

Operator's Manual

AMAZONE

UX 3200

UX 4200

UX 5200

Trailed Field Sprayer



MG 1277
BAG0010.0 05.05
Printed in Germany



Before initial operation, please
carefully read and
follow this instruction
manual and safety notices!
Keep for future users!



Reading the instruction

Manual and following it should seem to be inconvenient and superfluous as it is not enough to hear from others and to realize that a machine is good, to buy it and to believe that now everything should work by itself. The person in question would not only harm himself but also make the mistake of blaming the machine for possible failures instead of himself. In order to ensure success one should enter the mind of a thing, make himself familiar with every part of the machine and get acquainted with how it's handled. Only in this way could you be satisfied both with the machine and with yourself. This goal is the purpose of this instruction manual.

Leipzig-Plagwitz 1872. Rud. Sack.



Identification specifications

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

Machine-Ident-no.:
Type: **UX 3200, UX 4200,
UX 5200**

Permissible system pressure bar: Max. 200 bar

Year of construction:

Factory:

Power kW:

Basic weight kg:

Permissible total weight kg:

Address of manufacturer

AMAZONEN-WERKE
H. DREYER GmbH & Co. KG
Postfach 51
D-49202 Hasbergen
Tel.: + 49 (0) 5405 50 1-0
Fax.: + 49 (0) 5405 501-234
E-mail: amazone@amazone.de

Ordering spare parts

AMAZONEN-WERKE
H. DREYER GmbH & Co. KG
Postfach 51
D-49202 Hasbergen
Tel.: + 49 (0) 5405 501-290
Fax.: + 49 (0) 5405 501-106
E-mail: et@amazone.de
Spare parts online catalogue: www.amazone.de
When ordering spare parts please always indicate the serial number of your machine.

Formal remarks on this instruction manual

Document Number: MG 1277
Print No.: 05.05
© Copyright AMAZONEN-WERKE H. DREYER GmbH & Co. KG, 2005
All rights reserved.
Reprint – even in extracts – requires the approval of
AMAZONEN-WERKE H. DREYER GmbH & Co. KG.

Dear Customer,

You have 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 you receive this machine, please check immediately that no damage has occurred in transit and that all parts are present. Please check whether all parts mentioned in the delivery note including any optional equipment ordered is present. Only damages reported immediately will be considered for compensation.

Before the initial operation, please read and follow this instruction manual and the safety instructions. When you have thoroughly read the instruction manual, you can get the most benefits out of your recently purchased machine.

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

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

Maintenance at regular intervals and the replace 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 instruction manual, which is always user-friendly. Please send your suggestions by fax.

AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

Postfach 51

D-49202 Hasbergen

Tel.: + 49 (0) 5405 50 1-0

Fax.: + 49 (0) 5405 501-234

E-mail: amazone@amazone.de

1	User recommendation	9
1.1	Purpose of the document	9
1.2	Information about directions in this instruction manual	9
1.3	Figures used	9
2	General safety notices	10
2.1	Obligations and liability	10
2.2	Illustration of the safety notices	12
2.3	Organizational measures	13
2.4	Safety device and guards	13
2.5	Informal safety measures	13
2.6	Staff training	14
2.7	Safety measures and normal operation	14
2.8	Hazard for residual power	14
2.9	Maintenance and repair, remedy of faults	15
2.10	Construction modifications	15
2.10.1	Spare parts and wearing parts and auxiliary parts	15
2.11	Cleaning and disposal	15
2.12	Workplace of the operator	16
2.13	Safety symbols and other identifications on the machine	16
2.13.1	Positioning of warning decals and other identifications	21
2.14	Danger when not adhering to the safety notices	23
2.15	Safety-conscious operation	23
2.16	Safety recommendation for the operator	24
2.16.1	General safety and accident prevention recommendation	24
2.16.2	Hydraulic system	27
2.16.3	Electrical equipment	28
2.16.4	Maintenance, repair and care	28
2.16.5	Operation with PTO shafts	29
2.16.6	Trailed machines	30
2.16.7	Brake system	30
2.16.8	Bolted joints, tires	31
2.16.9	Field sprayer operation	32
3	Loading	33
4	Product description	34
4.1	Overview – Assembly groups	35
4.2	Liquid circuit	39
4.3	Supply pipes between tractor and machine	40
4.4	Traffic safety kit	40
4.5	Intended use of the machine	41
4.5.1	Designated equipment of the field sprayer	42
4.6	Caution when using specific crop protection agents	43
4.7	Danger zones	43
4.8	Safety - and guard facilities	44
4.9	Conformity	44
4.10	Type plate and CE declaration	44
4.11	Technical specifications	45
4.11.1	Overall dimensions UX with Super-S sprayer boom	45
4.11.2	Overall dimensions UX with L sprayer boom	45
4.11.3	Data sheet	46
4.11.4	Weights basic machine and components	47
4.11.5	Weights of sprayer booms	47
4.11.6	Permissible total weights and permissible tires	48



4.12	Required tractor equipment	49
4.13	Details about noise level	50
5	Assembly and function	51
5.1	Function	51
5.2	Explanation of the valve chest operation	53
5.3	Operator terminal AMATRON⁺	55
5.4	AMASPRAY⁺	56
5.5	Running gear and tires	56
5.5.1	Running gear with unbraked axle	56
5.5.2	Running gear with braked axle	56
5.6	Draw bars	59
5.7	Track follow-up steering via tractor control valve	60
5.8	Trail-Tron-track follow-up steering	60
5.9	Track following steering axle	61
5.10	The track following steering draw bar	62
5.11	Hydraulic jack	63
5.12	Mechanic jack	63
5.13	Working platform	64
5.14	Agitators	65
5.15	Pump equipment	66
5.16	Filter equipment	67
5.16.1	Filling sieve	67
5.16.2	Suction filter	67
5.16.3	Self cleaning pressure filter	68
5.16.4	Nozzle filter	69
5.16.5	Bottom sieve in the induction bowl	69
5.17	Clean water tank	70
5.18	Induction bowl with filling port ECOFILL and canister flushing	71
5.19	Hand wash tank	72
5.20	Tank level indicator on the machine	72
5.21	Spray boom	73
5.21.1	Super-S- booms	77
5.21.2	Super-L- Boom	80
5.21.3	Operation with one side folded out sprayer boom	82
5.21.4	Hydraulic boom tilting	83
5.21.5	Distance-Control	83
5.21.6	Boundary nozzle switching, electric	83
5.21.7	End nozzle switching, electric	83
5.22	Spray lines	84
5.22.1	Technical specifications	84
5.22.2	Single nozzles	87
5.22.3	Multiple nozzles	87
5.23	Options for the application of liquid fertilizer	89
5.23.1	3-ray nozzles	89
5.23.2	5- and 8-hole-nozzles	90
5.23.3	Drag hose kit, for Super-S-sprayer boom	91
5.23.4	Drag hose kit for Super-L-sprayer-boom	92
5.24	Spray pistol, with 0.9 m long spray tube, without pressure hose	93
5.24.1	Pressure hose up to 10 bar, e.g. for spray pistol	93
5.25	Foam marker	93
5.26	Permanent working width reduction on the Super-S-boom	94
5.27	Pressure-circulation system (DUS)	95
5.27.1	Hose filter for spray lines	96
5.28	The hydro-pneumatic sprung suspension	97
5.29	Towing device	97

6	Commissioning.....	98
6.1	First operation.....	99
6.1.1	Determining the actual values for the total tractor weight, tractor axle loads, tire load capacity as well as the required minimum ballast weights.....	99
6.1.2	Initial operation with the service brake system.....	102
6.1.3	Fitting the wheels.....	102
6.1.4	PTO shaft.....	103
6.1.5	Setting the system setting screw on the hydraulic valve block	105
6.1.6	Trail-Tron- Pivot angle transmitter	106
7	Coupling and uncoupling the machine.....	107
7.1	Hitching up.....	107
7.1.1	Draw bar	107
7.1.2	PTO shaft.....	107
7.1.3	Connect the brake system.....	108
7.1.4	Hydraulic connections.....	108
7.1.5	Traffic lights	109
7.1.6	AMATRON⁺ / AMASPRAY⁺	110
7.2	Unhitching.....	110
7.2.1	Manoeuvring with the unhitched machine	111
8	Settings	113
8.1	Overview valve chest operation.....	113
8.1.1	Spraying operation.....	113
8.1.2	Suctioning off induction bowl	114
8.1.3	Diluting urea in the induction bowl and suctioning off	115
8.1.4	Pre-cleaning the canister using the spray mixture	116
8.1.5	Diluting the residual amount in the spray mixture tank.....	117
8.1.6	Cleaning the field sprayer with a filled spray mixture tank	118
8.1.7	Filling via suction hose on the filling port.....	120
8.1.8	Tank interior cleaning	121
8.1.9	Exterior cleaning.....	122
9	Transport travel	123
9.1	Checks prior to any travelling	124
9.2	Checks after any travel	124
10	Commissioning the machine.....	125
10.1	Preparing spraying process.....	126
10.2	Preparing the spray mixture	127
10.2.1	Calculating the filling or refilling quantities	128
10.2.2	Filling table for finishing off remaining field areas	129
10.3	Filling with water	131
10.4	Inducting spray agents	132
10.4.1	Inducting liquid agents.....	133
10.4.2	Inducting powdered agents and urea	134
10.4.3	Inducting with ECOFILL.....	135
10.4.4	Pre-cleaning the canister with the spray mixture.....	136
10.4.5	Cleaning canister with rinse water.....	137
10.5	Spraying operation.....	138
10.5.1	Spraying crop protection liquid	140
10.5.2	Spraying operation.....	142
10.5.3	Measures for drift reduction	143
10.6	Excess amounts	143
10.6.1	Removal of residual amounts	144
11	Malfunction.....	147

12	Maintenance, repair and care.....	148
12.1	Cleaning	150
12.1.1	Cleaning the sprayer with an empty tank.....	152
12.1.2	Cleaning the sprayer with a filled tank.....	153
12.1.3	Storing for the winter or prolonged downtimes	154
12.1.4	Cleaning the suction filter.....	155
12.2	Greasing prescription	156
12.2.1	Overview – lubricating points.....	156
12.2.2	Greasing the axle.....	158
12.3	Maintenance and care - Review	160
12.4	Draw bars.....	163
12.5	Axle and brake system.....	164
12.5.1	Maintenance work.....	165
12.6	Parking brake.....	169
12.7	Tires / wheels.....	170
12.7.1	Tyre air pressure	170
12.7.2	Fitting wheels	170
12.8	Axle carrier of the hydro-pneumatic suspension.....	171
12.9	Hydraulic system.....	172
12.9.1	Mounting and dismounting hydraulic hoses.....	174
12.9.2	Checking the hydraulic oil filter	175
12.10	Setting the hydraulic throttle valves	176
12.11	Electric traffic light kit	177
12.12	Pump -.....	177
12.12.1	Checking oil level	177
12.12.2	Oil change	178
12.12.3	Pump drive	179
12.13	Calibrating the flow meter	183
12.14	Nozzles	184
12.14.1	Fitting the nozzles	184
12.14.2	Dismantling the diaphragm valve in case of dripping nozzles	184
12.15	Hose filters	185
12.16	Tips for checking the field sprayer	186
12.17	Bolt torques	188
13	Spray rate calibration chart.....	189
13.1	Spray rate chart for flat fan-, anti-drift-, injector- and air mix-nozzles, spraying height 50 cm.....	189
13.2	Spray rate table for 3-ray nozzles, Spraying height above ground 120 cm	193
13.3	Spray rate table for 5- and 8-hole nozzles (permissible pressure range 1-2 bar)	194
13.4	Spray rate table for drag hose equipment (permissible pressure range 1-4 bar)	196
13.5	Conversion table for spraying liquid fertilizer Ammonium Nitrate / Urea suspension (AUS).....	198
14	Combination matrix	199

1 User recommendation

The chapter "User recommendation" provides information on using the instruction manual.

1.1 Purpose of the document

This instruction manual

- describes the operation and the maintenance for the machine.
- gives important tips for the safety-conscious and efficient operation of the machine.
- is part of the machine and should be kept so that it is always on 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 directions in this instruction manual is to be understood as meaning in the direction of travel.

1.3 Figures used

Operational action and reactions

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

1. Operational action step 1
→ Reaction of the machine on operational action step 1
2. Operational action step 2

Enumerations

Enumerations without an essential sequence are described as a list with the items enumerated. Example:

- Item 1
- Item 2

Position figures in illustrations

Figures in round brackets refer to position figures in illustrations. The first figure refers to the illustration, the second figure refers to the item number in the illustration.

Example (Fig. 3/6)

- Figure 3
- Position 6

2 General safety notices

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

2.1 Obligations and liability

Follow the recommendation given in this instruction manual

Knowledge of the basic safety notices and safety regulations are the basic condition to work with the machine in a safety-conscious manner and to ensure trouble-free operation.

Obligations of the owner

The owner is obligated to only have the machine operated by persons who

- are familiar with the basic recommendations regarding the operational safety and accident prevention.
- have been introduced to the machine.
- have read and understood this instruction manual.

The owner is obligated to

- to ensure that all warning signs on the machine are in legible condition.
- to replace damaged warning signs.

Obligations of the operator

Before commencing any operation, all persons who have been instructed on how to operate the machine are obligated to

- follow the basic regulations regarding operational safety and accident prevention,
- to read and to adhere to the chapter "Safety" and the warning notices in this instruction manual.
- to read and to adhere to the chapter "Warning signs and other signs on the machine" (Page 16).
- In case of queries, please contact the manufacturer.

Danger when working with the machine

The machine is state-of-the-art in terms of its manufacture and its certified safety regulations. Nevertheless, the operation of the machine could cause danger and adverse effects on

- life and limb of the operator or third parties,
- the machine itself,
- other property.

Only use the machine

- for the purpose for which it has been designed.
- when it is in ideal safety engineering condition.

Immediately remedy all failures affecting safety.

Warranty and liability

Our "General terms of sale and delivery" always apply. These will be made available to the user on the date of conclusion of the contract at the latest. Warranty and liability claims for injuries to life or damage to property are denied when they are attributable to one or several of the following causes:

- improper use of the machine.
- improper fitting, commissioning, operating and maintaining the machine.
- operating the machine with defective safety facilities or improperly fitted or non-functioning safety devices and guards.
- failure to adhere to the instruction manual regarding commissioning, operation and maintenance.
- non-required modifications to the machine.
- poor monitoring of the wearing parts of the machine.
- improper repair work.
- in emergencies due to foreign elements and *force majeure*.

2.2 Illustration of the safety notices

The safety notices are identified by a symbol and a signal word. The signal word describes the severity of the imminent danger. The individual symbols have the following meaning:



Danger!

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

Not adhering following this instruction will cause severe damage to the health including life-threatening injuries.



Warning!

Possible danger to the life and health of persons.

Not adhering to these notices may cause severe adverse health effects including life-threatening injuries.



Caution!

Possible dangerous situation (slight injuries, material damage).

Not adhering to these notices may cause slight injuries or material damages.



Important!

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

Not adhering to these notices may cause problems with the machine or the environment.



Tip!

A tip for use and particularly useful information.

These tips will help you to make optimum use of the functions on your machine.

2.3 Organizational measures

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

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



Important!

The instruction manual

- **should always be kept in the area where the machine is operated!**
- **should always be available to the operator and the service staff!**

Regularly check all existing safety devices!

2.4 Safety device and guards

Only operate the machine when all safety devices and guards are equipped and are properly functioning. Regularly check all safety devices and guards.

Defective safety devices

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

2.5 Informal safety measures

In addition to the safety notices in this instruction manual, follow and adhere to the national, local and generally valid instructions for operational safety, accident prevention and environmental care.

Please particularly observe the accident prevention recommendation of your nationally authorized trade association.

2.6 Staff training

Only people who are trained and familiar with the machine may work with/on the machine. The responsibility of individual persons for operation and maintenance should clearly be specified.

A trainee may only operate the machine under the supervision of a skilled person

Action \ Personnel	Persons with special training	Instructed operator	Persons with specialist training (Mechanics/electrical engineering)
Loading /Transport	X	X	X
Commissioning	--	X	--
Installation, set-up	--	--	X
Operation	--	X	--
Maintenance	--	--	X
Troubleshooting and remedies	X	--	X
Disposal	X	--	--
Legend: X. allowed --. not permitted			

*) All maintenance and repair work which has been marked with the addendum "authorized repair centre" must be carried out in an authorized specialist repair centre. Only the personnel at a specialist authorized repair centre has the necessary knowledge and is equipped with the appropriated aids (tools, lifting and supporting devices) for the proper performance of this maintenance and repair work as it relates to safety.

2.7 Safety measures and normal operation

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

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

2.8 Hazard for residual power

Be aware of incidents of mechanical, hydraulic, pneumatic, and electric/electronic residual power on the machine.

Take the appropriate measures when instructing the operating staff. Detailed tips are given again in the relevant chapters of this instruction manual

2.9 Maintenance and repair, remedy of faults

Perform all specified setting-, maintenance and service work in a timely manner.

Protect all operating systems like compressed air and hydraulics against unintentional activation.

When replacing larger components carefully affix them to the hoisting device.

Check that loose screw joints are firmly in place. When maintenance work is completed, carefully check all safety devices for proper function.

2.10 Construction modifications

Never do any alterations or fitting or modifications to the machine without the approval of **AMAZONEN-WERKE**. This also applies to the welding work on bearing parts.

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

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



The following is always prohibited

- **Drilling on the frame or the chassis.**
- **Re-drilling existing holes on the frame or the chassis.**
- **Welding on bearing parts.**

2.10.1 Spare parts and wearing parts and auxiliary parts

Immediately replace defective machine parts.

Only use original-**AMAZONE**-spare- and wearing parts or the parts approved by **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 there is no guarantee that they have been designed and manufactured to fulfil the operational stress and safety requirements.

AMAZONEN-WERKE does not accept any liability for damages due to using non-approved spare or wearing parts or auxiliary parts

2.11 Cleaning and disposal

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

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

2.12 Workplace of the operator

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

2.13 Safety symbols and other identifications on the machine



Important!

Always keep all safety symbols on the mounted sprayer clean and in legible condition! Replace illegible safety symbols. Ask your dealer for replacement safety symbols. The image no. on the safety symbol is the order number.

Warning signs - structure

Warning signs indicate hazardous areas on the machine and warn about danger. At these areas, there is a constant risk of danger or danger that can occur unexpectedly.

The warning sign consists of 2 fields:



Field 1

Gives a clear description of the danger and is surrounded by a triangle safety symbol.

Field 2

Gives clear instructions on avoiding these dangers.

Warning signs - Explanation

The column **Order Number and explanation** provides a description to the warning sign opposite. The description of the warning sign is always the same and indicates the required sequence:

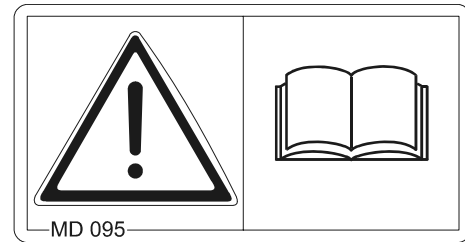
1. Description of danger.
For example: Danger of severing or being severed!
2. Consequences not following the instruction supplied on how to avoid dangers.
For example: will cause severe injury to the fingers or hand.
3. Instructions on how to avoid danger.
For example: Touch machine parts only then when they have come to a full stop.

Picture No. and Explanation

Warning signs

MD 095

Before commencing operation read thoroughly operator's manual and safety notices!



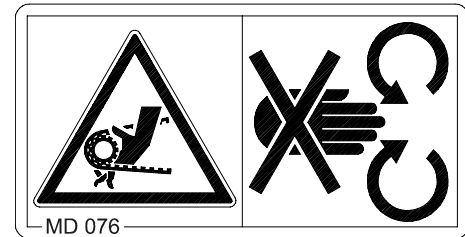
MD 076

Danger from being drawn in or getting caught!

Will cause severe injury on hand or arm.

Never ever open or remove the guards from chain or belt drives

- as long as the tractor engine is still running with connected PTO shaft / coupled hydraulic drive
- or the ground wheel drive is moving.

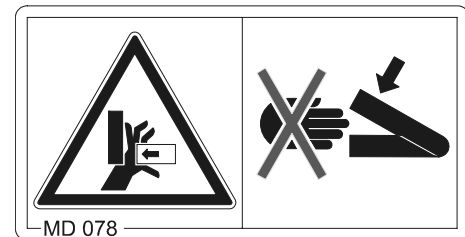


MD 078

Danger of squeezing on moving parts!

Will cause severe injury to finger or hand.

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

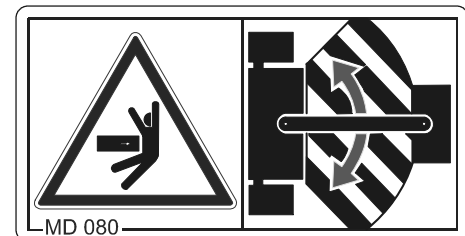


MD 080

Danger of squeezing!

Will cause severe injury or fatal injury.

Never ever stand in the kinking area of the draw bar between tractor and machine as long as the tractor engine is running.

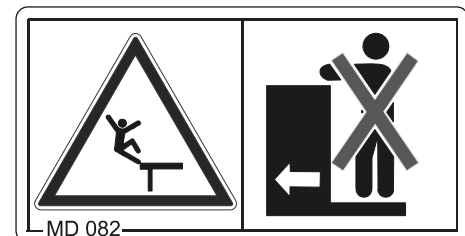


MD 082

Danger of falling for persons!

Will cause severe injury on the entire body.

Riding on the machine and/or climbing the running machine are prohibited. This prohibition is also valid for machines with steps or platforms.



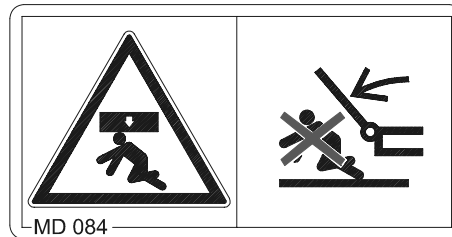
General safety notices

MD 084

Danger of pinching!

Will cause severe injury to the entire body or fatal injury.

Persons may not stand within the swivelling area of the machine parts.

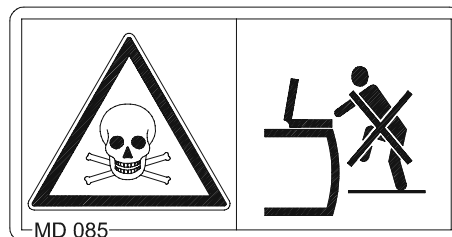


MD 085

Danger of injury from toxic fumes!

Will cause severe injury or fatal injury.

Never climb inside the spray tank.



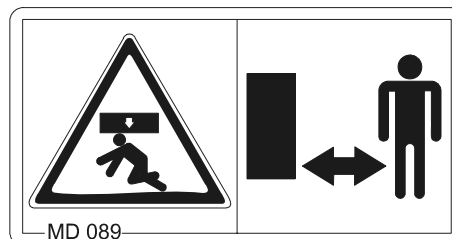
MD 089

Danger!

Danger of pinching!

Will cause severe injury to the entire body or fatal injury.

Ensure there is sufficient clearance to unsecured machine or to machine parts

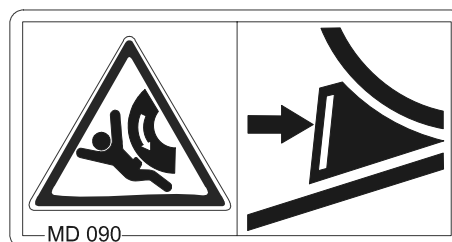


MD 090

Danger from unintentional movement of the machine.

Will cause severe or fatal injury to the whole body.

Safeguard the machine against unintentional movements before you disconnect the machine from the tractor. Use the parking brake and/or chocks(s).

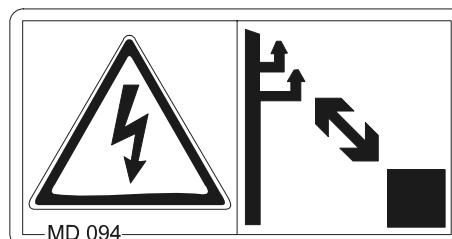


MD 094

Danger from electricity!

Will cause severe injury to the entire body or fatal injury.

When folding out and in the sprayer booms ensure there is sufficient clearance to high voltage lines.

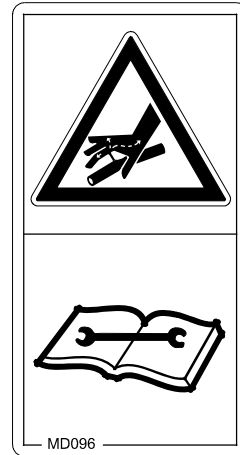


MD 096

Danger from liquids leaking under high pressure (hydraulic oil)!

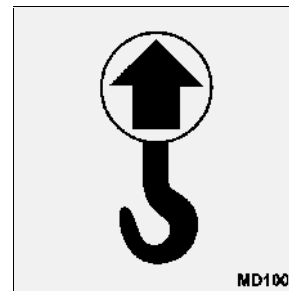
Liquids leaking under high pressure, which can reach the skin and make contact with the body will cause severe injury.

Before performing any maintenance and repair work, read and follow the tips in the technical manual.



MD 100

Equipment for attaching loading auxiliary equipment.

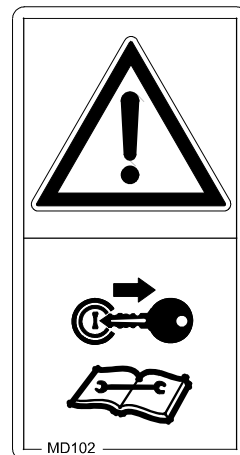


MD 102

Danger from unintentional movement of the machine.

Will cause severe or fatal injury to the whole body.

- Before performing any maintenance and repair work, stop the tractor engine and remove the ignition key.
- Read and follow the tips in the technical manual before performing maintenance and repair work.



MD 103

Danger of poisoning from toxic liquids! Water not potable!

Will cause severe injury to the entire body or fatal injury!

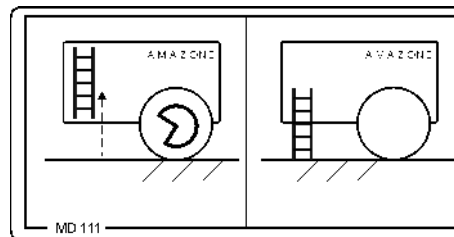
The materials of the wash-down tank are not of a consumable grade.



General safety notices

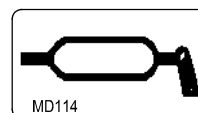
MD 111

Fold in the ladder during transport!



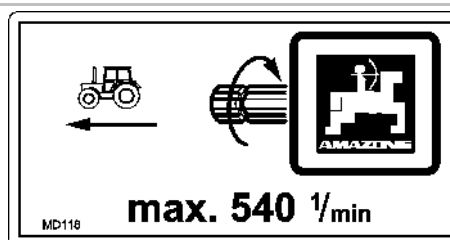
MD 114

Lubrication point



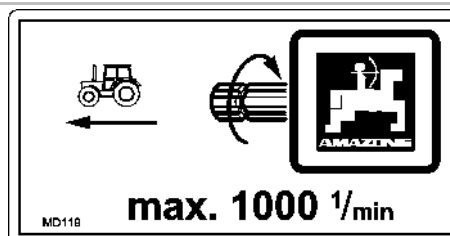
MD 118

Max. PTO shaft speed 540/min.



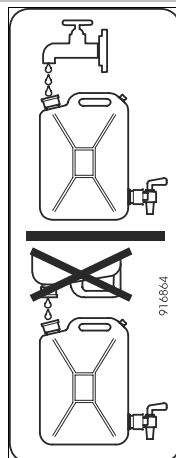
MD 119

Max. PTO shaft speed 1000/min.



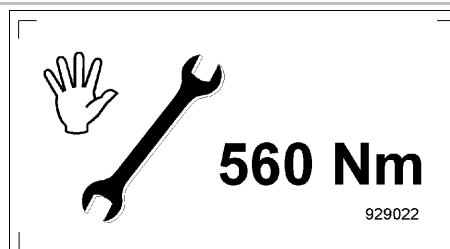
916 864

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



929 022

Check wheel nuts at regular intervals.



911888

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



2.13.1 Positioning of warning decals and other identifications

Warning decals

The following figures show the position of the warning decals.

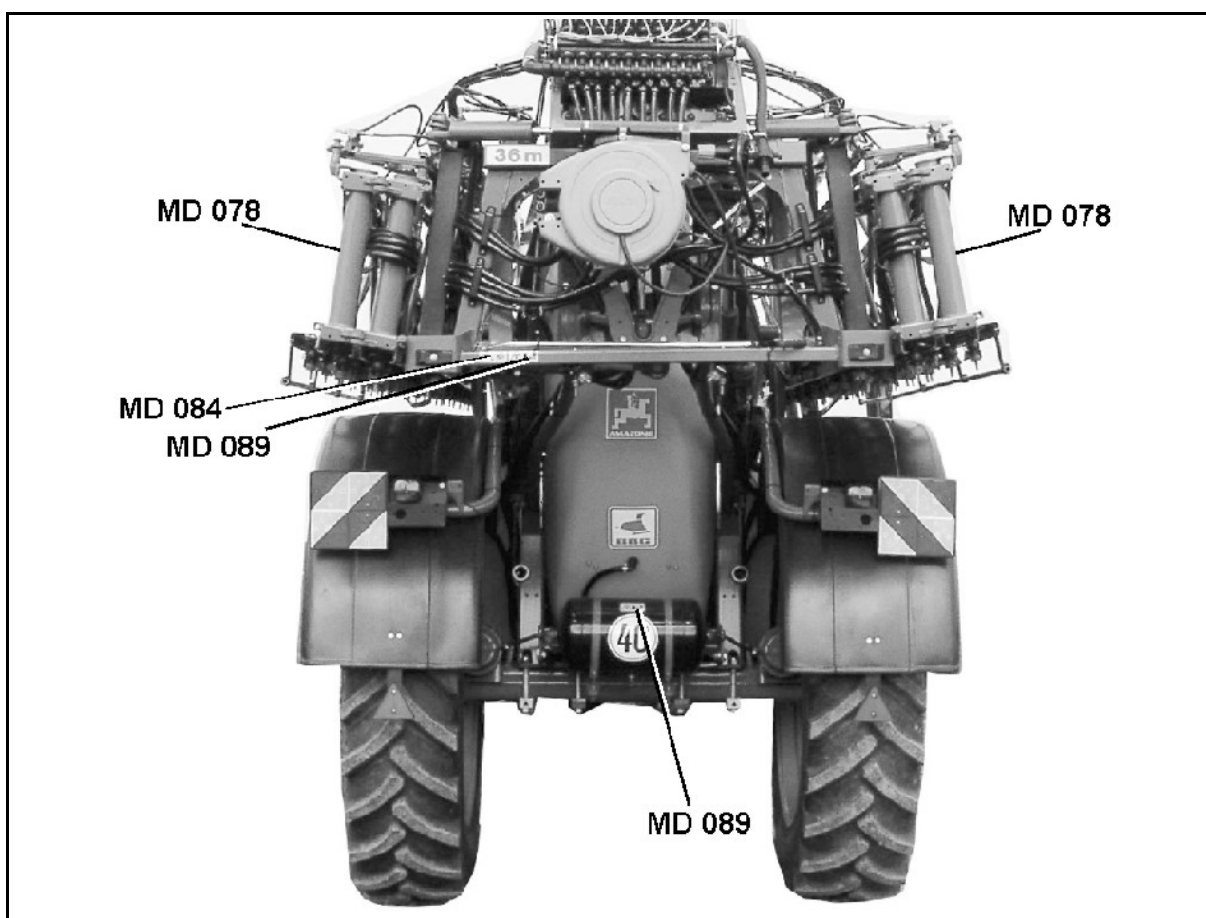


Fig. 1

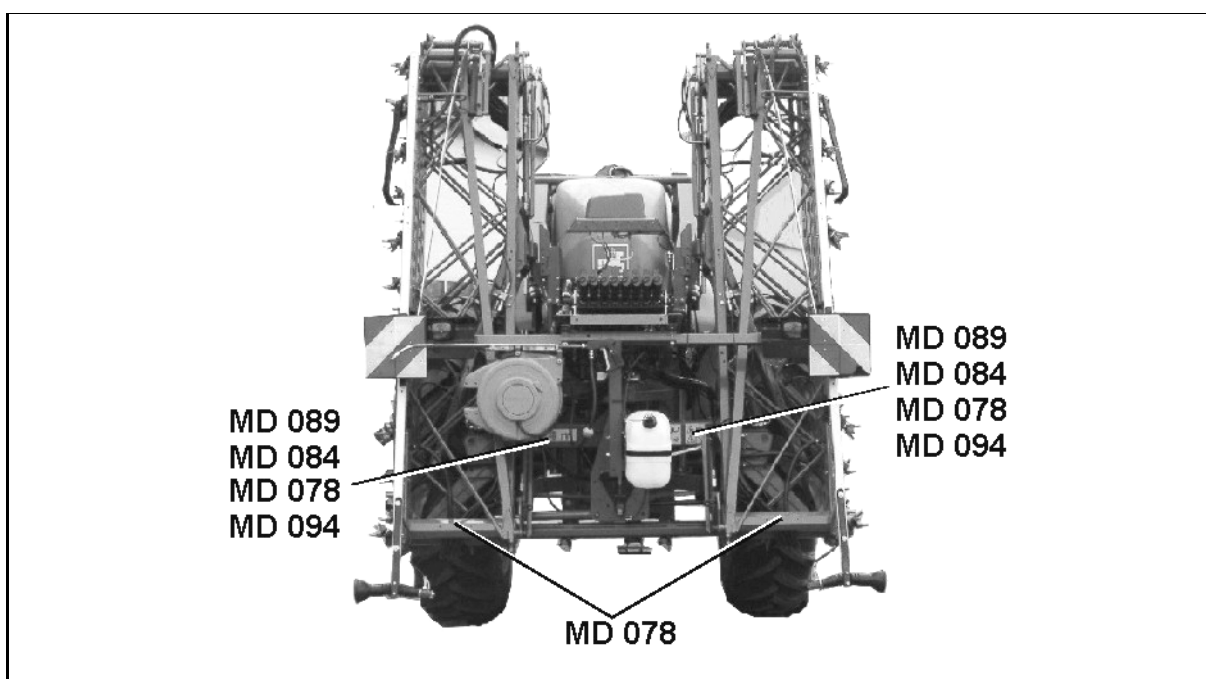


Fig. 2

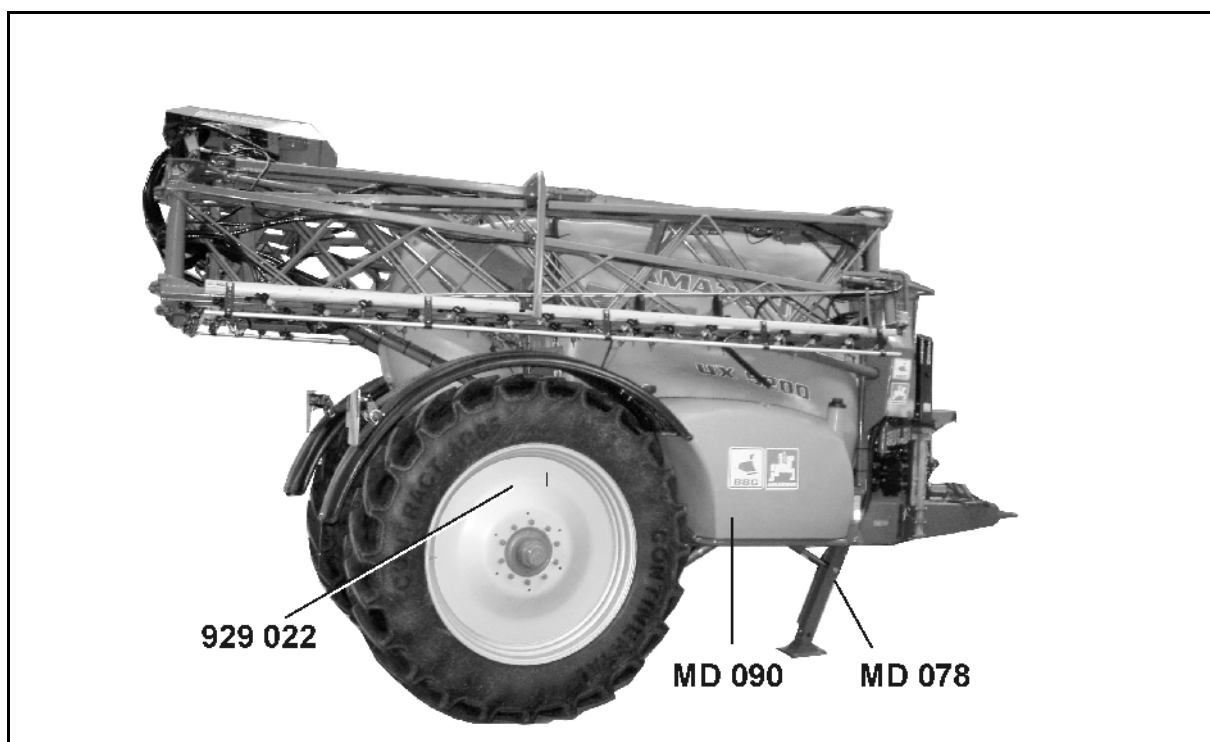


Fig. 3

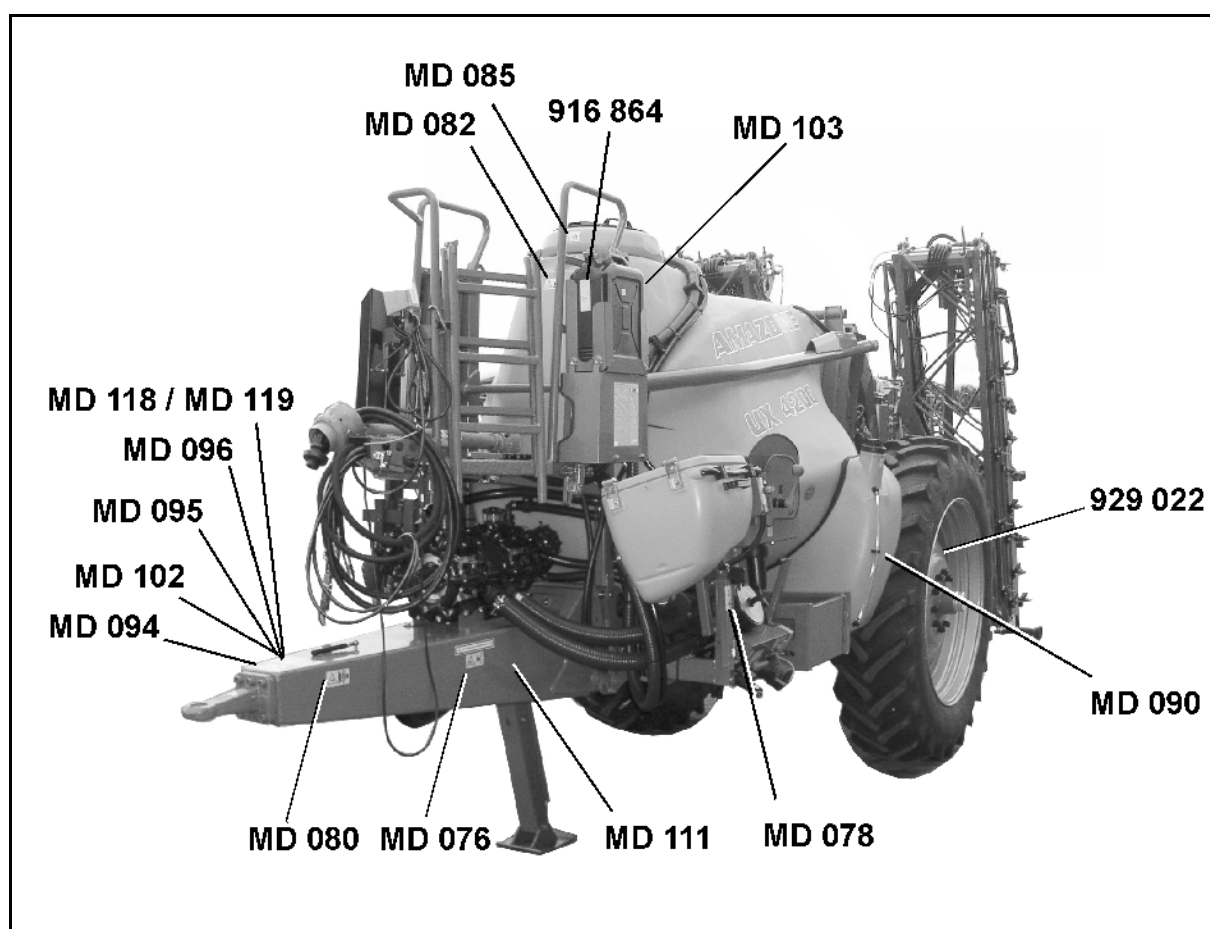


Fig. 4

2.14 Danger when not adhering to the safety notices

Not adhering to the safety notices

- may result in danger to persons, the environment and also the machine itself.
- may result in the denial of any claim for damages.

Failure to adhere to the safety notices may cause the following risks:

- Danger to persons not prohibited from entering operational areas.
- Failure of important functions of the machine.
- Failure to carry out specified maintenance and repair measures.
- Danger to persons through physical or chemical contact.
- Danger to persons or the environment through leaks of hydraulic oil.

2.15 Safety-conscious operation

In addition to the safety notices in this instruction manual, the national and generally applicable operation safety and accident prevention instruction of the relevant authorized trade association are binding. Especially VSG 1.1 and VSG 3.1.

Follow the safety notices on the decals on the machine.

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

2.16 Safety recommendation for the operator



Warning!

Always be sure to check traffic and operational safety before operating the machine!

2.16.1 General safety and accident prevention recommendation

- Follow the general rules of health- and safety precautions in addition to the recommendation in this instruction manual!
- The warning- and advising decals give important tips for safe operation. Following these instructions protects your safety!
- Before beginning to move, check the surrounding area (children etc.)! Ensure there is sufficient visibility!
- Riding or any form of transport on the machine is prohibited!

Coupling and uncoupling the machine

- The machine should only be transported and driven by a tractor, which meets the appropriate power requirements.
- When fitting to the three-point linkage, the mounting categories on the tractor and the machines must be compatible!
- When mounting machines at the front or in the rear of a tractor, do not exceed
 - the permissible total tractor weight
 - the permissible tractor axle loads
 - the permissible tire load capacity of the tractor tires
- Protect the tractor and the machine against unintentional rolling before mounting or dismounting the machine.
- Do not allow anyone to stand between the tractor and machine while the tractor is backing up.

Any assistants may only stand at the side of the vehicle and help to direct it. They are allowed to step between the vehicles only when the vehicles have come to a full stop.
- Before mounting and dismounting the machine to the three-point linkage, secure the control lever for the tractor hydraulics to a position that makes unintentional lifting or lowering is impossible.
- When attaching or uncoupling the machine bring any parking or storing devices into the corresponding position (standing safety)!
- Danger of pinching and shearing when actuating the supporting device.
- Special care should be taken when coupling the machines on or off the tractor. There are pinching and shearing points at the coupling points between the tractor and machine.
- Standing between tractor and machine when the three-point hydraulic is actuated is prohibited.
- Attach machines as specified and hitch the machine in the appropriate manner to the specified devices.
- The release ropes for the quick coupler should hang freely and must not release the quick coupling by themselves when lowered.
- Park unhitched machines safely!

Operation of the machine

- Familiarize yourself with the machine controls and functions before beginning operation. It is too late to do this during operation!
- Wear close-fitting clothes. Wearing loose-fitting clothes would increase the danger of getting caught by the drive shafts!
- Only start the machine when all guards are equipped and in serviceable condition!
- Observe the maximum payload of the mounted / trailed machine and the permissible axle and support loads of the tractor. If necessary, only travel with a partially filled hopper.
- Persons may not stand within the operational range of the machine!
- Person may not stand within the pivot and swivel area of the machine!
- There danger of injury through bruising and catching on all hydraulically operated pivoting parts!
- Machine parts may only be hydraulically operated when persons ensure sufficient clearance to the machine!
- Before leaving the tractor
 - lower the machine to the ground
 - stop the tractor engine
 - remove the ignition key



Transport of the machine

- When travelling on public roads, observe your national traffic regulations in force.
- Always ensure sufficient steering brakeage of the tractor.
Steering and brakeage of the tractor are influenced by mounted or trailed machines and front or rear ballast weights.
- If necessary, use ballast weights.
The tractor front axle load must be at least 20 % of the tractor's net weight in order to ensure sufficient steering capacity.
- Attach the front or rear ballast weights in the appropriate manner at the attachment points supplied.
- Observe the max. payload of the mounted / trailed machine and the permissible axle and support loads of the tractor.
- The tractor must provide the specified brake lag for the loaded combination (tractor plus mounted / trailed machine).
- Before starting to travel on public roads, check that the brakes are functioning properly.
- When driving around bends, note the width of the mounted or trailed machine and the gyrating mass of the machine.
- Before starting to travel on public roads, ensure there is sufficient lateral locking of the tractor lower link arms when the machine is attached to the three-point hydraulics or the lower link arms of the tractor.
- Before starting to travel move all swivelling machine parts into transport position.
- Before starting to travel protect all swivelling machine parts in transport position against movement from their position, which can be dangerous. To do this, use the proper transport safety device devices.
- Before starting to travel secure the lever of the three-point hydraulics against unintentional lifting or lowering of the mounted or trailed machine.
- Before any transport, ensure that the required transport device is correctly fitted on the machine, as, e.g. traffic lights, warning devices, guards.
- Adapt your travelling speed to the existing conditions.
- Select a lower gear when driving down hill.
- Always switch off the single wheel braking (lock the pedal) before starting any transport runs.

2.16.2 Hydraulic system

- The hydraulic system is under high pressure!
- Connect hydraulic hoses to the hydraulic rams and motors according to the recommendation 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 machine is pressure-free!
- Before starting to do repair work to the hydraulic system,
 - lower machine to the ground,
 - release the pressure and
 - stop tractor engine.
- All hydraulic hoses must be checked for their operational safety by a skilled person at least once annually. In the event of damage or ageing, replace the hydraulic hoses. Only use original **AMAZONE** hydraulic hoses.
- The usage period of any hose circuit should not exceed six years including a possible a storing period of two years maximum. Also even when stored and used properly, hoses and hose circuits do age. Therefore their longevity and service life is limited. Deviations from the above may be accepted by the Health- and Safety Authorities depending on the experience they have had with the product and the potential danger. For hoses and hose circuits, made of thermoplasts other guidelines may prevail.
- Danger of infection! Liquids leaking under high pressure (hydraulic oil) can penetrate to the skin and cause severe injury! In case of injury, see a doctor immediately!
- When searching for leaks the appropriate safety equipment should be used because of the danger of injury!

2.16.3 Electrical equipment

- When working on the electric system always disconnect the battery (negative pole!)
- Use specified fuses only. If you use fuses which are too strong, the electric circuit may be damaged - danger of fire!
- Make sure the polarity is correctly fitted. First connect the positive pole and then negative pole. - When disconnecting do this in reverse order!
- Always provide plus pole with supplied cover. There is a risk of explosion on accidental contact with the ground!
- Avoid sparks and open fire near the battery!
- The function of the machine's electronic components and parts may be affected by the electro-magnetic transmittance of other devices. The effects from these devices may endanger third parties when the following safety notices has not been adhered to:
 - When retrofitting electric and electronic devices and/or components to the machine with a connection to the tractor's on-board electric circuit, the burden is on the user to ensure that the installation will not be detrimental to either the tractor's electronics or other components.
 - Special attention must be paid that the retrofitted electric and electronic parts correspond to the EMC-directive 89/336/EC in the currently applicable version and that they bear the CE-mark.

2.16.4 Maintenance, repair and care

- Repair-, maintenance- and cleaning operations as well as the remedy of function faults should always be conducted with
 - drive stopped
 - engine stopped
 - ignition key removed
 - machine plug of job computer off
- Check nuts and bolts for tightness and retighten if necessary!
- Before performing any maintenance-, repair- and cleaning work ensure the elevated machine or elevated machine parts against unintentional lowering.
- When exchanging operational tools with cutting edges use appropriate tools and wear gloves.
- Dispose of oil, grease and filters in the appropriate manner!
- Before doing any electrical on the tractor or on the mounted machine, remove the cable from the generator and battery!
- Any spare parts fitted must at least meet the machine manufacturers' established technical standards! To ensure this occurs, only use original **AMAZONE** spare parts for example!

2.16.5 Operation with PTO shafts

- Only use PTO shafts which are designed for the machine by the manufacturer and which are equipped with all legally required guards!
- Guard tubes and cones of the PTO shaft as well as a tractor and machine side PTO guard must be fitted and kept in 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 the engine is stopped and the ignition key has been removed!
- Ensure correct fitting and securing of the PTO support!
- Prevent the PTO guard from spinning by connecting the supplied 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 machine input speed!
- When using the ground PTO, note that the PTO speed is related to the forward speed and that the direction of rotation reverses when backing up!
- Before switching on the PTO shaft no one is permitted to stand in the machine's danger area!
- Never switch on the tractor PTO while the engine is stopped!
- When working with the PTO, no one may stand in the area around the PTO or propeller shaft!
- When operating with an activated PTO shaft no one is permitted to stand near the spinning PTO or universal joint shaft!
- Attention! After switching off the PTO the mounted machine may continue to run by its dynamic forces!
- During this time, never get too close to the machine. Begin work on the machine only after it has come to a full stop!
- Clean and grease the universal joint shaft and the PTO-actuated machine only after the PTO shaft and engine have stopped and ignition key has been pulled out!
- Place the removed PTO shaft into the supplied carrier!
- When travelling over curves, be aware of the permissible angle and sliding length!
- When you have removed the PTO shaft, apply the guard cap onto PTO stub!
- Immediately repair any damage before operation to avoid subsequent problems!
- When using wide angle PTO shaft always attach the wide-angle joint onto the pivot point!

2.16.6 Trailed machines

- With one-axle machines observe the max. permissible support load of the tractor on the coupling device.
- Always ensure the tractor has a sufficient steering and braking capacity.

The tractor or trailed machines affect the driving behaviour as well as the steering and braking of the tractor. This is especially true for one-axle machines with a support load on the tractor.

- Only an authorized repair centre is permitted to adjust the draw bar height on straight drawbars.
- Machines without brake system:
 - o The max. speed is restricted to 25 km/h.
 - o The basic weight of the tractor (not the total permissible weight) plus the support load of the machine must be bigger than the max. axle load of the machine.

2.16.7 Brake system

- Only authorized repair centres or brake services are allowed to carry out adjustment or repair work on the brake system.
- The brake system must be carefully checked at regular intervals.
- Immediately stop the tractor when function faults are noted on the brake system. Provide an immediate remedy for this malfunction.
- Before performing any servicing on the brake system, safely park the machine and secure the machine against unintentional lowering and unintentional rolling (chocks).
- Special care should be taken when performing welding, solder and drilling work near brake hoses.
- Always do a brake test after any setting and repair work.

Air brake system

- Before hitching the machine, clean the seal rings on the coupling claw of the secondary hose and the brake hose to remove any dirt.
- Only start driving with the machine hitched when the pressure gauge on the tractor indicates 5.0 bars.
- Drain the air reservoir daily.
- Before starting to travel without a hitched machine, cover the coupling claws on the tractor.
- Hang the machine's coupling claws of the supply and brake line onto the supplied dummy couplings.
- Only use the specified brake liquid for topping-off or refilling.
- You are not permitted to alter the determined settings on the brake valves.
- Replace the air reservoir if
 - the air reservoir can be moved within the tensioning belts
 - the air reservoir is defective
 - the type plate on the air reservoir starts to rust, is loose or missing.

Hydraulic brake system for export machinery

- Hydraulic brake systems are not permitted in Germany.
- For topping-off or refilling only use the specified hydraulic oils. When replacing hydraulic oils, please observe the relevant recommendations.

2.16.8 Bolted joints, tires

- Repair work on the tires must only be done by skilled professionals with the appropriate fitting tools!
- Before performing any work on the wheels, ensure that the trailed sprayer has been parked safely and that it is secured against rolling (chocks)!
- There is a danger of explosion if the air pressure in the tires is too high!
- Check air pressure at regular intervals!
- Retighten all fixing bolts and nuts according to the manufacturer recommendations!
- Retighten bolts and nuts after any wheel change!

2.16.9 Field sprayer operation

- Observe the recommendations on the plant protective agent manufacturer regarding
 - Protective clothing
 - Warning notices when handling plant protective agents
 - Metering-, application- and cleaning recommendations
- Observe the recommendations of the plant protective law!
- Never turn on hoses when they are under pressure!
- You are only permitted to use original **AMAZONE**-hoses as replacements which resist the chemical, mechanical and thermal stress. Always use hose clamps made from stainless steel/V2A!
- Repair work inside the spray tank should only be started only after thorough cleaning and when wearing a protective breathing mask. For safety reasons, a second person should observe the work from outside the tank!
- The following should be noted when repairing sprayers which have been used for liquid fertilizing with Ammonium Nitrate Urea solutions:

Residue of Ammonium-Nitrate-Urea solutions can produce salt through the evaporation of the water both outside and inside the machine. Thus, pure Ammonium Nitrate and urea are developed. In pure form, Ammonium Nitrate in conjunction with an organic material, e. g. urea, can explode if critical temperatures are reached during repair operations (e. g. welding, grinding, filing).

The salt of the Ammonium Nitrate Urea solution is water-soluble, i. e. this danger is precluded by thoroughly washing down the machine or the part to be repaired with water. Therefore, before starting any repair work, thoroughly clean the machine with water!

- When filling the tank do not exceed the nominal volume!



Important!

- **When handling spray agents, always wear correct protective clothing such as gloves, overalls, protective glasses etc!**
- **In tractor cabs with ventilation fans, replace the fresh air filters for active carbon filters!**
- **Consider the compatibility of spray agents and materials of the field sprayer!**
- **Do not spray any materials which tend to glue or to solidify!**
- **For the protection of people, animals and the environment, crop sprayers must never be filled from open sources!**
- **Crop sprayers may only be filled with a free falling stream of water stream from the public water mains!**

3 Loading

Loading by using the tractor



Danger!

- Before loading or unloading the machine from the transport vehicle, carefully hitch the machine to the tractor.
- When unloading and loading the machine, only hitch and transport the machine with a tractor which is designed for this task (has sufficient power).
- Only begin driving with the hitched machine when the pressure gauge on the tractor indicates 0.5 bars.
- There is a danger of an accident if the tractor is not sufficiently proportioned and the brake system of the machine has not been connected to the tractor and filled!

Loading with a hoist crane

There are 3 indicated points on the machine (Fig. 5/1, Fig. 6/1, Fig. 7/1).



Danger!

When loading the machine with a hoist crane use the points indicated to attach the lifting straps.



Danger!

The minimum tensile strength per lifting strap must be

- 3000 kg rear (Fig. 5)
- 1500 kg front (Fig. 6 / Fig. 7)!

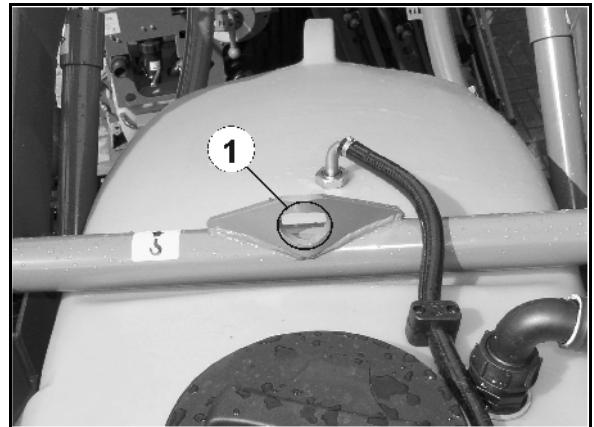


Fig. 5

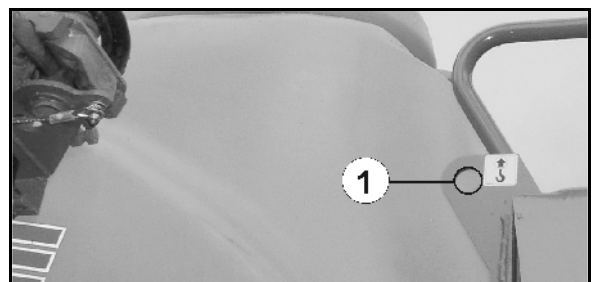


Fig. 6



Fig. 7

4 Product description

This chapter

- provides you with a comprehensive overview on the design of the machine.
- provides a description of the individual components and parts.

Read this chapter when you are at the machine. In this way, you can optimally familiarize yourself with the machine.

The machine consists of the following main components:

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

4.1 Overview – Assembly groups

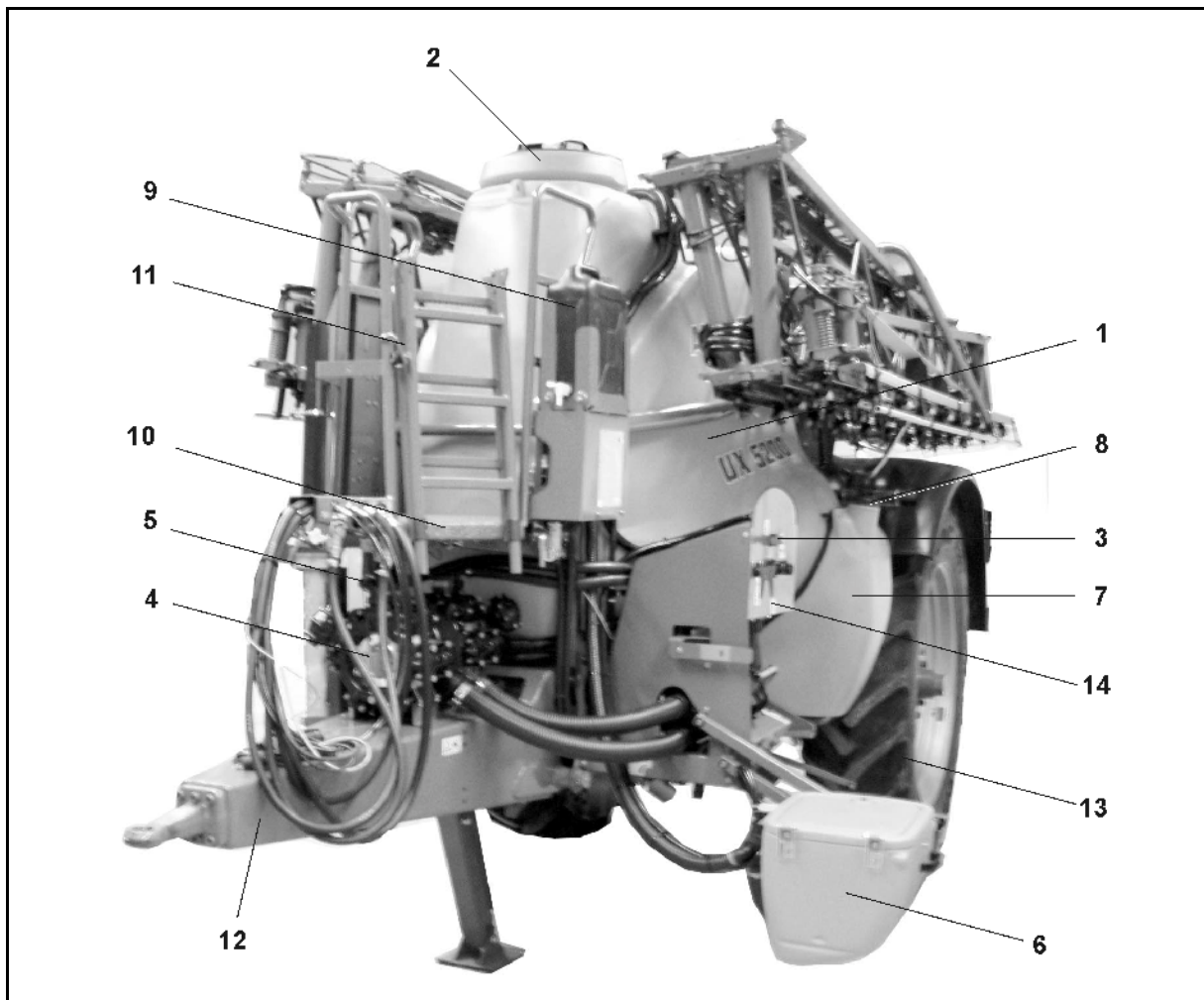


Fig. 8

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

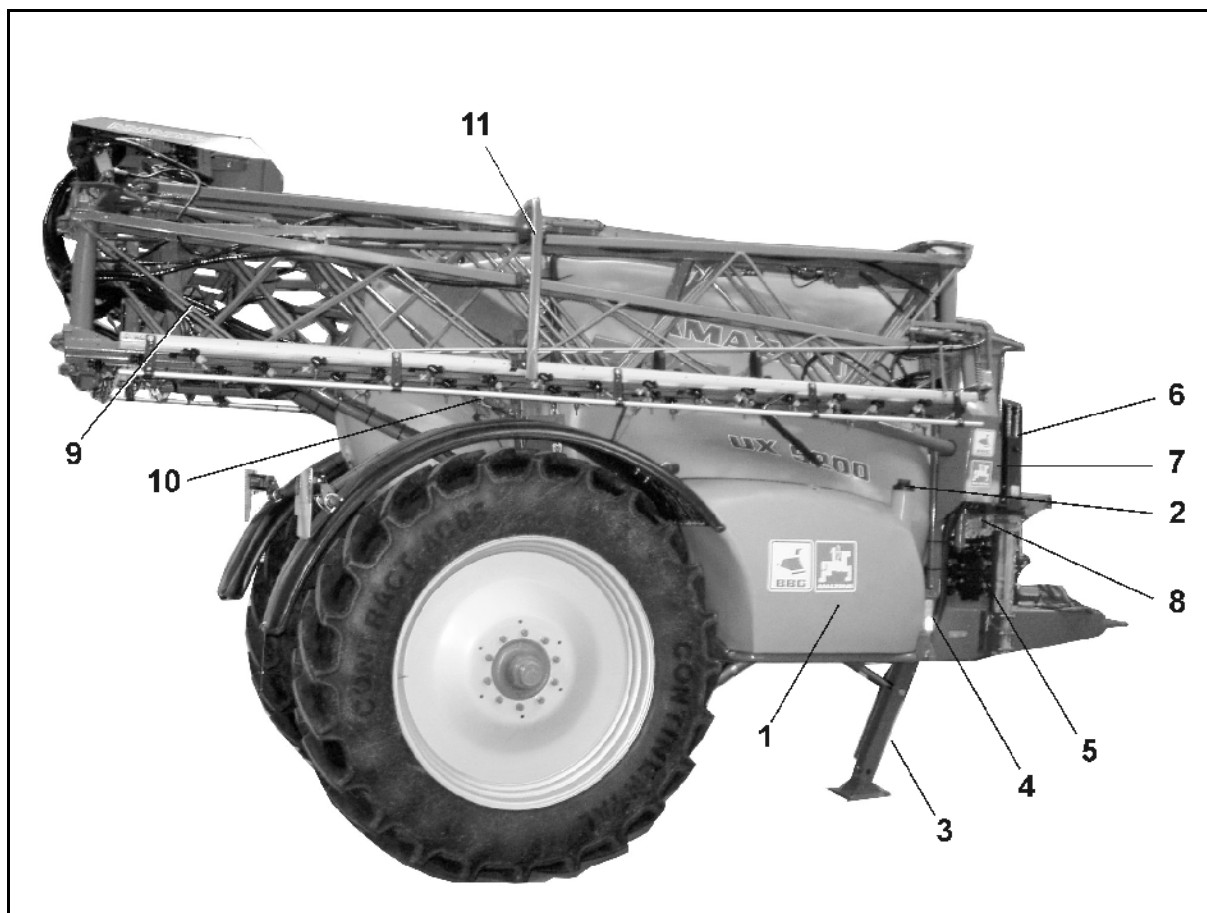


Fig. 9

- | | |
|---|---|
| (1) Fresh water rinsing tank 2 | (7) Fresh water rinsing tank 2 |
| (2) Filling port fresh water rinsing tank 2 | (8) Filling port fresh water rinsing tank 2 |
| (3) Hydraulic jack | (9) Hydraulic jack |
| (4) Parking brake | (10) Parking brake |
| (5) Pump equipment | (11) Pump equipment |
| (6) Chocks | (12) Chocks |
| | (13) Transport safety device - boom |

Overview – Assembly groups - continued

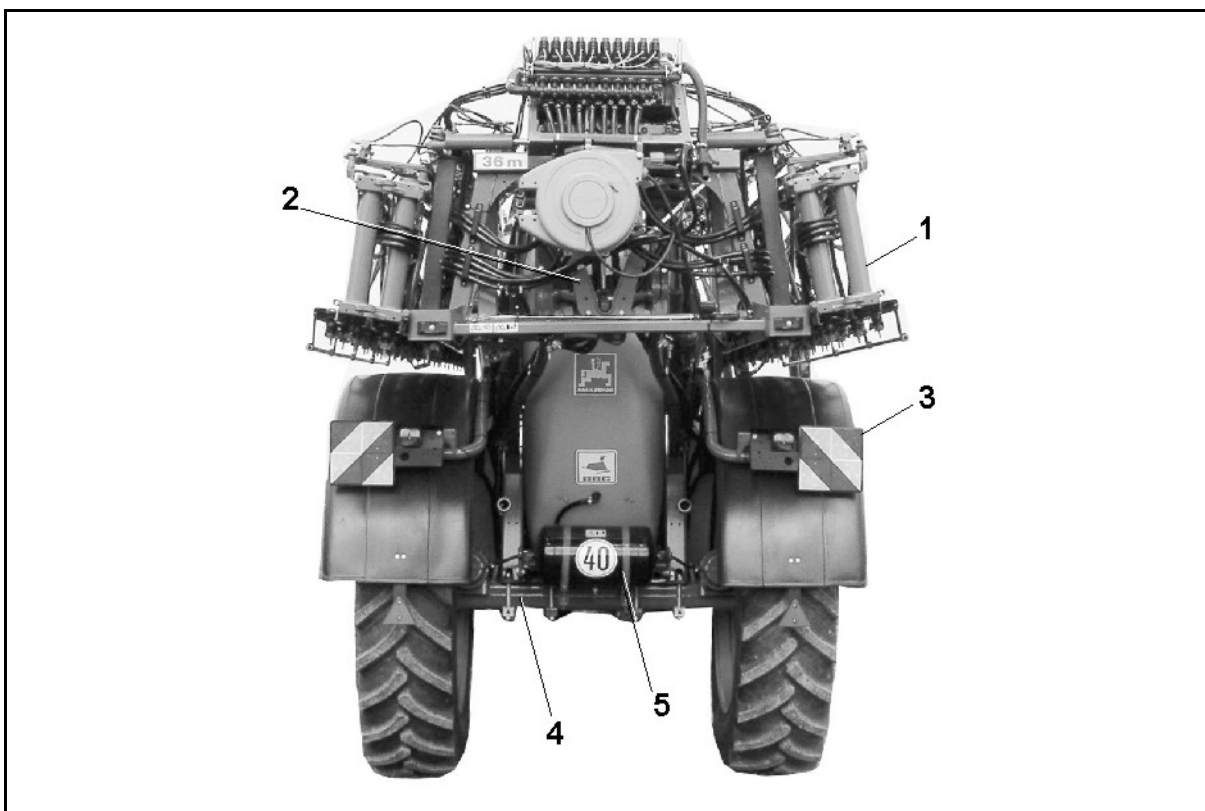


Fig. 10

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

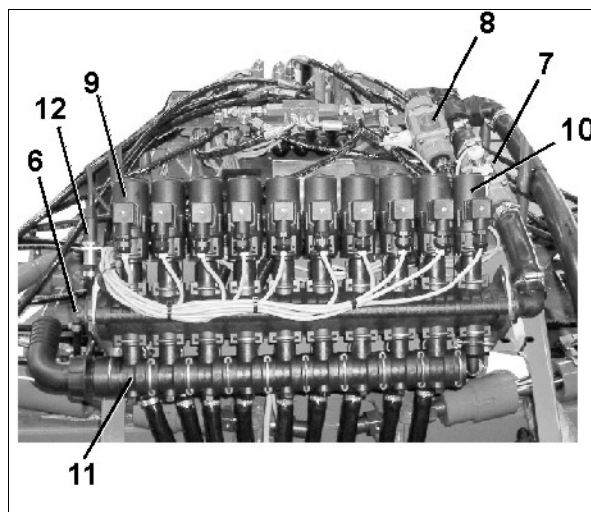


Fig. 11

Overview – Control panel

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

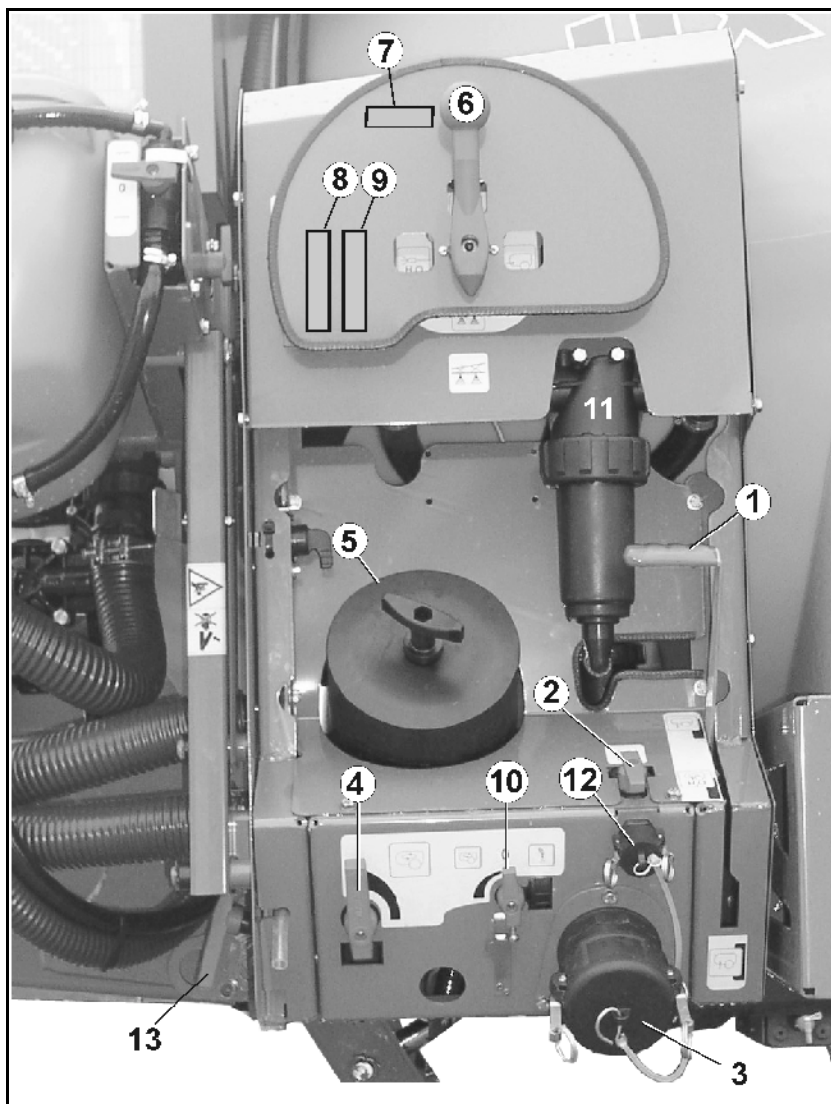


Fig. 12

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

4.3 Supply pipes between tractor and machine

Fig. 13/..

- (1), (2), (3) Hydraulic hose lines (depending on equipment)



Tip!

All hydraulic hoses should be equipped with coloured marks to assign the relevant hydraulic function to the tractor control valve!

- (4) Electric cable for traffic light
- (5) Connection to the hydraulic brake
- (6) Machine cable with machine plug for the connection of job computer and **AMATRON⁺**

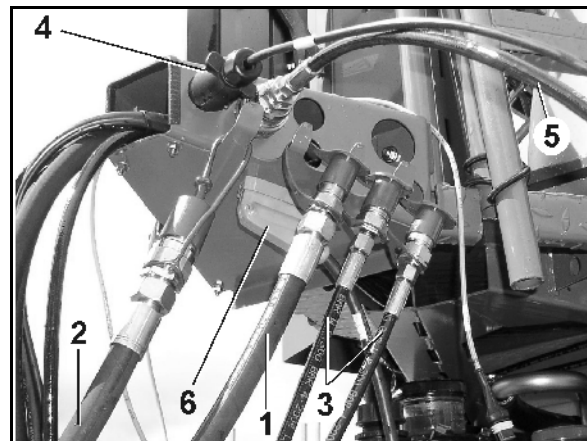


Fig. 13

Fig. 14/..

- (7) Air brake system
 - o Brake hose with coupling claw yellow (Fig. 14/1)
 - o Supply line with coupling claw red (Fig. 14/2)

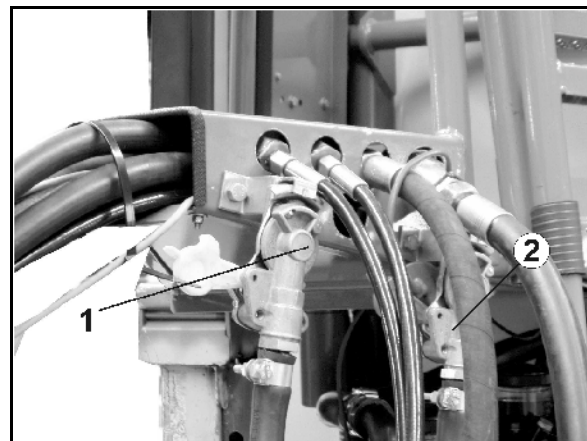


Fig. 14

4.4 Traffic safety kit

Fig. 15:

- (1) 2 rear lights / 2 stop lights
- (2) 2 indicators (required when the tractor indicator is hidden by the machine)
- (3) 2 warning plates (square)
- (4) 2 red reflectors (triangle)
- (5) 1 license plate carrier with light (required in case the tractor registration number is hidden)

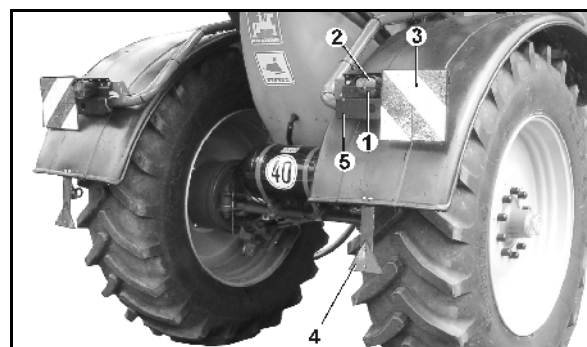


Fig. 15

Fig. 16:

- (1) 2 x 3 spots, yellow (at the side with an increment of max. m) and on the collision guard)

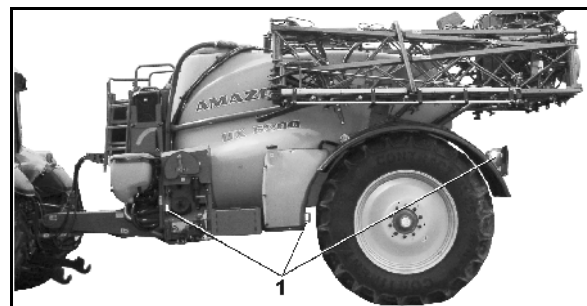


Fig. 16

4.5 Intended use of the machine

The field sprayer

- is designed for the transport and application of plant protection agents (insecticides, fungicides, herbicides and others) in the form of suspensions, emulsions and blends. Additionally, it can also be used for the application of liquid fertilizers.
- is state of the art. When used with the correct settings and accurate application, biological success is ensured while the most economical spray agent consumption and the least environmental damage will be achieved.
- is for exclusive operation in agriculture only.

Operating on slopes is possible under the following conditions

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

Intended use also includes:

- observing all recommendations in this operator's manual.
- performing service and maintenance work as required.
- the exclusive use of original **-AMAZONE-** spare parts.

Other uses than that stipulated are prohibited and are no longer considered intended usage.

For damage resulting from non-intended use

- the operator himself will assume the full risk,
- the manufacturer will not accept any responsibility
AMAZONEN-WERKE.

4.5.1 Designated equipment of the field sprayer

The designated equipment of the field sprayer consists of a combination of

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

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

The address of the Institute

Messeweg 11/12

D-38104 Braunschweig

Germany

4.6 Caution when using specific crop protection agents

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

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

Care should also be shown when doing non-permissible mixtures of two or more different crop protection agents.

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

When spraying such aggressive crop protection agents, it is recommended that you apply them onto the field immediately after mixing them with water and then carefully clean the entire system with water.

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

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

4.7 Danger zones

Within these zones, there is always danger or dangerous situations can suddenly arise. Safety symbols identify these danger zones. Here safety notices particularly apply. Please refer to chapter "General safety notices", page 16.

The following are considered danger zones:

- between tractor and mounted sprayer, particularly when hitching or unhitching and when filling the hopper.
- within the operational range of moving parts.
- when climbing on to the machine.
- in the swivel range of the sprayer booms.
- inside the spray tank due to poisonous fumes.
- under elevated, non-secured machines or machine parts.
- when folding out and in the sprayer boom near power lines and when touching power lines.

4.8 Safety - and guard facilities

- Transport locking on the Super-L- boom
- Transport locking on the Super-S- boom
- Railing on the platform
- PTO shaft guard
- Guard plate on the pump drive (depending on equipment)

4.9 Conformity

	Guide lines- / Standard terms
The machine fulfils the:	<ul style="list-style-type: none"> • Machine guideline 98/37/EC • EMC- guideline 89/336/EEC

4.10 Type plate and CE declaration

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

The type plate (Fig. 17/1) and the CE declaration (Fig. 17/2) are located on the left side of the machine.

On the type plate are mentioned:

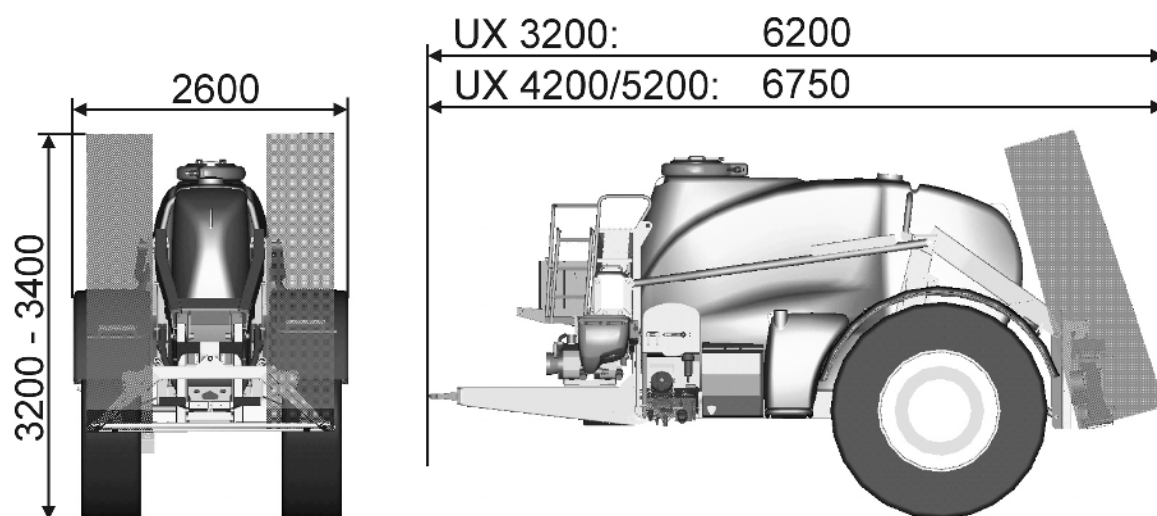
- Machine-Ident-no.:
- Type
- Permissible system pressure bar
- Year of construction
- Factory
- Basic weight kg
- Allowable total weight kg
- Axle load rear kg
- Axle load front support load. kg



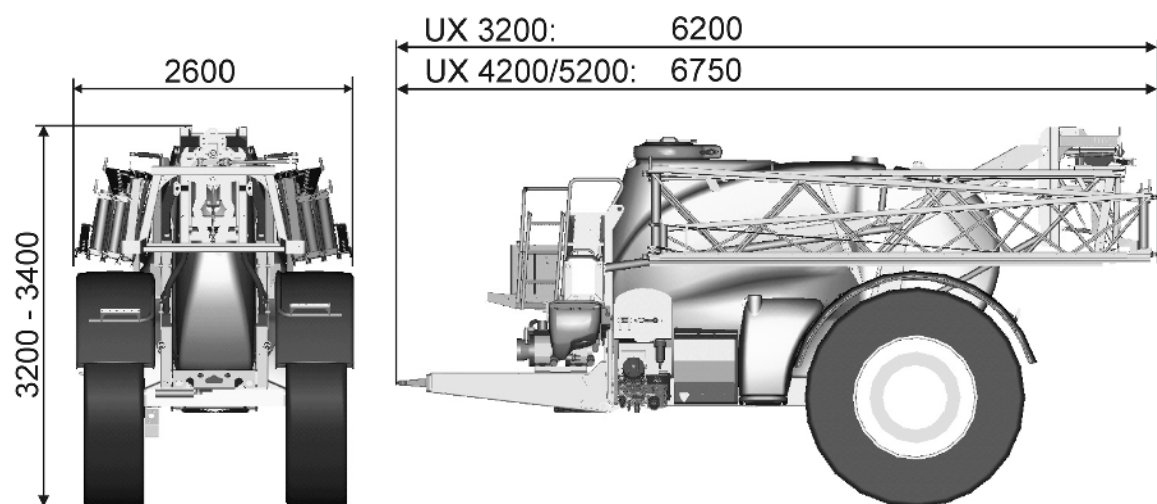
Fig. 17

4.11 Technical specifications

4.11.1 Overall dimensions **UX** with Super-S sprayer boom



4.11.2 Overall dimensions **UX** with L sprayer boom



(The total heights depend on the tire size.)

4.11.3 Data sheet

Type UX		3200	4200	5200
Basic weight	[kg]	3100 - 4100	3200 - 4100	3300 - 4200
Spray mixture tank				
Actual volume	[l]	3600	4450	5460
Nominal volume		3200	4200	5200
Filling height				
• from the ground	[mm]	2823 - 2915	2744 - 2830	3064 - 3150
• from the platform		1180	1080	1400
Permissible system pressure	[bar]	10	10	10
Technical residual amount incl. Pump				
• on level ground		21	23	23
• when operating across slopes		21	23	23
o 15% in driving direction to the left hand	[l]	21	23	23
o 15% in driving direction to the right hand		21	23	23
• when operating up and down hill				
o 15% up hill		32	37	37
o 15% down hill		28	30	30
Centre control	•	Electric, coupling of part section valves		
Spray pressure adjustment	•	Electrical		
Spray pressure setting range	[bar]	0.8 – 10		
Spray pressure indication		Pressure gauge 0-8 / 25 bar expanded Ø 100 mm liquid fertilizer proof and digital spray pressure gauge		
Pressure filter		50 (80) mesh		
Agitator		Infinitely variable setting		
Spray rate control		Speed related the job computer		
Nozzle height	[mm]	500 - 2500		

The permissible total weight depends on the tires chapter 4.11.6.

The empty weight results from the sum of the weights according to chapter 4.11.4 and chapter 4.11.5.

Payload = permissible total weight – basic weight


Danger!

Exceeding the permissible payload is prohibited. Exceeding the payload would cause the load capacity of the tires to be exceeded at an impermissible level. This would cause unstable driving situations.

Carefully determine the payload and thereby the permissible filling of your machine. Not all filling material allows you to completely fill the tank.

4.11.4 Weights basic machine and components

Type UX		3200	4200	5200
	[kg]			
Basic machine		1457	1527	1573
Axle				
Axle rigid		360		
Axle steering		-	-	550
Draw bars				
Straight draw bar and hitch draw bar		120		
Steering draw bar		180		
Tires				
270/95 R48		412		
300/95 R46		440		
300/95 R52		566		
340/85 R48		524		
460/85 R38		582		
460/85 R46		524		
520/85 R42		690		
520/85 R38		652		
Additional special options		Max. 190		

4.11.5 Weights of sprayer booms

- **Super-S- booms:**

Working width	[m]	15/16	18	20	21	24	27	28
Weight	[kg]	530	535	646	654	673	719	720

- **Super-L- booms:**

Working width	[m]	24	27	28	30	32	33	36
Weight	[kg]	788	793	795	996	1040	1045	1070

4.11.6 Permissible total weights and permissible tires

The tires and the axle of the trailed sprayer and the forward speed determine the permissible total weight of the trailed sprayer. The following table shows the required tires for the various permissible total weights and forward speeds.

Tires	UX 3200			UX 4200			UX 5200		
	Support load max. 1500 kg Permissible total weight 7500 kg at 25 km/h 6500 kg at 50 km/h			Support load max. 2000 kg Permissible total weight 10000 kg at 25 km/h 8000 kg at 50 km/h					
	Permissible total weight in kg at an air pressure of bar			Permissible total weight in kg at an air pressure of bar					
	km/h			km/h			km/h		
	25	40	50	25	40	50	25	40	50
270/95R48 (11.2R54) LI 142 A8	7400 3.6	6800 3.6	-	-	-	-	-	-	-
270/95R54 (11.2R54) LI 146 A8	8100 3.6	7500 3.6	-	8600 3.6	8000 3.6	-	8600 3.6	8000 3.6	-
300/95R46 (12.4R46) LI 145 A8	7900 3.6	7300 3.6	-	-	-	-	-	-	-
300/95R52 (12.4R52) LI 148 A8	8400 3.6	7800 3.6	-	8900 3.6	8300 3.6	-	8900 3.6	8300 3.6	-
340/85R48 (13.6R48) LI 148 A8	8500 3.3	8000 3.3	-	8900 3.6	8300 3.6	-	8900 3.6	8300 3.6	-
340/85R48 (13.6R48) LI 151 A8	9000 3.3	8000 3.3	-	9600 3.6	8900 3.6	-	9600 3.6	8900 3.6	-
460/85R38 (18.4R38) LI 146 A8 / 143 B	8100 1.6	7500 1.6	6900 1.6	8600 1.6	8000 1.6	7400 1.6	8600 1.6	8000 1.6	7400 1.6
460/85R42 (18.4R42) LI 148A8 / 143 B	8500 1.6	7800 1.6	7300 1.6	8900 1.6	8300 1.6	7700 1.6	8900 1.6	8300 1.6	7700 1.6
460/85R46 (18.4R46) LI 155A8 / 152B	9000 1.6	8000 1.6	8000 1.6	10600 1.9	9300 1.9	9100 2.0	10600 1.9	9750 2	9100 2
460/85R46 (18.4R46) LI 158A8/ 155 B	9000 1.6	8000 1.6	8000 1.6	11000 2	9300 1.8	9300 2.1	11400 2.1	10000 2.1	9700 2.4
520/85R38 (20.8/R38) LI 153 A8 / 150 B	9000 1.4	8000 1.4	8000 1.6	10100 1.6	9300 1.6	8600 1.6	10100 1.6	9300 1.6	8600 1.6
520/85R38 (20.8/R38) LI 155 A8 / 152 B	9000 1.4	8000 1.4	8000 1.6	10600 1.6	9750 1.6	9100 1.6	10600 1.6	9750 1.6	9100 1.6
520/85R42 (20.8R42) LI 155 A8	9000 1.2	8000 1.2	8000 1.4	10600 1.6	9750 1.6	9100 1.6	10600 1.6	9750 1.6	9100 1.6
520/85R42 (20.8R42) LI 162 A8	9000 1.2	8000 1.2	8000 1.4	11000 1.6	10000 1.6	9300 1.6	12000 1.8	10000 1.6	10000 1.9
650/65R38 LI 154 A8 / 151 B	9000 1.0	8000 1.0	8000 1.1	10300 1.2	9500 1.2	8900 1.2	10300 1.2	9500 1.2	8800 1.2
710/70R42 LI 168/A8 / 165B	-	-	-	11000 0.7	10000 0.9	10000 1	12000 1	10000 0.9	10000 1

4.12 Required tractor equipment

In order to be able to operate the machine, the tractor must meet the power requirements and must be equipped with the required electric, hydraulic and brake connections for the brake system.

Tractor engine power

UX 3200	from 75 kW (100 PS)
UX 4200	from 85 kW (115 PS)
UX 5200	from 95 kW (130 PS)

Electrical system

Battery voltage:	• 12 V (Volt)
Socket for lights:	• 7- pole

Hydraulic

Max. service pressure:	• 200 bar
Tractor pump capacity:	• Min. 20 l/min at 150 bar for hydraulic block (at professional folding - option) • Min. 40 l/min at 150 bar for hydraulic pump drive (Option)
Hydraulic oil of the machine:	• Gear / hydraulic oil SAE 80W API GL4 The hydraulic / gear oil of the machine is suitable for the combined hydraulic/gear oil circuits of all common tractor types.

Control valve		Function		Hose marking
1	double acting	Jack	lifting	3 x blue
			lower	4 x blue

Control valve at professional-folding		Function	Hose marking
2	single acting with priority	Hydraulic block	1 x red
3	single acting	Pump drive (Option)	3 x red
pressure free return flow		• Hydraulic block • Pump drive	2 x red

Product description

Folding via tractor control valve		Function		Hose marking
2	double acting	Boom folding	Folding down	1 x green
			Folding in	2 x green
3	single acting	Height adjustment		1 x yellow
4	double acting	Steering draw bar	Extract hyd. Ram (machine to the left hand side)	1 x blue
			Retract hydr. ram (machine to the right hand side)	2 x blue
5	double acting	Tilt adjustment	Lifting boom left hand side	1 x natural
			Lifting boom right hand side	2 x natural

Brake system

Dual circuit brake system:

- 1 Coupling claw - red - to secondary hose
- 1 Coupling claw - yellow - to brake hose

or

Hydraulic brake system:

- 1 Hydraulic connection for the hydraulic brake line



Tip!

The hydraulic brake system is not permitted in Germany and some EC countries!

Permissible total weight of the tractor

When combining the traction vehicle and the sprayer ensure that D_c -value of 50 kN is not exceeded.

This results for machines with

• a permissible maximum speed:	• a permissible total weight:	a permissible total weight for the tractor.
25 km/h	12000 kg	8860 kg
50 km/h	10000 kg	10400 kg

4.13 Details about noise level

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

Measuring machine: OPTAC SLM 5.

The noise level depends on the type of tractor used.

5 Assembly and function

The following chapter provides you with information on the assembly of the machine and the functions of the individual components.

5.1 Function

Fig. 18/..

The suction device (E), the suction line (M) and the suction filter (N) the spray pump (L) suctions

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

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

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

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

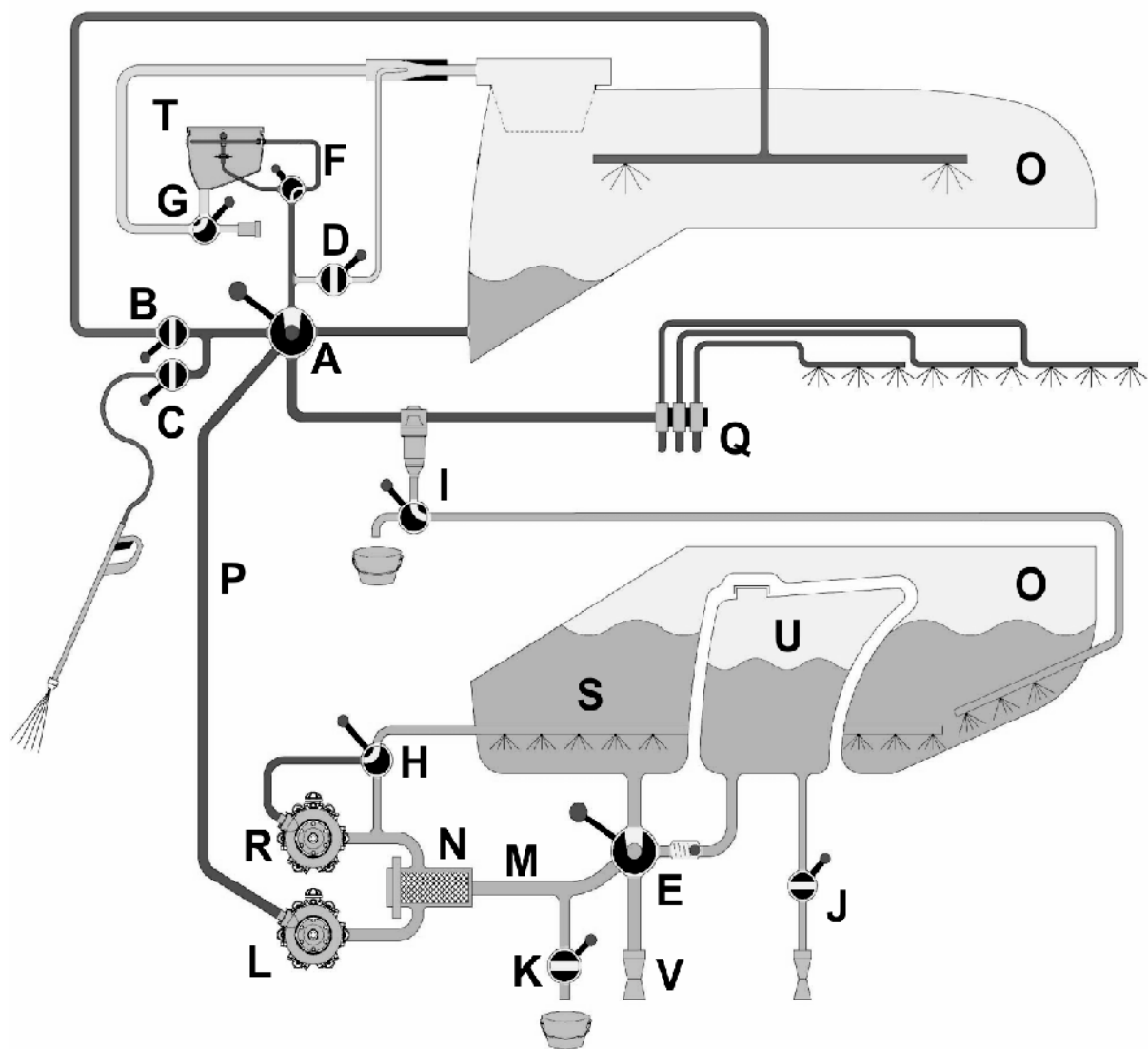






Fig. 18

5.2 Explanation of the valve chest operation

• A - control-suction side

-  External suction
-  Cleaning
-  Injection
-  Filling the spray mixture tank

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

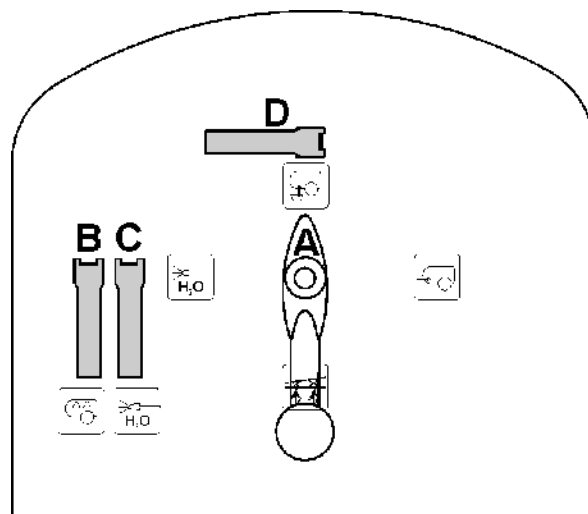





Fig. 19

• E - Lever suction device

-  Suction from the spray mixture tank
-  Suction from the fresh water rinsing tank
-  Suctioning from the suction hose

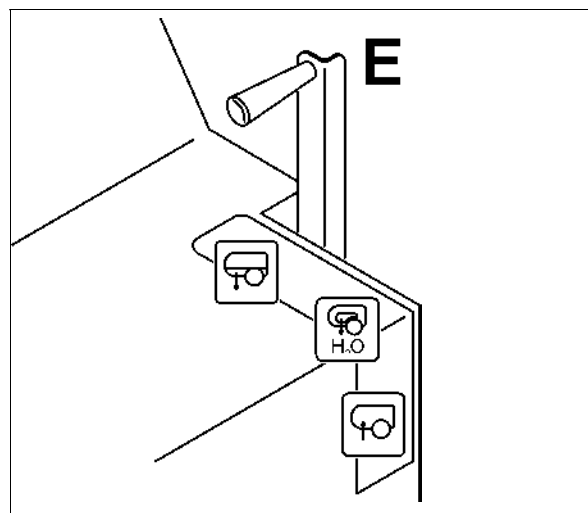




Fig. 20

• F - Reversing tap circuit line / canister flushing

- 0 Zero position
-  Circuit line
-  Canister flushing

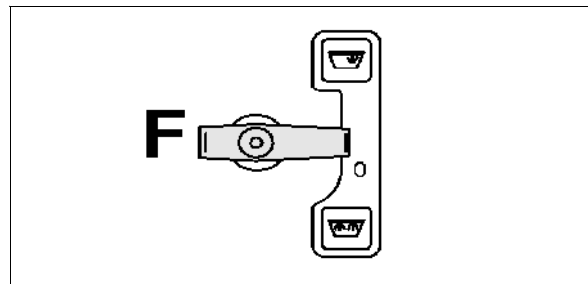


Fig. 21

- **G - Reversing tap suctioning off the induction bowl / ECOFILL**

- **0** Zero position



- Suctioning from the induction bowl

- **ECO-FILL** filling port for spray mixture tank

- **H - Step tap main agitator**

- **I - Step tap additional agitator**



- Draining off residual amount

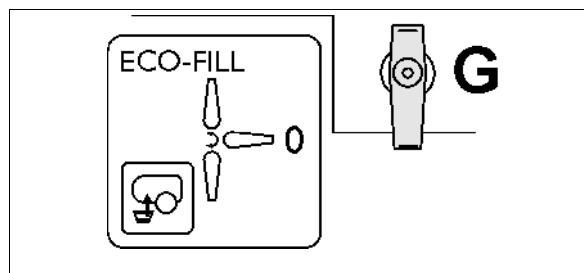


Fig. 22

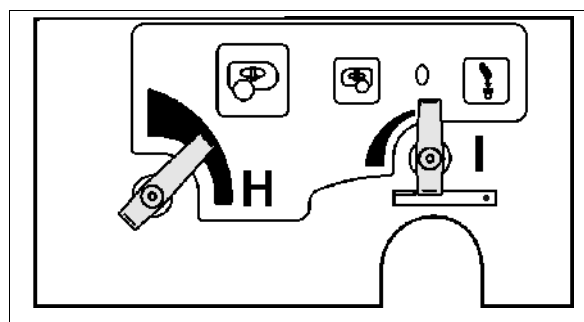


Fig. 23

- **J - Stop tap filling port fresh water**

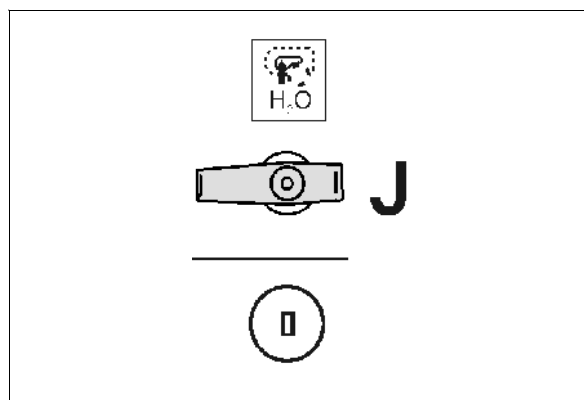


Fig. 24

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

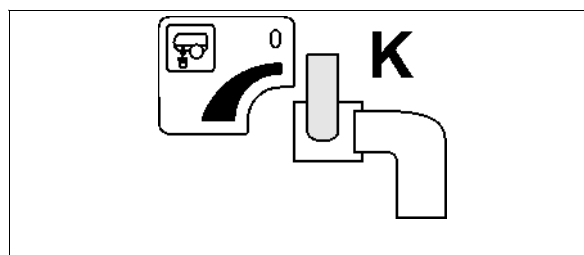


Fig. 25

5.3 Operator terminal **AMATRON⁺**

The operator terminal **AMATRON⁺** (Fig. 26):

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

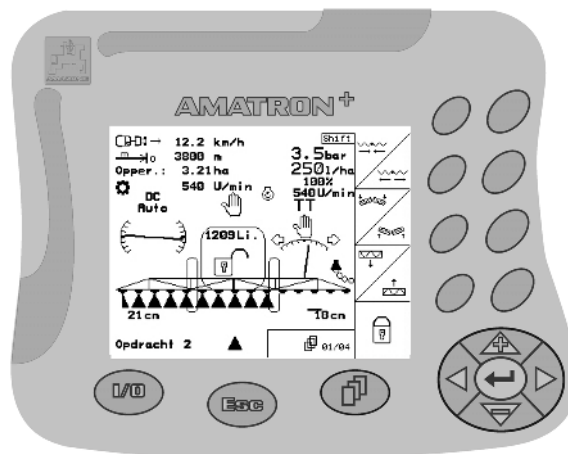


Fig. 26

The **AMATRON⁺** accesses the machine computer. The machine computer thereby receives all necessary information and takes over the area-related control of the spray rate [l/ha] depending on the entered spray rate (required rate) and the actual forward speed [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 tank has been sprayed empty
- The actual spray tank-contents in [l].
- The spray pressure.
- The PTO shaft rev. speed (only with signal socket and NE 629).

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

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

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



Important!

See **AMATRON⁺** instruction manual !

5.4 AMASPRAY⁺

AMASPRAY⁺ can be used with the field sprayer as a fully automatic regulating device. The device provides the area related regulation of the spray rate depending on the current speed and working width.

Continuous determination of the current spray rate, the speed, the worked area, the total area, the sprayed amount, the working hours and the travelled distance.



Important!

See instruction manual
AMASPRAY⁺!

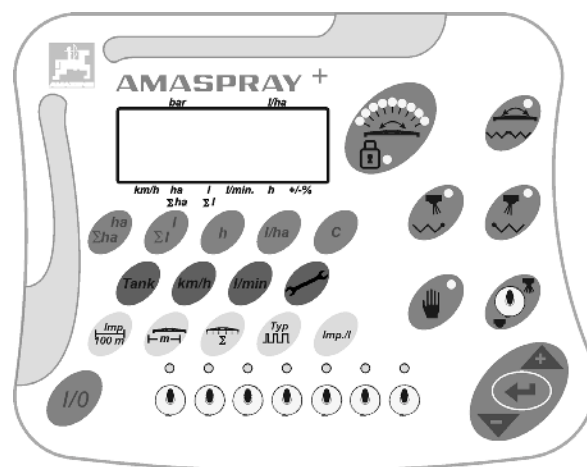


Fig. 27

5.5 Running gear and tires

The permissible total weight and the forward speed are determined by

- the type of axle (unbraked or braked).
- the tires, on page 48.

5.5.1 Running gear with unbraked axle

The following restrictions result for trailed sprayers with unbraked axle:

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

5.5.2 Running gear with braked axle

The axle is supplied with two independently functioning brake systems (service brake system and parking brake).

The service brake system is

- a dual circuit air brake system with either a manually adjustable brake pressure regulator or
- a hydraulic brake.

The applied parking brake works independently from the service brake system and secures the unhitched trailed field sprayer against unintentional rolling.

5.5.2.1 Dual circuit air brake system

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

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

Fig. 28/..

- (1) Manual lever for setting the braking power steps.
- (2) Release valve with control button (3)
- (3) Control button;
 - press in until the stop and the service brake system will release, e.g. when manoeuvring the unhitched trailed field sprayer.
 - pull out until the stop and the trailed sprayer will be braked again by the supply pressure coming from the air reservoir.

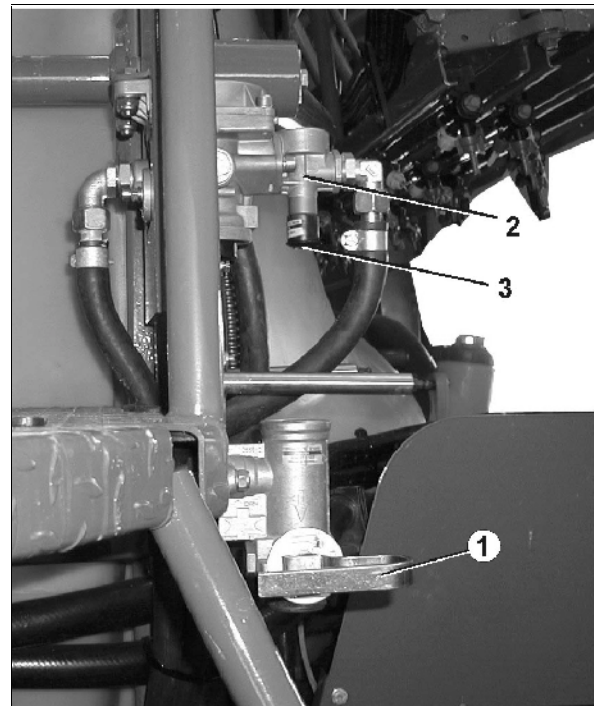


Fig. 28

Air reservoir

Fig. 29/..

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

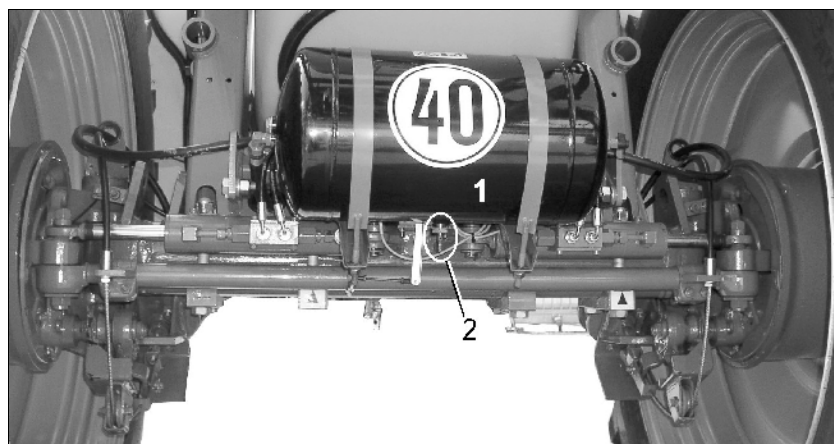


Fig. 29

Parking brake

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

- Crank, locked in neutral position (Fig. 30).
- Crank in actuating position (Fig. 31).



Fig. 30

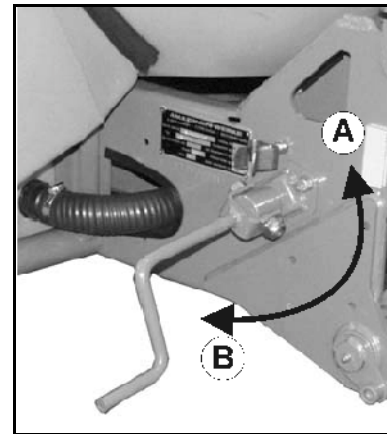


Fig. 31

Releasing the parking brake: Fig. 31/A

Actuating the parking brake: Fig. 31/B
(the initial force of the parking brake is approx. 40 kg manual force).



Important!

- **Correct the setting of the parking brake if the tensioning of the cable is noted to be insufficient**
- **Check guidance of cable. It must never rest or rub on outside parts.**
- **When the parking brake is released, the cable should slightly sag.**

5.5.2.2 Hydraulic brake system

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

- Parking brake (Fig. 32/1)
 - Released (Fig. 32/A)
 - Applied (Fig. 32/B)
- Pulling rope (Fig. 32/2)

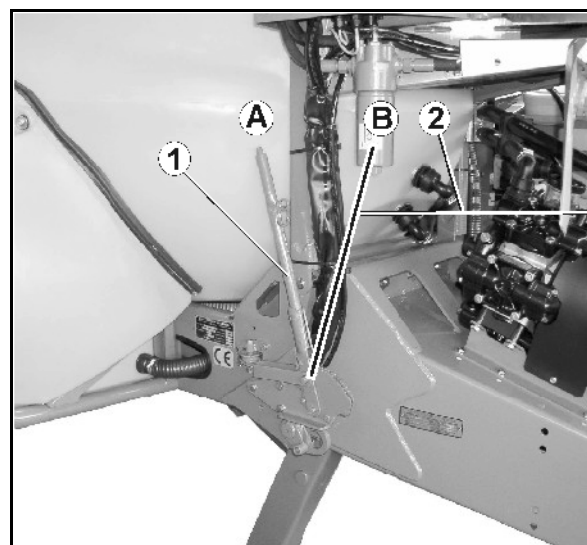


Fig. 32

5.6 Draw bars



Important!

After hitching, check that the connection for the automatic hitch couplings is secure. For non-automatic hitch couplings, insert the coupling pin and ensure it has engaged.

- **Straight draw bar**

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



Fig. 33

- **Hitch draw bar**

Hook the hitch draw bar into the tractor hitch hook. (Fig. 34).

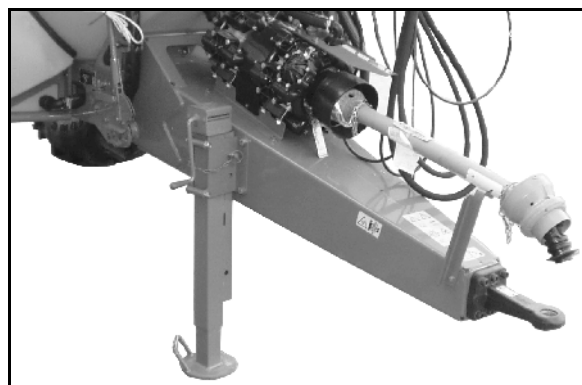


Fig. 34

5.7 Track follow-up steering via tractor control valve

During operation on steep slopes (sprayer is skidding)

- the **tractor-control valve 4**
(Hose marking blue)

allows manual steering of the steering draw bar for actual track following from the tractor seat.

With appropriate manual steering, the hydraulic steering reduces crop damage, especially with crops growing in rows (e.g. potatoes or vegetables) when driving into and manoeuvring out of the rows.

Rotating circle diameter $d_{wk} > 18$ m.

5.8 Trail-Tron-track follow-up steering

The Trail-Tron-track follow-up steering for the automatic and virtually true track following records the angle (Fig. 35/1) of the draw bar (Fig. 35/2) in the tractor's direction of travel. If the draw bar position deviates from the centre position of the tractor (draw bar in alignment with the tractor) the Trail-Tron steers to

- the following steering draw bar
- the track following the steering draw bar

and is in alignment again

During operation on steep slopes (sprayer is skidding)

- the **AMATRON⁺**

allows manual steering of the steering draw bar for true track following from the tractor seat.

With appropriate manual steering, the hydraulic steering reduces crop damage, especially with crops grown in rows (e.g. potato or vegetable) when driving into and manoeuvring out of the rows.

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

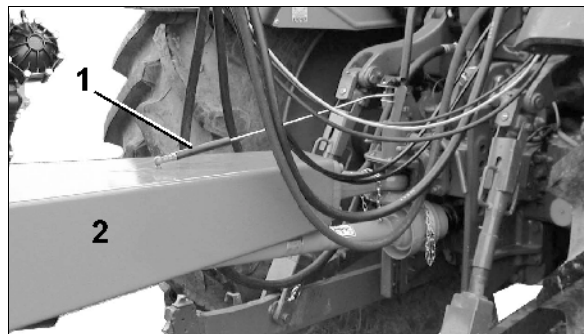


Fig. 35



Danger!

Transport travel with an activated Trail-Tron is prohibited

Important!

Prerequisite for the correct function of the hydraulically actuated track following steering axle is accurate Trail-Tron calibration in advance.

Calibrate the Trail-Tron

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



Tip!

See instruction manual **AMATRON⁺**.

5.9 Track following steering axle

Fig. 36/..

- (1) Track following steering axle
- (2) Control rams



Important!

For machines with a

- track width which is not 1800 mm
- tire size exceeding 500 mm

Set the stop bolts (Fig. 37/1) in the brake drum in such a way that wheels and machine do not collide in case the max. steering limit is reached.

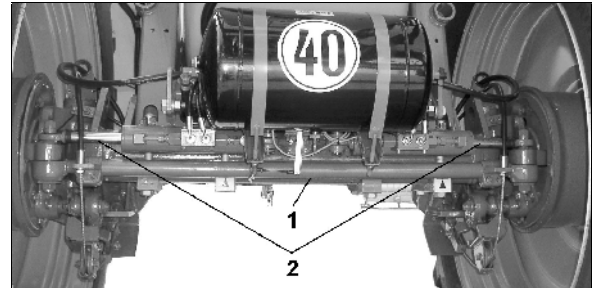


Fig. 36

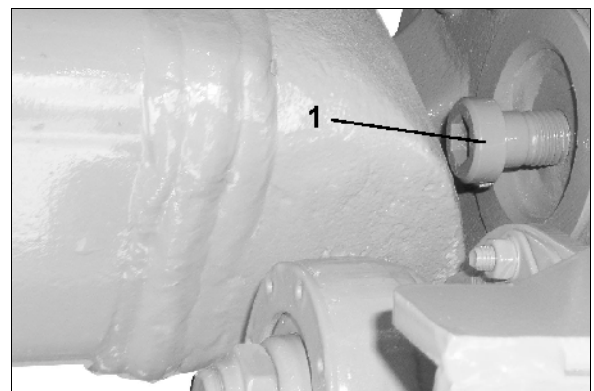


Fig. 37

5.10 The track following steering draw bar

Fig. 38/..

- (1) Steering draw bar
- (2) Control rams
- (3) Ball tap



Danger!

For transport runs

- Get the steering axle into the zero position (steering axle is in alignment with the machine).
- Shut the block tap to secure the steering axle in position.



Danger!

Danger of tipping the machine when the steering draw bar is turned, especially in heavily flooded terrain or on slopes!

At high speeds, danger of tipping when turning at the headlands with a loaded or partly loaded machine with track follow-up steering draw bar due to shifted centre of gravity with the draw bar turned. Especially great danger when driving down hills on slopes.

Reduce your forward speed when turning at the headlands and drive in such a way so that you safely control tractor and the trailed sprayer.

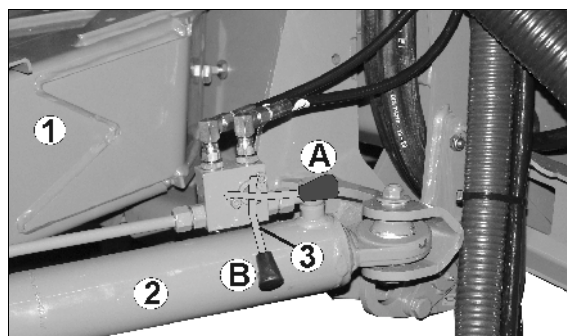


Fig. 38

5.11 Hydraulic jack

The hydraulically actuated jack (Fig. 39/1) supports the unhitched trailed field sprayer. The actuation is done via a double acting control valve.

Tractor control valve 1:

- Lift the support jack:
Hose marking 3 x blue.
- Lower the support jack:
Hose marking 4 x blue.



Danger!

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



Important!

- For actuating the jack step on the clutch of the tractor and release the pin of the pulling eye / hitch.
- The red mark (Fig. 40/1) on the jack indicator is visible when the machine is parked on the hydraulic jack.

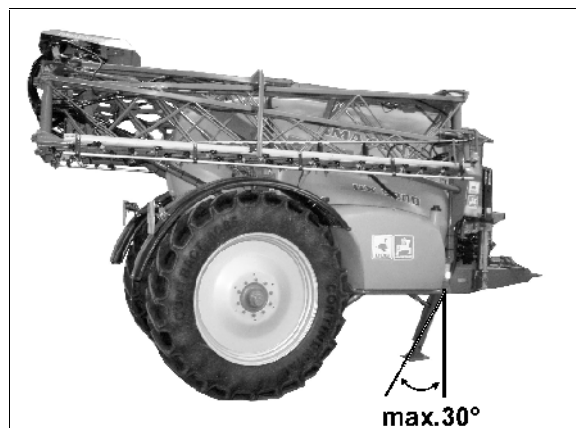


Fig. 39

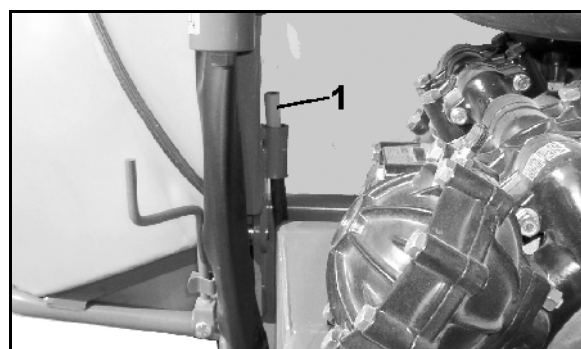


Fig. 40

5.12 Mechanic jack

- Jack raised during operation or transport (Fig. 41).
- Jack lowered (Fig. 42) with machine unhitched.

To actuate the jack, proceed as follows:

1. Slacken the lynch pin (Fig. 41/2).
2. Pull out the pin (Fig. 41/3).
3. Use the handles (Fig. 41/4) to lift / lower the jack.
4. Lock the jack by using the pin and secure using the lynch pin.
5. Use the hand crank (Fig. 41/5) to further lowering / lifting the jack.

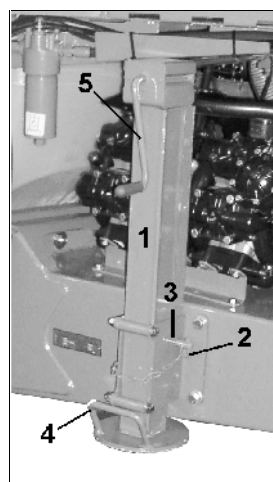


Fig. 41

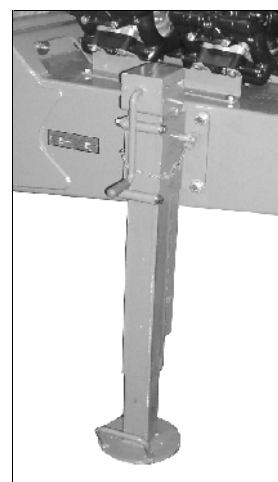


Fig. 42

5.13 Working platform



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

Danger!

- **Never climb into the spray mixture tank.**
 - **Danger of injury from poisonous fumes!**
- **Always prohibited: riding on the field sprayer during transport.!**
 - **Danger of falling down when riding on the sprayer!**



Important!

Always ensure that the ladder is located in its catching hooks when it is in the transport position.

Fig. 43/..

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



Fig. 43

5.14 Agitators

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

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

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

Setting of the agitation intensity

- for the main agitator on the setting step tap (Fig. 44/1).
- for the auxiliary agitator on the setting step tap (Fig. 44/2).

When the step tap is in the 0 position the relevant agitator is switched off. The highest agitation intensity is achieved in position (Fig. 44/3).

Safety for the drainage function of the pressure filter (Fig. 44/4).

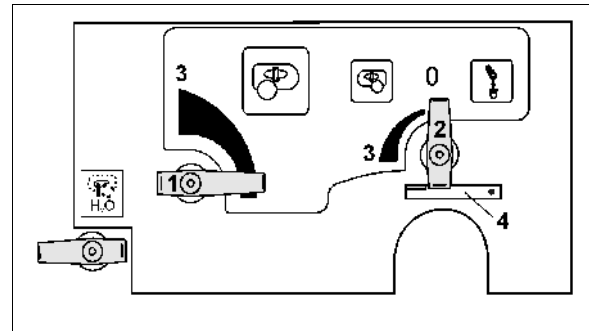


Fig. 44

5.15 Pump equipment

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



Important!

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

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

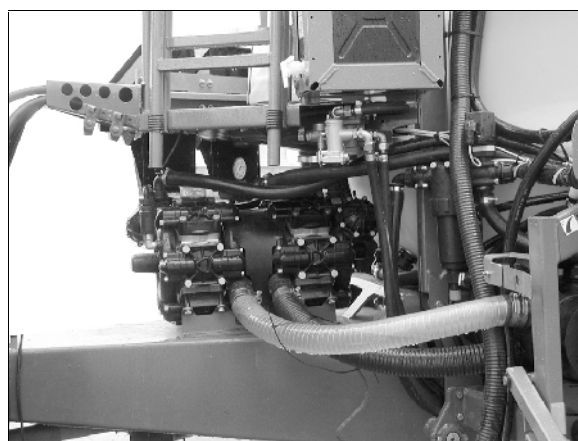


Fig. 45

Technical specifications pump equipment

Type UX			3200		4200 / 5200	
Pump equipment			AR 185	AR 250	AR 250	AR 280
Capacity at nominal speed	[l/min]	at 0 bar	185	250	250	280
		at 10 bar	180	235	235	265
Power requirement	[kW]		6.1	4.6	4.6	5.1
Design			4 ram piston dia- phragm pump	6- ram piston dia- phragm pump	6- ram piston diaphragm pump	
Pulse absorption			Pressure reservoir			

The drive of the pump is supplied

- Directly from the PTO shaft (hitch draw bar)
 - Drive rev. speed 540 R.P.M
- Via a belt drive from the PTO shaft (straight draw bar).
 - Drive rev. speed 540 R.P.M. /1000 R.P.M. (depending on the ratio)
- Directly from the hydraulic motor.
 - Drive rev. speed 540 R.P.M

5.16 Filter equipment



Important!

- Use all specified filters. Clean all filters regularly (please refer to chapter "Cleaning", on page 150). The trouble-free operation of the field sprayer is only achieved by fault-free filtering of the spray agent. Fault-free 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.

5.16.1 Filling sieve

The filling sieve (Fig. 46/1) prevents the spray agent from dirt when filled into the spray tank the tank access lid.

Mesh width: 1.00 mm

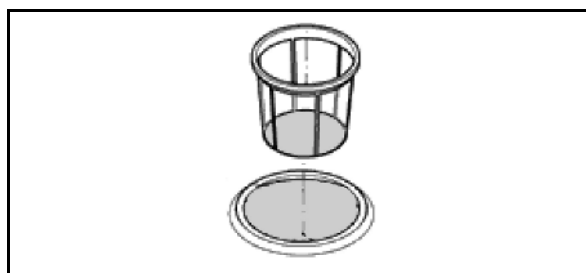


Fig. 46

5.16.2 Suction filter

The suction filter (Fig. 47/1) filters

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

Mesh width: 0.60 mm

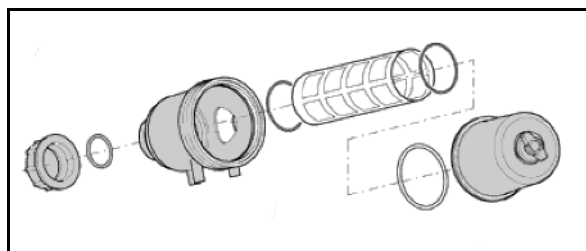


Fig. 47

5.16.3 Self cleaning pressure filter

The self cleaning pressure filter (Fig. 48/1)

- 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 tank.



Fig. 48

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

5.16.4 Nozzle filter

The nozzle filters (Fig. 49/1) prevent the blockage of the spraying nozzles.

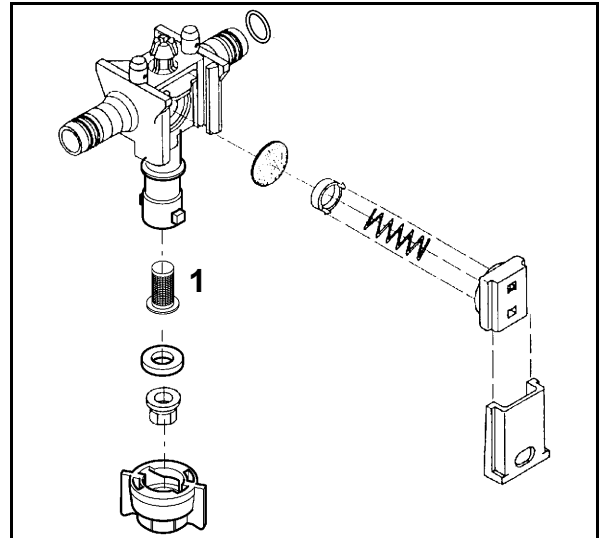


Fig. 49

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

5.16.5 Bottom sieve in the induction bowl

The bottom sieve (Fig. 50/1) in the induction bowl protects from sucking lumps and foreign particles.

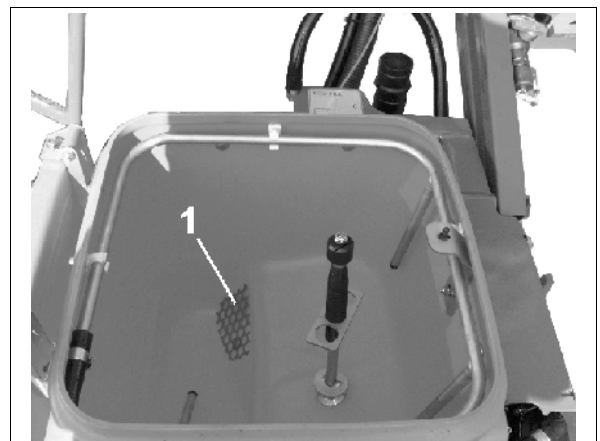


Fig. 50

5.17 Clean water tank

Clear water is transported in the interconnected clean water tanks (Fig. 51/1 and (Fig. 52/1). This water is used for

- Diluting the residual amount in the spray tank when you have finished the spraying process.
- Cleaning (flushing) the entire field sprayer in the field.
- Cleaning the suction device and the spray lines with filled spray tank.

Fig. 51 / Fig. 52

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



Important!

- Only fill clear water into the fresh water rinsing tank.
- Before filling the fresh water rinsing tanks unscrew both lids. Uneven filling would damage the tanks!

Filling port (Fig. 53/1) for both fresh water rinsing tanks.

1. Attach the filling hose.
2. Remove the lids of both fresh water rinsing tanks.
3. Open the stop tap.
4. Fill the fresh water rinsing tanks (observe the filling level indicator)
5. Close the stop tap.
6. Screw on the lids.

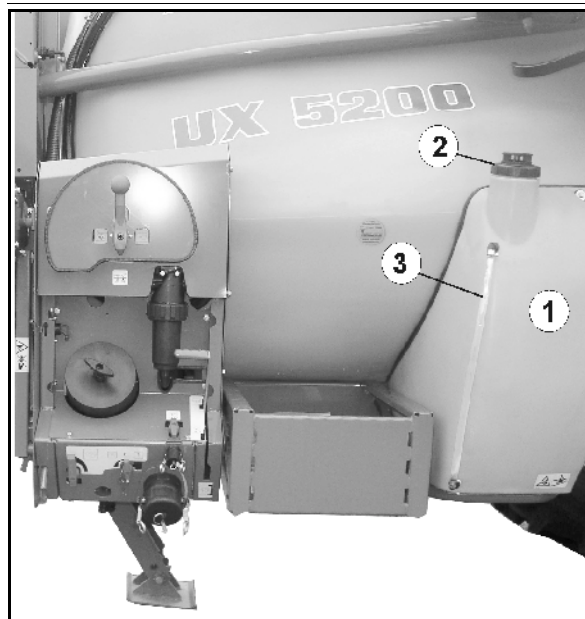


Fig. 51



Fig. 52

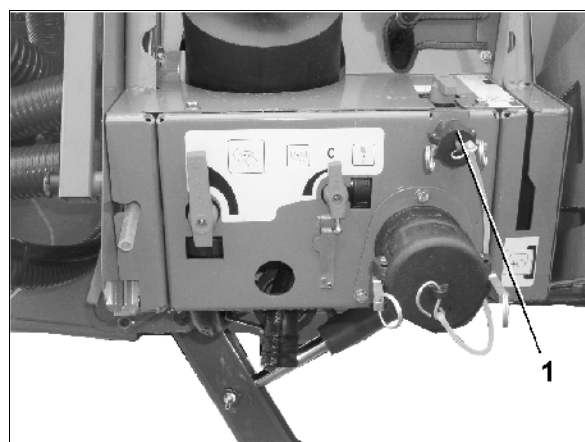


Fig. 53

5.18 Induction bowl with filling port ECOFILL and canister flushing

Fig. 54/..

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

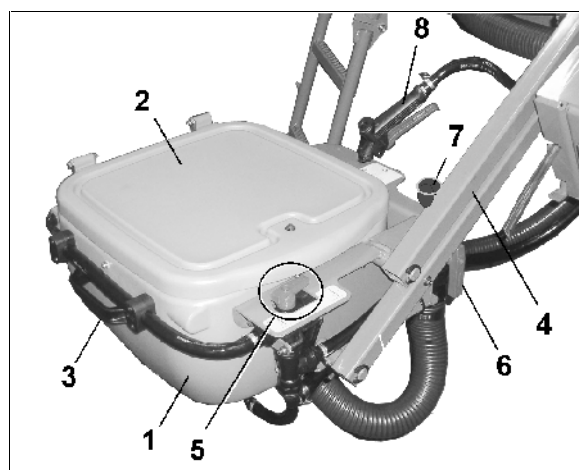


Fig. 54

Fig. 55/ ..

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

- For swivelling the induction bowl into the filling position proceed as follows:
 1. Hold the handle with your left hand (Fig. 55/1).
 2. With your right hand push the transport safety to the side (Fig. 55/2).
 3. Swivel the induction bowl downwards.

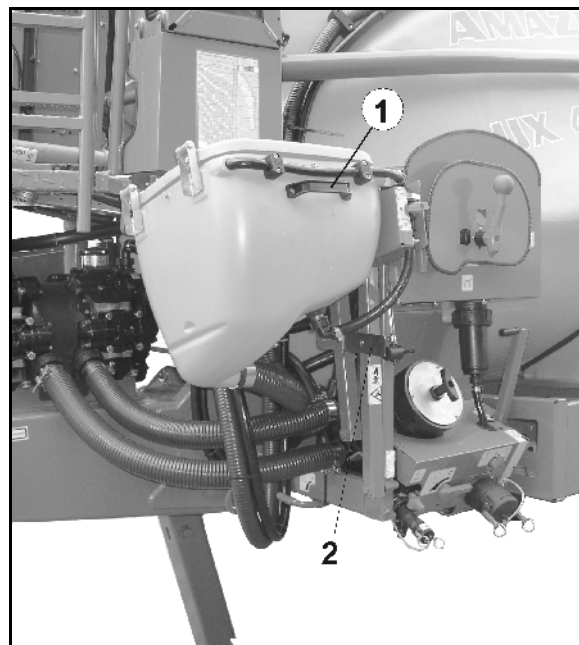


Fig. 55

Fig. 56/..

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



Tip!

Water leaks from the canister flushing nozzle (Fig. 56/2) if

- the pressure plate (Fig. 56/3) is pressed downwards.
- the closed folding lid (Fig. 54/2) presses the canister flushing nozzle downwards.



Warning!

Close the folding lid (Fig. 54/2) before starting to flush the induction bowl.

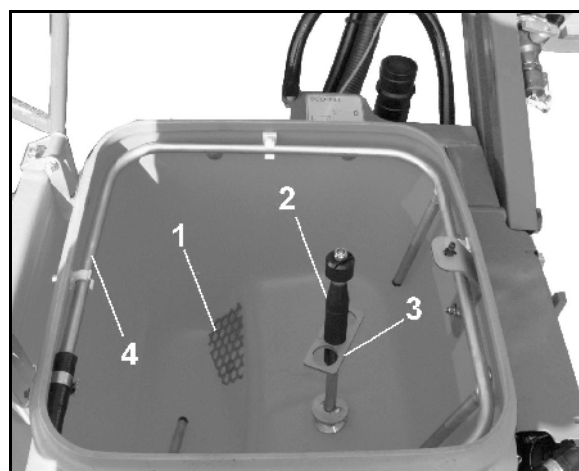


Fig. 56

5.19 Hand wash tank

Clear water hand wash tank (Fig. 57/1) for cleaning the hands with hose (Fig. 58/2) and drain tap (Fig. 58/1).



Important!

Only fill the hand wash tank with clear water.



Warning!

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



Fig. 57

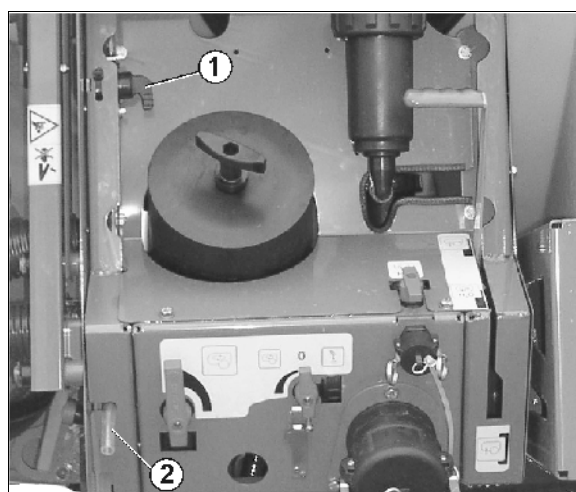


Fig. 58

5.20 Tank level indicator on the machine

The fill level of the machine is indicated

- electronically (Fig. 26/1)(Option)
- mechanically (Fig. 26/2).

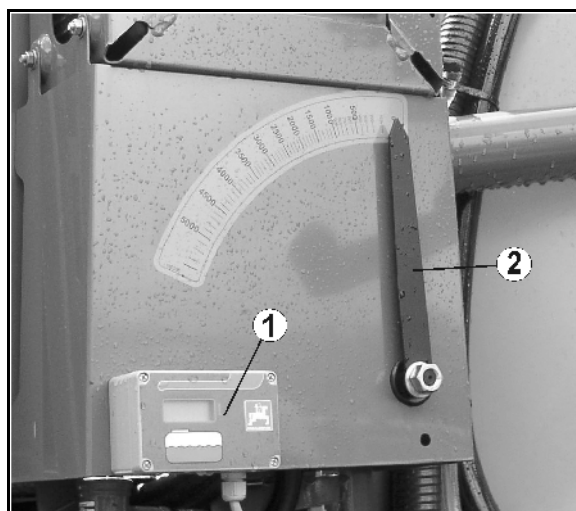


Fig. 59

5.21 Spray boom

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 an increment 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.



Tip!

- Professional- folding:
The boom is controlled by the **AMATRON⁺**.
- Folding the tractor control valve:
The operation of the booms is carried out via tractor control valves and **AMASPRAY⁺** / **AMATRON⁺**!



Important!

- Set the height of the spray boom (height between the nozzles and the crop) according to the spraying table referring to the nozzles used.
- Align the sprayer boom parallel to the ground. Only then will the specified spraying height on every nozzle be achieved.
- Be extremely careful when setting the sprayer booms.

Unlocking and locking the swing compensation

Unlocking the swing compensation (Fig. 60/1):



Tip!

- An even lateral distribution will only be achieved with the swing compensation unlocked.
- The swing compensation is unlocked (Fig. 60/1), when the display of **AMATRON⁺** shows the open lock symbol.

- Folding via tractor control valve:
During the unfolding procedure of the sprayer boom keep the actuation lever of the **control valve 2 (hose marking 1 x green)** for approx. 5 seconds in the position "unfold" after the boom has been unfolded entirely.

- Professional-folding:
Unlock the swing compensation via function



→ the menu operation shows the open lock symbol.

- The swing compensation (Fig. 60/1) 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.

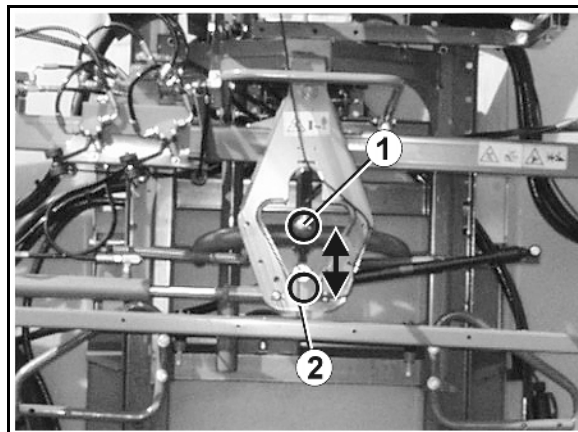


Fig. 60

Locking the swing compensation (Fig. 60/2):



Caution!

- Lock the boom swing compensation in transport position
 - for transporting the sprayer!
 - when folding or unfolding the booms!



Tip!

- Folding via tractor the control valve: The swing compensation is automatically locked before folding in the booms.
- **AMATRON⁺:**
The swing compensation is locked (Fig. 60/2), when the display of **AMATRON⁺** shows the closed lock symbol.
- Professional-folding: Lock the swing compensation via function



→ The menu operation shows the closed lock-symbol

- When the swing compensation is locked the sprayer boom cannot swing freely above the boom carrier.

Folding in and out:



Caution!

- Before folding the booms in or out, all persons should leave the boom folding area!
- Avoid any crushing and bruising points at all the hydraulically actuated folding sections!
- Never fold the boom in or out while moving!
- Never put the double acting control valve 2 on the tractor that actuates the boom folding into the "float position".



Important!

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

Operation with one side folded out sprayer boom



Tip!

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

- with the swing compensation locked.
- to briefly pass obstacles (trees, pylons etc.).



Important!

- Lock the swing compensation in front of 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 process, significantly 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. When driving with an uneven sprayer boom, even, lateral distribution is no longer ensured.

The professional-folding

The professional-folding offers the following functions:

- sprayer booms folding in and out,
- hydraulic height adjustment,
- hydraulic boom tilting,
- one-side sprayer boom folding
- one-side, individual angling of the sprayer boom carrier (only professional-folding II).



Tip!

See **AMATRON⁺** operator's manual!



Tip!

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

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

All operational speeds of the hydraulic functions can be set with the hydraulic throttle valves. Please refer on page 176.

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. 61/1) allow the outer boom sections to give way into or against the driving direction, pivoting around the hinge point (Fig. 61/2) and after the obstacle is cleared away, the booms will automatically return to the operating position.

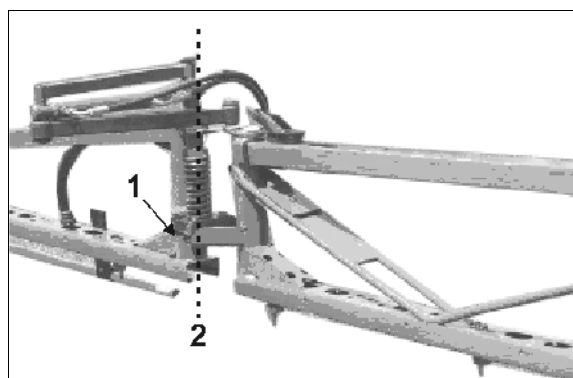


Fig. 61

5.21.1 Super-S- booms

Fig. 62/..

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

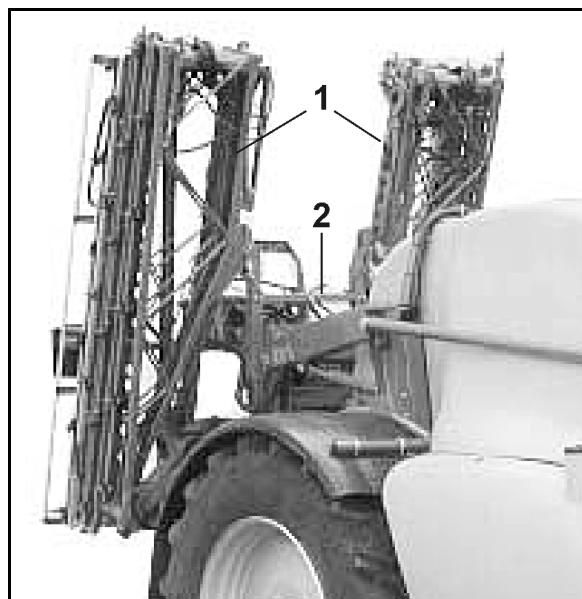


Fig. 62

Fig. 63/..

- (1) Spacer
- (2) Swivel able boom carrier

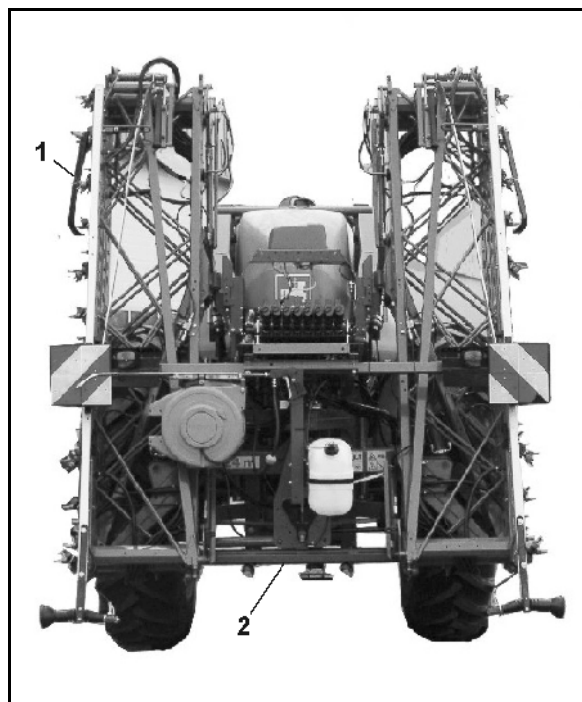


Fig. 63

Transport safety for booms with locating sockets (Fig. 64/1) transport latches (Fig. 64/2). The transport latches retain the locating sockets when locking the boom packages in the transport position against unintentional folding out.



Tip!

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

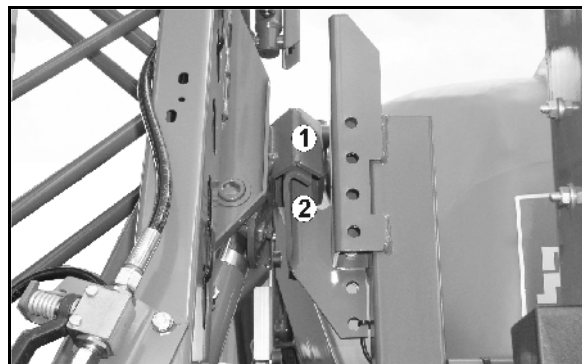


Fig. 64

5.21.1.1 Unlocking and locking the transport safety device



Important!

Before any transport lock the folded boom package the transport safety device in the transport position!

Unlocking the transport safety device

1. Open the block tap for the hydraulic height adjustment.
 2. Lift the sprayer booms the height adjustment, until the latches (Fig. 65 /1) release the location pockets (Fig. 65 /2).
- The transport safety device unlocks the sprayer booms from the transport position.

Fig. 65 shows the unlocked sprayer booms.

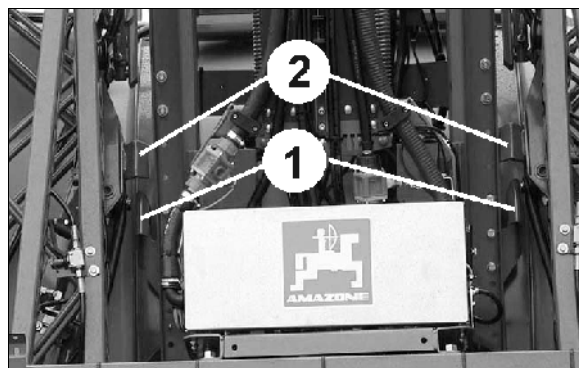


Fig. 65

Locking the transport safety device

1. Folding via tractor control valves:
Open the block tap for the hydraulic height adjustment.
 2. Entirely lower the sprayer booms the height adjustment, until the latches (Fig. 66 /1) release the location pockets (Fig. 66 /2).
- The transport safety device unlocks the sprayer booms from the transport position.

Fig. 66 shows the locked sprayer booms.

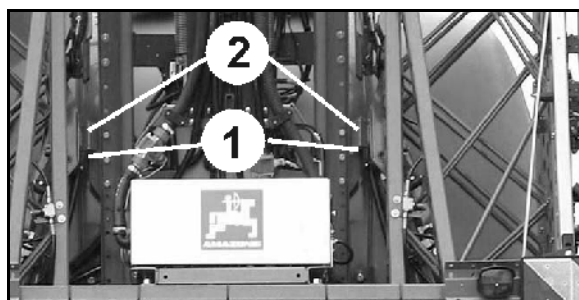


Fig. 66



Tip!

Align the sprayer booms for the tilt adjustment if the latches (Fig. 66 /1) do not retain the location pockets (Fig. 66 /2).

5.21.1.2 Super-S-booms, Folding via tractor control valve



Tip!

See operation manual **AMASPRAY⁺ / AMATRON⁺**!

Folding out:

1. Open the block tap.
2. Lift the sprayer booms (**controller 1**) and unlock the transport safety device.
3. Hold the control lever of the double acting **control valve 2** in "folding down" position (Ausklappen) " (**hose marking 1 x green**) until
 - o both boom packages have been folded down
 - o the individual segments have been completely unfolded
 - o and the swing compensation is unlocked.
 - **The relevant hydraulic rams will lock the boom in operational position.**
 - **The fold-down is not always symmetrical.**
4. Setting the spray height of the boom the height adjustment.
5. Shut the block tap. So, the height adjustment is locked and the adjusted spraying height is exactly maintained.

Folding in:

1. Open the block tap.
2. Lift the boom the height adjustment (**control valve 1**) to a medium height position.
3. Tilt adjustment "0" (if present).
4. Hold the operating lever of the double acting **control valve 2** in "folding in" position (**hose marking 2 x green**) until the individual segments have been folded in completely and the two boom packages have been folded upwards.
5. Lower the boom and lock in transport position.
6. Shut the block tap.



Caution!

Only travel in the locked transport position!

Tip!

Prior to folding in the booms, the swing compensation locks automatically.

5.21.1.3 Set the boom height above the ground

1. Open the block tap for the hydraulic height adjustment.
2. Actuate the **control valve 3** until the hydraulic height adjustment of the sprayer boom is elevated to the desired spraying height or until it is lowered.

5.21.1.4 Operation with reduced working width



Important!

The special optional equipment reduction of the "Super-S-boom" is required for the symmetrical working width reduction of the boom. For every folding ram 2 ball taps (Fig. 67/1 and Fig. 67/1) must be actuated.

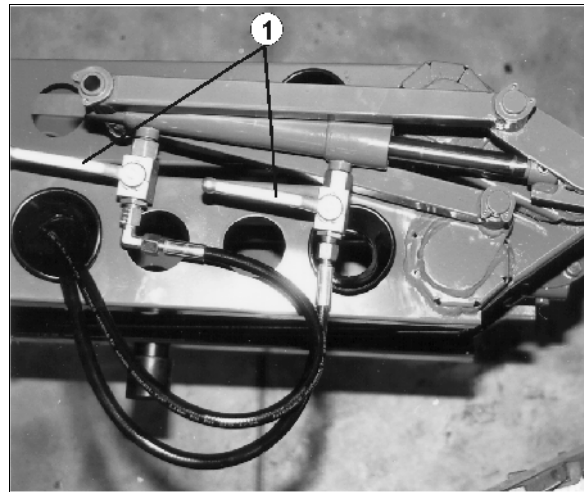


Fig. 67

Prior to folding down the boom shut the relevant ball taps (Fig. 68/1) on the outer hinges – e.g. the reduction from 24 to 18 m working width -, or the ball taps (Fig. 68/1) on the inner boom elements – for the reduction to 12 m.

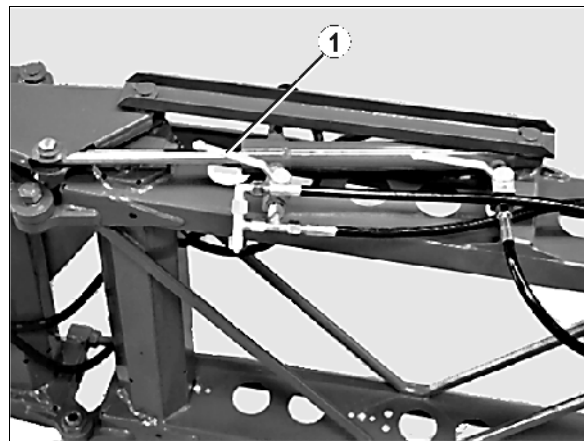


Fig. 68

5.21.2 Super-L- Boom

Fig. 69/..

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

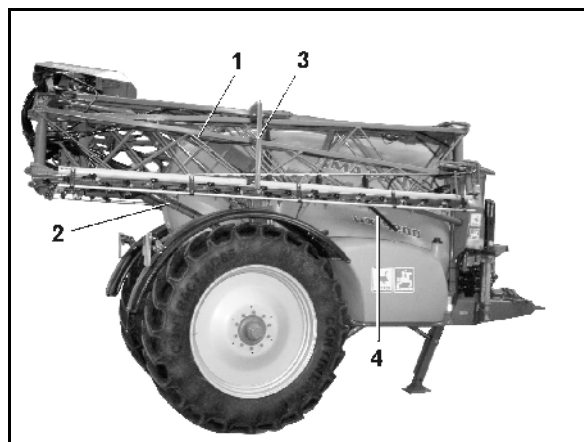


Fig. 69

5.21.2.1 Super-L- booms, Folding via tractor control valve



Tip!

See operation manual **AMASPRAY⁺ / AMATRON⁺**!

Folding out:

1. Open the block tap.
2. Lift the booms off the catch hooks (**control valve 3**).
3. Hold the control lever of the double acting **control valve 2** in "folding down" position (**hose marking 1 x green**) until
 - o both boom packages are folded to the rear
 - o the individual segments have been completely unfolded
 - o and the swing compensation is unlocked.
- **The relevant hydraulic rams will lock the boom in operational position.**
- **The folding down is not always symmetrical.**
4. Setting the spray height of the boom the height adjustment.
5. Shut the block tap. So, the height adjustment is locked and the adjusted spraying height is exactly maintained.

Folding in:

1. Open the block tap.
2. Use the height adjustment to lift the boom (**control valve 3**) to the maximum height.
3. Tilt adjustment "0" (if present).
4. Hold the operating lever of the double acting **control valve 2** in position "folding in" in the "fold-in position" (**hose marking 2 x green**)
 - o the individual segments have been folded in completely
 - o the two boom packages have been folded upwards
 - o the transport locking device locks the booms.
5. Lower the booms into the catch hooks.
6. Shut the block tap.



Caution!

Only travel with locked transport position!



Tip!

Prior to folding in the booms, the swing compensation locks automatically.

5.21.2.2 Set the boom height above the ground

1. Open the block tap for the hydraulic height adjustment.
2. Actuate the **control valve 3** until the hydraulic height adjustment of the sprayer boom is elevated to the desired spraying height or until it is lowered.

5.21.3 Operation with one side folded out sprayer boom



Tip!

Only operation with one side folded out sprayer boom is allowed

- with the swing compensation locked.
- to briefly pass obstacles (tree, pylons 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 the spraying process, 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. With an uneven sprayer boom run, an even lateral distribution is no longer ensured.

The sprayer booms are completely folded out!

1. Lock the swing compensation.
2. The height adjustment lift the sprayer boom to an average height position.
3. Fold in the desired boom side.



Warning!

After the folding procedure the booms swivel in forward direction! Release the key on **AMASPRAY⁺**/**AMATRON⁺** early enough as otherwise the booms or the machine might get damaged!

4. Align the sprayer boom the tilt adjustment parallel to the area to be sprayed.
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 part width sections of the left hand side boom.
7. During spraying procedure clearly reduce the forward speed.

5.21.4 Hydraulic boom tilting

(Option)

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

Adjustment via:

- **AMATRON⁺**
- **AMASPRAY⁺**

5.21.5 Distance-Control

(Option)

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 a 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 elevated by approx. 50 cm. When switching on, the sprayer booms lowers to the calibrated height.



Tip!

See operation manual
AMATRON⁺.

- Adjustment of the ultrasound sensors:
→ see Fig. 70

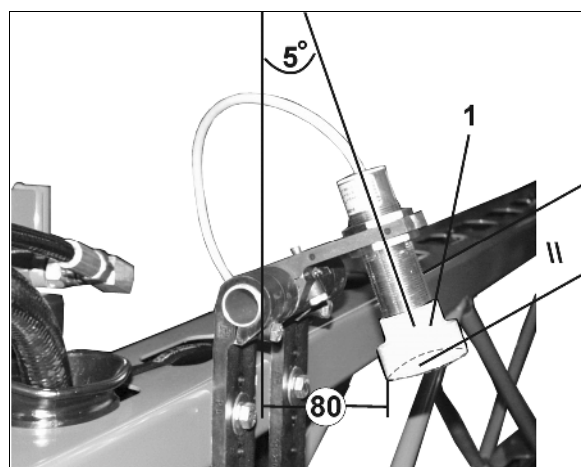


Fig. 70

5.21.6 Boundary nozzle switching, electric

(Option)

From the tractor cab the boundary nozzle switching allows to switch off electrically the last nozzle and to switch on electrically one boundary nozzle 25 cm further outwards (accurately on the edge of the field).

5.21.7 End nozzle switching, electric

(Option)

From the tractor cab, the end nozzle switching two or three of the outer nozzles are electrically switched at the edge of the fields near to open waters.

5.22 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.

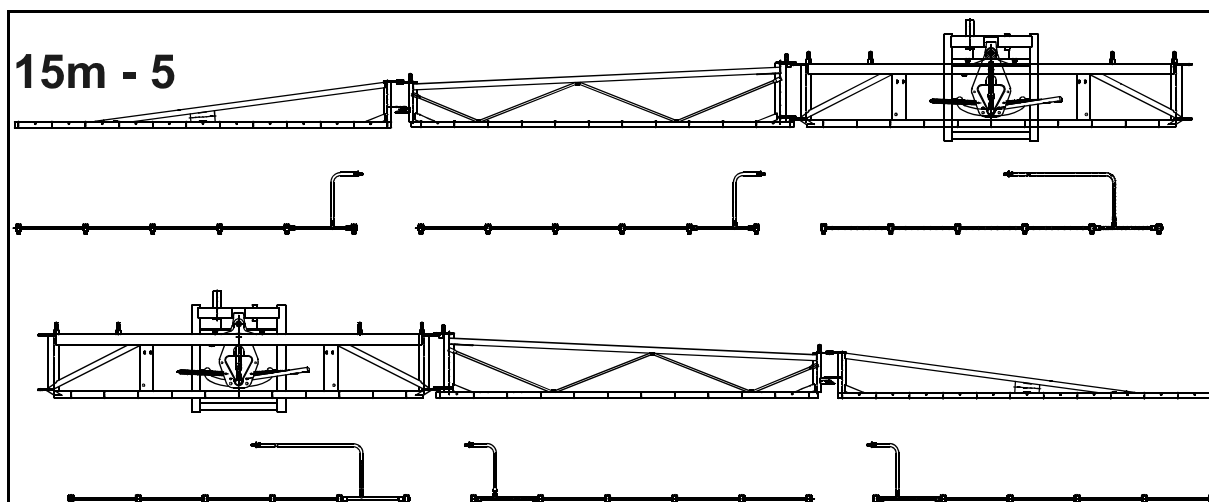


Fig. 71

5.22.1 Technical specifications



Important!

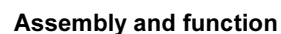
Note that the residual amount in the spray lines will be sprayed in undiluted concentration. Always spray these residual amounts on a not treated area. The residual amount of the spray lines depends on the sprayer boom-working width.

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/h the travel distance for emptying the boom corresponds to a distance of approx. 23m.



UX BAG0010.0 05.05

85

Spray lines L-Sprayer booms with single or multiple-nozzles

Working width	[m]	24	27		28		30	32	33	36
Number of boom part section feed controls		7	7	9	7	9		9		
Number of nozzles per boom section		6-6-8-8 8-6-6	7-8-8-8 8-8-6-7	6-6-6-6-6 6-6-6-6-6	8-8-8-8 8-8-8	7-6-6-6-6 6-6-6-7	8-7-6-6-6 6-6-7-8	8-6-7-7-8 7-7-6-8	7-8-7-7-8 7-7-8-7	9-9-7-7-8 7-7-9-9
Residual amount	[l]									
• dilutable		5.0	5.0	5.5	5.0	5.5	5.5	5.5	5.5	5.5
• non dilutable		11.5	12.5	17.5	13.0	17.5	18.0	18.5	19.0	19.5
• total		16.5	17.5	23.0	18.0	23.0	23.5	24.0	24.5	25.0
Residual amount at pressure circulation system (DUS) incl. valve chest and hose package	[l]									
• dilutable		17.5	18.5	24.0	19.0	24.0	24.0	24.5	25.0	25.5
• non dilutable		1.5	2.0	2.0	2.0	2.0	2.5	2.5	2.5	3.0
• total		19.0	20.5	26.0	21.0	26.0	26.5	27	27.5	28.5
Weight (spray lines)	[kg]	22	23	29	23	30	32	34	35	38

5.22.2 Single nozzles

Fig. 72/..

- (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 under the housing.

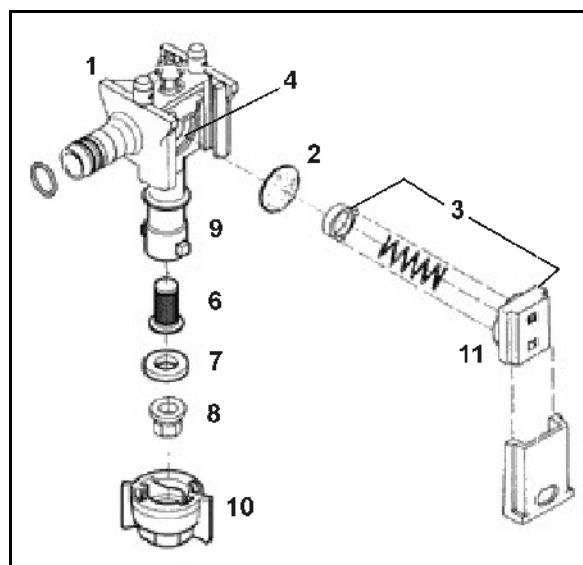


Fig. 72

5.22.3 Multiple nozzles

(Option)

When using different nozzles the use of multiple nozzles shaped as a triple nozzle head (Fig. 73) is advantageous. The vertically positioned nozzle is fed.

By revolving the triple nozzle head (Fig. 73/1) in counter clockwise direction another 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.



Important!

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

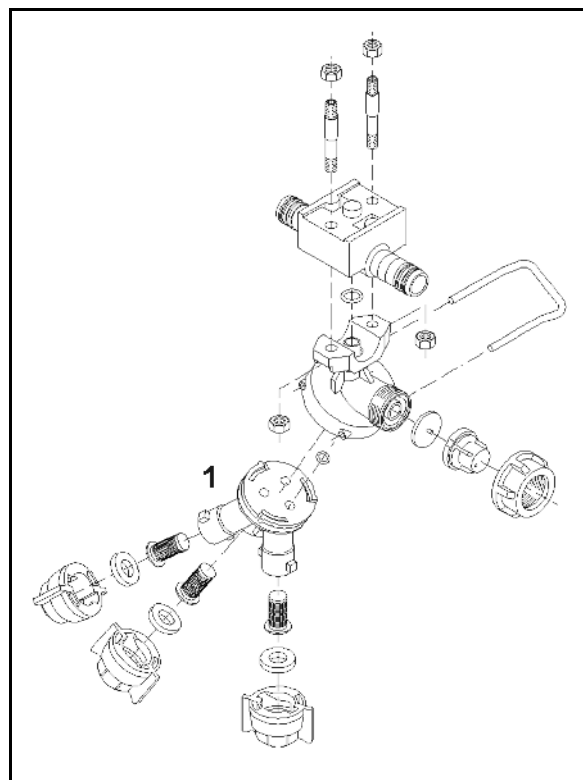


Fig. 73

Assembly and function

- (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.
- (9) Bayonet connector.
- (10) Bayonet cap red.
- (11) Bayonet cap green.
- (12) Bayonet cap black.
- (13) Bayonet cap yellow.
- (14) O-ring.
- (15) O-ring.

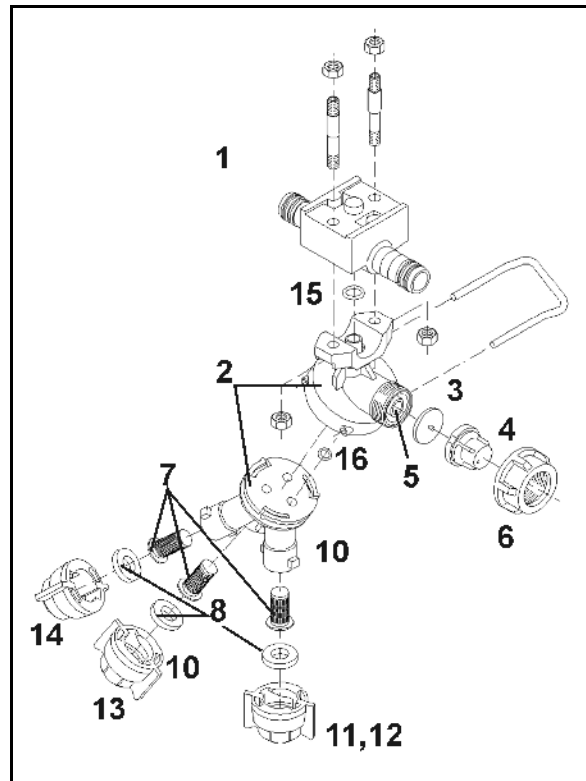


Fig. 74

5.23 Options for the application of liquid fertilizer

At present there are mainly two different kinds of liquid fertilizer 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 fertilizer 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 only apply to pure water.

The following principle applies:

Apply liquid fertilizers 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 fertilizer.

Basically no higher rates of liquid fertilizer should be applied as e. g. 40 kg/N (please refer also to "Conversion table for the spraying of liquid fertilizers"). Re-fertilizing 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.

5.23.1 3-ray nozzles

(Option)

Should the liquid fertilizer 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 fertilizer application.

An integrated metering aperture inside the nozzle produces a nearly pressure less, coarse droplet distribution of the liquid fertilizer 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 scorching damage is thereby 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 application.

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

5.23.2 5- and 8-hole-nozzles

(Option)

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. 75) are not directed downwards but sideways. This results in the production of very large droplets raining even more gently on the plants.

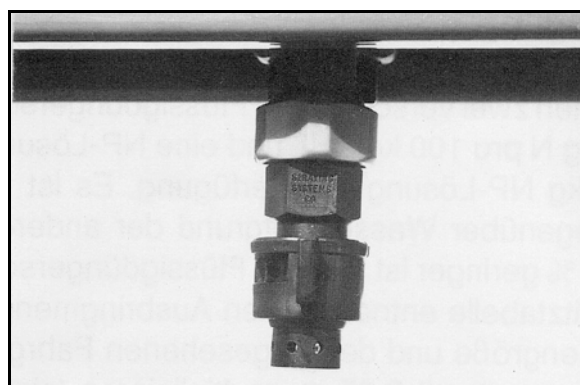


Fig. 75



Tip!

- 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", on page 194).

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. 4916-55);

The following metering discs are available

4916-39	ø 1.0	60 - 115 l	AUS/ha
4916-45	ø 1.2	75 -140 l	AUS/ha
4916-55	ø 1.4	110 -210 l	AUS/ha
4916-63	ø 1.6	145 -280 l	AUS/ha
4916-72	ø 1.8	190 -360 l	AUS/ha
4916-80	ø 2.0	240 -450 l	AUS/ha

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

5.23.3 Drag hose kit, for Super-S-sprayer boom

(Option)

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

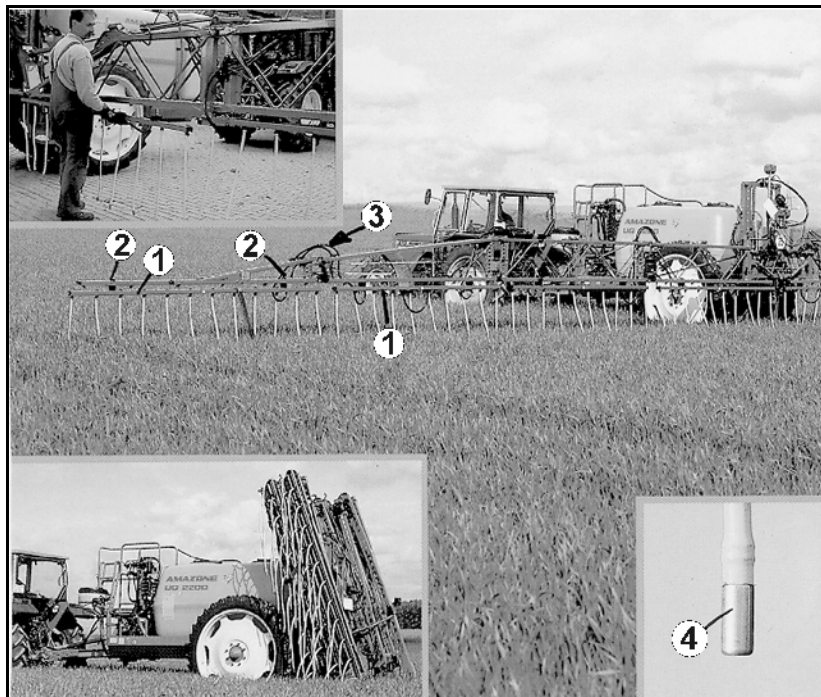


Fig. 76

Fig. 76/..

- (1) Numbered, separate drag hose part sections with 25 cm nozzle- and hose spacing. In this case fitted is No. 1 left hand outside, seen in driving direction, No. 2 next to it, 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 stabilizing the position during operation.

Tip!

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
4916-32	ø 0.8	80 -	210 l	AUS/ha
4916-39	ø 1.0	115 -	300 l	AUS/ha, (standard)
4916-45	ø 1.2	150 -	395 l	AUS/ha
4916-55	ø 1.4	225 -	590 l	AUS/ha

Please refer to "Spray rate table for drag hose equipment", on page 194.

5.23.4 Drag hose kit for Super-L-sprayer-boom

- (Option) with metering washers for late top dressing with liquid fertilize

Fig. 77/..

- (1) Numbered, separate drag hose part sections with 25 cm nozzle- and hose spacing. In this case fitted is No. 1 left hand outside, seen in driving direction, No. 2 next to it,.
- (2) Bayonet connection with metering discs.
- (3) Metal weights for stabilizing the position during operation.

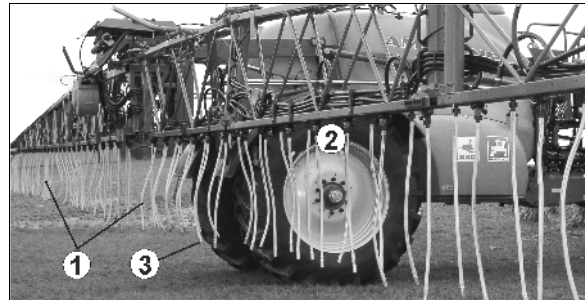


Fig. 77

Fig. 78/..

- (1) Deflection bow for transport position.
- (2) Increased transport position by lowering the transport hook
- (3) Spacing skids



Important!

For the operation with drag hoses remove both spacing skids (Fig. 78/3)!

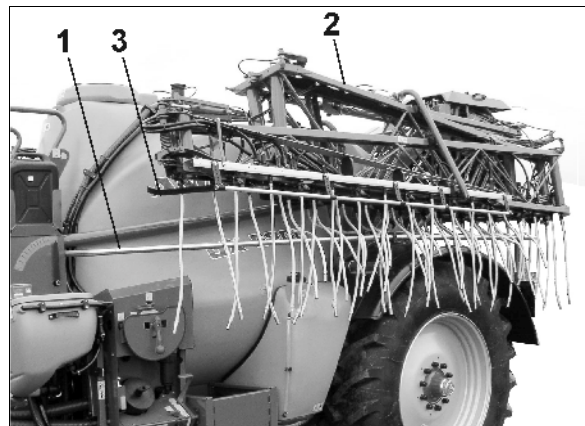


Fig. 78

Fig. 79/..

- (1) one setting tap for each boom part width section:
 - a Spraying via both spray lines with drag hoses
 - b Spraying the standard spray line
 - c Spraying only the 2nd spray line



Important!

Remove the drag hoses for the normal spraying process.

After removal of the drag hoses, close the nozzle bodies using blank caps!

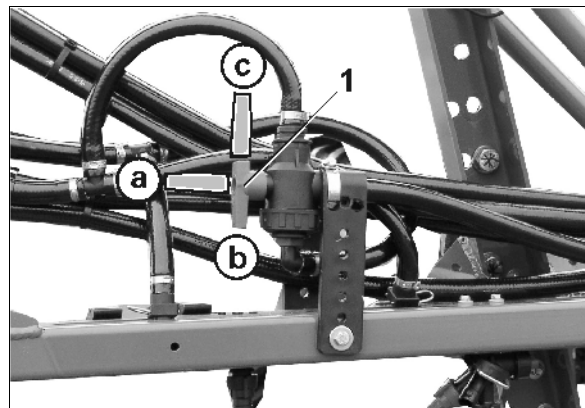


Fig. 79

Fig. 80/..

- (1) Transport hook



Important!

For the operation with drag hoses bolt on both transport hooks in a lower position. In transport position the distance from nozzle to mud guard should be 20 cm! For the normal spraying process re-bolt both transport hooks in the earlier position!

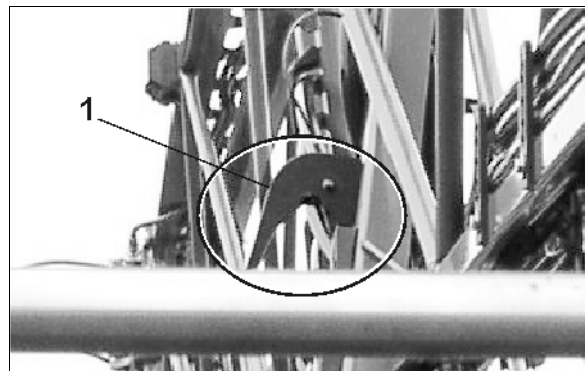


Fig. 80

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

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



Important!

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

(Option)

Pressure hose made from fibre enforced PVC (nominal width/inside: 13 mm; outside: 20 mm; wall gauge: 3.5 mm).

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

5.25 Foam marker

(Option)

The **foam marker** which can be retrofitted at any time (Fig. 81/1 and Fig. 81/3) 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 increments 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.

Set the **spacing between the individual foam bubbles** on the slotted head bolt (Fig. 81/2 und Fig. 82/2) set as follows:

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

- **Foam marker S-sprayer boom**
Fig. 81/..:
- **Foam marker Super-L-sprayer boom**
Fig. 82/..

- (1) Container
- (2) Slotted head bolt



Fig. 81

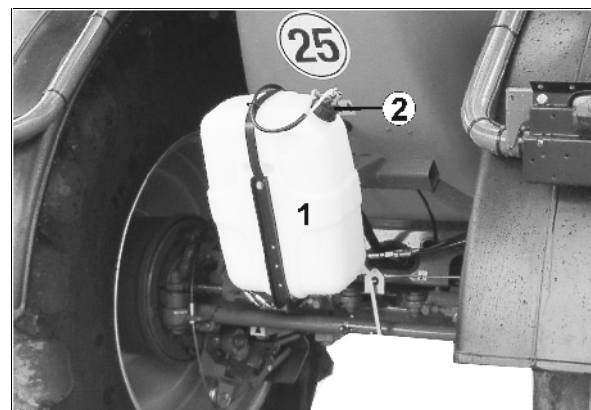


Fig. 82

Compressor (Fig. 83/1)

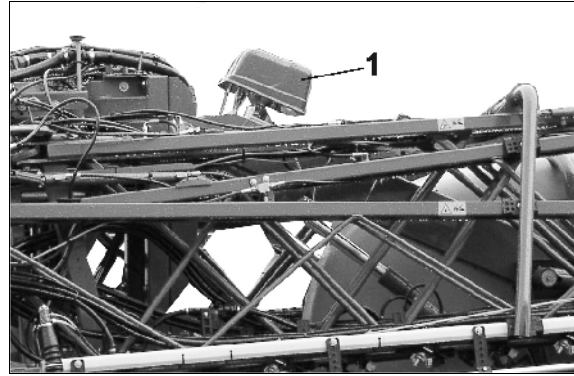


Fig. 83

Fig. 84/..

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

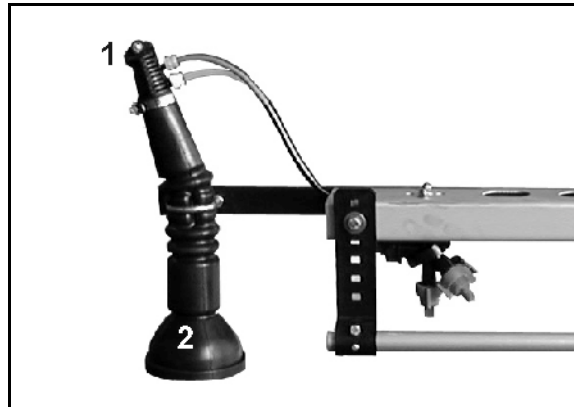


Fig. 84



Tip!

See instruction manual **AMA-TRON⁺**

5.26 Permanent working width reduction on the Super-S-boom

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

5.27 Pressure-circulation system (DUS)



Important!

- To spray always switch on the pressure circulation system.
- When using drag hoses always switch off the pressure circulation system.

(Option)

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 supplied with a flushing hose (Fig. 85/1).
- can be operated at random with spray mixture or flushing water.
- reduces the undiluted residual amount to 2 l for all spray lines.

The permanent liquid circulation

- allows an even spray pattern right from the beginning as immediately after switching on the sprayer boom the spray mixture 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. 85/1) per boom part width section.
- the DUS-reversing tap (Fig. 86/1).
- the DUS-pressure relief-valve (Fig. 86/2). The DUS-pressure relief-valve is supplied 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. 86/1), the pressure circulation system is switched on.

When the DUS reversing tap is in position (Fig. 86/3), the pressure circulation system is switched off.

When the DUS reversing tap is in position (Fig. 87/1), liquid can be drained off the field sprayer.

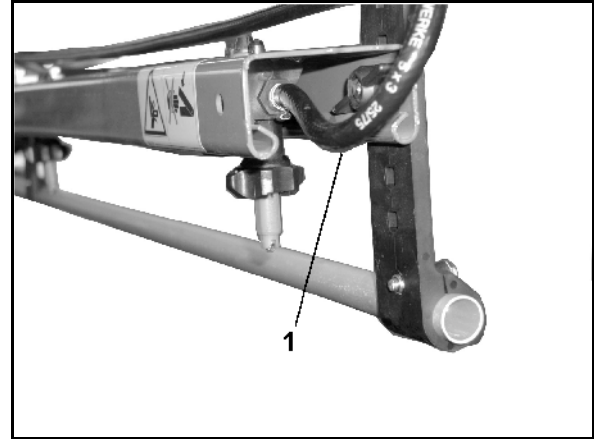


Fig. 85

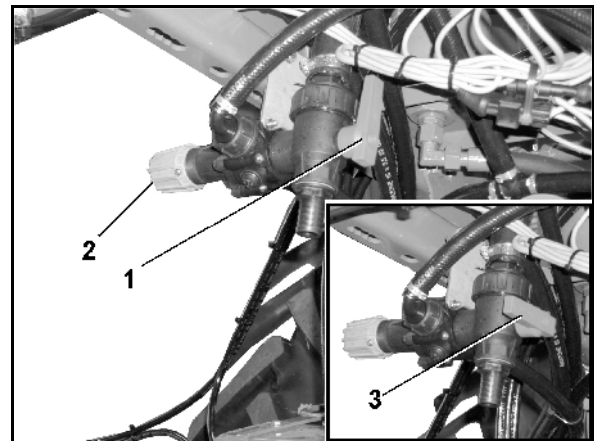


Fig. 86

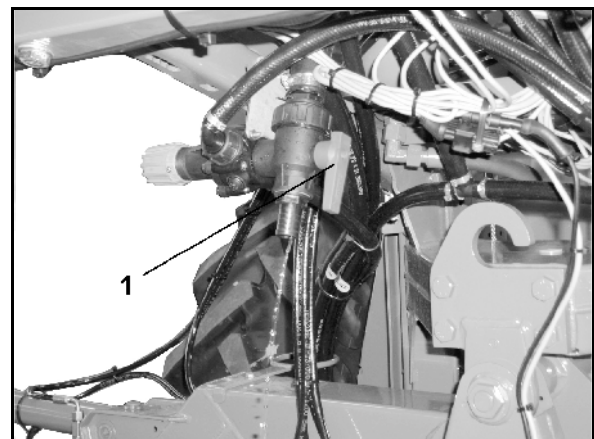


Fig. 87

Overview – Pressure circulation system (DUS)

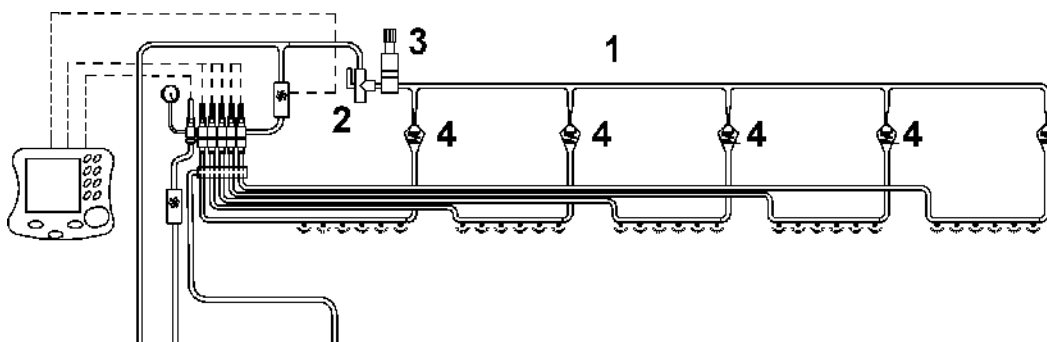


Fig. 88

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

5.27.1 Hose filter for spray lines

(Option)

Order-No.: 916 204

The hose filter (Fig. 89/1)

- is mounted in the spray lines in every boom part width section.
- it is an additional measure to prevent the nozzles from getting dirty.

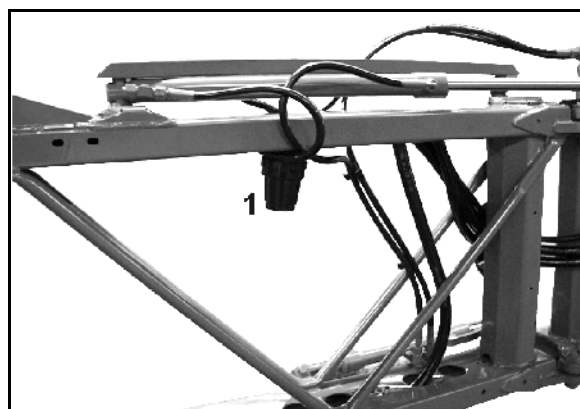


Fig. 89

Overview filter inserts

- Filter insert with 50 Mesh/inch (series, blue), Order No. ZF379
- Filter insert with 80 Mesh/inch (series, grey), Order No. ZF380
- Filter insert with 100 Mesh/inch (series, red), Order No. ZF381

5.28 The hydro-pneumatic sprung suspension

(Option)

The hydro-pneumatic sprung suspension contains the automatic level regulation irrespective of the loading condition.

In the manual mode the machine can be lowered in order to

- reduce the passage height
- switch off the sprung suspension.

Fig. 90/..

- (1) Hydraulic ram
- (2) Pressure reservoir
- (3) Axle carrier



Tip!

See instruction manual
AMATRON⁺

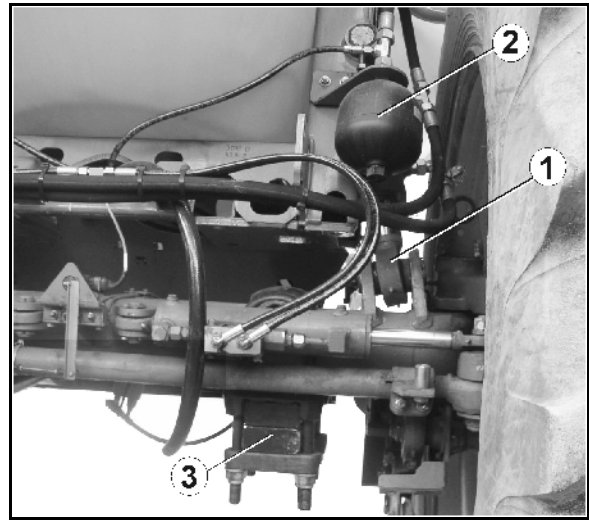


Fig. 90

5.29 Towing device

(Option)

The towing device (Fig. 91) intended for a two axle trailing vehicle without support load.

The permissible total weight of the trailing vehicle must be

- smaller than / equal 10000 kg and
- smaller than / equal the permissible total weight of the trailed sprayer.

Fig. 89/..

- (1) Towing device
- (2) Connection for traffic lights
- (3) Connection for the brake

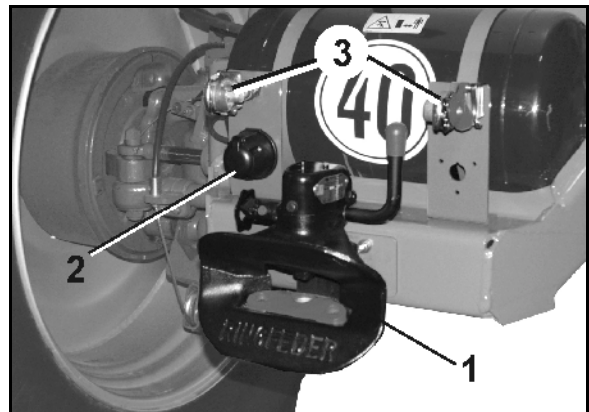


Fig. 91

6 Commissioning

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



Danger!

- Before commissioning the machine ensure that the operator has read and understood the instruction manual.
- Read the chapter "Safety recommendation for the operator", on page 24 when
 - hitching the machine on or off
 - transporting the machine
 - operation of the machine
- Take account to these effects and allow sufficient steering and braking of your tractor!
- If necessary, use ballast weights!
- When mounting of machines at the front and/or in the rear do not exceed
 - the permissible total tractor weight
 - the permissible tractor axle loads
 - the permissible tire load capacity of the tractor tires
- Before starting to operate the combination tractor/mounted machine, carefully determine the actual values for:
 - the total tractor weight
 - the tractor axle loads
 - the tire load capacity
 - the minimum ballast

(by calculating or weighing the tractor-machine combination)

For this please refer to chapter "Calculation of the actual values for the total tractor weight, tractor axle loads and tire load capacity as well as the necessary minimum ballast", on page 99.

- The tractor must provide the specified 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.
- Both the vehicle owner and operator are responsible for adhering to the legal traffic rules.
- Observe the max. load of the mounted/trailed machine and the permissible axle and support loads of the tractor. If necessary only drive with partly filled tank.
- Before any transport runs lock the operating lever of the three-point hydraulics against unintentional lifting or lowering on the mounted or trailed machine.

6.1 First operation

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

6.1.1.1 Required data for the calculation

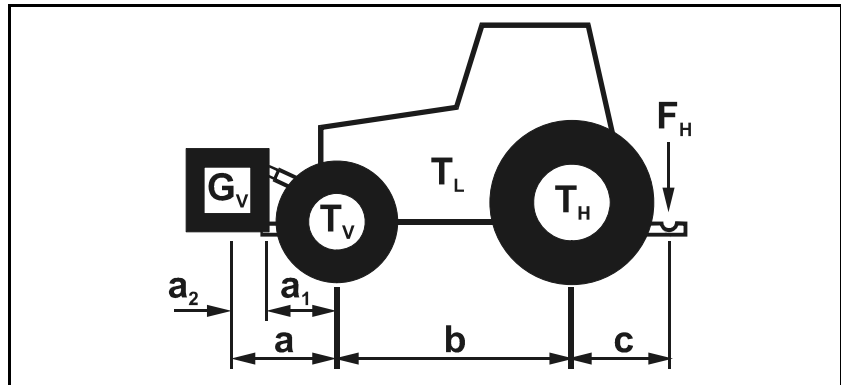


Fig. 92

T_L	[kg]	Tractor net weight	Please see tractor Instruction manual / registration papers
T_V	[kg]	Front axle load of the empty tractor	
T_H	[kg]	Rear axle load of empty tractor	
G_H	[kg]	Total weight of rear mounted machine or rear weight	Please refer to technical data machine or rear weight
G_V	[kg]	Total weight front mounted machine or front weight	Please refer to technical data for front mounted machine or front weight
a	[m]	Spacing between point of gravity of front mounted machine or front weight and middle of front axle (sum $a_1 + a_2$)	Please refer to technical data tractor and front mounted machine or front weight or measure
a_1	[m]	Spacing between centre front axle and centre of lower link ball	Please see tractor Instruction manual or measure
a_2	[m]	Distance between centre lower link point and centre of gravity of front mounted machine or front weight (point of gravity spacing)	Please refer to technical data front mounted machine or front weight or measure
b	[m]	Wheel base of tractor	Please see tractor Instruction manual / registration papers or measure
c	[m]	Spacing between centre rear axle and centre lower link ball	Please see tractor Instruction manual / registration papers or 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 (on page 101).

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 (on page 101).

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

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

Enter the figure for the calculated actual total weight and the permissible total tractor weight as indicated in the tractor-instruction manual into the table on page 101).

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 value for the calculated actual back axle load and the permissible back axle load in the tractor operating manual into the table.

6.1.1.6 Tyre load capacity

Enter double the value (two tires) of the tire load capacity (please refer e.g. to the documentation of the tire manufacturer) into the table (on page 101).

6.1.1.7 Table

	Actual value according to the calculation	Permissible value according to the tractor-instruction manual	Double the permissible tire load capacity (two tires)
Minimum ballast Front / rear	<div style="border: 1px solid black; padding: 10px; text-align: center;">/ kg</div>	--	--
Total weight	<div style="border: 1px solid black; padding: 10px; text-align: center;">kg</div>	≤ <div style="border: 1px solid black; padding: 10px; text-align: center;">kg</div>	--
Front axle load	<div style="border: 1px solid black; padding: 10px; text-align: center;">kg</div>	≤ <div style="border: 1px solid black; padding: 10px; text-align: center;">kg</div>	≤ <div style="border: 1px solid black; padding: 10px; text-align: center;">kg</div>
Rear axle load	<div style="border: 1px solid black; padding: 10px; text-align: center;">kg</div>	≤ <div style="border: 1px solid black; padding: 10px; text-align: center;">kg</div>	≤ <div style="border: 1px solid black; padding: 10px; text-align: center;">kg</div>



Tip!

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



Danger!

- The actual calculated values must be smaller than /equal to (≤) the permissible values!
- Hitching up the machine to the tractor on which the calculation is based is prohibited if
 - Even just one of the actual, calculated values is bigger than the permissible value.
 - no front weight (if required) has been fixed on the tractor for the required min. ballasting ($G_{V \min}$).



Important!

- Use a front weight which at least corresponds to the required minimum front ballasting ($G_{V \min}$)!

6.1.2 Initial operation with the service brake system



Important!

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

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

6.1.3 Fitting the wheels



Tip!

In case the machine is supplied with transport wheels, fit the proper running wheels before starting the operation.



Warning!

Only use appropriate tires according to the technical data (on page 48).

The rims the proper for the tires must feature a rim disc welded all around!

1. Slightly lift the machine by using a hoist crane



Danger!

When loading the machine with a hoist crane use the indicated points for fixing the lifting straps.



Danger!

The minimum tensile strength per lifting strap must be

- 3000 kg rear (Fig. 93)
- 1500 kg front (Fig. 94 / Fig. 95)!

There are 3 indicated points on the machine (Fig. 93/1, Fig. 94/1, Fig. 95/1).

2. Slacken the wheel nuts on the transport wheels.
3. Remove the transport wheels.



Caution!

Take care when removing the transport wheels and fitting the running wheels!

4. Put the running wheels on to the threaded pins.
5. Tighten the wheel nuts.



Caution!

Required torque for the wheel nuts: 560 Nm.

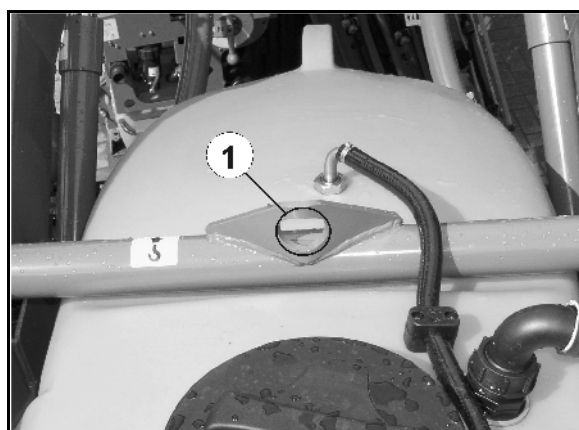


Fig. 93

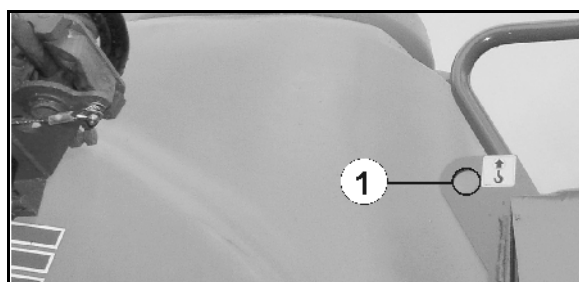


Fig. 94

6. Lower the machine and remove the lifting belts.
7. Retighten the wheel nuts after 10 hours of operation.



Fig. 95

6.1.4 PTO shaft



Important!

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



Danger!

- Before starting the PTO-shaft observe the chapter "Safety recommendation for the operator", on page 24.

6.1.4.1 First fitting and matching the PTO shaft



Important!

- Prior to the initial hitching, match the PTO shaft length to the tractor, if necessary.
 - Please observe the operator's manual of the PTO shaft manufacturer.
 - When first attaching the sprayer to the tractor check the length of the universal joint shaft in relation to the tractor according to. When changing the tractor, you should the length of the universal joint shaft again.

Slide the PTO shaft halves on to the universal joint shaft of the tractor and the machine input shaft in the specified fitting direction (see symbol on the PTO shaft, however **do not insert the PTO shaft tubes into each other!**

Fig. 96/..

- (1) By **holding** the two PTO shaft tubes **next to one another** check whether the PTO shaft tubes overlap by min. $A = 150$ when driving in straight direction and in curves.
- (2) In the inserted position the PTO shaft tubes must not touch the yokes of the universal joints. Note that the PTO shaft **gets shorter** at the braking procedure in case the machine is equipped with a run-on brake. Ensure a safety distance of min. 10 mm.
- (3) To match the universal joint shaft halves hold them in shortest operational position next to one another and mark them.
- (4) Shorten inner and outer guard tube equally.
- (5) Shorten inner and outer profile tube by the same amount.
- (6) Round off the cut edges and carefully remove any metal filings.
- (7) Apply grease to the sliding profiles and slide them into each other.
- (8) The guard tubes of the PTO shaft are supplied with fixing chains which have to be fixed on the tractor and on the machine. The safety chains prevent the guard tubes from spinning at the running PTO shaft. Hook the fixing chains into the supplied holes in such a way that a sufficient manoeuvrability is ensured in all operational positions and that the guard tubes do not spin during operation.

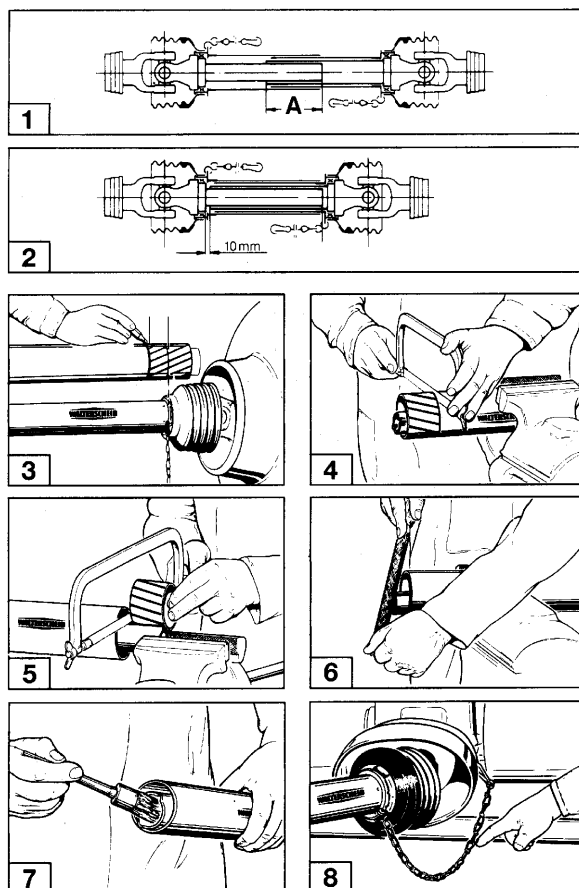


Fig. 96

6.1.5 Setting the system setting screw on the hydraulic valve block

- Only for professional folding:



Important!

Always match the setting of the system reversing screw to the hydraulic system of your tractor. Increased hydraulic oil temperatures are the result of incorrect setting of the system reversing screw, caused by the permanent strain of the pressure relief valve of the tractor hydraulics

The setting of the system setting screw on the hydraulic block (Fig. 97/1) 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:

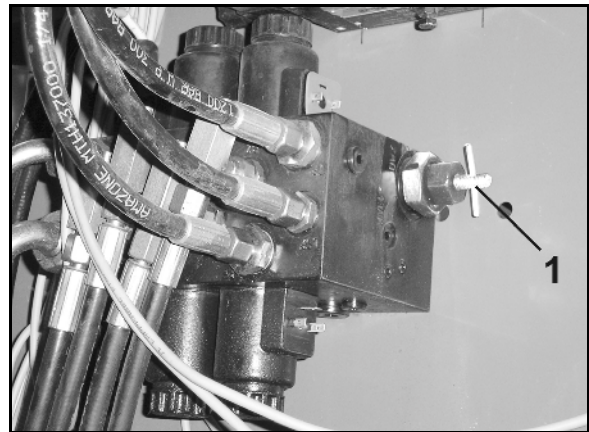


Fig. 97



- The setting must only be carried out when the system is not pressurized!**
- The hydraulic block is located at the front right hand side of the machine behind the cover plate.**

6.1.6 Trail-Tron- Pivot angle transmitter

If it is intended to work with the Trail-Tron draw bar, a holder (Fig. 98/1) for the pivot angle transmitter (Fig. 98/2) should be mounted on the tractor.

For this proceed as follows: Weld the supplied sleeve with the fixing bolt (Fig. 99/1) on to the metal plate (Fig. 99/2) according to the existing conditions on the tractor and mount directly above the pivot point of the tractor pin coupling (Fig. 98).

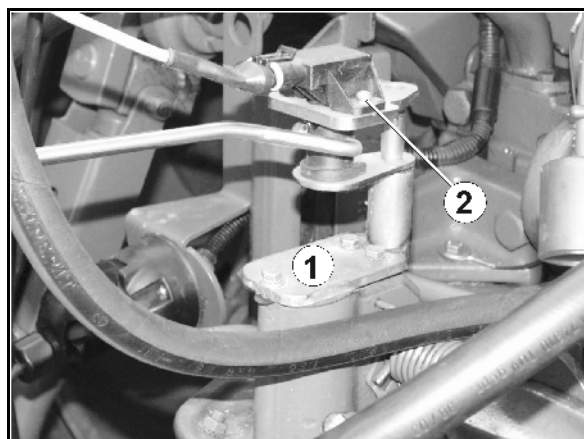


Fig. 98

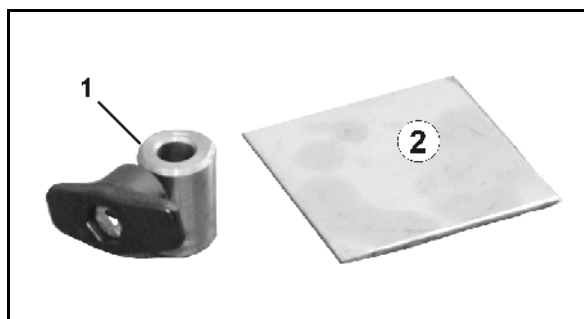


Fig. 99

7 Coupling and uncoupling the machine



Danger!

- Only hitch and transport the machine with a tractor which has been designed for this task and meets the power requirements.
- When fitting the machine to the tractor three-point linkage the mounting categories on the tractor and the machine must coincide.
- When hitching tractor and machine, only use the specified tools.
- Persons are not permitted to stand between the machine to be hitched and the tractor while the tractor is backing up.
Any assistants may only stand at the side of the vehicle and help to direct it. Only when the vehicles have come to a full stop are they allowed to step between them.
- When hitching and unhitching machines, observe the chapter "Safety recommendation for the operator", on page 24.

7.1 Hitching up

Couple the trailed sprayer as follows

Ensure that the unhitched machine is safeguarded against rolling

- o on **level ground** using the parking brake **or** chocks.
- o on **very flooded** terrain or on slopes using the parking brake **and** chocks.

7.1.1 Draw bar

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

7.1.2 PTO shaft



1. Slide the PTO shaft on to the tractor's universal joint shaft.

Important!

When first attaching the machine to the tractor check the length of the PTO shaft and match it.

2. Prevent the PTO guard from spinning by fixing the supplied chains.

7.1.3 Connect the brake system

Air brake system



1. Coupling claw of brake hose (yellow).
2. Coupling claw of second hose (red).

Important!

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

3. Release the parking brake.

Hydraulic brake system



1. Brake hose sleeve of the hydraulic brake hose

Important!

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

2. Release the parking brake.
3. Attach the pulling rope of the parking brake on to a fix point on the tractor.

7.1.4 Hydraulic connections



Danger!

The hydraulic system is under high pressure!

When connecting hydraulic hoses to the tractor hydraulics ensure that the hydraulic system is pressure less on the tractor and on the machine side!

Control valve		Function		Hose marking
1	Double acting	Jack	lift	3 x blue
			lower	4 x blue
Control valve for professional folding		Function		Hose marking
2	Single acting with priority control	Hydraulic block		1 x red
3	Single acting	Pump drive (Option)		3 x red
Pressure free return flow		<ul style="list-style-type: none">Hydraulic blockPump drive		2 x red



Important!

1 pressure free return flow with large plug coupling (DN 16) for the pressure free oil return flow. In the return flow the back pressure should be max. 10 bar

Before connecting the machine to your tractor hydraulic system check the compatibility of the hydraulic oils.

Folding via tractor control valve		Function		Hose marking
2	Double acting	Boom folding	Folding down	1 x green
			Folding in	2 x green
3	Single acting	Height adjustment		1 x yellow
4	Double acting	Steering draw bar	Extract hydr. Ram (machine to the left hand side)	1 x blue
			Retract hydr. ram (machine to the right hand side)	2 x blue
5	Double acting	Tilt adjustment	Lifting left hand boom	1 x natural
			Lifting right hand boom	2 x natural

7.1.5 Traffic lights

Connect the power cable of traffic lights on tractor.



Caution!

Check function of indicator for direction of travel, traffic light kit and brake light!

7.1.6 **AMATRON⁺ / AMASPRAY⁺**



Important!

Switch off the power supply on- board computer before you connect the machine plug with on-board computer and the job computer the connecting cable.

Connect on board computer and the job computer the connecting cable.

Miscellaneous



Important!

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

1. Connect the connecting cable for Trail-Tron.
2. Before the first daily travel drain the air reservoir.
3. Remove chocks, deposit in the retainers and secure.

4. Lift the jack.
5. Check the brake system and the traffic lights for proper.

7.2 Unhitching



Danger!

- **Always unhitch and park the machine, firm ground (danger of tipping over)!**
- **Before unhitching machine**
 - **apply the parking brake**
 - **secure the machine against rolling by using the chocks.**



Tip!

Air brake system:

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

1. Lower the jack.
2. Secure the machine against rolling
 - on **level ground** by applying the parking brake **or** chocks.
 - on **very flooded terrain** or on slopes by applying the parking brake **and** chocks.
3. Uncouple the supply lines between tractor and machine.
 - 3.1 Hydraulic hose lines.
 - 3.2 Power supply cable for the traffic light kit.
 - 3.3 Connecting cable between the on-board computer and the job computer.

Air brake system:

3.4 Coupling claw of the second hose (red).

3.5 Coupling claw of the brake hose line (yellow).

Hydraulic brake system:

3.6 Hydraulic brake line

3.7 Remove the tearing rope of the locking brake from the tractor.



Important!

- **Air brake system:**
Always unhitch first the red coupling claw (second line) and then the yellow coupling claw (brake hose). Always follow this order as otherwise the service brake system would release and the non-braked trailed sprayer would roll away.
- **Attach the disconnected supply lines in the relevant dummy couplings.**

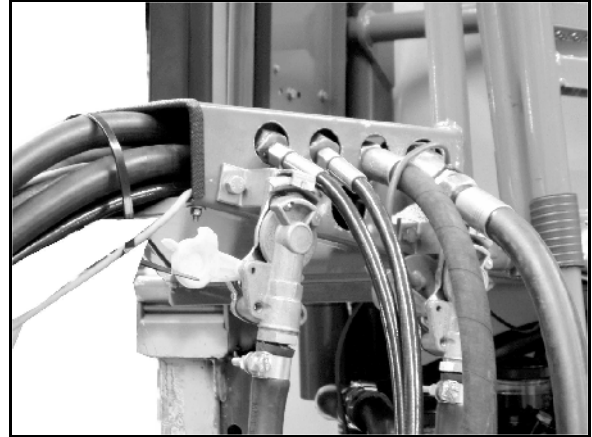


Fig. 100

4. Close the coupling claws on the tractor with the relevant coupling claw lid.
5. Remove the PTO shaft from the tractor universal joint shaft and locate in the retainer.
6. Uncouple the draw bar and pull the tractor forward.

7.2.1 Manoeuvring with the unhitched machine

Air brake system



Danger!

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

Ensure that the machine is connected to the towing vehicle before activating the release valve on the brake valve of the trailing vehicle.

The towing vehicle must be braked.



Tip!

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

Proceed as follows to release the service brake system

- fill the air reservoir.
- completely bleed the brake system on the drain valve of the air reservoir.

1. Connect the machine with the towing vehicle.
2. Brake the towing vehicle.
3. Remove the chocks and release the parking brake.
4. Press the control button on the release valve until the stop (for this, please see chapter "Two circuit air brake system", on page 57).
- The service brake system releases and allows for manoeuvring the machine.
5. When the manoeuvring procedure is finished pull out the control button on the release valve until the stop.
- The pressure in the air reservoir again brakes the trailed sprayer.
6. Brake the towing vehicle.
7. Firmly apply parking brake again and use the chocks to secure the machine against rolling.
8. Unhitch the trailed sprayer and the towing vehicle.

Hydraulic brake system



Danger!

Special care is required when manoeuvring as only the towing vehicle would now brake the machine.

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

The towing vehicle must be braked.

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

8 Settings

8.1 Overview valve chest operation

8.1.1 Spraying operation

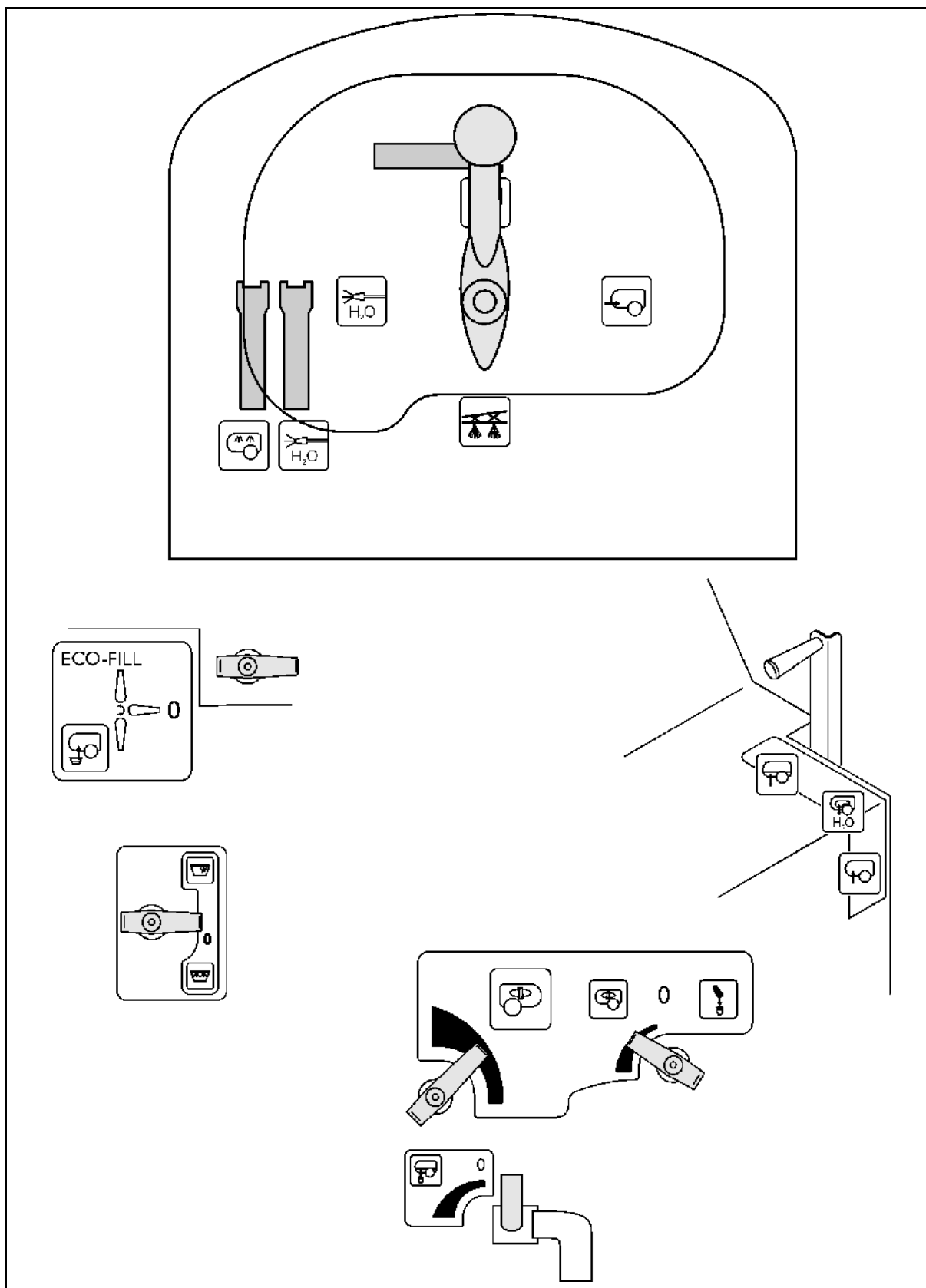


Fig. 101

8.1.2 Suctioning off induction bowl

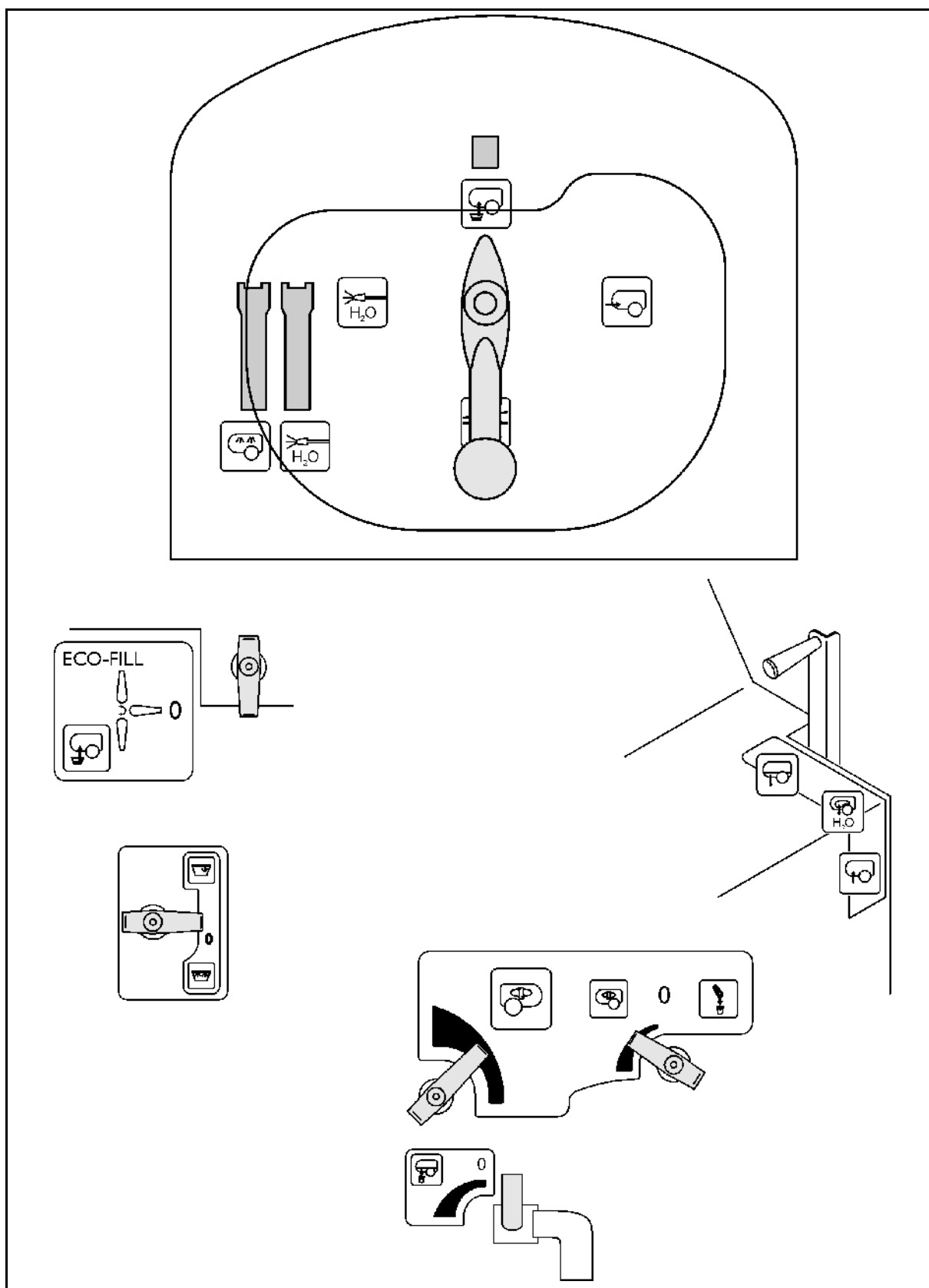


Fig. 102

8.1.3 Diluting urea in the induction bowl and suctioning off

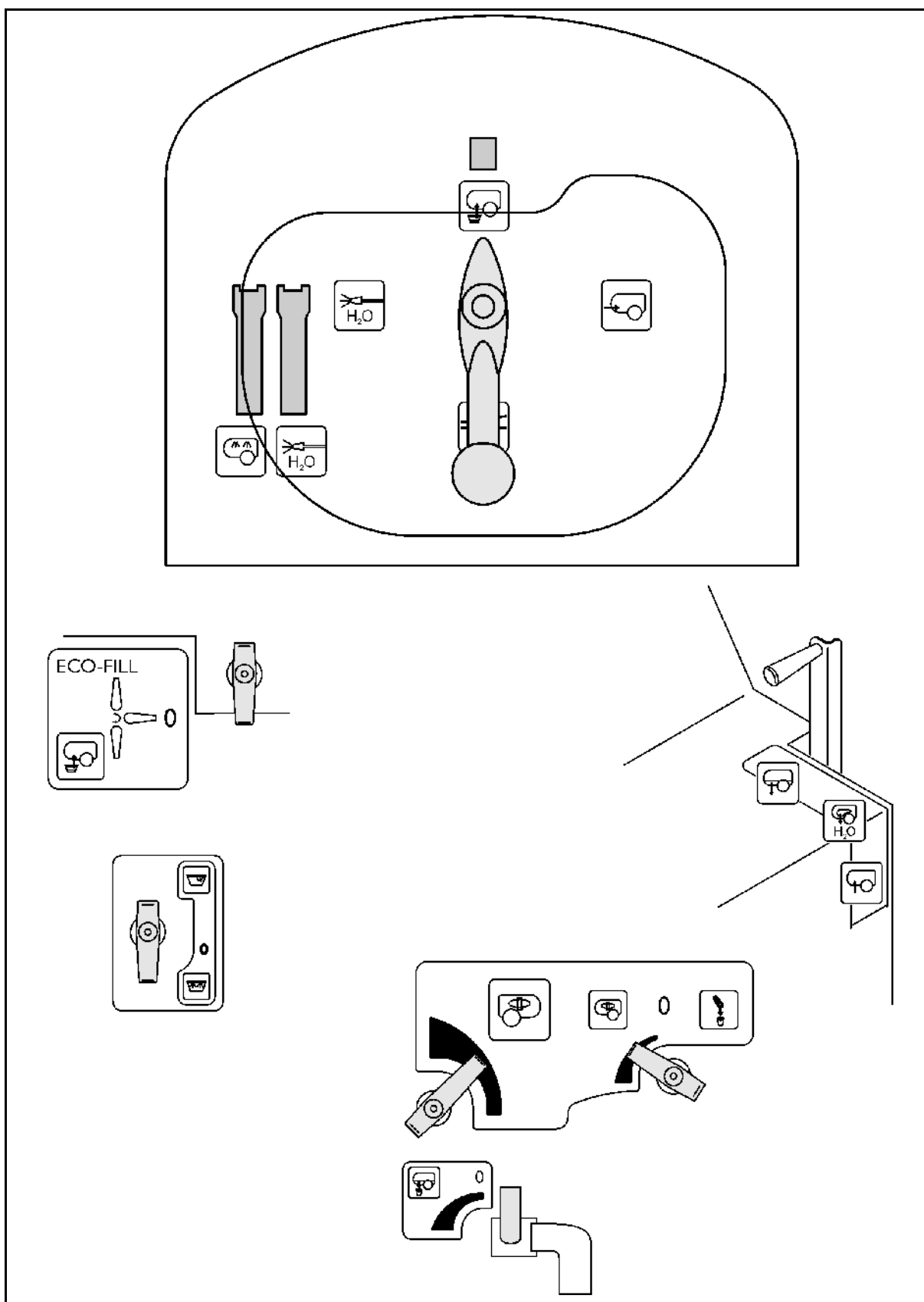


Fig. 103

8.1.4 Pre-cleaning the canister using the spray mixture

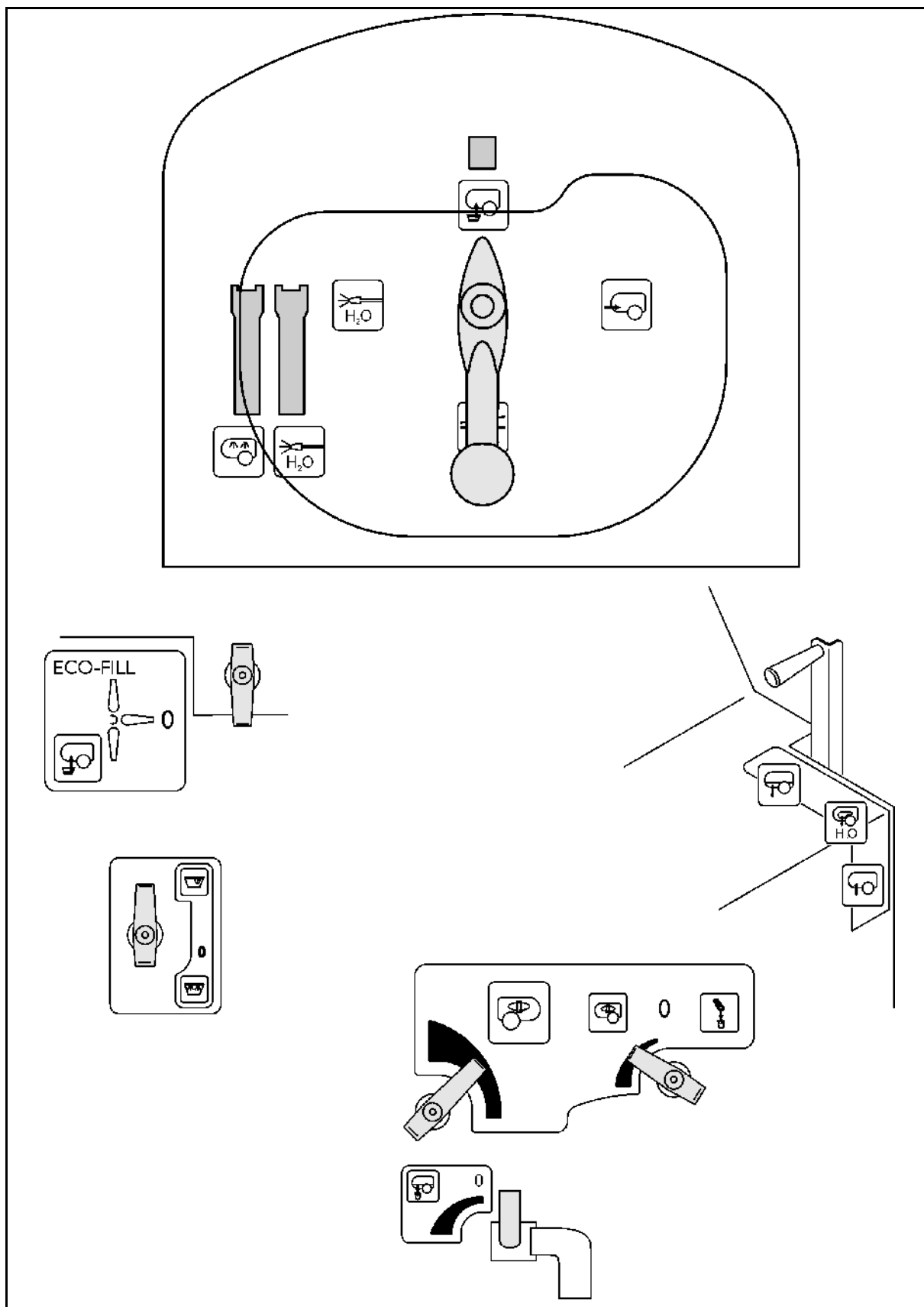


Fig. 104

8.1.5 Diluting the residual amount in the spray mixture tank

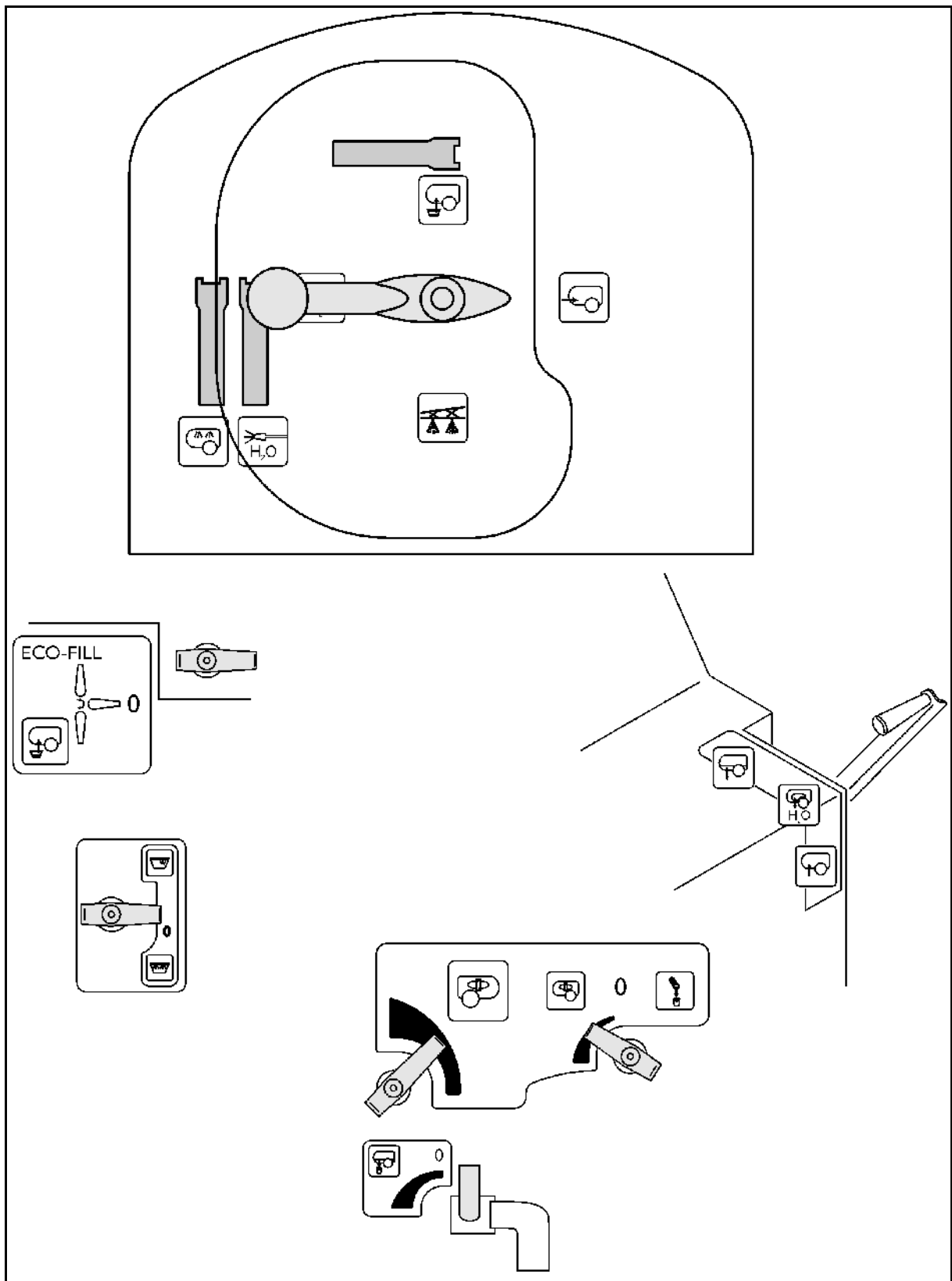


Fig. 105

8.1.6 Cleaning the field sprayer with a filled spray mixture tank

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

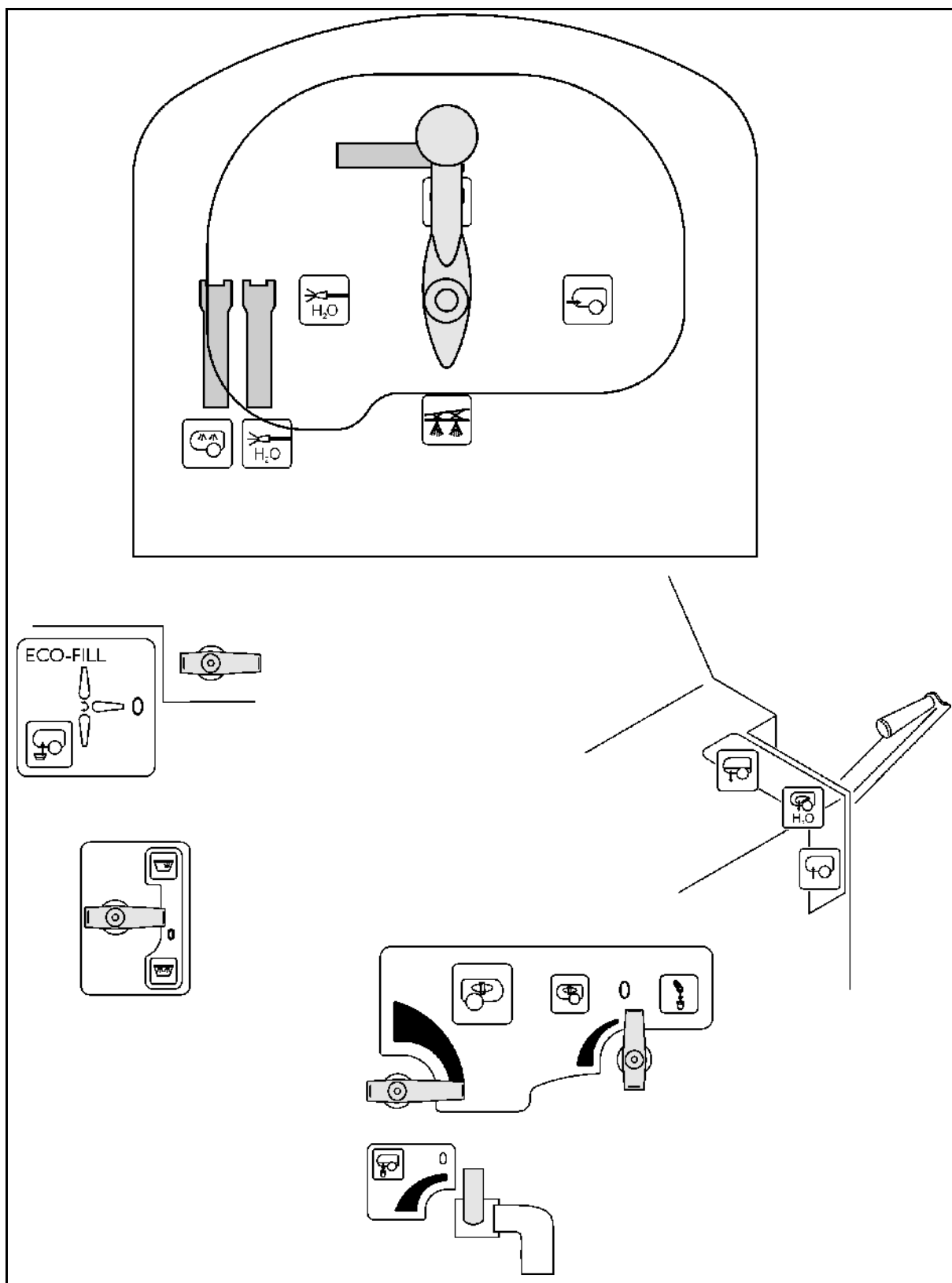


Fig. 106

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

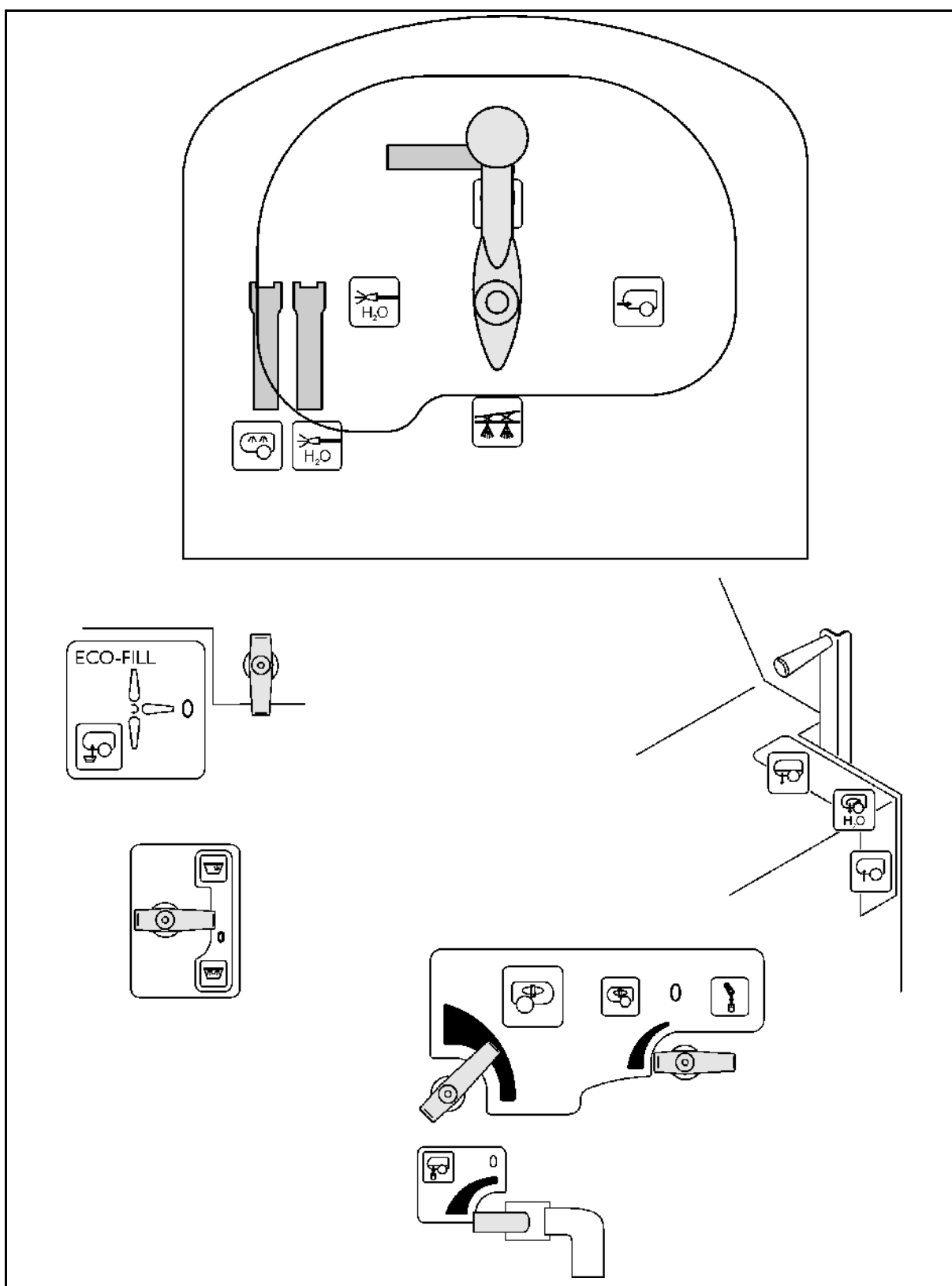


Fig. 107

8.1.7 Filling via suction hose on the filling port



Danger!

To fill always open the lid of the spray mixture tank!

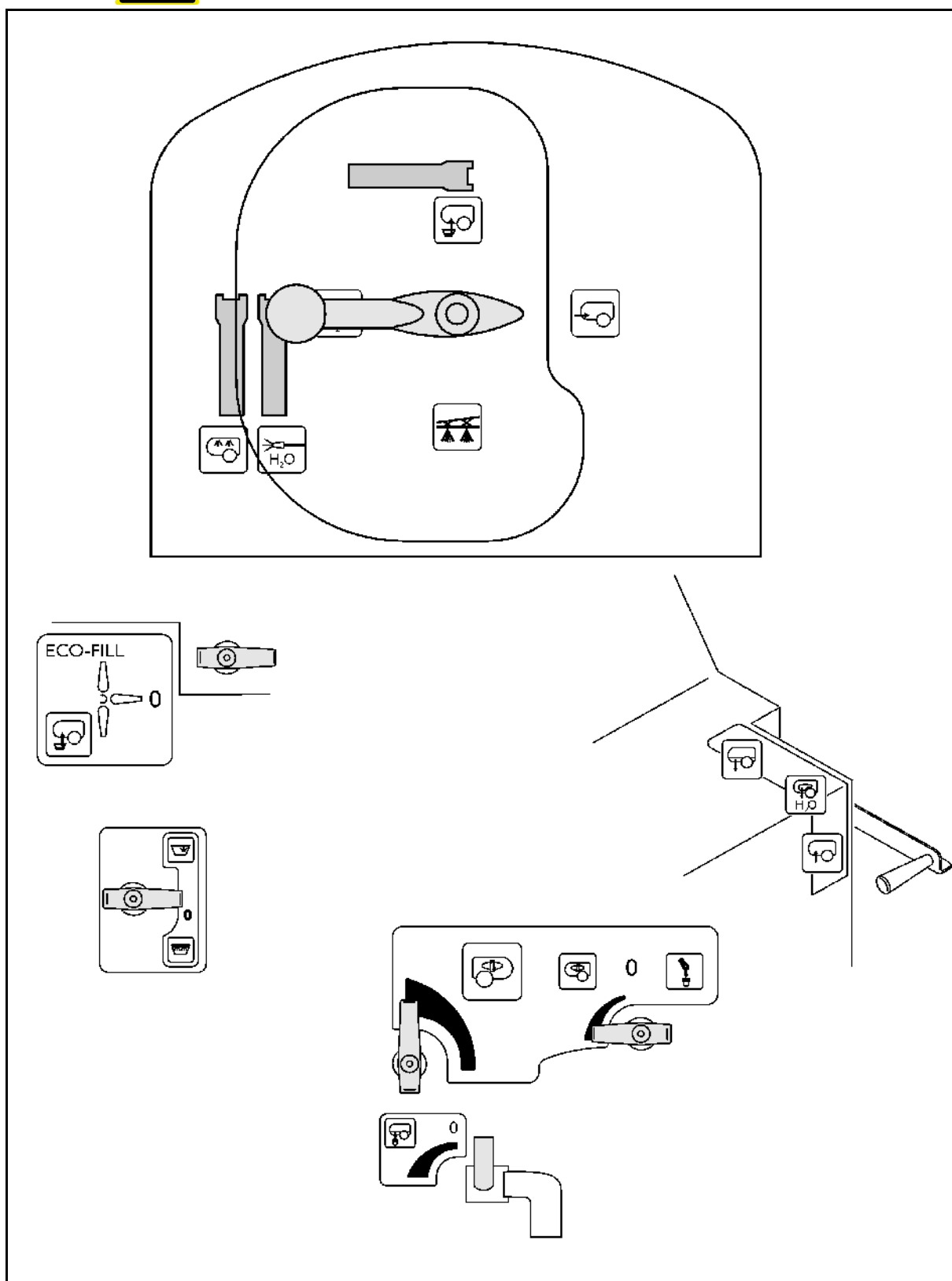


Fig. 108

8.1.8 Tank interior cleaning

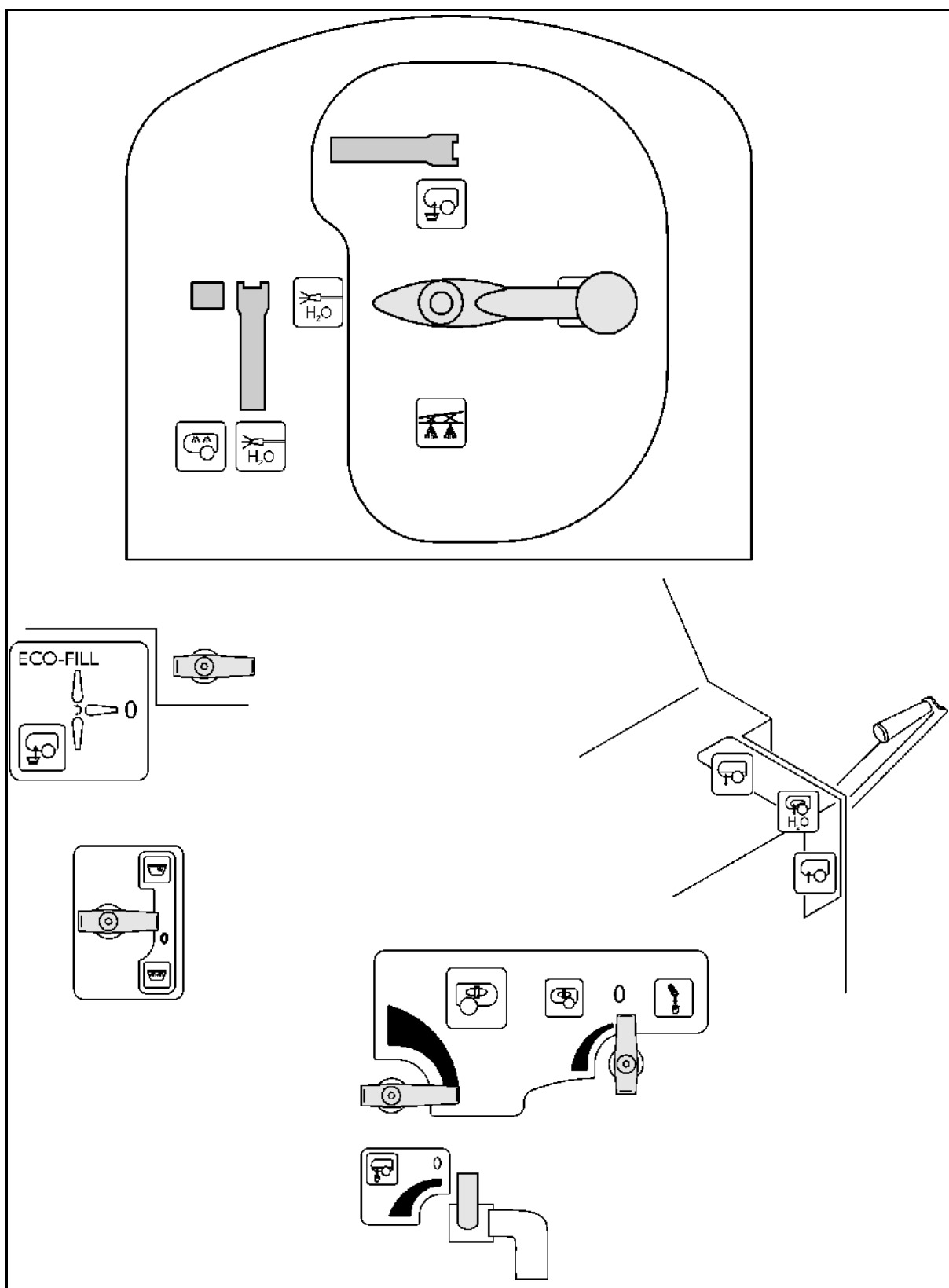


Fig. 109

8.1.9 Exterior cleaning

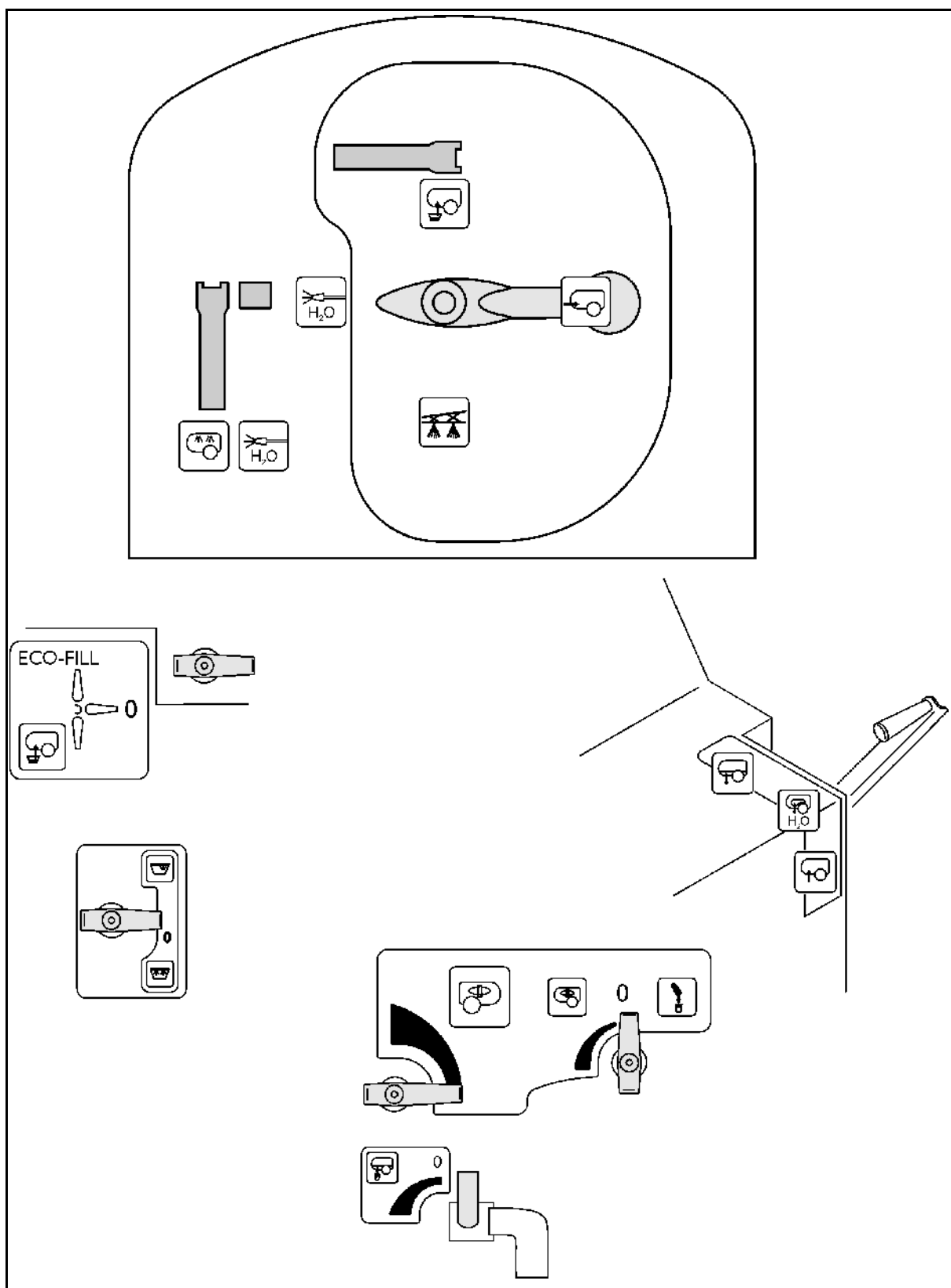


Fig. 110

9 Transport travel



Danger!

- Prior to any transport runs observe the chapter "Safety recommendation for the operator ", page 26.
- Transport travels with the Trail-Tron switched on are prohibited.
- Transport travels with locked control valve are prohibited. Always set the control valve on the tractor to the neutral position before any transport runs.
- Make use of the transport safety device to secure the folded sprayer boom in transport position against unintentional folding down.
- Make use of the transport safety device to secure the induction bowl when swivelled upwards into transport position against unintentional lowering of the induction bowl.
- Safety elements catch into the catching hooks and protect the ladder in the transport position against unintentional folding.



Important!

- Always ensure that the ladder is slid in and is locked in its proper end positions.
- Always ensure that the support jack has been elevated during operation or transport.



Danger!

Move the steering axle / -drawbar to the zero position (draw bar / wheels are in alignment with the machines longitudinal axis)!

- **Folding the tractor control valves:**

Actuate control valve 4 (hose mark blue) until the draw bar is in zero position (Fig. 111/1) Note the pointer (Fig. 111/1) with scale on the hydraulic ram!

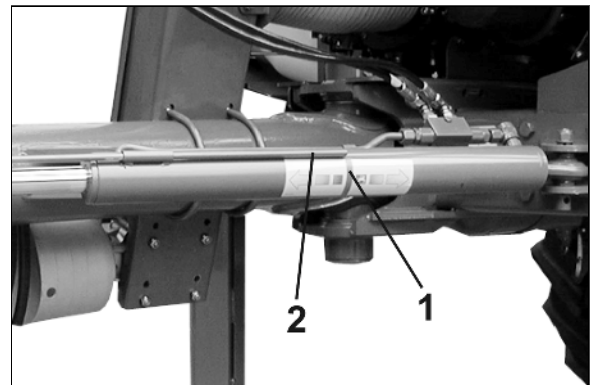


Fig. 111

- **professional- folding:**

For this proceed as follows on the **AMATRON⁺**:

1. Trail-Tron in manual operation
 2. Manually align steering axle /-draw bar
→ Trail-Tron automatically stops when the zero position has been reached.
 3. Switch off **AMATRON⁺**.
- **Steering drawbar: Shut the block tap (Fig. 112/3) on the hydraulic (position B).**

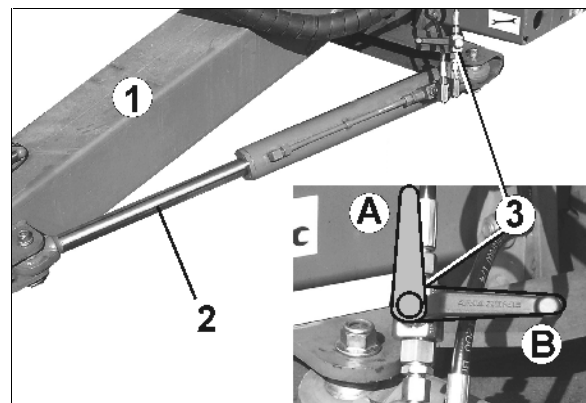


Fig. 112

9.1 Checks prior to any travelling



Important!

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

Before starting a run,

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

9.2 Checks after any travel



Important!

Instructions for the operator

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

10 Commissioning the machine



Danger!

- When commissioning the machine, please observe chapter "Safety tips for the operator, page 23.
- Observe the warning signs on the machine. The warning signs provide you with important tips for the danger free operation of the machine. Observing these tips benefits your own safety.



Danger!

Danger of machine tipping with angled steering draw bar, especially in very flooded terrain or on slopes!

Danger of tipping over when turning at the headlands with laden or partly laden machine with track follow-up steering draw bar due to shifted centre of gravity with turned draw bar. Especially great danger when driving down hill on slopes.

During the turning manoeuvre in the headlands drive in such a way and reduce the speed that you safely control the tractor and machine.



Tip!

During operation of the machine it is possible that the spray tank can scrub parts of the frame. This is detrimental to the durability of the tank!



Tip!

Open the block tap to operate the steering draw bar (/3) on the hydraulic ram (position A)!

10.1 Preparing spraying process



Important!

- The prerequisite for the proper 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 any faults immediately.
- Use all designed filters. Clean all filters regularly (please refer to chapter "Cleaning", page 150). 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 ensure 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", on page 67.

- Always clean the field sprayer before applying an other plant protective agent (please refer to chapter "Cleaning", on page 150).
- 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".

10.2 Preparing the spray mixture



Warning!

Always wear protective gloves and the proper protective clothing! The highest risk to be contaminated by the spray agent occurs when mixing the spray agents.



Important!

- In addition to the generally valid instructions listed here, note the product-specific procedures described in the plant protection agent application instructions.
- See the application instructions for the plant protection agent for the specified water and preparation quantities.
- Read the application instructions of the for the preparation and note the safety measures listed below!
- We recommend that you visit our website at www.Wirkstoffmanager.de on the Internet. Here you can calculate your filling and refilling quantities using a program.
- Carefully determine the required filling or re-filling quantity to avoid residual quantities at the end of the spraying process because environmentally friendly disposal of residual quantities is difficult.
 - To calculate the required refilling quantity for the last spray mixture tank filling, use the "Filling table for residual areas". To do this, deduct the technical, undiluted residual quantity from the spray rod from the calculated filling quantity!

For this see chapter "Filling table for residual areas", on page 129.

- Rinse spray agent containers which have been carefully emptied (e.g. by the can washing device) and pour the rinsed water into the spray mixture!

Procedure

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

10.2.1 Calculating the filling or refilling quantities



Important!

For the calculation of the required refilling amount for the last spray tank filling, use the table "Filling table for left over areas ", on page 129.

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 hectares of the area to be treated which can be sprayed with one tank filling when the tank can be emptied up to a surplus quantity of 20 litres?

Calculation formula and reply to question 1:

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

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

Calculation formula and reply to question 2:

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

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

10.2.2 Filling table for finishing off remaining field areas



Important!

To determine the required refilling amount for the last spray 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 84.



Tip!

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

Fig. 113

Example:

Remaining left over distance):	100 m
Spray rate:	100 l/ha
Working width:	21 m
Number of boom part section feed controls:	5
Residual amount spray line:	5.2 l

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

Necessary refilling quantity: $21 \text{ l} - 5.2 \text{ l} = 9.8 \text{ l}$

10.3 Filling with water



Important!

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



Caution!

When filling the suction port (chapter 8.1.7) always open the lid of the spray mixture tank.!

Specific weights of the individual liquids

Liquid	Water	Urea	AUS	NP-solution
Density [kg/l]	1	1.11	1.28	1.38



Important!

- Before 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 process", Fehler! Textmarke nicht definiert..
- 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.
- Attach the end of the filling hose at minimum 20 cm above the filling opening of the spray tank. The resulting free run out provides the best safety possible to prevent the spray agent from flowing back into the pipe circuit.
- Avoid the 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 tank bottom effectively prevents the formation of foam.
- Fill the spray tank only with inserted filling sieve.



Tip!

The preferred method of filling is on the edge of the field 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 128).
2. Fill the spray agent and clear water tank 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 using a folding or screw-on lid.

10.4 Inducting spray agents



Danger!

For inducting spray agents wear the protective clothing specified by the plant protective agent manufacturer!



Tip!

Usually the agitation remains engaged from when it is filled the spraying process is completed. Please follow the instructions of the spray agent manufacturer.



Important!

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

Induct the relevant **spray agent with the induction bowl** (Fig. 114/1) into the water of the spray mixture tank. A distinction is made here between the inducting of liquid and powdery agents or urea.

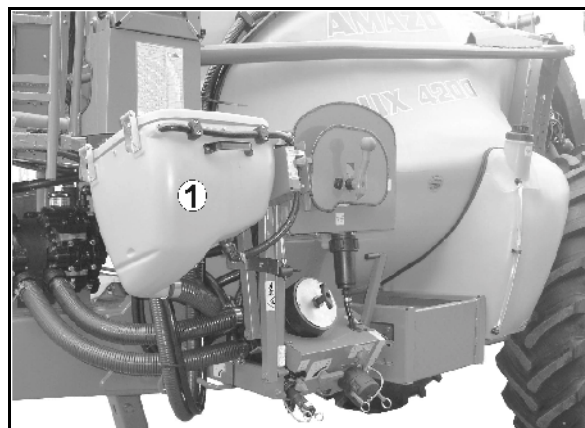


Fig. 114

Empty spray agent containers





Important!


- Carefully rinse empty spray agent containers, make them no longer usable, collect them and dispose of them in the appropriate manner. Never use them for other purposes.
- If there is only one spray mixture 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 tank-filling or when diluting the residual amount of the last spray tank-filling.

10.4.1 Inducting liquid agents

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

3. Suction device lever **E** in position .
4. Pressure device control **A** in position .

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

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

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

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

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

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

11. Pour in remaining quantity of water.

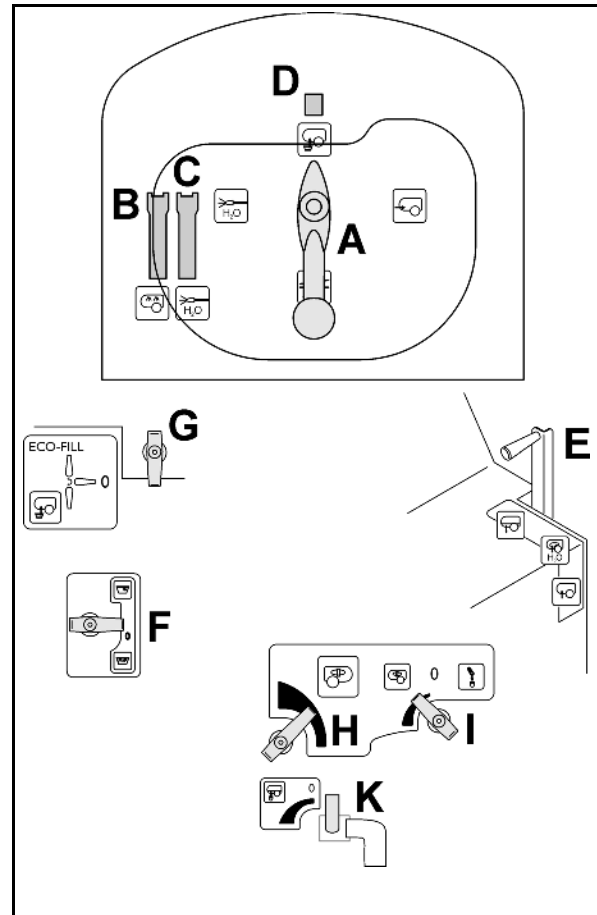






Fig. 115

10.4.2 Inducting powdered agents and urea



Important!

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

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

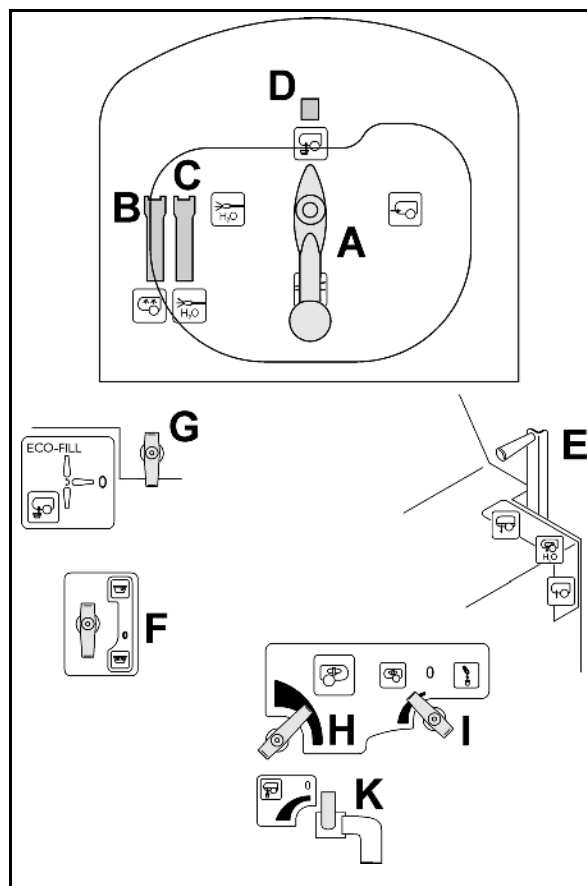




Fig. 116

10.4.3 Inducting with ECOFILL

1. Fill the spray mixture tank half with water en.
2. Suction device lever **E** in position .
3. Pressure device control **A** in position .
4. Open switch tap **D**.
5. Reversing tap **F** in position **0**.
6. Reversing tap **G** in position **ECO-Fill**.
7. Drive the pump. Set the pump speed of 400 R.P.M. and switch on agitator **H**. If necessary increase agitating intensity.
8. Reversing tap **G** in position **0**, when the desired quantity has been suctioned out of the ECO-Fill-container.
9. Close switch tap **D**.
10. Refill the remaining quantity of water.

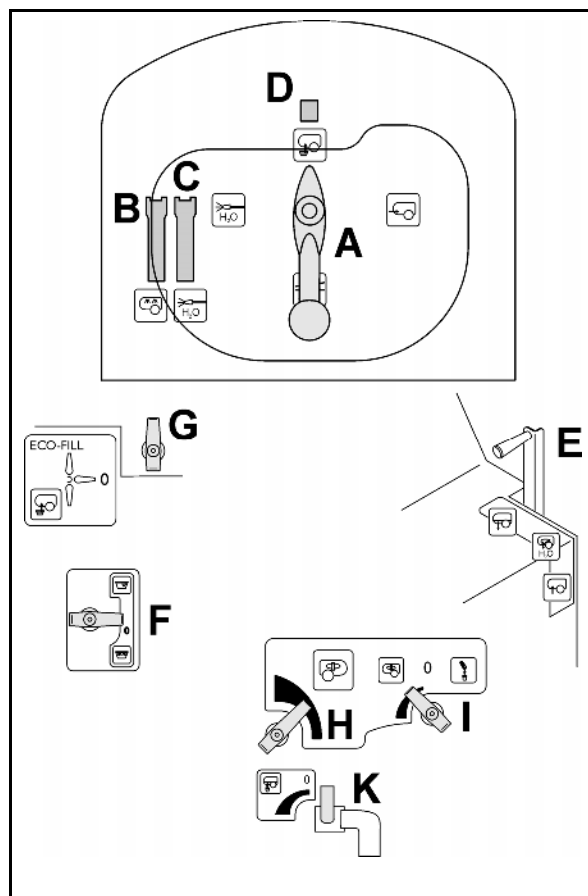






Fig. 117

10.4.4 Pre-cleaning the canister with the spray mixture

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

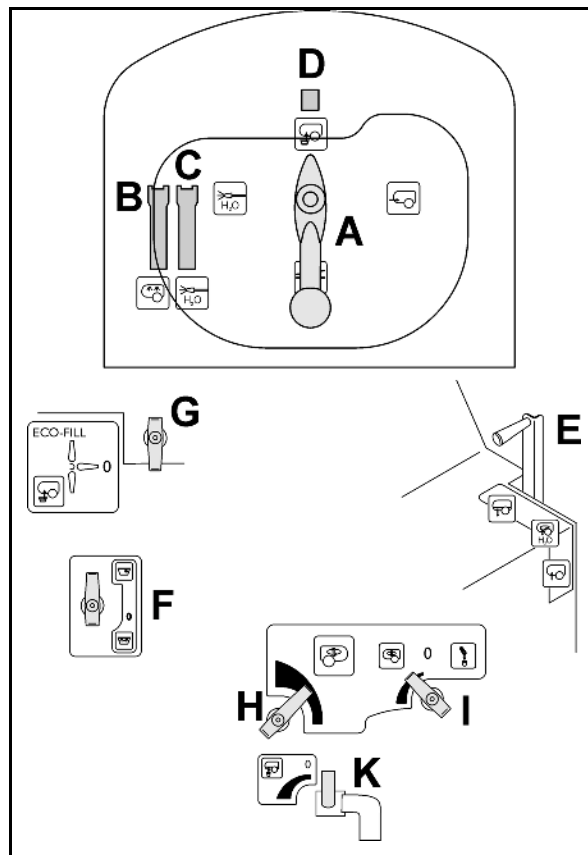


Fig. 118

10.4.5 Cleaning canister with rinse water

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



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



3. Reversion tap **F** in position



4. Reversion tap **G** in position



5. Drive pump. Set the pump speed to 400 R.P.M.

6. Open the lid of the induction bowl.

7. Slide the canister or another container over the canister flushing and press down for at least 30 seconds.

If another spray mixture has been sprayed beforehand, it will take some time until the rinse water is available at the nozzle.

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



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

10. Reversing tap **G** in position **0**.

11. Close switch tap **D**.

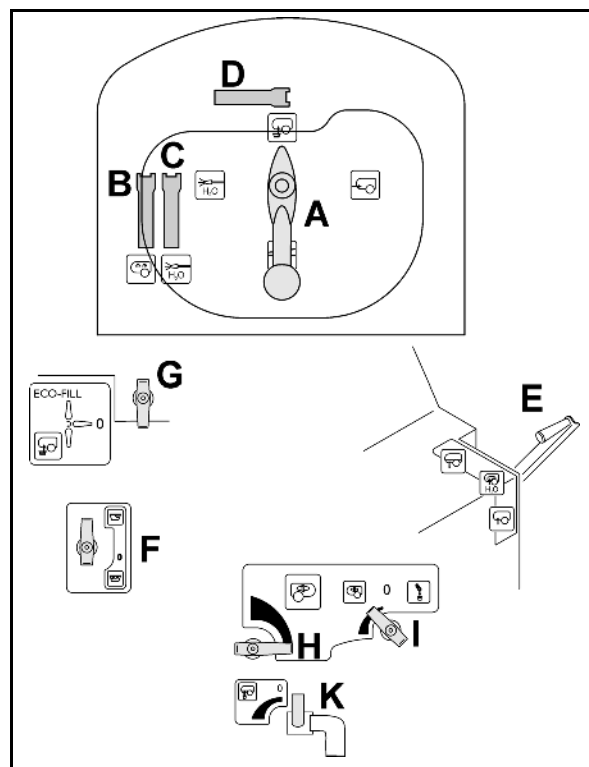


Fig. 119

10.5 Spraying operation

Special tips for the spraying process



Important!

- Check your field sprayer by performing a calibration
 - prior to starting operation in the season.
 - in case of deviations between the actual spray pressure and the spray pressure required according to the spray rate chart.
- Before commencing the spraying process accurately determine the required spray rate following the instructions of the plant protective agent manufacturer.
 - Before starting the spraying process, please enter the necessary spray rate (required rate) into **AMATRON⁺ / AMASPRAY⁺**.
 - **AMATRON⁺** sends a fault message and an audible alarm signal if the necessary spray rate is not maintained during the spraying process.
- Accurately maintain necessary spray rate [l/ha] during the spraying process,
 - 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 process 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 air mix-nozzles", on page 189.
- Prior to the spraying process 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 air mix-nozzles", on page 189.
- Choose a slow forward speed and a low spray pressure to avoid drifting loss!

Take additional measures for drift reduction at wind speeds of 3 m/s (please refer to chapter "Measures for drifting reduction", on page 189.

**Important!**

- Discontinue the spraying process at average wind speeds of above 5 m/sec. (leaves and thin branches are moving).
- Only switch on and off the sprayer boom only while 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 process constantly check the actual spray mixture 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 instruction manual **AMATRON⁺**.
- 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 litre", instruction manual **AMATRON⁺ / AMASPRAY⁺**.
- Thoroughly clean the suction filter, the pump, the valve chest and the spray lines the event of a weather-induced interruption of the spraying process. Please refer to on page 137.

**Tip!**

- Spray pressure and nozzle size influence the droplet size and the spray rate. The higher the spray pressure the smaller the droplet diameter of the sprayed spray mixture. Smaller droplets are more susceptible to an undesired 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 with the **AMATRON⁺ / AMASPRAY⁺**.



Tip!

- 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 the spraying process is completed. Please adhere to the recommendation of the agent manufacturers.
- The spray 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.

10.5.1 Spraying crop protection liquid



Important!

- Hitch the field sprayer to the tractor as instructed!
- Before starting the spraying process check the following machine data in the **AMATRON⁺**:
 - 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".
- Take the relevant measures if a fault message appears on the display of the **AMATRON⁺** during the spraying process and at the same time an audible alarm sounds. Please refer to faults listed on page 147.
- Check the indicated spray pressure during the spraying process.

Ensure that the indicated spray pressure by no means deviates more than $\pm 25\%$ from the intended spray pressure as indicated on the spray rate chart, e.g. when changing the spray rate 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 tank entirely (this is not applicable when finishing the spraying process). Refill the spray tank at a filling level of approx. 50 litres at the latest.
- After having finished the spraying process, at a filling level of approx. 50 litres,
 - the reversing tap spraying process / flushing in position "Flushing".
 - switch off the agitation.

Example:

Necessary spray rates:	250 l/ha
Intended forward speed:	8 km/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.
2. Adjust the agitation intensity (infinitely variable setting). Please refer to chapter "Agitator ", page 65.
3. Switch on the **AMATRON⁺ / AMASPRAY⁺** .
4. Fold out the sprayer booms.
5. Set the height of the spray boom (height between the nozzles and the crop) according to the spraying table referring to 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⁺ / AMASPRAY⁺** the value "Impulses per 100m ".
8. Check in the **AMATRON⁺** the values "max. pressure" and min. pressure" for the permissible spraying range of the spray nozzles fitted in the sprayer boom.
9. Enter the value "required rate" for the necessary spray rate into the **AMATRON⁺ / AMASPRAY⁺** or check the stored value.
10. Engage the PTO shaft and drive the pump with a nominal speed (540 R.P.M.
11. Select the suitable tractor gear and start moving.
12. Switch on the spraying process the **AMATRON⁺ / AMASPRAY⁺**.

10.5.2 Spraying operation

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



Tip!

At lower spray rates the pump speed can be reduced to save energy.

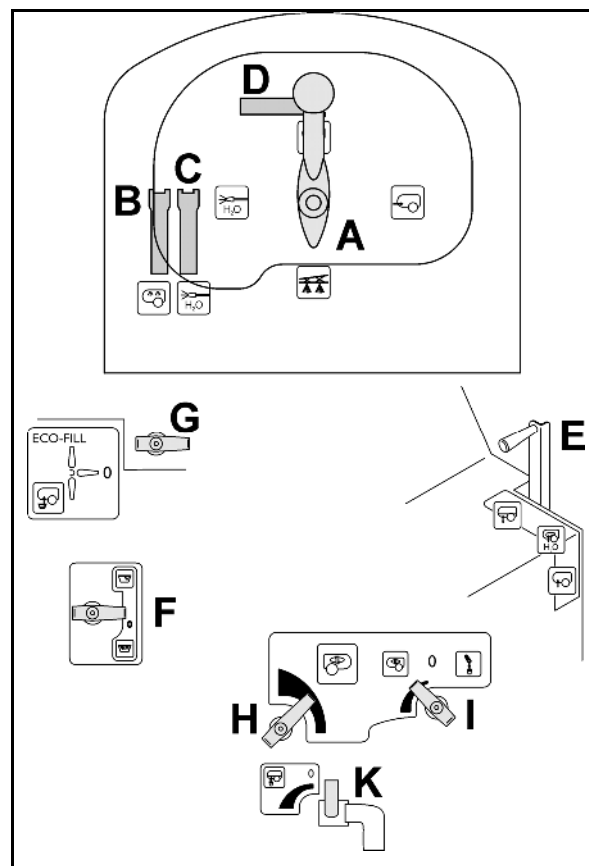


Fig. 120

Travelling to the field with agitator engaged

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



Important!

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

10.5.3 Measures for drift reduction

- Choose the early morning or the evening for the treatment (usually less wind).
- Choose larger nozzles and higher water rates.
- Decrease spray pressure.
- Maintain the correct boom operational height as the danger of drift increases with increased nozzle spacing.
- Reduce the forward speed (to below 8 k.p.).
- 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.

10.6 Excess amounts

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

- Residual amount in the spray tank when you finish the spraying process.
- Technical residual amount, which still remains in the spray tank, the suction device and the spray line in case of an obvious spray pressure drop. The suction device consists of the components suction filter, pump and pressure regulator. For the values for the technical excess amounts of the individual components from the see the chapter "Technical specifications", page 84. The residual amounts of the individual components have to be added.

10.6.1 Removal of residual amounts



Important!

- Note that the residual amount in the spray lines will be sprayed in undiluted concentration. Always spray these residual amounts on a non-treated area. For the required travel distance for spraying this undiluted residual amount see the chapter "Technical specifications – spray lines", page 84. The residual amount of the spray line depends on the sprayer boom working width.
- When emptying the spray tank, switch off the agitation if the residual amount in the spray tank is only 50 litres. With the agitation switched on, the technical residual amount would increase compared to the values indicated.
- Measures for personal protection apply when emptying excess amounts. Please observe the recommendation given on crop protection agents by the manufacturer and wear appropriate protective clothing.
- Dispose of the collected spray mixture-residual amount according to applicable legal requirements. Collect spray mixture-residual amounts in the proper containers. Let the spray mixture residual amounts dry up. Dispose of the spray mixture residuals at the required waste disposal point.

Dilute the residual amount in the spray tank and spray the diluted residual amount when you have finished the spraying process





Important!

When you have finished the spraying process, dilute and spray the residual amount intermittently.

Proceed as follows:

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

1. Switch off spraying process in the **AMA-TRON⁺**.
2. Drive the pump, pump nominal rev. speed 540 R.P.M.
3. Agitator(s) **H, I** in pos **0**.
4. Suction device lever **E** in position .
5. Pressure device control **A** in position  Cleaning.
6. Open switch tap **B**.
7. Again close the switch tap **B** after 15 seconds.

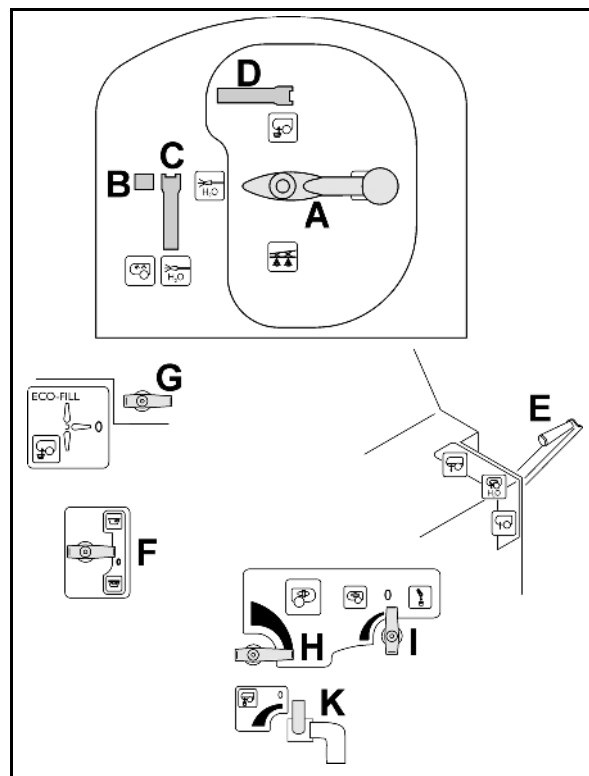




Fig. 121

8. Suction device lever **E** in position .
9. Pressure device control **A** in position .
10. At first spray the undiluted residual amount in the spray line on to an **untreated leftover area**.
11. Then spray the diluted residual amount also on to an **untreated leftover area**.
12. Switch the agitator(s) **H, I** to position **O**, when the residual amount in the spray mixture tank is only 100 litres.
13. Repeat the steps 1 to 13 for a second time (if necessary for a third time).

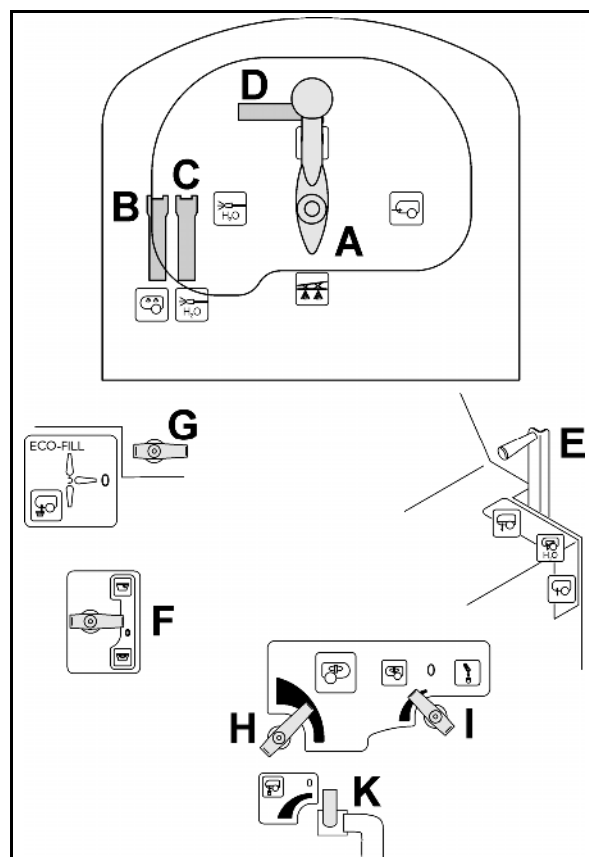


Fig. 122

Drain off the technical residual amounts

14. Place the proper collecting container underneath the outlet opening of the suction device.

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



16. Agitator lever **I** in position



17. Open stop tap **K** and drain the technical residual amount off into the proper collecting container.

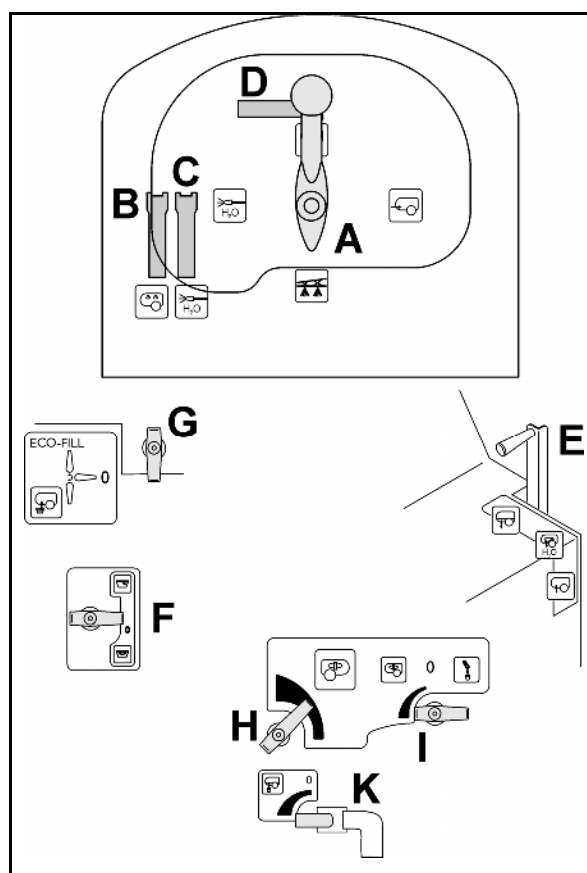


Fig. 123

11 Malfunction

Fault	Cause	Remedy
Pump does not suction	Stoppage on the suction side (Suction filter, Filter insert, Suction hose).	<ul style="list-style-type: none"> Remove the stoppages.
	The pump draws air.	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Suction filter, clean filter insert.
	Jammed or damaged valves.	<ul style="list-style-type: none"> Replace the valves.
	Pump draws air, can be noted by air bubbles in the spray tank.	<ul style="list-style-type: none"> Check hose joint on suction hose for leakage.
Knocking of the spraying cone	Uneven delivery by pump.	<ul style="list-style-type: none"> Check suction- and pressure-side valves and replace if necessary (please refer to on page 180).
Oil-spray agent mixture in the oil filler or obvious oil consumption	Pump diaphragm defect.	<ul style="list-style-type: none"> Replace all 6 diaphragms (please refer to Seite 182).
AMATRON⁺ : The required input application rate has not been reached.	High forward speed, low pump rev. speed;	<ul style="list-style-type: none"> Reduce the forward speed and increase the pump drive rev. speed until the fault message and the alarm stops sounding
AMATRON⁺ : The permissible spray pressure range inside the spray nozzles fitted in sprayer boom has been exceeded	Change the given forward speed, which effects on the spray pressure	<ul style="list-style-type: none"> Change the forward speed to return to the intended forward speed range which you have determined for the spraying process.

12 Maintenance, repair and care

The following will provide you with information regarding cleaning, maintenance and repair work on the machine. A prerequisite for the efficient operation of the trailed sprayer is performing maintenance work at regular intervals according to the maintenance work check list.



Danger!

- When performing maintenance and service, observe the safety notices, in particular on page 28!
- Maintenance or repair work below elevated moving machine parts must only be carried out when these machine parts have been safeguarded against unintentional lowering with the appropriate tools.



Important!

- Regular and proper maintenance will keep your machine in proper operational condition for a long time and will prevent early wear. Regular and appropriate maintenance is a prerequisite for our warranty terms.
- Only use original -**AMAZONE**- spare parts (please refer to chapter "Spare parts and wearing parts and auxiliary parts", page 15).
- Only use original - **AMAZONE**- hoses and for fitting always hose clamps made from stainless steel V2A.
- Special knowledge is the prerequisite to perform inspection and maintenance work. This knowledge is not supplied in this operator's manual.
- Be environmentally aware when doing cleaning and maintenance work.
- Follow the legal regulation for the disposal of lubricating systems, as e.g. oil and grease. Also parts which have been in contact with these materials are subject to these legal requirements.
- Never exceed a greasing pressure of 400 bar when using high pressure grease guns.

**Important!**

- **The following is always prohibited**
 - drilling on the frame or the chassis.
 - re-drilling existing holes on the frame or the chassis.
 - welding on bearing parts.
- **Take all necessary safety measures, e.g. covering lines or dismantling lines on especially critical places**
 - for welding, drilling and grinding work.
 - when working with cutter wheels near plastic lines and electric cables.
- **Before any repair work the sprayer should thoroughly be cleaned with water.**
- **Repair work on the field sprayer should always only be conducted when the pump is not running.**
- **Repair work inside the spray mixture tank may only be conducted after a thorough cleaning. Never climb into the spray mixture tank!**
- **Always disconnect all machine cables and the electric power cable from the onboard computer when performing care and maintenance work.**

12.1 Cleaning



Important!

- Carefully check the brake-, air and hydraulic hose lines!
- Never treat brake-, air- and hydraulic hoses with petrol, benzene, paraffin or mineral oils.
- Grease the machine after any cleaning work, particularly after cleaning with a high pressure / steam jet cleaner or fat soluble agents.
- Observe the legal requirements for the handling and disposal of cleaning agents.

Cleaning by using a high pressure cleaner / steam jet



Important!

- Thoroughly the following instructions when using a high pressure cleaner / steam jet for cleaning work:
 - Do not clean any electrical components.
 - Do not clean any chromium-plated components.
 - Never point the cleaning jet of the cleaning nozzle of the high pressure cleaner / steam jet directly at grease or bearing points.
 - Always ensure there is a minimum distance of 300 mm between the cleaning jet of the high pressure cleaner or steam jet and parts of the machine.
 - Follow the safety notices required by law for operating with high pressure cleaners.

Cleaning the machine







Important!

- Let the materials react for as short a time as possible, e. g. by cleaning daily when finishing spraying. The spray mixture should not be left without good reason for any length of time in the sprayer tank, e. g. not overnight.

Service life and reliability of the field sprayer greatly depends on contact time of the crop protection agents with the materials of the field sprayer.

- Always clean the field sprayer before spraying another crop protection agent.
- Dilute the residual amount in the spray mixture tank and spray the diluted residual amount (for this, please refer to chapter "Residual amounts", on page 143).
- Before thoroughly cleaning the field sprayer, pre-clean the field sprayer while still in the field.
- After every cleaning of the sprayer, dispose of any cleaning residues in an environmentally friendly manner.
- 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 the paragraph "Maintenance"). Flush the spray lines without spray nozzles.

12.1.1 Cleaning the sprayer with an empty tank

1. Fill the spray mixture tank with approx. 400 l water.
2. Drive the pump approx 400 R.P.M.
3. Switch on agitators **H, I**.
4. Suction device lever **E** in position .
5. Pressure device control **A** in position .
6. Open switch tap **B**.
7. Close switch tap **B** after 15 seconds.
8. Suction device lever **E** in position .
9. Pressure device control **A** in position .
10. At first spray the undiluted residual amount in the spray line on to an **untreated remnant area**.
11. Then spray the diluted residual amount also on to an **untreated remnant area**.
12. Switch off the agitator(s) **H, I**, when the residual amount in the spray mixture tank is only 100 litres.
13. Repeat the steps 1 to 12 for a second time (if necessary for a third time).
14. Clean the suction filter. Please refer to chapter "Cleaning the suction filter " chapter.12.1.4.

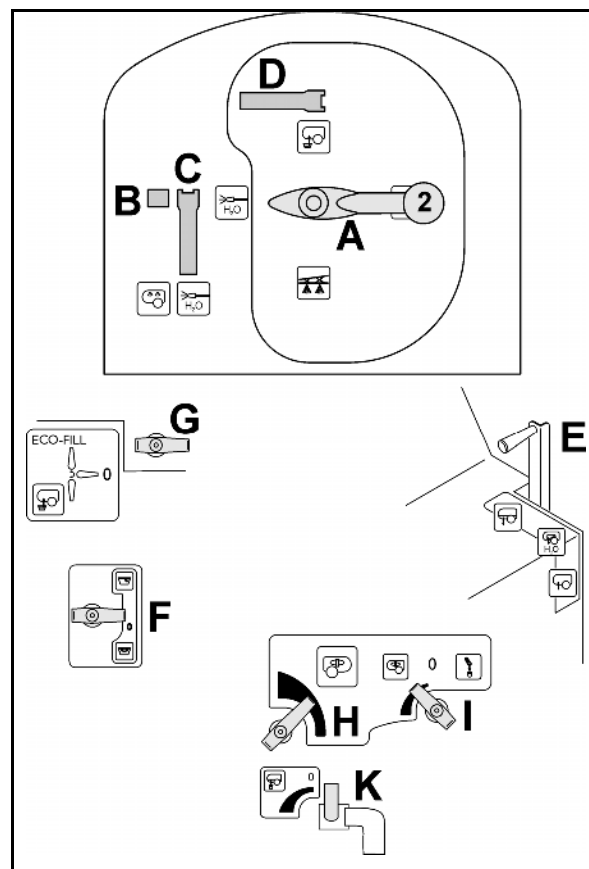


Fig. 124

12.1.2 Cleaning the sprayer with a filled tank





Important!

- Thoroughly clean the suction filter, the pump, suction device and the spray lines if there is a weather-induced interruption of the spraying process.

Clean in that area with clear water from the rinse water tank.

- Bear in mind that the residual amount in the spray line is still sprayed in an undiluted concentration. This residual amount must always be sprayed onto an area that has not yet been treated. See chapter "Technical specifications – spray line", page 84" on the required travel distance for spraying this undiluted residual amount.

- Switch off spraying on the **AMATRON⁺**.
- Switch off agitator **H** and **I**.
- Suction device control **E** in position 
- Pressure device control **A** in position 
- Drive pump, set the pump rev. speed 400 R.P.M.
- First spray the undiluted residual amount in the spray line on to an untreated remnant area.
- 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 onto an untreated area.
- For cleaning the agitator lines briefly switch on the agitator **H**.
Only for a short time – otherwise the tank contents would be diluted!

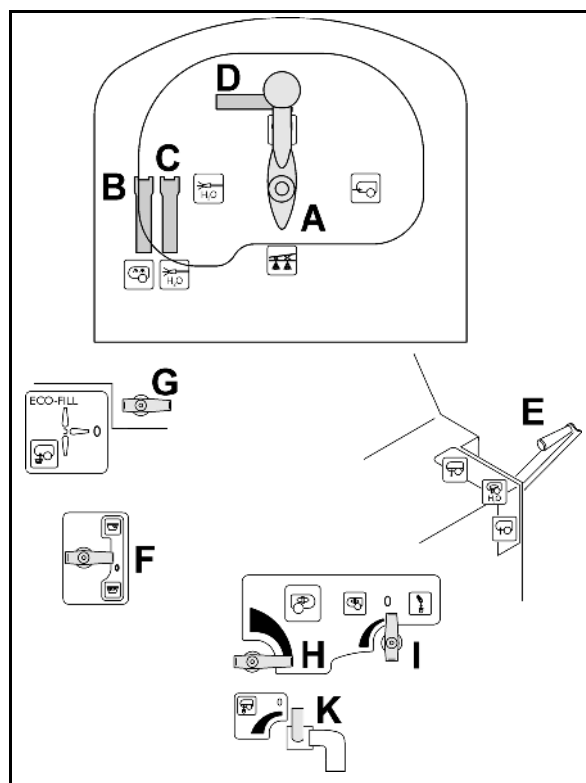


Fig. 125

12.1.3 Storing for the winter or prolonged downtimes

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



Important!

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

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



Important!

Assemble the pressure hose only when starting the next operation.

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



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 pressure gauge and electronic options free from frost.**

12.1.4 Cleaning the suction filter



Important!

Clean the suction filter (Fig. 126) daily after the spraying process.

1. Drive the pump, set the pump speed 300 R.P.M.
2. Suction device control **E** in position .
Attention: Ensure that the Kamlock-coupling must be fitted onto the suction port.
3. Pressure device control **A** in position .
4. Switch off agitator(s) **H, I** (position 0).
5. Slacken the thumb nut on the suction filter (Fig. 126/1).
6. Remove the lid (Fig. 126/2).
7. Pull out the filter insert (Fig. 126/3) and clean with water.
8. Check the O-rings (Fig. 126/4) for damage.
9. Re-assemble the suction filter in reverse order.



Important!

Ensure the correct fitting of the O-rings (Fig. 126/4).

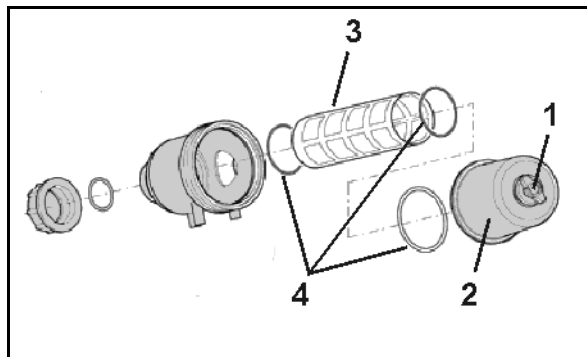


Fig. 126

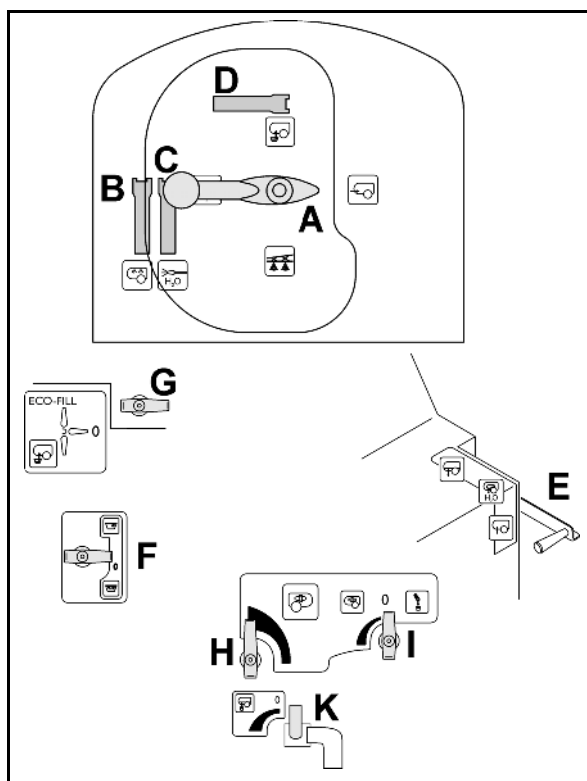


Fig. 127

12.2 Greasing prescription



Important!

Grease all grease nipples (keep seals clean).

Grease / lubricate the machine in the intervals indicated (operating hours – h).

The lubricating points on the machine are identified with a decal (Fig. 128).

Carefully clean the grease nipples and grease gun before the grease is applied, so that no dirt penetrates into the bearings. Carefully remove the used grease from the bearings and replace with new grease!

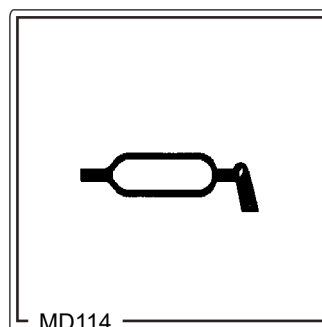


Fig. 128

Lubricants

For lubrication work use lithium saponified multipurpose grease with EP additives:

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

12.2.1 Overview – lubricating points

Fig. 129:	Lubricating point	Interval [h]	Number of lubricating points	Kind of greasing
1	Lifting rams	100	4	Grease nipples
2	Rigid axle	See on page 158		
	Tracking steering axle			
3	Hydraulic ram for support jack	100	2	Grease nipples
4	Draw bar bearing	50	2	Grease nipples
5	Hydr. ram of the hydraulic suspension	100	4	Grease nipples
6	Parking brake	100	1	Apply grease to ropes and deflection pulley. Grease the spindle using the grease nipples.
7	Pulling eye	50	1	Grease
8	PTO shaft	see on page 157		

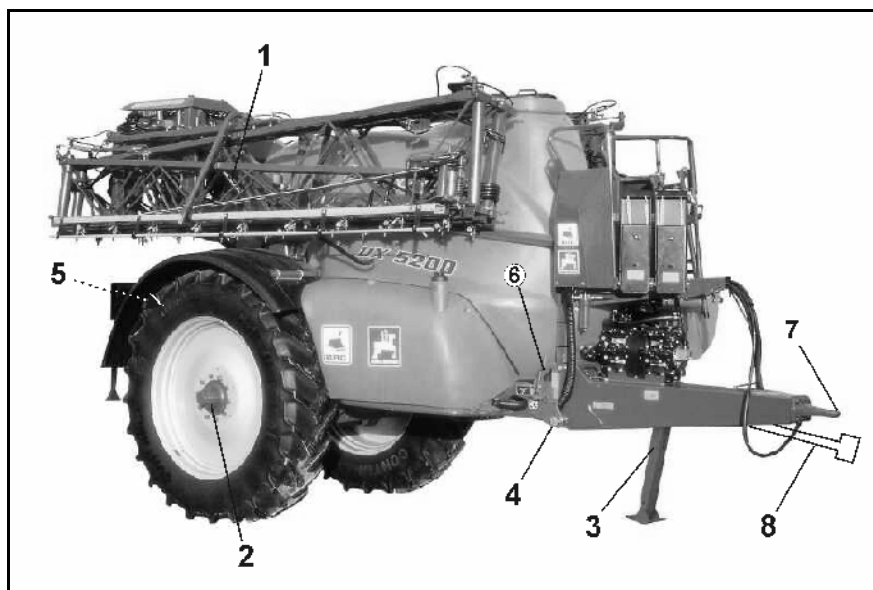


Fig. 129

Greasing the PTO shaft

When the spreader is used in winter, the guard tubes must be greased to prevent it from freezing solid.

Also follow the shaft manufacturer's assembly and maintenance instructions on the PTO shaft.

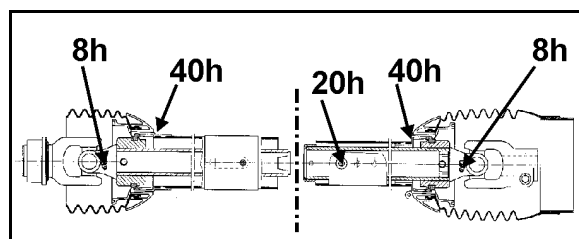


Fig. 130

12.2.2 Greasing the axle

Fig. 131: Tracking axle

Fig. 132: Standard axle

	Lubrication with BPW –special long life grease ECO- LI 91	after 40 opera- tional hours	every 200 op- erational hours	every 1000 operat. hours (annually)
1	Steering knuckle bearing up- per and lower	X		
2	Locating cylinder heads on steering axle		X	
3	Brake shaft bearing outer and inner		X	
4	Slack adjustment			X
5	Automatic slack adjustment ECO-Master			X
6	Replace grease in the wheel hub bearing, Taper roller bear- ings when worn			X

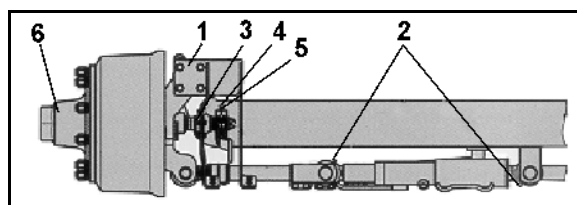


Fig. 131

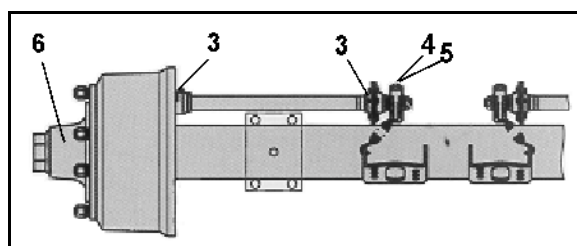


Fig. 132

Locating cylinder heads on the steering axles

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

Brake shaft bearing, outer and inner

Caution! Ensure that no grease or oil can penetrate into the brake. Depending on the design, the cam bearing may not be sealed at the brake side.

Only use lithium saponified grease with a drop point above 190° C.

Automatic slack adjuster ECO-Master

Whenever the brake lining is replaced:

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

Changing the grease of the wheel hub bearings

1. Safely jack up the vehicle and release the brake.
2. Remove wheels and rod caps.
3. Remove the split pin and unscrew the axle nut.
4. Use a proper gear puller to remove the wheel hub with brake drum, the taper roller bearings and the seals from the stub axle.
5. Mark the removed wheel hubs and bearing cages to ensure that they are not confused when fitted again.
6. Clean the brake, check for wear, ensure that it is in ordinary condition and check for function, replace worn parts.
Keep the interior of the brake free of grease and dirt.
7. Carefully clean the wheel hubs inside and outside. Completely remove the old grease. Carefully clean bearings and seals (diesel oil) and check for reusability.
Before mounting the bearings slightly grease the bearing seating and assemble all parts in the opposite order. Carefully drive the parts on the force fits without tilting and avoid damage by using tube bushings.
Prior to fitting, apply grease to the bearings, the wheel hub hollow space between the bearings and the dust cap. The grease should fill approx. one quarter to one third of the space in the fitted hub.
8. Fit the axle nut and carry out the setting of bearings and brake. Finally carry out a function check and a test run and remedy any faults noted.



Important!

For lubricating the wheel hub bearings, only use BPW special long life grease with a drop point above 190°C.

The wrong grease and too much grease would cause damage.

Mixing of lithium saponified and sodium saponified grease may cause damage due to incompatibility.

12.3 Maintenance and care - Review



Important!

- Carry out maintenance at the shortest intervals indicated.
- Give priority to the intervals, running times and maintenance intervals stated in the documentation possibly supplied by other manufacturers.

After the first travel under stress

Component	Maintenance work	see page	Authorized repair centre
Wheels	• Check wheel nuts	165	X
	• Check wheel hub bearing clearance, readjust if necessary	166	

Daily

Component	Maintenance work	see page	Authorized repair centre
Pump	<ul style="list-style-type: none"> • Checking oil level • Cleaning or flushing 	177	X
Oil filter (only professional folding)	• State check	175	
Spray mixture tank	• Cleaning or flushing	151	X
Suction filter		155	
Self cleaning pressure filter		68	
Hose filter for spray circuits (if fitted)		185	
Spraying nozzles		184	
Air tank	• Drain	168	
Hydraulic hoses	<ul style="list-style-type: none"> • Check for faults • Check for tightness 	173	X
Electric traffic lights	• Replace of bulbs	177	
Wheels	• Check wheel nuts for firm seating.	170	
	• Check air pressure.		
Parking brake	• Check braking power with the parking brake applied	169	

Monthly / 50 hours of operation

Component	Maintenance work	see page	Authorized repair centre
Pump pressure reservoir	<ul style="list-style-type: none"> Check the air pressure 	186	X

Quarterly / 200 hours of operation

Component	Maintenance work	see page	Authorized repair centre
Two circuit service air brake system	<ul style="list-style-type: none"> Check for tightness 	168	X
	<ul style="list-style-type: none"> Check pressure in the air reservoir 		
	<ul style="list-style-type: none"> Check brake cylinder pressure 		
	<ul style="list-style-type: none"> Visual inspection of brake cylinder 		
	<ul style="list-style-type: none"> Joints on brake valves, brake cylinders and brake linkage 	167	
	<ul style="list-style-type: none"> Brake settings on the slack adjuster 	166	
	<ul style="list-style-type: none"> Check brake linings 		
Pumps	<ul style="list-style-type: none"> Check drive Adjust belt tensioning 	179	X
Wheels	<ul style="list-style-type: none"> Check clearance of wheel hub bearings 	166	X
Hose filter	<ul style="list-style-type: none"> Clean Check the filter inserts, replace if necessary 	185	
Axle carrier of the hydro-pneumatic suspension	<ul style="list-style-type: none"> Check nuts for firm seating 	171	

Annually / 1000 Operating hours

Component	Maintenance work	see page	Authorized repair centre
Pump	• Perform an oil change every 500 hours of operation, or at least once a year	178	X
	• Check valves, change if necessary	180	
	• Check piston diaphragms and replace if necessary	181	
Oil filter	• Replace	175	X
Flow and return flow meter	• Calibrating the flow meter	183	
	• Check return flow meter		
Nozzles	• Calibrate the field sprayer and check the lateral. If necessary, replace worn nozzles	184	
Automatic slack adjuster	• Brake settings	167	X
	• Function check		

12.4 Draw bars



Danger!

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



Important!

Grease the draw bar at regular intervals

Straight draw bar



Important!

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

No wear can be allowed on the coupling ring which increases the coupling ring diameter of up to 1.5 mm.

In case of more wear, replace the wearing bushing of the coupling ring in a timely manner.

Hitch draw bar



Important!

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

In case of more wear, replace the ball coupling of the ring in a timely manner.

12.5 Axle and brake system



Important!

After an appropriate run-in time of the service brake system, we recommend that you re-adjust the hitched tractor and trailed sprayer to achieve an optimum braking behaviour and minimum wear on the brake linings. This work should be done at an authorized repair centre.

Run in times:

- With majority of runs on regular roads after approx. 1000 to 2000 km.

The indicated run-in times are experimental values.

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

In order to avoid any problems with the brake system, adjust all vehicles according to the EC directive 71/320 EU.!



Warning!

- Repair work and settings on the service brake system must only be carried out by skilled professionals.
- Special care is required when performing welding-, soldering and boring work near brake hoses.
- Always perform a brake test after any setting and repair work on the brake system.

General site check



Warning!

Carry out a general site check of the brake system. Observe and check the following conditions are present:

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

12.5.1 Maintenance work

Fig. 133: Tracking axle

Fig. 134: Standard axle

	Maintenance work
1	Check wheel nuts for tightness, retighten if necessary, torque 560 Nm.
2	Check wheel hub bearing clearance, readjust if necessary
3	Brake lining check
4	Check brake adjustment on the slack adjuster, readjust if necessary
5	Check the brake adjustments on the automatic slack adjuster, readjust, if necessary
6	Function check on automatic slack adjuster

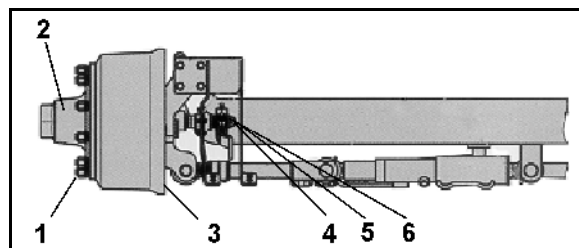


Fig. 133

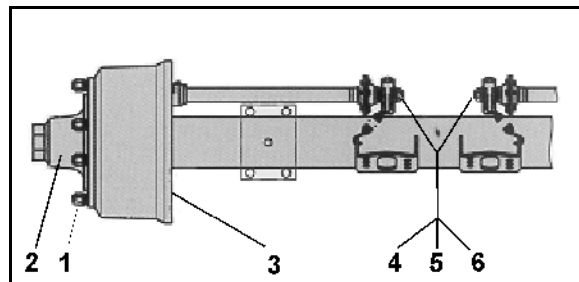


Fig. 134

Checking the wheel hub bearing clearance

To check the wheel hub bearing clearance, lift the axle until the tire is loose. Release the brake. Insert lever between tire and ground and check the clearance.

When a bearing clearance is discernable:

Readjust the bearing clearance

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

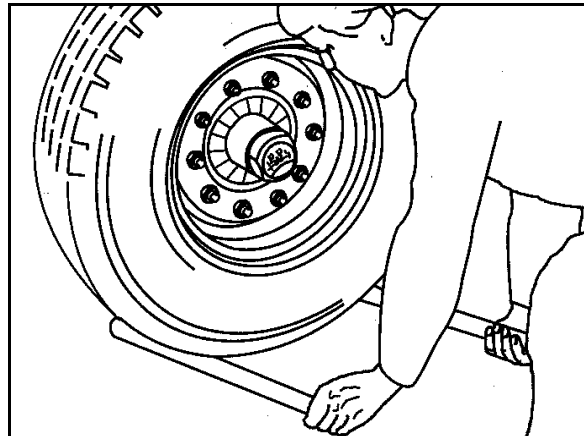


Fig. 135

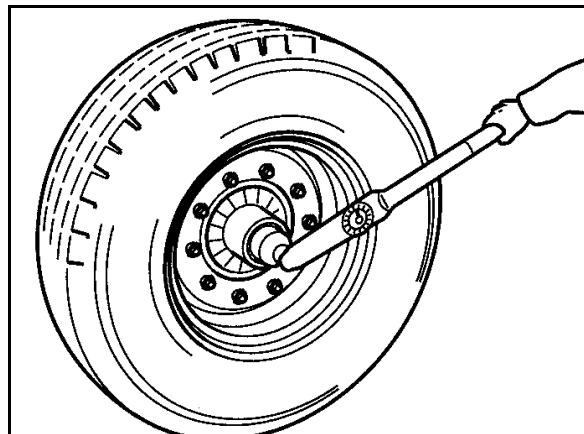


Fig. 136

Inspection of brake linings

Open the inspection hole (Fig. 137/1) by pulling out the rubber plug (if present).

With a remaining lining thickness of

- | | | |
|----|-----------------|------|
| a: | riveted linings | 5 mm |
| | (N 2504) | 3 mm |
| b: | bonded linings | 2 mm |

replace the brake lining.

Reinsert the rubber strap.

Adjustment of the brake

Check the wear and function of the brakes at regular intervals and re-adjust if necessary. When you use approx. 2/3 of the max. piston stroke at a full braking, re-adjustment is required. To do this, jack up the axle and protect it against unintentional movement.

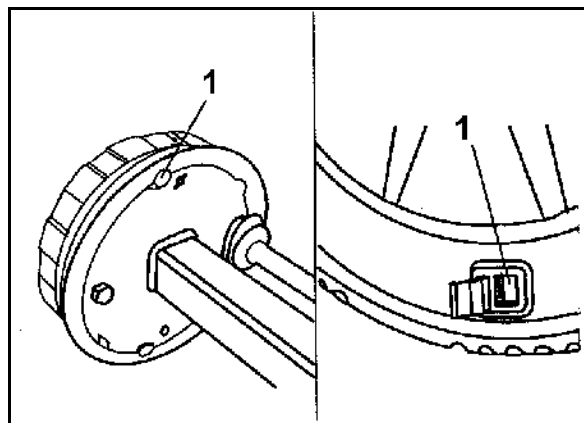


Fig. 137

Settings on the slack adjuster

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

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

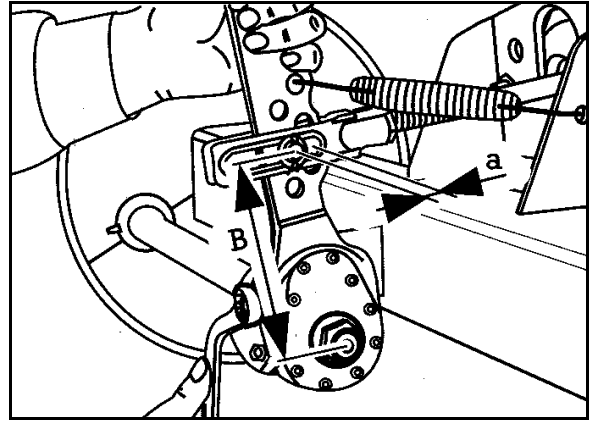


Fig. 138

Setting on the automatic slack adjuster

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

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

Function check for automatic slack adjuster

1. Remove the rubber seal cap.
2. Use the ring spanner to turn back the setting screw (arrow) by about $\frac{3}{4}$ turn in counter clockwise direction. A dead range of at least 50 mm at a lever length of 150 mm is required.
3. Repeatedly actuate the brake lever by hand. Care for a smooth automatic re-adjustment with an audible catching of the denture clutch. At the return stroke the setting screw slightly turns in clockwise direction.
4. Mount the seal cap.
5. Lubricate by using BPW-special long-term ECO_Li91.

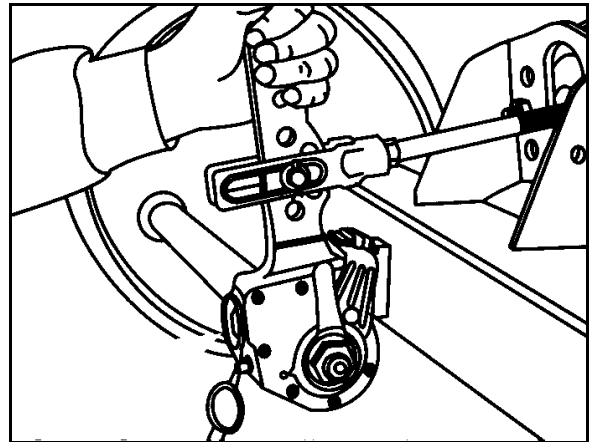


Fig. 139

Air reservoir

**Important!**

Drain the air reservoir daily.

Fig. 140/..

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

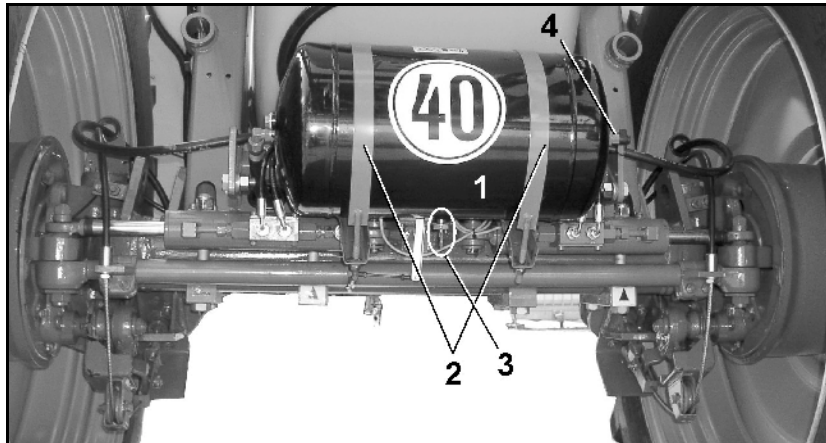


Fig. 140

1. Pull the drain valve (3) the ring to the side until no water can still escape from the air reservoir (1).
- Water runs out of the drain valve (3).
2. Remove the drain valve (3) from the air reservoir and clean the air reservoir if you note any dirt.

Inspection recommendation for two circuit service brake system

1. Leak test

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

2. Checking the pressure in the air reservoir

1. Connect a pressure gauge with the inspection port of the air reservoir.

Required value 6.0 to 8.1 + 0.2 bar

3. Checking the brake cylinder pressure

1. Connect the pressure gauge with the inspection port of the brake cylinder.

Required values: brake not engaged 0.0 bar

4. Visual inspection of the brake cylinders

1. Check the dust collars or the bellows (Fig. 140/5) for damage.
2. Replace defective parts.

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

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

12.6 Parking brake



Important!

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

Re-adjust the parking brake,

- if three quarters of the spindle must be elongated to apply the parking brake firmly.
- if the brakes are equipped with new linings.

Re-adjustment of parking brake



Important!

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

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

12.7 Tires / wheels



Important!

- Check at regular intervals
 - the firm seating of the wheel nuts.
 - Tyre pressure (please refer to chapter Fehler! Verweisquelle konnte nicht gefunden werden.).
- Only use tires and rims which we recommend. See chapter on page 48.
- Repair work on the tires must only be carried out by skilled professionals with the appropriate fitting tools!
- Fitting tires requires sufficient knowledge and appropriate tools!
- Only apply the jack at the places indicated!

12.7.1 Tyre air pressure



Tip!

- The required air pressure in the tires depends on
 - the tire size.
 - the tire load capacity.
 - the forward speed.
- The lifespan of tires is reduced by
 - overload.
 - too low a tire air pressure.
 - too high a tire air pressure.



Important!

- Check the tire air pressure when tires are cold, before starting to travel, at regular intervals, see on page 48.
- The air pressure difference in the tires of one axle must not exceed 0.1 bar.
- The tire pressure may increase by 1 bar after travelling at high speeds or in warm weather. Under no circumstances should you reduce the tire air pressure, as it would be too low when the tire cools down.

12.7.2 Fitting wheels



Important!

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

12.8 Axle carrier of the hydro-pneumatic suspension

- Check that nuts are tight (Fig. 142/1).

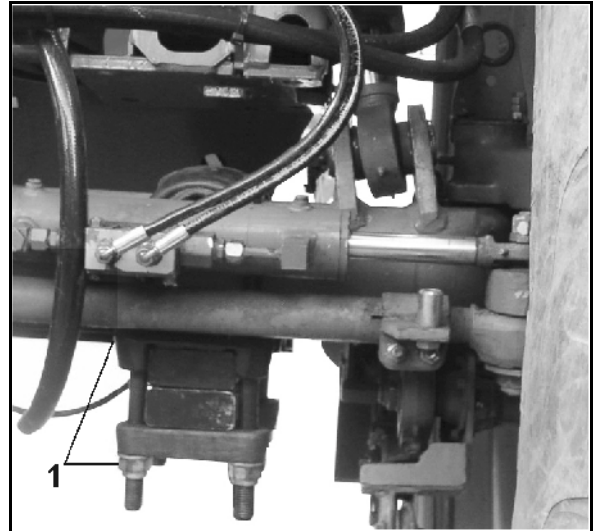


Fig. 141

12.9 Hydraulic system



Danger!

- Only an authorized repair centre is permitted to carry out repair work on the hydraulic system.
- The hydraulic system is under high pressure.
- When looking for leaks, the appropriate tools should be used.
- Before starting work on the hydraulic system, de-pressurize the system.
- When under high pressure, any fluids (such as hydraulic oil) may penetrate the skin and cause serious injury. Immediately call a doctor. There is risk of infection.
- When connecting hydraulic hoses to the tractor hydraulic system, ensure that the hydraulic system on the tractor and on the trailing vehicle is at zero pressure!
- When connecting hydraulic hoses to the tractor hydraulic system ensure that the hydraulic system on the tractor and on the trailing vehicle is at zero pressure.
- Dispose of old oil as specified. In case of problems, contact your oil supplier.
- Store hydraulic oil out of reach of children.
- Hydraulic oil must not penetrate into the soil or water supply.
- When performing maintenance and repair work on the hydraulic system, note the chapter "Safety recommendation for the operator", page 24.



Important!

- Ensure the correct connection of the hydraulic hoses.
- Check all hydraulic hoses and connections for damage and cleanliness at regular intervals.
- All hydraulic hoses must be checked for their operational safety by a skilled person at least once a year!
- Replace damaged and aged hydraulic hoses. Only use original -**AMAZONE** hydraulic hoses!
- 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 depending on the experience and the danger potential. For hoses and hose circuits made from thermoplasts other guidelines may prevail.

Identification of hydraulic hoses

The identification provides the following information:

Fig. 142/..

- (1) Identification of the marker (A1HF)
- (2) Date of production of the hydraulic hose circuit (02 04 = February, 2004)
- (3) Max. permissible operating pressure (210 BAR).

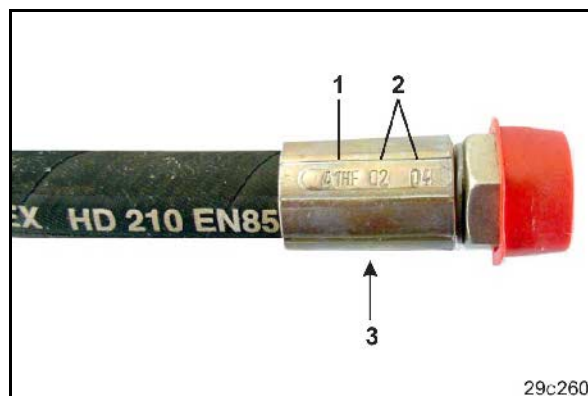


Fig. 142

Maintenance intervals

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

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

Prior to any initiating operation

1. Check the hydraulic hose circuits for visible defects.
2. Remedy any points on hydraulic hoses and tubes which are rubbing together.
3. Replace worn or defective hydraulic hoses immediately.

Inspection criterion for hydraulic hose circuits



Important!

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

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

- Defects from the casing to the inner lining (e.g. rubbing points, cuts, tears).
- Check whether the hose casing is brittle (tears in the hose material).
- Check hose for deformation which deviate from the common shape of the hose or which do not correspond to the hose circuit. This applies both to the pressure free and the pressurized condition or when bending the hose (e.g. separation of layers, bubbles, buckling, squeezing).
- Leakages.
- Damage or deformation of the hose fitting (tightness is affected), slight surface damage is no reason for a replacement.
- Movement of the hose out of the fitting.
- Corrosion on the fitting which affects function and strength.
- Demands on the assembly not observed.

- The permissible usage period of 6 years has been exceeded.

The deciding factor is the date of production of the hydraulic hose on the fitting plus 6 years. If the date of production on the fitting is "2004" the service life will end in February, 2010. For more information on this, please refer to "Identification of hydraulic hoses".

12.9.1 Mounting and dismantling hydraulic hoses



Tip!

Always follow the following instructions when mounting and dismantling hydraulic hoses:

- Only use original-**AMAZONE** hydraulic hoses!
- Always ensure cleanliness.
- Always install the hydraulic hoses in such a manner that the following operational conditions occur
 - the hose is not under tension, except for its own weight
 - short hoses are not upset.
 - external mechanical affects on the hydraulic hoses are avoided.

the hoses are arranged and attached properly to prevent the hoses from rubbing on components or against each other. If necessary, secure the hydraulic hoses by using guard covers. Cover sharp-edged components.
 - the permissible bending radius is maintained
- When connecting a hydraulic hose with moving parts, ensure that through the entire range of movement, the hose length ensures that the smallest permissible bending radius is maintained and/or the hydraulic hose is not tensioned.
- Fasten the hydraulic hoses at the fixing points indicated. Avoid hose attachments where they would prevent the natural movement and length change of the hose.
- Painting hydraulic hoses is prohibited.

12.9.2 Checking the hydraulic oil filter

During operation, the function of the hydraulic oil filter (Fig. 143/1) can be checked on the control panel. Display in the check window (Fig. 143/2).



Important!

Check the dirt indicator (Fig. 143/2) at regular intervals to ensure the proper function of the hydraulic system and its components.

Immediately replace the oil filter if the red ring is shown instead of the green one (Fig. 143/1).



Important!

Check the oil filter when tractor engine is running and the oil circuit is switched on!



Danger!

Replace the oil filter (Fig. 143/1) only with a pressure-free hydraulic system! Otherwise there is a risk that hydraulic oil can escape under high pressure.

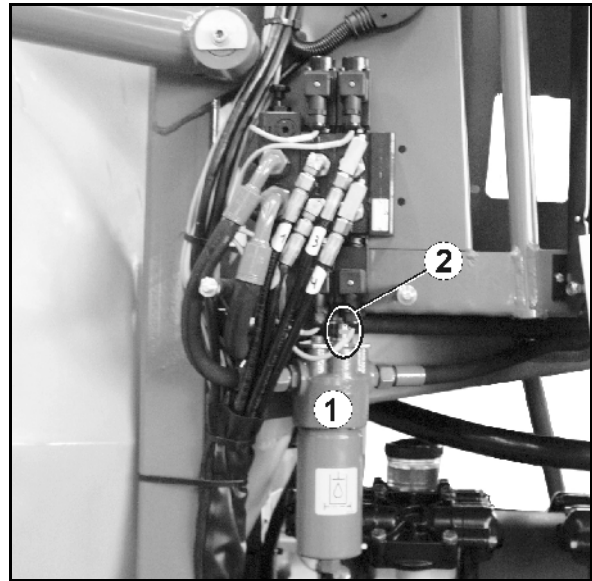


Fig. 143

12.10 Setting the hydraulic throttle valves

The setting affects the speed for the activation of the individual hydraulic functions on the relevant hydraulic throttle valves (folding in and out the booms, locking and unlocking the swing compensation, etc.). **However, depending on the tractor, it may be necessary to adjust this setting.**

You can modify the speed for actuating the hydraulic function allocated to the pair of throttle valves in question by screwing and unscrewing the Allen screws on each throttle.

- Reducing the actuating speed = Screw in Allen screw.
- Increasing the actuating speed = Unscrew Allen screw.

Important!

When correcting the actuation speeds of the hydraulic function, always adjust the two throttle valves of the throttle pair equally.



Professional folding I

Fig. 144/..

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

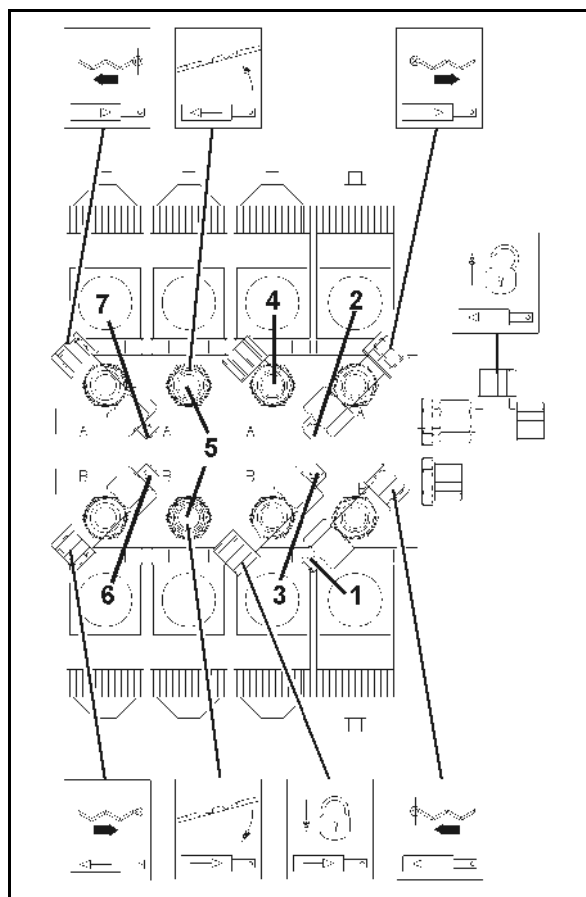


Fig. 144

Professional folding II

Fig. 145/..

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

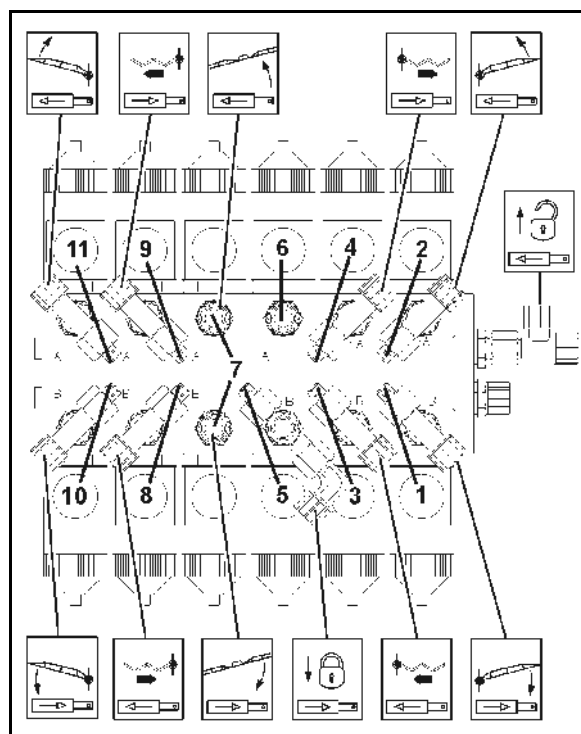


Fig. 145

12.11 Electric traffic light kit

Replace of bulbs:

1. Remove the protecting glass.
2. Remove the defective bulb.
3. Insert the replacement bulb (ensure you have the correct voltage and watt number).
4. Put the protecting glass in place and screw it back on.

12.12 Pump -

12.12.1 Checking oil level



Important!

- **Always use only quality oil 20W30 or multi-purpose oil 15W40!**
- **Always ensure that a correct oil level is maintained! Too low or too high an oil level can be harmful.**
- The pump is not in a horizontal position at the hitch draw bar. Therefore, the displayed oil level should be averaged.

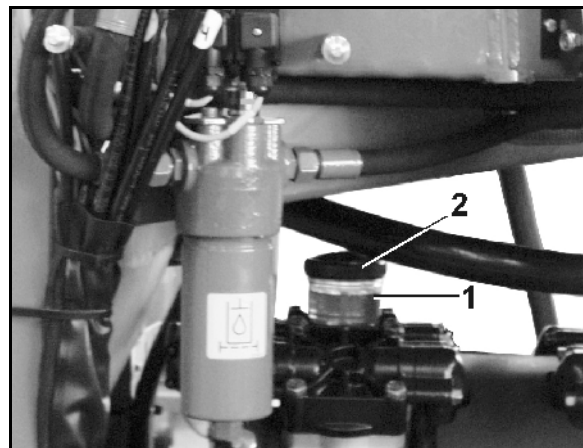


Fig. 146

1. Check whether the oil level is at the mark (Fig. 146/1) is visible with running pump in horizontal position.
2. Remove the lid (Fig. 146/2) and top off the oil if the oil is not visible at the mark (Fig. 146/1).

12.12.2 Oil change



Important!

- **Do an oil change every 400 to 450 hours of operation, but or at least once a year.**
 1. Remove the pump from the sprayer.
 2. Remove the lid (Fig. 146/2).
 3. Drain off the oil.
 - 3.1 Turn the pump upside down.
 - 3.2 Spin drive shaft 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. This is why we recommend the aforementioned procedure.
 4. Place the pump on a level surface.
 5. Turn the drive shaft, alternating to the right and left hand side and slowly pour in new oil. The correct oil quantity has been poured in when the oil is visible on the marks (Fig. 146/1).

12.12.3 Pump drive

12.12.3.1 Checking the belt tensioning / adjustment

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

For pump nominal speed of 540 1/min.:

→ max. permissible deflection 14 mm

For pump nominal speed of 1000 1/min.:

→ max. permissible deflection 16 mm

If the max. deflection is exceeded, increase the belt tensioning by increasing the axle spacing the slotted holes.

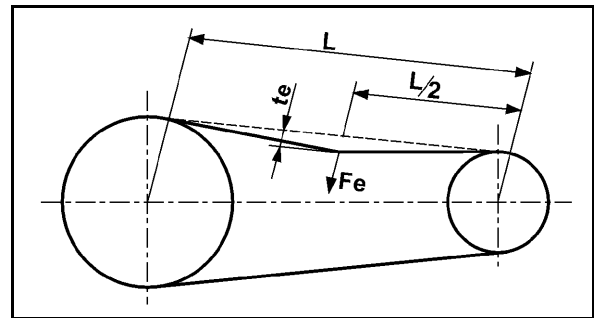


Fig. 147

12.12.3.2 Exchanging drive belts

Replace worn drive belts!

Proceed as follows:

1. Release the belt tensioning the slotted holes on the lower belt pulley.
2. Remove upper belt guard.
3. Remove one pump.
4. Replace the belt.

12.12.3.3 Cleaning



Important!

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

12.12.3.4 Check and replace suction- and pressure-side valves



Important!

- Note the fitting position of the suction- and pressure-side valves, before you remove the valve groups (Fig. 148/5).
- When refitting watch that the valve guide (Fig. 148/9) will not be damaged. Damage could lead to blockage of valves.
- Tighten bolts (Fig. 148/1) diagonally with the torque stated. Inaccurately tightened bolts will cause tensioning and thus leakage.

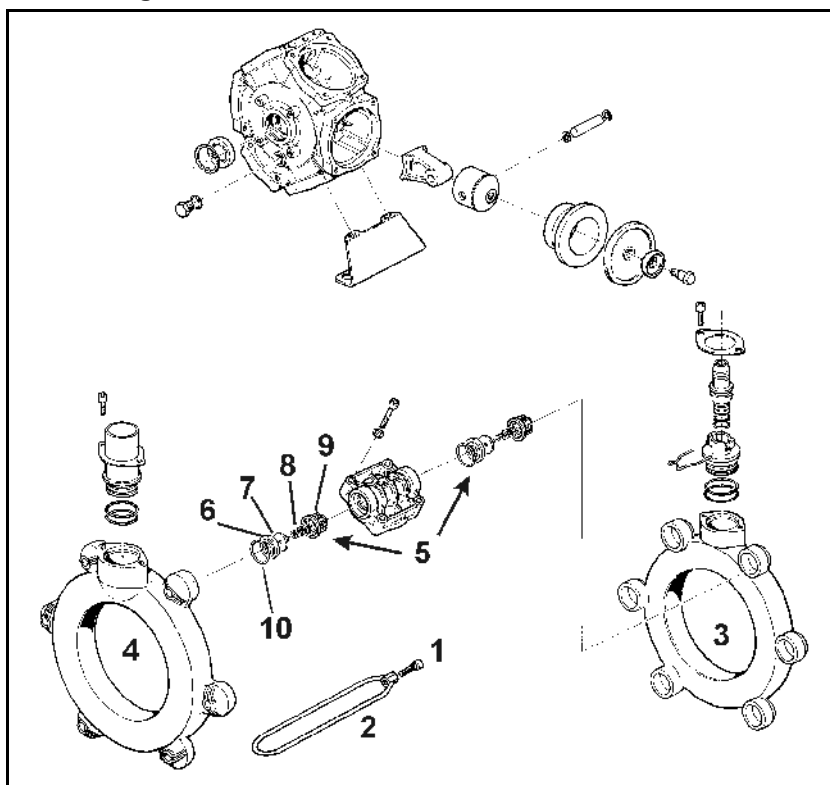


Fig. 148

1. Remove the pump from the sprayer.
2. Slacken bolt (Fig. 148/1) and remove tensioning clamp (Fig. 148/2).
3. Take off suction- and pressure channel (Fig. 148/3 and Fig. 148/4).
4. Take off valve groups (Fig. 148/5).
5. Check for damage or wear of the valve seat (Fig. 148/6), valve (Fig. 148/7), valve spring (Fig. 148/8) and valve guide (Fig. 148/9).
6. Remove the O-ring (Fig. 148/10).
7. Replace any faulty parts.
8. Mount the valve groups (Fig. 148/5) after checking and cleaning.
9. Fit new O-rings (Fig. 148/10).
10. Re-install suction - (Fig. 148/3) and pressure channel (Fig. 148/4) to the pump housing and refit the tensioning clamp (Fig. 148/2).
11. Tighten the bolts (Fig. 148/1) always diagonally with a torque of **11 Nm**.

12.12.3.5 Checking and exchanging the piston diaphragms



Important!

- Check the piston diaphragms (Fig. 149/1) at least once a year by dismantling them.
- Pay attention to the fitting position of the suction- and pressure-side valves before you remove the valve groups (Fig. 149/5).
- When checking and exchanging the piston diaphragms, it is recommended that you do this work for each piston individually. Start to dismantle the next piston only after having completely reassembled the one you have checked.
- Always bring the piston to be checked in the upper position so that any oil inside the pump housing is not drained out.
- Always replace all 6 piston diaphragms (Fig. 149/6) even if just one piston diaphragm is swollen, broken or porous.

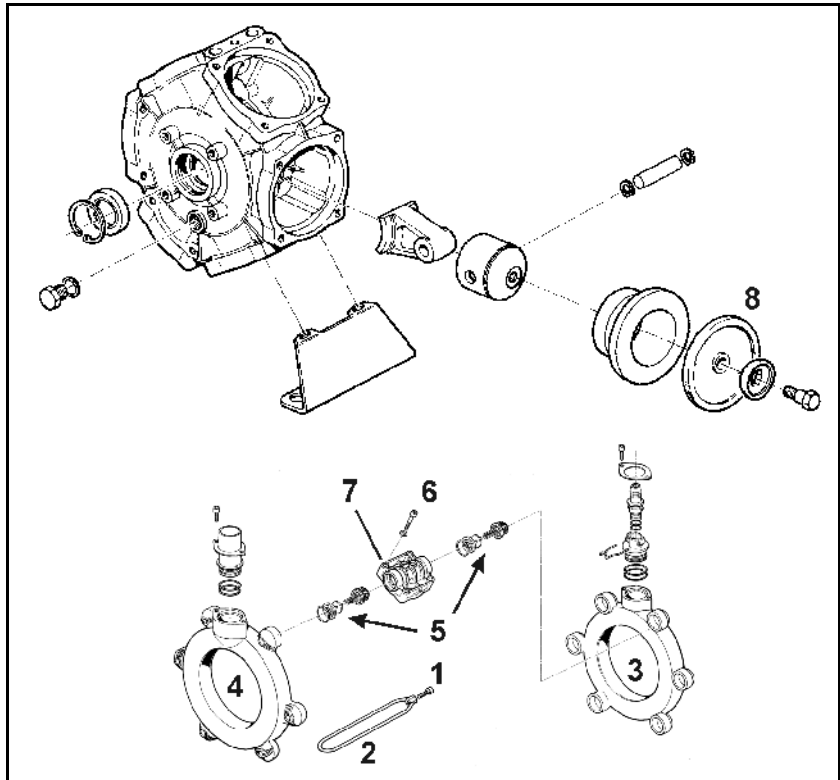


Fig. 149

Checking the piston diaphragms

1. Take off pump.
2. Slacken bolt (Fig. 149/1) and remove tensioning clamp (Fig. 149/2).
3. Take off suction- and pressure channel (Fig. 149/3 and Fig. 149/4).
4. Take off valve groups (Fig. 149/5).
5. Tighten bolts (Fig. 149/6).
6. Remove the cylinder head (Fig. 149/7).
7. Check the piston diaphragms (Fig. 149/8).
8. Replace faulty piston diaphragms (Fig. 149/8).

Replace the piston diaphragm



Important!

- Ensure the correct position of the cut outs or bores in the rams.
- Fasten the piston diaphragm (Fig. 150/2) in such a way with the retaining disc (Fig. 150/3) and bolt (Fig. 150/1) to the piston (Fig. 150/4), so that the edge (Fig. 150/14) faces the cylinder head side (Fig. 150/6).
- Tighten bolts (Fig. 150/13) diagonally with the torque indicated. Bolts tightened inaccurately will cause tensioning and thereby leakage.

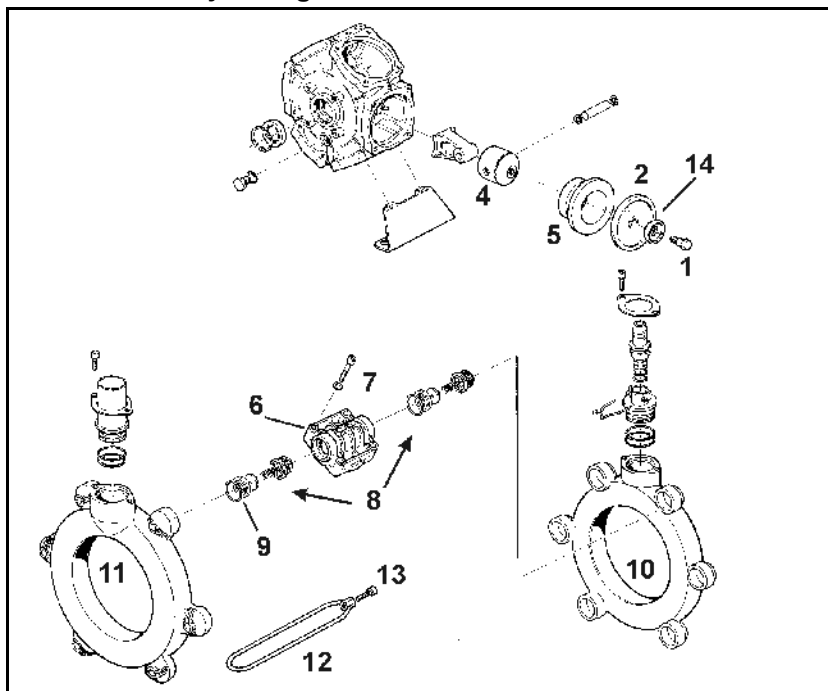


Fig. 150

1. Loosen the bolt (Fig. 150/1) and the piston diaphragm (Fig. 150/2) together with the retaining disc (Fig. 150/3) of the piston (Fig. 150/4).
2. Drain off the oil spray liquid mixture from the pump housing, if the piston diaphragm is broken.
3. Remove the cylinder (Fig. 150/5) 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. 150/5) again into the pump housing.
7. Fit the piston diaphragm (Fig. 150/2).
8. Fit cylinder head (Fig. 150/6) to pump housing and tighten bolts (Fig. 150/7) cross wise and equally.
9. Mount the valve groups (Fig. 150/8) after checking and cleaning.
10. Fit new O-rings (Fig. 150/9).
11. Re-install suction (Fig. 150/10) and pressure channel (Fig. 150/11) to the pump housing and refit the tensioning clamp (Fig. 150/12).
12. Tighten the bolts (Fig. 150/13) always diagonally with a torque of **11 Nm**.

12.13 Calibrating the flow meter



Important!

- Calibrate the flow meter(s) at least once a year.
- Calibrate the flow meter(s):
 - after removal of the flow meter.
 - after a prolonged period of operation as there may be deposits of spray agent residue.
 - in case of deviations between the required and the actual spray rate.
- When you intend to start driving with the field sprayer to determine the amount of water applied, note the indicated value "pulses". The displayed pulse value will stop being illuminated when the field sprayer is transported.
- Align the return flow meter and the flow meter at least once a year.
- Align the return flow meter with the flow meter:
 - after calibration of the flow meter.
 - after removal of the return flow meter.
- Switch off "spraying process" in the menu operation. The alignment can only be carried out when now liquid is delivered to the sprayer booms.



Tip!

For this, please observe the operator's manual **AMATRON⁺**; chapter: Impulses per litre.

12.14 Nozzles

Occasionally check the seating of the tapered slide (Fig. 151/7).

- To do this, push the slide into the nozzle body (Fig. 151/2) as far as possible with slight pressure with your thumb.

Under no circumstances push the slide into the nozzle body to the stop when it is new.

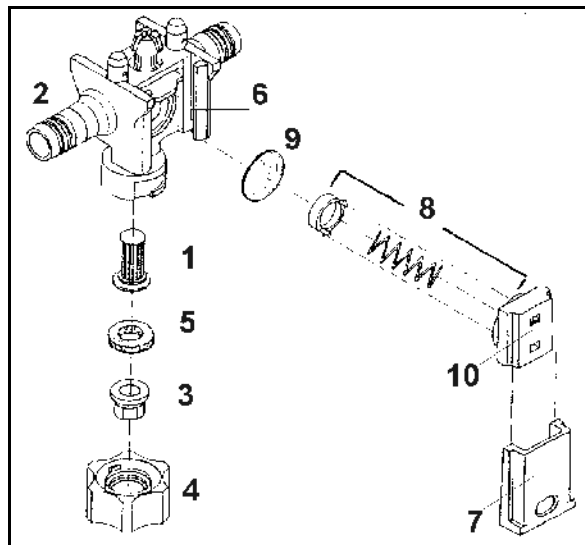


Fig. 151

12.14.1 Fitting the nozzles



- The nozzle filter (Fig. 151/1) is placed from below into the nozzle carrier (Fig. 151/2).
- Insert the nozzle (Fig. 151/3) into the bayonet cap (Fig. 151/4).

Tip!

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

- Place the rubber seal ring (Fig. 151/5) above the nozzle.
- Press the rubber sealing ring into the seating of the bayonet.
- Place the bayonet cap onto the joint of the nozzle carrier.
- Turn the bayonet cap until the stop.

12.14.2 Dismantling the diaphragm valve in case of dripping nozzles

The reason for **dripping** of the nozzles at a shut off boom feed is residue on the diaphragm seating (Fig. 151/6) Therefore the corresponding diaphragm should be cleaned as follows:

- Pull the slide (Fig. 151/7) out of the nozzle carrier (Fig. 151/2) in direction of the bayonet cap.
- Remove the spring element (Fig. 151/8) and the diaphragm (Fig. 151/9).
- Clean the diaphragm seating (Fig. 151/6).
- Assembly is done in reverse order.



Important!

Ensure the correct fitting directions of the spring elements. The edges on the spring element housing (Fig. 151/10) are offset on the right and left hand side and should rise in direction of the boom profile when fitting.

12.15 Hose filters

- Clean the hose filters (Fig. 152/1) depending on the operational conditions approx. every 3 – 4 months.
- Replace defective filter inserts.



Important!

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

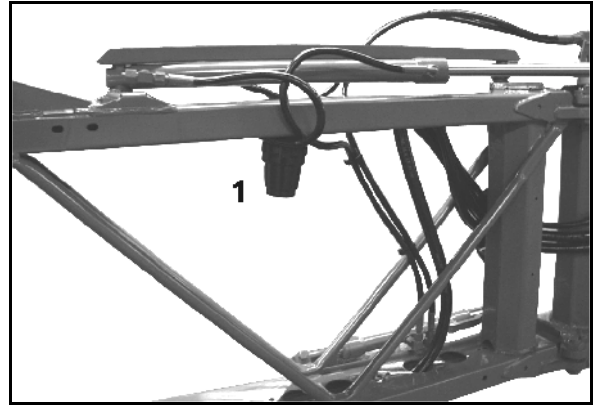


Fig. 152

12.16 Tips for checking the field sprayer



Important!

- Only authorized persons may carry out the field sprayer check.
- The legal requirement for the field sprayer check is as follows:
 - at least 6 months after first operation (if not carried out at the time of purchase), then
 - every 2nd year thereafter.

Check-Set-field sprayer: (special optional equipment), Order No.: 930 420

Fig. 153/..

- (1) Hose connection (Order no.: GE 112)
- (2) Turned cap (Order no.: 913 954) and plug (Order no.: ZF 195)
- (3) Flow meter connection
- (4) Pressure gauge connection

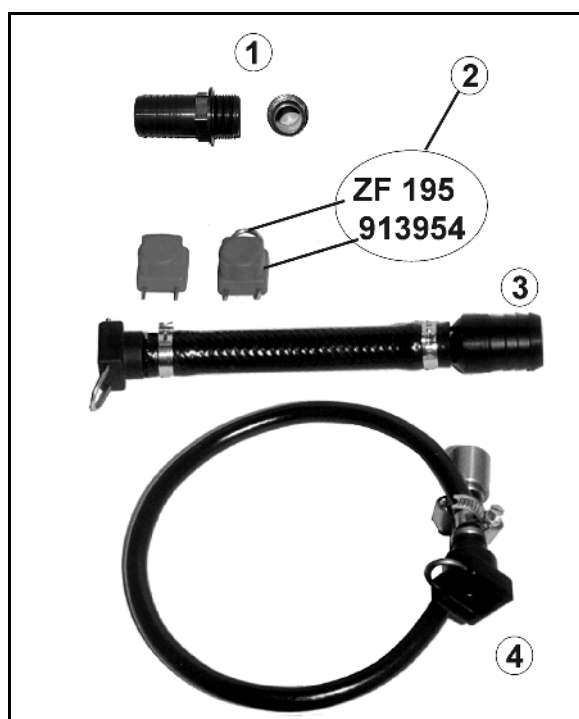


Fig. 153

Checking the pump – Check the pump capacity (delivery capacity, pressure)

1. Loosen clamping nut (Fig. 154/1).
2. Attach hose connection.
3. Tighten clamping nut.

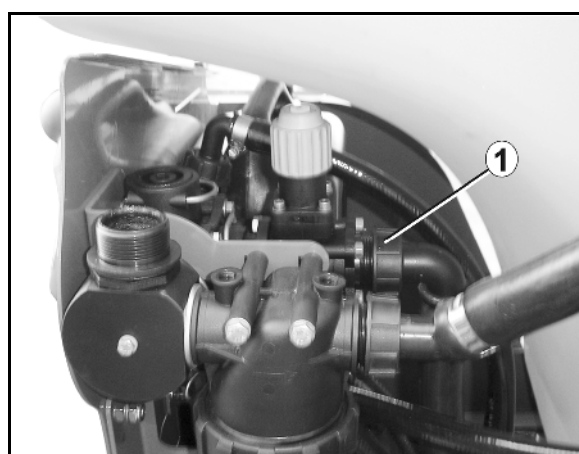


Fig. 154

Checking the flow meter

1. Pull all spray lines from the part width section valves.
2. Connect the flow meter joint (Fig. 153/3) with a part section valve and connect to the sensor instrument.
3. Shut the joints of the remaining part section valves with blanks (Fig. 153/3).
4. Switch on the boom feed.

Checking the pressure gauge

1. Pull one spray line off a part width section valve.
2. Connect the pressure gauge connection (Fig. 153/4) using the turned socket with the part width section valve.
3. Bolt the checking pressure gauge into the inner thread 1/4 inch.

12.17 Bolt torques

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

13 Spray rate calibration chart

13.1 Spray rate chart for flat fan-, anti-drift-, injector- and air mix-nozzles, spraying height 50 cm



Tip!

- 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.
- Fig. 155 is 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.
- Fig. 156 is used to
 - determine the nozzle size.
 - determine the required spray pressure.
 - determine the required individual nozzle output for the calibration of the field sprayer.

Permissible pressure ranges of the individual nozzle types and nozzle sizes

Nozzle type	Nozzle size	Permissible pressure range [bar]	
		min. pressure	max. pressure
LU / XR- nozzles	'015'	1	1.5
	'02'	1	2.5
	'0.3'	1	3.0
	'0.4' to '0.8'	1	5.0
AD / DG / TT	all sizes	1.5	5
AI	all sizes	2	7
ID	all sizes	3	7
Air mix- nozzles	all sizes	1	5

Spray rate calibration chart

Select the nozzle type

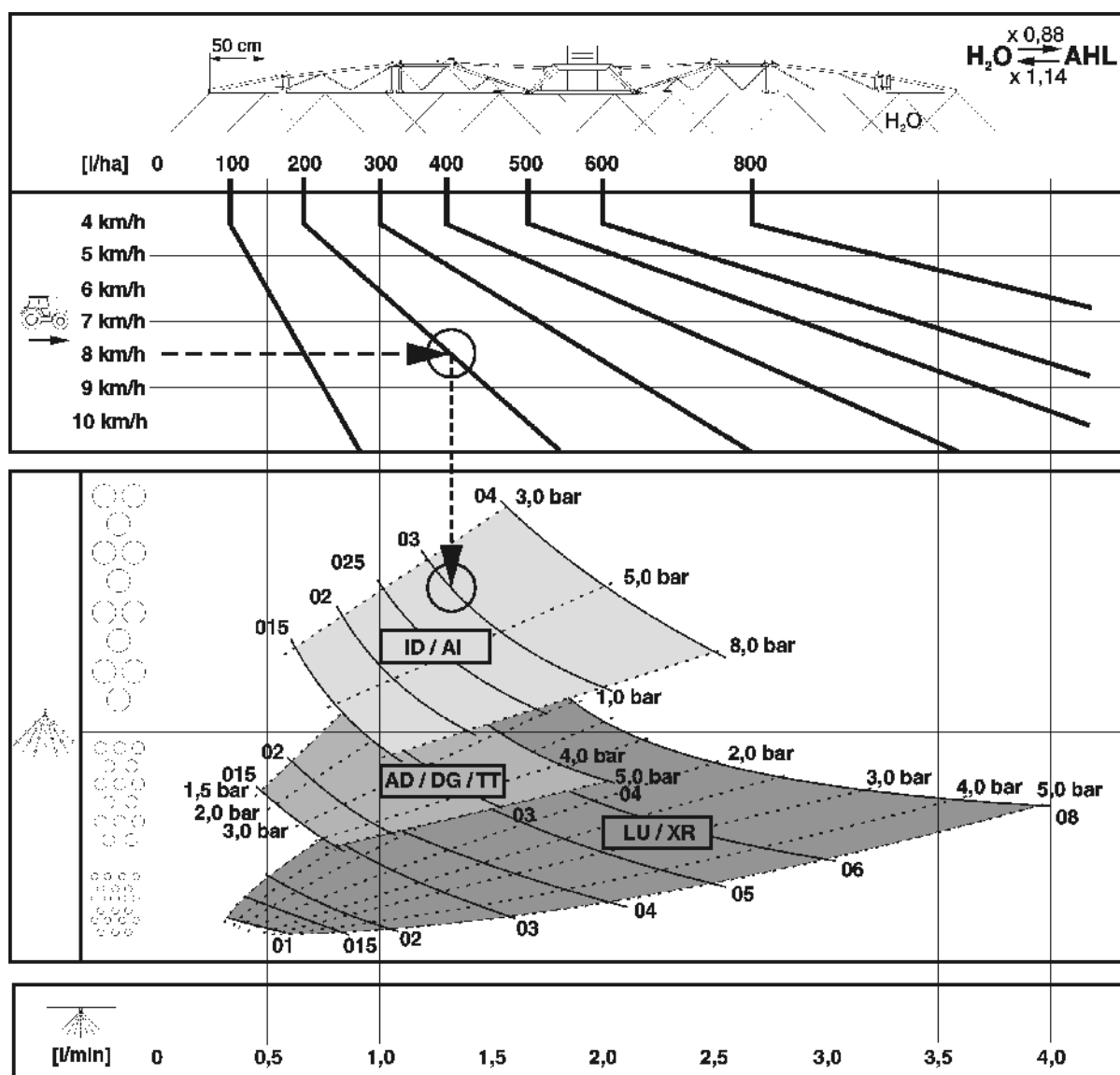


Fig. 155

Example:

Required spray rate:	200 l/ha
Intended forward speed:	8 km/h
Required spraying characteristic for the intended plant protection measure:	coarse droplets (little drifting)
Required nozzle type:	?
Required nozzle size:	?
Required spraying pressure:	? bar
required individual nozzle output for the calibration of the field sprayer.	? l/min

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

1. Determine the operational point for the required spray rate (**200 l/ha**) and the intended forward speed (**8 k.p.h**).
 2. Plumb a vertical line downwards at the operational point. Depending on the position of the operational point, this line crosses the input/output maps of the various 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. 156).
 5. Find the column with the intended forward speed (**8 k.p.h**), the required spray rate (**200 l/ha**) or a spray rate which is nearest to the required spray rate (in this case, e.g. **195 l/ha**).
 6. In the line with the required spray rate (**195 l/ha**)
 - o Read off the possible nozzle sizes. Choose a suitable nozzle size (e.g. **'03'**).
 - o In the point of intersection with the selected nozzle size read off the required spray pressure (e.g. **3.7 bar**).
 - o read off the required individual nozzle output (**1.3 l/min**) for the calibration of the field sprayer.

Required nozzle type:	AI /ID
Required nozzle size:	'03'
Required spraying pressure:	3.7 bar
Required individual nozzle output for the calibration of the field sprayer:	1.3 l/min

Spray rate calibration chart

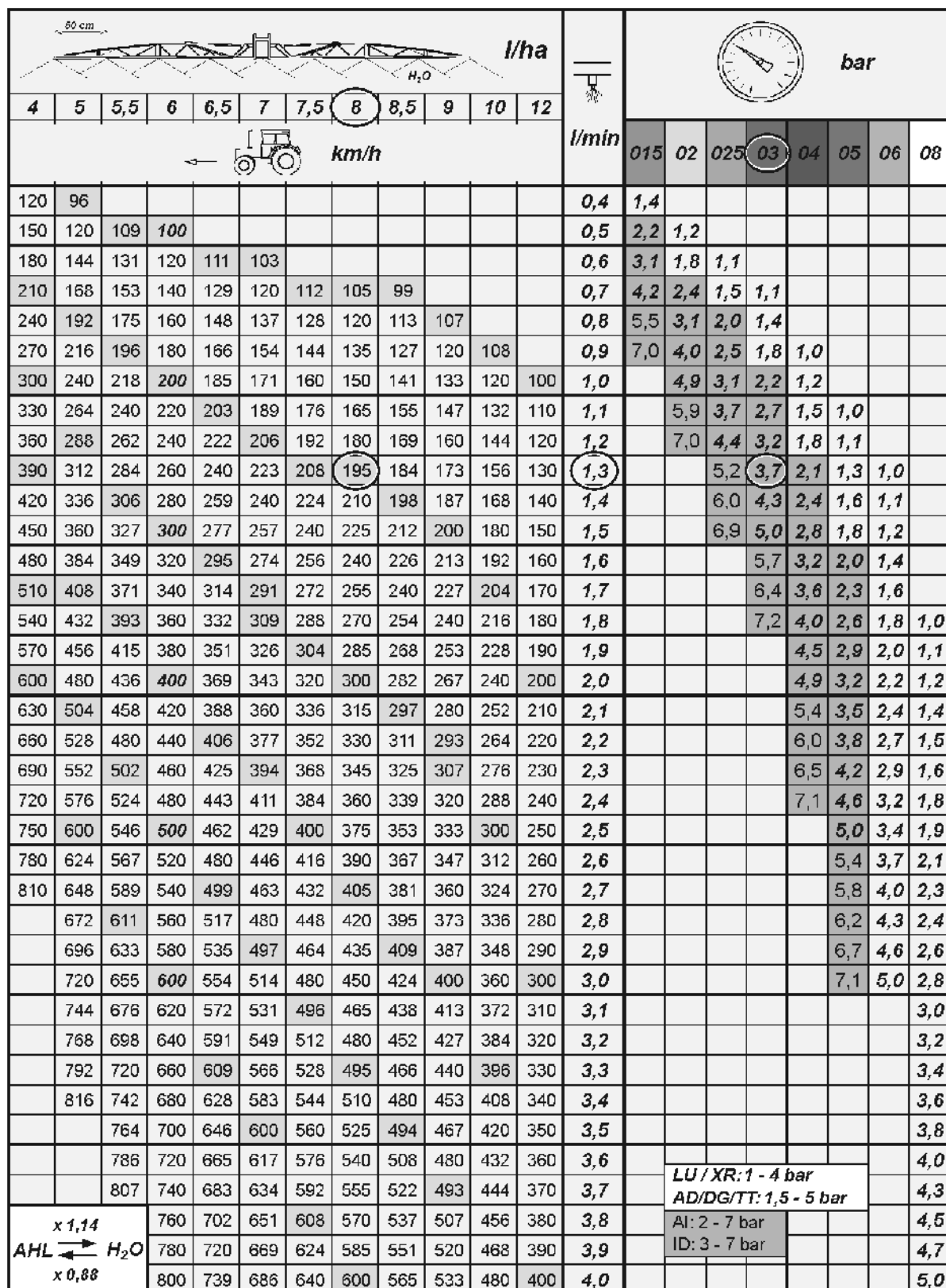


Fig. 156

13.2 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 (l/min)	5	5.5	6	6.5	7	7.5	8	8.5	9 (km/h)
1.0	0.36	0.32	77	70	64	59	55	51	48	45	43
1.2	0.39	0.35	83	75	69	64	60	55	52	49	47
1.5	0.44	0.39	94	85	78	72	67	62	59	56	53
1.8	0.48	0.42	102	93	85	78	73	67	64	60	57
2.0	0.50	0.44	106	96	88	81	75	70	66	62	59
2.2	0.52	0.46	110	100	92	85	78	73	69	65	62
2.5	0.55	0.49	118	107	98	91	84	78	74	70	66
2.8	0.58	0.52	124	112	103	95	88	82	77	73	69
3.0	0.60	0.53	127	115	106	98	91	85	80	75	71

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

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 (km/h)
1.0	0.61	0.54	129	118	108	100	93	86	81	76	72
1.2	0.67	0.59	140	128	118	109	101	94	88	83	78
1.5	0.75	0.66	158	144	132	122	114	105	99	93	88
1.8	0.79	0.69	165	151	138	127	119	110	104	97	92
2.0	0.81	0.71	170	155	142	131	122	114	107	100	95
2.2	0.84	0.74	176	160	147	136	126	118	111	104	98
2.5	0.89	0.78	186	169	155	143	133	124	117	109	104
2.8	0.93	0.82	196	177	163	150	140	130	122	114	109
3.0	0.96	0.84	202	183	168	155	144	134	126	118	112

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

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 (km/h)
1.0	0.86	0.76	182	166	152	140	130	122	114	107	101
1.2	0.94	0.83	198	181	166	152	142	133	124	117	110
1.5	1.05	0.93	223	203	186	171	159	149	140	132	124
1.8	1.11	0.98	234	213	196	180	167	177	147	139	131
2.0	1.15	1.01	242	220	202	186	173	162	152	143	135
2.2	1.20	1.06	254	231	212	196	182	170	159	150	141
2.5	1.26	1.12	269	244	224	207	192	179	168	158	149
2.8	1.32	1.17	281	255	234	216	201	187	176	165	156
3.0	1.36	1.20	288	262	240	222	206	192	180	169	160

Spray rate calibration chart

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 (km/h)
1.0	1.16	1.03	247	225	206	190	177	165	155	145	137
1.2	1.27	1.12	267	244	224	207	192	179	168	158	149
1.5	1.42	1.26	302	275	252	233	217	202	190	178	168
1.8	1.56	1.38	331	301	277	255	237	221	207	194	184
2.0	1.64	1.45	348	316	290	268	249	232	217	204	193
2.2	1.73	1.54	369	335	307	284	263	246	230	216	204
2.5	1.84	1.62	390	355	325	301	279	260	244	229	216
2.8	1.93	1.71	410	373	342	316	293	274	256	241	228
3.0	2.01	1.78	427	388	356	329	305	285	267	251	237

13.3 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 (km/h)
1.0	0.43	0.38	91	83	76	70	65	61	57	54	51
1.2	0.47	0.42	100	91	83	77	71	67	62	59	55
1.5	0.53	0.47	113	102	94	87	80	75	70	66	63
1.8	0.58	0.51	123	112	103	95	88	82	77	72	68
2.0	0.61	0.54	130	118	108	100	93	86	81	76	72

AMAZONE Spray rate table for metering disc 4916-45, (ø 1.2 mm) spraying height 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 (km/h)
1.0	0.56	0.50	120	109	100	92	86	80	75	71	67
1.2	0.62	0.55	132	120	110	102	94	88	83	78	73
1.5	0.70	0.62	149	135	124	114	106	99	93	88	83
1.8	0.77	0.68	163	148	136	126	117	109	102	96	91
2.0	0.80	1.71	170	155	142	131	122	114	106	100	95

AMAZONE Spray rate table for metering disc 4916-55, (ø 1.4 mm) spraying height 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	AUS	5	5.5	6	6.5	7	7.5	8	8.5	9 (km/h)
	(l/min)										
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	AUS	5	5.5	6	6.5	7	7.5	8	8.5	9 (km/h)
	(l/min)										
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	AUS	5	5.5	6	6.5	7	7.5	8	8.5	9 (km/h)
	(l/min)										
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	AUS	5	5.5	6	6.5	7	7.5	8	8.5	9 (km/h)
	(l/min)										
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

13.4 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	AUS	5	5.5	6	6.5	7	7.5	8	8.5	9 (km/h)
	(l/min)										
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	AUS	5	5.5	6	6.5	7	7.5	8	8.5	9 (km/h)
	(l/min)										
1.0	0.31	0.27	132	120	110	101	94	88	82	77	73
1.2	0.34	0.30	144	131	120	111	103	96	90	85	80
1.5	0.38	0.34	161	147	135	124	115	108	101	95	90
1.8	0.41	0.36	174	158	145	134	124	116	109	102	97
2.0	0.43	0.38	183	166	152	141	130	122	114	107	101
2.2	0.45	0.40	191	174	159	147	137	127	119	112	106
2.5	0.48	0.42	204	185	170	157	146	136	127	120	113
2.8	0.51	0.45	217	197	181	167	155	144	135	127	120
3.0	0.53	0.47	225	205	188	173	161	150	141	132	125
3.5	0.57	0.50	242	220	202	186	173	161	151	142	135
4.0	0.61	0.54	259	236	216	199	185	173	162	152	144

AMAZONE Spray rate table for metering disc 4916-39, (ø 1.0 mm) (standard)

Pressure (bar)	Nozzle output per metering disc		Spray rate AUS (l/ha)								
	Water	AUS	5	5.5	6	6.5	7	7.5	8	8.5	9 (km/h)
	(l/min)										
1.0	0.43	0.38	183	167	153	141	131	123	114	107	101
1.2	0.47	0.41	200	182	167	154	143	134	124	117	110
1.5	0.53	0.47	224	204	187	172	160	150	141	132	126
1.8	0.58	0.51	244	223	204	188	175	164	154	144	137
2.0	0.61	0.53	259	236	216	200	185	172	162	152	144
2.2	0.64	0.56	272	248	227	210	194	181	170	160	151
2.5	0.68	0.59	288	263	240	222	206	191	180	169	160
2.8	0.71	0.62	302	274	251	232	215	201	189	177	168
3.0	0.74	0.64	315	286	262	243	224	209	197	185	175
3.5	0.79	0.69	336	305	280	258	236	224	210	197	186
4.0	0.85	0.74	362	329	302	280	259	240	226	212	201

AMAZONE Spray rate table for metering disc 4916-45, (ø 1.2 mm)

Pressure (bar)	Nozzle output per metering disc		Spray rate AUS (l/ha)								
	Water	AUS	5	5.5	6	6.5	7	7.5	8	8.5	9 (km/h)
	(l/min)										
1.0	0.57	0.50	242	220	202	186	173	161	151	142	135
1.2	0.62	0.55	263	239	219	203	188	176	165	155	146
1.5	0.70	0.62	297	270	248	229	212	198	186	175	165
1.8	0.77	0.68	327	297	273	252	234	218	204	192	182
2.0	0.81	0.72	344	313	287	265	246	229	215	202	192
2.2	0.86	0.76	365	332	304	281	261	244	228	215	203
2.5	0.92	0.81	391	355	326	301	279	261	244	230	217
2.8	0.96	0.85	408	371	340	314	291	272	255	240	227
3.0	1.00	0.89	425	386	354	327	303	283	266	250	236
3.5	1.10	0.97	467	425	389	359	334	312	292	275	260
4.0	1.16	1.03	492	448	411	379	352	329	308	290	274

AMAZONE Spray rate table for metering disc 4916-55, (ø 1.4 mm)

Pressure (bar)	Nozzle output per metering disc		Spray rate AUS (l/ha)								
	Water	AUS	5	5.5	6	6.5	7	7.5	8	8.5	9 (km/h)
	(l/min)										
1.0	0.86	0.76	365	332	304	281	261	244	228	215	203
1.2	0.93	0.82	395	359	329	304	282	263	247	232	219
1.5	1.05	0.93	446	405	372	343	319	297	278	262	248
1.8	1.15	1.02	489	444	407	376	349	326	305	287	271
2.0	1.22	1.08	518	471	432	399	370	346	324	305	288
2.2	1.27	1.12	539	490	450	415	385	360	337	317	300
2.5	1.35	1.19	573	521	478	441	410	382	358	337	319
2.8	1.43	1.27	607	552	506	467	434	405	380	357	337
3.0	1.47	1.30	624	568	520	480	446	416	390	367	347
3.5	1.59	1.41	675	614	563	520	482	450	422	397	375
4.0	1.69	1.50	718	653	598	552	513	479	449	422	399

13.5 Conversion table for spraying liquid fertilizer Ammonium Nitrate / Urea suspension (AUS)

(Density 1.28 kg/l, i.e. approx. 28 kg N for 100 kg liquid fertilizer or 36 kg N for 100 litres liquid fertilizer 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	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									



KOMBINATIONSMATRIX UX 3200
BBA E-NUMMER 1507

Stand 10.2005

	Pumpe	Armatur	Gestänge ohne Spritzleitung hydraulisch geklappt	Spritzleitung	Wahlaustrüstung
UX 4200-	AKZ8U06P+ARZ5U06P	G-7 G-9 S15 S16m S20m S21m S21f5m S24m S27m S28m L24m 3lg. L27m 3lg. L27m 4lg. L28m 3lg. L28m 4lg. L30m 4lg. L32m 4lg. L33m 4lg. L36m 4lg. S15m -5 S16m -5 S18m -5 S20m -5 S21m -5 S21m -7 S21f5m -7 S24m -7 S27m -7 S28m -7 S29m -7 L24m -7 L27m -7 L28m -7 L28m -9 L30m -9 L32m -9 L33m -9 L36m -9 S18m -5 S20m -5 S21m -5 S21f5m -7 S24m -7 S27m -7 S28m -7 S29m -9 L24m -9 L27m -9 L28m -9 L30m -9 L32m -9 L33m -9 L36m -9 Amaspray + Armatron +	zum Grundgerät Befüllanschluss Einrachtdüsenkörper Vierachtdüsenkörper	zum Spritz- gerät zum Spritz- gestänge	
1	x	x			x
2	x	x			x
3	x	x			x
4	x	x			x
5	x	x			x
6	x	x			x
7	x	x			x
8	x	x			x
9	x	x			x
10	x	x			x
11	x	x			x
12	x	x			x
13	x	x			x
14	x	x			x
15	x	x			x
16	x	x			x
17	x	x			x
18	x	x			x
19	x	x			x
20	x	x			x
21	x	x			x
22	x	x			x
23	x	x			x
24	x	x			x
25	x	x			x
26	x	x			x
27	x	x			x
28	x	x			x
29	x	x			x
30	x	x			x
31	x	x			x
32	x	x			x
33	x	x			x
34	x	x			x
35	x	x			x
36	x	x			x
37	x	x			x
38	x	x			x
39	x	x			x
40	x	x			x
41	x	x			x
42	x	x			x
43	x	x			x
44	x	x			x
45	x	x			x
46	x	x			x

200



BBA E-NUMMER 1403

UX 5200- AR2800dp+AR250dp	Pumpe		Armatur		Gestänge ohne Spritzleitung hydraulisch geklappt	Spritzleitung		Wahlaustrüstung		
						mit Dreifach- düsenkörper	mit Dreifach- düsenkörper und Druckum- laufsystem	zum Grundgerät	zum Spitz- gestänge	
1	x		x						x	x
2	x		x						x	x
3	x		x						x	x
4	x		x						x	x
5	x		x						x	x
6	x		x						x	x
7	x		x						x	x
8	x			x					x	x
9	x		x						x	x
10	x			x					x	x
11	x		x						x	x
12	x		x						x	x
13	x		x						x	x
14	x		x						x	x
15	x		x						x	x
16	x		x						x	x
17	x		x						x	x
18	x		x						x	x
19	x		x						x	x
20	x		x						x	x
21	x		x						x	x
22	x		x						x	x
23	x		x						x	x
24	x		x						x	x
25	x		x						x	x
26	x		x						x	x
27	x		x						x	x
28	x		x						x	x
29	x		x						x	x
30	x		x						x	x
31	x		x						x	x
32	x		x						x	x
33	x		x						x	x
34	x		x						x	x
35	x		x						x	x
36	x		x						x	x
37	x		x						x	x
38	x		x						x	x
39	x		x						x	x
40	x		x						x	x
41	x		x						x	x
42	x		x						x	x
43	x		x						x	x
44	x		x						x	x
45	x		x						x	x
46	x		x						x	x

Stand 10.2005

Combination matrix

Description of nozzles for **UX 3200**, **UX 4200** and **UX 5200**

1) LU flat fan nozzles		2) XR flat fan nozzles		3) Double flat fan nozzles		4) AD flat fan nozzles			
- from plastic - from plastic with ceramic core		- from plastic - from plastic with stainless steel (V2A) core		- from V2A		- from plastic - from plastic with ceramic core			
(Lechler)		(Teejet)		(Lechler)		(Lechler)			
-015	-05	-015	-05	DF-120-02		-015			
-02	-06	-02	-06	DF-120-03		-02			
-03	-08	-03	-08	DF-120-04		-03			
-04		-04		DF-120-05		-04			
				DF-120-06					
5) Air mix flat fan nozzles		6) ID flat fan nozzles		7) IDK flat fan nozzles		8) Flat fan nozzles AI		9) Flat fan nozzles IDN	
- from plastic		- from plastic - from plastic with ceramic core		- from plastic		- from plastic with stainless steel (V2A) core		- from plastic	
(Agrotop)		(Lechler)		(Lechler)		(Teejet)		(Lechler)	
-015		-015	-05	-015		-015	-05		-025
-02		-02	-06	-02		-02	-06		-03
-03		-025		-03		-025	-08		
-04		-03		-04		-03			
-05		-04		-05		-04			
-06									





AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

Postfach 51	Tel.:	+ 49 (0) 5405 501-0
D-49202 Hasbergen-Gaste	Fax:	+ 49 (0) 5405 501-234
Germany	Email:	amazone@amazone.de
	http://	www.amazone.de



BBG Bodenbearbeitungsgeräte

Leipzig GmbH & Co.KG

Rippachtalstr. 10
D-04249 Leipzig
Germany

Branch factories in: D-27794 Hude • D-04249 Leipzig
• F-57602 Forbach • Subsidiaries in England and France

Factories for mineral fertilizer spreaders, field sprayers, seed drills, soil tillage machines,
multi-purpose storing halls and municipal machines
