

# Instruction manual

Mounted Sprayer

**AMAZONE**

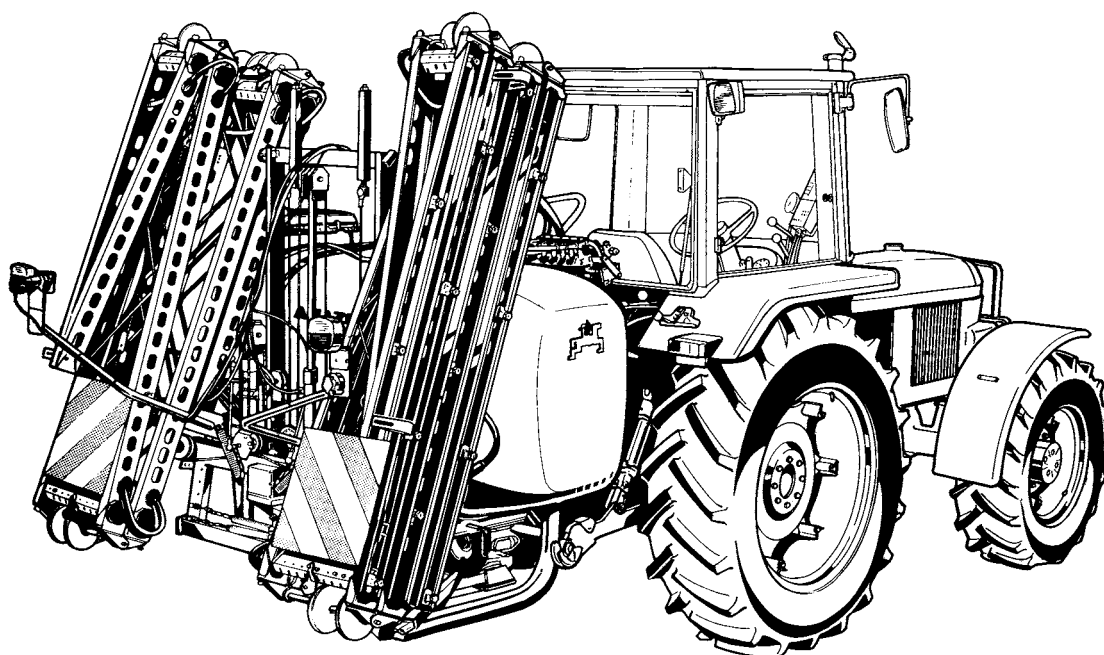
**UF**

**UF 600**

**UF 800**

**UF 1000**

**UF 1200**



MG 370  
SB 233.2 (GB) 04.03  
Printed in Germany



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



# Reading the instruction

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

---

*Leipzig-Plagwitz 1872. Rud. Sark.*

### Preface

Dear Customer, the mounted sprayer UF 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 UF.



**AMAZONEN-WERKE**

H. DREYER GmbH & Co. KG

Copyright 2003 AMAZONEN-WERKE  
H. DREYER GMBH & Co. KG  
D-49502 Hasbergen-Gaste  
Germany  
All rights reserved



|           |  |           |
|-----------|--|-----------|
| <b>1.</b> | <b>Details about the machine.....</b>  | <b>9</b>  |
| 1.1       | Range of application.....  | 9         |
| 1.1.1     | Designated use of the machine.....   | 9         |
| 1.1.2     | Designated equipment of the crop protective implement.....   | 9         |
| 1.2       | Attention when using specific crop protection agents.....  | 10        |
| 1.3       | Manufacturer.....  | 10        |
| 1.4       | Conformity declaration.....  | 10        |
| 1.5       | On requesting after sales service and parts.....   | 10        |
| 1.6       | Type plate.....  | 10        |
| <b>2.</b> | <b>Safety .....</b>  | <b>11</b> |
| 2.1       | Danger when not adhering to the safety advice.....   | 11        |
| 2.2       | Qualification of operator.....   | 11        |
| 2.3       | Identification of advice in this instruction manual.....   | 11        |
| 2.3.1     | General danger symbol.....   | 11        |
| 2.3.2     | Attention symbol.....  | 11        |
| 2.3.3     | Hint Symbol.....   | 11        |
| 2.4       | "Attention" pictographs and "advice" pictographs on the machine.....   | 11        |
| 2.5       | Safety conscious operation.....  | 14        |
| 2.6       | Safety advice for the operator.....  | 14        |
| 2.6.1     | General safety and accident prevention advice.....   | 14        |
| 2.6.2     | Means for traffic safety.....  | 15        |
| 2.6.3     | Tractor/trailed implements.....  | 15        |
| 2.6.4     | Operating with PTO shafts.....   | 15        |
| 2.6.5     | Hydraulic system.....  | 16        |
| 2.6.6     | Electric outfit.....   | 16        |
| 2.6.7     | General safety and accident prevention advice for maintenance, repair and cleaning.....  | 17        |
| 2.6.8     | Basic safety rules on crop protection equipment.....   | 17        |
| <b>3.</b> | <b>Product description .....</b>   | <b>18</b> |
| 3.1       | Liquid flow UF.....  | 19        |
| 3.2       | Control units.....   | 20        |
| 3.2.1     | Control units, manually actuated.....  | 20        |
| 3.2.1.1   | Control unit "B".....  | 20        |
| 3.2.2     | Control units, remote controlled via switch box.....   | 21        |
| 3.2.2.1   | Control unit "F" and "G", remote controlled via switch SKS 3 or 2, suitable for combinations with functions of the Super-S-boom..... | 22        |
| 3.3       | Switch boxes SKS.....  | 24        |
| 3.3.1     | Elektric switch boxes SKS 50 / 70.....   | 24        |
| 3.3.1.1   | Electric switch box SKS 50.....  | 24        |
| 3.3.1.2   | Switch box SKS 50 with integrated electric boom tilt control.....  | 25        |
| 3.3.1.3   | Switch box SKS 3 with Profi folding for Super-S- and Q-plus- booms.....  | 26        |
| 3.4       | AMACHECK II A.....   | 27        |
| 3.5       | Spraycontrol II A / AMATRON II A.....  | 27        |
| 3.6       | Filter equipment.....  | 28        |
| 3.6.1     | Filter tap.....  | 28        |
| 3.6.2     | Self cleaning the pressure filter of the.....  | 29        |
| 3.7       | Intensity hydraulic agitator.....  | 30        |
| 3.8       | Clean water tank with integrated Vario-control.....  | 31        |
| 3.9       | Pump outfit diaphragm pump 105, 115, 140, 160, 180 and 210 l/min.....  | 32        |
| 3.10      | Nozzles.....   | 32        |
| 3.10.1    | Triple nozzle body (special option).....   | 33        |

|           |   |           |
|-----------|---|-----------|
| <b>4.</b> | <b>On receipt of the machine.....</b>   | <b>34</b> |
| 4.1       | First fitting of the switch box.....  | 34        |
| 4.1.1     | Main console, bracket and top hat profile rail .....  | 34        |
| 4.1.2     | Battery link up cable.....  | 34        |
| 4.1.3     | Electric switch box.....  | 35        |
| 4.1.3.1   | On-board computer "AMACHECK II A", "SPRAYCONTROL II A" or "AMATRON II A" .....                        | 35        |
| 4.2       | PTO-shaft.....  | 36        |
| 4.2.1     | Initial fitting and matching up of the PTO shaft .....  | 36        |
| 4.2.2     | Adjustable mounting bracket for control units .....   | 37        |
| <b>5.</b> | <b>Hitching up or off.....</b>  | <b>38</b> |
| 5.1       | Hitching up .....   | 38        |
| 5.2       | Hitching off and parking the tractor mounted sprayer .....  | 38        |
| 5.3       | Traffic lights .....  | 39        |
| 5.4       | Electric switch box.....  | 39        |
| 5.5       | Hydraulic hoses.....  | 39        |
| 5.6       | "AMACHECK II A" .....   | 39        |
| 5.7       | Spraycontrol II A" or "AMATRON II A" .....  | 39        |
| <b>6.</b> | <b>En route to the field - Transport on public roads and ways .....</b>                               | <b>40</b> |
| 6.1       | Calculating the payload.....  | 41        |
| <b>7.</b> | <b>Putting into operation .....</b>   | <b>42</b> |
| 7.1       | Preparing the spray mixture .....   | 42        |
| 7.1.1     | Calculating the filling or refilling quantities .....   | 43        |
| 7.1.2     | Filling with water.....   | 45        |
| 7.1.3     | Inducting spray agents .....  | 47        |
| 7.2       | Setting the equal pressure control chest before the first operation and after any change of jets..... | 48        |
| 7.3       | Spraying crop protection liquid.....  | 49        |
| 7.3.1     | Hints for automatic metering .....  | 49        |
| 7.3.1.1   | Hints regarding the slip clutch of the .....  | 50        |
| 7.3.2     | Operational range of the control units .....  | 50        |
| 7.3.3     | Measures to avoid spray drift .....   | 50        |
| 7.3.4     | Setting the spray rate [l/ha] .....   | 51        |
| 7.3.4.1   | Determine the spraying pressure .....   | 51        |
| 7.3.4.2   | Set the spray pressure .....  | 52        |
| 7.4       | Calibrating .....   | 53        |
| 7.4.1     | Determining the liquid rate [l/ha] .....  | 53        |
| 7.4.1.1   | Determined by driving a measured distance.....  | 53        |
| 7.4.1.2   | Stationary calibrating from single nozzle output .....  | 54        |
| 7.5       | Determining the actual operation speed .....  | 55        |
| 7.6       | Practical operation with "AMACHECK II A" .....  | 56        |
| 7.7       | Practical operation with "Spraycontrol II A" or "AMATRON II A" .....                                  | 58        |
| 7.7.1     | Special hints for practical operation .....   | 58        |
| 7.7.1.1   | The liquid volume inside the tank is only approx. 100 l .....   | 59        |
| 7.8       | Surplus amounts .....   | 60        |
| 7.8.1     | Removal of residual amounts.....  | 60        |
| 7.9       | Cleaning .....  | 61        |
| 7.9.1     | Cleaning the sprayer with a filled tank .....   | 62        |
| 7.10      | Storing over winter .....   | 62        |



|           |  |           |
|-----------|--|-----------|
| <b>8.</b> | <b>Sprayer booms .....</b>   | <b>63</b> |
| 8.1       | P-boom in package folding technique, rigid booms, manually folded including manual winch for height adjustment .....                   | 63        |
| 8.1.1     | Manual winch adjustment .....  | 63        |
| 8.2       | Q-booms and Q-plus-booms .....   | 64        |
| 8.2.1     | Q-booms up to 8 m working width (incl. swing compensation and hydraulic height adjustment) .....                                       | 64        |
| 8.2.1.1   | Q-boom, manually folded .....  | 65        |
| 8.2.1.1.1 | Folding the boom in or out .....   | 66        |
| 8.2.1.1.2 | Operating with the booms folded asymmetrically .....   | 67        |
| 8.2.1.2   | Operating with the booms folded asymmetrically .....   | 68        |
| 8.2.1.2.1 | Hydraulically folding the Q-boom in or out .....   | 70        |
| 8.2.1.2.2 | Operating with the booms folded asymmetrically .....   | 72        |
| 8.2.1.3   | Locking and unlocking swing compensation into transport position .....   | 73        |
| 8.2.1.3.1 | Locking the boom into transport position .....   | 74        |
| 8.2.1.3.2 | Boom safety release at obstacles .....   | 74        |
| 8.2.1.3.3 | Settings on the folded out boom .....  | 74        |
| 8.2.1.4   | Electric boom tilting (Special option Q-booms) .....   | 76        |
| 8.2.1.4.1 | Alignment of sprayer boom via boom tilting .....   | 77        |
| 8.2.2     | Q-plus-boom up to 15 m working width, fully hydraulically folded (incl. boom swing compensation and hydraulic height adjustment) ..... | 78        |
| 8.2.2.1   | Folding the boom in or out .....   | 79        |
| 8.2.2.2   | Locking and unlocking sprayer boom into the transport position .....   | 80        |
| 8.2.2.3   | Unlocking and the swing compensation .....   | 81        |
| 8.2.2.4   | Operation with one side folded boom .....  | 82        |
| 8.2.2.5   | Boom safety release at obstacles .....   | 83        |
| 8.2.2.6   | Correcting the hydraulic throttle valves .....   | 84        |
| 8.2.2.7   | Settings on the folded out boom .....  | 85        |
| 8.2.2.8   | Electric boom tilting (special option) .....   | 86        |
| 8.2.3     | Q-plus-boom with Profi-folding I (Special option) .....  | 87        |
| 8.2.3.1   | Setting the system setting screw on the hydraulic valve block .....  | 87        |
| 8.2.3.2   | Folding the boom in or out .....   | 88        |
| 8.2.3.3   | Locking and unlocking sprayer boom into the transport position .....   | 90        |
| 8.2.3.4   | Locking and unlocking sprayer boom into the transport position .....   | 91        |
| 8.2.3.5   | Operation with asymmetrically folded out booms .....   | 92        |
| 8.2.3.6   | Correcting the hydraulic throttle valves .....   | 93        |
| 8.2.3.7   | Electro-hydraulic boom tilting .....   | 94        |
| 8.3       | Super-S-Boom 8 to 3 m working width .....  | 95        |
| 8.3.1     | Super S-Boom, fully hydraulically foldable (without Profi-Folding) .....   | 95        |
| 8.3.1.1   | Folding the boom in or out .....   | 96        |
| 8.3.1.2   | Locking and un sprayer boom into the transport position .....  | 97        |
| 8.3.1.3   | Unlocking and the swing compensation .....   | 97        |
| 8.3.1.4   | Operation with reduced working width .....   | 98        |
| 8.3.1.5   | Lifting and lowering speed of the height adjustment .....  | 98        |
| 8.3.1.6   | Boom folding speed .....   | 99        |
| 8.3.1.7   | Settings on the folded out boom .....  | 100       |
| 8.3.1.8   | Electric boom tilting (special option) .....   | 100       |
| 8.3.1.9   | Alignment of sprayer boom via boom tilting .....   | 101       |
| 8.3.2     | Super S-booms with Profi-Folding (0, I, II and III) (Special Optional Equipment) .....   | 102       |
| 8.3.2.1   | Setting the system setting screw on the hydraulic valve block .....  | 103       |
| 8.3.2.2   | Folding the boom in or out .....   | 104       |
| 8.3.2.3   | Locking and un sprayer boom into the transport position .....  | 106       |
| 8.3.2.4   | Unlocking and the swing compensation .....   | 107       |
| 8.3.2.5   | Electro-hydraulic boom tilting (only for Profi-folding) .....  | 108       |
| 8.3.2.6   | Operation with asymmetrically (one-sided) folded out booms up to 24 m .....  | 109       |
| 8.3.2.7   | Angling up and down the boom tips (only profi-folding "II" and "III") .....  | 110       |
| 8.3.2.8   | Correcting the hydraulic throttle valves .....   | 111       |

|            |   |            |
|------------|---|------------|
| <b>9.</b>  | <b>Maintenance, repair- and care-work .....</b>   | <b>114</b> |
| 9.1        | Check list for maintenance work .....   | 114        |
| 9.2        | Cleaning the filter tap .....   | 115        |
| 9.3        | Pump - Maintenance-, cleaning- and remedy in case of malfunction .....  | 116        |
| 9.3.1      | Checking oil level .....  | 116        |
| 9.3.2      | Oil change .....  | 116        |
| 9.3.3      | Cleaning .....  | 117        |
| 9.3.4      | Remedy in case of malfunction .....   | 117        |
| 9.3.4.1    | Adaptation of air pressure in the pressure reservoir to the spraying pressure .....                                   | 118        |
| 9.3.4.2    | Check and exchange suction- and pressure-side valves .....  | 120        |
| 9.4        | Switch box, AMACHECK II A, SPRAYCONTROL II A and AMATRON II A -<br>Maintenance and remedy in case of malfunction..... | 122        |
| 9.4.1      | Remedy in case of malfunction .....   | 122        |
| 9.4.1.1    | Continuing the field operation with a defective switch box .....  | 122        |
| 9.4.1.2    | Continuing the field operation with a defective electric outfit or defective "AMACHECK II A" .....                    | 123        |
| 9.4.1.3    | Continuing the field operation with a defective "SPRAYCONTROL II A" or "AMATRON II A" .....                           | 123        |
| 9.4.1.4    | Spray rate is not maintained .....  | 123        |
| 9.5        | Calibrating the flow meter .....  | 124        |
| 9.5.1      | Calibrating the flow meter with "AMATRON II A" .....  | 124        |
| 9.5.2      | Calibrating the flow meter with "AMATRON II A" .....  | 124        |
| 9.6        | Nozzles.....  | 125        |
| 9.6.1      | Fitting the nozzles .....   | 125        |
| 9.6.2      | Dismantling the diaphragm valve in case of dripping nozzles .....   | 125        |
| 9.7        | Adjusting the tank level indicator .....  | 125        |
| 9.8        | Hints for checking the field sprayer.....   | 126        |
| <b>10.</b> | <b>Special options .....</b>  | <b>127</b> |
| 10.1       | Options for the application of liquid fertilisers .....   | 127        |
| 10.1.1     | 3-ray nozzles .....   | 127        |
| 10.1.2     | 5- and 8-hole-nozzles.....  | 128        |
| 10.1.3     | Drag hose kit, cpl. (with metering washers No. 4916-39) for late top dressing with liquid fertiliser...               | 129        |
| 10.1.4     | Urea filter.....  | 129        |
| 10.2       | Suction hose for filling the tank .....   | 130        |
| 10.3       | Filling ports .....   | 131        |
| 10.3.1     | Filling port with connection to the water supply network.....   | 131        |
| 10.4       | Filling device and canister flushing .....  | 131        |
| 10.5       | Spray pistol with 0,9 m long spray tube, without hose.....  | 132        |
| 10.5.1     | Pressure hose up to 10 bar, e.g. for spray pistol .....   | 132        |
| 10.6       | Pressure filter insert .....  | 132        |
| 10.7       | Single tap for connecting additional users to the control unit .....  | 132        |
| 10.8       | Hand washing tank (20 litres).....  | 132        |
| 10.9       | Traffic options.....  | 133        |
| 10.9.1     | Traffic lights for Q- and Super-S-booms .....   | 133        |
| 10.10      | Foam marker .....   | 134        |
| 10.11      | Tank-Control.....   | 136        |
| 10.12      | Wide throw-nozzles .....  | 136        |
| 10.13      | Digital pressure display with liquid fertiliser proof pressure sensor on switch box SKS 50,<br>SKS 70 and SKS 90..... | 136        |
| 10.14      | Manometer ø 100 mm, liquid fertiliser proof .....   | 136        |
| 10.15      | Inside tank pre-cleaning device with rotating nozzles.....  | 137        |
| 10.16      | Exterior wash down equipment for outer cleaning of the sprayer.....   | 137        |
| 10.17      | Transport device .....  | 138        |
| 10.18      | Line filter inside the boom .....   | 138        |
| 10.19      | Permanent working width reduction on the Super-S-boom .....   | 138        |



|            |   |            |
|------------|---|------------|
| 10.20      | Induction bowl with canister flushing .....   | 139        |
| 10.20.1    | Inducting liquid agents.....  | 139        |
| 10.20.2    | Inducting powdered agents and urea .....  | 140        |
| 10.20.3    | Flushing of spray agent containers with the aid of the can wash nozzle .....                              | 140        |
| 10.21      | Induction bowl with power injector and canister flushing .....  | 141        |
| 10.21.1    | Inducting liquid agents.....  | 141        |
| 10.21.2    | Inducting powdered agents and urea .....  | 142        |
| 10.21.3    | Flushing of spray agent containers with the aid of the can wash nozzle .....                              | 143        |
| 10.21.4    | Filling via power injector and suction joint on the filter tap .....                                      | 143        |
| <b>11.</b> | <b>Technical data .....</b>   | <b>144</b> |
| 11.1       | Technical data basic implement, .....   | 144        |
| 11.2       | Technical data control units.....   | 145        |
| 11.3       | Technical data pump equipment .....   | 146        |
| 11.4       | Technical data sprayer boom .....   | 147        |
| 11.4.1     | P-boom, manually folded and rigid.....  | 147        |
| 11.4.2     | Q-boom (incl. hydraulic height adjustment and swing compensation) and Q-plus-boom.....                    | 148        |
| 11.4.3     | Super-S-boom, hydraulically foldable (including hydraulic height adjustment and swing compensation) ..... | 149        |
| 11.5       | Technical data filling sieve, filter.....   | 150        |
| 11.6       | Details about noise level .....   | 150        |
| <b>12.</b> | <b>Spray rate calibration chart.....</b>  | <b>151</b> |
| 12.1       | Spray rate chart for flat fan-, anti drift- and injector-nozzles, spraying height 50 cm.....              | 151        |
| 12.2       | Spray rate table for 12-ray nozzles, Spraying height above ground 2 cm .....                              | 154        |
| 12.3       | Spray rate table for 5- and 8-hole nozzles (permissible pressure range 1-2 bar).....                      | 155        |
| 12.4       | Spray rate table for drag hose equipment (permissible pressure range 1-4 bar) .....                       | 157        |
| 12.5       | Conversion table for spraying liquid fertiliser Ammonium Nitrate / Urea suspension (AUS) .....            | 159        |
| 12.6       | Filling table for finishing off remaining field areas .....   | 160        |

## 1. Details about the machine

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

### 1.1 Range of application

The mounted sprayer UF 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.

#### 1.1.2 Designated equipment of the crop protective implement

The designated equipment of the mounted sprayer UF results from the combination of:

- ≡ Basic implement,
- ≡ Control units,
- ≡ Pump equipment,
- ≡ Sprayer boom and
- ≡ Special options.

#### 1.1.1 Designated use of the machine

The mounted sprayer UF is for exclusive operation in agriculture only.

**Operating on slopes is possible under following conditions:**

##### ≡ When operating across slopes

maximum angle of machine in the direction of travel to the left: 20 %

maximum angle of machine in the direction of travel to the right: 20 %

##### ≡ When operating up and down hill

max. angle of machine when operating uphill  
20 %

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

- ≡ relevant accident prevention advice,
- ≡ all applicable generally accepted safety-, working-, medical- and road-traffic regulations and
- ≡ all safety advice on the machine's decals.



## 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 Trammat, 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 mounted sprayer UF fulfils the requirements of the EC guide-line Machine 98/37/EC.

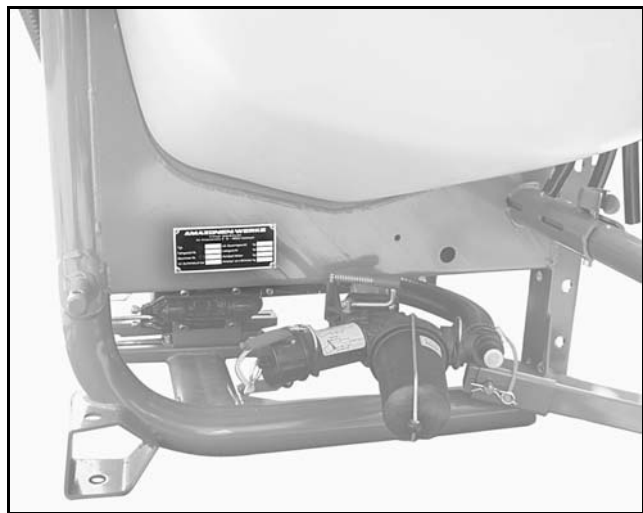
## 1.5 On requesting after sales service and parts

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

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

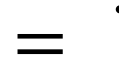
#### 2.3.1 General danger symbol

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).



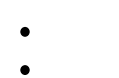
#### 2.3.2 Attention symbol

Attention symbols which may cause dangers to the machine and it's 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. 1, Fig. 2 and Fig. 3 show the fixing points of attention signs and advice signs. Please refer to the following pages for relevant explanations.

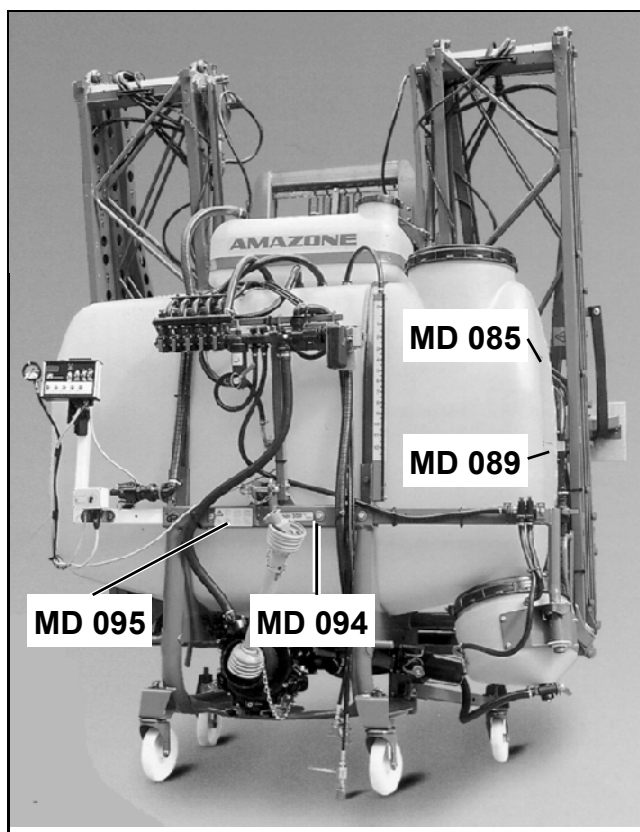


Fig. 1



Fig. 2

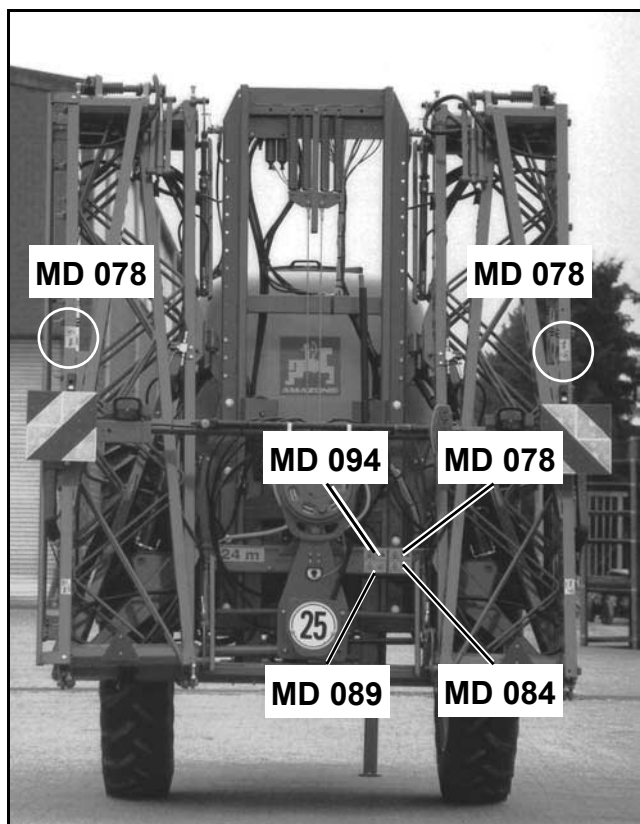
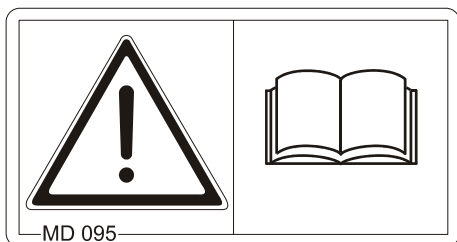


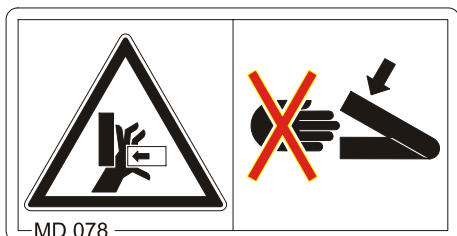
Fig. 3



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.

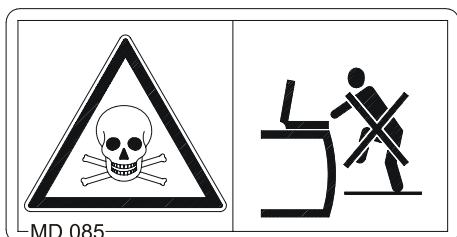


Picture No.: **MD 084**

**Explanation:**

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

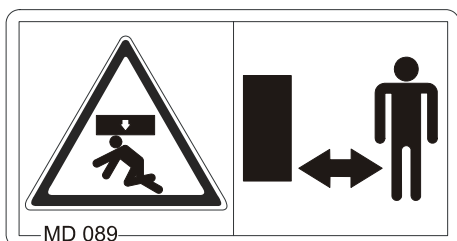
Advise people to leave the danger area.



Picture No.: **MD 085**

**Explanation:**

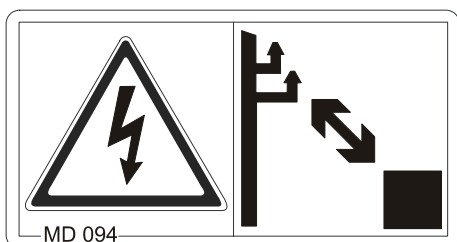
Never climb inside the tank.



Picture No.: **MD 089**

**Explanation:**

Never work under a lifted, unsecured load.



Picture No.: **MD 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 1.1 and VSG 3.1.

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

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

## 2.6 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. Therefore always ensure a sufficient steering 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 trailed 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 trailed 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.

### 2.6.5 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, 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.

### 2.6.6 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.

## 2.6.7 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.

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.

•For safe guarding men, animal and environment, crop sprayers must never be filled from open sources.

•From the public water net work crop sprayers may only be filled in free fall.

## 2.6.8 Basic safety rules on crop protection equipment

1. Adhere to the recommendations of the crop agent manufacturer.
  - Protective clothing.
  - Warning advice.
  - Metering-, using- and cleaning advice!
2. **Observe advice given in your national crop protective agent law!**
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 spray agent tank should only be started after thorough cleaning and by wearing a protective breathing mask. For safety reasons a second person should watch the work from outside the tank.
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.



### 3. Product description

The mounted sprayer UF has been designed for fitting to the rear three point hydraulics of the tractor.

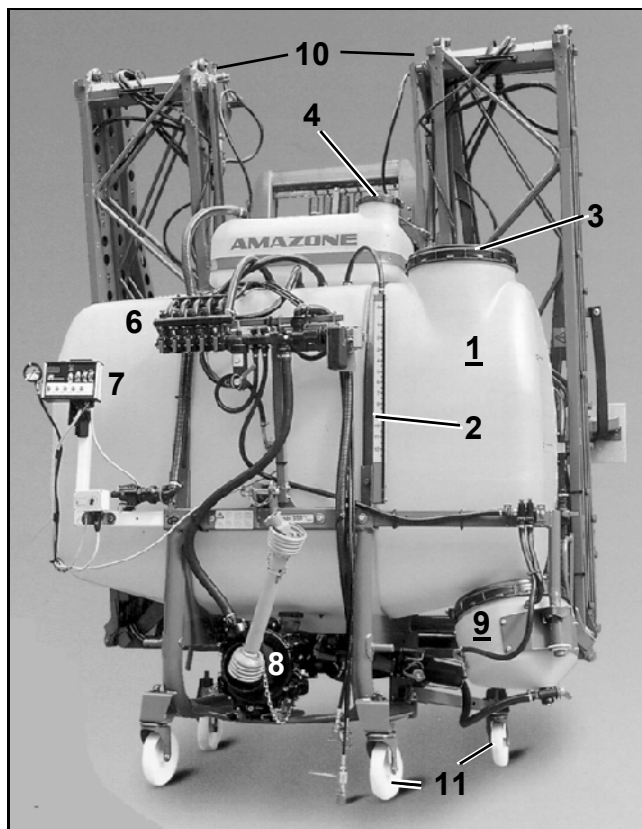


Fig. 4



Fig. 5

#### Fig. 4/... or Fig. 5/...

- 1 - Tank with intensive hydraulic agitation system
- 2 - Tank level indicator  
Tank volume [l] = indicated scale figure x 100
- 3 - Tank access lid
- 4 - Filling and opening of the fresh water flushing tank
- 5 - Vario-control for sprayer rinsing and diluting function
- 6 - Electrically remote controlled control unit
- 7 - Electric remote control
- 8 - Pump equipment
- 9 - Swivelable induction bowl with canister flushing nozzle (special option)
- 10 - Super-S-booms
- 11 - Transport device

### 3.1 Liquid flow UF

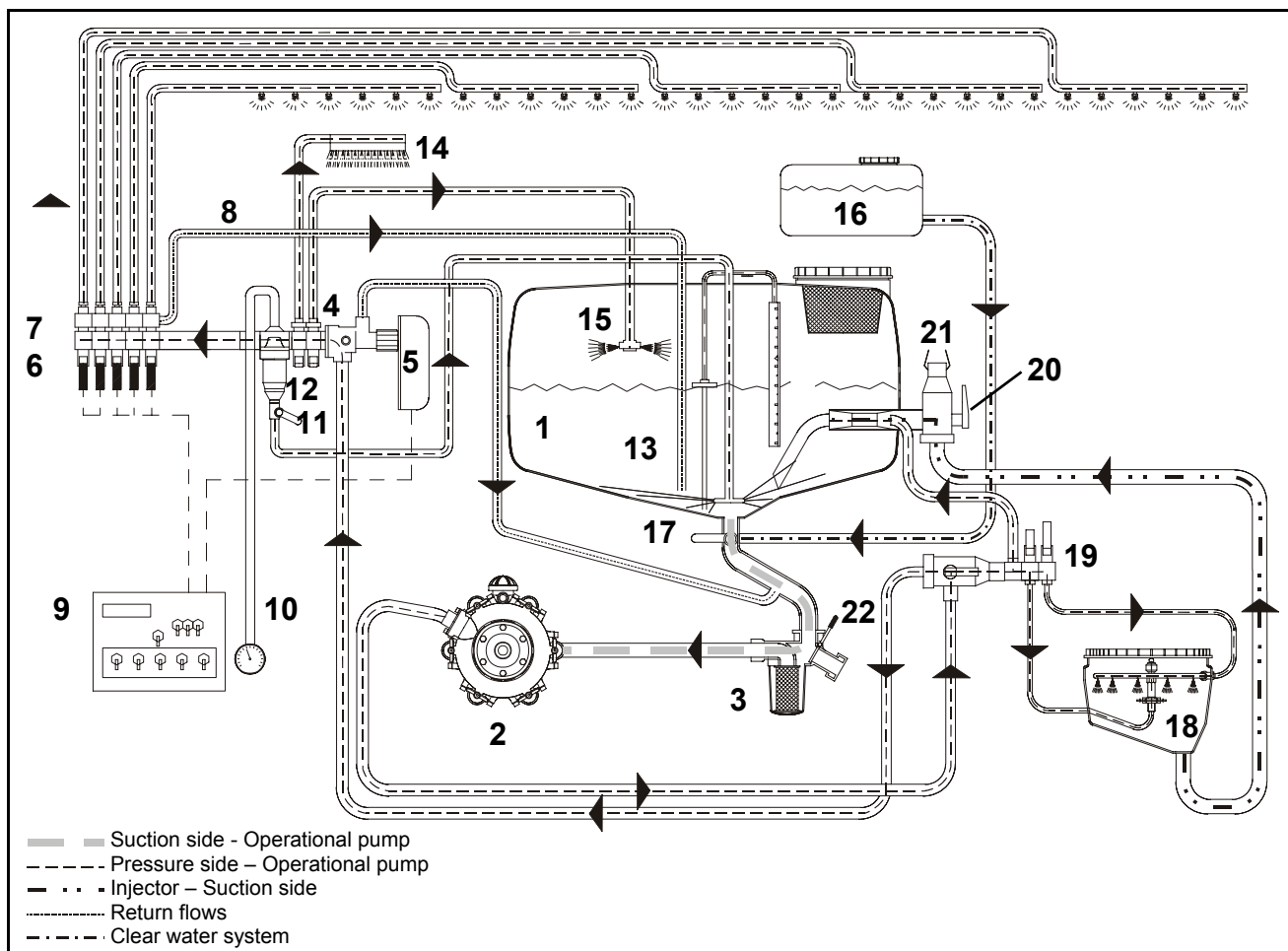


Fig. 6

Fig. 6/...

- |  |   |
|--|---|
| 1 - Spray agent tank                                   | 15 - Internal tank wash with rotating nozzles   |
| 2 - Pump   | 16 - Fresh water flushing tank  |
| 3 - filter tap   | 17 - Vario-control for sprayer rinsing and diluting function (spraying, cleaning, diluting) |
| 4 - Automatic metering                                 | 18 - Induction bowl (special option)  |
| 5 - In cab controlled electric flow rate setting motor | 19 - 3-way reversing tap (spraying, injecting)  |
| 6 - Part width shut off valves                         | 20 - 3-way reversing tap (spraying, sucking via suction hose, inducting via induction bowl) |
| 7 - Equal pressure control                             | 21 - Filling point for the suction hose   |
| 8 - Pressure relief valve                              | 22 - Port for suction hose  |
| 9 - Electric switch box                                |   |
| 10 - Spray pressure gauge                              |   |
| 11 - Step tap for agitator                             |   |
| 12 - Self cleaning pressure filter                     |   |
| 13 - Intensity hydraulic agitator                      |   |
| 14 - Exterior wash down kit (special option)           |   |



### 3.2 Control units

#### 3.2.1 Control units, manually actuated

##### 3.2.1.1 Control unit "B"

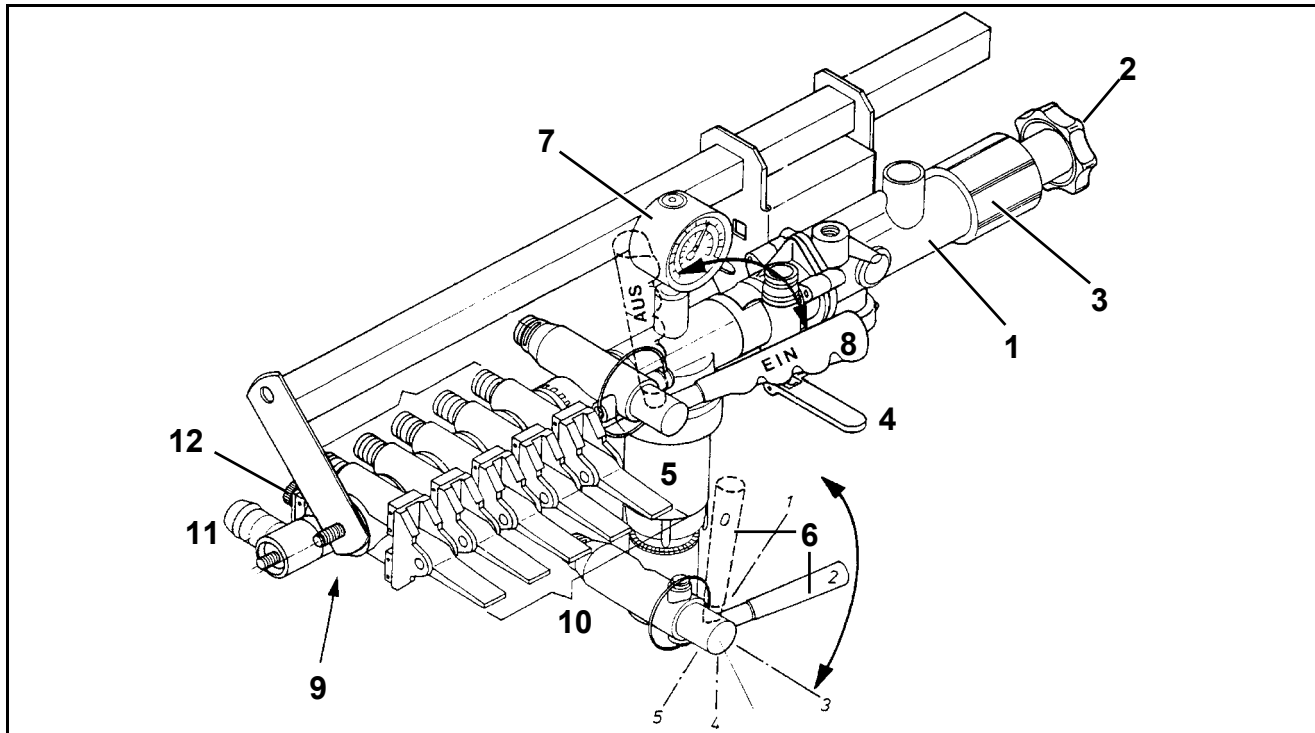


Fig. 7

Fig. 7/...

- |  |  |
|--|--|
| <p>1 - Volume control for a constant spray rate [l/ha] within one tractor gear.</p> <p>2 - Star knob for setting and adjusting the spray pressure. Turning the star knob clockwise the spray pressure is increased.</p> <p>3 - Knurled screw for setting the relief valve pressure in the automatic metering valve (please refer to chapter: Setting the equal pressure controls prior to first operation and after every nozzle change).</p> <p>4 - Accessory single tap for optional equipment.</p> <p>5 - Self cleaning pressure filter.</p> <p>6 - Step tap for hydraulic agitator. The drawing shows the corresponding positions of the lever for the agitation steps "0, 1, 2, 3, 4 and 5".</p> <p>7 - Liquid fertiliser proof spray pressure gauge.</p> <p>8 - Central tap for the control of liquid flow to the booms:</p> <p>Position "ON" ("EIN") - liquid supply to the booms is switched on.</p> <p>Position "OFF" ("AUS") - liquid supply to the booms is switched off.</p> | <p>9 - Equal pressure control.</p> <p>10 - Equal pressure part width shut off valves for switching on and off individual part width shut offs. When switching off one boom section the volume of spray agent that was being supplied to this section is returned via the equal pressure return flow into the tank without increasing the spraying pressure.</p> <p>11 - Equal pressure valve chest return flow.</p> <p>12 - Knurled thumb knobs for setting the equal pressure valves.</p> |
|--|--|

**•Set up the equal pressure control units via the setting screw before the first operation and after every change of nozzles.**

### 3.2.2 Control units, remote controlled via switch box

|                       |  |
|-----------------------|--|
| Electric switch box   | SKS 50/70<br>Functions for Super-S-booms |
|                       | Control units                            |
| w.o. control computer | F  |
| with control computer | G  |

### 3.2.2.1 Control unit "F" and "G", remote controlled via switch SKS 3 or 2, suitable for combinations with functions of the Super-S-boom

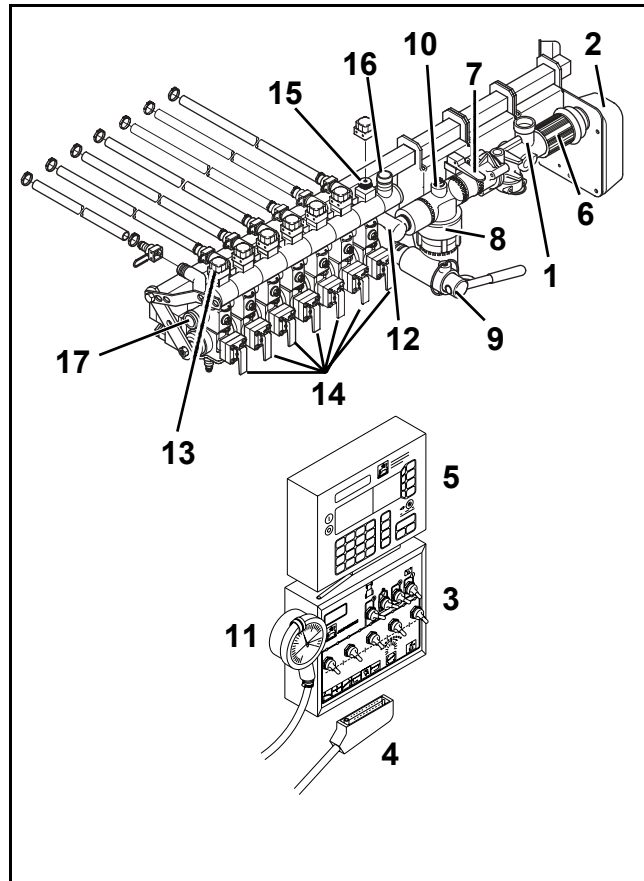
The control unit "G" is suitable for the use with the control computers AMACHECK II A, SPRAYCONTROL II A and AMATRON II A.

**Fig. 8/... or Fig. 9/...**

- 1 - Volume control for a constant spray rate [l/ha] within one tractor gear.
- 2 - Electric motor for adjusting the spray pressure and hence the spray rate via the switch box.
- 3 - Switch box SKS 50/70.
- 4 - Implement supply cable with implement plug for the switch box.
- 5 - Control computer AMATRON II A or AMACHECK II A or SPRAYCONTROL II A (only for control unit "G").
- 6 - Setting nut for setting the relief valve pressure in the volume control (please refer to chapter: "Setting the equal pressure gauge before the first operation and at every nozzle change).
- 7 - Single tap for water supply to the tank rinsing nozzles.
- 8 - Self cleaning pressure filter
- 9 - Step tap for hydraulic agitator.
- 10 - Pressure connection for the spray pressure gauge.
- 11 - Liquid fertiliser proof spray pressure gauge.
- 12 - 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") (only for control unit "G").

== **•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.**

- 13 - Equal pressure control.
- 14 - Solenoid valves for part width shut off. The individual boom sections are switched on and off by the solenoid valves. The solenoid valves can be actuated either individually via the part width shut off switches or simultaneously via master boom switch on the switch box.



**Fig. 8**

15 - Knurled thumb knobs for setting the equal pressure valves.

**•Set up the equal pressure control units via the setting screw before the first operation and after every change of nozzles.**

16 - Equal pressure valve chest return flow. When switching off one boom section the volume of spray agent that was being supplied to this section is returned via the equal pressure return flow into the tank without increasing the spraying pressure.

17 - Part width shut off return flow. Serves for the pressure relief in the equal pressure valve chest. When the sprayer boom is switched off the remaining pressure in the spray line decays via this return flow and thus, in conjunction with the diaphragm valves, ensures a drip-free nozzle shut off.

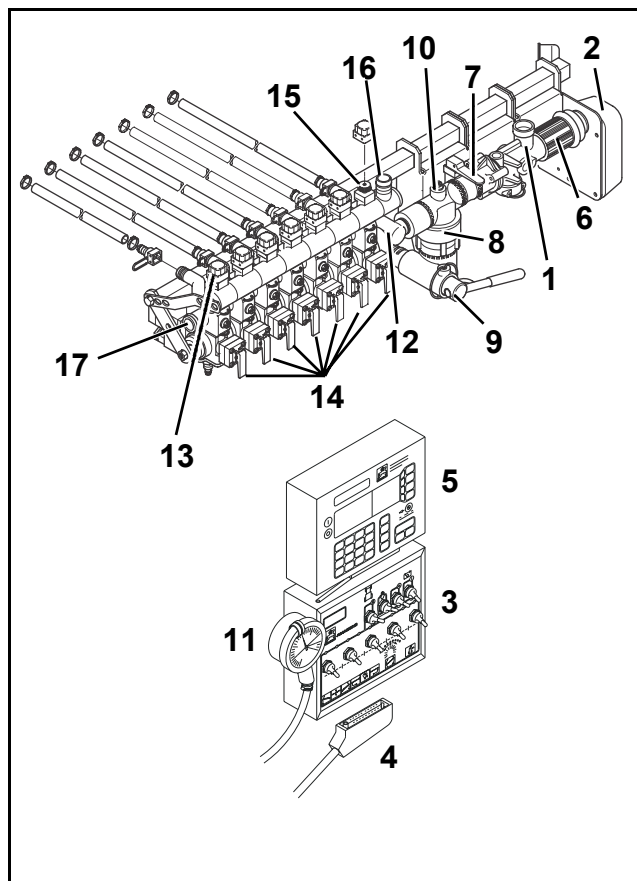


Fig. 9



### 3.3 Switch boxes SKS

#### 3.3.1 Elektric switch boxes SKS 50 / 70

##### 3.3.1.1 Electric switch box SKS 50

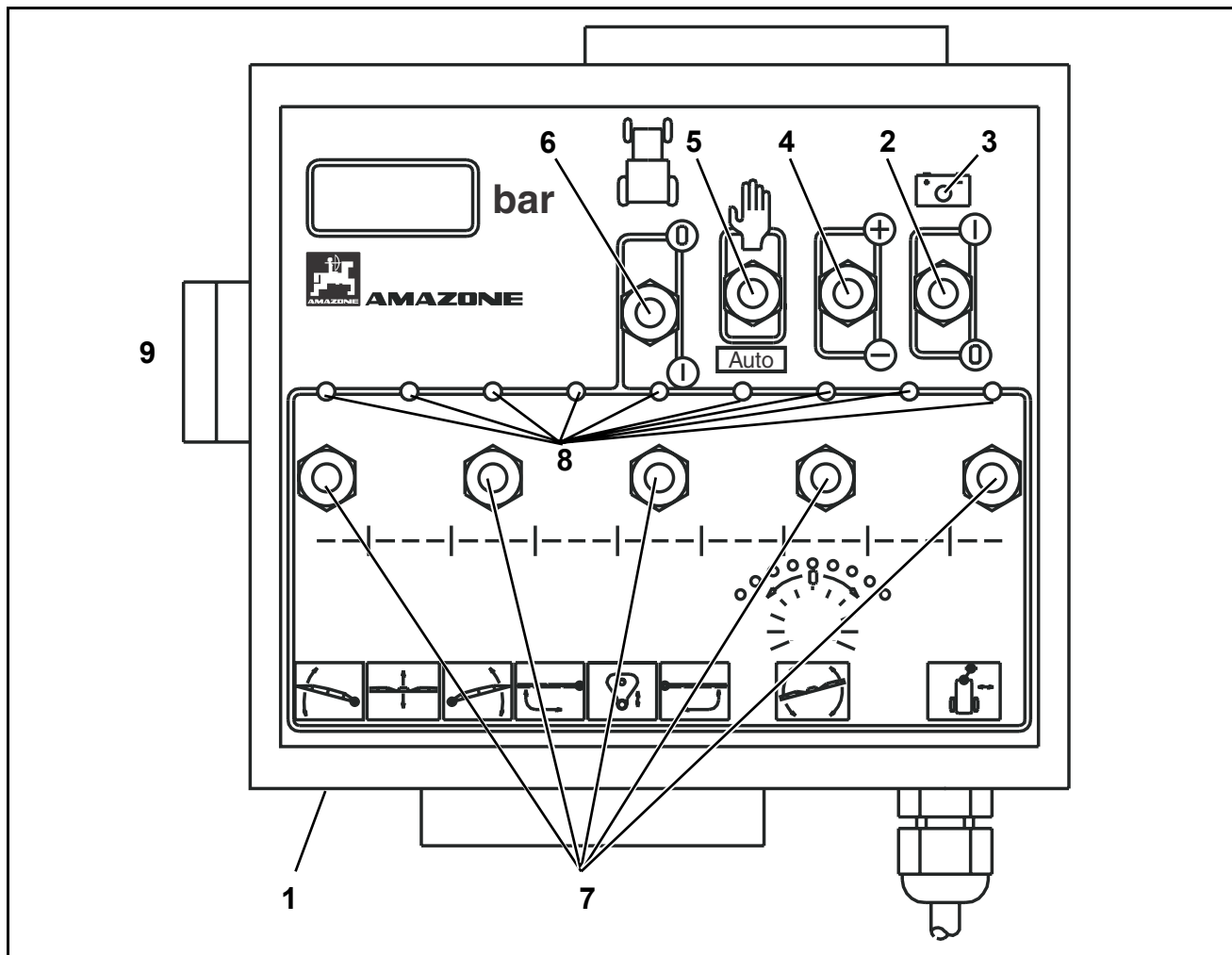


Fig. 10

Fig. 10/...

- 1 - Switch box SKS 50.
- 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 -  $\pm$  key for increasing or decreasing the spray pressure.
- 5 - 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.**

- **For first fitting the switch box, please refer to chapter "Machine installation".**

- 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 - Holder for fertiliser proof pressure gauge.

## 3.3.1.2 Switch box SKS 50 with integrated electric boom tilt control

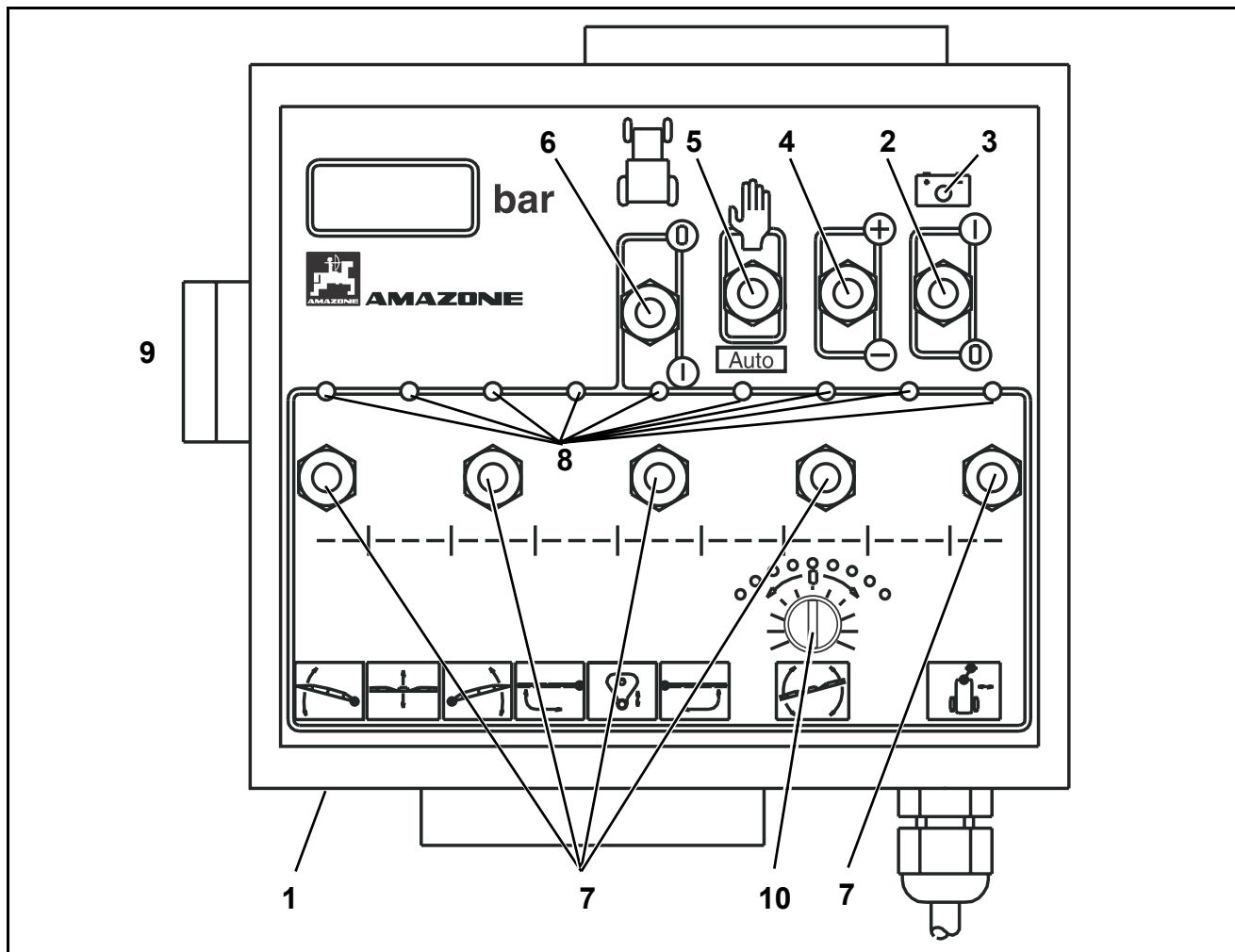


Fig. 11

Fig. 11/...

- 1 - Switch box SKS 50 N.
- 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 -  $\pm$  key for increasing or decreasing the spray pressure.
- 5 - 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.**

- 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 - Holder for fertiliser proof pressure gauge.
- 10 - Electric boom tilt control with zero position.



### 3.3.1.3 Switch box SKS 50 with Profi folding for Super-S- and Q-plus- booms

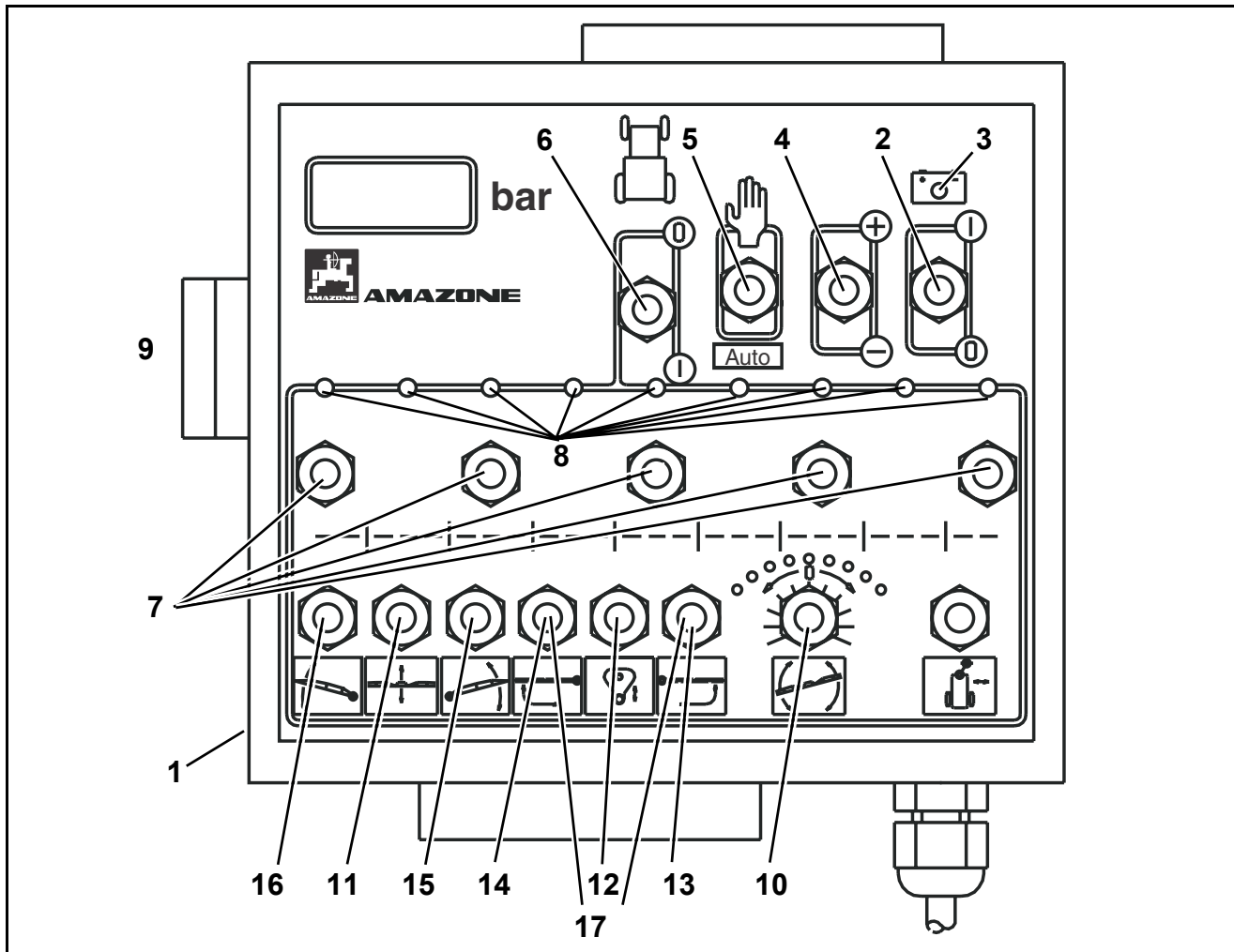


Fig. 12

Fig. 12/...

- |  |  |
|--|--|
| <p>1 - Switch box SKS 50 HAD.</p> <p>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).</p> <p>3 - Indicator lamp (red).</p> <p>4 - <math>\pm</math> key for increasing or decreasing the spray pressure.</p> <p>5 - Programming switch "Auto/Manual operation".</p> <p><b>•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.</b></p> <p>6 - Central sprayer boom switching on and off.</p> <p>7 - Part width shut off switch used for switching on and off individual boom sections.</p> <p>8 - Indicator lights (green). When the part width section has been switched on the relevant indicator lamp lights up.</p> | <p>9 - Holder for fertiliser proof pressure gauge.</p> <p>10 - Electro-hydraulic boom tilt adjustment.</p> <p>11 - Hydraulic boom height adjustment.</p> <p>12 - Locking and unlocking the boom swing compensation.</p> <p>13 - Folding in and out the right hand boom (only Profi I/II).</p> <p>14 - Folding in and out the left hand boom (only Profi I/II).</p> <p>15 - Boom tip lift and lower on right hand boom (only Profi-folding "II" and "III").</p> <p>16 - Boom tip lift and lower on left hand boom (only Profi-folding "II" and "III").</p> <p>17 - Folding in and out both right and left hand boom (only Profi 0/III).</p> |
|--|--|

### 3.4 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 [km/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 [h].
- Displays the work rate in [ha/h].
- Displays the spray rate in [l/min].
- Matches the feed to boom part width sections.
- Monitors the rev. speed.

### 3.5 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].
- Registers the applied amount and the applied total amount in litres.
- 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].

### 3.6 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.

#### 3.6.1 Filter tap

Fig. 13/...

- 1 - Filter tap for filtering the spray agent from the induction bowl / for filtering the water when filling the tank with the aid of the suction hose.
- 2 - Connection inlet for the suction hose (optional equipment).
- 3 - Operating lever for position "Spraying" and "Filling".
- 4 - Decal indicating the available operating lever positions "Spraying" and "Filling".

The filter tap is designed as a two-way tap. It allows choice of the positions **"Spraying"** and **"Filling"**.

Position **"Spraying"**: Operating lever in position (Fig. 13/3). Spray agent is sucked out of the induction tank.

Position **"Filling"**: Operating lever in position (Fig. 14/1). Fills the main tank with water via the suction hose (optional equipment).

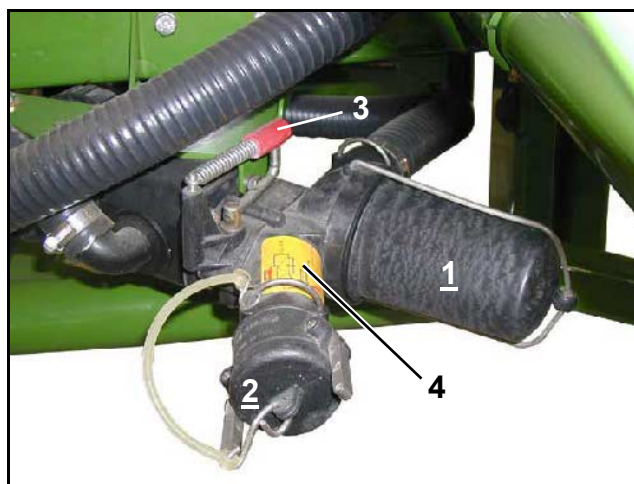


Fig. 13

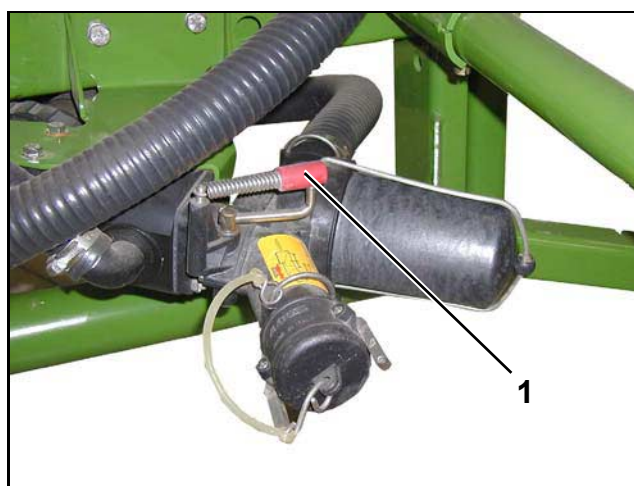


Fig. 14

### 3.6.2 Self cleaning the pressure filter of the

The pressure filter (Fig. 15/ 1) has a larger number of meshes per inch than the suction filter insert in the filter tap. This way the undesirable large particles that still remain in the spray liquid are filtered off protecting the nozzle filters in the spray nozzles.

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 0.3 mm and 65 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.

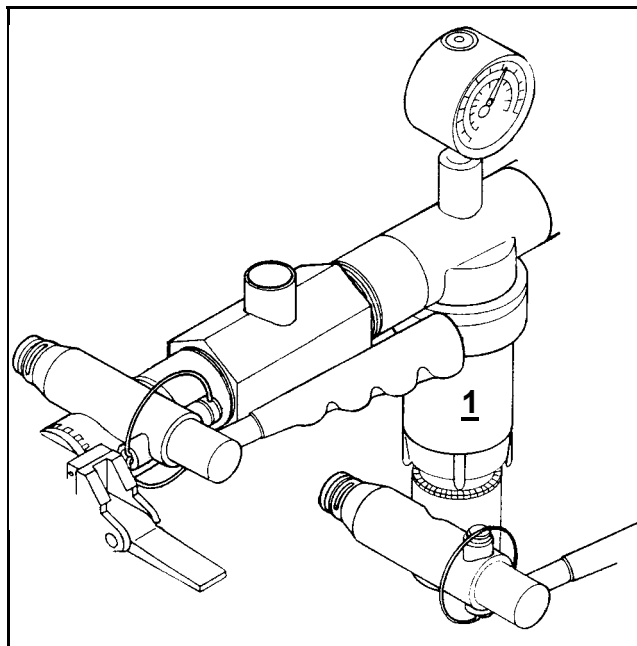


Fig. 15

### 3.7 Intensity hydraulic agitator

Fig. 16/...

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. If the 105 l pump is fitted, always set agitation position "1".

== **•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.**

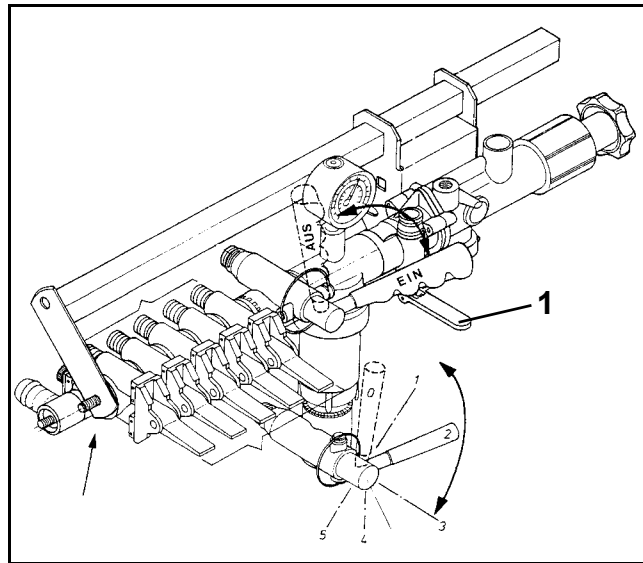


Fig. 16

#### Travelling to the field with agitator engaged:

- ## Switch off the boom feed.
- ## Engage the PTO shaft.
- ## Adjust the required agitation intensity.

== **•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.**

### 3.8 Clean water tank with integrated Vario-control

The clean 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 tank.

Fig. 17/...

- 1 - Filling and opening of the fresh water flushing tank
- 2 - Venting valve.
- 3 - Tap for draining water off the flushing water tank (e.g. for washing your hands, canister flushing, etc.).
- 4 - Flushing water outlet.
- 5 - Additional drain off hose detachably fitted to the side of the spray agent tank.

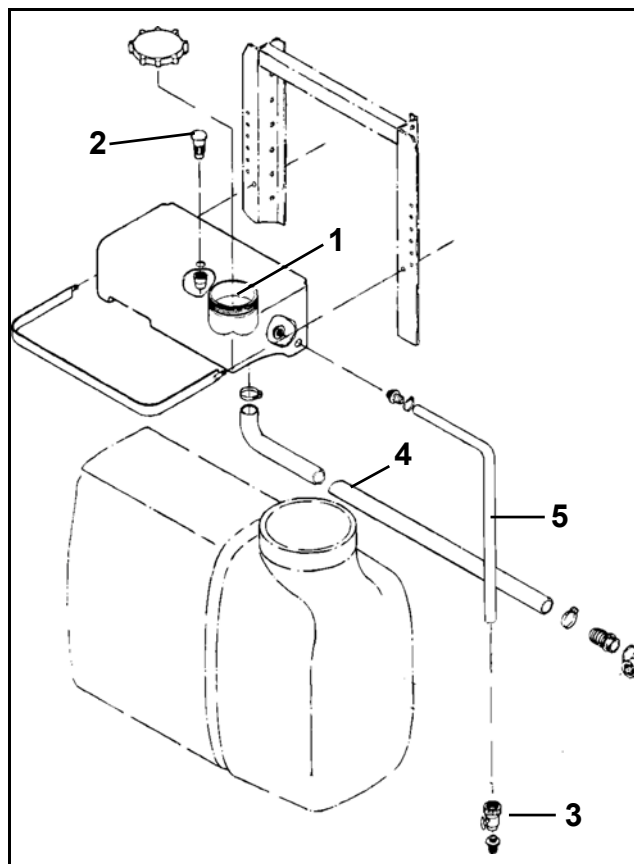


Fig. 17

**Vario-control (Fig. 18/1) in position "spraying":** For filling the flushing water tank via the charging opening and for spraying operation.

**Vario-control (Fig. 18/1) in position "flushing":** For cleaning suction- and pressure hose, filter tap, pump, control unit and spray tubes. The clean water transported in the flushing water tank is sucked into the spraying system.

≡ . Before flushing shut off the step tap of the agitator.

**Vario-control (Fig. 18/1) in position "diluting":** For diluting the residual amount still left inside the spray agent tank after concluding the spraying operation.



Fig. 18

### 3.9 Pump outfit diaphragm pump 105, 115, 140, 160, 180 and 210 l/min

The pumps (Fig. 19) are piston diaphragm pumps with a capacity of each 140, 160, 180, 210, 180 and 210 l/min. All components which come into contact with spray agents have been made from injection moulded plastic coated aluminium or entirely from plastic. As far as we are aware these pumps are suitable for the application of all commercially available crop protective agents and liquid fertiliser.



Fig. 19

### 3.10 Nozzles

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

Fig. 20/...

- 1 - Nozzle body with locking bayonet cap (standard execution).
- 2 - Diaphragm.  
Anti-drip 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.

- From time to time check seat of tapered slide. For this push the slide into the nozzle body as far as it is possible with slight pressure of your thumb. By no means puh the slide into the nozzle body until its stop when it is new.

- 6 - Nozzle filter; standard 24 meshes, fitted into the nozzle body from below.
- 7 - Rubber seal.
- 8 - Nozzle; standard LU-K 120-'05'.
- 9 - Bayonet cap coloured; standard red.
- 10 - Bayonet connector.
- 11 - Spring loaded plunger housing.

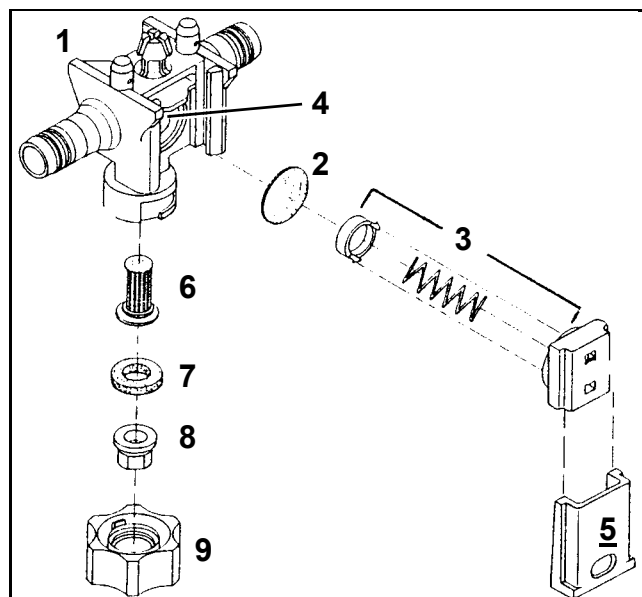


Fig. 20

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

### 3.10.1 Triple nozzle body (special option)

When using a variety of nozzles we recommend the use of triple or three way nozzle bodies (Fig. 21). In the triple nozzle body the vertically positioned nozzle is fed. By swivelling the triple nozzle body to the right or left hand side or by turning counter clockwise another nozzle is brought into the operational position. By switching to the intermediate position the triple or three way 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. 21/...

- 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.

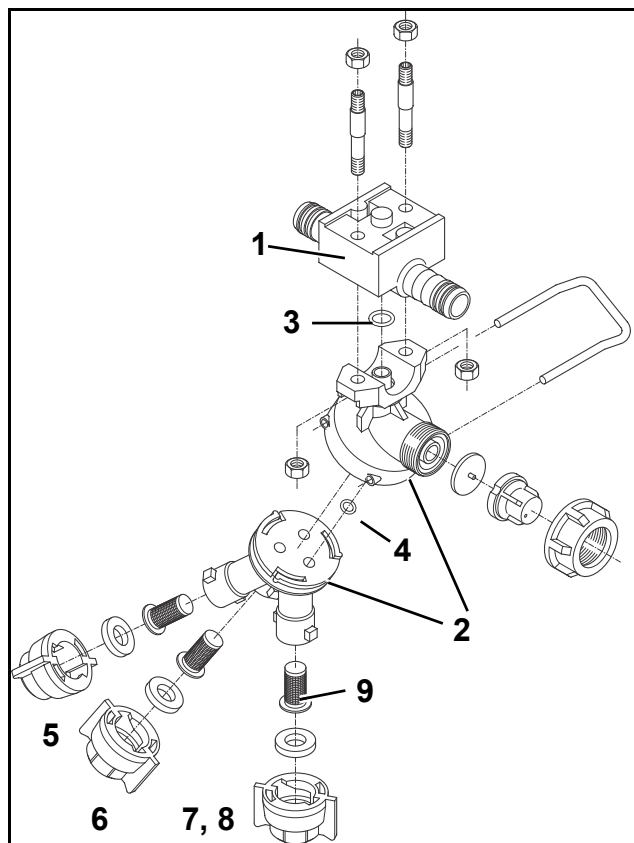


Fig. 21

## 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 (Fig. 22/1) for retaining the bracket (Fig. 22/2) with top hat profile rail (Fig. 22/3) and battery cable (Fig. 22/4) inside the tractor cab so that the switch box (Fig. 22/5) 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 (Fig. 22/4) directly to the tractor battery (12 V) and install cable.
- Connect the 16A fuse holder (Fig. 22/6) 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 (Fig. 22/7) to console (Fig. 22/1).

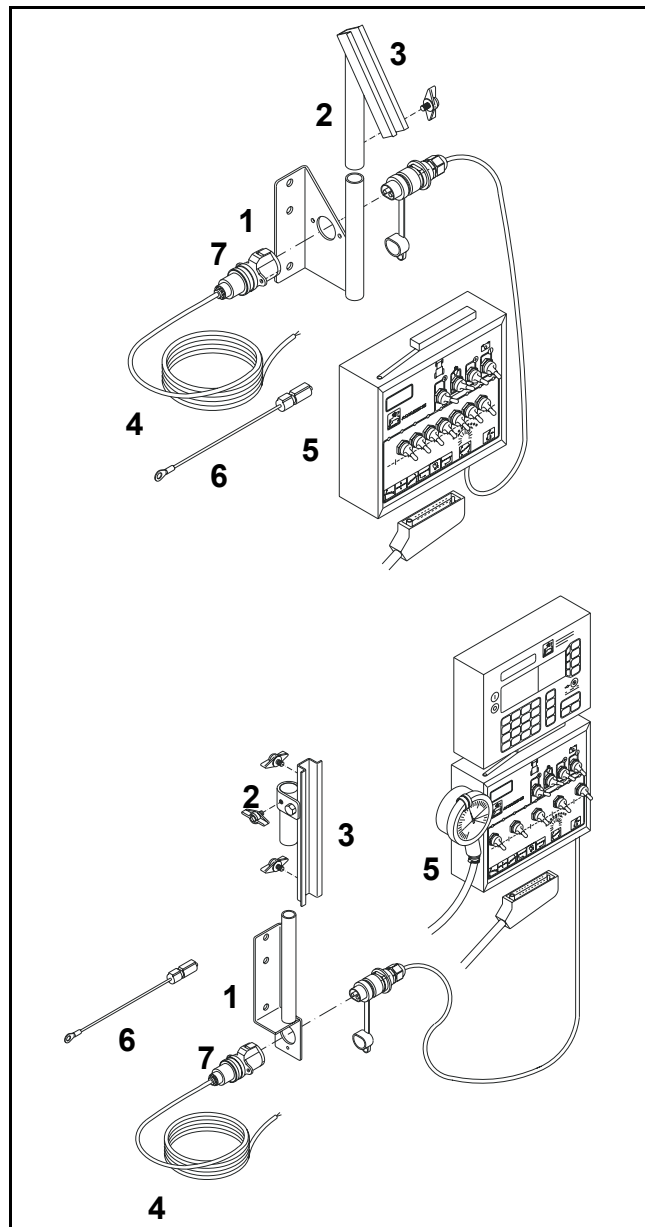


Fig. 22

## 4.1.3 Electric switch box

- Slide the SKS-switch box (Fig. 23/1) into the guide key way of the hat profile rail (Fig. 23/2) and tighten the clamping screws.

• **The on/off switch (Fig. 23/3) for the electric power supply of the switch box should be in position "0" (OFF/AUS) before connecting to the battery.**

- Link up the power supply cable (Fig. 23/4) with the socket (Fig. 23/5) of the battery cable.
- Connect the implement plug (Fig. 23/6) to the implement socket of the control chest (only switch box SKS 90/ 70/ 90).
- Fit the pressure gauge to switch box (only switch box SKS 50/ 70/ 90).

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

- Mount the relevant on-board computer (Fig. 23/7) 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.**

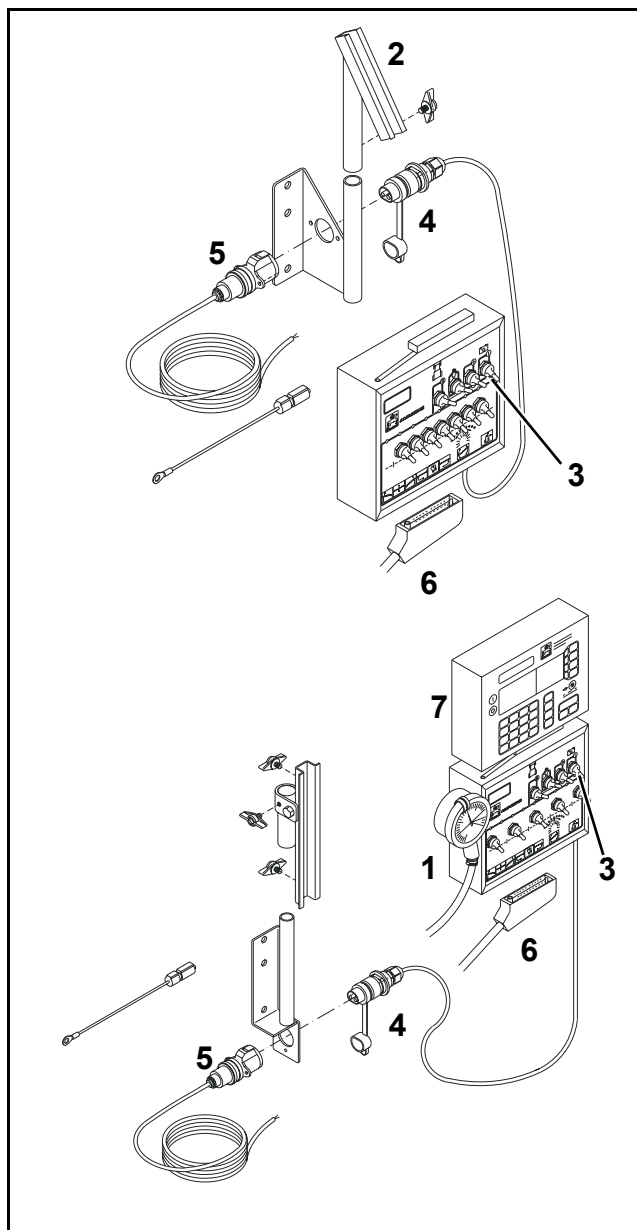


Fig. 23

## 4.2 PTO-shaft

• Only use the Walterscheid WWE 2280 PTO shaft provided.

- Clean and grease the tractor PTO-shaft.
- 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 be checked to be matched to the tractor.**

• 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.



Adhere to the fitting and maintenance advice of the PTO shaft manufacturer which are fixed to the PTO shaft.



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



Before switching on the PTO shaft observe the safety advice according to para. 2.

### 4.2.1 Initial fitting and matching up of the PTO shaft

Slide the apart pulled traktor PTO shaft halves onto the PTO and the pump input shaft in the prescribed fitting direction.

When first attaching the sprayer to the tractor check the length of the universal joint shaft in relation to the tractor according to Fig. 24. 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.

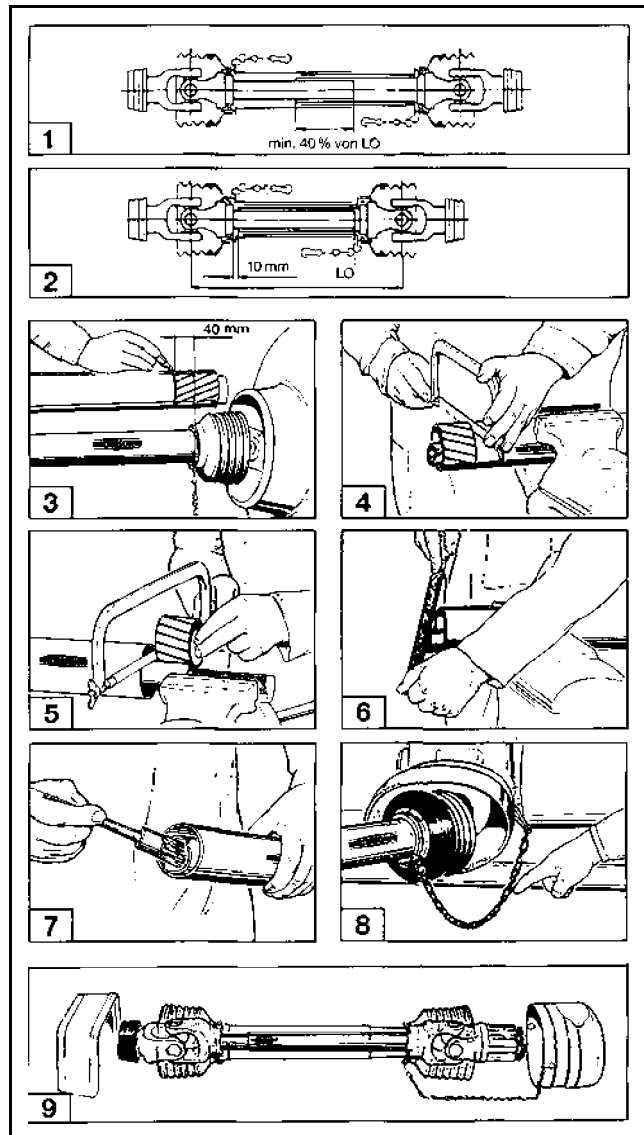


Fig. 24

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.

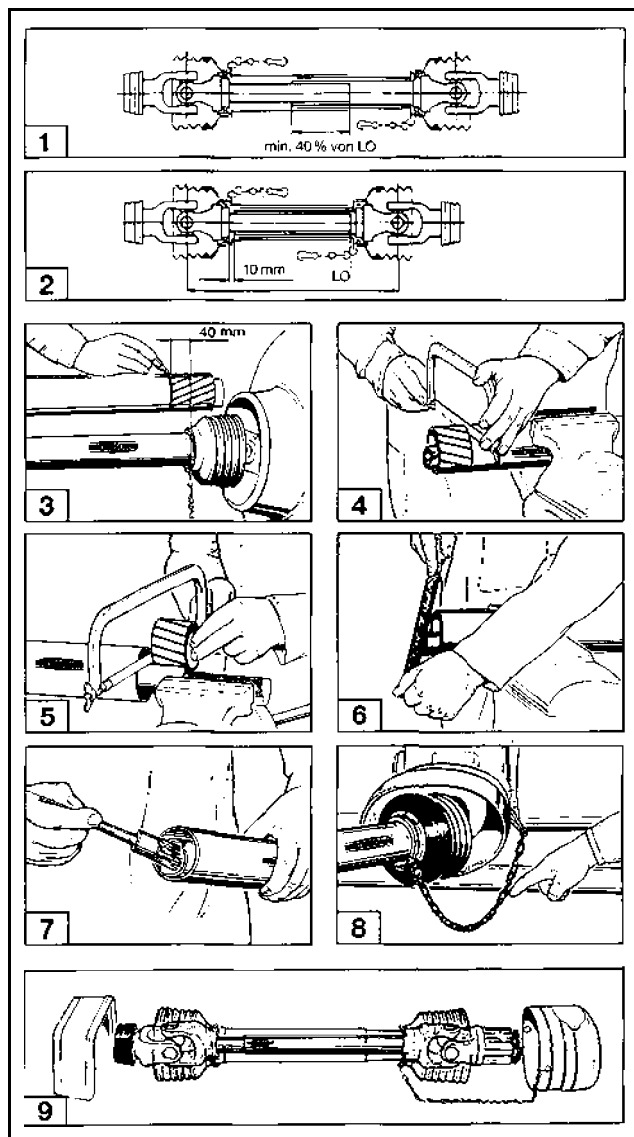


Fig. 25

## 4.2.2 Adjustable mounting bracket for control units

The position of the control units is individually adjustable depending on tractor type used, reachability of the operator by the adjustable mounting bracket for control units (Fig. 26/1). For this the mounting bracket (Fig. 26/4) can be swivelled within the limitations of the slotted hole (Fig. 26/4) on the top link mounting bracket (Fig. 26/3). The vertical alignment of the control unit (use pressure gauge (Fig. 26/5) as a reference) is conducted at the slotted hole (Fig. 26/6) on the carrier bracket (Fig. 26/7).

The control unit carrier may be bolted at random to the right hand or left hand top link mounting bracket (Fig. 26/3).

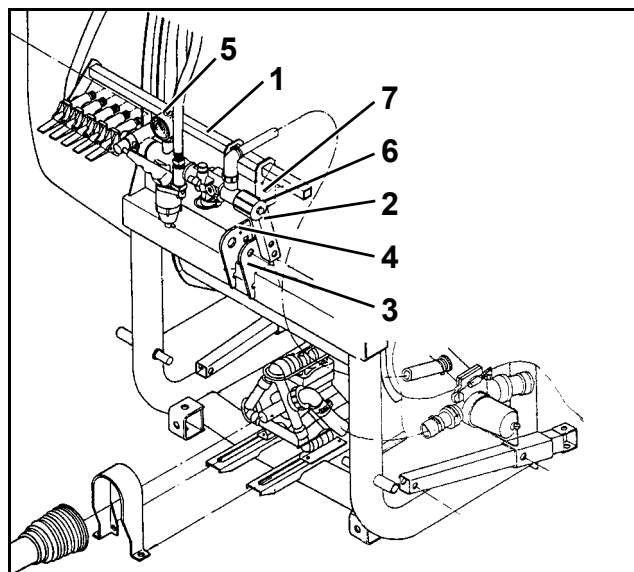


Fig. 26

## 5. Hitching on or off



**When hitching on or off the mounted sprayer adhere to the safety advice.**

### 5.1 Hitching on

- The mounted sprayer is fitted to the rear hydraulic three point linkage of the tractor. The lower link arms of the tractor are connected to the lower link pins (cat. I or II at UF 600 or cat. II at UF 800, UF 1000 and UF 1200).
- Fit top link with mounting pins (cat. I or II at UF 600 or cat. II at UF 800, UF 1000 and UF 1200) to the sprayer and secure. Adjust the top link length in such a way that the boom carrying frame stands vertical when the machine is lifted. Only in this fitting position the liquid level indicator can be read off correctly.

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

- Slide the two parking supports (Fig. 27/1) into working position and arrest them.

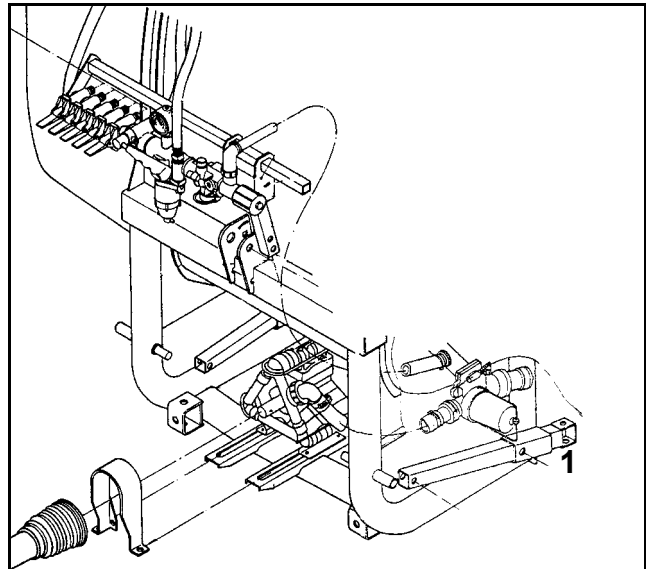


Fig. 27

### 5.2 Hitching off and parking the tractor mounted sprayer

- Pull out and arrest both parking supports (Fig. 27/1).



**Danger of tipping over prevails when both parking supports have not been pulled out and fixed in position prior to parking the mounted sprayer.**

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

### 5.3 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)

- 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.

##### 2. Fully hydraulic boom control "II" (one-sided folding in driving direction to the right and left hand side is possible).

- Connect the hydraulic hoses on the height adjustment to a single acting spool valve on the tractor.
- Connect hydraulic hoses (green) for the boom folding of the right hand boom to a double acting spool valve of the tractor.
- Connect hydraulic hoses (red) for the boom folding of the left hand boom to a double acting spool valve of the tractor.

#### 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.

#### 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.

### 5.4 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.**

- Link up the power supply cable with the socket of the battery cable.
- **SKS 50, SKS 70:** Connect both the implement cable and the hydraulic cable on the switch box.
- Connect the pressure gauge by quick coupling to the pressure socket on the control unit.

### 5.6 "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.**

### 5.7 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.



When lifting the 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.



Before travelling with the mounted implement secure the control lever against unintended lowering.

## 6.1 Calculating the payload

$$\text{Payload [kg]} = \text{allowable total weight [kg]} - \text{net weight [kg]}$$

The net weight depends on the execution of the implement. You may take it from the type plate or determine the net weight by adding the weight of the individual components with the aid of the para. "Technical data".

### Example :

€# UF 1000 (253 kg),

€# Control unit G 7-fold (22 kg),

€# Pump equipment 180 l/min. (32 kg).

€# Super-S-booms 24 m 7-sections (558 kg).

**Net weight: 253 kg + 22 kg + 32 kg + 558 kg = 865 kg**

**Payload = 2250 kg - 865 kg = 1385 kg**



•In case the payload is exceeded a complete filling of the spray agent tank with liquid fertiliser is not permissible. Please always check (please refer to para. "Filling").



## 7. Putting into operation

== •Before the first operation set up the equal pressure control unit (refer to para. 7.2).

== •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").

### 7.1 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.

== •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.

- 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 spray agent tank half with water.
- Switch on the agitation.
- Add the calculated quantity of the spray agent.
- Top up remaining quantity of water in the tank.
- Agitate the spray mixture according to the spray agent manufacturer's advice before spraying.

## 7.1.1 Calculating the filling or refilling quantities

### Example 1:

#### Known data:

|                                |          |
|--------------------------------|----------|
| Tank nominal volume            | 1000 l   |
| Residual amount in tank        | 0 l      |
| required rate of water         | 400 l/ha |
| Spray agent requirement per ha |          |
| Agent A                        | 1,5 kg   |
| Agent B                        | 1,0 l    |

#### Question:

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

#### Reply:

|          |           |            |         |
|----------|-----------|------------|---------|
| Water:   | 400 l/ha  | x 2.5 ha = | 1000 l  |
| Agent A: | 1.5 kg/ha | x 2.5 ha = | 3.75 kg |
| Agent B: | 1.0 l/ha  | x 2.5 ha = | 2.5 l   |

### Example 2:

#### Known data:

|                           |          |
|---------------------------|----------|
| Tank nominal volume       | 1000 l   |
| Residual amount in tank   | 200 l    |
| Required rate of water    | 500 l/ha |
| Recommended concentration | 0,15 %   |

#### Question 1:

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

#### Question 2:

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:

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

$$\frac{(1000 - 200) \text{ [l]} \times 0.15 \text{ [\%]}}{100} = 1,2 \text{ [l or kg]}$$



Calculation formula and reply to question 2:

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

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

## 7.1.2 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     | 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.
- Ensure that there is never a direct connection between the filling hose and the spray mixture inside the tank so that a back suction of spray mixture into the water supply network is prevented.
- 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 spray agent 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 7.1.1).
- The filling of the spray mixture tank (Fig. 28/1) und and clean water tank (Fig. 28/2) is always conducted via the filling opening (Fig. 28/3) or (Fig. 28/4) by a water pipe in "free flow".

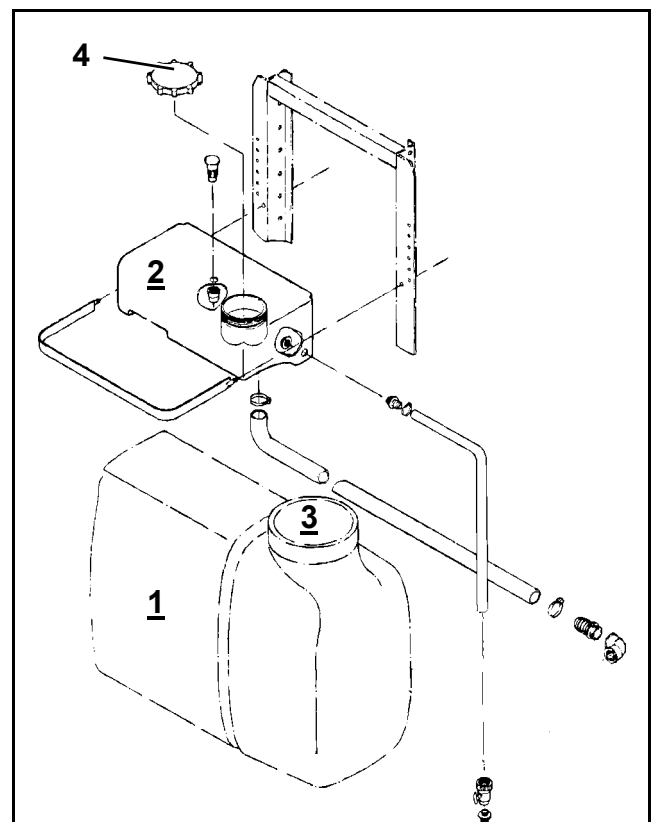


Fig. 28

- ==
- Always use the filling sieve (Fig. 29/1) when filling the spray agent tank.

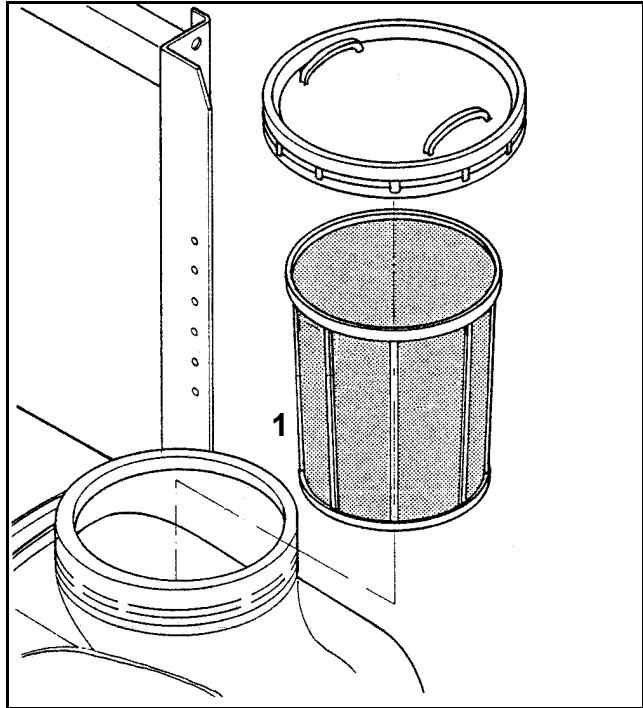


Fig. 29

- Read the tank volume off the pointer position on the scale (Fig. 30/1) of the tank level indicator (Fig. 30/2).

Tank volume [l] = indicated scale figure x 100

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

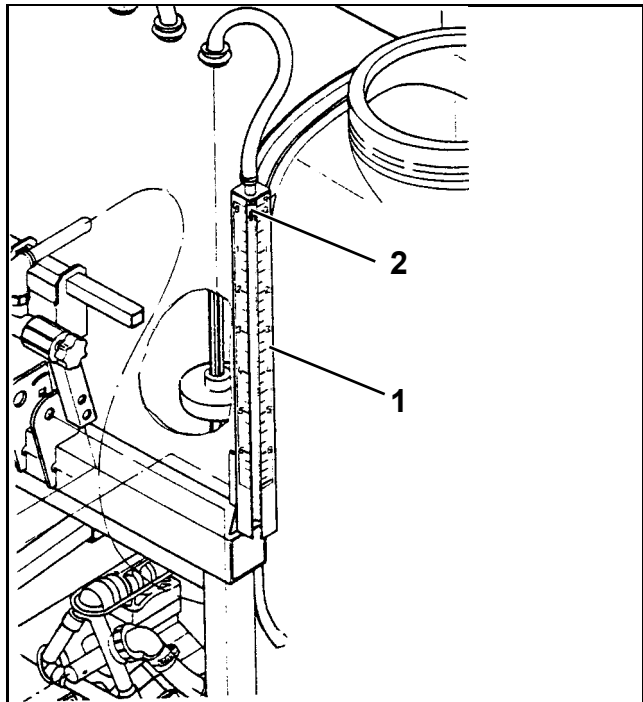


Fig. 30

## 7.1.3 Inducting spray agents

- 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.
  - 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.
- ==
- 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.
- Fill spray agent tank half with water.
  - Switch off the master boom feed on/off switch to position "0".
  - Drive the pump with approx. 400 R.P.M. and switch on the agitator. If necessary increase the agitation intensity (general agitating step "2").
  - Pour in the calculated and metered spray agent quantity or the urea quantity necessary for one tank filling via the filling opening into the spray agent tank (Fig. 31/1).
  - Put in water soluble plastic bags directly into the tank while the agitator is engaged.
  - 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.

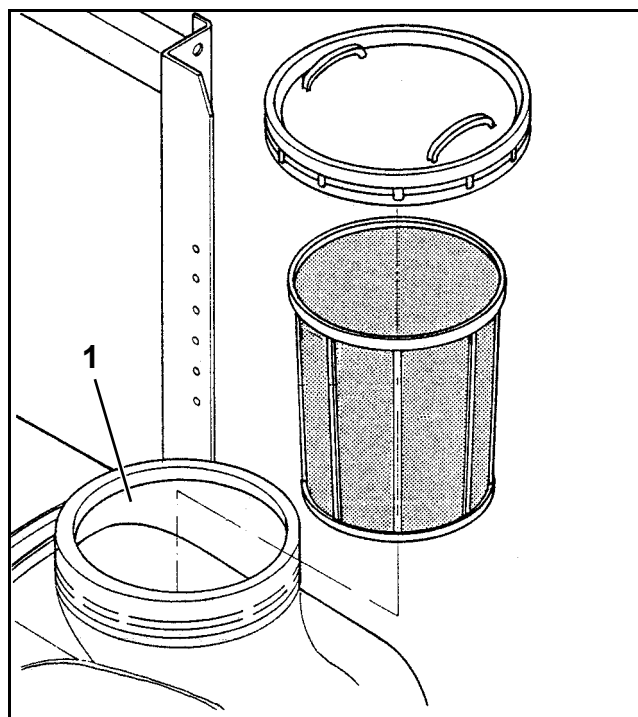


Fig. 31

## 7.2 Setting the equal pressure control chest before the first operation and after any change of jets

- Set the pressure relief valve.
  - Turn the adjustment nut (Fig. 32/1) of the automatic metering unit until a spacing of 5 mm is reached between the edge of the adjustment nut and the return flow hose (Fig. 32/2). This way the pressure relief valve has been set to approx. 7 bar ( $P_{\max} = 10$  bar).

**When using ID- or AI-nozzles screw in the pressure relief valve until its stop.**

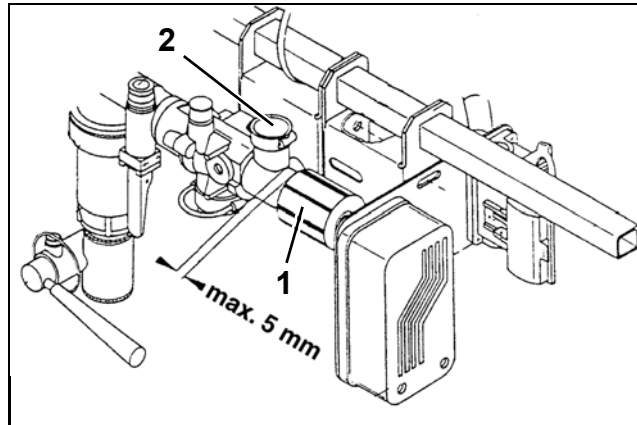


Fig. 32

- Fill the mounted 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 (Fig. 33/1) 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 (Fig. 33/2) to the position "manual operation".
- Turn on the master boom control switch (central tap (Fig. 34/1) or switch (Fig. 33/3) into position "I" (EIN/ON). All part section valves open and water is sprayed out of the nozzles.
- On the step tap (Fig. 34/2) set agitation intensity "1".
- Turn the star knob (Fig. 34/4) or actuate the  $\pm$  key (Fig. 33/4) until the spray pressure display shows a spraying pressure of 4 bar.
- Set the equal pressure gauge with the aid of the knurled thumb screw (Fig. 34/4).
- Shut off one sprayer boom section via a metering tap (Fig. 34/5) or a part width switch (Fig. 33/5). The set spraying pressure will change on the spraying pressure display.
- Turn the thumb screw (Fig. 34/4) on the equal pressure valve belonging to this solenoid valve until the spray pressure of exactly 4 bar is displayed. Then re-open this sprayer boom section.
- Set the equal pressure valves of the other metering taps or boom part sections in the same manner.
- After setting shut all the boom part sections. Now the displayed pressure should still be 4 bar. If this is not the case repeat the setting procedure.

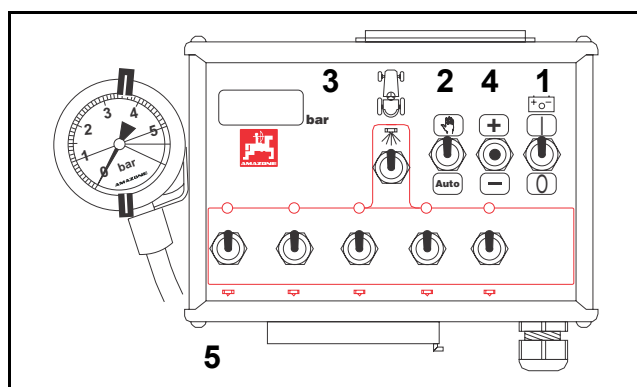


Fig. 33

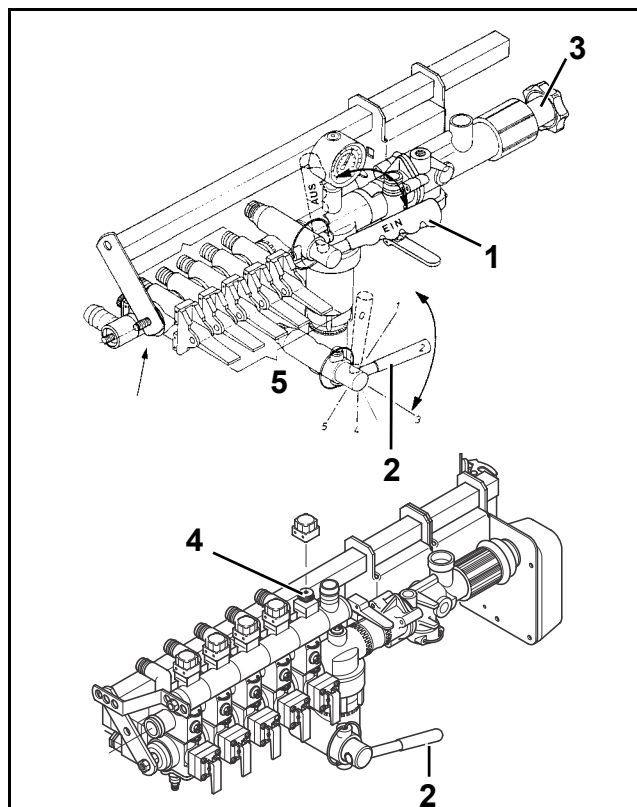


Fig. 34

## 7.3 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").
- 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 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.
  - Set the desired liquid rate 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 supply.

### 7.3.1 Hints for automatic metering

Within one tractor gear 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.

Spray pressure deviations of more than  $\pm 25\%$  result 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.

== **When using ID- or AI-nozzles screw in the pressure relief valve until its stop.**

**7.3.1.1 Hints regarding the slip clutch of the**

- Regularly check whether the metering spindle (Fig. 35/1) is at its stop position (Fig. 35/2). If this is the case the desired spray rate [l/ha] might possibly not be achieved.

**Possible causes:**

- ≠# Pump drive speed is too low.
- ≠# Agitation intensity is too high.
- Change pump drive speed or agitation intensity as necessary.

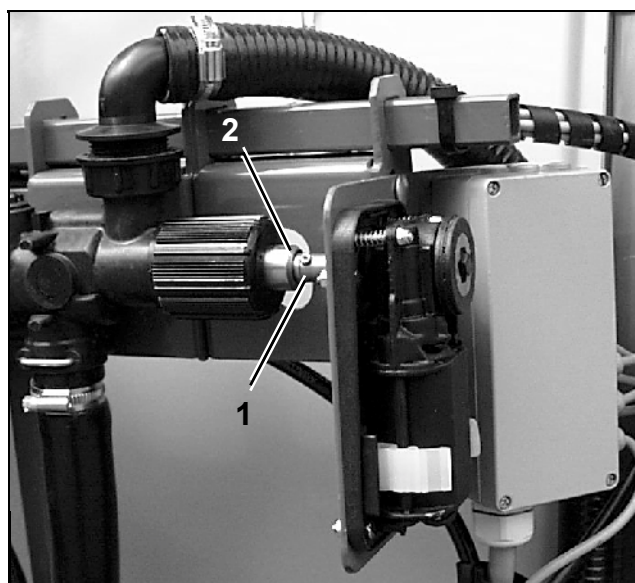
== **If the desired spray rate cannot be achieved though the metering spindle is not at its stop position, please refer to chapter "Maintenance".**

**7.3.2 Operational range of the control units**

|   |                   |
|---|-------------------|
| Pressure:   | 1 to 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 %          |

**7.3.3 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).

**Fig. 35**

### 7.3.4 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 the nozzle output is reduced.**
- **The forward speed [km/h].** The actual forward speed should be first checked over a pre measured distance as the forward speed display on the tractor clock may only be a guide (please refer to para. "Actual tractor forward speed").
  - == • **The selection of the suitable nozzle depends on the desired spray rate.**

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").

#### 7.3.4.1 Determine the spraying 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.**

### 7.3.4.2 Set the spray pressure

== •Pre-condition for a correct spray pressure setting is to start with a correctly set equal pressure control chest.

- Turn On/Off-switch (Fig. 36/1) for the power supply to position "I" (EIN) (**only with control units "electrically remote controlled with switch box"**).

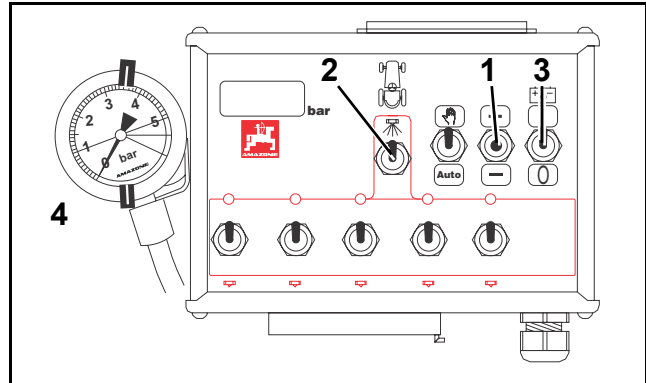


Fig. 36

- Set the central tap (Fig. 37/1) on to position (ON/EIN) and shut off metering taps (Fig. 37/2) (**only for control units "manually actuated"**) or turn off the master boom on/off switch (Fig. 36/2) to position "0" (OFF/AUS) (**only for control units "electrically remote controlled with switch box"**).
- Set the required intensity of the hydraulic agitation.
- Engage the PTO shaft.
- Read off the tractor clock for which tractor gear will allow a forward speed of 6 to max. 8 kph. 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.).
- Set the spray pressure found in the spray setting chart via the star knob (Fig. 37/3) or the  $\pm$ key (Fig. 36/3) on the spray pressure display (Fig. 36/4 or Fig. 37/4).
- The actual nozzle delivery [l/min] must be checked (calibration) and in case of deviations be corrected by changing the spray pressure.

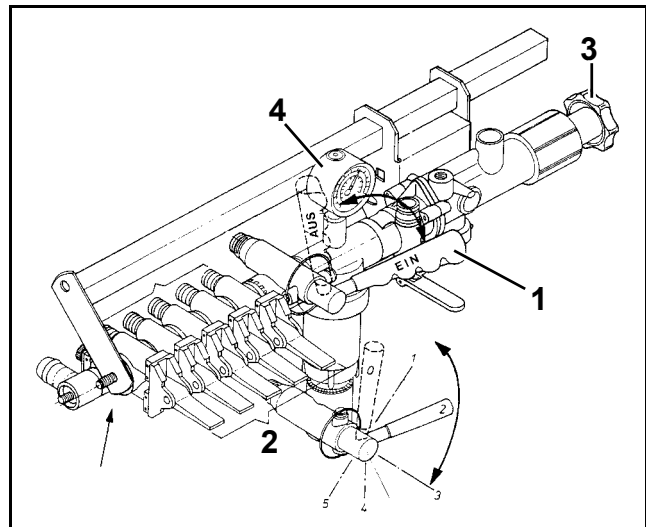


Fig. 37

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

## 7.4 Calibrating

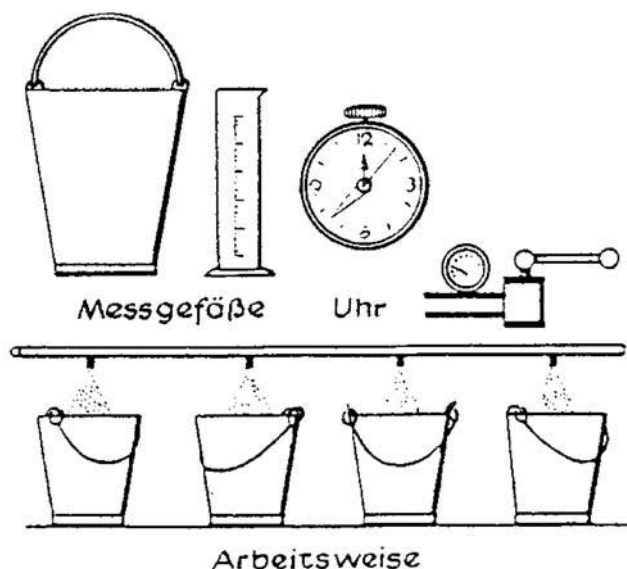
**Always calibrate the sprayer with the spray pressure set according to the spray rate table:**

- ⌘ 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.



- Measure on the field accurately a distance of 100 m. Mark the starting and end point.
- Read off the tractor clock for which tractor gear will allow a forward speed of 6 to max. 8 kph. 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 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 calibration 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

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

### 7.4.1 Determining the liquid rate [l/ha]

#### 7.4.1.1 Determined by driving a measured distance

- Fill up tank with water.
- Switch on the sprayer boom and check whether all nozzles are properly functioning.
- Take the required spray rate (l/ha) from the spray table and set it.
- Switch off the boom feed.



#### 7.4.1.2 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 [l/ha]

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

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',

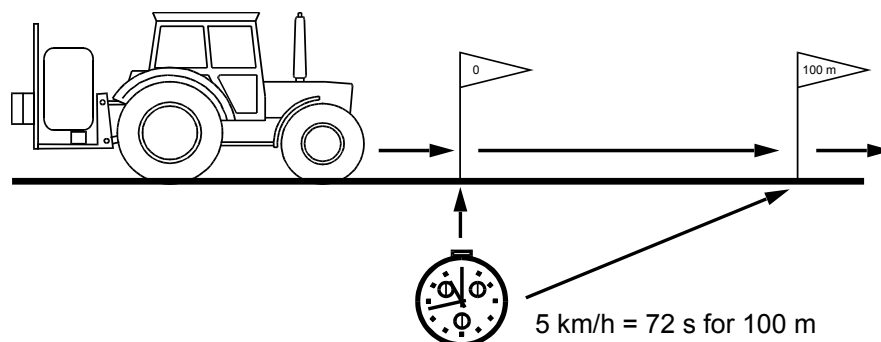
## Collected nozzle output [2,8 l/min],

## 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.

## 7.5 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 for which tractor gear will allow a forward speed of 6 to max. 8 kph. 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      |      |          |      |           |



## 7.6 Practical operation with "AMACHECK II A"

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 figure lies between 200 - 300 Imp./l. After this input the computer automatically runs on program "field sprayer".
- Working width in 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 (Fig. 38/1) 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.**

- Set the programme switch (Fig. 38/2) to the position "manual operation".
- Initiate start function by simultaneously pressing key "C" and "input". At the same time the memory for worked area, operating time and sprayed liquid is set to "0".
- On/off switch (Fig. 38/3) for power supply of switch box in position "I" (ON/EIN).
- Switch for the master boom feed control on/off switch (Fig. 38/4) 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.

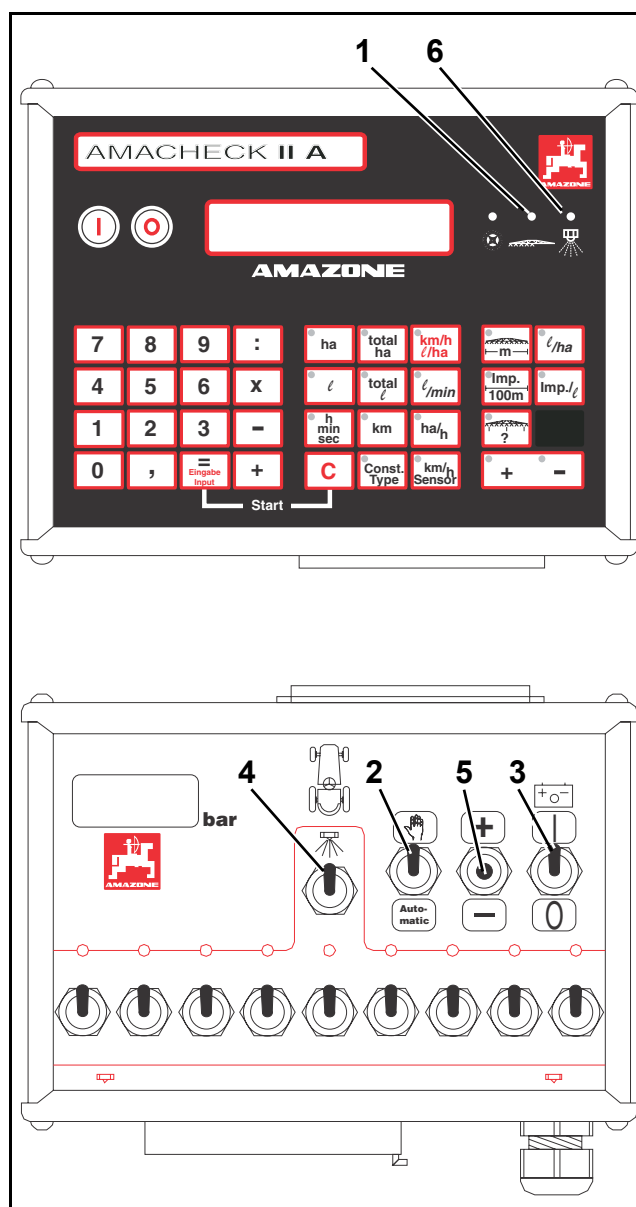


Fig. 38

- By the  $\pm$  key (Fig. 39/5) 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  $\pm$  key (Fig. 39/5) 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 (Fig. 39/6) lights up, e. g. the sprayer is ready to operate.

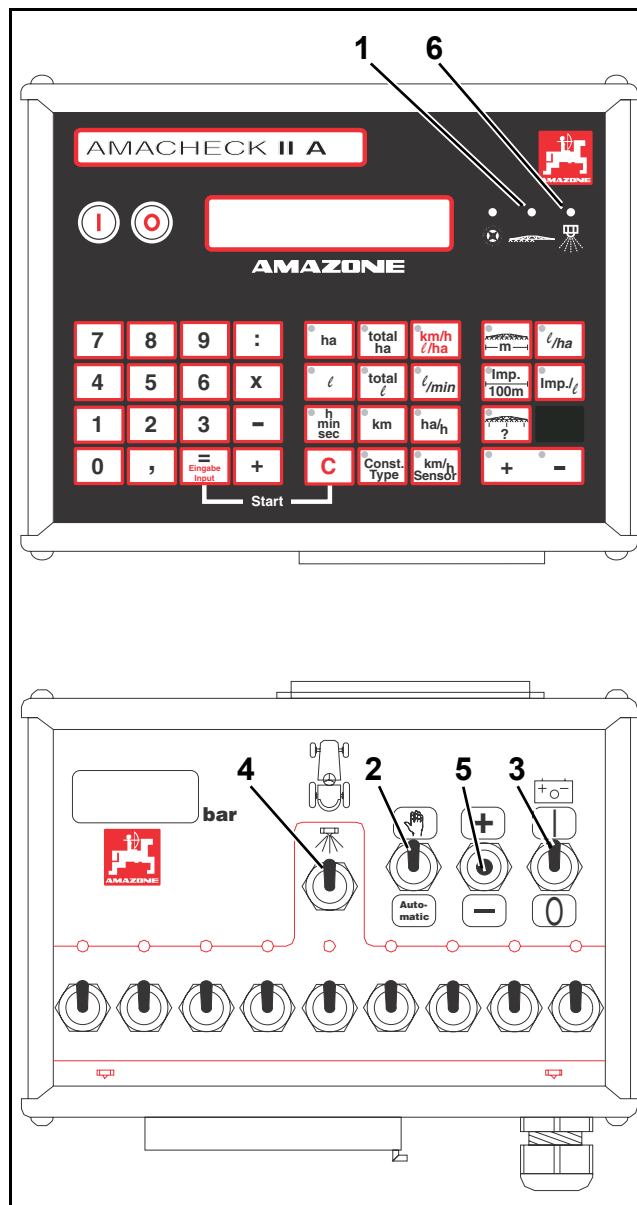


Fig. 39



## 7.7 Practical operation with "Spraycontrol II A" or "AMATRON II A"

The control units "G" or "K" 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 (on the control units "G" the value is between 150 and 200 Imp./l, on the control unit "K" between 600 and 700 Imp./l).** 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").



- **Choose information displays "machine control unit" in data block "implement" and confirm question "with equal pressure device" by key "T2" (Yes). In the next display confirm question "with return flow calibration?" by Key "T2" (Yes) as well.**

The following operating procedure results:

- Hitching on the mounted sprayer to the traktor.
- Connect implement plug with implement socket of the control unit (only SKS 5).
- Connect implement cable to switch box (only SKS 50, SKS 70).
- Plug "Spraycontrol II A" or "AMATRON II A" on to 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".**

- Switch on the "Spraycontrol II A" or "AMATRON II A".

The machine type is automatically recognised, the programme "Field Sprayer" is installed with the machinery data of the field sprayer already entered in the data block "machine".

- Enter the work related data into the data block "order".
  - 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 "order" 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 job 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.

### 7.7.1 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 "G" and "K" the permissible spray pressure of the nozzles fitted to the sprayer boom should be manually monitored on the pressure gauge.

On the control unit "G" with the optional equipment "digital pressure monitoring" the permissible pressure range for the nozzles fitted to the sprayer boom is automatically monitored. To obtain this the permissible pressure range should be entered into the "data block machine". An audible and visible signal will be produced as soon as this entered pressure range is left.

#### **7.7.1.1 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.

## 7.8 Surplus amounts

You may encounter two kinds 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.

### 7.8.1 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 (Fig. 40/1).
- Bring the Vario-control tap (Fig. 41/1) to position "diluting".
- Engage 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.
- Return the Vario control tap (Fig. 41/1) back to position "spraying".
- 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 50 l switch off the hydraulic agitation device.

- If the residual amount inside the tank is less than 50 l 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.

- The residual amount in the sprayer boom depends on the boom's working width and is sprayed out still 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".

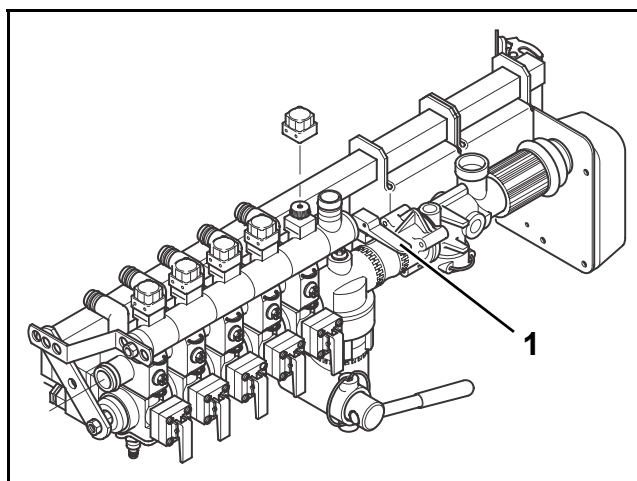


Fig. 40



Fig. 41

- Drain off the tank into a suitable collecting container any diluted surplus amount via the filter tap (Fig. 42/1).
- 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. 42

## 7.9 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 spray agent 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 spray agent 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 spray agent 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 sprayer nozzles.



• Before changing or fitting nozzles flush all spray circuits.



• After every cleaning the sprayer dispose of any cleaning residues environmentally correctly.



### 7.9.1 Cleaning the sprayer with a filled tank

If due to poor weather conditions the spraying operation has to be interrupted the filter tap, pump, control chest 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.
- Vario-control in position "flushing":
- 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.
- 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".**

### 7.10 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 filter bowl, filter insert and centring ring of the two filter taps and clean them.

== **•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.
- Engage PTO shaft and drive pump for approx. 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 pump 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 pump before storing the pumps over winter.

== **•When putting the piston diaphragm pumps into operation at temperatures of below 0°C, drive pumps by hand first to prevent any remains of ice from damaging the diaphragms.**

== **•Store 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. By correctly setting up the spray boom height above the crop a perfect overlapping of nozzles is achieved. The boom's nozzles are fitted at a spacing of 50 cm.

== **•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.**

== **•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 P-boom in package folding technique, rigid booms, manually folded including manual winch for height adjustment

Fig. 43/...

- 1 - Boom frame.
- 2 - Belt of the self securing manual winch.
- 3 - Locking pin.

For more details regarding boom, please refer to para. 8.2.1!

#### 8.1.1 Manual winch adjustment

The self securing manual winch serves the comfortable height adjustment of the P-boom.

- First stretch the belt over the manual winch.
- Remove the locking pin from the boom carrier.
- Set the desired spray boom height by turning the manual winch.
- Fix the spray boom height by inserting the locking pin into the boom carrier.
- Relieve the belt from strain over the manual winch after having fixed the boom height by pins.

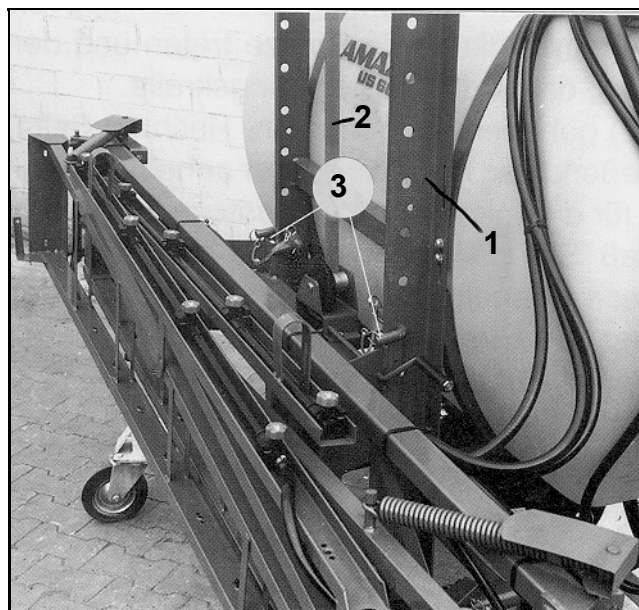


Fig. 43



**Squeezing danger when folding in or out the boom ends.**

**For folding out or in the booms place your hands only on the yellow marked places**

## 8.2 Q-booms and Q-plus-booms

### 8.2.1 Q-booms up to 8 m working width (incl. swing compensation and hydraulic height adjustment)

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

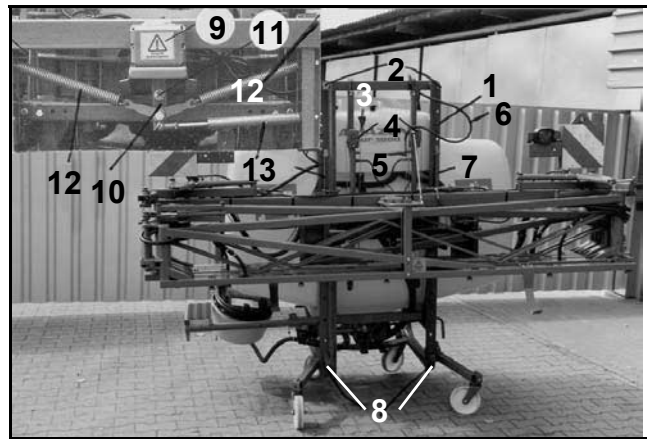
For the hydraulic boom height adjustment a single acting control valve is required on the tractor side.

**Fig. 44/...**

- 1 - Boom 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 height adjustment. The hydraulic height adjustment may be locked in any position via the block tap.

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

- 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.
- 9 - Boom swing compensation lockable - maintenance free and allows a stable boom guidance.
- 10 - Swivelling arm - for horizontal boom positioning.
- 11 - Bolt with self-locking nut for arresting the swivelling arm when boom is horizontally positioned.
- 12 - Coil springs for horizontal boom positioning.
- 13 - Shock absorber.



**Fig. 44**

#### Setting the lifting and lowering speed of the height adjustment

The lifting and lowering speed can be set at the throttle valves (Fig. 44/5) by screwing in or out the set screw.

- Lower the lowering speed = screw in the set screw.
- Increase lowering speed = screw out the set screw.

## 8.2.1.1 Q-boom, manually folded

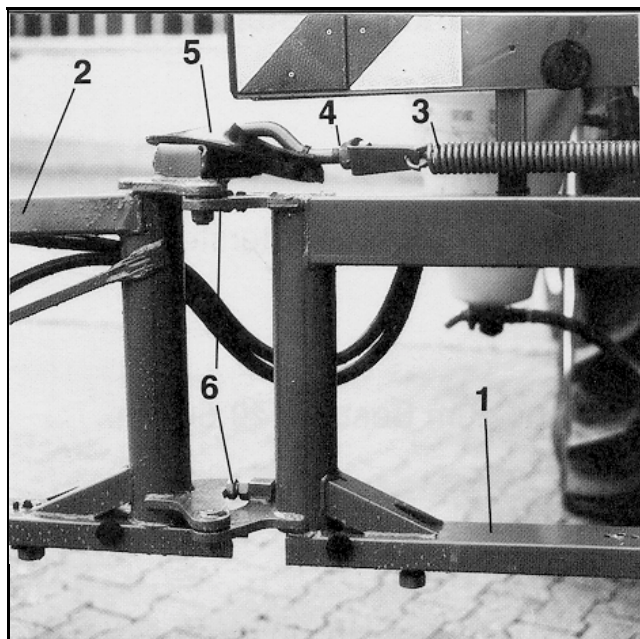
**Fig. 45/...**

- 1 - Boom centre.
- 2 - Inner boom section (L.H).
- 3 - Coil springs; keep the booms automatically in the corresponding set position (transport- and operational position).
- 4 - Threaded rod for changing the coil spring pre-tension. With these the pressure can be set at which the boom ends are released when hitting an obstacle or when folding in or out the boom sections.
- 5 - Guard.



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

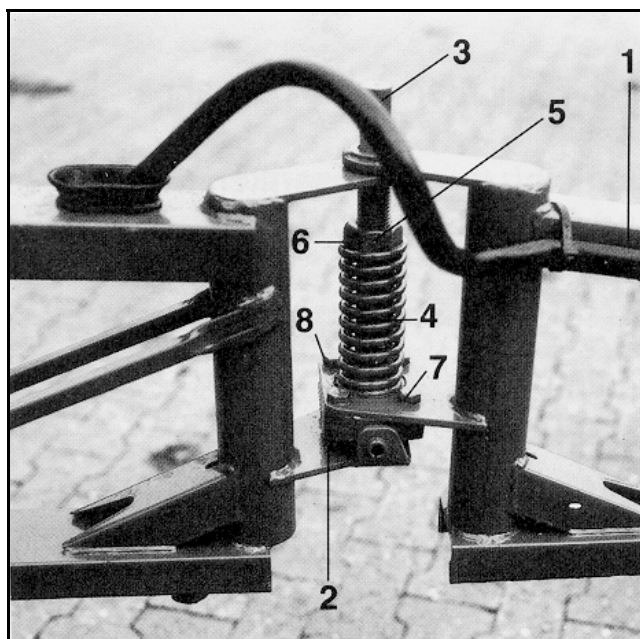
- 6 - Setting screws; for horizontal set up of the booms in driving direction.



**Fig. 45**

**Fig. 46/...**

- 1 - Outer boom section (R. H.).
- 2 - Plastic trip. Keeps the outer boom sections in the fold-in or out position in the corresponding end positions (transport- and operational position).
- 3 - Hinge shaft.
- 4 - Pressure spring. Sets the required power needed for pushing the outer boom sections outwards by changing the spring pre-tensioning.
- 5 - Locking screw for securing the nut (6) from unintentional loosening.
- 6 - Nut for changing the spring pre-tensioning.
- 7 - Fixing bracket with slotted holes. Is used for the horizontal alignment of the outer booms after having slackened the bolts (8).
- 8 - Bolts for fixing the plastic trip.



**Fig. 46**



#### 8.2.1.1.1 Folding the boom in or 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



Always lock the boom sway compensation in transport position

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

#### Folding out

With the boom locked in the transport position.

- Open the block tap.
- Fold out the right hand boom side.
- Fold out the left hand boom side.
- On the height adjustment set the spraying height. (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 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.
- **Locking the swing compensation.** 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.
- Shut the block tap.

## 8.2.1.1.2 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 asymmetrically.**

The boom is in symmetrically folded out position.

- **Lock the boom in the set boom height.**
  - Push up the two square profiles (Fig. 47/1) by hand as far as possible and lock in this position by raising the stop elements (Fig. 47/2) on the boom carrying bracket (Fig. 47/3).
  - Fold in the required boom. At this stage the boom may go into a slightly tilted position.
  - Open the 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.
  - Shut the block tap.

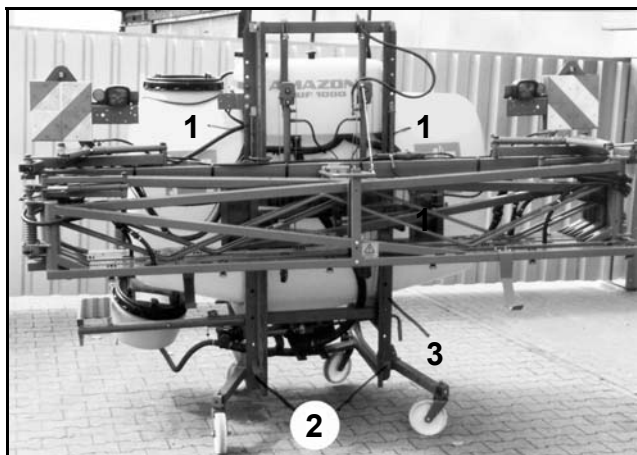


Fig. 47

**To operate again with a symmetrically folded out boom:**

- Slightly lift the boom on the height adjustment.
- Fold out boom again.
- Lower the stop elements (Fig. 47/2) on the boom carrying frame (Fig. 47/3).
- Set the boom height above the ground.

### 8.2.1.2 Operating with the booms folded asymmetrically

The hydraulically folding sprayer booms are available in two versions:

1. **Fully hydraulic boom control "I" (one-sided folding in driving direction to the left hand side is possible)**

**Required on tractor:**

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

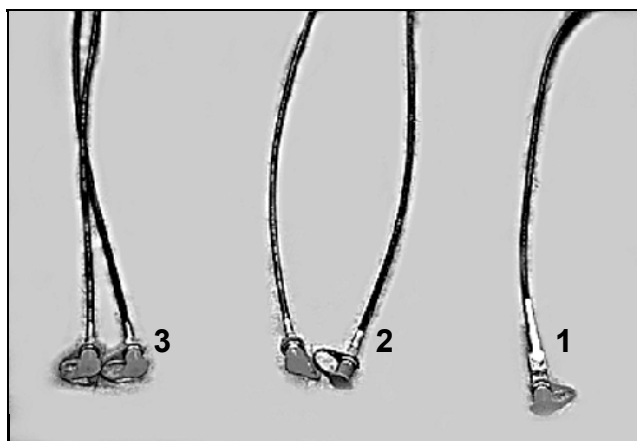
2. **Fully hydraulic boom control "II" (one-sided folding in driving direction to the right and left hand side is possible).**

**Required on tractor:**

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

**Fig. 48/...**

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

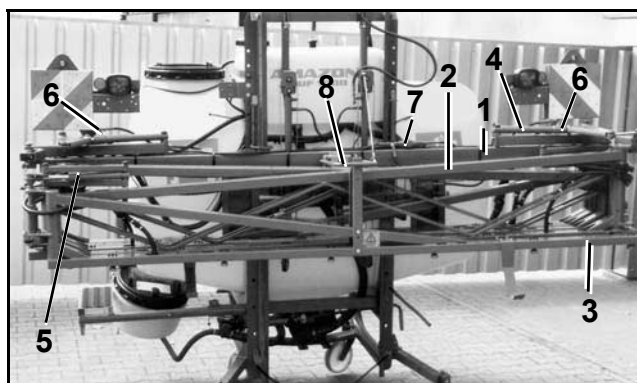


**Fig. 48**

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

**Fig. 49/...**

- 1 - Boom centre.
- 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. 49**

## 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 (Fig. 50/6) 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.

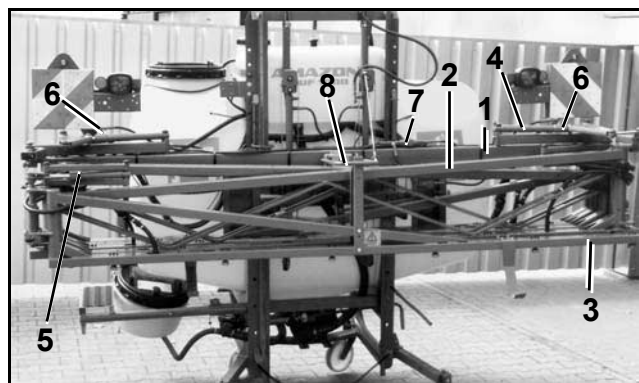


Fig. 50

### 8.2.1.2.1 Hydraulically folding the Q-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 folding speed of the boom can be changed on the throttle valves (Fig. 51/6).
- The hydraulic rams used for the boom folding keep the boom in its corresponding final position (either in transport or working position).



Never put the double acting control valve on the tractor that actuates the boom folding into the "float position".

#### 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. 52/1) releases (boom height will be about 2/3 up the boom mounting frame length (Fig. 52/2)).

#### Sprayer boom with hydraulic boom actuation "I"

- Actuate the double acting control valve on tractor and the boom will fold automatically out.

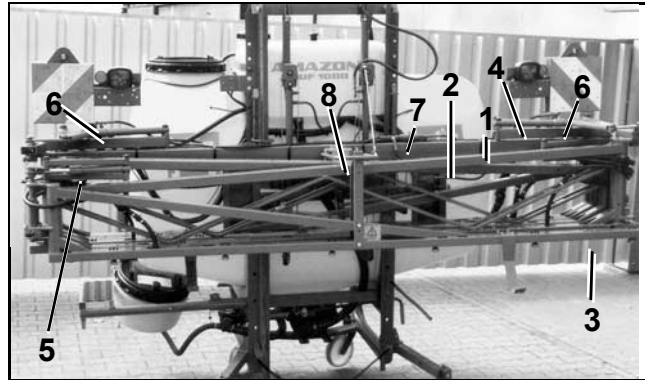


Fig. 51

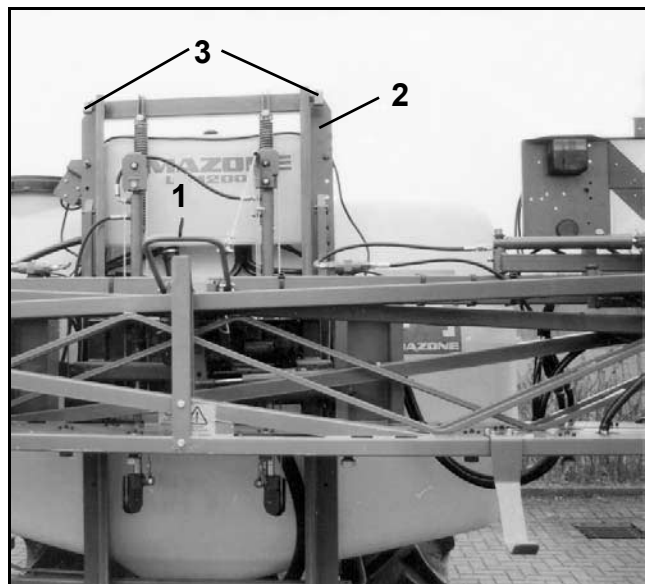


Fig. 52

## Sprayer boom with hydraulic boom actuation "II"

- By actuating the control valve on the tractor swivel the control lever (Fig. 53/1) 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 (Fig. 52/3) (please refer to para. 8.2.2.3).
- On the height adjustment set the spraying height.
- Shut the block tap. Now the height adjustment is locked and the set sprayer boom height can be maintained.

## Folding in

- Open the block tap.
- **Lock the boom swing compensation into transport position** by lowering the boom down to it's lowest position (please refer to para. 8.2.2.3).
- **Sprayer boom with hydraulic boom actuation "I"**
  - Actuate the double acting 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"**
  - Move control lever (Fig. 53/1) into position "B". Fold in the left hand side boom by actuating the control valve on the tractor.
  - Move control lever (Fig. 53/1) into position "A". Fold in the right hand side boom by actuating the control valve on the tractor.
- Close the block tap to lock the height adjustment.

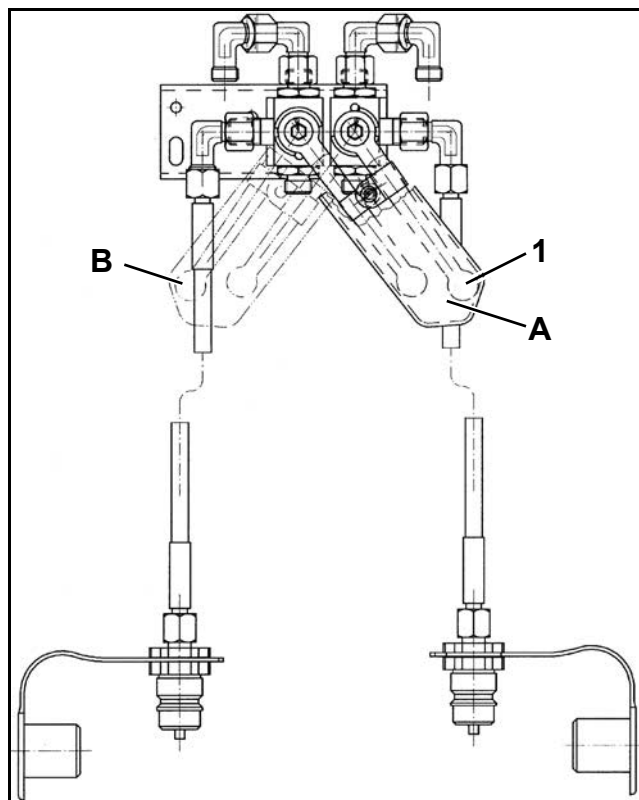


Fig. 53



#### 8.2.1.2.2 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 symmetrically folded out position.

- Open the block tap.
- Lock the boom swing compensation into the transport position (please refer to para. 8.2.2.3).
- Set the boom height using 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.

#### **Operation with symmetrically folded out boom:**

- Fold out boom again.
- Open the block tap.
- Unlock the boom swing compensation (please refer to para. 8.2.2.3).
  - Set the boom height using the height adjustment.
  - Shut the block tap.

## 8.2.1.3 Locking and unlocking swing compensation into transport position

### Locking the swing compensation into the transport position (Fig. 54)

- Lower the booms in the lowest position with the height adjustment, so that both square profiles (Fig. 54/1) rest on the stop elements and latches (Fig. 54/2) are locked.



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

- Shut the block tap.

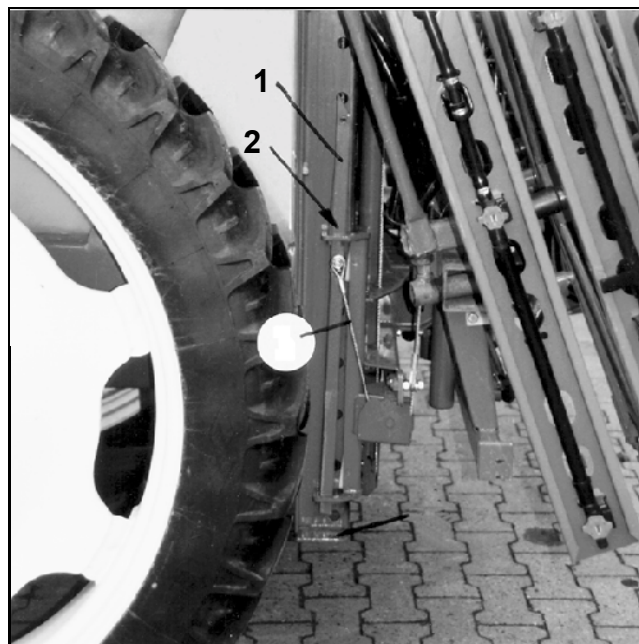


Fig. 54

### Unlocking the swing compensation from the transport position (Fig. 55)

- 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. 55

### 8.2.1.3.1 Locking the boom into transport position

- For road transport always lower the booms into the lowest position (see para. 8.2.2.3). This way automatic locking of both the swing compensation and the transport lock on the boom occurs (Fig. 56).



Fig. 56

### 8.2.1.3.2 Boom safety release at obstacles

The plastic trips (Fig. 57/2) allow the giving way of the outer boom sections up to 80° into or against the driving direction pivoting around the hinge point (Fig. 57/3). After passing the obstacle the booms will automatically return to the operating position.

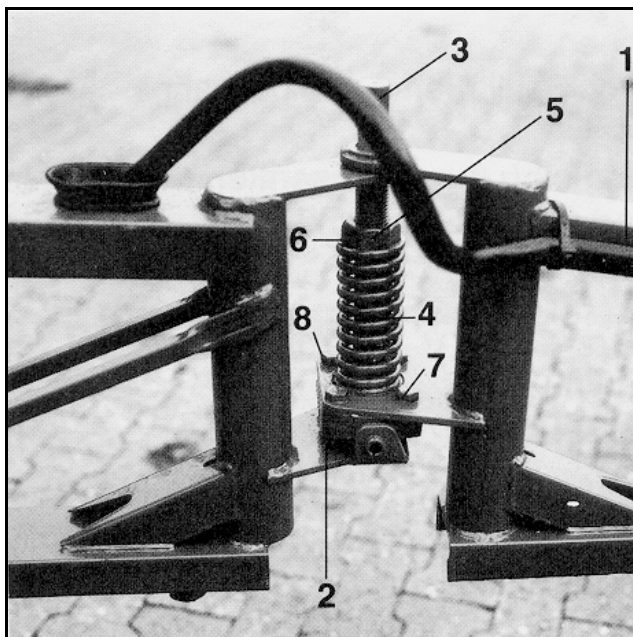


Fig. 57

### 8.2.1.3.3 Settings on the folded out boom

#### 1. Alignment parallel with 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 (Fig. 58/1) with the swing compensation unlocked. Fix the counterweights where appropriate to the sprayer boom.

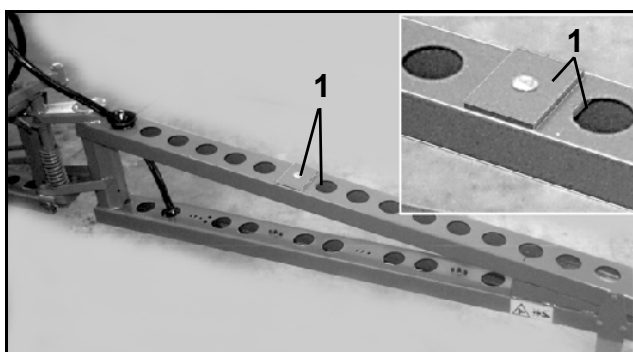


Fig. 58

## 2. Horizontal alignment

Seen in driving direction all boom sections must be aligned.

A re-adjustment may become necessary

- ≠ long periods of operation or
- ≠ excessive contact of the boom with the ground.

### Inner boom section

- Slacken the counter nut of the setting bolt (Fig. 59/6).
- Twist the setting screw against the stops until the inner boom section is in line with the boom centre section.
- Retighten counter nut.

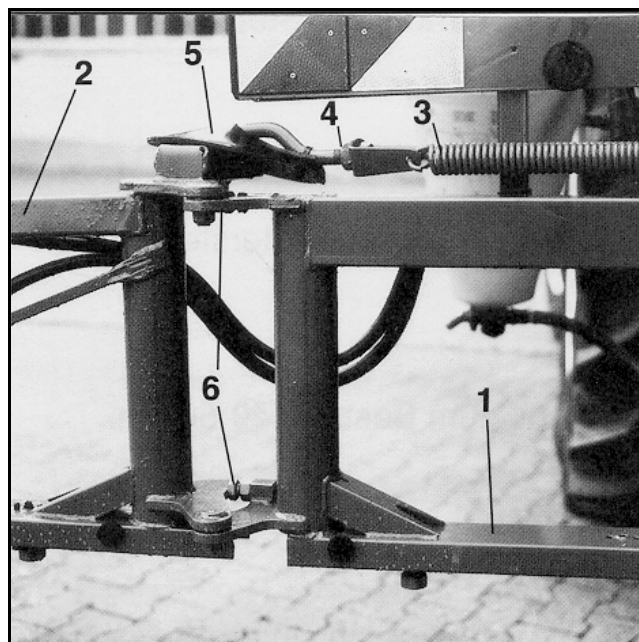


Fig. 59

### Outer boom section

- Slacken the bolts (Fig. 60/8) on the bracket (Fig. 60/7). The alignment is achieved by adjusting the plastic claw (Fig. 60/2) via the slotted holes of the bracket.
- Align outer boom section.
- Retighten the bolts (Fig. 60/8).

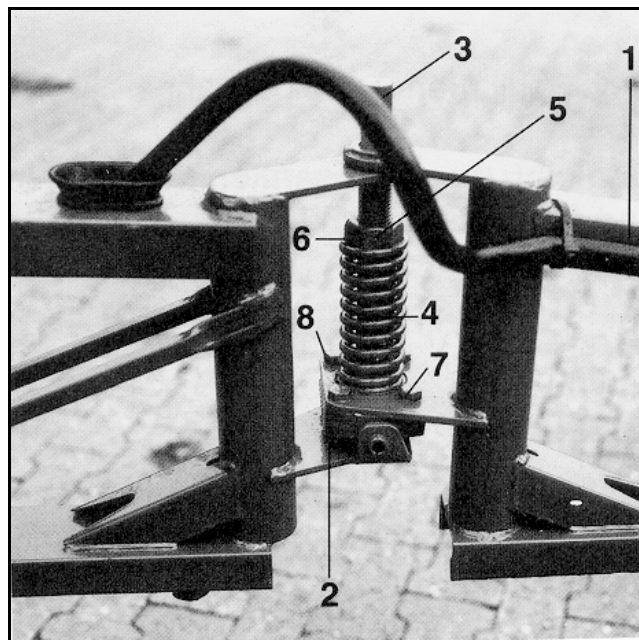


Fig. 60

### 8.2.1.4 Electric boom tilting (Special option Q-booms)

**Version I,**      **Order No.: 723 500**

Operated via separate control box (Fig. 61)

**Version I A,**      **Order No.: 914 378**

Actuation from the switch box SKS 50 N or SKS 70 N (Fig. 62)

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. Thus sprayer boom can be guided parallel to the ground, e. g. with varying track depths or where one wheel drops in a furrow.

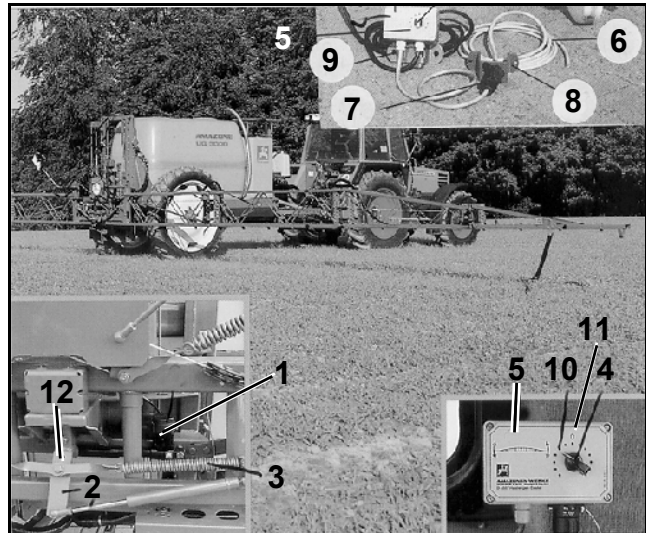
When tilting the linear motor (Fig. 61/1) moves the swivel arm (Fig. 61/2). By moving the swivel arm a differing tensioning of the self levelling springs (Fig. 61/3) is controlled and the boom is then brought into the correct position. The switch box (Fig. 61/5 or Fig. 62/2) activates the linear motor when the setting knob (Fig. 61/4 or Fig. 62/1) is turned.

**Fig. 61/...**

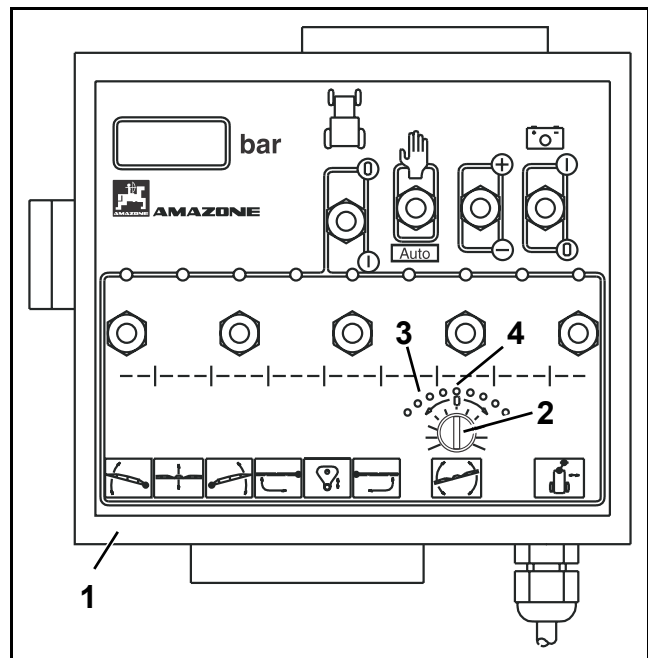
- 1 - Linear motor.
- 2 - Swivel arm.
- 3 - Self levelling springs.
- 4 - Setting knob.
- 5 - Separate switch box; place inside the pocket.
- 6 - Connect battery cable directly to the tractor battery (12 V) and install cable. To provide electric power to the switch box plug in the socket (7).
- 7 - Socket.
- 8 - Carrier for electric socket of the power supply cable - fit to a suitable place on the tractor.
- 9 - Socket for switch box (3) - fix to a suited position on the tractor.
- 10 - Scale; arranged around the setting knob (4).
- 11 - O-position.
- 12 - Nut of swivel arm.

**Fig. 62/...**

- 1 - Switch box SKS 50 N.
- 2 - Setting knob.
- 3 - Scale; arranged around the setting knob (2).
- 4 - O-position.



**Fig. 61**



**Fig. 62**

## 8.2.1.4.1 Alignment of sprayer boom via boom tilting

• Electric boom tilting can only be conducted with the nut (Fig. 63/12) slackened on the swivel arm and when the swing compensation is unlocked.

- Turn the setting knob (Fig. 63/4 or Fig. 64/2) of the boom tilt adjustment with the boom fully folded out. The individual points on the scale represent pre-determined angle of boom tilt.

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 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).

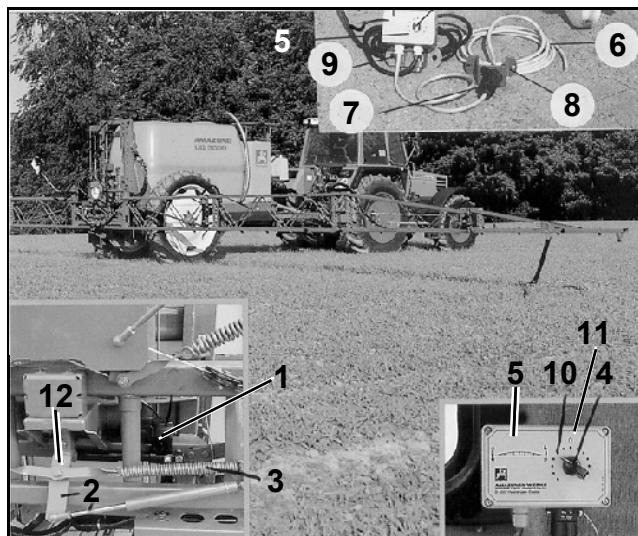


Fig. 63

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

- Align booms in horizontal position (please refer to para. 8.2.2.6).
- 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.  $\pm 1$  point. If more than  $\pm 1$  point is necessary to align the boom then the alignment needs to be executed in a professional workshop.

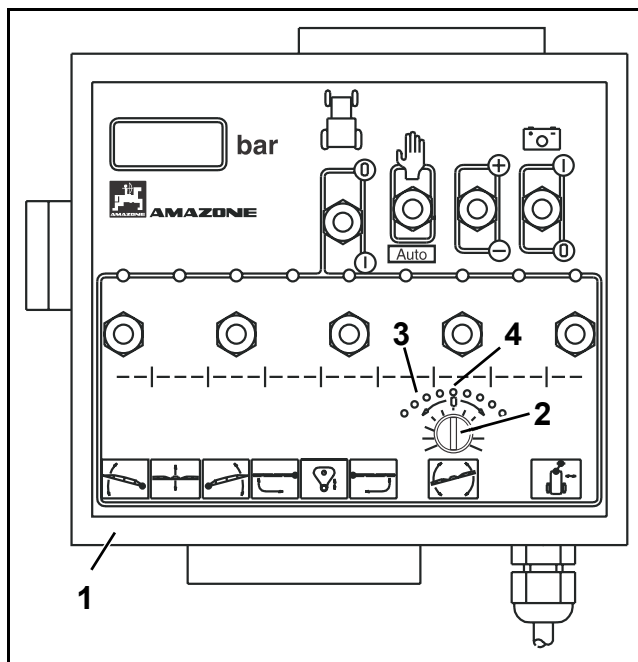


Fig. 64

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

Fig. 65/...

- 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 indicator for the swing compensation.
- 6 - Swivel arm.
- 7 - Self-levelling tensioning springs for parallel boom alignment.
- 8 - Shock absorber.
- 9 - Automatic boom transport lock; locks the folded booms automatically when the boom is lowered down onto the stops.

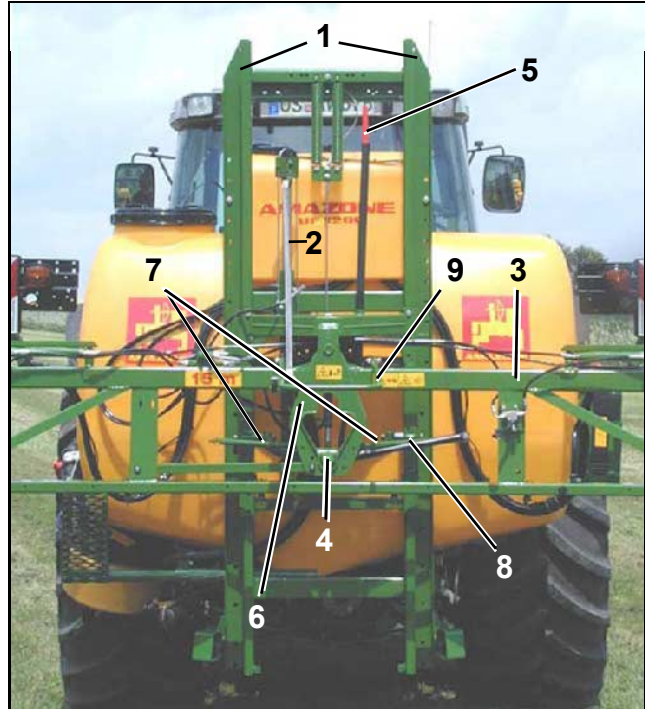


Fig. 65

Fig. 66/...

- 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.**

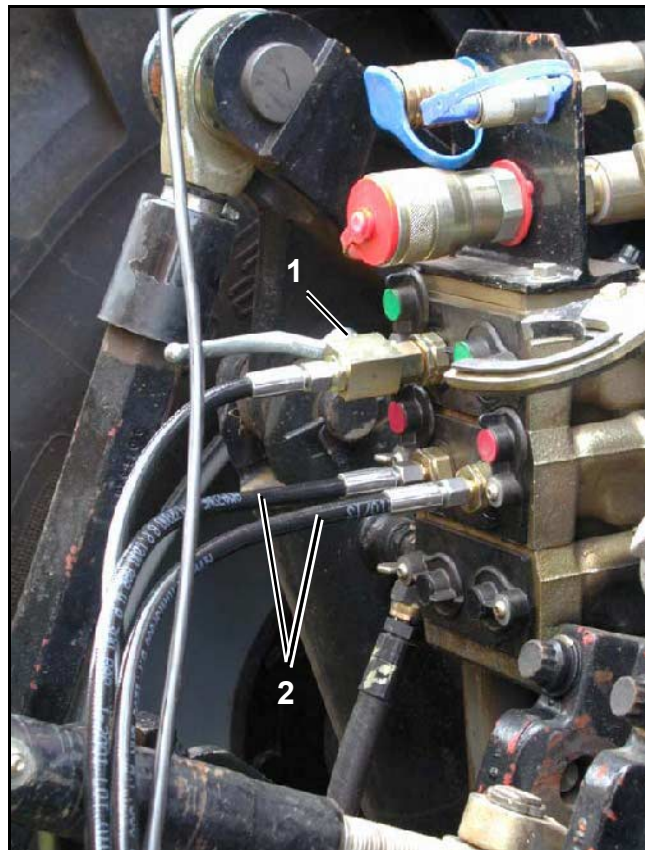


Fig. 66

## 8.2.2.1 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.

- 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).



Never put the double acting control valve on the tractor that actuates the boom folding into the "float position".

### 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.**

- Setting the sprayer boom height can then be done via the height adjustment ram.
- Shut 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 folded boom pack via the automatic transport locking device.

**≡ Always travel with the booms locked in the transport position.**

- Shut the block tap.

### 8.2.2.2 Locking and unlocking sprayer boom into the transport position

#### Unlocking

Lift the folded boom pack via height adjustment until the automatic transport latches (Fig. 67/1) are released (height position approx. 2/3 of the boom carrier frame).

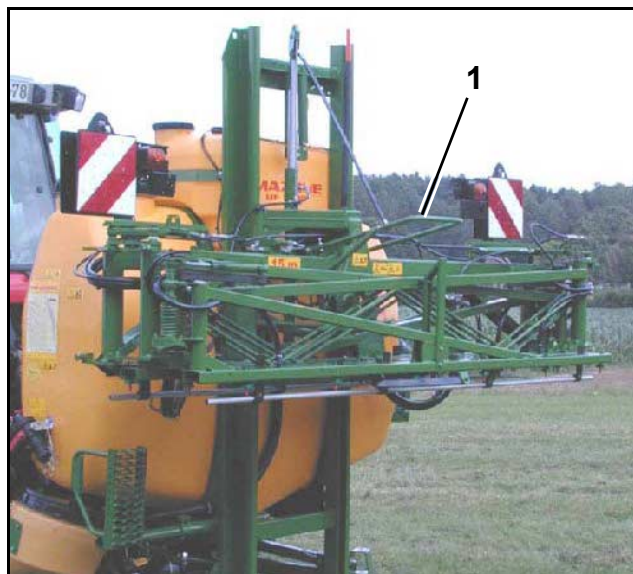


Fig. 67

#### 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 (Fig. 68/1) lock the boom pack.



**Only move with locked boom pack!**



Fig. 68

## 8.2.2.3 Unlocking and the swing compensation

Unlocking the swing compensation (Fig. 69/1) from the transport position

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

• The swing compensation (Fig. 69/1) is unlocked when the green section on the unlock/lock tube (Fig. 69/2) can be seen.



Fig. 69

Locking the swing compensation (Fig. 70/1) into the transport position

• The swing compensation is automatically locked before folding in the booms. It is locked when only approx. 1/3 of the red section on the unlock/lock tube (Fig. 70/2) can be seen.



Fig. 70



#### 8.2.2.4 Operation with one side folded boom

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.**

### 8.2.2.5 Boom safety release at obstacles

The plastic trips (Fig. 71/1) allow the giving way of the outer boom sections into or against the driving direction pivoting around the hinge point (Fig. 71/2) and after clearing any obstacle the booms will automatically return to the operating position.

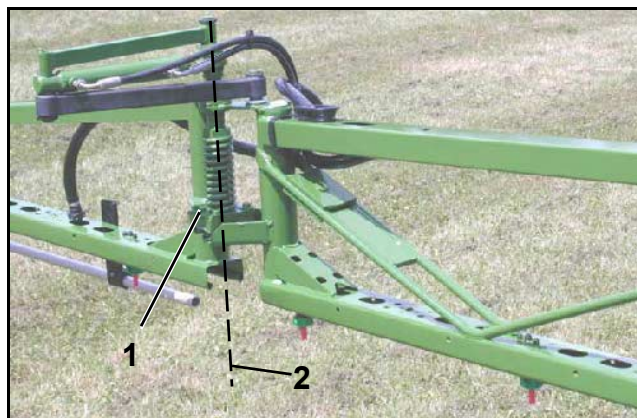


Fig. 71

### 8.2.2.6 Correcting 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. 72) 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 for boom folding, always alter all three hydraulic throttle valves equally (Fig. 72/1 and Fig. 72/3).**

Fig. 72/... or Fig. 73/...

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

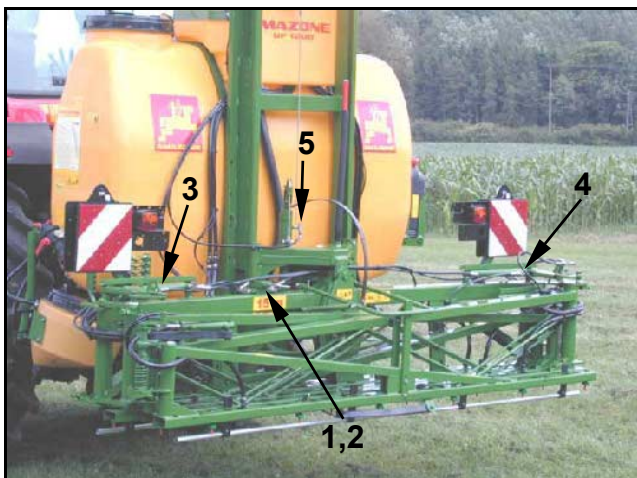


Fig. 72



Fig. 73

## 8.2.2.7 Settings on the folded out boom

### 1. Alignment parallel with the ground

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

If this is not the case, fold out the boom, **unlock** the swing compensation and align the boom via the counter weights (Fig. 74/1). Fix the counterweights where appropriate to the sprayer boom.

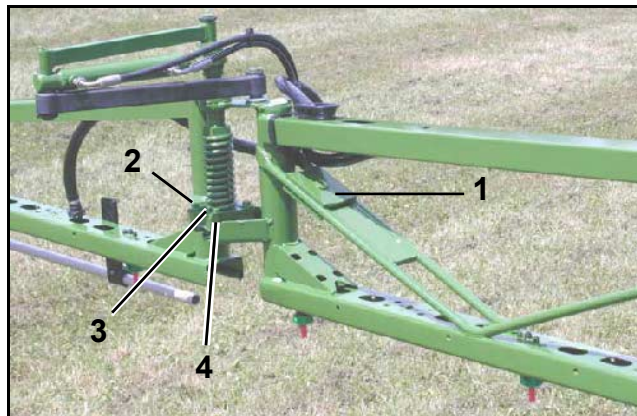


Fig. 74

### 2. Horizontal alignment

Seen in driving direction all boom sections must be aligned.

A re-adjustment may become necessary

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

#### Inner boom section

- Slacken the counter nut of the setting bolt (Fig. 75/1).
- Twist the setting screw against the stops until the inner boom section is in line with the boom centre section.
- Retighten counter nut.

#### Outer boom section

- Slacken the bolts (Fig. 74/2) on the bracket (Fig. 74/3). The alignment is achieved by adjusting the plastic claw (Fig. 74/2) via the slotted holes of the bracket.
- Align outer boom section.
- Retighten the bolts (Fig. 74/2).



Fig. 75

### 8.2.2.8 Electric boom tilting (special option)

#### Version II Order No.: 910 921

Operated via separate control box  
(Fig. 76/5)

#### Version III Order No.: 911 811

Operated directly from the sprayer main switch box  
SKS 50 N, SKS 70 N (Fig. 77)

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. Thus sprayer boom can be guided parallel to the ground, e. g. with varying track depths or where one wheel drops in a furrow.

When tilting the linear motor (Fig. 76/1) moves the swivel arm (Fig. 76/2). By moving the swivel arm a differing tensioning of the self levelling springs (Fig. 76/3) is controlled and the boom is then brought into the correct position. The switch box (Fig. 76/5 or Fig. 77/1) activates the linear motor when the setting knob (Fig. 76/4 or Fig. 77/2) is turned.

#### Fig. 76/...

- 1 - Linear motor.
- 2 - Swivel arm.
- 3 - Self levelling springs.
- 4 - Setting knob.
- 5 - Separate switch box.
- 6 - Scale; arranged around the setting knob (3).
- 7 - 0-position; in 0-position the boom is in position parallel to the ground level.

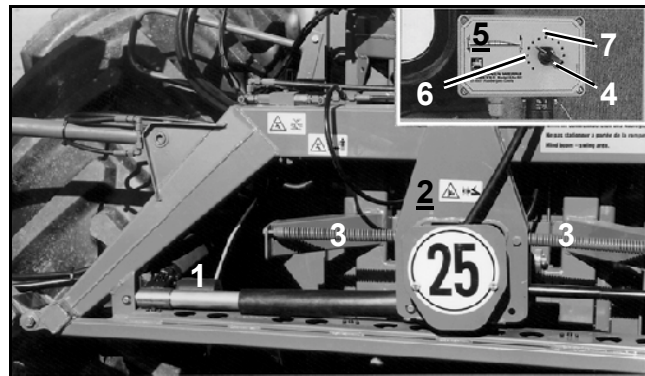


Fig. 76

#### Fig. 77/...

- 1 - Switch box SKS 50 N.
- 2 - Setting knob.
- 3 - Scale; arranged around the setting knob (2).
- 4 - 0-position.

#### Alignment of sprayer boom via boom tilting

- For tilting the unfolded booms turn the setting knob (Fig. 76/4 or Fig. 77/2). 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".

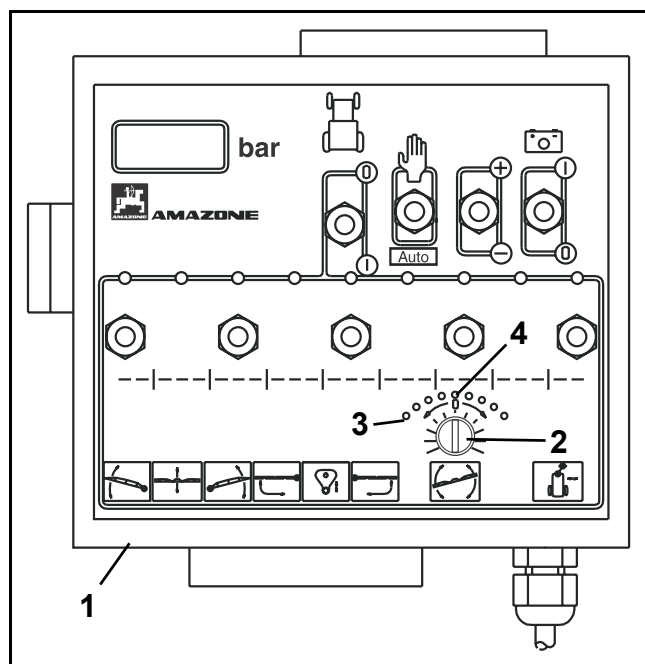


Fig. 77

## 8.2.3 Q-plus-boom with Profi-folding I (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 50 H (HA), SKS 70 H (HA)) from tractor cab. The acting control valve should be fitted to the tractor.

Required on tractor:

- ≠ 1 single acting control valve for connecting to the pressure hose (Fig. 78/1).
- ≠ 1 pressure-free return flow for connecting to the return flow hose (Fig. 78/2).

•During road transport switch off the oil supply to the valve block!

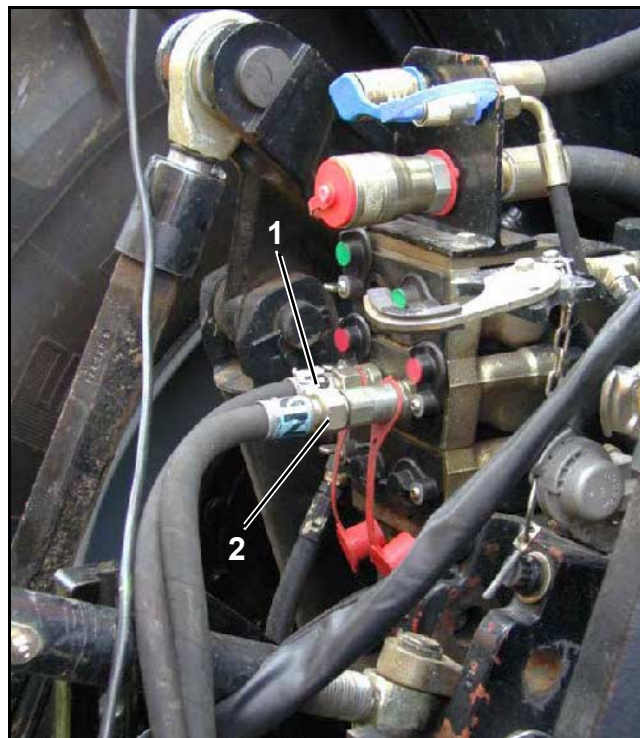


Fig. 78

### 8.2.3.1 Setting the system setting screw on the hydraulic valve block

The setting of the system setting screw (Fig. 79/1) on the hydraulic block (Fig. 79/2) 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. 79



### 8.2.3.2 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 (Fig. 80/1) of the hydraulic height adjustment.
- Folding out the right hand boom.
  - Keep the key (Fig. 80/2) 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.
- Folding out the left hand boom.
  - Keep the key (Fig. 80/3) 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 key (Fig. 80/4) unlock the swing compensation from transport position.
  - Set the spraying height of the boom via the key (Fig. 80/1) for the hydraulic height adjustment.

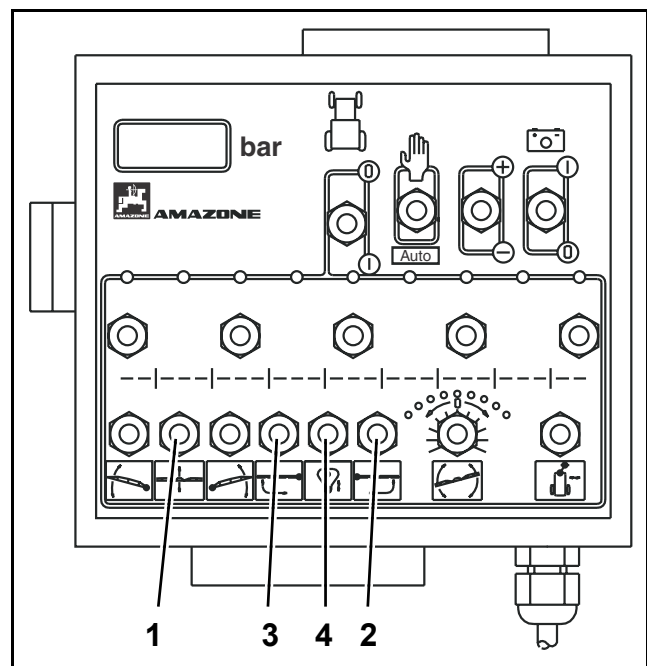


Fig. 80

## Folding in

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

- Lift the boom into a middle height by pressing key (Fig. 81/1).
- Boom tilting in position "0".

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

- **By pressing key (Fig. 81/4) lock the swing compensation in transport position.**
- Fold in the left hand boom.
  - Keep the key (Fig. 81/3) 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 key (Fig. 81/2) in position "folding in" until the individual sections of the left hand boom have been completely folded in.
- Lock the folded boom pack via the automatic transport locking device.

**Only move with locked boom pack.**

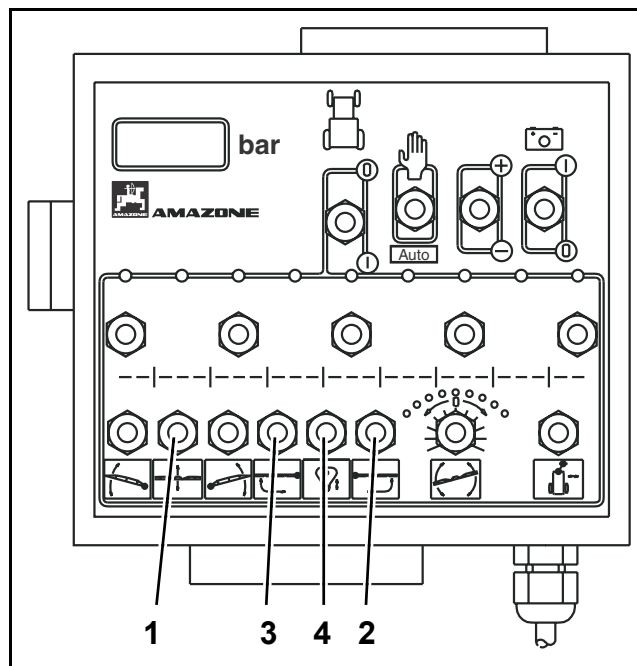


Fig. 81

### 8.2.3.3 Locking and unlocking sprayer boom into the transport position

#### Unlocking

- Lift the boom with the aid of the height adjustment key (Fig. 82/1) until the automatic transport locking device (Fig. 83/1) releases the boom pack (height approx. 2/3 of the boom carrier length).

#### Locking

- Lower the boom via the height adjustment key (Fig. 82/1) until approx. 30 cm (measured from the lower edge of the boom carrier frame), until the automatic transport latches (Fig. 84/1) lock the boom pack.



**Only move with locked boom pack!**

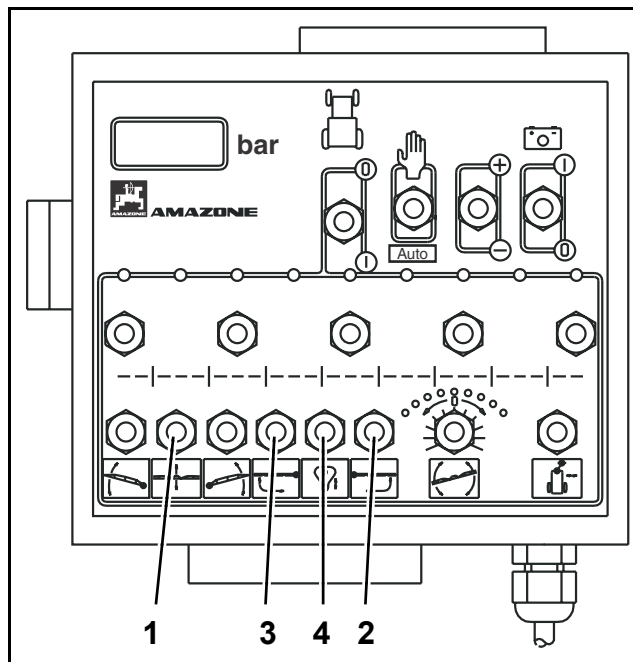


Fig. 82



Fig. 83



Fig. 84

## 8.2.3.4 Locking and unlocking sprayer boom into the transport position

- 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 key (Fig. 85/4).

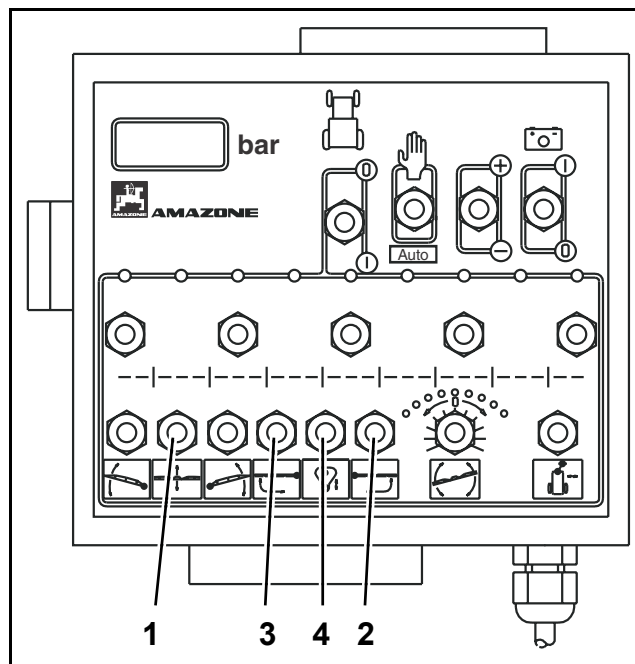


Fig. 85

- To unlock the swing compensation briefly push the key (Fig. 85/4) upwards. **The swing compensation** (Fig. 86/1) is unlocked when the green section of the lock indicator (Fig. 86/2) can be seen. **Fig. 86 illustrates the swing compensation when locked.**

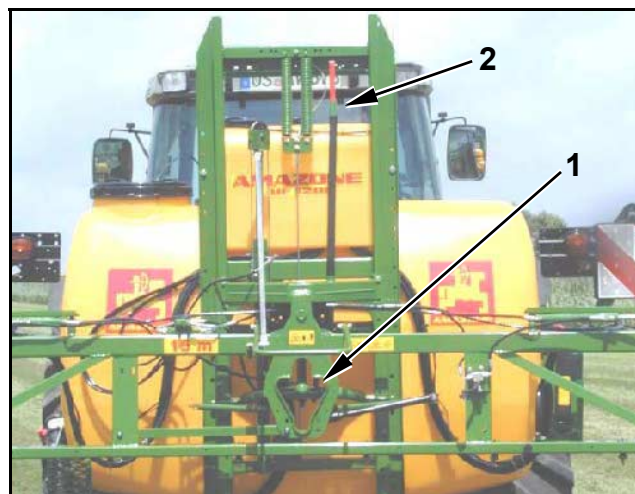


Fig. 86

- For locking the swing compensation briefly push the key (Fig. 85/4) downwards. The swing compensation (Fig. 87/1) is **locked** when only 1/3 of the red section of the unlock indicator (Fig. 87/2) can be seen. **Fig. 87 illustrates the swing compensation when locked.**



Fig. 87



### 8.2.3.5 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 key (Fig. 88/4) to lock the swing compensation.
- Actuate key (Fig. 88/1) and set the spraying height of the boom via the height adjustment.
- Actuate keys (Fig. 88/2 or Fig. 88/3) 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 keys (Fig. 88/5).

Operation with symmetrically folded out boom:

- Fold out boom again.
- Actuate key (Fig. 88/4) to unlock the swing compensation.
- Actuate key (Fig. 88/1) and set the spraying height of the boom via the height adjustment.

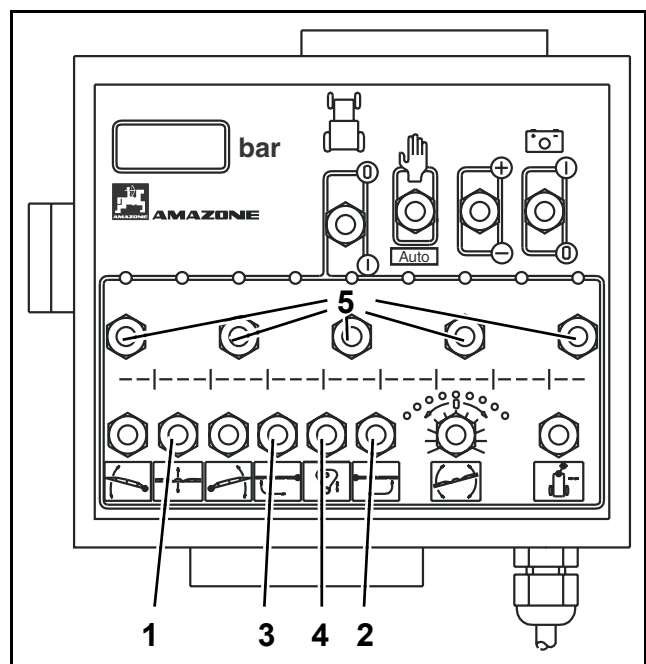


Fig. 88

## 8.2.3.6 Correcting 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. 89) 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.**

Fig. 89/...

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

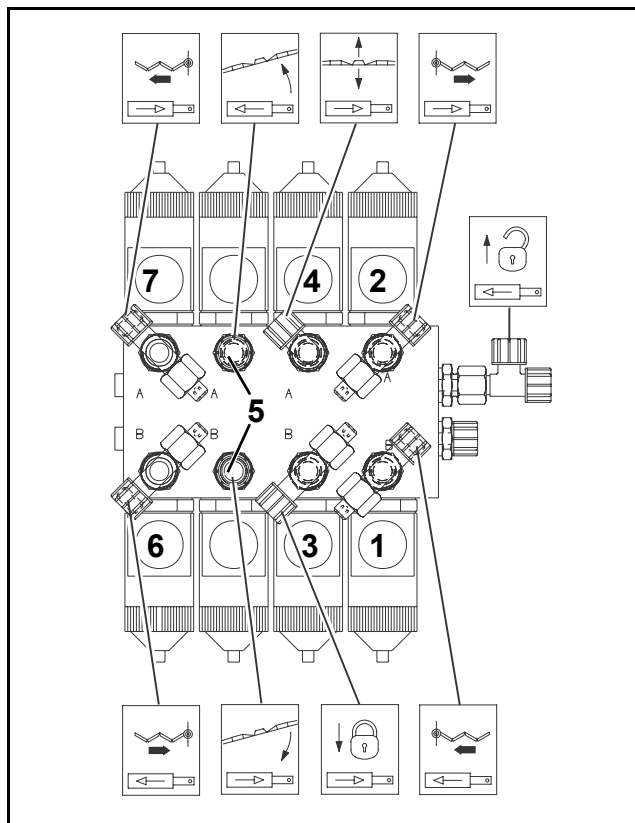


Fig. 89

### 8.2.3.7 Electro-hydraulic boom tilting

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 (Fig. 90/2) is moved via the hydraulic ram (Fig. 90/1). By moving the swivel arm a differing tensioning of the self levelling springs (Fig. 90/3) is controlled and the boom is then brought into the correct position. The hydraulic ram is actuated via the switch box (Fig. 91/1) by pressing key (Fig. 91/2).

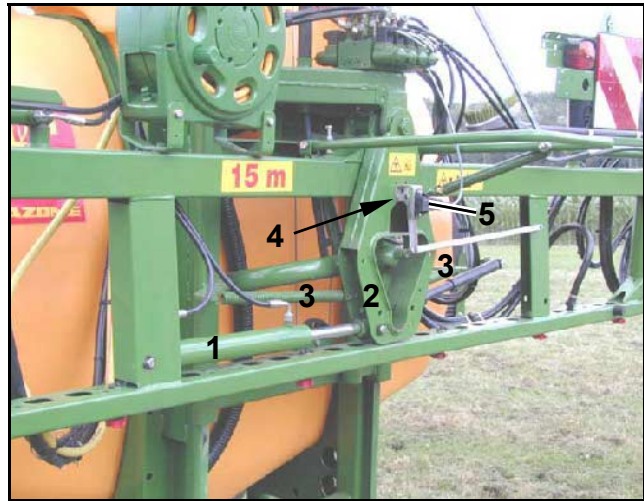


Fig. 90

#### Fig. 91/...

- 1 - Switch box (SKS 1 HA, SKS 50 HA).
- 2 - Key for boom tilting.
- 3 - Scale, consisting of luminous diodes; arranged around key (2).
- 4 - 0-position. If the boom is in "0" position (parallel to sprayer frame) the diode lights up above "0".

#### Alignment of sprayer boom via boom tilting

- Actuate key (Fig. 91/2) 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.**

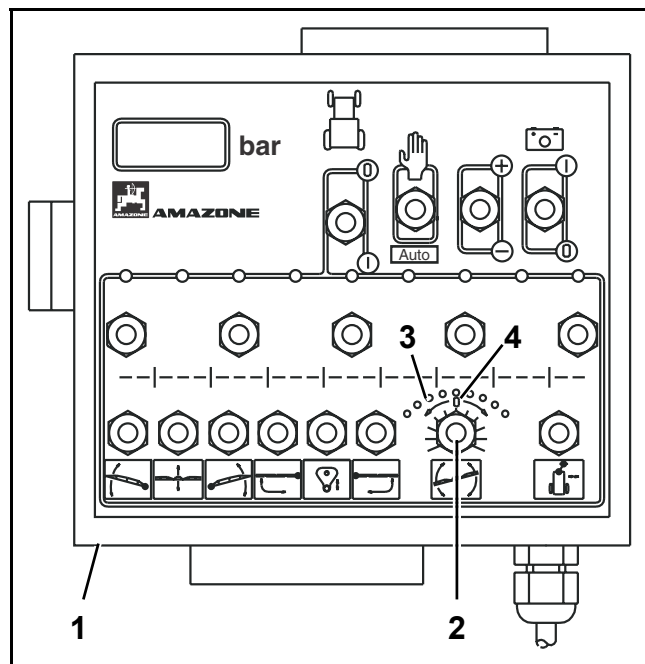


Fig. 91

The central diode (Fig. 91/4) 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"

- Lock the swing compensation and unfold both booms completely.
- Align booms parallel to the sprayer frame by pressing key (Fig. 91/2).
- Slacken bolt (Fig. 90/4) and swivelling the potentiometer (Fig. 90/5) in the slotted holes on the swivel arm in the appropriate manner.
- Retighten bolt (Fig. 90/4) and affix the potentiometer (Fig. 90/5) 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 an authorised workshop.**

## 8.3 Super-S-Boom 15 to 28 m working width

Fig. 92/...

- 1 - Boom frame.
- 2 - Transport latch for locking boom sections in transport position.
- 3 - Locating sockets.
- 4 - Single acting hydraulic height adjustment ram allow the setting of 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.
- 7 - Self-levelling tensioning springs for parallel boom alignment.
- 8 - Shock absorber.

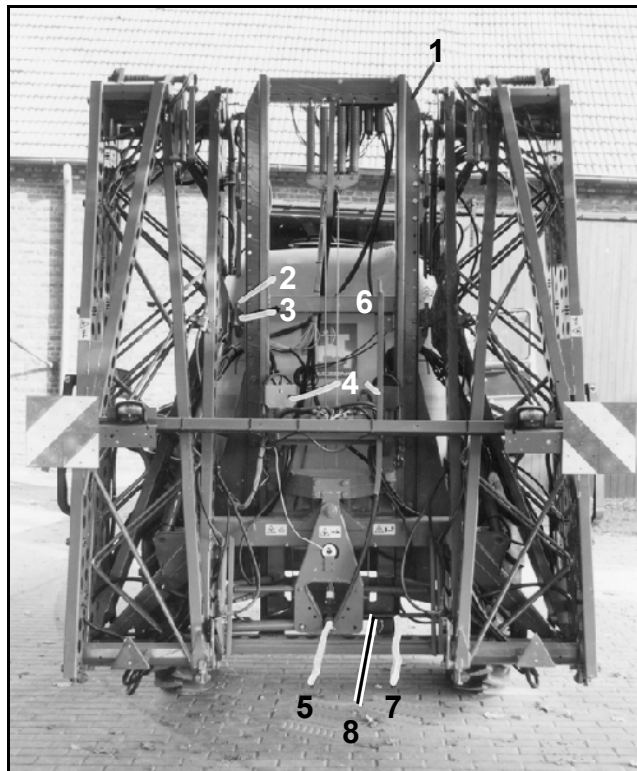


Fig. 92

### Boom safety release at obstacles

The plastic trips (Fig. 93/1) allow the giving way of the outer boom sections into or against the driving direction pivoting around the hinge point (Fig. 93/2) and after clearing any obstacle the booms will automatically return to the operating position.

#### 8.3.1 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.

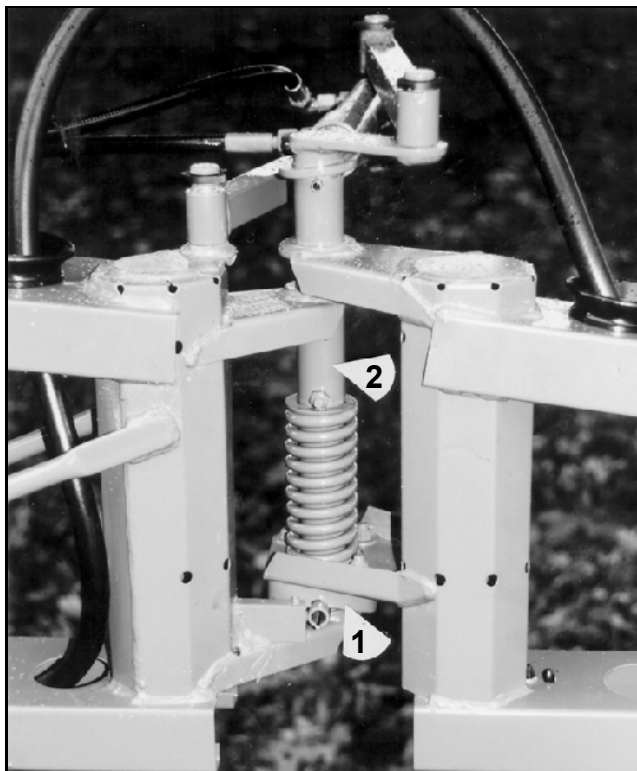


Fig. 93



### 8.3.1.1 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).**



**Never put the double acting control valve on the tractor that actuates the boom folding into the "float position".**

#### 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 locked in the transport position.**

- Shut the block tap.

#### 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 the block tap. Now the height adjustment is locked and the set sprayer boom height can be accurately maintained.

## 8.3.1.2 Locking and unlocking sprayer boom into the transport position

### Unlocking

Lift the sprayer boom via height adjustment until the transport latches (Fig. 94/1) are released from the pockets (Fig. 94/2).

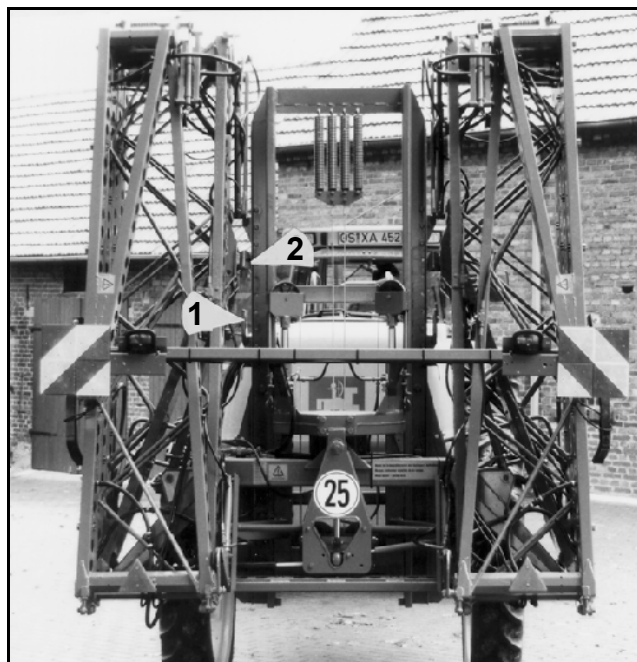


Fig. 94

### Locking

Fully lower the sprayer boom via the height adjustment until the transport latches (Fig. 95/1) pick up the pockets (Fig. 95/2).

- 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!**

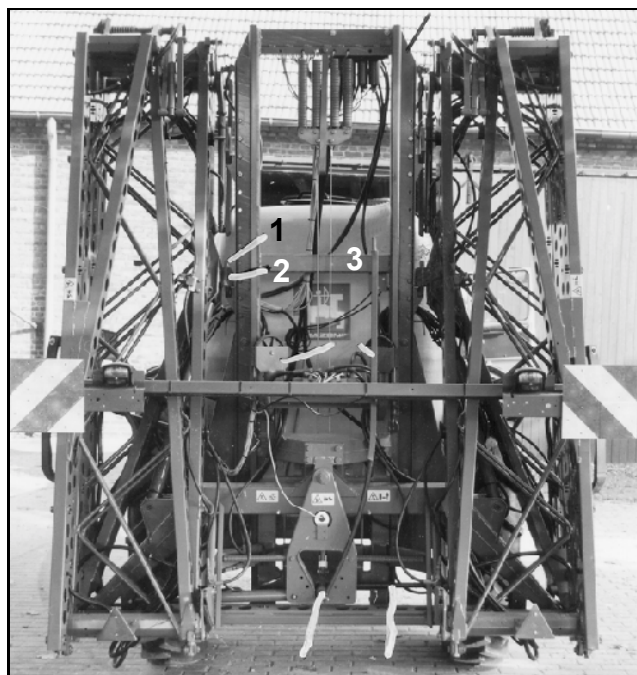


Fig. 95

## 8.3.1.3 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.

The **swing compensation** (Fig. 96/1) is unlocked when the green section of the lock indicator (Fig. 95/3) can be seen.

The swing compensation is automatically **locked** before folding in the booms. The swing compensation (Fig. 96/2) is locked when only 1/3 of the red section of the unlock indicator (Fig. 95/3) can be seen.

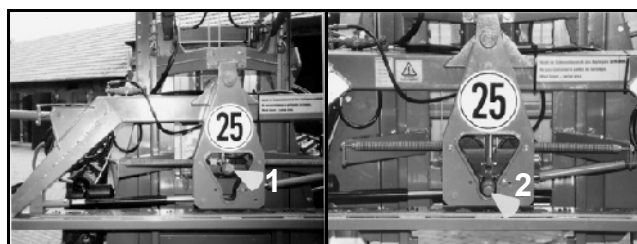


Fig. 96

### 8.3.1.4 Operation with reduced working width

==

For a symmetrical working width reduction of the sprayer booms the special optional equipment "Super S boom mechanical boom width reduction kit" is required. On every ram used for folding out the booms, 2 ball taps (Fig. 97/1 or Fig. 98/1) must be actuated.

Before folding out the booms, shut the ball taps (Fig. 97/1) on the outer joints, e.g. for reducing the working width from 24 m to 18 m, or the ball taps (Fig. 98/1) on the inner boom section joint for reducing the working width to 12 m.

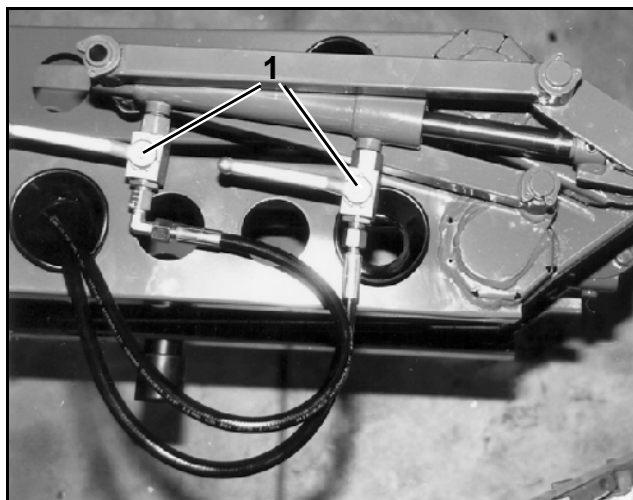


Fig. 97



Fig. 98

### 8.3.1.5 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 (Fig. 99/1), by equally screwing in or out the corresponding Allen key headed set screw as follows:

- 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.

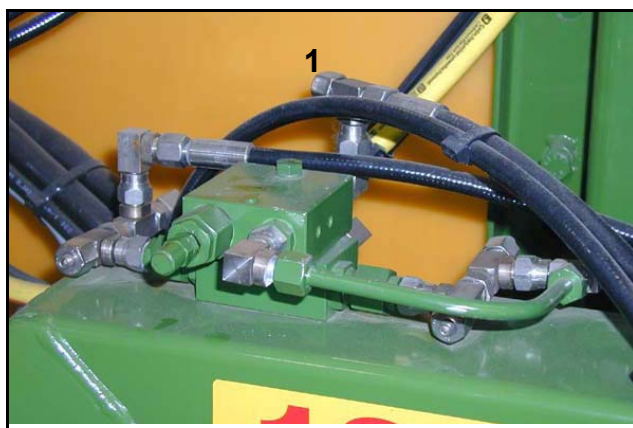


Fig. 99

## 8.3.1.6 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 (Fig. 100/2, Fig. 100/3, Fig. 101/1 and Fig. 101/2) by equally screwing in or out the corresponding Allen 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.

### 1. Folding speed of the boom section packs

The speed for folding the booms in and out may be set by the throttle valves (Fig. 100/2 and Fig. 100 /3).

### 2. Folding speed of complete boom section packs

The folding speed of the complete folded left hand boom section pack may be changed by the throttle valves (Fig. 101/1 and Fig. 101/2).

•If necessary adjust both throttle valves.

==

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



Fig. 100



Fig. 101

### 8.3.1.7 Settings on the folded out boom

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 (Fig. 102/1) with the swing compensation **unlocked**. Fix the counterweights where appropriate to the sprayer boom.

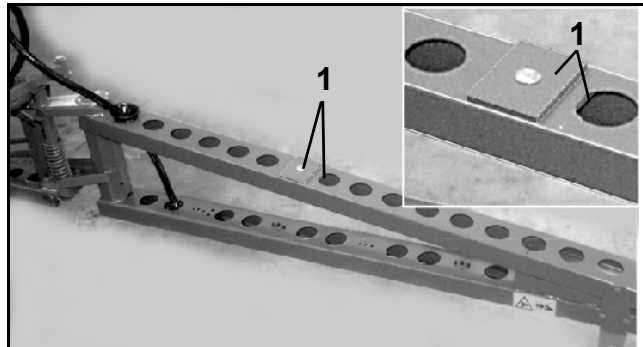


Fig. 102

### 8.3.1.8 Electric boom tilting (special option)

**Version II**                      **Order No.: 910 921**

Operated via separate control box (Fig. 103/5)

**Version III**                      **Order No.: 911 811**

Operated directly from the sprayer main switch box SKS 50 N, SKS 70 N (Fig. 104)

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. Thus sprayer boom can be guided parallel to the ground, e. g. with varying track depths or where one wheel drops in a furrow.

When tilting the linear motor (Fig. 103/1) moves the swivel arm (Fig. 103/2). By moving the swivel arm a differing tensioning of the self levelling springs (Fig. 103/3) is controlled and the boom is then brought into the correct position. The switch box (Fig. 103/5 or Fig. 103/1) activates the linear motor when the setting knob (Fig. 103/4 or Fig. 104/2) is turned.

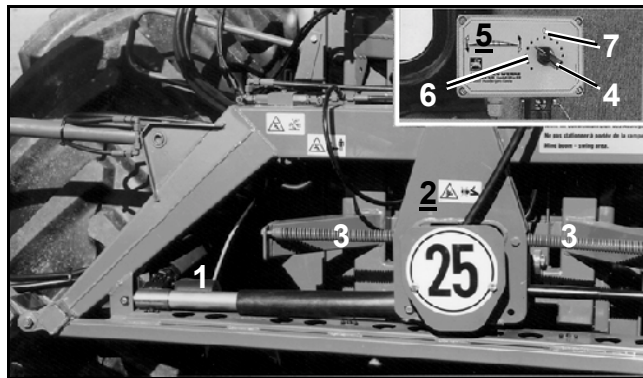


Fig. 103

#### Fig. 103/...

- 1 - Linear motor.
- 2 - Swivel arm.
- 3 - Self levelling springs.
- 4 - Setting knob.
- 5 - Separate switch box.
- 6 - Scale; arranged around the setting knob (3).
- 7 - 0-position; in 0-position the boom is in position parallel to the ground level.

#### Fig. 104/...

- 1 - Switch box SKS 50 N.
- 2 - Setting knob.
- 3 - Scale; arranged around the setting knob (2).
- 4 - 0-position.

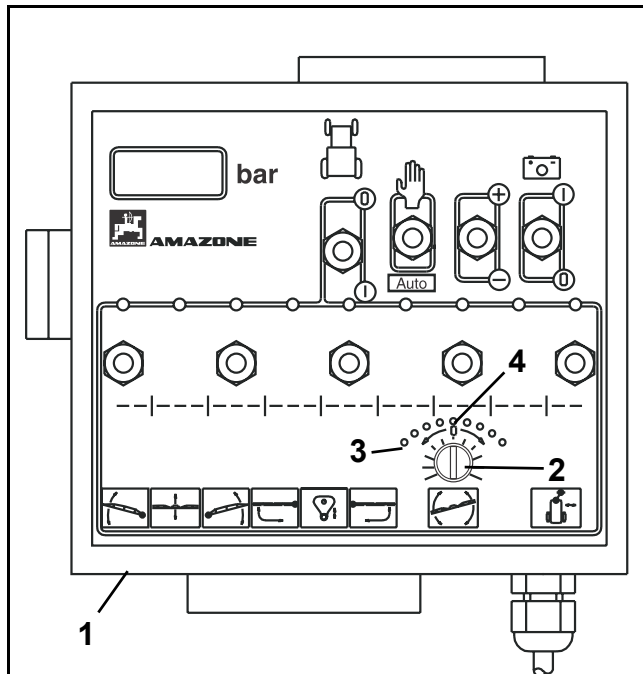


Fig. 104

## 8.3.1.9 Alignment of sprayer boom via boom tilting

- For tilting the unfolded booms turn the setting knob (Fig. 105/4 or Fig. 106/2). 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).

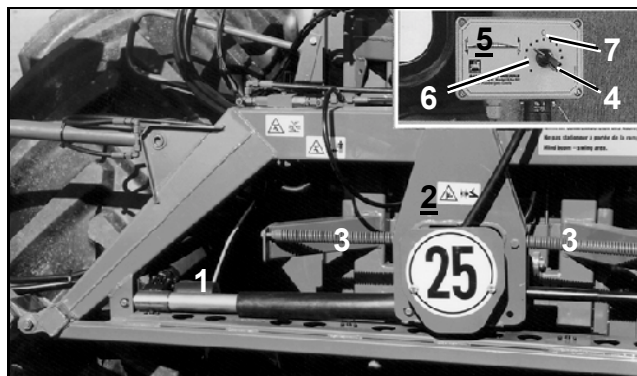


Fig. 105

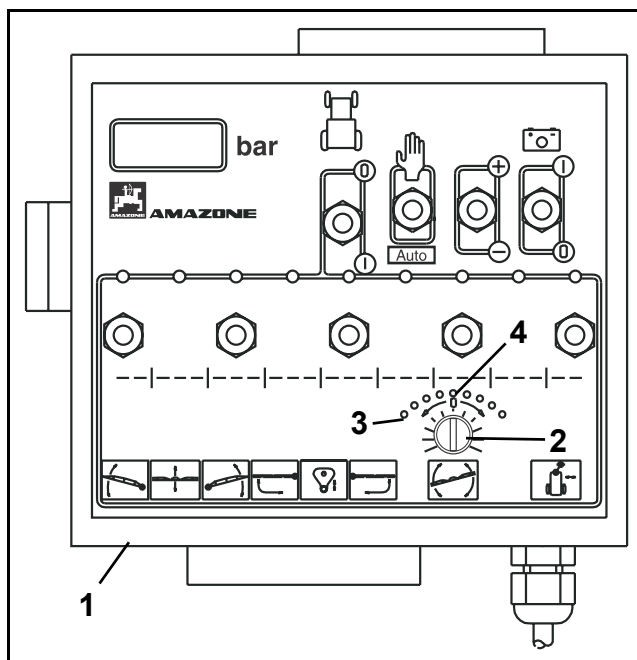


Fig. 106

### 8.3.2 Super S-booms with Profi-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 tilting,
- ≡ 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 50 H (HA), SKS 70 H (HA)) from tractor cab. The acting control valve 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 (Fig. 107/1) on the right hand side of the boom near the hydraulic valve block is provided with a pollution display (Fig. 107/2). 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. 107

## 8.3.2.1 Setting the system setting screw on the hydraulic valve block

The setting of the system setting screw (Fig. 108/1) on the hydraulic block (Fig. 108/2) 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.

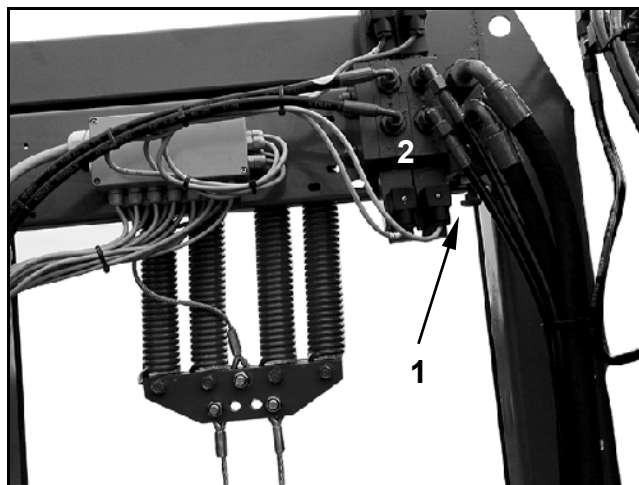


Fig. 108



### 8.3.2.2 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. 8.3.2.3).
- Lift boom to a middle height by pressing the key (Fig. 109/1) of the hydraulic height adjustment.

#### ## Profi-folding "0" up to 27/28 m

- Keep one of the keys (Fig. 109/2 or Fig. 109/3) in position "folding 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 key (Fig. 109/2 and Fig. 109/3) in position "folding 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 (Fig. 109/4 and Fig. 109/5) in position "tip angling" until both boom packs have been folded down **horizontally**.
- Keep key (Fig. 109/2 and Fig. 109/3) in position "folding 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.

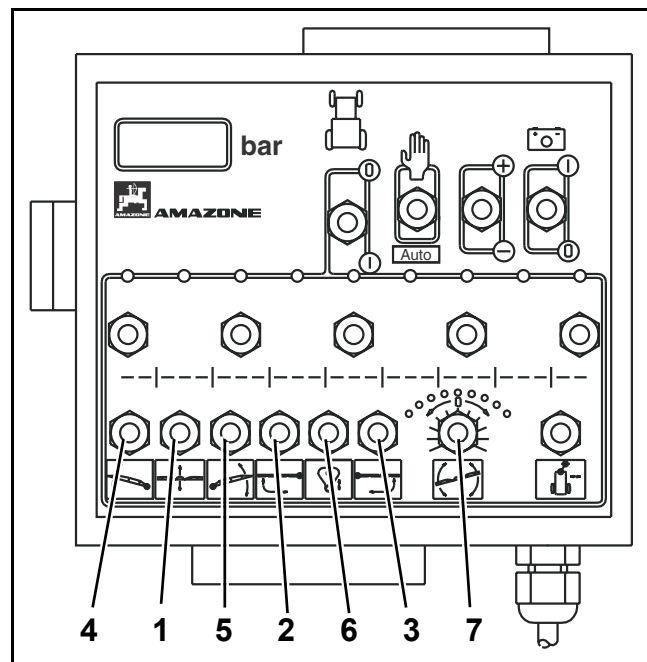


Fig. 109

## ⚡ Profi-folding "III" up to 27/28 m

- Keep the switches (Fig. 110/4 and Fig. 110/5) in position "tip angling" until both boom packs have been folded down **horizontally**.
- Keep one of the keys (Fig. 110/2 or Fig. 110/3) in position "folding 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 key (Fig. 110/6) (please refer to para. 8.3.2.4).**
- Set the spraying height of the boom via the key (Fig. 110/1) for the hydraulic height adjustment.

## Folding in

- Lift the boom into a middle height by pressing key (Fig. 110/1).
- Set boom tilting and independent boom angling (Profi folding "II" and "III") to "0".

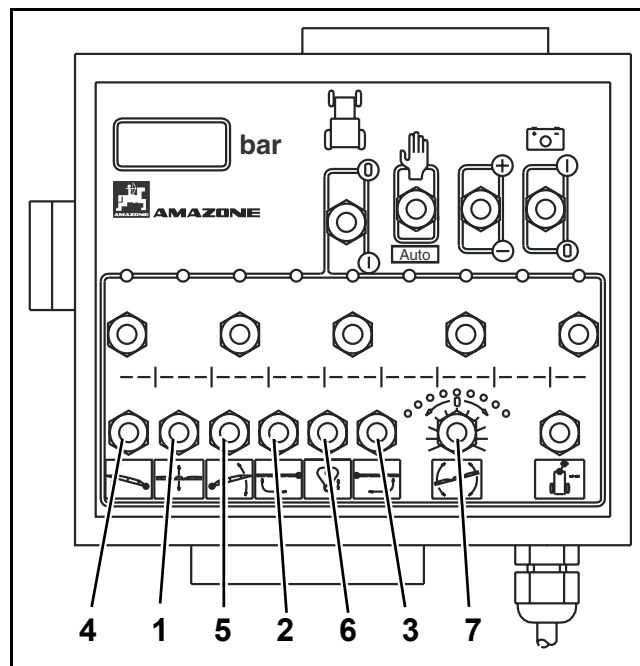


Fig. 110

- **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).**
- **Lock the swing compensation via the key (Fig. 110/6) (please refer to para. 8.3.2.4).**

## ⚡ Profi-folding "0"

- Keep one of the keys (Fig. 110/2 or Fig. 110/3) 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 keys (Fig. 110/4 and Fig. 110/5) in position "folding in" until the individual sections have been completely folded and the two folded boom packs have been folded upwards.

## ⚡ Profi-folding "II" up to 24 m

- Keep keys (Fig. 110/4 and Fig. 110/5) in position "folding in" until the individual sections have been completely folded.
- Keep the keys (Fig. 110/2 and Fig. 110/5) in position "tip angling" until both boom packs have been folded upwards.

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

- Keep one of the keys (Fig. 111/2 or Fig. 111/3) in position "folding in" until the individual segments have completely been folded in and both boom packs have been folded upwards.
- Keep the keys (Fig. 111/4 and Fig. 111/5) 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. 8.3.2.3).

### Folding in

- Lift the boom into a middle height by pressing key (Fig. 110/1).
- Set boom tilting and independent boom angling (Profi folding "II" and "III") to "0".

### 8.3.2.3 Locking and unlocking sprayer boom into the transport position

#### Unlocking

- Lift the sprayer boom via height adjustment until the transport latches (Fig. 112/1) are released from the pockets (Fig. 112).

#### Locking

- Lower the boom completely via the height adjustment key (Fig. 111/1) until the transport latches pick up on the sockets (Fig. 113).
- If the transport latches do not pick up on the sockets (Fig. 113/1), align the booms in a parallel position to the sprayer frame with the key (Fig. 111/7) for the tilting device.

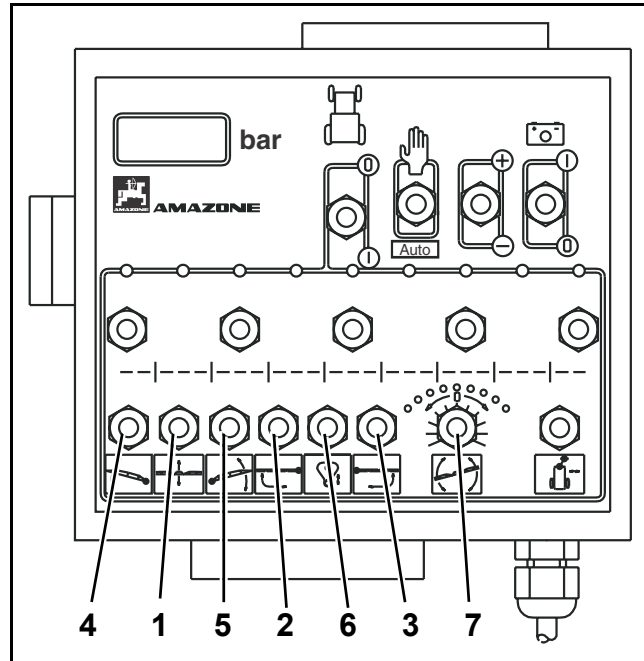


Fig. 111

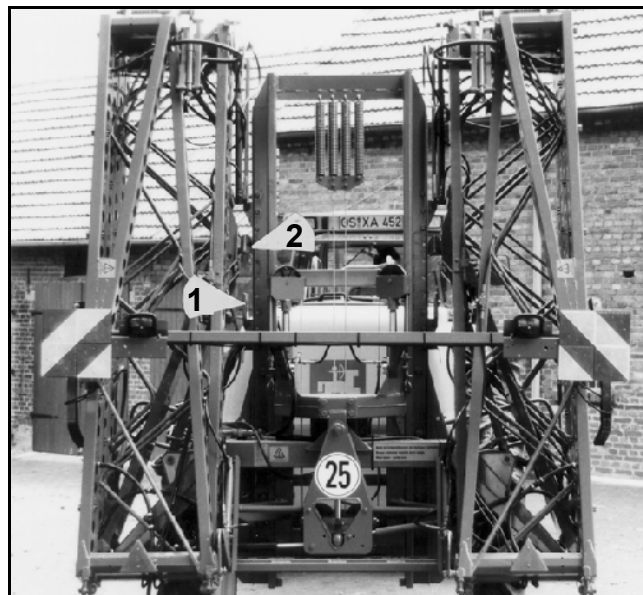


Fig. 112

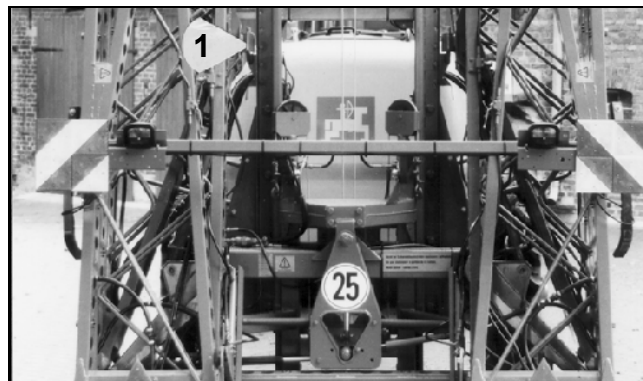


Fig. 113

## 8.3.2.4 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 from the transport position via the key (Fig. 114/6).

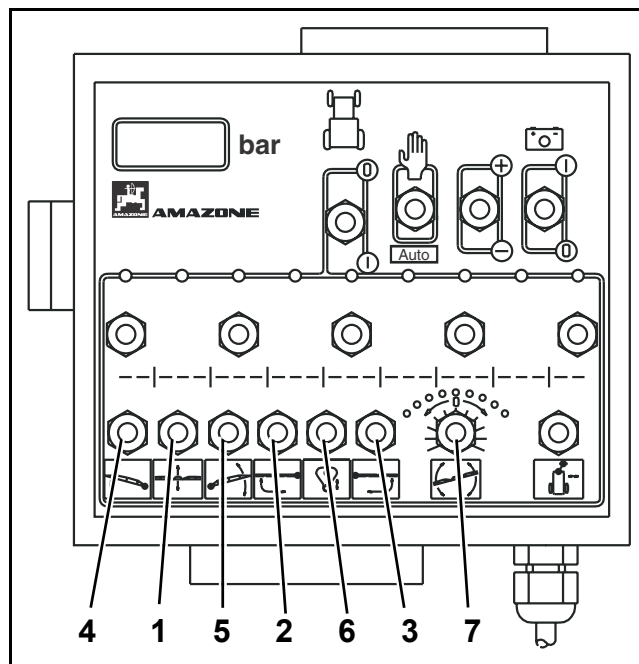


Fig. 114

The swing compensation (Fig. 115/1) is unlocked when the green section of the lock indicator (Fig. 115/2) can be seen. Fig. 115 illustrates the swing compensation when unlocked.

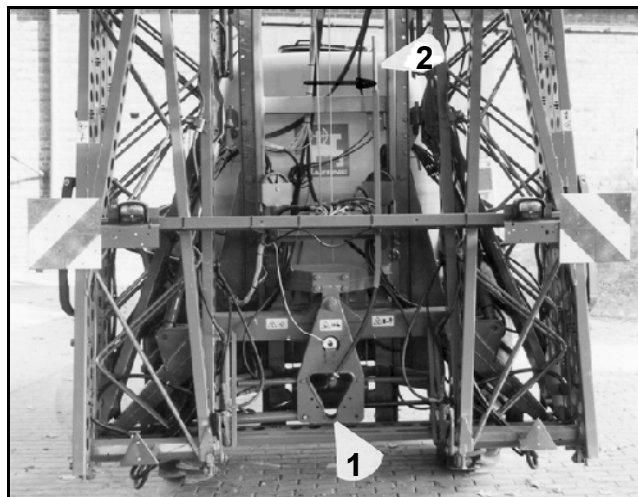


Fig. 115

The swing compensation (Fig. 116/1) is locked when only 1/3 of the red section of the unlock indicator (Fig. 116/2) can be seen. Fig. 116 illustrates the swing compensation when locked.

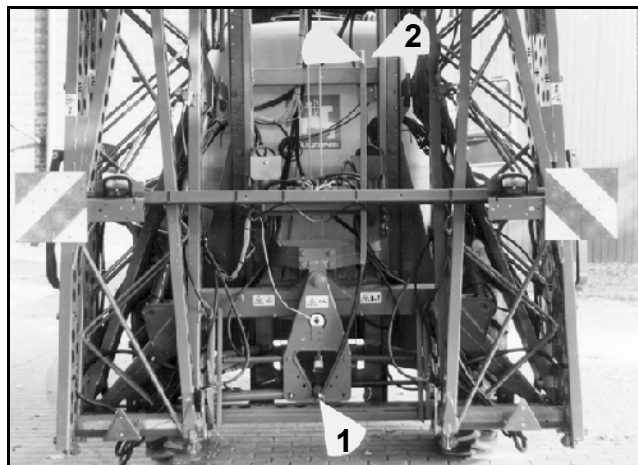


Fig. 116

### 8.3.2.5 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 (Fig. 117/2) is moved via the hydraulic ram (Fig. 117/1). By moving the swivel arm a differing tensioning of the self levelling springs (Fig. 117/3) is controlled and the boom is then brought into the correct position. The hydraulic ram is actuated via the switch box (Fig. 118/1) by pressing key (Fig. 118/2).

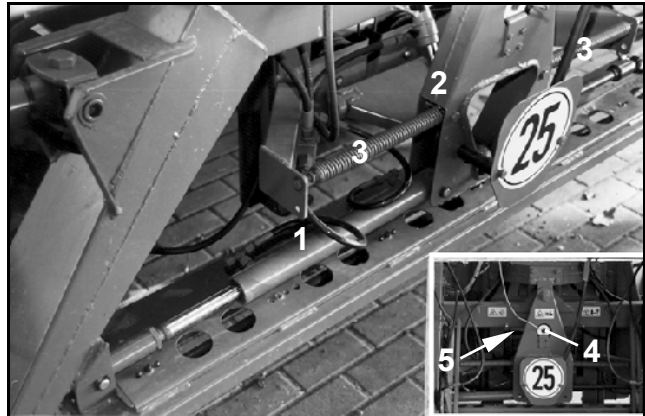


Fig. 117

#### Fig. 118/...

- 1 - Switch box (SKS 1 HA, SKS 50 HA).
- 2 - Key for boom tilting.
- 3 - Scale, consisting of luminous diodes; arranged around key (2) .
- 4 - 0-position. If the boom is in "0" position (parallel to sprayer frame) the diode lights up above "0".

#### Alignment of sprayer boom via boom tilting

- Actuate key (Fig. 118/2) 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 (Fig. 118/4) 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.

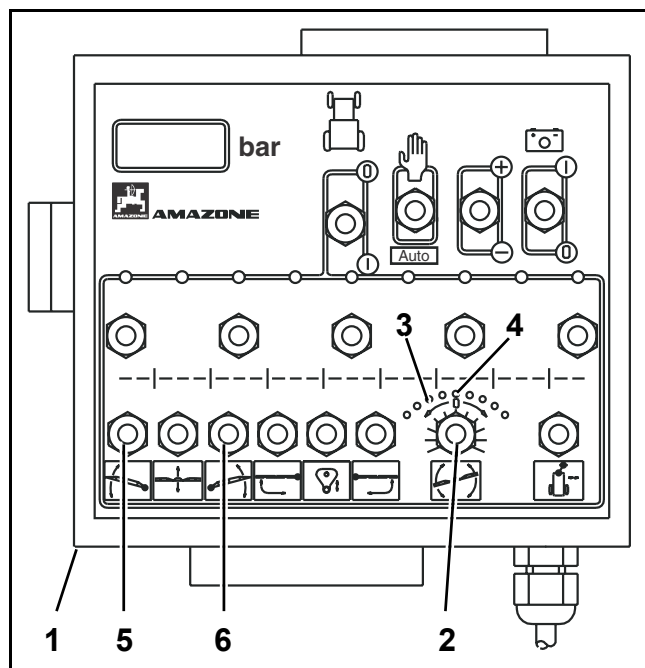


Fig. 118

## Readjustment of "0-Position"

- Lock the swing compensation and unfold both booms completely.
- Align booms parallel to the sprayer frame by pressing key (Fig. 120/2).
- Turn the potentiometer (Fig. 119/4) on the roller with the thread is turn around (Fig. 119/5) by hand until the centre diode (Fig. 120/4) lights up.

• Turn the potentiometer by max.  $\pm 20^\circ$ . If this is not sufficient, ask for boom alignment in an authorised workshop.

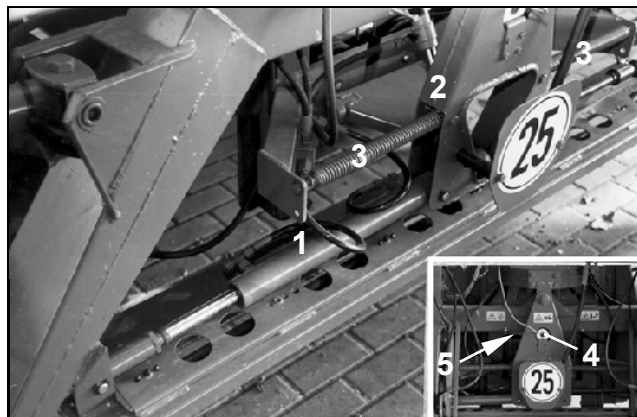


Fig. 119

## 8.3.2.6 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.

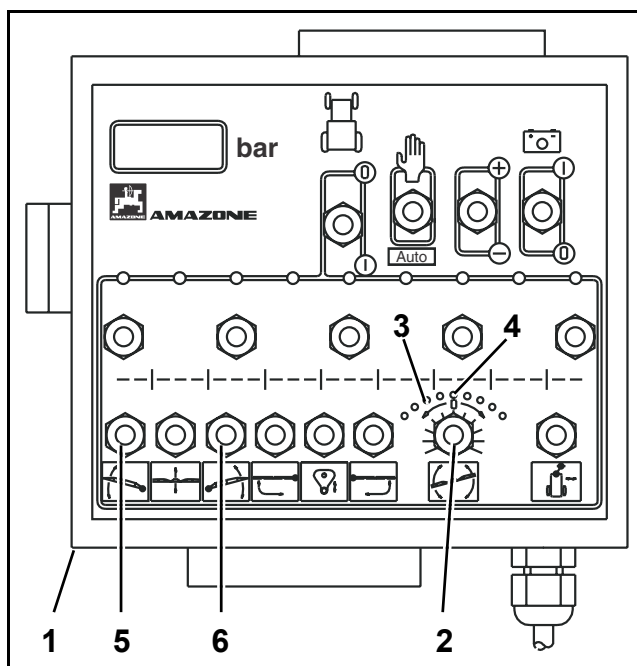


Fig. 120



### 8.3.2.7 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 (Fig. 121/5 and Fig. 121/6).

- **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").**

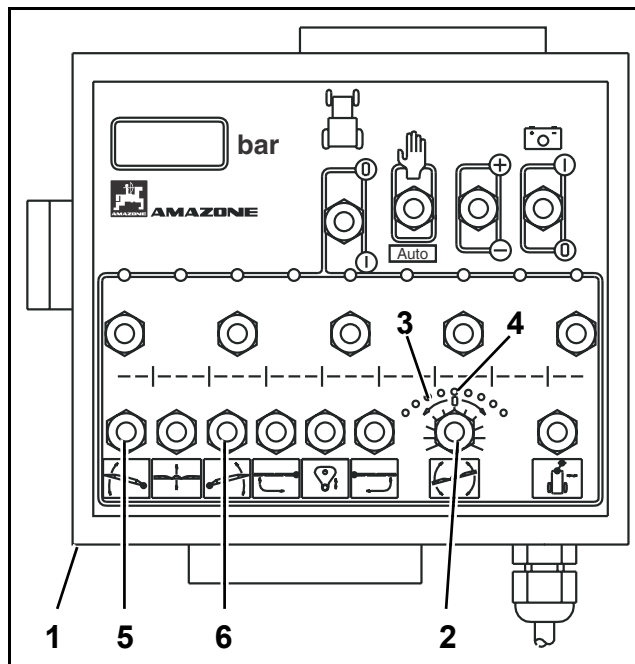


Fig. 121

## 8.3.2.8 Correcting 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. 122 up to Fig. 125) 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. 122/...

- 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 the right and left hand boom.
- 5 - Throttle valve - folding in the right and left hand boom.

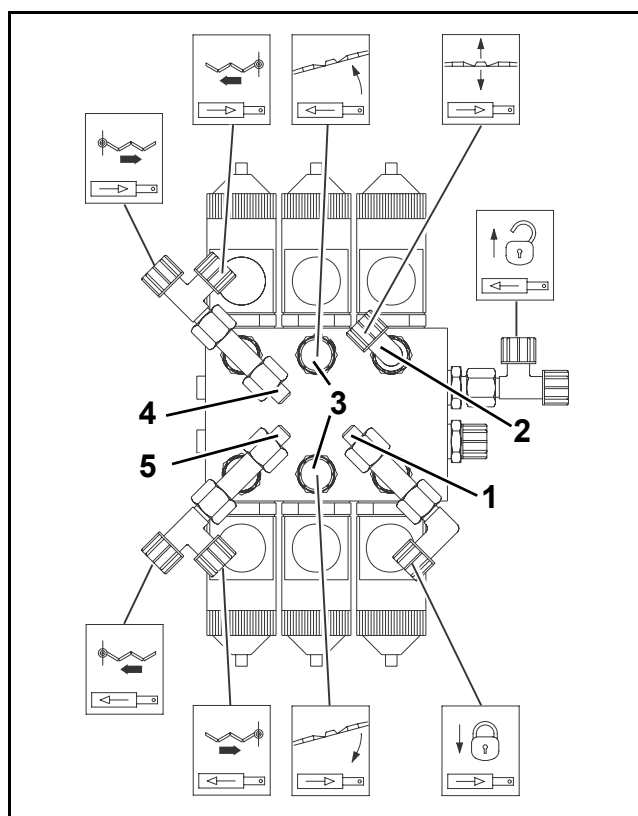


Fig. 122

## 2. Profi I

Fig. 123/...

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

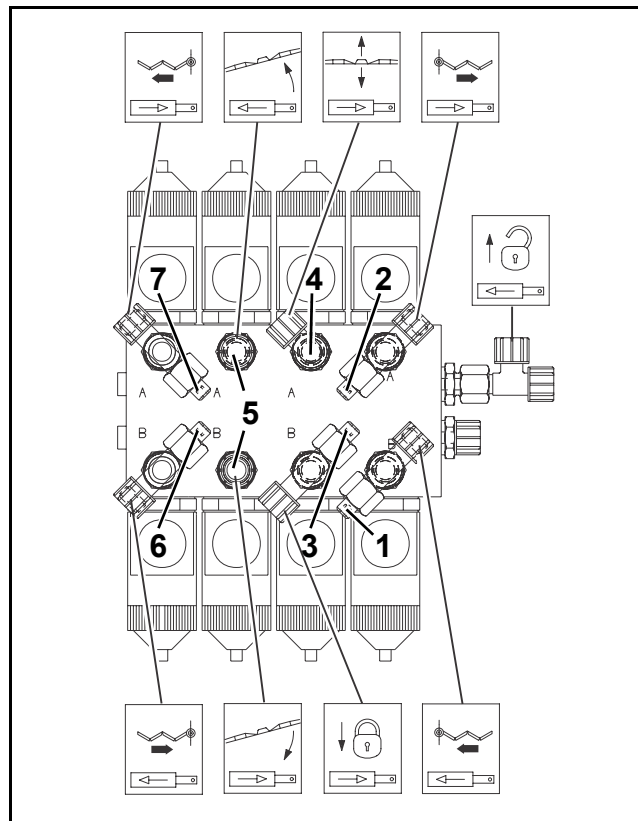


Fig. 123

## 3. Profi II

Fig. 124/...

- 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.

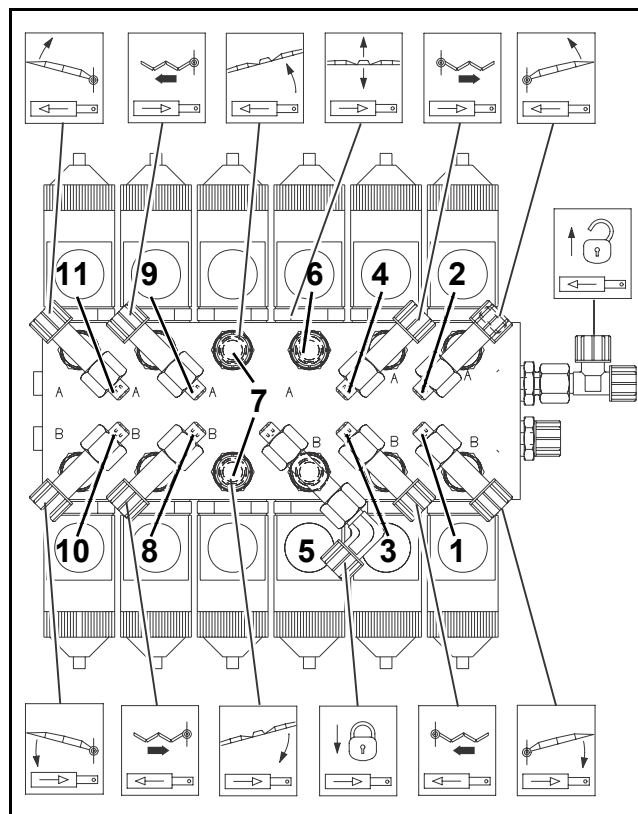


Fig. 124

## 4. Profi III

Fig. 125/...

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

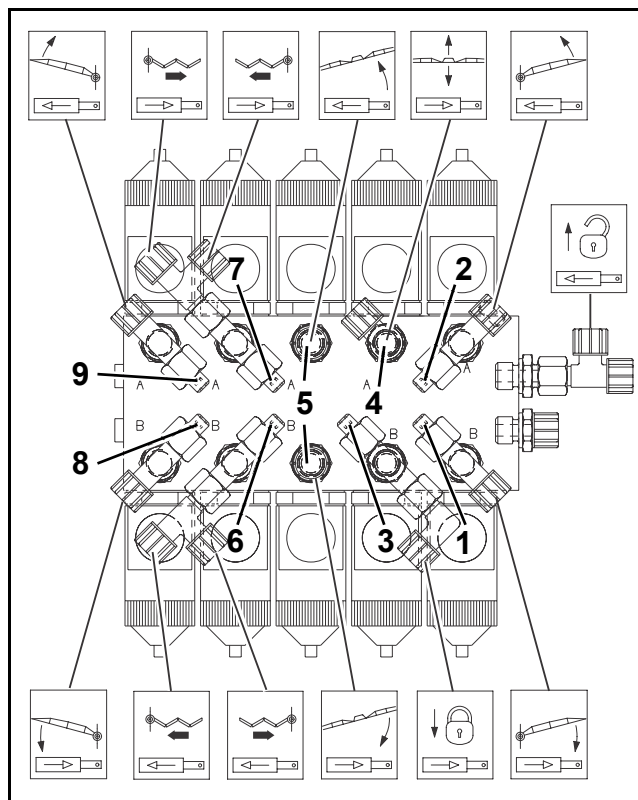


Fig. 125



## 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 .**

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 spray agent tank may only be conducted after a thorough cleaning. The spray agent 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.**

### 9.1 Check list for maintenance work

|   |  |
|---|--|
| <b>Daily</b>  |  |
| Pump  | Checking oil level   |
| Oil filter (Profi-folding "0")  | state check  |
| Container<br>Suction filter<br>Pressure filter<br>Hose filter for spray circuits (if fitted).<br>Pump<br>Control units<br>Nozzles | cleaning or flushing   |
| <b>Monthly</b>  |  |
| Pressure reservoir  | check pressure   |
| <b>Annually, minimum</b>  |  |
| Pump  | check piston diaphragms and exchange if necessary<br>check valves, change if necessary |
| Oil filter  | exchange   |
| Control units   | check pressure gauge   |
| Nozzles   | check lateral distribution, exchange if necessary                                      |
| <b>After hours of operation</b>   |  |
| Pump  | Oil change every 400 to 450 hours of operation   |

## 9.2 Cleaning the filter tap

- Daily clean the filter insert (Fig. 126/1) after having finished operation.

For cleaning the filter tap proceed as follows:

- Drive the pump (300 R.P.M.).
- Set control lever (Fig. 126/2) on position "filling".
- Swivel spring bracket (Fig. 126/3) to the side.
- Remove filter bowl (Fig. 126/4) by slightly turning it to the right and left hand side.
- Now filter insert (Fig. 126/1) and centring ring (Fig. 126/5) are easy to access.
- Clean filter bowl, filter insert and centring ring using water.
- Assembly of parts in the reverse order.

- The open side of the filter insert should face towards the filter tap housing (Fig. 126/6).

- Swivel the control lever (Fig. 126/2) to position "spraying" and check the filter tap for tightness.

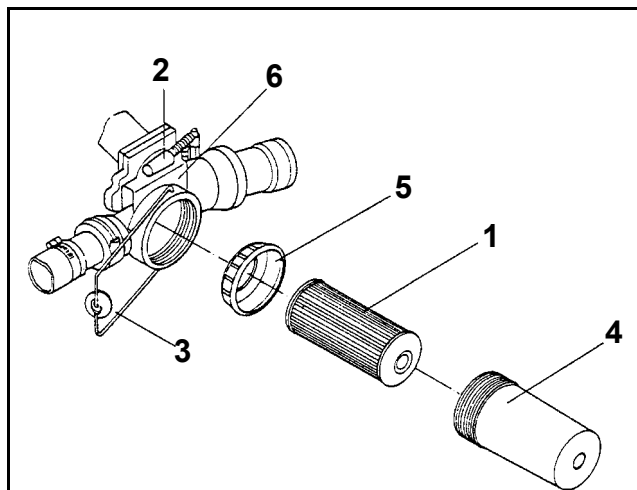


Fig. 126

### 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 markings of the oil filler (Fig. 127/1, Fig. 128/1, Fig. 129/1).

== **•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 of the 6 piston diaphragm pump (BP 205 or BP 235) (Fig. 128) 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 6 piston diaphragm pump.**

#### 9.3.2 Oil change

== **•Conduct an oil change every 400 to 450 hours of operation, at least, however, once a year.**

- Take off pump.
- Remove the pump lid (Fig. 127/2, Fig. 128/2 or Fig. 129/3).
- Drain off oil.
  - Turn pump upside down.
  - Spin drive shaft (Fig. 127/3, Fig. 128/3, Fig. 129/4) by hand until the old oil is fully drained off.

It is possible to drain the oil off the 6-piston diaphragm pump at the drain screw. 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 in the oil level gauge.

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

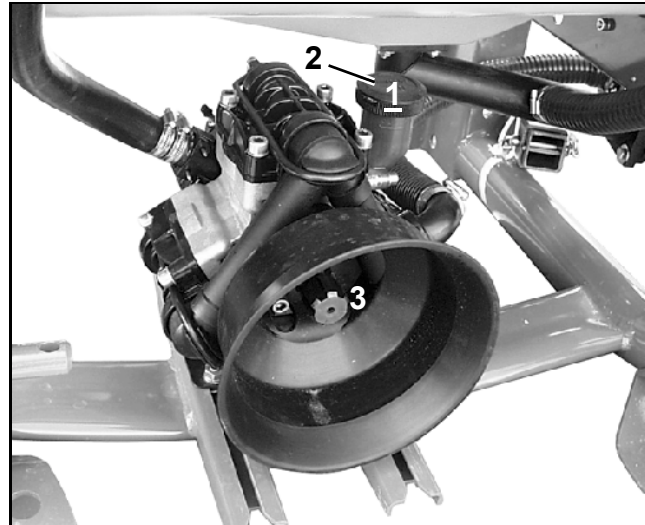


Fig. 127

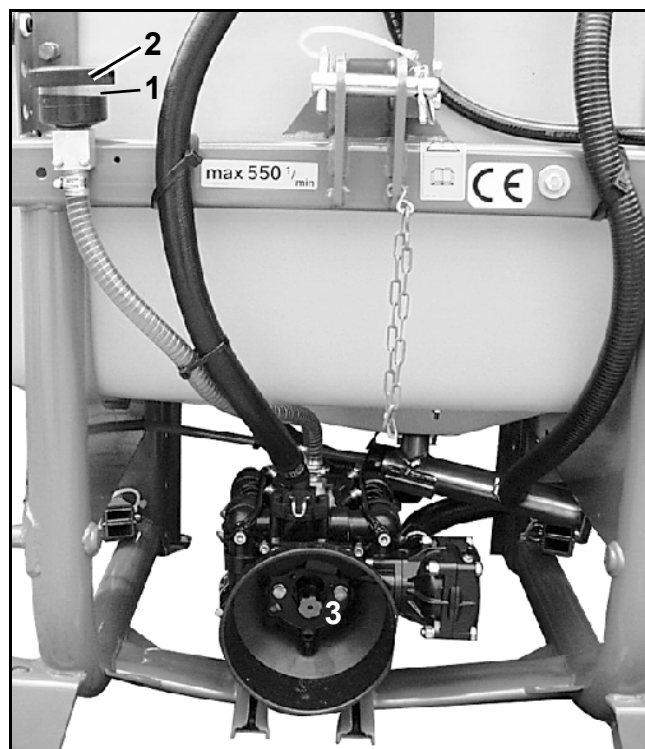


Fig. 128

### 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, suction hose).
- The filter insert of the filter tap was fitted twisted by 180°.
- 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

- 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.
- Clean filter tap.

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

- Uneven delivery of pump.
  - Match the pressure in the pressure reservoir with the spraying pressure (only BP 105 or BP 151, please refer to para. 9.3.4.1).
  - Check suction- and pressure-side valves and replace if necessary (please refer to para. 9.3.4.2).

#### 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. 9.3.4.2).

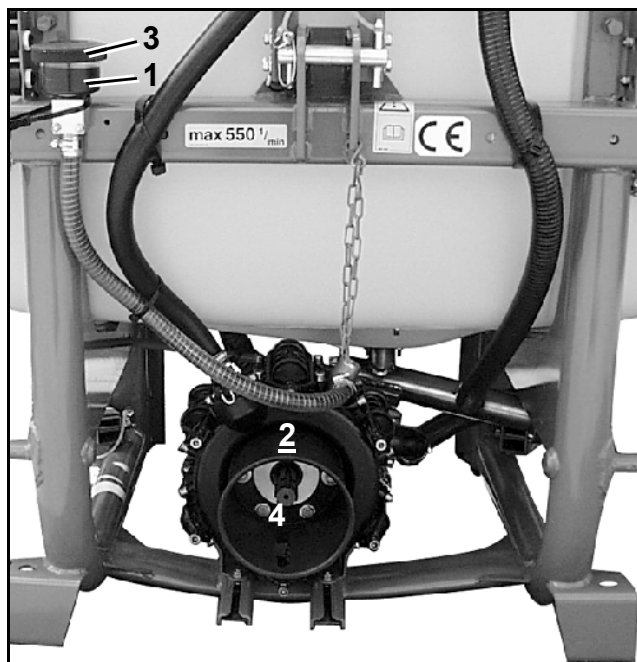


Fig. 129

### 9.3.4.1 Adaptation of air pressure in the pressure reservoir to the spraying pressure

(only possible with BP 105, 125 or BP 151, 171)

The pressure reservoir (Fig. 130/ 1, Fig. 131/ 1) 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.

== •To ensure a constant pump volume adapt the air pressure in the pressure reservoir to the spraying pressure.

**Required air pressure in the pressure reservoir in dependence of the required spraying pressure:**

- ≠# 1,5 bar; at a spraying pressure from 1 to 5 bar.
- ≠# 3,0 bar; at a spraying pressure from 5 to 10 bar.
- ≠# 6,0 bar; at a spraying pressure from 10 to 20 bar.

#### Checking the air pressure

Use an air pressure gauge to check the air pressure on the air valve (Fig. 130/2, Fig. 131/2) and correct as follows according to the above table if found necessary:

- Blow up the pressure reservoir with an air pressure of 5 bar.
- Engage the PTO shaft and drive the pump with the required speed for the spraying operation.
- Set the required spraying pressure on the pressure gauge, e.g. 4 bar.

#### Heavy deflection on the pressure indicator

- Deflate air on the air valve until the pointer on the pressure gauge calms down and indicates an accurately readable pressure value (in this case 4 bar).
- Recheck the air pressure and correct, if necessary. If the air pressure will fall within shortest time the pressure reservoir diaphragm is defect and must be exchanged.

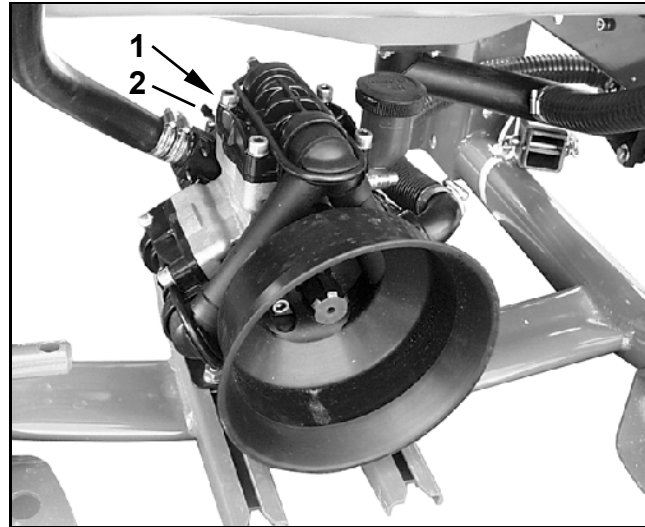


Fig. 130

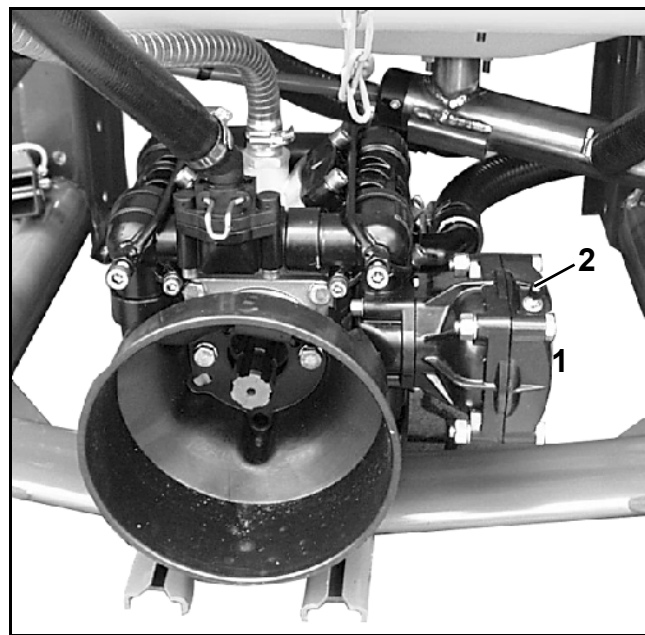


Fig. 131

## Exchanging the air reservoir diaphragm



Deflate the air pressure from the pressure reservoir (Fig. 132/1) via the air valve (Fig. 132/3) before removing the lid of the pressure reservoir (Fig. 132/2).

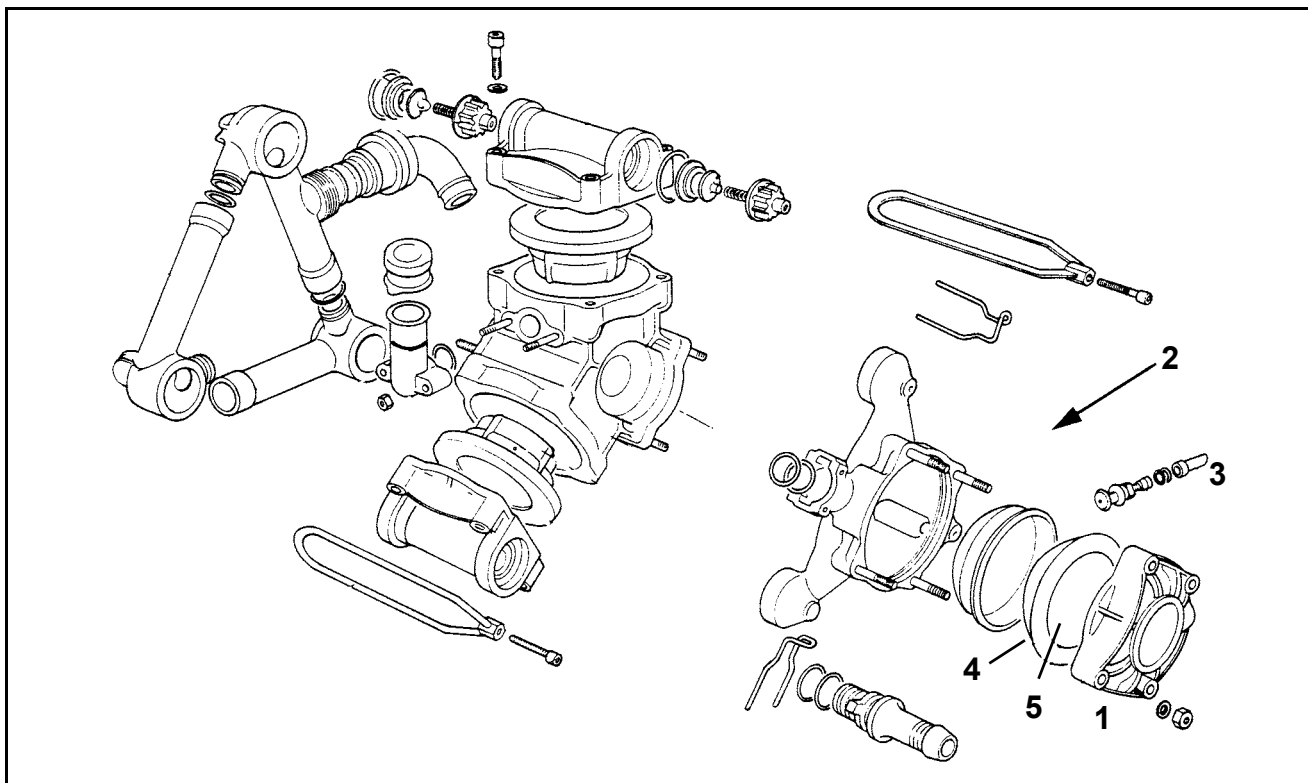


Fig. 132

- Slacken the four fixing bolts, remove the pressure reservoir lid (Fig. 132/1) and take out the diaphragm (Fig. 132/4).
- Clean all sealing surfaces.
- Fit new diaphragm.

**•When fitting the diaphragm ensure that it is located properly in its seat and that the open surface (Fig. 132/5) of the convex diaphragm shows in direction of the pressure reservoir lid (Fig. 132/1).**

- Affix the pressure reservoir lid and diagonally tighten the bolts equally.

### 9.3.4.2 Check and exchange suction- and pressure-side valves

- Take off pump.
- Slacken bolt (Fig. 133/1, Fig. 134 /1) and remove tensioning clamp (Fig. 133/2, Fig. 134/2).
- Take off suction- and pressure-tube (Fig. 133/3, Fig. 134/3 and Fig. 133/4, Fig. 134/4).

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

- Take off valve groups (Fig. 133/5, Fig. 134/5) .
- Check for damage or wear of the valve seat (Fig. 133/6, Fig. 134/6), valve (Fig. 133/7, Fig. 134/7), valve spring (Fig. 133/8, Fig. 134/8) and valve guide (Fig. 133/9, Fig. 134/9) and remove O-ring (Fig. 133/10, Fig. 134/10).
- Exchange any faulty parts.
- Mount the valve groups after checking and cleaning.

- **When refitting watch that the valve guide (Fig. 133/9, Fig. 134/9) will not be damaged. Damage could lead to blockage of valves.**

- Fit new O-rings.
- Re-install pressure- (Fig. 133/6, Fig. 134/6) and suction-hose (Fig. 133/5, Fig. 134/6) to the pump housing and refit the tensioning clamp.
- Tighten the bolts (Fig. 133/1, Fig. 134/1) always diagonally with a torque of **11 Nm**.

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

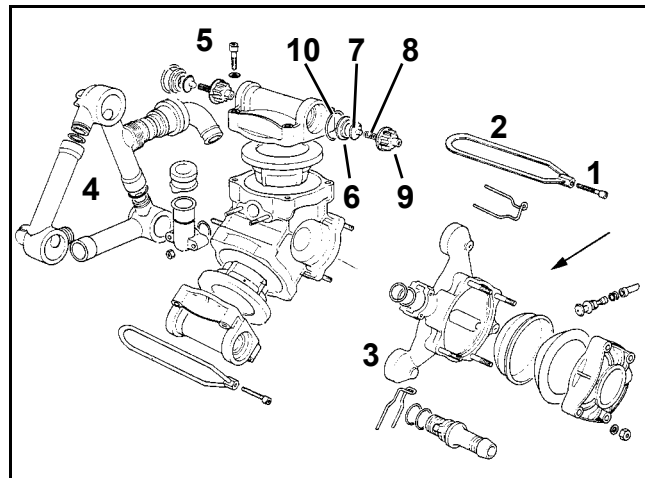


Fig. 133

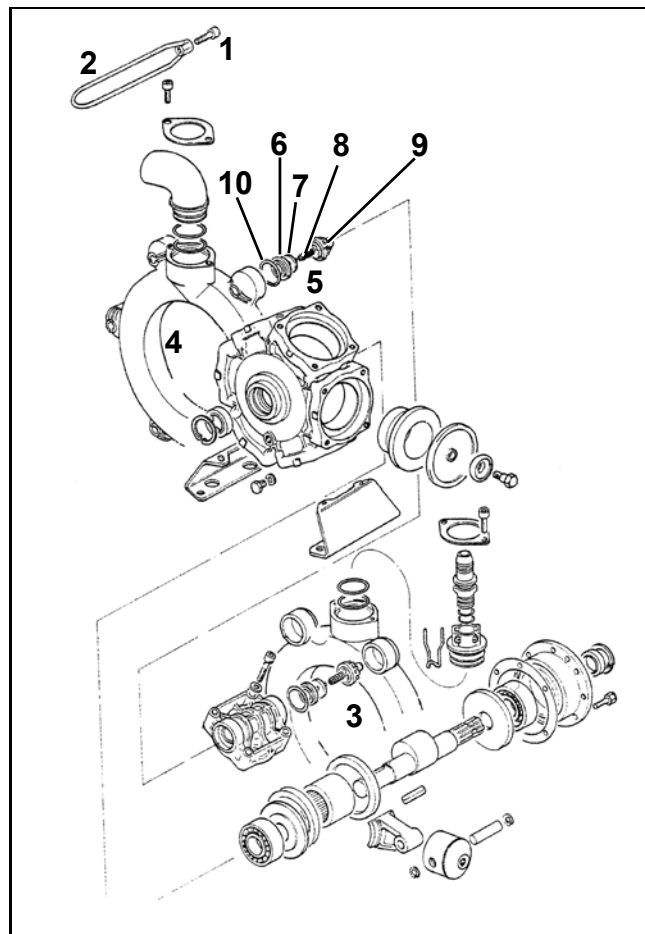


Fig. 134

### Checking and exchanging the piston diaphragms

Check the piston diaphragms (Fig. 135/1) 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 (Fig. 136/1).
- Remove the tensioning clamp (Fig. 136/2) as well as the suction- and pressure hoses (Fig. 136/3, Fig. 136/4) including the valve groups (Fig. 136/5). Pay attention to the fitting position of the suction- and pressure-side valves
- Take off the cylinder head (Fig. 136/7) after removal of the bolts (Fig. 136/6).
- Checking the piston diaphragms (Fig. 135/1).

- Even if only one of the piston diaphragms is swollen or porous, exchange all diaphragms.

### Exchange the piston diaphragm

- Slacken the bolt (Fig. 135/2) and remove the piston diaphragm (Fig. 135/1) together with the retaining disc (Fig. 135/3) of the piston (Fig. 135/4).
- 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 (Fig. 136/8) from the pump housing.
  - Flush pump housing thoroughly. Use Diesel-oil or Paraffin for flushing.
  - Clean all sealing surfaces.
  - Insert cylinder into pump housing.

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

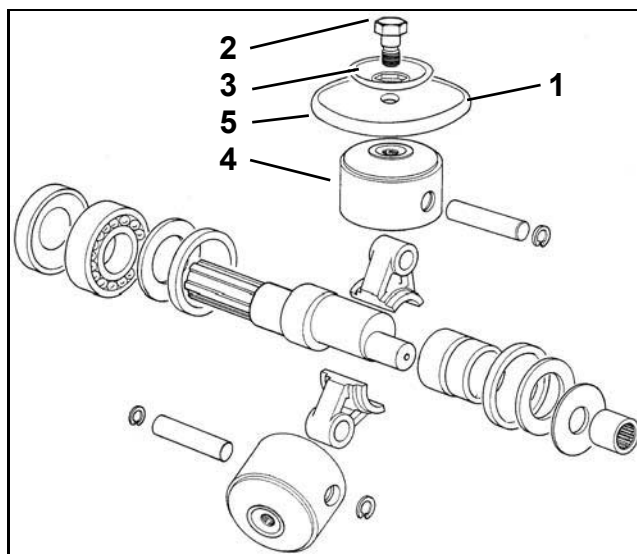


Fig. 135

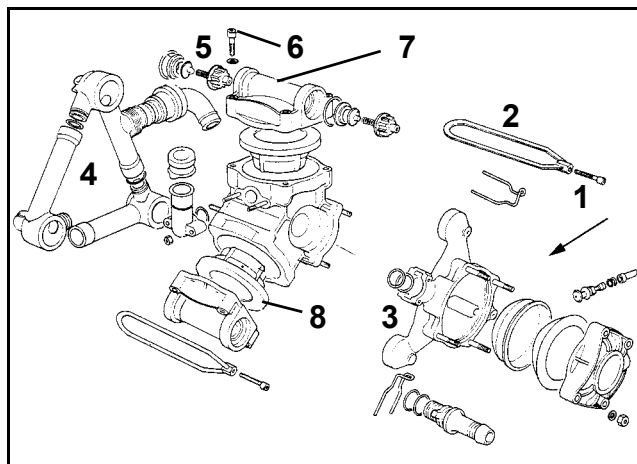


Fig. 136

- Fit the piston diaphragm (Fig. 135/1).

- Fasten the piston diaphragm in such a way with the retaining disc and bolt to the piston so that the edge (Fig. 135/5) shows towards the cylinder head side (Fig. 136/7).

- Fit cylinder head to pump housing and tighten bolts cross wise and equally.
- Fit valves and the suction- and pressure hose (please refer to para. 9.3.4.2).



## 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 a defective switch box

In case of a failure of the electric remote control via the switch box the field operation can be continued and terminated - depending on the fault - as follows:

##### 1. The spraying pressure cannot be set or adjusted via the $\pm$ key.

- Set and adjust the spraying pressure by turning the metering spindle by hand.
- Remove the screw joint (Fig. 137/1) from the control device retainer (Fig. 137/2).
- Move the control retainer with the flange plate (Fig. 137/3) for the electric motor (Fig. 137/4) on the bracket (Fig. 137/5) to the right hand side until the electric motor and the metering spindle of the automatic metering are no longer connected.
- Set the metering spindle by hand.

##### 2. The master boom control cannot be actuated via the key on the switch box.

- Use the tractor PTO shaft to switch the boom on and off.

##### 3. Individual boom part sections cannot be controlled.

- Actuate the relevant solenoid valve lever directly on the control unit to switch on and off by hand the individual boom part sections.

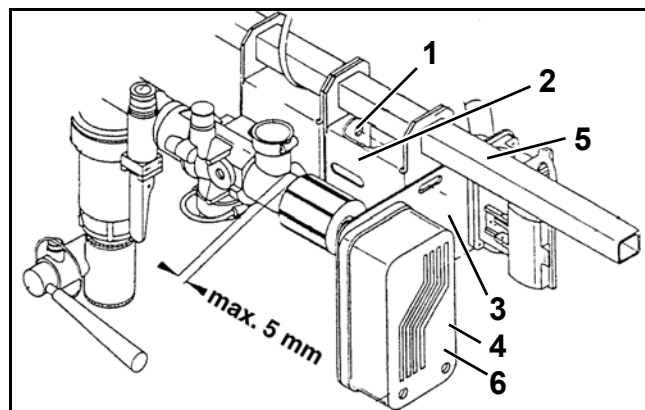


Fig. 137

#### 9.4.1.2 Continuing the field operation with a 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.

#### 9.4.1.3 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.

#### 9.4.1.4 Spray rate is not maintained

The desired spray rate is not maintained. The metering spindle is not at its stop position.

- Remove the screw joint (Fig. 138/1) from the control device retainer (Fig. 138/2).
- Move the control retainer with the flange plate (Fig. 138/3) for the electric motor (Fig. 138/4) on the bracket (Fig. 138/5) to the right hand side until the electric motor and the metering spindle (Fig. 139/1) of the automatic metering are no longer connected.
- Check whether the metering spindle can be turned by hand:
  - if so, re-adjust the slip clutch.
  - Remove the lid (Fig. 138/6) from the housing.
  - Re-adjust the hex. bolt (Fig. 139/2) by one "catch".
  - if not, dismantle the pressure governor and care for smooth movement.
- Recheck and repeat procedure, if necessary.

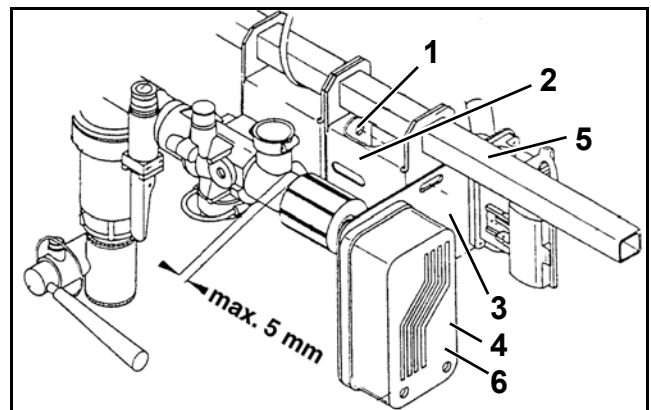


Fig. 138

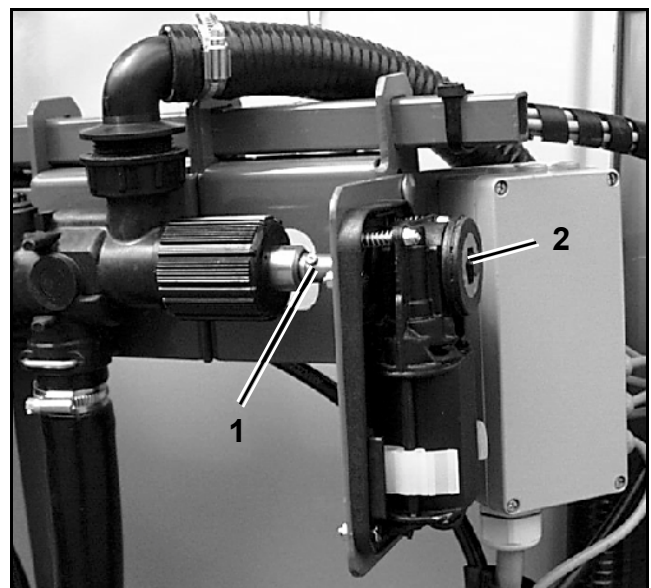


Fig. 139



## 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 "AMATRON II A"

- Fill the tank of the sprayer with approx. 600 l water 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 the PTO shaft.
- 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.
- 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 then "AMACHECK 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" in "Imp./l".

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

- Fill the tank of the sprayer with approx. 600 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 the PTO shaft.
- 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 then "AMATRON II A" will calculate automatically the figure for "Imp./l" which then will be displayed and memorised.

## 9.6 Nozzles

### 9.6.1 Fitting the nozzles

- The nozzle filter (Fig. 140/1) is placed from below into the nozzle carrier (Fig. 140/2).
- Place the nozzle (Fig. 140/3) inside the bayonet cap (Fig. 140/4).

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

- Place the rubber seal ring (Fig. 140/5) above the nozzle.
- Press the rubber sealing ring into the seating of the bayonet cap.
- Place the bayonet cap onto the take up of the nozzle carrier.
- Twist the bayonet cap until the stop.

### 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 (Fig. 140/6). Therefore the corresponding diaphragm should be cleaned as follows:

- Pull out the slide (Fig. 140/7) from the nozzle carrier (Fig. 140/2) in direction of the bayonet cap.
- Remove the spring element (Fig. 140/8) and the diaphragm (Fig. 140/9).
- Clean the diaphragm seating (Fig. 140/6).
- 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 (Fig. 140/10) 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 (Fig. 141/2) on the scale (Fig. 141/1) must show the scale figure "5" for 500 l.
- If the indicated level deviates from the quantity of water filled then, set the pointer (Fig. 141/2) accurately on the scale figure "5" by twisting the bolt (Fig. 141/3).

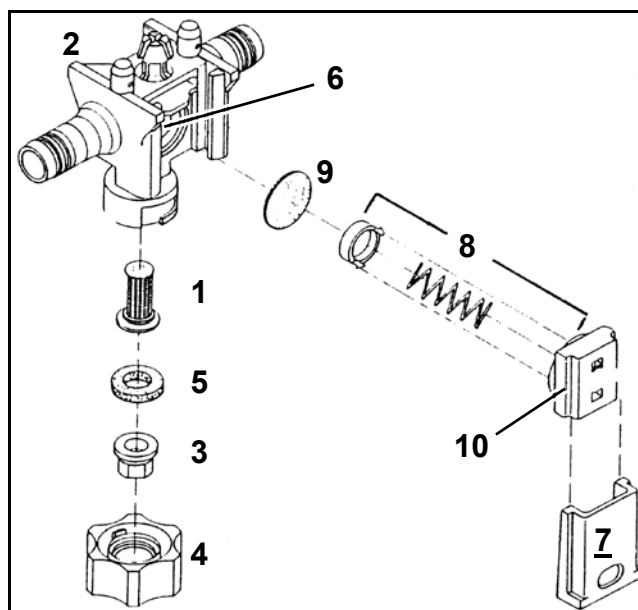


Fig. 140

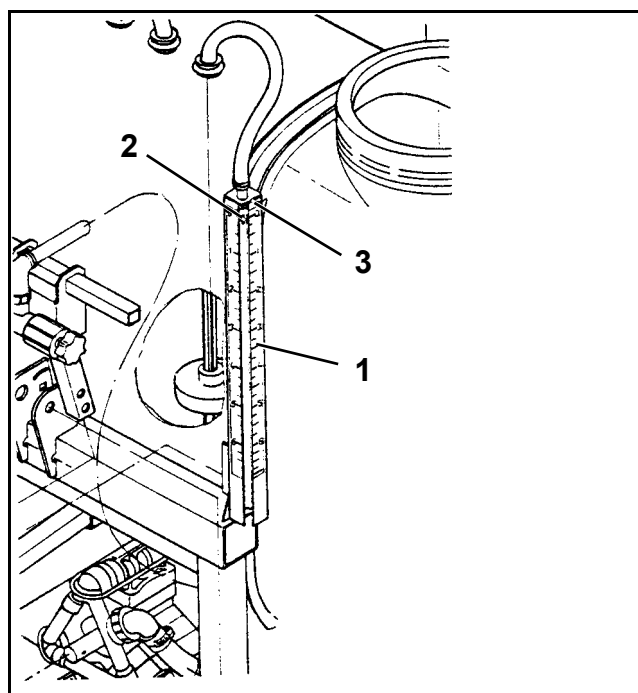


Fig. 141

## 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. 142).

**Fig. 142/...**

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

### Pump checking

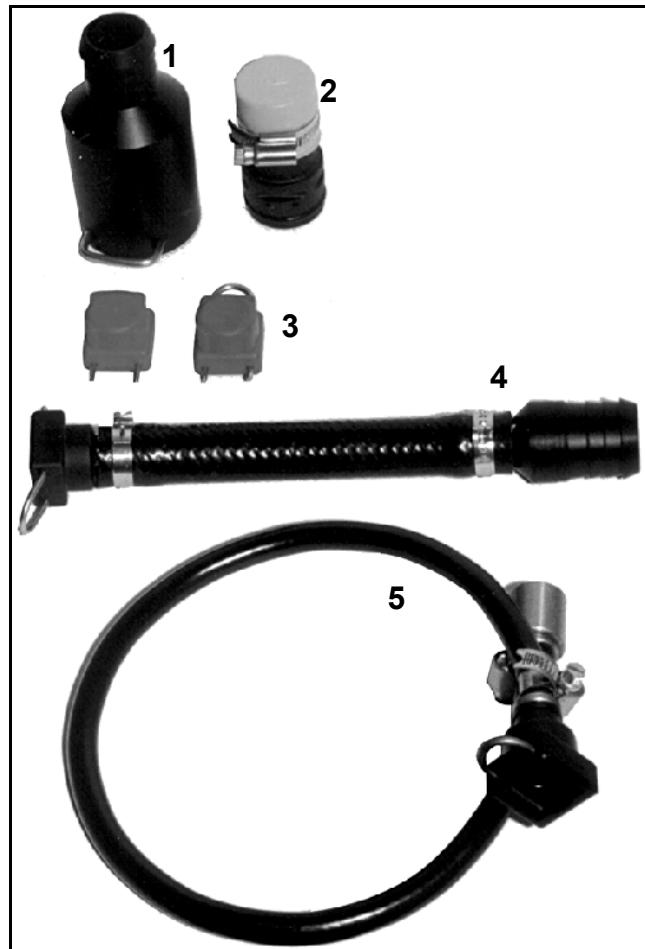
Checking the pump function (capacity, pressure):

- 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 (Fig. 142/1) on to the checking instrument.
- Shut the pressure joint of the control unit with the plug (Fig. 142/2).

### 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 (Fig. 142/4) with a part section valve and connect to the checking instrument.
- Shut the joints of the remaining part section valves with blanks (Fig. 142/3).
- Set all part section valves on to position "spraying".



**Fig. 142**

### 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 (Fig. 142/5) with the aid of the turned socket on to 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  $P_2O_5$  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,<br>Order No.: 798 900 | 50  | - | 105 l | AUS/ha, |
| 3-ray-red,<br>Order No.: 779 900    | 80  | - | 170 l | AUS/ha, |
| 3-ray-blue,<br>Order No.: 780 900   | 115 | - | 240 l | AUS/ha, |
| 3-ray-white,<br>Order No.: 781 900  | 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. 143) are not directed downwards but sideways. This results in the production of very large droplets raining even more gently on the plants.

== •The metering discs determine the spray rates [l/ha].

The following nozzles are available:

5-hole nozzle cpl., black  
(with metering disc No. 4916-45); Order No.: 911 517

5-hole nozzle cpl., grey  
(with metering disc No. 4916-55); Order No.: 911 518

8-hole nozzle cpl.,  
(with metering disc No. 4916-55); Order No.: 749 901

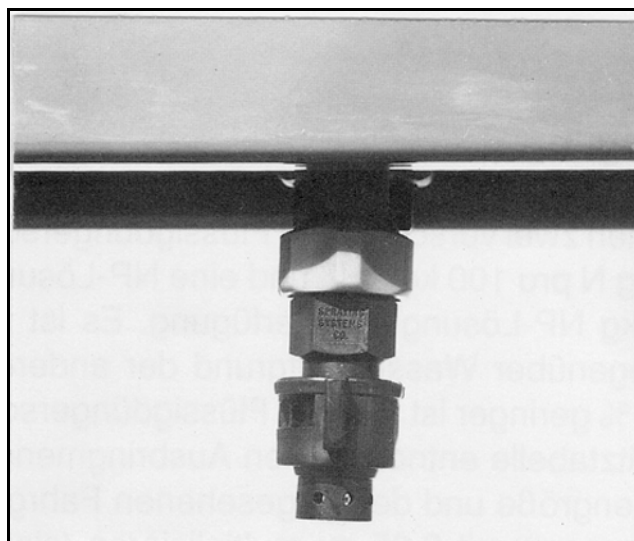


Fig. 143

The following metering discs are available:

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

The metering discs can be combined with the nozzles as follows:

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

== •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, cpl. (with metering washers No. 4916-39) for late top dressing with liquid fertiliser

Fig. 144/...

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

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



Fig. 144

The following metering discs are available:

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

Refer to para 12.4 for "Spray rate table for drag hose equipment".

### 10.1.4 Urea filter

Order No.: 707 400

The use of the urea filter (Fig. 145/1) is recommended when filling with urea to avoid undiluted particles reaching into the suction area and to blocking the filter tap (Fig. 145/2).

#### Fitting the urea filter:

- Remove the plug of the screw-in opening (Fig. 145/3) in the tank sump.
- Screw in the urea filter by spinning it clock-wise into the bottom (Fig. 145/4).

- It is not necessary to remove the urea filter for the following spraying operation.

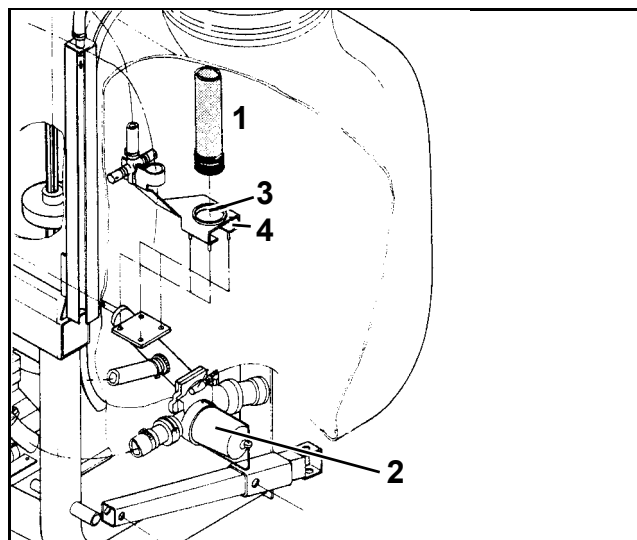


Fig. 145

## 10.2 Suction hose for filling the tank

1. Suction hose (5m/8m), Order No. 717100/718100, (Fig. 146)

Fig. 146/...

- 1 - Suction hose.
  - 2 - Quick coupling.
  - 3 - Suction filter. Filters the sucked water.
  - 4 - Return valve. Prevents the liquid already in the tank from running out, if during filling procedure the sub-pressure suddenly collapses.
- **During the tank filling via the suction hose from open water sources adhere to the applicable advice (see also para. "Putting into operation").**



Fig. 146

### Operational order when filling the tank via the suction hose

- Connect the suction hose with the aid of the quick coupling with the relevant suction joint (Fig. 147/1) of the filter tap.
  - Switch off the central sprayer boom on- and off switching unit.
  - Engage the PTO shaft.
  - Set the operating lever (Fig. 147/2) on the filter tap to position **"filling"**.
  - As soon as tank is full:
    - Remove suction hose from liquid to be sucked so that the hose is completely emptied by the pump.
    - Set the operating lever on the filter tap to position **"spraying"**.
    - Disengage the PTO shaft.
    - Remove the suction hose from the suction joint.
- **If it is not intended to remove the suction hose from the water source constantly, set the operational lever on the filter tap to position "Spraying" and then remove the suction hose from the suction joint.**

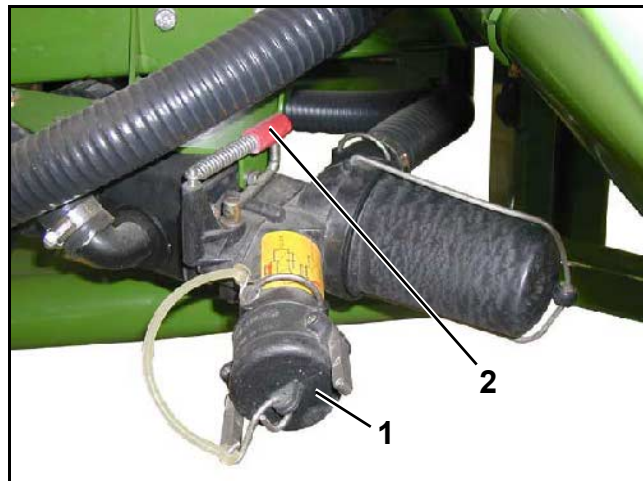


Fig. 147

- **During the filling operation do not leave the implement unattended.**

### 10.3 Filling ports

#### 10.3.1 Filling port with connection to the water supply network

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. 148).

##### Operational procedure when filling the tank

- Create the connection with the water supply network via the C-coupling (Fig. 148/1).
- Swivel the three way tap (Fig. 148/2)
  - into flowing direction for filling the spray agent tank.
  - cross ways in the flowing direction for filling the flushing water tank.
- Control the filling procedure via the relevant taps of the water supply network.

== •During the filling operation do not leave the implement unattended.



Fig. 148

### 10.4 Filling device and canister flushing

For filling via 1¼" Kamlok-connection (Fig. 149/1), Inducting via sieve (Fig. 149/2) and canister flushing. For this

- Remove the screw lid from the filling opening.
- Depending on the kind of spraying operation swivel the filling device (Fig. 149/3) or canister flushing device (Fig. 149/4) above the filling opening.
  - For filling connect the filling hose with the Kamlok-connection (Fig. 149/1).
  - For canister flushing
    - Drive the pump with approx. 400 R.P.M. and switch on the agitator.
    - Open the single tap for the can wash nozzle on the control unit.
    - Slide the canister or another container over the can wash nozzle and press downwards for at least 30 sec.
    - Shut off the single tap for the can wash nozzle on the control unit.

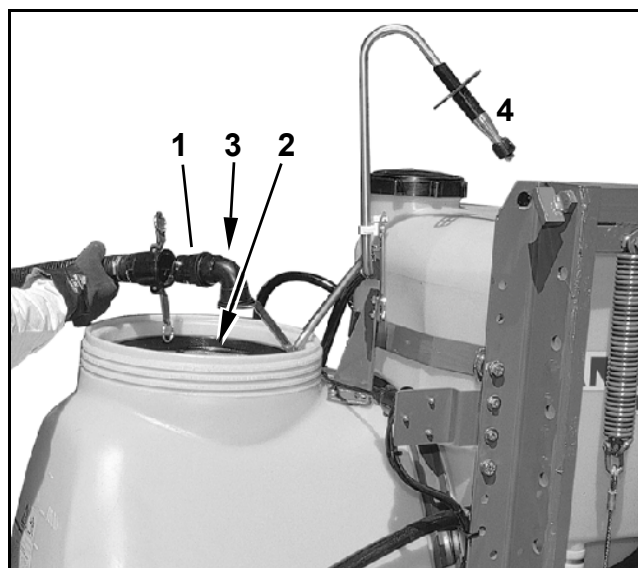


Fig. 149

## 10.5 Spray pistol with 0,9 m long spray tube, without hose

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

Fibre enforced PVC (Nominal width/inside: 13 mm; outside: 20 mm; wall gauge: 3.5 mm).

Connect the pressure hose of the spray pistol to 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.

## 10.6 Pressure filter insert

1. Pressure filter insert with 65 meshes/inch (standard), Order-No.: ZF 150
2. Pressure filter insert with 80 meshes/inch (for nozzle size '02'), Order-No.: ZF 151
3. Pressure filter insert with 100 meshes/inch (for nozzle size '015' and '01'), Order-No.: ZF 152

## 10.7 Single tap for connecting additional users to the control unit

## 10.8 Hand washing tank (20 litres)

(from 1998 Standard execution)

Fig. 150/1.

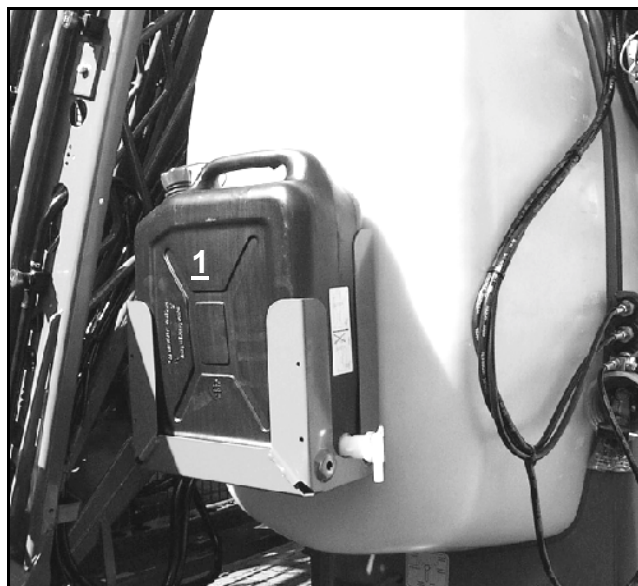


Fig. 150

## 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.

**Mounted implements should be equipped as follows:**

- to the front and to the rear with warning plates and limiting or tail lights if they protrude sideways more than 400 mm over the utmost point of the illuminated areas of the tractor's limiting lights.
- with warning plates and lights when the tail lights of the tractor are covered or their outer end protrudes more than 1000 mm beyond the tail lights of the tractor to the rear.

### 10.9.1 Traffic lights for Q- and Super-S-booms

1. Rear lights (Fig. 151/1), Order No.: 916 253 (Q- and Super-S-boom)  
Consisting of:  
Light combination r.h. and l.h., parking warning plates, licence plate carrier and connecting cable.
2. Position lights to the front (Fig. 151/2), Order No.: 917 649 (only required for Q-boom)  
Consisting of:  
Parking warning plates according to DIN 11 030 with position lights r.h. and l.h. and connecting cable.



Fig. 151

### 10.10 Foam marker

The foam marker (Fig. 152/1) 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.

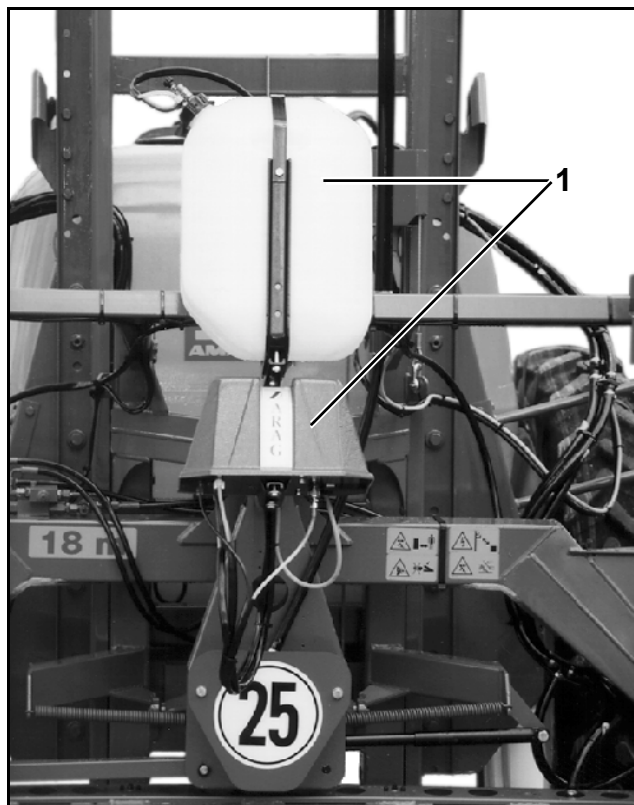


Fig. 152

Fig. 153/...

- 1 - Tank
- 2 - Compressor
- 3 - Fixing bracket
- 4 - Slotted head bolt

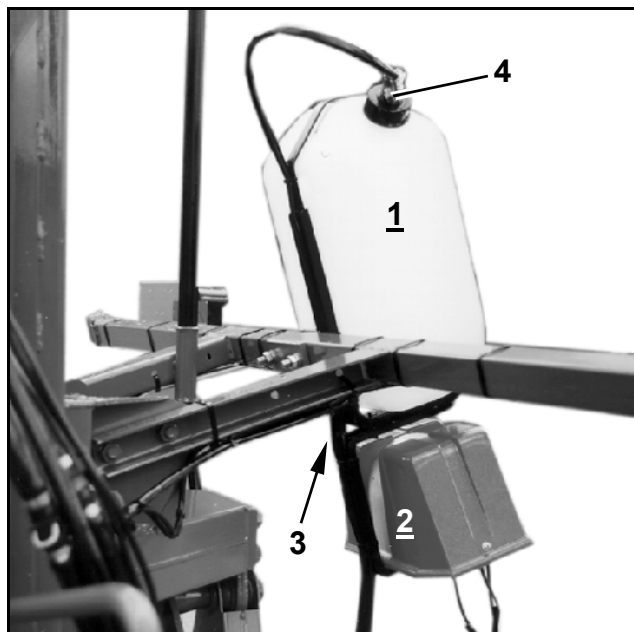
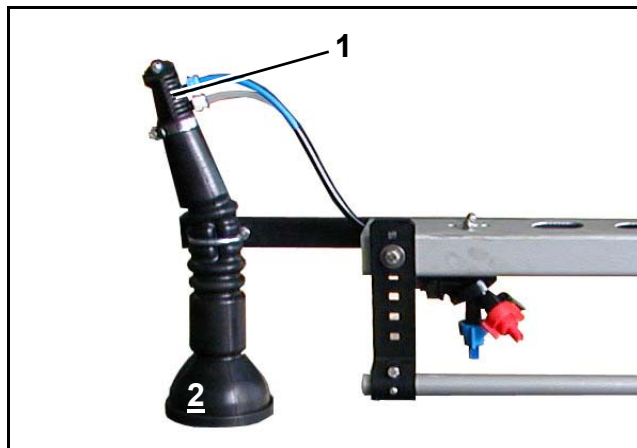


Fig. 153

**Fig. 154/...**

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



**Fig. 154**

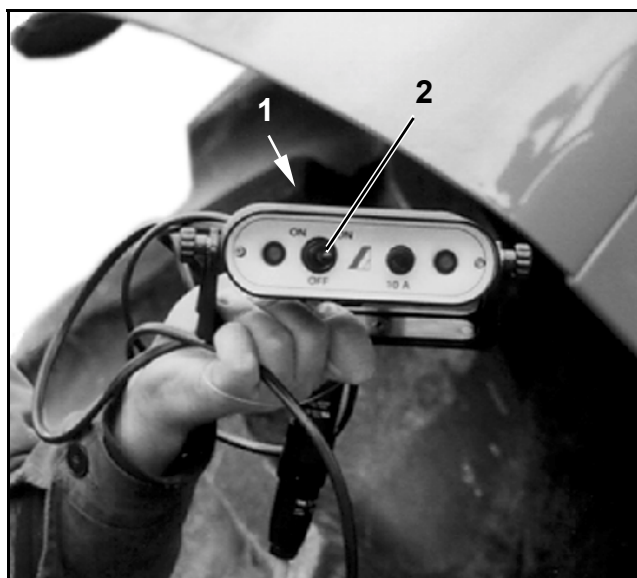
**Fig. 155/...**

- 1 - Control unit
- 2 - Switch

Switch in centre position "Aus" (off).

Switch moves to the left onto position "AN" (on), foam bubbles are created on the left hand sprayer boom side in travelling direction.

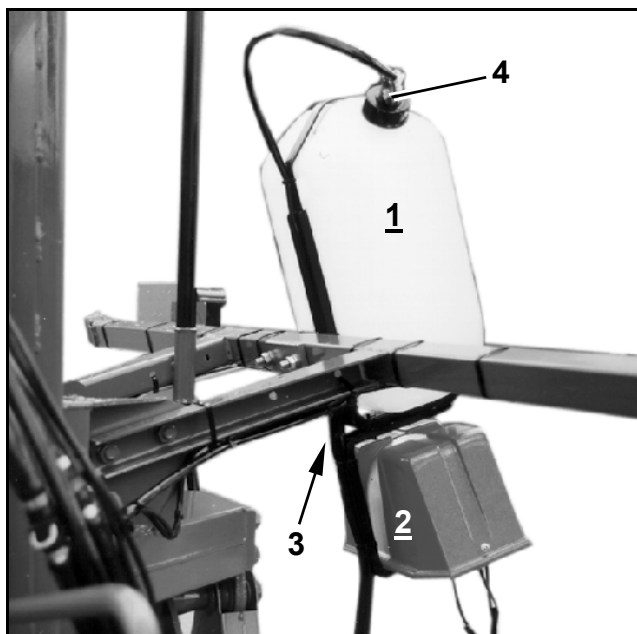
Switch moves to the right onto position "AN" (on), foam bubbles are created on the right hand sprayer boom side in travelling direction.



**Fig. 155**

Set the spacing between the individual foam bubbles on the slotted head bolt (Fig. 156/4) as follows:

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



**Fig. 156**



## 10.11 Tank-Control

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 calibrations are factory set.

The tank contents is shown in litres (l) on the digital display of the tank-control. Tank Control 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.

## 10.12 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. 2 Nozzles A0C 40, Order No.: 700 7000

suitable for nozzle size:

'03' at 2 x 6 m additional working width

'04' at 2 x 5 m additional working width

### 2. 2 Nozzles A0C 60, Order No.: 701 7000

suitable for nozzle size:

'05' at 2 x 6 m additional working width

'06' at 2 x 5 m additional working width

### 3. 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.

## 10.13 Digital pressure display with liquid fertiliser proof pressure sensor on switch box SKS 50, SKS 70 and SKS 90

Order No.: 911 827

## 10.14 Manometer ø 100 mm, liquid fertiliser proof

Ranges 0-5/16 bar (standard),  
Order No.: GD 076

Ranges 0-8/ 25 bar,  
Order No.: GD 086, recommended for ID-nozzles and operational pressure of more than 4 bar.

### 10.15 Inside tank pre-cleaning device with rotating nozzles

Order No.: 910 055

(from 1998 Standard execution)

Requires an additional single tap on the control unit.

The inner tank walls can be rinsed with the cleaning device. This way the thorough tank cleaning is considerably eased.

### 10.16 Exterior wash down equipment for outer cleaning of the sprayer

Order No.: 911 069

Incl. hose reel (Fig. 157/1) with 20 m pressure hose (Fig. 157/2), spraying lance and washing brush (Fig. 157/3).

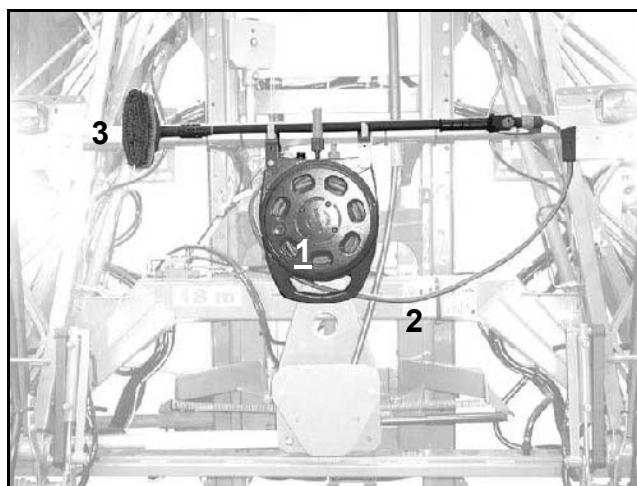


Fig. 157

### 10.17 Transport device

for UF 600, Order No.: 736 300

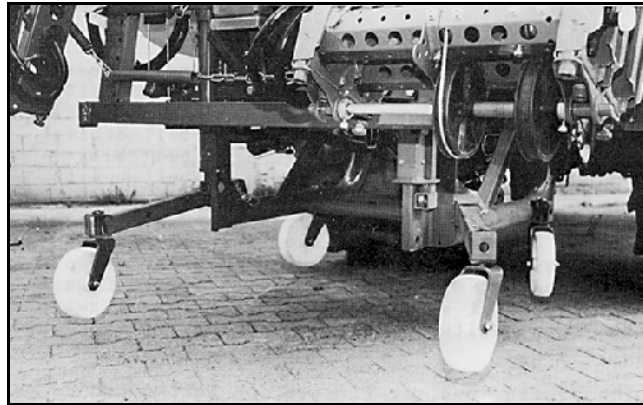
for UF 800/ 1000/ 1200, Order No.: 910 022

The transport device (Fig. 158) consists of four castor wheels which are inserted from below into the provided retainer pockets and secured. Never forget to secure the sprayer against rolling away.



**Only park or move the sprayer with empty tank and extended parking supports.**

During the spraying operation the parking supports must be pushed inwards. In lower crops the castor wheels may remain in place. They should only be removed in higher crop or for grain-ear treatment.



**Fig. 158**

### 10.18 Line filter inside the boom

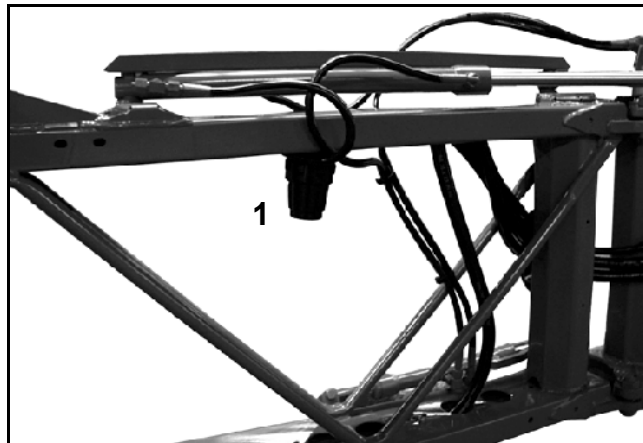
**Order No.: 916 204**

The line filter (Fig. 159/1) 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. ZF381



**Fig. 159**

**•Clean the line filter once a day.**

==

**•For storing over winter, remove the filter cap and store the filter insert in a dry room.**

==

### 10.19 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".

## 10.20 Induction bowl with canister flushing


Order No.: 715 100

Fig. 160/...

- 1 - Induction bowl with litre scale for inducing and metering liquid and powdery agents and for flushing canisters.
- 2 - Single tap. When tap is opened liquid will be sucked off container (1) and directly be inducted into the suction hose (3).
- 3 - Suction hose.
- 4 - Single tap.
- 5 - Flushing hose.
- 6 - Single tap for flushing nozzle (7).
- 7 - Flushing nozzle for rinsing the container or for diluting powdery agents.
- 8 - Single tap for canister flushing (9).
- 9 - Canister flushing nozzle for cleaning empty agent containers.
- 10 - Induction bowl opening with lid.
- 11 - Spray agent canister.

### 10.20.1 Inducting liquid agents

- Fill spray agent tank half with water.
- Ensure that the single tap (Fig. 160/ 2) is shut off.
- Fill agent into the induction bowl (max. 30 l).
- Set central boom on/off switch to position "AUS" (OFF).
- Switch on agitator via step tap and PTO shaft - drive the pump with at least 300 R.P.M. If necessary, increase agitation intensity of agitation device on the step tap.
- Open single tap (Fig. 160/ 2) by watching the scale and induct the desired amount of spray agent.
- Top up remaining quantity of water in the tank.
- Switch back the agitator into its start position.


**When mixing blends of two or more agents fill into the induction bowl only the proportionally calculated and metered agent amount of each of the various agents.**

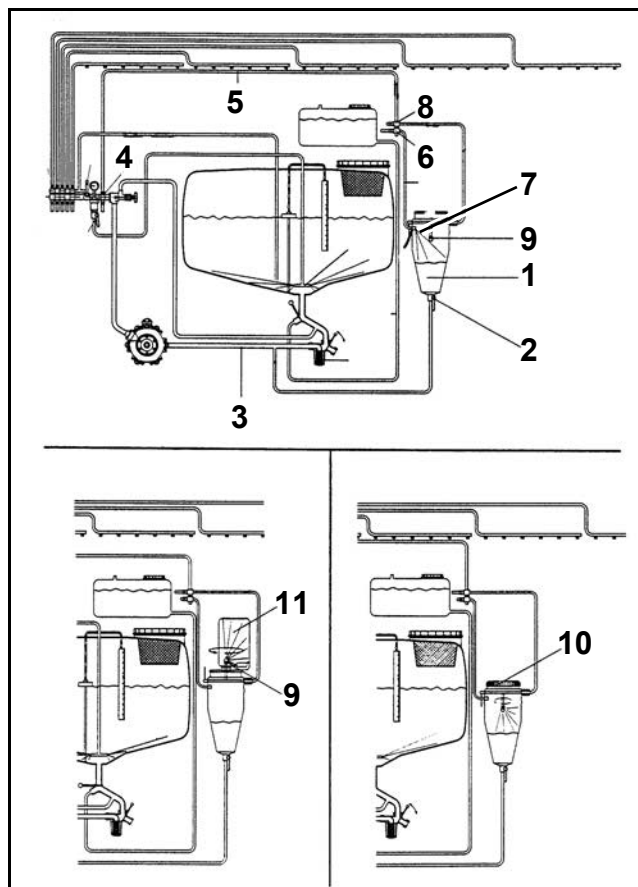


Fig. 160

### 10.20.2 Inducting powdered agents and urea

- Fill spray agent tank half with water.
- Set central boom on/off switch to position "AUS" (OFF).
- Switch on agitator via step tap and PTO shaft - drive the pump with at least 300 R.P.M.
- Open single taps (Fig. 161/ 2 and Fig. 161/ 4) on induction bowl bottom and on the control unit.
- Open single tap (Fig. 161/ 6) for the flushing nozzle (Fig. 161/ 7).
- Fill in the calculated and calibrated amount of agent resp. urea for one tank filling into the induction bowl.
- Pump liquid through the induction bowl until the contents is fully diluted.
- Shut off single tap (Fig. 161/ 6).
- Suck all liquid off the induction bowl. Once more rinse the induction bowl with the canister flushing nozzle (Fig. 161/ 9).

**•Close the induction bowl opening with its lid before rinsing the induction bowl (Fig. 161/ 10).**

- Shut off single taps (Fig. 161/ 2 und Fig. 161/ 4) after sucking off the liquid in the induction bowl.
- Top up remaining quantity of water in the tank.
- Switch back the agitator into its start position.

- **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.**

- **For diluting larger amounts of urea (e.g. 50 kg) please refer to para. 10.1.4.**

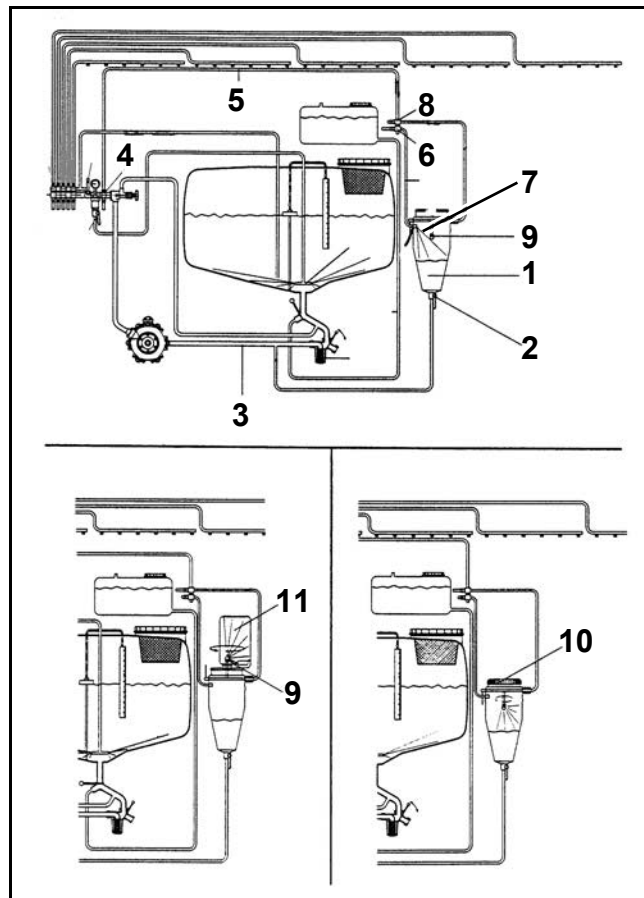


Fig. 161

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

- Drive the pump with about 400 R.P.M. and set the spray pressure to approx. 3 bar.
- Swivel the canister flushing nozzle upwards and secure.
- Slide the spray agent canister (Fig. 161/ 11) over the canister flushing nozzle and open the single taps (Fig. 161/ 4 and Fig. 161/ 8). Rinse canister for at least 30 seconds. Suck off collected flushing liquid.

## 10.21 Induction bowl with power injector and canister flushing

Order No.: 915347

Fig. 162/...

- 1 - Induction bowl for inducing all kinds of spray agent incl. urea.
- 2 - Screw on lid.
- 3 - Hinged joint for swivelling the induction bowl. The induction bowl catches in two determined positions.
- 4 - Suction hose of induction bowl.
- 5 - Power-Injector.
- 6 - Three-way tap for sucking liquid via the induction bowl or external filling.
- 7 - Single tap for the rotating canister flushing nozzle.
- 8 - Single tap for the circular flushing line of the induction bowl.
- 9 - Three-way tap for switching between injector operation and spraying operation.

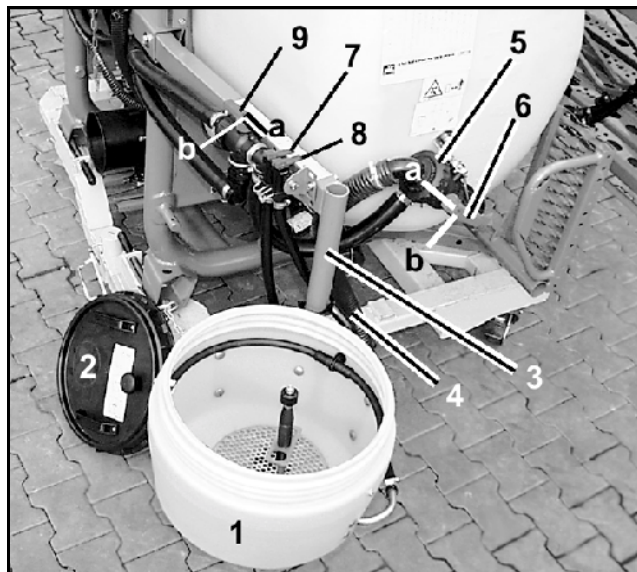


Fig. 162

Fig. 163/...

- 1 - Bottom sieve; protects from sucking lumps and foreign particles.
- 2 - Canister flushing nozzle (rotating nozzle). For rinsing canisters or other containers.
- 3 - Pressure plate.
- 4 - Circular pipe line for rinsing the induction bowl.

### 10.21.1 Inducting liquid agents

- Fill spray agent tank half with water.
- Pour the calculated and metered spray agent quantity necessary for one tank filling into the induction bowl (max. 34 l).
- Switch the master boom feed control on the switch box into position "0".
- Drive pump with approx. 400 U/min and switch on the agitator. If necessary increase the agitation intensity.
- Open single tap for (Fig. 162/ 8) closed circuit pipe line.
- Swivel three-way tap (Fig. 162/ 9) to position "a".



Fig. 163

- Swivel the three-way tap (Fig. 164/ 6) to position "a" and suck the spray agent rate off the induction bowl (before remove the lid of the induction bowl) (Before, remove the lid of the induction bowl.).
- Shut the single tap (Fig. 164/ 8) for the closed circular pipe line.
- Shut off three way tap (Fig. 164/ 6) (position "b").
- Shut off three way tap (Fig. 164/ 9) (position "b").
- 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.

### 10.21.2 Inducting powdered agents and urea

- Fill spray agent tank half with water.
  - Switch the master boom feed control on the switch box into position "0".
  - Drive pump with approx. 400 U/min and switch on the agitator. If necessary increase the agitation intensity.
  - Pour the calculated and metered spray agent quantity or the urea quantity necessary for one tank filling into the induction bowl.
  - Open single tap for (Fig. 164/ 8) closed circuit pipe line.
  - Swivel three-way tap (Fig. 164/ 9) to position "a".
  - Swivel three-way tap (Fig. 164/ 6) in position "a" and suck out the diluted agent spray rate. (Before, remove the lid of the induction bowl.)
  - Pump liquid through the induction bowl until the contents is fully diluted.
  - Shut the single tap (Fig. 164/ 8) for the closed circular pipe line on the tap group.
  - Shut off three way tap (Fig. 164/ 6) (position "b").
  - Top up remaining quantity of water in the tank.
  - Switch back the agitator into its start position.
- **Before starting spraying operation dilute urea completely by pumping the spray cocktail around the tank. (Three way tap (Fig. 164/ 9 position "a") ). 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.**

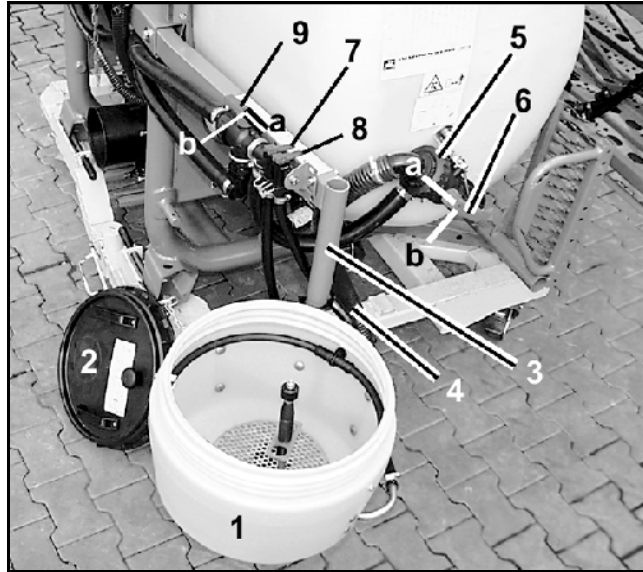


Fig. 164

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

- Switch off the sprayer boom and shut the single tap on the control unit on the induction bowl.
- Drive the pump with approx. 400 R.P.M. and switch on the agitator.
- Set spraying bar on 3 bar.
- Open the single tap (Fig. 165/ 7) for the tap group of the can wash nozzle (Fig. 165/ 1).
- Swivel three-way tap (Fig. 165/ 9) to position "a".
- Slide the canister (Fig. 166/ 2) or another container over the can wash nozzle and press downwards for at least 30 sec. Rinse the canister with the aid of the rotating canister flushing nozzle.
- For rinsing the induction bowl via the closed circular pipe line (Fig. 166/3) open the single tap (Fig. 165/8).
- Swivel the three way tap (Fig. 165/ 6) to position "a" and suck the liquid into the spray agent tank. (Before, remove the lid of the induction bowl.)
- Shut off single taps (Fig. 165/ 7, Fig. 165/ 8) for the closed circular pipe line and the canister flushing.
- Shut off three way tap (Fig. 165/ 6) (position "b").
- Shut off tap group on the control unit and the induction bowl bottom.

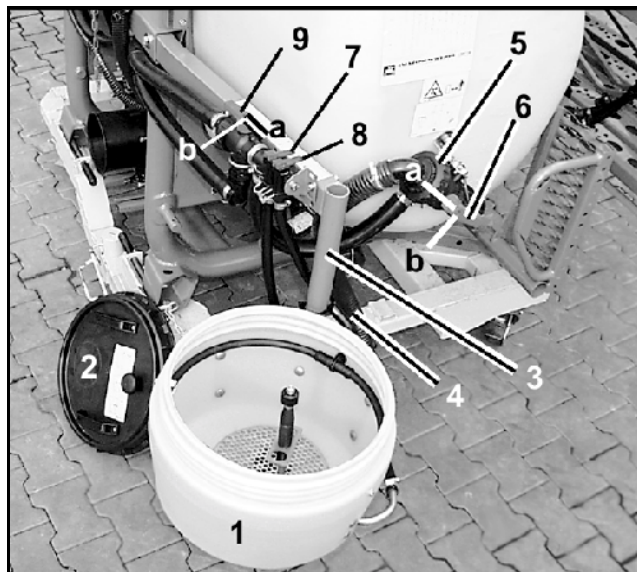


Fig. 165

### 10.21.4 Filling via power injector and suction joint on the filter tap

- Switch the master boom feed control on the switch box into position "0".
- Drive pump with approx. 400 R.P.M.
- Swivel the three way tap (Fig. 165/ 6) to position "b".
- Swivel three way tap (Fig. 165/ 9) to position "a".
- Via both suction joints (power-Injector and filter tap) water is sucked into the spray agent tank.
- As soon as sufficient water is in the spray agent tank, swivel the three way tap (Fig. 165/ 9) to position "b".

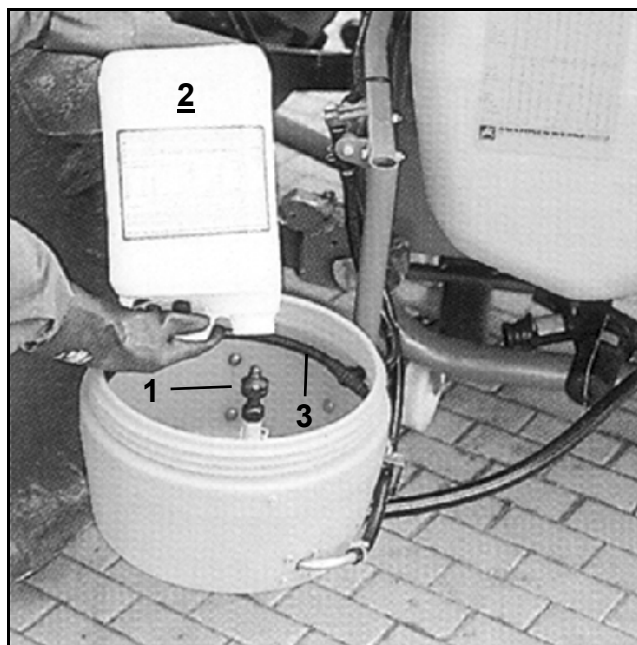


Fig. 166



## 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,

| Typ UF                                       |       | 600        | 800         | 1000 | 1200 |
|--|-------|------------|-------------|------|------|
| Tank volume<br>actual<br>nominal             | [l]   | 680        | 960         | 1130 | 1310 |
|  |       | 600        | 800         | 1000 | 1200 |
| Allowable total weight                       | [kg]  | 1250       | 2000        | 2250 | 2500 |
| Allowable pressure in system                 | [bar] | 10         | 10          | 10   | 10   |
| Filling height                               | [mm]  | 1420       | 1510        | 1650 | 1790 |
| Length *                                     | [mm]  | 680        | 810         | 810  | 810  |
| Width  |       | 1750       | 2050        | 2050 | 2050 |
| Height                                       |       | 1980       | 2460        | 2460 | 2460 |
| total weight                                 | [kg]  | 158        | 218         | 253  | 274  |
| Three point linkage                          | cat.  | I + II     | II          | II   | II   |
| Technical surplus amount incl.<br>filter tap |       |            |             |      |      |
| on level ground                              |       | 0 % 2.0 l  | 0 % 2.6 l   |      |      |
| When operating across slopes: **             |       |            |             |      |      |
| in driving direction to the left hand        |       | 20 % 2.0 l | 20 % 3.0 l  |      |      |
| in driving direction to the right hand       |       | 20 % 4.6 l | 20 % 10.2 l |      |      |
| When operating up and down hill: **          |       |            |             |      |      |
| up hill                                      |       | 20 % 1.8 l | 20 % 2.6 l  |      |      |
| down hill                                    |       | 20 % 1.9 l | 20 % 3.0 l  |      |      |

\* measured from lower link point

\*\* percent figure relates to the angle in the mentioned line

## 11.2 Technical data control units

| Control units   | B         | D         | K         | E         | F  | G  |
|---|-----------|-----------|-----------|-----------|--|--|
| Central control   | x         | x*        | x*        | x*        | x*   | x*   |
| Equal pressure control<br>(boom part sections)                | 5/7       | 5 *       | 5 *       | 5 *       | 5 / 7 *  | 5 / 7 *  |
| Pressure adjustment   | manual    | electr. * | electr. * | electr. * | electr. *  | electr. *  |
| Pressure range [bar]  | 0.8 - 10  | 0.8 - 10  | 0.8 - 10  | 0.8 - 10  | 0.8 - 10   | 0.8 - 10   |
| Agitation (hydraulic)   | x         | x         | x         | x         | x  | x  |
| Pressure gauge 0-8/25bar<br>spread<br>liquid fertiliser proof | Ø 100 mm  | Ø 100 mm  | Ø 100 mm  | Ø 100 mm  | Ø 100 mm<br>digital pres-<br>sure indic.<br>(option) | Ø 100 mm<br>digital pres-<br>sure indic.<br>(option) |
| Pressure filter (65 mes-<br>hes)                              | x         | x         | x         | x         | x  | x  |
| Return flow device  | x         | x         | x         | x         | x  | x  |
| Automatic metering  | x         | x         | x         | x         | x  | x  |
| Weight [kg]   | 8 / 9     | 18        | 20        | 20        | 18 / 20  | 20 / 22  |
| Surplus amount [l]  | 0.5 / 0.8 | 0.9       | 1.1       | 1.1       | 0.9 / 1.2  | 1.1 / 1.4  |
| AMACHECK II A   | -         | -         | x         | x         | -  | x  |
| SPRAYCONTROL II A   | -         | -         | x         | x         | -  | x  |
| AMATRON II A  | -         | -         | x         | x         | -  | x  |
| Flow meter  | -         | -         | x         | x         | -  | x  |

\* function remote controlled



### 11.3 Technical data pump equipment

| Pump equipment                    |         |        | 105 l/min                        | 115 l/min                        | 140 l/min                        | 160 l/min                        | 180 l/min                        | 210 l/min                        |
|-----------------------------------|---------|--------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Type of pump                      |         |        | BP 105                           | BP 125                           | BP 151                           | BP 171                           | BP 205                           | BP 235                           |
| Delivery at 540 R.P.M             | [l/min] | 2 bar  | 104                              | 115                              | 142                              | 160                              | 191                              | 208                              |
|                                   |         | 20 bar | 101                              | 110                              | 138                              | 154                              | 174                              | 201                              |
| Power requirement                 | [kW]    |        | 4.2                              | 5.0                              | 5.8                              | 7.0                              | 7.3                              | 8.4                              |
| total weight                      | [kg]    |        | 13                               | 15                               | 24                               | 24                               | 32                               | 32                               |
| Kind of pump                      |         |        | 3-piston actuated diaphragm pump | 3-piston actuated diaphragm pump | 4-piston actuated diaphragm pump | 4-piston actuated diaphragm pump | 6-piston actuated diaphragm pump | 6-piston actuated diaphragm pump |
| Pulsing damping                   |         |        | Pressure reservoir               | Pressure reservoir               | Pressure reservoir               | Pressure reservoir               | Oil dampening                    | Oil dampening                    |
| Surplus amount                    |         |        |                                  |                                  |                                  |                                  |                                  |                                  |
| Pump                              | [l]     |        | 0.6                              | 0.7                              | 1.6                              | 1.6                              | 1.6                              | 1.7                              |
| Suction hose                      | [l]     |        | 0.4                              | 0.5                              | 0.9                              | 0.9                              | 0.9                              | 0.9                              |
| Pressure hose                     | [l]     |        | 0.8                              | 0.8                              | 0.8                              | 0.8                              | 0.8                              | 0.8                              |
| Pump equipment total              | [l]     |        | 1.8                              | 2.0                              | 3.3                              | 3.3                              | 3.3                              | 3.4                              |
| Pump equipment total total weight | [kg]    |        | 15                               | 15                               | 26                               | 26                               | 30.5                             | 32                               |

## 11.4 Technical data sprayer boom

### 11.4.1 P-boom, manually folded and rigid (height adjustment via hand winch, without swing compensation)

| Working width  | [m]  | 10       | 12                 | 12.5      |
|--|------|----------|--------------------|-----------|
| Number of boom sections  |      | 3        | 3 o. 5             | 5         |
| Number of nozzles per boom section (from l.h. to r.h. seen in driving direction) |      | 7-6-7    | 9-6-9<br>5-4-6-4-5 | 5-5-5-5-5 |
| Transport width  | [mm] | 2560     | 2560               | 2560      |
| Length   | [mm] | 640      | 640                | 640       |
| Height of machine placed on the ground   | [mm] | -        | -                  | -         |
| Nozzle height from/to  | [mm] | 480/1980 | 480/1980           | 480/1980  |
| Weight *   | [kg] | 138      | 141 o. 142         | 144       |
| Surplus amount   | [l]  | 3.0      | 3.3 o. 4.0         | 4.0       |

\* net weight increased by 5 kg if the optional electric boom tilt adjustment 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.



#### 11.4.2 Q-boom (incl. hydraulic height adjustment and swing compensation) and Q-plus-boom

|  |      | Q-boom   |                 |           |           | Q-plus-boom     |           |           |
|--|------|----------|-----------------|-----------|-----------|-----------------|-----------|-----------|
| Working width  | [m]  | 10       | 12              | 12.5      | 15        | 12              | 12.5      | 15        |
| Number of boom sections  |      | 3        | 3 o. 5          | 5         | 5         | 3 o. 5          | 5         | 5         |
| Number of nozzles per boom section (from l.h. to r.h. seen in driving direction) |      | 7-6-7    | 9-6-9 5-4-6-4-5 | 5-5-5-5-5 | 6-6-6-6-6 | 9-6-9-5-4-6-4-5 | 5-5-5-5-5 | 6-6-6-6-6 |
| Transport width  | [mm] | 2560     | 2560            | 2560      | 2998      | 2560            | 2560      | 2998      |
| Length   | [mm] | 640      | 640             | 640       | 640       | 640             | 680       | 680       |
| Height of machine placed on the ground   | [mm] | -        |                 |           |           |                 |           |           |
| Nozzle height from/to  | [mm] | 480/1980 |                 |           |           |                 |           |           |
| weight */**  | [kg] | 168*     | 171 o. 172*     | 174*      | 198*      | 171 o. 172*     | 212**     | 236**     |
| Surplus amount   | [l]  | 3.0      | 3.3 o. 4.0      | 4.0       | 5.2       | 3.3 o. 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 tilt adjustment is fitted  
 net weight increased by 24 kg if the optional Profi folding I 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.

### 11.4.3 Super-S-boom, hydraulically foldable (including hydraulic height adjustment and swing compensation)

| Working width  | [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] | 800       | 800       | 800       | 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            |
|--|------|-------------|---------------|
| Number of boom sections  |      | 5           | 7             |
| Number of nozzles per boom section (from l.h. to r.h. seen in driving direction) |      | 12-8-8-8-12 | 6-6-8-8-8-6-6 |
| Transport width  | [mm] | 2400        | 2400          |
| Length   | [mm] | 900         | 900           |
| Height of machine placed on the ground   | [mm] | 3200        | 3200          |
| Nozzle height from/to  | [mm] | 500/2000    | 500/2000      |
| Weight *   | [kg] | 588         | 588           |
| Surplus amount   | [l]  | 9.3         | 10.8          |

\* 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.



### 11.5 Technical data filling sieve, filter

|   | Area,<br>cm <sup>2</sup> | Mesh width<br>[mm] | Number of<br>meshes | Type                         |
|---|--------------------------|--------------------|---------------------|------------------------------|
| Filling sieve   | 2650                     | 1.00               |                     |                              |
| Filling insert in filter tap                                  | 207                      | 0.32               |                     | UF 600                       |
|   | 415                      | 0.32               |                     | UF 800<br>UF 1000<br>UF 1200 |
| ∅# Pressure filter insert<br>∅# Standard in all control units | 216                      | 0.30               | 65                  |                              |
| ∅# (special option)   | 216                      | 0.20               | 80                  |                              |
|   | 216                      | 0.15               | 100                 |                              |
| Nozzle filter "015"<br>up to:                                 | 5.07                     | 0.15               | 100                 |                              |
|   | "04" 5.07                | 0.35               | 50                  |                              |
|   | "05" 5.00                | 0.50               | 24                  |                              |
| Urea filter (special option)                                  | 760                      | 1.00               |                     |                              |

### 11.6 Details about noise level

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

Measuring implement: OPTAC SLM 5.

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

## 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

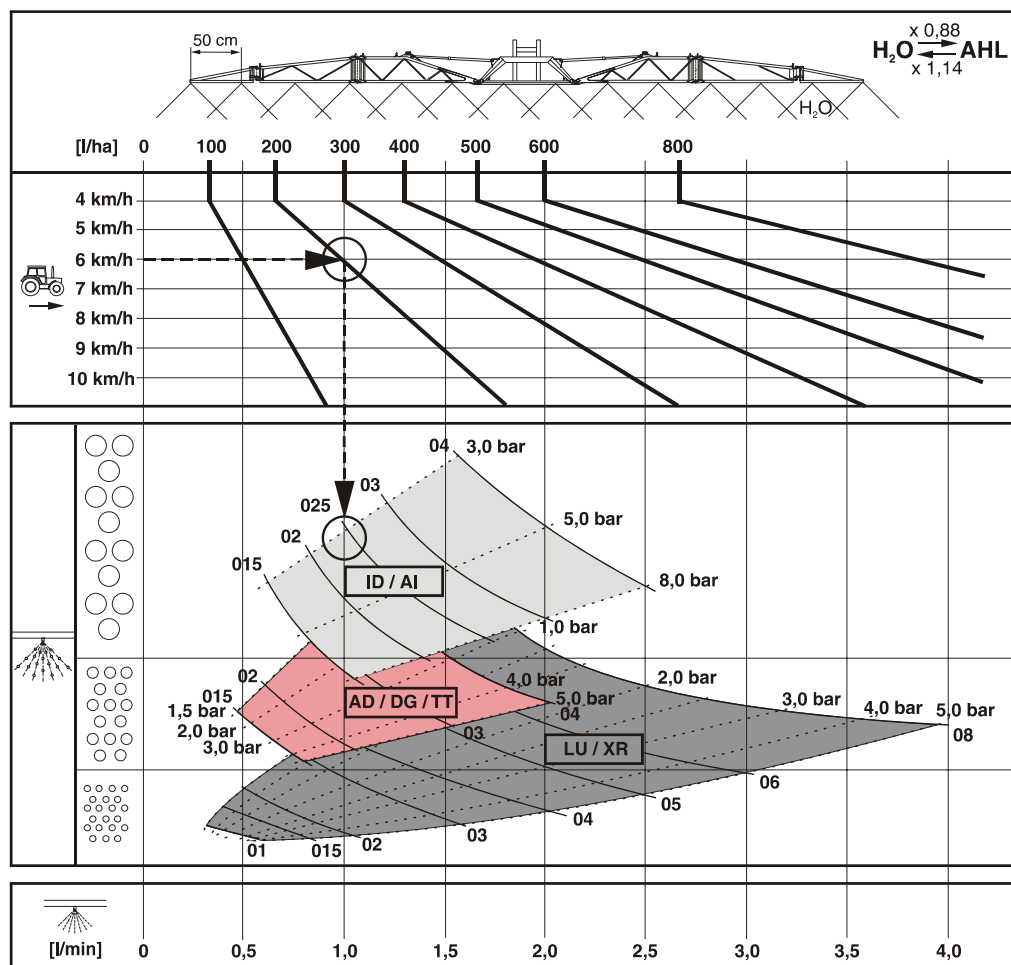


Fig. 167

1. Determine the operation point (Fig. 167/1) for the required spray rate [l/ha] and the intended forward speed [km/h].
2. Using a perpendicular line (Fig. 167/2) follow the position of operation point as this line crosses the characteristic diagram of the different nozzle types.

3. 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:  
 intended forward speed:  
 atomising characteristics:

200 l/ha  
 6 km/h  
 coarse droplets  
 (little drifting)

selected:

AI / ID 025



### Determine the spraying pressure

1. Find the column with the intended operational speed [km/h] in the spraying table (Fig. 168).
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 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..

|  |     |     |     |     |     |     |     |     |     |     |     | l/min | <br>bar |     |     |     |     |     |     |     |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|---------|-----|-----|-----|-----|-----|-----|-----|
| 4  | 5   | 5,5 | 6   | 6,5 | 7   | 7,5 | 8   | 8,5 | 9   | 10  | 12  |       | 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 |
| x 1,14<br><b>AHL</b> ↔ <b>H<sub>2</sub>O</b><br>x 0,88 |     |     | 760 | 702 | 651 | 608 | 570 | 537 | 507 | 456 | 380 | 3,8   |         |     |     |     |     |     |     | 4,5 |
|  |     |     | 780 | 720 | 669 | 624 | 585 | 551 | 520 | 468 | 390 | 3,9   |         |     |     |     |     |     |     | 4,7 |
|  |     |     | 800 | 739 | 686 | 640 | 600 | 565 | 533 | 480 | 400 | 4,0   |         |     |     |     |     |     |     | 5,0 |

Fig. 168



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

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

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

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

| Pres-<br>sure<br>(bar) | Nozzle output    |      | Spray rate AUS (l/ha) |     |     |     |     |     |     |     |          |
|------------------------|------------------|------|-----------------------|-----|-----|-----|-----|-----|-----|-----|----------|
|                        | Water<br>(l/min) | AUS  | 5                     | 5.5 | 6   | 6.5 | 7   | 7.5 | 8   | 8.5 | 9 (km/h) |
| 1.0                    | 0.61             | 0.54 | 129                   | 118 | 108 | 100 | 93  | 86  | 81  | 76  | 72       |
| 1.2                    | 0.67             | 0.59 | 140                   | 128 | 118 | 109 | 101 | 94  | 88  | 83  | 78       |
| 1.5                    | 0.75             | 0.66 | 158                   | 144 | 132 | 122 | 114 | 105 | 99  | 93  | 88       |
| 1.8                    | 0.79             | 0.69 | 165                   | 151 | 138 | 127 | 119 | 110 | 104 | 97  | 92       |
| 2.0                    | 0.81             | 0.71 | 170                   | 155 | 142 | 131 | 122 | 114 | 107 | 100 | 95       |
| 2.2                    | 0.84             | 0.74 | 176                   | 160 | 147 | 136 | 126 | 118 | 111 | 104 | 98       |
| 2.5                    | 0.89             | 0.78 | 186                   | 169 | 155 | 143 | 133 | 124 | 117 | 109 | 104      |
| 2.8                    | 0.93             | 0.82 | 196                   | 177 | 163 | 150 | 140 | 130 | 122 | 114 | 109      |
| 3.0                    | 0.96             | 0.84 | 202                   | 183 | 168 | 155 | 144 | 134 | 126 | 118 | 112      |

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

| Pres-<br>sure<br>(bar) | Nozzle output    |      | Spray rate AUS (l/ha) |     |     |     |     |     |     |     |          |
|------------------------|------------------|------|-----------------------|-----|-----|-----|-----|-----|-----|-----|----------|
|                        | Water<br>(l/min) | AUS  | 5                     | 5.5 | 6   | 6.5 | 7   | 7.5 | 8   | 8.5 | 9 (km/h) |
| 1.0                    | 0.86             | 0.76 | 182                   | 166 | 152 | 140 | 130 | 122 | 114 | 107 | 101      |
| 1.2                    | 0.94             | 0.83 | 198                   | 181 | 166 | 152 | 142 | 133 | 124 | 117 | 110      |
| 1.5                    | 1.05             | 0.93 | 223                   | 203 | 186 | 171 | 159 | 149 | 140 | 132 | 124      |
| 1.8                    | 1.11             | 0.98 | 234                   | 213 | 196 | 180 | 167 | 177 | 147 | 139 | 131      |
| 2.0                    | 1.15             | 1.01 | 242                   | 220 | 202 | 186 | 173 | 162 | 152 | 143 | 135      |
| 2.2                    | 1.20             | 1.06 | 254                   | 231 | 212 | 196 | 182 | 170 | 159 | 150 | 141      |
| 2.5                    | 1.26             | 1.12 | 269                   | 244 | 224 | 207 | 192 | 179 | 168 | 158 | 149      |
| 2.8                    | 1.32             | 1.17 | 281                   | 255 | 234 | 216 | 201 | 187 | 176 | 165 | 156      |
| 3.0                    | 1.36             | 1.20 | 288                   | 262 | 240 | 222 | 206 | 192 | 180 | 169 | 160      |

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

| Pres-<br>sure<br>(bar) | Nozzle output    |      | Spray rate AUS (l/ha) |     |     |     |     |     |     |     |          |
|------------------------|------------------|------|-----------------------|-----|-----|-----|-----|-----|-----|-----|----------|
|                        | Water<br>(l/min) | AUS  | 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**

| Pres-<br>sure<br>(bar) | Nozzle output<br>per metering disc |      | Spray rate AUS (l/ha) |     |     |     |    |     |    |     |          |
|------------------------|------------------------------------|------|-----------------------|-----|-----|-----|----|-----|----|-----|----------|
|                        | Water<br>(l/min)                   | AUS  | 5                     | 5.5 | 6   | 6.5 | 7  | 7.5 | 8  | 8.5 | 9 (km/h) |
| 1.0                    | 0.43                               | 0.38 | 91                    | 83  | 76  | 70  | 65 | 61  | 57 | 54  | 51       |
| 1.2                    | 0.47                               | 0.42 | 100                   | 91  | 83  | 77  | 71 | 67  | 62 | 59  | 55       |
| 1.5                    | 0.53                               | 0.47 | 113                   | 102 | 94  | 87  | 80 | 75  | 70 | 66  | 63       |
| 1.8                    | 0.58                               | 0.51 | 123                   | 112 | 103 | 95  | 88 | 82  | 77 | 72  | 68       |
| 2.0                    | 0.61                               | 0.54 | 130                   | 118 | 108 | 100 | 93 | 86  | 81 | 76  | 72       |

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

| Pres-<br>sure<br>(bar) | Nozzle output<br>per metering disc |      | Spray rate AUS (l/ha) |     |     |     |     |     |     |     |          |
|------------------------|------------------------------------|------|-----------------------|-----|-----|-----|-----|-----|-----|-----|----------|
|                        | Water<br>(l/min)                   | AUS  | 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<br>(bar) | Nozzle output<br>per metering disc |                | Spray rate AUS (l/ha) |     |     |     |     |     |     |     |          |
|-------------------|------------------------------------|----------------|-----------------------|-----|-----|-----|-----|-----|-----|-----|----------|
|                   | Water<br>(l/min)                   | AUS<br>(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<br>(bar) | Nozzle output<br>per metering disc |                | Spray rate AUS (l/ha) |     |     |     |     |     |     |     |          |
|-------------------|------------------------------------|----------------|-----------------------|-----|-----|-----|-----|-----|-----|-----|----------|
|                   | Water<br>(l/min)                   | AUS<br>(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<br>(bar) | Nozzle output<br>per metering disc |                | Spray rate AUS (l/ha) |     |     |     |     |     |     |     |          |
|-------------------|------------------------------------|----------------|-----------------------|-----|-----|-----|-----|-----|-----|-----|----------|
|                   | Water<br>(l/min)                   | AUS<br>(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<br>(bar) | Nozzle output<br>per metering disc |                | Spray rate AUS (l/ha) |     |     |     |     |     |     |     |          |
|-------------------|------------------------------------|----------------|-----------------------|-----|-----|-----|-----|-----|-----|-----|----------|
|                   | Water<br>(l/min)                   | AUS<br>(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)**

| Pres-<br>sure<br>(bar) | Nozzle output<br>per metering disc |                | Spray rate AUS (l/ha) |     |     |     |     |     |     |     |          |
|------------------------|------------------------------------|----------------|-----------------------|-----|-----|-----|-----|-----|-----|-----|----------|
|                        | Water<br>(l/min)                   | AUS<br>(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)**

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

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

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

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

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

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

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

## 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 kg | Sol. N l | Sol. N kg | N kg | Sol. N l | Sol. N kg | N kg | Sol. N l | Sol. N kg | N kg | Sol. N l | Sol. N kg | N kg | Sol. N l | Sol. N kg |
|------|----------|-----------|------|----------|-----------|------|----------|-----------|------|----------|-----------|------|----------|-----------|
| 10   | 27.8     | 35.8      | 52   | 144.6    | 186.0     | 94   | 261.2    | 335.8     | 136  | 378.0    | 485.0     |      |          |           |
| 12   | 33.3     | 42.9      | 54   | 150.0    | 193.0     | 96   | 266.7    | 342.7     | 138  | 384.0    | 493.0     |      |          |           |
| 14   | 38.9     | 50.0      | 56   | 155.7    | 200.0     | 98   | 272.0    | 350.0     | 140  | 389.0    | 500.0     |      |          |           |
| 16   | 44.5     | 57.1      | 58   | 161.1    | 207.3     | 100  | 278.0    | 357.4     | 142  | 394.0    | 507.0     |      |          |           |
| 18   | 50.0     | 64.3      | 60   | 166.7    | 214.2     | 102  | 283.7    | 364.2     | 144  | 400.0    | 515.0     |      |          |           |
| 20   | 55.5     | 71.5      | 62   | 172.3    | 221.7     | 104  | 285.5    | 371.8     | 146  | 406.0    | 521.0     |      |          |           |
| 22   | 61.6     | 78.5      | 64   | 177.9    | 228.3     | 106  | 294.2    | 378.3     | 148  | 411.0    | 529.0     |      |          |           |
| 24   | 66.7     | 85.6      | 66   | 183.4    | 235.9     | 108  | 300.0    | 386.0     | 150  | 417.0    | 535.0     |      |          |           |
| 26   | 75.0     | 92.9      | 68   | 188.9    | 243.0     | 110  | 305.6    | 393.0     | 155  | 431.0    | 554.0     |      |          |           |
| 28   | 77.8     | 100.0     | 70   | 194.5    | 250.0     | 112  | 311.1    | 400.0     | 160  | 445.0    | 572.0     |      |          |           |
| 30   | 83.4     | 107.1     | 72   | 200.0    | 257.2     | 114  | 316.5    | 407.5     | 165  | 458.0    | 589.0     |      |          |           |
| 32   | 89.0     | 114.2     | 74   | 204.9    | 264.2     | 116  | 322.1    | 414.3     | 170  | 472.0    | 607.0     |      |          |           |
| 34   | 94.5     | 121.4     | 76   | 211.6    | 271.8     | 118  | 328.0    | 421.0     | 175  | 486.0    | 625.0     |      |          |           |
| 36   | 100.0    | 128.7     | 78   | 216.5    | 278.3     | 120  | 333.0    | 428.0     | 180  | 500.0    | 643.0     |      |          |           |
| 38   | 105.6    | 135.9     | 80   | 222.1    | 285.8     | 122  | 339.0    | 436.0     | 185  | 514.0    | 660.0     |      |          |           |
| 40   | 111.0    | 143.0     | 82   | 227.9    | 292.8     | 124  | 344.0    | 443.0     | 190  | 527.0    | 679.0     |      |          |           |
| 42   | 116.8    | 150.0     | 84   | 233.3    | 300.0     | 126  | 350.0    | 450.0     | 195  | 541.0    | 696.0     |      |          |           |
| 44   | 122.2    | 157.1     | 86   | 238.6    | 307.5     | 128  | 356.0    | 457.0     | 200  | 556.0    | 714.0     |      |          |           |
| 46   | 127.9    | 164.3     | 88   | 242.2    | 314.1     | 130  | 361.0    | 465.0     |      |          |           |      |          |           |
| 48   | 133.3    | 171.5     | 90   | 250.0    | 321.7     | 132  | 367.0    | 471.0     |      |          |           |      |          |           |
| 50   | 139.0    | 178.6     | 92   | 255.7    | 328.3     | 134  | 372.0    | 478.0     |      |          |           |      |          |           |



## 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.

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.





AMAZONEN-WERKE  
H. DREYER GmbH & Co. KG  
Am Amazonenwerk 9-13  
D-49205 Hasbergen-Gaste  
Tel.: ++49 (0) 5405 – 5010  
Fax ++49 (0) 5405 – 501147

- (D) **EG Konformitätserklärung**  
entsprechend der EG-Richtlinie 98/37/EG
- (F) **Déclaration de conformité pour la CE**  
conforme à la directive de la CE 98/37/CE
- (GB) **EC Declaration of Conformity**  
according to Directive 98/37/EC
- (NL) **EG-Conformiteitsverklaring**  
overeenkomstig Richtlijn 98/37/EG

Wir erklären in alleiniger Verantwortung, daß das Produkt / Nous déclarons sous notre seule responsabilité que le produit / We declare under our sole responsibility, that the product / Wij verklaren enig in verantwoording, dat het produkt

### Anbau-Feldspritze / Pulvérisateur porté

Fabrikat / marque / make / merk

### Field Sprayers / Gedragen spuiltmachine

Fabrikat / marque / make / merk

### UF 600, UF 800, UF 1000, UF 1200

Type / modèle / model / type

Masch.-Nr / numéro de machine / serial No. / machine number

Baujahr / année de la fabrication / year of manufacture / bouwjaar

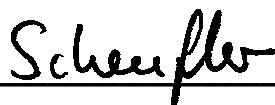
auf das sich diese Erklärung bezieht, den einschlägigen grundlegenden Sicherheits- and Gesundheitsanforderungen der EG-Richtlinie **98/37/EG** sowie den Anforderungen der EG-Richtlinie **89/336/EEG** (EMV-Richtlinie) entspricht.

faisant l'objet de la déclaration est conforme aux prescriptions fondamentales en matière de sécurité et de santé stipulées dans la Directive de la CEE **98/37/CE** ainsi qu'aux prescriptions de la Directive de la CEE **89/336/CEE**.

to which this declaration relates corresponds to the relevant basic safety and health requirements of the Directive **98/37/EC** and of the Directive **89/336/EEC**.

waarop deze verklaring betrekking heeft, beantwoordt aan de van toepassing zijnde fundamentele veiligheids- en gezondheidseisen van de richtlijn **98/37/EG**, en aan de eisen van de richtlijn **89/336/EEG** van toepassing zijn.

Hasbergen, 18.05.2000



**ppa Dr. Bernd Scheufler**

(Leiter Entwicklung / directeur technique  
director of development / directeur ontwikkeling)



**F. Oberheide**

(Gruppenleiter / Chef de groupe  
Section Manager / Groepleider)



## **AMAZONEN-WERKE**

### **H. DREYER GMBH & Co. KG**

Postfach 51  
D-49202 Hasbergen-Gaste  
Germany

Tel.: + 49 (0) 5405 501-0  
Telefax: + 49 (0) 5405 501-193  
e-mail: [amazone@amazone.de](mailto:amazone@amazone.de)  
http:// [www.amazone.de](http://www.amazone.de)

---

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

Factories for mineral fertiliser broadcasters, field sprayers, seed drills, soil tillage implements,  
multi-purpose storing halls and municipal implements

---