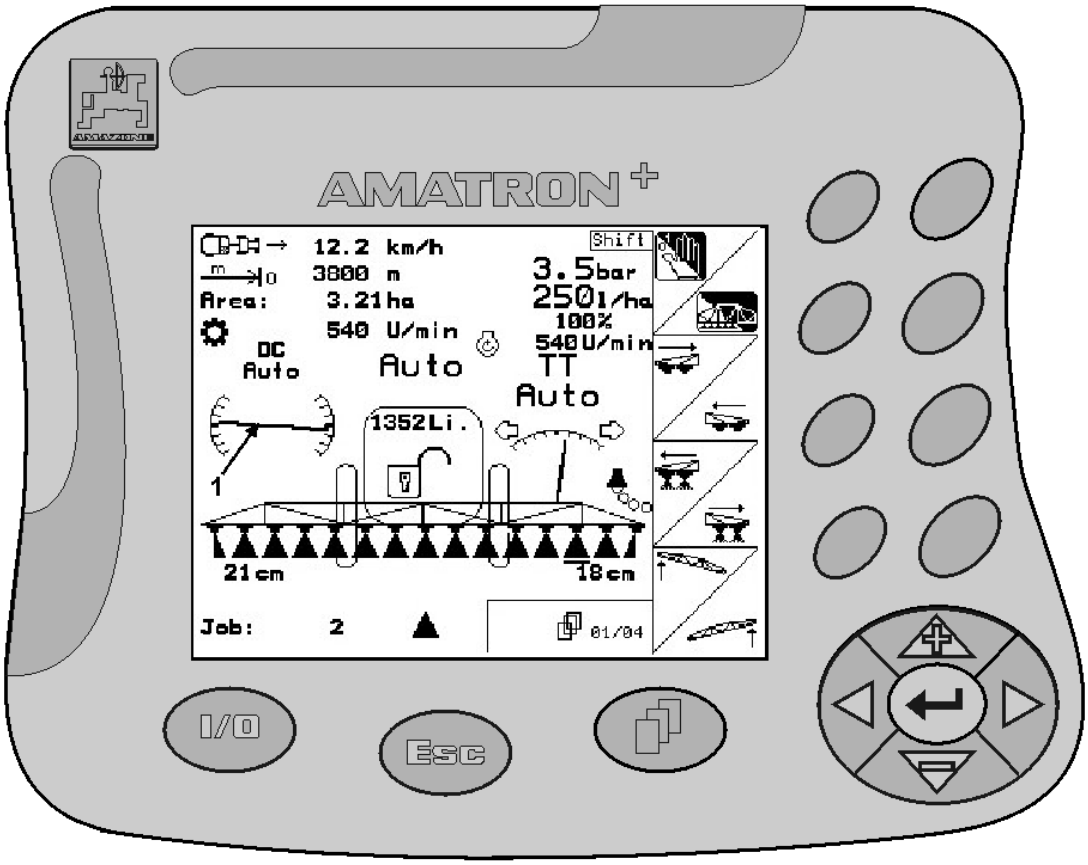
AMAZONE

Operator's Manual
On-board computer
AMATRON +

for the use in conjunction with

Field Sprayers



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CE

Before starting operation, please carefully read and adhere to this instruction manual and safety advice!

BBG AMAZONE

Reading the instruction

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

Leipzig-Plagwitz 1872.

Preface

Dear customer,

The **AMATRON+** on board computer is yet another product from the comprehensive range of farm equipment produced by AMAZONEN-WERKE, H. Dreyer GmbH & Co. KG.

In order to ensure one makes the fullest use of this on-board computer in conjunction with **AMAZONE**-Field sprayers we recommend that you carefully read and observe the information within this operator's manual and adhere to the advice given therein.

Please ensure that this operator's manual is made available to any operator before he or she starts to operate the machine.

This operator's manual refers to the **AMATRON+** on-board computer used in conjunction with field sprayers.

AMAZONEN-WERKE
H.DREYER GmbH & Co. KG

1 Details about the computer and its range of application

The computer displays, controls and monitors the **AMAZONE** implement to which it is connected.

1.1 Manufacturer

AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

P. O. Box 51, D-49202 Hasbergen-Gaste / Germany

1.2 Conformity declaration

The board computer fulfils the EMV-guide line 89/336/EC.

1.3 Details when making enquiries and ordering

When ordering spare parts always indicate the serial-number of the on-board computer.

The safety requirements are only fulfilled when in the event of a repair original AMAZONE spare parts are used. Using other parts may rule out the liability for resulting damage.

1.4 Identification

Type plate on the on-board computer.

The type plate is of documentary value and may not be changed or disguised!

1.5 Intended use of the on-board computer

The computer has been exclusively designed for normal operation in agriculture as a display-, monitoring and controlling device in combination with a wide range of **AMAZONE** equipment (in this instance: Field sprayers **UF01, UX, SX** and **UG nova**).

Use for any other purpose than that stipulated above is no longer regarded as intended use. The manufacturer does not accept any responsibility for damage resulting from this and therefore, the operator himself carries the full risk.

Under "intended use" the operator must adhere to the manufacturer's prescribed operation, maintenance and repair conditions and **exclusively use original AMAZONE spare parts**.

The implement may only be operated, maintained and repaired by persons who are familiar with it and who have been informed about the possible dangers.

All applicable accident prevention advice as well as any further generally accepted safety-, working, medical and road traffic rules should be adhered to.

Though our machines having been manufactured with greatest care deviations in use cannot totally be excluded even when used as intended. These deviations may be caused by, for example:

- Blocking up or bridging (e.g. by foreign particles, bag residues, damp fertiliser, seed, spray chemicals etc.),
- Normal wear and tear
- Damage by external influence,
- Wrong input-R.P.M. and travelling speeds,
- Wrong adjustment of the machine (incorrect mounting, not adhering to the operator's manual, setting chart, spray table).

Before and also during every operation check the proper function and the accuracy of application.

Claims for damage that has occurred anywhere but on the on-board computer itself will be rejected. This also applies to damage due to application errors when fertilising, seeding or spraying. Arbitrary modifications to the on-board computer may result in damage and therefore, the manufacturer does not accept liability for such damage.

Arbitrary changes on the implement may cause consequential damage and rule out the liability of the supplier/manufacturer for this damage.

2 General safety advice

This chapter contains basic advice for the safe operation of the machine.

2.1 Obligations and liability

Observe the advice given in this instruction manual

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

Obligation of the owner

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

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

Adhere to the requirements of the EC guideline for the use of work equipment 89/655/EWG and particularly the accident prevention regulations VSG 1.1, VSG 3.1.

Obligation of the operator

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

- observe the basic regulations regarding the operational safety and accident prevention,
- to read and to adhere to the chapter "Safety" and the warning hints in this instruction manual.

In case of queries, please contact the manufacturer.

Danger when dealing with the machine

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

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

Only use the machine

- for the purpose it has been designed for.
- in a perfectly safe, engineering condition.

Immediately remedy any failure affecting the safe operation.

Warranty and liability

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

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

Safety advice for retrofitting electric and electronic devices and/or components

The function of the implements' electronic components and parts may be affected by the electro-magnetic transmittance of other devices. Such affects may endanger third parties when the following safety advice has not been adhered to:

When retrofitting electric and electronic devices and/or components to the implement with a connection to the tractor's on-board electric circuit, the onus is on the user to ensure that the installation will not cause any disturbance to either the tractor's electronics or other components.

Special attention must be paid that the retrofitted electric and electronic parts correspond to the EMV-guideline 89/336/EC in the relevant valid edition and that they bear the CE-mark.

For retrofitting mobile communication systems (e.g. radio, telephone) the following requirements must be fulfilled:

Only install devices which have officially been authorised for the country of use.

Fix the device securely.

For cabling and installation as well as for the maximum permissible current supply, adhere to the fitting instructions of the implement manufacturer.

Safety advice for repair work

Before carrying out any repair work on the electric system or arc welding on the tractor or the mounted implement, disconnect all connections to the on-board computer..

2.2 Illustration of safety advice

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

Danger!

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

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

Warning!

<u>Possible</u> danger to life and health of persons.

Not adhering to these hints may cause severe adverse health effects with the possibility of life threatening injuries.

Caution!

<u>Possible</u> dangerous situation (slight injuries, material damage).

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

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

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

Hint for use and particularly useful information.

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

3 Fitting instruction

3.1 Mounting of the terminal

Fit the base tractor equipment (Fig. 1/1) (console and distributor) within reach and sight to the right hand side of the operator. It must be installed in the tractor cab free from vibrations and electrical conductivity. The distance from a radio transmitter or an antenna should at least be 1 m.

Attach the bracket for the computer (Fig. 1/2) on to the tube of the console.

Pivot the computer until the best angle of view is achieved.

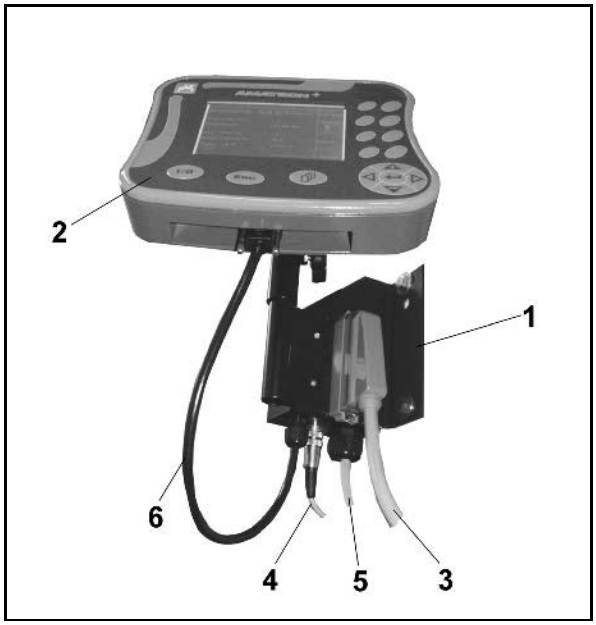


Fig. 1

Via the console the computer housing must have an earth connection to the tractor chassis. Before fitting, scratch off the paint around the contact area of the bracket to avoid electrostatic charging.

3.2 Connection of the machine

3.2.1 Connection of the machine

Connect the field sprayer via the implement plug (Fig. 1/3).

Only UF 01: Connect the forward speed signal cable (Fig. 1/4) from the tractor signal socket or from the Sensor X to the on-board computer base equipment.

Connect battery cable (Fig. 1/5) to the tractor battery.

Insert the plug of the connecting cable (Fig. 1/6) into the centre 9-pole Sub-D socket (Fig. 2/1).

The serial interface (Fig. 2/2) allows connection with a GPS-Terminal.

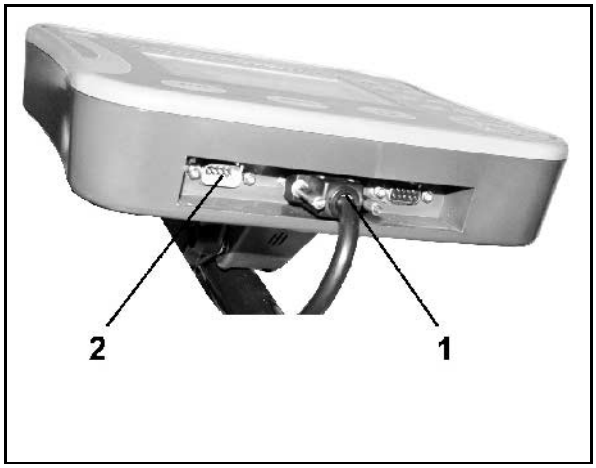


Fig. 2

3.2.2 Battery connecting cable

The required power supply of **12 V** should be provided directly from the battery or from the 12 V starter motor.

- Route the battery connecting cable from the tractor cab to the tractor battery and secure. Ensure that the battery connecting cable cannot be trapped.
- Shorten the battery connecting cable as necessary.
- Strip the cable end by approx. 250 to 300mm.
- Individually remove the insulation from the cable ends by 5 mm.

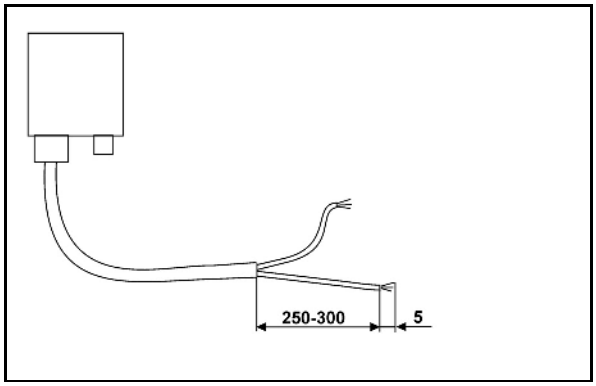


Fig. 3

- Insert the blue cable (earth cable) into the loose ring tongue (Fig. 4/1).
- Use crimping pliers to secure the joint.
- Insert the brown cable (+ 12 Volt) into a free butt joint (Fig. 4/2).
- Use crimping pliers to secure the joint.
- Shrink the casing over the butt joint (Fig. 4/2) by using a heat source (lighter or hair dryer) until the adhesive escapes.
- Connect battery cable to tractor battery:
  - Brown cable with **+**.
  - Blue cable with -

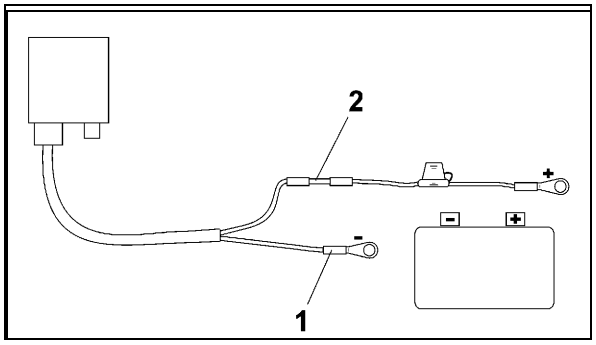


Fig. 4

Before connecting AMATRON+ with a tractor that is equipped with several batteries, please refer to either the tractor's manual to ascertain the battery to which the computer should be connected, or ask the tractor manufacturer.

4 Description of product

AMATRON+ can be used to control, actuate and monitor

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

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

The AMATRON+ determines:

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

The AMATRON+ stores for a started order:

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

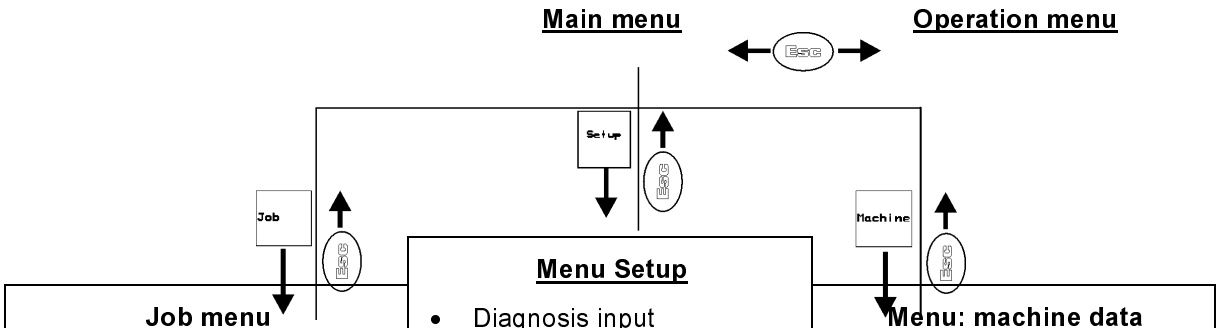
The AMATRON+ consists of the main menu and the additional 4 sub menus order, implement data, setup and operation.

- **Job menu**
  Jobs are created in the **job menu** and the determined data of up to 20 jobs are stored. Please refer to chapter "Job menu", page 22.
- **Menu machine**
  In the **menu implement data** the implement specific settings are entered, dialled or determined via a calibration procedure. Please refer to chapter "Menu machine":
- **Menu setup**
  The **Menu setup** serves for input and output of diagnosis data and for dialling and entering of implement basic data. Please refer to chapter "Menu setup".
- **Operation menu**
  During spraying operation the **operation menu** shows all necessary data. During the spraying operation the field sprayer is controlled from **the operation menu**.

This instruction manual refers from terminal-software version:

Machine:	Terminal:
MHX-Version: 4.X.5	IOP-Version: 3.1.0
IOP-Version:3.2.0	BIN-Version: 2.3.0

4.1 Hierarchy of the AMATRON+



Job menu

- Enter name
- Enter note
- Enter spray rates (required rate)
  - Nozzle a
  - Nozzle b (only for multiple nozzle access)
- Order start / continue
- Delete order
- Delete daily data or order data for
  - worked area
  - Operational hours
  - Operational output
  - sprayed spray cocktail amount

Menu Setup

- Diagnosis input
- Diagnosis output
- Speed simulator
- Display settings (Setup)
- Implement basic data
  - Select machine type
  - Select boom type
  - Select tank size
  - Filling level indicator on/off, calibration and learning
  - Enter working width
  - Enter number of boom part sections
  - Enter nozzles per boom part section
  - Enter number of flow meters
  - Enter pressure control constant
  - Off centre nozzles on/off
  - Foam marker on/off
  - Comfort package on/off
  - Multiple nozzle access on/off
  - Distance Control on/off
  - Configuration of Trail-Tron
  - Select folding system
  - hydro pneumatic suspension
  - Select steering system
  - Enter alarm delay time vacuum
  - Unlocking/locking the transport position for maintenance work

Menu: machine data

- Calibration of tilt adjustment/ Distance Control
- Determination of impulses per litre for both flow meters (DFM)
- Enter the nominal PTO shaft rev. speed
- Calibration impulses per 100 m
- Boom part width sections permanently switched off
- selection of individual boom sections on/off
- Enter filling level alarm delay time
- Refill tank
- Enter percentage application rate increase
- Enter max. pressure
- Enter min. pressure
- Switching on/off the automatic locking of the sprayer booms
- Calibrating the Trail-Tron-system
- Entering the factor for the pump input revs
- Distance counter
- Distance Control: Automatic tilt adjustment at the headlands

4.2 Description of operator terminal

4.2.1 Display and function icons

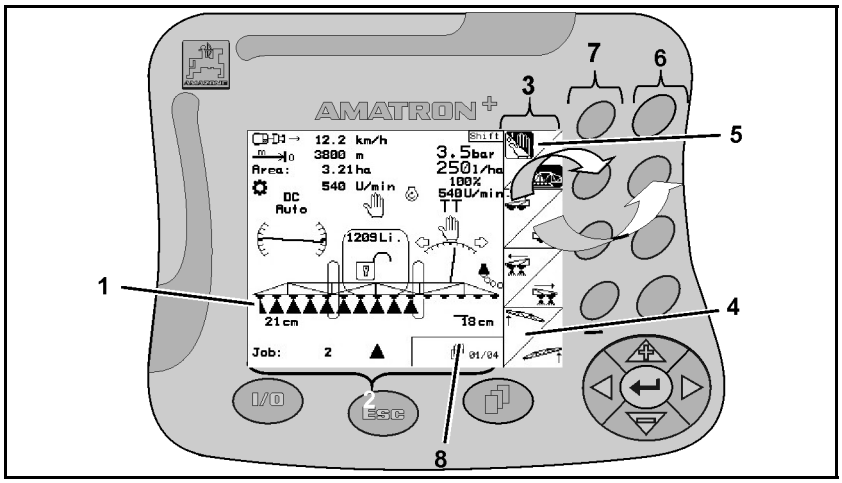


Fig. 5

Fig. 5/...

(1) Display. The display consists of the operating display (2) and the function icons (3).
(2) Operating display. The operating display shows the actual chosen functions of the plant protection sprayer and the actual forward speed [km/h], the travelled distance [m], the worked area in [ha] and the actual PTO shaft rev. speed [R.P.M.].
(3) The function icons are either complete icons (4) or a diagonally divided icons (5).

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

(4) Complete icon. In cases where the function icon is a square field only the right hand row of function keys (6) allow access to the function field.
(5) Diagonally divided icon. If the function icon is a diagonally divided icon,
- the function icon on the top left is accessed or recalled via the left hand row of keys (7).
- the function icon at the bottom right is accessed or recalled via the right hand row of keys (6).

(6) Right hand row of keys.
(7) Left hand row of keys.
(8) Page symbol. Page on to other menu pages when the page symbol appears in the display.

4.2.2 Keys on the implement front side

ON (I) / OFF (0) (Fig. 6). Via this key you switch the AMATRON+ on and off.

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

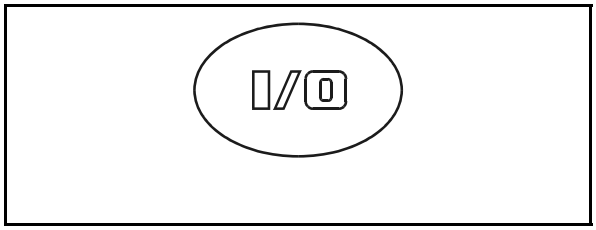


Fig. 6

This key has several functions:

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

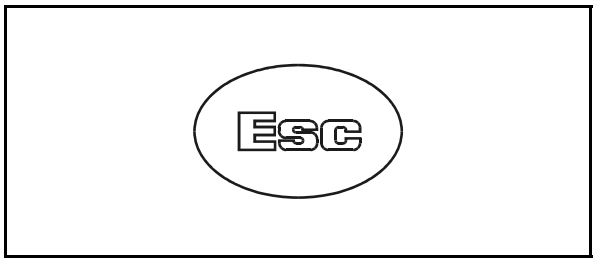


Fig. 7

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

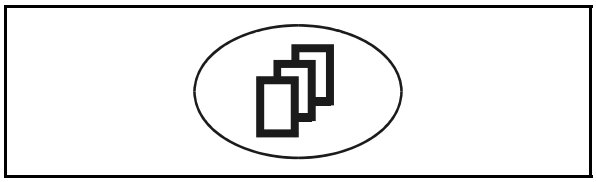


Fig. 8

Fig. 9/...

(1) Cursor in display to the right.
(2) Cursor in display to the left.
(3)
- Increase of spray rate during spraying operation by pre-selected percentage application rate (e.g. by 10%).
- Cursor upwards

(4)
- Reduce spray rate during spraying operation by pre-selected percentage application rate (e.g. by 10%).
- Cursor downwards.

(5)
- Accepting selected figures and letters.
- Confirmation of a warning alarm.
- Reset spray rates to 100 % in the operation menu.

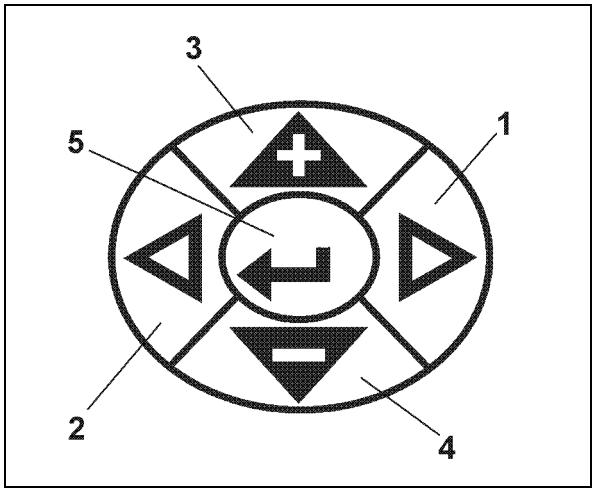


Fig. 9

4.2.3 Keys on implement rear side

The shift key is located on the rear of the terminal (Fig. 10/1).

The shift key is active (1) only in the operation menu and in the job menu.

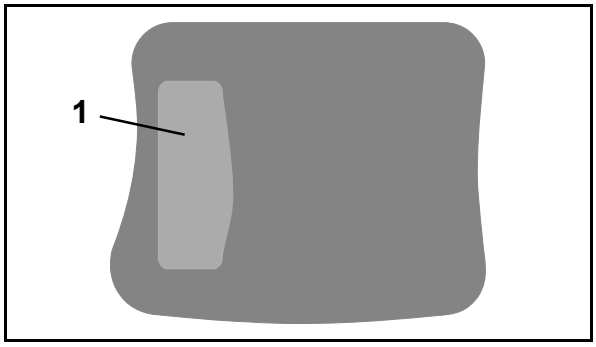


Fig. 10

If the shift key is pressed in the menu operation (Fig. 11/1), other function keys will appear on the display. At the same time the coverage of the keys will change also. With the shift key pressed the indicated functions can be actuated via the relevant function key.

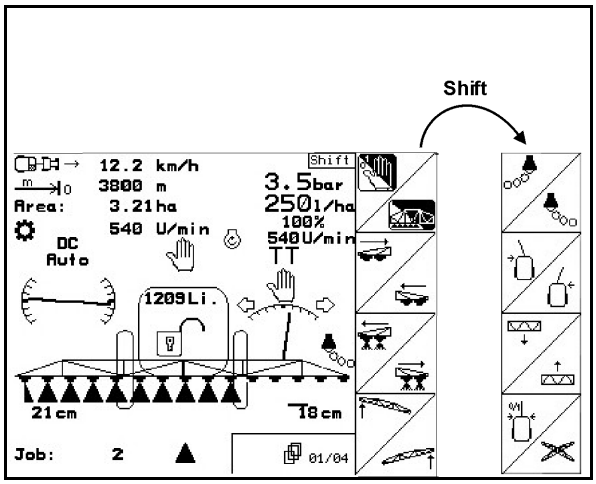


Fig. 11

4.3 AMATRON+ switch on

1. Press key (I/O).

→ When the implement computer is connected the start menu appears (Fig. 12) with the terminal version. After approx. 2 seconds the AMATRON+ will automatically jump into the main menu.

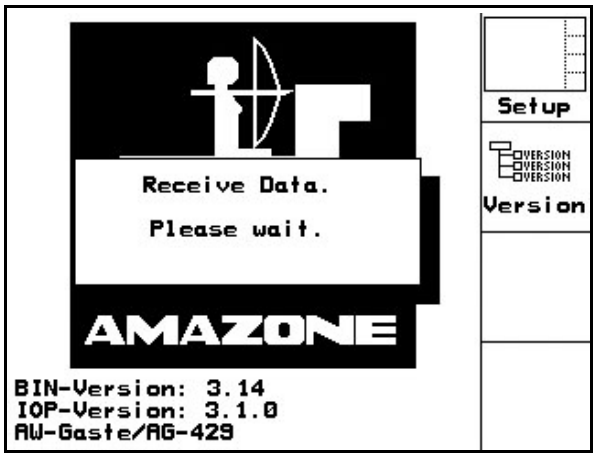


Fig. 12

When the AMATRON+ loads data from the implement computer, the start screen opposite appears (Fig. 13). New data is loaded when

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

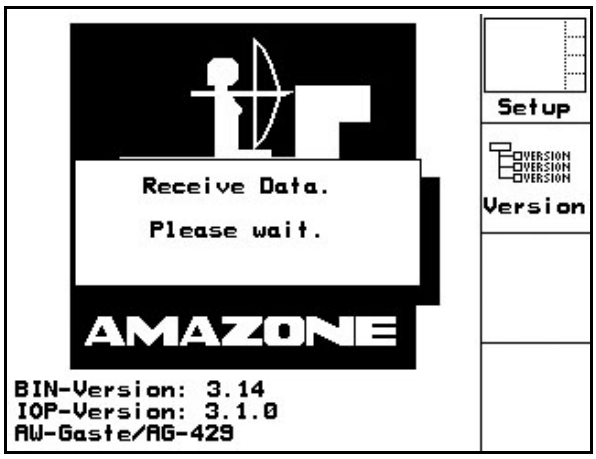


Fig. 13

4.4 Inputs on AMATRON+

For operating the AMATRON+ the relevant function icons appear in this operator's manual. Press the relevant key for the function icon to carry out the indicated function..

Example: Function icon 

Description:

Lift sprayer boom.

Action:

1. Press the relevant key(Fig. 14/1) for the function icon  , to lift the sprayer booms.

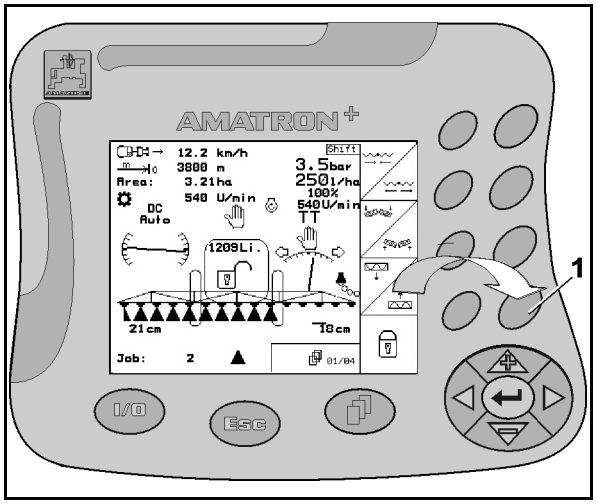


Fig. 14

4.4.1 Inputting text and figures

If AMATRON+ requires the input of text or figures the entry menu (Fig. 15/1) appears on the display (Fig. 15 /2),.

In the entry menu (Fig. 15/3) the individual letters or figures are chosen that will appear in the input line (Fig. 15/4)..

1. Select the desired letter or the desired figure in the selection field (Fig. 15/3) with the aid of the keys , , and Change the letter case via the key A<->a .
2. Press key (Fig. 15/5), to take over the accept the selected letter or the selected figure into the input line (Fig. 15/4).

→ The cursor advances by one digit.

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

   With key CE the entire input line is deleted.

   The arrows ← → in selection field (Fig. 15/3) allow the movement of the cursor within the input line (Fig. 15/4).

   The arrow ← in the selection field (Fig. 15/3) deletes the last input.
4. Confirm the input with the function icon , to accept the finished input line into AMATRON+.

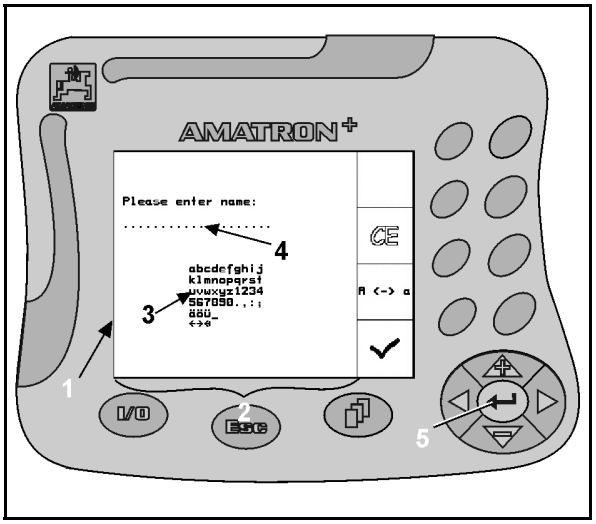


Fig. 15

4.4.2 Selection of Options

1. Position the selection arrow (Fig. 16/1) with the aid of the keys or .
2. Press key (Fig. 16/2), to accept the input into AMATRON+.

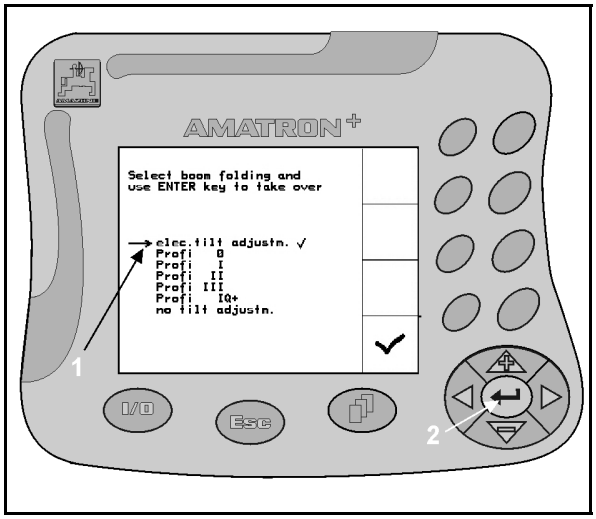


Fig. 16

4.4.3 Switching on/off of functions (Toggle Function)

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

1. Press key (Fig. 17/1) once.

→ In the display appears "on" and the function "comfort package" is switched on.

2. Press key once again (Fig. 17/1).

→ In the display appears "off" and the function "comfort package" is switched off (Fig. 17/1) once.

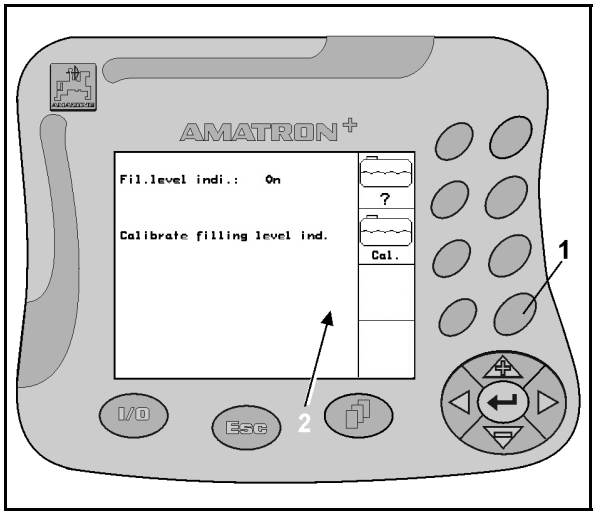


Fig. 17

5 Operation

5.1 Start screen

Having switched on **AMATRON+** with the machine connected, the start menu will appear . It shows the terminal-software version number. After approx. 2 sec **AMATRON+** will automatically jump into the main menu.
After switching on the terminal, **AMATRON+** may load data from the machine's job computer after, for example

- installation of a new machine computer,
- installation of a new **AMATRON+**-terminal,
- a RESET of the **AMATRON+**-terminal,

the start screen will show this message.

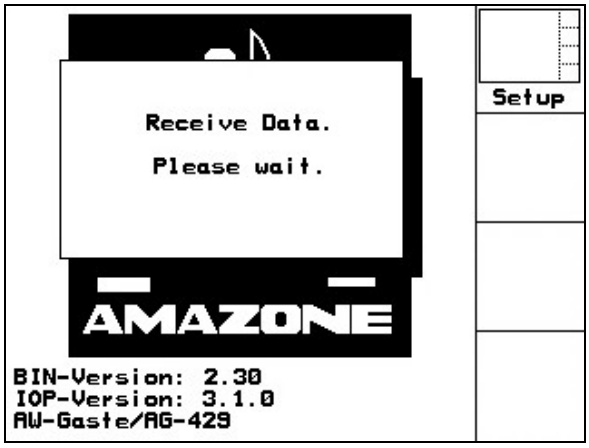


Fig. 18

5.2 Main menu

The main menu shows

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

Via the function icon 

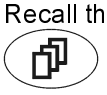
the job menu is recalled (please refer page 22).

Via the function icon "machine" 

the menu machine is recalled (please refer page 24).

Via "Setup" 

the Setup menu is recalled (please refer page 41).

Recall the "Aid" function icon via the symbol 
. In the aid window you may choose between

- aid for operation and
- aid for fault messages.

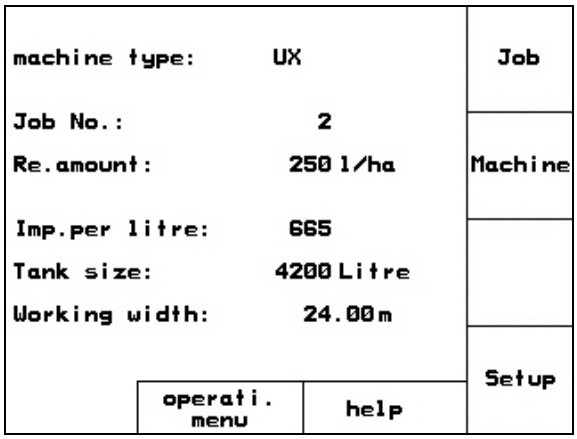


Fig. 19

5.3 Job menu

In the job menu

- you can create individual jobs and start or continue.
- you may recall stored job data. A maximum of 20 jobs can be stored (Order No. 1 to 20).

When the job menu is recalled, the data for the last started job will appear.

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

5.3.1 Create order / start or recall stored job data

1. Recall any job no. or a specific job no. via the symbol .
2. Delete the job data via the function icon when intending to create a new job. Skip the steps 2 to 5, if intending to continue a recalled job.
3. Recall function icon and enter a name. Please refer to chapter "Inputting text and figures", page 19.
4. Recall function icon and enter a note.
5. Recall function icon and enter the required rate for the spray rate.
6. Recall the function icon and start the order or continue.

→ For this job the following are now determined and stored:

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

7. Recall the function icon and the daily data is deleted for

- the worked daily area (ha/day)
- the daily amount sprayed (amount/ day)
- the daily period spraying (hours/day).

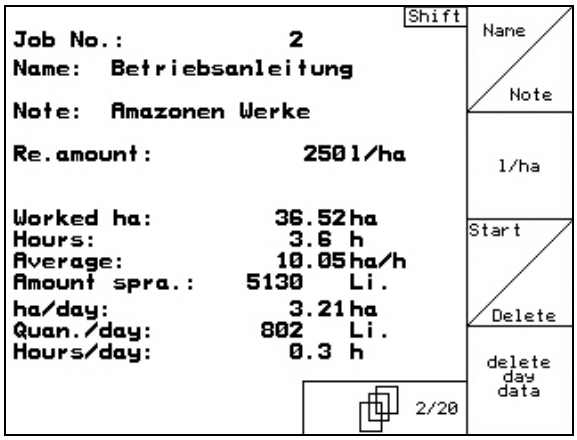


Fig. 20

5.3.2 External job

Via a PDA computer an external job can be transferred into **AMATRON+** and started.

This order always takes job number 21.

The data transfer takes place via the serial interface.

- externen Auftrag beenden finish external job.
- l/ha Enter the required amount.

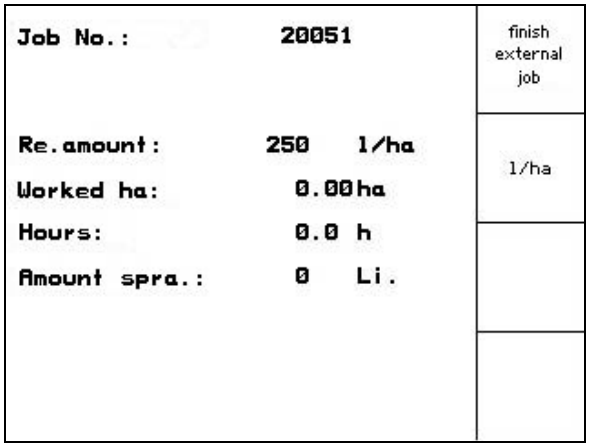


Fig. 21

5.4 Menu machine data

In the machine data menu proceed as follows

- before initially putting into operation enter the machine specific data or settings, select them or determine by a calibration procedure.
- if necessary correct the machine specific data or settings, when the field sprayer does not function correctly.

01/04

- Recall via the function icon  to display
  - "tilt adjustment", (option) please refer page 26"
  - "Calibration Distance Control", (option) please refer page
- Recall via the function icon  to display "Impulses per litre determine / enter (DFM 1 and DFM 2), please refer to chapter "Determine impulses per litre – flow meter or manual entering of impulses per litre – flow meter", please refer to chapter "Impulses per litre".
- Recall via the function icon  to display "enter nominal PTO shaft rev. speed", please refer to chapter "Nominal PTO shaft rev. speed"..
- Recall via the function icon  to display "Value for impulses per 100 m" input or automatic calibration", please refer to chapter "Impulses per 100m".

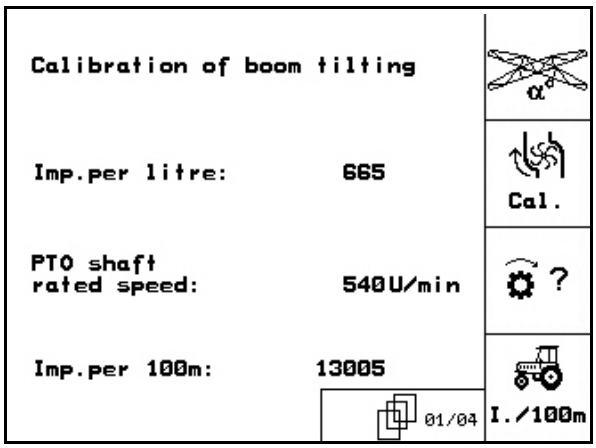


Fig. 22

02/04

- Via the function icon  you can permanently switch off individual boom sections. The indicated figure (Fig. 23/1) informs which of the boom sections are permanently switched off (Figure 0 = no boom section switched off). Please refer page 38.
- Via the function icon  the function "selection of individual boom sections" is switched on and off. Please refer page 39.

→ In the display appears either the word "on" (function switched on) or "off" (function switched off) " (Fig. 23/2).

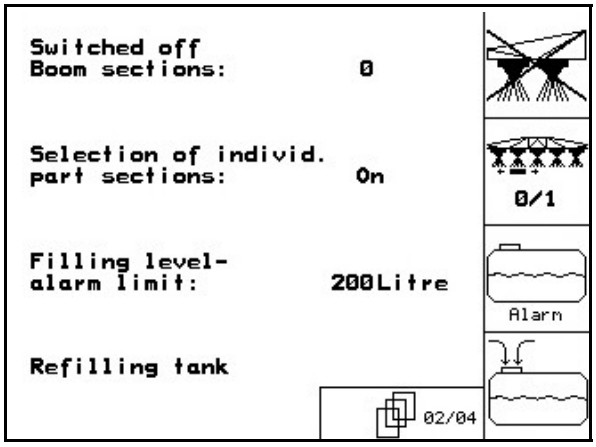


Fig. 23

- Via the function field  recall the entering of the filling level alarm delay limit. Enter the filling level alarm limit. Please refer to chapter "Inputting text and figures", page 19.

→ During spraying operation an alarm is triggered when the level in the spray cocktail tank drops beyond the filling level alarm limit (in this case 200 litres).

- Recall via the function icon  the function "Tank refilling quantity". Please refer page 40.

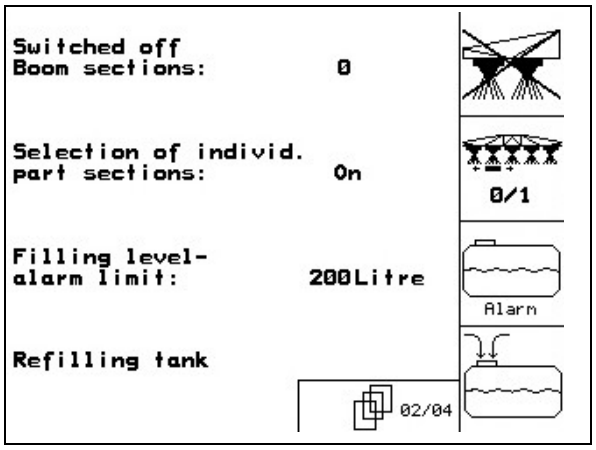


Fig. 24

03/04

- Recall via the function icon  the entering of the percentage application rate increase. Enter the desired percentage application rate increase (in this case 10 %).

→ If you press the keys  or  during spraying operation, the spray rate changes per key pressure by the entered percentage application rate increase (in this case by 10 % each).

- Recall via the function icons  and  the entering of the max. and min. permissible spray pressure for the nozzles fitted to the sprayer boom..

→ If during the spraying operation the permissible spraying pressures are exceeded or undercut an alarm signal sounds.

- Automatic locking of the boom on and off via the function icon  .

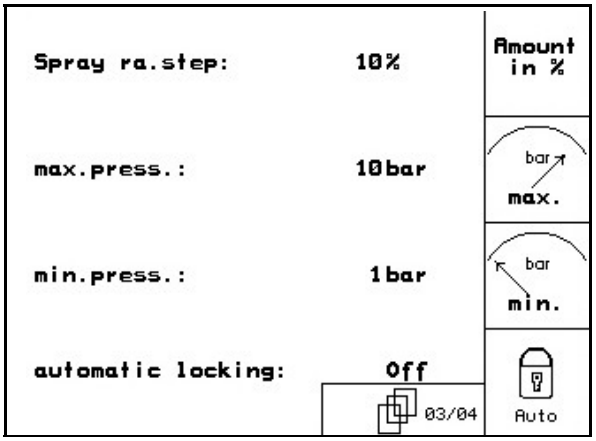


Fig. 25

04/04

-  Actuating the distance counter. For marking out tramlines the distance travelled is indicated whilst driving at the headland. The distance counter starts to register the travelled distance as soon as the "sprayer" is switched off.
-  Actuating the automatic tilt adjustment at the headland
-  Actuating the Trail-Tron calibration procedure.
- Only UX: Via function icon  recall the nominal pump rev. speed.

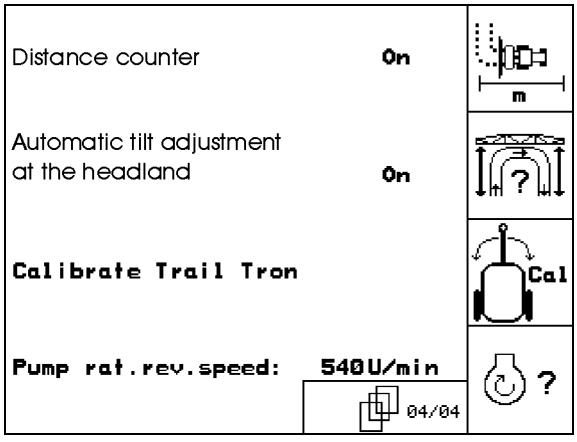


Fig. 26

5.4.1 Calibration of tilt adjustment

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

Calibrate the tilt adjustment

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

1. Move into the horizontal position. For this actuate the function icon  or  and align the sprayer boom in a horizontal position to the ground.
2. Determine the horizontal position. For this actuate function icon  .

→ The horizontal position is determined.

3. Move to the right hand limit. For this actuate the function icon  until the right hand spacer slightly touches the ground.
4. Determine right hand stop. For this actuate function icon  .

→ Right hand stop is determined.

5. Move to the left hand limit. For this actuate the function icon  until the left hand spacer slightly touches the ground.
6. Determine the left hand limit. For this actuate function icon  .

→ The left hand limit is determined.

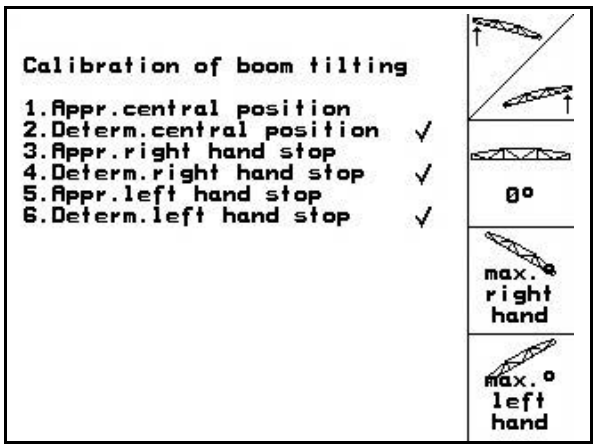


Fig. 27

5.4.2 Calibrating the Distance Control

The pre-condition for the perfect functioning of Distance Control is prior, careful calibration. Carry out a calibration

- **before initially putting in to operation.**
- **once per season.**

Before calibrating Distance Control ensure the sprayer is sat on level ground without inclination and without any undulations below the ultrasound sensors. The ground surface should not be too smooth (e.g. asphalt, concrete).

1. Via the function icon 

the menu: machine data is recalled.
2. Press the  key to recall the menu: calibration of distance control.

The calibration itself runs in 3 stages.

1. Horizontal calibration

- Via the function icon  start the horizontal calibration.
- Using the  and  keys align the booms horizontally. The actual height of the two sensors is permanently displayed (Fig. 29).

→ when "boom now horizontal" appears in the display, press  in order to input the horizontal position.

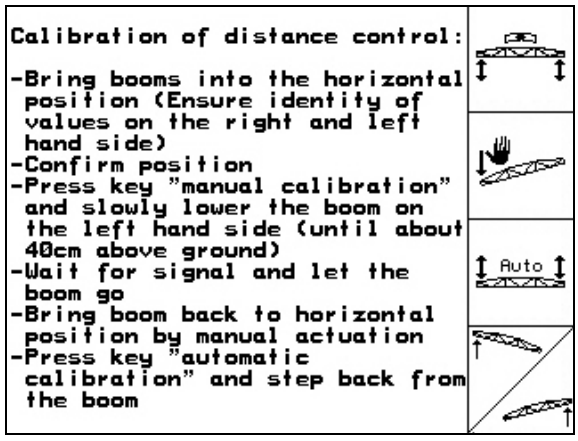


Fig. 28

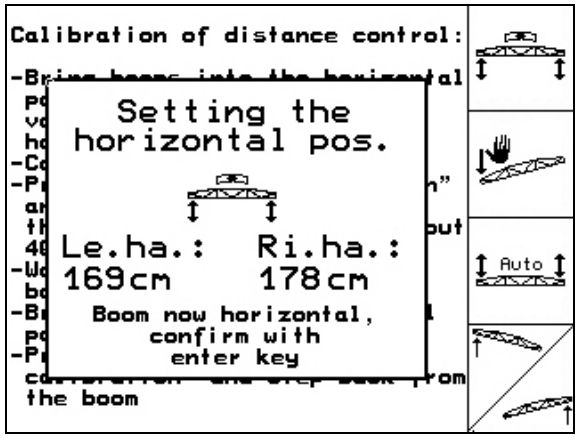


Fig. 29

2. Manual calibration

- Via the function icon  start the manual calibration.
- Manually push down the left hand boom until its tip is about 40 cm above the ground. Hold this position for approx. 5 seconds..

→ An audible signal indicates **AMTRON**+ recognises that position.

- Let go the boom and wait until "boom now horizontal" appears in the display.
- If the boom does not automatically return into the neutral position (for instance if when the boom is prevented by the boom suspension), manually align the boom in the neutral position.
- Confirm the horizontal position with  .

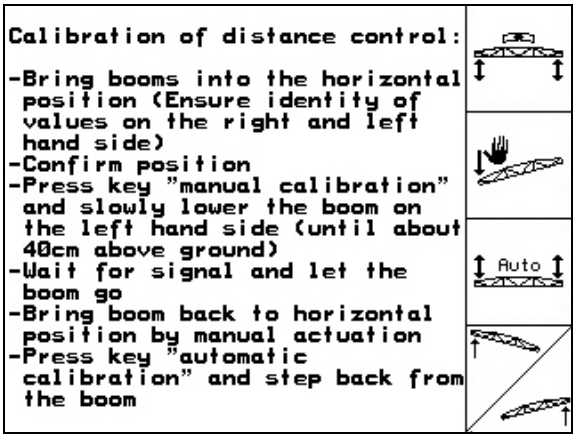


Fig. 30

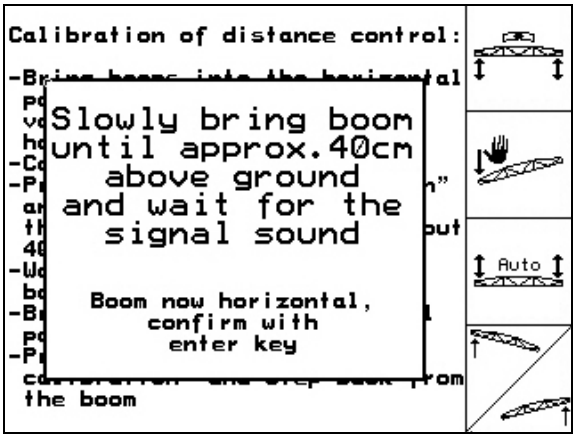


Fig. 31

3. Automatic calibration

- Via the function icon  (Fig. 30) start the automatic calibration.

Danger!

During the automatic calibration no person should be allowed within the range of the pivoting boom. Danger of injury by automatically moving boom.

- The boom raises automatically first on the left hand side and then on the right before finally being returned into the horizontal position.
- The computer will display the completion of the automatic calibration (Fig. 32).
- Press key  to leave the menu.

It is not necessarily a fault if the boom is not exactly in the horizontal position.

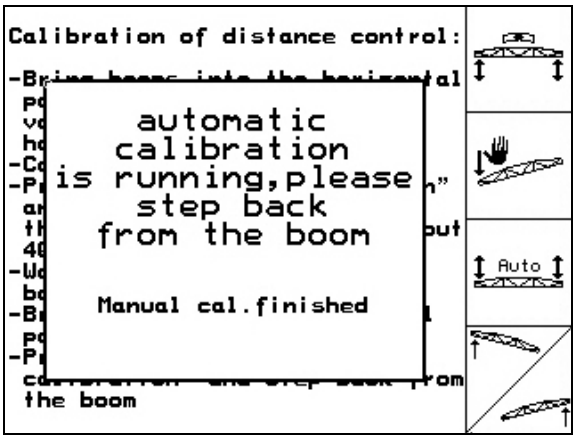


Fig. 32

5.4.3 Impulses per litre

- The AMATRON+ requires the calibration value "Impulses per litre" for the flow meter / return flow meter
  - for determination and control of the spray rate [l/ha].
  - for the determination of the daily and total amount of the sprayed spray cocktail [l].

- In case the calibration figure is not known you have to determine the calibration value "Impulses per litre" via a calibration of the flow meter /return flow meter.

- If the calibration figure is exactly known you can manually enter the calibration value "Impulses per litre" for the flow meter / return flow meter into the AMATRON+.

- For the accurate conversion of the spray rate in [l/ha] it is necessary to determine the calibration value "Impulses per litre" of the flow meter at least one a year.

- As a matter of principle determine the calibration value "Impulses per litre" of the flow meter:
  - after removal of the flow meter.
  - after a prolonged period of operation as there may be deposits of spray agent residue may in the flow meter.
  - in case of deviations between the required and the actually applied spray rate [l/ha].

- For the accurate conversion of the applied spray cocktail amount in [l] align the return flow meter with the flow meter at least once a year.

- Align the return flow meter with the flow meter:
  - after the determination of the calibration value "Impulses per litre" of the flow meter.
  - after removal of the flow meter.

- Note the indicated value "Impulses" when driving the field sprayer away from its position for the determination of the sprayed amount of water.

5.4.3.1 Determine the Impulses per litre - Flow meter

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

.

→ The calibration procedure starts.

4. Switch on sprayer booms and spray at least 500 l of water (see tank level indicator) via the sprayer booms.

→ The display shows the permanently determined value of the "Impulses" for the sprayed amount of water.

5. Disengage the feed to the sprayer boom and the PTO shaft.
6. Note the indicated value "Impulses", in this case e.g. 365851.
7. Accurately determine the sprayed quantity of water by refilling the spray agent tank back up to the filling marks on both sides of the spray cocktail tank
   - with the aid of a calibration container,
   - by weighing or
   - by a water meter.
8. Enter the value for the determined quantity of water, e.g. 550 l.
9. Press key  and the calibration procedure is finished.

→ The AMATRON+ automatically calculates the calibration value "Impulses per litre" shows the calibration value and stores the calibration value

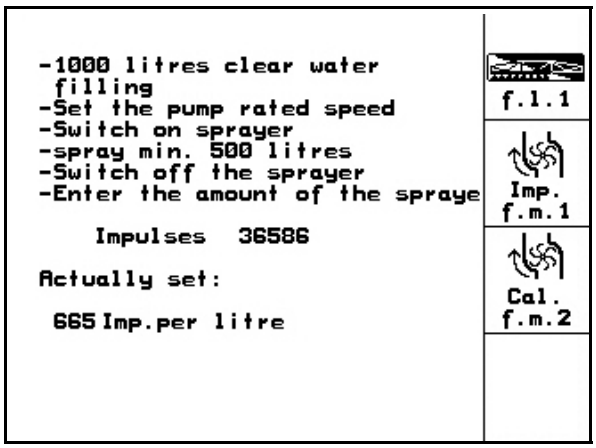


Fig. 33

5.4.3.2 Manually enter the Impulses per litre - Flow meter

1. Recall via the function icon 

the entry "Enter the impulses for flow meter 1".
2. Enter the calibration value "Impulses per litre". Please refer page 19.
3. Accept via the function icon  .

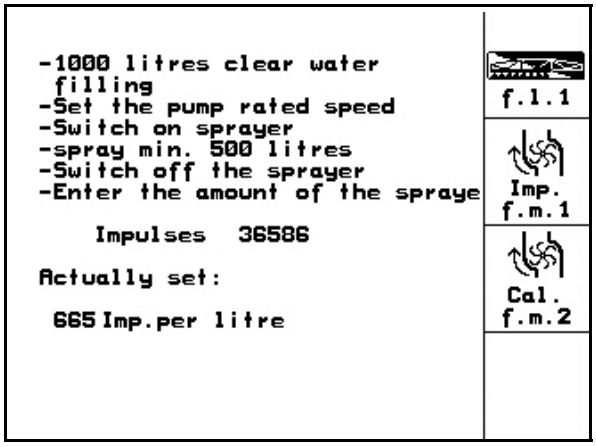


Fig. 34

5.4.3.3 Align return flow meter with flow meter

1. Change via the function icon 

into the menu "Alignment Flow meter 2".

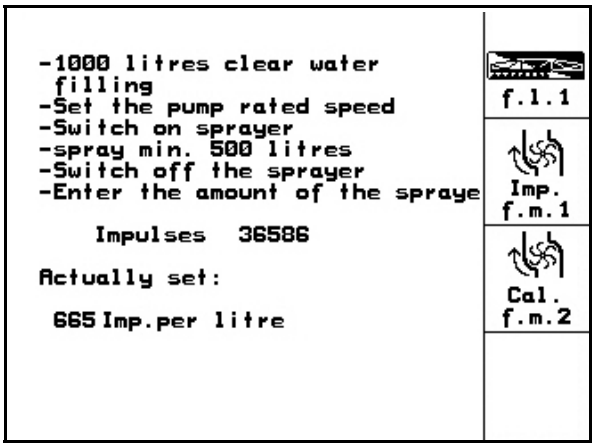
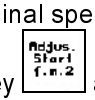


Fig. 35

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

and the alignment starts

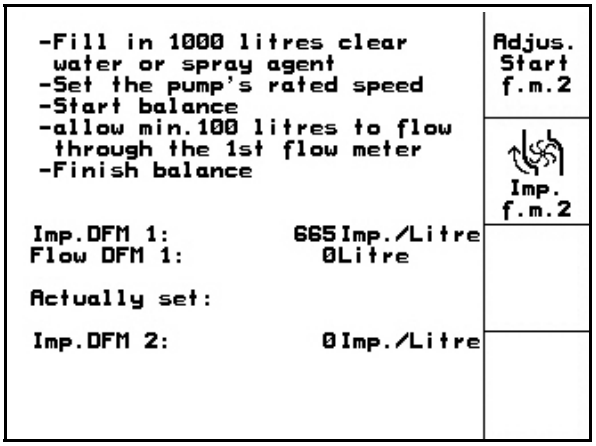


Fig. 36

The alignment is only possible when "spraying" is switched off.  .

When the opposite display appears the alignment is finished

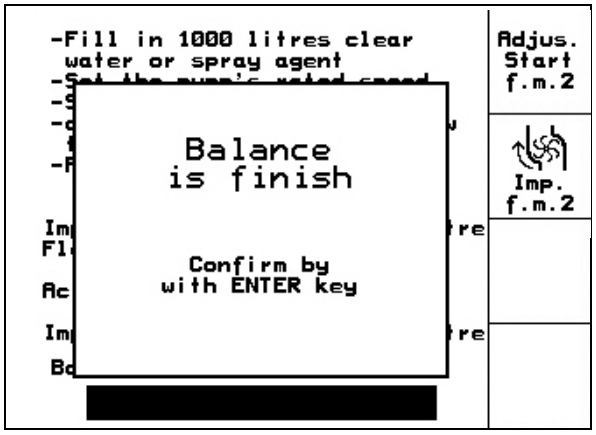


Fig. 37

5. Press key  and the alignment of the return flow meter is finished.

→ The AMATRON+ automatically calculates the calibration value "Impulses DFM 2", shows the calibration value and stores the calibration value.

5.4.3.4 Manually enter impulses per litre – return flow meter

1. Recall via the function icon  the entry "Enter the impulses for flow meter 2".
2. Enter the calibration value "Impulses per litre". Please refer page 19.
3. Accept via the function icon  .

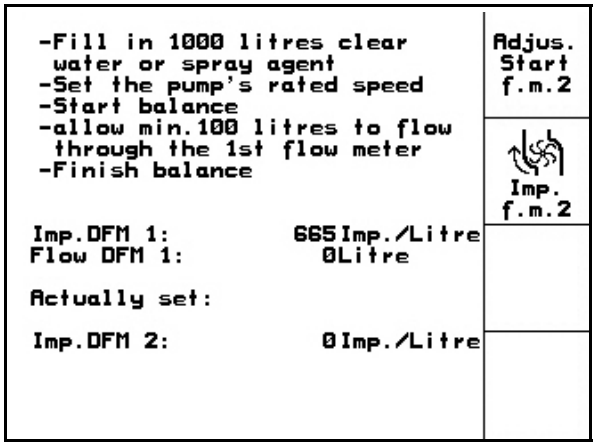


Fig. 38

5.4.4 Nominal PTO shaft rev. speed

- **You can store information for up to 3 tractors**
  - **the nominal PTO shaft speeds.**
  - **the impulses per PTO shaft rev.**
- **When selecting a tractor already stored in the computer the relevant values for the PTO nominal rev. speed and the impulses per 100m are simultaneously activated.**
- **The AMATRON+ monitors the nominal PTO shaft rev. speed. During the spraying operation an alarm signal sounds when the alarm delay limit is exceeded or falls short.**

5.4.4.1 Enter the nominal PTO shaft rev. speed

1. Recall via the function icon  the input "Please enter nominal PTO shaft rev. speed".
2. Enter the nominal PTO shaft rev. speed, e.g. 540 R.P.M.
   Enter for the nominal PTO shaft rev. speed the value "0" when
   - no PTO shaft rev. speed sensor exists.
   - the rev. speed monitoring is not wanted.
3. Accept via the function icon  .
4. Enter the alarm delay time for the rev. speed monitoring (see page 34).

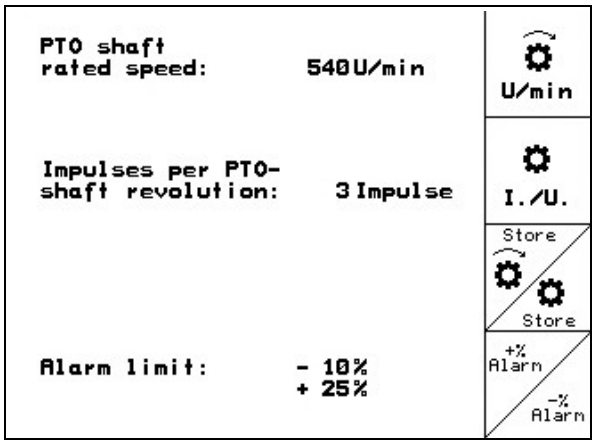


Fig. 39

5.4.4.2 Storage of the nominal PTO shaft speeds for different tractors

1. Recall via the function icon  the entry "Please select tractor".

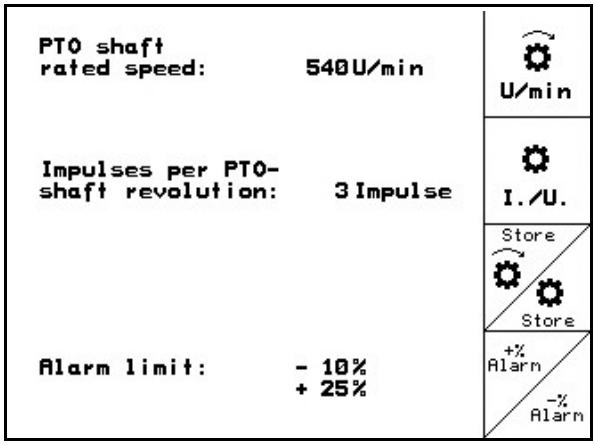


Fig. 40

2. Position the selection arrow (Fig. 41/1) with the aid of the keys  or  in front of the desired tractor.
3. Recall via the function icon  the input "Please enter nominal PTO shaft rev. speed".
4. Enter the nominal PTO shaft rev. speed for the selected tractor, e.g. 540 R.P.M. Enter for the nominal PTO shaft rev. speed the value "0" when
   - no PTO shaft rev. speed sensor exists.
   - the rev. speed monitoring is not wanted..
5. Accept via the function icon  .

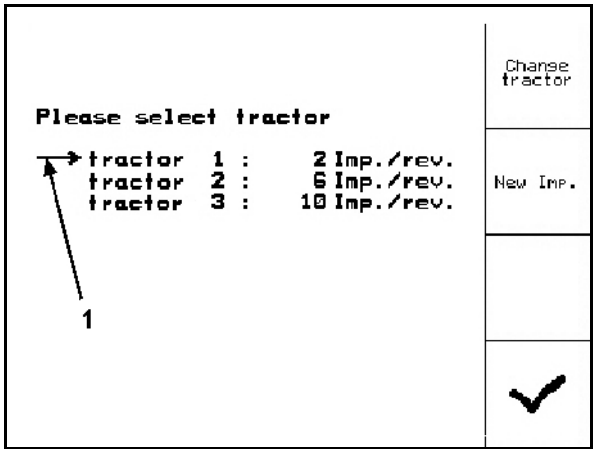


Fig. 41

Via the function icon  you can change the tractor name for the selected tractor.

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

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

1. Recall via the function icon 

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

, e.g. - 25% (min. permissible PTO shaft rev. speed: 540 R.P.M. - 25% = 405 R.P.M.).

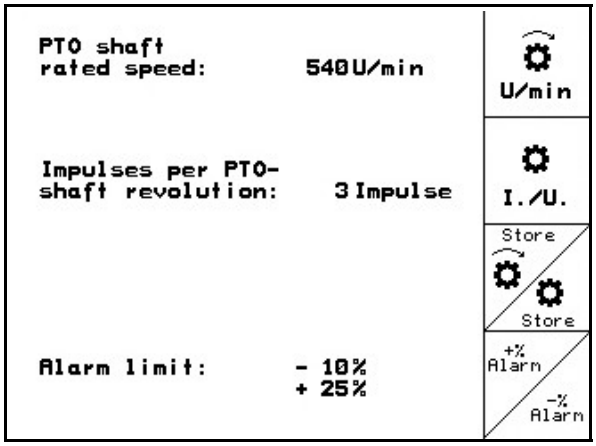


Fig. 42

5.4.5 Impulses per 100m

- The AMATRON+ requires the calibration value "Impulses per 100m" to determine the
  - actual forward speed [k.p.h].
  - travelled distance [m] for the actual order.
  - worked area.

- If the calibration value is accurately known you can manually enter the calibration value "Impulses per 100m" into the AMATRON+

- If the calibration value is not known the calibration value "Impulses per 100m" has to be determined via a calibration run.

- The AMATRON+ can store the calibration values "Impulses per 100m" for 3 different tractors. Please refer to chapter "Storage of Impulses per 100m for different tractors", page 37. The AMATRON+ inputs the stored calibration values of the selected tractor.

- For the accurate conversion of the actual forward speed in [km/h], the travelled distance [m] or the worked area in [ha] determine the calibration value "Impulses per 100 m" of the forward speed sensor.

- As a matter of principle determine the accurate calibration value "Impulses per 100m" via a calibration run:
  - before the first operation.
  - when using another tractor or after changing the tractor tyre size.
  - in case of deviations between the determined and the actual forward speed / travelled distance.
  - in case of deviations between the determined and the actually worked area.
  - when different soil conditions prevail.

- Determine the calibration value "Impulses per 100m" in relation to the prevailing operational conditions in the field. When the spraying operation is carried out with the all wheel drive actuated, switch over to the calibration value determined for the all wheel drive.

5.4.5.1 Manual entering of impulses per 100m

1. Recall via the function icon [manual enteri.] the input "Please enter impulses per 100m".
2. Manually enter the calibration value "Impulses per 100m". Please refer page 19.
3. Accept via the function icon [✓]

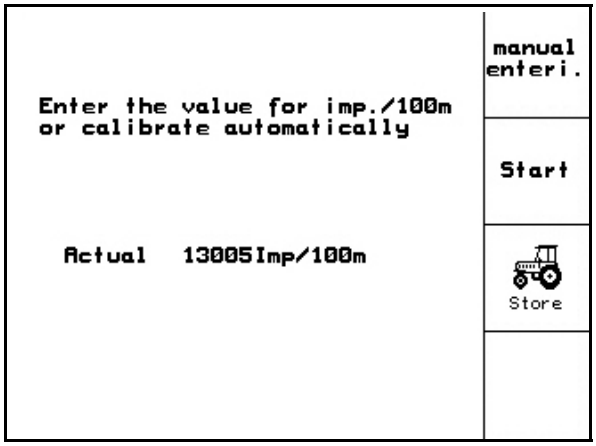


Fig. 43

5.4.5.2 Determination of impulses per 100m via a calibration travel

1. Accurately measure out in the field a calibration distance of 100m.
2. Mark the start and the finish points (Fig. 44).

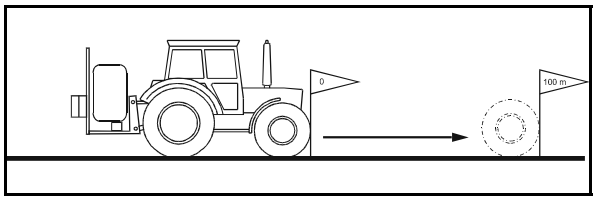


Fig. 44

3. Recall function icon [Start] and start the calibration travel.
4. Travel steadily along the calibration distance from the start to the finish point.

→ The display shows continuously the accumulating impulses.

5. Stop accurately at the finish point.
6. Press key [↵] and the calibration procedure is finished.

→ The AMATRON+ accepts the number of the impulses determined and automatically calculates the calibration value "Impulses per 100m" (in this case 13005 Imp/100m).

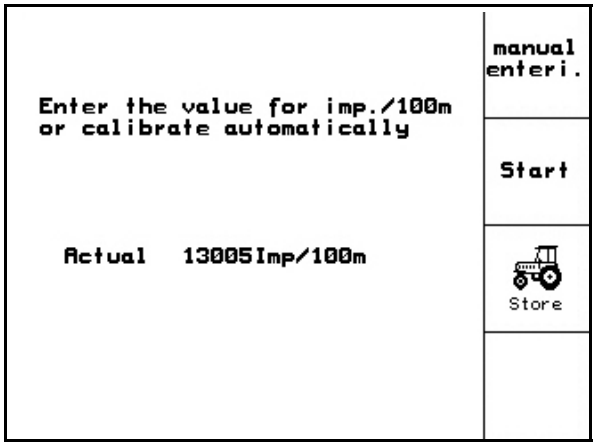


Fig. 45

5.4.6 Storage of impulses per 100m for different tractors

1. Via the function icon  recall the entry "Please select tractor.
2. Select the desired tractor. For this see "Selection of options".
3. Via the function icon  recall the input "Please enter tractor name". If necessary change the tractor name (see 19).
4. Accept via the function icon  .
5. Via the function icon  recall the input "Please enter impulses per 100m for this tractor" .
6. Manually enter the calibration value "Impulses per 100m".
7. Accept via the function icon  .

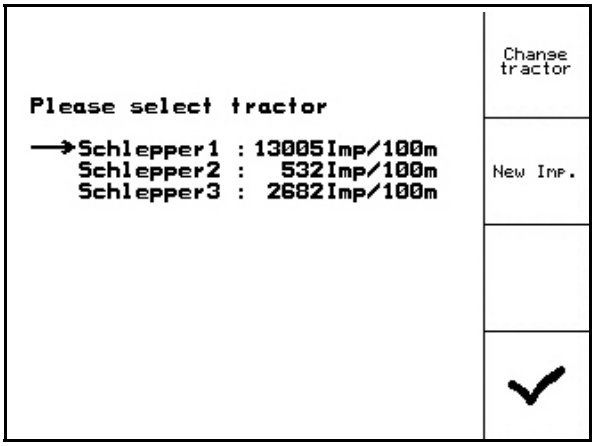


Fig. 46

5.4.7 Permanently switch on / off the boom part width sections

1. Select the desired boom part width section which you intend to switch on or off. For this see "Selection of options", page 20.
2. Press key  .

→ Opposite the selected part section the word "on" appears (boom section switched on) or "off" (boom section switched off).

3. Repeat the steps 1 and 2, if you intend to switch on/off additional boom sections.
4. Accept via the function icon  .

→ The boom sections identified with "off" are permanently switched off during the spraying operation.

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

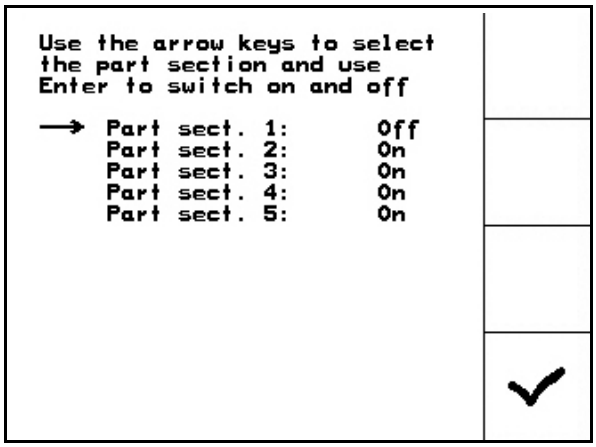


Fig. 47

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

If the function "Selection of individual boom sections" is switched on a horizontal bar (Fig. 48/1) will additionally appear underneath the boom section in the operation menu. The boom section identified by the horizontal bar (Fig. 48/1) (in this case switched on) can be switched on and off at random via the key , e.g. for spraying weed windows. You can switch on or off any desired boom section via the key when you move the horizontal bar (Fig. 48/1) accordingly via the keys and .

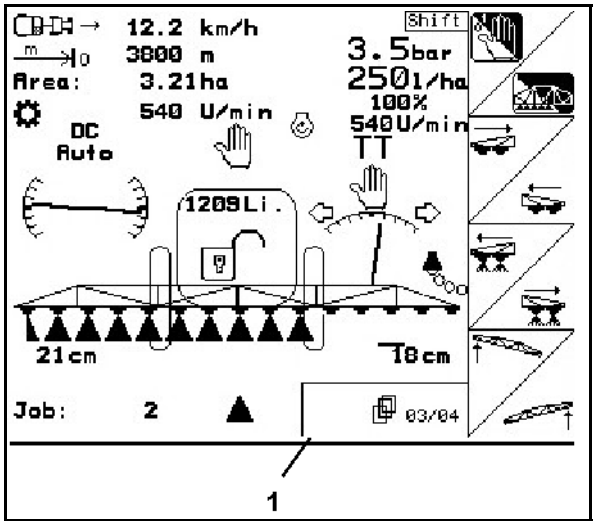


Fig. 48

5.4.9 Refill spray cocktail tank with water

With filling level indicator

1. Recall the refill indicator via the function icon in the operation menu or in the machine data menu.
2. Determine the accurate amount of water refilled.
3. Enter the alarm limit for the max. spray cocktail filling level to be refilled (in this case 1801 litres).

→ When refilling the spray cocktail tank an alarm signal sounds as soon as the spray cocktail level has reached this alarm limit. Monitoring the refilled amount of spray cocktail helps to avoid unnecessary residual amounts when the alarm limit is adapted accurately to the calculated refilling quantity.

4. Filling the spray cocktail tank via the filling port with water.

→ During the filling procedure the refilled quantity of water is determined and shown opposite the word "refilled:" (in this case 355 litres).

5. Finish the filling procedure at the latest when the alarm signal sounds.
6. Actuate the function icon , to accept value for the actual fill level in the spray cocktail tank in the AMATRON+ (in this case 1352 litres).

→ With this actual fill level the AMATRON+ calculates the remaining distance that can be sprayed with the new tank fill.

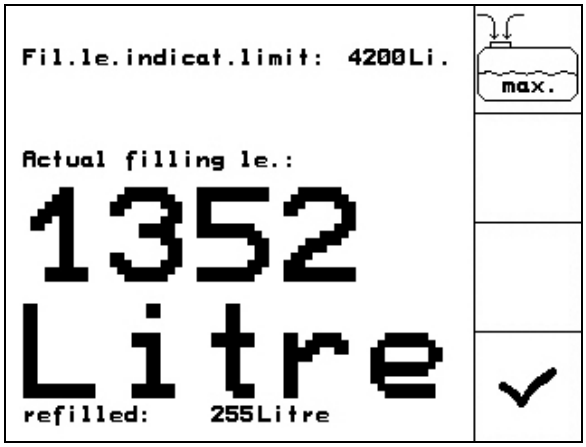


Fig. 49

Without filling level indicator

1. Recall the refill indicator via the function icon  in the operation menu or in the machine data menu.
2. Determine the accurate amount of refilled water.
3. Fill the spray cocktail tank via the filling port with water.
4. Read the actual fill level from the filling level indicator.
5. Enter the value for the actual fill level.
6. Actuate the function icon  , to accept the value for the actual fill level in the spray cocktail tank in the AMATRON+.

→ With this actual fill level the AMATRON+ calculates the remaining distance that can be sprayed with the new tank filli.

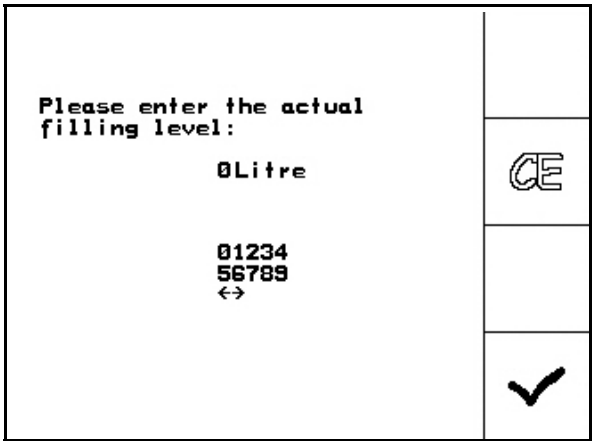
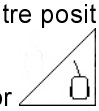
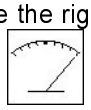


Fig. 50

5.4.10 Calibrating the Trail-Tron-system

1. Move to the centre position. For this press the key  or  and align the sprayer's tracking steering axle/drawbar in such a way that the wheels of the trailed sprayer follow in the tractor wheel track exactly.
2. Determine the centre position. For this press key  .
3. Move to the right hand stop. For this press key  until the hydraulic rams in the following steering axle/draw bar have reached the right hand limit.
4. Determine the right hand limit. For this press key  .
5. Move to the left hand stop. For this press key  until the hydraulic rams in the following steering axle/draw bar have reached the left hand limit.
6. Determine the left hand limit. For this press key  .

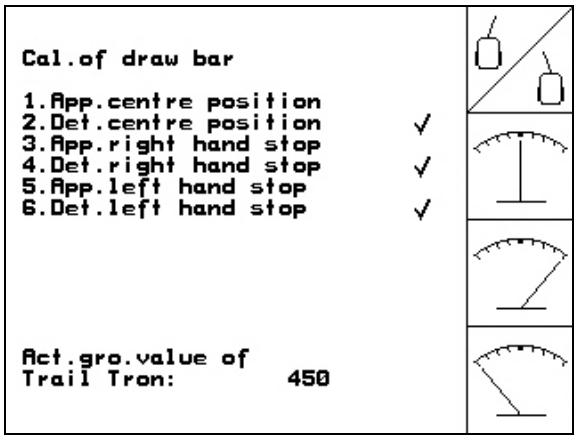


Fig. 51

5.4.11 Input of the nominal pump rev. speed

Only for UX:

1. Via the function icon  recall the input "please enter the nominal pump rev. speed"
2. Enter the nominal pump rev. speed, e.g. 540 R.P.M. If you enter for the nominal pump rev. speed the value "0", the pump nominal rev. speed monitoring is switched off.
3. Actuate the function icon  , to accept the entered pump nominal rev. speed in the **AMATRON+**.
4. Via the function icon  recall the input "Please enter the max. deviation" until the pump alarm is triggered.
5. Enter the max. permissible deviation from the nominal pump rev. speed, e.g. + 10% (max. permissible PTO shaft rev. speed: 540 R.P.M. + 10% = 594 R.P.M
6. Actuate function icon  , to register the max. permissible deviation to the upper alarm limit for the nominal pump rev. speed in the **AMATRON+**.
7. Repeat the steps 4 to 6 for the function key  .

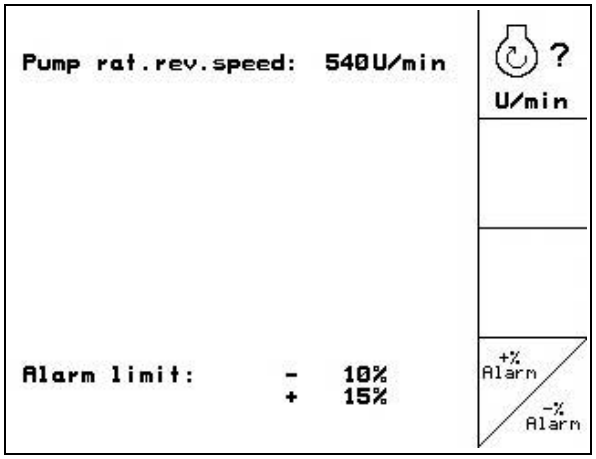


Fig. 52

5.5 Setup menu

The settings in the Setup menu are workshop jobs and may only be carried out by qualified personnel.

The Setup menu provides

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

Changing settings in the set up menu:

1. Setup
2. ESC

01/02

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

- worked total area in [ha].
- totally sprayed volume [litres].
- total operating time of the field sprayer [h].
- The function icons and are provided for the input and output of diagnostic data and are reserved for the customer service staff only.
- Recall via the function icon km/h sim. the input of a simulated speed "sim. km/h" in case of a defective forward speed sensor.
- Recall via the function icon the sub-menu basic machine data.
- Recall via the function icon the Terminal-Setup.

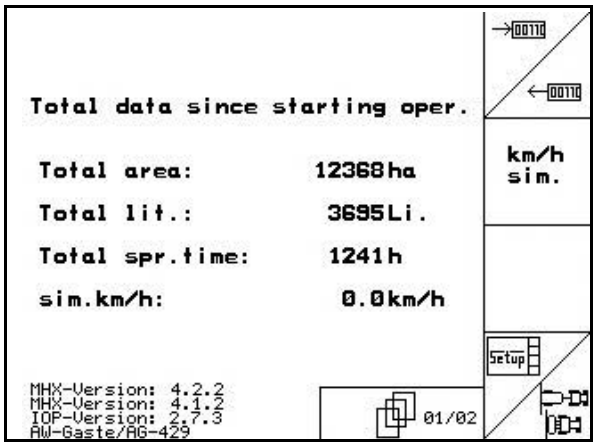


Fig. 53

02/02

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

Please note the values for

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

Re-enter all machine basic data.

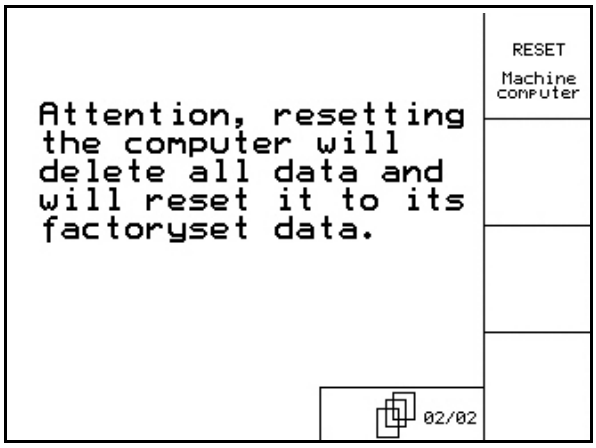


Fig. 54

5.5.1 Entering simulated speed (in case of a defective forward speed sensor)

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

1. Pull the signal cable off the tractor basic equipment.
2. Recall via the function icon km/h sim. the input "Please enter simulated speed". Enter, e.g. a simulated speed of 8.0 k.p.h. chapter "Inputting text and figures", page 19.
3. Recall the function icon ✓.

→ The inverted speed symbol appears in the operation menu.

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

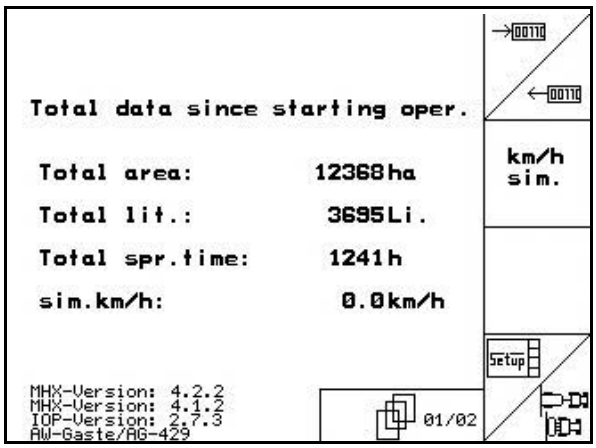


Fig. 55

5.5.2 Entering machine basic data

01/05

- Recall via the function icon  the function "Select machine type",
- Recall via the function icon  the function "Select boom folding".
- Select the tank size via the function icon  . The function icon allows to select the tank sizes 1501 litres, 1801 litres, 4200 litres, and 5200 litres.
- Recall via the function icon  the function "Configuration of the filling level indicator".

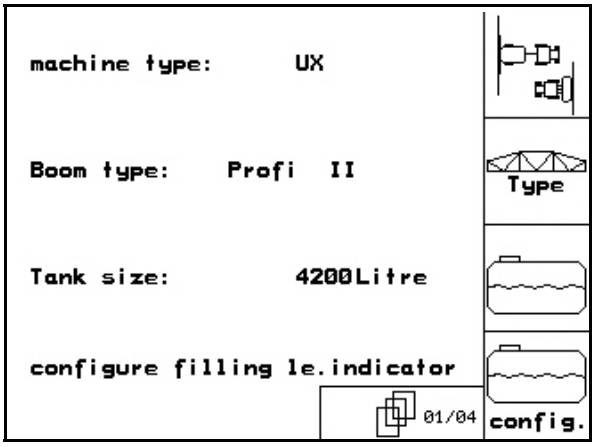


Fig. 56

02/05

- Recall via the function icon  the input "Please enter working width". Enter the working width of your sprayer boom.
- Recall via the function icon  the input "Please enter number of boom sections". Enter the number of boom sections of your sprayer boom.
- Recall via the function icon  the function "Nozzles per boom section".
- Via the function icon  select the number of existing flow meters.

→ In the display either the figure "1" (1 flow meter) or the figure "2" (1 flow meter and 1 return flow meter) appears.

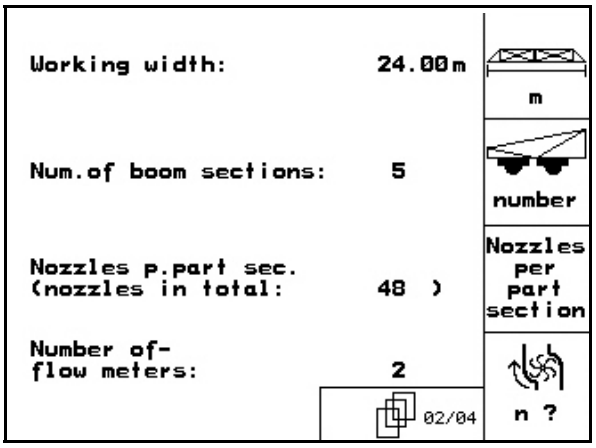


Fig. 57

03/05

- Recall via the function icon the input "Please enter the value for the pressure control constant". Enter the value for the pressure control constant. Please refer to chapter "Inputting text and figures".
- Via the function icon the "Off centre nozzles" are switched on and off (Option).
- Via the function icon the "Foam marker" is switched on and off.
- Via the function icon input the number of end nozzles on the left hand side.
- Via the function icon input the number of end nozzles on the right hand side.
- Via the function icon the "Comfort package" is switched on and off.

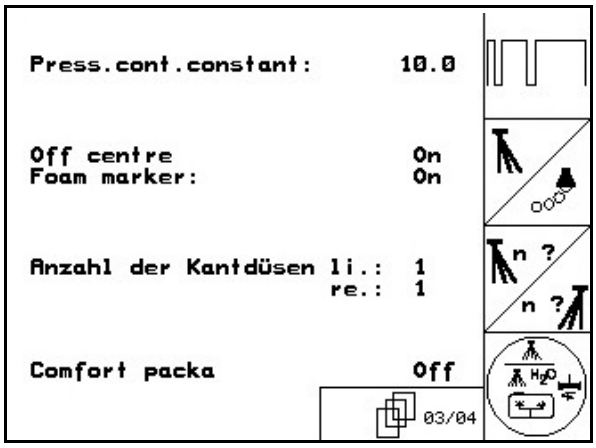


Fig. 58

04/05

- Via the function icon the "Multiple nozzle access" is switched on and off (Option).
- Via the function icon the "Distance Control" is switched on and off (Option).
- Via the function icon input the turn factor for distance control.
  - 0→ gives minor adjustment on bends
  - 10→ gives major adjustment on bends
- Via the function icon the "Trail tron control" is switched on and off (Option).

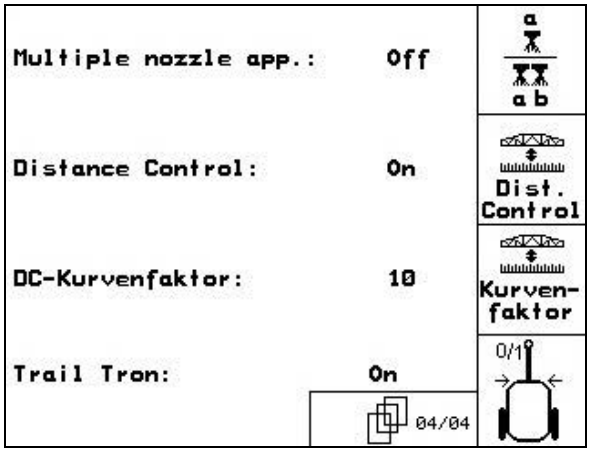


Fig. 59

05/05

Only for UX:

- 

Configuration of the hydro-pneumatic suspension, see page 50.
- Via the function icon 

select the relevant folding system.
- Via the function icon 

recall the input "Upper alarm limit vacuum" and enter the alarm delay time for the vacuum.
- Via the function icon 
"Unlocking transport position" unlock the booms (only for maintenance work).
- Via the function icon 
"Locking transport position" lock the booms (only for maintenance work).

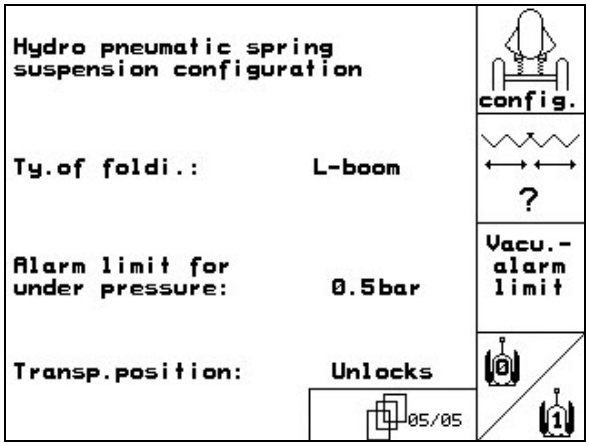


Fig. 60

5.5.2.1 Configuration of Trail-Tron

Before starting the configuration of Trail-Tron determine the impulses/100 m, see page 5.4.5.

UX: Completely open the throttle valves for the steering rams.

1. Via the function icon 

select either tracking axle or draw bar.
2. Via the function icon  enter the "Regulation factor Trail-Tron"
   Normal value:1,15
   - Machine oversteers (Fig. 62/1):
     - Select a smaller regulation factor.
   - Machine understeers (Fig. 62/2:
     - Select a larger regulation factor.
3. Via the function icon  enter the "Deviation factor Trail Tron".
   (0: -sensitive through to 15: -insensitive, preferred value: 8 to 10).
   The deviation factor states the ity from which steering limit the steering will start working.
4. Via the function icon 

enter the N-factor in cm.
   The sprayer wheels should start to turn in the same track as the tractor rear wheels. (Fig. 63/1)!
   - Sprayer turns too late into the bend:
     - Add measurement a (Fig. 63) to the N-factor.
   - Sprayer turns too early into the bend:
     - Deduct measurement b (Fig. 63) from the N-factor.

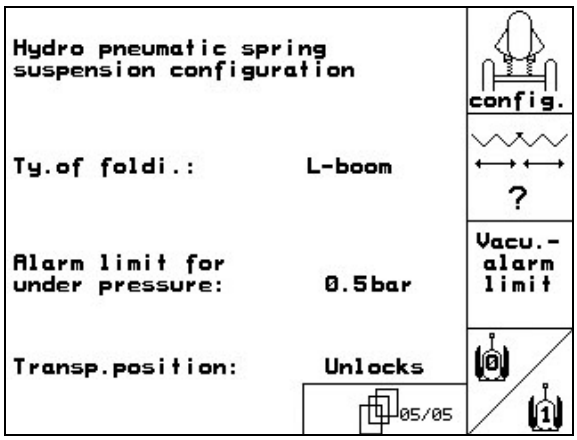


Fig. 61

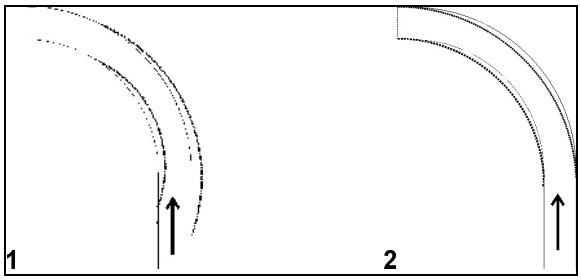


Fig. 62

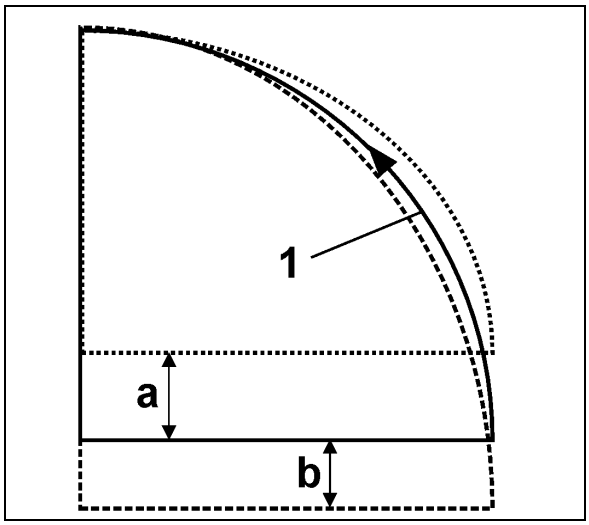


Fig. 63

5.5.2.2 Configuration of the tank filling level indicator

- Via the function icon  the equipment "Filling level indicator" is switched on and off.

→ In the display appears either the word "on" (filling level indicator existing and switched on) or "off" (no filling level indicator existing or switched off).

- Recall via the function icon  "Calibration filling level indicator".
-  By taking several measurements the fill level curve will be created.
-  After a RESET manually enter the fill level curve after having taken down the data beforehand.

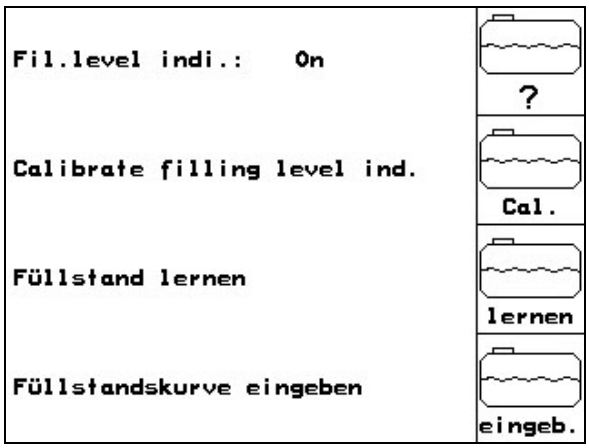


Fig. 64

Calibration filling level indicator

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

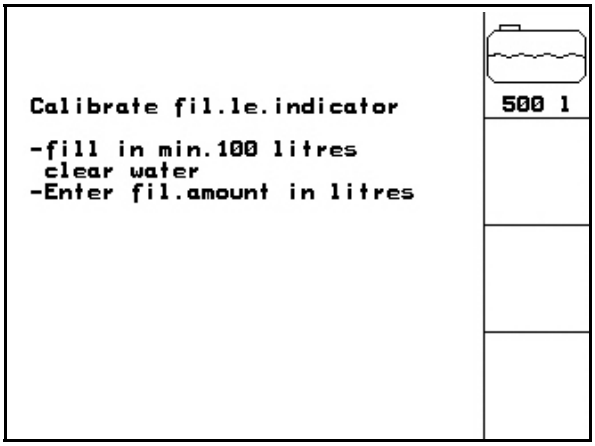


Fig. 65

Creating the fill level curve

1. Fill the tank up to the next check point.
2.  Input the actual tank contents.
3. Note all 29 check points in the same way.
4. Note all the check points via the menu "fill level curve".

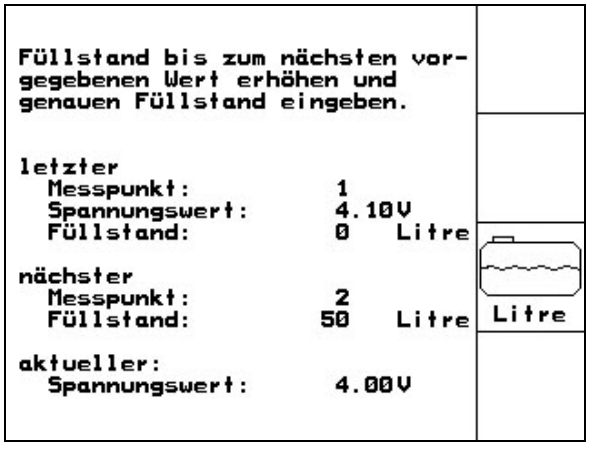


Fig. 66

Input of fill level curve

1. 

, 

Select check point.
2. 

Enter the value for fill level.
3. 

Enter the voltage value.
4. The complete input of the fill level curve requires the entering of all check points following the above items 1 to 3.
5. After having entered the fill level curve calibrate the fill level indicator.

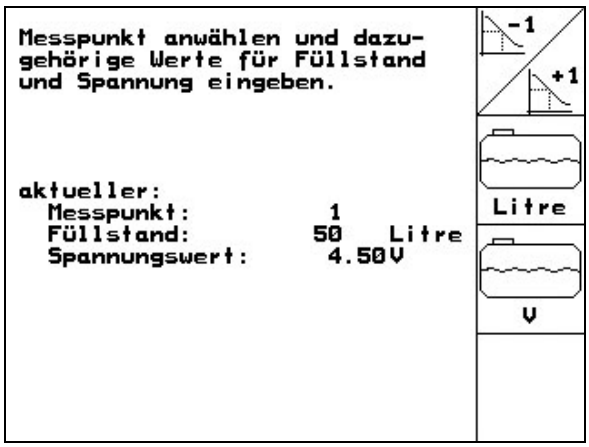


Fig. 67

The menu also serves for noting the check points for later use in case of a defective computer or a RESET.

In case of a nearly empty or nearly full tank choose smaller check point distances than at an average fill level!

Enter the check points of the fill level curve here:

Check point	Fill level	Voltage	Check point	Fill level	Voltage
1			16		
2			17		
3			18		
4			19		
5			20		
6			21		
7			22		
8			23		
9			24		
10			25		
11			26		
12			27		
13			28		
14			29		
15					

5.5.2.3 Enter nozzles per boom part section

The numbering of the boom sections for the spray line is carried out from outer left hand side to outer right hand side. See Fig. 68.

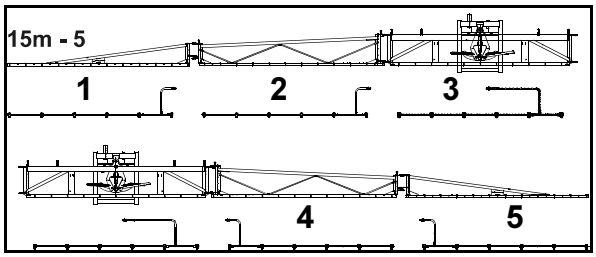


Fig. 68

1. Select the desired boom part width section. For this see "Selection of options", page 20.
2. Press key ↵.

→ The display changes to the entering "Please enter number of nozzles for boom section 1".

3. Enter the number of nozzles for boom section 1 for your spray line.
4. Repeat the steps 1 to 3 until you have entered the number of nozzles for all boom sections.
5. Actuate the function icon ✓, to accept number of nozzles for the individual boom sections in the AMATRON+.

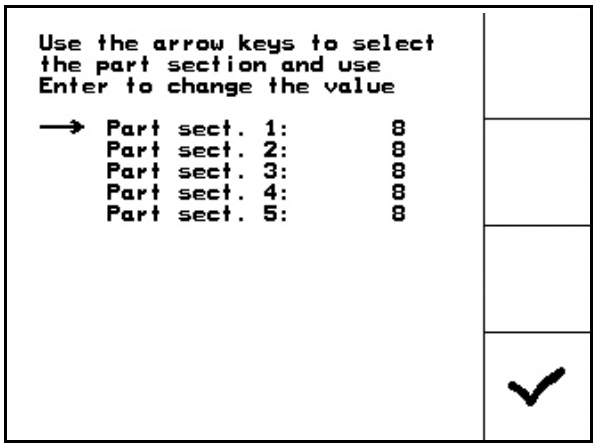


Fig. 69

5.5.2.4 Configuration of Distance Control

- Dist. Control Switching Distance Control on / off.
- Via function icon Kurven-faktor the curve factor of the distance control is entered
  - 0 → little regulation when turning
  - 10 → much regulation when turning.
- Modus Enter DC mode.
  Distance Control operates with tilt adjustment or boom angling.

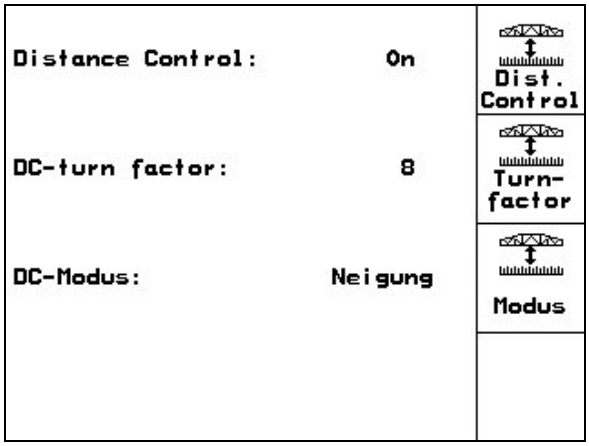


Fig. 70

5.5.2.5 Configuration of hydro-pneumatic suspension

- 

Switching hydro-pneumatic suspension on / off.
- 

Calibration of hydro-pneumatic suspension.
- 

Enter the required value for the hydro-pneumatic suspension. Nominal value: 80%. This value indicates the machine height as a percentage which then should be maintained with a changing tank contents.

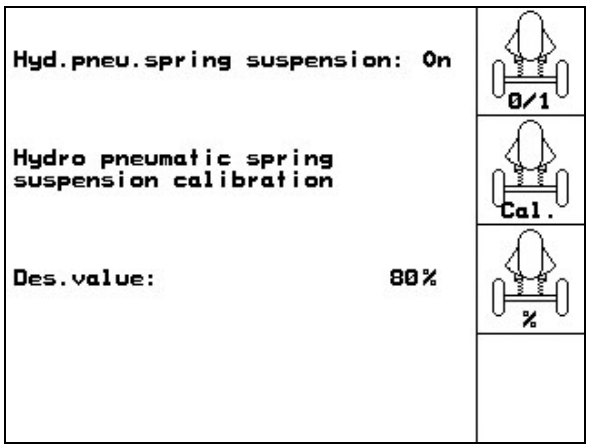


Fig. 71

Calibration of hydro-pneumatic suspension

1.  raise to the upper position.
2.  determine the upper position.
3.  drop to the lower position.
4.  determine the lower position

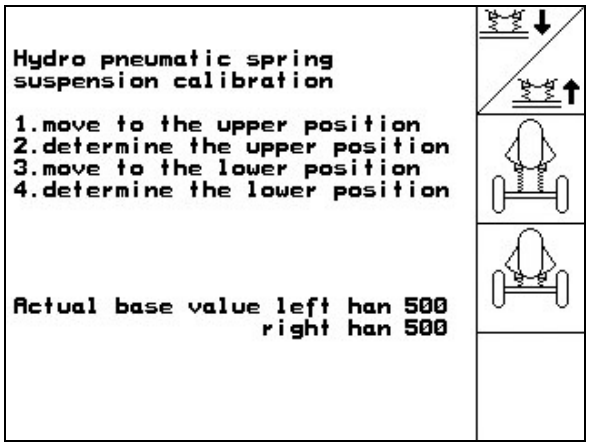


Fig. 72

5.6 Terminal-Setup

To change the settings of the display, simultaneously press

- the page 
- shift  keys:

- Recall via the function icon  the entering "Display settings".
-  Indication of the implements on the Bus

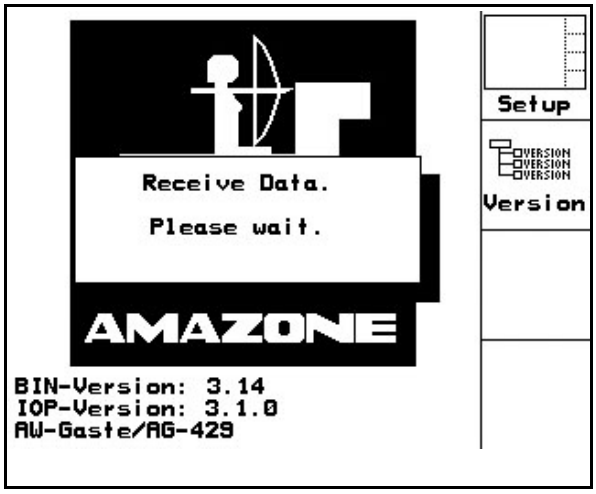
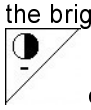


Fig. 73

Via the entering "Display setting" you can change:

- the contrast via the function icons  or  .
- the brightness via the function icons  or  .
-  Push button click sound On / Off
- inverting the display black ← → white via the function icon  .
- deletion of the stored data via the function icon  (see page 42).
- the language of the operator terminal via the function icon  .

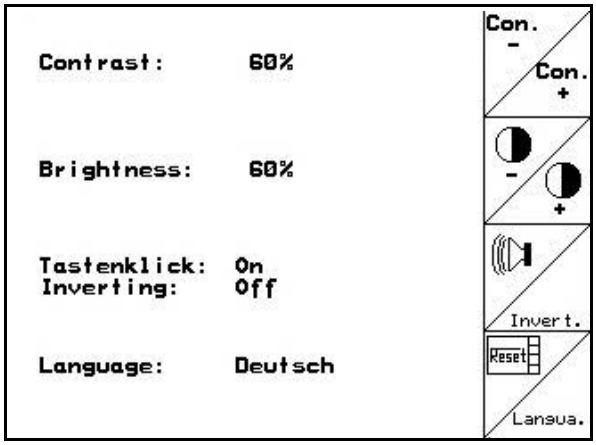


Fig. 74

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

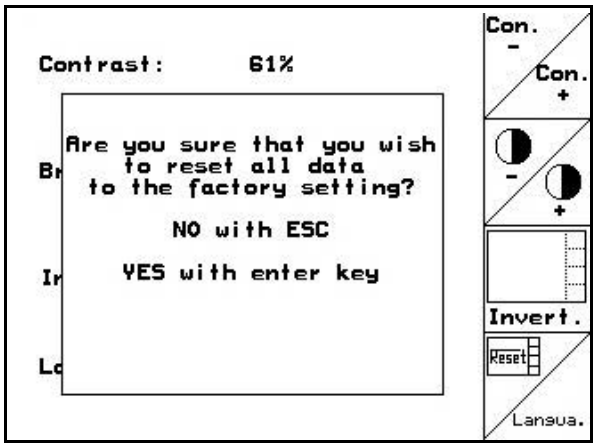


Fig. 75

02/03

-  Input of time
-  Input of date
- 

Input of data transfer baud speed

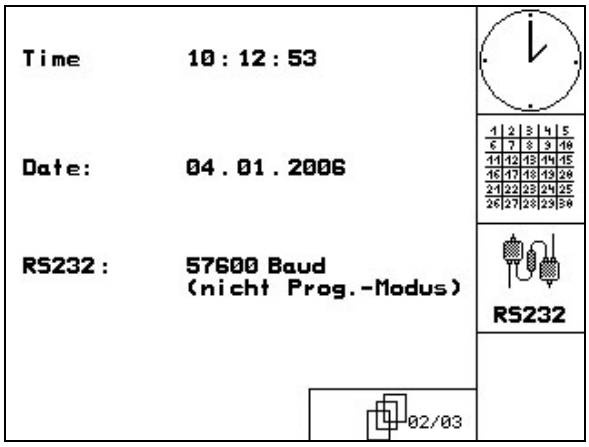


Fig. 76

03/03

Deletion of programme:

1.  ,  Selection of programme.
2. 

Deletion of programme.

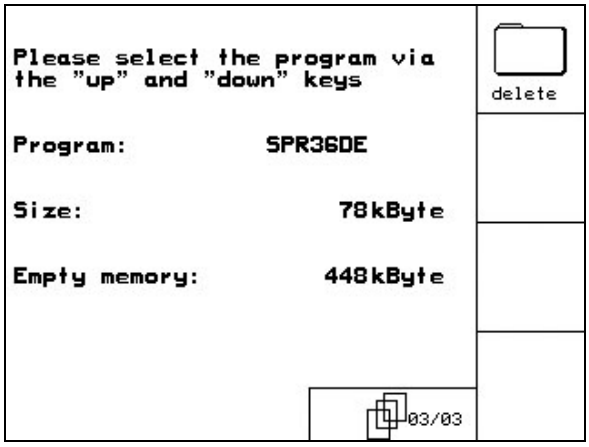


Fig. 77

6 Operation in the field

Warning!

Trail-Tron: For road transport ensure that Trail-Tron axle / draw bar is in zero position.

Secure the Trail-Tron drawbar with the aid of the locking tap.

Whilst travelling to the field and on public roads AMATRON+ should always be switched off!

Prior to any spraying operation input the following information:

Enter the relevant machine data.

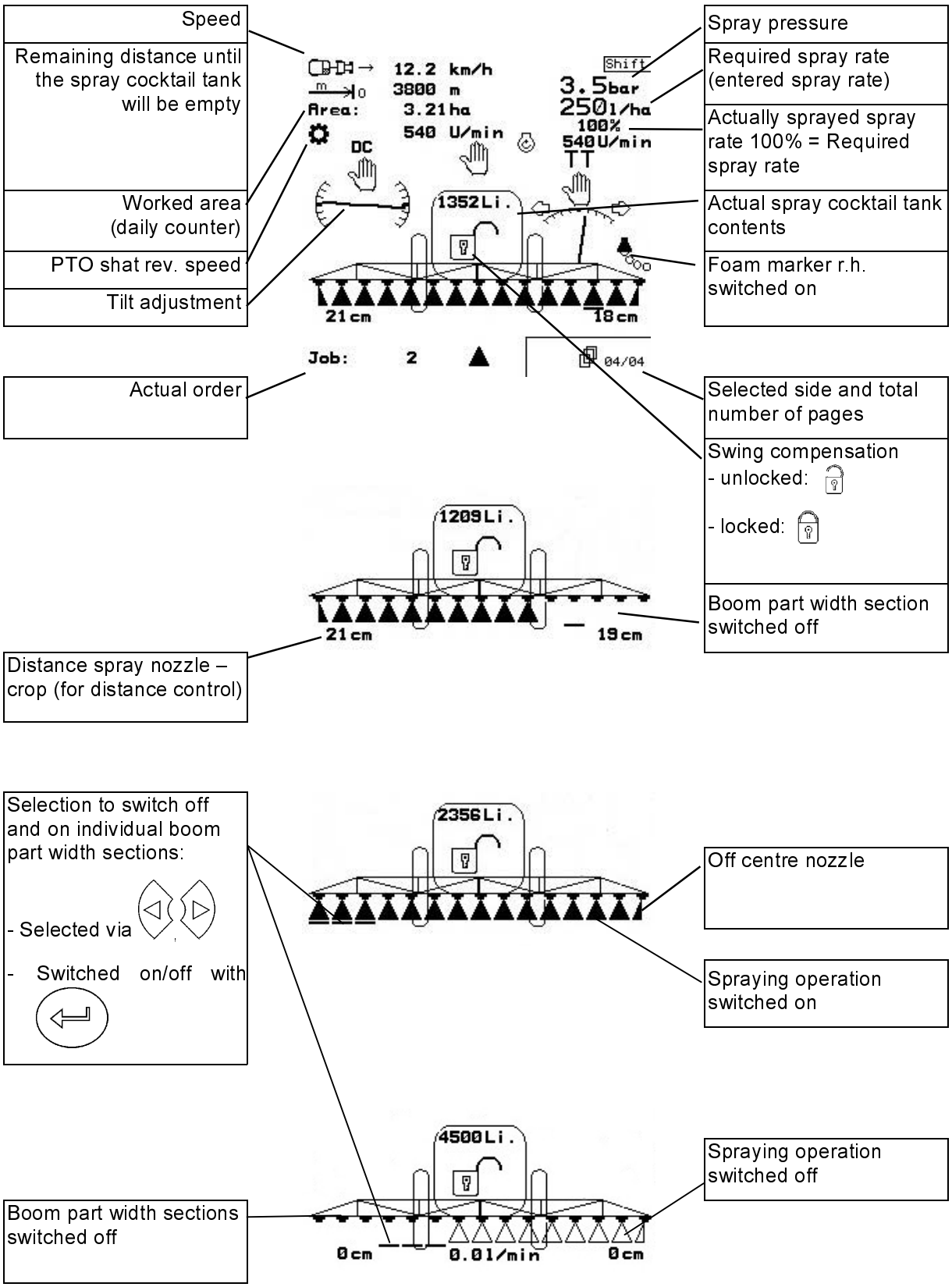
Create and start the job.

6.1 Procedure during operation

1. I/O switch on the AMATRON+.
2. Esc change to the menu operation.
3. Via the tractor spool valve circulate oil to the hydraulic valve block.
4. Fold out the sprayer booms using either
   - Profi-folding: see on page 59.
   -Pre-select folding with 
   - via a tractor spool valve.
5. Adjust the boom height  ,  and tilt  ,  .
6.  For UX/UG with tracking axle/draw bar: Trail-Tron is in automatic operation.
7.  Distance Control (option) is in automatic operation.
8.  Commence spraying operation, covering the area to be sprayed..
9.  Switch off spraying operation.
10. Fold in the sprayer booms
    using either
    - Profi folding see page 60.
    - Pre-select folding with: 
    - via a tractor spool valve.
11. Set the Trail-Tron draw bar to the zero position
12. For Profi-folding: stop the oil supply from the tractor.
13. I/O switch off the AMATRON+.

6.2 Menu operation

6.2.1 Display menu operation



6.3 Functions in the menu operation

6.3.1 Switching on / off the spraying operation.

	**Spraying operation switched on: Spray liquid is sprayed via the spray nozzles.** **Spraying operation switched off: No spray liquid is sprayed.**

Display in the menu operation:

Fig. 78/...

(1) Spraying operation - switched off.

(2) Spraying operation – switched on.

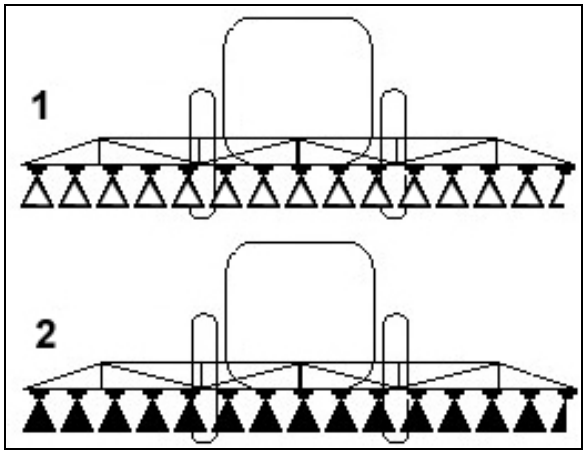


Fig. 78

6.3.2 Spray rate control

	**Manual operation (Fig. 80/1), Automatic (Fig. 81/1)**

When the automatic operation is switched on the symbol "Auto" (Fig. 81/1) appears in the display. The implement computer controls the spray rates in relation to the actual forward speed.

With the aid of the keys  and  the spray rate can be changed by the pre-set percentage application rate increase (see on page 25).

When the manual operation is switched on the symbol "  " (Fig. 80/1) and in addition the indication [l/min] (Fig. 80/2) appears in the display. Manually control the spray rates by changing the spray pressure via the keys  or  .

Manual operation is not suitable for the spraying operation and is used only for maintenance and cleaning work.

6.3.3 Tracking axle / draw bar

	**Manual operation (Fig. 80/2), Automatic (Fig. 81/2), when travelling on the road (Fig. 80/5)**

When the automatic operation is switched on the symbol "Auto" (Fig. 81/2) appears in the display. The implement computer controls the true track following of the machine.

If a forward speed faster than 15 km/h is reached (road travel) the Trail tron axle automatically moves to its zero position and remains in the road travel mode (Fig. 80/5).
When the manual operation is switched on the symbol appears (Fig. 80/2). Press key or until the tyres of the trailed sprayer accurately follow the tractor track.

→ **The trailed sprayer newly aligns itself to the tractor. In the display, the symbol "Track following axle" (Fig. 79/1) shows the selected steering limit of tracking axle.**

Trail-Tron calibration - see on page 39

Trail-Tron configuration - see on page 46

Display in the menu operation:

Fig. 79/…

(1) Display of the current status angle of steering axle / draw bar.

(2) Steering axle / draw bar is steered to the left hand side towards the slope.

(3) Steering axle / draw bar is steered to the right hand side contrary the slope.

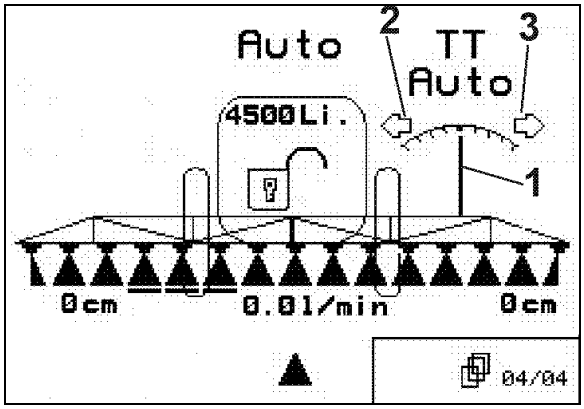


Fig. 79

6.3.4 Distance Control

	**Manual operation (Fig. 80/3), Automatic (Fig. 81/3)**

When the automatic operation is switched on the symbol "Auto" (Fig. 81/3) appears in the display. The implement computer controls the spraying nozzle distance above crop.

Beforehand determine the required nozzle distance above crop.

1. **Adjust the required distance of the spraying nozzle above the as desired.**
2. **Confirm with key**  **.**

   0 Required distance spraying nozzle to - crop is stored.
3. **Determine the boom height for the turning procedure by moving the booms into the desired height for the turning procedure.**
4. **Confirm with key** 

   1 The boom height for the turning procedure is stored (is actuated as soon as the spraying operation is switched off).

When the manual operation is switched on the symbol  **(Fig. 80/3) Distance Control is switched off. The nozzle height above – crop – is controlled via the tilt- and height adjustment.**

- **Actuate**  **the distance between the spray nozzles and the crop is displayed in the menu operation.**

Calibration of Distance Control see on page 27

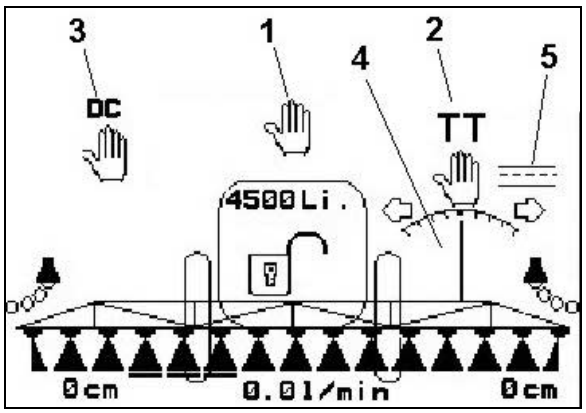


Fig. 80

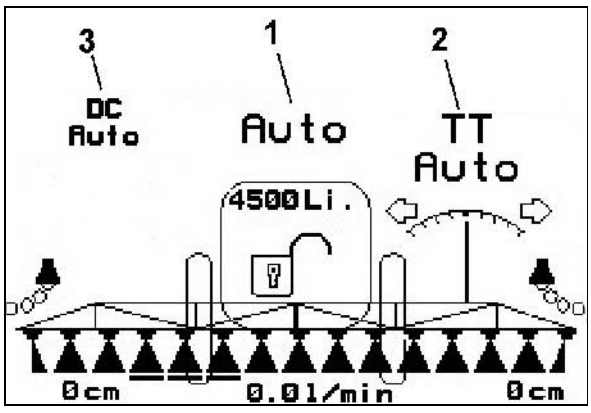
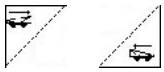
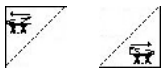


Fig. 81

6.3.5 Boom part with sections

	**Switching off boom part-width sections from left hand/from right hand side .**
	**Switching on boom part-width sections from left hand/to the right hand side .**

Boom part-width section control enables the switching off and on

- during the spraying operation,
- when the spraying operation has been switched completed.

Fig. 82, Boom part-width section switched off from the right hand side.

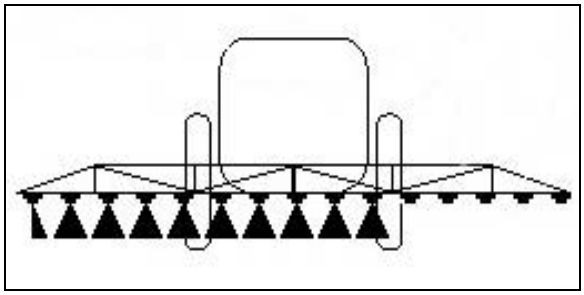


Fig. 82

6.3.6 Optional function icon (pre-select folding)

	**Pre-selection of:** • Tilt adjustment or • boom folding

The pre-selection chosen is displayed in the menu operation (Fig. 83)!
The functions are controlled via the tractor control valve!
Folding procedure: Please refer to the operator's manual for the field sprayer!

6.3.7 One side boom folding with pre-select folding

	**Boom folding right hand side.**
	**Boom folding left hand side.**

The pre-selection chosen is displayed in the menu operation!
The functions are controlled via the tractor control valve!
Folding procedure: Please refer to the operator's manual for the field sprayer!

Display in the menu operation:
Fig. 83/...

(1) Pre-select boom folding.
(2) Pre-select tilt adjustment.
(3) Pre-select boom folding right hand side.
(4) Pre-select boom folding left hand side.

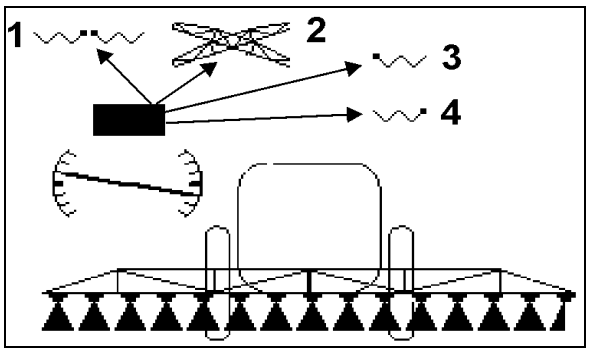


Fig. 83

6.3.8 Setting the boom height (Profi-fold)

	**Boom lowering and lifting**

- To set the distance from the spraying nozzle to the crop.
- To fold the booms.

6.3.9 Locking/unlocking the pendulum compensation

	**Pendulum compensation unlocked:** • during spraying operation **Pedulum compensation locked:** • during boom folding procedure. When spraying with boom folded one-side.

Display in the menu operation:

Fig. 84/...

(1) Pendulum compensation locked.

(2) Pendulum compensation unlocked.

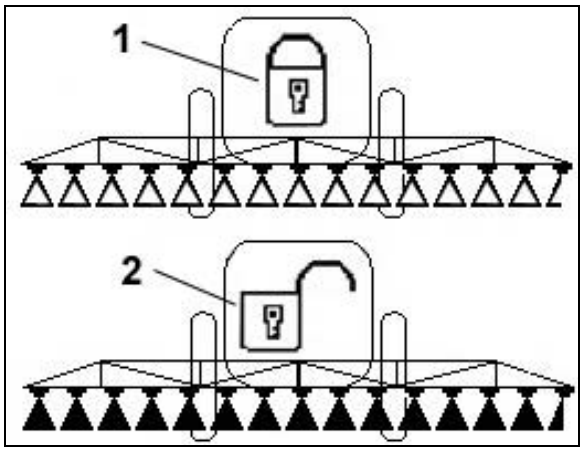


Fig. 84

6.3.10 Boom folding (Profi- fold)

	**Both boom sides folding out or folding in**

Field sprayers without Profi-fold: please refer to the operator's manual for the field sprayer!

- **The booms do not always fold down symmetrically.**
- **The relevant hydraulic rams lock the sprayer booms in the operational position.**

Before any folding in always align the sprayer booms to the horizontal position (0-position). Not adhering to this advice could result in difficulties when locking the sprayer booms into the transport position (catching lugs do not catch the sockets properly.)

Folding out the sprayer boom

1.  Lift the sprayer boom (min. 30 cm).

After lifting fold the booms out within 10 seconds – safety switching.

Super S-boom with Profi-control II:

2.  ,  Angle down both boom packs into the horizontal position.

3.  Fold out the booms on both sides.

The transport securing device unlocks automatically.

4.  Unlock the swing compensation.

5. Adjust the boom tilt / height or distance control.

Folding in the sprayer boom

Super S booms:

1.  lift sprayer boom (approx. 1 m).

Super L-booms:

1.  lift sprayer boom (approx. 2 m) so that when folded in completely the booms are safely located above the mud guards on the side of the spraying tank.

Horizontal alignment of the booms!

Caution!

2.  lock the swing compensation.

The automatic locking of the swing compensation for both side folding can be set in the machine data menu..

Automatic locking switched on:
Align the sprayer booms into the horizontal position before folding in.

3.  completely fold the booms in on both sides into the transport position.

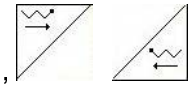
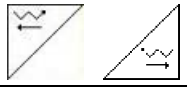
L-booms with Profi II: When the booms have been folded in horizontally align the boom packs via angling  ,  right into its final position before folding the boom packs into the transport position.

4. **Super S-booms with Profi II**:


Angle the boom packages into the vertical position.

5. 
Lower the booms until the transport locking device locks automatically.

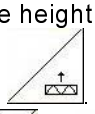
For an improved boom suspension in road transport, slightly raise the Super-S-booms.

	**One-sided independent boom fold**
	**Folding in the boom to one side**

The operation with only one side folded out permissible

- **with the swing compensation locked.**
- **only when the other boom side, folded as a package**
  - **on the Super S-booms: folds down from the transport position**
  - **on the Super L-booms: is folded to the rear diagonally to the direction of travel.**
- **for the brief passing of obstacles (tree, pylon etc.)..**
- **Lock the swing compensation before folding one side in or out.**

  When the swing compensation has not been locked the sprayer boom can swing to one side. Then when folded out the prayer boom side can hit the ground and the sprayer booms could be damaged.
- **During spraying operation clearly reduce the forward speed. In this way you avoid a boom movement and ground contact of the sprayer boom when the swing compensation is locked. With an uneven sprayer boom ride an even lateral distribution is no longer ensured.**

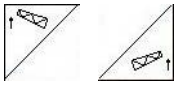
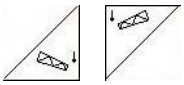
1. 
Lock the swing compensation.
2. Lift the sprayer booms via the height adjustment into a medium height position (function icon  .
3. Actuate the function icon  or  or  or  .

→ The desired boom side folds in.

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

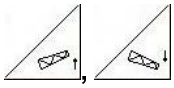
5.  Adjust the spraying height of the sprayer boom in such a way that the spacing between sprayer boom and ground surface is at least 1 m.
6. Switch off the boom sections of the boom side folded in.
7. During spraying operation drive with a much reduced speed.

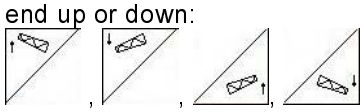
6.3.11 Boom end angling (only Profi-fold II)

	**Angling up boom end - left hand/right hand side;**
	**Angling down boom end - left hand/right hand side**

The one side, individual angling up and down of the sprayer boom ends allows for boom alignment in extremely unfavourable terrain, when the adjustments of height- and tilt will not achieve the required alignment to the area to be sprayed.

Never angle the folded down boom ends up by more than 20°.

To align the side boom ends into the horizontal position angle the sprayer boom to a maximum  (move to the stop).

1. Press one of the following keys to angle the desired boom side end up or down:
   
2. Align the sprayer boom horizontally before folding the sprayer boom into the transport position.

6.3.12 Boom tilting

	**Lifting tilt adjustment on the left hand side**
	**Lifting tilt adjustment on the right hand side**

When unfavourable field conditions prevail, e.g. in cases where a deep track mark on one side when driving in a furrow, the sprayer booms can be aligned parallel to the ground or to the desired area to be treated via the hydraulic boom tilt.

Calibrating the tilt adjustment – please see on page **26.**

Align the sprayer booms via the tilt adjustment

1. Actuate the function icon  or  until the sprayer booms are aligned parallel to the area to be treated.
2. In the operation menu the symbol tilt adjustment (Fig. 85/1) shows the selected sprayer boom tilting. In this case the left hand side sprayer boom is lifted.

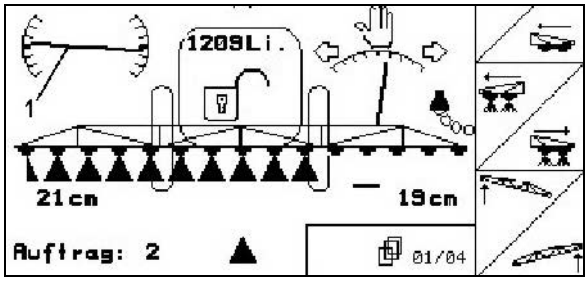


Fig. 85

	**Mirroring tilt adjustment (slope mirroring)**

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

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

1. Actuate the function icon once  and hydraulic boom tilt aligns the sprayer boom horizontally (0-Positon).

→ In the operation menu the symbol tilt adjustment (Fig. 86/1) shows the horizontal alignment of the sprayer booms.

2. Carry out the turning manoeuvre at the headlands.

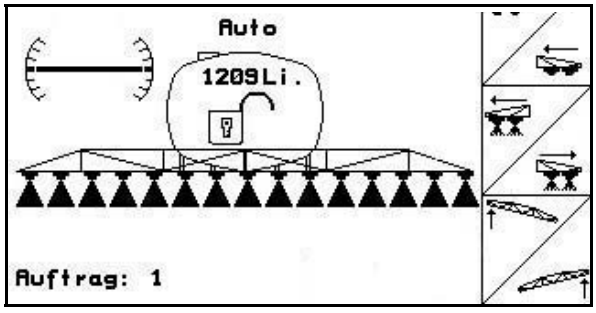


Fig. 86

3. Actuate the function icon once more  and the hydraulic boom tilti mirrors the previously used sprayer tilt setting.
→ In the operation menu the symbol tilt adjustment (Fig. 87/1) shows the mirrored sprayer boom tilt. Now the right hand side sprayer boom is lifted.

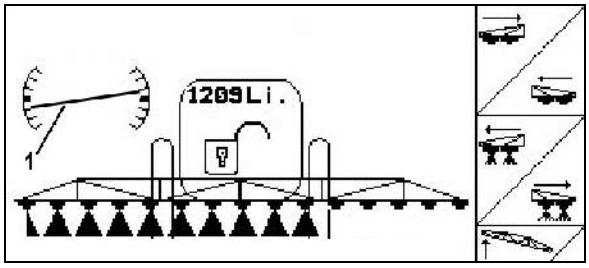


Fig. 87

6.3.13 Foam marker

	**Foam marker - left hand side: switching on / off**
	**Foam marker - right hand side: switching on / off.**

Display in the menu operation:

Fig. 88/...

(1) The left hand side foam marker switched on.

(2) The right hand side foam marker switched on.

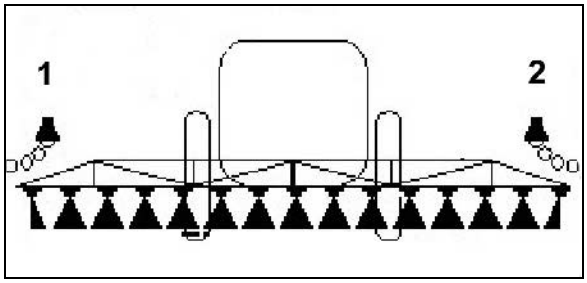


Fig. 88

6.3.14 Refilling the main spray liquid tank

	**Please see on page 38**

6.3.15 Boundary nozzle

	**Boundary nozzle - right hand side: switching on / off**
	**Boundary nozzle - left hand side: switching on / off**

Display in the menu operation:

Fig. 89/...

(1) Boundary nozzle - left hand side switched on.
(2) Boundary nozzle - right hand side switched on.

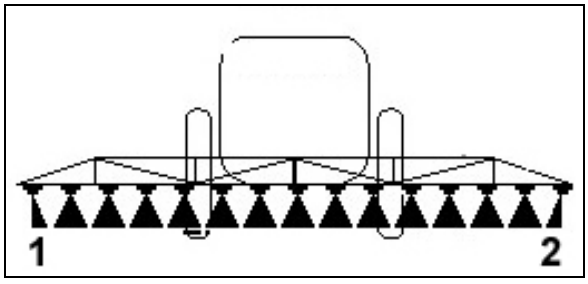


Fig. 89

6.3.16 Comfort package

	**Recall the menu: Comfort package!**

 **Flushing the spray nozzles and spray lines with rinsing water,**

 **Cleaning the tank with rinsing water,**

 **, Increasing the agitation intensity,**

 **Reduction of the agitation intensity.**

6.3.17 Hydro-pneumatic suspension (only UX)

	**Manual operation, automatic**
	**Manual lowering of the machine.**
	**Manual lifting of the machine.**

With the automatic operation "Auto" switched on AMATRON+ regulates the driving height of the field sprayer to the value adjusted in the Setup, irrespective of the tank contents!

The machine can be lowered or lifted manually  **.**

Display in the menu operation:

(Fig. 90/1) Hydro-pneumatic suspension in automatic operation (working order).

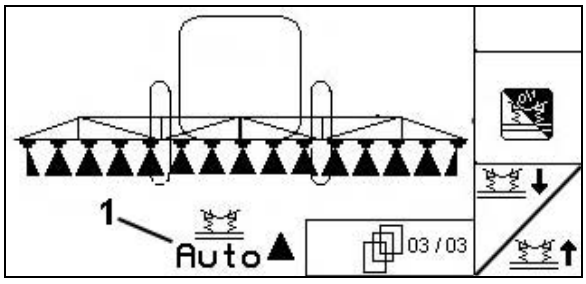


Fig. 90

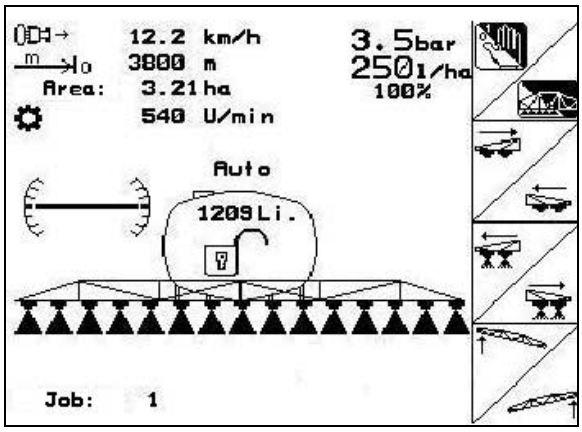
6.4 Function icons for the different sprayer boom types

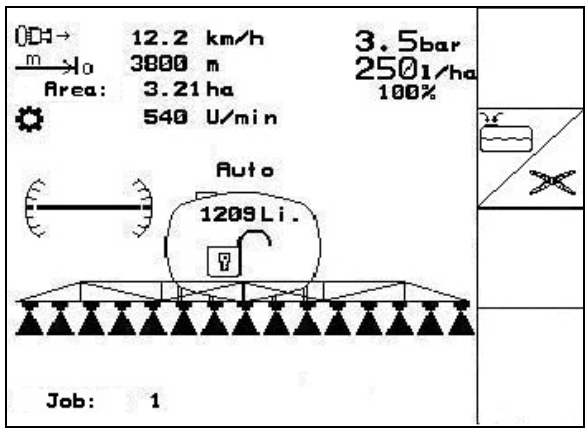
Hint!

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

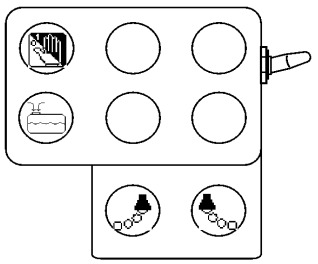
6.4.1 Sprayer booms with electric boom tilting

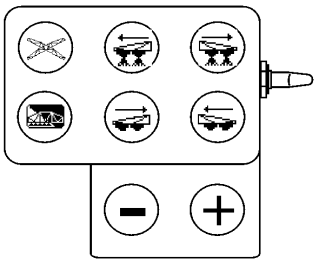
Pressed shift key :

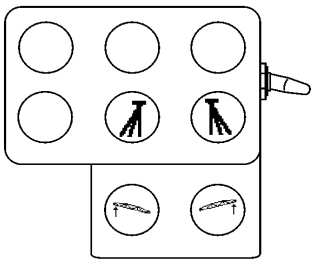




Key layout Joystick:

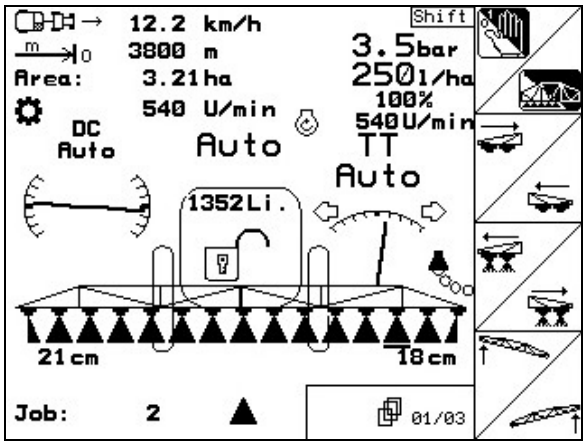




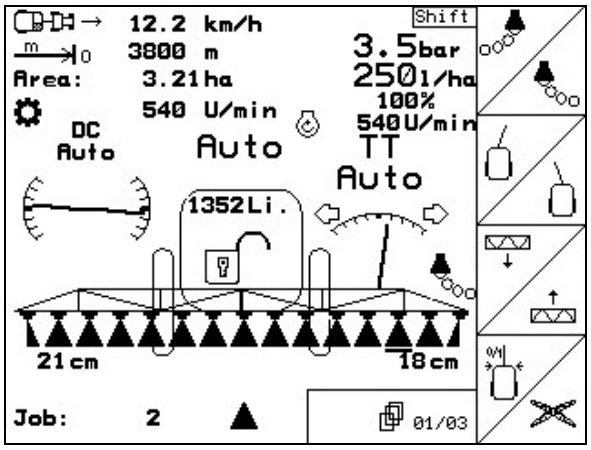


6.4.2 Boom folding Profi I

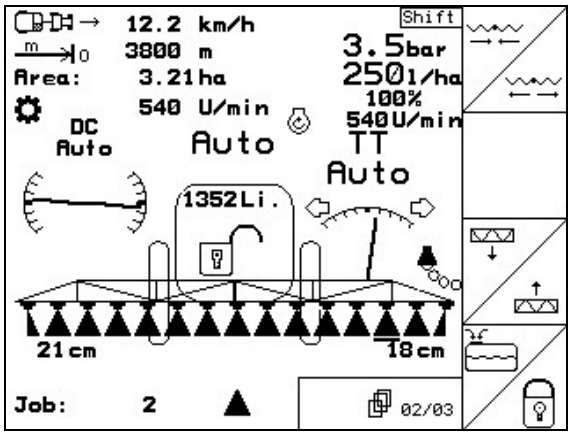
01/03



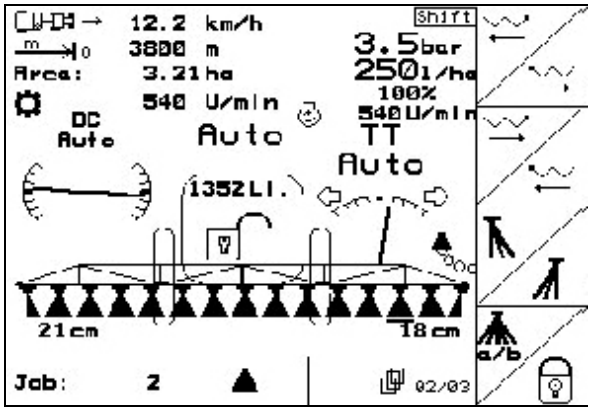
Pressed shift key



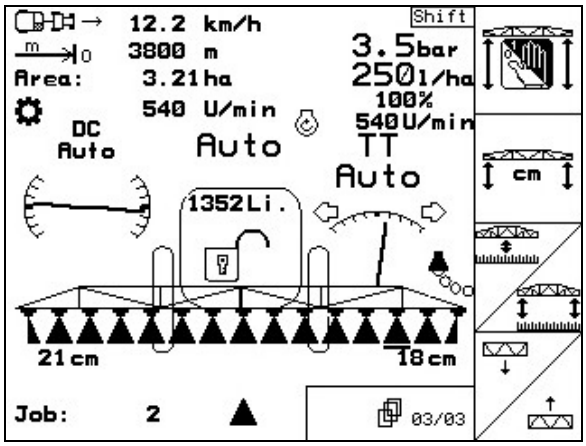
02/03



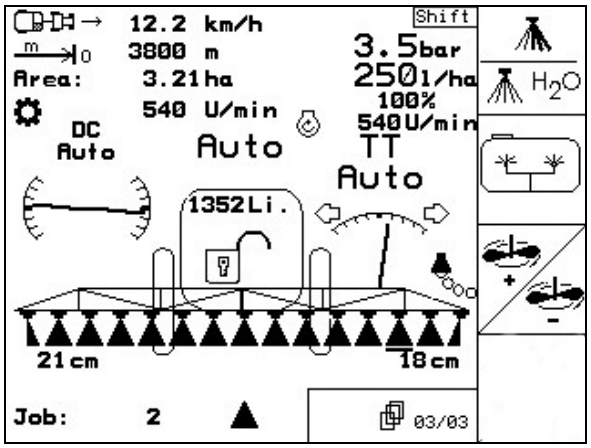
Pressed shift key



03/03

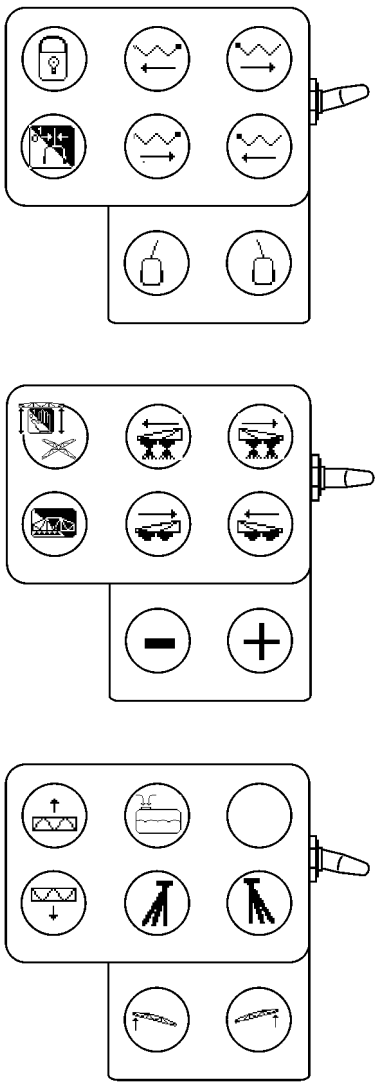


Pressed shift key

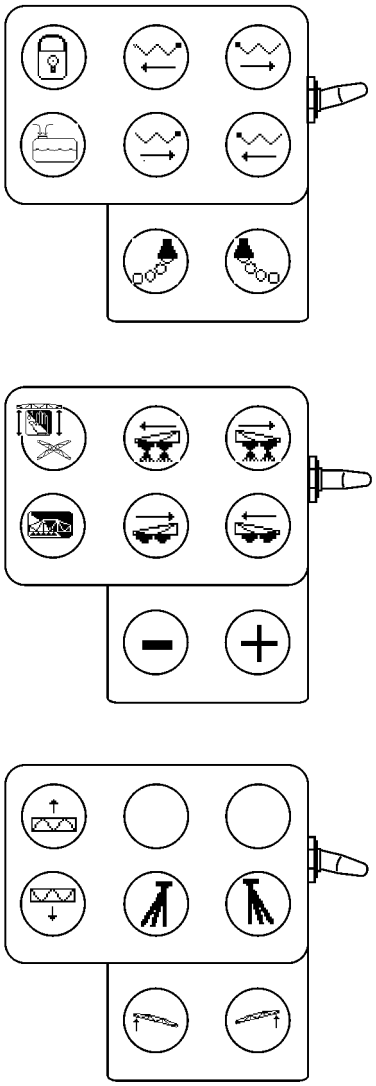


Key layout Joystick

UX, UG

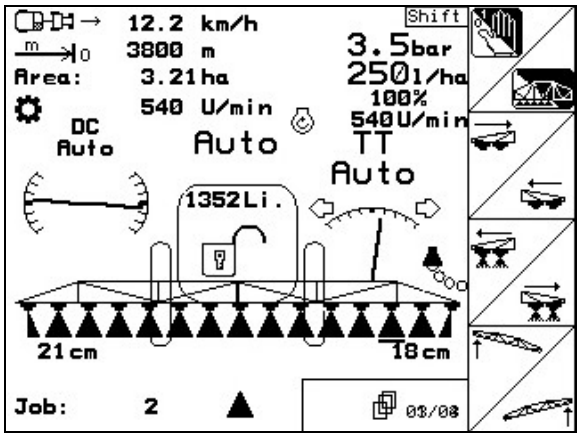


UF 01

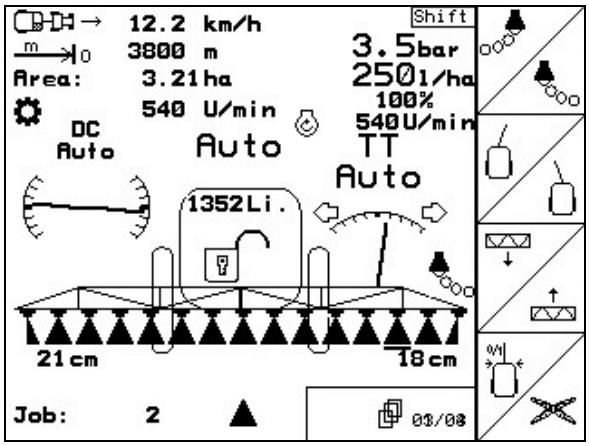


6.4.3 Boom folding Profi II

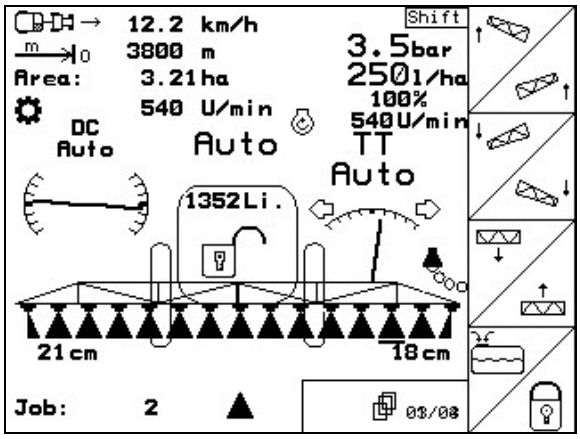
01/04



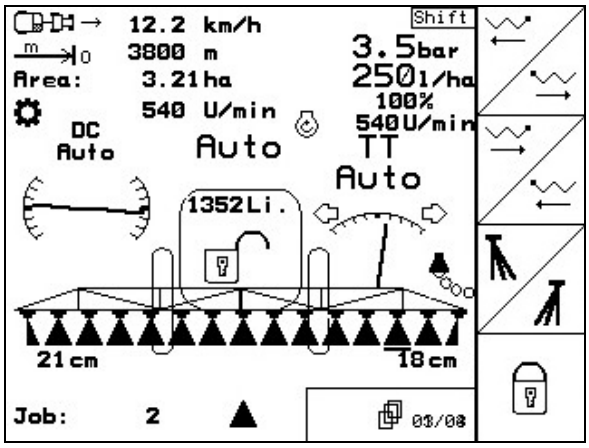
Pressed shift key



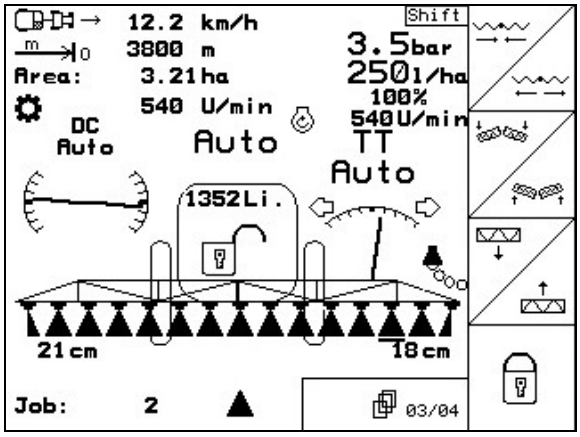
02/04



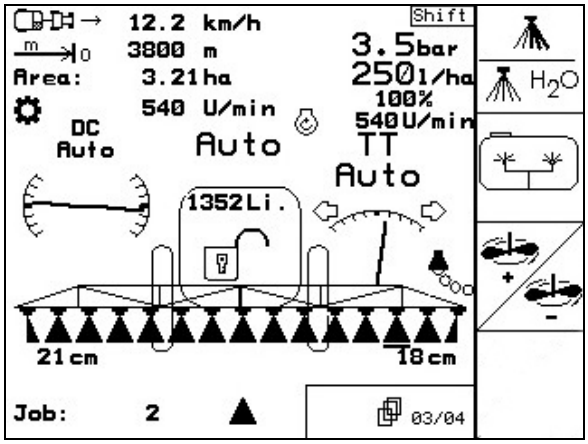
Pressed shift key



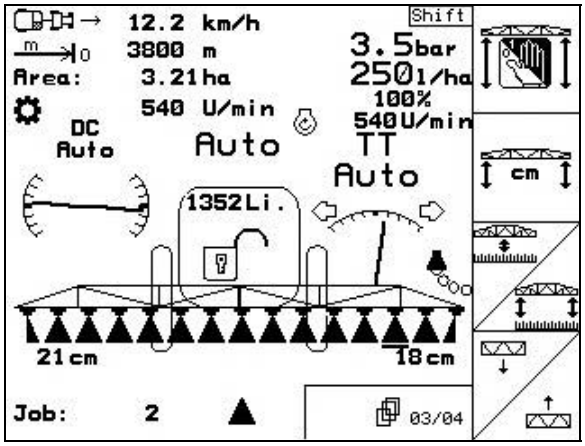
03/04



Pressed shift key

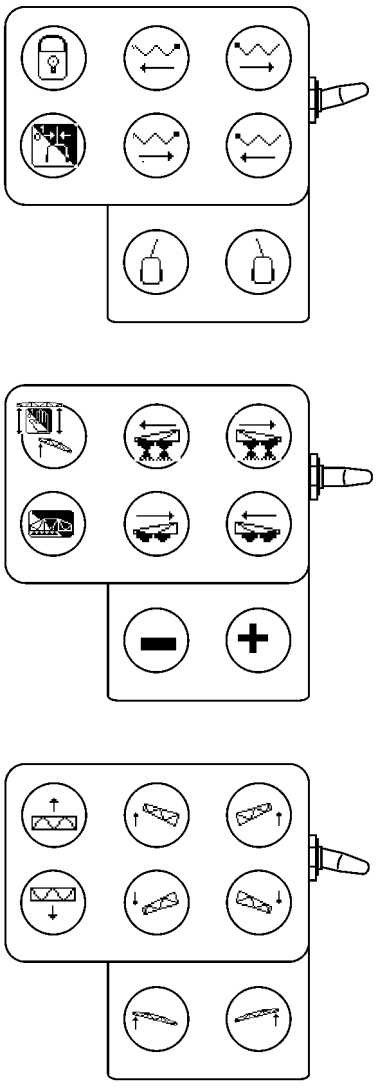


04/04

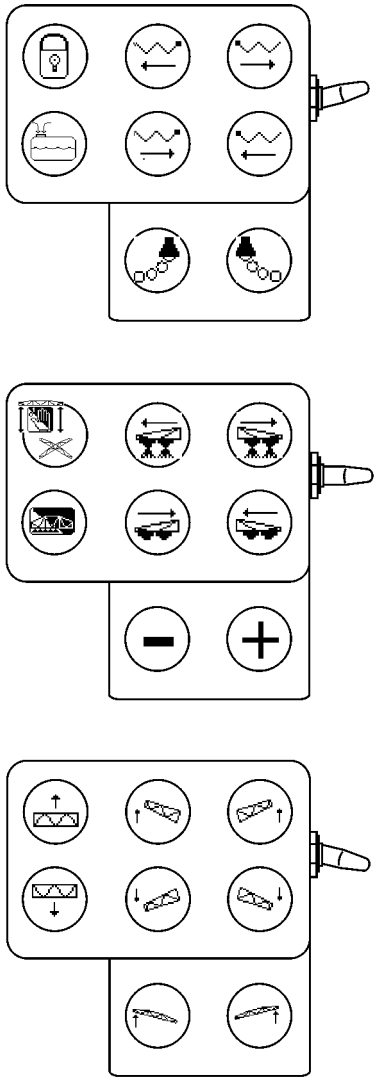


Key layout Joystick

UX, UG

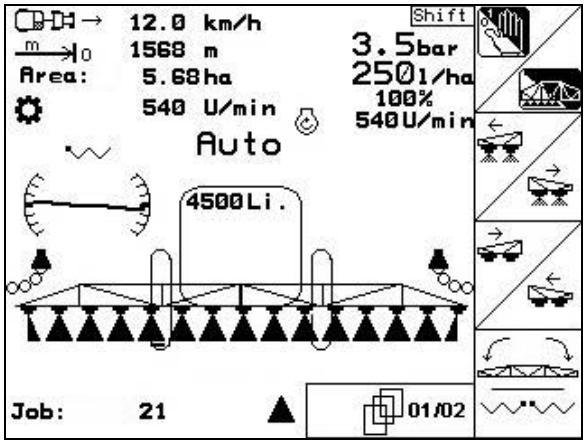


UF 01

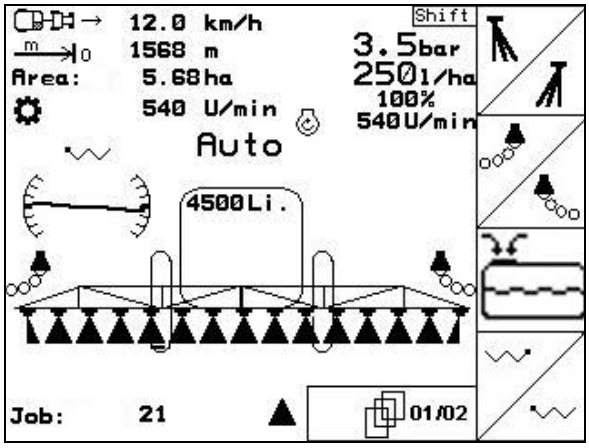


6.4.4 Pre select folding

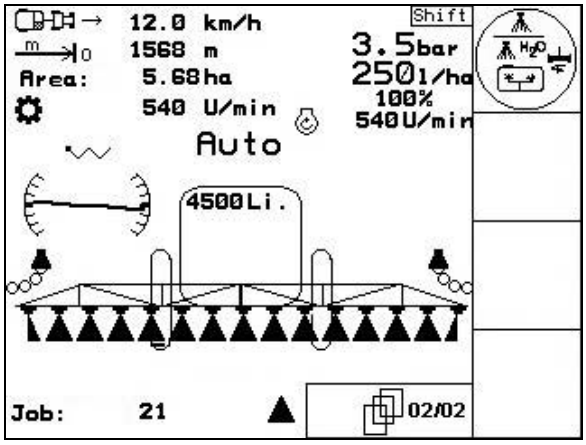
01/02



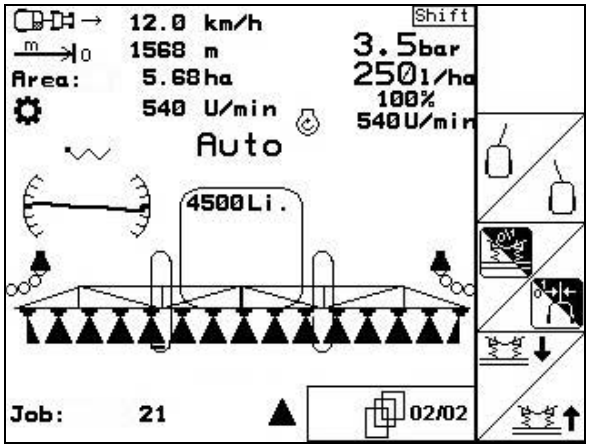
Pressed shift key



02/02

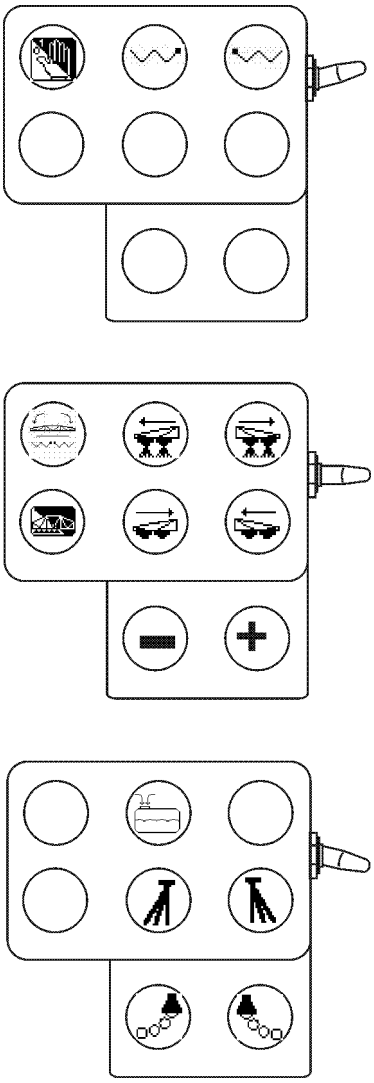


Pressed shift key

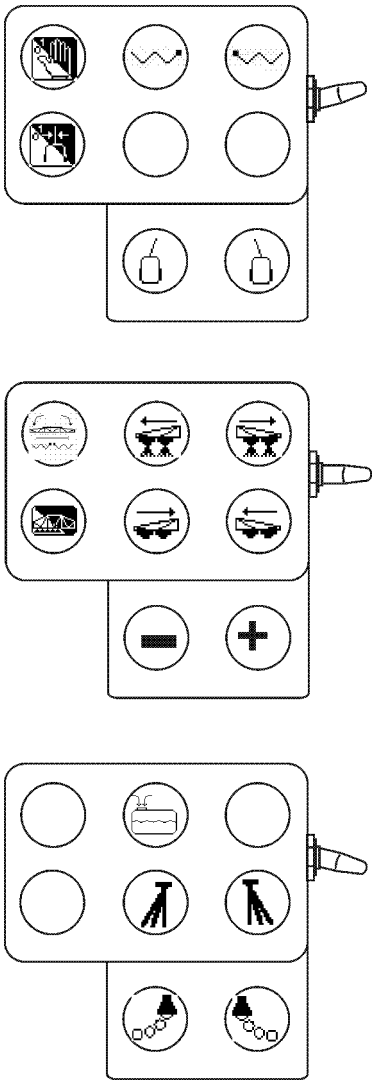


Key layout Joystick

UF 01



UX, UG



7 Joystick

7.1 Fitting

Attach the joystick (Fig. 91/1) by using 4 bolts within convenient reach in the tractor cab.

Insert the plug of the basic equipment into the 9-pin Sub-D socket of the joystick (Fig. 91/2).

Insert the plug (Fig. 91/3) of the joystick into the mid Sub-D socket of **AMATRON**+.

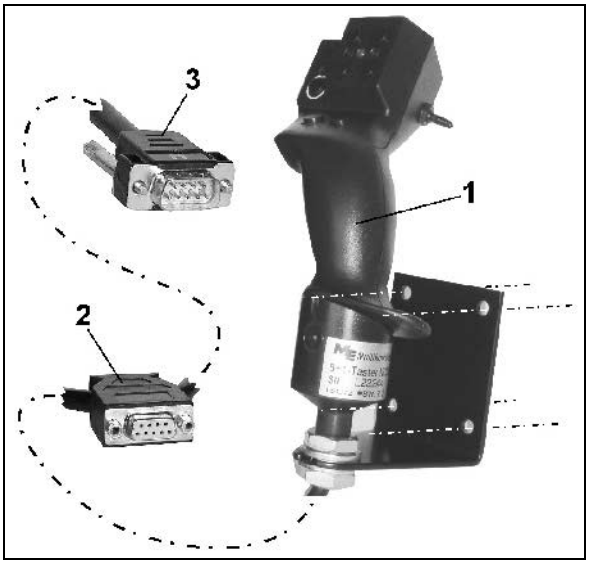


Fig. 91

7.2 Funktion

The joystick only functions in the operational menu of **AMATRON**+. It allows the blind actuation of **AMATRON**+ during operation in the field.

For the actuation of **AMATRON**+ the joystick (Fig. 92) provides 8 keys (1 – 8). In addition the coverage of the keys can be changed 3 times by the switch (Fig. 93/2).

As standard the switch is in the

- mid position (Fig. 93/A) and can be moved
- upwards (Fig. 93/B) or
- downwards (Fig. 93/C).

The position of the switch is indicated by a LED light (Fig. 93/1).

- LED-indication yellow
- LED-indication red
- LED-indication green

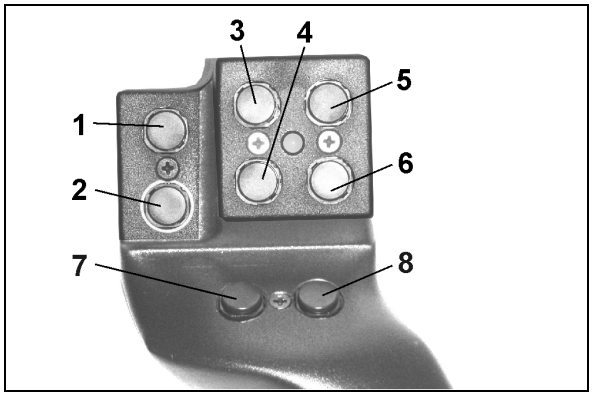


Fig. 92

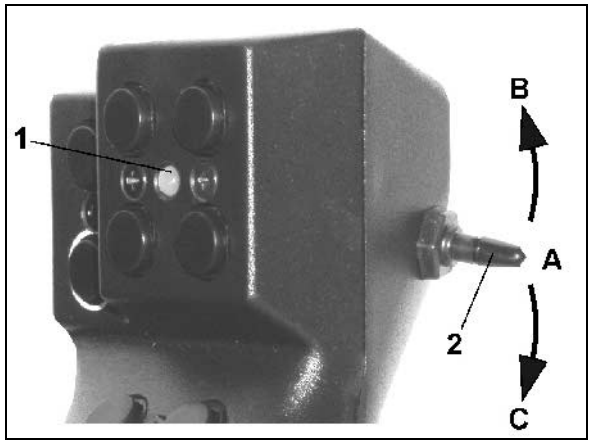


Fig. 93

8 AMACLICK boom part-width section shut off switch box

8.1 Fitting

Bolt **AMACLICK** above the hole cut out of the console on to the joystick or alternatively fit in the tractor cabin within easy reach.

Connection of **AMACLICK**:

- with joystick according to Fig. 94.
- without joystick according to Fig. 95

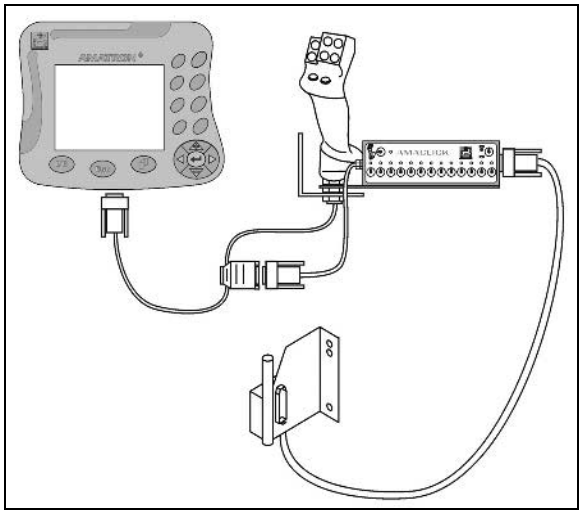


Fig. 94

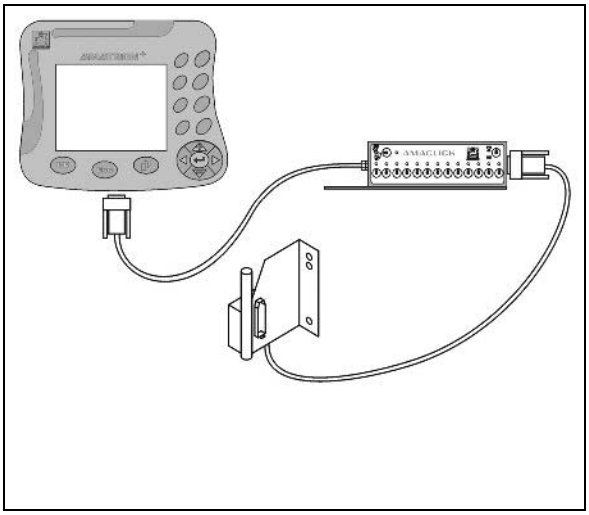


Fig. 95

8.2 Function

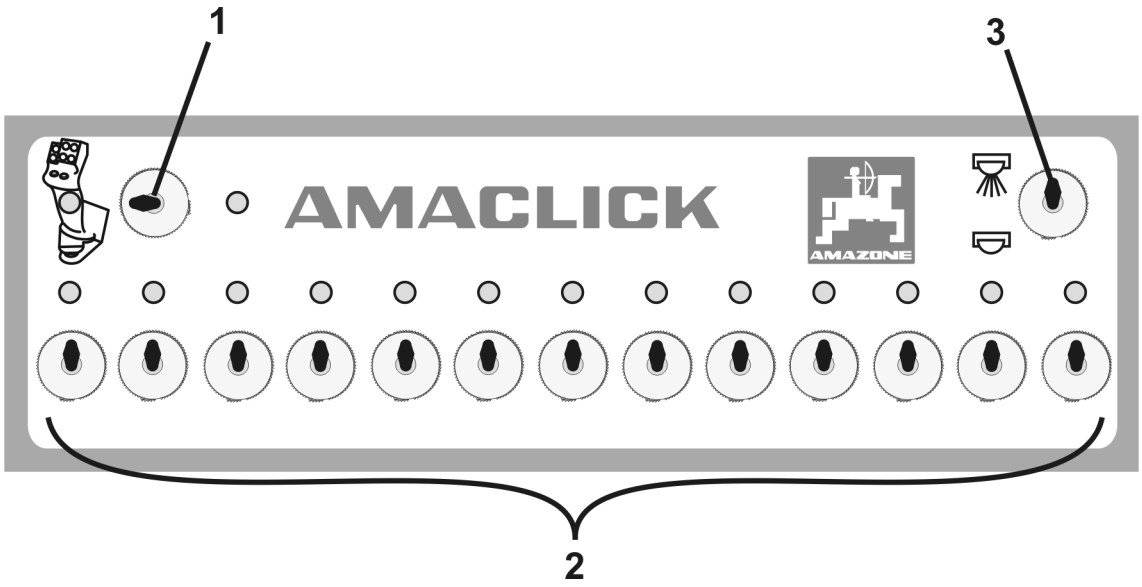
The **AMACLICK** switch box is used in conjunction with

- **AMATRON+**,
- **AMATRON+** and joystick

for the operation of **AMAZONE** crop protection sprayers.

AMACLICK+ allows for

- switching on or off any boom part-width section at random.
- switching on and off the spraying of spray liquid across the full boom.



(1) On / Off switch

- Switch position  :
  AMACLICK not active. Operation via **AMATRON+** / joystick.
- Switch position „**AMACLICK**“:
  Spraying operation on / off and boom part-width sections are switched with the aid of **AMACLICK**
  (The operation with **AMATRON+** / joystick is then not possible) .
  The light above the boom part-width section switch indicates, that the part section has been switched off.

(2) Boom part-width section switch
Every part section is provided with a individual switch. .
In cases where more switches than sections are available, the switches on the right hand side are not elongated.

(3) Switch spraying on / off.
Spray liquid is sprayed via all part widths switched on / no spray agent is sprayed.

9 Malfunction

9.1 Alarm

Warning message:

A warning message (Fig. 96) appears at the bottom of the display and the audible alarm sounds three times. Remedy fault as soon as possible.

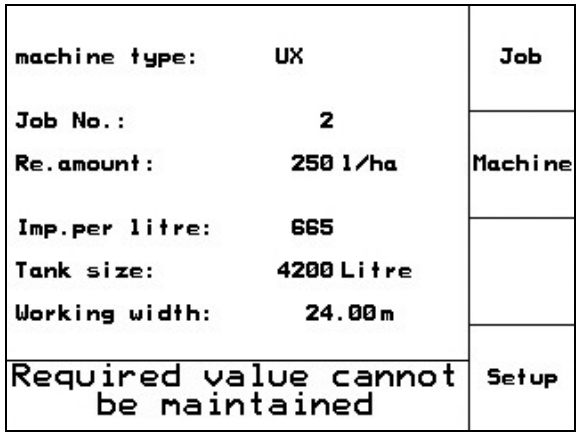


Fig. 96

Error message:

The error message (Fig. 97) appears in the middle of the display and the audible alarm sounds.

- Read alarm message on the display.
- Recall the help text.
- Confirm the error message.

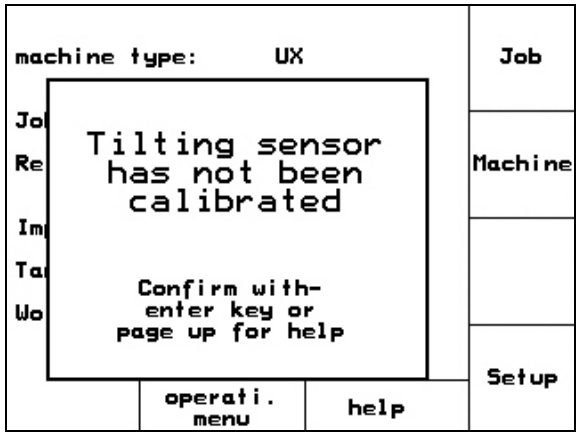


Fig. 97

9.2 Help-Menu

The help menu is started from the main menu.

Help menu page 1 01/02.

- 1 Help for controls.
- 2 Help for fault messages.

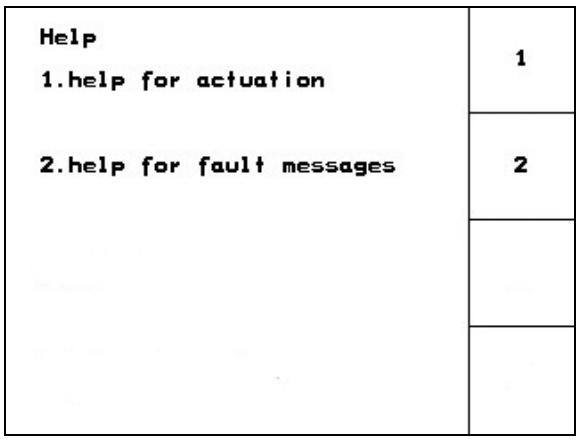


Fig. 98

9.3 Failure of forward speed sensor(Imp/100m)

Enter simulated speed in the Service Setup menu to continue the spraying operation in spite of a defect in the forward speed sensor.

Proceed as follows:

- Remove the signal cable from the tractor basic equipment.
- km/h sim. Enter simulated speed.
- Continue spreading operation and maintain the entered simulated speed.

As soon as impulses are sensed from the forward speed sensor the computer automatically changes over to the actual speed from the forward speed sensor.

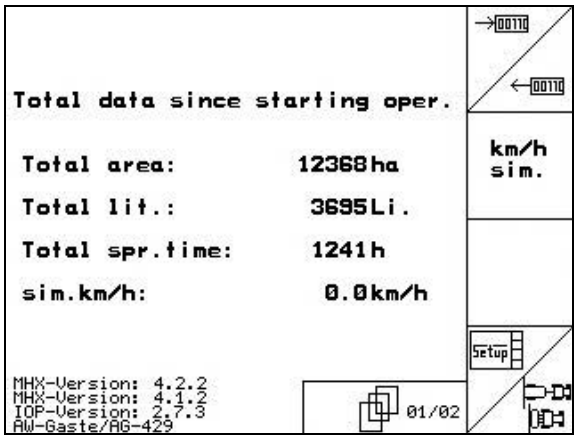


Fig. 99

AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

P. O. Box 51
D-49202 Hasbergen-Gaste
Germany

Tel.: + 49 (0) 5405 501-0
Telefax: + 49 (0) 5405 501-193
e-mail:
http://

BBG-Bodenbearbeitungsgeräte Leipzig GmbH & Co.KG

P. O. Box 341152
D-04233 Leipzig
Germany

Tel.: + 49 (0) 341 4274-600
Telefax: + 49 (0) 341 4274-619
e-mail:
http://

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