

Instruction Manual

Trailed Sprayer

AMAZONE UG

UG 2200 Nova

UG 3000 Nova

UG 4500 Nova



MG 743

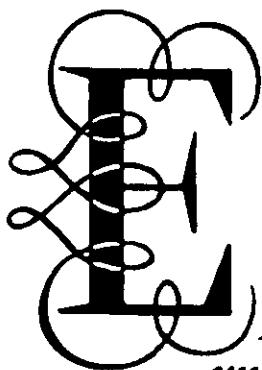
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Before starting operation carefully read and adhere to this instruction manual and the safety advice.





ES DARB NICHT

unbequem und überflüssig erscheinen· die Ge-
brauchs-Anweisung zu lesen und sich danach
zu richten; denn es genügt nicht· von anderen
zu hören und zu sehen· daß eine Maschine
gut sei· sie daraufhin zu kaufen und zu glau-
ben· es gehe nun alles von selbst. Der Betreffend-
e würde alsdann nicht nur sich selbst Schäden
zufügen· sondern auch den Fehler begehen· die
Ursache eines etwaigen Mißerfolges auf die Ma-
schine anstatt auf sich zu schieben. Um des guten
Erfolges sicher zu sein· muß man in den Geist der
Sache eindringen· bezw. sich über den Zweck
einer jeden Einrichtung an der Maschine un-
terrichten und sich in der Handhabung Übung
verschaffen. Dann erst wird man sowohl mit
der Maschine als auch mit sich selbst zufrieden
sein. Das zu erreichen· ist der Zweck dieser
Gebrauchs-Anweisung.

Leipzig-Plagwitz 1872. Rnd. Sack.



Preface

Dear Customer,

The trailed sprayer UG is yet another high quality product from the large range of farm machinery manufactured by **AMAZONEN**-WERKE, H. Dreyer GmbH & Co. KG.

In order to make fullest use of your trailed sprayer and to ensure trouble-free operation, we recommend that this instruction manual is carefully read and that the content is observed and the advice given therein is adhered to.

Please ensure that this instruction manual is made available to all operators before commencing to operate the machine.

This instruction manual refers to all trailed sprayers of the type UG Nova.



AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

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1 Details about the machine

1.1 Range of application

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

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

1.1.1 Designated use of the machine

The designated use of the AMAZONE UG Nova-trailed sprayer is for exclusive operation in agriculture only.

Operating on slopes is possible under following conditions:

- When operating across slopes
maximum angle of machine in the direction of travel to the left or right.: 20 %
- When operating up and down hill:
maximum angle of machine when operating uphill 16 %
max. angle of machine when operating downhill 20 %

Any use beyond these guidelines stipulated above is no longer considered as designated use. The manufacturer does not accept any responsibility for damage resulting from non-compliance and therefore the operator himself carries the full risk.

Under "designated use" also the manufacturer's prescribed operation, maintenance and repair conditions must be adhered to as well as the exclusive use of **original AMAZONE spare parts**.

Any damage resulting from arbitrary changes on the machine rule out the responsibility of the manufacturer.

Always adhere to the relevant accident prevention advice,

- all applicable generally accepted safety-, working-, medical- and road-traffic regulations
- all safety advice on the machine's decals should be adhered to.

Please ensure safety advice is passed on to all other users.

1.2 Attention when using specific crop protection agents

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

It should be pointed out that these crop protection agents, known as, for example Lasso, Betanal and Tramat, Stomp, Iloxan, Mudecan, Elancolan and Teridox may cause damage to pump diaphragms, hoses, tubes and the tank if exposed for a long period of time (20 hours) to such agents. There may be other crop protection agents that could cause damage and as so the list may not be taken as complete.

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

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

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

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

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

1.3 Manufacturer

AMAZONEN-WERKE

H. DREYER GmbH & Co. KG
Postfach 51, D-49202 Hasbergen-Gaste

1.4 Conformity declaration

The trailed sprayer UG Nova fulfils the requirements of the EC guide-line Machine 98/37/EC (see attachment).

1.5 On requesting after sales service and parts

When ordering options or spare parts, the machine model and the serial number have to be quoted.



The safety technical requirements are only fulfilled if, in case of repair AMAZONE original spare parts are used. Using non-original spare parts will rule out the liability of AMAZONE for resulting damage.

1.6 Type plate

Fig. 1.1 Type plate on the machine



The entire type plate is of documentary value and should not be damaged or removed.

2. Safety

This instruction manual contains basic advice, which has to be observed when mounting, operating and maintaining the machine. Thus, this instruction manual has implicitly to be read by the operator before starting to operate and this book must be made available to him.

All safety advice in this instruction manual must be strictly observed and adhered to.

2.1 Danger when not adhering to the safety advice

Not adhering to the safety advice

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

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

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

2.2 Qualification of operator

The implement may only be operated, maintained and repaired by persons, who are acquainted with it and have been informed of the relevant dangers.

2.3 Identification of advice in this instruction manual

2.3.1 General danger symbol

The safety advice in this operators manual, which may lead to a danger to persons if not being observed, are identified with the general danger symbol (Danger symbol according to DIN 4844-W9).



2.3.2 Attention symbol

Attention symbols which may cause dangers to the machine and its function when not being adhered to, are identified with the attention symbol.



2.3.3 Hint Symbol

This symbol marks machine's specific points that should be observed to ensure the correct spraying operation.



2.4 "Attention" pictographs and "advice" pictographs on the machine

- Attention pictographs indicate dangerous points on the machine. Observing these pictographs means safety for all persons using this machine. The attention pictographs always are linked to safety/warning symbols.
- The advice pictographs mark the machine's specific points which have to be observed to ensure correct spraying operation.
- Strictly observe all warning and advice pictographs.
- Please pass on all safety advice also to other users.
- Please always keep all attention and advice signs clean and in an easily readable condition!

Please ask for replacement of damaged or missing decals from your dealer and attach to relevant place! (picture-No.: = Order-No.)

Fig. 2.1 and Fig. 2.2 show the fixing points of attention signs and advice signs. Please refer to the following pages for relevant explanations.



Fig. 2.1

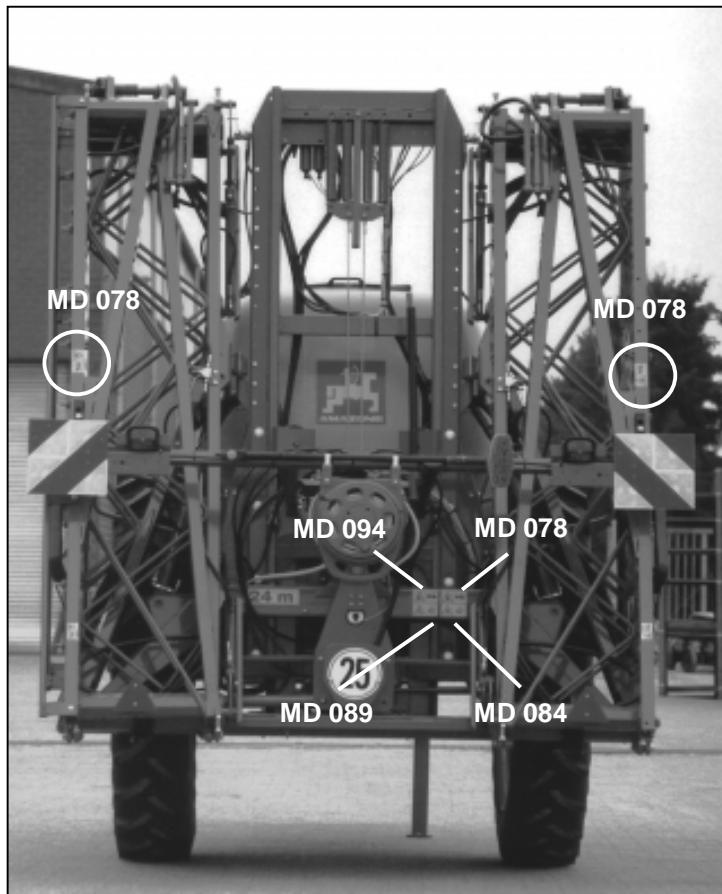
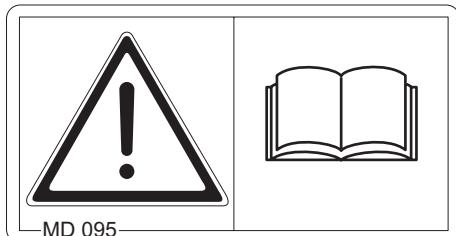
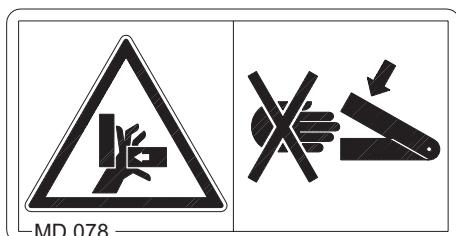


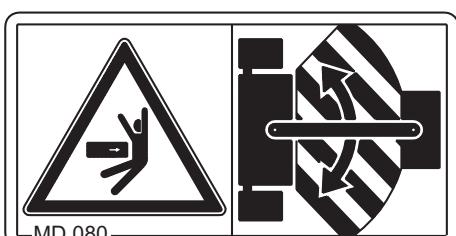
Fig. 2.2

Picture No.: **MD 095****Explanation:**

Before commencing operation read thoroughly operators manual and safety advice.

Picture No.: **MD 078****Explanation:**

Never enter into bruising zones without first isolating any further movement.

Picture No.: **MD 080****Explanation:**

Do not stay within the working area when tractor engine is running.

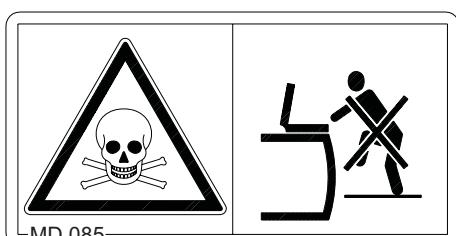
Picture No.: **MD 082****Explanation:**

Sitting or standing on the implement during operation or road transport is not permissible.

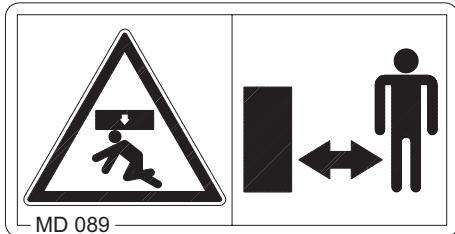
Picture No.: **MD 084****Explanation:**

Never stay within the operating area of the folding/unfolding sprayer booms.

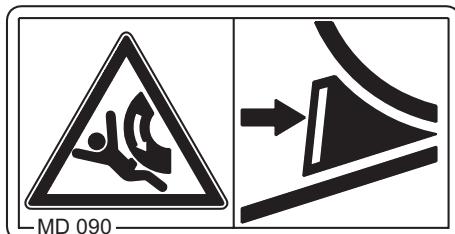
Advise people to leave the danger area.

Picture No.: **MD 085****Explanation:**

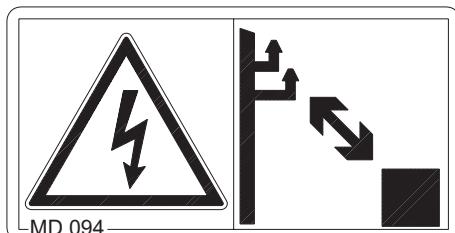
Never climb inside the tank.

Picture No.: **MD 089****Explanation:**

Never work under a lifted, unsecured load.

Picture No.: **MD 090****Explanation:**

Use parking chocks before uncoupling and parking the machine!.

Picture No.: **MD 094****Explanation:**

Observe sufficient clearance distance when near high voltage power lines.

2.5 Safety conscious operation

Besides the safety advice in this instruction manual additionally, the national, and generally valid operation safety and accident prevention advice of the authorised trade association are binding, especially VSG 3.1.

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

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

2.6 Safety advice for the operator

2.6.1 General safety and accident prevention advice



Basic principle:

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

1. Adhere to the general rules of health- and safety precautions besides the advice in this instruction manual.
2. The fitted warning- and advising decals give important hints for a safe operation; adhering to them protects your own safety.
3. When making use of public roads adhere to applicable traffic rules.
4. Become acquainted with the machines controls and functions before beginning the operation. Doing this during operation would be too late.
5. Avoid wearing any loose clothing that would possibly wrap or catch on moving machinery!
6. Avoid danger of fire by keeping the machine clean!
7. Before beginning to move, check surrounding area (children etc.). Ensure sufficient visibility!
8. Sitting or standing on the implement during operation or during transport is not permissible!
9. Attach implements as advised and only to the advised devices!

10. Special care should be taken when the implement is coupled to or off the tractor!
11. When attaching or removing the machine bring any parking or storing devices into the corresponding position (standing safety)!
12. Fit weights always to the fixing points provided and as advised for that purpose!
13. Adhere to the maximum permissible axle loads, total weights and transport dimensions!
14. Fit and check transport gear, traffic lights, warnings and guards!
15. The release ropes for quick coupling three point linkages should hang freely and in the lowered position must not release by themselves!
16. During driving never leave the operator's seat!
17. Moving behaviour, steerability and braking are influenced by mounted implements, trailers and ballast weights. Check sufficient steerability and braking.
18. When lifting a three-point-implement the front axle load of the tractor is reduced depending on its size. The sufficient front axle load (20 % of the tractor net weight) has to be observed.
19. When driving round bends note the width of the machine and/or the changing centre of gravity of the implement.
20. Put implement into operation only when all guards are fixed in position.
21. Never stay or allow anyone stay within the operation area of the machine.
22. Never stay or allow anyone stay within the pivot and swivel area of the implement.
23. Hydraulic folding frames should only be actuated if no persons are staying in the slewing area.
24. On all hydraulically actuated pivoting parts exists danger of injury by bruising and trapping.
25. Before leaving the tractor lower the machine to the ground. Actuate the parking brake, stop the engine and remove ignition key.
26. Allow nobody to stand between tractor and implement if the tractor is not secured against rolling away by the parking brake and/or by the supplied chocks.

27. Secure sprayer booms in transport position.
28. When filling the tank do not exceed the nominal volume.
29. Use the platform only for filling. During use riding on the platform is not permissible.

2.6.2 Means for traffic safety

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

2.6.3 Tractor/trailed implements

1. When fitting the machine to the three point linkage of the tractor bring all control levers into such a position that unintended lifting or lowering is impossible.
2. When fitting to the three-point linkage the mounting categories at the tractor and the implement must be compatible.
3. There is danger of injury when mounting implements!
4. Secure trailers against rolling away (use parking brakes, chocks).
5. In the area of the three point linkage there is danger of injury by its crushing and shearing areas.
6. Never allow anyone to stay between tractor and implement without having secured by stop wedges against rolling away.
7. Implements and trailers should only be fitted to the provided devices.
8. Consider the max. permissible load of trailer draw bars, hitches or tool bars and tyres.
9. When fitting draw bars ensure sufficient manoeuvrability on the hitching point.
10. Hitch up trailers according to the law. Check the function of the brakes of the traile implement.
- Adhere to the manufacturer's advice.
11. Whenever travelling with trailers the tractor brake pedals must be locked together.

12. For travelling on public roads bring all devices into transport position!
13. When driving in bends with traile or mounted implements mind the wide protrusions and the dynamic forces of the implement.
14. Before travelling in public roads secure all swivelling components against an endangering change of their position.
15. When operating the supporting devices danger by crushing or shearing may occur.
16. The adjustment of loaded draw bars should always be conducted under suitable workshop conditions.
17. On single axle trailers beware of the weight reduction on the tractor front axle and the influence to the steerability of the tractor by the rear load.
18. Park implement/trailer safely (prevent tipping over or rolling away).
19. As a matter of principle always remove ignition key before conducting any repair, maintenance and cleaning operation.
20. Keep all guards fitted and always in serviceable condition.

2.6.4 Operating with PTO shafts

1. Use only PTO shafts which are designed for the implement by the manufacturer and which are equipped with all legally requested guards.
2. Guard tubes and cones of the PTO shaft as well as a tractor and implement side PTO guard must be fitted and kept in a proper condition.
3. On PTO shafts always ensure the tube has sufficient overlap in transport- and operating position. (Observe instruction manual of the PTO shaft manufacturer.)
4. Fit and remove the PTO shaft only when engine is stopped and ignition key is removed.
5. Ascertain correct fitting and securing of the PTO support.
6. Prevent PTO guard from spinning by fixing the provided chain to a nearby static part.
7. Before switching on the PTO shaft ensure that the chosen PTO speed of the tractor corresponds to the allowable implement input speed.



8. When using the ground-related PTO take into account that the PTO speed depends on the driving speed and that the turning direction is reversed when driving backwards.
9. Before switching on the PTO shaft take care that no one stays in the danger zone of the implement.
10. Never switch on the tractor PTO while engine is stopped.
11. When operating with a switched on PTO shaft allow no one to stay near to the spinning PTO or universal joint shaft.
12. Always stop PTO when it is not needed or when the shaft is in an adverse position!
13. Attention! After switching off the PTO the mounted implement may continue to run by its dynamic mass!
During this period never come too close to the implement. Begin to work on the implement only after it has come to a full standstill.
14. Clean and grease the universal joint shaft and the PTO driven implement only after the PTO shaft and engine have been stopped and ignition key pulled out.
15. Place the uncoupled PTO shaft on the retaining support provided.
16. When travelling in curves mind the permissible angling and sliding length of the PTO-shaft.
17. After removal of PTO shaft apply guard cap onto PTO stub.
18. Immediately repair any damage before operation to avoid consequential problems.
19. When using wide angle PTO shafts, always attach the wide angle joint to the pivot point.

2.6.5 Brakes

1. Check functions of brake before travelling on public roads.
2. Brake systems should regularly be carefully checked.
3. Setting and repair work on the braking system must be conducted only by specialist workshops or approved repairers.
4. When travelling on public roads ensure tractor brake pedals are locked together to prevent single wheel braking!

2.6.6 Hydraulic system

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

2.6.7 Bolted connections, tyres

1. Repair work to the tyres may only be conducted by trained personnel and with specialist mounting tools.
2. When working on the wheels make sure that the trailed sprayer is safely parked and secured against rolling away (chocks).
3. Excessive air pressure may cause the tyre to explode.
4. Check air pressures regularly.
5. All fixing bolts and nuts should be re-tightened as advised by the manufacturer.
6. This re-tightening should be conducted after every change of the wheels.

2.6.8 Electric outfit

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

2.6.9 General safety and accident prevention advice for maintenance, repair and cleaning

1. Repair-, maintenance- and cleaning operations as well as the remedy of function faults should principally be conducted with drive and engine stopped. Remove ignition key.
2. Check nuts and bolts for tightness and retighten if necessary.

3. Before conducting electric welding operations on tractor or on the mounted implement, remove cable from generator and battery.
4. Any spare parts fitted must, as a minimum meet with the implement manufacturers' fixed technical standards. Using original **AMAZONE** spare parts for example ensures this. Non original parts invalidate warranty and contravene these documentation for safe use.

2.6.10 Basic safety rules on crop protection equipment

1. Adhere to the recommendations of the crop agent manufacturer.
 - Protective clothing.
 - Warning advice.
2. Metering-, using- and cleaning advice.
3. Never open hoses or tubes which are pressurised.
4. If spare hoses are to be fitted, use only original **AMAZONE**-hoses (hydraulic hoses 290 bar) which resist the chemical, mechanical and thermal strain. In principle when fitting hoses or tubes use only hose fittings made of stainless steel (refer to health- and safety advice regarding fitting of hoses).
5. Repair work inside the sprayer tank should only be started after thorough cleaning and by wearing a protective breathing mask. For safety reasons a second person should watch the work from outside the tank.
6. The following should be noted when repairing sprayers which have been used for liquid fertiliser with Ammonium Nitrate Urea solutions:
 Residue of Ammonium-Nitrate-Urea solutions can produce both outside and inside the machine a salt by evaporation of the water. Hereby pure Ammonium Nitrate and urea is developed. In pure form Ammonium Nitrate in conjunction with an organic material, e. g. urea can react explosively if during repair operations (e. g. welding, grinding, filing) the critical temperatures are reached.

The salt of the Ammonium Nitrate Urea solution is water soluble, i. e. by thorough washing with water of the implement or the part to be repaired this danger is removed. Therefore, before starting any repair conduct a thorough cleaning of the implement with water.

7 When filling the tank do not exceed the nominal volume.



When handling spray agent always wear the correct protective clothing as e. g. gloves, overall, protective glasses etc.



In tractor cabs with ventilation fans exchange the fresh air filters for active carbon filters.



Consider the compatibility of spray agents and materials of the machine.



Do not spray any materials which tend to glue or to solidify.





3. Product description

The trailed sprayers UG Nova have been designed for fitting

- to the rear three point hydraulics (true track following draw bar and universal tracking draw bar),
- to the tractor high towing eye (straight draw bar)
- to the hitch draw bar.

3.1 Control units "NG" for UG Nova 2200 - 4500

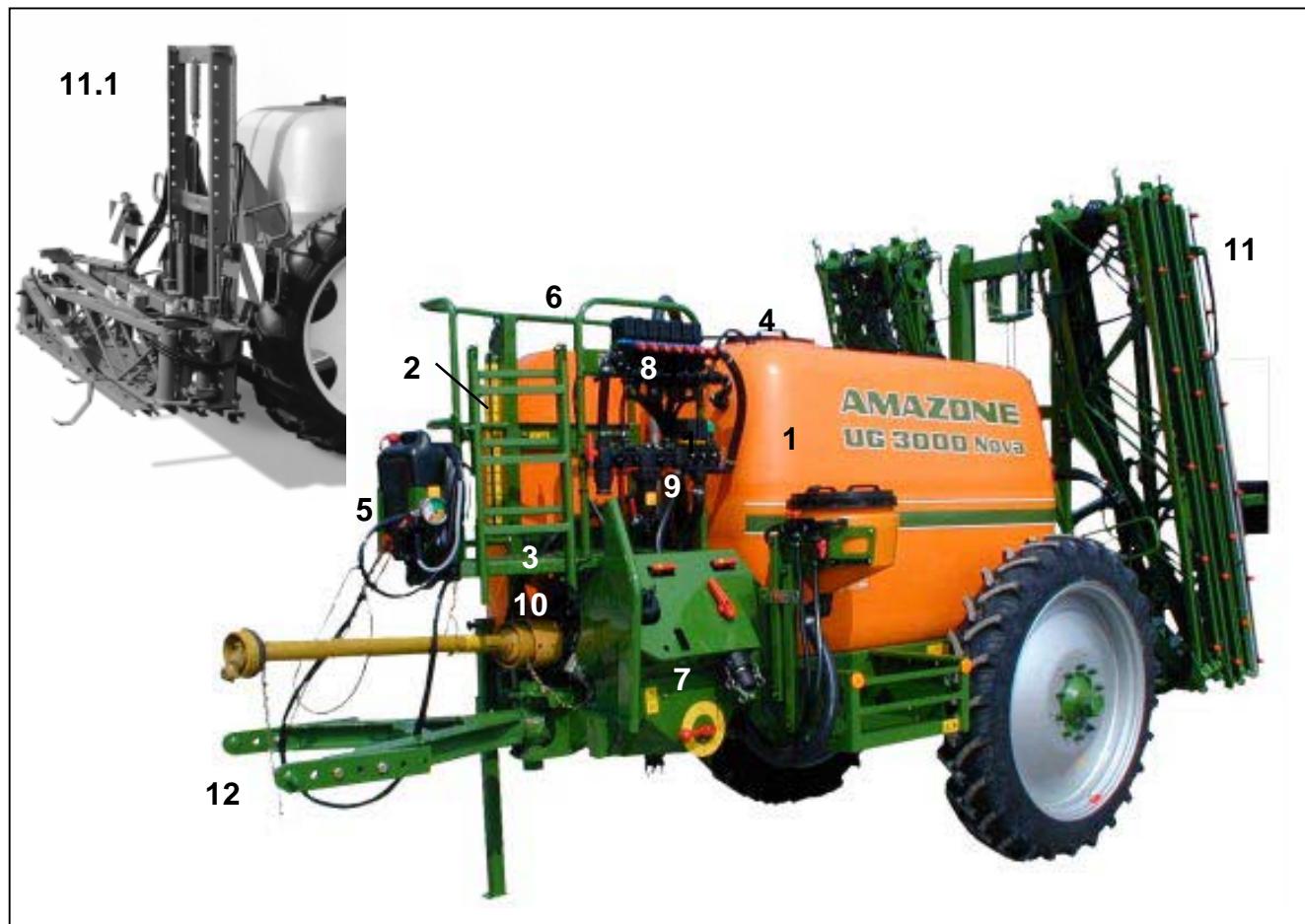


Fig. 3.1

Fig. 3.1/...

- 1 - Tank with integrated rinsing tank and intensive hydraulic agitation system.
- 2 - Tank dry sight gauge level indicator
Tank capacity [l] = indicated scale figure x 100
- 3 - Tank access platform
- 4 - Tank access lid
- 5 - Hand washing tank
- 6 - Filling and opening of the fresh water flushing tank

- 7 - Vario-control for sprayer rinsing and diluting function
- 8 - electrically remote controlled control unit (NG)
- 9 - Part width shut off valves
- 10 - Pump equipment
- 11 - Super-S-boom
- 11.1 - Q-boom
- 12 - True track following draw bar

3.1.1 Liquid flow- 1 pump

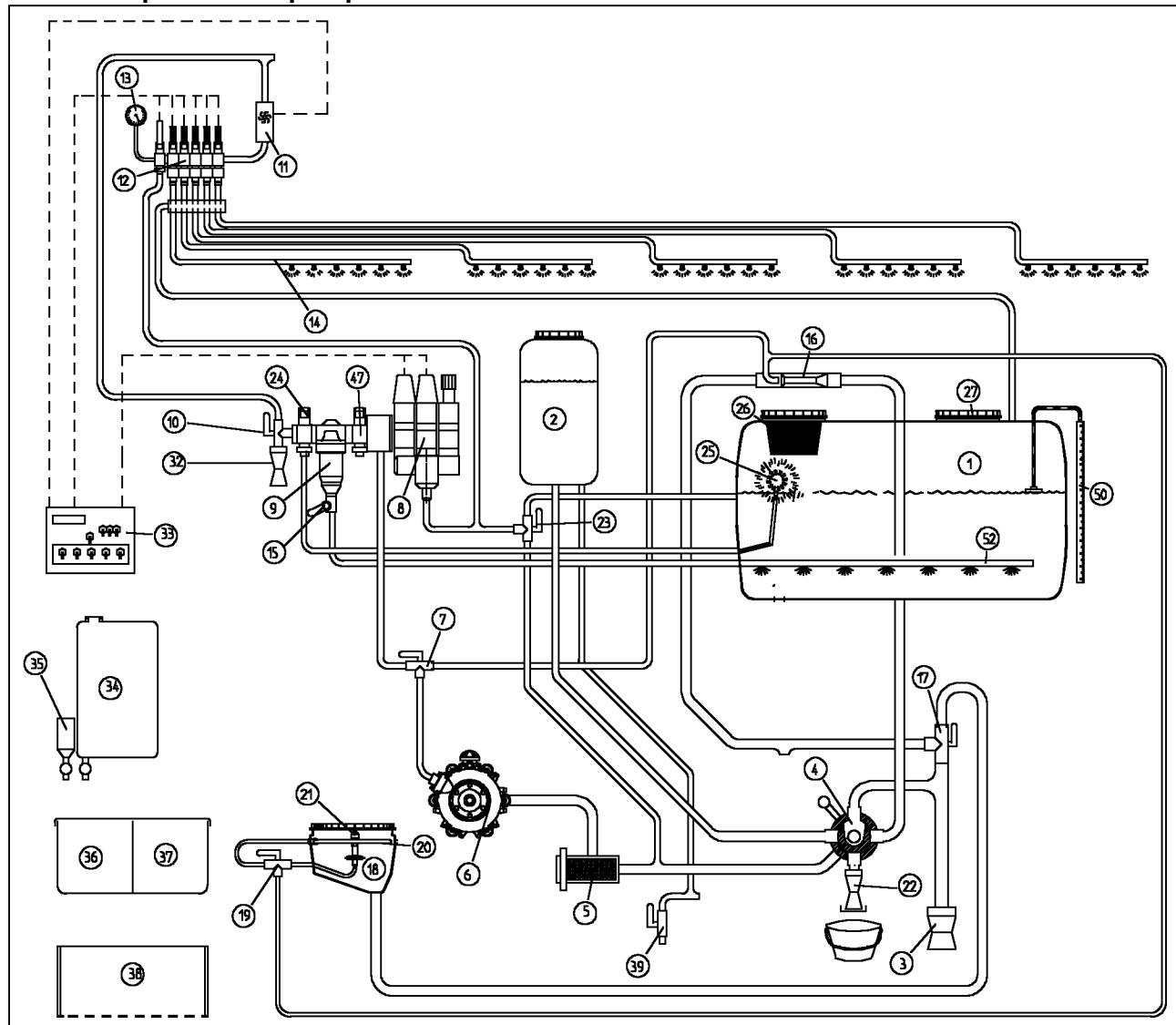


Fig. 3.2

Fig. 3.2/...

- 1 Spray agent tank
- 2 Fresh water flushing tank
- 3 Suction port
- 4 Central suction valve
- 5 Suction filter
- 6 Piston diaphragm pump
- 7 Valve – filling - spraying
- 8 Pressure governing
- 9 Self cleaning pressure filter
- 10 Valve quick emptying
- 11 Flow meter sensor
- 12 Part width shut off valves
- 13 Pressure gauge
- 14 Spray pipe
- 15 6 – step agitation control

- 16 Injector
- 17 Injector – choice - valve
- 18 Induction bowl
- 19 Valve – ring – rotation nozzle
- 20 Ring circuit nozzle
- 21 Rotation nozzle
- 22 Emptying device
- 23 Choice valve for return flow
- 24 Valve for tank cleaning
- 25 Rotation nozzle for tank
- 26 Filling sieve
- 27 Lid
- 32 Quick emptying port
- 33 Switch box (Computer)
- 34 Hand wash tank
- 35 Soap dispenser
- 36 Box for protective clothing (clean)
- 37 Box f. protective clothing (contam.)
- 38 Canister carrier
- 39 Tap for can flushing
- 47 Valve cleaning brush
- 50 Tank level indicator
- 52 Agitator nozzle

3.2 Control unit "TG" – part section valves mounted at the rear in the boom centre

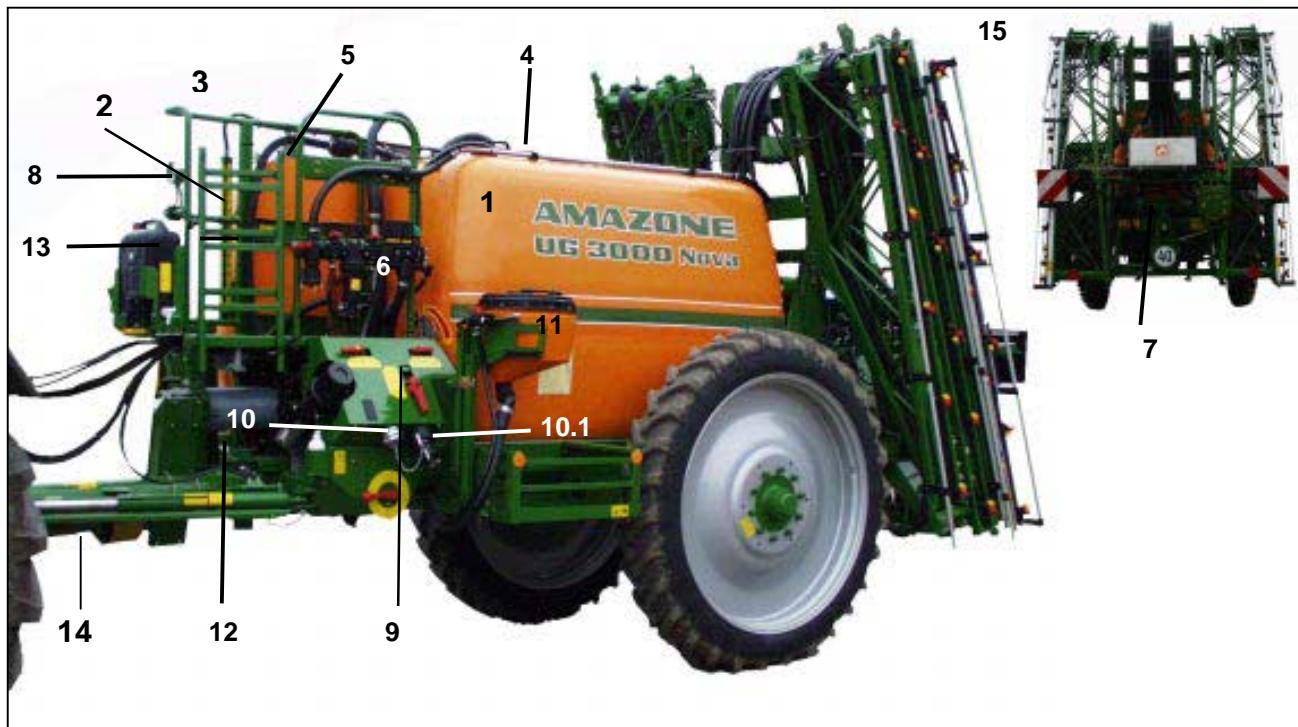


Fig. 3.3

Fig. 3.3 /...

- | | |
|---|--|
| 1 - Tank with intensive hydraulic agitator | 10 - Connection point |
| 2 - Tank level indicator | 10.1 Connection point for self fill hose |
| Tank volume [l]
=indicated scale figure x 100 | 11 - Induction bowl |
| 3 - Tank access platform | 12 - Pump equipment |
| 4 - Tank access flap | 13 - Hand wash tank |
| 5 - Fresh water flushing tank | 14 - Towing eye draw bar (straight draw bar) |
| 6 - Remote controlled electric volume control (TG) | 15 - Super-S-boom |
| 7 - Part width shut off valves | |
| 8 - Spray pressure gauge | |
| 9 - Control panel for the central setting of the individual operational states (spraying, diluting, rinsing, inducting, filling via self fill hose) | |

3.2.1 Liquid flow – 2 pumps

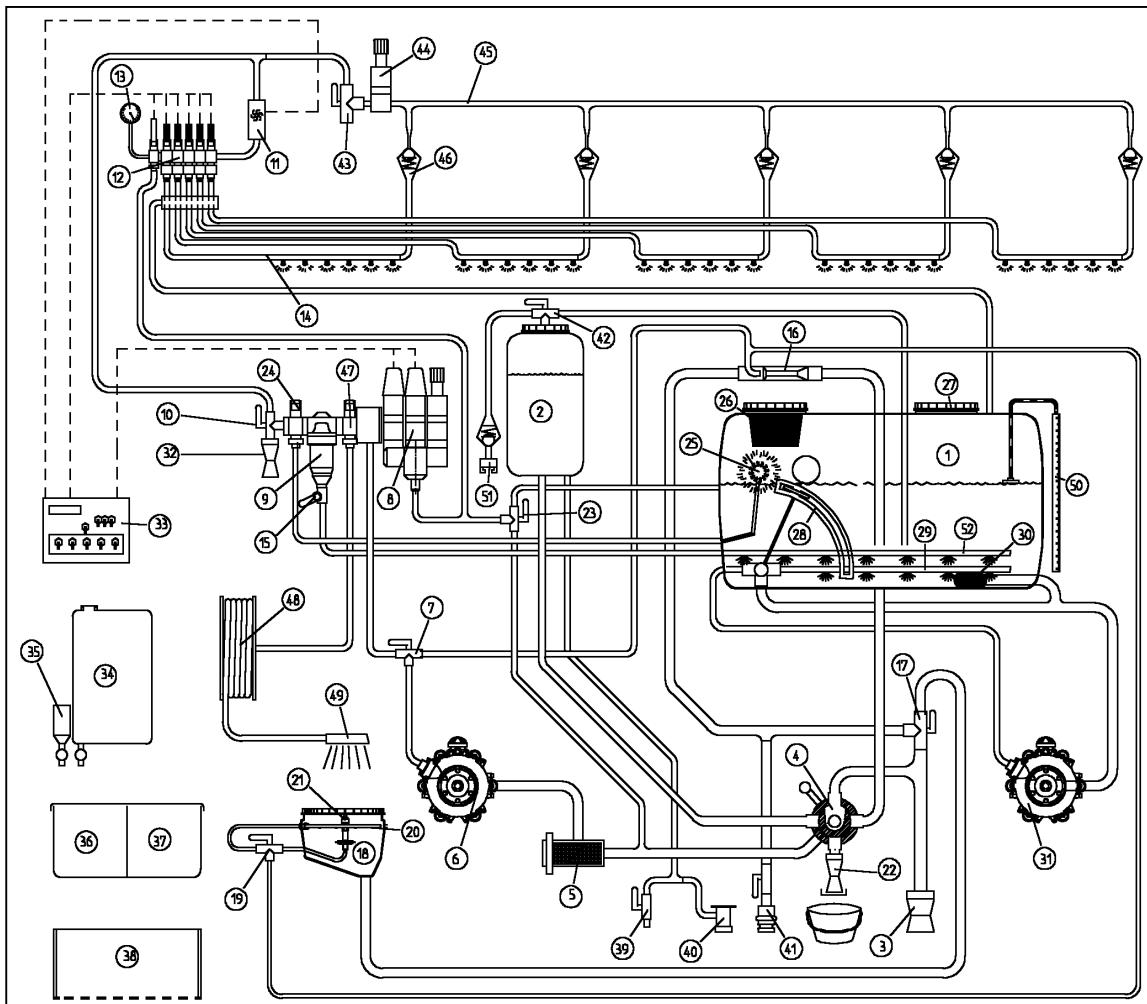


Fig. 3.4

- | | | |
|---------------------------------|---------------------------------------|--|
| Fig. 3.4 /...Spray agent tank - | 19 Valve – circuit – rotation nozzle | 37 Box for protective clothes (contaminated) |
| 2 Fresh water flushing tank | 20 Ring circuit nozzle | 38 Canister carrier |
| 3 Self fill connection | 21 Rotation nozzle | 39 Tap for canister flushing |
| 4 Central-suction-valve | 22 Emptying coupling | 40 Flushing base for ECOFILL |
| 5 Suction filter | 23 Optional valve for return flow | 41 Coupling for ECOFILL |
| 6 Piston diaphragm pump | 24 Valve for tank wash | 42 Optional valve for hydrant filling |
| 7 Valve – filling - spraying | 25 Rotating nozzle for tank | 43 Sequence valve |
| 8 Pressure governing | 26 Filling sieve | 44 DUS - valve |
| 9 Self cleaning pressure filter | 27 Lid | 45 DUS - system |
| 10 Valve quick emptying | 28 "Rührmatik" | 46 Throttle return valve |
| 11 Flow meter sensor | 29 Rührmatic agitating nozzles | 47 Valve – cleaning brush |
| 12 Part width shut off valves | 30 Rührmatic suction filter | 48 Hose reel |
| 13 Pressure gauge | 31 Piston diaphragm pump | 49 Cleaning brush |
| 14 Spray pipe | 32 Quick emptying port | 50 Tank level indicator |
| 15 6 – step agitator control | 33 Switch box (Computer) | 51 Port for hydrant filling |
| 16 Injector | 34 Hand wash tank | 52 Agitator – nozzle harness |
| 17 Injector - optional valve | 35 Soap dispenser | |
| 18 Induction bowl | 36 Box for protective clothes (clean) | |

3.3 Control units

Review - Possible use of control units						
Control units -remote con- trolled-	Switch box SKS	Functions for Su- per-S-booms	Control computer			
			AMACHECK II A	SPRAYCONTROL II A	AMATRON II A	UX-PILOT
NG	500 / 700 / 900	-	-	-	-	-
	501 / 701 / 901	x	-	-	-	-
NG with flow meter	500 / 700 / 900	-	x	x	x	-
	501 / 701 / 901	x	x	x	x	-
TG	500 / 700 / 900	-	-	x	x	x
	501 / 701 / 901	x	-	x	x	x
	502 / 702 / 902	x	-	x	x	x

3.3.1 Control unit "NG"

Fig. 3.5/...

- 1 - Volume control for a constant spray rate [l/ha] within one tractor gear. The spray pressure can be increased or decreased via the switch box.
- 2 - Switch box SKS with cable and implement plug for connection to the switch box.
- 4 - Knurled sleeve for setting the relief valve (set by the factory $P_{max} = 10$ bar).
- 5 - Single tap for water supply for the tank rinsing nozzles.
- 6 - Single tap for exterior wash down kit (option).
- 7 - Self cleaning pressure filter.
- 8 - Step tap for hydraulic agitation.
- 9 - free
- 10 - Switching tap for supply to the equal pressure control unit.



Only shut the switching tap if it is intended to increase the intensity of the hydraulic agitator whilst mixing the spray agent.

- 11 - Equal pressure valve chest.
- 12 - Motor valves for part width shut offs. The motor valves switch on and off the individual part width shut offs. The motor valves are actuated either individually via the part width switches or simultaneously via central master boom on / off switch on the switch box.
- 13 - Knurling thumb screw for setting the equal pressure valves before the first operation and after every nozzle change.
- 14 - Equal pressure control return flow. When a boom section is switched off, the excess spray agent which otherwise would have been supplied to this part width section, flows back into the suction pipe via the equal pressure control return flow ensuring that the spray pressure will not be increased.
- 15 - Part width return flow. Serves for pressure relief in the equal chest so when the sprayer boom is switched off, the remaining spray liquid pressure in the sprayer boom decays via this return flow and thus – in conjunction with the diaphragm valves – ensures an immediate drop-free nozzle shut off.

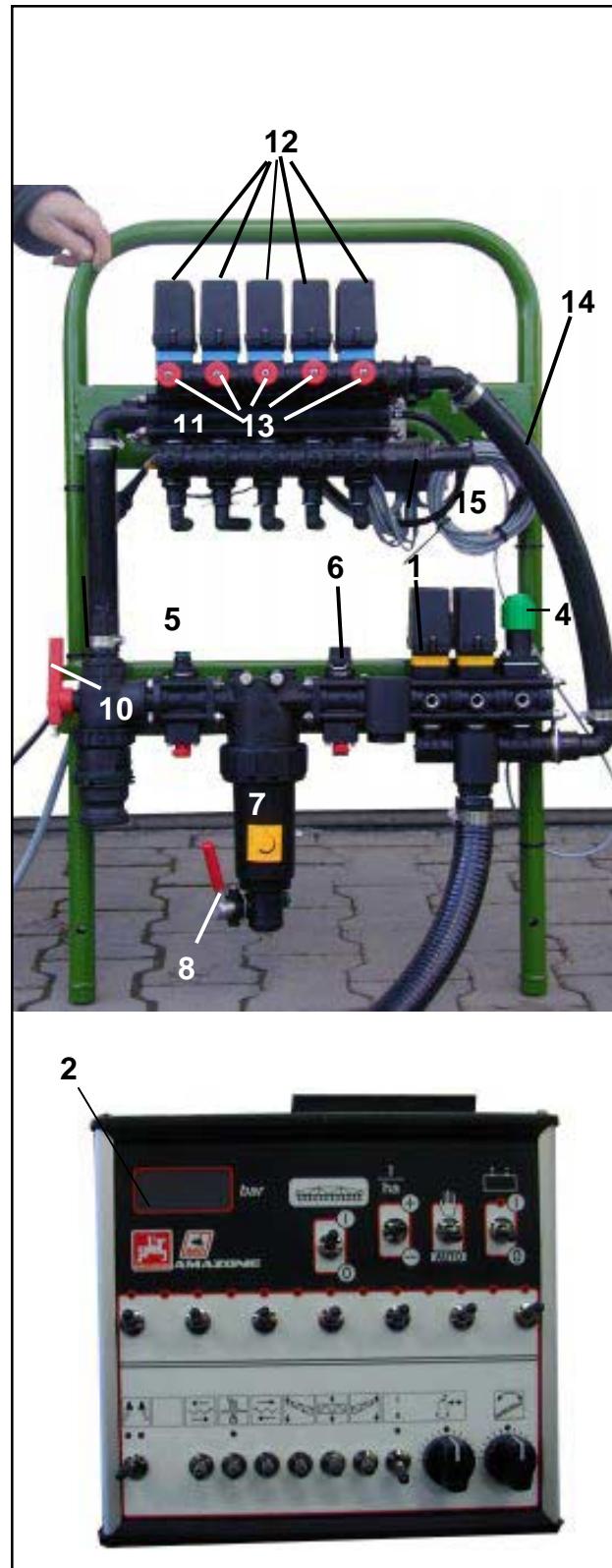


Fig. 3.5

3.3.2 Control unit "TG"

Fig. 3.6/...or 3.7/...

- 1 - Volume control for a constant spray rate [l/ha] within one tractor gear.
- 2 - Electric motors for adjusting the spray pressure and hence the spray rate via the switch box..
- 3 - Switch box SKS 500/700/900, SKS 501/701/901 or SKS 502/702/902.
- 4 - Implement supply cable with implement plug for the switch box.
- 5 - Control computer AMATRON II A or SPRAY-CONTROL II A.
- 6 - Knurl sleeve for setting the relief valve pressure (set by the factory $P_{max} = 10$ bar).
- 7 - Single tap for water supply to the internal tank wash nozzles.
- 8 - Single tap for exterior wash down kit (option).
- 9 - Self cleaning pressure filter.
- 10 - Step tap for hydraulic agitation.
- 11 - Control tap to supply the boom section shut off valve chest (option quick tank emptying).
- 12 - 3-way bypass valve (13) (return flow inside the tank (factory provided item), return flow into suction hose of the pump).
- 13 - Bypass valve
- 14 - Connection port to spray pressure indicator.
- 15 - Digital spray pressure indicator (special option).
- 16 - Flow meter to determine the spray rate [l/ha].
The impulses per litre [Imp./l] supplied by the flow meter have already been determined in the factory and have been written on the housing of the flow meter. If the Imp./l are unknown, calibrate the flow meter (please refer to chapter "Calibrating the flow meter").



Residues of spray agent deposited inside the flow meter may cause deviations to the spray rate. We therefore recommend to calibrate the flow meter [Imp./l] every 1000 ha or at least, however, once a year.

- 17 - Motor valves for the part width shut offs. The individual boom sections are switched on and off by the motor valves. The motor valves are actuated either individually via the part width shut off switches or simultaneously via the central master boom switch on the switch box.
- 18 - Part width shut off return flow. Serves for pressure relief in the equal pressure control chest. When the sprayer boom is switched off the remaining pressure in the spray line is reduced via this return flow and thus, in conjunction with the diaphragm valves, ensures a fast drip-free nozzle shut off.

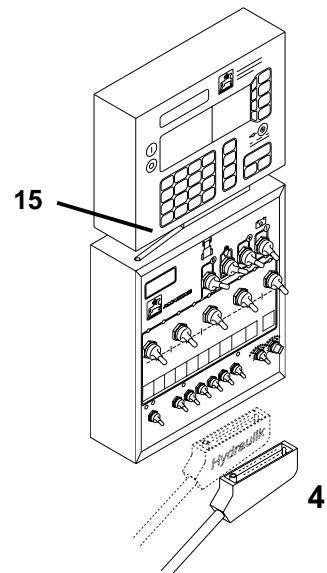
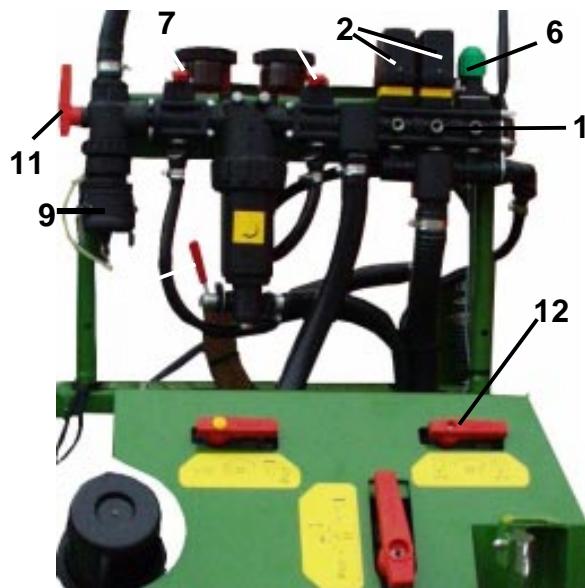


Fig. 3.6

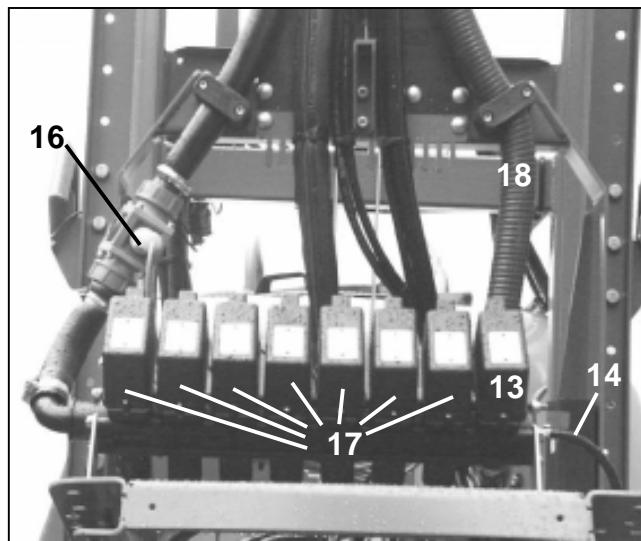


Fig. 3.7

3.4 Switch boxes SKS



For first fitting the switch box, please refer to chapter "upon receipt of machine and fitting"

Review switch boxes SKS						
Switch box SKS	Function of switch boxes					
	electr. remote control for control unit	Boom tilt con- trol	Profi Folding	Draw bar control II	Foam marker	Trail-tron
500/700/900	x	-	-	-	-	-
501/701/901	x	electric	-	-	x	-
	x	hydraulic	x	x	x	-
502/702/902	x	hydraulic	x	-	x	x

3.4.1.1 Switch box SKS 500/700/900

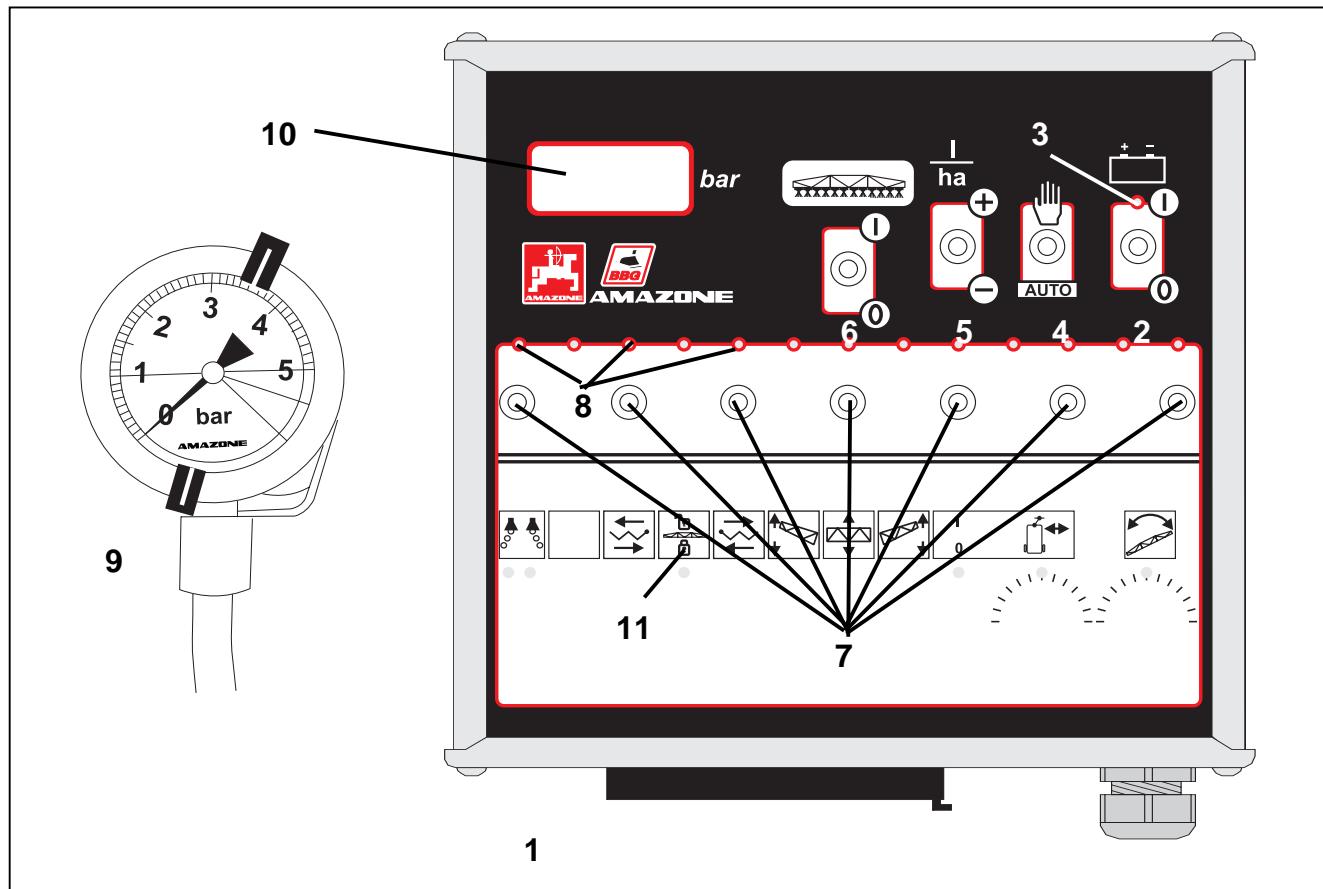


Fig. 3.8

Fig. 3.8/...

- 1 - Switch box SKS 700.
- 2 - On- and off switch for the power supply. In position "1" the sprayer is ready for operation with the red indicator light on (3).
- 3 - Indicator lamp (red).
- 4 - Programming switch „Auto/Manual operation“.



Set the programming switch to "AUTO" position only when the switch box has been connected to "Spraycontrol II A" or "AMATRON II A". For all other cases the programming switch is in "manual operation" position.

- 5 - ± Key setting or changing the spray pressure.
- 6 - Central sprayer boom switching on and off.
- 7 - Part width shut off switch used for switching on and off individual boom sections.
- 8 - Indicator lights (green). When the part width section has been switched on the relevant indicator lamp lights up.
- 9 - Liquid fertiliser proof pressure gauge – indicates the spray pressure – is fitted to the sprayer.
- 10 - Digital spray pressure indicator (option).
- 11 - Indicator lamp (red) for boom locking.

3.4.2 Switch box SKS 501/701/901

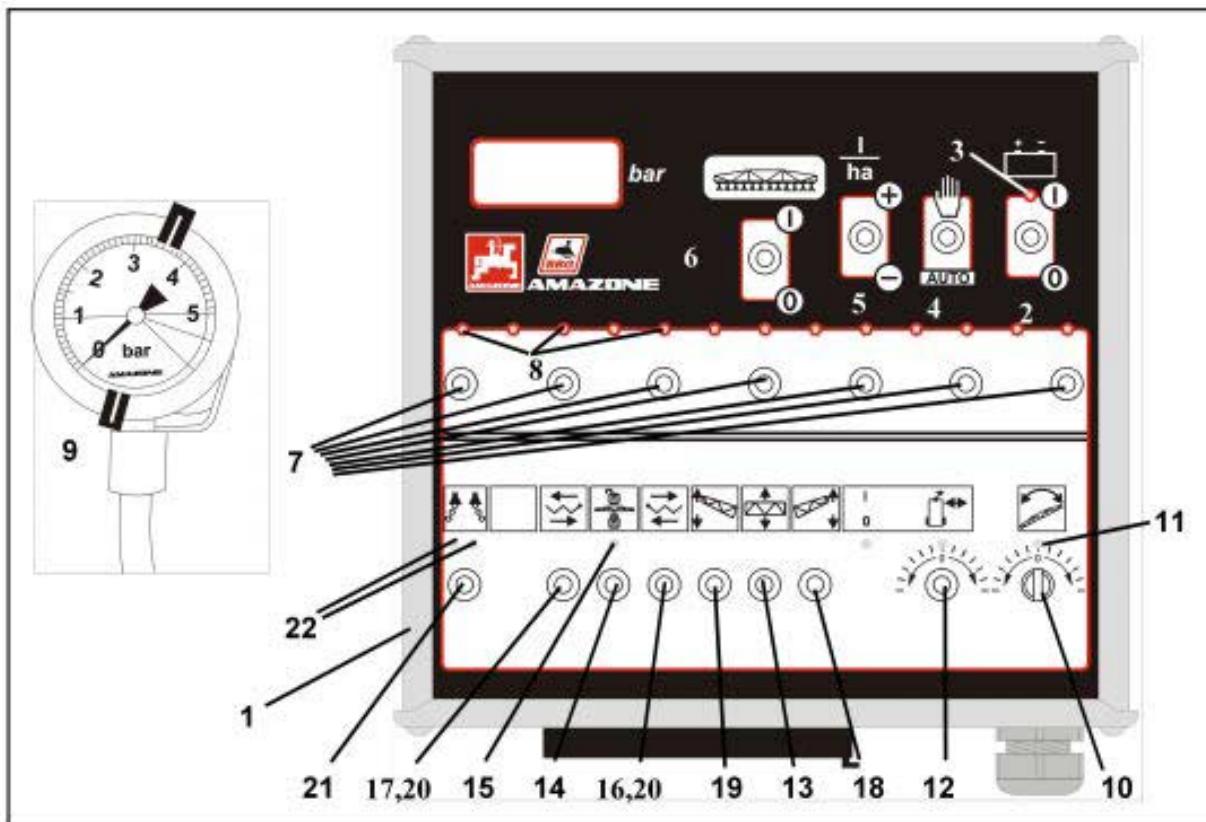


Fig. 3.9/...

- 1 - Switch box SKS 701.
- 2 - On- and off switch for the power supply. In position "I" the sprayer is ready for operation with the red indicator light on (3).
- 3 - Indicator light (red).
- 4 - Programming switch "Auto/Manual operation".

 **Set the programming switch to "AUTO" position only when the switch box has been connected to "Spraycontrol II A" or "AMATRON II A". For all other cases the programming switch is in "manual operation" position.**

- 5 - ± Key for setting or changing the spray pressure.
- 6 - Central master sprayer boom on and off switch.
- 7 - Part width section switch used for switching on and off the individual part width sections.
- 8 - Indicator lights (green). When the part width section has been switched on the relevant indicator lamp lights up.
- 9 - Liquid fertiliser proof pressure gauge for spray pressure indication – is fitted to the sprayer.
- 10 - Electro hydraulic or electric boom tilt adjustment. If the sprayer boom has been adjusted with the aid of the boom tilt control, the green control lamp lights up (11).

- 11 - Indicator lamp (green) boom tilt adjustment.
- 12 - Hydraulic universal draw bar steering – not possible with electric boom tilt.
- 13 - Hydraulic boom height adjustment.
- 14 - Locking and unlocking the boom swing compensation. If the boom swing compensation is locked, the red control lamp (14) lights up. Press the key for unlocking until the control lamp goes out.
- 15 - Control lamp (red) indicates boom swing compensation.
- 16 - Folding in and out the right hand boom (only Profi I/II).
- 17 - Folding in and out the left hand boom (only Profi I/II).
- 18 - Right hand boom tilt up / down (only Profi-folding "II" and "III").
- 19 - Left hand boom tilt up / down (only Profi-folding "II" and "III").
- 20 - Folding in and out of both the right and left hand boom (only Profi O/III).
- 21 - Foam marker. With the right hand red control lamp (22) lit up foam bubbles are placed on the right hand boom side – as seen in driving direction. With the left hand red control lamp (22) light up, the foam placement takes place on the left hand boom side.
- 22 - Control lamps (red) – foam marker.

3.4.3 Switch box SKS 502/702/902

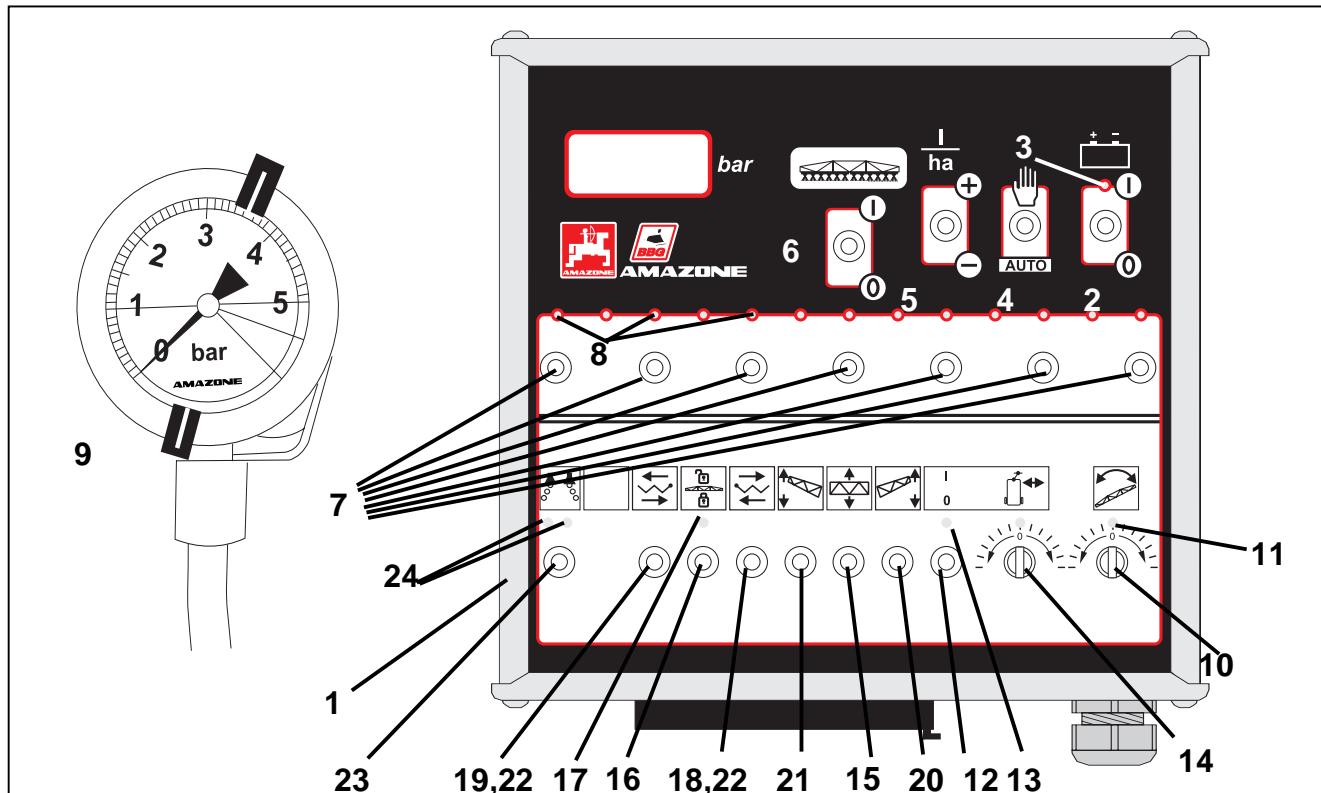


Fig. 3.10

Fig. 3.10/...

- 1 - Switch box SKS 702.
- 2 - On- and off switch for the power supply. In position "I" the sprayer is ready for operation and the red control lamp lights up (3).
- 3 - Control lamp (red).
- 4 - Programming switch "Auto/Manual operation".



Set the programming switch to position "AUTO" only when the switch box has been connected to "Spraycontrol II A" or "AMATRON II A". For all other cases the programming switch is in position "manual operation".

- 5 - ± key for setting or changing the spray pressure.
- 6 - Central sprayer boom switching on and off.
- 7 - Part width shut off section switch. For switching on and off the individual part width shut offs.
- 8 - Control lamps (green). When the boom section has been switched on the relevant control lamp lights up.
- 9 - Liquid fertiliser proof pressure gauge for spray pressure indication – is fitted to the sprayer.
- 10 - Electro hydraulic or electric boom tilt adjustment. If the sprayer boom has been adjusted with the aid of the boom tilt control, the green control lamp lights up (11).
- 11 - Control lamp (green) - boom tilt adjustment.

- 12 - On/off switch for the automatic draw bar steering Trail-tron. In Position "I" the automatic draw bar steering has been switched on, the green control lamp (12) lights up.
- 13 - Control lamp (green) - Trail-tron..
- 14 - Turning knob changes the base draw bar position (for operation on slopes, manoeuvring, etc.)
- 15 - Hydraulic boom height adjustment.
- 16 - Locking and unlocking the boom swing compensation. If the boom swing compensation is locked, the red control lamp (16) lights up. Press the key for unlocking until the control lamp goes out.
- 17 - Control lamp (red) - boom swing compensation.
- 18 - Folding in and out the r.h. boom (only Profi I/II).
- 19 - Folding in and out the l.h. boom (only Profi I/II).
- 20 - Right hand boom tilt up / down (only Profi-folding "II" and "III").
- 21 - Left hand boom tilt up / down (only Profi-folding "II" and "III").
- 22 - Right and left hand boom tilt up / down- / (only Profi 0/III).
- 23 - Foam marker. With the right hand red control lamp (24) light up foam bubbles are placed on the right hand boom side – seen in driving direction. With the left hand red control lamp (24) light up, the foam placement takes place on the left hand boom side.
- 24 - Control lamps (red)-foam marker.

3.5 AMACHECK II A

"AMACHECK II A" fastens directly on top of the switch box. "AMACHECK" is only a pure information and monitoring device and contains the following functions:

- Displays the actual operational speed [k.p.h.] and actual spray rate [l/ha].
- Registers the area and the total area in hectares (e. g. within one season).
- Registers the applied amount and the applied total amount in litres (e. g. within a season).
- Registers the working time in hours.
- Displays the actual work rate in [ha/h].
- Displays the actual spray rate in [l/min].
- Matches the feed to boom part width sections.
- Monitors the rev. speed.

3.6 Spraycontrol II A / AMATRON II A

"Spraycontrol II A" or "AMATRON II A" fastens directly on to the switch box. The relevant computer then provides an area related control of the spray rate [l/ha] in relation to the desired spray rate and the actual driving speed. For this the spray pressure adjustment motor is linked automatically to the computer via the switch box.

Registered and accordingly stored are:

- Actual forward speed in [km/h].
- Actual spray rate in l/ha or [l/min].
- Sprayed volume by field with a secondary total volume in [l].
- Worked area in ha, total area in [ha].
- Travelled distance in [km].
- Working time of tractor, working time of sprayer and working time of operator in [h].
- Average work rate in [ha/h].

3.7 UX-Pilot

For fitting and handling the UX-Pilot (Fig. 3.11) a special instruction book is provided.



Fig. 3.11

3.8 Filter equipment

Only if the spray mixture is thoroughly filtered can a trouble free operation of the sprayer, especially of the nozzles be ensured and thus the filter influences considerably the success of the treatment. Therefore always use all filters provided and check their function through regular maintenance.

 **Mesh width of the pressure and nozzle filter must always be smaller than the liquid flow cross section of the fitted nozzles.**

 **Permissible combinations of filters or their mesh width and any deviating statements by the crop protection agent manufacturers should be adhered to.**

3.8.1 Filter tap / Suction filter

3.8.1.1 Suction filter

Fig. 3.12/...

Suction filter for filtering the spray agent from the induction bowl / for filtering the water when filling the tank with the aid of the suction hose (Fig. 3.12/1).

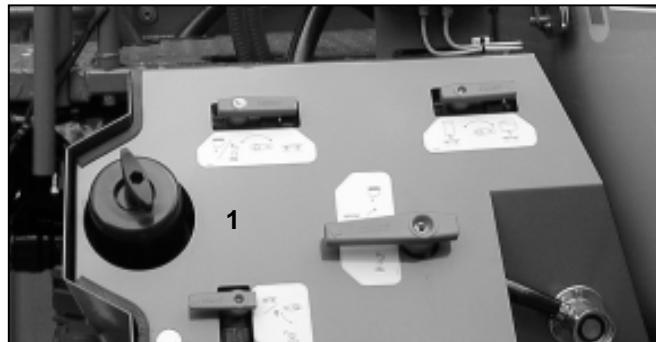


Fig. 3.12

3.8.2 Self cleaning the pressure filter of the control unit

The pressure filter (3.13/1) has a larger number of meshes per inch than the suction filter. This way the blockage of the nozzle filters in the spray nozzles is prevented.

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



The standard fitted filter insert has a mesh width of 0,36 mm and 50 meshes/inch . This pressure filter insert is suitable for nozzle sizes from "03".

For the nozzle size "02" the pressure filter insert with 80 meshes/inch is required (optional).

For "015" and "01" nozzles the 100 meshes/inch pressure filter insert is required (optional).



When using 80 or 100 meshes/inch pressure filter inserts it is possible that with some chemicals that some active spray agents are filtered off. Therefore in such individual cases seek advice from the crop protection agent manufacturer.



Fig. 3.13

3.9 Agitators

3.9.1 Intensity hydraulic agitation

Fig. 3.14/...

- 1 - Step tap for the adjustable intensity hydraulic agitation. The agitation can be set in 6 steps "0, 1, 2, 3, 4, 5". In position "0" agitation is switched off whereas the highest intensity agitation is achieved in position "5". Depending on the pump equipment set operational agitation in position "1 or 2.



While spraying never change the agitation position as this will affect the spraying pressure and thus the spray rate (l/ha) will be altered. If during spraying operation the agitation needs to be changed then the spray pressure must be reset.



Fig. 3.14

Travelling to the field with agitator engaged:

- Switch off the sprayer boom.
- Engage the PTO shaft.

Set the desired agitation position.



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



While agitating the spray mixture adhere to any advice from the spray agent manufacturer.

3.9.2 Liquid level dependent automatic agitation [Rührmatic] (only when 370 l/min or 460 l/min-pumps are fitted)

The "Rührmatic" tank level dependent agitation is set automatically depending on tank contents i. e. low tank level – less agitation and with higher tank level – more agitation. In this way an adapted agitation intensity is always ensured and frothing is avoided.



If it is desirable to increase the agitation intensity even when the tank is not completely filled fix the floatation body in position "B" (Fig. 3.15).

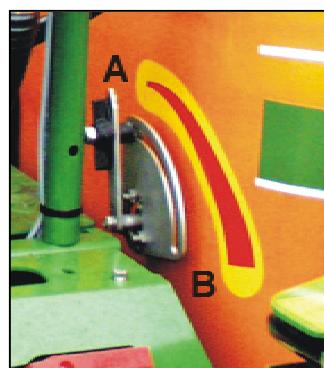


Fig. 3.15

3.10 Flushing water tank

The flushing water tank contains water without chemical contact. By actuating the Vario control this water can be used

- to dilute the spray agent residue in the tank.
- to clean the entire sprayer in the field (rinsing), even with the tank filled with spray agent.

3.10.1 UG 2200 Nova, UG 3000 Nova and UG 4500 Nova

Fig. 3.16/...

- 1 - Flushing water tank
- 2 - Charging opening with screw-on lid
- 3 - Venting valve



Fig. 3.16

3.10.2 Induction bowl with can wash

Fig. 3.17/...

- 1 Drop down induction bowl for quick and comfortable adding, dissolving and inducting large amounts of urea or other spray agents.
- 2 Parallel arm for swivelling the induction bowl from transport into working position.
- 3 Spring loaded latch for locking the induction bowl in transport position. For dropping the induction bowl down into the working position
 - Take the knurled knob,
 - Push the spring latch sideways,
 - Swivel down on the parallel arms.
- 4 Knurled know.
- 5 Suction hose.
- 6 Supply to the rotating can wash jet.
- 7 Supply to the rinse ring around the induction bowl.
- 8 3-way control tap for operating the can wash jet or rinse ring.
- 9 Suction hose for the 3-way control tap, connected to the injector on the control unit.
- 10 Supply hose for rinsing spray agent cans connected to the flushing water tank.

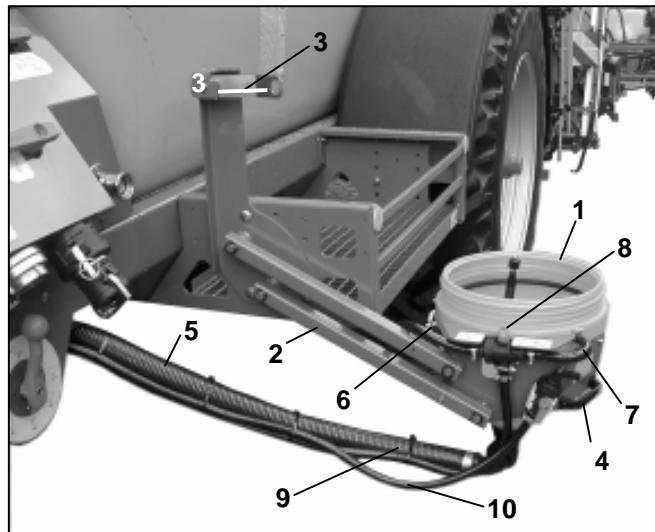


Fig. 3.17

Fig. 3.18/...

- 1 Bottom sieve; to prevent sucking in lumps or foreign particles.
- 2 Can wash jet (rotating jet) for washing out cans or other containers. Place container upside down above wash jet and press downwards.



For rinsing the induction bowl shut the induction bowl opening with the screw-on lid and open the can wash jet control tap (3.17/9).

- 3 Pressure plate.
- 4 Ring circuit for diluting and inducting spray chemical agents.

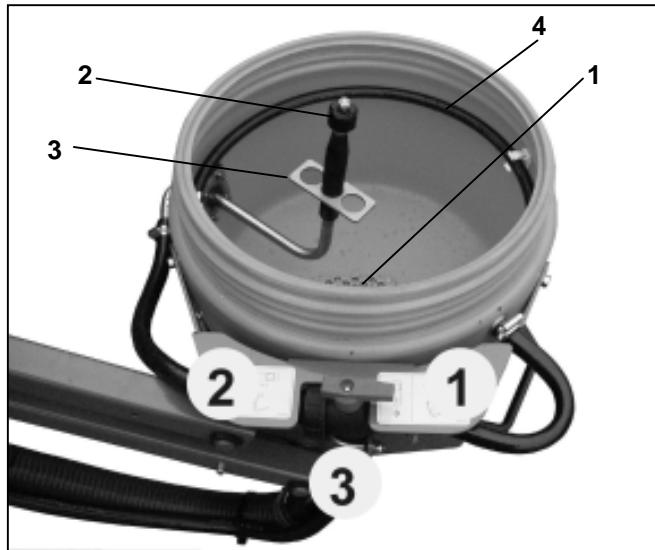


Fig. 3.18

3.10.3 Pump outfit 210, 250, 370, 410, 420 und 460 l/min

The pumps (Fig. 3.19) are piston diaphragm pumps with a capacity of each 210 and 250 l/min. 370, 410, 420, and 460 l/min are achieved by combining two pumps. All components which come into contact with spray agents have been made from injection moulded plastic coated aluminium or entirely from plastic. As far as we are aware these pumps are suitable for the application of all commercially available crop protective agents and liquid fertiliser.



Fig. 3.19

3.11 Draw bars



The track following or universal tracking draw bar needs to be set initially and then with any tractor exchange to ensure the geometry of the track lower links allows for true tracking.

3.11.1 Track following draw bar

The **track following draw bar** (3.20/1) works by the sprayer wheels following in the same track as the tractor rear wheels. This is possible only when the draw bar length is set to the length of the tractor lower links.

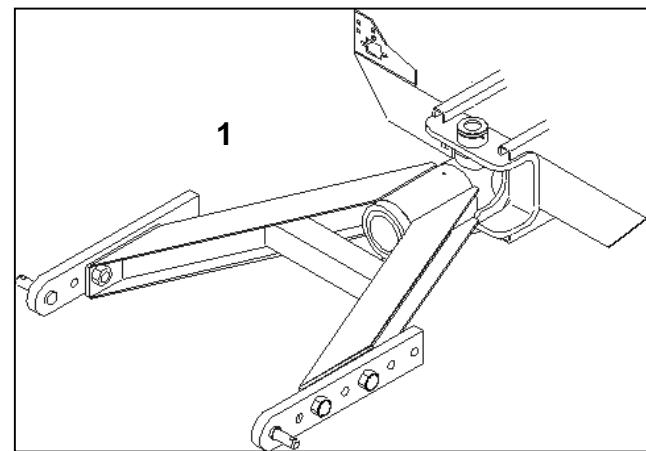


Fig. 3.20

3.11.2 Universal draw bar



The Universal tracking draw bar needs to be set initially and then with any tractor exchange to ensure the geometry of the track lower links allows for true tracking.

The **universal draw bar** (3.21/1) can be used as draw bar with or without track follow effect and with or without hydraulic draw bar steering / slope steering (special option). As standard this draw bar comes with a fixing rod (3.21/2).

- With **Tracking** – Link rod or hydraulic steering ram (3.34/3) should be fixed in **Position A (Field)**.
- Without track follow effect – fixing rod or hydraulic ram in position B (road).

With the hydraulic draw bar steering for track true following and slope steering, which can be retrofitted at any time, the fixing rod (3.21/2) is replaced by a hydraulic ram (3.21/3). When **operating on steep slopes** where the sprayer crabs downhill, a **manual track steering for a track true following** can be achieved using the draw bar steering from the tractor cab.

With the appropriate manual track steering the hydraulic draw bar steering reduces damage to the crop, especially in row crops (e. g. potatoes or vegetables) when manoeuvring within or leaving the rows.

Control of the hydraulic steering / slope compensation is available in 2 Versions:

- Version I** via a double acting tractor spool valve.
- Version II via **switch box SKS 501/701/901**.

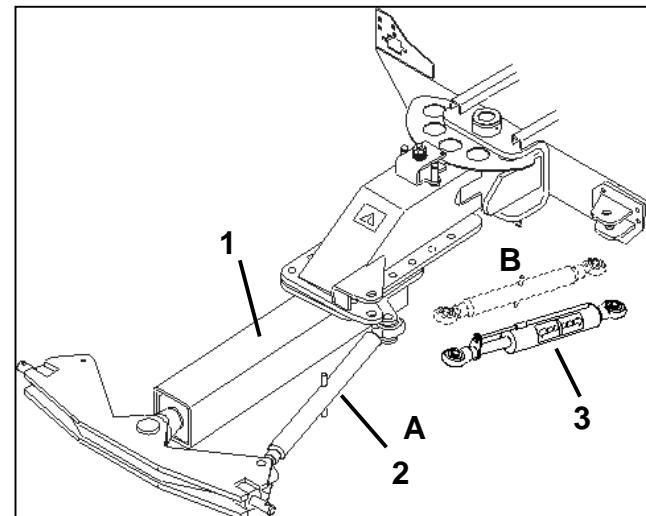


Fig. 3.21

3.11.3 Straight draw bar and hitch draw bar

Fig. 3.22 Hitch draw bar

Fig. 3.23 Straight draw bar

The **straight draw bar** and the **hitch draw bar** can be used as **draw bar with or without the true track following / slope steering**.

As standard the draw bars are equipped with a fixing rod (3.35/1 or. 3.36/1) and thus rigid.

With the hydraulic draw bar steering for **track true following and slope steering**, which can be retrofitted at any time, the fixing rod (3.28/1 or 3.29/1) is replaced by a hydraulic ram (3.28/2 or 3.29/2). When **operating at the headlands** (no track true following) and / or **when operating on steep slopes** (where the sprayer crabs downhill) a **manual track steering for a track true following** can be achieved using the draw bar steering from the tractor cab.

With the appropriate manual track steering the hydraulic draw bar steering reduces damage to the crop, especially with row crops (e. g. potatoes or vegetable) when or manoeuvring within or leaving the rows.

The hydraulic draw bar control / slope steering is offered in 2 versions:

Version I via double acting control valve.

Version II via switch box SKS 501/701/901.

Für die **Zugmaul- und Hitchdeichsel** ist die nachrüstbare **Trail-Control-Regeleinheit** bzw. **Trail-tron-Steuerung** (Kap. 10) als Sonderausstattung lieferbar.

This control unit provides an **automatic, track true following**. When operating on **steep slopes** (with the sprayer wanting to crab downhill) then manual override of tracking can be achieved using the trail-control actuator unit from the tractor seat (please also refer to para. 10).

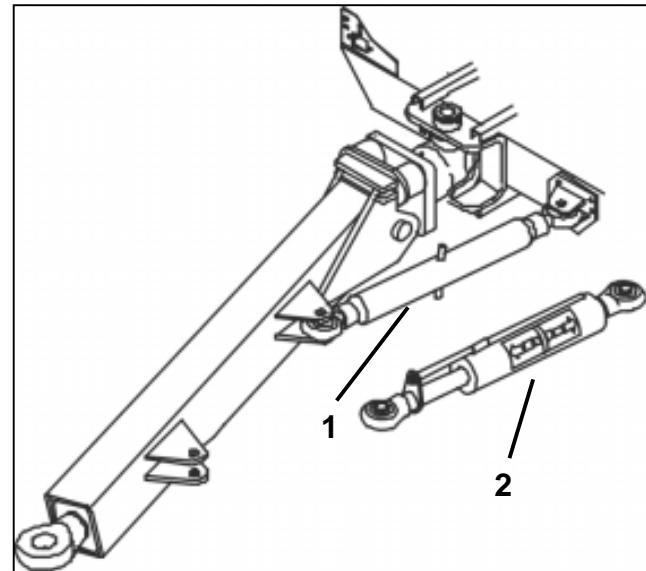


Fig. 3.22

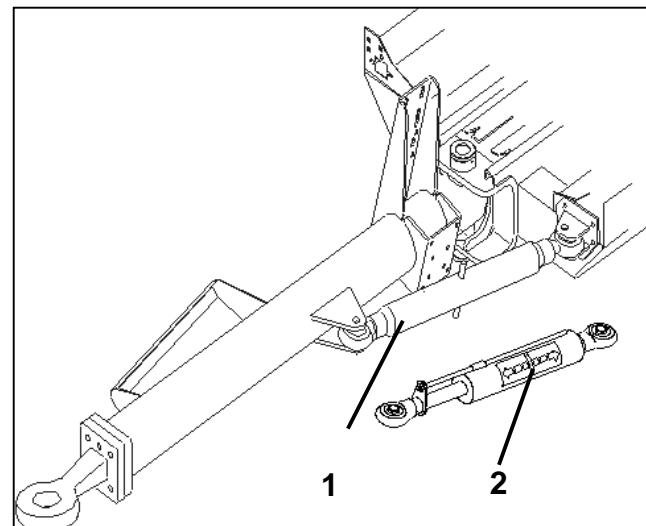


Fig. 3.23

3.12 Nozzles



Reset the equal pressure control unit at any change of the nozzles.

(not necessary with "TG"-control unit)

Fig. 3.24/...

- 1 - Nozzle body with locking bayonet cap (standard execution).
- 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. This ensures a drip free shut off of the nozzles when the boom feed is switched off.
- 3 - Spring loaded plunger.
- 4 - Diaphragm seat.
- 5 - Tapered slide – pressurises the plunger against the diaphragm.
- 6 - Nozzle filter. **Standard 50 meshes**, fitted into the nozzle body from below.
- 7 - Rubber seal.
- 8 - Nozzle
- 9 - Bayonet cap, coloured.
- 10 - Bayonet connector.
- 11 - Spring loaded plunger housing.

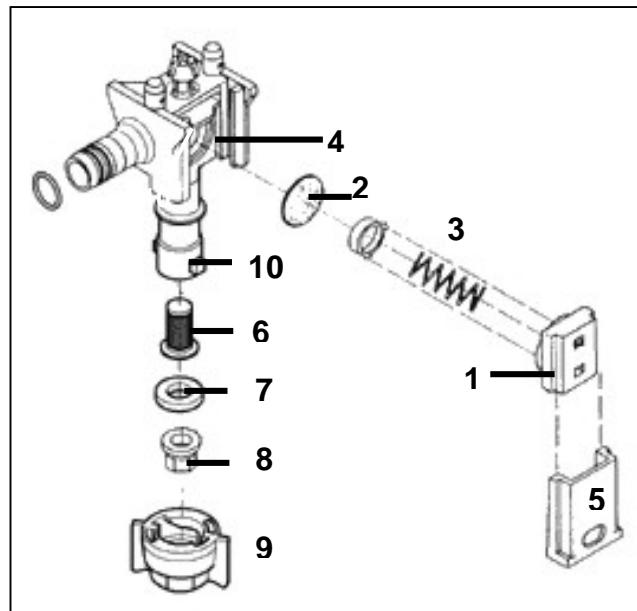


Fig. 3.24



Spray pressure and nozzle orifice size influences the droplet size and the spray rate. The higher the spray pressure the smaller the droplet diameter and these smaller droplets are more susceptible to unwanted drift.

3.12.1 Triple- or three-way nozzle body (special option)

When using a variety of nozzles we recommend the use of triple nozzle bodies (Fig. 3.25) In the triple nozzle body the vertically positioned nozzle is fed and by turning the triple nozzle body counter clockwise another nozzle is brought into the operational position. By switching to the intermediate position the triple nozzle body is switched off. This allows a temporary reduction of the sprayer boom working width.



Always flush the previous nozzles prior to swivelling / turning the triple nozzle heads to another nozzle size.

Fig. 3.25/...

- 1 - Nozzle body.
- 2 - 3-way nozzle body.
- 3 - O-Ring.
- 4 - O-Ring.
- 5 - Bayonet cap red.
- 6 - Bayonet cap green.
- 7 - Bayonet cap black.
- 8 - Bayonet cap yellow.
- 9 - Nozzle filter, standard 50 mesh.

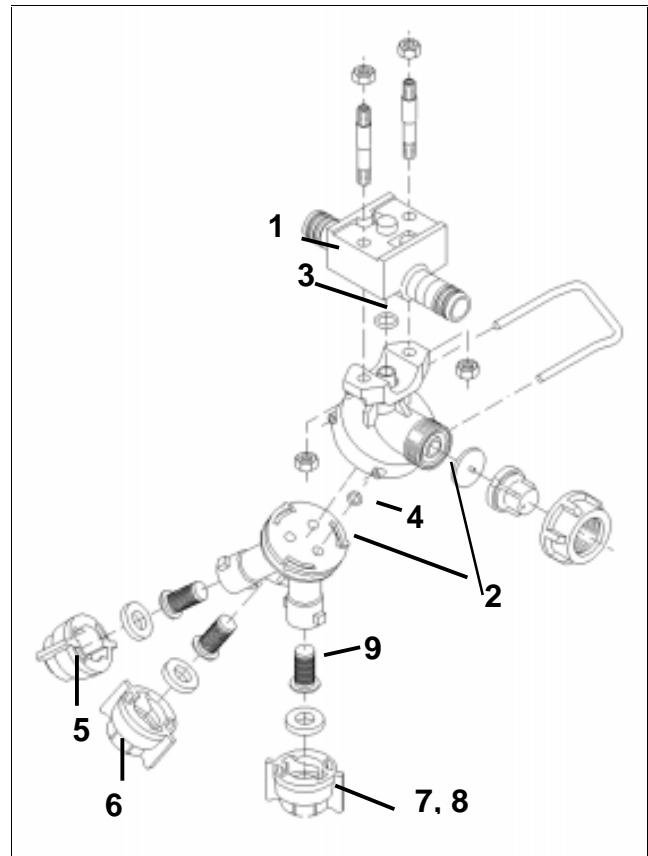


Fig. 3.25



4. On receipt of the machine

When receiving the machine check that no damage has been caused in transit and all parts are present. Only with the immediate reporting of damage towards the forwarder will be considered for compensation.

Please check whether all parts mentioned in the delivery note are present and the supplied machine is complete including any special optional equipment.

4.1 First fitting of the switch box

4.1.1 Main console, bracket and top hat profile rail

Attach the main console (4.1/1) for retaining the bracket (4.1/2) with top hat profile rail (4.1/3) and battery cable (4.1/4) inside the tractor cab so that the switch box (4.1/5) will be within view and reach of the tractor operator.



When using "AMACHECK II A", "SPRAYCONTROL II A" or "AMATRON II A" attach the main console inside the tractor cab so that the distance between the on-board-computer and a possibly available radio transmitter or the antenna will be at least 1 m.

4.1.2 Battery link up cable

- Connect battery cable (4.1/6) directly to the tractor battery (12 V) and install cable.
- Connect the 16A fuse holder (4.1/7) to the brown wire and connect to plus (+) pole of the tractor battery.
- Connect blue wire to minus pole (earth).



When connecting to battery fit first plus cable to plus pole. Thereafter fit earth cable to minus pole. When removing do it vice versa.



The minus pole from battery must be connected to the tractor chassis. When tractors have a switch in the earth cable of the battery (e. g. Zetor 8011, 8045), connect the blue earth cable directly to the tractor chassis.

- Fit 3-pin plug socket (4.1/8) to console (4.1/1).

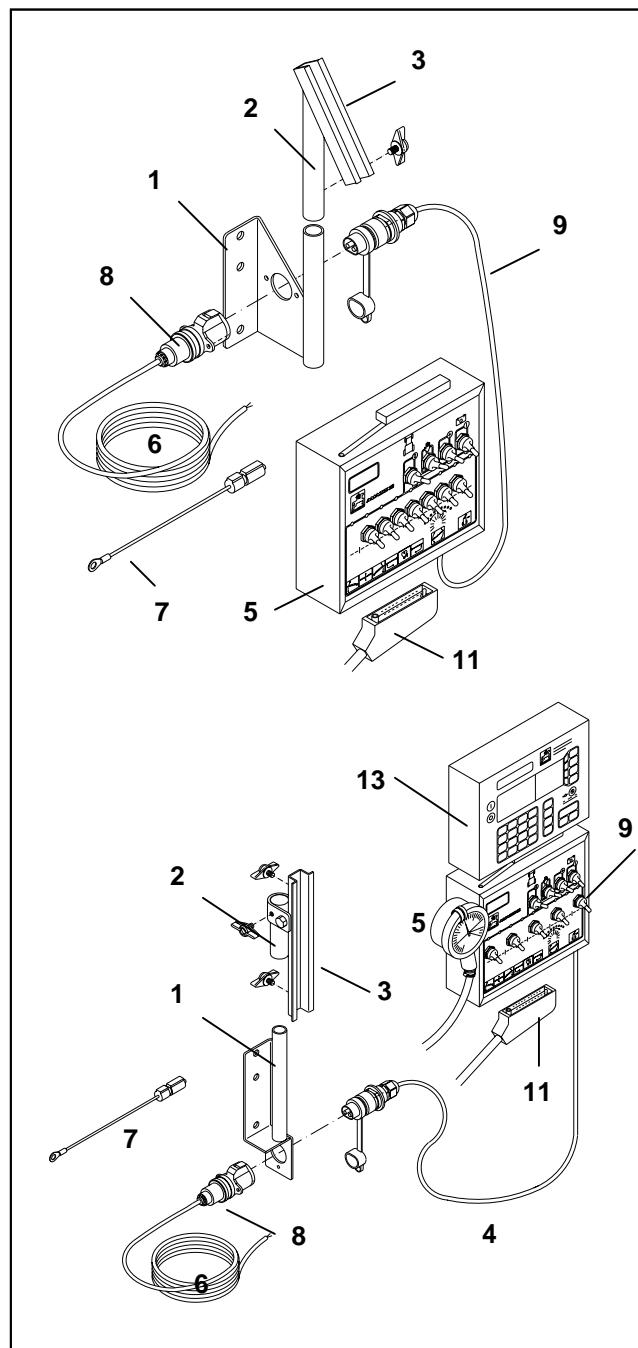


Fig. 4.1

4.1.3 Switch box

- Slide the SKS-switch box into the guide key way of the hat profile rail and tighten the clamping screws.



The on/off switch (4.1/9) for the electric power supply of the switch box should be in position "0" (OFF/AUS) before connecting to the battery.

- Connect the electric power supply cable (4.1/4) with the socket (4.1/8) of the battery connecting cable.
- Connect implement cable (4.1/11) to switch box.

4.1.3.1 On-board computer "AMACHECK II A", "SPRAYCONTROL II A" or "AMATRON II A"

- Mount the relevant on-board computer (4.1/13) via the 48-pole plug connector on to the switch box.



Before connecting the on-board-computer to the switch box switch off the power supply to the on-board computer.

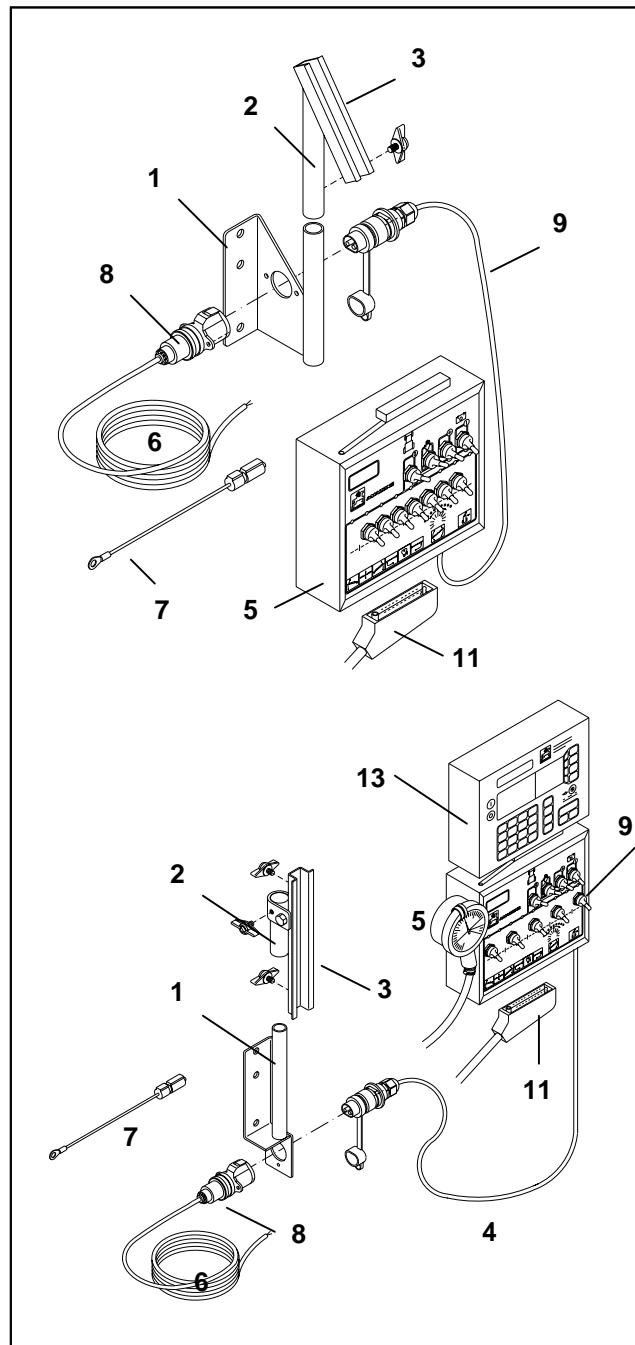


Fig. 4.1

4.2 PTO-shaft



Only use the Walterscheid WWE 2280 PTO shaft provided. The PTO shaft is suited for driving around corners in the field where spraying operation doesn't need to be interrupted (please observe max. PTO-angling instructions of manufacturer).

- Zapfwellenstummel reinigen und fetten.
- Slide the tractor PTO shaft halves onto the PTO and the pump input shaft in the prescribed fitting direction. When fitting initially or when changing the tractor the PTO length should checked be matched to the tractor.



If the trailed sprayer is equipped with a track following draw bar the wide angle universal joint of the PTO shaft should be fitted on the implement side to the pump.



If the trailed sprayer is equipped with a universal draw bar the wide angle universal joint of the PTO shaft should be fitted to the pivot point of the draw bar.



If the trailed sprayer is provided with a straight draw bar (rigid) apply the wide angle universal joint of the PTO shaft to the tractor.



If the trailed sprayer is equipped with a straight draw bar (rigid) and a hydraulic draw bar steering, fit the wide angle universal joint of the PTO shaft on the implement side to the pump.



Never exceed the permissible PTO-speed of 540 R.P.M.



To avoid damage to the PTO shaft engage it only at low tractor engine speed.



Operate always with all guards completely fitted!, i.e. PTO shaft with complete PTO and additional guards on tractor and implement. Replace any guards immediately if damaged.



Pay attention to the fitting and maintenance advice of the PTO manufacturer attached to the PTO shaft.



Secure the PTO guard against spinning by hooking both chains provided to the chassis!.



Before engaging the PTO shaft, please read safety advice according to chapter 2 thoroughly.

4.2.1 Initial fitting and matching up of the PTO shaft

Slide the corresponding universal joint shaft halves on to either the tractor's PTO shaft or the pump's PTO shaft in the correct direction according to the draw bar type.

When first attaching the sprayer to the tractor check the length of the universal joint shaft in relation to the tractor according to Fig. 4.2. Any matching up refers to only this one type of tractor, when changing the tractor the length of the universal joint shaft should be checked again.

1. Check whether the **overlapping** of the universal joint shaft's profile tube is in **any position** of the sprayer behind the tractor at a **minimum of 40 % of LO** (length in the totally retracted position) by holding the two mounted PTO shaft tubes next to one another.
 2. In shortest position the universal joint shaft tubes must never hit the universal yokes. Allow a safety spacing of **at least 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. Affix the stop chain in such a way that a sufficient manoeuvrability of the PTO shaft is allowed in all normal operational positions.
 9. Operate only with all PTO shaft guards fitted:
- Universal joint shaft with complete guard tubes and cones as well as guards around the tractor.



Engage slowly the PTO shaft at low tractor engine rev's.

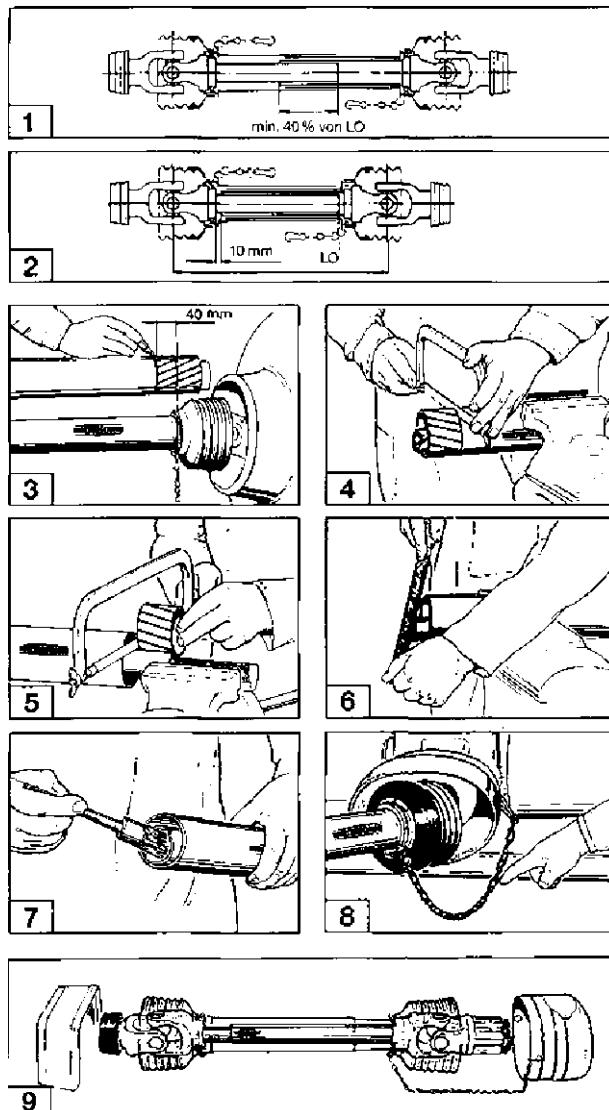


Fig. 4.2

4.3 Setting the track

Set the track of the sprayer so that the sprayer wheels run in the centre of the tractor's wheel marks.

The track width is infinitely variable (with tyres 9.5 x 44") from 1500 mm to 2250 mm (UG 2200 Nova, UG 3000 Nova).

The allowable track widths are dependent on the way the rims are fitted:

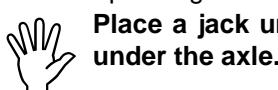
- Variable from 1500 mm to 1 960 mm if rims are fitted according to Pos. 1 (Fig. 4.3).
- Variable from 1700 mm to 2250 mm if rims are fitted according to Pos. 2 (Fig. 4.3).



Tighten the wheel studs to a torque of 450 Nm.

The track width adjustment is conducted as follows:

- Hook up sprayer to the tractor.
- Apply the parking brake of the tractor.
- Secure sprayer against rolling away with wheel chocks.
- Lift one side of the sprayer with a jack until the corresponding wheel is raised off the ground.



Place a jack under the sprayer frame, not under the axle.

- Loosen the clamping bolts (4.4/ 1).
- Slide in or out the axle half until the desired position is reached. For this determine the measurement "x" from outer edge of main frame (4.3/1) to centre of sprayer wheel and slide the axle half in or out accordingly.

$$x = \frac{\text{Desired track width [mm]} - 1200 \text{ [mm]}}{2}$$

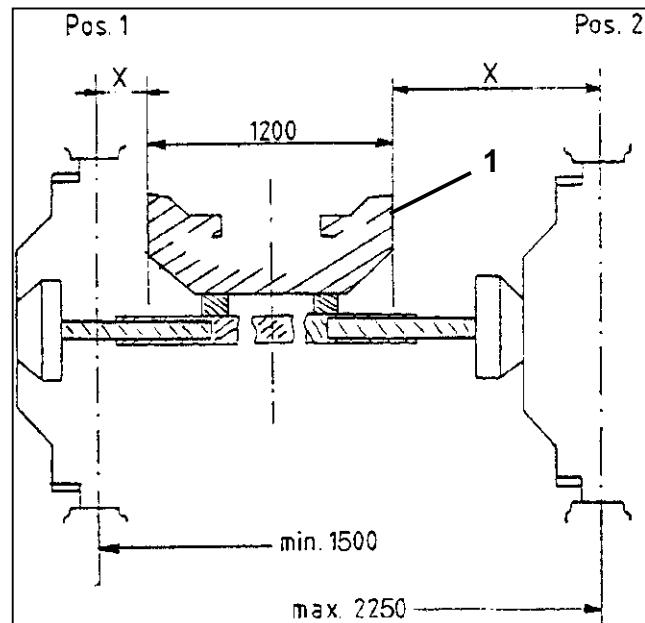


Fig. 4.3

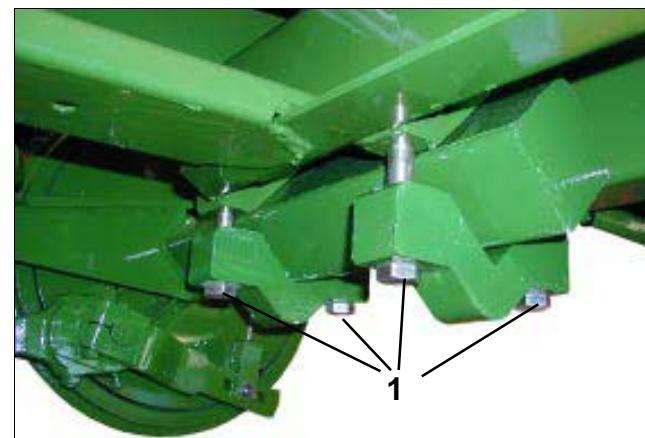


Fig. 4.4

- Retighten the clamping bolts to a torque of **360 Nm** for bolts M 20.
- Proceed by sliding in or out the other axle half in the same manner.

On the UG 4500 Nova the track width can be adjusted by wheel mounting (Fig. 4.3):

Position 1: 1.800 mm,

Position 2: 2.250 mm (Fig. 4.3)

 When using wheels which have not been fitted by the factory, ensure that the rim (4.5/1) does not touch the brake drum (4.5/2) (Fig. 4.5)! The rim should only touch the wheel hub (4.5/3).

 When adjusting the track width ensure that the distance between the outer point of the lightening area of the trailed sprayer's rear traffic lights (combined rear-, brake-, side-, identification light and reflectors) and the outer most vehicle extremity does not exceed 400 mm.

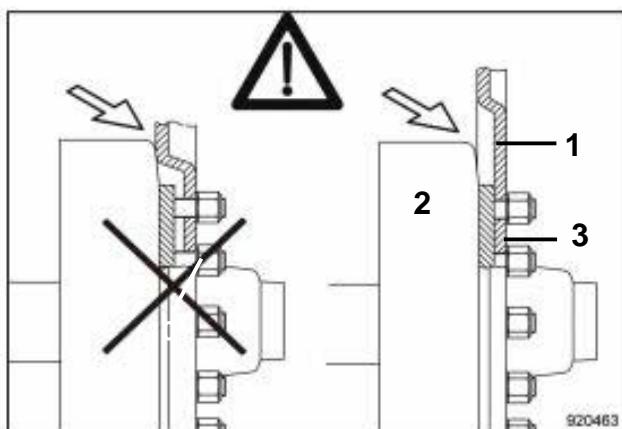


Fig. 4.5

4.4 Matching the steering geometry for track following- or universal draw bar to the tractor

A true track following of the trailed sprayer is achieved when the pivoting point (4.6/1) of the track following draw bar lies exactly in the centre between the tractor rear axle (4.6/2) and the axle (4.6/3) of the trailed sprayer " $a = b$ ".

To achieve this the distance "c" between the pivoting point (4.6/1) and the lower link connections is adjusted (4.6/4):

- of the track following draw bar (Fig. 4.7) is adjustable from 1020 to 1260 mm (in 4 steps of 80 mm).
- of the universal draw bar (Fig. 4.8) is adjustable from 1100 to 1260 mm (in 3 steps of 80 mm).

Set the steering geometry when the trailed sprayer is not connected and parked on its support stand:

- Determine the measure "c" between the pivot point and the lower link connector on the draw bar:

$$c = a - d$$

- a, b: Spacing between tractor's rear axle and the pivot point of the draw bar or between the trailed sprayer's axle and the pivot point of the draw bar.
- c: Spacing between the pivot point and the lower link connection of the track following draw bar.
- d: Abstand Mitte Schlepperhinterachse und Unterlenkeranschluss Schlepper.

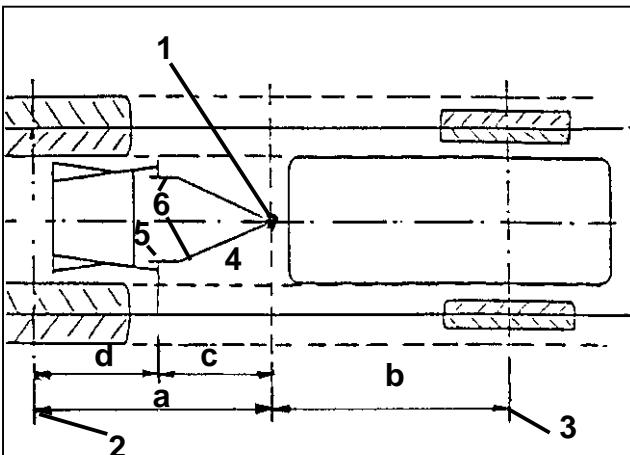


Fig. 4.6

- Undo and remove the fastening bolts.
- Bolt lower link arms or the draw bar according to measurement "c".
- Re-tightening the fixing bolts to a torque of **360 Nm** for bolts **M 20-** or of **450 Nm** for bolts **M 22**.

5. Hitching or unhitching the traile sprayer



When hitching on or off adhere to the safety advice.



Before hitching the traile sprayer secure against unintended rolling by applying the parking brake or by using chocks. For transport secure chocks in the pockets on the frame side by using springs.



When taking the traile sprayer on the public highways adhere to the applicable traffic law.

5.1 Draw bar



Mount the traile sprayer roughly horizontal to the tractor, i. e. with the frame staying parallel with the ground.



Consider maximum permissible supporting load.



Always fit the wide angle joint of the PTO shaft to the pivoting side of the draw bar.

5.1.1 Attaching and Detaching

- Attach the **true track following draw bar or tracking universal draw bar** to the lower links of the **three-point linkage** of the tractor. Lift hydraulic by approx. 5 cm.
- Attach the **straight draw bar and hitch draw bar** to the tractor top hitch coupling or on the pick up hitch eye.
- **Unpin the draw bar jack (true track following draw bar and universal draw bar) (5.1/1)** slide upwards and arrest with the locking pin.
- **Wind up the draw bar jack (straight draw bar and hitch draw bar) (5.2/1)** with the crank, unlock, slide upwards and lock with locking pin.
- **Secure locking pin with the clip.**
- The **hydraulic steering ram** of the **universal draw bar** (Version I) should be **connect** to a double acting spool valve.
- Detaching is done in the opposite order.



Fig. 5.1



Fig. 5.2

5.1.1.1 True track following draw bar and Universal tracking draw bar



On the UG 3000 the use of the true track following draw bar and universal tracking draw bar (in their track following position) are only permissible in conjunction with a chassis equipped with air assisted brakes.



Adjust the steering geometry of draw bar to the pulling tractor.



The tractor lower links should be stabilised with stabiliser bars or check chains. Lower links of tractors must be braced to prevent any to and fro movement of the traile sprayer.

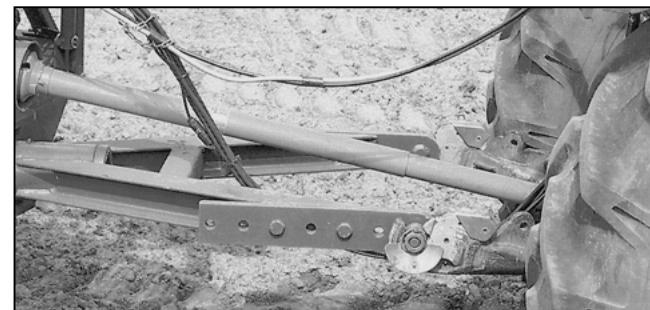


Fig. 5.3



Fig. 5.4

Fig. 5.3 True track following draw bar

Fig. 5.4 Universal tracking draw bar

Using the universal draw bar with true track effect

- Attach the fixing rod (5.4/1) or the hydraulic ram (5.5/1) on to the lower link rail (5.4/2 or 5.5/2).



The pivot point should be in the centre point (5.4/3 or 5.5/3) between the traile sprayer's axle and the tractor's rear axle.

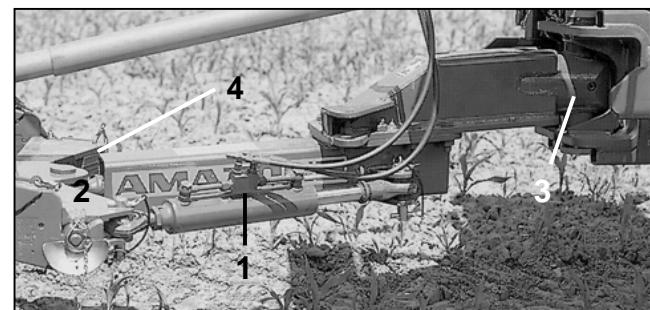


Fig. 5.5



Never ever use the fixing rod and the hydraulic draw bar steering at the same time.

When fitting

- the fixing rod one counterweight (5.4/4) has to be fitted to the draw bar.
- the hydraulic draw bar steering two counterweights (5.5/4) have to be fitted to the draw bar.

Using the universal draw bar without true track follow effect to improve the steering abilities when driving at high transport speeds.

- Attach the fixing rod (5.6/1) or the hydraulic ram at the rear of the basic implement. In this case the pivoting point (5.6/2) is between the lower links of the tractor.



Fig. 5.6

5.2 Dual circuit air brake system

Coupling up

- **Coupling of the air brake system** (if available) to tractor:
 - Coupling claw - yellow - to brake hose.
 - Coupling claw - red - to secondary hose.



Before coupling check cleanliness of coupling claws and ensure correct catching.



Check route of hoses. Hoses must not be allowed to rub on foreign parts.

- Before moving off the brake pressure regulator (5.7/1) on the hand lever (5.7/2) has to be adjusted manually according to the load of the implement.

Sprayer filled - full load

Sprayer partly filled - half load

Sprayer empty - empty

- Release parking brake (Fig. 5.8/1):
 - Turn hand crank located on the side of the chassis to the left until stop.



To ensure the proper function of the parking brake check whether the brake cable is well tensioned when the parking brake has been applied. If this is not the case, readjust the brake cable at the hollow plate (please also refer to chapter "Maintenance").



After any adjustment of the brakes conduct a brake test.

- Remove chocks and secure in the pockets (Fig. 5.8/2) on the frame side.

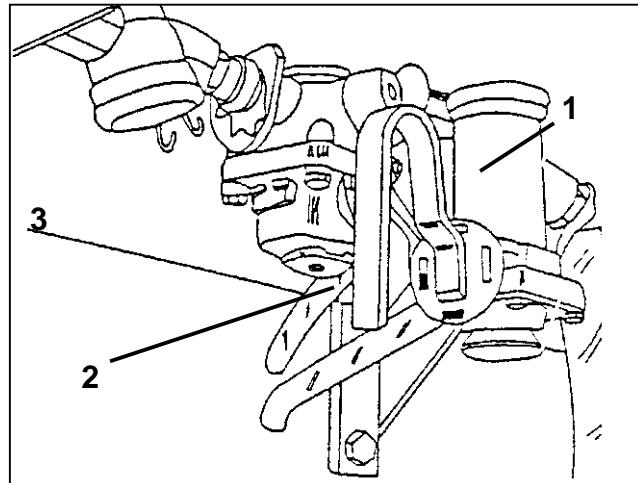


Fig. 5.7

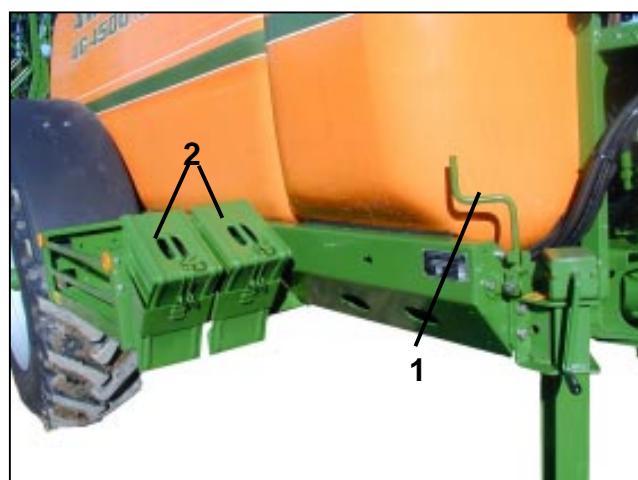


Fig. 5.8

Uncoupling

! The traile sprayer should only be uncoupled and parked with an empty tank on level ground (to prevent any danger of tipping over).

- Before uncoupling the traile sprayer secure against unintended rolling using the two chocks (Fig. 5.9/1).
- Apply parking brake (5.9/2).
- Turn hand crank on the side of the chassis to the right until the stop.
- After uncoupling the brake hose close the coupling heads or hang them into the empty couplings.

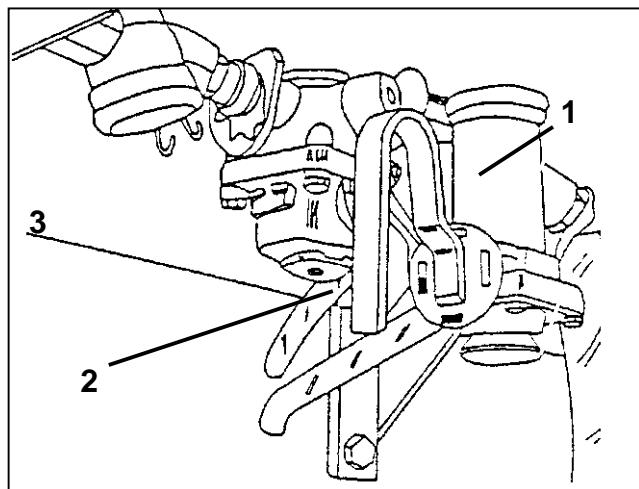


Fig. 5.7

Manoeuvring the uncoupled, pressure air braked sprayer

- To manoeuvre the uncoupled and thus automatically braked traile sprayer, set the hand lever (5.7/2) of the brake pressure regulator on to "Lösen" ("release").

 After manoeuvring set the hand lever in its initial position.

5.3 Hydraulic brake system with parking brake

Ankuppeln

A hydraulic braking outlet on the tractor is required which controls the hydraulic brake system of the field sprayer (not permitted in Germany).

- Connect the hydraulic plug of the hydraulic brake hose on the traile sprayer to the hydraulic socket of the hydraulic tractor brake.

 Before coupling ensure that the hydraulic joint is clean and tighten by hand.



Check route of any hoses. Hoses must never rub against foreign obstacles.

- Release parking brake (5.9/ 2)
 - Turn hand crank located on the side of the chassis to the left until the stop.



Fig. 5.9



To ensure the proper function of the parking brake check whether the brake cable is well tensioned when the parking brake has been applied. If this is not the case, readjust the brake cable on the hollow plate (please also refer to chapter "Maintenance").



After any adjustment of the brakes conduct a brake test.

- Remove chocks, secure them in the pockets (Fig. 5.8/2) on the frame side.

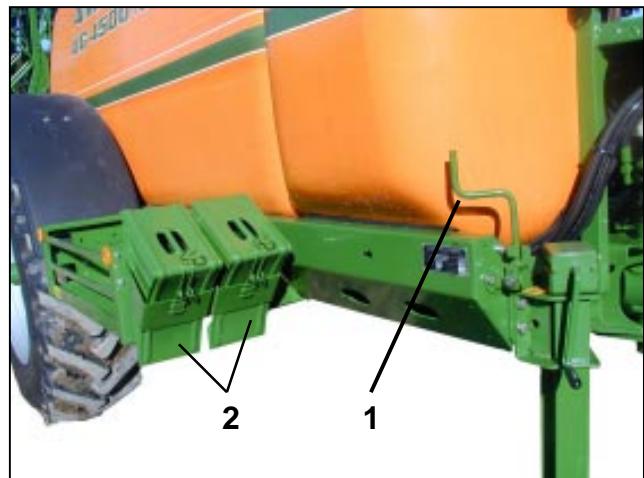


Fig. 5.8

Uncoupling



The trailec sprayer may only be uncoupled and parked with an empty tank on level ground (to prevent any danger of tipping over).

- Before uncoupling the trailec sprayer secure against unintended rolling with the two chocks (Fig. 5.9/1).
- Apply parking brake (5.9/ 2).
- Turn hand crank located on the side of the chassis to the right until the stop
- Uncouple hydraulic plug.



Fig. 5.9

Manoeuvring the uncoupled sprayer

- For manoeuvring the uncoupled sprayer release the parking brake



After manoeuvring apply parking brake. Nach dem Rangieren Feststellbremse wieder anziehen.



5.4 Traffic lights

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

5.5 Hydraulic hoses



Shut off the block valve on the plug of the hydraulic height adjustment hose before it is coupled to or from the tractor's hydraulic socket.

Q-boom, manually folded

- Connect the hydraulic hose of height adjustment to a **single acting spool valve** of the tractor (please also refer to chapter: Sprayer boom).

Q-boom, hydraulic folding (please also refer to chapter Sprayer boom)

1. **Fully hydraulic boom control "I"** (one-sided folding in driving direction to the left hand side is possible).
 2. **Fully hydraulic boom control "II"** (one-sided folding in driving direction to the right and left hand side is possible).
- Connect hydraulic hoses on the height adjustment to a **single acting spool valve** of the tractor.
 - Connect hydraulic hoses for the boom folding to a **double acting control valve** of the tractor.

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

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

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

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

5.6 Electric switch box

- Fit the switch box to the tractor (when first fitting refer also to chap. 4.1).



Make sure the on/off switch for the power supply of the switch box is in position "0" (AUS = OFF) before inserting the plug into the socket.

- Connect the power supply cables with the socket of the battery connecting cable.
- **SKS 500 to SKS 902:** Connect both the implement cable and the hydraulic cable on the switch box.

5.7 "AMACHECK II A"

- Connect „AMACHECK II A“ to switch box by machinery plug.



When connecting „AMACHECK II A“ with the switch box the power supply of „AMACHECK II A“ remains switched off.



Enter the machinery data before the "AMACHECK II A" is put to use.

5.8 "Spraycontrol II A" or "AMATRON II A"

- Connect the machinery plug of "Spraycontrol II A" or "AMATRON II A" with the switch box.



Ensure that the on/off switch for the power supply of the "Spraycontrol II A" or "AMATRON II A" is in position "0" before connecting the machinery plug of "Spraycontrol II A" or AMATRON II A" to the switch box.



Enter the machinery data before the "AMATRON II A" or "Spraycontrol II A" is put to use.

6. En route to the field – Transport on public roads and ways

Please adhere to the following hints. They help to prevent accidents in public traffic.



When travelling on public roads and highways during transport to the field the specification of tractor and implement have to correspond to the national road transport and traffic regulations!



Both, the vehicle owner and operator are responsible for adhering to the legal traffic rules.



Driving behaviour, steerage and brakes are affected by the mounting of trailed implements and ballast weights. Therefore always ensure a sufficient steering and braking.



The tractor must provide the prescribed braking deceleration for the loaded vehicle train.



The road traffic lights have to correspond to the national legal traffic regulations.



Check the road traffic lights for proper function before using on public roads.



When driving on public roads mind the max. payload of the trailed sprayer and if necessary only drive with partly filled tank.

6.1 Running gear with unbraked axle

The following restrictions have to be observed for UG Nova with unbraked axle:

- permissible maximum driving speed: 25 k.p.h.
- permissible total weight total 3.000 kg (2.600 kg axle load and 400 kg hitch load).
- payload on public roads: 3500 kg minus net weight of the individual components (depending on specification, please also refer to chapter technical data).
- payload on non-public roads: for husbandry operations (up to 10 k.p.h.) unrestricted filling with any type of tyre.

6.2 Running gear with two-circuit air brake system or hydraulic brake system

The field sprayer can be provided with a two circuit air brake system. With the aid of the brake power-control the brake pressure in the brake cylinders can be limited depending on the sprayer load. The connecting hoses are colour coded (yellow and red) to prevent any mixing up.

Die einstellbaren Stufen sind:

Sprayer filled	- full load	
Sprayer partly filled	- half load	
Sprayer empty	- empty	

Check the brake system for leakage once a week. The permissible pressure drop is 0.1 bar at an excess pressure in the air box of at least 5 bar and a checking time of 10 minutes.

The air box (Fig. 6.0/1), which also feeds the air suspension should be drained daily when permanently operated, otherwise once a week.

When setting the brake cylinder ensure that the permissible stroke should be between 10 and 50 % of the possible brake cylinder stroke. If 50 % are exceeded the mechanic brake system must be readjusted immediately. When readjusting the mechanic brake, proceed as follows:

1. Turn setting screw on the brake lever.
2. After brake adjustment check for even braking on both wheels.



Fig. 6.1



Please bear in mind that on new machines the full brake power will only be achieved after the brake has been applied several times.

At least once a year the brake must be maintained by a authorised brake workshop.



Check the route of the brake hoses!
They must not rub on foreign parts.



Conduct a braking testing after any work on the brake system (with empty machine).

The wheels may not jam.

Take the restrictions for the UG Nova with **hydraulic brake** from column "25 km/h" in the following air pressure table. This UG-Nova variety is only allowable up to a speed of 25 km/h

Take the restrictions for all UG Nova with **air brake system** from the following table:

Tyres	UG 2200 Nova			UG 3000 Nova			UG 4500 Nova		
	Axe load 1.000 kg allowable total weight kg at an air pressure of.....bar			Axe load 1.000 kg allowable total weight kg at an air pressure ofbar			Axe load 1.500 kg allowable total weight kg at an air pressure ofbar		
	25 km/h	40 km/h	50 km/h	25 km/h	40 km/h	50 km/h	25 km/h	40 km/h	50 km/h
230/95R44 (9,5R44) LI 134 A8	5500 3,6	4900 3,2	-	5700 3,6	4900 3,2	-	-	-	-
270/95R42 (11,2R42) LI 139 A8	5500 3,2	5500 3,2	-	6400 3,6	5500 3,2	-	-	-	-
270/95R48 (11,2R48) LI 142 A8	5500 2,8	5500 2,8	-	6900 3,6	5900 3,2	-	7400 3,6	6800 3,6	-
300/95R46 (12,4R46) LI 145 A8	5500 2,4	5500 2,4	-	7000 3,3	6300 3,2	-	7900 3,6	7300 3,6	-
420/85R38 (16,9R38) LI 141 A8	5500 1,2	5500 1,2	5500 1,2	6700 1,6	6100 1,6	5700 1,6	7200 1,6	6600 1,6	6200 1,6
480/70R38 LI 145 A8	5500 1	5500 1	5500 1	7000 1,4	6800 1,6	6300 1,6	7300 1,6	7300 1,6	6800 1,6
340/85R48 (13,6R48) LI 148 A8	- -	- -	- -	7000 3	6800 3,2	-	8500 3,6	7800 3,6	-
460/85R38 (18,4R38) LI 146 A8	5500 1	5500 1	5500 1	7000 1,4	7000 1,6	6400 1,6	8100 1,6	7500 1,6	6900 1,6
520/85R38 (20,8R38) LI 153 A8	- -	- -	- -	7000 1	7000 1,2	7000 1,4	9600 1,6	8500 1,5	8100 1,6
300/95R52 (12,4R52) LI 148 A8	- -	- -	- -	7000 2,8	6800 3,2	-	8500 3,6	7800 3,6	-
650/65R38 LI 154 A8	- -	- -	- -	7000 1	7000 1	7000 1	9800 1,2	8500 1,1	8300 1,2



6.2.1 How to calculate the payload

Payload [kg] = allowable total weight [kg] - empty weight [kg]
--

The net weight depends on the execution of the machine. It can be read off the type plate or calculated with the aid of the chapter "Technical Data" according to the weights of the individual components.

Example:

- UG 4500 Nova with air brake in execution 40 km/h (**1490 kg**),
- Tyres 460 / 85 R 38 (**582 kg**),
- Straight draw bar (**180 kg**),
- Control unit "TG" 7-fold (**38 kg**),
- Pump equipment 420 l/min. (**$2 \times 37,5 = 75 \text{ kg}$**).
- Super-S-boom 27 m 7-sections (**624 kg**).

Net weight =

$$1490 \text{ kg} + 582 \text{ kg} + 180 \text{ kg} + 38 \text{ kg} + 75 \text{ kg} + 624 \text{ kg} \\ = \mathbf{2989 \text{ kg}}$$

$$\text{Payload} = 7500 \text{ kg} - 2989 \text{ kg} = \mathbf{4511 \text{ kg}}$$



In case of a limited load capacity of the tyres the complete filling of the sprayer with liquid fertiliser is not permitted because the payload would be exceeded. Please always check (please refer to chapter "Filling").



Conduct a braking testing after any work on the brake system (with empty machine)!

The wheels may not jam!

6.3 Universal draw bar



For road transport re-insert the fixing rod (6.2/1) or the hydraulic ram from position A (true track follow effect) into position B (rigid).

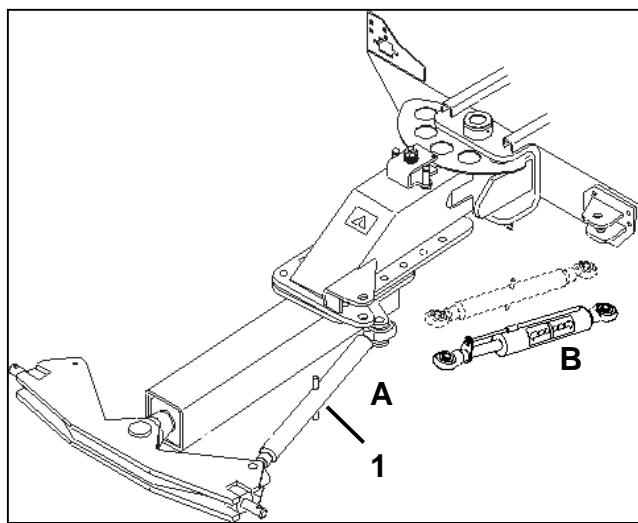


Fig. 6.2



7. Putting into operation



Condition for an appropriate application of plant protective agents is a trouble-free operation of the field sprayer. Therefore have your field sprayer checked on the test rig regularly and immediately remedy faults if necessary



By ensuring the spray mixture is thoroughly filtered a trouble-free operation of the field sprayer is ensured. Therefore, make use of all filters provided and ensure their proper function by a regular maintenance (refer to "Maintenance").



If it is intended to operate the sprayer with a "NG" control unit, initially set the equal pressure unit according to para. 7.6.

7.1 Review – Positions of the multiple way taps

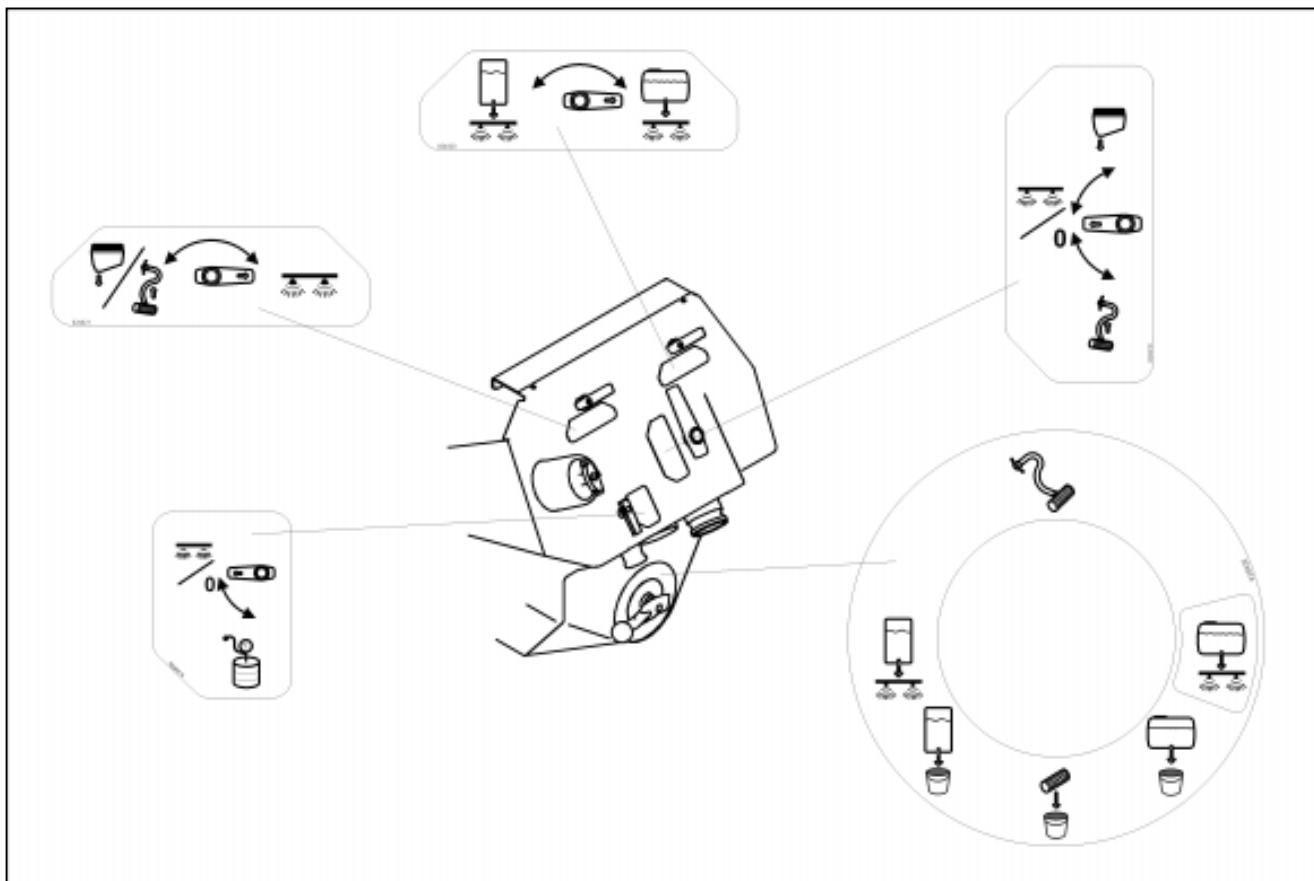
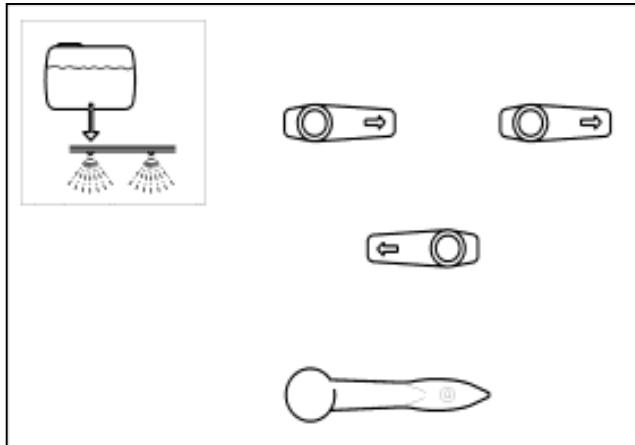
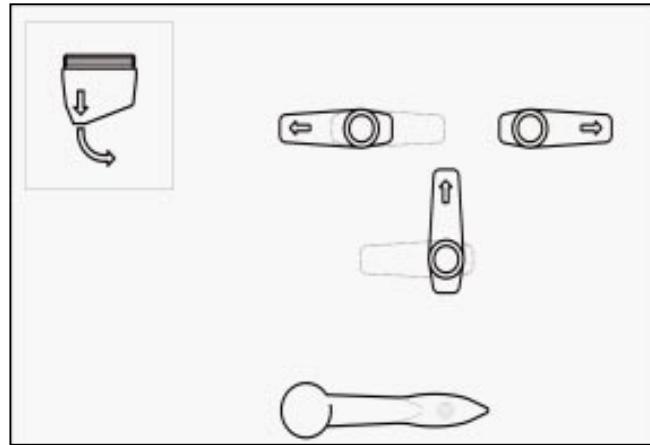


Fig. 7.1

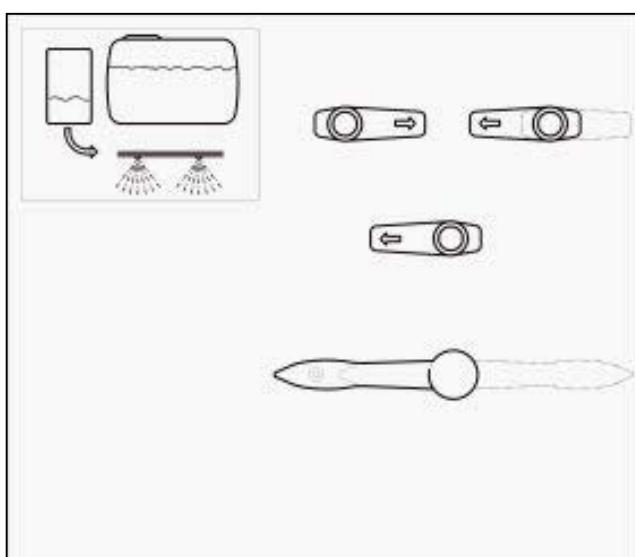
Spraying



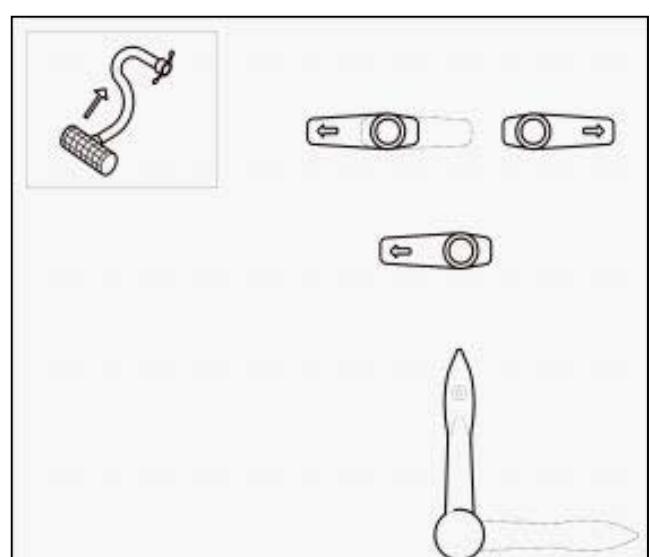
Induction



Rinsing

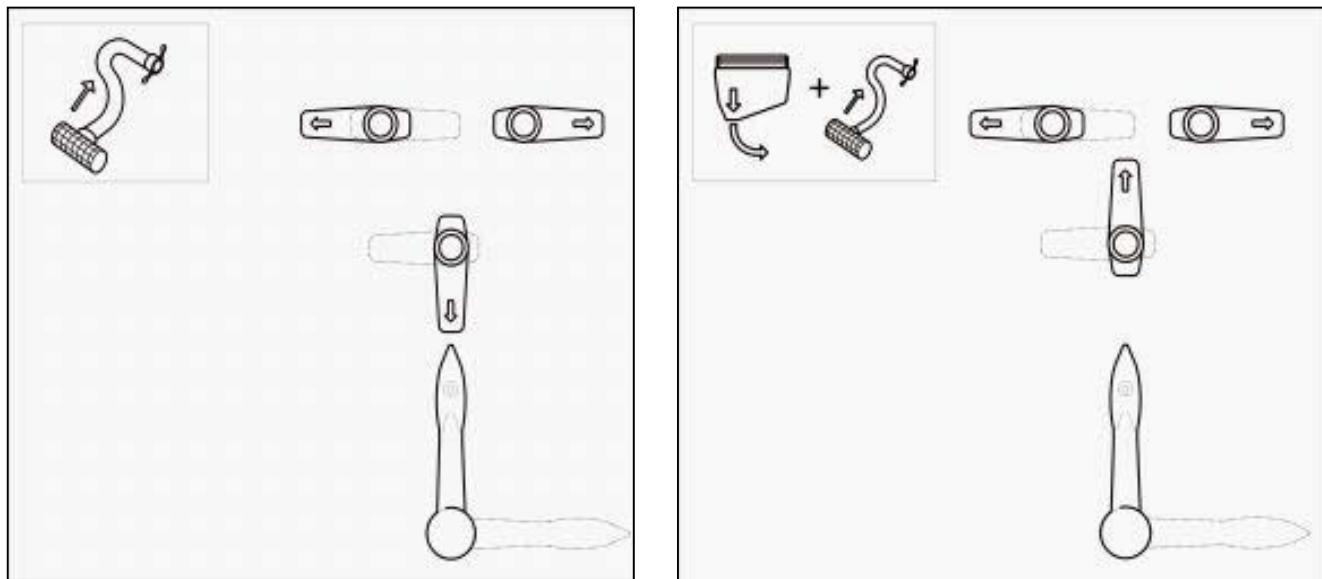


Sucking via suction hose 2 inch



Sucking via suction hose 3 inch

Sucking via suction hose and induction bowl



7.2 Preparing the spray mixture

Please pay attention to the operating advice mentioned here as well as such product specific procedures as described in the instructions on the spray agents.

The instructions on the spray agents provide you with the necessary information about the rates of water and spray agent quantities.

- Determine the necessary water and spray agent rates from the instructions on the crop protective agents.
- Calculate the quantity needed for the area to be treated.
- Fill sprayer tank half full with water.
- Switch on the agitation.
- Add the calculated quantity of the spray agent.
- Fill up with the remaining amount of water.
- Agitate the spray mixture according to the spray agent manufacturer's advice before spraying.



Read the instructions of the spray agent and adhere to any listed safety advice.



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



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



The more accurately the required filling or refilling rates are determined the smaller the final residue of spray mixture will be!



Try to reduce the excessive residual quantity for the last tank filling to a minimum as an environmentally safe disposal of spray residues is difficult.



Careful calculating and metering the required final fill should be conducted prior to spraying the remaining area. To achieve this deduct the technically undiluted quantity of liquid within the sprayer boom from the calculated refilling quantity.



When agitating the spray mixture adhere to the advice by the spray agent manufacturers.

7.3 Calculating the filling or refilling quantities

Example 1:

Known data:

Nominal tank volume	3000 l
Residual quantity in tank	0 l
Required amount of water	300 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 10 ha to be sprayed?

Answer:

$$\begin{array}{lll} \text{Water: } & 300 \text{ l/ha} & \times 10 \text{ ha} = 3000 \text{ l} \\ \text{Agent A: } & 1,5 \text{ kg/ha} & \times 10 \text{ ha} = 15 \text{ kg} \\ \text{Agent B: } & 1,0 \text{ l/ha} & \times 10 \text{ ha} = 10 \text{ l} \end{array}$$

Example 2:

Known data:

Nominal tank volume	3000 l
Residual quantity in tank	200 l
Required amount of water	400 l/ha
Recommended concentrate	0,15 %

Question 1:

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

Question 2:

How many hectares will one new tank filling last if the tank is emptied to a residual quantity of 20 litres?

Calculation formula and reply to question 1:

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

$$\frac{(3000 - 200) \text{ [l]} \times 0,15 \text{ [%]}}{100} = 4,2 \text{ [l or kg]}$$

Calculation formula and reply to question 2:

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

$$\frac{3000 \text{ [l]} (\text{tank nominal volume}) - 20 \text{ [l]} (\text{residual amount})}{400 \text{ [l/ha]} \text{ required rate of water}} = 7,45 \text{ [ha]}$$

7.3.1 Filling with water



Observe the permissible payload! For this bear in mind the individual weights [kg/l] for the various liquid agents.

Liquid	Water	Urea	AUS	NP-Dilution
density [kg/l]	1	up to 1,11	1,28	1,38



Before refilling check the implement for any damage, e. g. leaking tank and hoses as well as to check the correct position of all the controls.



Never leave the implement unattended when filling. Irrespective of any chosen or available filling method every user should follow this principle.



Never leave the implement unattended when filling. Irrespective of any chosen or available filling method every user should follow this principle.

Highest safety against the back flow of spray mixture is provided when the end of the filling hose is fixed at minimum 20 cm above the filling opening of the sprayer tank..



Avoid formation of foam. When filling do not allow foam to escape from the tank. To avoid the formation of foam use a pipe with a large diameter which reaches down to the bottom of the tank.

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

- Accurate determination of the water filling amount (refer to chapter. 7.3).

The filling of the spray mixture tank (7.2/1) and clean water tank (7.2/2) of the **UG Nova** is always conducted **via the filling opening** (7.2/3) or. (7.2/4)) by a water pipe in "free flow"

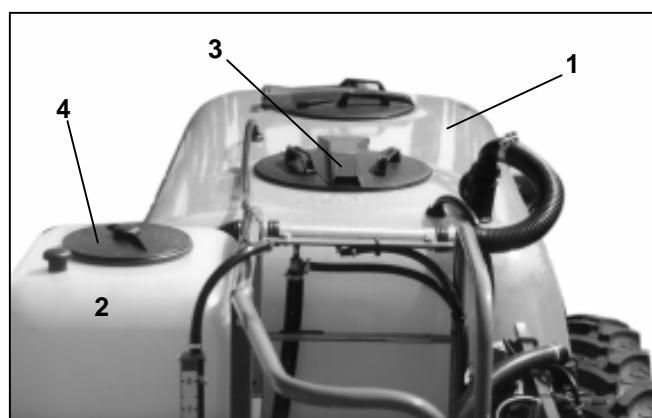


Fig. 7.2



For filling the spray tank the filling sieve (7.3/1) should always be in place.

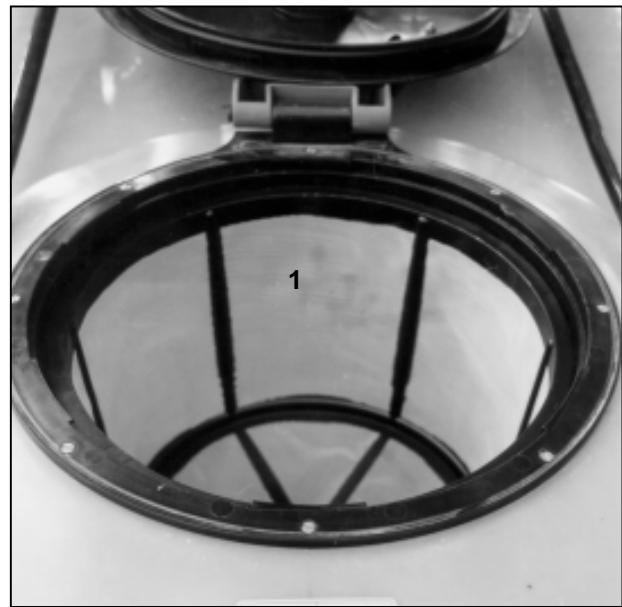


Fig. 7.3

- Read the tank volume off the pointer position (7.4/2) on the scale (7.4/1) of the tank level indicator.

Tank volume [l] = indicated scale figure x 100

- Close the filling opening with the aid of the hinged cover or screw lid.

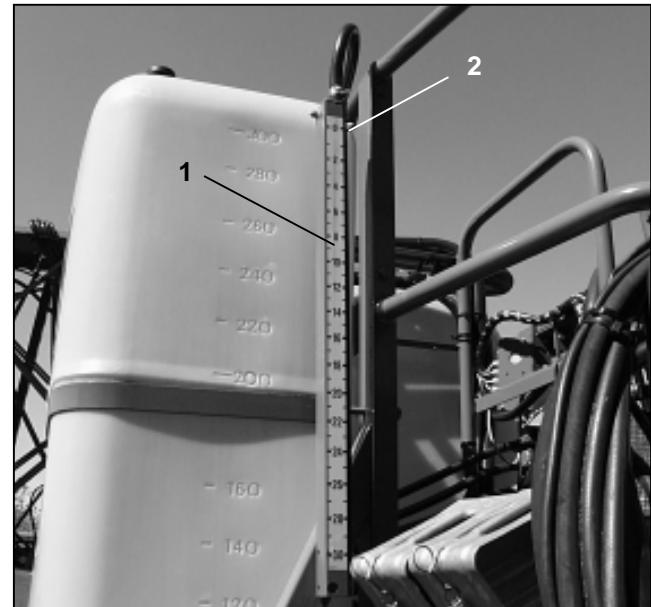


Fig. 7.4

On the UG Nova the filling of the spray agent tank can be achieved with the aid of the suction hose via the suction connections.

- Connect the suction hose with the suction ports.
- Move the multiple way tap into position "sucking via suction hose".
- Switch on pumps (approx. 400 R.P.M.) and fill the spray agent tank with water.
- When the tank is filled, return the 3-way tap (Fig. 7.6) and switch off the pump.

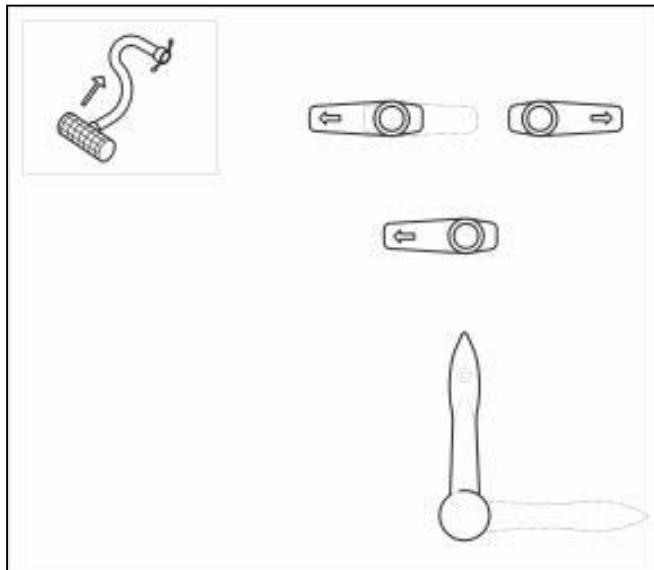


Fig. 7.5

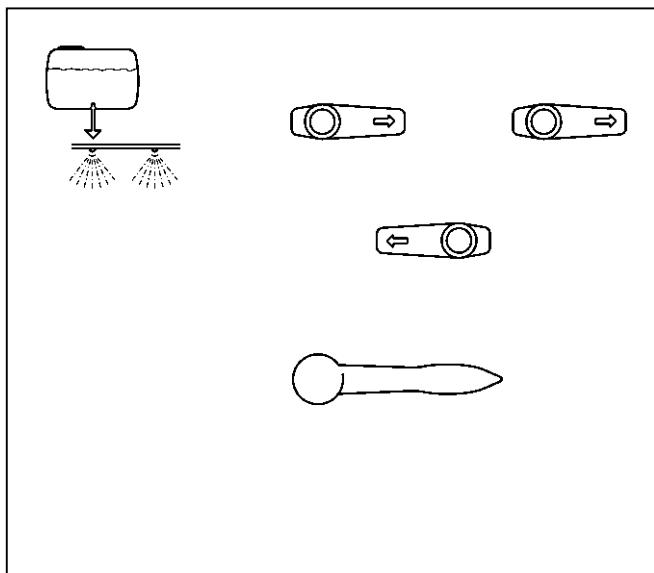


Fig. 7.6

7.3.2 Inducting spray agents

- **Induct the desired agent via the induction bowl** (7.7/1) into the water of the spray agent tank.
- Note liquid and powdery spray agents, e. g. urea, have to be handled differently

 If the urea filter (option) is placed into the tank sump the quantity of urea needed for one tank filling can be placed directly into the tank opening.

- **Water diluting foil bags** may be placed directly into the tank while the agitator is running.



Fig. 7.7



Empty spray agent containers should be flushed carefully, made unusable and collected so that they can be disposed according to advice and so that they cannot be used for other purposes again.



In cases when flushing the agent container only diluted spray agent is available, just carry out a pre-cleaning. A thorough flushing should then be carried out when clear water is available, e. g. before preparing the next tank filling or when diluting the residual liquid of the last tank filling.

7.3.2.1 Liquid agents

- Fill the spray agent tank half with water.
- The master boom on/off switch is in Position "0".
- Open the lid of the induction bowl.
- Swivel the 3-way tap according to Fig 7.8.
- Pour the calculated and metered spray agent quantity or the urea quantity necessary for one tank filling into the induction bowl (7.9/4) (max. 34 l).
- Drive both pumps with approx. 400 R.P.M. and switch on the agitator(s). If necessary increase the agitation intensity (general agitating step "2").
- Swivel 3-way tap (7.9/5) into position "1" (open circular pipe line).

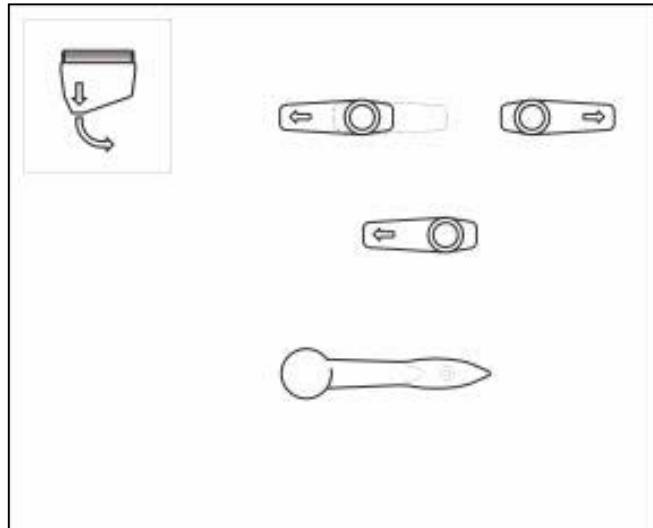


Fig. 7.8

- Swivel the 3-way tap (7.10/1) according to Fig. 7.10 and suck the liquid off the induction bowl.

The suction speed may be varied via intermediate positions of the 3-way tap (7.10/1) beliebig einstellen.

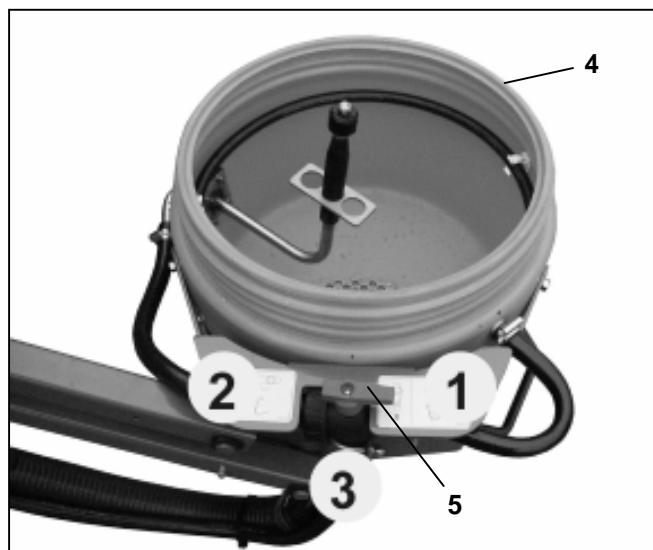


Fig. 7.9

- Swivel the 3-way tap into position 3 (shut off).
- Return the 3-way tap (7.10/1) according to 7.10.
- Fill remaining water quantity into the tank.
- Usually the agitation remains engaged from the time of filling until termination of the spraying operation. Please adhere to the advice of the agent manufacturers.

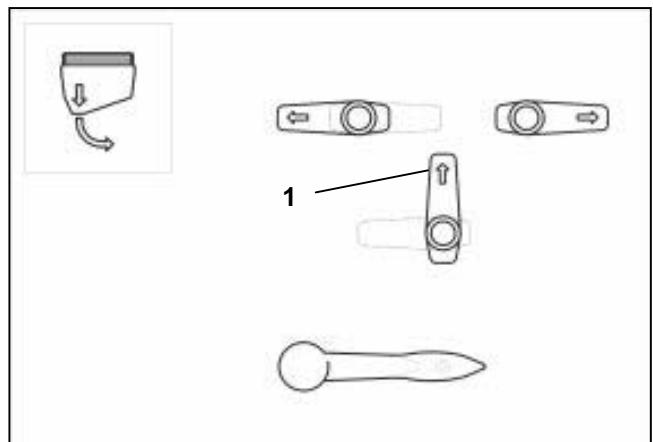


Fig. 7.10

Powdered spray agents and urea

- Fill sprayer tank half with water.
- Switch the master boom feed control on the switch box into position "0".
- Open induction bowl lid.
- Swivel the 3-way tap according to Fig. 7.10.
- Drive pump if fitted with approx. 400 R.P.M. and switch on both agitators. If necessary the agitation intensity may be increased (general agitating step "2").
- Swivel 3-way tap into position 1 (open circuit pipe line).
- Swivel the 3-way tap (7.12/1) according to Fig. 7.12 and suck the contents out of the induction bowl.



The suction speed may be varied via intermediate positions on the 3-way tap (7.12/1).

- Pour in the calculated and metered spray agent quantity or the urea quantity necessary for one tank filling into the sprayer tank (7.11/4).
- Pump liquid through the induction bowl until the contents is fully diluted and sucked off.
- Swivel 3-way tap (7.11/5) into position 3 (shut off circular pipe line).
- Return the 3-way tap (7.10/1) according to Fig. 7.10.
- Top up remaining quantity of water in the tank.
- Usually the agitation remains engaged from the time of filling until termination of the spraying operation. Please adhere to the advice of the agent manufacturers.



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

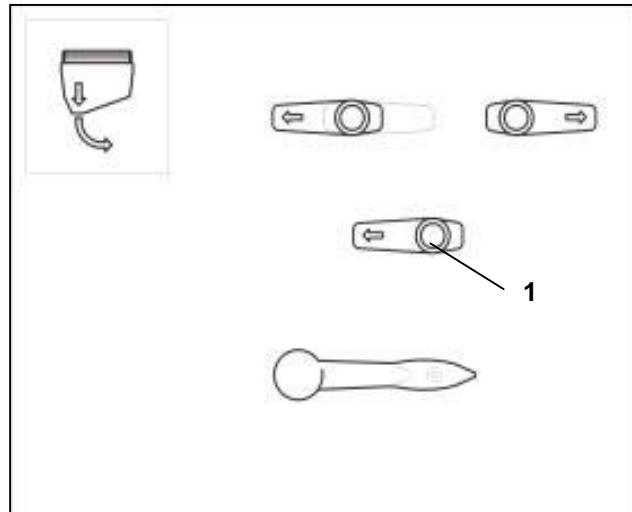


Fig. 7.10



Fig. 7.11

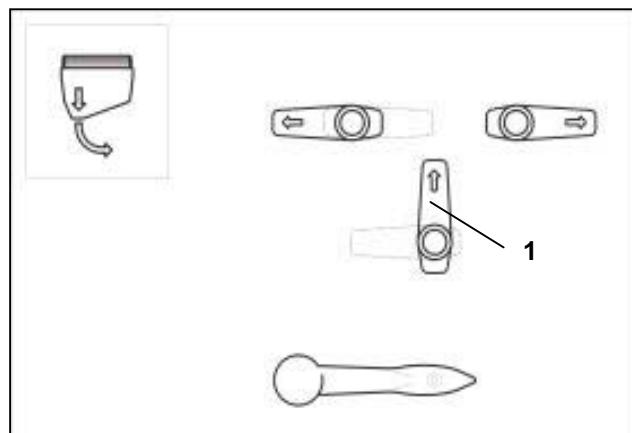


Fig. 7.12

Flushing of spray agent containers with the aid of the can wash nozzle

7.3.2.2 UG 2200 Nova, UG 3000 Nova and UG 4500 Nova

- switch off the sprayer boom.
- Drive the pump with approx. 400 R.P.M.
- Swivel the 3-way tap (7.12/1) according to Fig. 7.12.
- Swivel the 3-way tap (7.14/4) to the position 2 (open can wash nozzle).
- Slide the canister (7.13/1) or another container over the can wash nozzle and press downwards for **at least 30 seconds**.

Rinsing the induction bowl

- Swivel the 3-way tap (7.14/4) to the position 3 (shut off).
- Replace the lid (7.13/2) on to the induction bowl.
- Swivel the 3-way tap (7.14/4) to the position 2 (open can wash nozzle).
- Return the 3-way tap (7.10/4) to the position 3.
- Return the 3-way tap (7.10/1) according to Fig. 7.10.

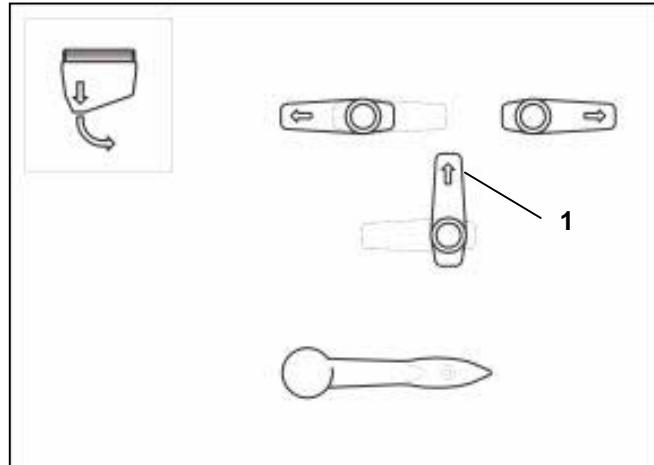


Fig. 7.12

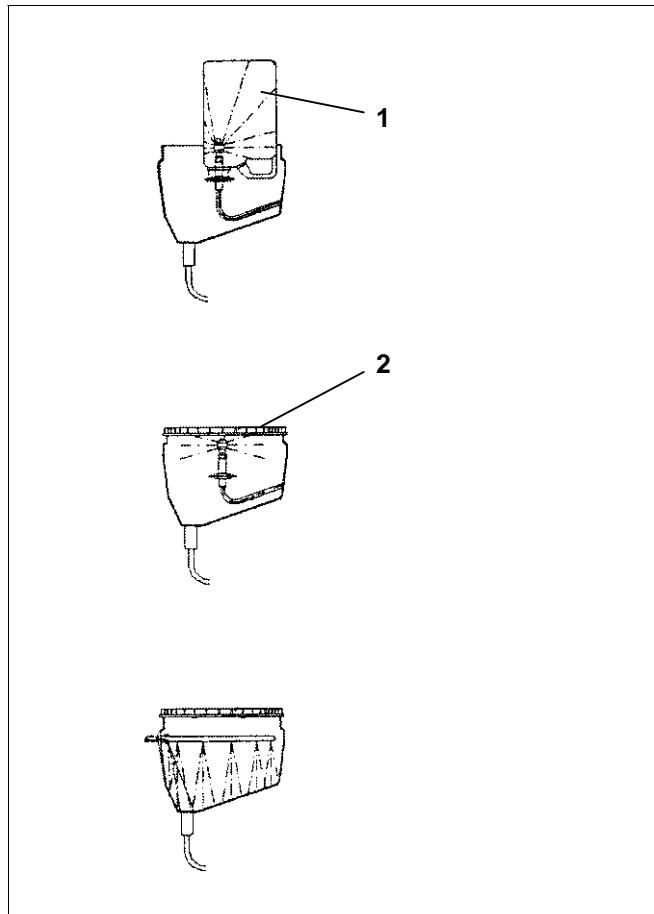


Fig. 7.13



Fig. 7.14

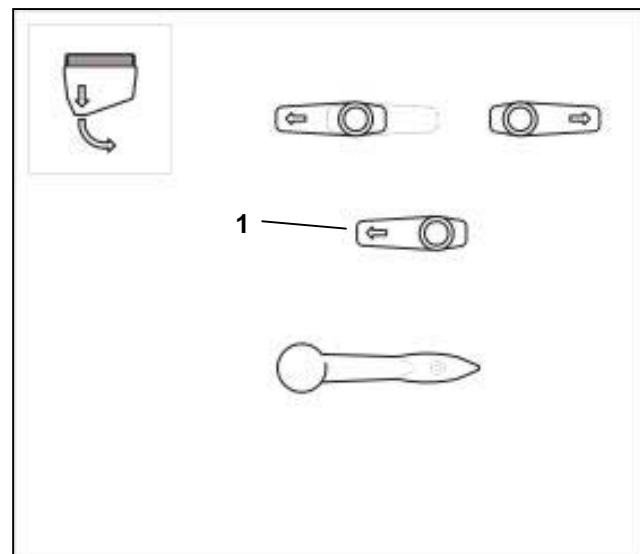


Fig. 7.10

7.4 Setting the equal pressure control chest before the first operation and after any change of nozzles (only for "NG"-control unit)

- Fill the coupled trailed sprayer with approx. 400 l water.
- Unfold booms and engage the pump with operating rev's of e. g. 450 R.P.M.
- Turn on the on/off switch (7.15/1) for the electric power supply of the switch box into position "I". The red control lamp lights up and the switch box is ready for operation.
- Set the programme switch (7.15/2) to the position "maunal operation".
- Turn on the master boom control switch (7.15/3) into position "I". The solenoid valves of the equal pressure control chest open and water is sprayed out of the nozzles.
- On the agitator set the **agitation intensity "1"**.
- Actuate the \pm key (7.15/4) until the spray pressure display shows a **spraying pressure of 4 bar**.
- Set the equal pressure device with the aid of the knurled thumb screw (7.16/1).
 - Shut off one sprayer boom section via a part width switch (7.15/5) The set spraying pressure will change on the spraying pressure display.
 - Turn the thumb screw on the equal pressure valve belonging to this solenoid valve until the spray pressure of exactly **4 bar** is displayed. Thereafter re-open the boom part width section feed again.
 - Set the equal pressure valves of the other sections in the same manner.
- After having set all solenoid valves shut all the boom part section shut offs on the master switch (7.16/3). Now the displayed pressure should still read **4 bar**. If this is not the case repeat the setting procedure of the equal pressure control chest.

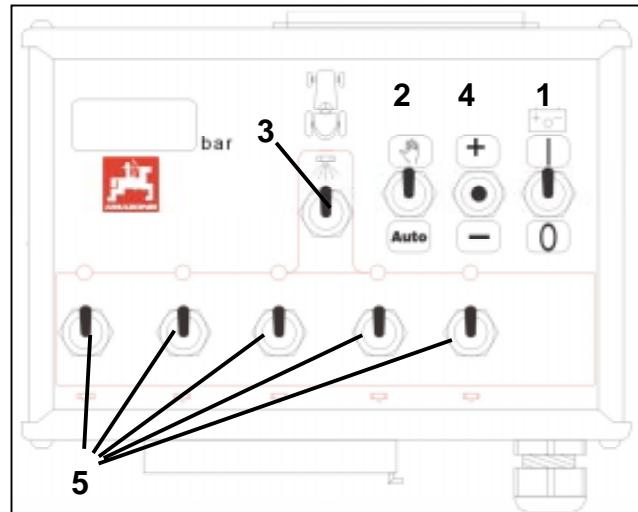


Fig. 7.15

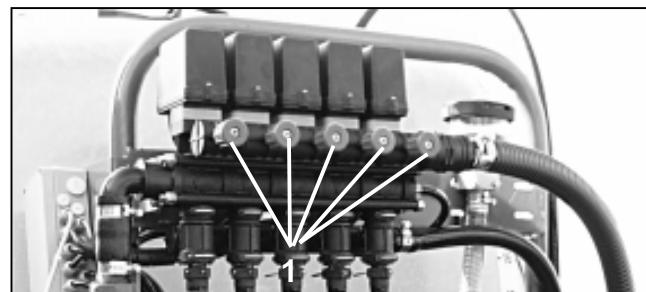


Fig. 7.16

7.5 Spraying crop protection liquid



Before the spraying season begins and after any change of nozzles the proper spraying ability of the sprayer should be checked by a calibration test (please refer to para. "Calibrating the crop protective sprayer")!



If wind speeds above 3 m/sec. prevail conduct additional measures to avoid spray drift (please refer to para. "Measures against drifting"). Discontinue the spraying operation at average wind speeds of above 5 m/sec. (leaves and thin branches are moving).



Do not choose forward speed higher than 8 k.p.h. Firstly so as not to mechanically over stress the boom but secondly also not to endanger the uniformity of application by creating too strong a driving wind



Avoid over application (caused by overlapping if not driving at the correct bout width properly and/or when driving into bends at the head lands with the boom switched on).



The advised spray agent application rate (litre or kg/ha) according to the instructions of the spray agent manufacturer can only be achieved when the user accurately maintains the prescribed spray rate [l/ha] during the spraying operation.



Switch the boom feed on or off only while moving.



Maintain the pre-selected tractor gear necessary for keeping the spray pressure setting and the agitation intensity during the spraying operation as otherwise deviations from the desired spray rate may occur



During the spraying operation continuously check the spray liquid consumption in relation to the treated area.



If the spray pressure suddenly drops the tank is empty. If the spray pressure fluctuates otherwise check either the suction or the pressure filter.



All mentioned spray rates in l/ha for nozzles in the spraying table refer to water. The corresponding figures should be multiplied by 0.88 for urea suspensions and by 0.85 for NP solutions.

- Mix up the spray mixture according to instructions and agitate according to instructions from the spray agent manufacturer.
- Fold out the spray booms.
- Set the height of the spray boom (height between the nozzles and the crop) according to the spraying table in regard of the nozzles used.
- Adjust the required agitation intensity.
- Read off the tractor clock which tractor gear allows a forward speed of between 6 and max. 8 k.p.h. Set the tractor engine rev's on the hand throttle lever for a constant pump drive speed (min. 350 R.P.M., max. 550 R.P.M.).
- Set the desired liquid rate on the computer or if "NG" control unit is available via the spray pressure.
- Select the suitable tractor gear and start moving. **Maintain accurately the forward speed during spraying operation.**
- Switch on the boom feed via the switch box.

7.5.1 Hints for automatic metering

When operating at a pre-set speed, a speed depending metering is achieved. For example, if the tractor engine speed drops, e. g. due to driving up hill then simultaneously as the forward speed drops also the tractor PTO speed is reduced and thus also the pump drive speed in the same proportion. This way the delivery volume of the pump is also changing in the same ratio and the desired spray rate (l/ha) remains, within the same tractor gear, constant. At the same time also the pre-set spray pressure changes.



For achieving an optimum effect of the spray liquid to be sprayed and for avoiding unnecessary ecological stress the deviation of the pre-set spray pressure may not be more than $\pm 25\%$. These pressure deviations of $\pm 25\%$ result when forward speed changes of $\pm 12\%$ within one tractor gear occur.

At forward speed deviations of more than $\pm 12\%$ - within one tractor gear - spray pressure deviations of more than $\pm 25\%$ prevail which results in an unwanted change of the droplet size of the spray mixture.

Example:

In case the spray pressure has been set to **3.2 bar**, spray pressures between **2.4** and **4.0** bar are permissible. At no time, however, should the maximum permissible pressure range of the nozzles fitted be exceeded.

 **Never exceed the maximum pump speed of 550 R.P.M. when increasing the forward speed.**

7.5.2 Operational range of the control units

Pressure:	1 bis 7 bar
Volume flow:	6 to 220 l/min.
PTO speed:	300 to 540 R.P.M.
Max. deviation from the pre-set spray rate:	+/- 5 %
Permissible speed deviations within one tractor gear::	+/- 12 %
Permissible pressure deviations from the pre-set spraying pressure:	+/- 25 %

7.5.3 Measures to avoid spray drift

- Choose the early morning or the evening for carrying out the treatment (usually less wind).
- Choose larger nozzles and higher water rates.
- Decrease spray pressure.
- Keep to the correct boom operational height as with increased nozzle spacing the danger of drift increases.
- Reduce the forward speed (to below 8 k.p.h.).
- Fit nozzles with a high proportion of coarse droplets, such as so-called anti drift (AD)-nozzles or injector (ID)-nozzles (nozzles with a high percentage of coarse droplets).
- Observe the spraying intervals for the individual plant protective agents..

7.5.4 Setting the spray rate [l/ha]

The spray rate depends on:

- The **liquid delivery of the nozzles (l/min.)**. The nozzle size and the spray pressure influence the delivery of the nozzle. The spray pressure to be set is taken from the spray table depending on the type of nozzle and size.

 **By increasing the spray pressure the nozzle output is increased by decreasing the pressure is reduced.**

 **The selection of the suitable nozzle depends on the desired spray rate.**

- The **forward speed (kph)**. The actual forward speed should be first checked over a pre measured distance.

(Please refer to para. **Fehler! Verweisquelle konnte nicht gefunden werden.** - "Checking the actual tractor forward speed").

The spray table provides full settings according to which the nozzles can be chosen and the spray pressure can be set. **Check in any case the data given in the spray table by calibrating the sprayer with water (please refer to para. "Calibrating the field sprayer").**

7.5.4.1 Determine the spray pressure

- Find the correct spray table - under consideration of the kind of nozzle and -size.
- Find the prescribed spray rate and spray pressure from the spray rate setting chart.

 **To avoid losses by drift choose slower forward speed and a lower spray pressure.**

 **The higher the spray pressure the smaller the droplet diameter gets. Smaller droplets are more susceptible to an unwanted drift.**

7.5.4.2 Set the spray pressure

- Set the spray rate via computer or – if "NG" control unit is fitted – via the spray pressure.
- Turn on the switch box using the main power switch (7.17/1) to position "I" (EIN/ON).
- Turn off the master boom on/off switch (7.17/2) to position "0" (AUS/OFF).
- Set the required intensity of the hydraulic agitation
- Engage the tractor PTO shaft.
- Read off the tractor clock which tractor gear should be chosen for a forward speed of 6 to max. 8 k.p.h. Set the tractor engine speed after considering the pump drive speed (350 to max. 550 R.P.M.) on the hand throttle lever to stay constant.
- When the "NG" control unit has been fitted set the spray pressure found in the spray setting chart via the \pm switch (7.17/3) on the spray pressure display.
- When the "TG" control unit has been fitted enter the desired spray rate on the computer.
- The jet delivery (l/min) must be checked and in case of deviations be corrected by changing the spray pressure.



If the spray pressure drops for no apparent reason, the suction or pressure filter should be cleaned.

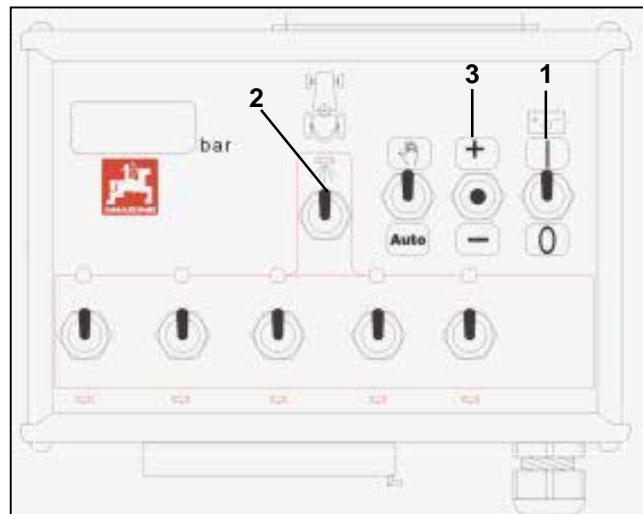


Fig. 7.17

7.6 Calibrating

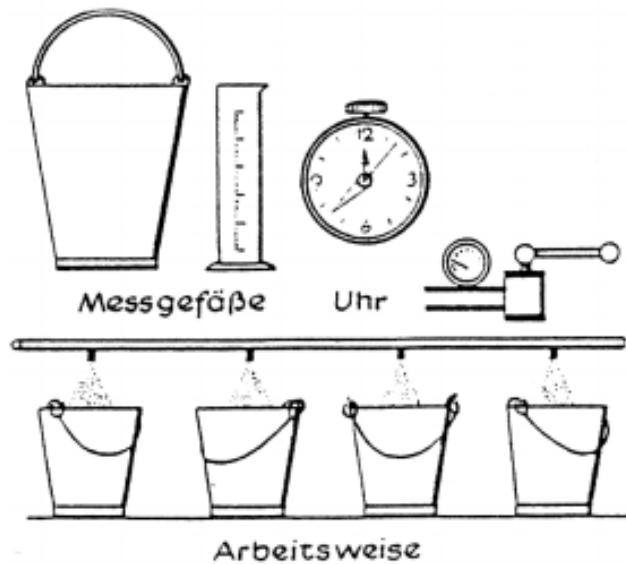
Always calibrate the sprayer with the spray pressure set according to the spray rate table

- before the beginning of any seasonal operation,
- after any change of nozzles,
- if not achieving the desired spray rate [l/ha].

Any differences between actual and desired spray rate [l/ha] may be caused by differences between the actual driven forward speed and the forward speed shown on the tractor clock and/or by the natural wear of the spray nozzles.

For calibrating the following accessories are needed:

- Suitable collection containers, e. g. buckets.
- Calibration jar or metering cylinder.
- Stop watch.



7.6.1 Determining the liquid rate [l/ha]

7.6.1.1 Determined by driving a measured distance

- Fill the sprayer tank with water.
- Switch on the sprayer boom and check whether all nozzles are properly functioning.
- Take the spray pressure for the desired spray rate (l/ha) from the spray table and set accordingly.
- Switch off the boom feed.
- Fill the tank with water up to a two-side level mark (if necessary apply).
- Measure out in the field a distance of exactly of 100 m. Mark the start and stop point.
- Read off the tractor clock which tractor gear is required for a forward speed of 6 to max. 8 k.p.h. With the hand throttle set the tractor engine speed to stay constant within the pump drive speed min. 350 R.P.M. and max. 550 R.P.M.
- Drive the measured distance with flying start from the start to the stop point in the pre-selected constant forward speed read off the tractor clock. For this the spray boom feed should be accurately switched on at the calibrating distance start and switched off at the stop point (please see also para. determining the actual tractor forward speed).
- Determine the sprayed volume of water by refilling the tank
 - with the aid of a measuring container,
 - by weighing or
 - by a water meter.

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

a: Water consumption on the calibration distance [l]

b: Working width [m]

c: Length of the calibration distance [m]

Example:

Water consumption: 80 l

Working width: 20 m

Calibration distance: 100 m

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

7.6.1.2 Stationary calibrating from single nozzle output

The calibrating can also be conducted by measuring the single nozzle output (l/min) with water when the forward speed of the tractor on the field is exactly known. This then allows the calculation of the liquid rate (l/ha) or to read it directly off the spray table.

Sensibly the nozzle output should be checked on three different nozzles. Always check one nozzle at the left hand and right hand boom as well as in the centre of the sprayer boom as follows:

- Fill up tank with water.
- Ensure that all nozzles are operating correctly.
- Take the required spray rate (l/ha) from the spray table and set it.
- Determine the single nozzle output [l/min] on several nozzles, e.g. by a stop watch, metering cylinder and measuring cup.
- Calculate the average single nozzle output [l/min].

Example:

Nozzle size: '06'

Intended or measured forward speed: 6.5 km/h

Nozzle output at the left hand boom: 2.8 l/min.

Nozzle output in the centre: 2.9 l/min.

Nozzle output at the right hand boom: 2.7 l/min.

Calculated mean rate: 2.8 l/min.

1. How to calculate the actual liquid amount

$$\frac{d \text{ [l/min]} \times 1200}{e \text{ [km/h]}} = \text{Liquid amount [l/ha]}$$

d: Nozzle output (calculated mean value) [l/min]

e: Forward speed [km/h]

$$\frac{2,8 \text{ [l/min]} \times 1200}{6,5 \text{ [km/h]}} = 517 \text{ [l/ha]}$$

2. Read the actual liquid amount [l/ha] off the spraying table for

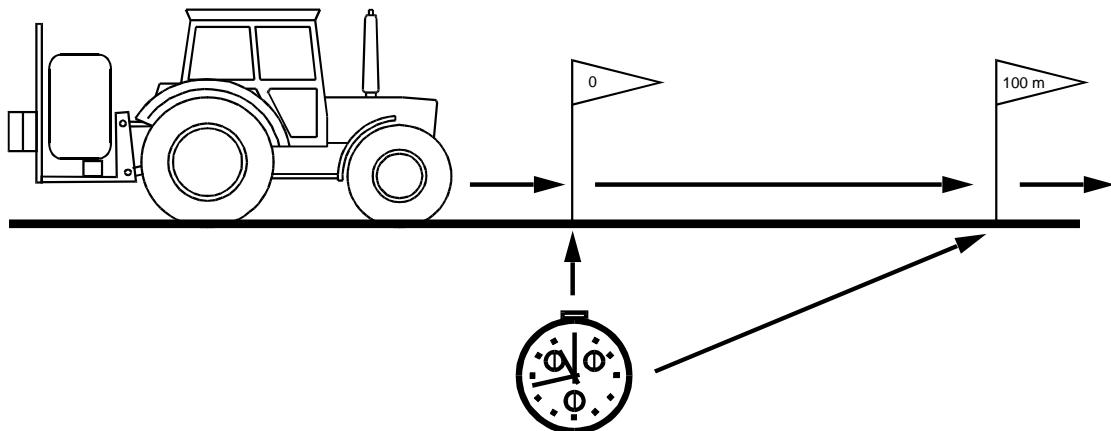
- Nozzle size '06',
- Collected nozzle output [2,8 l/min],
- Intended forward speed [6,5 km/h].

Liquid amount read off the spraying table 517 l/ha.

If the actual and the collected nozzle output do not coincide, correct the spraying pressure accordingly:

- In case of too a low liquid amount (nozzle output) increase the spray pressure.
- In case the liquid amount is too large reduce the spray pressure.
- Check the nozzle ejection as long as the determined and the desired liquid amount coincide.

7.7 Determining the actual operation speed



- Measure on the field accurately a distance of 100 m. Mark the starting and end point.
- Read off the tractor clock in which tractor gear a forward speed of 6 to max. 8 kph. is possible. Set on the hand throttle lever a constant tractor engine speed within the allowable pump drive speed (min. 350 R.P.M. and max. 550 R.P.M.).
- Drive over the pre-measured distance with a flying start from the start till the end point with the pre-selected constant forward speed read off the tractor clock. The time required to cover the distance should be determined by a stop watch
- By the determined time for covering the calibration distance (100 m) read off the following table the actual forward speed:

Table for determining the actual forward speed according to the time needed to cover the calibrating distance in the field

km/h	sec/100 m	km/h	sec/100m	km/h	sec/100 m
4,0	90,0	6,1	59,0	8,1	44,4
4,1	87,8	6,2	58,1	8,2	43,9
4,2	85,7	6,3	57,1	8,3	43,3
4,3	83,7	6,4	56,3	8,4	42,9
4,4	81,8	6,5	55,4	8,5	42,4
4,5	80,0	6,6	54,5	8,6	41,9
4,6	78,3	6,7	53,7	8,7	41,4
4,7	76,6	6,8	52,9	8,8	40,9
4,8	75,0	6,9	52,2	8,9	40,4
4,9	73,5	7,0	51,4	9,0	40,0
5,0	72,0	7,1	50,7	9,1	39,6
5,1	70,6	7,2	50,0	9,2	39,1
5,2	69,2	7,3	49,3	9,3	38,7
5,3	67,9	7,4	48,6	9,4	38,3
5,4	66,7	7,5	48,0	9,5	37,9
5,5	65,5	7,6	47,4	9,6	37,5
5,6	64,3	7,7	46,8	9,7	37,1
5,7	63,2	7,8	46,2	9,8	36,7
5,8	62,1	7,9	45,6	9,9	36,4
5,9	61,0	8,0	45,0	10,0	36,0
6,0	60,0				

7.8 Practical operation with "AMACHECK II A" (only with "NG" control unit)

The control units are supplied ready for operation. For starting the field operation programme "AMACHECK II A" according to the mounting and operation instructions "AMACHECK II A".

- Switch off "AMACHECK II A".
- Attach sprayer to tractor, connect "AMACHECK II A" by its connecting unit to the switch box.
- Switch on "AMACHECK II A".

Before operating programme the following machinery data:

- Imp./100 m
- Imp./l. The required figures lies between **600 - 700 Imp./l.** After this input the computer automatically runs on program "field sprayer".
- Working width [m].
- Number of boom part section feed controls.



When changing the present working width by switching on or off individual boom part width sections the lamp above the boom symbol (7.18/1). lights up. At the same time an automatic information about this working width change is given to "AMACHECK II A". In maximum 12 boom part sections are considered.

- Programme switch (7.18/2) in position "manual".
- Initiate start function by simultaneously pressing key "C" and "input". At the same time the memory for hectare counter, operating time and sprayed liquid is set to "0".
- On/off switch (7.18/3) for spower supply of switch box in position "1" (ON/EIN).
- Switch for the master boom feed control on/off switch (7.18/4) on the switch box in position "0" (OFF/AUS).
- Set the desired agitation rate of the hydraulic agitation.
- Read off the tractor clock for which tractor gear will allow a forward speed of 6 to max. 8 kph. Also set the tractor engine speed on the hand throttle lever considering the allowable pump drive speed of min. 350 R.P.M. and max. 550 R.P.M.

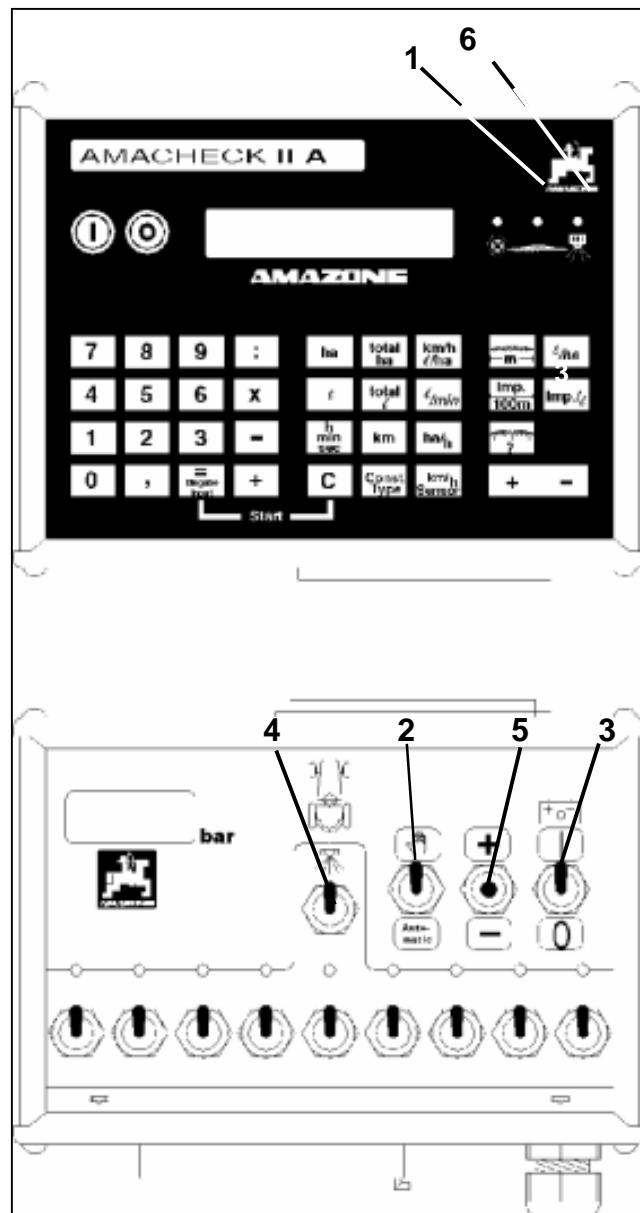


Fig. 7.18

- By the \pm switch (7.18/5) set the spray pressure for the desired spray rate.

 **When deviations are noticed between the displayed spray rate and the nominated spray rate change the spray pressure accordingly by the \pm switch (7.18/5) of the switch box until the displayed spray rate and the nominated rate coincide.**

 **When the boom feed supply is switched on the diode above the nozzle symbol (7.18/6), e. g. the sprayer is ready to operate.**

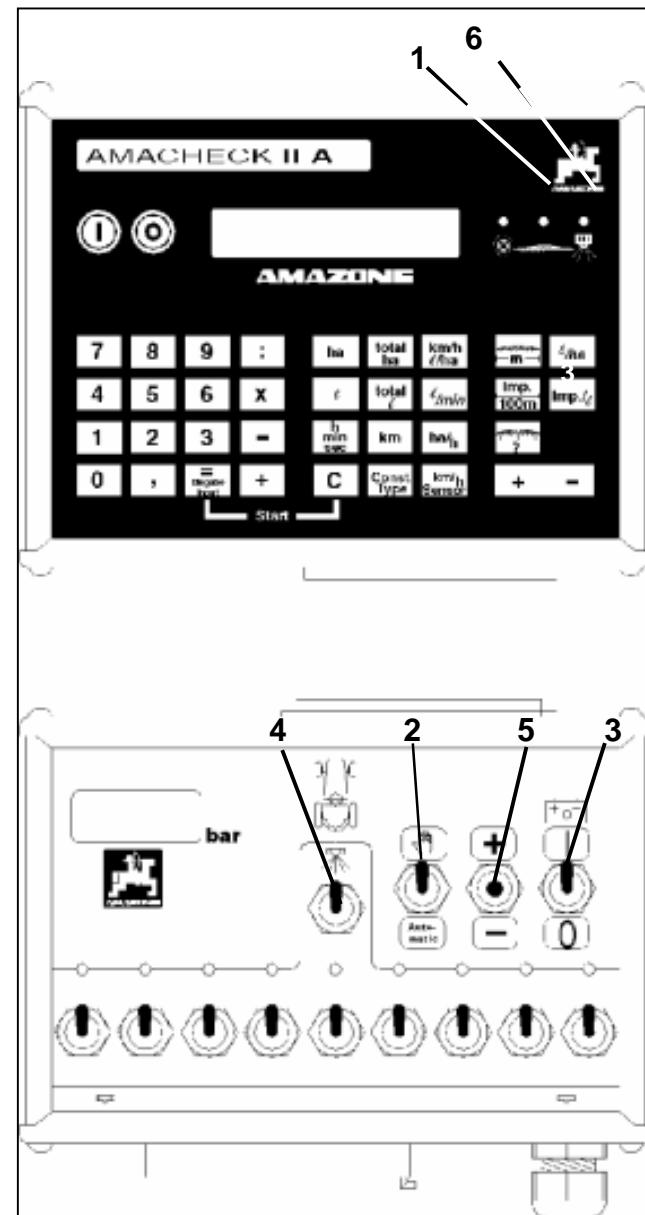


Fig. 7.18

7.9 Practical operation with "Spraycontrol II A" or "AMATRON II A"

The control units are supplied ready for operation. Before starting the field operation the "Spraycontrol II A" or "AMATRON II A" must be programmed according to the individual fitting and operating instructions for the units. **The manufacturer has already determined the data Imp./l of the flow meter.** This value is stored in the computer (in addition the value "Imp./l" is written on the housing of the flow meter).

If the figure Imp./l is unknown it should be determined by re-calibrating the flow meter (please refer to para. "Maintenance").

Before use firstly enter the implement specific data into the "Data block implement" (please also refer to the fitting- and operating instructions "Spraycontrol II A" or "AMATRON II A").

The following operating procedure results:

- Attach the sprayer to tractor.
- Connect implement cable to switch box.
- Plug "Spraycontrol II A" or "AMATRON II A" onto the switch box.



When plugging the "Spraycontrol II A" or "AMATRON II A" onto the switch box the on/off switch for the electric power supply of the "Spraycontrol II A" or "AMATRON II A" should be in position "0".

- "Spraycontrol II A" bzw. "AMATRON II A" einschalten.

The machine type is automatically recognised via the implement plug and the programme "field sprayer" with the once entered implement data is automatically dialled.

- Enter the work related data into the data block "Job".
 - Enter name (field plot name, name of customer)
 - Enter and check "spray rate and nominated spray rate"
 - Enter commentary.



Commentary and name need not necessarily be used. However, the figure "nominal spray rate" has to be entered.

- Move from data block "Job" via key "T2" directly into data block "operation".
- Start the order in the "data block "operation" via key "T2".
- During the spraying operation all functions of the key board including the calculators can be accessed. The spray rate is changeable via the keys " ± 10 " in 10 % steps, relative to the entered nominal spray rate.
- The order will be terminated and stored by pressing the key "T2" (End). This way all data determined for this order such as area, working hours, sprayed quantity etc. are stored.
For a new job this data is automatically returned to "0" and automatically a new order number is allocated and the operation procedure begins again.

7.9.1 Special hints for practical operation

Due to the automatic area related spray rate control forward speed and pump drive speed can freely be chosen in a wide range.

The pump capacity depends on its drive speed. Choose the pump drive speed (between 350 and 550 R.P.M.) in such a way that there is always sufficient spray volume available for the sprayer boom and for the function of the hydraulic agitation. 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.

However, before starting the spraying operation choose from the spray rate table a closer forward speed- and spray pressure range that considers the nozzle size and the desired nominal spray rate.

If at a higher forward speed and lower pump drive speed the nominal spray rate is not achieved an alarm message is shown on the display, and simultaneously an alarm signal can be heard. This can be remedied by reducing the forward speed and increasing the pump drive speed.



When spraying please ensure that the spray pressure by no means deviates by more than 25 % from the desired spray pressure.

Example:

If the desired spray pressure is e. g. 3.2 bar, all spray pressures between 2.4 and 4.0 bar are permissible.



For ensuring an optimum crop treatment and for reducing any risk to the environment never exceed the permissible pressure range corresponding to the nozzles fitted to the sprayer boom. For example the pressure range for the nozzle size "05" ranges from 1.0 to 5.0 bar.

On the **control units "NG"** and **"TG"** the permissible spray pressure of the nozzles fitted to the sprayer boom should be manually monitored on the **pressure gauge**.

On the optional equipment "**digital pressure monitoring**" the spray pressure for the nozzles fitted to the sprayer boom is monitored and displayed on the SKS.

When "**AMATRON II A**" is used enter the permissible pressure range for the nozzles into the "data block machine". An audible and visible signal will be produced as soon as this entered pressure range is left.



When spraying with only 1 part boom section switch over to manual operation on the switch box.

7.9.1.1 The liquid volume inside the tank is only approx. 100 l

- Switch the programming switch over from position "Auto" to "manual", when the tank level drops to around 100 l.



With a low tank level movement of the water level may allow the sucking of air. This causes a malfunction on the flow meter and results in the wrong measure values.

- After filling switch over the programming switch to position "Auto" again.

7.10 Surplus amounts

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

1. Surplus remaining in the tank after concluding the spraying operation
2. Technical surplus amount left in the tank, filter tap, pump, suction and pressure hose, control chest and nozzle tubes after the pressure has dropped indicating no more can be sprayed out. The surplus amounts of the individual components may be taken from the chapter "Technical data" and have to be added.

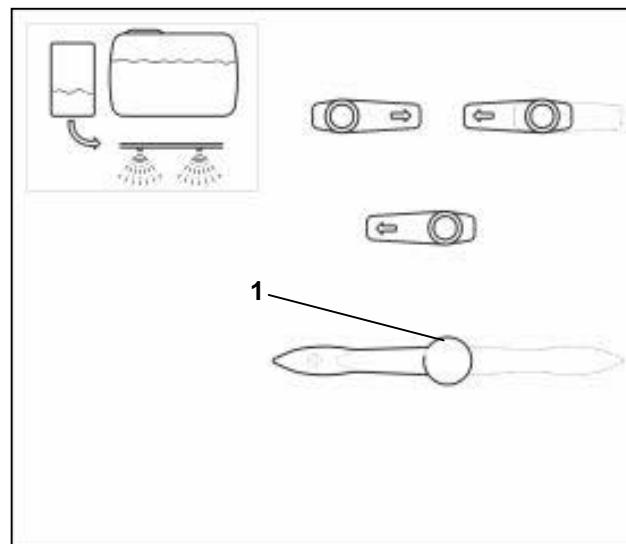


Fig. 7.19

7.10.1 Removal of residual amounts

Proceed as follows:

- Switch off the master boom feed on/off switch to position "0".
- Start the hydraulic agitation.
- Switch on the nozzles for the internal tank wash via the single tap.
- Bring control tap (Fig. 7.19/1) to position "diluting".
- Switch on the PTO shaft.
- Dilute the surplus amount remaining in the tank with at least a 10 fold amount of water from the clean water tank.
- Bring control tap (7.20/1) to position "spracing" according to Fig. 7.20.
- **Spray the diluted surplus amount on the already treated field at increased forward speed** by choosing the next higher tractor gear.
- In case of residual liquid of below 100l switch off the hydraulic agitation device.



If the residual amount inside the tank is less than 100l switch off the agitation device while spraying out the tank and re-set the spray pressure. If the agitation is left switched on the technical surplus amount is increased compared with the indicated values.

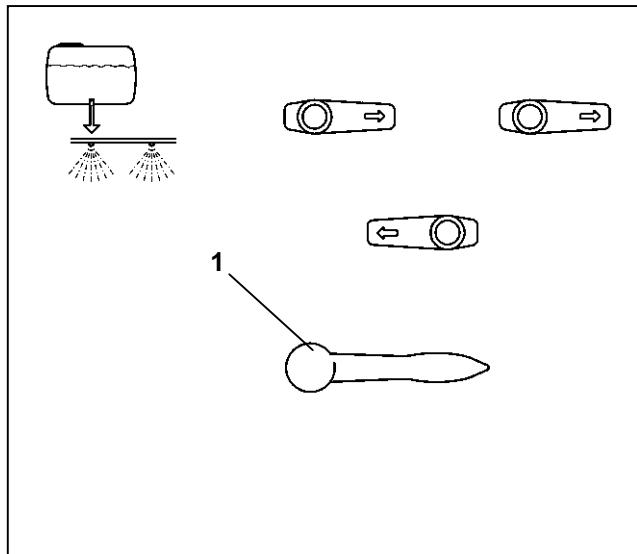


Fig. 7.20



The residual amount in the sprayer boom depends on the boom's working width and is sprayed out still in undiluted concentration. This residual amount must implicitly be sprayed onto an area that has not yet been treated. Take the required driving distance for spraying this undiluted residual amount from the chapter "Technical data – sprayer boom".

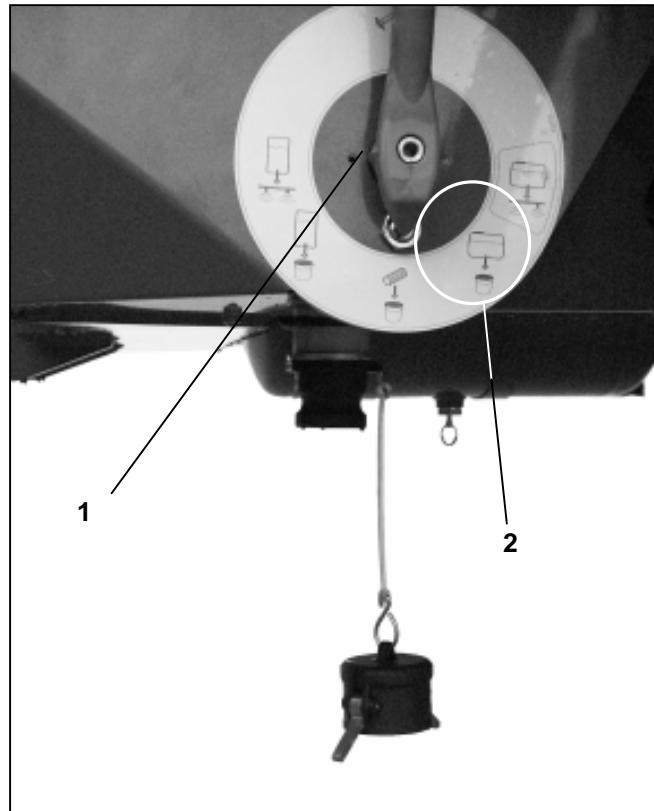


Fig. 7.21

Swivel the multiple-way tap (Fig. 7.22/1) to position "drain off" (Fig. 7.21/2) to drain off into a suitable collecting container any diluted surplus amount.

- Clean by rinsing with water: pump, suction- and pressure hose, control unit and nozzle tubes.



When emptying residual amounts note all measures for operator safety. Follow the instructions of the spray agent manufacturer and wear suitable protective clothing. Dispose of the collected surplus spray mixture according to the applying legal advice, e.g. suitable containers for the advised removal of waste material.

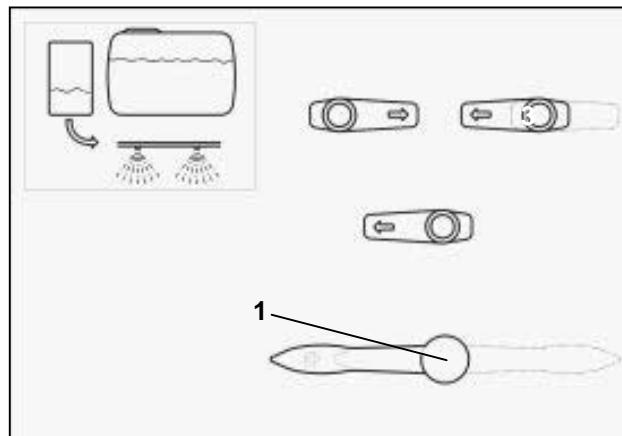


Fig. 7.22

7.11 Cleaning

Life span and reliability of the AMAZONE sprayer depend considerably on the period of contact of the spray agent with the materials of the implement. Therefore let these materials react for as short as possible, e. g. by cleaning immediately after finishing spraying. The spray mixture should not be left unnecessarily for any length of time in the sprayer tank, e. g. not over night.

As a matter of principle always clean out the sprayer before another spray agent has to be sprayed.

Conduct a pre-cleaning in the field before the actual cleaning procedure with the sprayer. For this purpose the surplus amount still left in the sprayer tank should be diluted with a 10-fold amount of water from the rinsing water tank. Thereafter spray this diluted surplus amount as mentioned in para "surplus amount".

Conduct the cleaning as follows:

- Flush the empty sprayer tank with a sharp jet of water. Fill the tank with approx. 400 l water.
- After having switched off the boom section feed on/off-control start the agitators, drive the pumps with approx. 400 R.P.M. to let the water flush in a circle several times.
- Conduct several switching procedures on boom feed controls, hydraulic agitator and central boom feed on and off control switch. This way all parts of the implement are rinsed with clean water.
- Finally spray the contents of the tank through the nozzles.
- Dismantle filter taps and clean filter inserts (see para. "Maintenance").
- Remove all nozzles after every season, flush all sprayer tubes, check nozzles for dirt and clean if necessary with a soft brush (ref. para. "Maintenance").



Before changing or fitting nozzles flush all spray lines.

7.11.1 Cleaning the sprayer with a filled tank

If due to poor weather conditions the spraying operation has to be interrupted the filter tap, pumps, control units and spray liquid circuits should be cleaned.

The cleaning in the field with clear water from the rinsing water tank is conducted as follows:

- Switch off the boom feed supply.
- Switch off the hydraulic agitation.
- 3-way taps in position "flushing" (Fig. 7.22).
- Drive pumps with a nominal speed of e. g. 450 R.P.M.
- Increase tractor speed into the next higher tractor gear and start and start spraying operation.
- Switch on the boom feed supply. The clean water is now being sucked from the fresh water tank and dilutes the spray mix cocktail in the filter tap, suction hose, pump, pressure hose, control chest and return flow.
- Spray this diluted spray mixture onto an area of already treated crop with an increased forward speed.



The residual amount inside the sprayer boom depends on the boom width and will still be sprayed in undiluted concentration. It is imperative that this surplus amount should be sprayed onto an untreated area of the field. The driving distance required for spraying this undiluted residual amount can be taken from para "technical data – Sprayer boom"

7.12 Storing over winter

- Clean the sprayer before discontinuation of the spraying operation.
- After completion of the flushing and cleaning operations and when no further liquid leaves the sprayer nozzles, let the pumps "pump air" at a PTO speed of 300 R.P.M.
- Switch all possible functions of the control unit so that any spray agent containing hoses can empty.
- Dismantle one diaphragm valve from one nozzle carrier per boom part section so that the spray lines of the sprayer boom can drain off.
- Disengage tractor PTO shaft if after several times the functions of the control chests are switched over and no liquid comes through the sprayer booms.
- Remove the nut (7.23/1) and drain the liquid off the pressure hose leading to the pressure gauge.
- Push back guard plate (Fig. 7.24/1), swivel control tap (7.24/2) downwards and drain off the residual liquid.
- Remove filter bowl, filter insert and centring ring of the two filter taps and clean them.



Fig. 7.23



Do not reinstall filter taps after cleaning but place them into the filling basket of the sprayer till next operational season.

- Take pressure hose off main pump so that any remaining water may drain from pressure hose and control chest.
- Once again switch on and off all functions of the control unit.
- Take off pressure hose from agitator pump.
- Engage PTO shaft and drive pump for approx. $\frac{1}{2}$ minute till no liquid is draining from the pressure side outlet of the pumps.



Leave the pressure hoses off until next operation.

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



Fig. 7.24



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 switch box, pressure gauge and any additional electronic options in a frost free dry room.



8. Sprayer booms

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



Set the sprayer boom height (distance between the nozzles and the crop) according to the table.



The advised height of the sprayer boom will only be achieved on each nozzle if the sprayer boom is operated parallel to the ground.



Any operational set-up required should be conducted carefully.



Always lock the boom sway compensation in transport position.

- for transporting the sprayer.
- when folding or unfolding the booms.

8.1 Q-booms up to 15 m working width (incl. swing compensation and hydraulic height adjustment)

8.1.1 Q-boom, manually folded

The manually folded and the hydraulically folded booms are identical except for the hydraulic components necessary for the folding operation.

For the manually folded Q-boom a single acting control valve for the hydraulic height adjustment is required on the tractor side.

Fig. 8.1/...

- 1 - Boom mounting frame.
- 2 - Upper stop elements - function as stop for the square profiles (7) when unlocking the boom swing compensation (9) (only on the hydraulically foldable booms).
- 3 - Hydraulic height adjustment - for setting the spray boom height above the ground.
- 4 - Single acting hydraulic rams of the height adjustment.
- 5 - Throttle valve for setting the lifting and lowering speed of the boom height adjustment.
- 6 - Hydraulic hose with block tap for the hydraulic boom height adjustment. The hydraulic height adjustment is lockable by the block tap at any height of the boom.
- 7 - Square profiles for locking the boom swing compensation.
- 8 - Lower stop elements – can be fitted on the boom mounting frame in various heights and function as stop for the square profiles (7) when locking the boom swing compensation.



Before coupling/uncoupling the plug of the hydraulic hose from the tractor hydraulic socket shut off the block tap.

Setting the lifting and lowering speed of the height adjustment

The lifting and lowering speed can be set at the throttle valves (8.1/5) by screwing in or out the set screw.

- To slow down the lifting and lowering speed: screw in the Allen key set screw.
- To speed up the lifting and lowering speed: screw out the Allen key set screw.

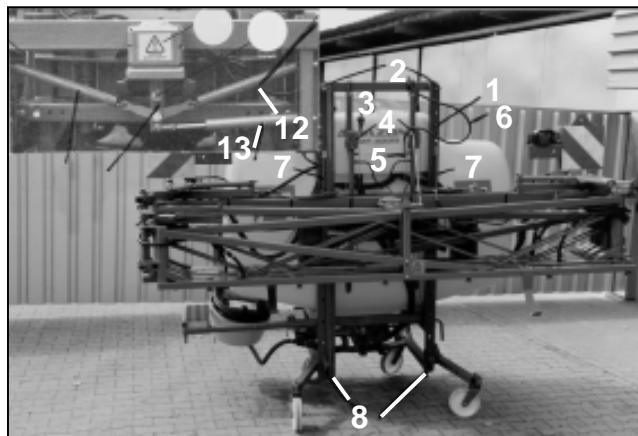


Fig. 8.1.

8.1.1.1 Folding in and out



Squeezing danger when folding in or out the boom ends. Fold the booms out placing your hands only on the yellow marked places of the booms.



As a matter of principle: Lock the boom swing compensation in transport position

- for transport
- when folding in and out the booms.
-

Folding out

The booms in the locked transport position.

- Open the block tap.
- Fold out the right hand boom side.
Fold out the left hand boom side.
- Setting the boom height above the crop on the hydraulic boom height adjustment. (Distance between nozzles and crop in respect of the nozzle type according to spray table). The boom swing compensation is now also automatically unlocked.
- Shut block tap. Hereby the height adjustment is locked and the set spraying height will be accurately maintained.

Folding in

- Open the block tap.
- **Lock the boom swing compensation** by lowering the down onto the lowest most position (square profiles rest on the lower stop-elements).
- Folding in the left hand boom side.
- Folding in the right hand boom side.
- Close block tap.

8.1.1.2 Operating with asymmetrically folded side sections



Lock the boom swing compensation in the pre-set desired boom height before the side arms of the boom are asymmetrically folded out or in.

The boom in symmetrically folded out position.

- **Lock the boom in the set boom height.**

- Push up the two square profiles (8.2/1) by hand as far as possible and lock in this position by raising the stop elements (8.2/2) on the boom carrying bracket (8.2/3).
- Fold in the required boom at this stage the boom may go into a slightly tilted position
- Open block tap.
- Lower the boom via the height adjustment until it is horizontally aligned. Now the two square profiles rest on the raised stop elements.
- Close block tap.

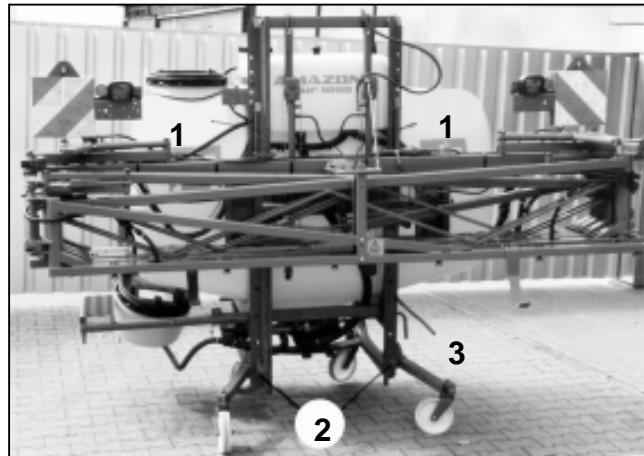


Fig. 8.2

To operate again with a symmetrically folded out boom:

- Slightly lift the boom on the height adjustment.
- Fold out the boom.
- Lower the stop elements (8.4/2) on the boom carrying frame (8.4/3).
- Set the boom height above the ground:

8.1.2 Q-boom, hydraulically folding

The hydraulically folding sprayer booms are available in two versions:

1. **Fully hydraulic boom actuation "I"**, with the possibility to independently fold the left hand side in the driving direction.

Services required on the tractor:

- 1 single acting control valve and 1 double acting control valve

2. **Fully hydraulic boom actuation "II"** with the possibility of independently folding either the left hand or the right hand in the driving position.

Services required on the tractor:

- 1 single acting control valve and 1 double acting control valve.

Fig. 8.3/

- 1 - Hydraulic coupling (single acting) with block tap for height adjustment.
- 2 - Hydraulic couplings red (double acting) for folding the left hand side boom in or out (only fully hydraulic boom actuation "II").



Close block tap off for the boom height adjustment before uncoupling the plug from the hydraulic socket on the tractor.

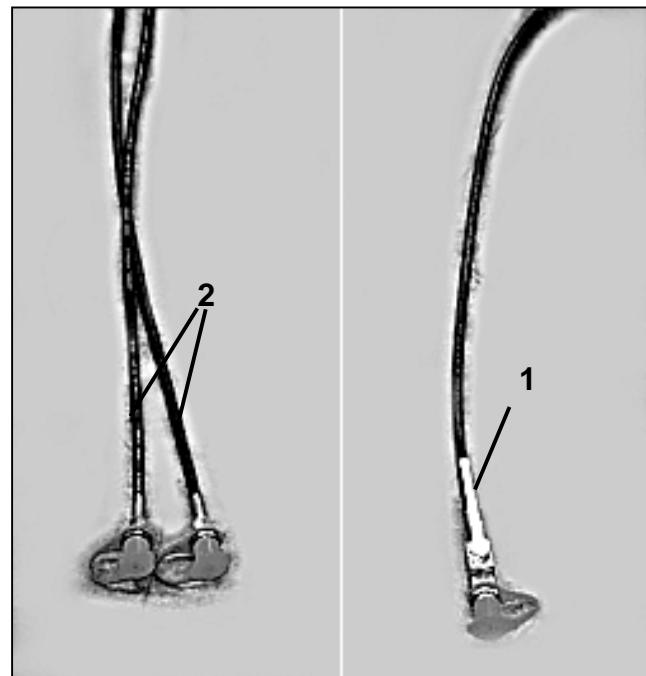


Fig. 8.4/....

- 1 - Centre boom assembly.
- 2 - Inner boom section.
- 3 - Outer boom section.
- 4 - Hydraulic ram (inner).
- 5 - Hydraulic ram (outer).
- 6 - Throttle valves for setting the folding speed of the boom.
- 7 - Unlockable return valve; linked in with the hydraulic rams for the boom folding and operates the boom lock when the boom is either folded in to the transport position or out in the operating position).
- 8 - Automatic boom transport lock; locks the folded booms automatically when the boom is lowered down onto the stops.

Fig. 8.3

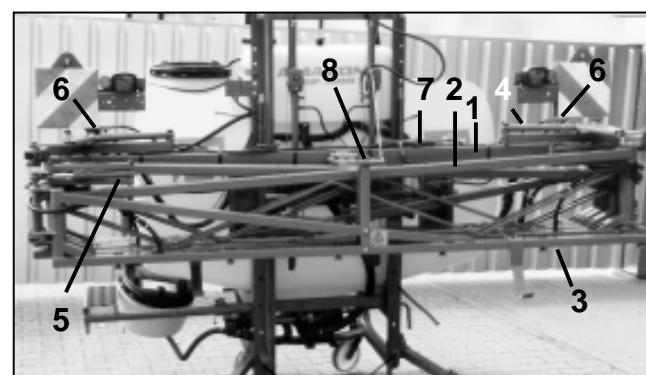


Fig. 8.4

Setting the folding speed of the boom

The folding speed has been factory set. Depending on the tractor type adjustment of this set folding speed might be necessary. The folding speed of the boom is settable on the throttle valves (8.4/6) by screwing in or out the Allen key headed set screw.

- To slow down the folding speed - screw in the Allen key set screw.
- To speed up the folding speed - screw out the Allen key set screw.

8.1.2.1 Hydraulically folding the Q-boom in or out



Before operating the booms in or out all persons should leave the folding area of the boom.



Avoid any crushing and bruising points at all the hydraulically actuated folding sections.



Never fold the boom in or out while moving.



The folding speed of the boom can be changed on the throttle valves (Fig. 8.4/6).



The hydraulic rams maintain the boom either folded out in to the work position or folded in to the transport position.



Never put the double acting control valve on the tractor that actuates the boom into the position for the pressure free return flow.

Folding out

With the boom locked in the transport position

- Open the block tap.
- Lift the boom in the transport position until the automatic transport lock (Fig. 8.4/8) releases (boom height will be about 2/3 up the boom mounting frame length).
- Sprayer boom with **hydraulic boom actuation "I"**
 - Actuate the control valve on tractor and the boom will fold automatically out.
- Sprayer boom with **hydraulic boom actuation "II"**
 - By actuating the control valve on the tractor swivel the control lever (8.5/1) in to position „A“ and fold out the right hand boom section.
 - By actuating the control valve on the tractor swivel the control lever in to position "B" and fold out the left hand boom section.
- Unlock the boom swing compensation from the transport position by lifting the boom up to its upper stops (please refer to para. **Fehler! Verweisquelle konnte nicht gefunden werden.**).
- On the height adjustment set the spraying height.
- Shut the block tap so that the height adjustment of the boom is locked and the spraying height will be accurately maintained.

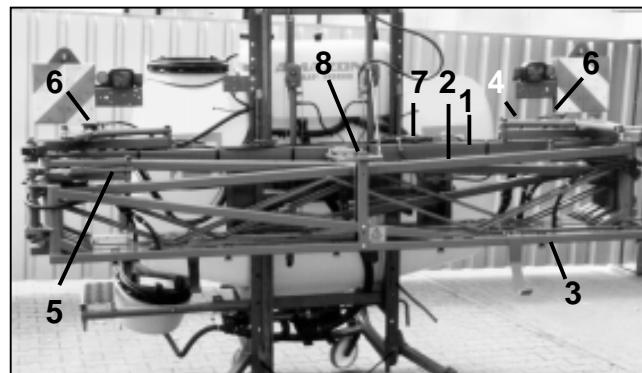


Fig. 8.4

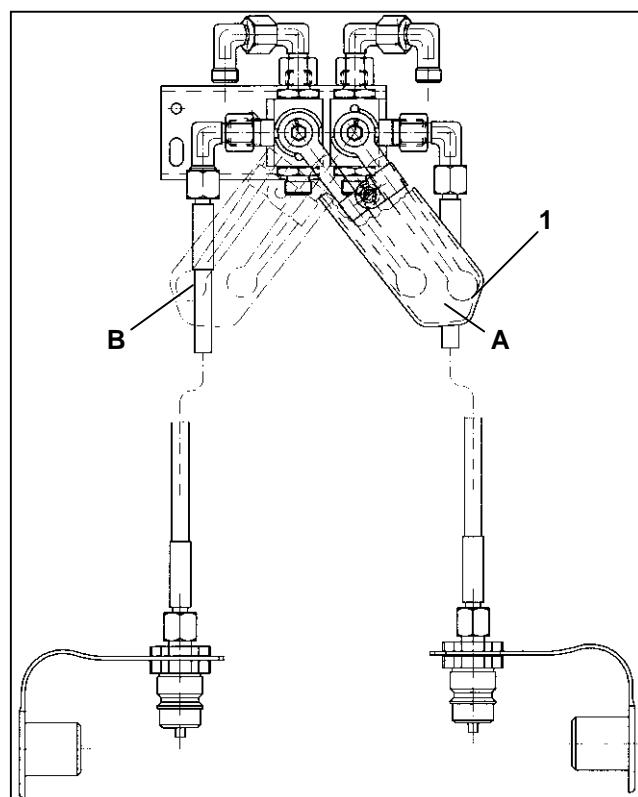


Fig. 8.5

Folding in

- Open the block tap.
- Lock the boom swing compensation into transport position by lowering the boom down to its lowest position (please refer to para. 8.1.2.3).
- Sprayer boom with **hydraulic boom actuation "I"**
 - Actuate the control valve on the tractor and the boom folds in a predetermined order automatically into the transport position.
- Sprayer boom with **hydraulic boom actuation "II"**
 - By actuating the control valve on the tractor move control lever in to Pos. B (Fig. 8.5) and fold in the left hand side boom.
 - By actuating the control valve on the tractor move control lever in to Pos. A (Fig. 8.5) and fold in the right hand side boom.
- Close the block tap to lock the height adjustment.

8.1.2.2 Operating with the booms folded asymmetrically



Lock the boom swing compensation at the pre-set or desired boom height before either boom is folded out or in unsymmetrical.

The boom is in the normal symmetrically working position.

- Open the block tap.
- Lock the boom swing compensation into the transport position (please refer to para. 8.1.2.3).
- Set the boom height on the height adjustment.
- Shut the block tap.
- Sprayer boom with **hydraulic boom actuation "I"**
 - the left hand boom can be then be folded in as necessary (only the folding in of the left hand side boom is possible).

Sprayer boom with **hydraulic boom actuation "II"**

- Fold in either side boom as where necessary.

To operate again with the booms folded symmetrically:

- Unfold both side booms.
- Open the block tap.
- -Unlock the boom swing compensation from the transport position (please refer to para. **Fehler! Verweisquelle konnte nicht gefunden werden.**).
- Set the boom height using the height adjustment.
- -Shut the block tap.

8.1.2.3 Locking and unlocking swing compensation in transport position

Locking the swing compensation into the transport position (Fig. 8.6)

- Lower the booms in the lowest position with the height adjustment, so that both square profiles (8.6/1) rest on the stop elements and latches (8.6/2) are locked.

 When the latches in the square profiles catch in a locking sound can be clearly heard.

- Shut the block tap.

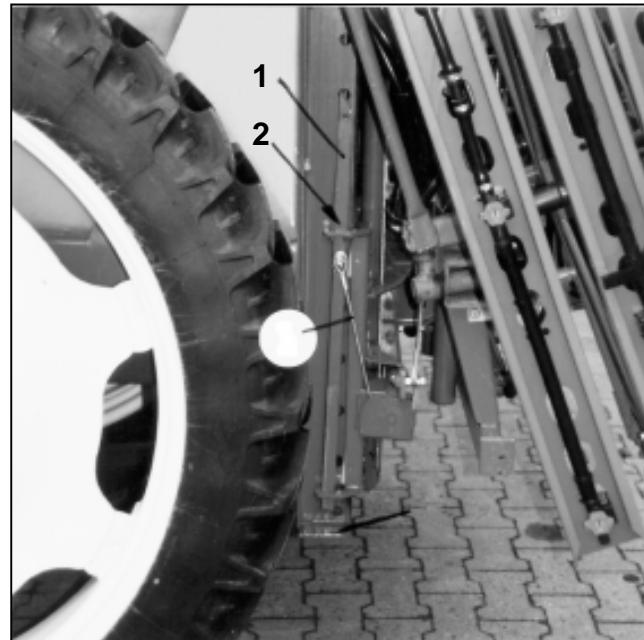


Fig. 8.6

Unlocking the swing compensation from the transport position (Fig. 8.7)

- Open the block tap.
- Lift the booms on the height adjustment right up to the upper most stop. The unlocking is done automatically as the square profiles are pushed against the stops which releases the latches.



Fig. 8.7

8.1.2.4 Locking the boom into transport position



For road transport always lower the booms into the lowest position (see para. Fehler! Verweisquelle konnte nicht gefunden werden.). This way automatic locking of both the swing compensation and the transport lock on the boom occurs (Fig. 8.8).



Fig. 8.8

8.1.2.5 Boom break back against obstacles

The plastic trips (8.9/2) allow the giving way of the outer boom sections up to 80° into or against the driving direction pivoting around the hinge point (8.9/3). After passing the obstacle the booms will automatically return to the operating position.

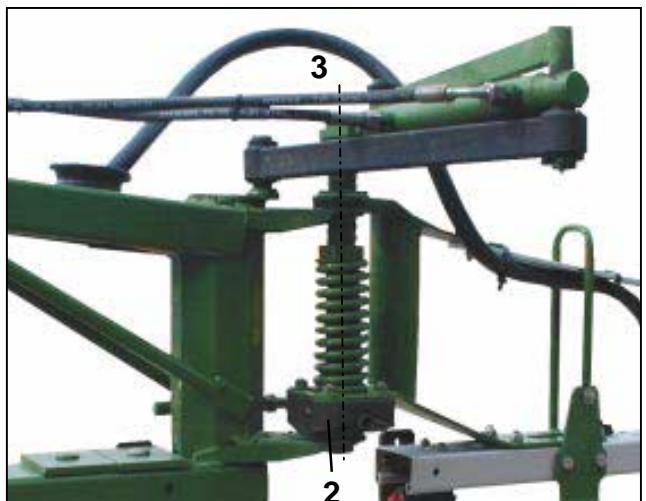


Fig. 8.9

8.1.2.6 Settings on the folded out sprayer boom

1. Alignment level to the ground

If the sprayer boom has been set correctly all nozzles should have the same distance parallel to the ground.

If this is not the case, align the sprayer boom with the aid of counter weights (8.10/1) with the swing compensation **unlocked**. Attach the counter weights properly on the sprayer boom.

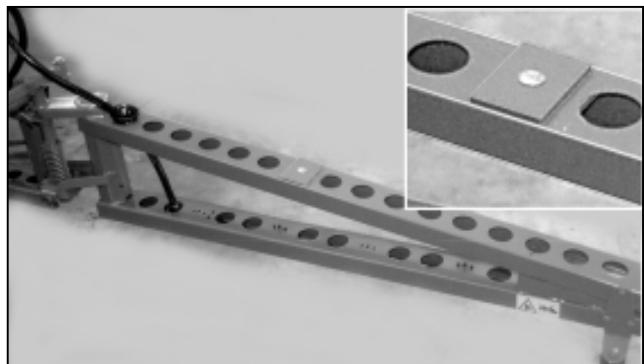


Fig. 8.10

2. Horizontal alignment

Seen in driving direction, all sprayer boom sections should be in alignment.

Readjustment might be necessary after:

- long periods of operation
- excessive contact of the boom with the ground

Inner boom section

- Slacken the counter nut of the setting bolt (8.11/6).
- Turn the setting bolt towards the stops until the inner boom section is in alignment with the centre boom section.
- Retighten the lock nut.

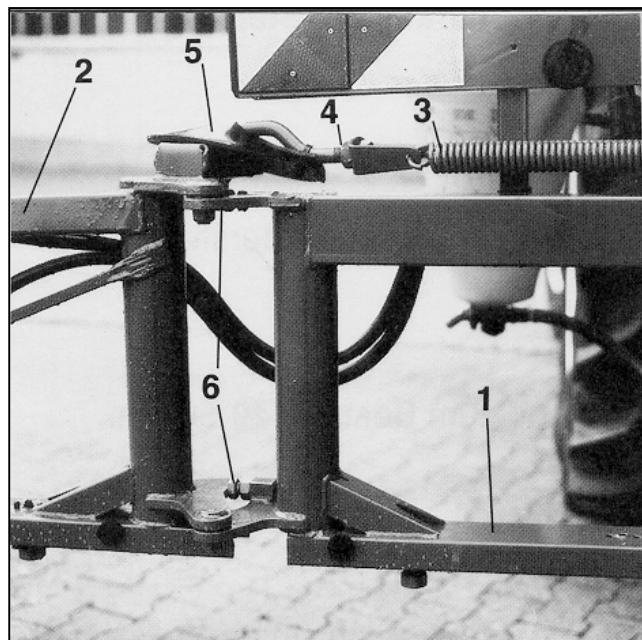


Fig. 8.11

Outer boom section

- Slacken the bolts (8.12/8) on the bracket (8.12/7). The alignment is achieved by adjusting the plastic claw (8.12/2) via the slotted holes of the bracket.
- Align the boom section.
- Align the boom section (8.12/8).

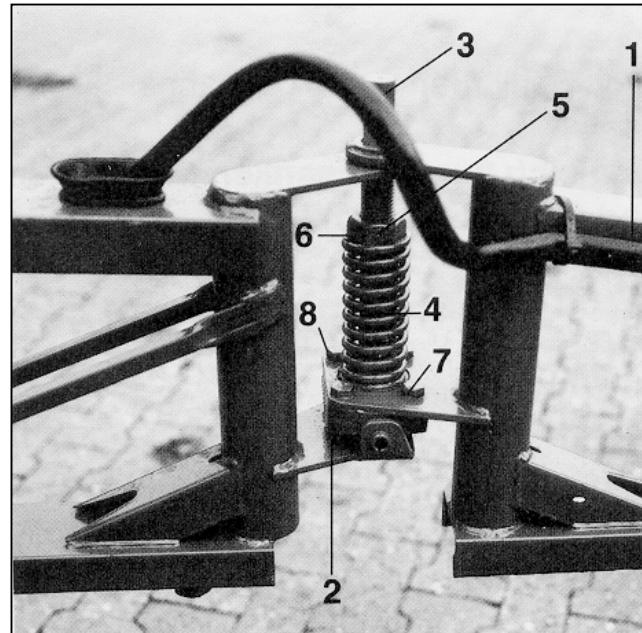


Fig. 8.12

8.1.3 Electric boom tilting (Special option Q-booms)

Version I A, Order No.: 914 378

Actuation via switch box SKS 501, SKS 701 (Fig. 8.13)

In unfavourable terrain conditions the alignment of the sprayer booms with the area to be treated can be corrected by the electric boom tilt kit and without influencing the swing compensation. This way, the sprayer boom can be steered parallel with the ground, e. g. in case of a one tractor wheel being in a deeper wheel mark.

When tilting the linear motor moves the swivel arm. This way the two springs are tensioned to differing amounts and this brings the boom into the desired position. The switch box (8.13/2) activates the linear motor when the setting knob is turned. (8.13/2).

Fig. 8.13/...

- 1 Switch box SKS 701.
- 2 Setting knob.
- 3 Scale arranged around the setting knob (2).
- 4 0-position.

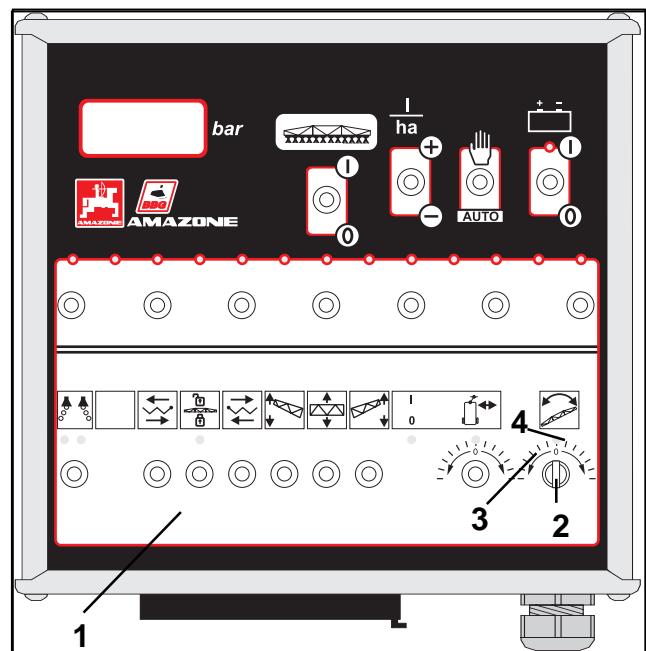


Fig. 8.13

8.1.3.1 Using boom tilt adjustment for alignment of the sprayer boom



Electric boom tilting can only be conducted with the nut (8.14/1) slackened on the swivel arm and when the swing compensation is unlocked.

- Turn the setting knob of the boom tilt adjustment with the boom fully folded out. The individual points on the scale represent a pre-determined boom tilt angle.

The horizontal position of the boom can be returned from any boom angle by turning the setting knob back to "0".

When the setting knob is in „0“ position the sprayer boom has to be aligned horizontally. If this is not the case, readjust the „0-position“ of the setting knob.



Before folding the sprayer boom always check that it is aligned parallel to the sprayer frame (tilt adjustment "0").

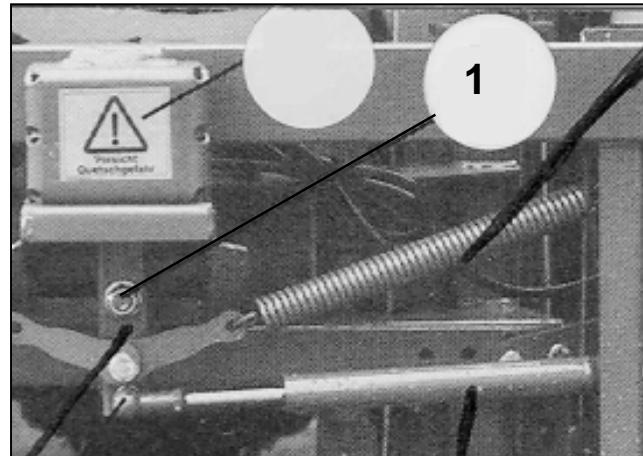


Fig. 8.14

Readjusting the "0-Position" of the switch box setting knob

- Align booms in horizontal position (please refer to para. **Fehler! Verweisquelle konnte nicht gefunden werden.**).
- Slacken the setting knob fixing screw.
- Align the pointer of setting knob exactly on scale figure "0" and retighten the setting knob fixing screw in this position.



Only move the pointer by max. ± 1 point. If more than ± 1 point is necessary to align the boom then the alignment needs to be executed in a professional workshop.

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

Fig. 8.15/...

- 1 - Boom frame.
- 2 - Single acting hydraulic height adjustment ram allow the setting of the spraying height of the boom (3).
- 3 - Boom centre.
- 4 - Lock/unlock on the swing compensation; maintenance free, takes care of a steady boom ride.
- 5 - Lock/unlock on the swing compensation.
- 6 - Swivel arm.
- 7 - Tensioning springs for parallel boom alignment.
- 8 - Shock absorber.
- 9 - Automatic transport locking. Automatically locks the folded boom when lowered in to the transport position.



Fig. 8.15

Fig. 8.16/...

- 1 - Hydraulic hose with block tap for the hydraulic height adjustment. The hydraulic height adjustment may be locked in any position via the block tap.
- 2 - Hydraulic hoses for boom folding in and out.

Required on tractor:

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



Shut the block tap on the height adjustment before uncoupling the plug from the tractor hydraulic socket.

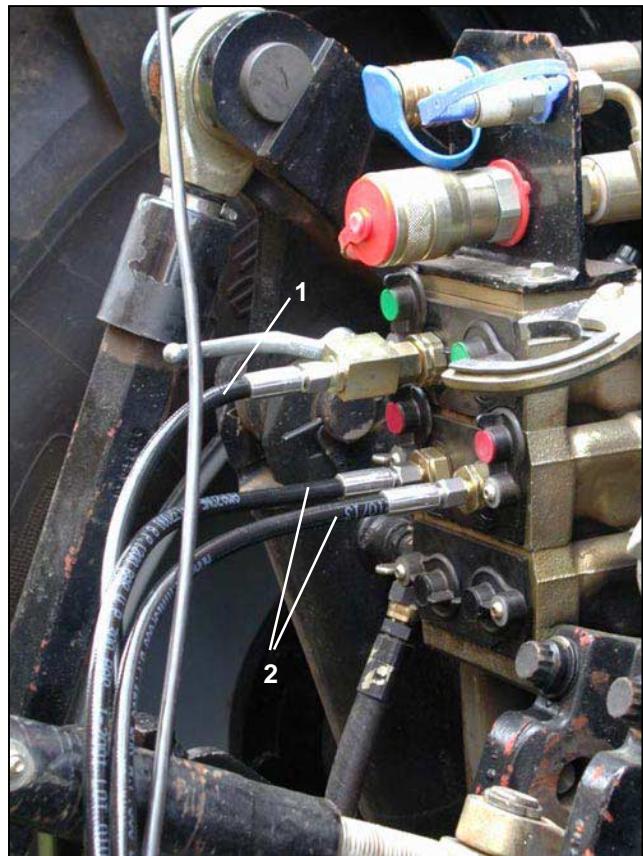


Fig. 8.16

8.1.4.1 Folding the Q-plus boom (up to 15 m) in or out



Before operating the booms in or out all persons should leave the folding area of the boom.



Avoid any crushing and bruising points at all the hydraulically actuated folding sections.



Never fold the boom in or out while moving.



All operational speeds of the hydraulic functions may be set via the hydraulic throttle valves.



The hydraulic rams maintain the boom either folded out in to the work position or folded in to the transport position.



Never put the double acting control valve on the tractor that actuates the boom folding into the position for the pressure free return flow.

Folding out

The folded boom pack is in its locked transport position.

- Open the block tap.
- Lift the folded boom pack via the height adjustment until the automatic transport latches are released (height position about 2/3 of the boom frame length).
- Hold the control lever of the dual acting control valve in position "folding out" until the individual segments have been folded out entirely and the swing compensation has been unlocked.



The swing compensation is unlocked when the green section on the unlock/lock tube can be seen.



The hydraulic rams lock the boom in the operational position.

- Setting the sprayer boom height can then be done via the height adjustment ram.
- Shut off the block tap. Now the height adjustment is locked and the set sprayer boom height can be accurately maintained.

Folding in

- Open the block tap.
- Lift boom into a middle height position via the height adjustment ram.
- Set boom tilt adjustment back to pos. "0" (if available).
- Hold the control lever of the double acting control valve in the position "fold in" until all the boom sections of the two booms are fully folded.



Before folding the booms automatically lock the swing compensation. It is locked when only approx. 1/3 of the red section on the unlock/lock tube can be seen.

- Lock the boom into the transport position by fully lowering it down onto the transport latches.



Always travel with the booms in locked transport position.

- Shut the block tap.

8.1.4.2 Unlocking and locking the sprayer boom from transport position

Unlocking

Lift the folded boom pack via height adjustment until the transport latches (8.17) release the boom pack (height position approx. 2/3 of the boom carrier frame).

Locking

Lower the boom via the height adjustment until approx. 30 cm (measured from the lower edge of the boom carrier frame), until the automatic transport latches (8.15/1) lock the boom pack.



Always travel with the booms locked in the transport position.



Fig. 8.17

8.1.4.3 Unlocking and locking the swing compensation

Unlock the swing compensation (8.19/1) from the transport position



An even lateral distribution will only be achieved with an unlocked swing compensation.

- After the boom has been folded out entirely hold the lever of the double acting control device for another 5 seconds in position "Fold out".



The swing compensation (8.19/1 is unlocked when the green section of the unlock/lock tube (8.19/2) can be seen.



Unlock the swing compensation (8.20/1) from the transport position



The swing compensation is automatically locked before folding in the booms. When approx. 1/3 of the red section of the unlock/lock tube (8.20/2) can only be seen the swing compensation is locked.

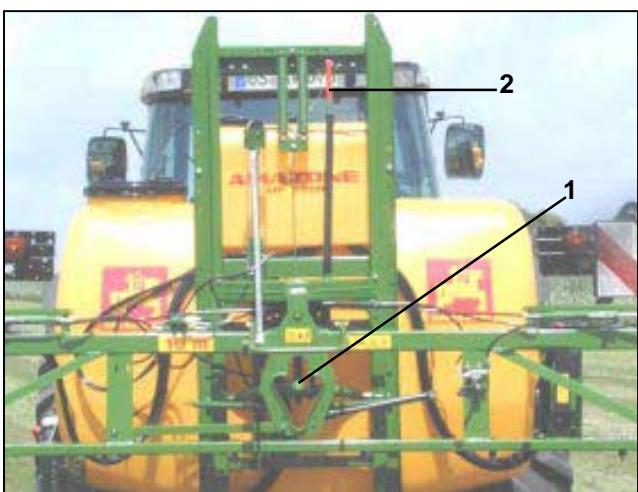


Fig. 8.19

8.1.4.4 Operation with one-sided folded out booms

For giving way to obstacles or for one side spraying the Q-plus boom can be folded either on the right or left hand side.

Folding the left hand boom side:

- Keep the actuating lever of the double acting control device in position "folding out" until the individual segments of both boom sides are entirely folded out.
- Entirely fold in the left hand boom side.
- To do this, keep the actuating lever of the double acting control device in position "folding in" until the individual segments of the left hand boom side are entirely folded in.

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

Folding in the right hand boom side:

- Keep the actuating lever of the double acting control device in position "folding out" until the individual segments of both boom sides are entirely folded out
- With the aid of the single acting spool valve lift the boom until its final stop.
- Fold in the boom (now first of all the right hand boom side is folded in automatically). Keep the control device in position "folding in" until the right hand boom side is entirely folded in.
- Lower the boom into the position for spraying operation.
- For folding out the right hand boom side again, lift the boom until the transport safety device is unlocked automatically. (Height approx. 2/3 of the boom carrier length).

 When folding in the booms completely start with the left hand boom side, seen in driving direction. Prior to this unfold the right hand boom side in case it has been folded in before.

8.1.4.5 Boom safety release at obstacles

The plastic trips (8.21/1) allow the giving way of the outer boom sections into or against the driving direction pivoting around the hinge point (8.21/2) and after clearing any obstacle the booms will automatically return to the operating position.



Fig. 8.20

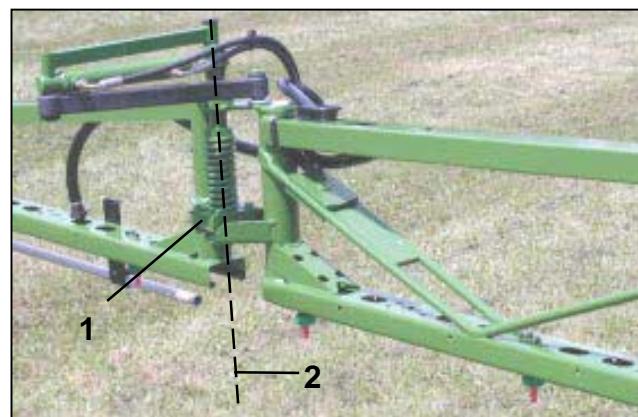


Fig. 8.21

8.1.4.6 Setting the hydraulic throttle valves

The individual speeds for the individual hydraulic functions are factory set (boom folding in and out, swing compensation locking and unlocking) on the individual hydraulic throttle valves. However, depending on the tractor, it might be necessary to adjust this speed setting. By screwing in or out the Allen key headed set screw on each throttle valve the speed for actuating the hydraulic function allocated to the relevant throttle valves can be altered.

- To slow down the folding speed, screw in the Allen key headed set screw.
- To speed up the folding speed, screw out the Allen key headed set screw.



The boom folding speed is adjusted by equally screwing in or out all 3 hydraulic throttle valves (8.22/1, 8.22/3 and 8.22/4).

Fig. 8.22/...

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



Fig. 8.22

8.1.4.7 Settings on the folded out boom

1. Alignment parallel with the ground level

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

If this is not the case, fold out the boom, **unlock** the swing compensation and align the boom via the counter weights (8.23/1). Fix the counter-weights where appropriate to the sprayer boom.

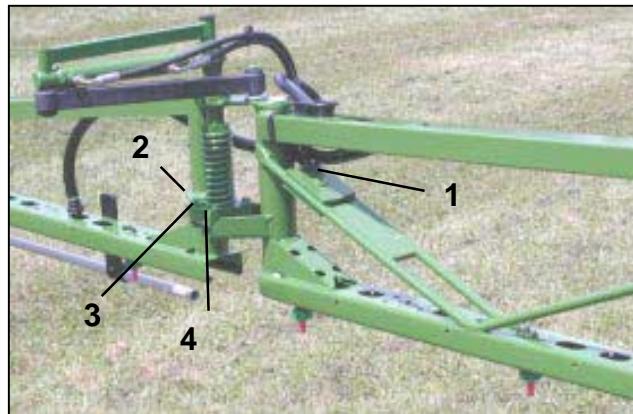


Fig. 8.23

2. Horizontal alignment

All boom sections should be in alignment seen in driving direction.

A readjustment might become necessary

- after a long operational period.
- if the booms urgently hit the ground.

Inner boom

- Slacken the counter nut of the setting bolt (8.24/1).
- Turn the setting bolt towards the stops until the inner boom section is in alignment with the centre boom section.
- Retighten the lock nut.



Fig. 8.24

Outer boom section

- Slacken the bolts (8.23/2) of the fixing bracket (8.23/3). The alignment is achieved by adjusting the plastic claw (8.23/4) via the slotted holes of the bracket.
- Align the boom section.
- Retighten the bolts (8.23/2).

8.1.4.8 Electric boom tilting (Special option)

Actuation from the switch box SKS 501 – 901 (Fig. 8.13-13)

In unfavourable terrain conditions the alignment of the sprayer booms with the area to be treated can be corrected by the electric boom tilt kit and without influencing the swing compensation. This way, the sprayer boom can be steered parallel with the ground, e. g. in case of a one tractor wheel being in a deeper wheel mark.

When tilting the linear motor (8.25/1) moves the swivel arm (8.25/2). By moving the swivel arm the two springs (8.25/3) are tensioned to differing amounts and this brings the boom into the desired position. The switch box activates the linear motor when the setting knob (8.26/2) on the switch box (8.26/1) is turned.

Fig. 8.25/...

- 1 - Linear motor.
- 2 - Swivel arm.
- 3 - Springs.

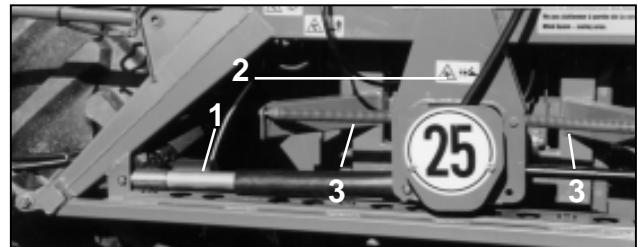


Fig. 8.25

Fig. 85/...

- 1 - Switch box SKS 701.
- 2 - Setting knob.
- 3 - Scale arranged around the setting knob (2)
- 4 - 0-position.

Using boom tilt adjustment for alignment of the sprayer boom

- Turn the setting knob (8.26/2) of the boom tilt adjustment with the boom fully folded out. The individual points on the scale represent a pre-determined boom tilt angle.

The horizontal position of the boom can be returned from any boom angle by turning the setting knob back to "0".

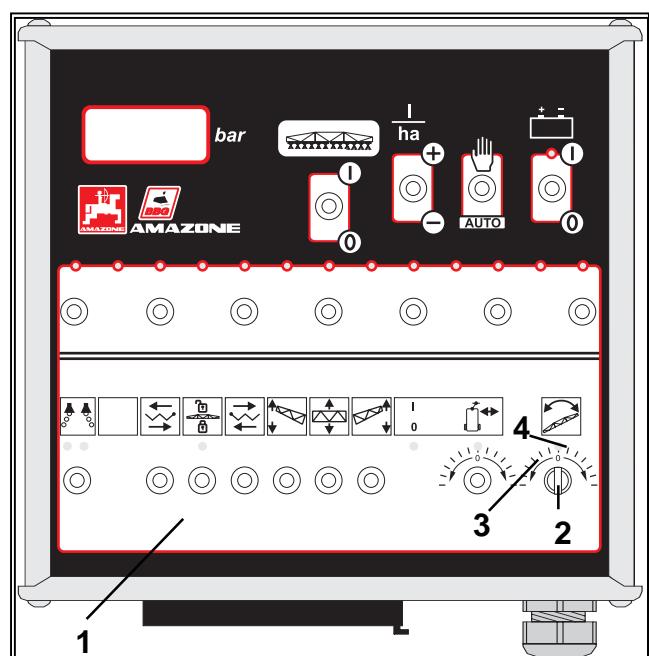


Fig. 8.26

8.1.5 Q-plus-boom with Profi-folding (Special option)

The profi-folding offers the following functions:

- Folding in / folding out,
- One-sided boom folding,
- Hydraulic height adjustment,
- Hydraulic boom tilting.
- Locking of the swing compensation.

All hydraulic functions are controlled by solenoid valves via the switch box (SKS) from tractor cab. The switch box should be fitted to the tractor.

Required on tractor:

- 1 single acting control valve for connecting to the pressure hose (8.27/1).
- 1 pressure-free return flow for connecting to the return flow hose (8.27/2).



During road transport switch off the oil supply to the valve block.

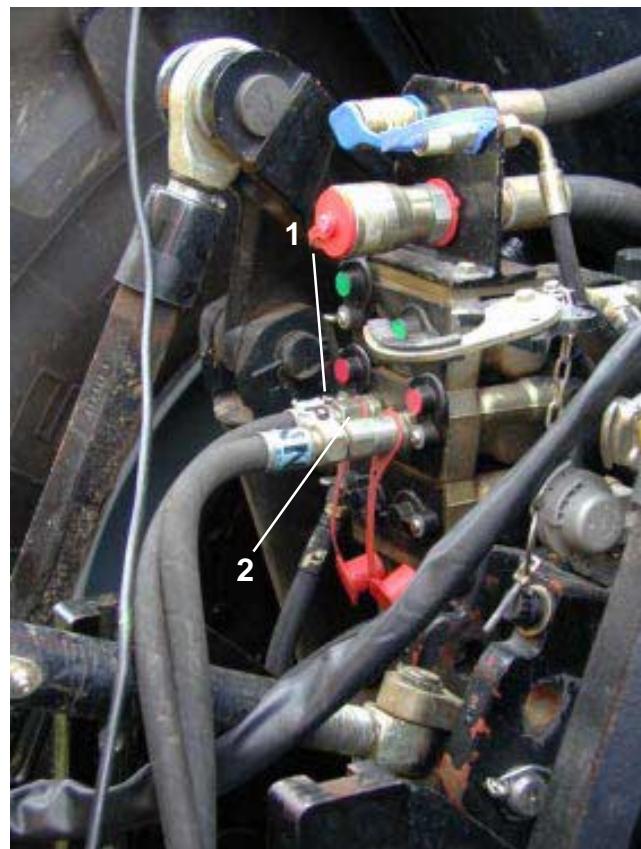


Fig. 8.27

8.1.5.1 Setting the system setting screw on the hydraulic valve block

The setting of the system setting screw (8.28 /1) on the hydraulic block (8.28/2) depends on the tractor's hydraulic system. After determining the type of hydraulic system the **system shifting bolt**

- 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.

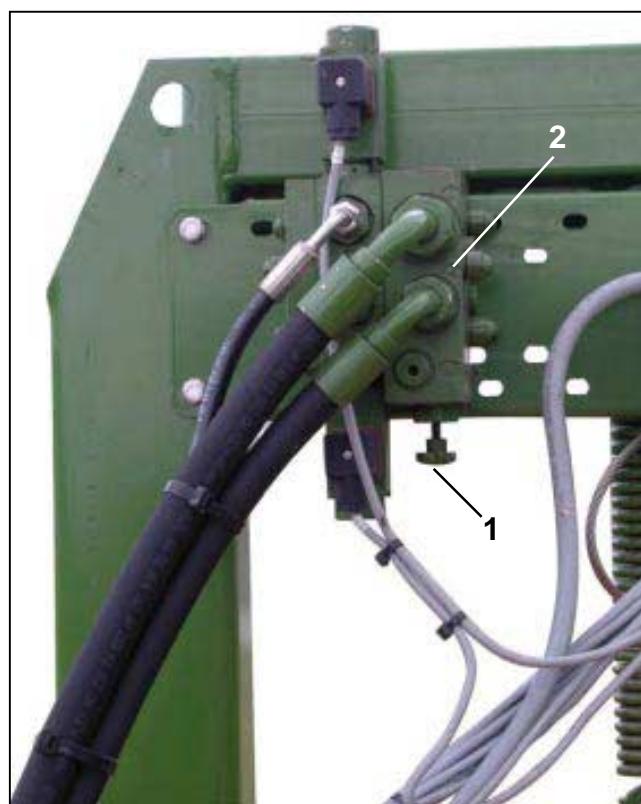


Fig. 8.28

8.1.5.2 Folding the boom in or out



Before folding the booms in or out all persons should leave the folding area of the boom.



As a matter of principle lock the swing compensation in transport position before starting any boom folding operation.



Avoid any crushing and bruising points at all the hydraulically actuated folding sections.



Never fold the boom in or out while moving.



All operational speeds of the hydraulic functions can be set via the hydraulic throttle valves.



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

Folding out



When folding out always first unfold the right hand and then the left hand boom.

Ensure that the swing compensation is locked in transport position.

Unlock the folded boom pack from transport position.

- Lift boom to a middle height by pressing switch (8.29/1) of the hydraulic height adjustment.
- **Folding out the right hand boom.**
 - Keep the switch (8.29/2) in position "fold out" until the individual segments of the right hand boom have been folded down completely. The relevant hydraulic rams lock the boom in working position.
- **Folding out the left hand boom.**
 - Hierzu den Taster (8.29/3) in position "fold out" until the individual segments of the left hand boom have been unfolded completely. The relevant hydraulic rams lock the boom into the operational position.
- **Via the switch (8.29/4) unlock the swing compensation from transport position.**
- Set the spraying height of the boom via the switch (8.29/1) for the hydr. height adjustment.

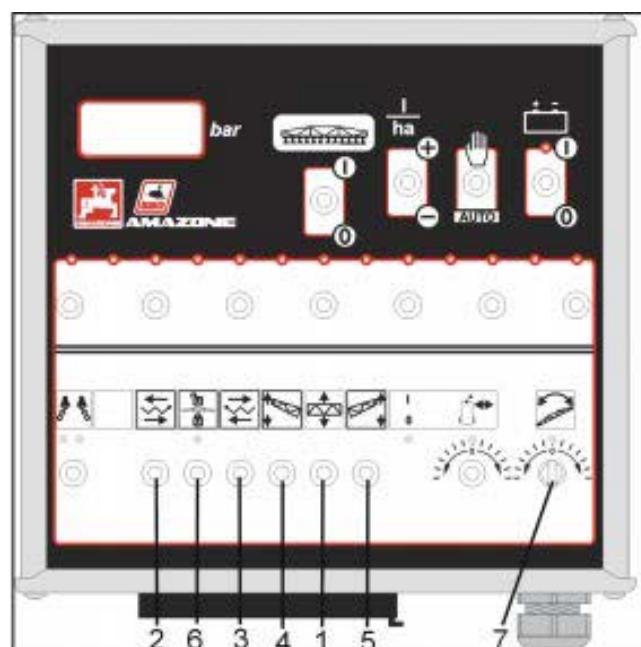


Fig. 8.29

Folding in



When folding in always first fold in the left hand and then the right hand boom.

- Lift boom to a middle height by pressing key (8.29/1).
- Boom tilting in position "0".



Before folding in align booms into a parallel position with the sprayer frame.

- **By pressing switch (8.29/9) lock the swing compensation in transport position.**
- Fold in the **left hand** boom.
 - Keep the switch (8.29/2) in position "folding in" until the individual sections of the left hand boom have been completely folded in.
- Fold in the **right hand** boom.
 - Keep the switch (8.29/3) in position "folding in" until the individual segments of the right hand boom have been folded in completely.
- Use the key (Fig. 8.29/1) to lock the folded boom pack in transport position via the automatic transport locking device.



Never fold the boom in or out while moving.

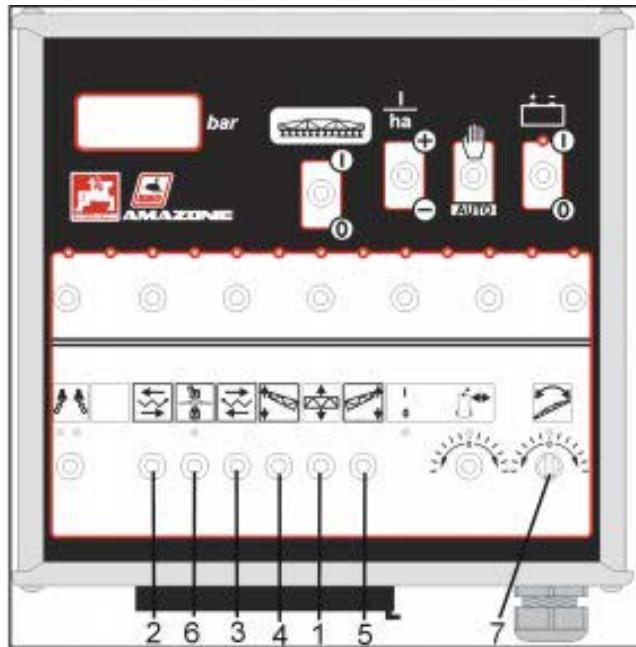


Fig. 8.29

8.1.5.3 Locking and unlocking sprayer boom into the transport position

Unlocking

Das Gestänge-Paket über die Höhenverstellung - Taster (8.29/1) - anheben, bis die automatische Transport-Verriegelung (8.30/1) das Gestänge-Paket freigibt (Höhenlage etwa 2/3 der Gestängeträgerlänge).

Locking

Lower the boom completely via the height adjustment switch (8.29/1) until approx. 30 cm (measured from the lower edge of the boom carrier) until the automatic transport locking device (8.31/1) locks the boom pack.



Only move with locked boom pack.

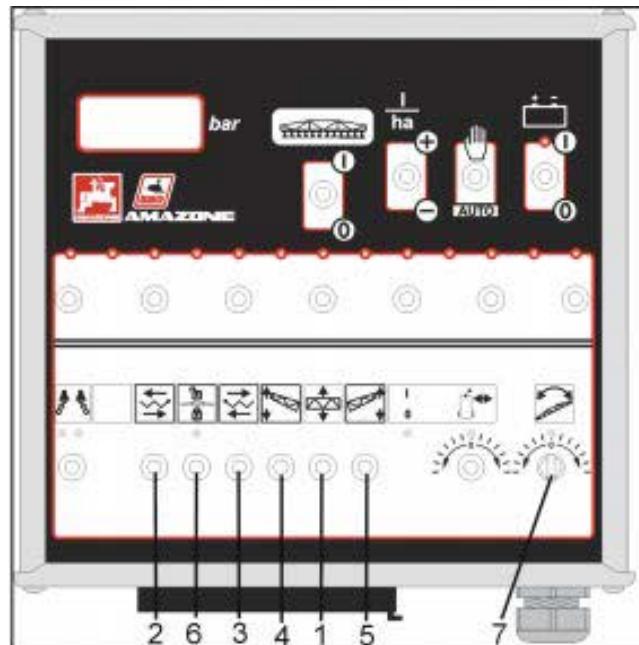


Fig. 8.29



Fig. 8.30



Fig. 8.31

8.1.5.4 Unlocking and locking the swing compensation



As a matter of principle lock the swing compensation.

- before folding out and in the booms.
- before the one-sided folding out and in of the booms to prevent the boom from leaning over one way.



An even lateral distribution will only be achieved with the swing compensation unlocked.

Unlock and lock the swing compensation from the transport position via the switch (8.29/1).

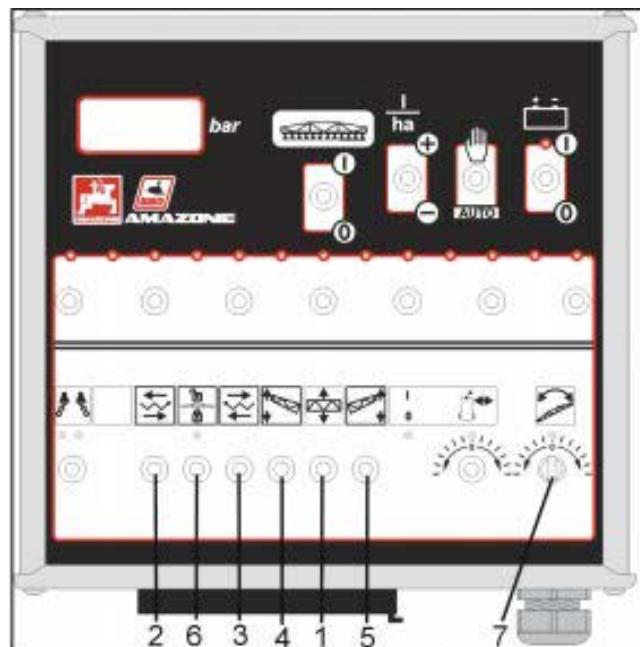


Fig. 8.29

To unlock the swing compensation briefly push the switch (8.29/1) upwards. The swing compensation is **unlocked** when the green section (8.32/1) der Ent- und Verriegelungsanzeige (8.32/2) of the unlocking and locking indicator can be seen. **Fig. 8.32 illustrates the swing compensation when unlocked.**

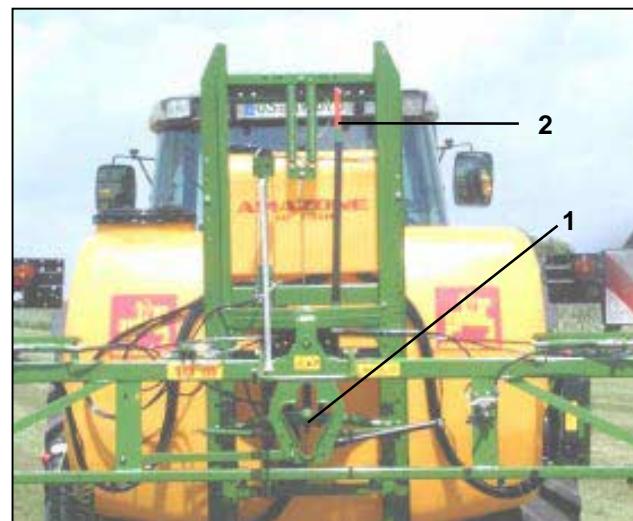


Fig. 8.32

For locking the swing compensation briefly push the switch (8.30/1) downwards. The swing compensation is **locked** when only 1/3 of the red section (8.33/1) of the unlocking and locking indicator (8.33/2) can be seen. **Fig. 8.33 illustrates the swing compensation when locked.**



Fig. 8.33

8.1.5.5 Operation with asymmetrically folded out booms



Only operate with the swing compensation locked. Lock the swing compensation before folding one side in or out so that the boom will not lean over one way.



Avoid an unstable oscillation and any ground contact with the boom while the swing compensation is locked, because in this case an even lateral spray distribution is no longer ensured.

For this

- Set the spraying height above ground to at least 1 m,
- Reduce the forward speed and
- Align the boom via the tilt adjustment parallel to the ground again.

The boom is in symmetrically folded out position.

- Actuate switch (8.29/6) to lock the swing compensation.
- Actuate switch (8.29/1) and set the spraying height of the boom via the height adjustment.
- Actuate switches (8.29/2 or 8.29/3) and fold in the right hand or left hand boom as desired.
- Switch off the part sections of the folded in boom segments via the relevant part section switches (8.29/8)

Operation with symmetrically folded out boom:

- Fold out boom again.
- Actuate switch (8.29/6) to unlock the swing compensation.
- Actuate switch (8.29/1) and set the spraying height of the boom via the height adjustment.

8.1.5.6 Setting the hydraulic throttle valves

The speed of the individual hydraulic functions (lifting and lowering of the folded boom sections, fold in and out of the booms, lock and unlock of the swing compensation etc.) via the relevant hydraulic throttle valves on the valve block (Fig. 8.34) **is factory set.** However, depending on the tractor, it may be necessary to adjust this setting.

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

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



For re-setting the actuation speed of the hydraulic function, always re-adjust both throttles of the throttle pair equally.

Fig. 8.34/...

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

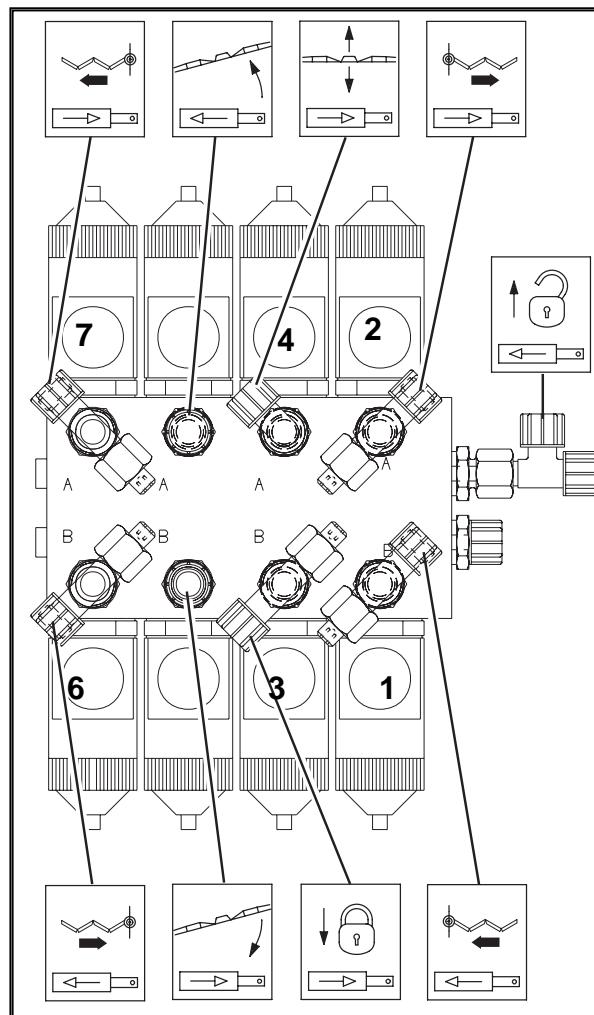


Fig. 8.34

8.1.5.7 Electro-hydraulic boom tilting

Über die Elektro-Hydraulische Neigungsverstellung ist die Lage des Spritzgestänges gegenüber der zu behandelnden Zielfläche bei ungünstigen Gelände-Verhältnissen korrigierbar - ohne Beeinträchtigung des Schwingungsausgleiches. Hierdurch lässt sich das Spritzgestänge immer parallel zum Erdboden führen, z.B. auch bei unterschiedlich tiefen Spurrillen bzw. einseitigem Fahren in einer Furche.

For setting the boom tilting the swivel arm (8.35/2) is moved via the hydraulic ram (8.35/1). By moving the swivel arm a differing tensioning of the two springs (8.35/3) is controlled and the boom is then brought into the correct position. The hydraulic ram is actuated via the switch box (8.35/1) by pressing the switch (8.35/2).

Fig. 8.36/...

- 1 - Switch box SKS 701.
- 2 - Setting knob for boom tilting device.
- 3 - Scale; arranged around the setting knob (2).
- 4 - 0-Position – boom parallel to sprayer frame.

Alignment of sprayer boom via boom tilting

- Turn setting knob (8.36/2) for tilting the unfolded boom.

The height at the boom ends varies by approx. 10 - 15 cm per diode spacing. If the hydraulic ram is extended further than to its stop position, the outer left hand or right hand diode still lights up.

The central diode (8.36/4) represents the "0"-Position" of the boom. When the boom is set parallel to the sprayer frame and another than the central diode lightens, a readjustment of the "0-position" becomes necessary.

Readjustment of "0-Position"

- Den **Schwingungsausgleich verriegeln** und beide Gestänge-Ausleger komplett ausfalten.
- Align booms parallel to the sprayer frame by pressing switch (8.36/2).
- Slacken the bolts (8.35/4) and turn the potentiometer (8.35/5) in the slotted holes on the swivel arm in the appropriate manner.

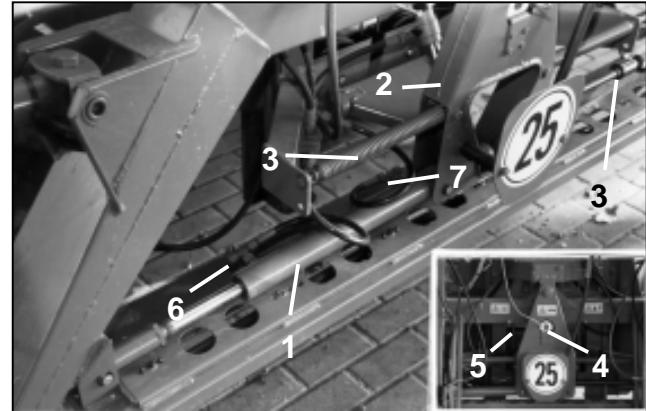


Fig. 8.35

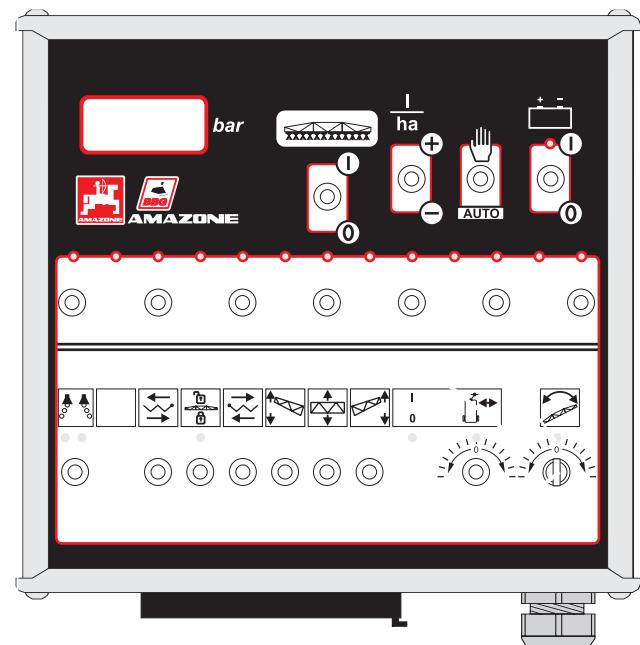


Fig. 8.36

- Retighten bolts (8.35/4) Retighten bolt r (8.35/5) in the new position.

If the setting space of the slotted holes is not sufficient to readjust the "0" position, ask for boom alignment in a authorised workshop.

8.2 Super-S-Boom 15 to 28 m working width

Fig. 8.37/...

- 1 - Boom frame.
- 2 - Transport latch for locking boom sections in transport position.
- 3 - Locating sockets.
- 4 - Single acting hydraulic height adjustment rams allow the setting the spraying height of the boom.
- 5 - Lock/unlock on the swing compensation; maintenance free, takes care of a steady boom ride.
- 6 - Lock/unlock indicator for the swing compensation (only for "NG"-control unit).
- 7 - Self-levelling tensioning springs for parallel boom alignment.

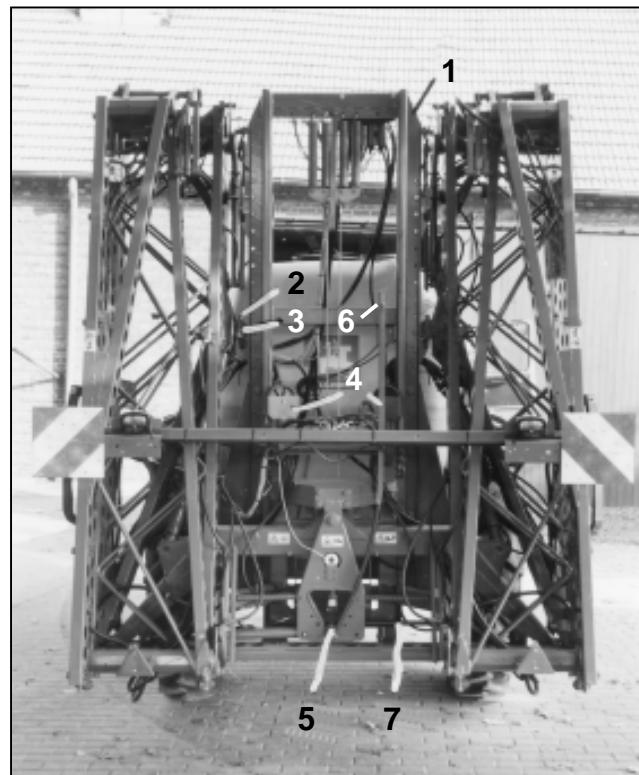


Fig. 8.37

Boom safety release at obstacles

The plastic trips (8.38/1) allow the giving way of the outer boom sections into or against the driving direction pivoting around the hinge point (8.38/2) and after clearing any obstacle the booms will automatically return to the operating position.

8.2.1 Super S-Boom, fully hydraulically foldable (without Profi-Folding)

Required on tractor:

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



Shut the block tap on the height adjustment before uncoupling the plug from the tractor hydraulic socket.

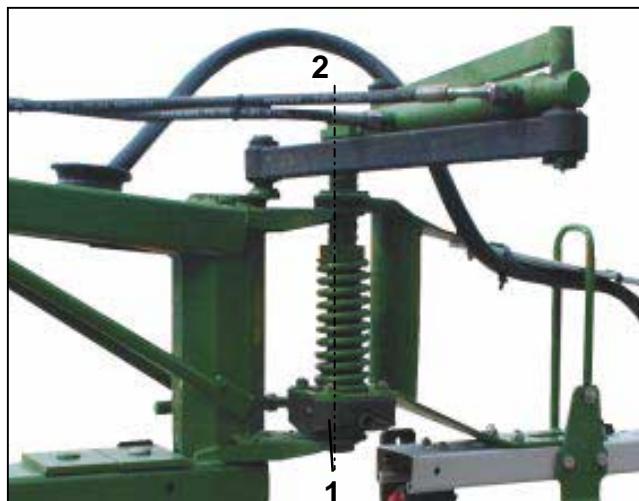


Fig. 8.38

8.2.1.1 Folding the boom in or out



Before operating the booms in or out all persons should leave the folding area of the boom.



Avoid any crushing and bruising points at all the hydraulically actuated folding sections.



Never fold the boom in or out while moving.



The hydraulic rams maintain the boom either folded out in to the work position or folded in to the transport position.



Never put the double acting control valve on the tractor that actuates the boom folding into the position for the pressure free return flow.

Folding out

- Open the block tap.
- Lift the booms to unlock from the transport position.
- Hold the control lever of the dual acting control valve in position "folding out" until
 - both boom packs are folded out
 - the individual segments have been folded out entirely
 - the swing compensation has been unlocked.



The corresponding hydraulic rams lock the boom in operation position.



The booms do not always fold down symmetrically.

- Setting the sprayer boom height can then be done via the height adjustment ram.
- Shut off the block tap. Now the height adjustment is locked and the set sprayer boom height can be accurately maintained.

Folding in

- Open the block tap.
- Lift boom into a middle height position via the height adjustment ram.
- Set boom tilt adjustment back to Pos. "0" (if available).
- Hold the control lever of the double acting control valve in the position "fold in" until all the boom sections of the two booms are fully folded in and the two boom section packs are raised vertically.
- Lock the boom into the transport position by fully lowering it down onto the transport latches.

Always travel with the booms in locked transport position.

- Shut the block tap.

8.2.1.2 Unlocking and locking the sprayer boom from transport position

Unlocking

Lift the sprayer boom via height adjustment until the transport latches (8.39/1) are released from the pockets (8.39/2).

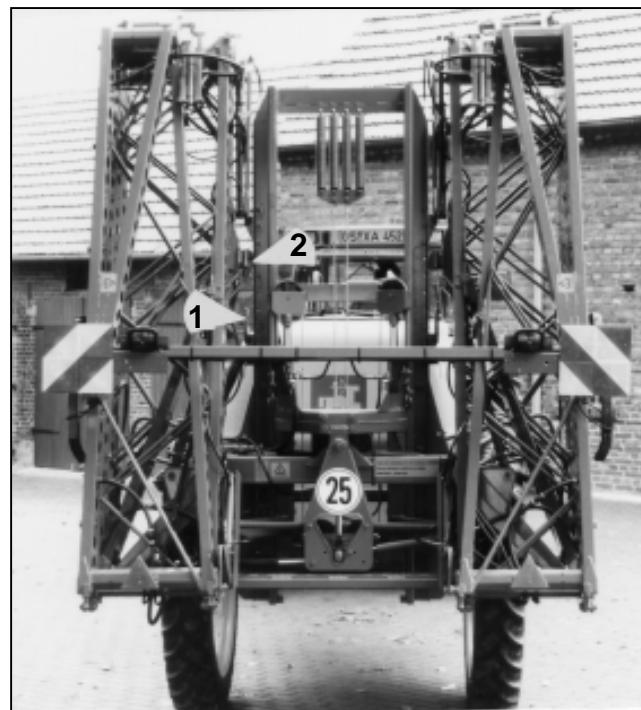


Fig. 8.39

Locking

Fully lower the sprayer boom via the height adjustment until the transport latches (8.40/1) pick up the pockets (8.40/2).



If on a sprayer equipped with boom tilt option, the transport latches do not pick up on the sockets, align the booms via the boom tilt control box accordingly.



Always travel with the booms locked in the transport position.

8.2.1.3 Unlocking and locking the swing compensation

For **unlocking** the swing compensation hold the lever of the double acting control device for another 5 seconds in position "Fold out" after the boom has been completely unfolded.

When operating with the "NG" control unit the swing compensation (8.41/1) is unlocked when the **green** section of the locking/unlocking indicator (8.40/3) can be seen. When the "TG" control unit is used the swing compensation is unlocked when the light emitting diode in the switch box goes out.

The swing compensation is automatically **locked** before folding in the booms. The swing compensation (8.41/2) is locked when – if the "NG" control unit is used – when only 1/3 of the **red** section of the locking/unlocking indicator (8.40/3) can be seen or – if the "TG"-control unit is used, the light emitting diode in the switch box lights up.

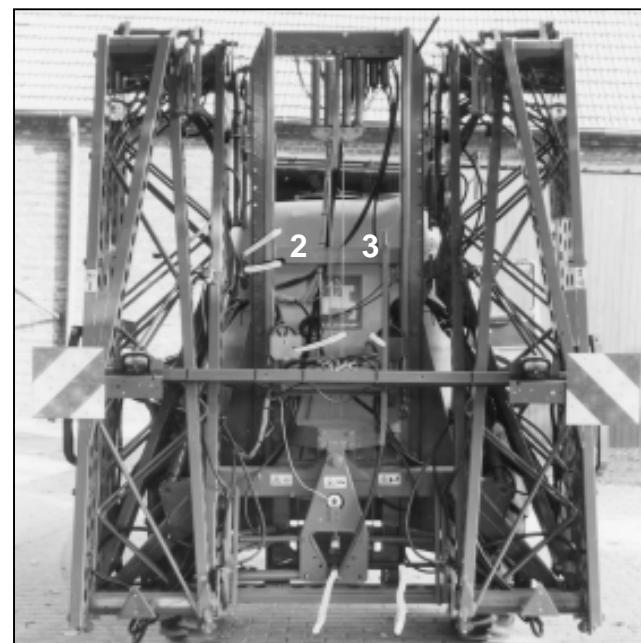


Fig. 8.40

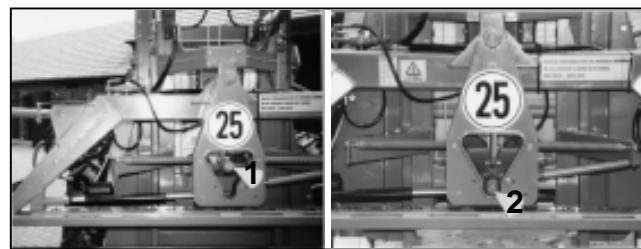


Fig. 8.41

8.2.1.4 Operation with reduced working width



For a symmetrical working width reduction of the sprayer booms the special optional equipment "Super S boom width reduction kit" is required. On every ram used for folding out the booms, 2 ball taps (8.42/1 or 8.43/1) must be actuated.

- Before folding out the booms, shut the ball taps (8.42/1) on the outer joints, e. g. for reducing the working width from 24 m to 18 m, or the ball taps (8.43/1) on the inner boom section joint for reducing the working width to 12 m.

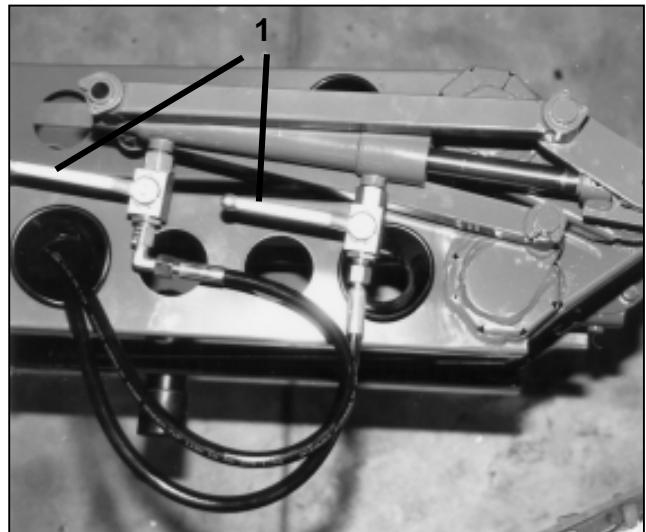


Fig. 8.42

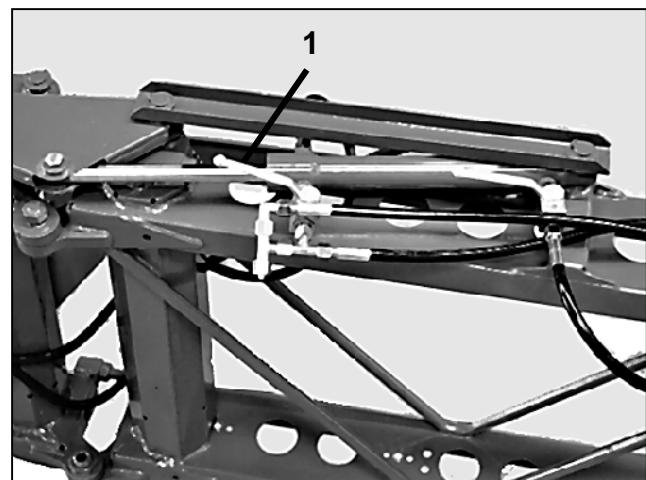


Fig. 8.43

8.2.1.5 Lifting and lowering speed of the height adjustment

This is factory set. However, depending on the tractor, it might be necessary to adjust this setting. The boom folding speed is adjusted on the throttle valve (8.44/1), by equally screwing in or out the corresponding Allen key headed set screw as follow:

- To reduce the lifting and lowering speed, screw in the Allen key headed set screw
- To increase the lifting and lowering speed, screw out the Allen key headed set screw.

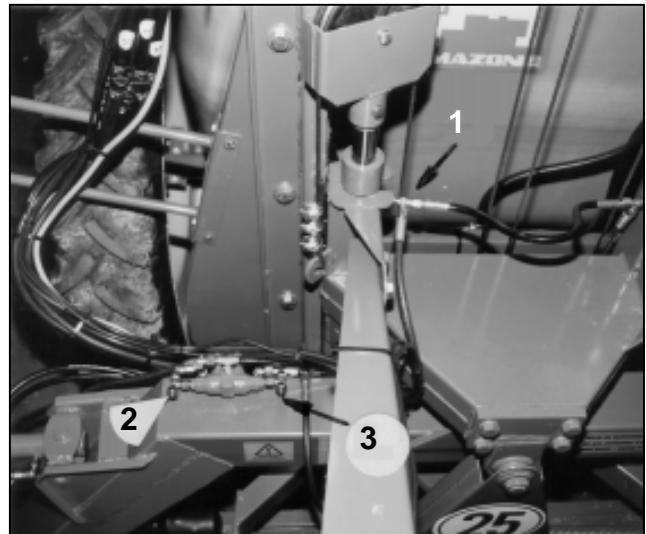


Fig. 8.44

8.2.1.6 Boom folding speed

These speeds are factory set. However, depending on the tractor type it might be necessary to adjust these settings. The boom folding speed of the folded in boom packs can be set on the throttle valves (8.45/2, 8.45/3, 8.46/1 and 8.46/2) by equally screwing in or out the corresponding Allen key headed set screw as follows:

- To reduce the folding speed = screw in the Allen key headed set screw.
- To increase the folding speed = screw out the Allen key headed set screw.

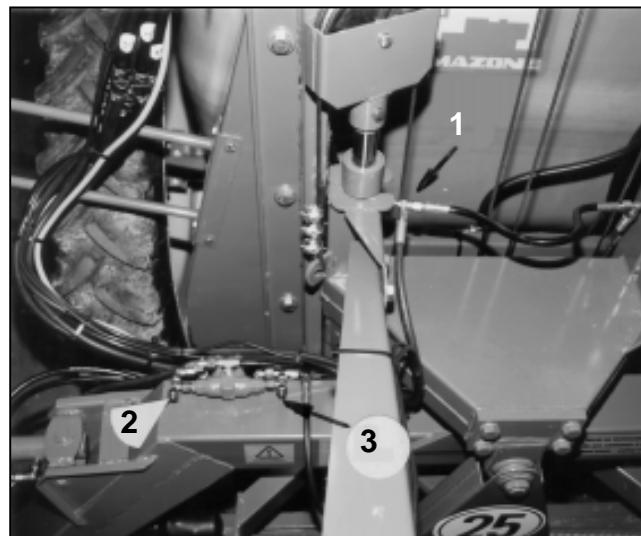


Fig. 8.44

1. Folding speed of the boom section packs

The speed for **folding the booms in and out** may be set by the **throttle valves** (8.45/2 and 8.45/3)



If necessary adjust both throttle valves.



Fig. 8.46

2. Horizontal folding speed of the boom section packs

The **folding speed** of the **left hand boom section pack** may be changed by the **throttle valves** (8.46/1 and 8.46/2)



If necessary adjust both throttle valves.

Setting the right hand boom section pack should be conducted as above.

8.2.1.7 Alignment of the folded out boom parallel with the ground level

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

If this is not the case, fold out the boom, **unlock** the swing compensation and align the boom via the counter weights (8.47/1). Fix the counterweights where appropriate to the sprayer boom.

8.2.1.8 Electric boom tilting - special option

Operated directly from switch box SKS (Fig. 8.49).

In unfavourable terrain conditions the alignment of the sprayer booms with the area to be treated can be corrected by the electric boom tilt kit and without influencing the swing compensation. This way, the sprayer boom can be steered parallel with the ground, e. g. in case of a one tractor wheel being in a deeper wheel mark.

Fig. 8.48/...

- 1 - Linear motor.
- 2 - Swivel arm.
- 3 - Self levelling springs.

When tilting the linear motor (8.48/1) moves the swivel arm (8.48/2). By moving the swivel arm the two self-levelling springs (8.48/3) are tensioned to differing amounts and this brings the boom into the desired position. The switch box (8.49/1) activates the linear motor when the setting knob (8.49/2) is turned.

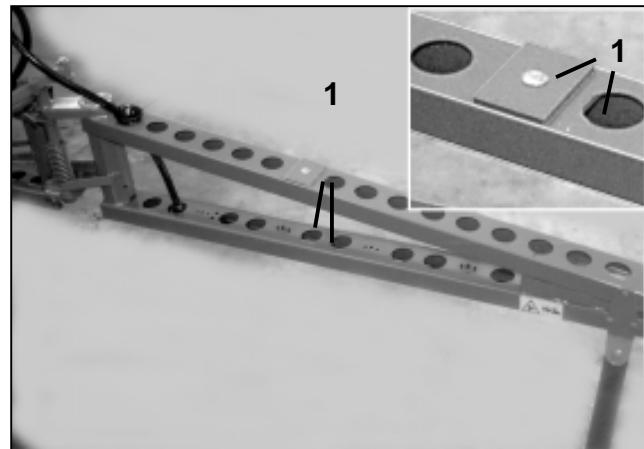


Fig. 8.47

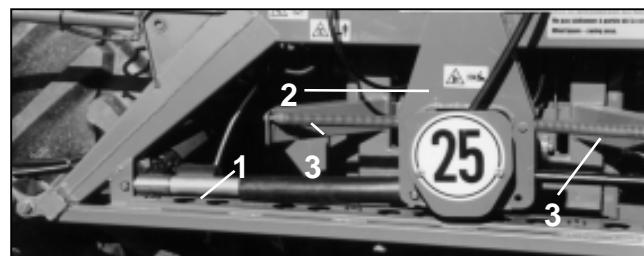


Fig. 8.48

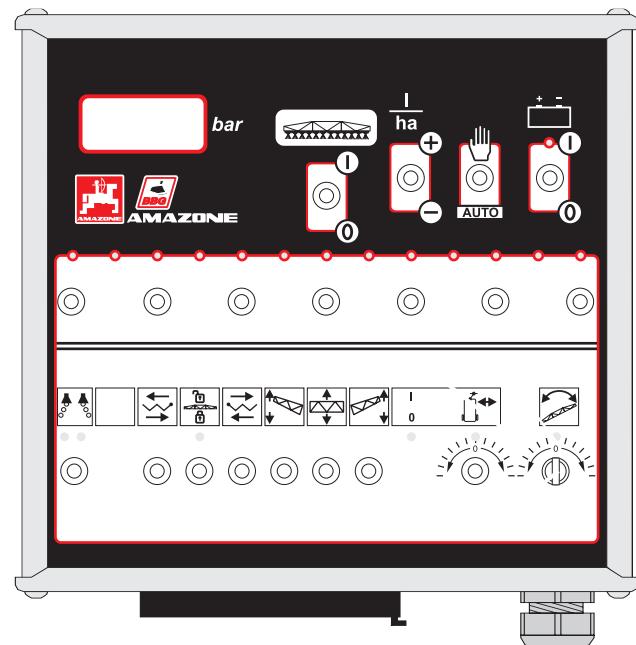


Fig. 8.49

Fig. 8.49/...

- 1 - Switch box SKS 701.
- 2 - Setting knob.
- 3 - Scale arranged around the setting knob (2)
- 4 - 0-Position.

Boom alignment via the boom tilt adjustment

- For tilting the unfolded booms turn the setting knob (8.49/2). The individual points on the scale represent pre-determined angle of boom tilt.

The horizontal position of the boom can be set from any boom tilting position by readjusting the setting knob to "0".



Before folding the boom always check that it is aligned parallel to the sprayer frame (tilt adjustment "0") as otherwise difficulties may occur when locking the boom in the transport position (sockets do not catch on to the transport latches).

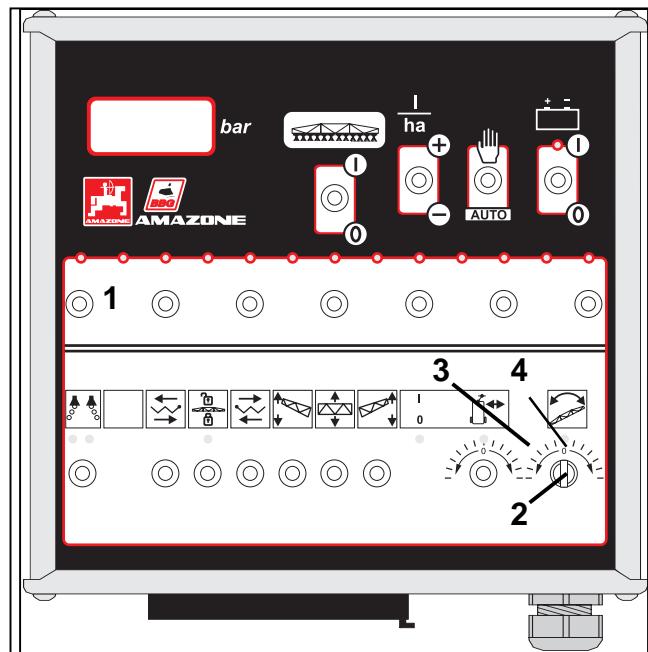


Fig. 8.49

8.2.1.9 Boom carrier mast for Super-S-booms

Order No.: 911 813

For individual fitting to spraying implements.

8.2.2 Folding (0, I, II and III) (Special optional equipment)

The profi-folding offers the following functions:

- Folding in / folding out
- Independent boom fold (only profi-folding I and II until 24 m)
- Hydraulic height adjustment
- Hydraulic boom tilt
- Individual independent angling of booms variable geometry (only profi-folding II and III).

All hydraulic functions are controlled by solenoid valves via the switch box (SKS) from tractor cab. The switch box should be fitted to the tractor.

Required on tractor:

- 1 single acting control valve for connecting to the pressure hose.
- 1 pressure-free return flow for connecting to the return flow hose.



During road transport switch off the oil supply to the valve block.

The oil filter (8.50/1), on the right hand side of the boom near the hydraulic valve block is provided with a pollution display (8.50/2). This should be checked regularly – in case a red ring can be seen instead of the green one, the oil filter should be exchanged without any delay.



Only check the oil filter with the tractor and oil supply switched on.



Replace the oil filter at least once a year.



Fig. 8.50

8.2.2.1 Setting the system setting screw on the hydraulic valve block

The setting of the system setting screw (8.51/2) on the hydraulic block (8.51/1) depends on the tractor's hydraulic system. After determining the type of hydraulic system the **system shifting bolt**

- 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.

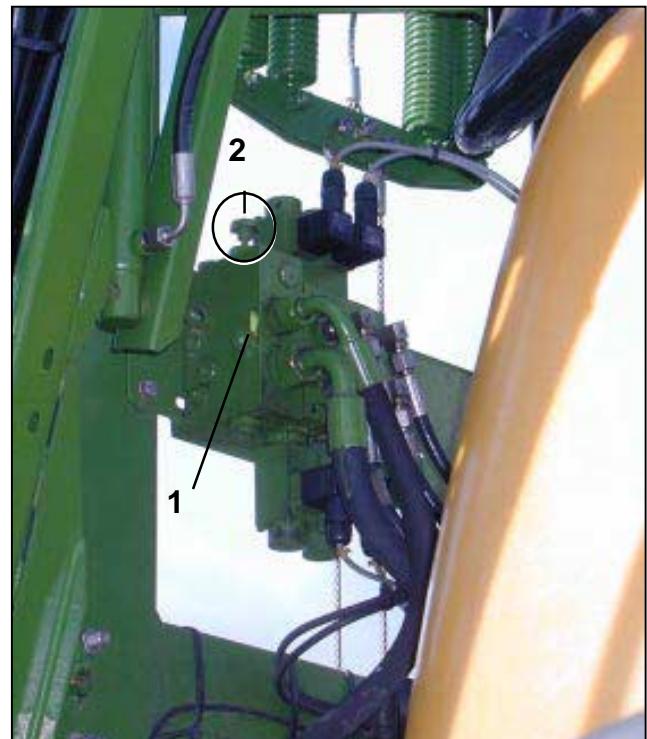


Fig. 8.51

8.2.2.2 Folding the boom in or out



Before folding the booms in or out all persons should leave the folding area of the boom.



Avoid any crushing and bruising points at all the hydraulically actuated folding sections.



Never fold the boom in or out while moving.



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

Folding out

- Unlock boom from transport position (please see para (chapt. 8.2.2.3)).
- Lift boom to a middle height by pressing the switch (8.49/1) of the hydraulic height adjustment.
- **Profi-folding "0" up to 27/28 m**
 - Keep one of the switches (8.49/2 **or** 8.49/3) in position "Fold out" until both boom packs have been folded down and the individual segments have been unfolded completely. The relevant hydraulic rams lock the boom into the operational position.
- **Profi-folding "I" up to 24 m**
 - Keep the switches (8.49/2 **and** 8.49/3) in position "Fold out" until both boom packs have been folded down and the individual segments have been unfolded completely. The relevant hydraulic rams lock the boom into the operational position.
- **Profi-folding "II" up to 24 m**
 - Keep the switches (8.49/4 **and** 8.49/5) in position "Tip angling" until both boom packs have been folded down **horizontally**.
 - Keep the switches (8.49/2 **and** 8.49/3) in position "Fold out" until the individual segments have been unfolded completely. The relevant hydraulic rams lock the boom into the operational position.

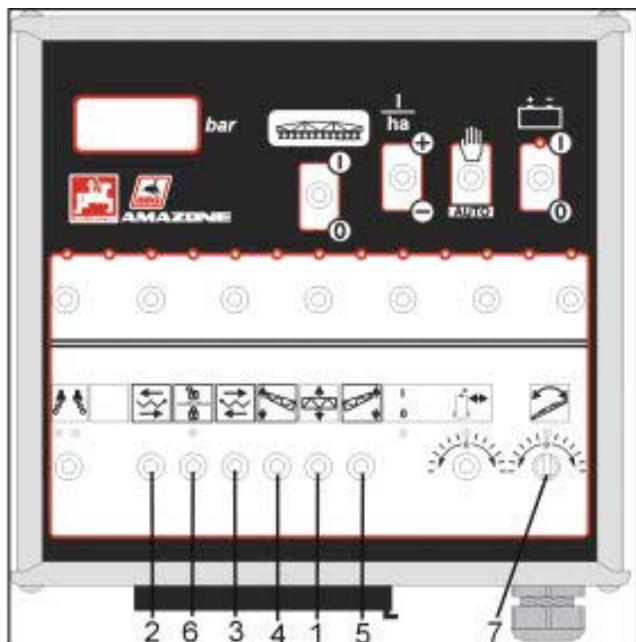


Fig. 8.49

- **Profi-folding "III" up to 27/28 m**

- Keep the switches (8.49/4 **and** 8.49/5) in position "Tip angling" until both boom packs have been folded down **horizontally**.
- Keep one of the switches (8.49/2 **or** 8.49/3) in position "Fold out" until the individual segments have been unfolded completely. The relevant hydraulic rams lock the boom into the operational position.
- **Unlock the swing compensation via the switch (8.49/6)** (please refer to para. 8.2.2.4).
- Set the spraying height of the boom via the key (8.49/1) for the hydraulic height adjustment.

Folding in

- Lift the boom into a middle height by pressing switch (8.49/1).
- Set boom tilting and independent boom angling (Profi folding II and III) to position "**0**".



Before folding in align booms into a parallel position with the sprayer frame as otherwise difficulties may occur when locking the boom into the transport position (sockets are not picked up on the transport latches).

- **Lock the swing compensation via the switch (8.49/6)** (please refer to para. 8.2.2.4).

- **Profi-folding "0"**

- Keep one of the switches (8.49/2 **or** 8.49/3) in position "Folding in" until the individual segments have **completely** been folded in and both boom packs have been folded upwards.

- **Profi-Folding "I" up to 24 m**

- Keep switches (8.49/2 **and** 8.49/3) in position "folding in" until the individual sections have been **completely** folded and the two folded boom packs have been folded upwards.

- **Profi-Klappung "II" up to 24 m**

- Keep switches (8.49/2 **and** 8.49/3) in position "folding in" until the individual sections have been **completely** folded.
- Keep switches (8.49/4 **and** 8.49/5) in Position "tip angling" until the two folded boom packs have been folded upwards.

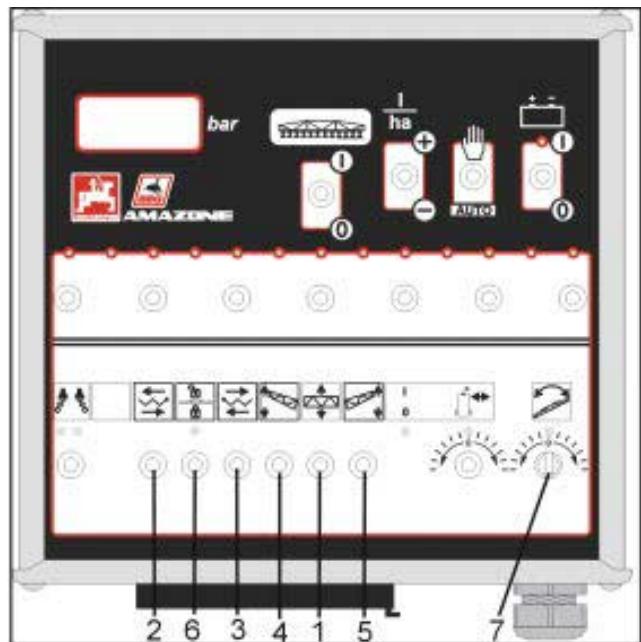


Fig. 8.49

- **Profi-folding "III" u to 27/28 m**
 - Keep one of the switches (8.49/2 **or** 8.49/3) in position "Folding in" until the individual segments have been folded in **completely**.
 - Keep the switches (8.49/4 **and** 8.49/5) in position "Tip angling" until both boom packs have been folded upwards.
 - Lock boom into the transport position by lowering down (please refer to para. **Fehler! Verweisquelle konnte nicht gefunden werden.**).

8.2.2.3 Locking and unlocking sprayer boom into the transport position

Unlocking

Lift the boom with the aid of the height adjustment switch (8.49/1) - until the transport latches release the sockets (Fig. 8.52).

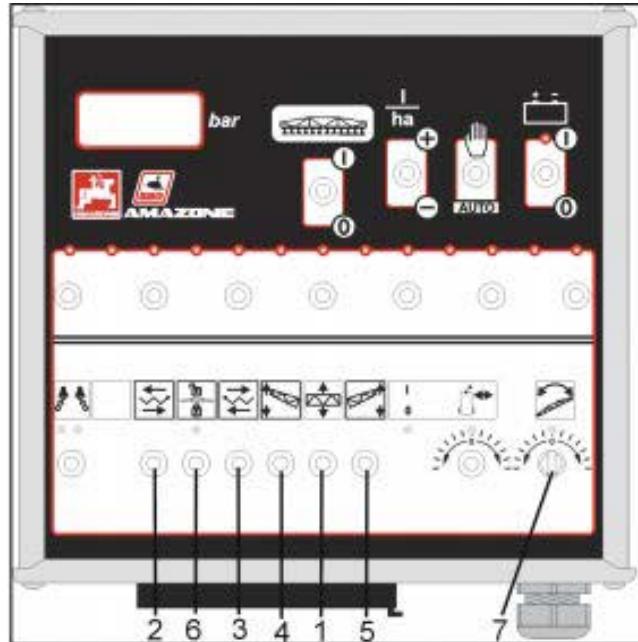


Fig. 8.49

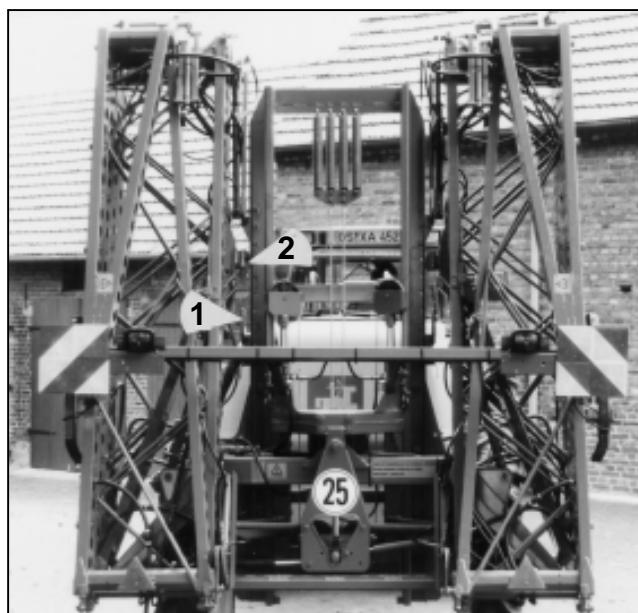


Fig. 8.52

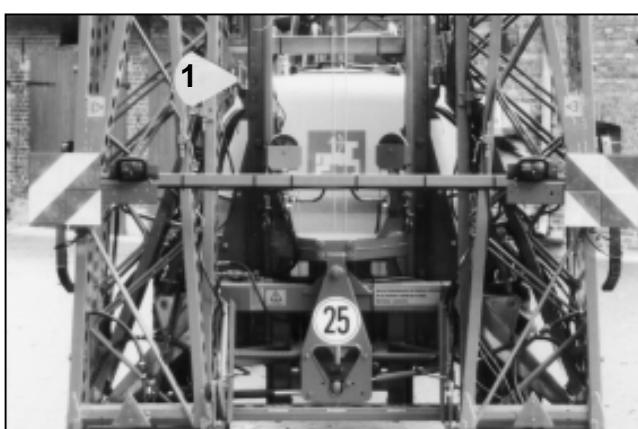


Fig. 8.53

Locking

Lower the boom completely via the height adjustment switch (8.49/1) until the transport latches pick up on the sockets (Fig. 8.53).



If the transport latches do not pick up on the sockets, actuate the turning knob (8.49/7) to align the booms in a parallel position to the sprayer frame via the tilting device.

8.2.2.4 Unlocking and locking the swing compensation



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

Unlock and lock the swing compensation via the switch (8.54/6).

In conjunction with the TG control unit the swing compensation is locked when the red indicator 8.54/8 lights up and it is unlocked when the indicator 8.54/8 goes out. A mechanic indication is not available.

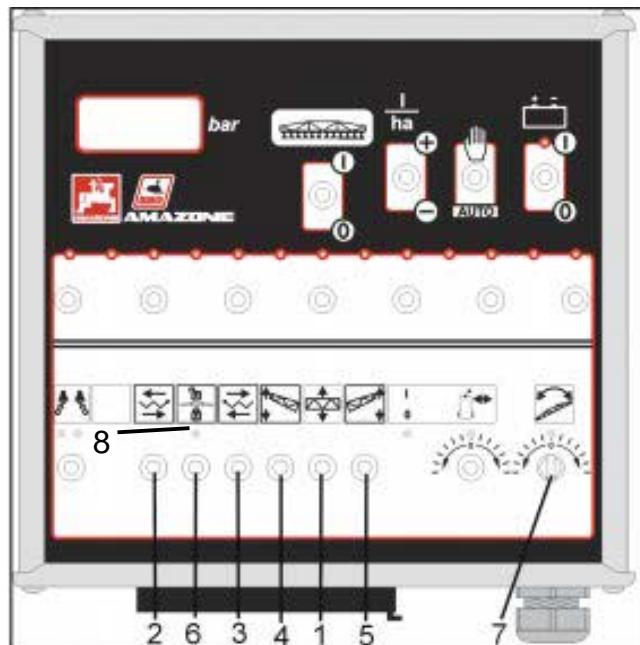


Fig. 8.54

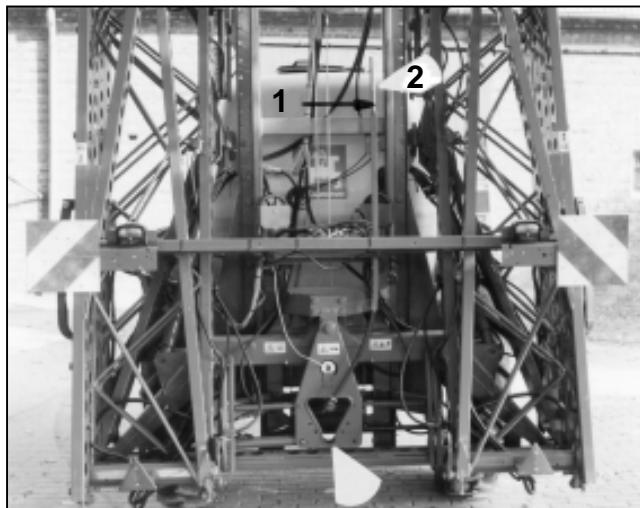


Fig. 8.55

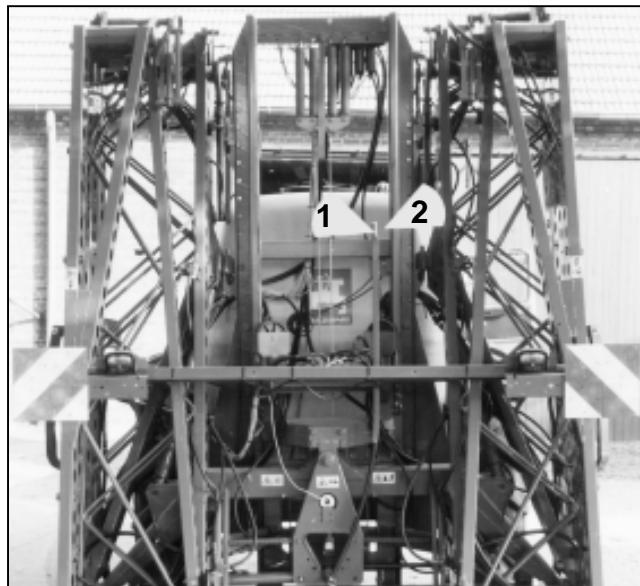


Fig. 8.56

The swing compensation is **locked** when on the "NG" control unit only 1/3 of the red section (8.56/1) of the unlock indicator (8.56/2) can be seen or when on the "TG" control unit the light emitting diode (Fig. 8.54/8) lights up. **Fig. 8.56 illustrates the swing compensation when locked.**

8.2.2.5 Electro-hydraulic boom tilting (only for Profi-folding)

In difficult terrain the position of the sprayer booms in relation to the area to be sprayed is correctable via the hydraulic boom tilting - without affecting the swing compensation. Thus sprayer boom can be guided parallel to the ground, e. g. with varying track depths or where one wheel drops in a furrow.

For setting the boom tilting the swivel arm (8.57/2) is moved via the hydraulic ram (8.57/1). By moving the swivel arm a differing tensioning of the self-leveling springs (8.57/3) is controlled and the boom is then brought into the correct position. The hydraulic ram is actuated via the switch box (8.57/1) by actuating the turning knob (8.58/2).

Alignment of sprayer boom via boom tilting

- Actuate turning knob (8.58/2) for tilting the unfolded booms.



The height at the boom ends varies by approx. 10 - 15 cm per diode spacing



Fig. 8.57

Fig. 8.58/...

- 1 Switch box (SKS 702)
- 2 Turning knob for boom tilting.
- 3 Scale arranged around the turning knob (2).
- 4 0 position – alignment of booms parallel to the sprayer frame.

These indications also apply for SKS 501, SKS 701, SKS 901, SKS 502 and SKS 902 zu.

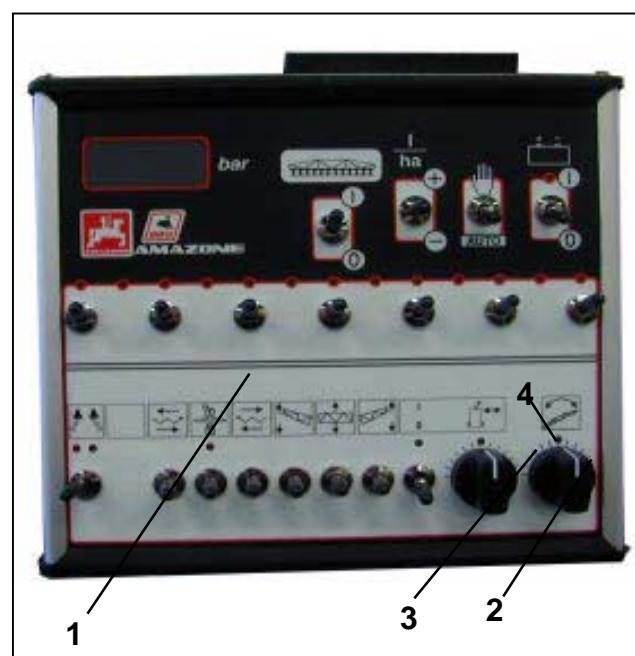


Fig. 8.58

8.2.2.6 Operation with asymmetrically (one-sided) folded out booms up to 24 m



If it is intended to operate temporarily with only one side boom folded out, the other side boom as a pack must be folded downwards from transport position.



Only operate with the swing compensation locked. Lock the swing compensation before folding one side in or out so that the boom will not lean over one way.



Operating with asymmetrically folded out booms and with a locked swing compensation is only allowable for a short time when passing obstacles.



Avoid an unstable oscillation and any ground contact with the boom while the swing compensation is locked, because in this case an even lateral spray distribution is no longer ensured. For this

- set the spraying height above ground to at least 1 m,
- reduce the forward speed and
- Align the boom via the tilt adjustment parallel to the ground again.

8.2.2.7 Angling up and down the boom tips (only profi-folding "II" and "III")

If in very unfavourable terrain conditions the boom can no longer be aligned with the ground by the height- and tilt adjustment, it is possible to angle up or down the boom tips via keys (8.49/5 and 8.49/6).



Never angle the booms folded out for more than 20°.



The decal on the hydraulic rams that lift the folded boom packs indicates the return position of the angled booms.



Before folding in the sprayer booms align them horizontally (tip angling set to „0“).

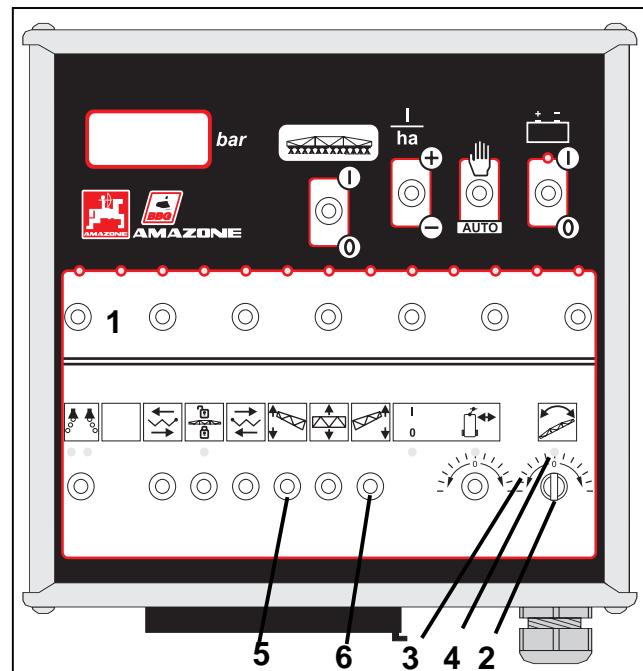


Fig. 8.49

8.2.2.8 Hydraulik-Drosselventile einstellen

The speed of the individual hydraulic functions (lifting and lowering of the folded boom sections, fold in and out of the booms, lock and unlock of the swing compensation etc.) via the relevant hydraulic throttle valves on the valve block (Fig. 8.59 to Fig. 8.62) **is factory set**. However, depending on the tractor, it may be necessary to adjust this setting.

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

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



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

1. Profi 0

Fig. 8.59/...

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

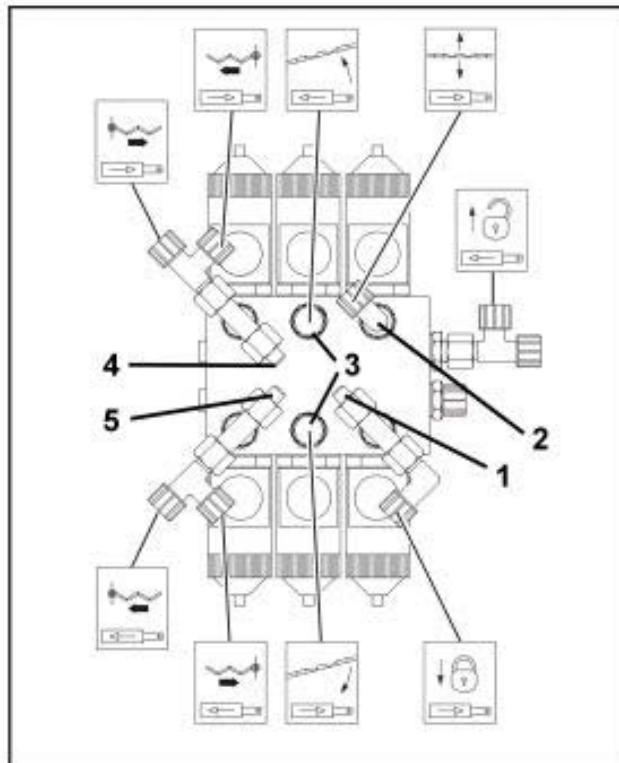
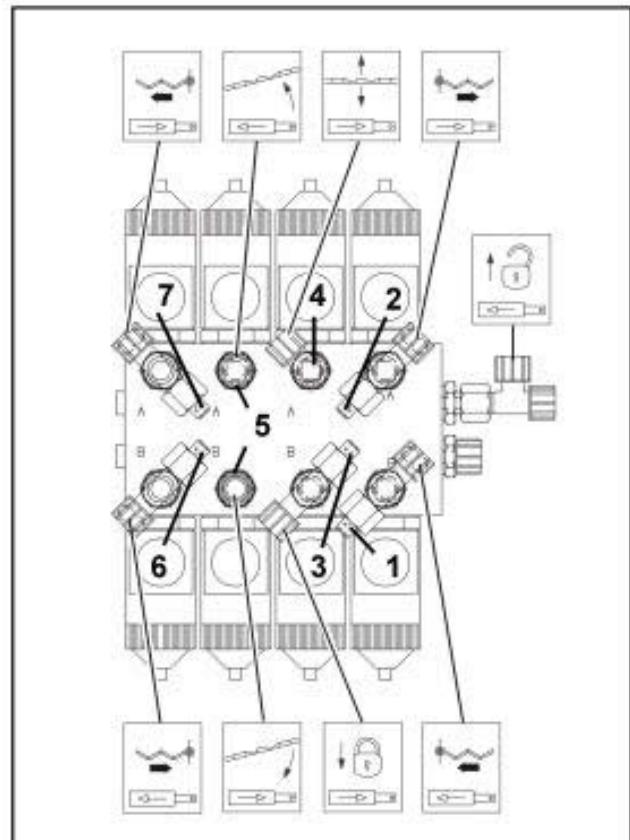


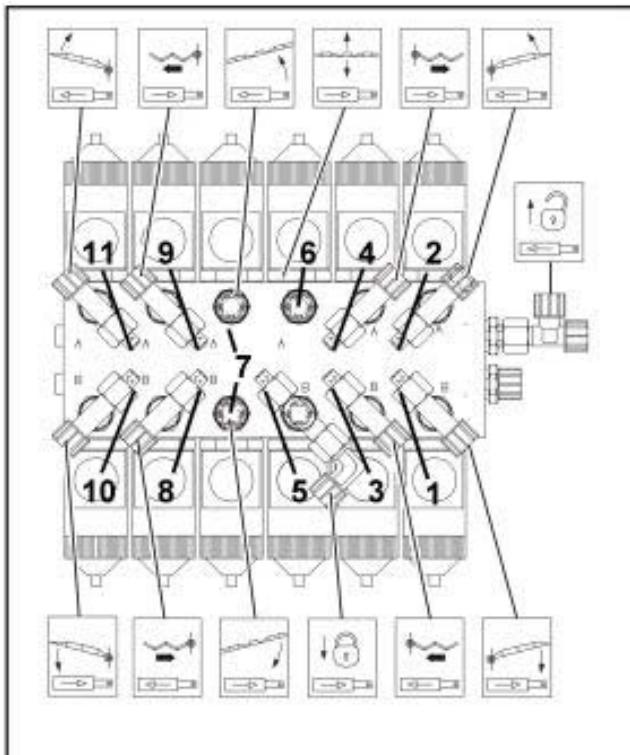
Fig. 8.59

2. Profi I
Fig. 8.60/...

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


Fig. 8.60
3. Profi II
Fig. 8.61/...

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


Fig. 8.61

4. Profi III

Fig. 8.62/...

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

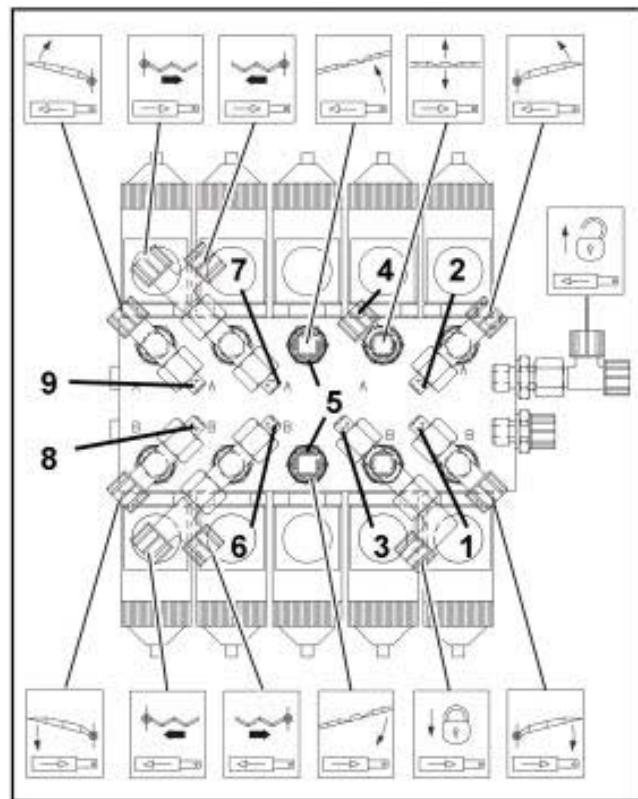


Fig. 8.62

9. Maintenance, repair- and care-work



When carrying out Maintenance-, repair- and care-work, please observe the safety advice, especially that given in para. 2.6.9 and 2.6.10.

Before any repair work the sprayer should thoroughly be cleaned with water.

Repair work should be conducted with the pump stopped.

If spare hoses are needed use only original AMAZONE hoses. When fixing use only hose clamps made of V2A stainless steel.

Repair work inside the sprayer tank may only be conducted after a thorough cleaning. The sprayer tank should never be entered by any one.



Before any welding work on the tractor or on the sprayer, remove the computer and switch box from the implement/tractor.

Please tighten the bolt sizes to the following torques:

- Axle
 - M 16 Ma = 210 Nm
 - M 20 Ma = 360 Nm
- Wheel nuts
 - M 20 x 1,5 Ma = 450 Nm
- Draw bar
 - M 20 Ma = 360 Nm
 - M 22 Ma = 450 Nm

Monthly

- | | |
|---------------------------------------|------------------|
| Pressure compensator
(only BP 171) | - check pressure |
|---------------------------------------|------------------|

Annually, minimum

- | | |
|--------------|---|
| Pump | - check piston diaphragms and exchange if necessary |
| Oil filter | - check valves, change if necessary |
| Control unit | - exchange |
| Nozzles | - check pressure gauge |
| | - check lateral distribution, exchange if necessary |

9.1 Check list for maintenance work

Täglich

Daily

- | | | |
|----------------------------|-----------------------------------|------------------------|
| Pump | - check oil level | |
| Oil filter (Profi-folding) | - state check | |
| Tank | } | - cleaning or flushing |
| Suction filter | | |
| Pressure filter | | |
| Hose filter
(if fitted) | | |
| Pump | | |
| Control unit | | |
| Nozzles | | |
| Air tank | - vent / drain | |
| Track follow draw bar | - grease | |
| Universal draw bar | - grease | |
| Straight draw bar | - grease | |
| Hitch draw bar | - grease | |
| Wheels | - check wheel nuts for tightness. | |

After hours of operation

- | | |
|-------|--|
| Pumps | - Oil change every 400 to 500 hours of operation |
|-------|--|

9.2 Maintenance- and operating advice

Daily maintenance and check-ups before starting to operate

The following checking-, maintenance- and care-schedule is valid. In case of any queries, please contact a skilled workshop or the manufacturer of the air brake system or its distribution network.

9.2.1 Airbrake system

Before travelling on public roads check the following functions:

1. Open shut off valve on tractor.
2. Check cleanliness of coupling heads before coupling and pay attention to a proper fitting.
3. Hoses should not touch other parts. Check guidance of hoses.
4. Check hand brake position of braking power governor!
5. During the operational seasons of the sprayer drain any water from the air tank daily.
6. Conduct a braking test!
7. Check the stroke of the braking ram pistons. At full braking readjust approx. 1 / 3 to 1 / 2 of the total ram piston stroke, at least when reaching 2/3 of the total stroke readjust wheel brake. Release brake and check whether the piston of the ram returns entirely! Replace damaged bellows.

 **Conduct a brake test after every brake servicing.**

8. After coupling off, hang the coupling heads into the dead couplings.

Weekly maintenance

1. Check and clean the inserts of the tube filters.
2. Check the braking circuit for leaks. The pointer of the pressure gauge should stay unchanged in the same position within 3 minutes after stopping tractor engine at an air tank pressure of 5.3 bar. In case of any loss of air pressure within the above mentioned time limit remedy should be made by a licensed workshop.

3. Check hydraulic hoses for faultless condition! Exchange damaged hydraulic hoses.
4. Never weld or solder on control units and pipes. Exchange damaged parts.
5. Grease. Use "grey special grease" for air pressure devices. During the general greasing apply oil to the pin on the yoke head of the piston cylinder.

9.2.2 Hydraulic brake system

Before any travelling, please check:

1. Hydraulic socket and hydraulic plug for cleanliness before coupling and observe proper fitting.
2. Hoses should not touch other parts. Check guidance of hoses.

 **Conduct a brake test after every brake servicing.**

Weekly maintenance

1. Check hydraulic joints for leaks.
2. Check hydraulic hoses for faultless condition! Exchange damaged hydraulic hoses.
3. Do not weld or solder on pipes. Exchange damaged parts.
4. During the general greasing apply oil to the pin on the yoke head of the piston cylinder.

9.2.3 Oil filter of Profi folding

The oil filter of the profi folding is provided with a pollution display. This should be checked regularly - in case a red ring can be seen instead of the green one, the oil filter should be exchanged without any delay.



Only check the oil filter with the tractor and oil supply switched on.



Exchange the oil filter at least once a year.

9.3 Pump – Maintenance-, cleaning- and remedy in case of malfunction

9.3.1 Checking oil level

With the pump stopped and in horizontal position the oil level is correct when it is visible **on the mark (Fig. 9.1/1)**.

For refilling the oil open the lid (9.1/7).



Always use only quality oil 20W30 or multipurpose oil 15W40.



Always pay attention to a correct oil level which must be maintained. Too low or too high an oil level can be harmful.

The oil reserve inside the pump housing (9.2/4) functions simultaneously for the necessary pressure balance of the peak pressures and thus dampening the pulsation effect during liquid delivery by the stroke movements of the pump's pistons.



Maintaining the correct oil level is required for ensuring a constant volume of the pumps.

9.3.2 Oil change



Conduct an oil change every 400 to 500 hours of operation, at least, however, once a year.

- Remove the pump from the sprayer.
- Remove the pump lid (9.2/2).
- Drain off oil.
 - Turn pump upside down.
 - Spin drive shaft (9.1/8) by hand until the old oil is fully drained off.

It is possible to drain the oil at the drain screw (9.2/3). However, oil can remain in the pump for which reason we recommend the procedure mentioned above.

- Place the pump on a level surface.
- Turn the drive shaft alternating to the right- and left hand side and slowly fill in new oil. The correct oil quantity has been filled in when the oil is visible on the mark.



Check the oil level after a few hours of operation and refill oil if necessary.

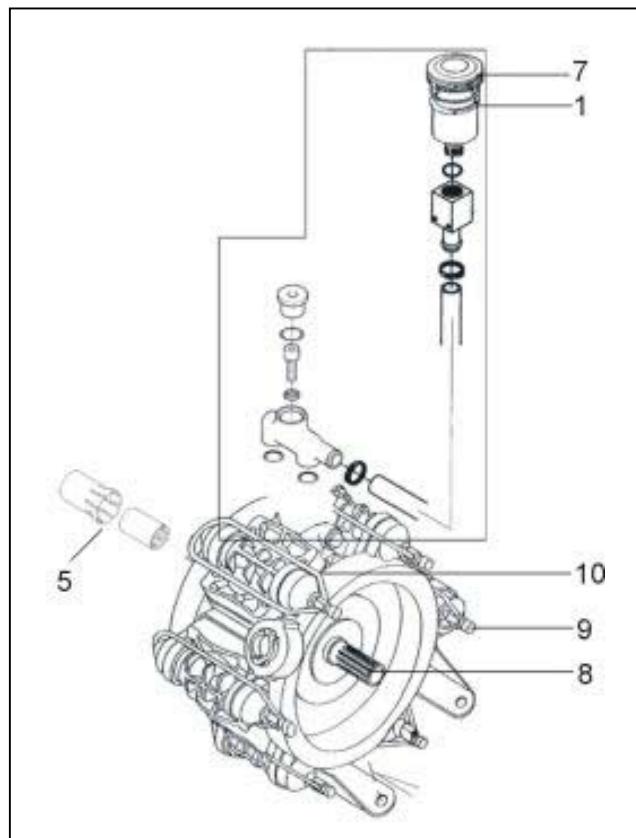


Fig. 9.1

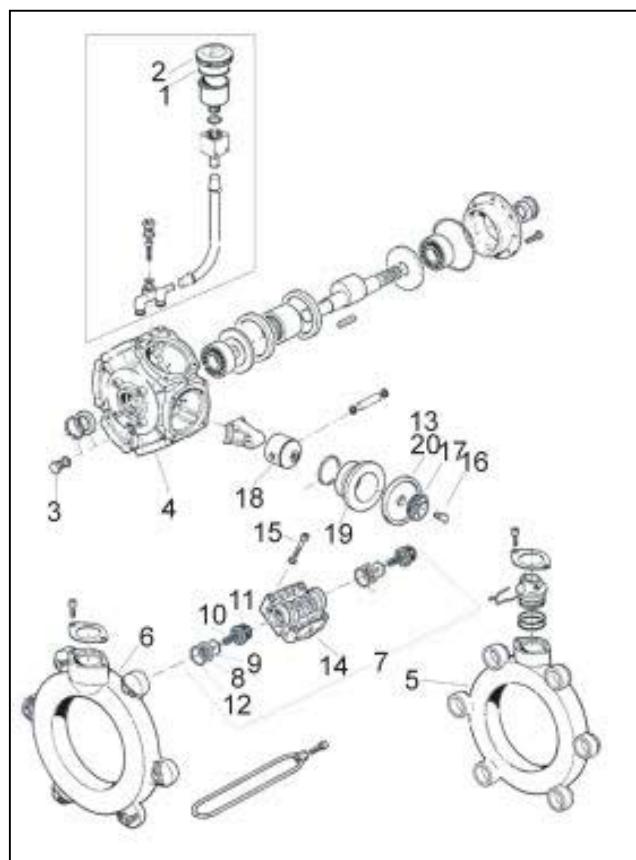


Fig. 9.2

9.3.3 Cleaning

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

9.3.4 Remedy in case of malfunction

1. Pump does not suck

- Remove stoppages in the feed hose (filter tap, filter insert, suction hose).
- The pump draws air.
 - Check the suction joint for suction hose (special option) on the filter tap for leakage.

2. Pump does not function properly

- Clean filter tap and filter insert.
- Jammed or damaged valves.
- Exchange valves.
- Pump draws air, can be noted by air bubbles in the spray agent tank.
 - Check hose joint on suction hose for leakage.

3. Heavy swinging of the pressure indicator and knocking of the spraying cone

- Uneven delivery of pump.
 - Check suction- and pressure-side valves and replace if necessary (please refer to para. **Fehler! Verweisquelle konnte nicht gefunden werden.**).

4. Oil-spray agent mixture in the oil filler or clearly noticeable oil consumption

- Pump diaphragm defect.
 - In this case always exchange all 6 piston diaphragms (see para. **Fehler! Verweisquelle konnte nicht gefunden werden.**).

9.3.4.1 Check and exchange suction- and pressure-side valves

- Pumpe ausbauen.
- Slacken bolt (9.1/9) and remove tensioning clamp (9.1/10).
- Take off suction and pressure tube (9.2/5, 9.2/6).

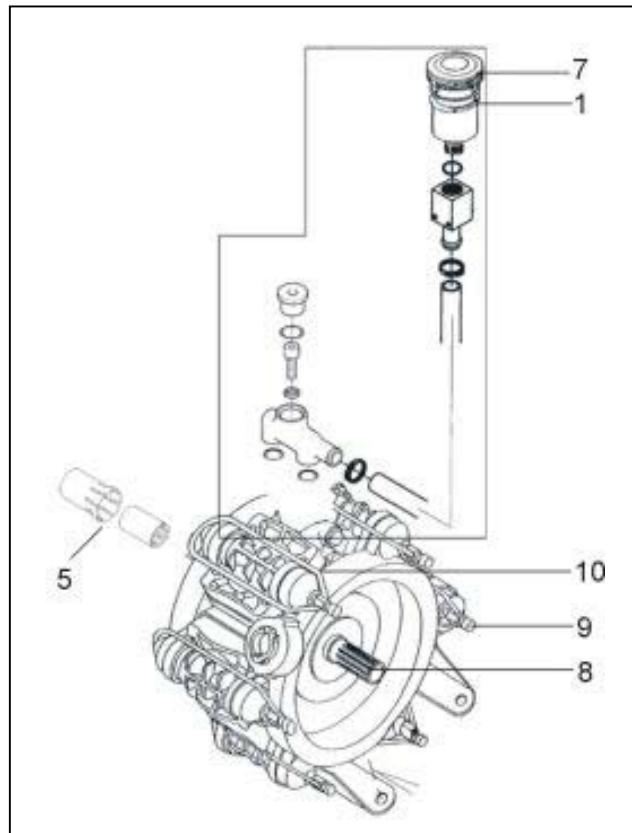


Fig. 9.1

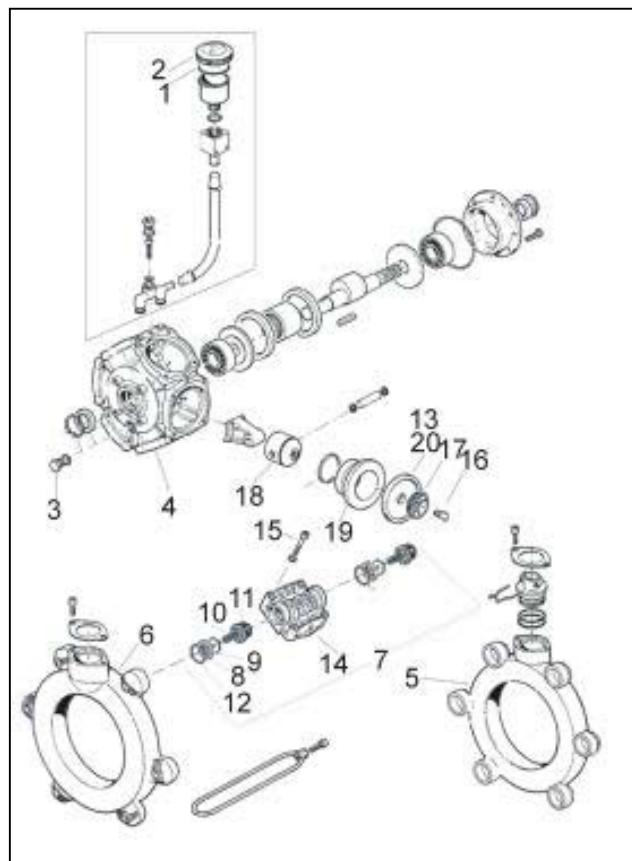


Fig. 9.2



Note and remember before removing the valves the individual mounting position.

- Take off valve groups (9.2/7).
- Check for damage or wear of the valve seat (9.2/8), valve (9.2/9), valve spring (9.2/10) and valve guide (9.2/11) and remove "O"-ring (9.2/12).
- Exchange any faulty parts.
- Mount the valve groups after checking and cleaning.



When refitting watch that the valve guide (9.2/11) will not be damaged. Damage could lead to blockage of valves.

- Fit new O-rings.
- Re-install pressure- (9.2/6) and suction-hoses (9.2/5) to the pump housing and refit the tensioning clamp.
- Tighten the bolts (9.1/9 or 9.3/5) always diagonally with a torque of **11 Nm**.



Tighten bolts diagonally with the torque stated. Inaccurately tightened bolts will cause tensioning and thus leakage.

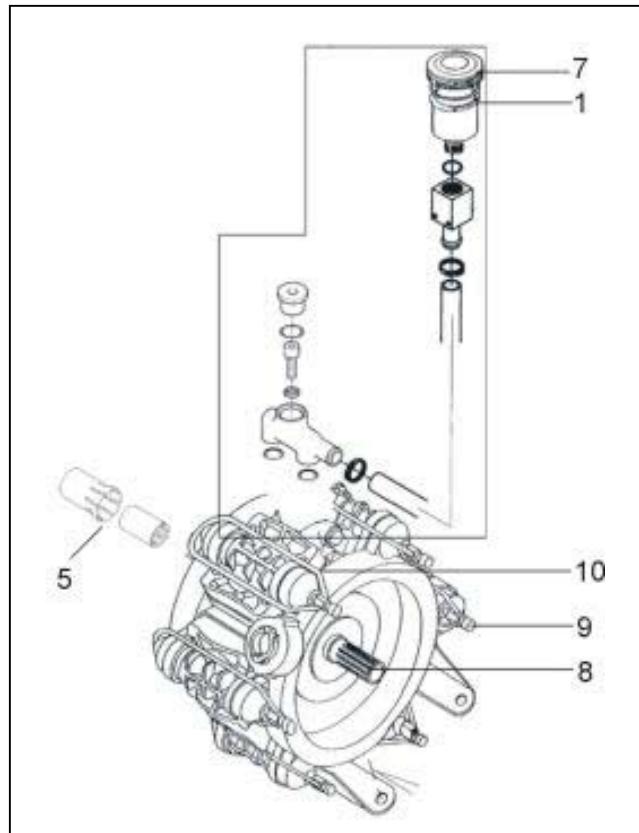


Fig. 9.1

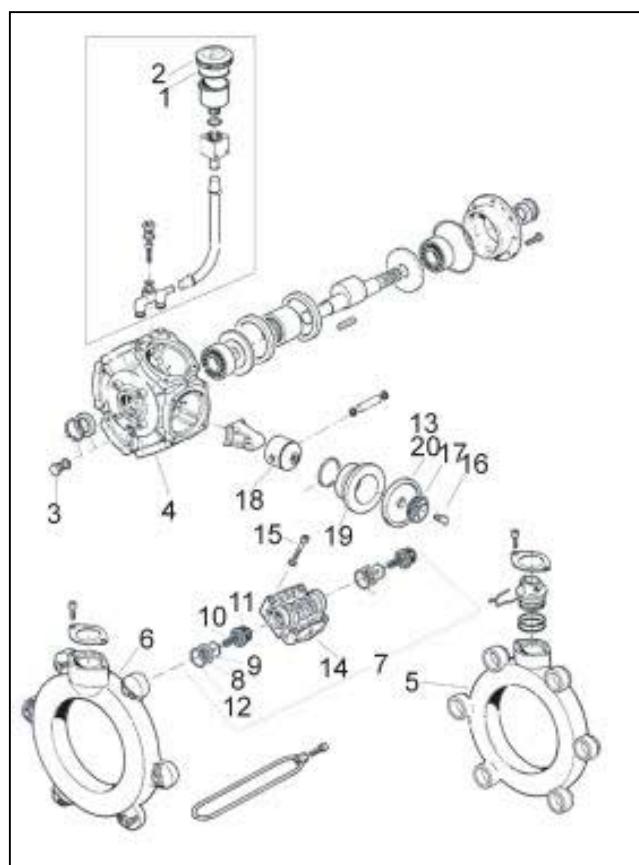


Fig. 9.2

9.3.4.2 Checking and exchanging the piston diaphragms

Check the piston diaphragms (9.2/13) at least once a year by dismantling.



In case of checking and exchanging the piston diaphragms it is recommended to conduct this work for each piston individually. Start to dismantle the next piston only after having completely reassembled the checked one.

Checking the piston diaphragms

- Take off pump.
- Always bring the piston to be checked in the upper position so that any oil inside the pump housing is not draining out.**
- Slacken the bolts (9.1/9).
 - Remove the tensioning clamp (9.1/10) as well as the suction- and pressure hoses (9.2/5, 9.2/6) including the valve groups (9.2/7 or 9.3/8). **Pay attention to the fitting position of the suction- and pressure-side valves.**
 - Take off the cylinder head (9.2/14) after removal of the bolts (9.2/15).
 - Check the piston diaphragm (9.2/13).
- Even if only one of the piston diaphragms is swollen or porous, exchange all diaphragms.**

Exchange the piston diaphragm

- Slacken the bolt (9.2/16) and remove the piston diaphragm (9.2/13) together with the retaining disc (9.2/17) of the piston (9.2/18).
- If the piston diaphragm is broken so that spray liquid and oil are mixed in the pump housing:
 - Drain off the oil spray liquid mixture from the pump housing.
 - Remove the cylinder (9.2/19) from the pump housing.
 - Flush pump housing thoroughly. Use Diesel-oil or Paraffin for flushing. Regard health and safety advice.
 - Clean all sealing surfaces.
 - Insert cylinder into pump housing.



Take care for the correct position of the cut outs or bores in the rams.

- Fit the piston diaphragm (9.2/13).
- Fasten the piston diaphragm in such a way with the retaining disc and bolt to the piston so that the edge (9.2/20) shows towards the cylinder head side (9.2/14).**
- Fit cylinder head to pump housing and tighten bolts cross wise and equally.
 - Fit valves and the suction- and pressure hoses (please refer to para. **Fehler! Verweisquelle konnte nicht gefunden werden.**).

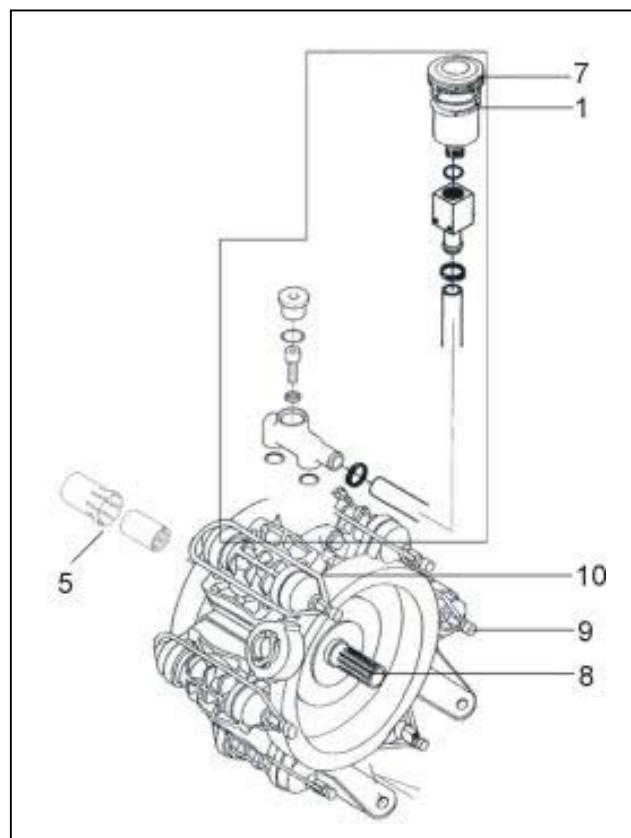


Fig. 9.1

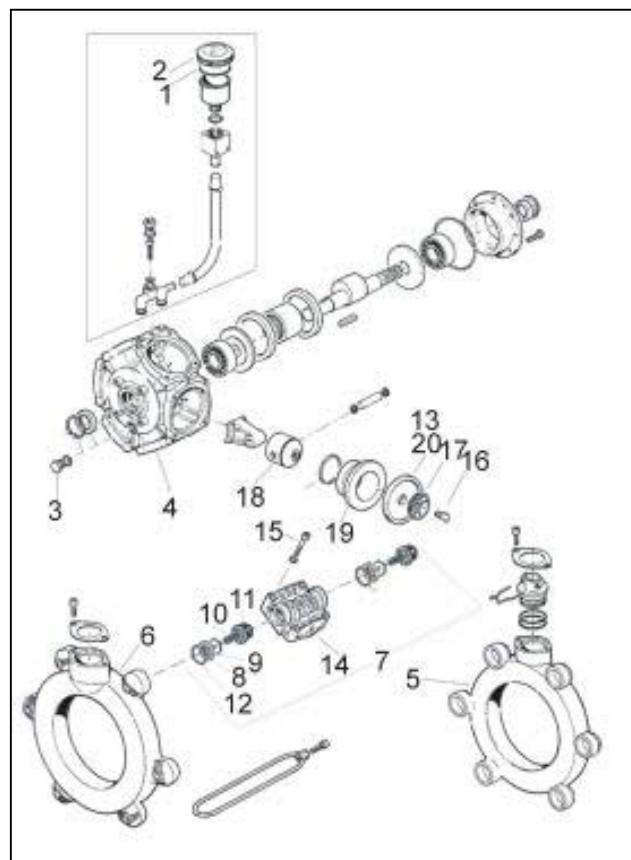


Fig. 9.2

9.4 Switch box, AMACHECK II A, SPRAYCONTROL II A and AMATRON II A – Maintenance and remedy in case of malfunction

Switch box SKS / implement plug

Switch box and implement plug are maintenance-free.

Protect the boxes from moisture. When removed, protect the 48-pole plug with the protective cap.

Computer AMACHECK II A, SPRAYCONTROL II A and AMATRON II A

The computer is maintenance-free. It contains an internal fuse. During wintertime store the computer in a frost-free room.

If no switch box or implement plug is connected, provide the 48-pole plug on the computer with the protective cap.

9.4.1 Remedy in case of malfunction

9.4.1.1 Continuing the field operation with defective electric outfit or defective "AMACHECK II A"

Any failure of the computer "AMACHECK II A" means no loss of function of the sprayer and the field operation can be continued without restrictions.

9.4.1.2 Continuing the field operation with a defective "SPRAYCONTROL II A" or "AMATRON II A"

When "SPRAYCONTROL II A" or "AMATRON II A" fail, operate the control unit manually via the switch box.

For this

- reset the program switch into position "manual operation" at the switch box.

9.5 Calibrating the flow meter

Always re-determine the impulse figure (Imp./l) received from the flow meter by a calibration test:

- after dismantling the control chest and/or the flow meter.
- After a long period of operation – whereby residue of spray agent rests can build up in the flow meter.
- When differences occur between the desired and the actual spray rate.



Calibrate the flow meter at least once a year.

9.5.1 Calibrating the flow meter with "AMACHECK II A" and „Spray-Control II A"

- Fill the tank of the sprayer with water (approx. 1000 l) up to an existing or self applied filling mark on both sides.
- Simultaneously press **key "Imp./l" and key "C"**. When engaging the PTO shaft the display returns to "0".
- Engage PTO shaft.
- Drive pump with its operational speed.
- Spray about 500 l water (according to tank level indicator) via the sprayer boom. The display shows the total counted impulse value.
- Determine the amount of sprayed water by re-filling the spray agent tank either:
 - with the aid of a graduated container,
 - by weighing or
 - with the aid of a water meter.

- Enter the value for the determined quantity of water, e. g. 480 l, via the 10 digit keyboard. Press **key "Entry"** and then "**AMACHECK II A**" or "**Spray-Control II A**" will calculate automatically the figure for "**Imp./l**" which then will be displayed and memorised.
- Press once again **key "Imp./l"** and check the memorised figure. Now the display should show the figure calculated by "**AMACHECK II A**" or "**Spray-Control II A**" in "**Imp./l**".

9.5.2 Calibrating the flow meter with "**AMATRON II A**"

- Fill the tank of the sprayer with approx. 1000 l water up to an existing or self applied filling mark on both sides.
- Switch on the "**AMATRON II A**" and the switch box.
- Dial "data block machine".
- Actuate **key "T4"** until the display shows "**Impulses/l**".
- By **key "T3"** the calibration procedure is dialled.
- Engage PTO shaft.
- Pump mit Betriebsdrehzahl antreiben.
- Drive the pump with its operational speed.
- Spray about 500 l of water (according to tank level indicator) via the spraying boom. The display shows the total counted impulse value.
- After having disengaged the PTO shaft the display shows the impulse figure determined for the sprayed quantity of water.
- Write down the indicated impulse figure.



The displayed impulse figure will extinguish when transporting the sprayer. Therefore never drive away from the field before having written down the determined impulse figure shown on the display.

- Determine the volume of water sprayed by refilling the tank either
 - with the aid of a calibration container,
 - by weighing or
 - by a water meter.
- After having determined the sprayed volume of water, e. g. 480 l, enter this figure via the ten-digit keys.
- Press **key "Entry"** and "**AMATRON II A**" will automatically calculate the figure "**Imp/l**" which is then displayed and memorised.

9.6 Nozzles

9.6.1 Fitting the nozzles

- The nozzle filter (9.3/1) is placed from below into the nozzle carrier (9.3/2)
- Place the nozzle (9.3/3) inside the bayonet nut (9.6/4).



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

- Place the rubber seal ring (9.3/5 above the nozzle.
- Press the rubber sealing ring into the seating of the bayonet nut.
- Place the bayonet nut onto the take up of the nozzle carrier.
- Twist the bayonet nut until the stop.

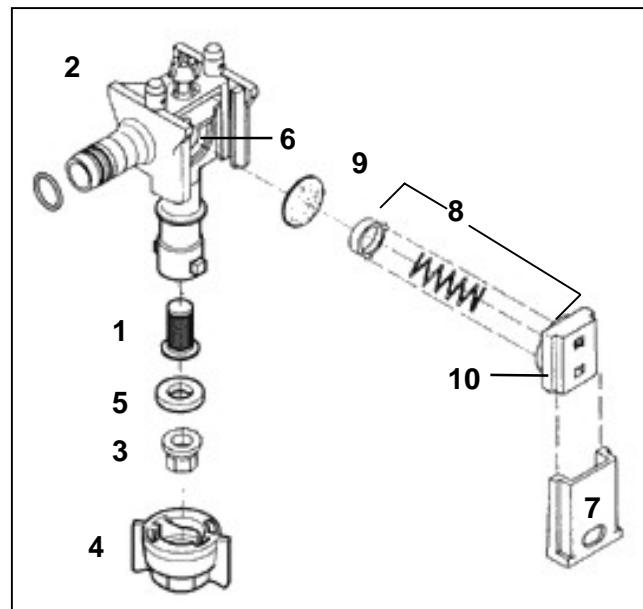


Fig. 9.3

9.6.2 Dismantling the diaphragm valve in case of dripping nozzles

Cause for dripping of the nozzles at a shut off boom feed is residue on the diaphragm seating (9.3/6). Therefore the corresponding diaphragm should be cleaned as follows:

- Pull out the slide (9.3/7) from the nozzle carrier (9.3/2) in direction of the bayonet nut.
- Remove the spring element (9.3/8) and the diaphragm (9.3/9).
- Clean the diaphragm seating (9.3/6).
- The assembly is done in vice versa order.



Pay attention to the correct fitting directions of the spring elements. The edges on the spring element housing (9.3/10) are offset on the right and left hand side and should rise in direction of the boom profile when fitting.

9.7 Adjusting the tank level indicator

- Fill in exactly 500 l water into the spray agent tank. The pointer (9.4/2) on the scale (9.4/1) must show the scale figure "5" for 500 l. If the indicated level deviates from the quantity of water filled then
 - set the pointer (9.4/2) accurately on the scale figure "5" by twisting the bolt (9.4/3).

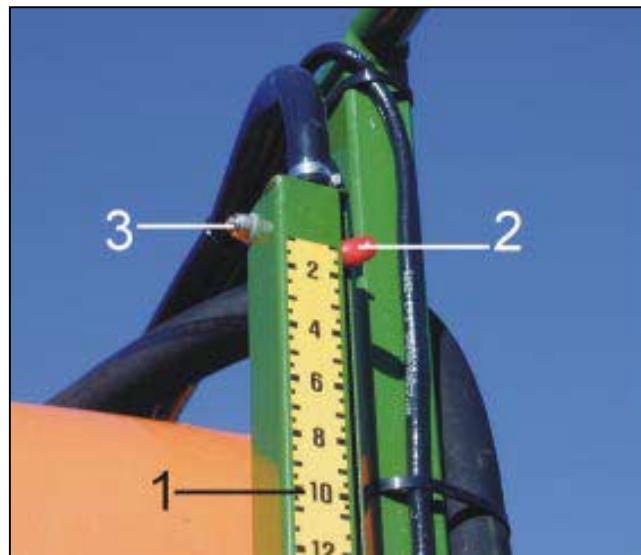


Fig. 9.4

9.8 Hints for checking the field sprayer

The sprayer check should be carried out by an authorised institution.

The following intervals prescribed by law must be maintained:

at least 6 months after first operation (if not carried out at the moment of buying),
every 2nd year thereafter.

For connecting the necessary measuring instruments a "field sprayer test kit" is available (special option) Order No. 919 872 (Fig. 9.5).

Fig. 9.8/...

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

Pump checking

Checking the pump function (capacity, pressure):

- Slacken the fixing clamp and remove the pressure hose with its turned socket from the control unit.
- Connect the pressure hose with the aid of the turned socket (9.5/1) on to the checking instrument.
- Shut the pressure joint of the control unit with the plug (9.5/2).

Flow meter checking

Checking the flow meter:

- Disconnect all pressure hoses from the part section valves of the control unit on the plug-in connection.
- Connect the flow meter joint (9.5/4) with a part section valve and connect to the checking instrument.
- Shut the joints of the remaining part section valves with blanks (9.5/3).
- Set all part section valves on to position "spraying".

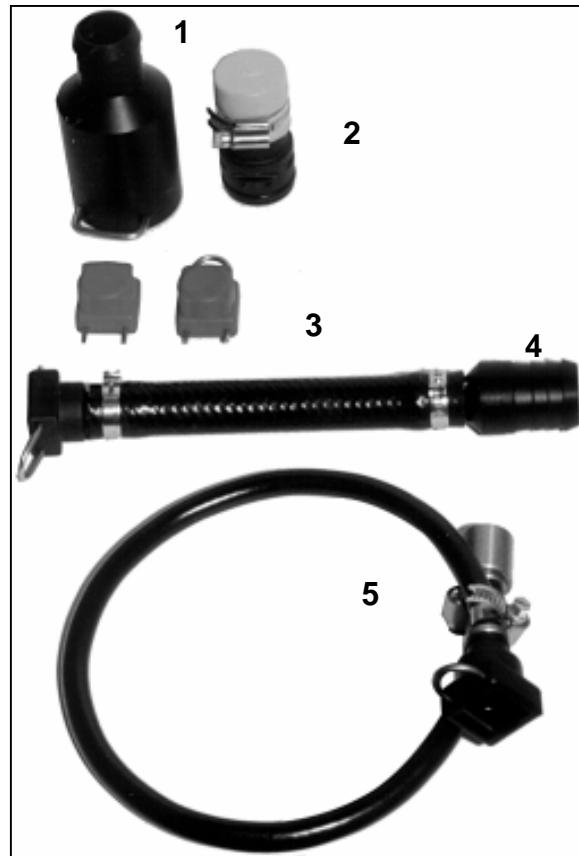


Fig. 9.5

Pressure gauge checking

Checking the pressure gauge:

- Disconnect the pressure hose from one part section valve of the control unit on the plug-in connector.
- Clip on the pressure gauge connector (9.8/5) with the aid of the turned socket on the joint of the part section valve.
- Bolt the checking pressure gauge into the inner thread 1/4 inch.

10. Special options

10.1 Options for the application of liquid fertilisers

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

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



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

The following principle applies:

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

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

10.1.1 3-ray nozzles

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

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

Various 3-ray nozzles and their range of use

3-ray-yellow,	50	-	105 l	AUS/ha,
3-ray-red,	80	-	170 l	AUS/ha,
3-ray-blue,	115	-	240 l	AUS/ha,
3-ray-white,	155	-	355 l	AUS/ha,

10.1.2 5- and 8-hole-nozzles

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



The metering washers determine the spray rates [l/ha].

The following nozzles are available:

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

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

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

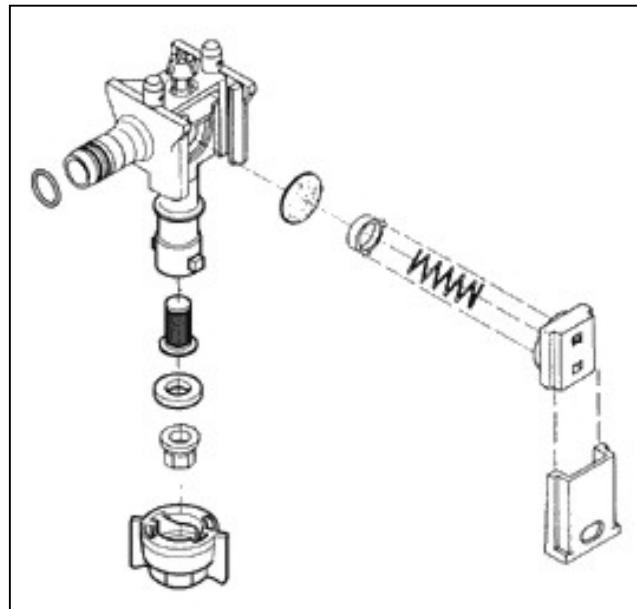


Fig. 10.1

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	AUSL/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



The spraying height above ground depends on the metering disc used (please refer to para. Spraying Table "5- and 8-hole nozzles").

10.1.3 Drag hose kit for late top dressing with liquid fertiliser

cpl. (with metering washers No. 4916-39)

Fig. 10.2/...

- 10.2/1 The drag hose sections have a 25 cm nozzle and hose spacing. The drag hose sections are numbered whereby No. 1 is placed to the outer left hand if looking in driving direction, No. 2 next etc.
- 10.2/2 Wing nuts are used for fixing the drag hose kit.
- 10.2/3 For coupling the drag hoses sleeve plug connections are used.
- 10.2/4 Metal weights for stabilising the position during operation.



The metering discs determine the spray rates ([l/ha]).



Fig. 10.2

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 specification)
4916-45	ø 1,2	150	-	395 l	AUS/ha,
4916-55	ø 1,4	225	-	590 l	AUS/ha.

Refer to para 12.4 for spray tables for the drag hose.

10.1.4 Urea filter

Order No.: 707 400

The use of the urea filter (10.3/1) is recommended when filling with urea to avoid undiluted particles reaching into the suction area and to blocking the filter tap.

Fitting the urea filter:

- Remove the plug of the screw-in opening (10.3/2) in the tank sump.
- Screw in the urea filter by spinning it clock-wise into the bottom (10.3/3).



It is not necessary to remove the urea filter for the following spraying operation.

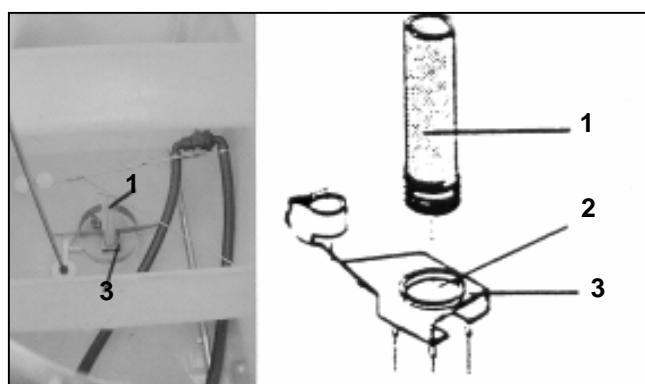


Fig. 10.3

10.2 Suction hose for filling the tank

- 1 Suction hose 2" (8m), Order No. 914398 (Fig. 10.4)
- 2 Suction hose 3" (8m), Order No. 924459 (Fig. 10.5)



During the tank filling via the suction hose from open water sources adhere to the applicable advice (see also para. "Putting into operation").



Fig. 10.4

Operational order when filling the tank via the suction hose

- Switch off the central sprayer boom on- and off switching unit
- Engage the PTO shaft.
- 2" suction hose:
place the 3-way tap into position "sucking".
- 3" suction hose:
first place the 3-way reversing tap into position "sucking". After the pump has sucked the spray agent bring the 3-way tap (Fig. 10.6/1) into position "sucking" (Fig. 10.7/1) as well.



During the filling operation do not leave the implement unattended.

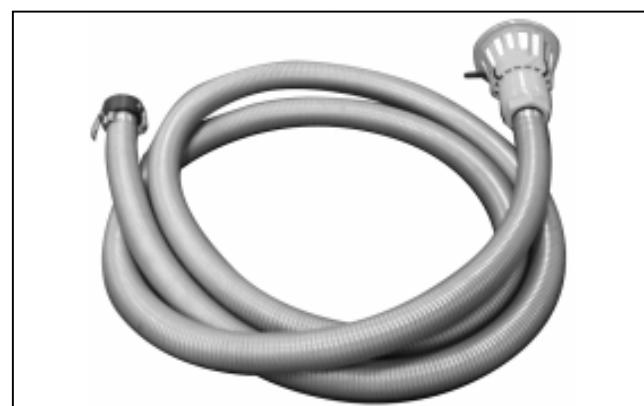


Fig. 10.5

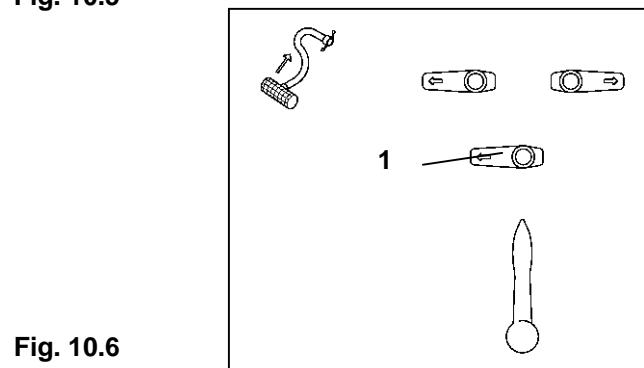


Fig. 10.6

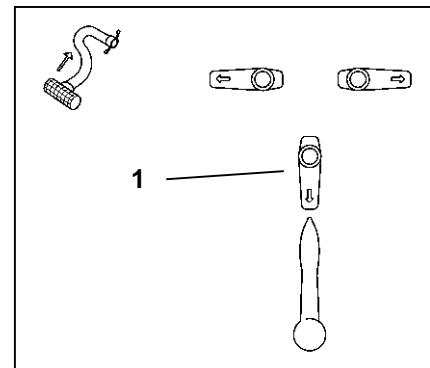


Fig. 10.7

10.3 Filling ports

10.3.1 Filling port with connection to the water supply network

Best.-Nr. 918642

The spray agent tank or the flushing water tank can be filled with water from the public water supply network with the aid of the filling port (Fig. 10.8).

Operational procedure when the tank

- Create the connection with the water supply network via the C-coupling (Fig. 10.8).
- For filling the spray agent tank swivel the three way tap (Fig. 10.9) into flowing direction (Fig. 10.9/A).
- For filling the flushing water tank swivel the three way tap (Fig. 10.11/2) cross ways in the flowing direction (Fig. 10.9/B).
- Control the filling procedure via the relevant taps of the water supply network.



During the filling operation do not leave the implement unattended.

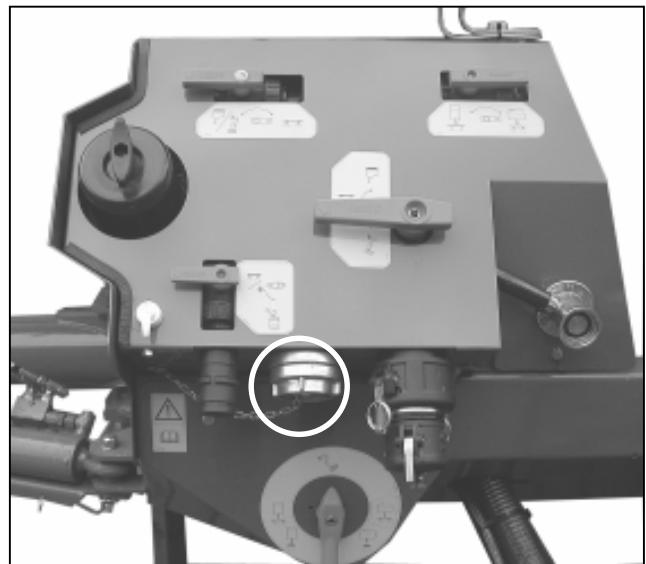


Fig. 10.8

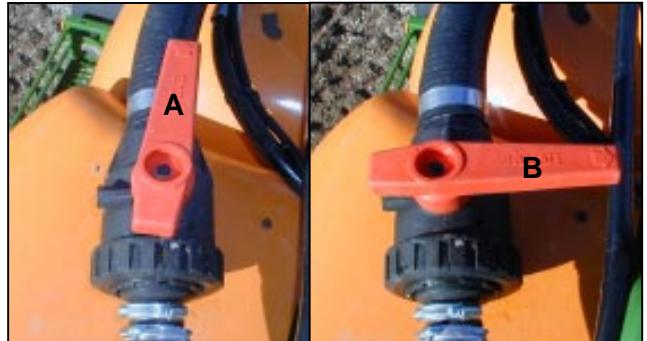


Fig. 10.9

10.3.2 Filling device and canister flushing

Order No. 914308

For this, please refer to para. "Flushing of agent containers with canister flushing nozzle".

10.4 Tank-Control

Order No.: 912057

The **filling level measuring device tank-control** allows an **exact quantity determination (litres)** in tanks of different design. The device operates with all aqueous solutions, even at a density deviating from water. The calibration allows to use tanks of differing and irregular design. For the most common standard tanks the calibration values are stored in the computer. All necessary calibration procedures are factory set.

The tank contents is shown in litres (l) on the **digital display** of the tank-control. Tank-Control (Fig. 10.10) can also be used with AMATRON II-A. After the device has been switched on (switch box SKS is switched on) the current measuring range of the used sensor is displayed and then the tank content. If the display shows the figure "9999" the maximum allowable filling level is exceeded.



Before starting to operate Tank-Control carefully read and adhere to the attached instruction manual.



All necessary calibrations are factory set.



Fig. 10.10



Fig. 10.11



Fig. 10.12

10.5 Exterior wash down equipment for outer cleaning

Order No.: 911 069

Incl. hose reel c/w 20 m pressure hose, spraying lance and washing brush.

10.6 Spray pistol with 0.9 m long spray tube, without hose

Order No.: 715 800

10.6.1 Pressure hose up to 10 bar

e. g. for spray pistol, order-No.: AP 078

Fibre enforced PVC (Nominal width/inside: 15 mm, outside: 22 mm; wall gauge: 3.5 mm).

Connect the pressure hose of the spray pistol to the single tap of the control unit. Set the spray pressure as usual.



The spray pistol should only be used for cleaning purposes. It is not possible to spray accurately crop protective agents because of the manual handling.

10.7 Pressure filter insert

- Pressure filter insert with 50 meshes/inch (standard), Order-No.: ZF 479
- Pressure filter insert with 80 meshes/inch (for nozzle size '02'), Order-No.: ZF 480
- Pressure filter insert with 100 meshes/inch (for nozzle size '015' and '01'), Order-No.: ZF 481

10.8 Ecomatic-Connection

Order No.: 924190

Operating procedure when adding spray agent with the aid of the Ecomatic-connection

- Move multiple-way taps into the illustrated position (Fig. 10.13).
- Attach Ecomatic-connection on to the quick coupling.
- Move 2-way-tap (Fig. 10.13/1) by 90° until the desired amount of spray agent has been sucked.
- Remove Ecomatic-connection.
- Briefly open once 2-way tap (Fig. 10.13/1) for after sucking.

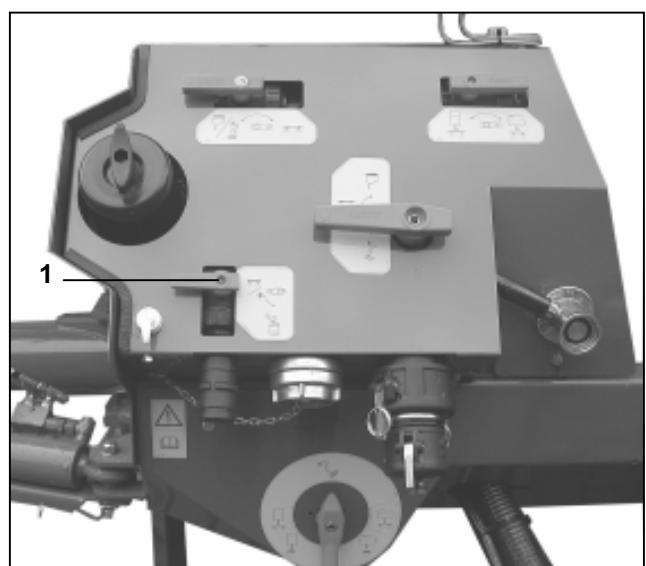


Fig. 10.13

10.9 Traffic options

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

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

1. Rear lights (10.14/ 1), Order No.: 918 296 (Q- and Super-S-booms)
Consisting of:
Light combination R. H. and L. H., parking warning plates, licence plate carrier and connecting cable.
2. Position lights to the front (Order No.: 918 296 (required for Q-booms only)
Consisting of:
Parking warning plates (DIN 11 030) with position lights R. H. and L. H. and connecting cable.



Fig. 10.14

10.11 Distance-Control



The control unit distance-control can only be used for Super-S-booms in conjunction with profi-folding O or 1, Job computer and UX-Pilot.

The sprayer boom control device "distance-control" automatically maintains the sprayer boom parallel and in the targeted distance to the crop.

Two ultrasonic sensors measure the distance between the boom and the ground and so respectively the crop. With a one-sided deviation from the desired height "distance control" actuates the boom tilting to match the height. In case the terrain rises to both sides the height adjustment raises the entire sprayer boom.

When switching off the field sprayer at the headlands the sprayer boom is automatically lifted for about 50 cm. When switching on the sprayer boom lowers to the calibrated height.



Before putting to operation distance-control, please carefully read and adhere to the attached instruction manual.



For maintenance work switch off switch box.

10.12 Foam marker

The foam marker (10.16/1) which can be retrofitted at any time, allows an accurate driving for the next bout when treating fields without marked tramlines.

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

Fig. 10.16/...

- 1 - Container
- 2 - Compressor
- 3 - fixing bracket
- 4 - slotted head bolt

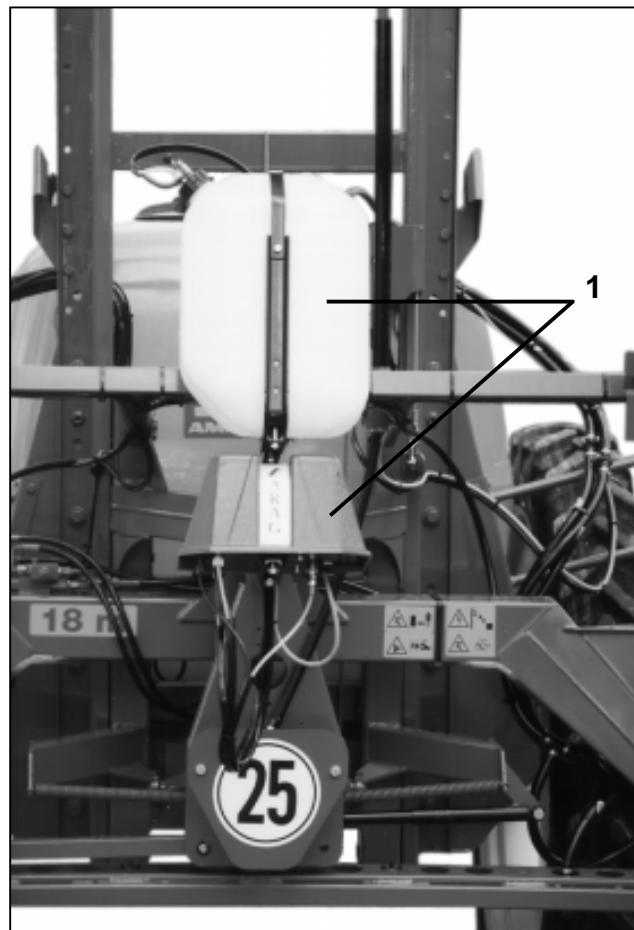


Fig. 10.15

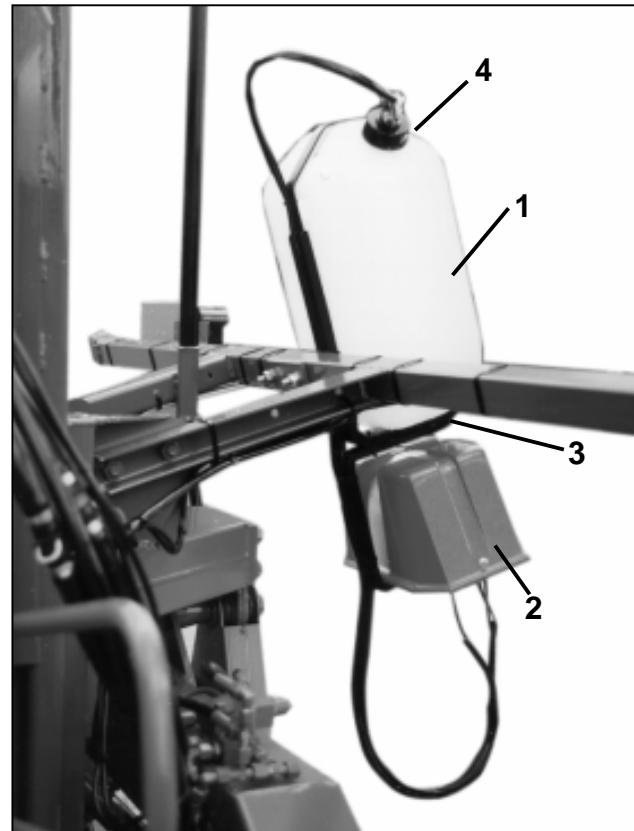


Fig. 10.16

The foam marker is operated via separate control unit or switch box SKS, depending on the equipment of the sprayer.

Switch 10.18/2 in centre position "Aus" (off).

Switch 10.18/2 moves to the **left** onto **position "An"** (on), **foam bubbles** are created on the left hand sprayer boom side in travelling direction.

Switch 10.18/2 moves to the **right** onto **Position "An"** (**on**) **foam bubbles** are created on the right hand sprayer boom side in travelling direction.

When the red, right hand indicator (10.19/3) lights up foam bubbles are created on the right hand boom side – seen in driving direction. When the left hand indicator (10.19/3) lights up the foam bubbles are created on the left hand boom side.

Set the spacing between the individual foam bubbles on the slotted head bolt (10.16/4) as follows:

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

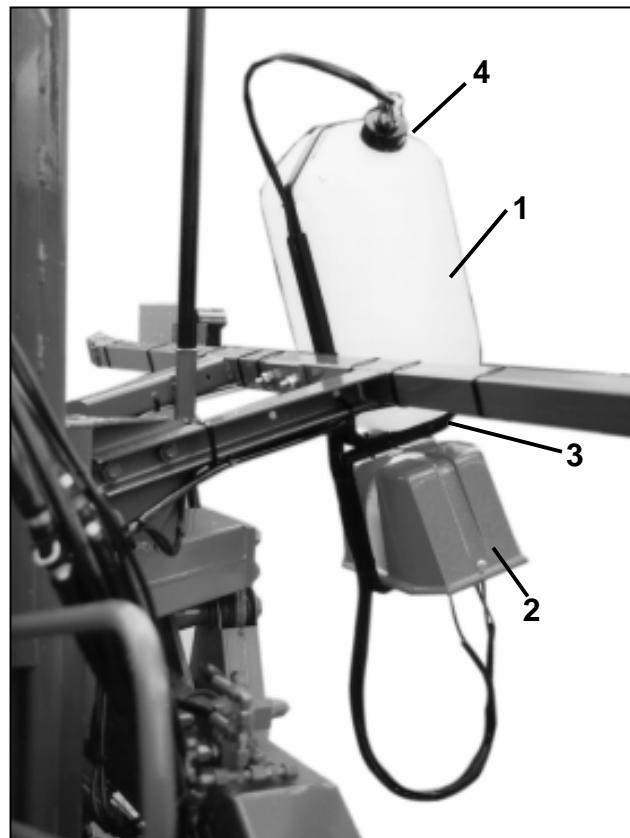


Fig. 10.16

Fig. 10.17/...

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

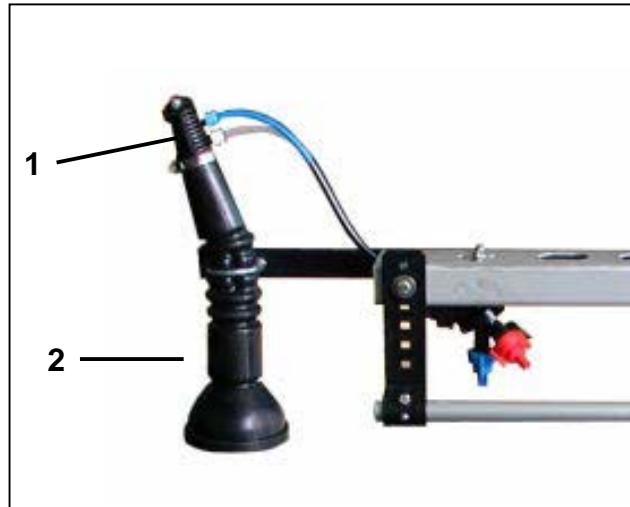


Fig. 10.17

Fig. 10.18/...

- 1 - Control unit
 - 2 - Switch

Fig. 10.19/...

- 1- Switch box SKS 702
 - 2 - Switch
 - 3 - Indicator light (red)

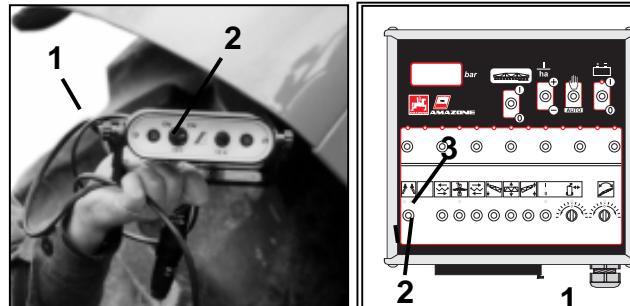


Fig. 10.18

Fig. 10.19

10.14 Digital pressure display with liquid fertiliser proof pressure sensor on switch box SKS

Order No.: 911 827

10.15 Wide throw-nozzles

For the use of the wide throw nozzles two additional single taps are required on the control unit. These single taps cannot be remote controlled via solenoid valves. The switching on and off of the spray liquid feed for the wide throw nozzles is done by engaging and disengaging of the tractor PTO shaft.



The wide throw nozzles must in any case be matched with the nozzles used on the sprayer boom.

1. Nozzles A0C 40, Order No.: 700 7000

suitable for nozzle sizes:

'03' at 2 x 6 m additional working width
'04' at 2 x 5 m additional working width

2 nozzles A0C 60, Order-No. 701 7000

suitable for nozzle sizes:

'05' at 2 x 6 m additional working width
'06' at 2 x 5 m additional working width

2. 2 nozzles A0C 80, Order-No. 702 7000

suitable for nozzle size:

'06' at 2 x 6 m additional working width
'08' at 2 x 5 m additional working width

The total working width can be increased by approx. 6 m with each one of the wide throwing nozzles.

Please determine the actual spraying width of the wide throwing nozzle with water on a suitable surface for starting the spraying operation. For this first check the setting of the wide throwing nozzle carrier. There should be a height difference between the wide throwing nozzles and the standard spraying nozzles of 350 - 400 mm.



The use of the wide throwing nozzle is only permissible for the particular use in spraying rape in full rape blossom (with fungicides and insecticides) as the lateral distribution does not come near the accuracy of a flat fan nozzle arranged on a sprayer boom.

10.16 Line filter inside the boom

Order No.: 916 204

The line filter (10.20/1) is fitted to the sprayer boom for each boom part section.

It represents an additional measure to avoid contamination of the nozzles and thus restricting their function.

The following filter inserts are available:

1. Filter insert with 50 meshes/inch (Standard, blue), Order-No. ZF379
2. Filter insert with 80 meshes/inch (grey), Order-No. ZF380
3. Filter insert with 100 meshes/inch (red), Order-No. ZF 381

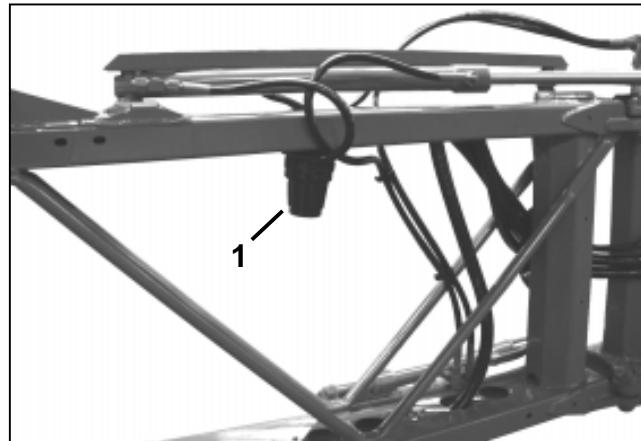


Fig. 10.20



Clean the line filter once a day.



For storing over winter, remove the filter cap and store the filter insert in a dry room.

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

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

Please also refer to chapter "Sprayer boom".

10.18 Mud guard equipment / Canister carrier

Order No.: 924458

Adjustable mud guards to match the various wheel outer diameters and the cross section widths.

- Mount tube bent with a spacing of approx. 5 cm towards the wheel.



Fig. 10.21

10.19 Trail-Tron



Only in conjunction with Profi-folding

Trail-Tron realises the angle position of the draw bar towards the driving direction of the tractor.

In case of a deviation of the draw bar position towards the mean position of the tractor (draw bar in alignment to the tractor) the hydraulic ram of the draw bar control is actuated until the mean position is achieved again..

Hereby a nearly track true following of the sprayer is achieved..

Turning circle diameter d_{wk} at

- UG 2200 / 3000 $d_{wk} > 16 \text{ m}$,
- UG 4500 $d_{wk} > 18 \text{ m}$.

Fitting

- Affix the straight draw bar (10.22/1) to the self catching eye of the tractor.
- Insert the bracket for the angular sensor (10.22/2) into the bushing (10.22/3) on the draw bar eye and affix using the clamping bolt (10.22/4).
- Remove the safety rail (10.23/1).
- Set the draw bar control via the switch (10.24/1) on the switch box to position "Deichsel-Ein" ("draw bar on").



The basic position of the draw bar can be altered by using the turning knob (10.24/2) (operating on slopes, manoeuvring).



Do not use the automatic control while travelling on public roads! Before driving on public roads (implement transport) set the switch (10.24/1) into position "Deichsel-Aus" ("draw bar off") and attach the safety rail (10.23/1).

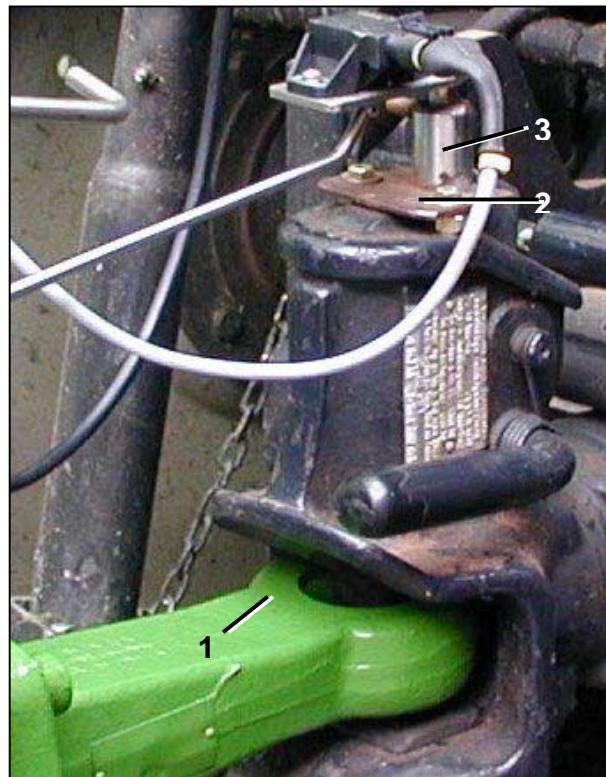


Fig.10.22



Fig.10.23

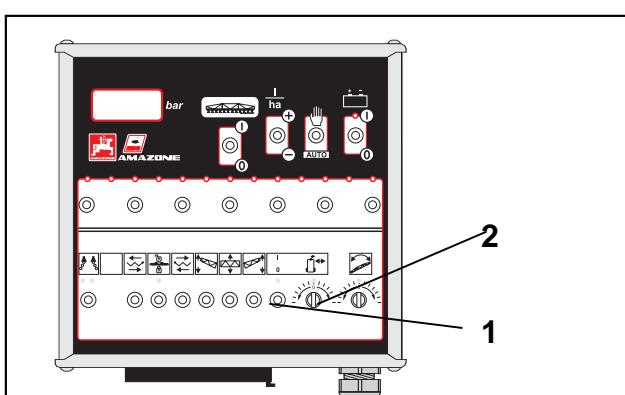


Fig.10.24

10.20 Trail-Control for LBS

For **straight** and hitch draw bars the **Trail-Control-unit** (Fig. 10.25) is available as an optional equipment. It is controlled via the UX-Pilot.

The gyroscope (Fig. 10.25/1) is fitted to the left hand side of the tractor.

As standard the straight draw bar is equipped with a fixing rod. By replacing the rigid system (fixing rod) by the **Trail-Control hydraulic ram** (Fig. 10.26/1) an **automatic true track following** is achieved with a turning circle from 16 m diameter.

When **operating on steep slopes** (sprayer crabs downhill), an additional manual track steering for a **true track following** is possible.

Trail-Control can only be used **in conjunction** with a **self catching pulling eye** and **profi folding**.



Before starting to operate with the Trail-Control, carefully read the attached instruction manual.



For field operation retreat the draw bar jack (10.26/2) completely to avoid damage on the angular gearbox.



Before travelling on the road apply the safety rail (10.27/1). This rail prevents the unwanted changes of the machine position.



Fig. 10.25

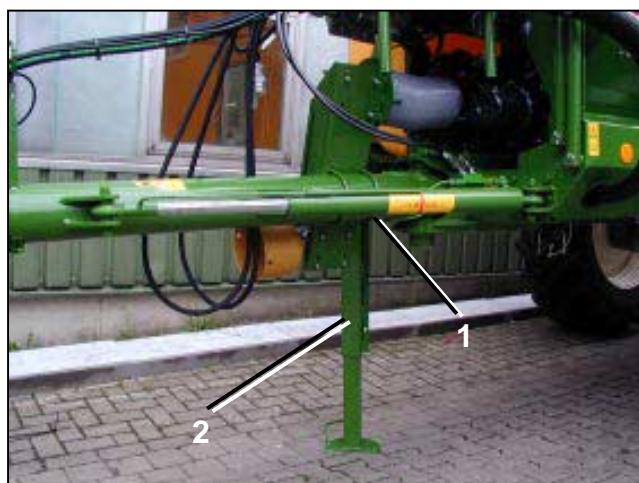


Fig. 10.26



Fig. 10.27

10.21 Pressure circulation system (Druck-Umlauf-System) (DUS)

By the flushing hose joints (10.28/1) related to every boom section the pressure circulation system allows a permanent circulation in the spraying line. At random the system can be operated with spray agent or flushing water. By this system the undilutable residual amount is reduced to 2 litres.

During the general spraying operation the system is always switched on (10.29/1).

This way the spray agent is available on all nozzles at any time whereby an even spray pattern is guaranteed right from the beginning of operation. At the same time the permanent liquid flow prevents the blockage of the spraying line.

The main components of DUS are

- Flushing port hoses (10.28/1)
- 3-way tap (10.29/1)
- Pressure reducing valve (10.30/1)

Before operation with drag hoses for the application of liquid fertiliser switch off the pressure circulation system via tap 10.29/1.

The system is switched off at tap position 10.29/2..



Before using the drag hose equipment switch off the DUS-System.

The tap position 10.30 allows draining as well as exhausting the system for storing during winter time.

The pressure reduction valve (10.30/1) is factory set and reduces the pressure inside the pressure system to 1 bar.



Fig. 10.28

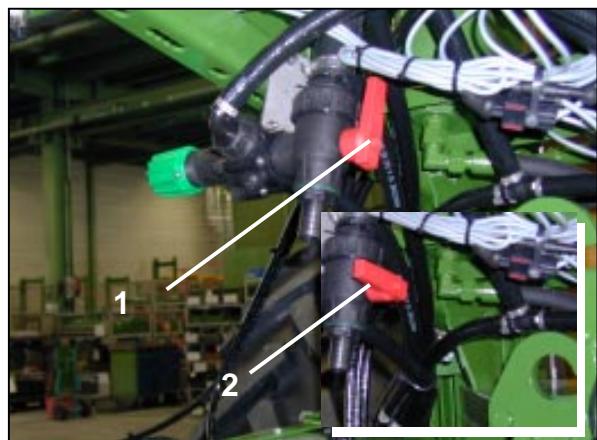


Fig. 10.29



Fig. 10.30

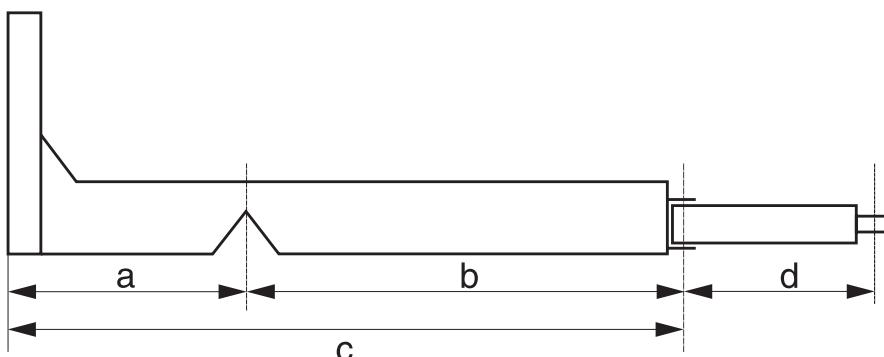




11. Technical data

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

11.1 Technical data basic implement and running gear



Typ UG Nova		2200	3000	4500
Tank volume actual	[l]	2400	3200	4750
nominal		2200	3000	4500
Filling height from ground	[mm]	2080	2430	2430
from operator's platform		650	1000	1000
<hr/>				
Total length	[mm]			
a		850	850	1150
b		2350	2350	3050
c		3200	3200	4200
<hr/>				
Weight	[kg]			
Axle, unbraked		960	1010	-
Axle, air brake system, parking brake		1070	1120	-
Axle, hydraulic brake*, parking brake		1060	1110	-
Rigid axle, air brake system, parking brake		-	-	1490
Rigid axle, hydraulic brake*,		-	-	1470
<hr/>				
Technical surplus amount, incl. filter tap		0 %	6 l	0 %
			17 l	0 %
			21 l	
<hr/>				
Tank level line** in driving direction to the left hand		20 %	15 l	20 %
in driving direction to the right hand		20 %	15 l	20 %
Dropping line**: up hill		16 %	45 l	16 %
down hill		20 %	47 l	20 %
			56 l	16%
			58 l	20%
			68 l	70 l

* not allowed in Germany

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

11.2 Technical data tyres

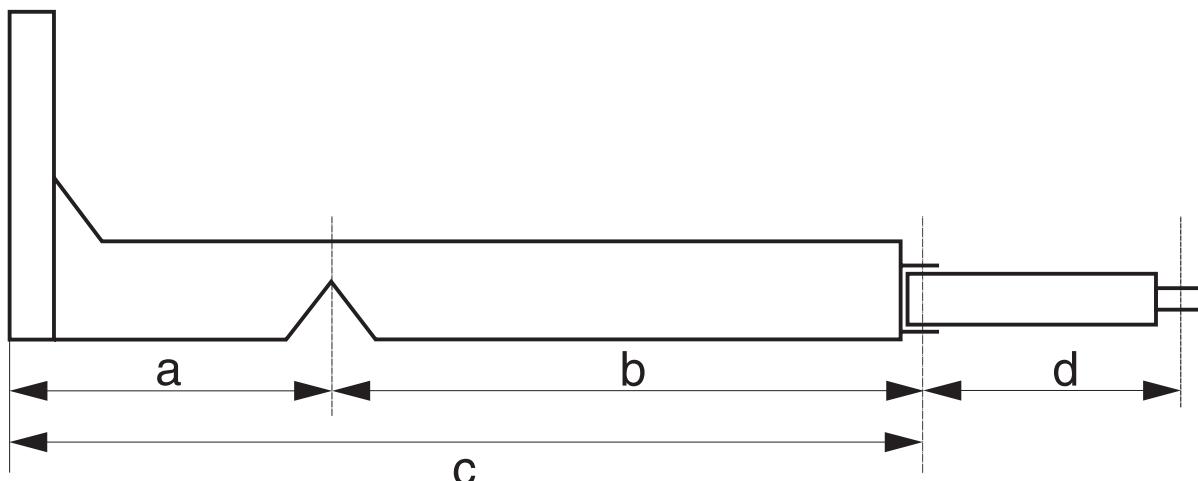
Tyres	UG2200 Nova			UG3000 Nova			UG4500 Nova		
	* Stützlast 1000 kg ** Zul. Gesamtgewicht in kg *** Bei Luftdruck..... in bar			* Stützlast 1000 kg ** Zul. Gesamtgewicht in kg *** Bei Luftdruck..... in bar			* Stützlast 1500 kg ** Zul. Gesamtgewicht in kg *** Bei Luftdruck..... in bar		
	25 km/h	40 km/h	50 km/h	25 km/h	40 km/h	50 km/h	25 km/h	40 km/h	50 km/h
230/95R44 (9,5R44) LI 134 A8	5500 3,6	4900 3,2	-	5700 3,6	4900 3,2	-	-	-	-
270/95R42 (11,2R42) LI 139 A8	5500 3,2	5500 3,2	-	6400 3,6	5500 3,2	-	-	-	-
270/95R48 (11,2R48) LI 142 A8	5500 2,8	5500 2,8	-	6900 3,6	5900 3,2	-	7400 3,6	6800 3,6	-
300/95R46 (12,4R46) LI 145 A8	5500 2,4	5500 2,4	-	7000 3,3	6300 3,2	-	7900 3,6	7300 3,6	-
420/85R38 (16,9R38) LI 141 A8	5500 1,2	5500 1,2	5500 1,2	6700 1,6	6100 1,6	5700 1,6	7200 1,6	6600 1,6	6200 1,6
480/70R38 LI 145 A8	5500 1	5500 1	5500 1	7000 1,4	6800 1,6	6300 1,6	7300 1,6	7300 1,6	6800 1,6
340/85R48 (13,6R48) LI 148 A8	-	-	-	7000 3	6800 3,2	-	8500 3,6	7800 3,6	-
460/85R38 (18,4R38) LI 146 A8	5500 1	5500 1	5500 1	7000 1,4	7000 1,6	6400 1,6	8100 1,6	7500 1,6	6900 1,6
520/85R38 (20,8R38) LI 153 A8	-	-	-	7000 1	7000 1,2	7000 1,4	9600 1,6	8500 1,5	8100 1,6
300/95R52 (12,4R52) LI 148 A8	-	-	-	7000 2,8	6800 3,2	-	8500 3,6	7800 3,6	-
650/65R38 LI 154 A8	-	-	-	7000 1	7000 1	7000 1	9800 1,2	8500 1,1	8300 1,2

* support load (- weight)

** weight max.

*** recommended air pressure (bar)

11.3 Technical data – draw bars



Kind of draw bar	True track follow draw bar	Universal draw bar	Straight draw bar	Hitch draw bar
Weight [kg]	118	170	240 (180*)	122
Length d [mm]	1020 – 1260	1100 – 1260	1700	1800
Adjustment range longitudinal	240 mm in 3 steps, each of 80 mm	160 mm in 2 steps each of 80 mm		
Three point linkage cat.	II	II		
smallest turning circle with true track following [m]				
UG 2200/3000 Nova**	11	11	16	-
UG 4500 Nova**	-	-	18	-

* UG 4500 Nova

** For straight draw bar the hydraulic steering Trail-Control is required

11.4 Technical data control units

Control units	„NG“ ¹⁾	„TG“
Central control	x	x
<u>w.o.</u> equal pressure control with equal pressure control	- 5 / 7	5 / 7 / 9 -
Pressure adjustment	electr.	electr.
Pressure range [bar]	0,8 - 10	0,8 - 10
Agitation (hydraulic)	x	x
Pressure gauge 0-8 / 25 bar ø 100 mm, spread liquid fertiliser proof	x	x
Pressure filter mesh number	50/(80)	50(80)
Return flow device	x	x
Automatic metering	x	x
Weight [kg]	21 / 22	37 / 38 / 39
Surplus amount [l]	3,1 / 4,5	4,2 / 4,5 / 4,8
possible computer equipment	AMACHECK II A	x -
	SPRAYCONTROL II A	x x
	AMATRON II A	x x
	Jobcomputer	- x
Flow meter	x	x

¹⁾ Retrofit flow meter (option)

11.5 Technical data pump equipment

Pump equipment			210 l/min	250 l/min	370 l/min (210+160) or 420 l/min (210+210) 210 l/min	410 l/min (250+160) or 460 l/min (250+210) 250 l/min	160 l/min
Type of pump			BP 235	BP 280	BP 235	BP 280	BP 171
Delivery at 540R.P.M.	[l/min]	2 bar 20 bar	208 202	250 240	208 202	250 240	160 154
Power requirement	[kW]		8,4	9,8	8,4	9,8	7,0
Power requirement	[kg]		32	34	32	34	24
Kind of pump			6-piston actuated diaphragm pump	6-piston actuated diaphragm pump	6-piston actuated diaphragm pump	6-piston actuated diaphragm pump	4-piston actuated diaphragm pump
Pulsing damping			Oil dampening	Oil dampening	Oil dampening	oil dampening	Pressure reservoir
Surplus amount							
Pump	[l]		1,7	1,9	1,7	1,9	1,6
Suction hose	[l]		0,9	1,5	0,9	1,5	0,9
Pressure hose	[l]		0,8	0,8	0,8	0,8	0,8
Pump equipment total	[l]		3,4	4,2	3,4	4,2	3,3
Pump equipment total weight	[kg]		34	40	37,5	40	30



11.6 Technical data sprayer boom

11.6.1 Q-boom (incl. hydr. height adjustment and swing compensation) and Q-plus-boom

		Q-boom manual folding			Q-plus boom hydraulic folding		
Working width	[m]	12	12,5	15	12	12,5	15
Number of boom sections		5	5	5	5	5	5
Number of nozzles per boom section (from l.h. to r.h. seen in driving direction)		5-4-6-4-5	5-5-5-5-5	6-6-6-6-6	5-4-6-4-5	5-5-5-5-5	6-6-6-6-6
Transport width	[mm]	2560	2560	2998	2560	2560	2998
Length	[mm]	640	640	640	680	680	680
Height of machine placed on the ground	[mm]	-	-	-	-	-	-
Nozzle height from/to	[mm]	480/1980	480/1980	480/1980	480/1980	480/1980	480/1980
Weight *	[kg]	172*	174*	198*	210**	212**	236**
Surplus amount	[l]	4,0	4,0	5,2	4,0	4,0	5,2

* net weight increased by 5 kg if the optional electric boom tilt adjustment is fitted.
net weight increased by 28 or 29 kg if the fully hydraulic boom control "I and II" is fitted..

** net weight increased by 7 kg if the optional electric boom tilting device is fitted
net weight increased by 24 kg if the optional Profi folding I is fitted

Required distance [m] for spraying the undiluted surplus liquid :

- for all working widths:	100 l/ha 45 m	250 l/ha 18 m
	150 l/ha 30 m	300 l/ha 15 m
	200 l/ha 23 m	400 l/ha 11 m

Example:

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

11.6.2 Super-S-boom, hydraulically foldable (including hydraulic height adjustment and swing compensation)

Arbeitsbreite	[m]	15	16	18	20	21	21
Number of boom sections		5	5	5	5	5	7
Number of nozzles per boom section (from l.h. to r.h. seen in driving direction)		6-6-6-6-6	4-8-8-8-4	6-8-8-8-6	8-8-8-8-8	9-8-8-8-9	6-6-6-6-6-6-6
Transport width	[mm]	2400	2400	2400	2400	2400	2400
Length	[mm]	900	900	900	900	900	900
Height of machine placed on the ground	[mm]	3200	3200	3200	3200	3200	3200
Nozzle height from/to	[mm]	500/2000	500/2000	500/2000	500/2000	500/2000	500/2000
weight *	[kg]	442	450	456	568	571	574
Surplus amount	[l]	6,2	7,2	7,6	7,9	7,9	9,2

* net weight increased by 7 kg if the optional electric boom tilt adjustment is fitted
net weight increased by 26 kg or 36 kg if the Profi-folding "I" or "II" is fitted.

Working width	[m]	24	24	27	27	28	28
Number of boom sections		5	7	7	9	7	9
Number of nozzles per boom section (from l.h. to r.h. seen in driving direction)		12-8-8-8-12	6-6-8-8-6-6	9-6-8-8-8-6-9	6-6-6-6-6-6-6-6	8-8-8-8-8-8-8	7-6-6-6-6-6-6-7
Transport width	[mm]	2400	2400	2400	2400	2400	2400
Length	[mm]	900	900	900	1000	1000	1000
Height of machine placed on the ground	[mm]	3200	3200	3200	3200	3200	3200
Nozzle height from/to	[mm]	500/2000	500/2000	500/2000	500/2000	500/2000	500/2000
Weight *	[kg]	588	588	624	627	625	628
Surplus amount	[l]	9,3	10,8	11,9	13,7	12,2	14,1

net weight increased by 7 kg if the optional electric boom tilt adjustment is fitted
net weight increased by 26 kg or 36 kg if the Profi-folding "I" or "II" is fitted.

Required distance in m for spraying the undiluted surplus liquid

- for all working widths: 100 l/ha 45 m 250 l/ha 18 m
150 l/ha 30 m 300 l/ha 15 m
200 l/ha 23 m 400 l/ha 11 m

Example:

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

11.7 Technical data filling sieve, filter

	Area, cm ²	Mesh width [mm]	Number of meshes	Type
Filling sieve	3750	1,00		
Filter insert in filter tap	660	0,6		UG 2200 Nova UG 3000 Nova UG 4500 Nova
Pressure filter insert Standard in all control units	216	0,35	50	„NG“ /“TG“
Nozzle filter bis "015" bis "04" bis "05"	5,07 5,07 5,00	0,15 0,35 0,50	100 50 24	
Urea filter (Special option)	760	1,00		

11.8 Details about noise level

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

Measuring implement: OPTAC SLM 5.

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

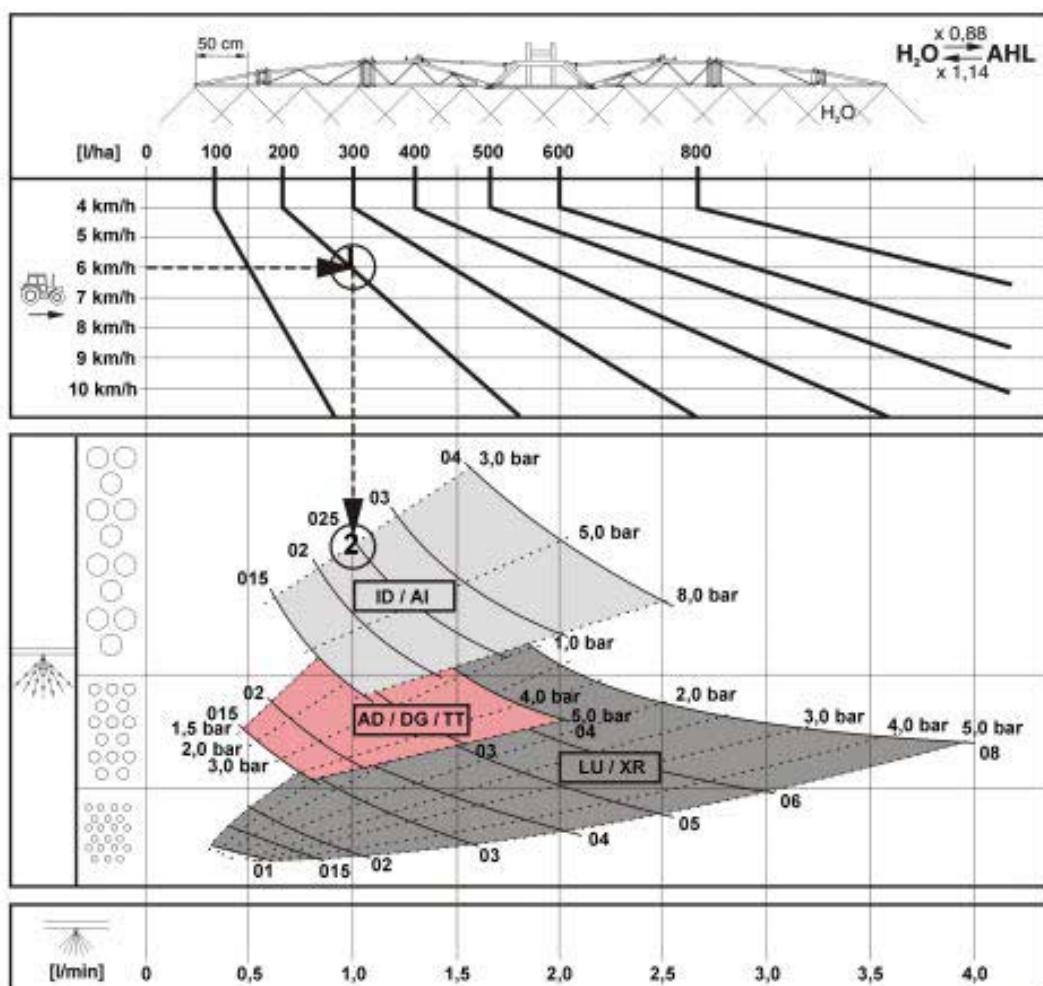


12. Spray rate calibration chart

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



All rates (l/ha) were determined with water. At AUS suspensions the corresponding figures should be multiplied by 0.88 and at NP-solutions by 0.85.



Select the optimum nozzle type, nozzle size and pressure range

- Determine the operation point (12.1/1) for the required spray rate [l/ha] and the intended forward speed [km/h].
- Using a perpendicular line (12.1/2) follow the position of operation point as this line crosses the characteristic diagram of the different nozzle types.

- Choose the optimum nozzle type, nozzle size and pressure range according to the desired atomising characteristics (fine-, middle- or coarse droplets).

Example :

necessary spray rate:	200 l/ha
intended forward speed:	6 km/h
atomising characteristics:	coarse droplets (little drifting)
selected:	AI / ID 025

l/ha												bar							
km/h												l/min							
												015	02	025	03	04	05	06	08
120	96											0,4	1,4						
150	120	109	100									0,5	2,2	1,2					
180	144	131	120	111	103							0,6	3,1	1,8	1,1				
210	168	153	140	129	120	112	105	99				0,7	4,2	2,4	1,5	1,1			
240	192	175	160	148	137	128	120	113	107			0,8	5,5	3,1	2,0	1,4			
270	216	196	180	166	154	144	135	127	120	108		0,9	7,0	4,0	2,5	1,8	1,0		
300	240	218	200	185	171	160	150	141	133	120	100	1,0	4,9	3,1	2,2	1,2			
330	264	240	220	203	189	176	165	155	147	132	110	1,1	5,9	3,7	2,7	1,5	1,0		
360	288	262	240	222	206	192	180	169	160	144	120	1,2	7,0	4,4	3,2	1,8	1,1		
390	312	284	260	240	223	208	195	184	173	156	130	1,3		5,2	3,7	2,1	1,3	1,0	
420	336	306	280	259	240	224	210	198	187	168	140	1,4		6,0	4,3	2,4	1,6	1,1	
450	360	327	300	277	257	240	225	212	200	180	150	1,5		6,9	5,0	2,8	1,8	1,2	
480	384	349	320	295	274	256	240	226	213	192	160	1,6		5,7	3,2	2,0	1,4		
510	408	371	340	314	291	272	255	240	227	204	170	1,7		6,4	3,6	2,3	1,6		
540	432	393	360	332	309	288	270	254	240	216	180	1,8		7,2	4,0	2,6	1,8	1,0	
570	456	415	380	351	326	304	285	268	253	228	190	1,9			4,5	2,9	2,0	1,1	
600	480	436	400	369	343	320	300	282	267	240	200	2,0			4,9	3,2	2,2	1,2	
630	504	458	420	388	360	336	315	297	280	252	210	2,1			5,4	3,5	2,4	1,4	
660	528	480	440	406	377	352	330	311	293	264	220	2,2			6,0	3,8	2,7	1,5	
690	552	502	460	425	394	368	345	325	307	276	230	2,3			6,5	4,2	2,9	1,6	
720	576	524	480	443	411	384	360	339	320	288	240	2,4			7,1	4,6	3,2	1,8	
750	600	546	500	462	429	400	375	353	333	300	250	2,5				5,0	3,4	1,9	
780	624	567	520	480	446	416	390	367	347	312	260	2,6				5,4	3,7	2,1	
810	648	589	540	499	463	432	405	381	360	324	270	2,7				5,8	4,0	2,3	
	672	611	560	517	480	448	420	395	373	336	280	2,8				6,2	4,3	2,4	
	696	633	580	535	497	464	435	409	387	348	290	2,9				6,7	4,6	2,6	
	720	655	600	554	514	480	450	424	400	360	300	3,0				7,1	5,0	2,8	
	744	676	620	572	531	496	465	438	413	372	310	3,1					3,0		
	768	698	640	591	549	512	480	452	427	384	320	3,2					3,2		
	792	720	660	609	566	528	495	466	440	396	330	3,3					3,4		
	816	742	680	628	583	544	510	480	453	408	340	3,4					3,6		
		764	700	646	600	560	525	494	467	420	350	3,5					3,8		
		786	720	665	617	576	540	508	480	432	360	3,6					4,0		
		807	740	683	634	592	555	522	493	444	370	3,7					4,3		
AHL H₂O		760	702	651	608	570	537	507	456	380	320	3,8					4,5		
x 1,14		780	720	669	624	585	551	520	468	390	320	3,9					4,7		
x 0,88		800	739	686	640	600	565	533	480	400	340	4,0					5,0		

Determine the spraying pressure

1. Find the column with the intended operational speed [km/h] in the spraying table (Fig. 12.2).
2. In this column find the line with the desired spray rate [l/ha]
3. In this line find the column for the nozzle size used and read off the necessary spraying pressure [bar] on the point of intersection.
4. Read the nozzle output flow necessary for calibrating the individual nozzle off the column nozzle output [l/min].

Example 1:

necessary spray rate : 200l/ha
intended forward speed : 6 km/h
atomising characteristics: coarse droplets (little drifting)

selected nozzle: AI 110-025 or ID 120-025

necessary spraying pressure: 3,1 bar

When calibrating the individual nozzle the nozzle output must be 1.0 l/min.

Example 2 (without illustration):

necessary spray rate: 300l/ha
intended forward speed: 8 km/h
atomising characteristics: fine droplets
selected nozzle: LU 120-05 or XR 110-05
necessary spraying pressure: 3,2 bar
When calibrating the individual nozzle the nozzle output must be 2,0 l/min.

12.2 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

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

Pressure (bar)	Nozzle output Water (l/min)	Nozzle output AUS (l/min)	Spray rate AUS (l/ha)								
			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

12.3 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 Spraying 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 (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	199	181	166	153	142	133	124	117	111
1,5	1,04	0,92	221	201	184	170	158	147	138	130	123
1,8	1,14	1,01	242	220	202	186	173	162	152	143	135
2,0	1,21	1,07	257	233	214	198	183	171	161	151	143

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

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

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

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

AMAZONE Spray rate table for metering disc 4916-80, (ø 2,0 mm) Spraying height above ground 75 cm for 8-hole nozzle

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

12.4 Spray rate table for drag hose equipment (permissible pressure range 1-4 bar)
AMAZONE Spray rate table for metering disc 4916-26, (ø 0,65 mm)

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

AMAZONE spray rate table with metering disc 4916-32, (ø 0,8 mm)

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

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

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

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

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

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

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

12.5 Conversion table for spraying liquid fertiliser Ammonium Nitrate / Urea suspension (AUS)

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

N in kg - AUS in litres- AUS in kg											
Ni kg	Sol.Ni l	Sol.Ni kg	Ni kg	Sol.Ni l	Sol.Ni kg	Ni kg	Sol.Ni l	Sol.Ni kg	Ni kg	Sol.Ni l	Sol.Ni 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			

12.6 Filling table for finishing off remaining field areas

Travelling distance [m]	Spray rate: 100 l/ha at working width [m]							
	10	12	15	16	18	20	21	24
10	1	1	2	2	2	2	2	2
20	2	2	3	3	4	4	4	5
30	3	4	5	5	5	6	6	7
40	4	5	6	6	7	8	8	10
50	5	6	8	8	9	10	11	12
60	6	7	9	10	11	12	13	14
70	7	8	11	11	13	14	15	17
80	8	10	12	13	14	16	17	19
90	9	11	14	14	16	18	19	22
100	10	12	15	16	18	20	21	24
200	20	24	30	32	36	40	42	48
300	30	36	45	48	54	60	63	72
400	40	48	60	64	72	80	84	96
500	50	60	75	80	90	100	105	120

For all other spray rates the refilling quantity has to be increased by a multiple.

Example:

Remaining left over distance: 100 m

Spray rate: 100 l/ha

Working width: 12 m

12 l would be the amount of spray cocktail needed to be refilled.

If the sprayer is equipped with a rinsing water tank which would allow to dilute the surplus amount inside the sprayer tank the undiluted surplus amount inside the sprayer boom would have to be deducted from the refilling amount of 12 litres. This surplus amount inside the boom is at a 12 m boom with 5-fold boom feed = 4 litres so that the refilling quantity would only be 8 litres.





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