the functional field and the swing compensation locks.
- In the operational menu appears the closed lock symbol (Fig. 137/1) when the swing compensation is locked.

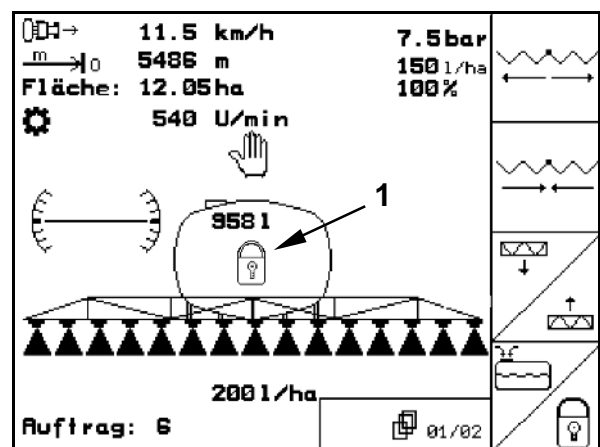


Fig. 137

4.10.3.4 Folding the sprayer booms in or out



Warning!

- When folding in and out the sprayer booms, implicitly observe the hints in the preface for chapter "Sprayer boom" on page 95.



Hint!

- The booms do not always fold down symmetrically.
- The corresponding hydraulic rams lock the boom in operation position.

Folding out the sprayer boom

1. Lift the sprayer booms via the height adjustment into a medium

height position (functional field ).

→ The latches release the location pockets and the transport securing unlocks the sprayer booms from the transport position.



Only Profi-folding "0" up to 27/28 m and Profi-folding "I" up to 24 m


2. Actuate the functional field  until

- both boom packages are folded out
- the individual segments have been folded out entirely.

→ The sprayer booms are in operational position.

Only Profi-folding "II" up to 24 m and Profi-folding "III" up to 27/28 m

2. Actuate the functional fields  and  until both boom packages are folded down horizontally.

- 2.1 Actuate the functional field  until the individual segments are entirely folded out.


→ The sprayer booms are in operational position.

Profi-folding "0, I, II, III"

3. Actuate the functional field .


→ The swing compensation unlocks.

4. Set the spraying height according to the spray rate chart – by

actuating the functional fields  or .

Folding in the sprayer boom

1. Lift the sprayer booms via the height adjustment into a medium


height position (functional field ).

1.1 Tilt adjustment and individual boom angling in position "0" (only Profi folding "II" and "III").



Important!

Before folding horizontally align the sprayer booms (0-position) as otherwise trouble when locking the transport securing for the sprayer booms may occur (latches do not retain the location pockets).


2. Actuate the functional field .
→ The swing compensation locks.



Only Profi-folding "0" up to 27/28 m and Profi-folding "I" up to 24 m

3. Actuate the functional field  until


- the individual segments are entirely folded in
- and both boom packages are folded upwards.

Only Profi-folding "II" up to 24 m and Profi-folding "III" up to 27/28 m

3. Actuate the functional field  until the individual segments are entirely folded in.

3.1 Actuate the functional fields  and  until both boom packages are folded upwards.

Profi-folding "0, I, II, III"

4. Actuate the functional field  until the transport securing locks the sprayer booms in the transport position.
→ The latches retain the location pockets and the transport securing locks the sprayer booms in the transport position.

4.10.3.5 Set the boom height above the ground



1. Actuate the functional field  or  until the hydraulic height adjustment (Fig. 138/1) of the sprayer boom is lifted to the desired spraying height or until it is lowered.



Fig. 138

4.10.3.6 Hydraulic boom tilting

The sprayer booms can be aligned parallel to the ground or to the desired area to be treated via the hydraulic tilt adjustment (Fig. 139/1) at prevailing unfavourable field conditions, e.g. in differently deep track marks or one wheel driving in a furrow.



Fig. 139





Hint!

Pre-condition for the proper functioning of the hydraulic tilt adjustment is an accurately calibration of the hydraulic tilt adjustment (tilt calibration). Please refer to chapter "Calibration of tilt adjustment", page 64.

Calibrate the tilt adjustment

- at the first operation.
- in case of deviations of the horizontal sprayer boom alignment shown in the display and the actual sprayer boom alignment.

Align the sprayer booms via the tilt adjustment

1. Actuate the functional field  or  until the sprayer booms are aligned parallel to the area to be treated.
→ In the operational menu the symbol tilt adjustment (Fig. 140/1) shows the selected sprayer boom tilting. In this case the left hand side sprayer boom is lifted.

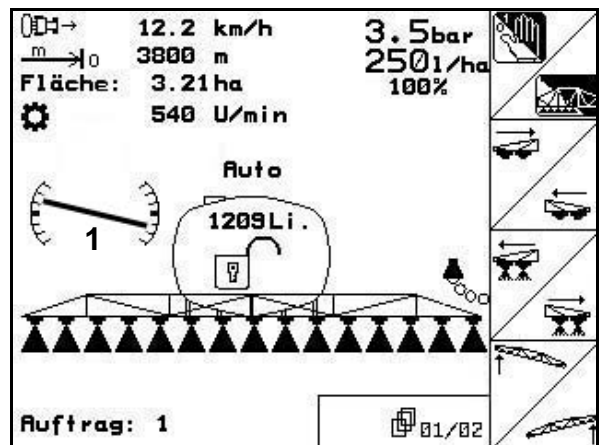



Fig. 140

Assembly and function

Mirroring tilt adjustment (slope mirroring)

The selected sprayer boom tilting can simply be mirrored when turning at the headlands, e.g. when spraying in sloppy terrain or when operating across slopes.

Start position: The left hand side sprayer boom is lifted.

1. Actuate once the functional field  and the hydraulic tilt adjustment aligns the sprayer booms in horizontal position (0-Positon).
- In the operational menu the symbol tilt adjustment (Fig. 141/1) shows the horizontal alignment of the sprayer booms.
2. Carry out the turning manoeuvre at the headlands.

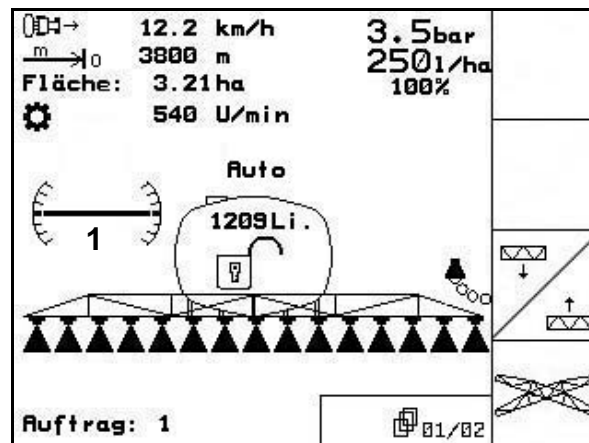



Fig. 141

3. Again actuate the functional field  and the hydraulic tilt adjustment mirrors the earlier used sprayer boom tilting.
- In the operational menu the symbol tilt adjustment (Fig. 142/1) shows the mirrored sprayer boom tilting. Now the right hand side sprayer boom is lifted.

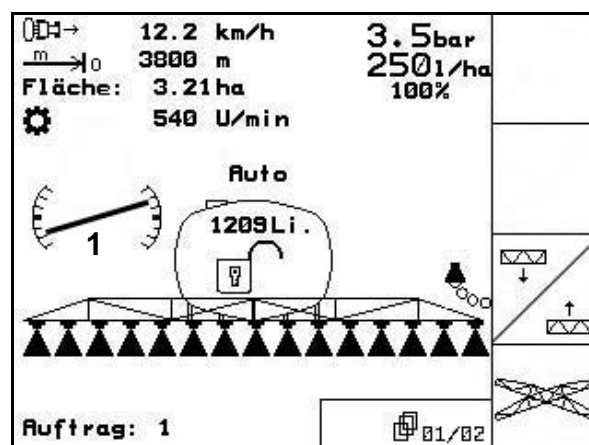


Fig. 142

4.10.3.7 Operation with one side folded out sprayer boom (only Profi-folding I and II up to 24 m)



Hint!

The operation with one side folded out sprayer boom is only permissible

- with the swing compensation locked.
- when the second boom is folded down as a package from the transport position.
- for the brief passing of obstacles (tree, pylon etc.).







Important!

- Lock the swing compensation before one sided folding in or out the sprayer boom.
When the swing compensation has not been locked the sprayer boom can swing to one side. If the folded out sprayer boom side hits the ground the sprayer booms could be damaged.
- During spraying operation clearly reduce the forward speed. In this way you avoid a swing build up and ground contact of the sprayer boom when the swing compensation is locked. At an uneven sprayer boom ride an even lateral distribution is no longer ensured.

1. Lock the swing compensation. Please refer to chapter "Unlocking and locking the swing compensation", page 122.
2. Lift the sprayer booms via the height adjustment into a medium

height position (functional field ).

3. Actuate the functional field  or  or  or .

→ The desired boom side folds in or out.

4. Align the sprayer booms via the tilt adjustment parallel to the area to be treated.

5. Adjust the spraying height so that the distance between ground surface and the sprayer boom is at least 1 m.

5. Switch off the boom sections of the boom side folded in.

6. During spraying operation drive with clearly reduced speed.

4.10.3.8 One-sided, individual angling of the booms (only Profi-folding II and III)

The one sided individual angling of the booms allows the angling up and down of the booms in very unfavourable field conditions when the adjustment possibilities of the height- and tilt adjustment is not sufficient any more to align the sprayer boom towards the area to be treated.



Important!





Hint!


Never ever angle up the folded out booms by more than 20°!


The stickers on the hydraulic rams are a guide when aligning the booms in the horizontal position.

1. Actuate one of the following functional fields to angle up or down the desired boom side.

Functional field  , angling up the left hand boom.

Functional field  , angling down the left hand boom.

Functional field  , angling up the right hand boom.

Functional field  , angling down the right hand boom.

2. Align the sprayer booms horizontally before folding in the sprayer booms. The stickers (Fig. 143/1) on the relevant hydraulic ram (Fig. 143/2) of the booms serve as a guide when aligning the booms in the horizontal position.

Fig. 143/...

(1) Sticker right hand side boom.

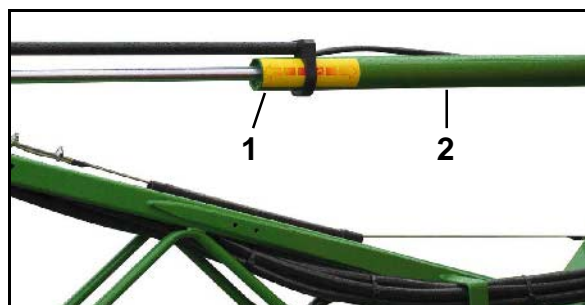


Fig. 143

4.10.3.9 Setting the hydraulic throttle valves

Factory set are the actuation speeds of the individual hydraulic functions on the relevant hydraulic throttle valves from valve block (Fig. 144 to Fig. 147) (fold up and down folded boom packages, fold in and out sprayer booms, lock and unlock swing compensation etc.). However, depending on the tractor, it may be necessary to adjust this setting.

By screwing in or out the Allen key headed set 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 key headed set screw.
- Increasing the actuating speed = screw out the Allen key headed set screw.



Important!

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

Profi-folding "0"

Fig. 144/...

- (1) Throttle valve - locking the swing compensation.
- (2) Hydraulic connection - height adjustment (the throttle valve is located on the left hand hydraulic ram of the height adjustment).
- (3) Hydraulic connections - tilt adjustment (the throttle valves are located on the hydraulic ram of the tilt adjustment).
- (4) Throttle valve - folding out right and left hand boom.
- (5) Throttle valve - folding in right and left hand boom.

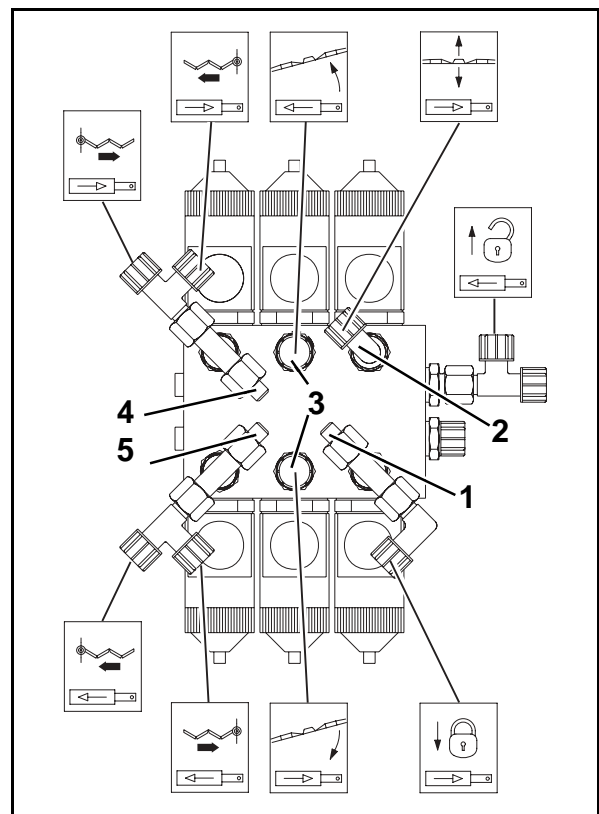


Fig. 144

Profi-folding "I"

Fig. 145/...

- (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) Hydraulic connection - height adjustment (the throttle valve is located on the left hand hydraulic ram of the height adjustment).
- (5) Hydraulic connections - tilt adjustment (the throttle valves are located on the hydraulic ram of the tilt adjustment).
- (6) Throttle valve - folding in the left hand boom.
- (7) Throttle valve - folding out the left hand boom.

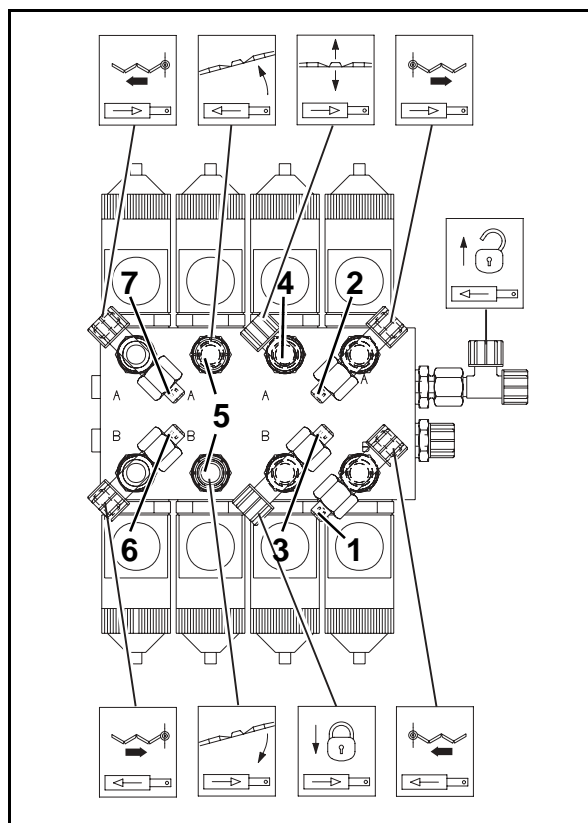


Fig. 145

Profi-folding "II"

Fig. 146/...

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

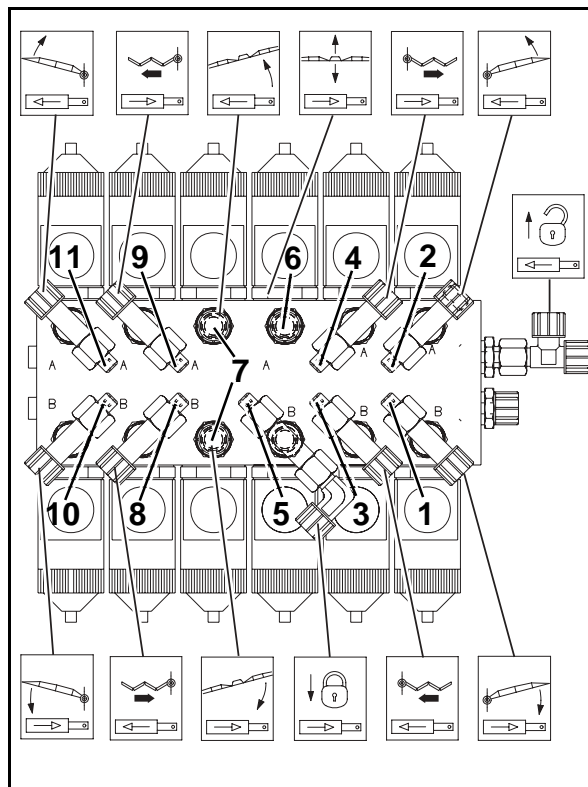


Fig. 146

Profi-folding "III"

Fig. 147/...

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

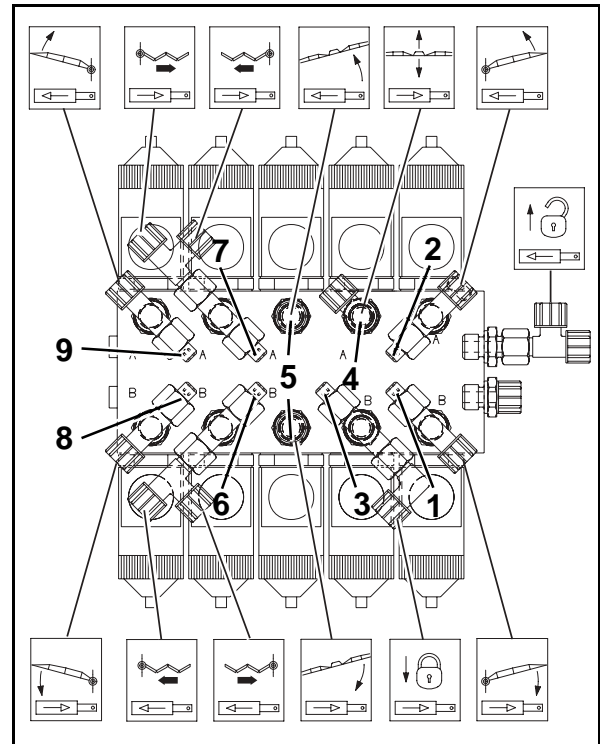


Fig. 147

4.11 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.

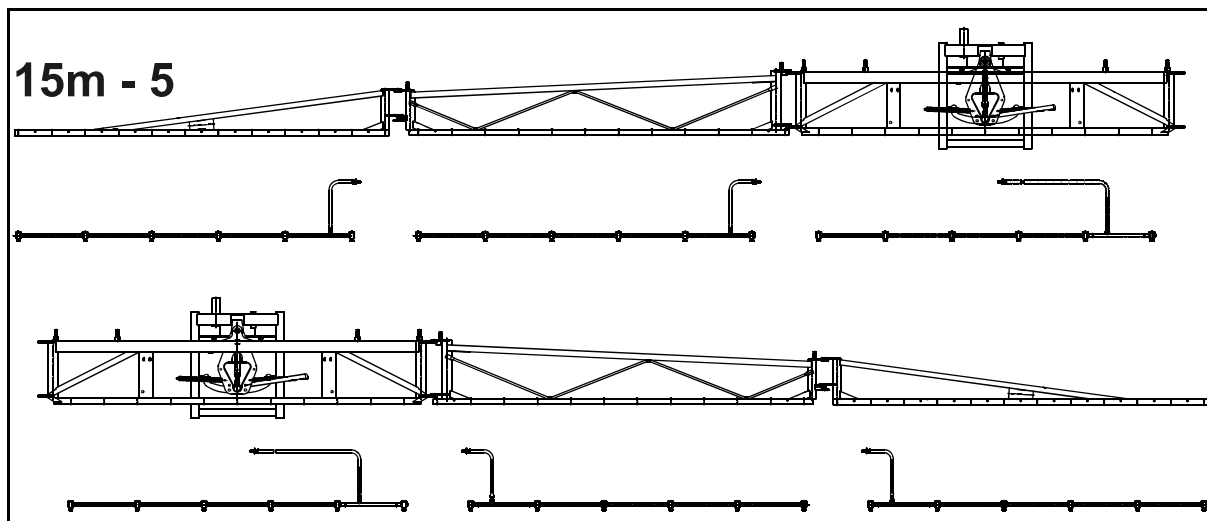


Fig. 148

4.11.1 Technical data



Important!

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

Required distance in [m] for spraying the undiluted residual amounts in the spray lines 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:

At a spray rate of 200 l/ha the travel distance for emptying the boom corresponds to a distance of approx. 23m.

Spray lines Q-plus-Sprayer booms with single and multiple-nozzles

Working width	[m]	12	12.5	15
Number of boom part section feed controls		5		
Number of nozzles per boom section		5-4-6-4-5	5-5-5-5-5	6-6-6-6-6
Residual amount	[l]	4.5		
• dilutable				
• non dilutable		5.0		6.0
• total		9.5		10.5
Weight *	[kg]	13		14



UF 01 DB 238. 07.04

Total residual amount: Basic implement + pump + spray line incl. valve chest + hose package

4.11.2 Single nozzles

Fig. 149/...

- (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 valve 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.

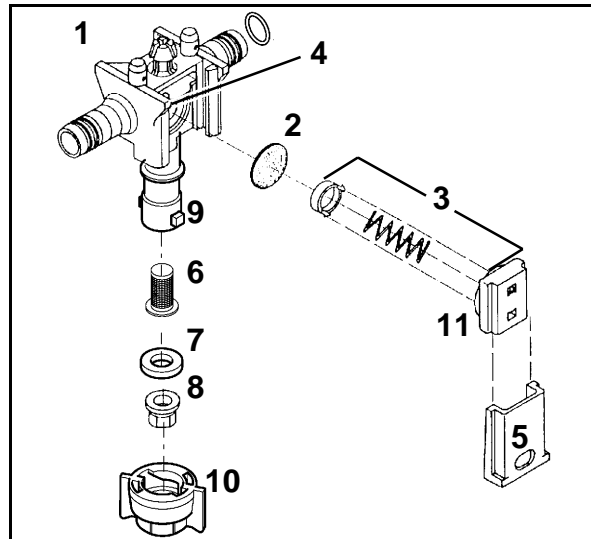


Fig. 149

4.11.3 Multiple nozzles

Special option

Order No.:

When using different nozzles the use of multiple nozzles shaped as a triple nozzle head (Fig. 150) is of advantage. The vertically positioned nozzle is fed.

By revolving the triple nozzle head (Fig. 150/1) in counter clockwise direction an other nozzle is put into operation.

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



Rinse the spray lines with rinsing water, before revolving the triple nozzle body to another nozzle type.

Important!

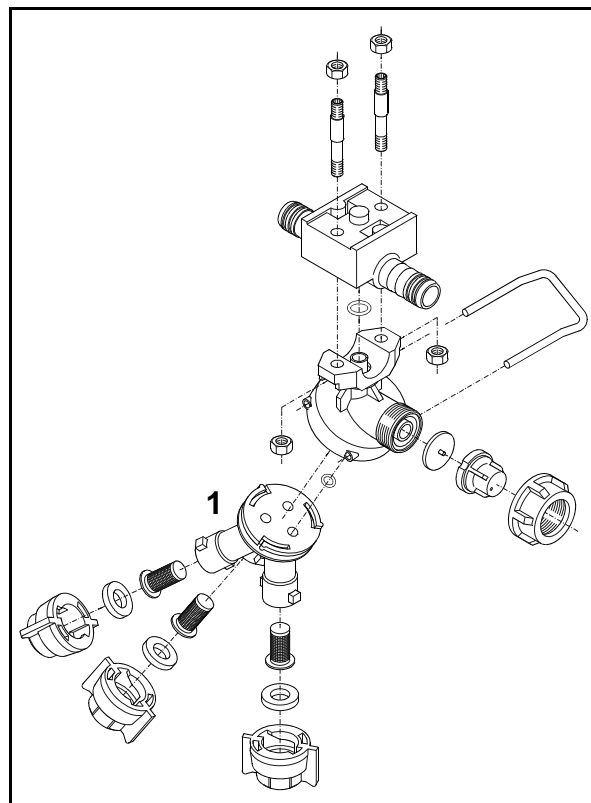


Fig. 150

Fig. 151/...

- (1) Nozzle body.
- (2) Triple nozzle body.
- (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 valve seat (5) inside 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; **as 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.

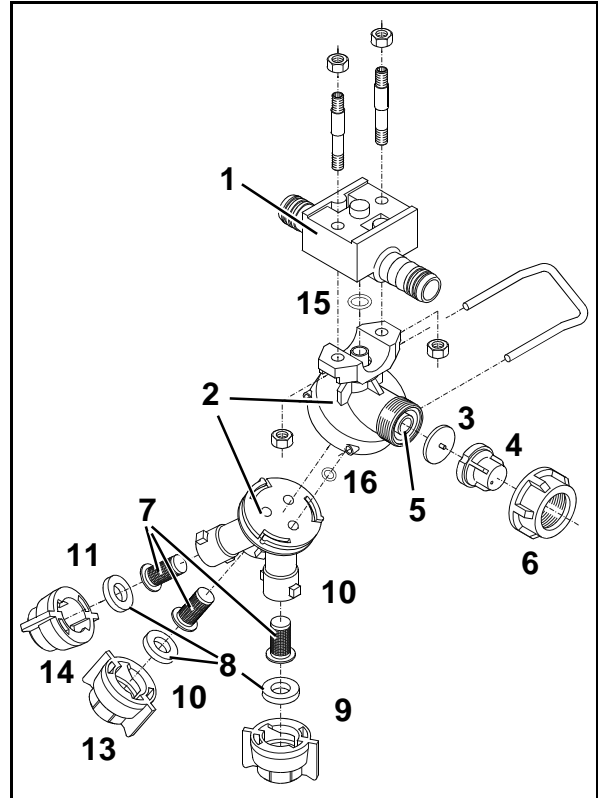


Fig. 151

5 Special options

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

5.1 Options for the application of liquid fertiliser

At present there are mainly two different kinds of liquid fertiliser available:

- Ammonium Nitrate-Urea-Solvents (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!

If the liquid fertiliser is applied by flat fan nozzles, multiply the corresponding values from the spraying chart for the rate l/ha at AUS with 0.88 and at NP-solutions with 0.85 as the mentioned rates in l/ha are only valid for pure water.

The following principle applies:

Apply liquid fertilisers only 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 refer also to "Conversion table for the spraying of liquid fertilisers"). Re-fertilising of AUS with nozzles should in any case be terminated in the 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 plants 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

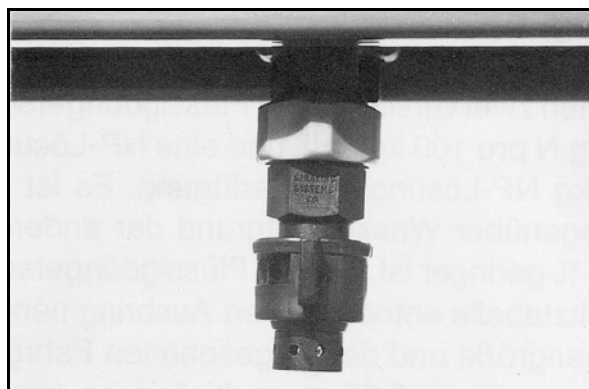


Fig. 152

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. 152) 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 rates [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 222).

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 discs 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

Special options

5.1.3 Drag hose kit, cpl. (with metering washers No. 4916-39) for late top dressing with liquid fertilise



Fig. 153

- (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 rates [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 "Spray rate table for drag hose equipment", page 224.

5.2 Suction port for filling the spray cocktail tank



Important!

Observe the relevant prescriptions when filling the spray cocktail-tank via the suction hose from open sources (for this please also refer to chapter "Putting into operation", page 185).

Fig. 154/...

- (1) Suction hose (8m, 2"), Order-No. 914398.
- (2) Quick coupling.
- (3) Suction filter for filtering the sucked water.
- (4) Non return valve. Prevents the liquid already in the tank from running out, if during filling procedure the sub-pressure suddenly collapses.



Fig. 154

Filling the spray cocktail-tank with the aid of the suction hose



Important!

- During the filling procedure never leave the field sprayer unattended.
- First set VARIO-control suction side to position "spraying" and then remove the suction hose from the suction joint if the suction hose is not taken out of the water supply place.

1. Connect the suction hose by using the quick coupling with suction joint (Fig. 155/1) of the suction filter.
2. Switch off the boom feed.
3. Engage PTO shaft.
4. VARIO-control-suction side in position "**Suction hose**".

As soon as tank is full:

5. Remove suction hose from liquid to be sucked so that the hose is completely emptied by the pump.
6. VARIO-control-suction side in position "**Spraying operation**".
7. Disengage the PTO shaft.
8. Remove the suction hose from the suction joint.



Fig. 155

5.3 Spray pistol with 0,9 m long spray tube, without pressure hose

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



Important!

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

Pressure hose 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 with the VARIO-control-pressure side. The spray pressure is 10 bar and cannot be adjusted.

5.4 Traffic options



Important!

- The traffic regulations advise the use of lighting units on agricultural and forest tractor mounted implements. The driving unit's owner is responsible for, as well as the operator for adhering to the legal rules and regulations of the traffic law.
- Mounted 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.

5.4.1 Traffic lights for Q- and Super-S-booms

- Rear lights (Fig. 156/1), Order No.: 916 253
Consisting of:
Light combination r.h. and l.h., parking warning plates, licence plate carrier and connecting cable.
- Position lights to the front, Order No.: 917 649 (only required for Q-boom)
Consisting of:
Parking warning plates according to DIN 11 030 with position lights r.h. and l.h. and connecting cable



Fig. 156

5.5 Foam marker

The **foam marker** (Fig. 157/1) which can be retrofitted at any time, allows an **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.

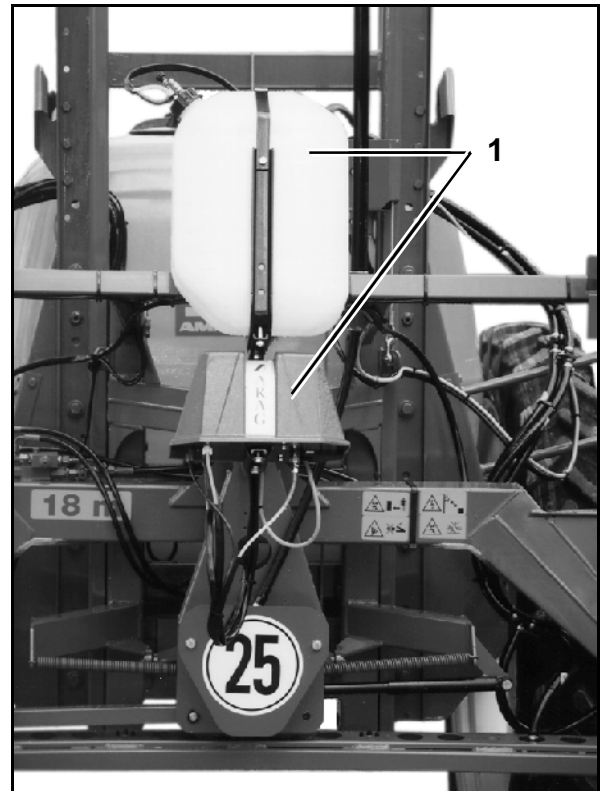


Fig. 157

Fig. 158/ ...

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

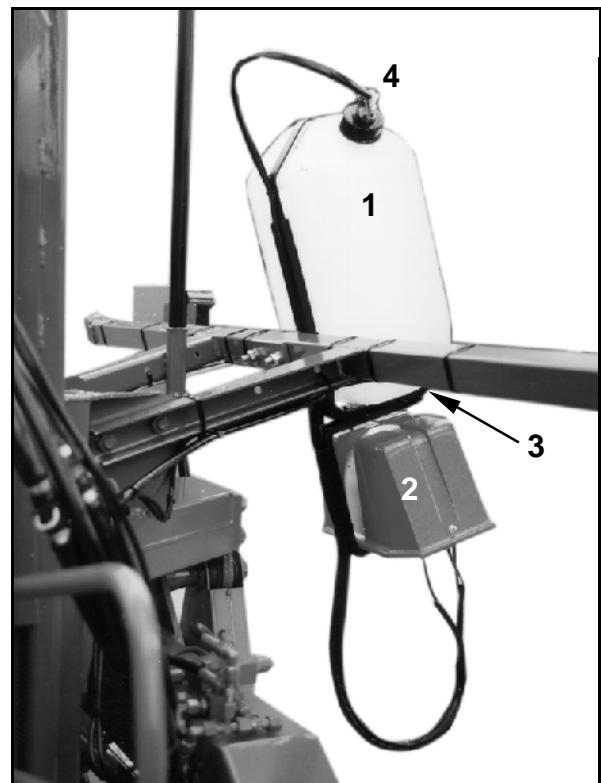


Fig. 158

Special options

Fig. 159/ ...

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

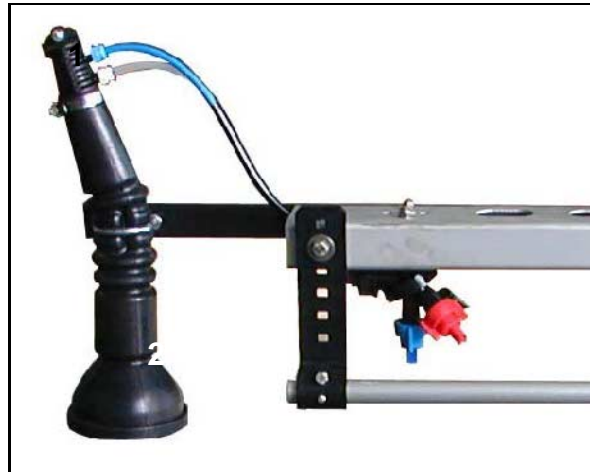


Fig. 159

Set the **spacing between the individual foam bubbles** on the slotted head bolt (Fig. 160/4) as follows:

- turn to the right - spacing is getting larger,
- turn to the left - spacing is getting smaller.

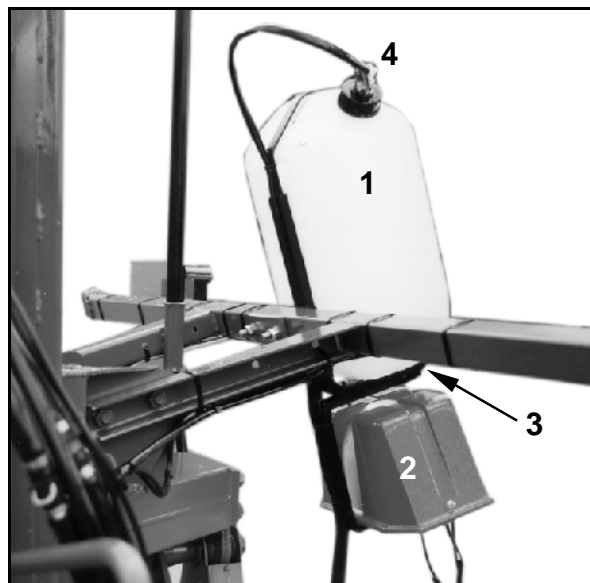


Fig. 160

5.6 Exterior wash down kit

Order No.: 928028

Exterior wash down kit for cleaning the field sprayer including hose reel (Fig. 161/1), 20 m pressure hose (Fig. 161/2) and spray pistol (Fig. 161/3).

Operational pressure: 10 bar

Water-output: 18 l/min



Fig. 161

5.7 Rolling device

Rolling device UF 1201, UF 1501, UF 1801

Order No.: 924457

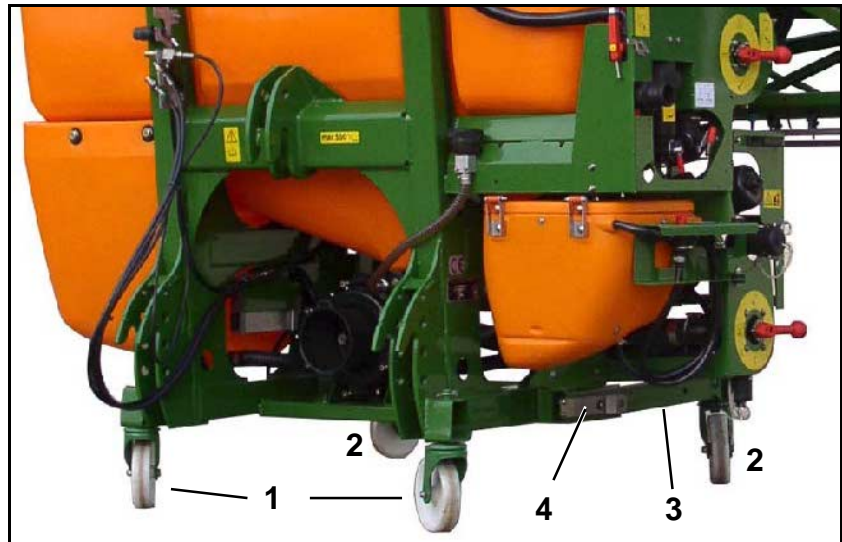


Fig. 162

Fig. 162/...

- (1) Rigid wheels
- (2) Castor wheels
- (3) Telescopic storing supports
- (4) Sprung suspended locking. The locking device catches in the holes and secures the storing supports in the relevant locking positions.



Warning!

Implicitly ensure that the sprung loaded locking device (Fig. 162/4) catches into the holes and secures the storing supports in their relevant locking positions.

5.8 Box for protective clothing

Box for protective clothing (Fig. 163/1), with each one compartment for clean and contaminated protective clothing.



Fig. 163

5.9 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

Please also refer to chapter "Sprayer boom".

5.10 Distance-Control



Hint!



Important!

- The control element Distance-Control can be operated with the Super-S-boom only in conjunction with Profi-folding "0, I, II and III.

- Before starting to operate the Distance-Control carefully read and adhere to the attached instruction manual.
- Switch off **AMATRON+** before carrying out any maintenance work.

The sprayer boom control element Distance-Control maintains the sprayer booms automatically parallel in the desired distance towards the area to be treated.

Two ultrasound sensors measure the distance towards the ground or the crop. At an one sided deviation from the desired height Distance-Control accesses the tilt adjustment for the height adaptation. When the terrain rises to both sides, the height adjustment lifts the entire sprayer boom.

When switching off the sprayer boom at the head lands the sprayer boom is automatically lifted by approx. 50 cm. When switching on, the sprayer booms lower to the calibrated height.

5.10.1 Calibration of Distance-control




Hint!

Pre-condition for the flawless functioning of the control element Distance-Control is the correct calibration of the tilt adjustment (Calibration of distance control).

Carry out a distance control calibration

- at the first operation.
- in case of deviations of the horizontal sprayer boom alignment shown in the display and the actual sprayer boom alignment.

1. Recall via the functional field  the function "Calibration of tilt adjustment".

→ The menu "calibration distance control" appears.






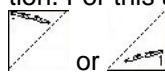

Neigungsverstellung kalibrieren		
Impulse pro Liter:	665	 Cal.
Zapfwellensoll-drehzahl:	540 U/min	 ?
Impulse pro 100m:	13005	
 01/03		I. / 100m

Fig. 164

Special options


2. Access the sprayer booms horizontal position. For this actuate the functional field



or  and align the sprayer boom in horizontal position to the ground.

3. Determine the sprayer boom horizontal position. For this actuate functional field




4. Actuate the functional field  (manual calibration).

5. Manually press the left hand boom downwards until an alarm signal sounds.

→ The end of the boom now shows a distance of approx. 40 cm towards the ground.

6. Let go the boom again.

7. Manually return the sprayer boom into the horizontal position.

8. Actuate the functional field  in order to finish calibration.

Distance Control kalibrieren:

- Taste "waagerechte Kalibrierung" drücken
- Taste "manuelle Kalibrierung" drücken und Gestänge langsam an der linken Seite von Hand nach unten drücken (bis ca. 40cm über dem Boden), Signalton abwarten und Gestänge loslassen
- Gestänge von Hand wieder in waagerechte Stellung bringen und Taste "automatische Kalibrierung" drücken

!!ACHTUNG!! vom Gestänge zurücktreten

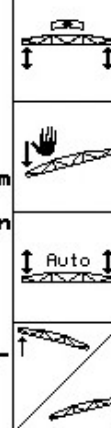


Fig. 165

5.11 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. 166/1).
- can be operated at random with spray cocktail 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. 166/1) per boom part width section.
- the DUS-reversing tap (Fig. 167/1).
- the DUS-pressure relief-valve (Fig. 167/2). 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. 167/1), the pressure circulation system is switched on.

When the DUS reversing tap is in position (Fig. 167/3), the pressure circulation system is switched off.

When the DUS reversing tap is in position (Fig. 168/1), liquid can be drained off the field sprayer.

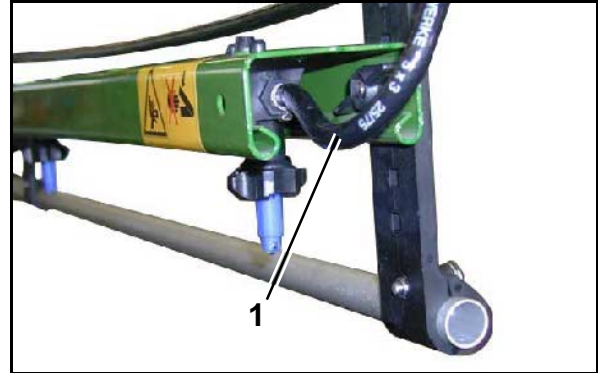


Fig. 166

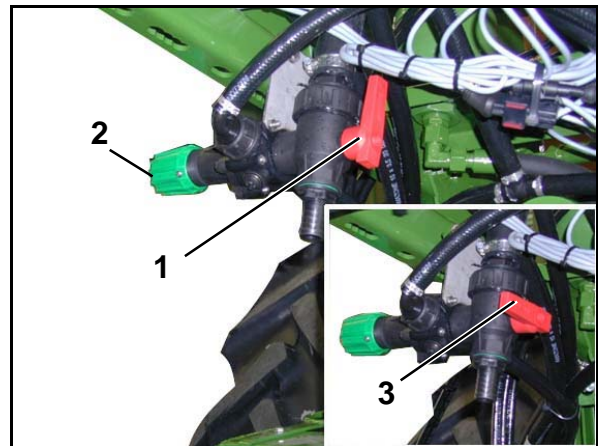


Fig. 167

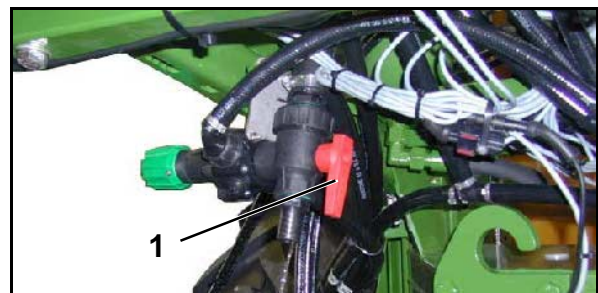


Fig. 168

Overview – Pressure circulation system (DUS)

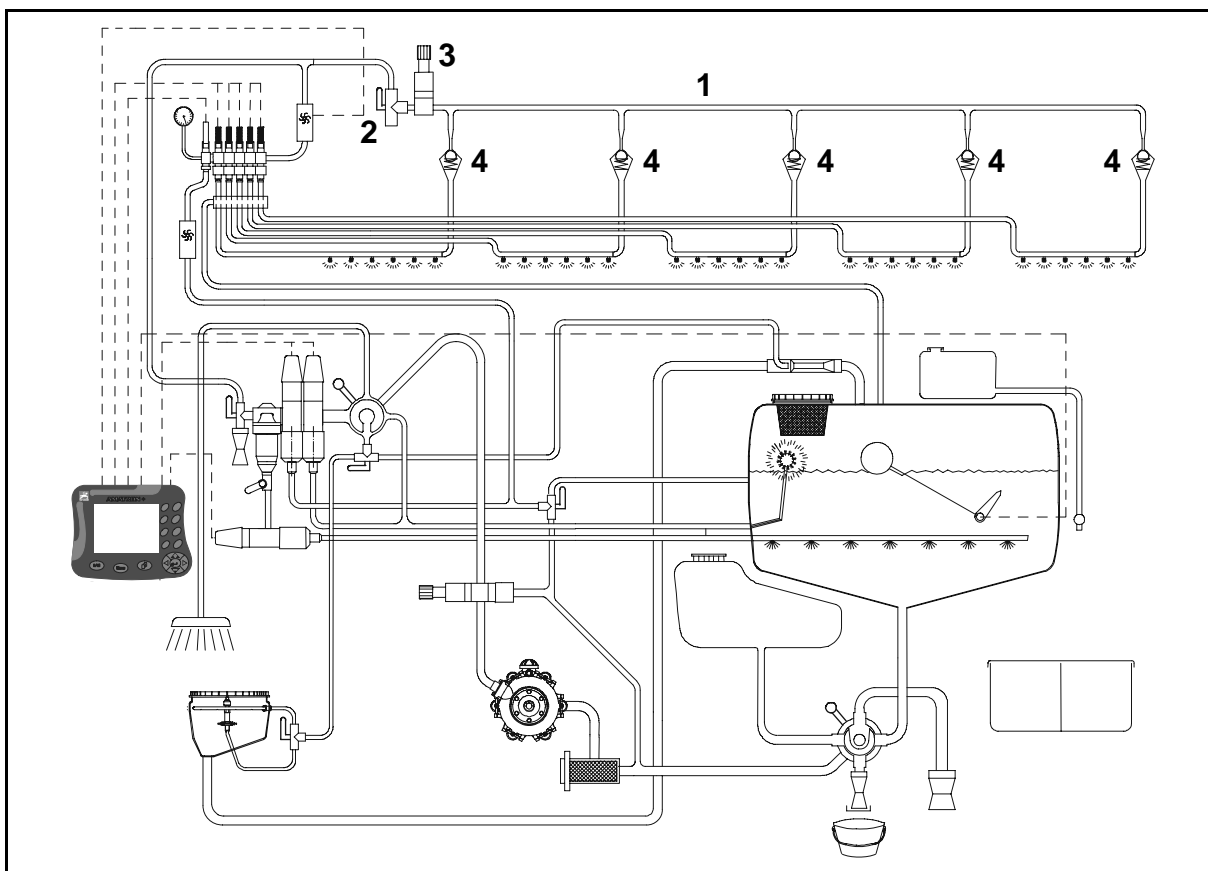


Fig. 169

- (1) Pressure-circulation system DUS
- (2) DUS-Reversing tap
- (3) DUS-Pressure-relief valve
- (4) DUS-Non-return valve

6 Putting into operation

In this chapter you will find information for putting your machine into operation.



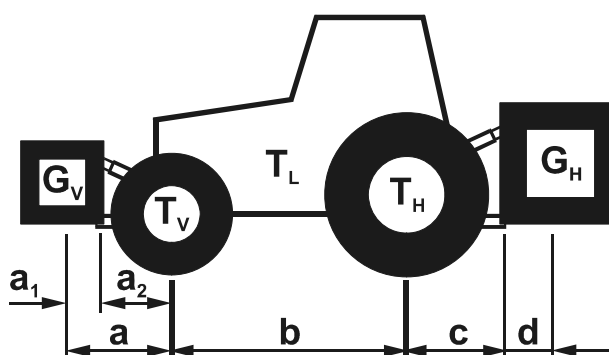
- Before putting the machine into operation ensure that the operator has read and understood the instruction manual.
- Before hitching the machine on or off read the chapter "Safety advice for the operator", page 26.
- Moving characteristics, steering and braking ability of the tractor are affected by mounted implements, trailers and ballast weights. Therefore, take account to these effects and allow sufficient 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.
- When mounting of machines at the front and/or in the rear do not exceed
 - the permissible tractor total weight.
 - the permissible tractor axle loads.
 - the permissible tyre carrying capacity of the tractor tyres.
- Before starting to operate the combination tractor/mounted implement, carefully determine the actual values for the tractor total weight, the tractor axle loads, the tyre carrying capacity and the minimum ballast with empty and filled mounted implement (by calculating or weighing the tractor-implement combination). For this please refer to chapter "Calculation of the actual values for the tractor total weight, tractor axle loads and tyre carrying capacity as well as the necessary minimum ballast", page 151.
- The tractor must provide the prescribed brake lag for the loaded combination according to the national legal traffic regulations.
- Tractor and machine must correspond to the local and national legal traffic regulations.
- The road traffic lights have to correspond to the national legal traffic regulations.
- 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 drive with partly filled spray agent tank.
- Lock the actuation lever of the three point hydraulic against unintended lowering when travelling on public roads with lifted machine.

6.1 First operation

6.1.1 Determining the actual values for the tractor total weight, tractor axle loads, tyre carrying capacity as well as the required minimum ballast weights

$G_{V \min}$	[kg]	Minimum weight for the front weight
G_{tat}	[kg]	Actual total weight of the entire combination
$T_{V \text{ tat}}$	[kg]	Actual front axle load
$T_{H \text{ tat}}$	[kg]	Actual rear axle load

6.1.1.1 Required data for the calculation



T_L	[kg]	Tractor net weight	❶
T_V	[kg]	Front axle load of the empty tractor	❶
T_H	[kg]	Rear axle load of empty tractor	❶
G_H	[kg]	Total weight of rear mounted implement	❷
G_V	[kg]	Total weight of front ballast	❷
a	[m]	Spacing between point of gravity of front ballast and middle of front axle	
a_1	[m]	Spacing between centre front axle and centre of lower link ball	❶ ❸
a_2	[m]	Spacing between centre lower link ball and point of gravity front ballast (point of gravity spacing)	❷
b	[m]	Wheel base of tractor	❶ ❸
c	[m]	Spacing between centre rear axle and centre lower link ball	❶ ❸
d	[m]	Spacing between centre lower link ball and point of gravity rear mounted implement (point of gravity spacing)	❷

-
- ❶ please see tractor Instruction manual / registration papers
 - ❷ Please refer to "Point of gravity spacings", page 43
 - ❸ Measure

6.1.1.2 Calculation of the minimum ballast front $G_{V \min}$ to ensure the steer ability

$$G_{V \min} = \frac{G_H \cdot (c + d) - T_V \cdot b + 0,2 \cdot T_L \cdot b}{a + b}$$

Enter into the table the figure for the determined minimum ballast weight $G_{V \min}$, which is required in the front of the tractor.

6.1.1.3 Calculation of the actual front axle load $T_{V \text{ tat}}$

$$T_{V \text{ tat}} = \frac{G_V \cdot (a + b) + T_V \cdot b - G_H \cdot (c + d)}{b}$$

Enter the figure for the calculated actual total front axle load and the permissible front axle load indicated in the instruction manual for the tractor into the table (chapter 6.1.1.7).

6.1.1.4 Calculation of the actual total weight of the combination tractor/mounted implement

$$G_{\text{tat}} = G_V + T_L + G_H$$

Enter the figure for the calculated actual total weight and the permissible tractor total weight as indicated in the tractor-instruction manual into the table (chapter 6.1.1.7).

6.1.1.5 Calculation of the actual rear axle load $T_{H \text{ tat}}$

$$T_{H \text{ tat}} = G_{\text{tat}} - T_{V \text{ tat}}$$

Enter the figure for the actual rear axle load and the permissible tractor rear axle load indicated in the tractor-instruction manual into the table (chapter 6.1.1.7).

6.1.1.6 Tyre carrying capacity

Enter double the value (two tyres) of the tyre carrying capacity (please refer e.g. to the documentation of the tyre manufacturer) into the table (chapter 6.1.1.7).

6.1.1.7 Table

	Actual value according to the calculation	Permissible value according to the tractor-instruction manual	Double the permissible tyre carrying capacity (two tyres)
Minimum ballast Front / rear	<div>/ kg</div>	--	--
Total weight	<div>kg</div>	<div>kg</div>	--
Front axle load	<div>kg</div>	<div>kg</div>	<div>kg</div>
Rear axle load	<div>kg</div>	<div>kg</div>	<div>kg</div>



Hint!



Danger!



Important!

Please take the permissible values for the tractor total weight, axle loads and tyre carrying capacity from the registration papers of your tractor.

The actual calculated values must be smaller than /equal to (\leq) the permissible values! If the actual calculated value is bigger than the permissible value the mounted implement is too big for your tractor.

- Attach the minimum ballast to your tractor either in the form of a mounted implement or a ballast weight!
 - If the necessary minimum front ballast ($G_{V \min}$) is not achieved with the front mounted implement (G_V) increase the weight of the front mounted implement up to the weight of the minimum ballast ($G_{V \min}$)!
 - If the necessary minimum rear ballast ($G_{H \min}$) is not achieved with the rear mounted implement (G_H) increase the weight of the rear mounted implement up to the minimum ballast ($G_{H \min}$)!
- Apply ballast to your tractor with a front or rear weight when the tractor axle load is exceeded on one axle.

6.1.2 PTO-shaft



Important!

- Only use the Walterscheid W 100E PTO shaft provided.
- Never exceed the permissible PTO-speed of 540 R.P.M!
- To avoid damage to the PTO shaft engage it only at low tractor engine speed!



Danger!

- Operate always with all guards completely fitted! PTO shaft with complete PTO and additional guards on tractor and implement. Replace any guards immediately if damaged.
- Adhere to the fitting and maintenance advice of the PTO shaft manufacturer which are fixed to the PTO shaft!
- Prevent the PTO guard from spinning by fixing the provided chains!
- Before engaging the PTO shaft read and adhere to the safety advice for operating the PTO shaft in chapter "Safety advice for the operator", page 27.

1. Clean and grease the tractor PTO-shaft.
2. Slide the tractor PTO shaft halves onto the PTO and the machine input shaft in the prescribed fitting direction. **When fitting initially or when changing the tractor the PTO length should be checked be matched to the tractor.**

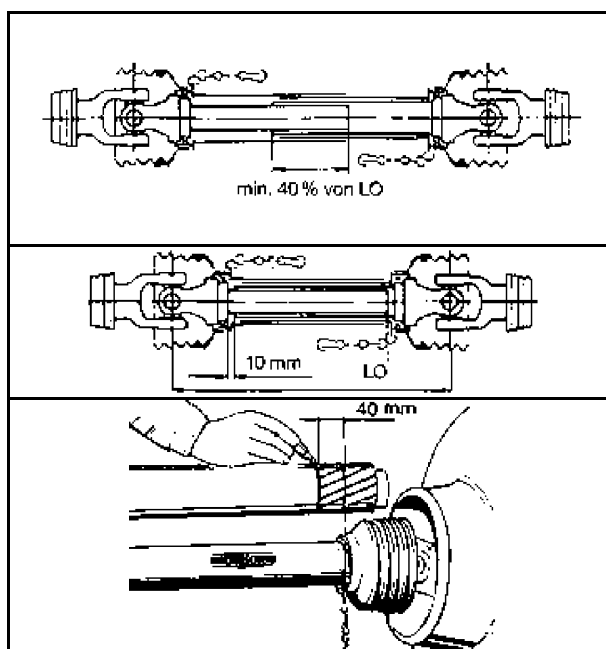
6.1.2.1 Initial fitting and matching up of the PTO shaft



Important!

When first attaching the sprayer to the tractor check the length of the universal joint shaft in relation to the tractor according to Fig. 170. 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. Slide the tractor PTO shaft halves onto the PTO and the machine input shaft (in the prescribed fitting direction).
2. Check whether the overlapping of the universal joint shaft's profile tube is in any position of the sprayer behind the tractor at a minimum of 40 % of LO (length in the totally retracted position) by holding the two mounted PTO shaft tubes next to one another.
3. In shortest position the universal joint shaft tubes must never hit the universal yokes. Allow a safety spacing of at **least 10 mm**.
4. To match the universal joint shaft halves hold them in shortest operational position next to one another and mark them.



Putting into operation

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.
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:
Universal joint shaft with complete guard tubes and cones as well as guards around the tractor.

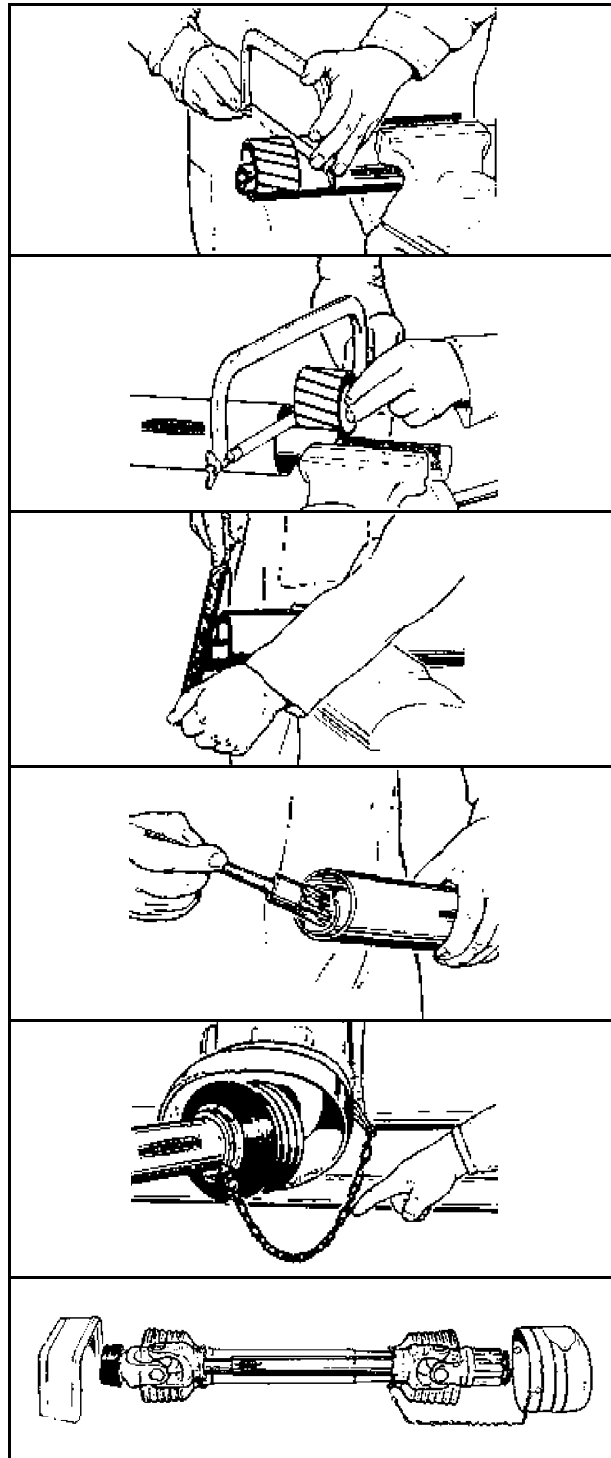


Fig. 170

6.1.3 First fitting of **AMATRON+**

6.1.3.1 Computer and console



Important!

- When fitting the tractor basic equipment (Fig. 171/1) ensure that the distance from any radio transmitter or antenna should be at least 1 m.
- Implicitly ensure that the computer housing is provided via the console with an electric earth connection to the tractor chassis. To avoid electrostatic charge scratch off the paint in the contact area.

1. Fit the tractor basic equipment (Fig. 171/1) (console with distributor) in such a way that it is vibration free and earthed electrically (scratch off paint on the fixing point) and within view and reach to the right hand side of the operator.
2. Push the carrier with the computer (Fig. 171/2) onto the tube of the console.
3. Swivel the computer to ensure an optimum view on to the display.

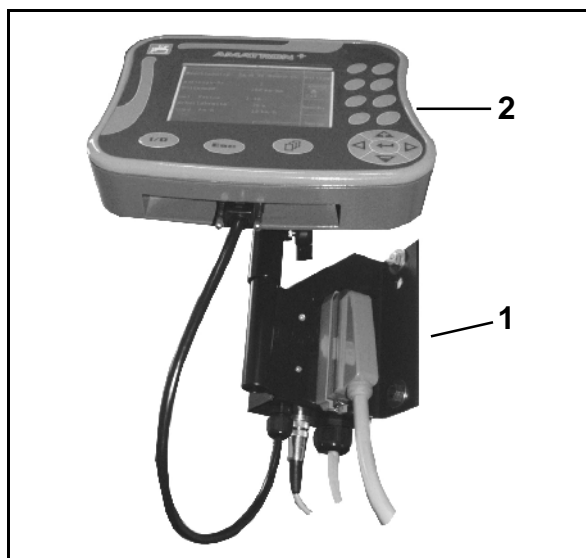


Fig. 171

6.1.3.2 Battery link up cable



Hint!

The power supply is 12 V. Connect the battery connection lead directly with the tractor battery or the 12 V starter.

1. Route the battery connection lead from the tractor cab to the tractor battery and fix. When routing don't kink the battery connecting lead.
2. Shorten the battery connecting lead to the required length.
3. Remove the cable sheathing on the cable end by approx. 250 to 300 mm.
4. Strip the individual cable ends by 5 mm.

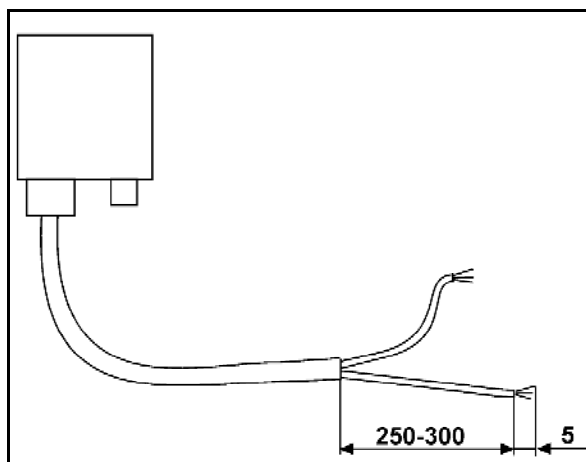


Fig. 172

Putting into operation

5. Insert the blue cable (earth cable) into the ring tongue (Fig. 173/1).
6. Use pliers for crimped joint.
7. Insert the brown cable (+ 12 Volt) into butt joint (Fig. 173/2).
8. Use pliers for crimped joint.
9. Shrink butt joint (Fig. 173/2) by using a heat source (lighter or hair dryer) until the adhesive escapes.
10. Connect the battery connection lead with the tractor battery:
 - Brown cable with +.
 - Blue cable with -.

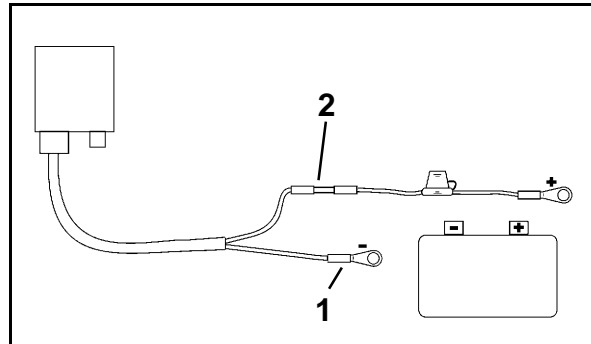


Fig. 173

6.1.3.3 Connect **AMATRON+** with machine computer

1. Connect cable (Fig. 174/1) from machine computer with **AMATRON+**.
2. Connect the signal cable (Fig. 174/2) of the tractor signal socket or of Sensor X with the tractor basic equipment.
3. Insert the plug of the connection cable (Fig. 174/3) into the centre 9-pole Sub-D-bushing (Fig. 174/4) on **AMATRON+**.



The serial interface (Fig. 174/5) allows the connection with a GPS-Terminal.

Hint!

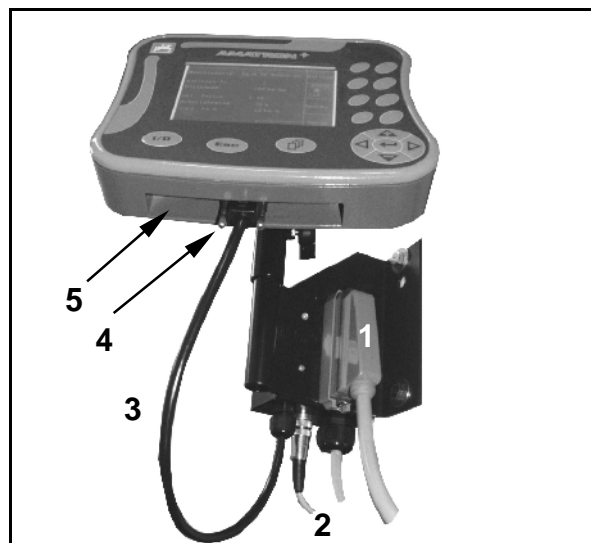


Fig. 174

6.1.3.4 Fitting - Sensor "X" (cardan shaft / wheel) for the distance or forward speed determination



Hint!

- If the tractor electronic system provides the tractor own forward speed determination the speed signals "Impulses per 100m" for the **AMATRON +** can be taken from the relevant signal socket DIN 9684.
In this case exchange the standard sensor "X" (cardan shaft / wheel) for the tractor specific adapter cable (special option) .
- Observe the following advice when fitting the sensor "X":
 - The fixing bolt of the magnet should point at the end of the sensor.
 - The distance magnet – sensor should be 5 – 10 mm.
 - The movement direction of the magnets should be diagonal towards the sensor.
 - Fix magnets with the provided high grade steel bolts on iron.
 - The painted side of the magnets must be visible.
 - The sensor should rise above the carrier by at least 25 mm.
 - Route the sensor cable in such a way that it is not damaged by the steer angle.

6.1.3.4.1 Fitting to tractor without four wheel drive

1. Evenly distribute the magnets (Fig. 175/1) on the plug gage in the wheel shell of the tractor front wheel.
2. Attach the magnets (Fig. 175/1) by using bolts (Fig. 175/2) made from non magnetic material (brass bolts or highest grade V4A steel).



Hint!

- The number of the magnets depends on the size of the tractor wheel.
- The travelled distance between 2 impulses of adjacent magnets must not exceed 60 cm.

3. Calculate the number of the required magnets as follows:

Calculation:

$$\frac{\text{wheel circumference [cm]}}{60 \text{ cm}} = \text{number of magnets}$$

Example:

$$\frac{256 \text{ cm}}{60 \text{ cm}} = 4,27 = \text{min. 5 magnets}$$

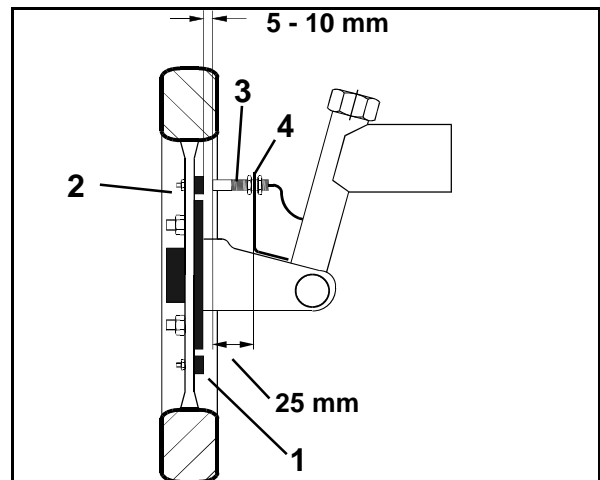


Fig. 175

Putting into operation

4. Attach the sensor (Fig. 176/3) by using a universal carrier (Fig. 176/4) to the stub axle of the tractor front wheel – behind the axle seen in direction of travel.

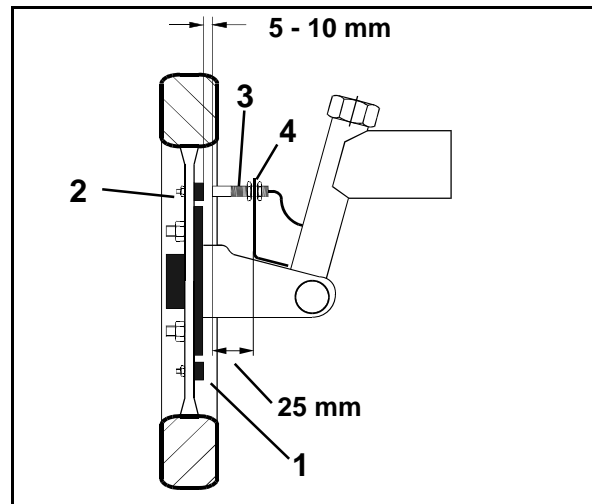


Fig. 176

6.1.3.4.2 Fitting to four wheel tractors or Mb-trac



Important!

- Fit the magnets only on a place free of angular movements of the cardan shaft.
- Adjust the spacing between magnet and sensor within a range of 5 – 10 mm.
- The sensor should rise above the carrier by at least 25 mm.

1. Fix the magnet (Fig. 177/1) by using the hose clamp (Fig. 177/2) on the cardan shaft.
2. Fix the sensor (Fig. 177/3) by using a universal carrier (Fig. 177/4) opposite the magnet on the vehicle frame.

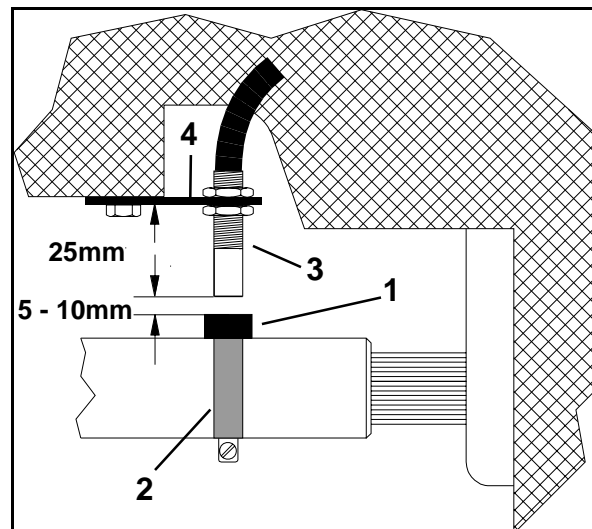


Fig. 177

6.1.4 Enter implement data into **AMATRON +**



Hint!

- The implement data have been entered into the **AMATRON +** in the factory. Please refer to chapter "Operator terminal **AMATRON +**", page 53.
- In the **AMATRON +** the implement data can be
 - selected directly,
 - entered manually via the entering functions or
 - determined by a calibration procedure.
- Depending on the selected boom type, boom specific functions are available.

Putting into operation

6.2 Hitching up

Mounted Sprayer

1. The mounted sprayer is fitted to the rear hydraulic three point linkage of the tractor. Attach the lower link arms of the tractor to the lower link pins (cat. II) (Fig. 178/1).
2. Fit and secure upper link arm with inserting pin cat. II (for UF 1501) (Fig. 178/2) or cat. III (for UF 1801).
3. Adjust the top link length in such a way that the boom carrying frame stands vertical when the machine is lifted.



Danger!

Advise people to leave the operational range of the machine when adjusting the upper link arm length.



Important!

The lower link arms of the tractor three point hydraulics must be fitted with stabilising bars or chains. They only allow little play on the lower link arms when the sprayer is in the lifted position to prevent bouncing to and fro of the sprayer.



Fig. 178

4. Slide in both supports (Fig. 178/3) and secure.
5. If necessary remove the rolling device (special option) if existing.



Hint!

If necessary remove the rolling device for ear treatment or in high crop to avoid cereal damage.

PTO-shaft

6. Slide the PTO shaft on to the tractor universal joint shaft.



Important!

When fitting initially the PTO length should be matched to the tractor.

7. Prevent the PTO guard from spinning by fixing the provided chains.

Traffic lights

8. Connect the power cable of traffic lights on tractor and check function of the traffic lights before every use.

Hydraulic connections



Important!

Connect the block tap with the hydraulic hose for the height adjustment before you couple or uncouple the plug of this hydraulic hose to the tractor hydraulic socket.

Q-plus and Super-S-boom, fully hydraulic folding

9. Connect the hydraulic hoses on the height adjustment to a single acting spool valve on the tractor.
- 9.1 Connect the hydraulic hoses for boom folding to a double acting spool valve on the tractor.

Q-plus and Super-S-boom with Profi-Folding

9. Connect the pressure hydraulic hose to a **single acting spool valve**, the return hydraulic hose to a **pressure-free return socket** on the tractor.

AMATRON +



Important!

Switch off the power supply on **AMATRON +** before you connect the implement plug with **AMATRON +**.

10. Connect the implement plug of the machine with **AMATRON +**.
11. Switch on **AMATRON +**.
12. Enter the order data into **AMATRON +**.



Important!

Before you start to operate the machine enter the order data into **AMATRON +**.

6.3 Hitching off and parking the tractor mounted sprayer

1. Uncouple the supply lines between tractor and machine and insert into the relevant retaining bushings (Fig. 179/1).
2. Pull out and arrest both parking supports (Fig. 179/2).



Only park or move the sprayer with empty tank and extended parking supports! Danger of tipping over!

Danger!

3. Lower the machine to the ground and uncouple the sprayer.

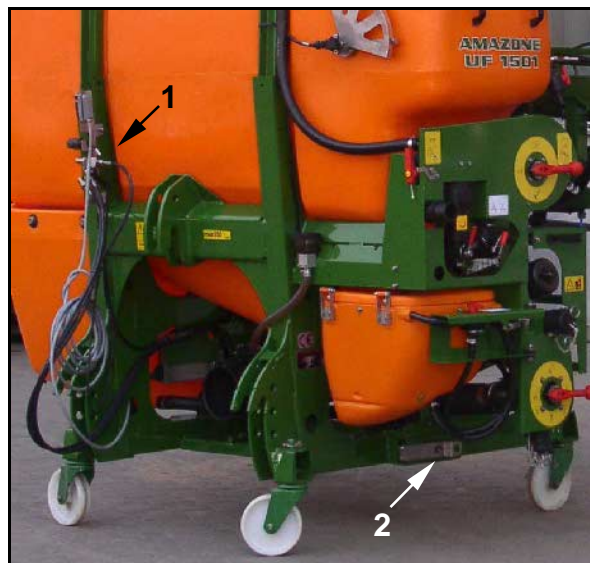


Fig. 179

6.4 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 all filters regularly (please refer to chapter "Cleaning", page 203). 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.
 - Observe the permissible combinations of filters or of the 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 (optional).
 - For '015' and '01' nozzles the 100 mesh/inch pressure filter insert is required (optional).
 - 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 46.
- As a matter of principle clean the field sprayer before applying an other plant protective agent (please refer to chapter "Cleaning", page 203).
 - Rinse the nozzle pipe
 - at every nozzle change.
 - before fitting other nozzles.
 - before revolving the triple nozzle head on to another nozzle.

Please refer to chapter "Cleaning", page 203.

6.4.1 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 166.

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 last 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!
- For this see chapter "Filling table for residual areas" page 167.
- When agitating the spray mixture adhere to the advice by the spray agent manufacturers.
- Rinse carefully emptied spray agent containers (e.g. by the can washing device) and pour the rinsed water into the spray mixture!

Carrying out

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 agent tank half with water.
4. Switch on the agitation.
5. Add the calculated quantity of the spray agent.
6. Fill in remaining water quantity.
7. Agitate the spray mixture according to the spray agent manufacturer's advice before spraying.

6.4.1.1 Calculating the filling or refilling quantities



Important!

For the calculation of the required refilling amount for the last spray agent tank filling, use the table "Filling table for left over areas", page 167.

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?

Reply:

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:

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

$\frac{(1000 - 200) \text{ [l]} \times 0.15 \text{ [\%]}}{100} = 1.2 \text{ [l or kg]}$

Putting into operation

Calculation formula and reply to question 2:

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

$$\frac{1000 \text{ [l]} (\text{Nominal tank volume}) - 20 \text{ [l]} (\text{residual amount})}{500 \text{ [l/ha]} \text{ required rate of water}} = 1.96 \text{ [ha]}$$

6.4.1.2 Filling table for finishing off remaining field areas



Important!

For determining the required refilling amount for the last spray agent tank filling use the "Filling table for residual areas". Deduct the surplus amount in the spray line from the calculated refilling quantity. For this see chapter "Spray lines", page 133.



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.

Travelling distance [m]	Refilling quantities [l] for sprayer booms in working widths of							
	10 m	12 m	15 m	16 m	18 m	20 m	21 m	24 m
10	1	1	2	2	2	2	2	2
20	2	2	3	3	4	4	4	5
30	3	4	5	5	5	6	6	7
40	4	5	6	6	7	8	8	10
50	5	6	8	8	9	10	11	12
60	6	7	9	10	11	12	13	14
70	7	8	11	11	13	14	15	17
80	8	10	12	13	14	16	17	19
90	9	11	14	14	16	18	19	22
100	10	12	15	16	18	20	21	24
200	20	24	30	32	36	40	42	48
300	30	36	45	48	54	60	63	72
400	40	48	60	64	72	80	84	96
500	50	60	75	80	90	100	105	120

Fig. 180

Example:

Remaining left over distance: 100 m
 Spray rate: 100 l/ha
 Sprayer booms: Q-plus-boom
 Working width: 15 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 **15 l**.
2. Deduct the residual amount in the spray line from the calculated refilling quantity.

Necessary refilling quantity: 15 l – 5.2 l = 9.8 l

6.5 Explanation of the control elements for the spraying operation

6.5.1 VARIO-control-pressure side

- (1) Spraying operation
- (2) Outer cleaning with clean water (H_2O)
- (3) Induction bowl
- (4) Internal tank wash with clean water (H_2O)

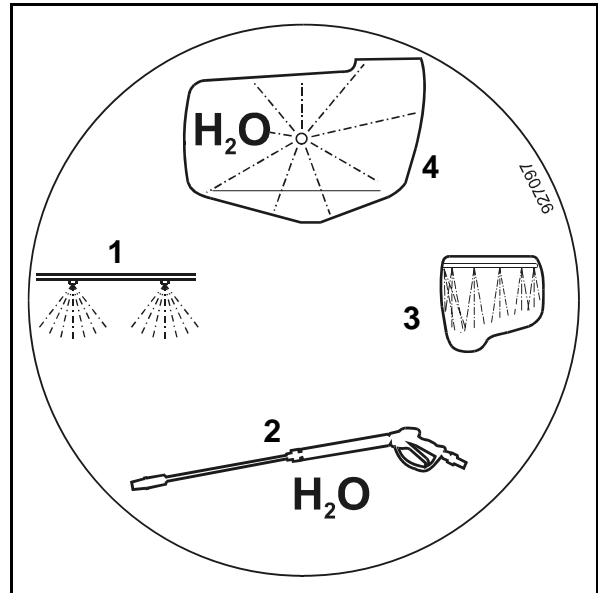


Fig. 181

6.5.2 VARIO-control-suction side

- (1) Spraying operation
- (2) Drain off the technical residual amounts out of the spray cocktail tank
- (3) Drain the technical residual amounts off the valve chest, suction hose, pump and suction filter
- (4) Diluting with clean water (H_2O) from the clean water tank
- (5) Filling the spray cocktail tank with water via the suction hose

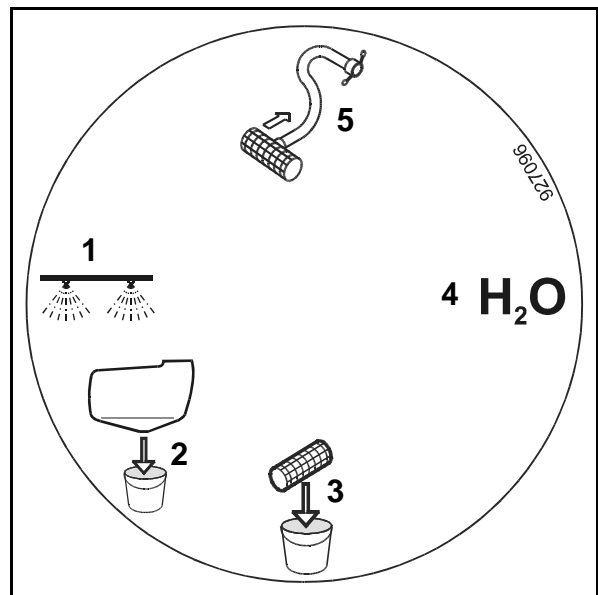


Fig. 182

6.5.3 Reversing tap Spraying operation / Spray cocktail tank quick emptying

- (1) Spraying operation
- (2) Spray cocktail tank quick emptying via the pump, e.g. into a tank lorry

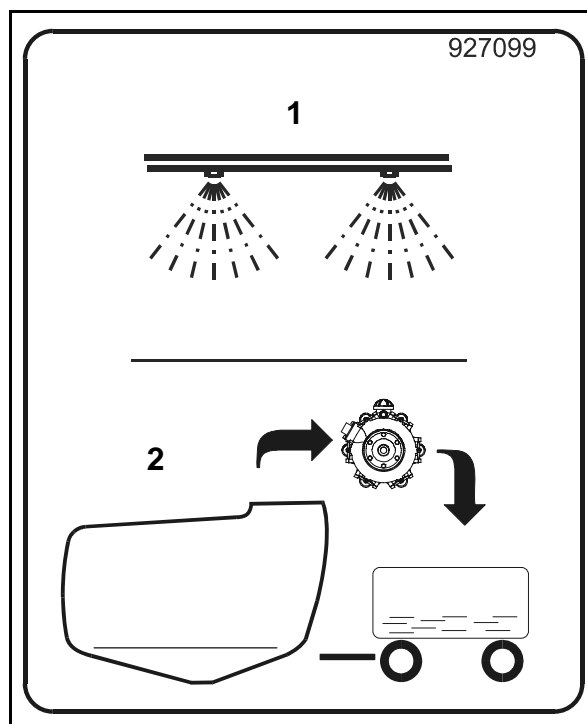


Fig. 183

6.5.4 Reversing tap Spraying operation / Flushing

- (1) Spraying operation
- (2) Flushing with clean water (H₂O) from the clean water tank

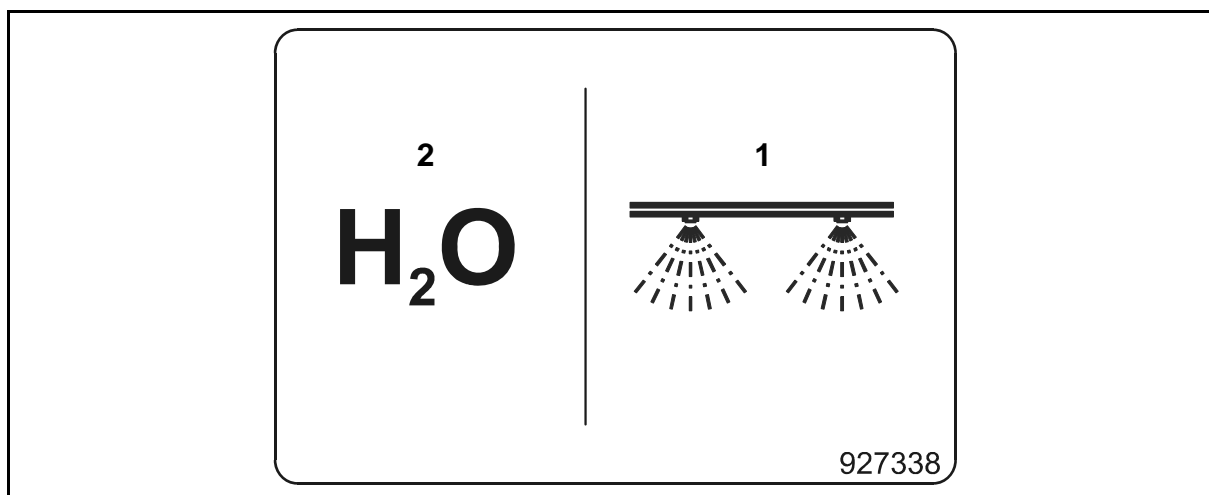


Fig. 184

6.5.5 Reversing tap Circuit line / Canister flushing

- (0) Zero position
- (1) Canister flushing
- (2) Circular pipe line

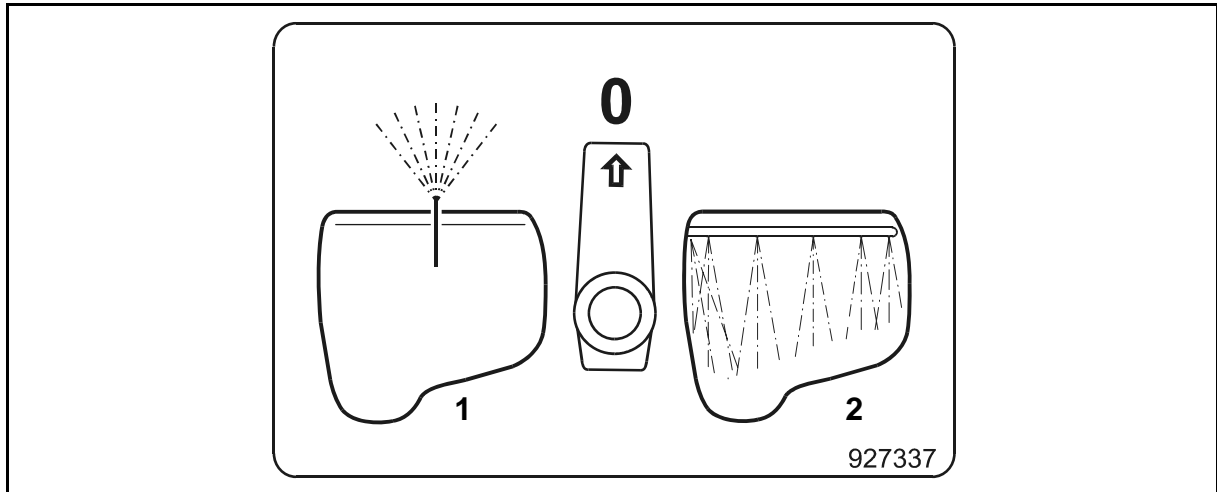


Fig. 185

6.5.6 Reversing tap Suck off induction bowl / Suction joint for spray agent tank

- (1) Spraying operation
- (2) Suck off induction bowl
- (3) Filling the spray cocktail tank with water via the suction hose

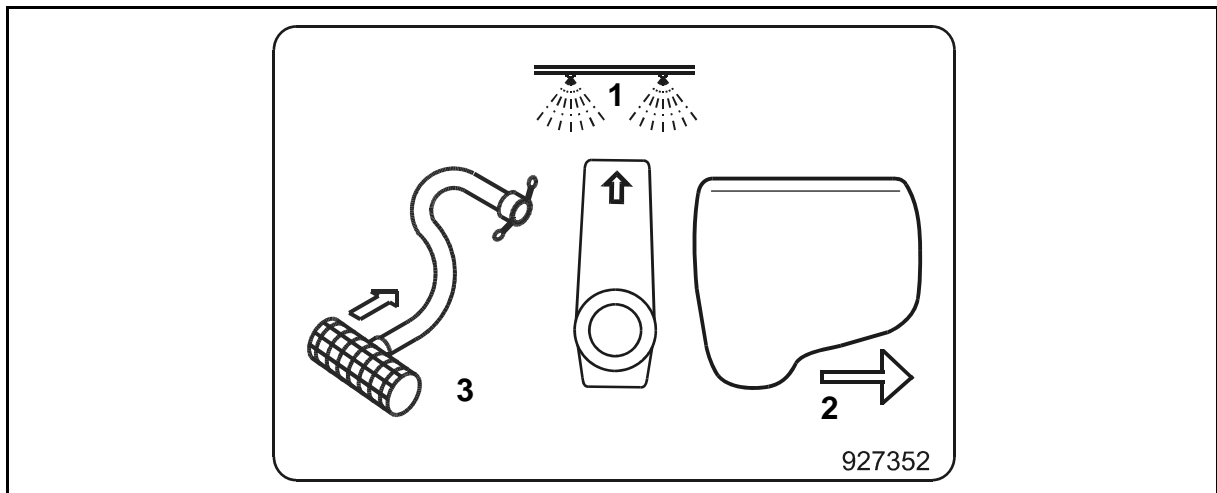


Fig. 186

Putting into operation

6.5.7 Position of the control elements for the relevant kinds of operation

6.5.7.1 Spraying operation

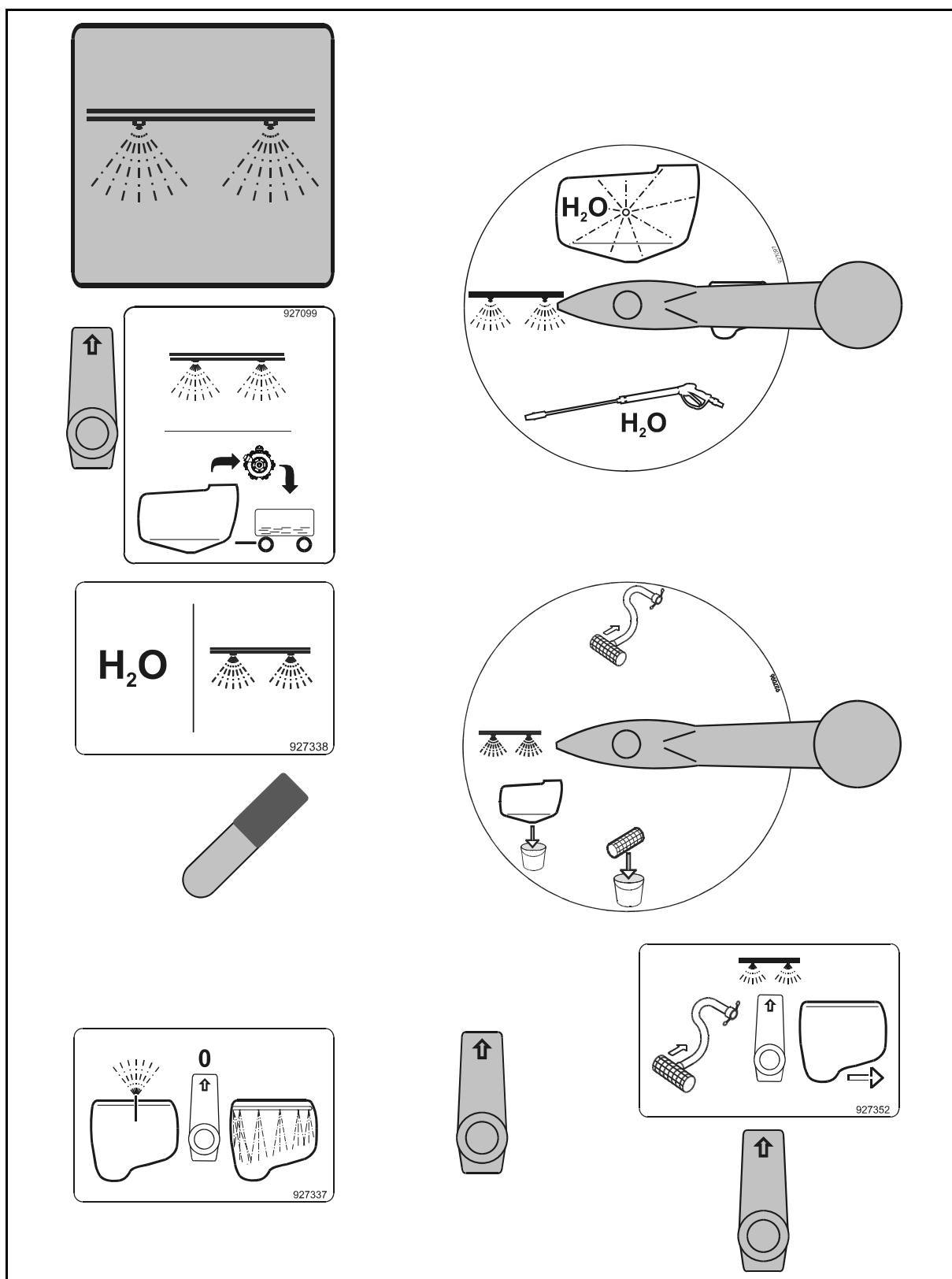


Fig. 187

6.5.7.2 Suck off induction bowl

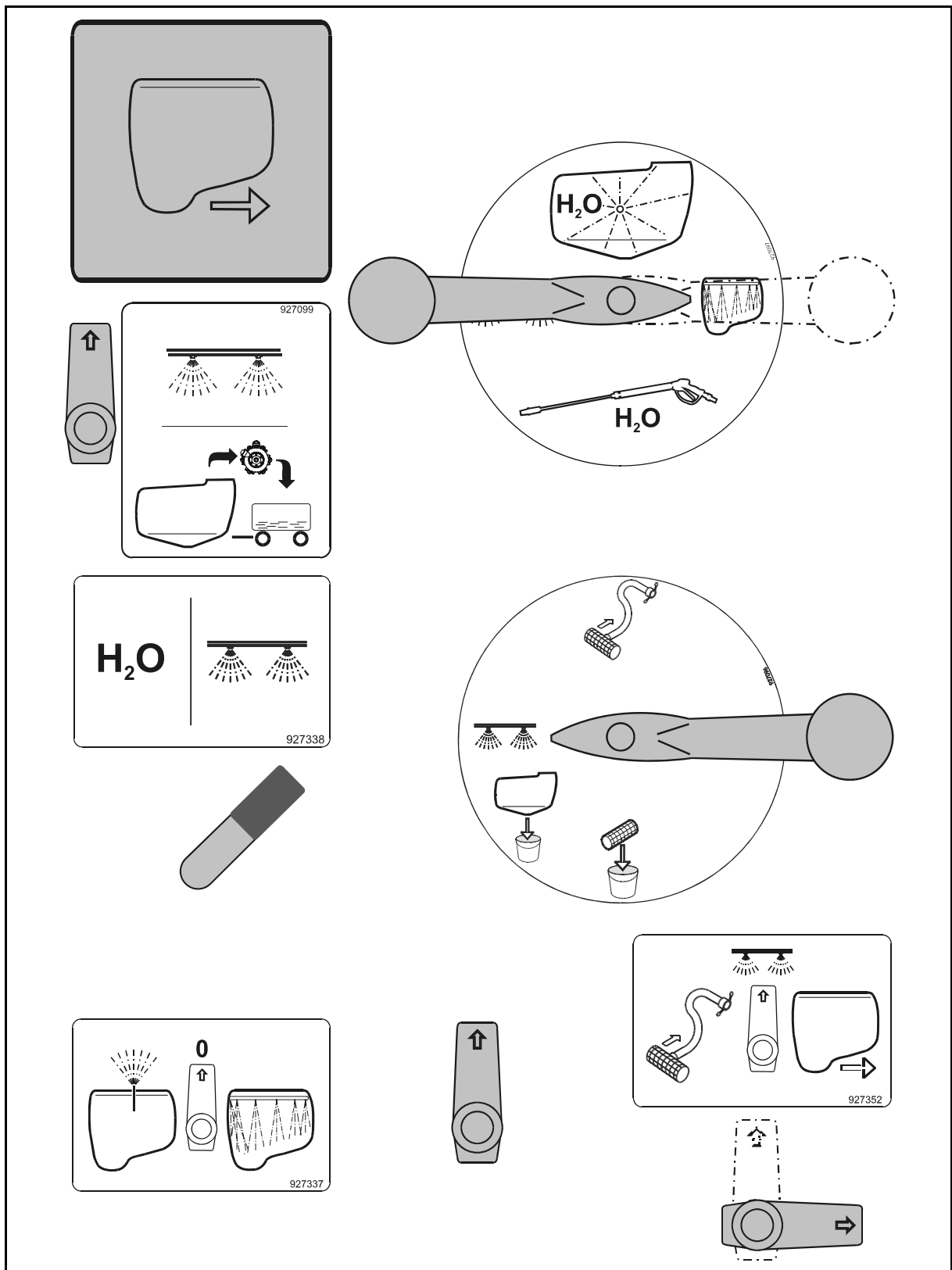


Fig. 188

6.5.7.3 Dissolve urea in the induction bowl via the circular pipe line and suck off

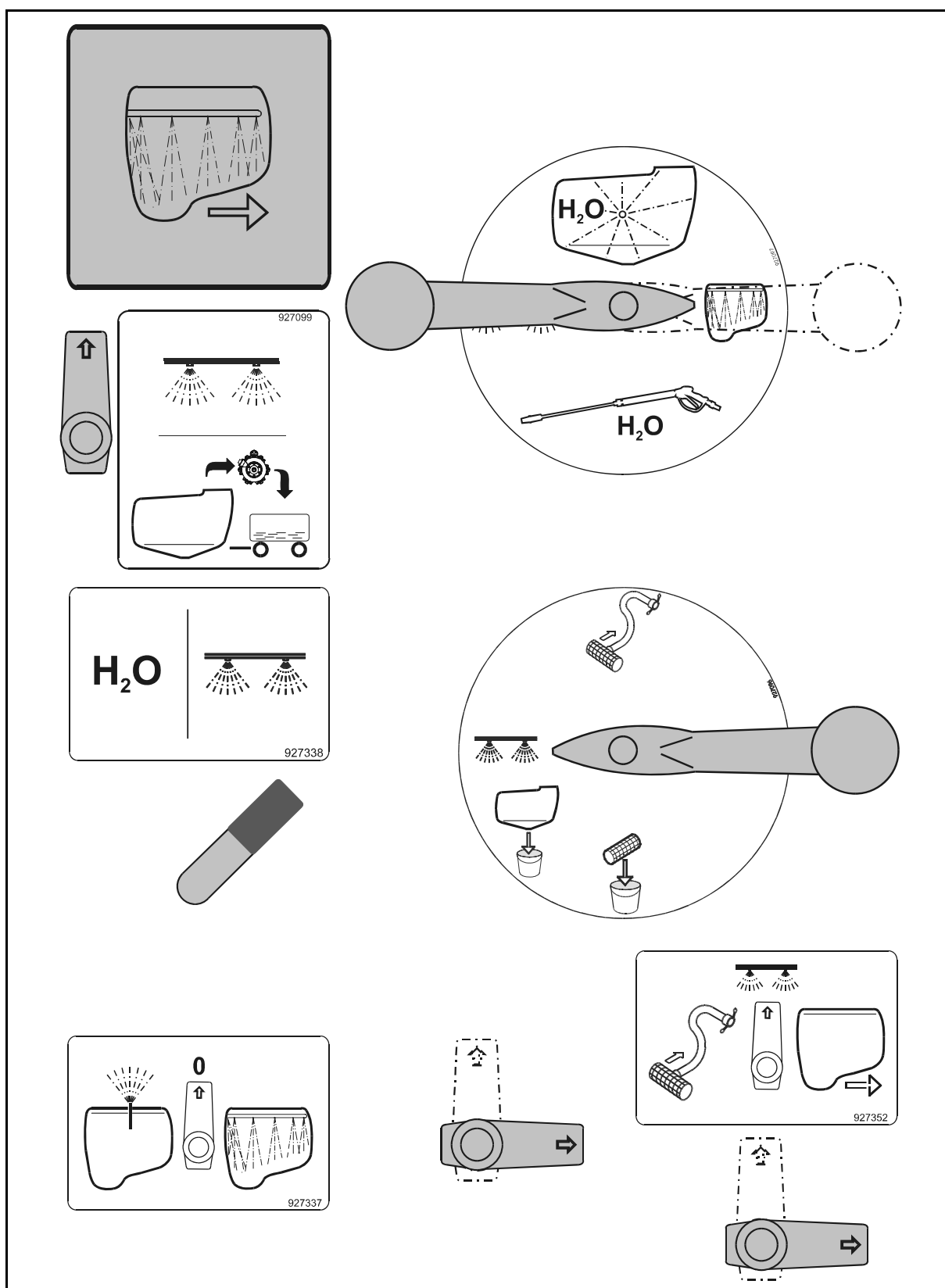


Fig. 189

6.5.7.4 Use the canister flushing device to pre-clean the canister with spray cocktail

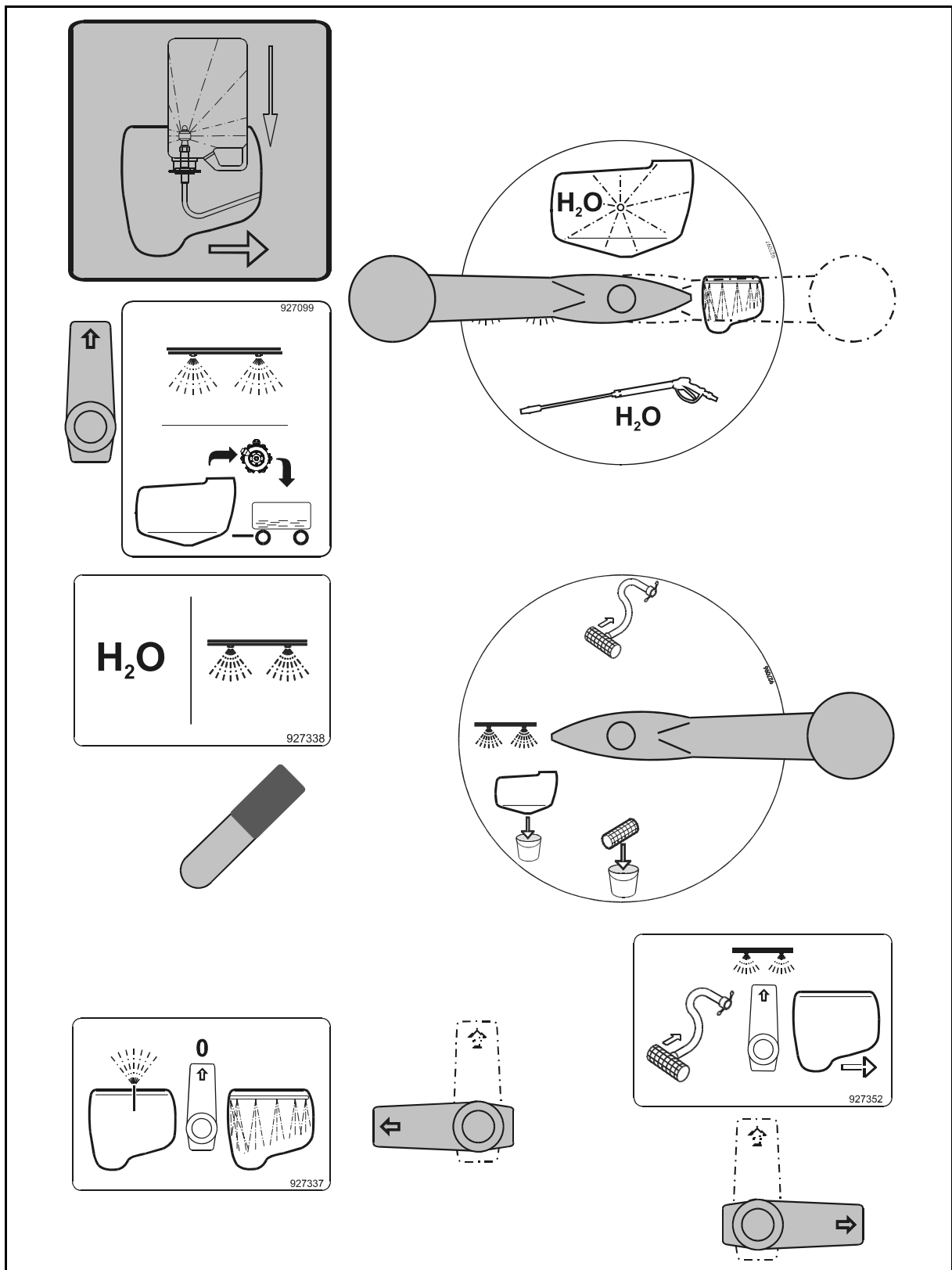


Fig. 190

6.5.7.5 Use the canister flushing to clean the induction bowl with rinse water

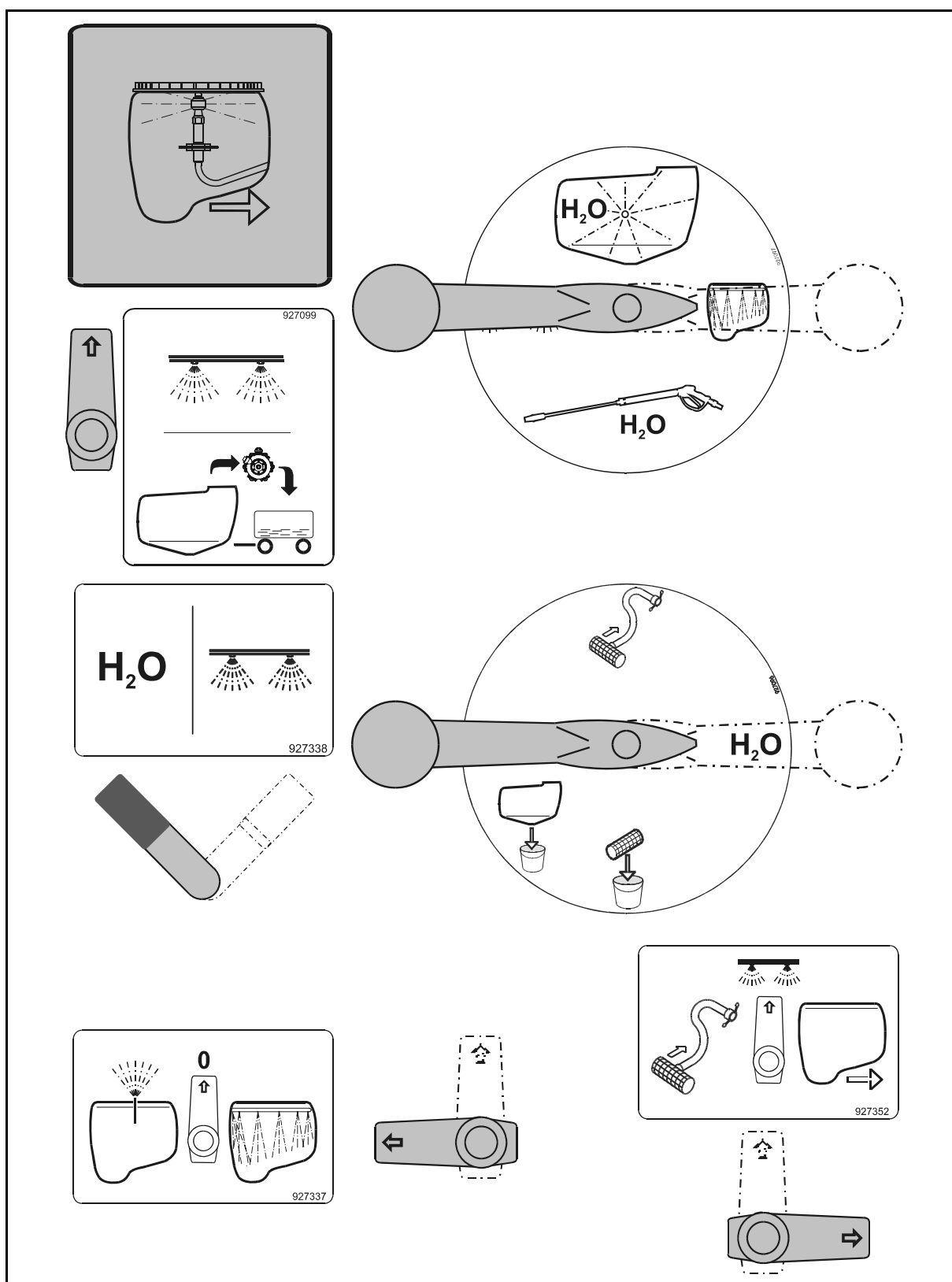


Fig. 191

6.5.7.6 Dilute the residual amount in the spray cocktail tank with rinse water

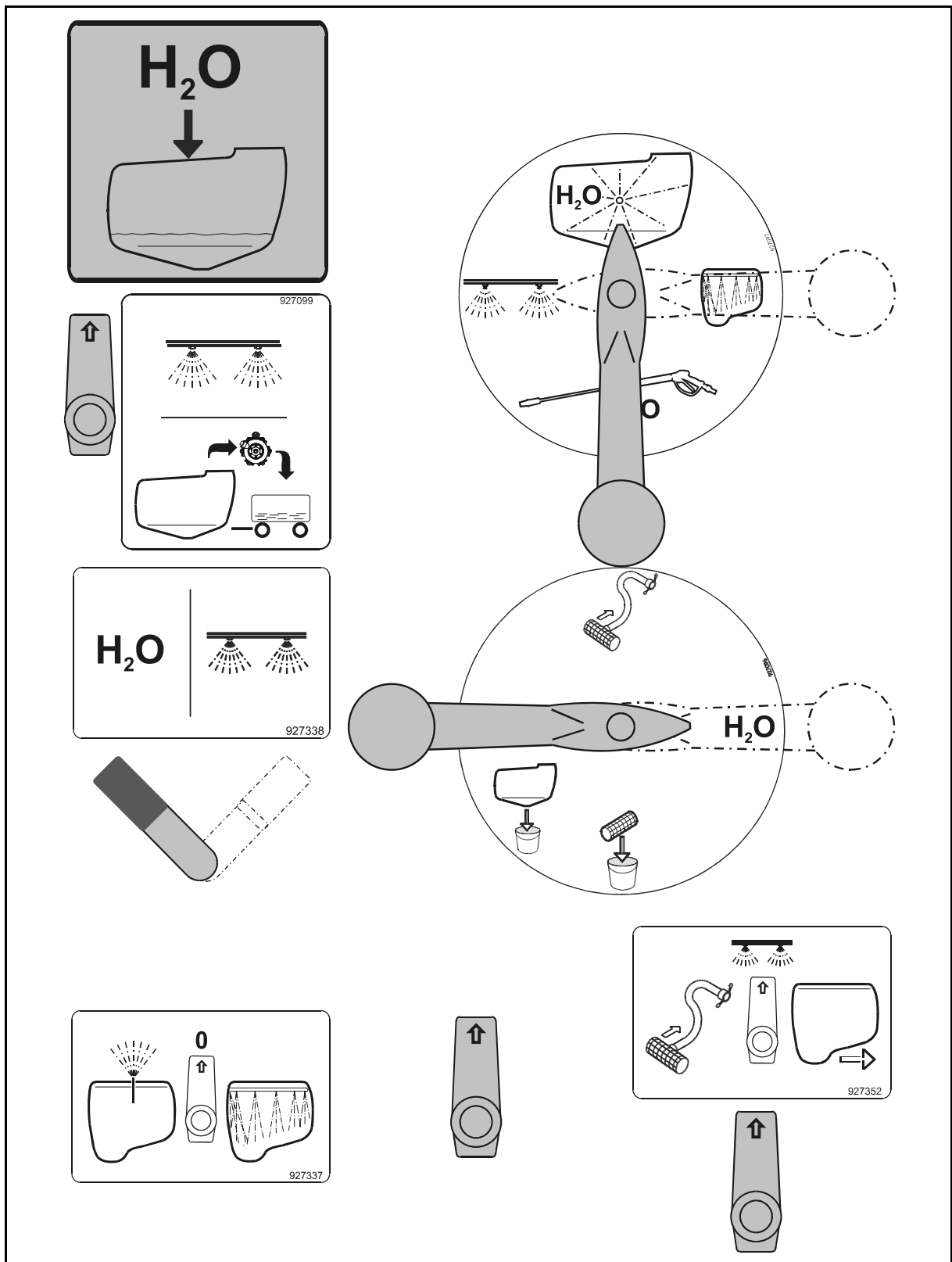


Fig. 192

6.5.8 Cleaning the field sprayer with a filled tank

1. Clean suction filter, pump, pressure governor and spray lines with rinse water

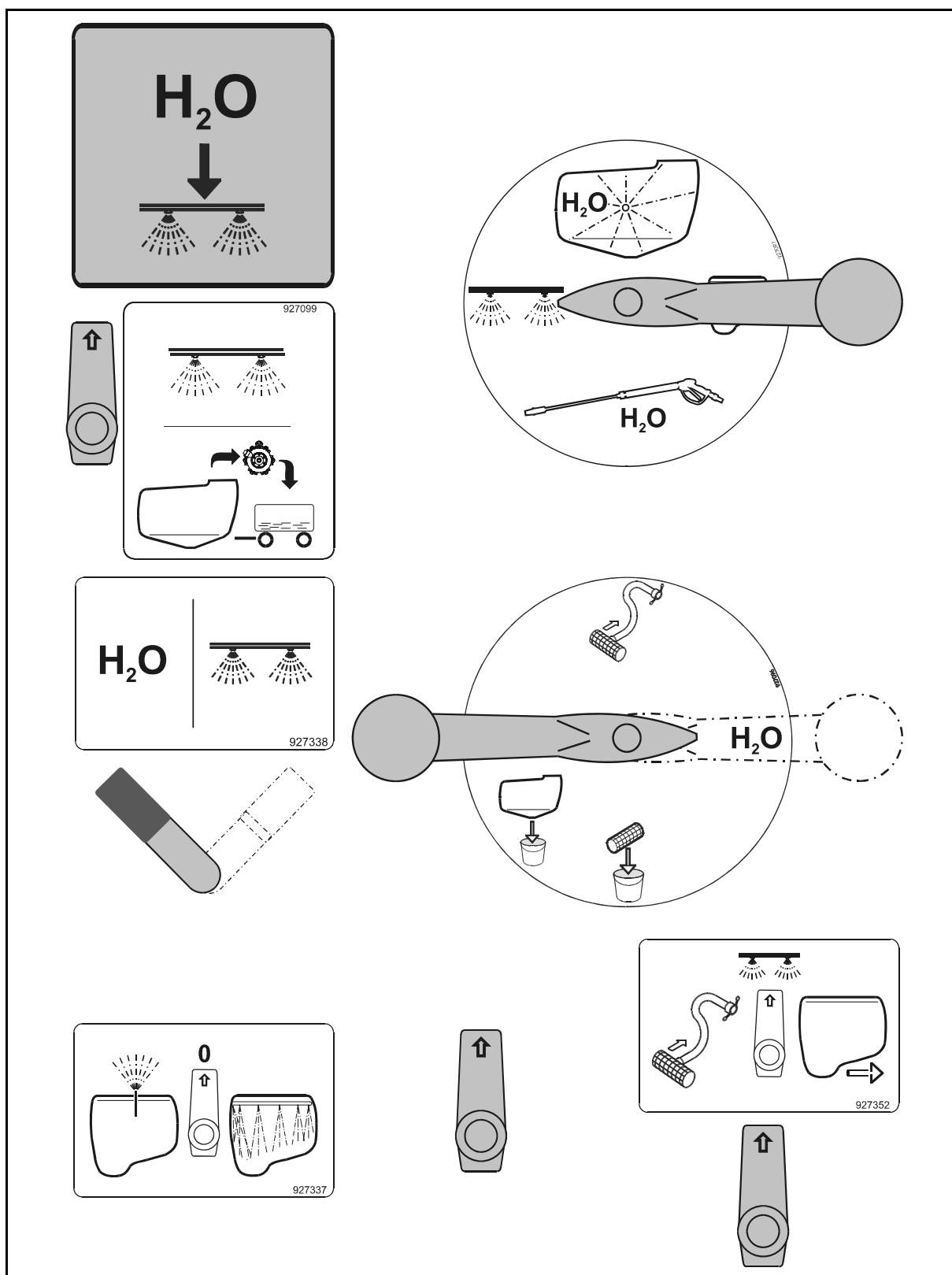


Fig. 193

2. Empty suction filter, pump and pressure governor

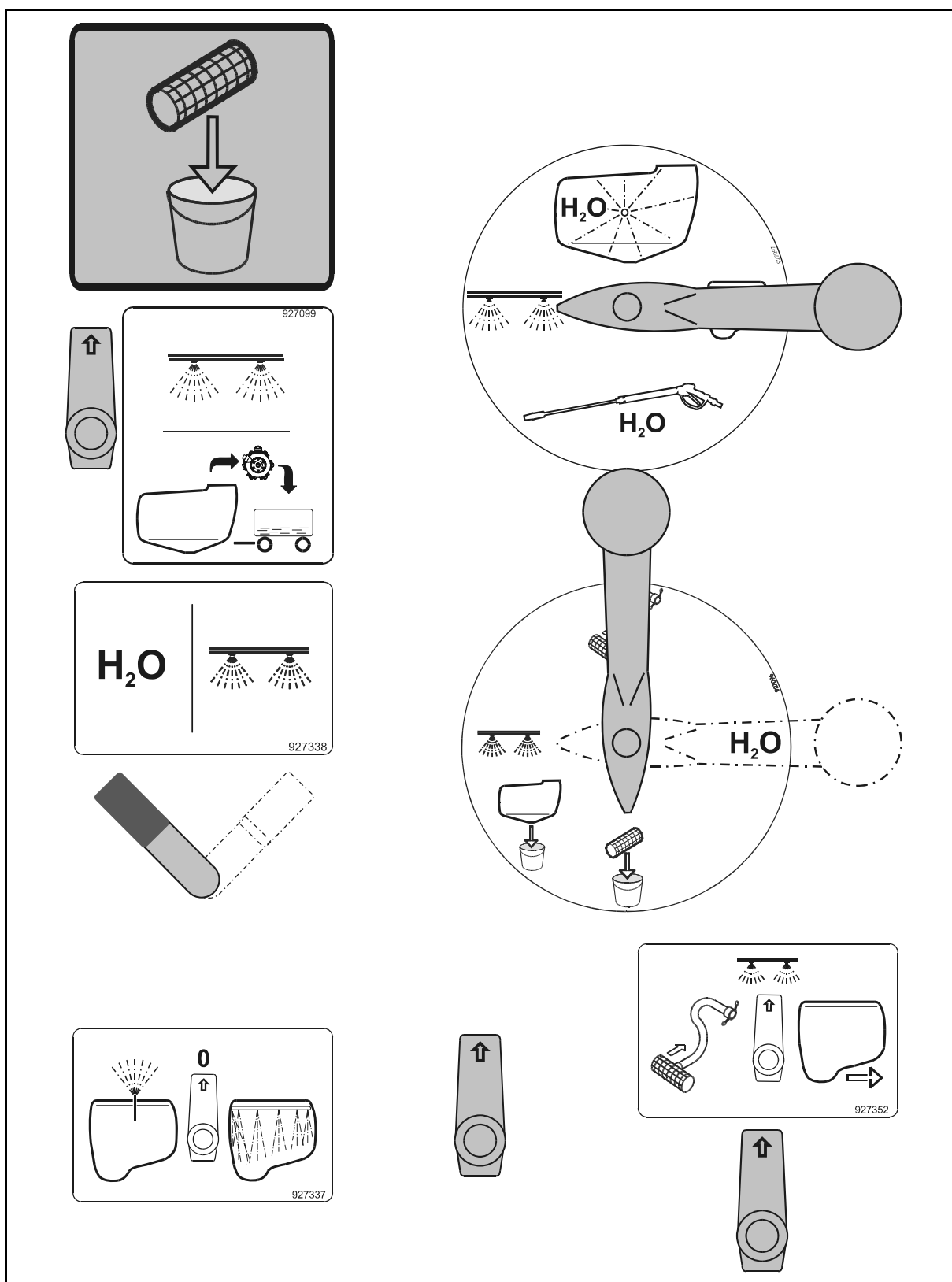


Fig. 194

6.5.9 Empty suction filter, pump and pressure governor

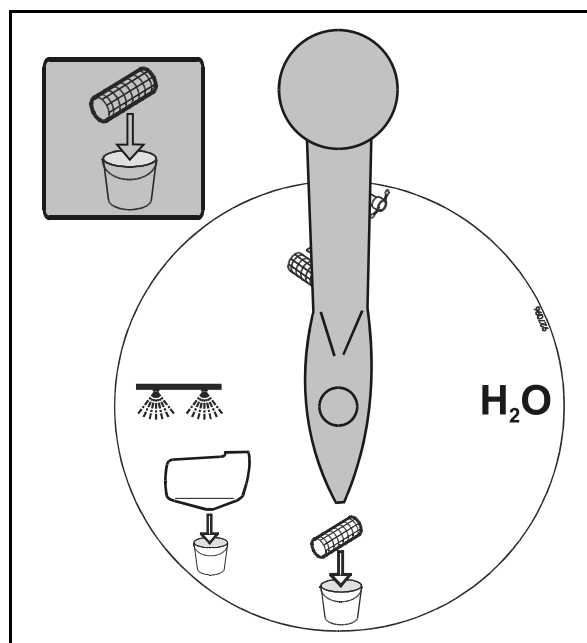


Fig. 195

6.5.10 Drain the residual amount off the spray cocktail tank

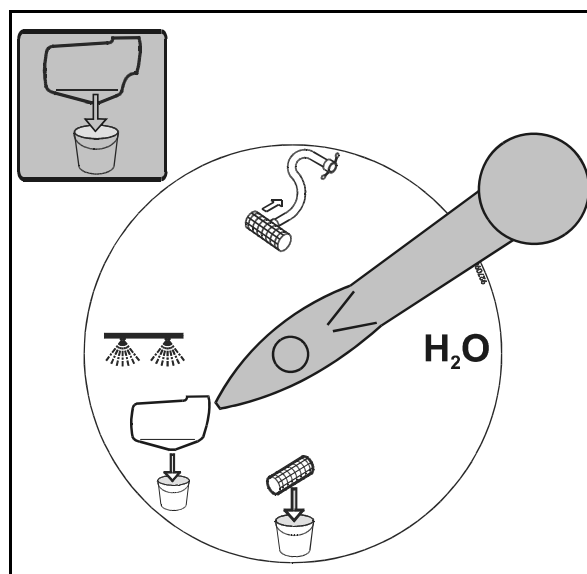


Fig. 196

6.5.11 Empty spray cocktail tank via the pump, e.g. in a tank lorry

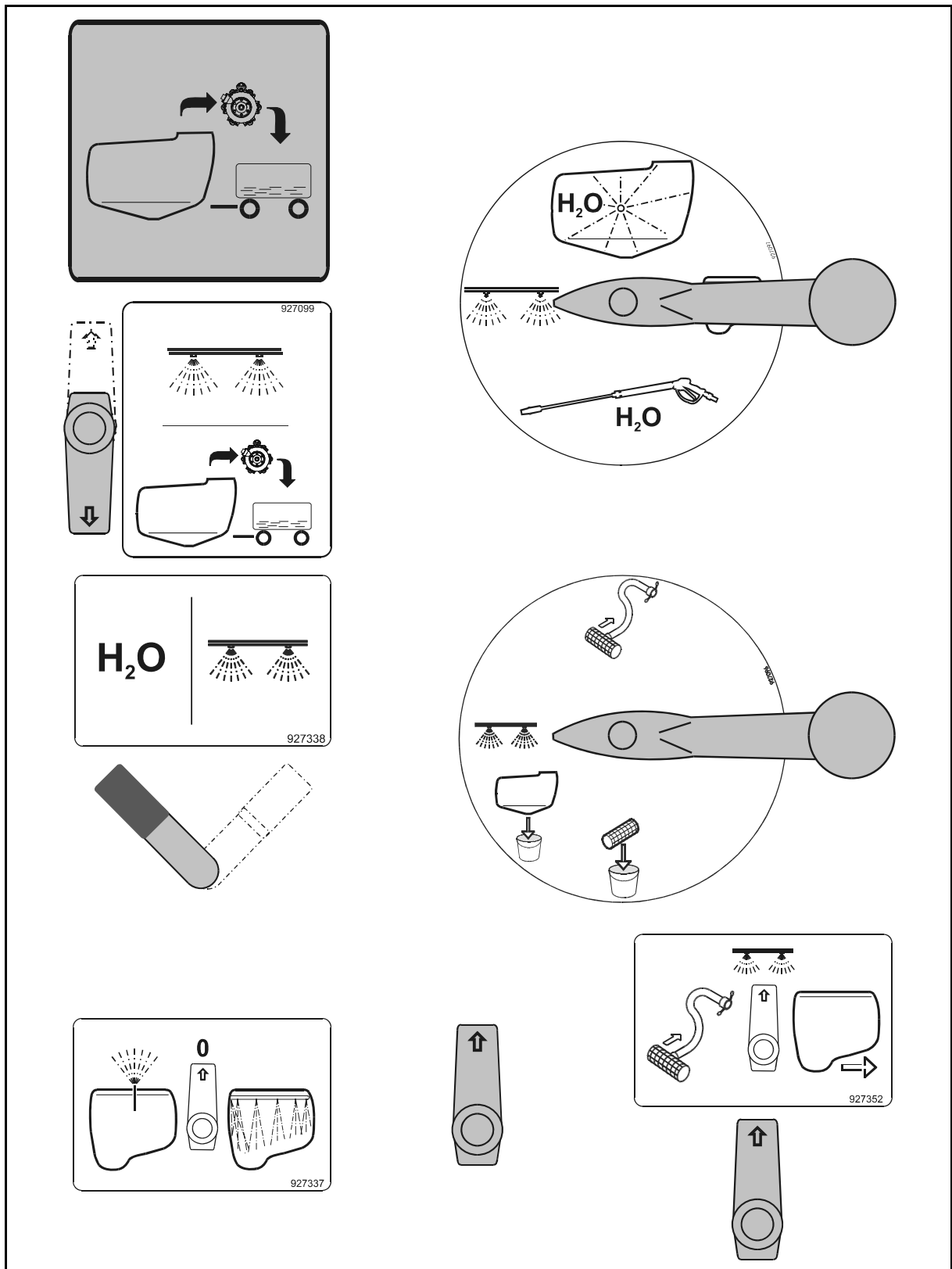


Fig. 197

6.5.12 Filling the spray cocktail tank via suction hose on the suction joint of the VARIO-control-suction side

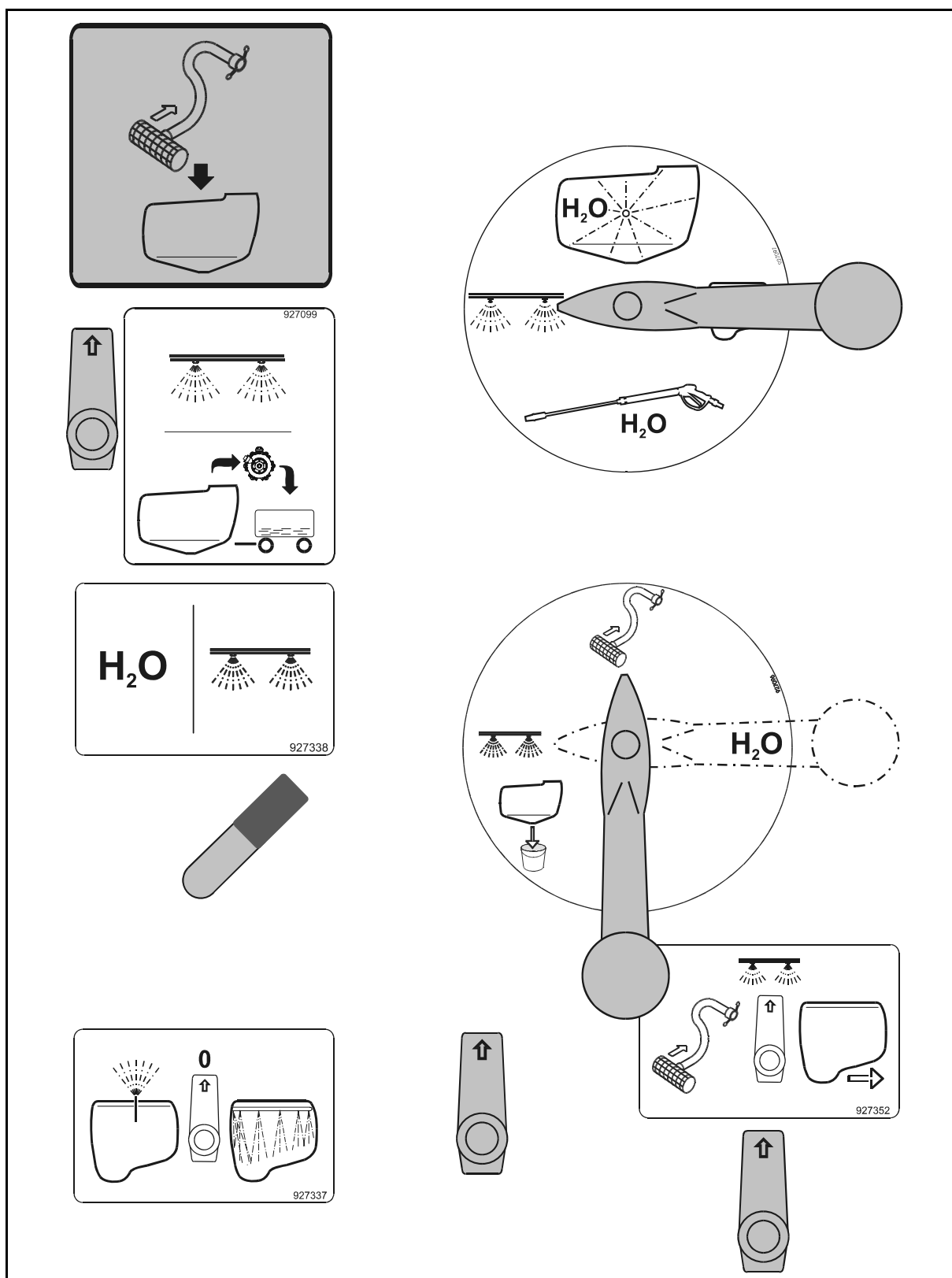


Fig. 198

6.5.13 Filling the spray cocktail tank via suction hose on the suction joint of the induction bowl

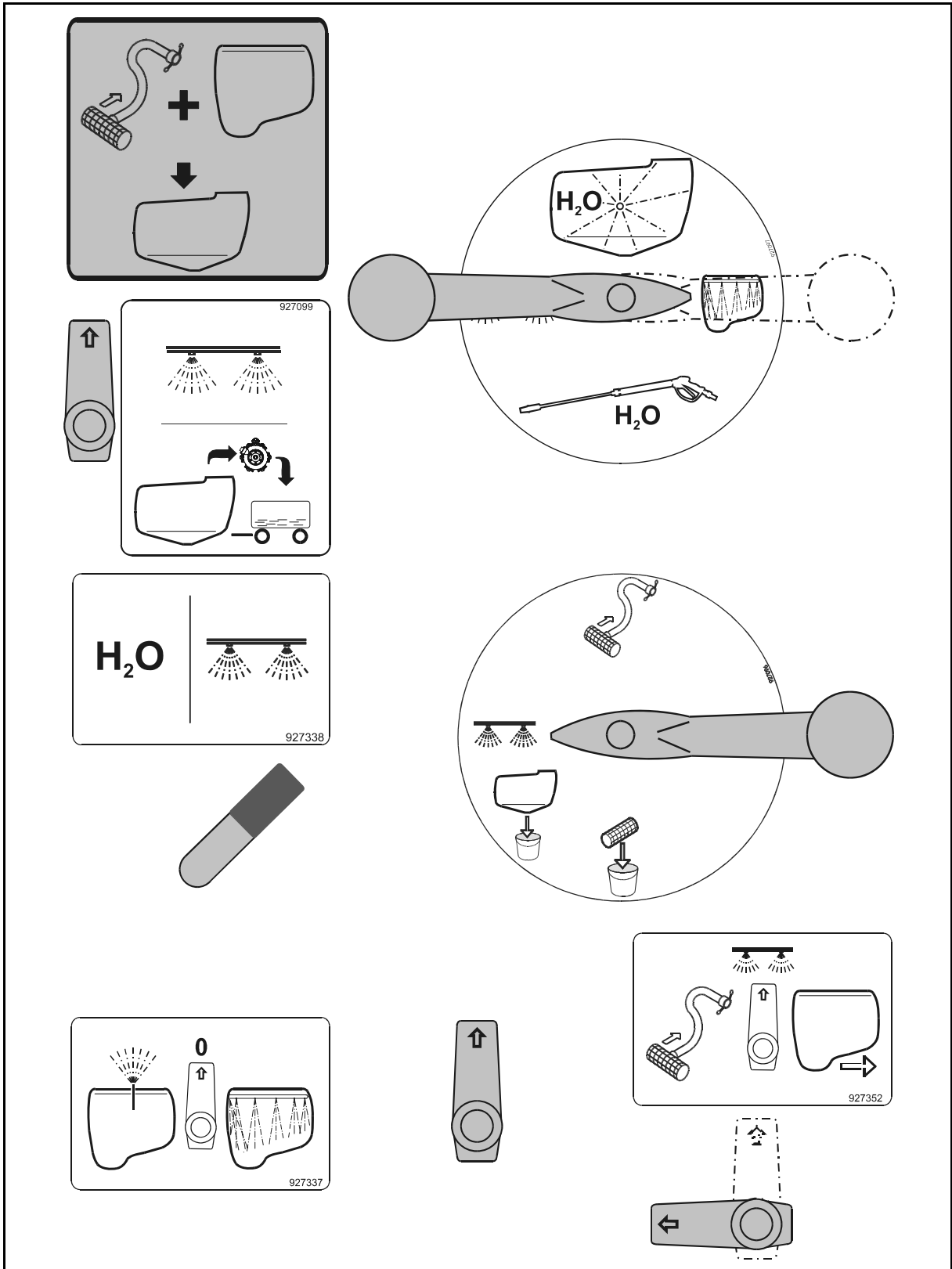


Fig. 199

6.5.14 Internal tank wash with clean water

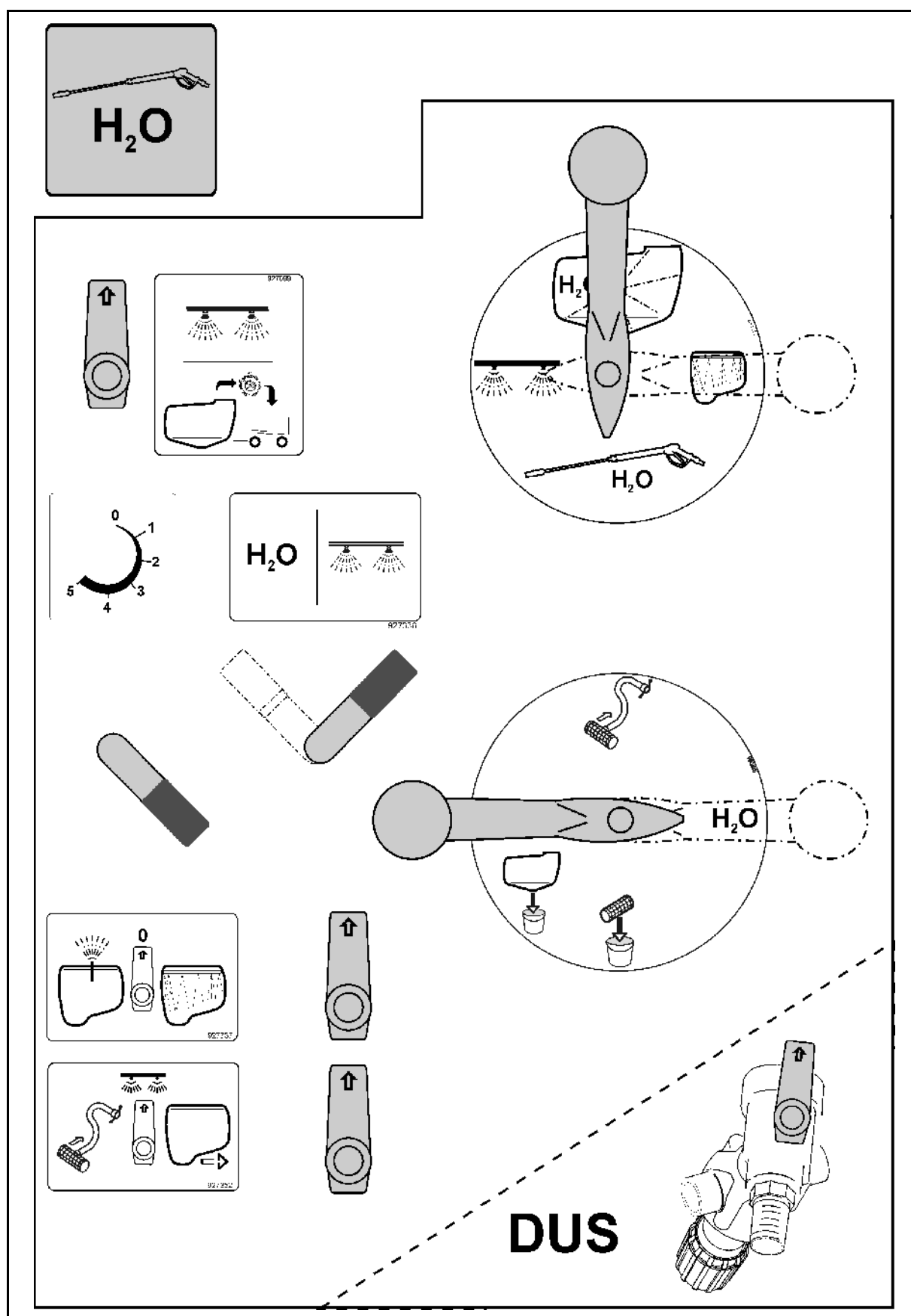


Fig. 200

6.5.15 Outer cleaning with clean water

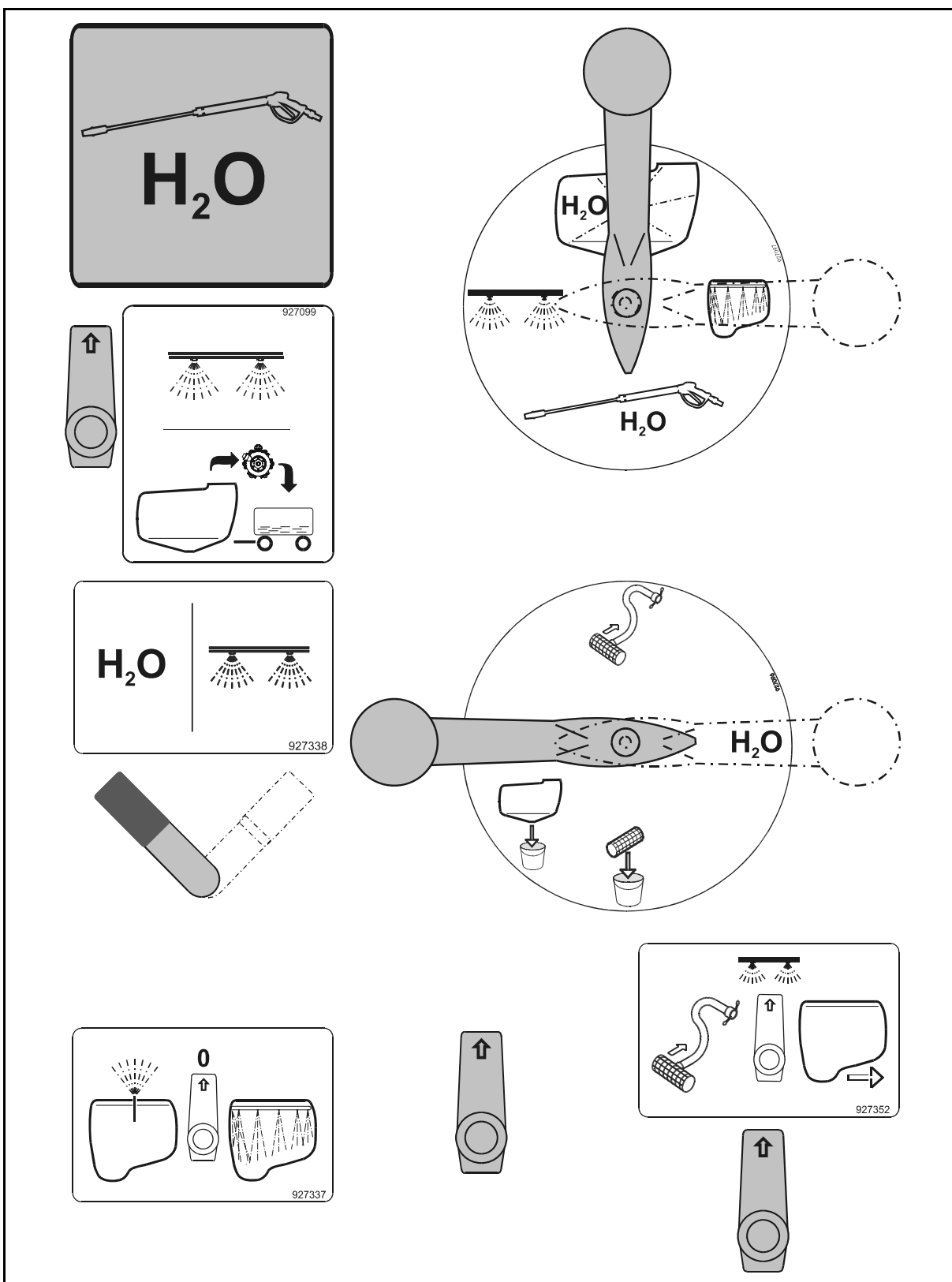


Fig. 201

6.6 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.

Specific weights of the individual liquids

Liquid	Water	Urea	AUS	NP-Dilution
Density [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 168.
- 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 166).
2. Recall in **AMATRON+** the filling display via the function  in the menu operation or in the menu machine data. Please refer to chapter "Refill spray cocktail tank with water", page 76.
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 level indicator.
4. Close the filling ports with the aid of folding or screw on lid.

6.7 Inducting spray agents



Warning!



Hint!



Important!

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

If the urea filter (option) is placed into the spray cocktail tank sump the quantity of urea needed for one tank filling can be placed directly into the tank opening. For this see chapter "Filter equipments", page 49.

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

Induct the relevant spray agent via the induction bowl (Fig. 202/1) into the water of the spray cocktail tank. A difference is made here between the inducting of liquid and powdery agents or urea.



Fig. 202

Empty spray agent containers



Important!

- Carefully rinse 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 cocktail available for rinsing the agent tank, use is for a pre-cleaning. Conduct the careful cleaning when clear water is available, e.g. before preparing the next spray cocktail tank-filling or when diluting the residual amount of the last spray cocktail tank-filling.

6.7.1 Inducting liquid agents

Fig. 203:

1. Fill the spray cocktail tank half with water.
2. Open induction bowl lid.
3. VARIO-control-suction side (1) in position **"Spraying operation"**.
4. VARIO-control-pressure side (2) in position **"Induction bowl"**.
5. Fill the agent or urea quantity calculated and measured for the tank filling into the induction bowl (max. 34 l).
6. Drive pump with approx. 400 U/min and switch on the agitator (7). If necessary increase the agitation intensity (general agitating step "3").
7. Reversing tap Spraying operation / Spray cocktail tank quick emptying (3) in position **"Spraying operation"**.
8. Reversing tap Spraying operation / Flushing (4) in position **"Spraying operation"**.
9. Reversing tap Circuit line / Canister flushing (5) in position **"Circuit line"**.
10. Reversing tap Spraying operation / Suck off induction bowl / Filling port for spray cocktail tank (6) in position **"Suck off induction bowl"**, until the contents has been entirely sucked off the induction bowl.
11. Fill in remaining quantity of water.

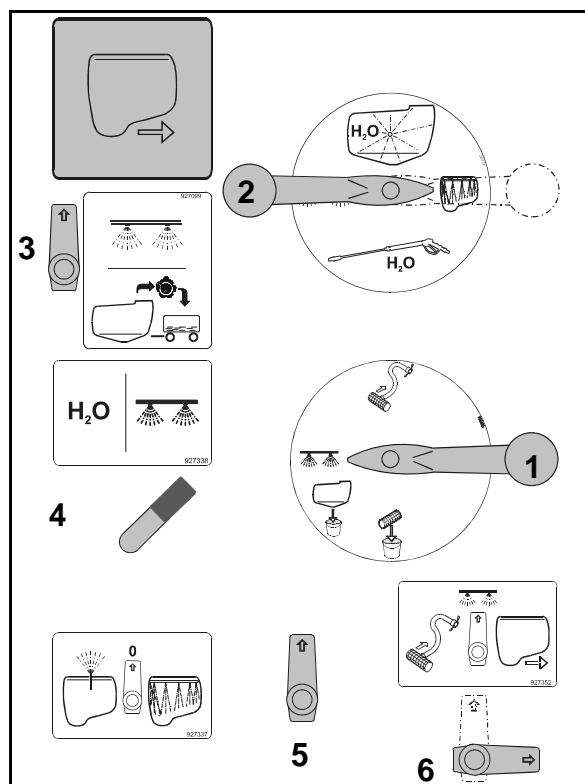


Fig. 203

6.7.2 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 cocktail'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.

Fig. 204:

1. Fill the spray cocktail tank half with water.
2. VARIO-control-suction side (1) in position **"Spraying operation"**.
3. VARIO-control-pressure side (2) in position **"Induction bowl"**.
4. Reversing tap Spraying operation / Spray cocktail tank quick emptying (3) in position **"Spraying operation"**.
5. Reversing tap Spraying operation / Flushing (Fig. 204/4) in position **"Spraying operation"**.
6. Open induction bowl lid.
7. Fill the agent or urea quantity calculated and measured for the tank filling into the induction bowl (max. 34 l).
8. Drive pump with approx. 400 U/min and switch on the agitator(7). If necessary increase the agitation intensity (general agitating step "3").
9. Reversing tap Circuit line / Canister flushing (5) in position **"Circuit line"**. Pump liquid through the induction bowl until the contents is fully diluted.
10. When the agent is fully diluted, keep reversing tap spraying operation / suck off induction bowl filling port for spray cocktail tank (6) in position **"suck off induction bowl"**, until the contents of the induction bowl has been completely sucked off.
11. Fill in remaining quantity of water.

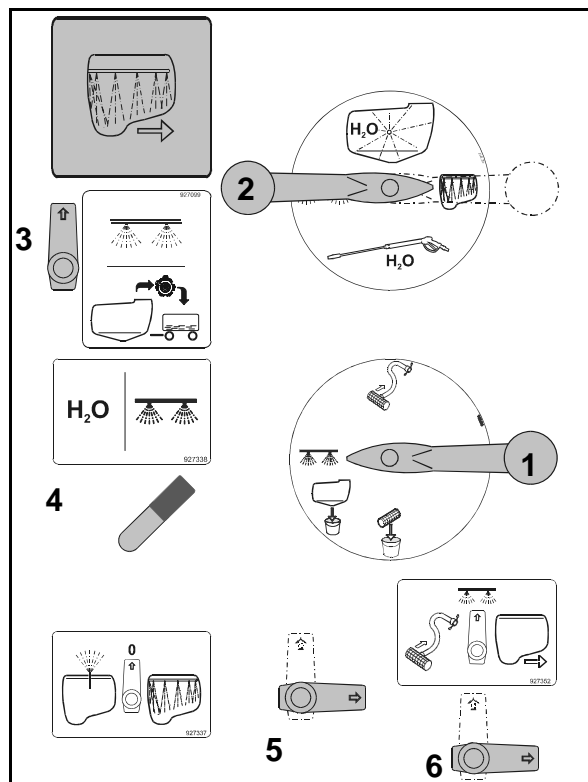


Fig. 204

6.7.3 Pre-clean the canister with the spray cocktail

Fig. 205:

1. Drive pump with approx. 400 R.P.M.
2. VARIO-control-suction side (1) in position **"Spraying operation"**.
3. VARIO-control-pressure side (2) in position **"Induction bowl"**.
4. Reversing tap Spraying operation / Spray cocktail tank quick emptying (3) in position **"Spraying operation"**.
5. Reversing tap Spraying operation / Flushing (4) in position **"Spraying operation"**.
6. Open induction bowl lid.
7. Reversing tap Circuit line / Canister flushing (5) in position **"Canister flushing"**.
8. Slide the canister or another container over the canister flushing and press downwards **for at least 30 sec.**
9. Reversing tap Spraying operation / Suck off induction bowl / Filling port for spray cocktail tank (6) in position **"Suck off induction bowl"**, until the contents has been entirely sucked off the induction bowl.

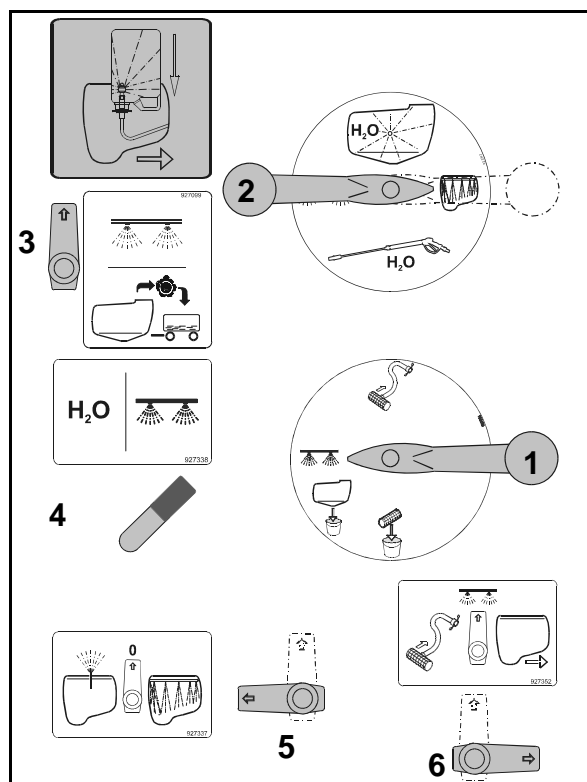


Fig. 205

6.7.4 Clean canister with rinse water



Hint!

Cleaning the canister with rinse water dilutes the concentration of the spray cocktail!

Fig. 206:

1. Drive pump with approx. 400 R.P.M.
2. VARIO-control-suction side (1) in position **"Diluting"**.
3. VARIO-control-pressure side (2) in position **"Induction bowl"**.
4. Reversing tap Spraying operation / Spray cocktail tank quick emptying (3) in position **"Spraying operation"**.
5. Reversing tap Spraying operation / Flushing (4) in position **"Flushing"**.
6. Open induction bowl lid.
7. Reversing tap Circuit line / Canister flushing (5) in position **"Canister flushing"**.
8. Slide the canister or another container over the canister flushing and press downwards **for at least 30 sec.**
9. Reversing tap Spraying operation / Suck off induction bowl / Filling port for spray cocktail tank (6) in position **"Suck off induction bowl"**, until the contents has been entirely sucked off the induction bowl.

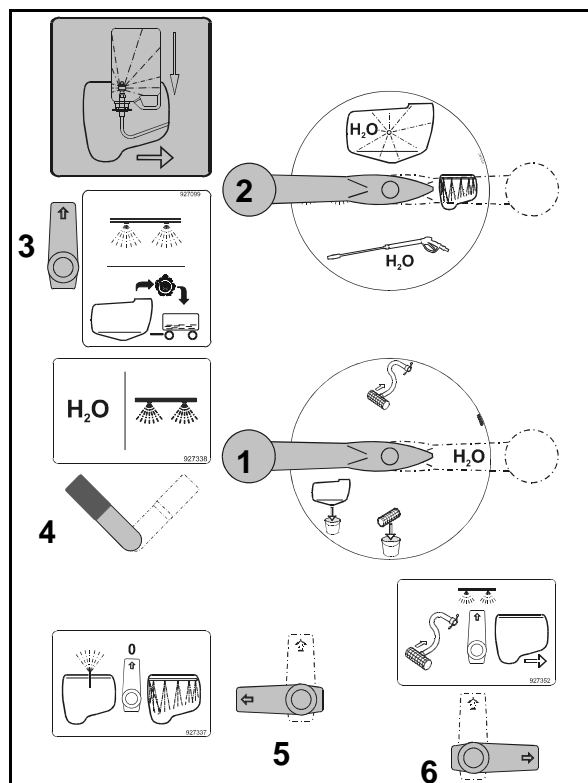


Fig. 206

6.8 Spraying operation

Special hints for spraying operation



Important!

- Check your field sprayer by carrying out a calibration
 - before the beginning of any seasonal operation.
 - 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 165).
 - Before starting the spraying operation, please enter the necessary spray rate (required rate) into **AMATRON +**.
The **AMATRON +** gives a fault message and an audible alarm signal if the necessary spray rate is not maintained during the spraying operation.
- Accurately maintain necessary spray rate [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 used.
Please refer to chapter "Spray rate charts for flat fan-, anti drift-, injector- and airmix-nozzles", page 218.
- Prior to the spraying operation choose the necessary nozzle size from the spray rate chart – considering
 - the intended operational speed,
 - the required spray rate and
 - the desired spraying pressure.
Please refer to chapter "Spray rate charts for flat fan-, anti drift-, injector- and airmix-nozzles", page 220.
- 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 220.
- Take additional measures for drift reduction at wind speeds of 3 m/s (please refer to chapter "Measures for drifting reduction", page 195)!
- An even lateral distribution will only be achieved with the swing compensation unlocked.
- Discontinue the spraying operation at average wind speeds of above 5 m/sec. (leaves and thin branches are moving).



Important!

- 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 cocktail consumption in relation to the treated area.
- Determine the "Impulses per litre" for the flow meter in case of deviations between the actual and the indicated spray rate. Please refer to chapter "Impulses per litre", page 65.
- Determine the "Impulses per 100m" for the distance sensor (Impulses per 100m) in case of deviations between the actual and the indicated travelled distance. Please refer to chapter "Impulses per 100m", page 72.
- 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 204.



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 cocktail. 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+**.
- The pump capacity depends on the pump drive speed. Choose the pump drive speed (between 350 and 550 R.P.M.), so that a sufficient volume flow to the sprayer booms and for the agitator is available. That means that at a high forward speed and a high spray rate more spray liquid must be supplied than at a lower forward speed and with a lower spray rate.
- Usually the agitation remains engaged from the time of filling until termination of the spraying operation. Please adhere to the advice of the agent manufacturers.
- The spray cocktail 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.

6.8.1 Enter the order related data into the **AMATRON +**



Important!

Before starting the spraying operation enter the order related data into the **AMATRON +**. Please refer to chapter "Menu order", page 61.

6.8.2 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 +** (please refer to chapter "Menu implement data", page 62):
 - percentage application rate increase.
 - the values for the permissible sign spray pressure-range of the nozzles fitted to the sprayer boom.
 - the value "Impulses per 100m".
- Enter the order related data in the correct manner "into" **AMATRON +**.
- 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 messages and audible alarm signals", page 195.
- 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 cocktail tank entirely (this is not applicable when finishing the spraying operation). Refill the spray cocktail 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 rates:	250 l/ha
Intended forward speed:	8 k.p.h
Nozzle type:	AI
Nozzle size:	'05'
Permissible pressure range of the fitted spraying nozzles:	min. pressure 1 bar max. pressure 5 bar
Intended spray pressure:	2.3 bar
Permissible spray pressures: 2.3 bar $\pm 25\%$	min. 1,7 bar and max. 2,9 bar

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 165.
2. Adjust the required agitation intensity (general agitating step "2"). Please refer to chapter "Agitation", page 44.
3. Switch on **AMATRON+**.
4. Folding out the sprayer boom
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 spray pressure range of the nozzles fitted to 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 (450 R.P.M).
11. Select the suitable tractor gear and start moving.
12. Switch on the sprayer boom via the **AMATRON+**.

Putting into operation

Travelling to the field with agitator engaged

1. Switch off the boom feed.
2. Engage PTO shaft.
3. Adjust the required agitation intensity.



Important!

If this agitation position deviates from what was used before when setting the spraying pressure, do not forget to reset the agitation before recommencing the spraying operation!

6.8.2.1 Fault messages and audible alarm signal



Hint!

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

- the necessary entered spray rate is not achieved.
- 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.

6.8.3 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.
- Decrease spray pressure.
- Keep to the correct boom operational height as with increased nozzle spacing the danger of drift increases.
- Reduce the forward speed (to below 8 k.p.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.

6.9 Calibrating the filed sprayer

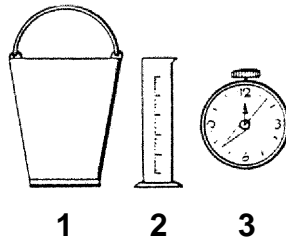
Check your field sprayer by carrying out a calibration

- before the beginning of any seasonal operation.
- at every nozzle change.
- to re-check the setting advice given in the spray rate chart.
- in case of deviations between the actual and the required spray rate [l/ha].

Deviations between the actual and the required spray rate [l/ha] may be caused by:

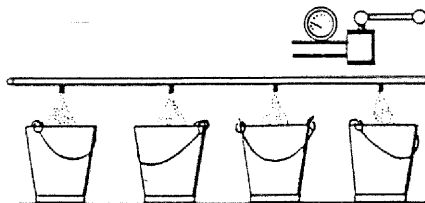
- the difference between the actually travelled and on the speedometer indicated forward speed and/or
- by natural wear on the spray nozzles.

For calibrating the following accessories are needed:



- (1) Suitable collection containers, e.g. buckets,
- (2) Calibration jar or metering cylinder,
- (3) Stop watch.

Operational procedure:



6.9.1 Determine the actual spray rate [l/ha]

The actual spray rate [l/ha] can be determined

- by driving a measured distance.
- stationary via the nozzle output of the individual spray nozzles (individual nozzle output).



6.9.1.1 Determination of the actual spray rate by driving a measured distance.

1. Carefully determine the spray rate [l/ha] required for the intended treatment and enter into the **AMATRON +**.
2. Enter the permissible spray pressure range for the nozzles fitted to the sprayer boom into the **AMATRON +**.
3. Fill up spray cocktail tank with water.
4. Switch on the agitation (general agitating step "2").
5. Switch on the sprayer boom and check whether all nozzles are properly functioning.
6. Switch off the boom feed.
7. Fill the spray cocktail tank up to a both side filling mark (if necessary newly apply) with water.
8. Measure out in the field a distance of exactly of 100 m. Mark the start and stop point.
10. Set on the hand throttle lever a constant tractor engine speed within the allowable pump drive speed (min. 350 R.P.M. and max. 550 R.P.M).
11. Drive over the pre-measured distance with a flying start from the start till the end point. For this the spray boom feed should be accurately switched on at the calibrating distance start and switched off at the stop point.
12. Determine the sprayed volume of water by refilling the tank
 - with the aid of a calibration container,
 - by weighing or
 - by a water meter.

$$\frac{a \text{ [l]} \times 10\,000}{b \text{ [m]} \times c \text{ [m]}} = \text{Spray rates [l/ha]}$$

a: Water consumption on the calibration distance [l]

b: Working width [m]

c: Length of the calibration distance [m]

Example:

Water consumption a: 80 l

Working width b: 20 m

Length of the calibration distance c: 100 m

$$\frac{80 \text{ [l]} \times 10\,000}{20 \text{ [m]} \times 100 \text{ [m]}} = 400 \text{ [l/ha]}$$



6.9.1.2 Stationary determination of the actual spray rate via the individual nozzle output

Collect the nozzle output on at least 3 different nozzles. For this check each one spray nozzle on the left hand and right hand boom and on the centre part of the sprayer boom.

Calculate the actual spray rate [l/ha] from the collected nozzle output [l/min] or read off directly off the spray rate chart.

1. Accurately determine the necessary spray rate [l/ha] for the intended plant protective measure. Please refer to chapter "Calculation of the filling or refilling quantity", page 166.
2. Enter the necessary spray rate into the **AMATRON +**.
3. Enter the permissible spray pressure range for the nozzles fitted to the sprayer boom into the **AMATRON +**. Please refer to chapter "Menu implement data", page 63.
4. Determine the necessary spray pressure.
5. Change from **AMATRON +** AUTOMATIC operation to MANUAL operation.
6. Refill the spray cocktail tank with water.
7. Switch on the agitation (general agitating step "2").
8. Manually enter the required spray pressure via the keys + / - into the **AMATRON +**.
9. Switch on the sprayer boom and check whether all nozzles are properly functioning.
10. Switch off the boom feed.
11. Determine the single nozzle output [l/min] on several nozzles, e.g. by a stop watch, metering cylinder and measuring cup.
12. Calculate the average single nozzle output [l/min].

Example:

Nozzle size:	'05'
intended forward speed:	8.0 k.p.h
Necessary spraying pressure:	3.2 bar
Nozzle output at the left hand boom:	1.9 l/min
Nozzle output in the centre:	2.0 l/min
Nozzle output at the right hand boom:	2.1 l/min
Calculated mean rate:	2.0 l/min

1. Calculate the actual spray rates [l/ha]

$$\frac{d \text{ [l/min]} \times 1200}{e \text{ [k.p.h]}} = \text{spray rates [l/ha]}$$

d: Nozzle output [l/min] (calculated mean value)
e: Forward speed [k.p.h]

$$\frac{2.0 \text{ [l/min]} \times 1200}{8.0 \text{ [k.p.h]}} = 300 \text{ [l/ha]}$$

2. Read the actual spray rates [l/ha] off the spray rate chart

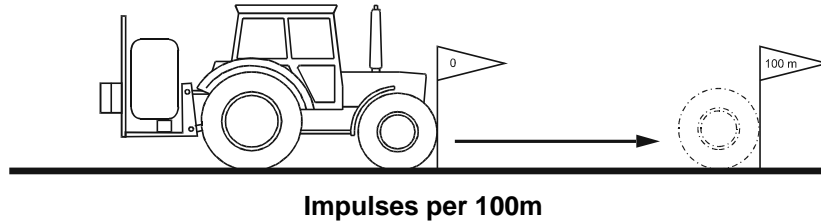
1. Find in chapter "spray rate chart" the spray rate chart on page 220.
2. In column **l/min** find the value **2,0**.
3. Move in this line to the left. Read off the spray rates **300 l/ha** in the point of intersection with column **8.0 k.p.h**.

6.10 Calibrate the distance sensor



Important!

Calibrate the distance sensor (impulses per 100 m) in case of deviations between the actual and the indicated travelled distance. Please refer to **AMATRON+** chapter "Impulses per 100m", page 72.



6.11 Surplus amounts

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

- Residual amount in the spray cocktail tank after concluding the spraying operation.
- Technical residual amount, which still remains in the spray cocktail 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, pump 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.

6.11.1 Removal of residual amounts



Important!

- Observe that the residual amount in the spray lines 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 133. 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 cocktail tank is only 50 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 cocktail-residual amount according to the valid legal prescriptions. Collect spray cocktail-residual amounts in suited containers. Let the spray cocktail residual amounts dry up. Put the spray cocktail residuals to the prescribed waste disposal.

Dilute the residual amount in the spray agent tank and spray 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 intermitted procedure.

Proceed as follows:

1. Dilute the residual amount in the spray cocktail tank with 80 litres rinsing 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 the untreated leftover area.
4. Again dilute the residual amount in the spray cocktail tank with 80 litres rinsing water.
5. Again spray this diluted residual amount on to an untreated leftover area.

Fig. 207:

1. Switch off the boom feed.
2. Engage PTO shaft.
3. Switch on the agitation (7).
4. Reversing tap Spraying operation / Spray cocktail tank quick emptying (1) in position **"Spraying operation"**.
5. VARIO-control-suction side (2) in position **"Diluting"**.
6. VARIO-control-pressure side (3) in position **"Internal tank wash"**.
7. Reversing tap Spraying operation / Flushing (4) in position **"Flushing"**.
8. Dilute the residual amount in the spray cocktail tank with approx. 80 litres from the rinse water container.

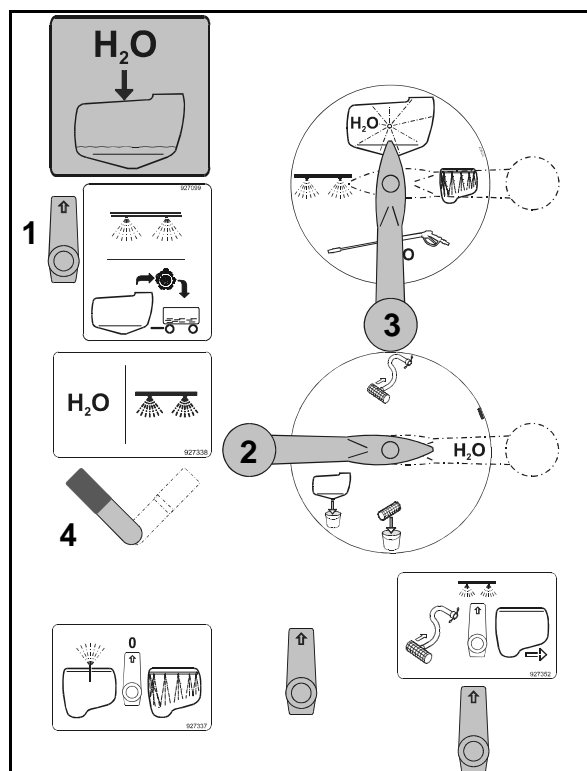


Fig. 207

Fig. 208:

9. VARIO-control-suction side (1) in position **"Spraying operation"**.
10. VARIO-control-suction side (2) in position **"Spraying operation"**.
11. Reversing tap Spraying operation / Flushing (3) in position **"Spraying operation"**.
12. At first spray the undiluted residual amount in the spray line on to an **untreated left-over area**.
13. Then spray the diluted residual amount also on to the **untreated leftover area**.
14. Switch off the agitation (7). when the residual amount in the spray cocktail tank is only 50 litres.
15. Repeat the steps 3 to 14 for a second time.

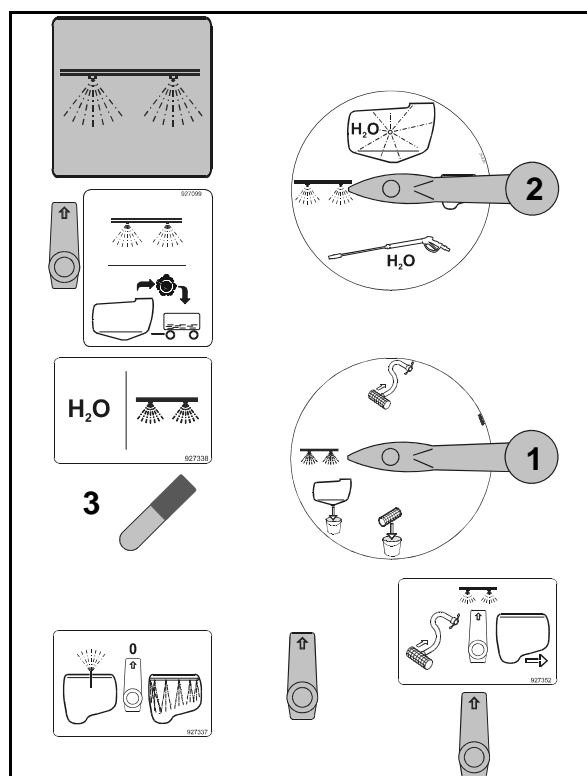


Fig. 208

Drain off the technical residual amounts.

16. Place a suited collecting container underneath the outlet opening of the VARIO control suction side.
17. VARIO-control-suction side (Fig. 209/1) in position "**Spray cocktail tank emptying**" and drain the technical residual amount off the spray cocktail tank in a suited collecting container.

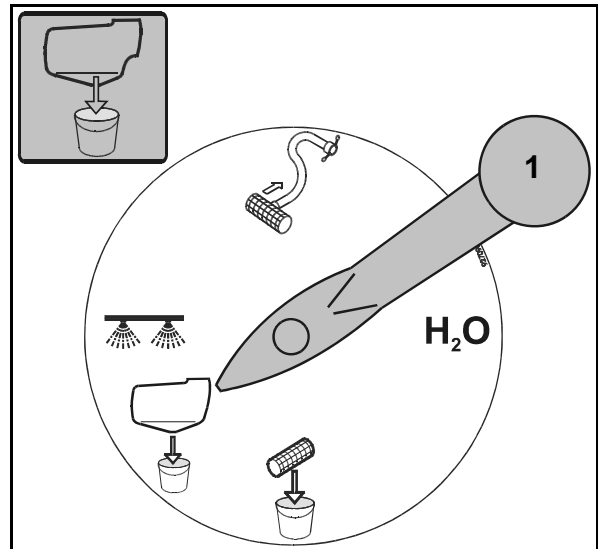


Fig. 209

18. VARIO-control-suction side (Fig. 210/1) in position "**Emptying the suction filter**" and drain off the technical residual amount in the spray line, the valve chest, the suction and pressure hose and the pump into a suited collecting container.

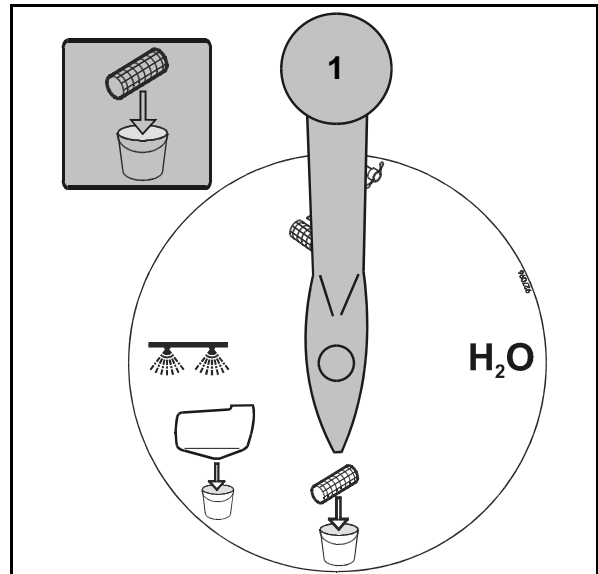


Fig. 210

6.12 Cleaning



Important!

- Let these materials react for as short as possible, e.g. by daily cleaning immediately after finishing spraying. The spray mixture should not be left unnecessarily for any length of time in the spray cocktail tank, e.g. not over night. Life span and reliability of the field sprayer is depend considerably on the period of contact of the crop protection agents with the materials of the field sprayer.
- Clean the field sprayer before spraying another crop protection agent.
- Dilute the residual amount in the spray cocktail tank and spray the dilutes residual amount (for this, please refer to chapter "Surplus amounts", page 200).
- 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 chapter "Maintenance"). Flush the spray lines without spray nozzles.

Fig. 211:

1. Flush the empty spray agent tank with a sharp jet of water.
2. Fill the spray cocktail tank with approx. 400 l water.
3. Engage the PTO shaft and drive pump with approx. 400 R.P.M..
4. Switch on the agitation (7).
5. VARIO-control-suction side (/1) in position "Spraying operation".
6. VARIO-control-pressure side (2) in position "Internal tank wash" and pump the water from the spray cocktail tank for some minutes in the closed circuit.
7. Change at the VARIO-control-pressure side (2) several times between the positions "Internal tank wash" and "Spraying operation". This way all components are rinsed with clean water.
8. Change the agitation steps several times on the step tap.
9. VARIO-control-pressure side (2) in position "Spraying operation" and spray the contents of the spray cocktail tank via the sprayer booms.
10. Drain off the technical residual amounts (please refer to chapter "Removal of residual amounts", page 200).
11. Clean the suction filter. Please refer to chapter "Cleaning the suction filter", page 207.

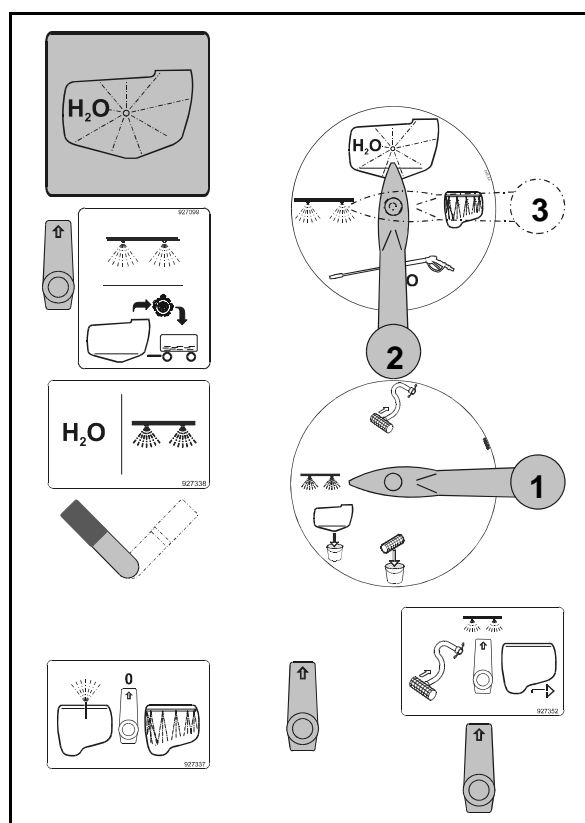


Fig. 211

6.12.1 Cleaning the sprayer with a filled tank



Important!

- Implicitly clean the suction filter, the pump, the valve chest and die spray circuits in case of weather induced interruption of the spraying operation.
Cleaning in the field with clear water from the rinsing water tank.
- Observe that the residual amount in the spray lines will be sprayed in undiluted concentration. Implicitly spray these residual amounts on a not treated area. Take from chapter "Technical data – Spray lines", page 133 the required travel distance for spraying this undiluted residual amount.

Fig. 212:

1. Switch off the boom feed.
2. Switch off the agitation (7).
3. Close the DUS-tap (DUS-option) to avoid segregation of the spray agent.
4. VARIO-control-suction side (1) in position "Diluting".
5. VARIO-control-pressure side (2) in position "Spraying operation".
6. Drive pumps with its operational speed (450 R.P.M.).
7. Spray the undiluted residual amount in the sprayer booms on to **an untreated** area.
8. 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.
9. Drain the technical residual amount from the spray lines, the suction device, the suction- and the pressure hose and the pump off into a suitable collecting container.
10. Clean the suction filter. Please refer to chapter "Cleaning the suction filter", page 207.
11. Open DUS-tap again.

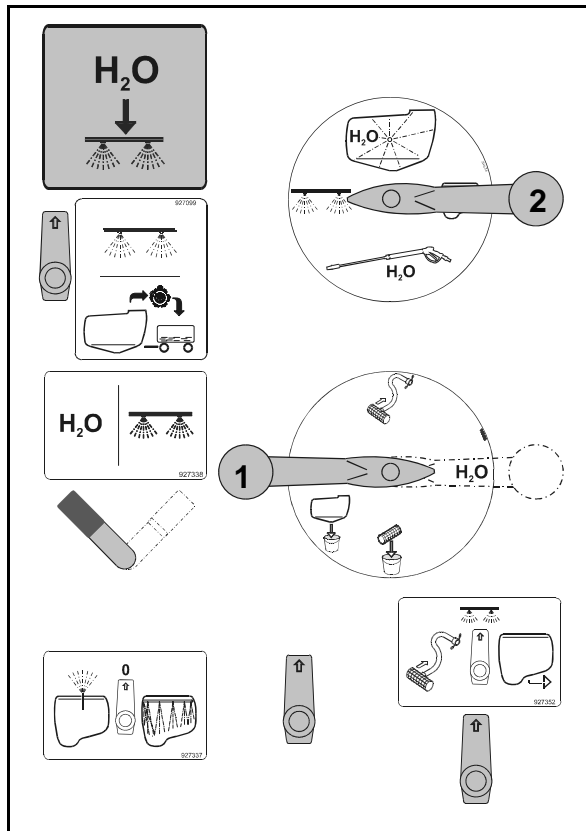


Fig. 212

6.12.2 Storing over winter or prolonged standstill

1. Clean the field sprayer thoroughly before storing over winter. Please refer to chapter "Cleaning", page 203.
2. Remove and clean the suction filter (Fig. 213/1). Please refer to chapter "Cleaning the suction filter", page 207.
3. 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.
4. Disengage the PTO shaft.
5. Remove the agitation hose (Fig. 213/2) from the spray cocktail tank. The agitation hose (Fig. 213/2) connects the step tap (Fig. 213/3) with the spray cocktail tank.
6. Remove the return flow hose (Fig. 213/4) from the spray cocktail tank. The return flow hose (Fig. 213/4) connects the reversing tap Spraying operation / Flushing (Fig. 213/5) with the spray cocktail tank.



Fig. 213

7. Remove the cap (Fig. 214/1) on the reversing tap Suck off induction bowl / Suction joint for spray cocktail tank. Swivel the reversing tap (Fig. 214/2) in position "Suction joint for spray cocktail tank".

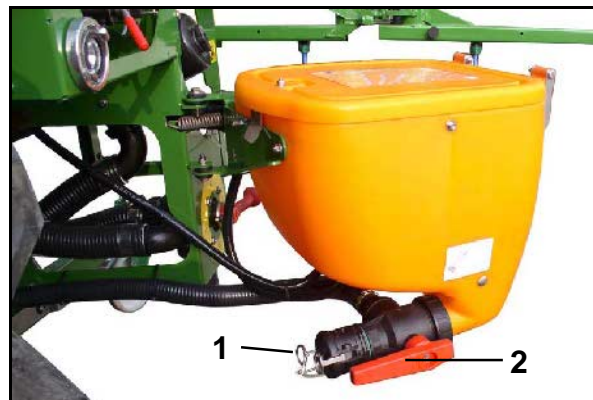


Fig. 214

8. Remove the cap (Fig. 215/1) from the check port of the VARIO-control-pressure side (Fig. 213/6) or (Fig. 215/2).

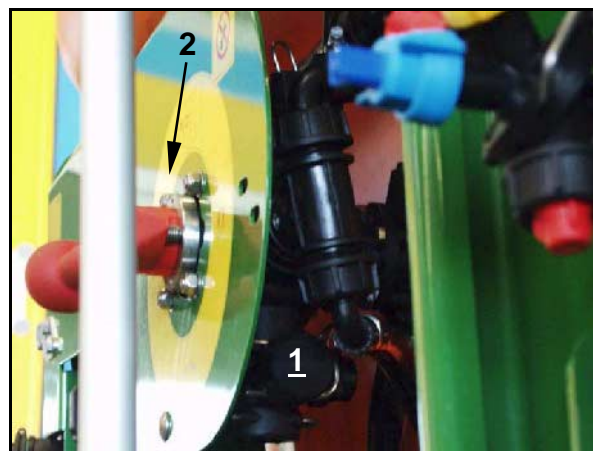


Fig. 215

9. Remove the pressure hose (Fig. 216/1) of the pump so that the remaining quantity of water can run out the pressure hose and VARIO-control-pressure side.
10. Again engage the PTO shaft and drive the pump for approx. ½ minute, until no liquid will escape from the pressure side connection of the pump.



Attach the pressure hose only at the next operation.

Important!

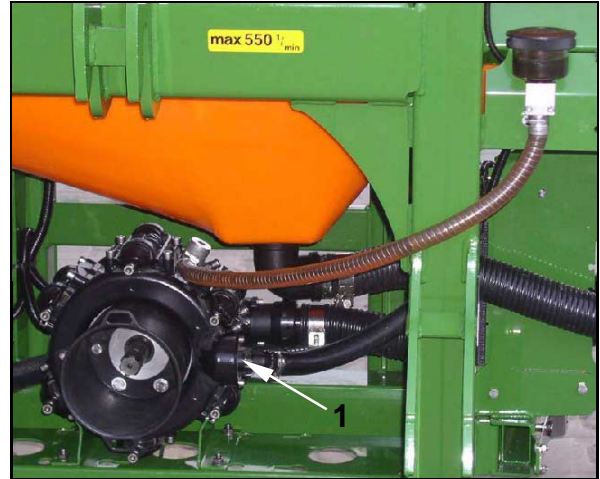


Fig. 216

11. Remove all spray lines from the boom part section valves (Fig. 217/1) and clean with compressed air.
12. Remove all nozzles.
13. Change on the VARIO-control-suction side (Fig. 213/7) and on the VARIO-control-pressure side (Fig. 213/6) several times among all switching positions.
14. On all other switching levers change several times among all switching positions, as e.g. boom part section shut off valves, reversing tap Spraying operation / Flushing, step tap for agitation.



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

Important!



Fig. 217

15. Cover the open pressure outlets of the pump to prevent them becoming dirty.
16. If the sprayer is additionally provided with a pressure circulation system (DUS)
 - screw out the drainage screw on the pressure relief valve.
 - open the DUS-reversing tap.
17. Grease the universal joints of the PTO shaft and apply grease to the profile tubes before storing for an extended period.
18. Change the oil in the pump before storing the pumps over winter.



Important!

- **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 electronic options free from frost.**

6.12.3 Cleaning the suction filter



Important!

Clean the suction filter (Fig. 218) daily after the spraying operation.

1. Drive the pump (300 R.P.M).
2. Place a suited collecting container underneath the outlet opening of the VARIO control suction side.
3. VARIO-control-suction side in position **"Emptying the suction filter"** and the technical residual amount from the suction device and the suction- and pressure hose into a suitable collecting container. Please refer to chapter "Emptying the suction filter", page 202.
4. Slacken thumb nut (Fig. 218/1) on the suction filter.
5. Remove filter bowl (Fig. 218/2) by slightly turning it to the right and left hand side.
6. Pull out the filter insert (Fig. 218/3) and clean with water.
7. Check for damage the O-rings (Fig. 218/4).
8. Re-assemble the suction filter in reverse order.

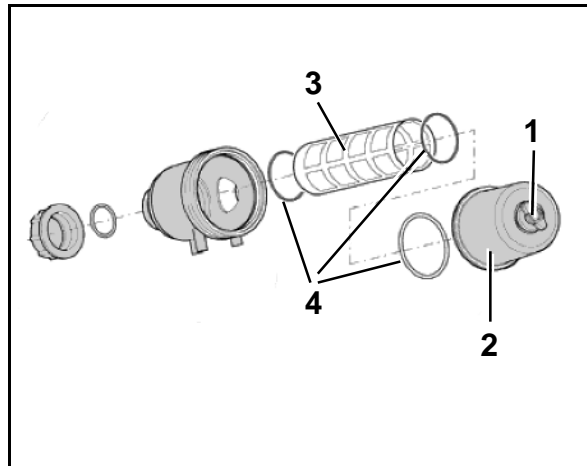


Fig. 218



Observe the correct fitting of the O-rings (Fig. 218/4).

Important!

9. VARIO-control-suction side in position **"Spraying operation"**. Please refer to chapter "VARIO-control-suction side", page 171.
10. Check the suction filter for tightness.

7 Maintenance, repair- and care-work



Danger!



Important!

When carrying out maintenance and care observe the safety advice, in particular chapter "Plant protection implements for surface cropping", page 29!

- Before any repair work the sprayer should thoroughly be cleaned with water.
- Repair work should be conducted with the pump stopped.
- Only use original-**AMAZONE**-spare hoses and for fitting only hose clamps made from stainless steel.
- Repair work inside the spray agent tank may only be conducted after a thorough cleaning! Do not climb into the spray cocktail tank!
- Remove **AMATRON +** from the tractor, before carrying out any welding operation on the tractor or the field sprayer.

7.1 Check list for maintenance work

Daily

Component	Maintenance work
Pump	1. Checking oil level
Oil filter on the Super-S-booms (only Profi folding)	1. State check
Spray cocktail tank	1. Cleaning or flushing
Suction filter	
Self cleaning pressure filter	
Hose filter for spray circuits (if fitted)	
Pump	
Control unit	
Spraying nozzles	

Annually

Pump	1. Check piston diaphragms and exchange if necessary 2. Check valves, change if necessary
Oil filter	1. Exchange
Nozzles	1. Calibrate the field sprayer and check the lateral. If necessary exchange worn nozzles
Flow and return flow meter	1. Calibrating the flow meter 2. Check return flow meter

After hours of operation

Pump	1. Conduct an oil change every 400 to 450 hours of operation, at least, however, once a year
------	--

7.2 Pump - Maintenance and remedy in case of malfunction

7.2.1 Checking oil level



Important!

- Always use only quality oil 20W30 or multipurpose oil 15W40!
- Always pay attention to a correct oil level which must be maintained! Too low or too high an oil level can be harmful.

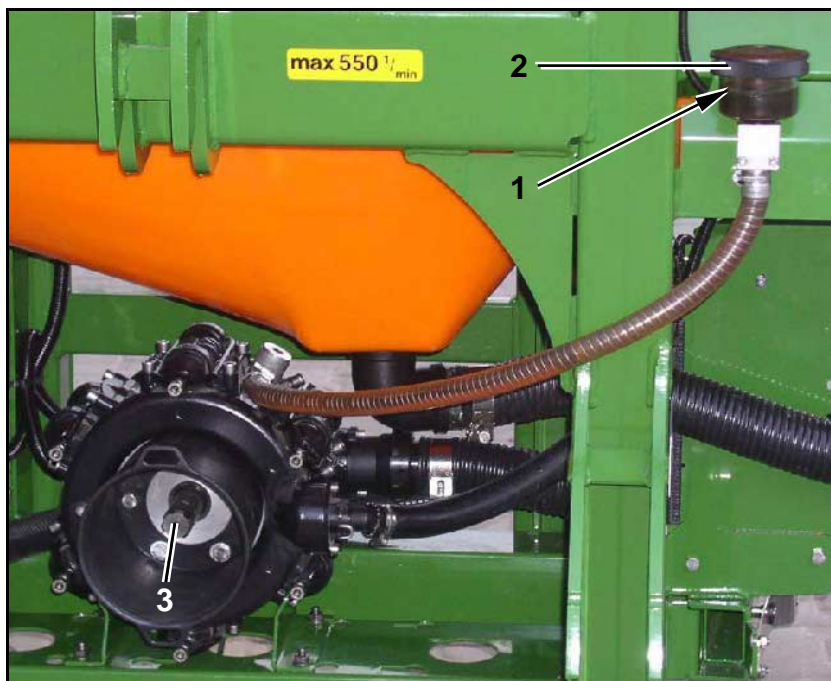


Fig. 219

1. Check whether the oil level at the mark (Fig. 219/1) is visible with running pump in horizontal position.
2. Remove the lid (Fig. 219/2) and top up oil if the oil is not visible at the mark (Fig. 219/1).

7.2.2 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. Remove the pump from the sprayer.
 2. Take off the lid (Fig. 219/2).
 3. Drain off oil.
 - 3.1 Turn pump upside down.
 - 3.2 Spin drive shaft (Fig. 219/3) by hand until the old oil is fully drained off.
It is possible to drain the oil off at the drain screw. 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 (Fig. 219/3) 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. 219/1).

7.2.3 Cleaning



Important!

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

7.2.4 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. Suction filter, clean filter insert.
	Jammed or damaged valves.	1. Exchange the valves.
	Pump draws air, can be noted by air bubbles in the spray agent 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 211).
Oil-spray agent mixture in the oil filler or clearly noticeable oil consumption	Pump diaphragm defect.	1. Exchange all 6 diaphragms (please refer to page 213).

7.2.4.1 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. 220/5).
- When refitting watch that the valve guide (Fig. 220/9) will not be damaged. Damage could lead to blockage of valves.
- Tighten bolts (Fig. 220/1) diagonally with the torque stated. Inaccurately tightened bolts will cause tensioning and thus leakage.

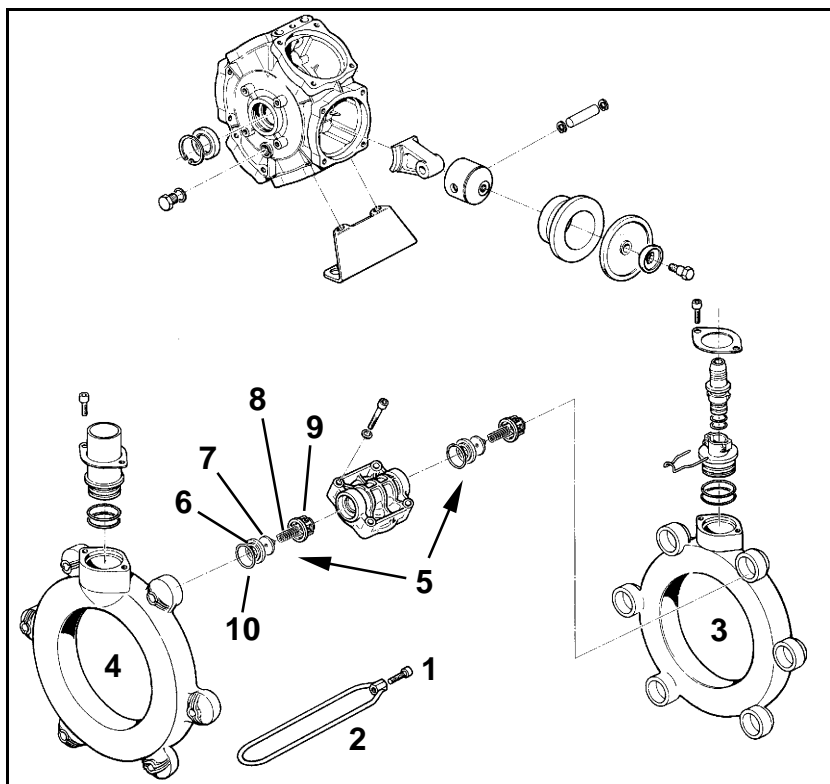


Fig. 220

1. Remove the pump from the sprayer.
2. Slacken bolt (Fig. 220/1) and remove tensioning clamp (Fig. 220/2).
3. Take off suction- and pressure channel (Fig. 220/3 and Fig. 220/3).
4. Take off valve groups (Fig. 220/5).
5. Check for damage or wear of the valve seat (Fig. 220/6), valve (Fig. 220/7), valve spring (Fig. 220/8) and valve guide (Fig. 220/9).
6. Remove the O-ring (Fig. 220/10).
7. Exchange any faulty parts.
8. Mount the valve groups (Fig. 220/5) after checking and cleaning.
9. Fit new O-rings (Fig. 220/10).
10. Re-install suction (Fig. 220/3) and pressure channel (Fig. 220/4) to the pump housing and refit the tensioning clamp (Fig. 220/2).
11. Tighten the bolts (Fig. 220/1) always diagonally with a torque of **11 Nm**.

7.2.4.2 Checking and exchanging the piston diaphragms



Important!

- Check the piston diaphragms (Fig. 221/1) at least once a year by dismantling.
- Pay attention to the fitting position of the suction- and pressure-side valves, before you remove the valve groups (Fig. 221/5).
- 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 always exchange all 6 piston diaphragms (Fig. 221/6), even if just one piston diaphragm is swollen, broken or porous.

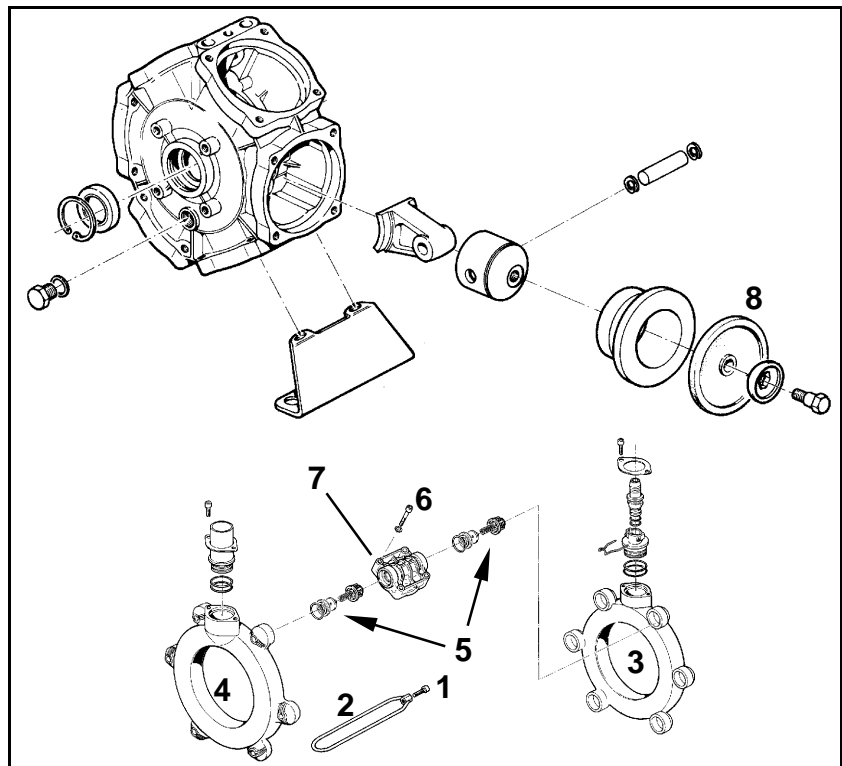


Fig. 221

Checking the piston diaphragms

1. Take off pump.
2. Slacken bolt (Fig. 221/1) and remove tensioning clamp (Fig. 221/2).
3. Take off suction- and pressure channel (Fig. 221/3 and Fig. 221/4).
4. Take off valve groups (Fig. 221/5).
5. Tighten bolts (Fig. 221/6).
6. Take off the cylinder head (Fig. 221/7).
7. Check the piston diaphragms (Fig. 221/8).
8. Exchange faulty piston diaphragms (Fig. 221/8).

Exchange the piston diaphragm



Important!

- Take care for the correct position of the cut outs or bores in the rams.
- Fasten the piston diaphragm (Fig. 222/2) in such a way with the retaining disc (Fig. 222/3) and bolt (Fig. 222/1) to the piston (Fig. 222/4) so that the edge (Fig. 222/14) shows towards the cylinder head side (Fig. 222/6).
- Tighten bolts (Fig. 222/1) diagonally with the torque stated. Inaccurately tightened bolts will cause tensioning and thus leakage.

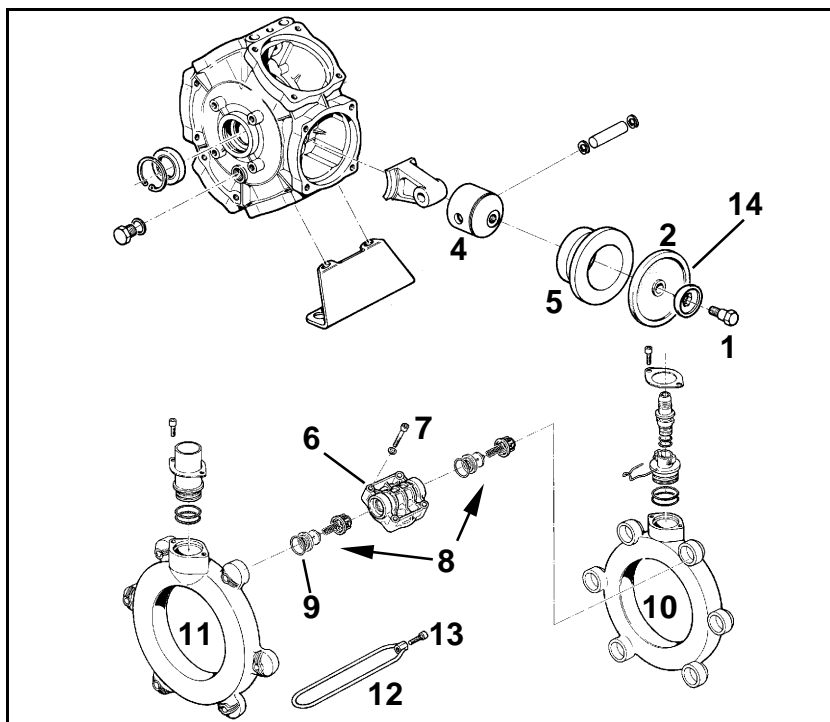


Fig. 222

1. Slacken the bolt (Fig. 222/1) and remove the piston diaphragm (Fig. 222/2) together with the retaining disc (Fig. 222/3) of the piston (Fig. 222/4).
2. Drain off the oil spray liquid mixture from the pump housing, if the piston diaphragm is broken.
3. Remove the cylinder (Fig. 222/5) from the pump housing.
4. Flush pump housing thoroughly. Use Diesel-oil or Paraffin for flushing.
5. Clean all sealing surfaces.
6. Move the cylinder (Fig. 222/5) again into the pump housing.
7. Fit the piston diaphragm (Fig. 222/2).
8. Fit cylinder head (Fig. 222/6) to pump housing and tighten bolts (Fig. 222/7) cross wise and equally.
9. Mount the valve groups (Fig. 222/8) after checking and cleaning.
10. Fit new O-rings (Fig. 222/9).
11. Re-install suction (Fig. 222/10) and pressure channel (Fig. 222/11) to the pump housing and refit the tensioning clamp (Fig. 222/12).
12. Tighten the bolts (Fig. 222/13) always diagonally with a torque of **11 Nm**.

7.3 Nozzles

1. From time to time check seat of tapered slide (Fig. 223/7). For this push the slide into the nozzle body (Fig. 223/2) 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.

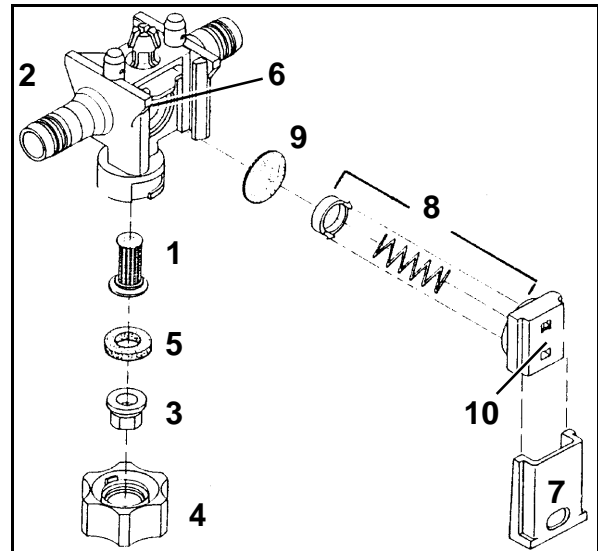


Fig. 223

7.3.1 Fitting the nozzles

1. The nozzle filter (Fig. 223/1) is placed from below into the nozzle carrier (Fig. 223/2).
2. Place the nozzle (Fig. 223/3) inside the bayonet cap (Fig. 223/4).



Hint!

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

3. Place the rubber seal ring (Fig. 223/5) above the nozzle.
4. Press the rubber sealing ring into the seating of the bayonet cap.
5. Place the bayonet cap onto the take up of the nozzle carrier.
6. Revolve the bayonet cap until the stop.

7.3.2 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. 223/6). Therefore the corresponding diaphragm should be cleaned as follows:

1. Pull out the slide (Fig. 223/7) from the nozzle carrier (Fig. 223/2) in direction of the bayonet cap.
2. Remove the spring element (Fig. 223/8) and the diaphragm (Fig. 223/9).
3. Clean the diaphragm seating (Fig. 223/6).
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. 223/10) are offset on the right and left hand side and should rise in direction of the boom profile when fitting.

7.4 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. 224/...

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

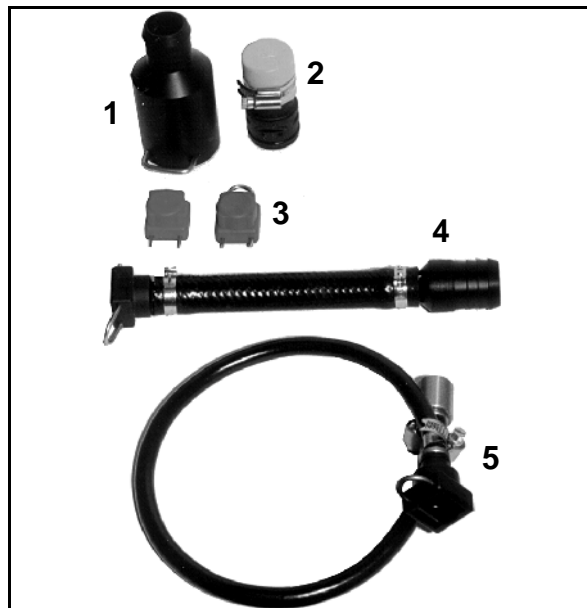


Fig. 224

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

1. Remove fixing clamp (Fig. 225/1) and pull the cap (Fig. 225/2) off the check port.
2. Swivel the VARIO control pressure side into position "exterior cleaning with rinse water".
3. Slide the turned socket (Fig. 224/1) onto the check port.

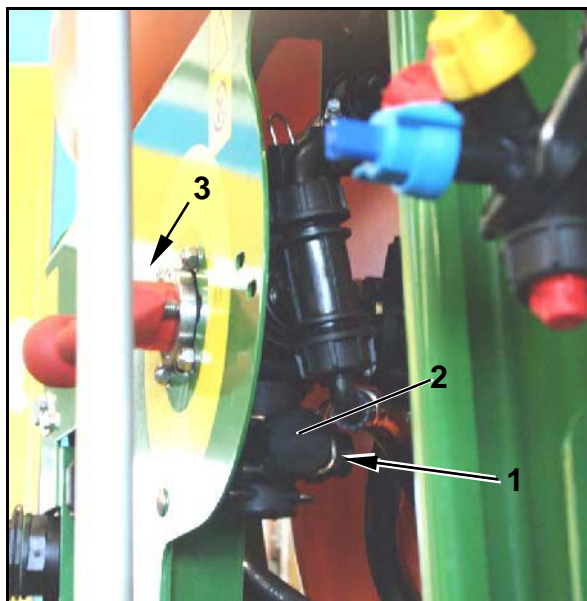


Fig. 225

Flow meter checking

1. Pull all spray lines off the part width section valves (Fig. 226/1).
2. Connect the flow meter joint (Fig. 224/4) with a part section valve and connect to the checking instrument.
3. Shut the joints of the remaining part section valves with blanks (Fig. 224/3).
4. Switch on the boom feed.

**Fig. 226****Checking the pressure gauge**

1. Pull one spray line off a part width section valve (Fig. 226/1).
2. Connect the pressure gauge connection (Fig. 224/5) 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.

8 Spray rate calibration chart

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



Hint!

- All rates [l/ha] were determined with water. For the conversion to AUS multiply the indicated spray rates by 0,88 and for the conversion to NP solvents by 0,85.
- The Fig. 227 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. 228 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' up 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

Select the nozzle type

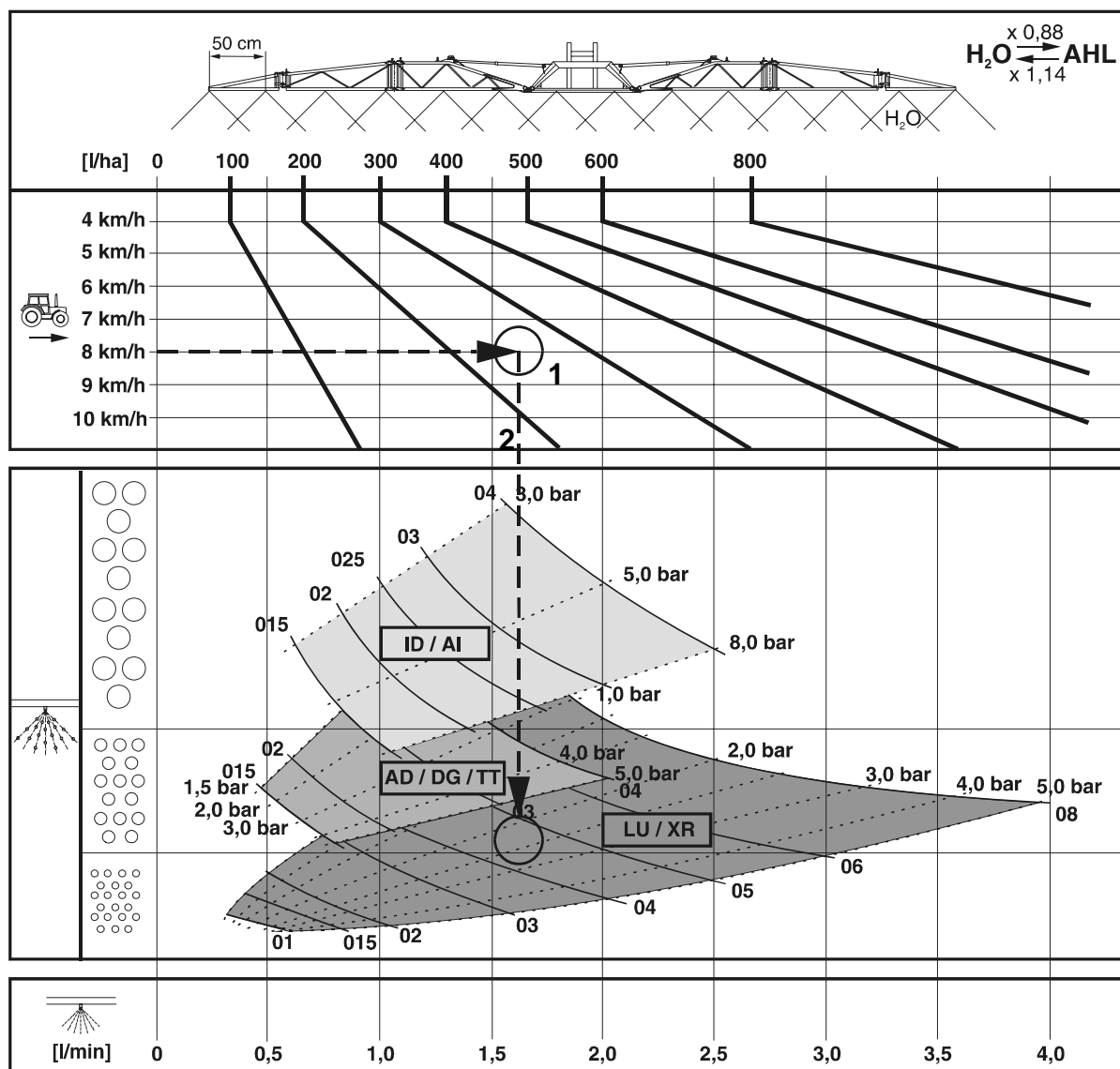


Fig. 227

Spray rate calibration chart

Example:

necessary spray rate:	250 l/ha
intended forward speed:	8 k.p.h
required spraying characteristic for the intended plant protection measure:	coarse droplets (little drifting)
necessary nozzle type:	?
necessary nozzle size:	?
necessary spraying pressure:	? bar
required individual nozzle output for the calibration of the field sprayer.	? l/min

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

1. Determine the operational point (Fig. 227/1) for the required spray rate (**250 l/ha**) and the intended forward speed (**8 k.p.h**).
2. Plumb at the operational point (Fig. 227/1) a vertical line (Fig. 227/2) 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: AI or ID
4. go over to the spraying table (Fig. 228).
5. Find the column with the intended forward speed it (**8 k.p.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**).
6. In the line with the required spray rate (**255 l/ha**)
 - read off the possible nozzle sizes. Choose a suitable nozzle size (e.g. **'05'**).
 - in the point of intersection with the chosen nozzle size read off the required spray pressure (e.g. **2,3 bar**).
 - read off the necessary individual nozzle output (**1,7 l/min**) for the calibration of the field sprayer.

necessary nozzle type:	AI / ID
necessary nozzle size:	'05'
necessary spraying pressure:	2,3 bar
required individual nozzle output for the calibration of the field sprayer:	1,7 l/min.



Fig. 228

Spray rate calibration chart

8.2 Spray rate table for 3-ray nozzles, Spraying height above ground 120 cm

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

Pressure (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 (k.p.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)

Pressure (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 (k.p.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)

Pressure (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 (k.p.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



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

Pressure (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 (k.p.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

8.3 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 above ground 100 cm
for 5-hole nozzle (black) and 8-hole nozzle**

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 (k.p.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 above ground 100 cm
for 5-hole nozzle (black) and 8-hole nozzle**

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 (k.p.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

Spray rate calibration chart

AMAZONE Spray rate table for metering disc 4916-55, (ø 1,4 mm) spraying height above ground 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 (l/min)	5	5.5	6	6.5	7	7.5	8	8.5	9 (k.p.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 above ground 75 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 (l/min)	5	5.5	6	6.5	7	7.5	8	8.5	9 (k.p.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 above ground 75 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 (l/min)	5	5.5	6	6.5	7	7.5	8	8.5	9 (k.p.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 above ground 75 cm for 8-hole nozzle

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 (k.p.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



8.4 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 (k.p.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 with 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 (k.p.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

Spray rate calibration chart

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

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 (k.p.h)
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)

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 (k.p.h)
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)

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 (k.p.h)
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

8.5 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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