

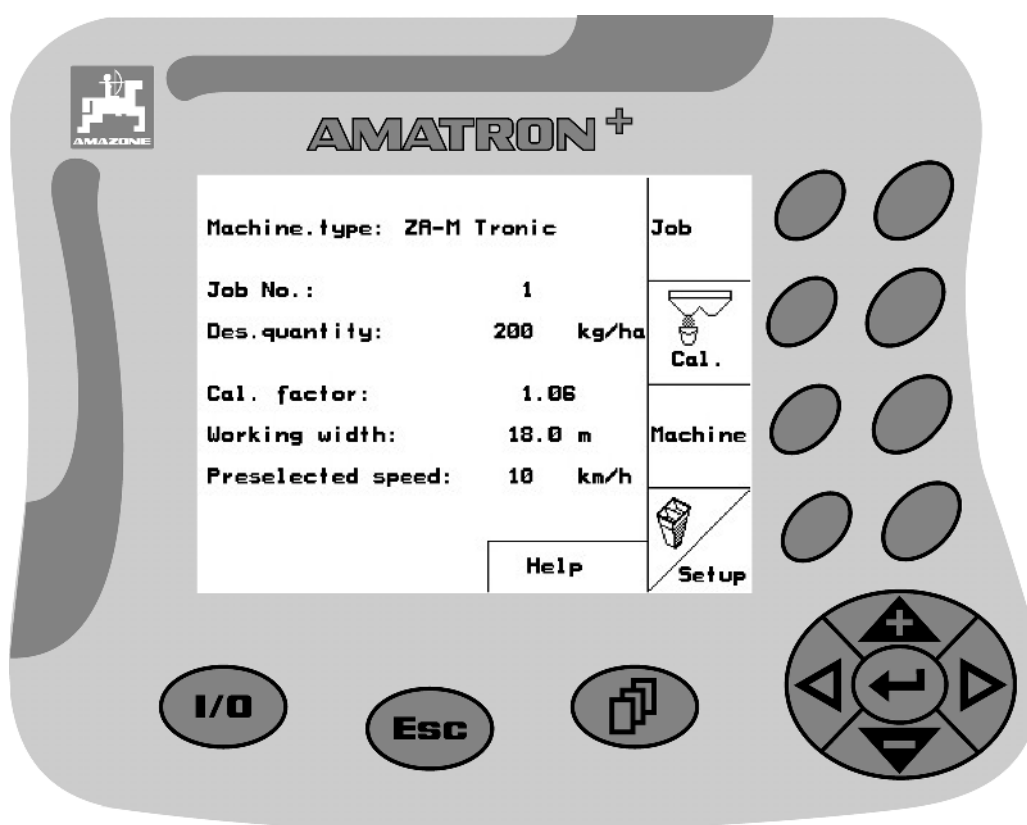
AMAZONE

Operation Manual

On board computer

AMATRON⁺

for **ZA-M** and **ZG-B**



MG934
DB 564.8 (GB) 03.06
Printed in Germany



Before starting to operate,
please carefully read and
adhere to this instruction
manual and safety advice.



Preface

Dear customer,

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

In order to ensure to make fullest use of your on board computer in conjunction with the fertiliser spreaders ZA-M and ZG-B we recommend that you carefully read and observe the information within this instruction manual and adhere to the advice given therein.

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

This instruction manual refers to the on board computer **AMATRON⁺**.



AMAZONEN-WERKE
H.DREYER GmbH & Co. KG

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D-49202 Hasbergen-Gaste
Germany
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1. Details about the computer, range of application

The computer is a display-, control and monitoring implement for **AMAZONE** mounted machinery.

1.1 Manufacturer

AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

Postfach 51, D-49202 Hasbergen-Gaste

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 board computer.



The safety requirements are only fulfilled when in the event of 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 Designated use of the on board computer

The computer has been exclusively designed for the usual operation in agriculture as a display-, monitoring and controlling device in combination with the **AMAZONE** fertiliser spreaders **ZA-M** and **ZG-B**.

Any use other than that stipulated above is no longer regarded as designated use. The manufacturer does not accept any responsibility for damage resulting from this. Therefore, the operator himself will carry the full risk.

Under "designated 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 danger.

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 great care deviations when spreading cannot totally be excluded even at a designated use. These deviations may be caused, e.g. by:

- Blocking up or bridging (e.g. by foreign particles, bag residue, damp fertilizer etc.),
- Wear of wearing parts
- Damage by external influence,
- Wrong drive-R.P.M. and travelling speeds,
- Wrong setting of the machine (incorrect mounting, not adhering to the spreading chart).

Before every operation and also during the operation check your machine for proper function and for sufficient application accuracy.

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



2. Safety

This instruction manual contains basic advice which must be adhered to when mounting, operating and maintaining the machine. Ensure that this instruction manual has been read by the user/operator before starting to operate the device and that it is made really available at all times to the user.

Please strictly observe and adhere to all safety advice given in this instruction manual.

2.1 Dangers when not adhering to the safety advice

Not adhering to the safety advice given

- may result in endangering the user or other persons, the environment and/or the machine itself.
- may result in the loss of any claim for damage.

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

- Danger for persons by not secured operational range.
- Failure of important functions of the machine.
- Failure of prescribed measures for maintenance and repair.
- Danger for persons by mechanic or chemical affects.
- Danger for the environment by leaking hydraulic oil.

2.2 Qualification of operator

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

2.3 Symbols in this instruction manual

2.3.1 General danger symbol

Not adhering to the safety advice in this instruction manual may cause danger to health and life of persons. They are identified by the general danger symbol (Safety symbol according to DIN 4844-W9)



2.3.2 Attention symbol

Safety advice which may cause dangers for the machine and it's function when not being adhered to, are identified with the attention symbol.



2.3.3 Hint symbol

Hints regarding machine's specific particularities, which have to be adhered to for a faultless function of the machine are identified with the hint symbol.



2.4 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 electric-magnetic transmittance of other devices. Such affects may endanger people when the following safety advice will not be adhered to:

When retrofitting electric and electronic devices and/or components to the implement with connection to the on-board electric circuit, the user must ensure by himself that the installation will not cause any disturbance to the tractor electronic or other components.

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

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

Only install devices which have officially been authorised in your country.

Firmly install the device.

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

2.5 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 of the board computer.

3. Fitting instruction

3.1 Console and computer



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 of vibrations and electrically conductive. The distance from the radio transmitter or the antenna should at least be 1 m.

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

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



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

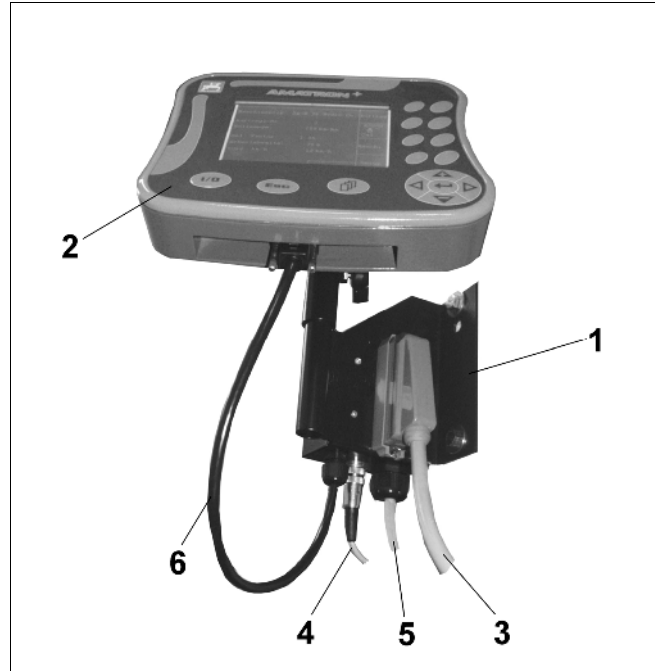


Fig. 1

3.2 Connection of the machine

Connect the fertiliser spreader mounted on to the tractor via the implement plug (Fig. 1/3).

Connect the signal cable (Fig. 1/4) of the tractor signal socket or of the Sensor X with the tractor base equipment (ZA-M only).

Connect battery cable (Fig. 1/5) with 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.

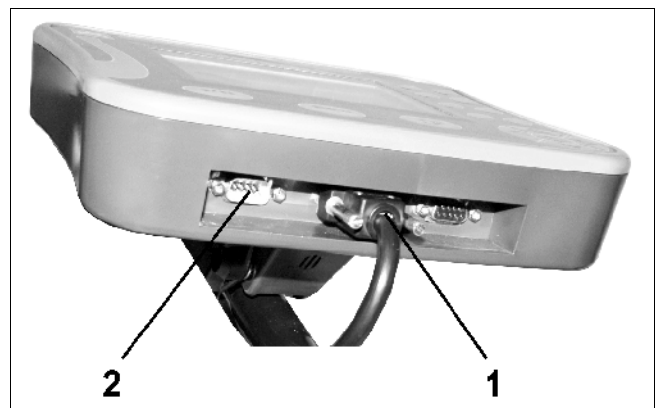


Fig. 2

3.3 Battery connecting cable

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

- Route the battery connecting cable from the tractor cab to the tractor battery and affix. Ensure that the battery connecting cable is not bent.
- Shorten the battery connecting cable as necessary.
- Strip the cable end by approx. 250 to 300 mm.
- Individually insulate the cable ends by 5 mm.

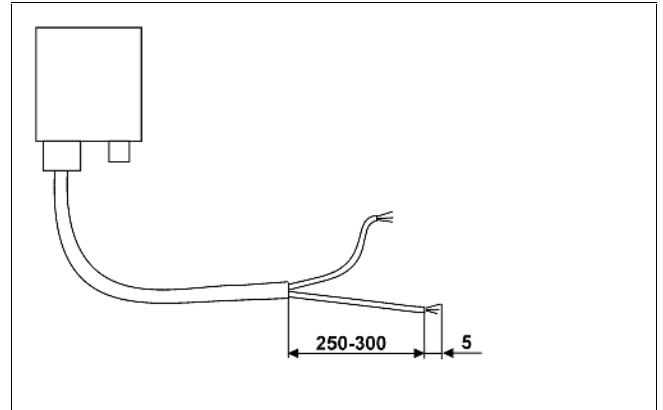


Fig. 3

- Insert the blue cable (earth cable) into the loose ring tongue (Fig. 4/1).
- Use pliers for crimped joint.
- Insert the brown cable (+ 12 Volt) into a free butt joint (Fig. 4/2).
- Use pliers for crimped joint.
- Shrink 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 -.

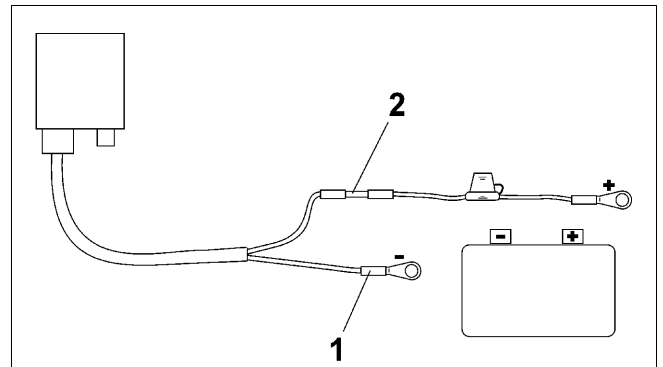


Fig. 4



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⁺ comfortably controls, actuates and monitors **AMAZONE** fertiliser spreaders **ZA-M** and bulk material spreaders **ZG-B**.

AMATRON⁺ works together with **AMAZONE**-fertiliser spreaders as follows:

Fertiliser spreader ZA-M:

- **ZA-M Tronic** with PTO shaft drive.
- **ZA-M Comfort** with hydraulic control block for actuating the hydraulic shutters and the limiter.
- **ZA-M Hydro** with hydraulic spreading disc drive (boundary spreading and part width control by reducing the spreading disc speed and the spread rate).
- **ZA-M profiS** with weighing system (fertiliser calibration during spreading operation).

Bulk material spreader ZG-B:

- **ZG-B drive** with electro hydraulically controlled floor belt.
- **ZG-B preciS** with ZA-M spreader unit.

AMATRON⁺ regulates the spread rate in dependence on the forward speed. Depending on machine and equipment a key pressure allows for

- changing the spread rate in pre determined steps (e.g. +/- 10%).
- calibration of fertiliser whilst travelling (only for spreaders with weighing system).
- comfortable boundary spreading.
- comfortable wedge shape spreading (only for ZA-M Hydro).
- comfortable actuation of the swivelable hopper cover (ZG-B).
- simple stationary emptying

Before starting to operate enter the required data into the four sub menus of the **main menu** (Fig. 5).






Machine.type: ZA-M Tronic		Job
Job No.:	1	 Cal.
Des. quantity:	200 kg/ha	
Cal. factor:	1.06	Machine
Working width:	18.0 m	
Preselected speed:	10 km/h	
Help		 Setup

Fig. 5

- In the **Job Menu**  orders are entered and the determined data are stored for up to 20 processed orders.
- The **Calibration Menu**  allows the determination of the fertiliser properties.
- The **Menu slug pellet calibration**  allows to meet with the particular requirements when spreading slug pellets




When spreading slug pellet drive with constant tractor speed (as entered in **AMATRON⁺**).

- Enter the spreader specific settings in the Menu

Machine data



- The lateral fertiliser distribution can be checked with the aid of the **Menu mobile fertiliser test kit**.

- The **Setup-Menu**  provides basic settings which are mainly reserved for the customer service.
- During operation the **Operational Menu** (Fig. 6) shows all necessary spreading data. From here the spreader is actuated during spreading operation.
- This instruction manual refers from terminal-software version:

- Maschine: MHX-Ver.: 2.14
- Terminal: IOP-Ver.: 3.3.2
BIN-Ver.: 3.14

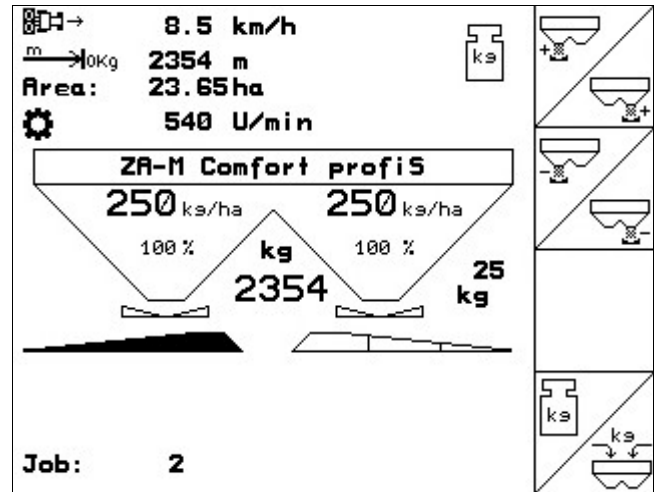


Fig. 6



















4.1 Description of keys

The functions which are indicated on the right hand margin of the display by a function field (square field Fig. 7/1 or diagonally separated square field Fig. 7/2) are accessed with the two key rows next to the right hand side of the display.

When the fields are diagonally separated:

- the left hand key is related to the top left function field (Fig. 8/1).
- the right hand key is related to the bottom right hand function field (Fig. 8/2).

If square fields appear on the display only the right hand key is related to the function field (Fig. 8/3).

-  - On / Off (only travel on public roads with the **AMATRON⁺** switched of.)
-  - Return to last menu view
-  - Change over Job menu ↔ Main menu
-  - Stop entering
-  - To the operational menu (keep key pressed for at least 1 second)
-  - Page to other menu pages (only possible when the page symbol (Fig. 9/1) appears in the display)
-  - Help menu only possible from the main menu (Fig. 17).
-  - Cursor in the display to the right
-  - Cursor in the display to the left
-  - Taking over selected figures and letters
-  - Confirmation of a critical alarm
-  - 100%-amount in the operational menu
-  - Cursor upwards in the display
-  - Increasing spread rate by quantity step during operation (e.g.:+10%) (for setting the quantity step please refer to para. 5.2.1.)
-  - Cursor downwards in the display
-  - Reducing the spread rate by quantity step during operation (e.g.: -10%) (for setting the quantity step please refer to para 5.2.1.)

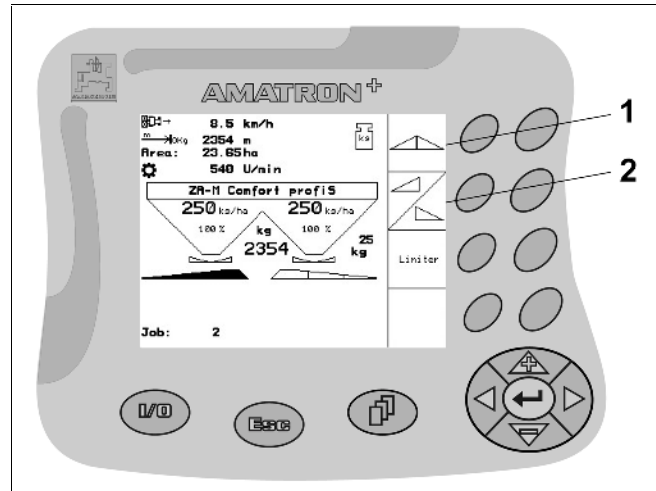


Fig. 7

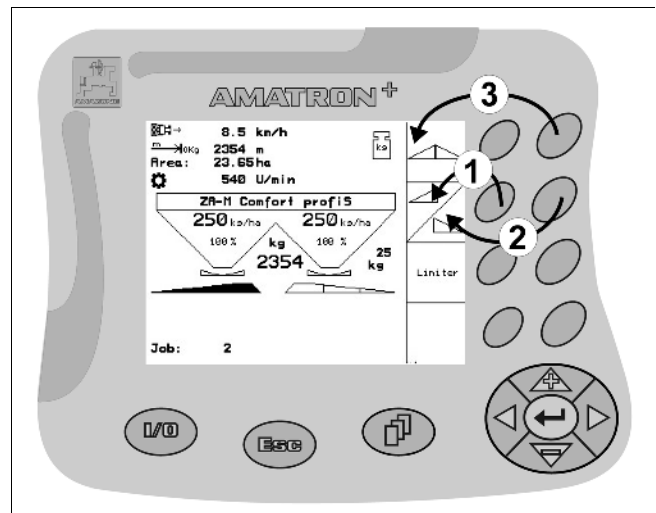


Fig. 8

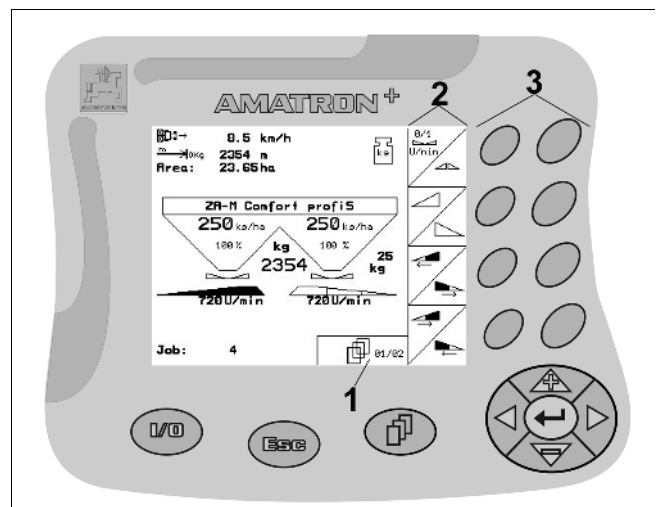



Fig. 9

4.1.1 Shift – key

Im Arbeitsmenü und Auftragsmenü aktiv!

When the shift key  on the rear of the implement (Fig. 10/1) is pressed additional function fields (Fig. 11) will appear in the operational menu / job menu and the coverage of the function keys (Fig. 9/3) will change accordingly.

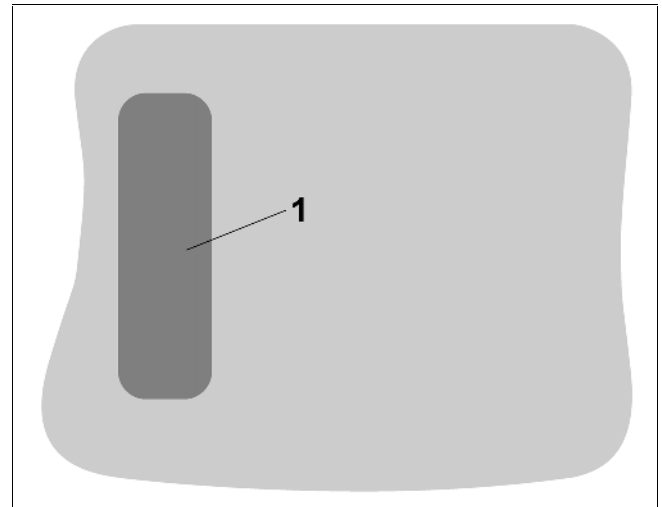


Fig. 10

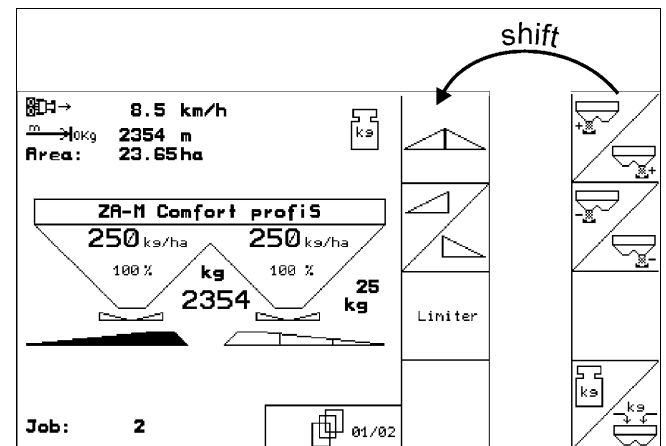
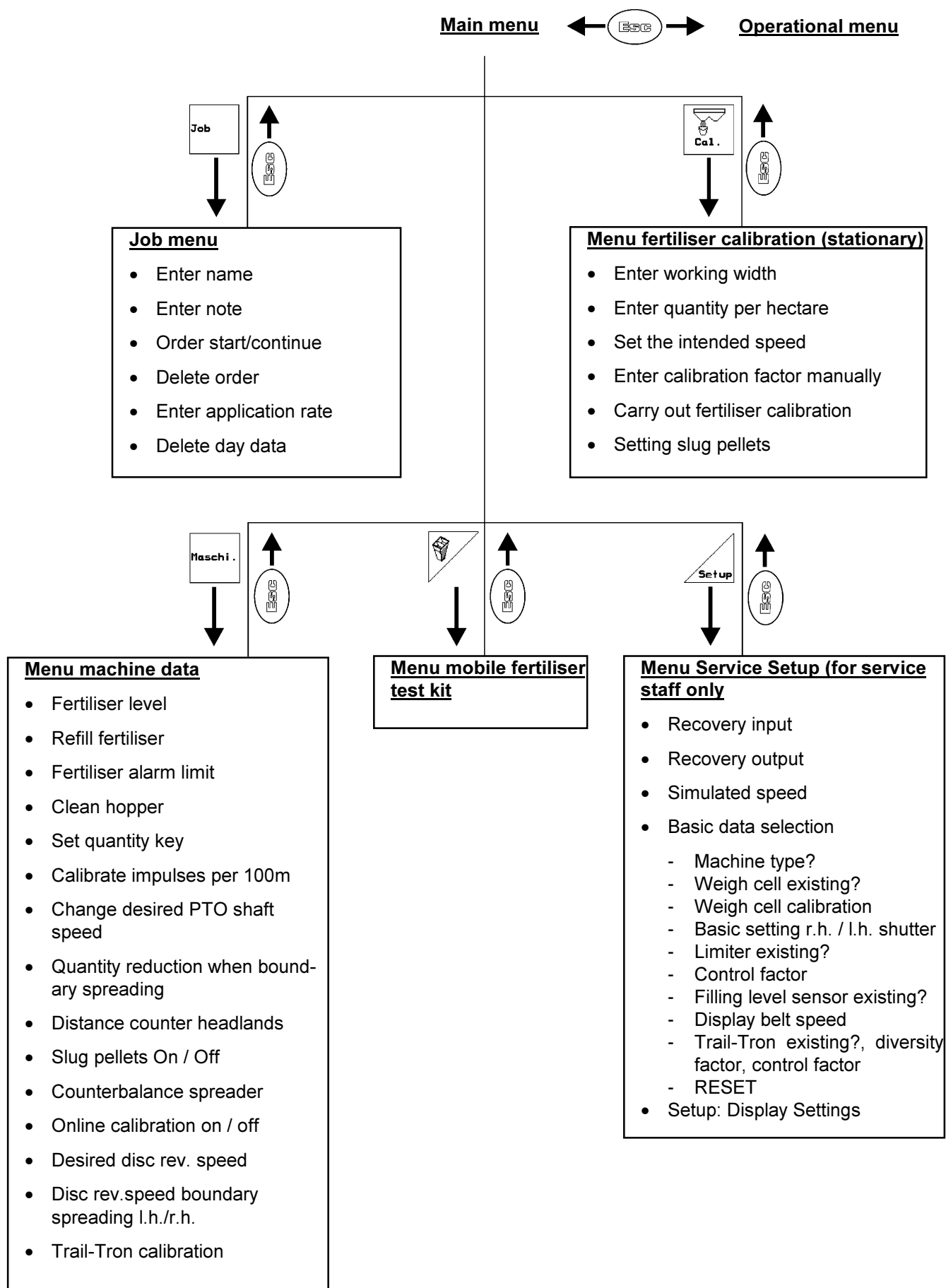


Fig. 11



4.2 Hierarchy of **AMATRON⁺**



4.3 Inputs on **AMATRON⁺**



To assist you in operating the **AMATRON⁺** the function fields are illustrated in this instruction manual in order to make clear that the key related to the function field should be pressed.

Example: Function field

Description:



Reduce spread rate by one quantity step on the right hand side.

Action:

The operator presses key (Fig. 12/2) re-

lated to function field (Fig. 12/1) to reduce the spread rate on the right hand side.

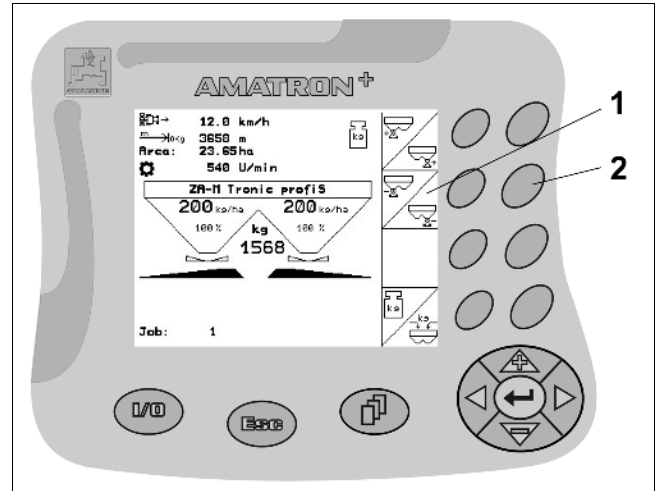


Fig. 12

4.3.1 Input of text and figures

If **AMATRON⁺** requires the entering of texts or figures the enter menu (Fig. 13) will appear.

A selection field (Fig. 13/1) with letters, figures and arrows with which the input line (Fig. 13/2) (text or figure) is created appears on the bottom part of the display.

- selection of letters or figures in the selection field (Fig. 13/3).

- Taking over the selection (Fig. 13/3).

- Deletion of input line.

- Change in capitalisation

- After having finished the input line, confirm.

The arrows in the selection field (Fig. 13/4) allow the movement in the text line.

The arrow in the selection field (Fig. 13/4) deletes the last entering.

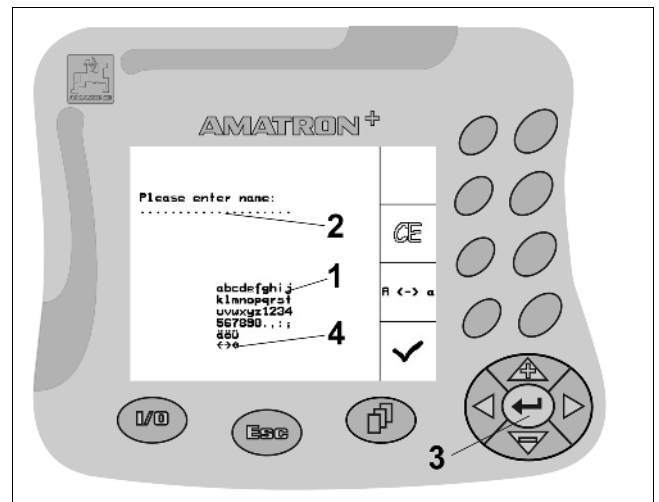





Fig. 13

4.3.2 Selection of options

- Position the selection arrow (Fig. 14/1) with  and .
-  Take over the selection (Fig. 14/2).

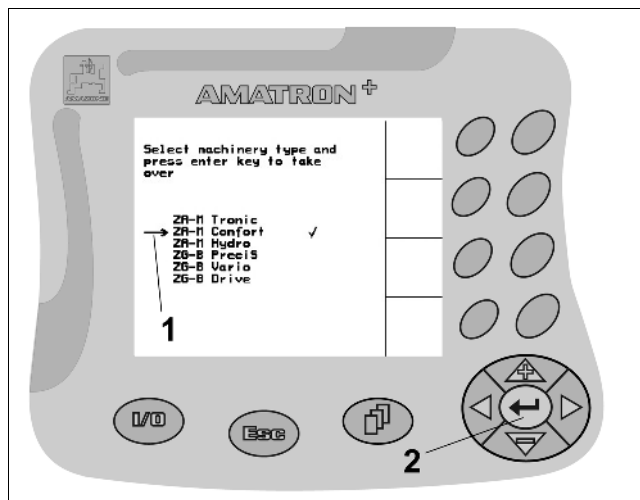


Fig. 14

4.3.3 Toggle Function

On / off switching of functions, e.g. weigh cell on / off.:

- Press function key (Fig. 15/2) once
→ Function **On** (Fig. 15/1).
- Press function key once again
→ Function **Off**.

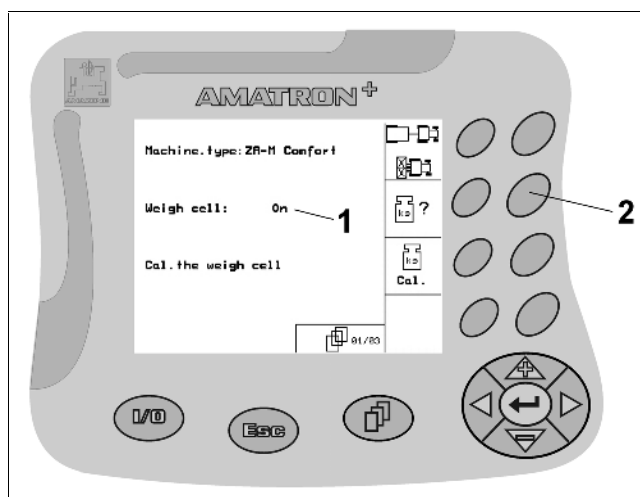


Fig. 15

5. Operation

5.1 Start screen

After having switched on **AMATRON⁺** with connected machine computer the start menu will appear. It shows the terminal-software version No. After approx. 2 sec **AMATRON⁺** automatically jumps into the main menu.

If machine computer data are loaded after **AMATRON⁺** has been switched on, e.g. at

- use of a new machine computer,
- use of a new **AMATRON⁺**-terminal,
- after RESET of **AMATRON⁺**-terminal,

the start screen will show this.

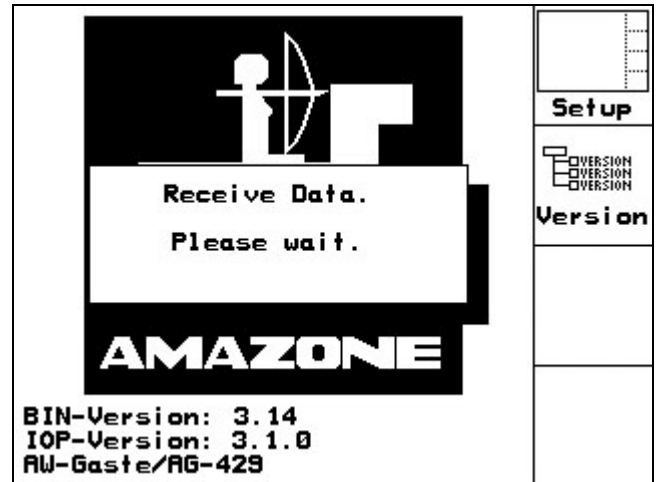




Fig. 16




5.2 Main menu

-  Menu Job: Input of data for a new job. Start job prior to spreading (see para 5.2.2.).
-  Menu calibrate fertiliser: Before starting operation determine the fertiliser calibration factor of the fertiliser to be spread (para 5.2.3.).

In case the actual spread rate deviates from the theoretical spread rate newly determine the fertiliser calibration factor.

On the ZA-M *profiS*

- the calibration factor can be determined whilst driving down a calibration distance (para. 5.2.4.2).
- the calibration factor can continuously be determined with online calibration (para. 5.2.4.3).

-  Menu calibrate slug pellets: Replaces the menu calibrate fertiliser when spreading slug pellets (para 5.2.4.6.).
-  Menu machine data: Input of machine specific or individual data (para.5.2.1).
-  Menu Service-Setup: Input or reading of data for customer service at maintenance or trouble (para. 5.2.5).

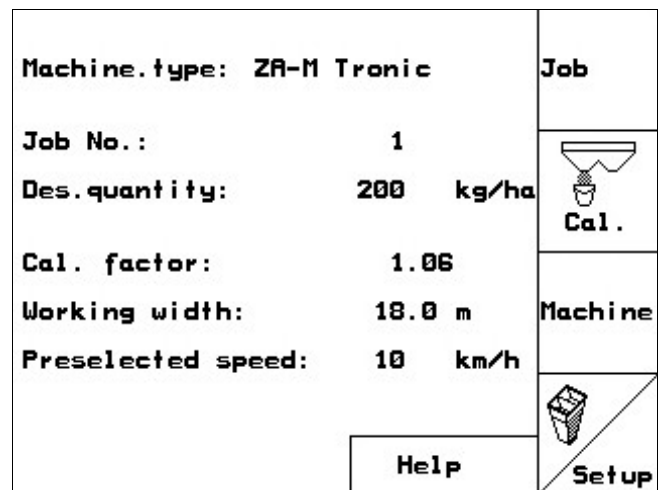








Fig. 17




Menu mobile fertiliser test kit: Checking of the lateral fertiliser distribution with the 16 collecting trays (please refer to instruction manual: Mobile fertiliser test kit).

5.2.1 Input of machine data

Page one  in menu machine data (Fig. 18):

-  enter fertiliser filling level in kg (not for ZA-M profiS).
-  Refill fertiliser (see para 6.6.).
-  Enter alarm limit for residual amount in kg.
- **ZA-M:** Open / close metering shutter (for hopper emptying):
 -  Metering shutter left hand
 -  Metering shutter right hand
 - Attention: Open hydraulic shutter hydraulically.

- **ZG-B drive:** (Fig. 19) Switch on floor belt (for hopper emptying).

-  Floor belt on/off.
 - on: Double shutters open automatically.
 - off: for safety sake double shutters remain opened.

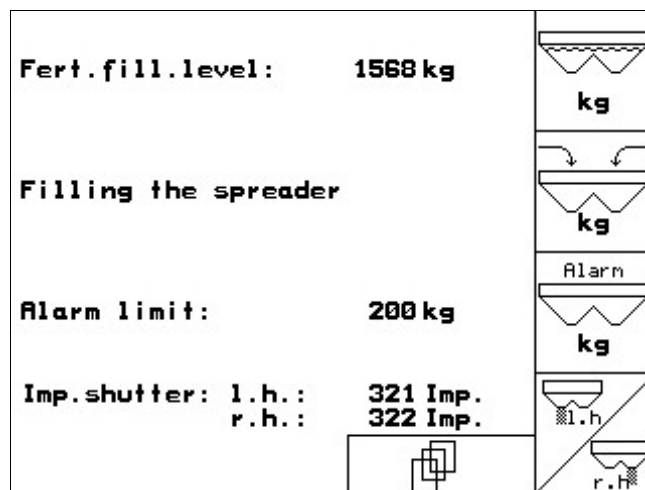


Fig. 18

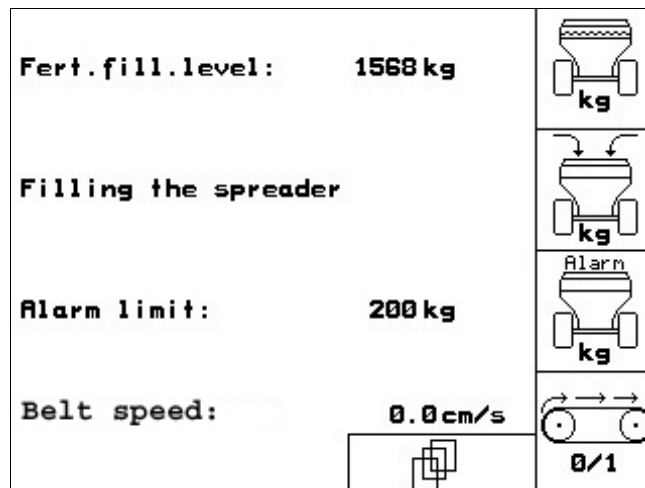


Fig. 19

ZG-B precis:

- Empty hopper (Fig. 20).
- Open/close metering shutter left hand / right hand.
- Hydraulic shutter left hand / right hand.
 - open
 - close
- Floor belt on / off.

Page 2 select in menu machine data (Fig. 21).

- Enter quantity step (value for the proportional fertiliser rate change during operation with).
- Enter impulses per 100m (calibrate distance sensor para 5.2.1.1.).
- Enter desired PTO shaft speed (para. 5.2.1.2).
- **ZA-M Hydro, ZA-M/ZG-B with Limiter:** Desired spread rate reduction in % when boundary spreading (at boundary spreading with half the working width the standard value is 10 %, side spreading without spread rate reduction).

Page three select in menu machine data (Fig. 22).

- Distance counter on/off: For tracing the tramlines the travelled distance is indicated at the headlands. When the hydraulic shutter is closed the distance counter starts the distance registration.
- Spreading slug pellets On / Off. Switching on covers the calibration key with "calibrate slug pellets"(para 5.2.4.6.).

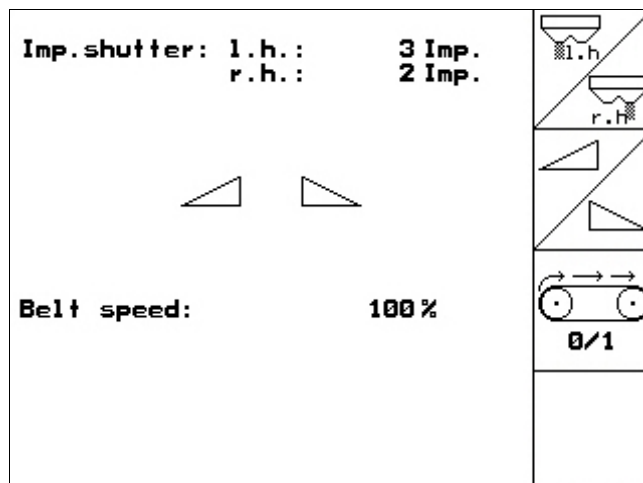


Fig. 20

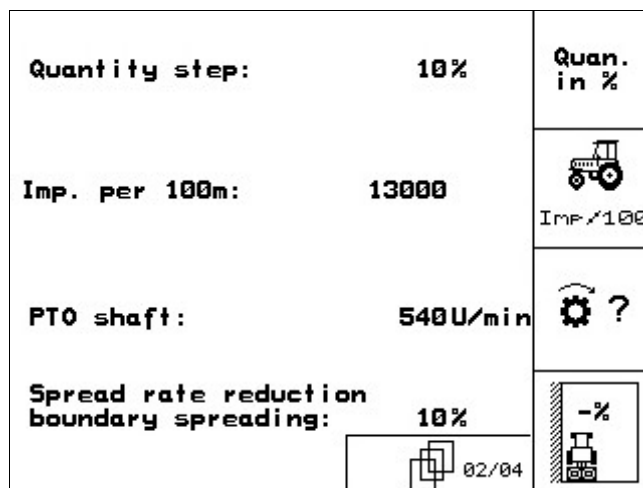


Fig. 21

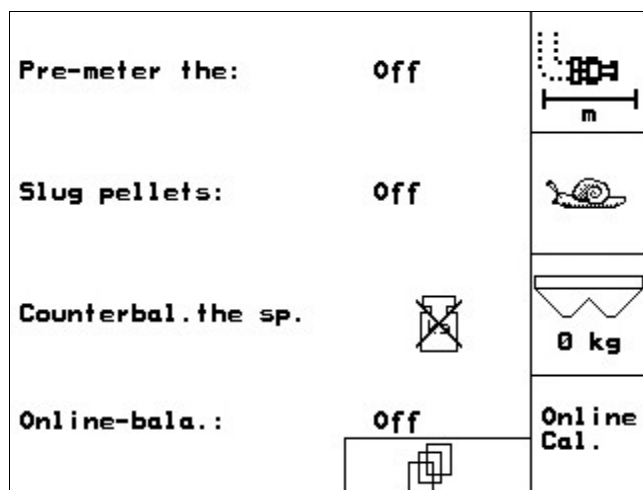



Fig. 22




When switching on "spreading slug pellets" danger of injury within the shutter slide area due to the automatic closing of the shutter.



- Counterbalance spreader, e.g. after special optional equipment has been fitted. (para. 5.2.5.1)

- Empty the fertiliser spreader completely, wait until symbol  extinguishes.

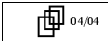


-  Confirm.



- Online balance (online fertiliser calibration) On / Off. (see para. 5.2.4.3).



Page four  select in menu machine data (Fig. 23).



- **ZA-M Hydro:** Enter wanted disc rev. speed (take value from setting chart, standard 720 $\frac{1}{\text{min}}$.)



- **ZA-M Hydro:** Enter rev. speed for left hand spreading disc for boundary spreading (take value from the setting chart).



- **ZA-M Hydro:** Enter rev. speed for right hand spreading disc for boundary spreading (take value from the setting chart).



- **ZG-B:** Trail-Tron-draw bar calibration (see para. 5.2.1.2).

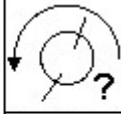

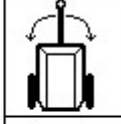
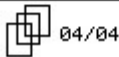
Desired disc speed:	720 U/min	
Rev. speed for bound. spread.:	300 U/min	
	300 U/min	
Calibrate Trail Tron		
		

Fig. 23

5.2.1.1 Calibration of distance sensor

To determine the actual speed **AMATRON⁺** requires the calibration value Imp/100m.



The calibration figure "Imp./100m" may never be smaller than "250", as otherwise **AMATRON⁺** does not operate properly.

(see menu machine data , page two 02/04)

There are provided three possibilities to enter Imp/100m:

- The value is known and is entered manually on **AMATRON⁺**
- The value is unknown and will be determined by driving down a test distance of 100 m.
 - Carefully measure the test distance of 100 m in the field. Mark beginning and end of the test distance (Fig. 25).
 - Start calibration.
 - Carefully drive test distance from beginning to end mark (when starting to drive the counter jumps to 0). The continuously determined impulses are shown on the display.
 - Stop after 100 m. The display now shows the number of the determined impulses.
 - Take over value Imp./100m. The value is related to the tractor selected from the memory.
 - Reject value Imp./100m.



If you operate with all wheel drive in the field the all wheel drive must be switched on for calibrating the distance sensor.

- The value Imp/100m can be stored for 3 tractors:

- , Select tractor →

- Enter name / change.

- Enter Imp/100m for selected tractor.



If a stored tractor is selected here, the corresponding value for Imp/100m and the desired PTO shaft rev. speed are taken over.

Enter value for impulses/100m or automatic calibration Actual: 13000Imp/100m	Man. Input
	Start
	Memory

Fig. 24

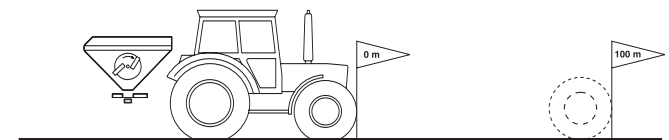


Fig. 25

Please select tractor: → Tractor__1 : 13000Imp/100m ✓ Tractor__2 : 5480Imp/100m Tractor__3 : 258Imp/100m	Tractor Change
	New imp.

Fig. 26



5.2.1.2 Entering the desired PTO shaft rev. speed

(see menu machine date , page two)

- Enter desired PTO shaft rev. speed e.g.:
 - 540¹/_{min} : Standard-standard PTO shaft speed.
 - 0¹/_{min} : No PTO shaft sensor existing. PTO shaft monitoring not wanted.

- Enter impulses per PTO rev. (Imp/rev.) (ask for at your dealer)

- Memory for 3 tractors with relevant PTO shaft rev. speed R.P.M.

- , Select tractor →.

- Enter name / change.

- Enter PTO rev. speed.

- Memory for 3 tractors with relevant value Imp/rev.

- , Select tractor →.

- Enter name / change

- Enter Imp./rev. PTO shaft

- Enter max. alarm limit in %. (Standard value 10%)

- Enter min. alarm limit in %. (Standard value 10%)



If a stored tractor is selected here, the corresponding value for Imp/100m and the desired PTO shaft rev. speed are taken over.

PTO shaft:	540 U/min	U/min
Impulses per PTO-Shaft rev.:	2 Impulse	Imp/U.
		Memory
		Memory
Alarm limit:	+ 10%	+% Alarm
	- 50%	-% Alarm

Fig. 27


Please select tractor:	Tractor Change
→ Tractor__1 : 540 U/min ✓	New rev.'s
Tractor__2 : 520 U/min	
Tractor__3 : 0 U/min	



Fig. 28

Please select tractor:	Tractor Change
→ Tractor__1 : 2 Imp./rev. ✓	New imp.
Tractor__2 : 6 Imp./rev.	
Tractor__3 : 10 Imp./rev.	


Fig. 29

5.2.1.3 Trail-Tron-draw bar calibration


(see menu machine date  , page two )

- Drive with your tractor with ZG-B straight on a short distance and align with  ,  until tractor and ZG-B are in one lane.



- Determine centre position.
- Pull the steering wheel of the tractor over max. to the right and retract with  Trail-Tron-ram.



- determine right hand lock.
- Pull the steering wheel of the tractor max. to the left and extend with  Trail-Tron-ram.



- determine left hand lock.

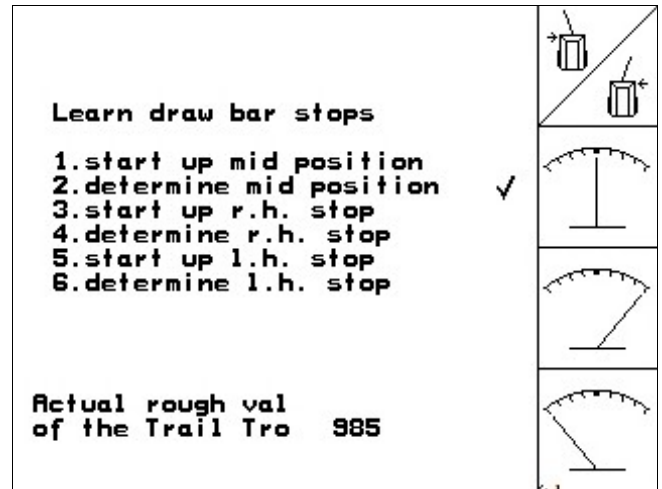


Fig. 30









5.2.2 Creating job

When the job menu is opened the last started (last worked) order appears.

20 jobs in maximum can be stored (Order No.1-20).



For creating a new job select an order No. (Fig. 31/1).



-  Delete data of selected order.
-  Enter name
-  Enter note
-  Enter desired application rate
-  Start order so that accumulating data for this order can be filed.
-  Delete daily data
 - Worked area (ha/day)
 - Applied fertiliser (amount/day)
 - Working hours (hours/day)



Already stored orders can be recalled

with  and started with  once again.

Pressed shift key  (Fig. 32):

-  Page forward in order.
-  Page backward in order.



Job No.:	25	Started		Name
Name:	Amazone			Note
Note:	instruction			kg/ha
Des. quantity:	200 kg/ha			Start Job
Finished area:	0.00 ha			Delete Job
Hours:	0.0 h			Delete the data of day
Average:	0.00 ha/h			
Quant. spread:	0 kg			
ha/day:	0.00 ha			
Amount/day:	0 kg			
Hours/day:	0.0 h			
 2/10				

Fig. 31



Job No.:	25	Started		next job
Name:	Amazone			Prev. job
Note:	instruction			
Des. quantity:	200 kg/ha			
Finished area:	0.00 ha			
Hours:	0.0 h			
Average:	0.00 ha/h			
Quant. spread:	0 kg			
ha/day:	0.00 ha			
Amount/day:	0 kg			
Hours/day:	0.0 h			
 2/10				



Fig. 32

5.2.3 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.

-  finish external job.
-  Enter the required amount.

Job No. :	20051	finish external job
Re. amount :	250 1/ha	1/ha
Worked ha:	0.00 ha	
Hours:	0.0 h	
Amount spra. :	0 Li.	

Fig. 33

5.2.4 Fertiliser calibration

The fertiliser calibration factor determines the control behaviour of **AMATRON⁺** and depends on

- the flowing property of the fertiliser to be spread.
- the entered spread rate.
- the entered working width.

On the other hand, the fertiliser flowing property depends on g

- fertiliser storage, period of storage and climatic factors.
- the operational conditions.

The calibration value is differently determined depending on spreader and equipment.

The calibration procedures which are related to the tractors in table 1 are described in the chapters mentioned there.













	ZA-M ZA-M Hydro	ZA-M <i>profiS</i> ZA-M Hydro <i>profiS</i>	ZG-B <i>preciS</i>	ZG-B <i>preciS</i> with weighing technology	ZG-B drive	ZG-B drive with weighing technology
Stationary calibration	Para.5.2.4.1	Para. 5.2.4.1	Para. 5.2.4.1	Para. 5.2.4.1	Para.5.2.4.4	Para.5.2.4.4
Automatic whilst driving down a test distance		Para.5.2.4.2		Para. 5.2.4.2		Para.5.2.4.5
Online calibration		Para.5.2.4.3				
Calibration of slug pellets	Para.5.2.4.6	Para. 5.2.4.6				

Table 1



The fertiliser flowing property will possibly change even after a short period of storage.

Therefore newly determine the fertiliser calibration factor before any operation.



Always newly determine the fertiliser calibration factor in case of deviations between the theoretical and the actual spread rate.



When determining the fertiliser calibration factor the entered spread rate on **AMATRON⁺** should not exceed the value "max.spread rate to be entered" of table 2 (values for calibration factor 1).

Working width [m]	max. to be entered spread rate [kg/ha] to determine the fertiliser calibration factor for the op- erational speed		
	6 km/h	8 km/h	10 km/h
10	3000	2400	1800
12	2500	2000	1500
15	2000	1600	1200
16	1900	1520	1140
18	1688	1350	1013
20	1525	1220	915
21	1450	1160	870
24	1263	1010	758
27	1125	900	675
28	1088	870	653
30	1013	810	608
32	950	760	570
36	850	680	510

Table 2

5.2.4.1 Stationary determination of fertiliser calibration factor

- Fill sufficient fertiliser into the hopper.
- Remove the **left hand** spreading disc.
- Place collecting bucket underneath the outlet opening (please note instruction manual ZA-M / ZG-B).



- Check working width / enter.



- Check spread rate / enter.



- Check intended speed / enter.



- In order to determine the calibration factor, enter the exact calibration factor, e.g. 1.00.

- To enter the calibration factor it is possible to
 - Take the calibration factor directly from the setting chart or
 - take experience value



Calibration factor realistical (0.7-1.4):

- about 0.7 for urea
- about 1.0 for mineral fertilizer CAN
- about 1.4 for fine, heaviness PK-fertilizer



- **ZG-B preciS:** (Fig. 35)

- Switch on floor belt and fill fertiliser sluice. The floor belt will stop automatically when the fertiliser sluice is filled (Do not switch on PTO shaft).

- **ZA-M Tronic:** Set the PTO shaft according to setting chart.



- **ZA-M Hydro:** Switch on spreading discs.

- Open hydraulic shutter left hand side

- **ZA-M Tronic:** Actuate tractor control unit.

- **ZA-M Hydro/Comfort / ZG-B preciS:**

- As soon as the collecting bucket is full, close the hydraulic shutter.

- **ZA-M Tronic:** Actuate tractor control unit.

- **ZA-M Hydro/Comfort / ZG-B preciS:**

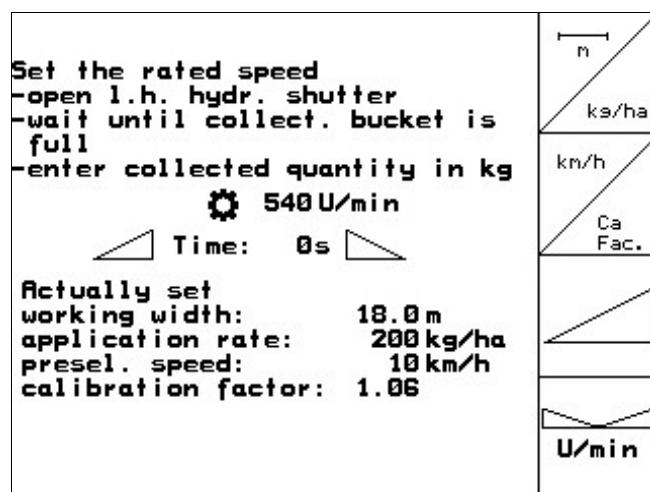


Fig. 34

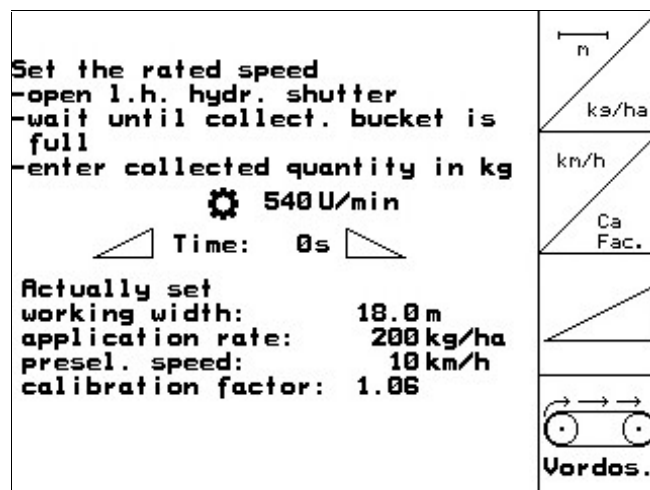
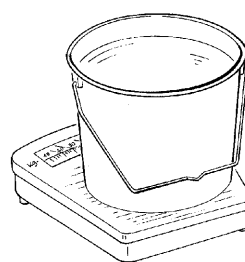


Fig. 35







- Switch off spreading disc drive.
- **ZA-M Tronic:** Switch off PTO shaft.
- **ZA-M Hydro:** Spreading discs switch off automatically.

Weigh collected fertiliser (mind the weight of the bucket).



The used balance must weigh accurately. Inaccuracies would deviations from the actually applicated spread rate.

- Enter the value for the weighed amount of fertiliser in kg.
- The new calibration factor is shown and confirmed with  or rejected with  (Fig. 36).

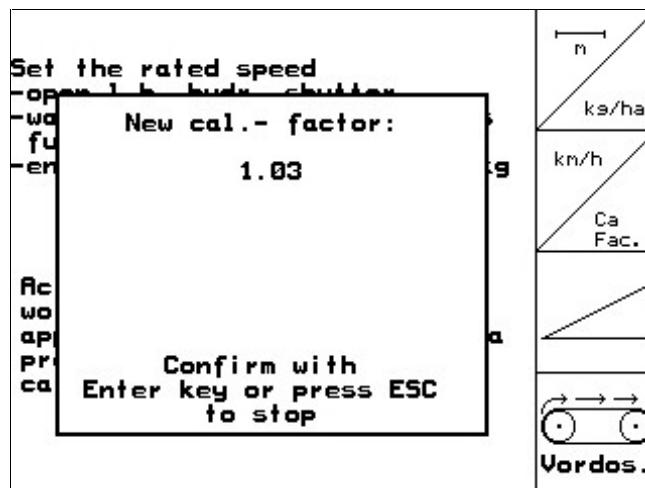


Fig. 36

5.2.4.2 Automatic determination of the calibration factor on spreaders with weighing system

The automatic fertiliser calibration is carried out whilst spreading, whereby at least

- 200 kg (for ZA-M)
- 500 kg (for ZG-B)

of fertiliser should be spread.

Before starting the automatic fertiliser calibration:

- proceed as follows in the menu fertiliser calibration:
 - Check working width / enter.
 - Check application rate/ enter.
 - Check intended speed / enter.
 - In order to determine the calibration factor, enter the exact calibration factor, e.g. 1.00.
- To enter the calibration factor it is possible to
 - Take the calibration factor directly from the setting chart or
 - take experience value



Calibration factor realistical (0.7-1.4):

- about 0.7 for urea
- about 1.0 for mineral fertilizer CAN
- about 1.4 for fine, heaviness PK-fertilizer

or

- carry out stationary calibration (para.5.2.4.1).



The determination of the calibration factor can only be determined with the balance in neutral position.



If the symbol appears in the display the spreader is not in neutral position.

- Select operation menu.

- Start automatic calibration.

Start spreading in the usual way and spread min. 200 kg / 500 kg fertiliser.

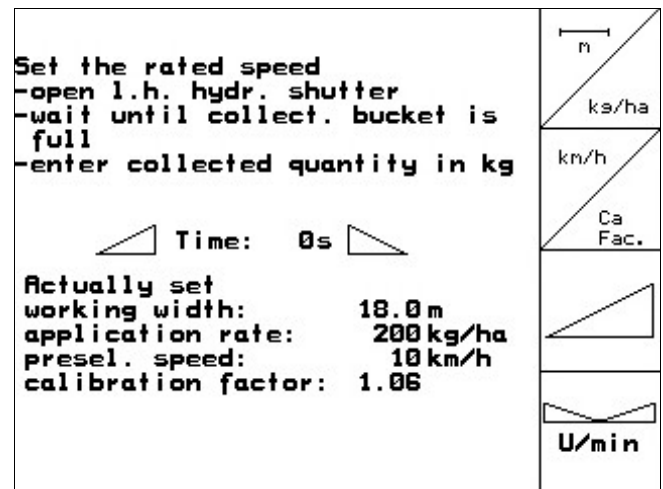


Fig. 37

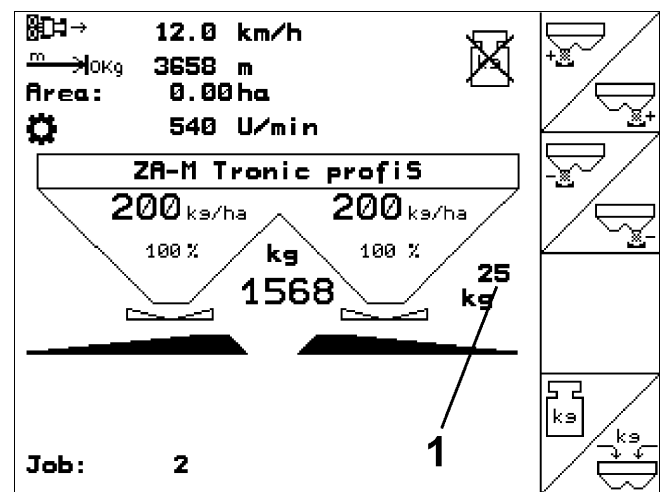




Fig. 38



- The amount of fertiliser spread will be shown in the operational menu (Fig. 38/1).
- When min. 200 kg / 500 kg fertiliser have been spread close the hydraulic shutter and stop.



finish automatic calibration .

- The new calibration factor is shown and confirmed with  or rejected with  (Fig. 39).



During operation a calibration travel can be carried out at any time in order to optimise the calibration factor.

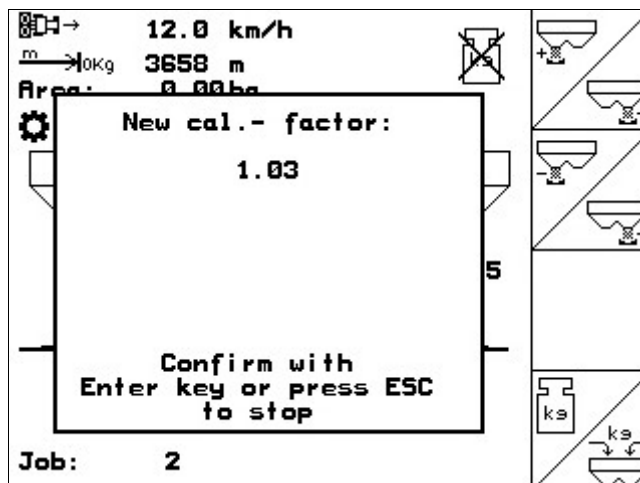


Fig. 39

5.2.4.3 Online-fertiliser calibration

Only for **ZA-M profiS**.

Menu machine data page three .



Mode Online-calibration. If a permanent fertiliser calibration during the spreading operation is intended, switch on the online-fertiliser calibration (Fig. 40/1).

• Online-calibration switched on:



Before commencing spreading proceed as follows in the menu fertiliser calibration:

- Check working width / enter.
- Check application rate / enter.
- Check intended speed / enter.
- In order to determine the calibration factor, enter the exact calibration factor, e.g. 1.00.

- To enter the calibration factor it is possible to
 - Take the calibration factor directly from the setting chart or
 - take experience value



Calibration factor realistical (0.7-1.4):

- about 0.7 for urea
- about 1.0 for mineral fertilizer CAN
- about 1.4 for fine, heaviness PK-fertilizer

- Before commencing spreading operation actuate in operation menu (Fig. 42) to start the online calibration.



The online calibration can only be started with the balance in rest position and with more than 200 kg hopper contents.

Pre-meter the:	Off	
Slug pellets:	Off	
Counterbal.the sp.		 0 kg
Online-bala.:	Off	Online Cal.

Fig. 40

Set the rated speed	
-open l.h. hydr. shutter	kg/ha
-wait until collect. bucket is full	kn/h
-enter collected quantity in kg	Ca Fac.
Time: 0s	
Actually set	
working width: 18.0 m	
application rate: 200 kg/ha	
presel. speed: 10 km/h	
calibration factor: 1.06	

Fig. 41

	12.0 km/h	
	3650 m	
	Area: 0.00 ha	
	540 U/min	
ZA-M Tronic profiS		
200 kg/ha	200 kg/ha	
100 %	100 %	
Ca 1.03	1568 kg	
1	25 kg	
Job: 2		

Fig. 42



If the symbol , appears in the display the spreader is not in neutral position.

The calibration value is continuously re-calculated via the online weighing and the theoretical spread amount. The required shutter position is online adapted.


During online calibration the following is shown in the operation menu:

- Actual calibration factor (Fig. 43/1).
- Spread amount since the last online calibration (Fig. 43/2).



Operation in hilly terrain or in undulated terrain:

In this case the online calibration can be

switched off whilst travelling  (display /2 goes out). Go on spreading with the last calibration factor.



During the spreading operation the online calibration is automatically switched off if the hopper contents is less than 200 kg.

After filling (hopper contents more than 500kg) the online calibration is automatically switched on again.

• Online calibration switched off:

Fertiliser calibration according to para.5.2.4.1 or 5.2.4.2

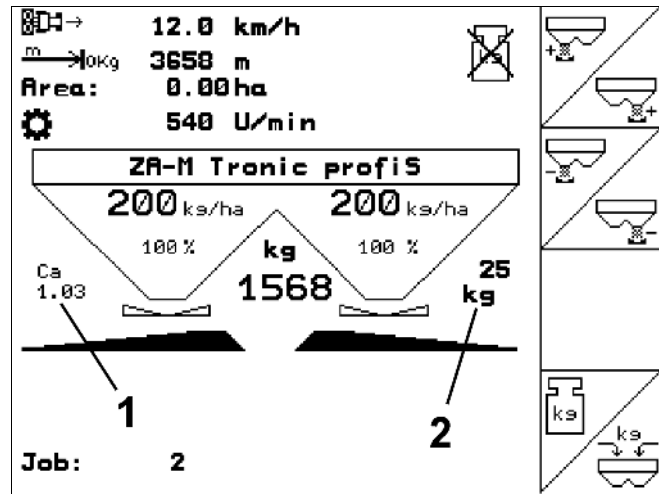


Fig. 43

5.2.4.4 ZG-B drive: Stationary calibration

- Remove both spreading discs.
- Place each one large collecting bucket underneath the fertiliser chutes.



- Check working width / enter.



- Check required amount / enter.



- Check intended speed / enter.



- Enter bulk density of fertiliser (see setting chart).



- confirm new main shutter position.



After having entered the working width, required amount, intended speed and bulk density set the recommended main shutter position (Fig. 45) on the ZG-B.



- Pre-metering until the fertiliser has reached the end of the floor belt. Double shutters open automatically.



Danger of injury by automatically closing double shutters when finishing the pre-metering procedure.



- Finish pre-metering.
- Switch on spreading disc drive: Set the tractor universal joint shaft according to the setting chart.

Start calibration:



- Open double shutter.

During the calibration procedure **AMATRON⁺** shows the period of calibration / time [s].



- Close double shutters when the collecting buckets are full.
- Weigh the collected fertiliser (mind weight of the collecting bucket).

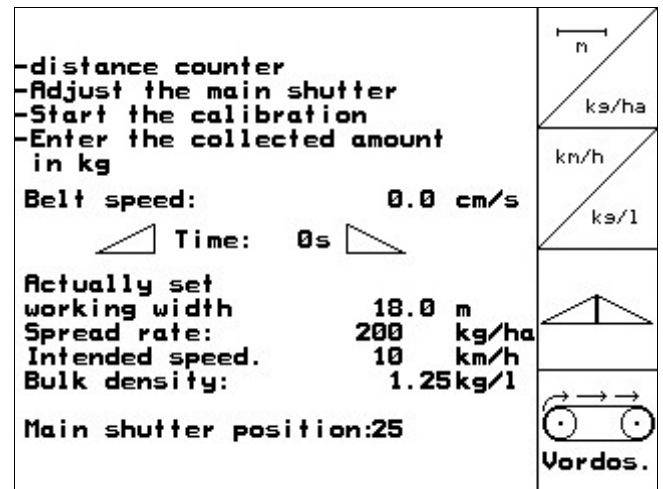


Fig. 44

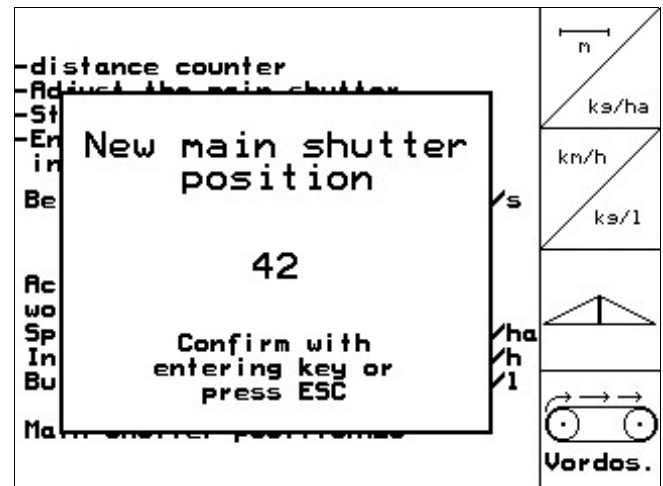
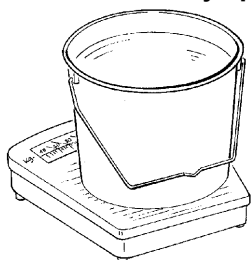


Fig. 45



The balance used should weigh accurately. Inaccuracy will cause deviations from the actually applicated spread rate.



- Enter the value for the amount of fertiliser in kg.
- **Calibration finished.** The spreading operation will now be carried out with the optimised belt speed.








If the deviation between theoretical and calculated calibration factor is too big a new main shutter setting will be determined. Repeat the calibration test with this setting.

5.2.4.5 ZG-B drive: calibration during travel




Only ZG-B drive with weighing technology!

-  Check working width / enter
-  Check required amount / enter.
-  Check intended speed / enter.
-  Enter bulk density of fertiliser (please refer to setting chart).
-  Confirm new main shutter position.




After having entered the working width, required amount, intended speed and bulk density set the recommended main shutter position (Fig. 47) on the ZG-B .

-  Pre-metering until the fertiliser has reached the end of the floor belt. Double shutters open automatically.






Danger of injury by automatically closing double shutters when finishing the pre-metering procedure.

-  Finish pre-metering.

Start calibration:

The automatic fertiliser calibration is carried out whilst the spreading operation whereby min. 500 kg fertiliser should be spread.

Switch on spreading disc drive: Set the tractor universal joint shaft according to the setting chart.

-  Select operation menu.
-  Start automatic calibration.
-  Open and access both hydraulic shutters.
- Start spreading as usual.
- The operation menu shows the applied amount of fertiliser (Fig. 48/1).

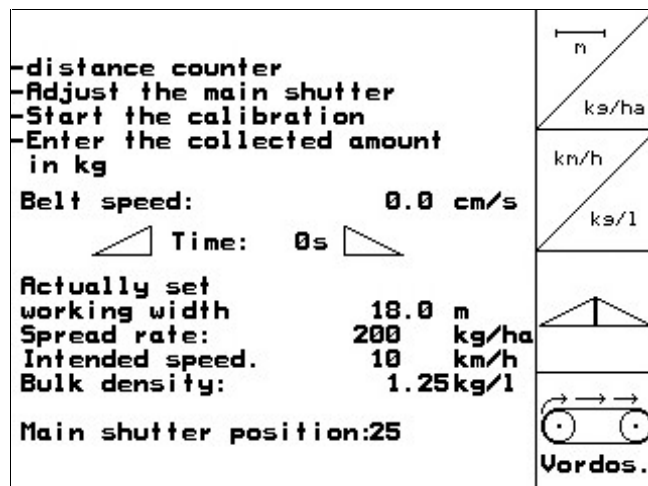


Fig. 46

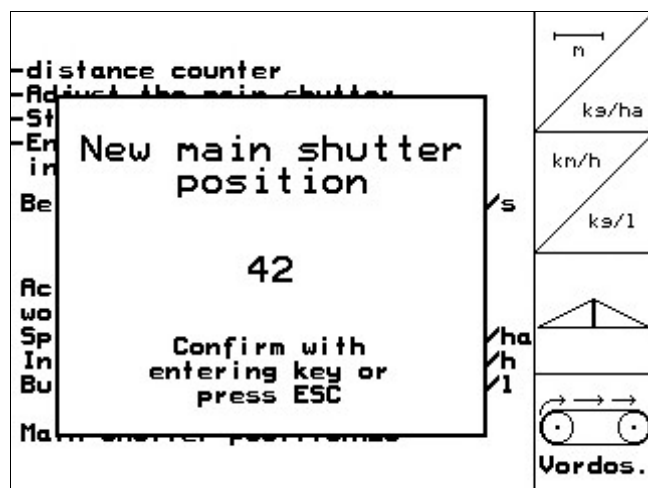


Fig. 47

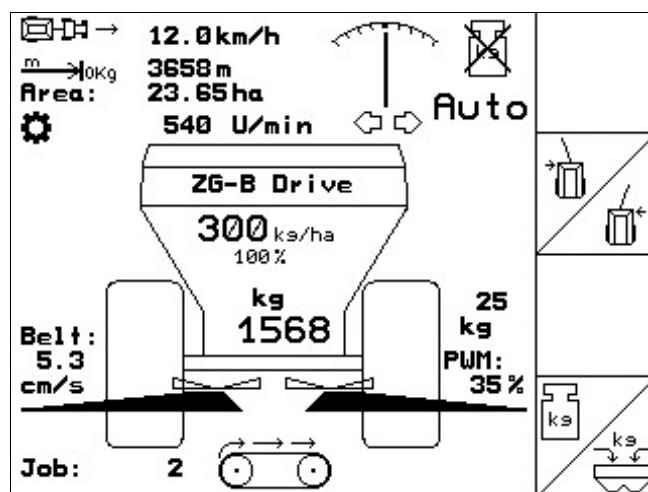


Fig. 48



- Spread at least 500 kg fertiliser.



- Close both double shutters and stop.

Calibration finished: The spreading operation will now be carried out with the optimised belt speed.



If the deviation between theoretical and calculated calibration factor is too big a new main shutter setting will be determined. Repeat the calibration test with this setting.



At the beginning and at the end of the calibration procedure the tractor with spreader should be aligned in level/horizontal position.



The calibration factor can only be started and finished in the neutral position.



If the symbol , appears on the display the spreader is not in neutral position.

5.2.4.6 Calibrating slug pellets



Not for ZG-B!



Before spreading slug pellets implicitly carry out a spread rate check for both outlet openings.

For spreading slug pellets proceed in menu machine

data page 3 as follows:



- Switch on slug pellets (Fig. 49).

• Calibration of slug pellets for the left hand outlet opening:

- Fill a sufficient amount of slug pellets into the hopper.
- Remove the left hand spreading disc.
- Place the collecting bucket underneath the left hand outlet opening.



Main menu actuate in order to get into the menu slug pellets calibration.

Pre-meter the:	Off	
Slug pellets:	Off	
Counterbal.the sp.		
Online-bala.:	Off	0 kg
		Online Cal.

Fig. 49

Machine.type: ZA-M Comfort	Job
Job No.: 2	
Des.quantity: 200 kg/ha	Sett.
Cal. factor: 1.06	Machine
Working width: 18.0 m	
Preselected speed: 10 km/h	Setup
Help	

Fig. 50

- Check working width / enter.
- Check required amount / enter.
- Check intended speed / enter.

Take the required shutter position for the entered values from the setting chart.

-Shutter via the keys +10 Move impulses and -10 Impulses to the desired position -the spread rate can be checked with the aid of the hectare counter		m
Actually set		kg/ha
Working width: 18.0 m		working speed
Spread rate: 15 kg/ha		+10 l.h.
working speed: 10.0 km/h		+10 r.h.
Impulses shutter l.h.: 321		-10 l.h.
Impulses shutter r.h.: 322		-10 r.h.

Fig. 51



- Press key until the reading (Fig. 52/1) of the left hand metering shutter shows the required shutter position.

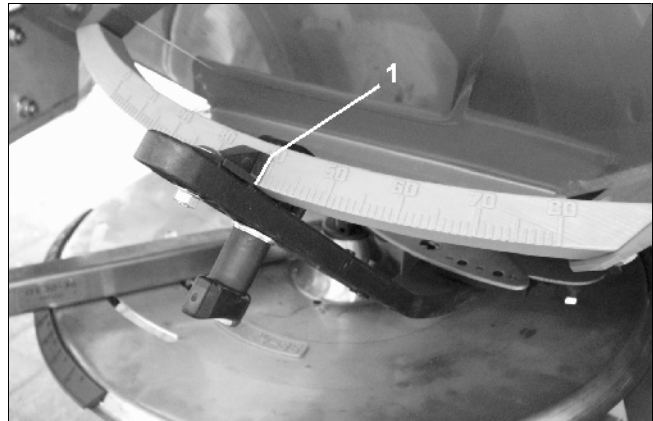


Fig. 52

- via main menu
- change into the operation menu (Fig. 53).
- Delete daily data in the started order (Fig. 53).

Job No.:	25		Name
Name:	Amazone		Note
Note:	instruction		kg/ha
Des. quantity:	200 kg/ha		Start Job
Finished area:	0.00 ha		Delete Job
Hours:	0.0 h		Delete the data of day
Average:	0.00 ha/h		
Quant. spread:	0 kg		
ha/day:	0.00 ha		
Amount/day:	0 kg		
Hours/day:	0.0 h		
		2/10	

Fig. 53

- change into the operation menu (Fig. 54).
- Switch on spreading disc drive.
 - **ZA-M Tronic:** set the tractor universal joint shaft according to the setting chart.
- **ZA-M Hydro:**
- open left hand hydraulic shutter:
 - **ZA-M Tronic:** actuate control unit
 - **ZA-M Hydro/Comfort:**

	12.0 km/h		
	3658 m		
Area:	0.00 ha		
	540 U/min		
ZA-M Tronic profiS <div style="display: flex; justify-content: space-around;"> <div> 200 kg/ha 100 % Ca 1.03 </div> <div> 1568 kg </div> <div> 200 kg/ha 100 % 25 kg </div> </div>			
 Job:			
			Limiter

Fig. 54

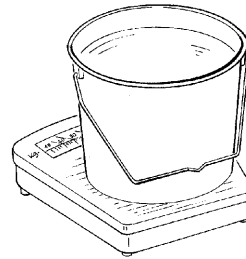
The theoretic spread area is shown in the operation menu. If about 1 ha has been spread theoretically, close the left hand hydraulic shutter.


- **ZA-M Tronic:** actuate control unit
- **ZA-M Hydro/Comfort:**
- Switch off spreading disc drive.

- Weigh collected slug pellets (mind weight of the collecting bucket)



The balance used should weigh accurately. Inaccuracy will cause deviations from the actually applied spread rate.



-  Take from the order the theoretical spread amount of slug pellets and compare with the weighed amount.
- Spread amount (from order) is **bigger** than the weighed amount:



- Actuate key to increase the spread rate.
- Spread amount (from order) is **smaller** than the weighed amount:



- Actuate key to reduce the spread rate.
- **Calibration of slug pellets for the right hand outlet opening:**

Proceed for the right hand side in the same way as for the calibration of slug pellets for the left hand outlet opening.



When spreading slug pellets implicitly ensure a constant forward speed (as entered on **AMATRON⁺**), as when spreading slug pellets the electric setting motors do not control in relation to the speed.



In the operation menu the symbol "slug" shows that in the menu "spreading slug pellets" has been selected.



5.2.5 Service Setup

Page 1 of Setup-Menu (Fig. 55).

- Diagnosis computer output (for customer service staff only).

- Diagnosis computer input (for customer service staff only).

- Enter simulated speed (allows to go on spreading in spite of a defect distance sensor) (see para. 10.3).

- Settings display (Fig. 62):

- Page 1 basic data (Fig. 56):

- Selection machine type.
- Weigh cell existing On (ZA-M *profiS*) /Off.
- Calibration weigh cell (see para. 5.2.5.1).

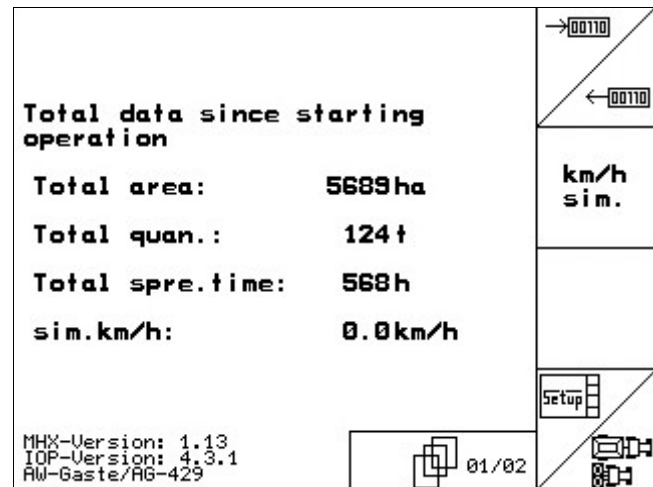


Fig. 55

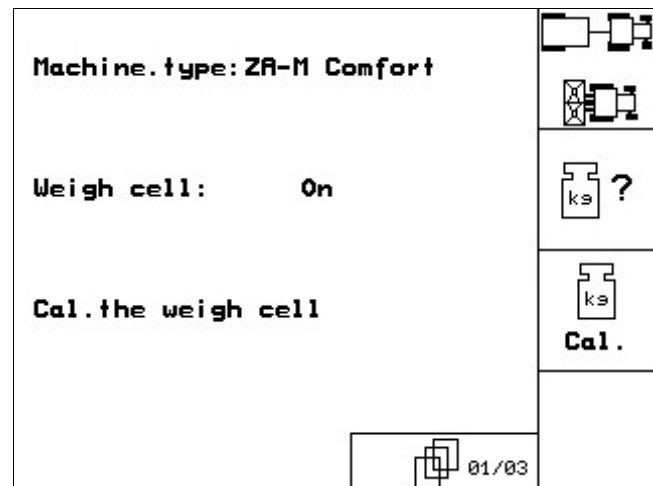








Fig. 56

-  Page 2  Basic data (Fig. 57):
 -  Basic setting of right hand shutter (see para. 8.2).
 -  Basic setting of left hand shutter (see para.8.2).
 -  Limiter existing Left/Right/ Off
 -  Control factor (for service staff only, only ZA-M Hydro, ZG-B).

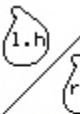


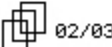






Electr. shutter basic position		
		
Limiter:	off	Limiter
Control fact	1.00	
		

Fig. 57

-  Page 3  Basic data (Fig. 58):
 -  Display belt speed in operation menu On / Off.
 -  Trail-Tron-draw bar for ZG-B existing On / Off.
 -  Trail-Tron-draw bar: Deviation factor (Standard value: 8)
 -  Trail-Tron-draw bar: Control factor (Standard value: 1.25).





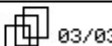



Display belt-speed:	On	
Trail Tron:	On	
deviation fac. Trail Tron:	8	
Control fac. Trail Tron:	1.25	
		

Fig. 58

-  Page 2  of Set Up menu (Fig. 59):

-  Reset machine computer to factory setting. All entered and accumulated data (orders, machine data, calibration values, Set Up data) will get lost.

Beforehand write down the following data:

- Parameter 1 and 2 of balance.
- Impulses shutter basic setting left and right hand.
- Impulses per 100 m
- Impulses per rev. PTO shaft

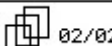

Attention, "RESET" of computer deletes all data and resets on its factory sett	RESET Maschinen-rechner
Before the "Reset" please write down the following values:	
-Parameter 1 and 2 of the bala. -Shutter basic position left and right hand side -Impulses per 100m -Impulses per rev./PTO	
	

Fig. 59



5.2.5.1 Weigh cell counterbalancing / calibration

When supplied the weigh cell has been counterbalanced and calibrated in the factory. Should, however deviations be noticed between the actual and the indicated spread rate or the hopper contents the weigh cell requires a new calibration.

See Menu Service Setup  Basic data page 1



Counterbalance the weigh cell after the fitting of special optional equipment.

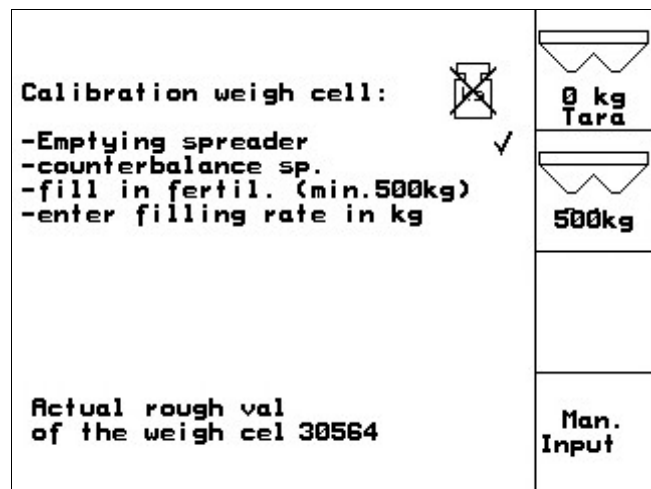





Fig. 60


- Empty fertiliser spreader completely (para.5.2.1, Page one ) , wait until the symbol  extinguishes..



→ Confirm.


- Park the tractor with mounted spreader on level ground, wait until symbol  extinguishes.



If the symbol  appears on the display, the tractor is not in neutral position.



→ Confirm → **Spreader is counterbalanced.**

- Fill an accurately weighed amount of fertiliser of min. 500 kg into the hopper and wait until the symbol  extinguishes.



Confirm.





- Enter the weighed amount of fertiliser in kg into **AMATRON⁺** → **The spreader is calibrated**



To recheck compare the display in the operation menu with the amount of fertiliser filled into the hopper.

5.2.6 Terminal Setup

To change the settings of the display, simultaneously press

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

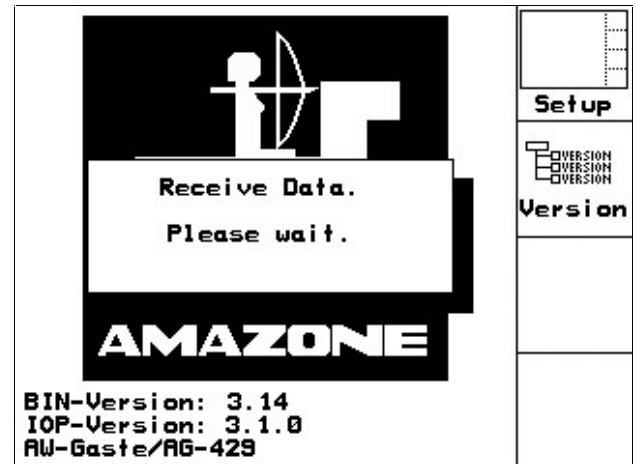












Fig. 61

page 1  of the Terminal Setup

Via the entering "Display setting" you can change:

- the contrast via the function icons  increase contrast or  reduce contrast
- the brightness via the function icons  increase brightness or  reduce brightness
-  Push button click sound On / Off
- inverting the display black $\leftarrow \rightarrow$ white via the function icon 
- the language of the operator terminal via the function icon 
- deletion of the stored data via the function icon 
-  Leave menu Terminal Setup



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

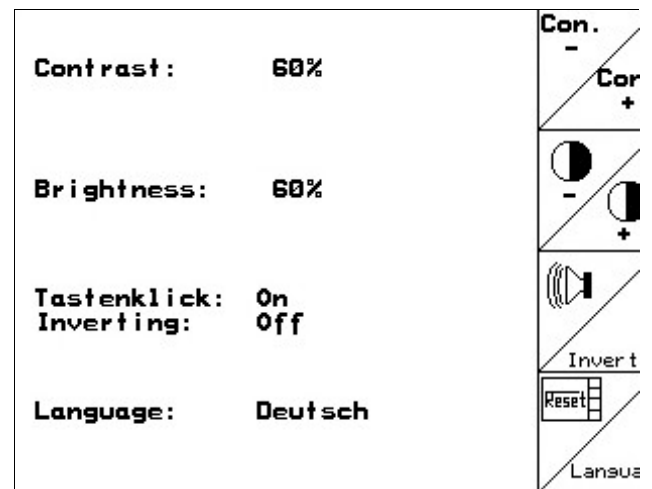


Fig. 62

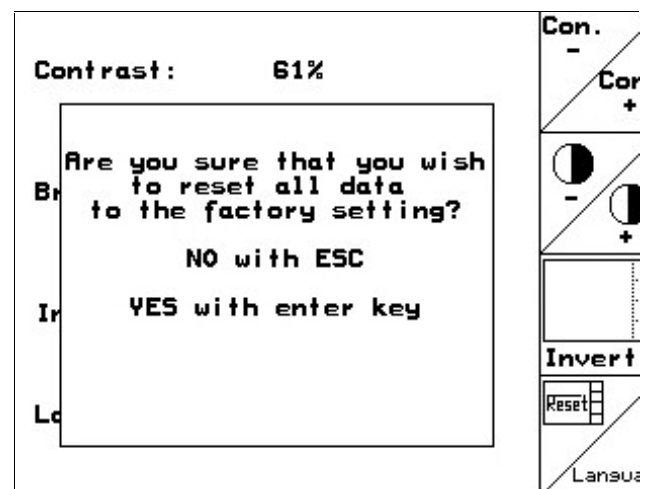


Fig. 63



Input of time



Input of date



Input of data transfer baud speed

Time	10 : 12 : 53																															
Date:	04 . 01 . 2006	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr> <tr><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td></tr> <tr><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> </table>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	2	3	4	5																												
6	7	8	9	10																												
11	12	13	14	15																												
16	17	18	19	20																												
21	22	23	24	25																												
26	27	28	29	30																												
RS232 :	57600 Baud (nicht Prog.-Modus)	 RS232																														
		02/03																														

Fig. 64



Deletion of programme:



1. Selection of programme.




2. Deletion of programme

Please select the program via the "up" and "down" keys		
		delete
Program:	SPR36DE	
Size:	78kByte	
Empty memory:	448kByte	
		03/03

Fig. 65

5.2.7 Mobile test kit

Please operate the mobile test kit according to the instruction manual: Mobile fertiliser test kit and evaluate the lateral distribution with the aid of the menu mobile test kit (please see instruction manual mobile test kit).

-  Start the menu mobile test kit from the main menu.







Machine.type: ZA-M Tronic		Job
Job No.:	1	
Des.quantity:	200 kg/ha	Cal.
Cal. factor:	1.06	Machine
Working width:	18.0 m	
Preselected speed:	10 km/h	
Help		
		Setup

Fig. 66

-  Enter the number of graduation marks for the fertiliser level I.
-  Enter the number of graduation marks for the fertiliser level II.
-  Enter the number of graduation marks for the fertiliser level III.
-  Enter the number of graduation marks for the fertiliser level IV.
- Correct the selected spreading vane positions by the calculated spreading vane adjustment positions.









I	II	III	IV	
				
10.0	9.0	9.0	9.5	
new paddle position:				
short paddle:				0.5
long paddle:				-1.5

Fig. 67



6. Operation in the field

Spreaders with weighing technology: Counterbalance the spreader (para.5.2.5.1). before initial use of **AMATRON⁺** and after fitting special optional equipment.



Ensure that **AMATRON⁺ is switched off during transport to the field and when travelling on public roads!**

- Before spreading operation the following inputs should be carried out:
 - Enter machine data (para.5.2.1).
 - Create job and start job. (Para.5.2.2.
 - Carry out a stationary fertiliser calibration or manually enter the calibration value.

During spreading operation the spread rate can be changed at random by key pressure.



with every key pressure the spread rate is increased by the quantity step (para.5.2.1) on both sides (e.g. +10%).



Reset spread rate on to 100% on both sides.



with every key pressure the spread rate is reduced by the quantity step (para.5.2.1) on both sides (e.g. -10%).

The operation menu shows the different operations procedures during spreading.



- Hydraulic shutter closed



- Normal spreading

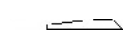


- Boundary spreading

ZA-M Hydro:



- One part width section switched off



- Pre-selection: Switch off one part width section



- Two part width sections switched off



- Pre-selection: Switch off two part width sections

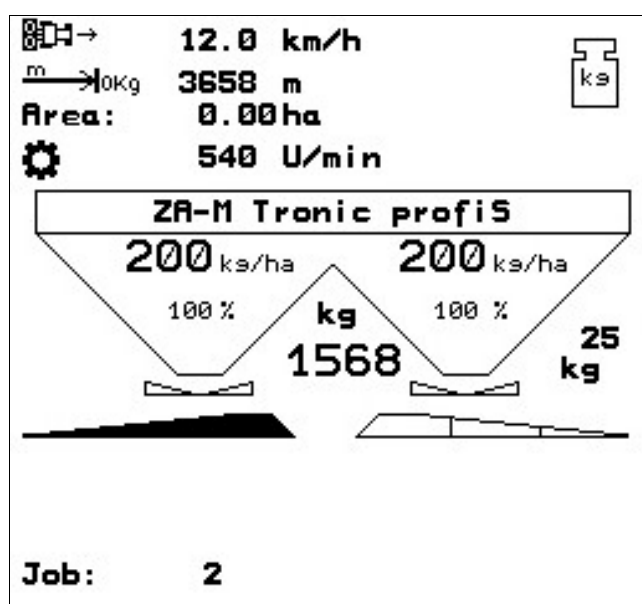
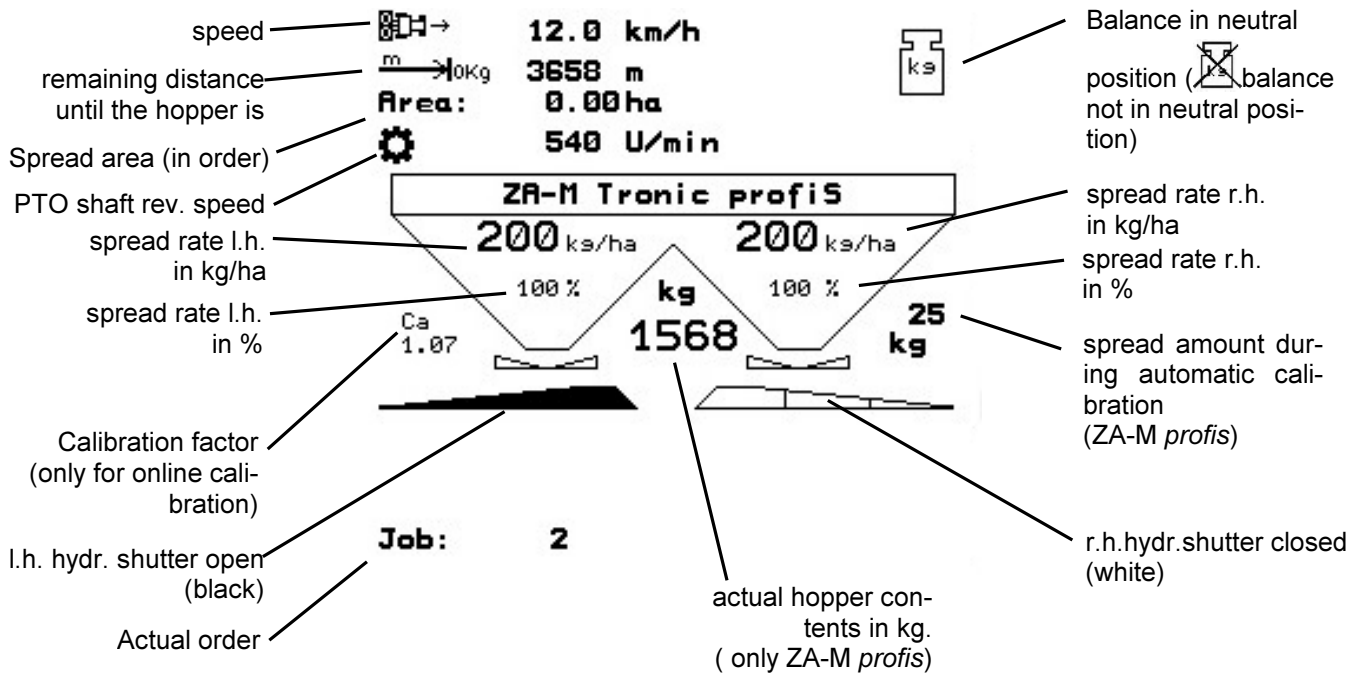


Fig. 68

6.1 ZA-M Tronic

6.1.1 Display operation menu ZA-M Tronic



6.1.2 Operation procedure

- switch on **AMATRON⁺**
 - select operation menu.
 - Set the PTO shaft rev. speed.
 - Start driving and open the hydraulic shutter with the aid of the hydraulic tractor control unit.
 - When the spreader is equipped with weighing system
 - a calibration travel can be started or
 - Online-calibration can be carried out (switch on menu machine data).
 - During the spreading operation **AMATRON⁺** shows the operation menu. From here all settings required for the spreading operation are carried out.
 - The determined data are stored in relation to the started order.
- When operation has been finished:**
- Close the hydraulic shutter with the aid of the hydraulic tractor control unit.
 - Switch off PTO shaft.
 - Switch off **AMATRON⁺**



6.1.3 Keypad layout operation menu ZA-M Tronic



increase spread rate left hand side by quantity step (e.g.:10%)



increase spread rate right hand side by quantity step (e.g.:10%)



reduce spread rate left hand side by quantity step (e.g.:10%)



reduce spread rate right hand side by quantity step (e.g. 10 %)



fertiliser calibration ZA-M *profis* (para.5.2.3)

- Whilst travelling
- Online-fertiliser calibration



Refill fertiliser (para.6.6)

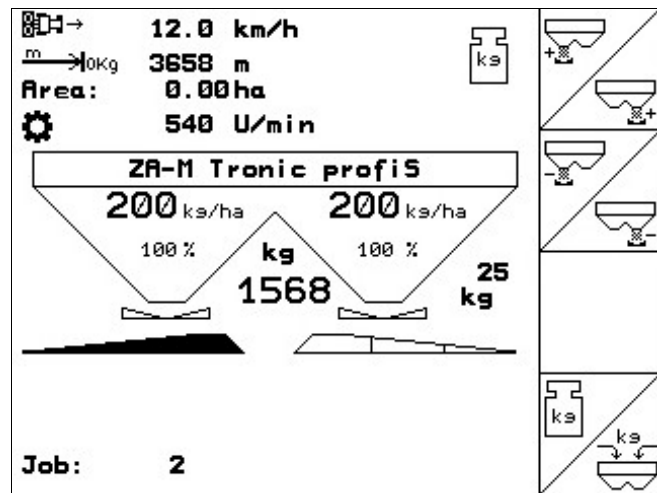


Fig. 69

6.1.4 Key layout Joystick

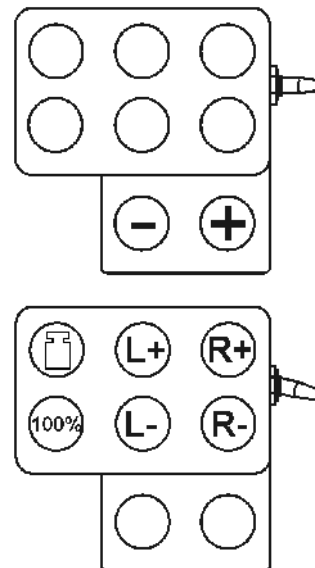
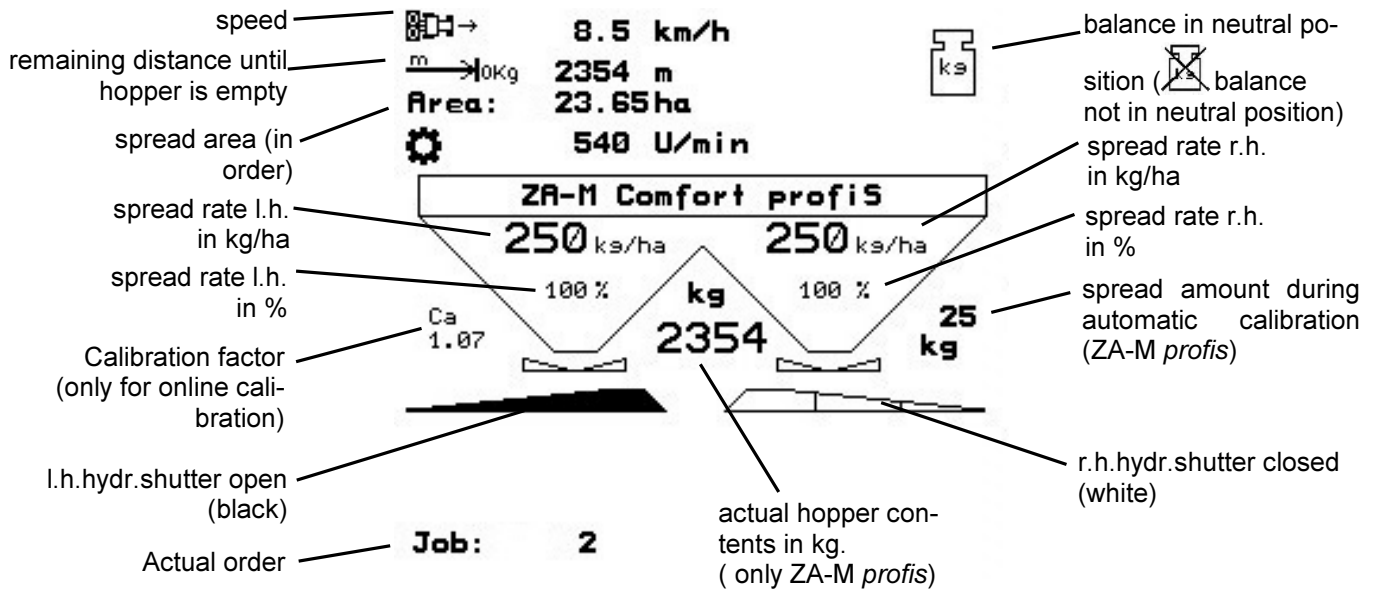


Fig. 70

6.2 ZA-M Comfort

6.2.1 Display operation menu ZA-M Comfort



6.2.2 Operation procedure

- Actuate control spool valve on tractor to provide the control block with hydraulic oil.
- **AMATRON⁺** einschalten.
- select operation menu.
- Set PTO shaft rev. speed .

- Start driving and open hydraulic shutter
- When the spreader is equipped with weighing system
 - a calibration travel can be started or
 - Online-calibration can be carried out (switch on menu machine data).
- When you start with boundary spreading:

- Switch on Limiter on **AMATRON⁺**.

When operation has been finished:

- Close hydraulic shutter.
- Switch off PTO shaft.
- Actuate the control spool valve on the tractor to Stop the hydraulic oil supply for the control block.
- switch off **AMATRON⁺**.



6.2.3 Key pad layout operation manu ZA-M Comfort

	Both hydraulic shutters open / closed
	Hydraulic shutter l.h. open / closed
	Hydraulic shutter r.h. open / closed
	Limiter lifting / lowering

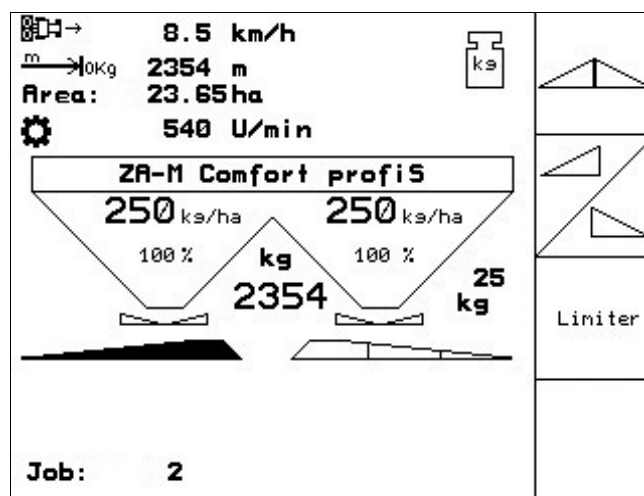


Fig. 71

Shift key pressed :

	Left hand spread rate increase by quantity step (e.g.:10%)
	Right hand spread rate increase by quantity step (e.g.:10%)
	Left hand spread rate reduction by quantity step (e.g.:10%)
	Right hand spread rate reduction by quantity step (e.g.:10%)
	Fertiliser calibration ZA-M <i>profis</i> (para.5.2.3)
	- whilst travelling
	- Online-fertiliser calibration
	Refill fertiliser (para.6.6)

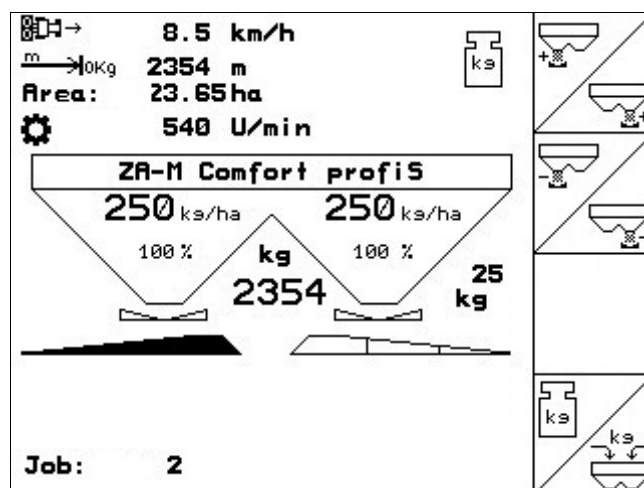


Fig. 72

6.2.4 Key layout Joystick

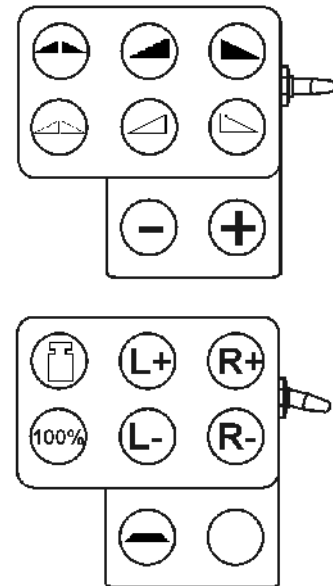
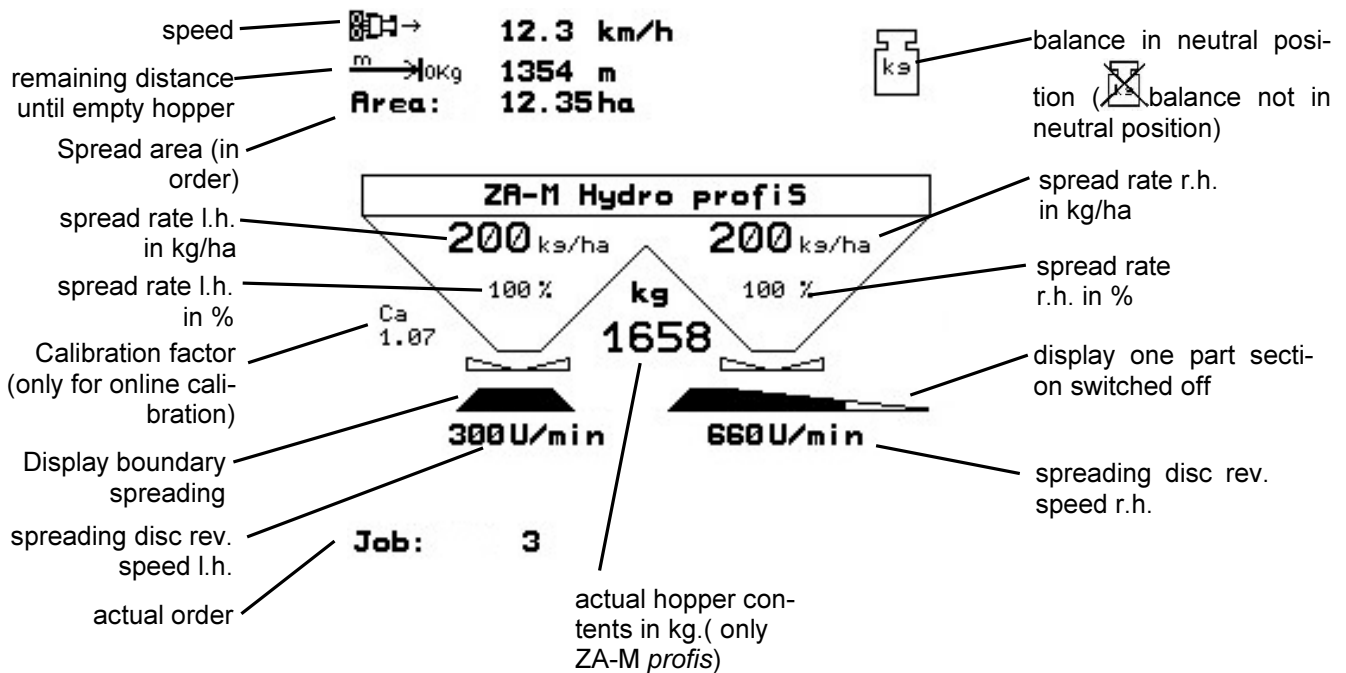


Fig. 73



6.3 ZA-M Hydro

6.3.1 Display in operation menu



6.3.2 Procedure during operation

- Actuate the control spool valve on the tractor in order to provide the control block with hydraulic oil.
- switch on **AMATRON⁺**.
- select operation menu.
- During spreading **AMATRON⁺** shows the operation menu. From here all necessary settings for the spreading operation can be carried out.
- The determined data are stored in relation to the started order.

- select operation menu.

- switch on spreading discs.

- start to drive and open hydraulic shutter

- for spreader with weighing system

- calibration travel can be started or
- Online-calibration can be carried out (switch on in the menu machine data).

- when starting with boundary spreading:

- switch on boundary spreading left / right hand side

After operation:

- close hydraulic shutter.
- switch off spreading discs.
- actuate the control spool valve on the tractor to stop the hydraulic oil supply of the control block.
- switch off **AMATRON⁺**.

6.3.3 Key pad layout operation menu ZA-M Hydro



Spreading disc drive on / off.

For safety sake: press key for 3 seconds, after the signal sounds the spreading discs start to rotate.



Both hydraulic shutters open / closed



Hydraulic shutter left hand side open / closed



Hydraulic shutter right hand side open / closed



Add part width sections left hand side (in 3 steps)



Add part width sections right hand side (in 3 steps)



Switch off part width sections left hand side (in 3 steps)



Switch off part width sections right hand side (in 3 steps)



The part width section reduction can be pre-selected when the shutters are closed.

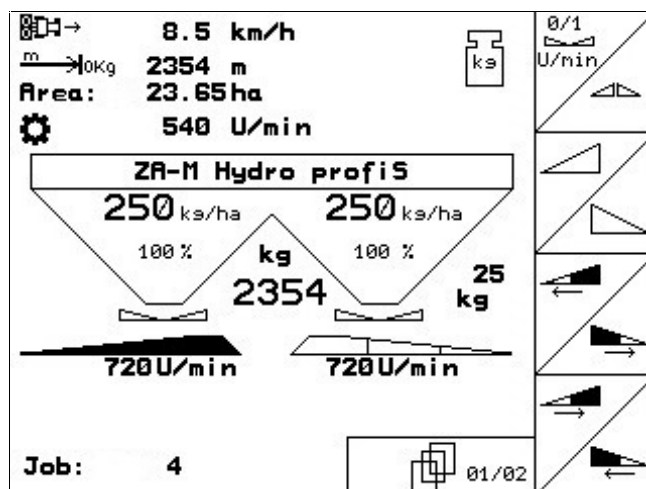


Fig. 74

Pressed shift key :



Left hand spread rate increase by quantity step (e.g.:10%)



Right hand spread rate increase by quantity step (e.g.:10%)



Left hand spread rate reduction by quantity step (e.g.:10%)



Right hand spread rate reduction by quantity step (e.g.:10%)



Boundary spreading left hand, on / off.

The boundary spreading rev. speed can be changed during the spreading operation.

Press the paging key for additional menu (para. 6.3.3.1)



Boundary spreading right hand, on / off.

The boundary spreading rev. speed can be changed during the spreading operation.

Press the paging key for additional menu (para. 6.3.3.1)

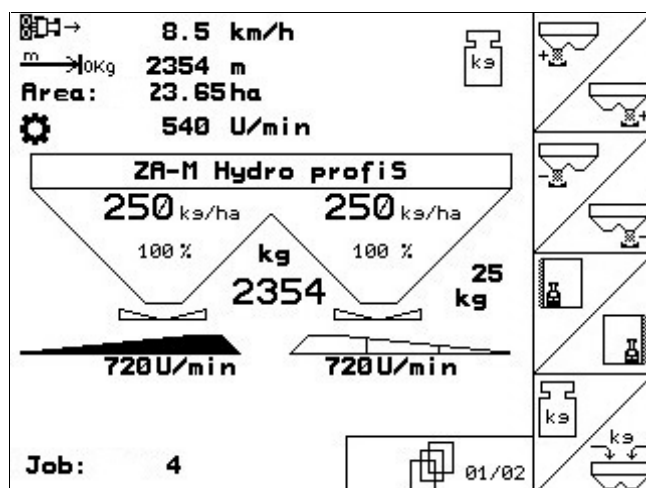


Fig. 75



Fertiliser calibration ZA-M *profis* (para.5.2.3)

- Whilst travelling
- Online-fertiliser calibration



Refill fertiliser (Kap.6.6)

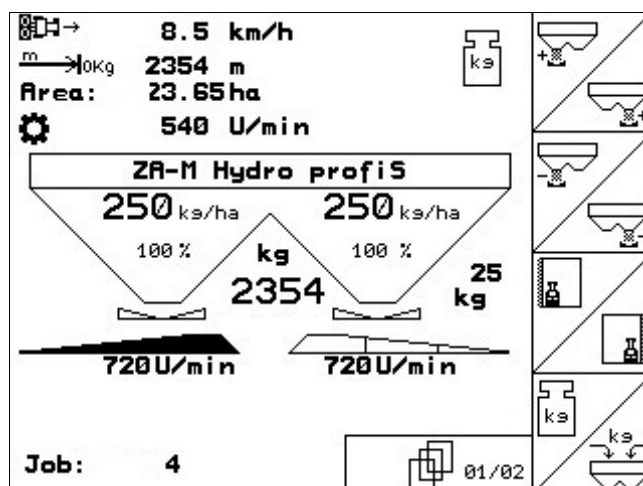


Fig. 76

6.3.3.1 Key pad lay out for sub menu boundary spreading on ZA-M Hydro



Page 2 02/02



Increase boundary spreading rev. speed left hand side



Increase boundary spreading rev. speed right hand side



Reduction boundary spreading rev. speed left hand side



Reduction boundary spreading rev. speed right hand side



With every key pressure the boundary rev. speed is increased or reduced by 10 R.P.M.

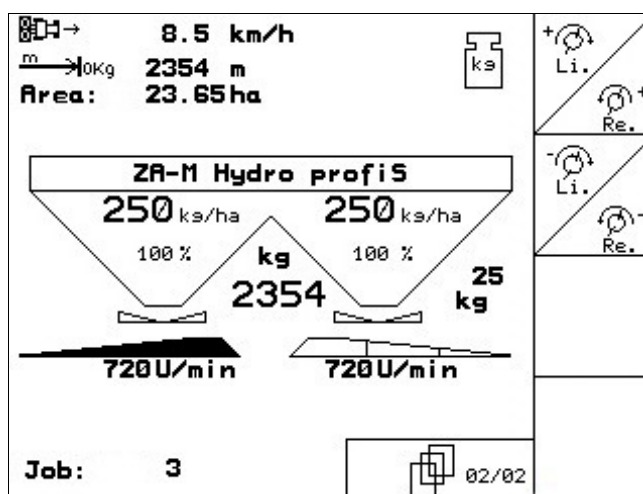


Fig. 77

6.3.4 Key layout Joystick

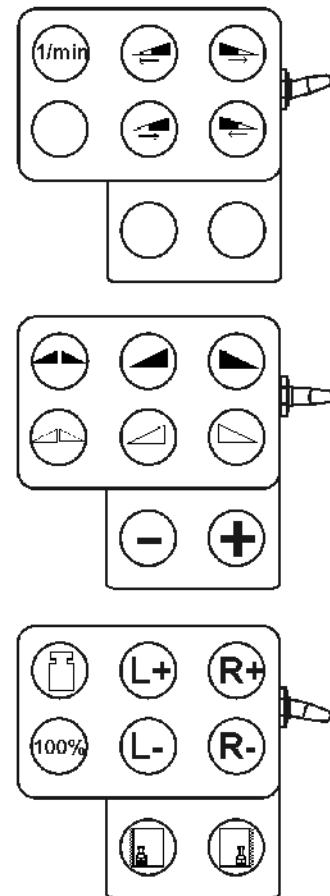
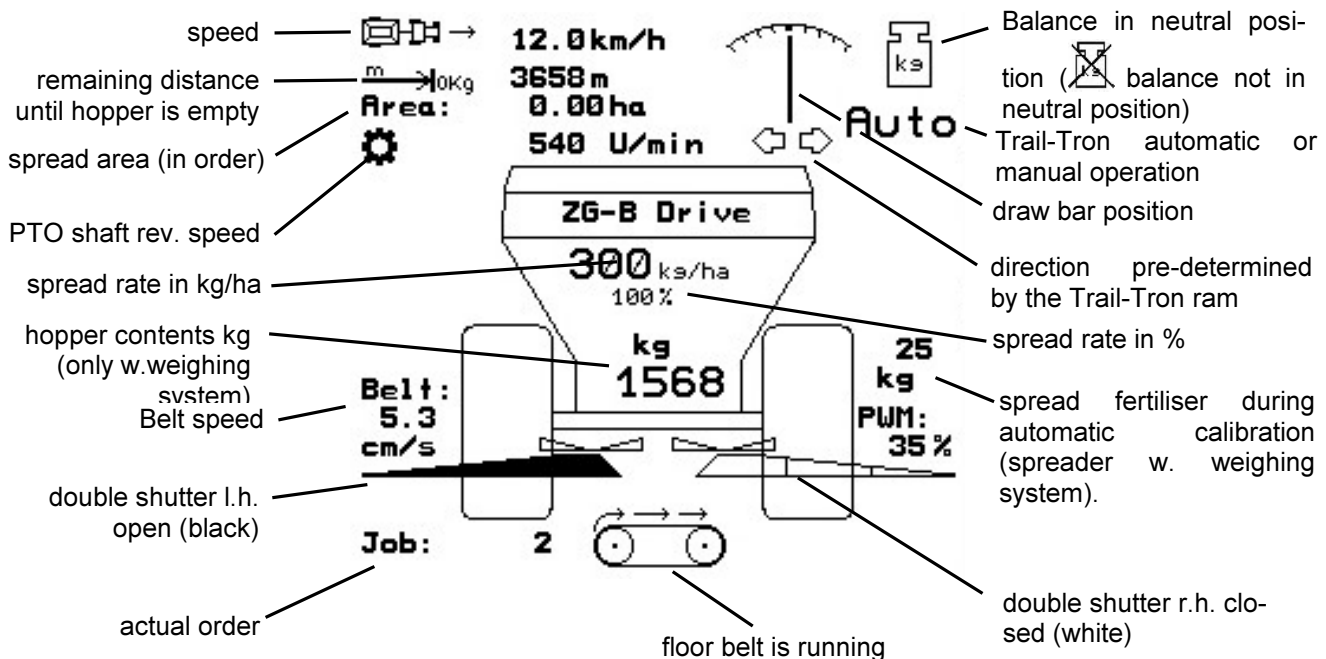


Fig. 78



6.4 ZG-B drive

6.4.1 Display operation menu ZG-B drive



6.4.2 Procedure during operation

- Actuate the control spool valve on the tractor in order to provide the control block with hydraulic oil.
- switch on **AMATRON⁺**
- select operation menu
- Set the PTO shaft speed.
- Start driving and open double shutters
- On spreaders with weighing system operation can be started with a calibration travel.
- If you start operation with boundary spreading:
 - switch on Limiter .
- During operation **AMATRON⁺** shows the operation menu. From here all settings required for the spreading operation are carried out.
- The determined date is stored in relation to the started order.



In order to ensure a faultless operation with **AMATRON⁺** ensure that the operational speed of the ZG-B drive is 4 km/h in minimum

After operation:

- Close double shutters.
- Switch off PTO shaft.
- Actuate the control spool valve on tractor in order to stop the hydraulic oil supply for the control block.
- switch off **AMATRON⁺**

6.4.3 Key pad layout ZG-B drive

	Double shutters open/closed
	Double shutter left hand side open / closed
	Double shutter right hand side open / closed
	Hopper cover open
	Hopper cover closed
	Limiter on / off

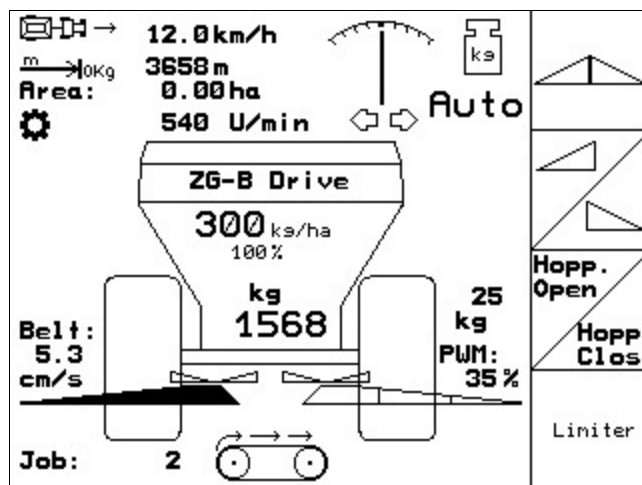


Fig. 79

Pressed shift key :

	Trail-Tron in manual / automatic operation
	Automatic operation: automatic true track following of ZG-B (e.g. when spreading in the field).
	Manual operation: Move draw bar only with (for manoeuvring).
	At forward speeds faster than 15 km/h Trail-Tron is switched off and the draw bar moves into centre position.
	Move draw bar to the left
	Move draw bar to the right
	Calibrate fertiliser (ZG-B with weighing technology, para.5.2.3)
	- Whilst travelling
	Refill fertiliser (Kap.6.6)

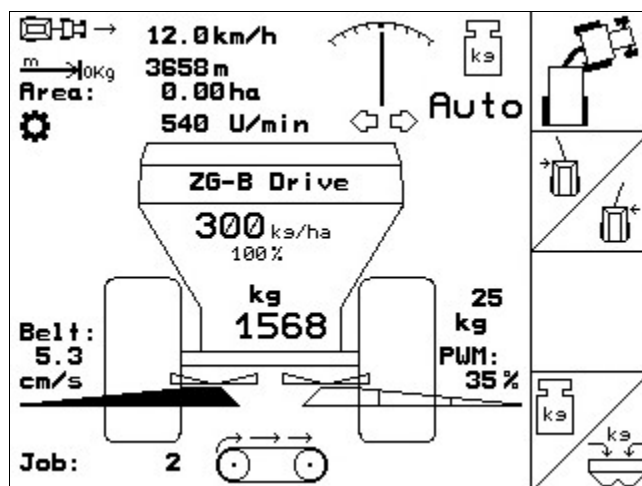


Fig. 80

6.4.4 Key layout Joystick

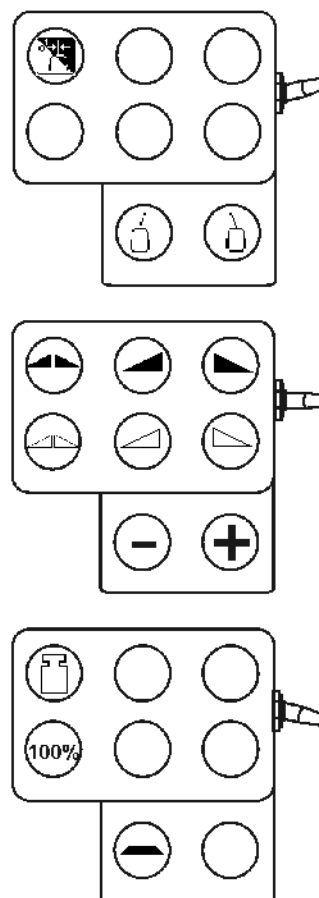
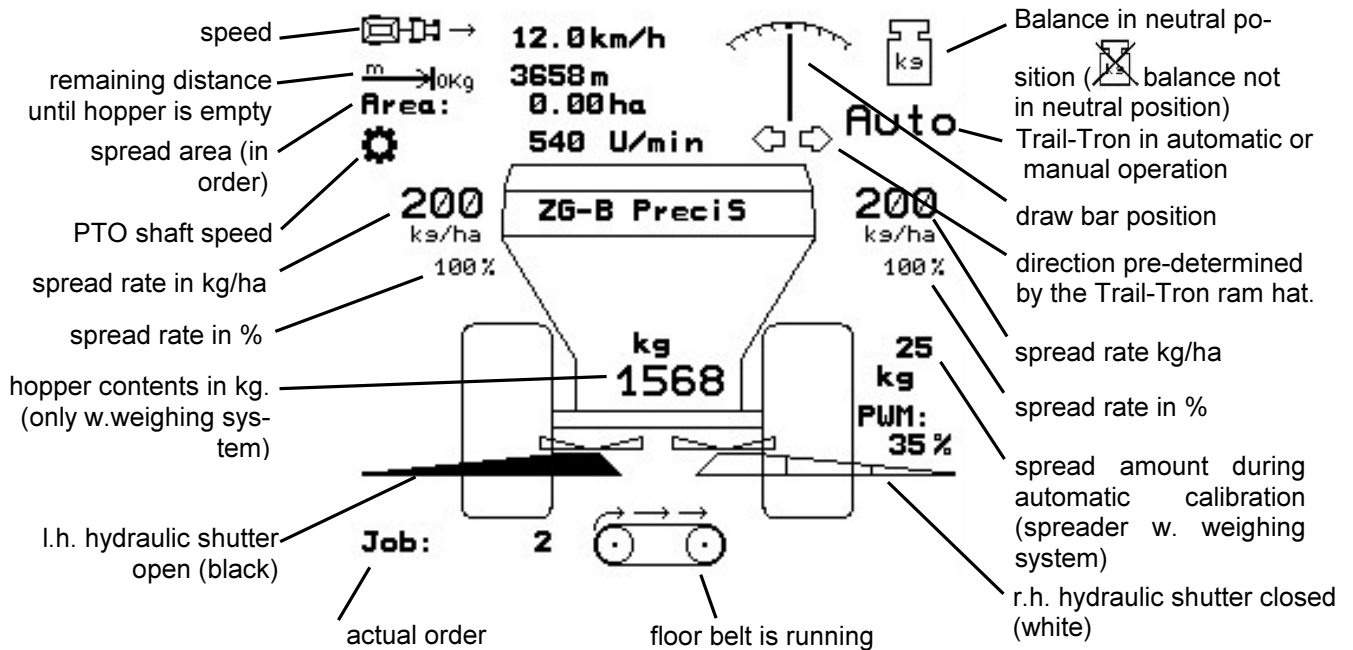


Fig. 81

6.5 ZG-B *precis*

6.5.1 Display operation menu ZG-B *precis*



6.5.2 Procedure during operation

- Actuate the control spool valve on tractor in order to provide the control block with hydraulic oil.
- switch on **AMATRON⁺**
- Select operation menu.
- Set the PTO shaft speed.
- Start driving and open double shutters
- On spreaders with weighing system operation can be started with a calibration travel.
- If you start operation with boundary spreading:
 - switch on Limiter.
- During operation **AMATRON⁺** shows the operation menu. From here all settings required for the spreading operation are carried out.
- The determined date a stored in relation to the started order.

After operation:

- close hydraulic shutters.
- Switch off PTO shaft.
- Actuate the control spool valve on tractor in order to stop the hydraulic oil supply for the control block.
- switch off **AMATRON⁺**.

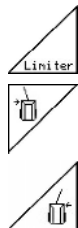


6.5.3 Key pad layout operation menu ZG-B preciS

	both hydraulic shutters open / closed
	hydraulic shutter left hand side open / closed
	Hydraulic shutter right hand side open / closed
	Trail-Tron in manual / automatic operation
Automatic operation: automatic true track following of ZG-B (e.g. when spreading in the field).	
Manual operation: Move draw bar only with (for manoeuvring)	



At forward speeds faster than 15 km/h Trail-Tron is switched off and the draw bar moves into centre position.



Limiter lift / lower



Move draw bar to the left



Move draw bar to the right

Pressed shift key :

	Left hand spread rate increase by quantity step (e.g.:10%)
	Right hand spread rate increase by quantity step (e.g.:10%)
	Left hand spread rate reduction by quantity step (e.g.:10%)
	Right hand spread rate reduction by quantity step (e.g.:10%)
	Hopper cover open
	Hopper cover closed
	Fertiliser calibration (para.5.2.3)
	- stationary
	- whilst travelling (weighing system)
	Refill fertiliser (para.6.6)

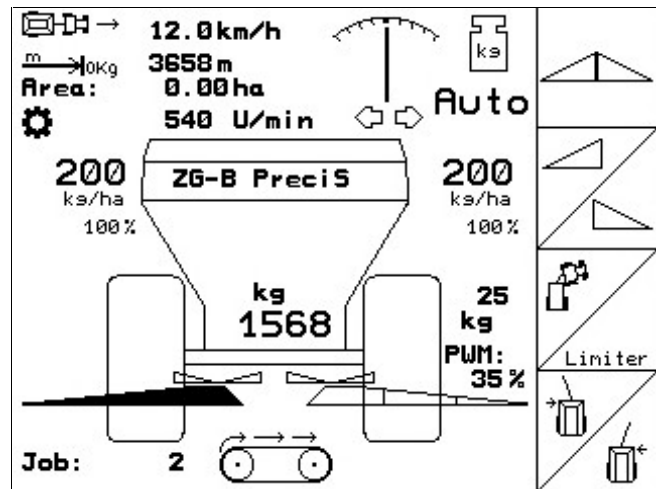


Fig. 82

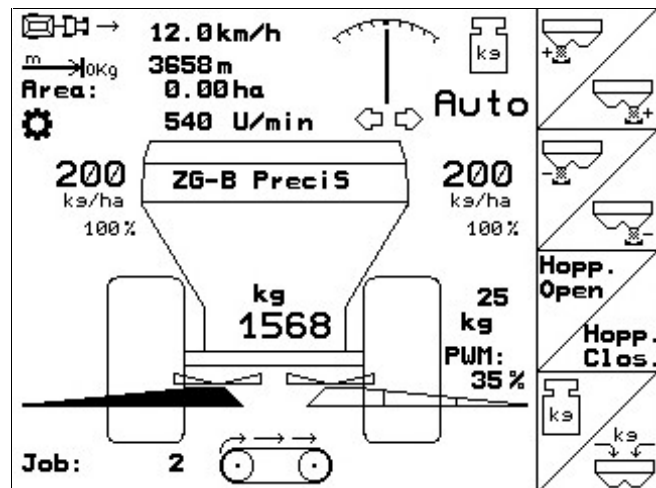


Fig. 83

6.5.4 Key layout Joystick

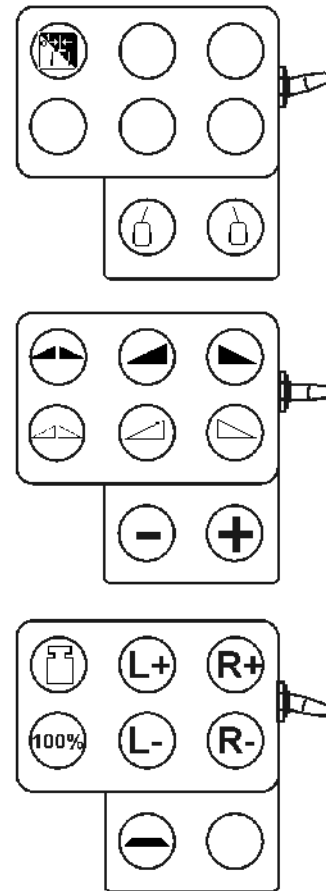


Fig. 84



6.6 Refilling fertiliser

Possible in the

- operation menu (Fig. 85).
- menu machine data page 1 (Fig. 86).

Fertiliser spreader w.o. weighing technology:



- Refilling fertiliser.
- Enter refilled fertiliser amount in kg

Fertiliser spreader with weighing technology:



- Refill fertiliser.
- Refilled fertiliser is shown in kg.
- confirm refilled amount of fertiliser (Fig. 87).

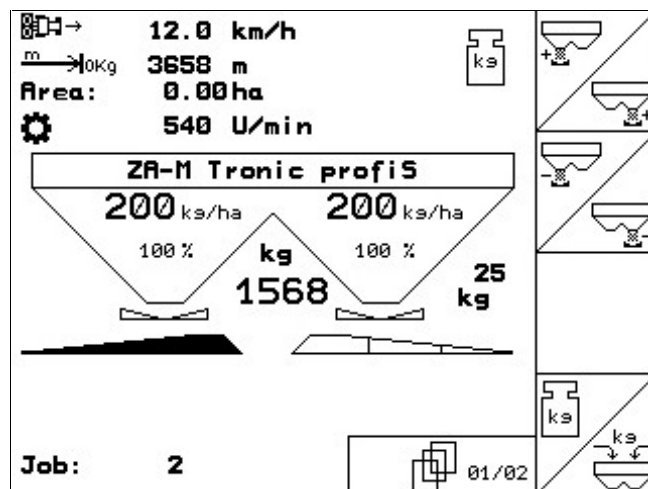


Fig. 85

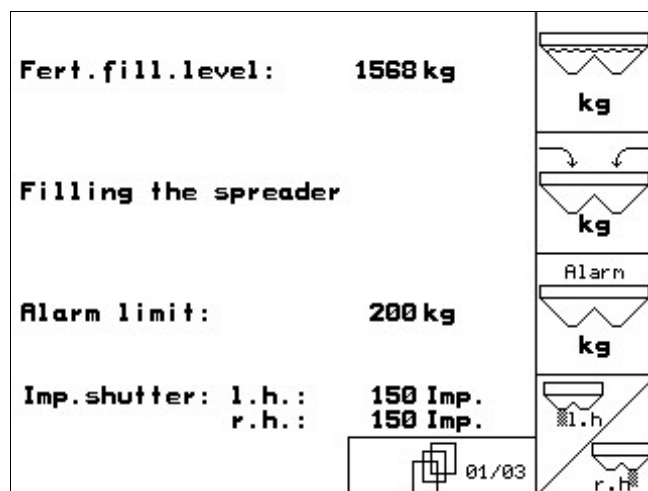


Fig. 86

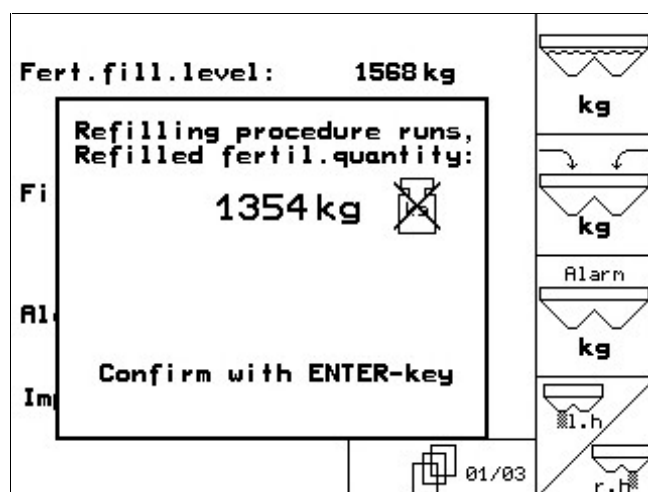


Fig. 87

7. Joystick

7.1 Fitting

Attach the joystick (Fig. 88/1) 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. 88/2).

Insert the plug (Fig. 88/3) of the joystick into the mid Sub-D socket of **AMATRON**⁺.

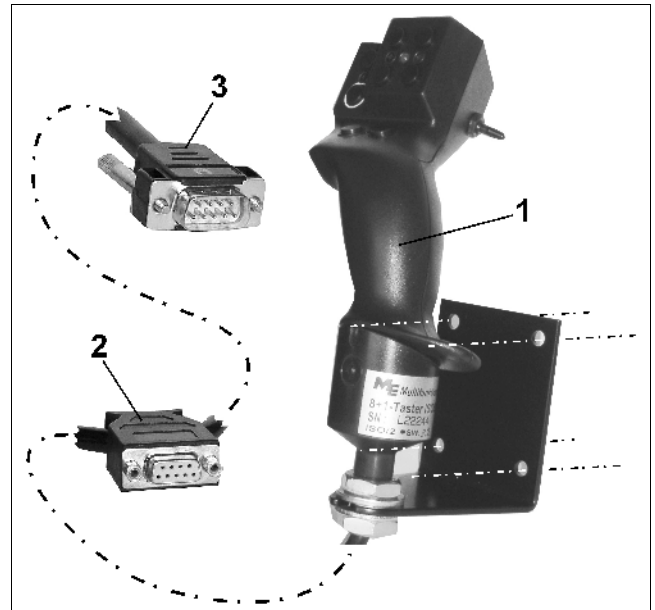





Fig. 88

7.2 Function




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. 89) provides 8 keys (1 – 8). In addition the coverage of the keys can be changed 3 times by the switch (Fig. 90/2).

As standard the switch is in the

-  mid position (Fig. 90/A) and can be moved
-  upwards (Fig. 90/B) or
-  downwards (Fig. 90/C).

The position of the switch is indicated by a LED light (Fig. 90/1).

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

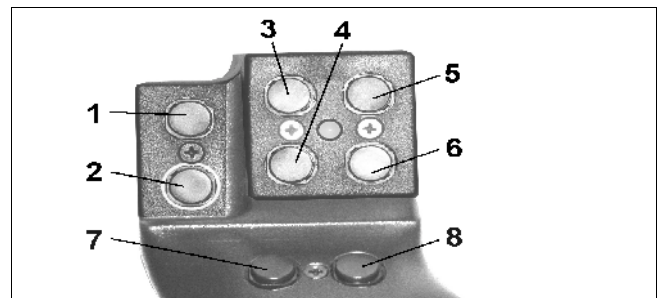


Fig. 89

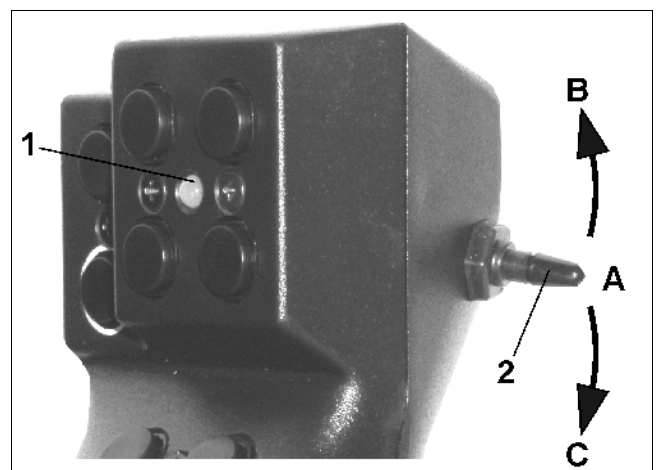


























Fig. 90



7.3 Key layout:

Key	ZA-M tronic	ZA-M comfort	ZA-M hydro	ZG-B precis	ZG-B drive
1 			Spreading disc drive on / off	Trail Tron on/off	Trail Tron on/off
2 					
3 			Add part width sections left hand side		
4 			Switch off part width sections left hand side		
5 			Add part width sections right hand side		
6 			Switch off part width sections right hand side		
7 				Draw bar ←	
8 				Draw bar →	
1 		Both hydraulic shutters open			
2 		Both hydraulic shutters closed			
3 		Hydraulic shutter left hand side open			
4 		Hydraulic shutter left hand side closed			
5 		Hydraulic shutter right hand side open			
6 		Hydraulic shutter right hand side closed			
7 	- Spread rate [%]				
8 	+ Spread rate [%]				
1 	Start calibration (Only with weighing technology!).				
2 	Spread 100%				
3 	Left + spread rate [%]				
4 	Left - spread rate [%]				
5 	Right + spread rate [%]				
6 	Right - spread rate [%]				
7 		Limiter on/off	Boundary spreading left hand	Limiter on/off	Limiter on/off
8 			Boundary spreading right hand		

8. Maintenance and cleaning

8.1 Cleaning

For ZA-M, ZG-B *precis*:

Before cleaning the fertiliser spreader open the hydraulic shutters and the electrically actuated shutters so that water and fertiliser residue can drain off.

- Open/close metering shutter – see menu machine data (para.5.2.1).
- Open/close hydraulic shutters – see operational menu (ZA-M Hydro/ZA-M Comfort/ZG-B).

8.2 Basic setting of shutters

For ZA-M, ZG-B *precis*:

The space opened by the electric metering shutters in the outlet opening has been set by the factory. (Fig. 91).

If at equal shutter slide position an uneven emptying of the two hopper tips is noticed, check the shutter slide basic position.



When actuating shutters do not reach into the hopper outlet opening. Danger of bruizing.

Set the shutter basic position for both shutters via the Service Setup:

- actuate.

page two 02/03 (Fig. 92):

- carry out shutter basic setting left hand side.
- carry out shutter basic setting right hand side.

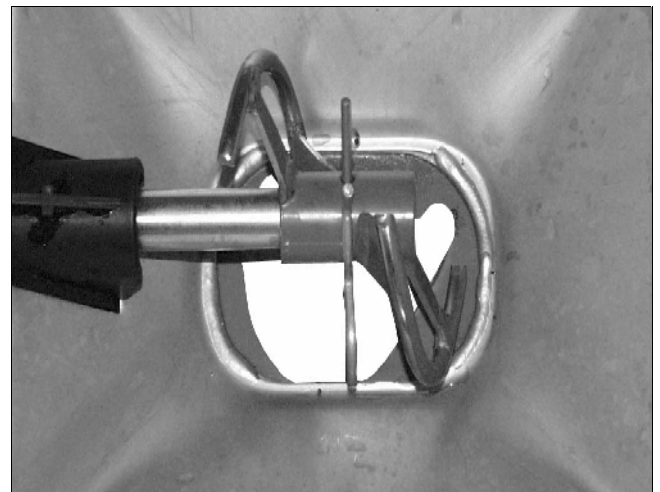


Fig. 91

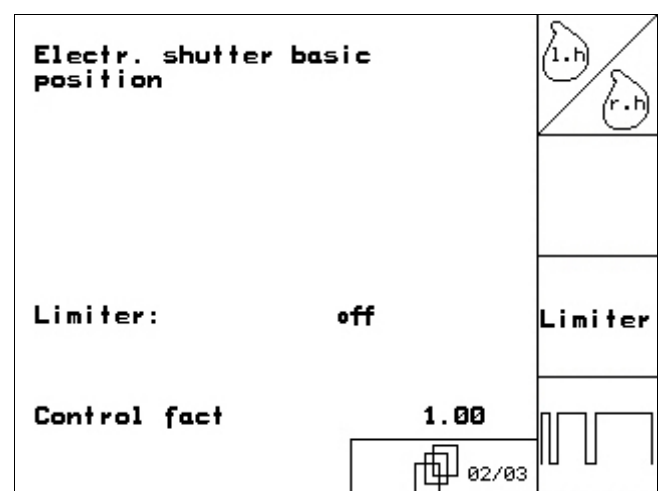








Fig. 92



-  Close outlet opening completely (move to 0 Imp.).
-  Open the outlet opening up to 1500 impulses.



Danger of injury within the range of the metering shutters when actuating the

keys    , as the metering shutters close before the shutters move to the selected shutter position.

Do not reach into the outlet opening and do not forget the setting gauge in it.

- The setting gauge should now easily pass the opened space in the outlet opening (Fig. 94/1) (special optional equipment, order No.: 915018).

1 - The setting gauge **cannot** pass the outlet opening space:




- Increase the actual offset by each 5 impulses until the gauge fits exactly into the opening (Fig. 95).

2 - Setting gauge has too much play:



- Reduce the actual offset by each 5 impulses until the gauge fits exactly into the opening (Fig. 95).

-  Confirm the position with the enter key.

Basic shutter setting:		to 1500
L.h.:		to 0
-Start up 1500 impulses		+5
-check opening with gauge		-5
-correct with +5/-5 if necessary		
-confirm position with enter key		
-recheck by starting up 1500 impulses again		
Actual impulses:	150	
Stored offset:	100	
Actual offset:	105	
display of impulses in Operation menu:		On
		Man. Input
		Impulse Display 1/0

Fig. 93

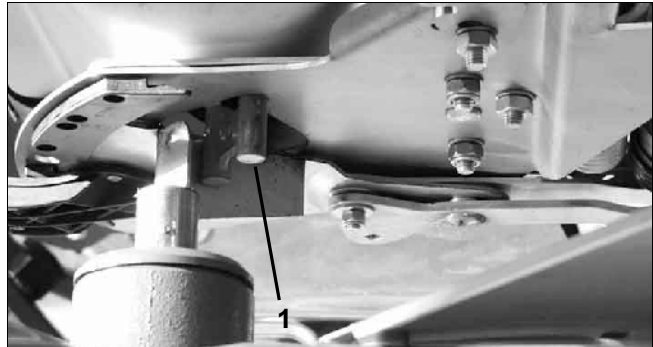


Fig. 94

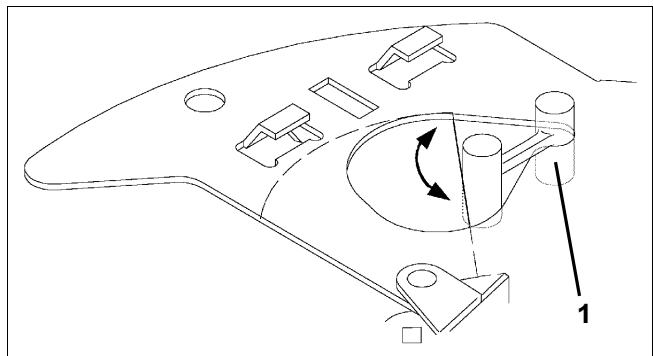


Fig. 95



The impulses (Fig. 96/1) of the setting motors can be shown in the operational menu.

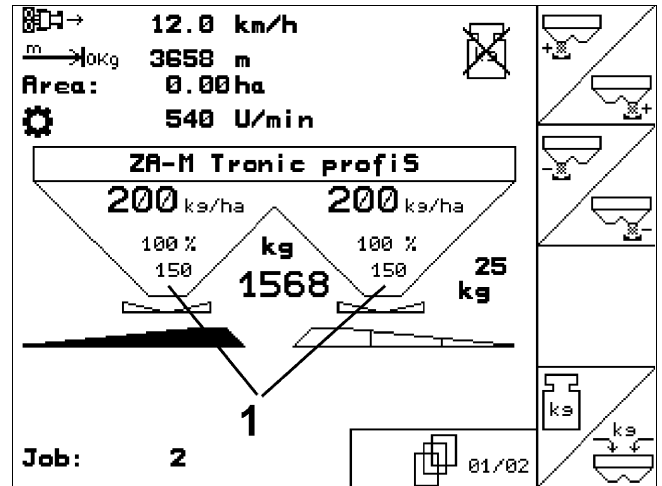


Fig. 96

9. Aid menu

the aid menu is started via the main menu.



Aid menu page 1



- **1** Aid for handling.
- **2** Aid for fault messages.
- **3** Aid for emergency mode.
- **4** Aid when spreading slug pellets.

Help	
1.help for actuation	1
2.help for fault messages	2
3.Aid for emergency mode	3
4.help when using slug pellets	4

Fig. 97



10. Malfunction

10.1 Alarm

Uncritical alarm:

Fault message (Fig. 98) appears at the bottom of the display and a signal sound can be heard three times. Remedy fault if possible.

Example:

- Fault message: Rev. speed of spreading disc is too slow.
- Remedy: Increase the rev. speed of PTO shaft.



Machine.type: ZA-M Comfort	Job
Job No.: 5	 Cal.
Des.quantity: 250 kg/ha	Maschi
Cal. factor: 1.07	
Working width: 24.0 m	
Preselected speed: 12 km/h	 Setup
Desired rate cannot be maintained	

Fig. 98

Critical alarm:

The alarm message (Fig. 99) appears in the middle of the display and a signal sound can be heard.

- Read alarm message on the display.

- Recall aid text.

- Confirm alarm message.



Machine.type: ZA-M Comfort		Job
Job	<div>Setting motor left hand does not react</div> <div>Confirm with entering key or by paging to help</div>	 Cal.
Des		
Ca		Maschi.
Wo		
Pro		
<div>operati. menu</div>		<div>Help</div> <div> Setup</div>

Fig. 99

10.2 Failure of setting motors

For ZA-M:

In the event of faults on the computer **AMATRON⁺** or the electric setting motors, the operation can be continued **after removal of the setting motors** even if the fault cannot be remedied straight away.

- Use the setting lever (Fig. 100/1) to set the spread rate according to the setting chart.
- Close hydraulic shutters.
- Slacken thumb nut (Fig. 100/2).
- Find the required shutter slide position on the scale (Fig. 100/3) .
- Align the reading edge (Fig. 100/4) of the setting lever (Fig. 100/5) and the scale figure.
- Firmly retighten thumb nut (Fig. 100/2).

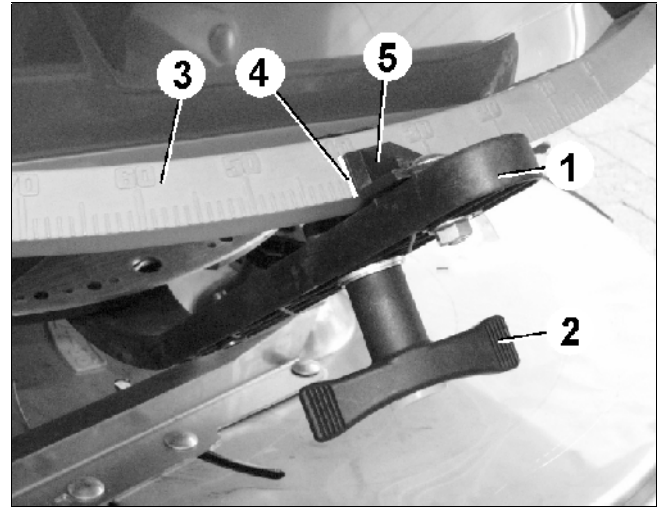


Fig. 100

Unhook the setting motors:

- Remove both circlips (Fig. 101/1) by using circlip pliers. (Fig. 101/2).

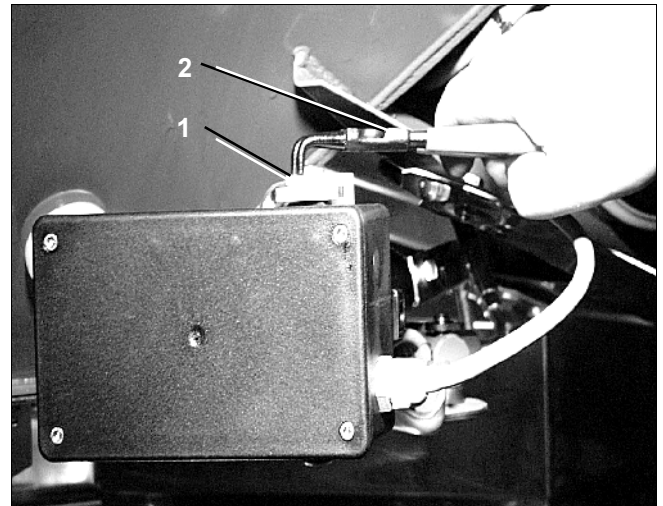


Fig. 101

- Pull off the two hinge pins (Fig. 102/1).
- Remove the setting motor from the retainer.

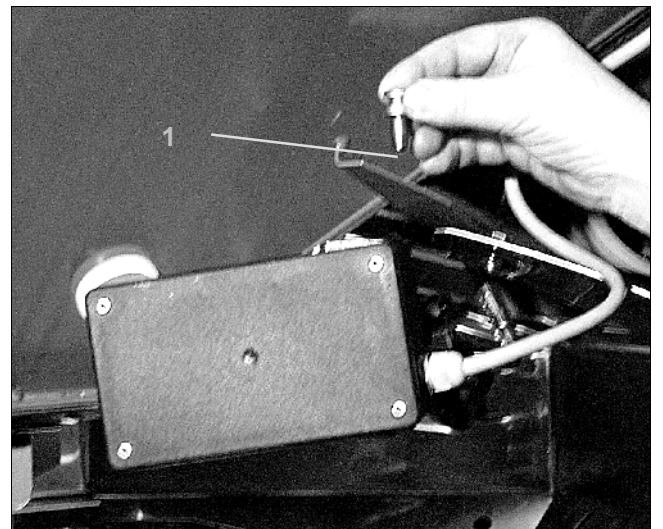


Fig. 102

- Lift the setting motor (Fig. 103/1) and unhook the setting spindle (Fig. 103/2) from the plug connection of the setting lever.

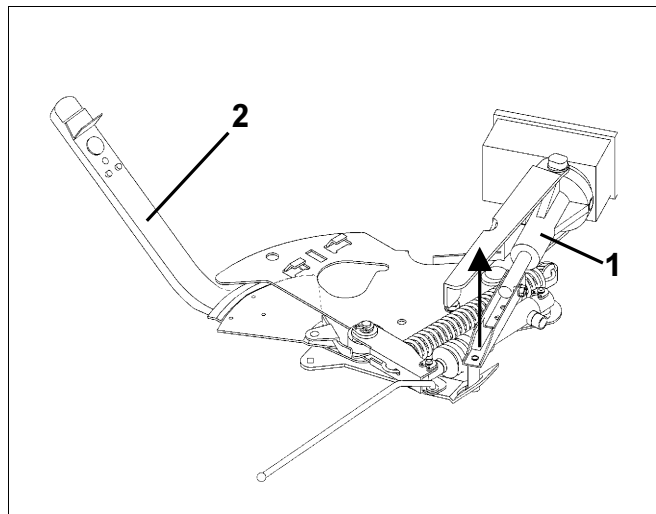


Fig. 103

- Then properly affix the setting motor with the unhooked setting spindle again in the motor retainer.



Secure the unhooked setting spindle (Fig. 104) with fixing aids from swivelling into the operational range of the hydraulic ram.

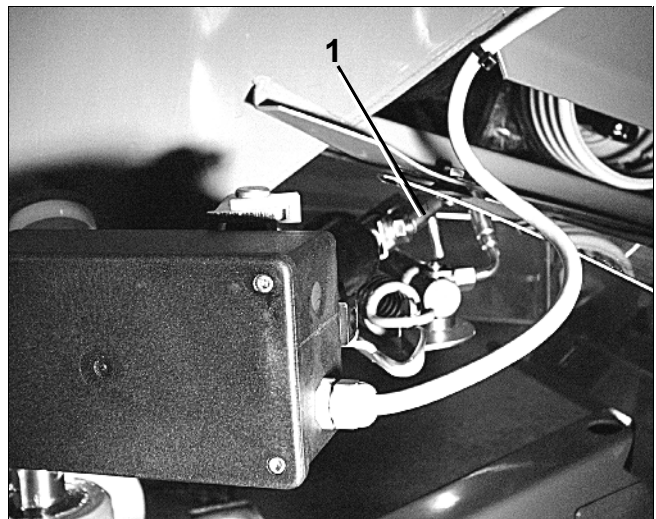


Fig. 104

- Install the clamping device (Fig. 105/1) for the setting lever (Fig. 105/2) as follows:
 - Remove thumb nut (Fig. 105/3) .
 - Remove the bolt and exchange the position of the two washers (Fig. 105/4) from the rear (Fig. 105/5) to the front (Fig. 105/6).

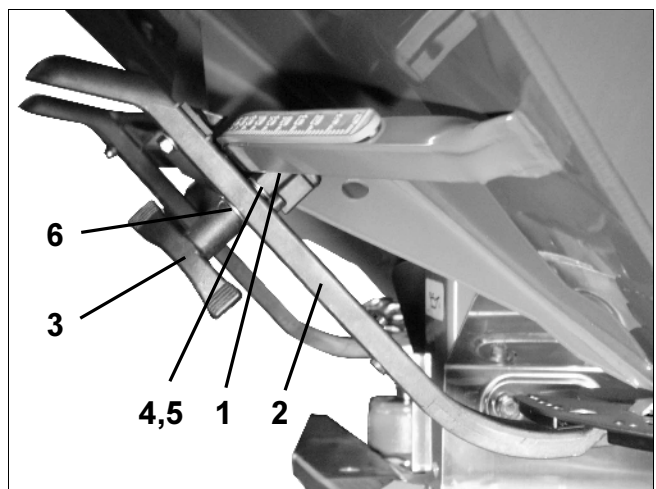


Fig. 105

10.3 Failure of distance sensor (Imp/100m)

Entering a simulated speed in the Service Setup menu allows to continue the spreading operation in the event of failure of the distance sensor.

Proceed as follows:

- Remove the signal cable from the tractor basic equipment.



- Enter simulated speed.
- Continue spreading operation and maintain the entered simulated speed.



As soon as impulses are registered on the distance sensor, the computer switches over to the actual speed of the distance sensor.

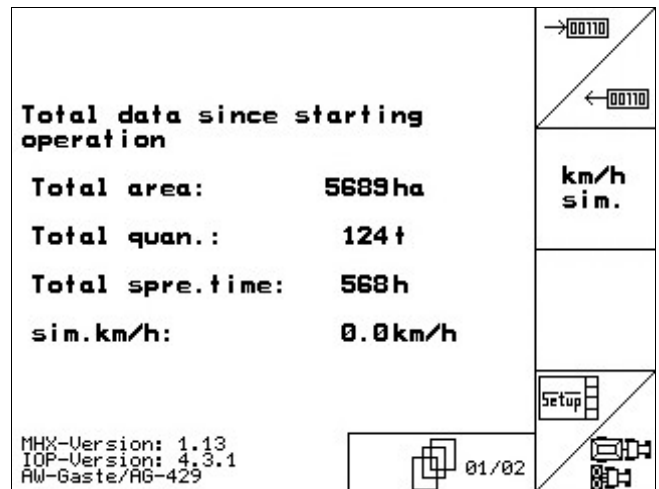


Fig. 106



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Factories for: Mineral fertiliser broadcasters, field sprayers, seed drills, soil cultivation machinery
multiple purpose storage halls, municipal machinery
