

AMAZONE
Operator's Manual
Pneumatic packer seed drill
PSKW / PSPW
403, 403-2, 503-2, 603-2
with front tank
FRS / FPS
103, 203



MG1015

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Before starting work, please carefully read and adhere to this operation manual and safety advice.



Preface

Dear customer,

The machine is yet another quality product from the comprehensive range of farm equipment manufactured by AMAZONEN-WERKE, H. Dreyer GmbH & Co. KG.

In order to ensure you make the fullest use of your machine 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 pneumatic packer seed drill .

PSKW , PSPW

with front tank

FRS, FPS

Amazonen-Werke
H. Dreyer GmbH & Co. KG

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1. Details about the machine

1.1 Range of application

The front sowing tank FRS (front frame – sowing tank) and FPS (front packer sowing tank) in combination with the packer sowing raul PSKW (with wedge ring roller) and PSPW (with tooth packer roller) and an approved AMAZONE rotary cultivator is suited for the transport, metering and sowing of all commercial seeds.

1.2 Manufacturer

AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

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

1.3 Conformity declaration

The combination fulfils the requirements of the EC-guide line Machine 98/37/EG and the corresponding additional guide lines.

1.4 Details when making enquiries and ordering

When ordering options and spare parts indicate the machine type and the serial number..



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

1.5 Type plate

Packer seed drill:



Fig. 1

Front tank:

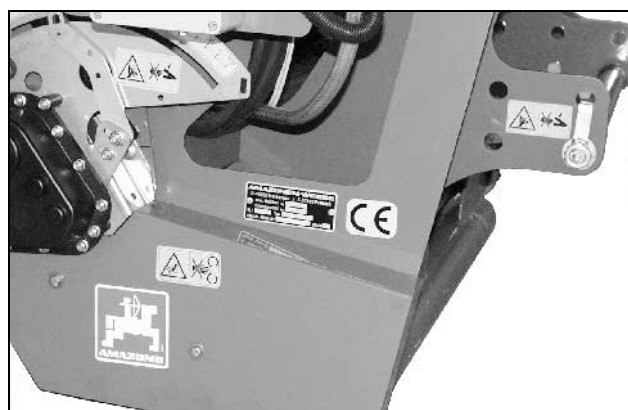


Fig. 2



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

1.6 Technical data

Packer seed drill	PSKW / PSPW 403	PSKW / PSPW 403-2	PSKW / PSPW 503-2	PSKW / PSPW 603-2
Working width (m)	4	4	5	6
Transport width (m)	4	3	3	3
Empty weight front-tank (kg)	FRS: 580 FPS: 1125	FRS: 580 FPS: 1125	FRS: 605 FPS: 1195	FRS: 605 FPS: 1195
Empty weight	Sowing combination with rotary cultivator			
and wedge ring roller (kg)	2856	3978	4970	4995
and tooth packer roller (kg)	2896	4072	5070	5169
Total width front tank (mm)	2670			
Hopper capacity (l)	1500	1500	1500	1500
- with extension (l)	2000	2000	2000	2000
Number of sowing rows	32	32	40	48
Row spacing (cm)	12,5	12,5	12,5	12,5
Filling height (mm)	FRS: 1400 FPS: 1630	FRS: 1400 FPS: 1630	FRS: 1280 FPS: 1510	FRS: 1280 FPS: 1510
Number of metering units / distributor heads	1	1	2	2
Blower fan drive	hydraulic			

1.6.1 Standard of the hydraulic system on the tractor



It is useful to combine the star wheel actuation and the lifting of the front tank via a Control valve.

- **Control valve 1: double acting**
 - PS 403-2, 603-2: Folding in and out the seed drill.
- **Control valve 2: double acting**
 - For FPS: Connect the lifting and lowering of the front tank and the star wheel lift with a control unit.
- **Control valve 3: single acting**
 - For FRS: Connect the lifting and lowering of the front tank and the star wheel lift with a control unit.
- **Control valve 4: single acting**
 - Folding in and out the track markers, actuation of the pre emergence marker (special option), setting the coulter pressure (special option), extra coverage following harrow pressure (special option).
- **Control valve 5: single acting and**
- **1 pressure free return flow:**
 - Drive blower fan.



Max. permissible hydraulic oil pressure: 200 bar



Max. permissible hydraulic oil pressure in the pressure free return flow: 10 bar

1.6.2 Details about noise level

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

Measuring implement: OPTAC SLM 5.

The noise level depends on the type of tractor used.

1.6.3 Designated use

The AMAZONE front sowing tank FRS (front frame – sowing tank) or FPS (front packer – sowing tank) with the packer seed drill PSKW (with wedge ring roller) or PSPW (with tooth packer roller) has been designed:

- for the exclusive operation with an approved AMAZONE rotary cultivator with levelling bar.
- for the exclusive common use for soil tillage, the transport, metering and application of crop seeds commonly used in agriculture.

Any use other than that stipulated is no longer considered as intended use. Therefore, the manufacturer will not and does not accept any responsibility for damage resulting from unaccepted use. 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 as well as the exclusive use of original spare parts.

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 implement and that it is made readily available at all times to the user.

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

2.1 Danger when not adhering to the safety advice

Not adhering to the safety advice

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

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

- Danger to persons by unsecured working width.
- Failure of important functions of the machine
- Failure of prescribed measures for maintenance and repair.
- Danger for persons by mechanical affects.
- Danger to persons or to 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



Attention symbols 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



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

2.4 Safety-/warning and hint symbols

The safety/warning symbols in this instruction manual are for all users working with this machine.

The following warning signs warn about remaining danger which cannot be remedied by design..

The danger and the fixing points for the safety-/warning and hint symbols are set off. Please find the explanations for the pictographs on the following pages.

1. Strictly observe all warning pictographs and hint symbols.
2. Please pass on all safety advice also to other users.
3. Please always keep all warning pictographs and hint signs clean and in well readable condition. Please ask for replacement of damaged or missing signs from your dealer and attach to relevant place (picture-No.: =order-No.)

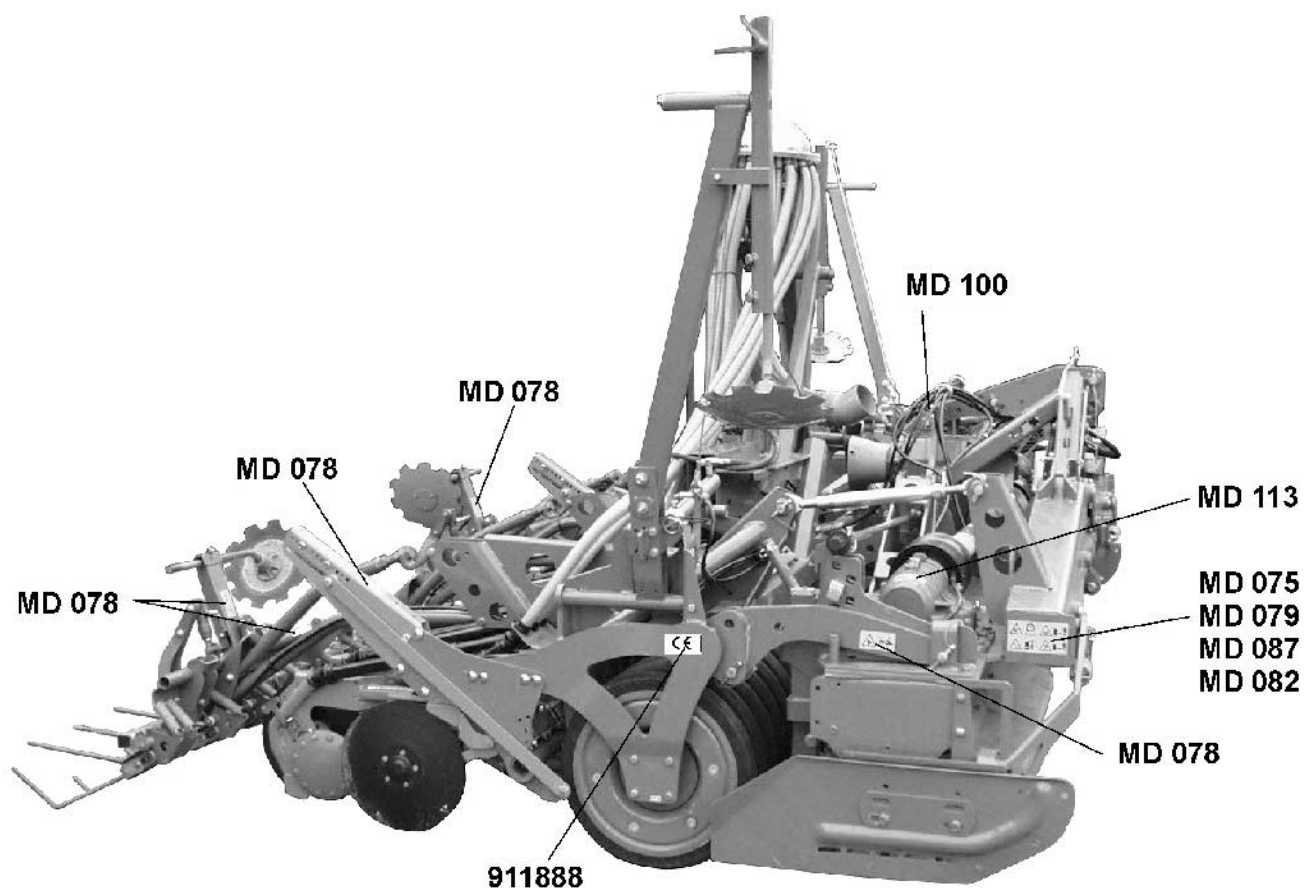


Fig. 3

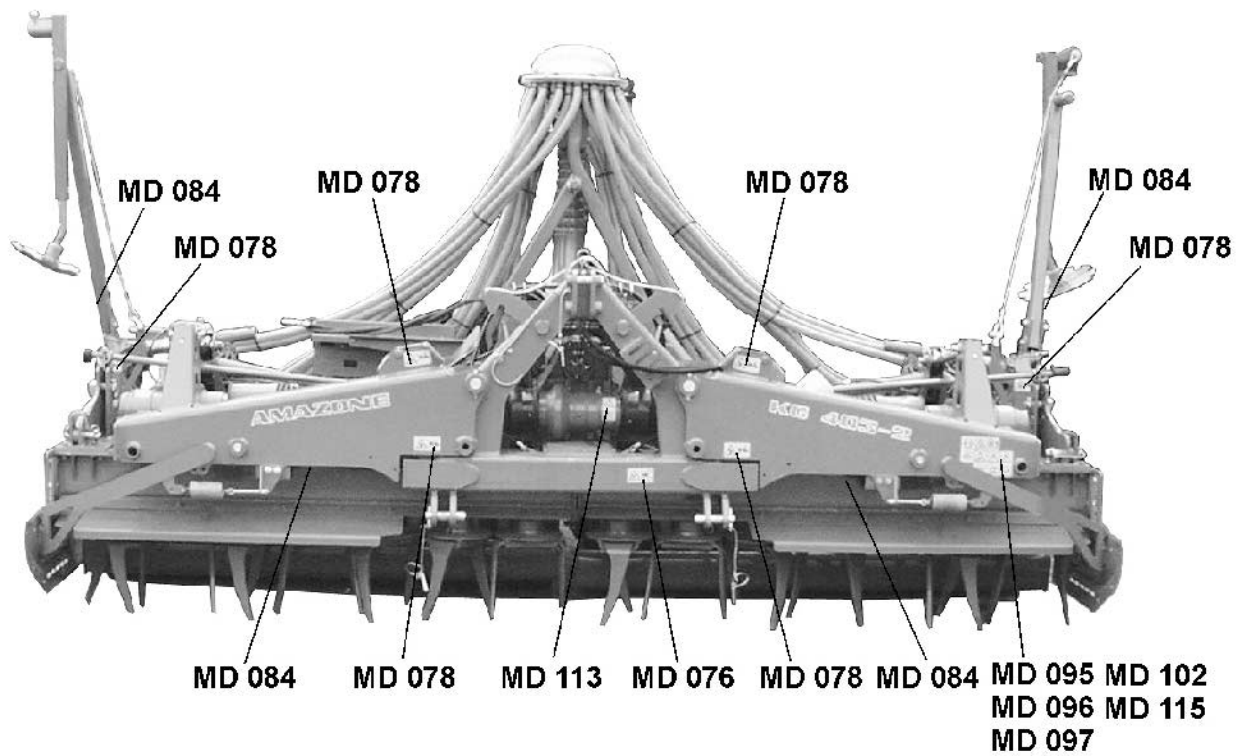


Fig. 4

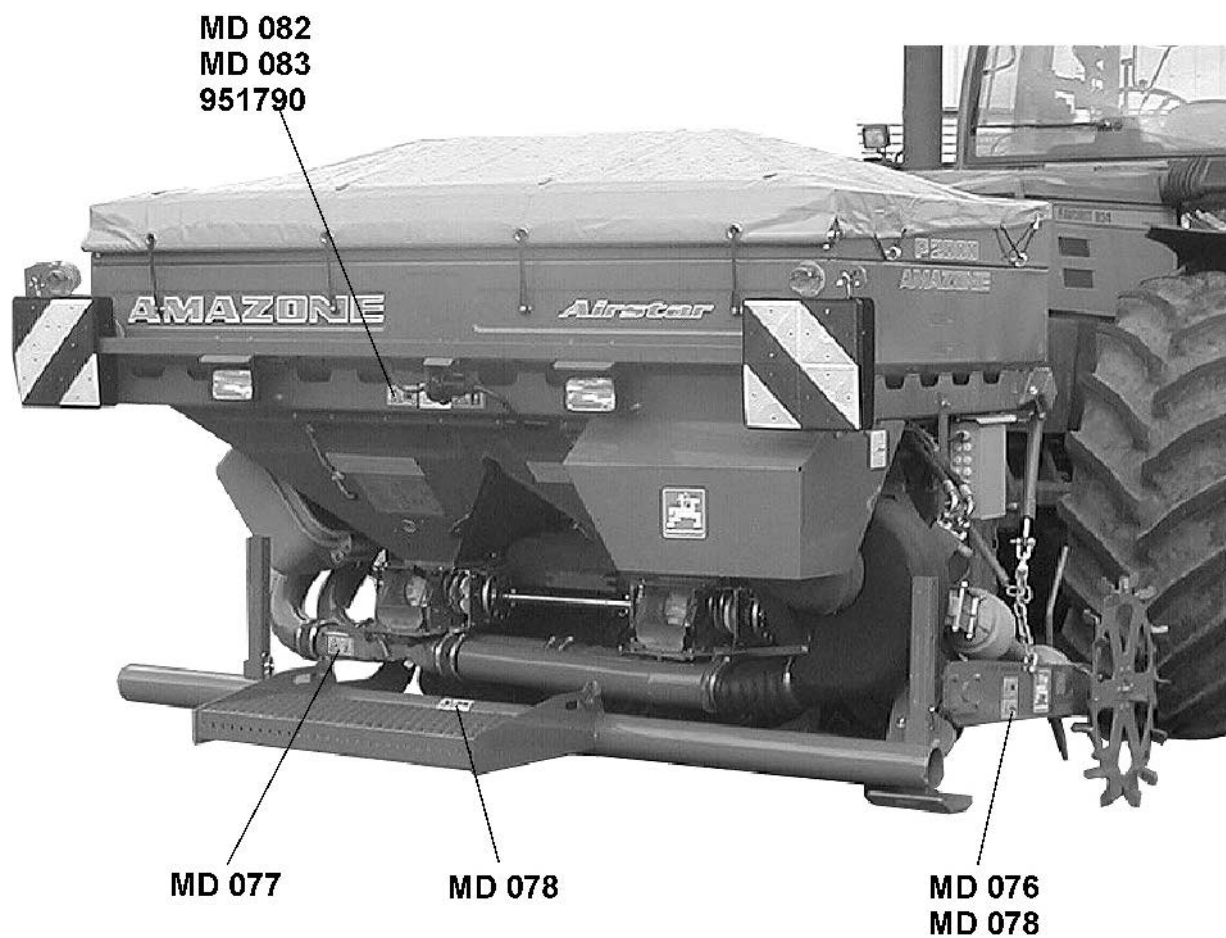


Fig. 5

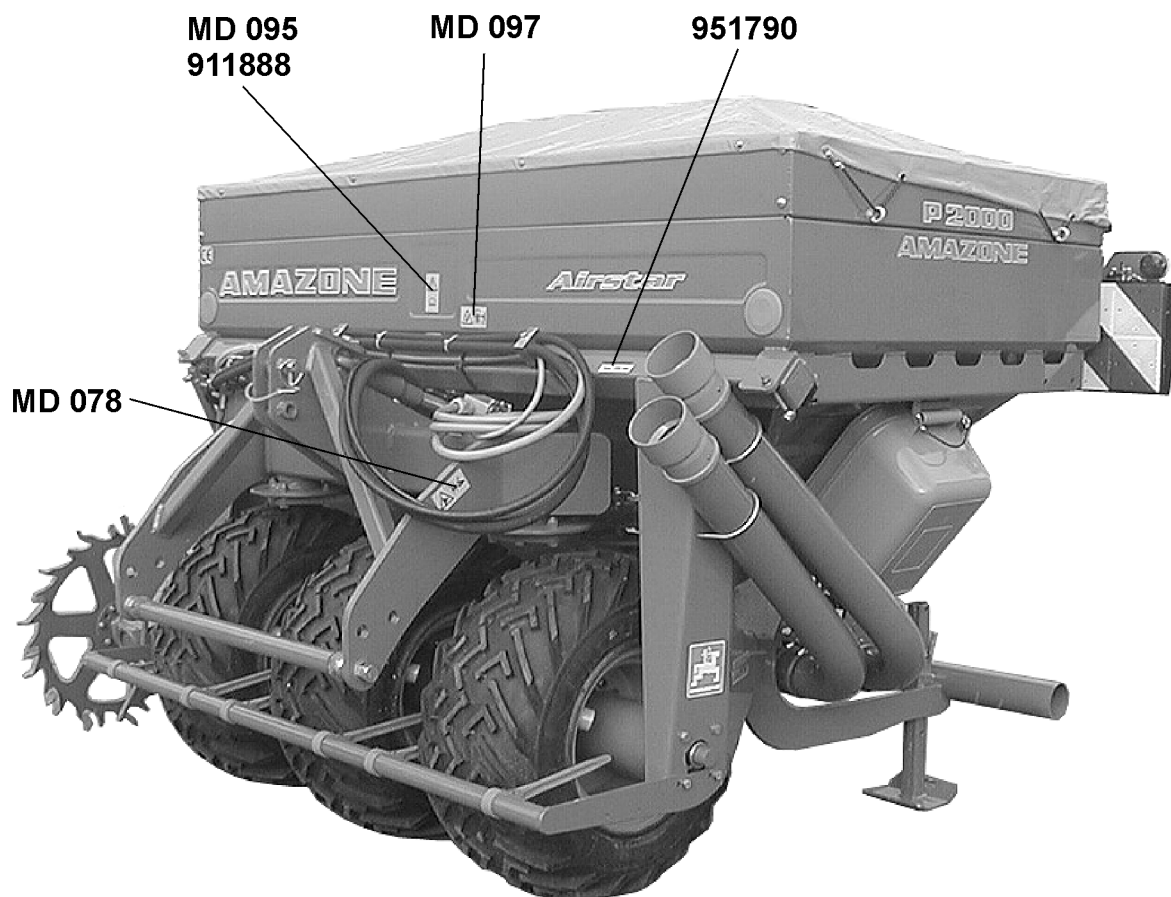
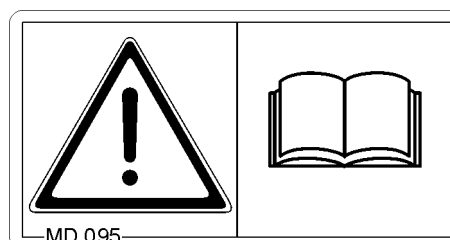


Fig. 6

Picture No.: MD 095

Explanation: Before commencing operation read thoroughly this operation manual and all safety advice!



Picture No.: 911888

Explanation: The CE-mark indicates, that the machine fulfils the requirements of the EC-guide lines Machine 89/392/EEG and the corresponding additional guide lines.



Picture No.: MD 075

Explanation:

Do not stay within the zone of spinning spreading discs!

Do not touch moving implement parts. Await their absolute standstill.

Disengage PTO shaft, stop the engine, and remove the ignition key before exchanging the spreading discs.

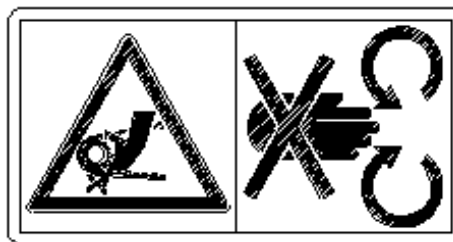


Picture No.: MD076**Explanation:**

Only start to operate with the implement with guards fitted.

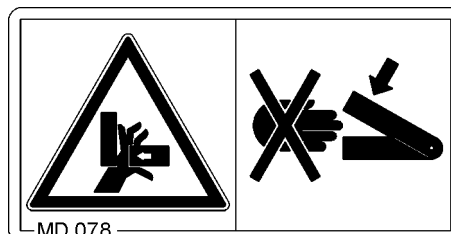
Do not remove guards when the engine is running.

Switch off the PTO shaft before removing the guard.
Stop engine and pull off ignition key!

**Picture No.: MD078****Explanation:**

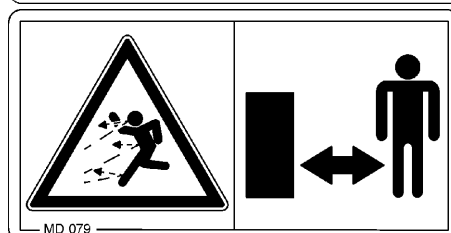
Never touch zone of bruising danger as long as parts can still be moving.

Advise people to leave the danger area!

**Picture No.: MD079****Explanation:**

Danger because of flinging foreign particles!

Advise people to leave the danger area!

**Picture No.: MD082****Explanation:**

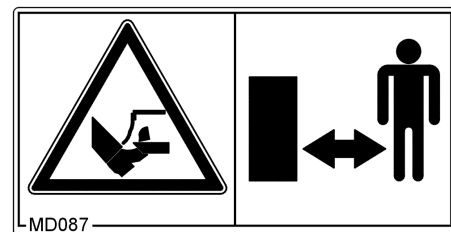
Sitting or standing on the implement during operation or road transport is not permitted!

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

Never stay within the operational area of the marker arms.

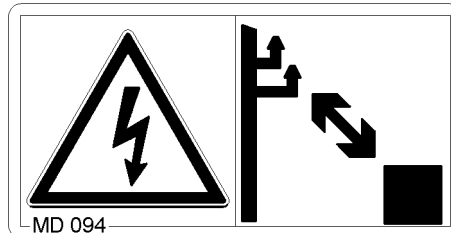
**Picture No.: MD087****Explanation:**

Observe sufficient safety zone from rotating tines when engine is running with PTO shaft engaged.

**Picture No.: MD 094**

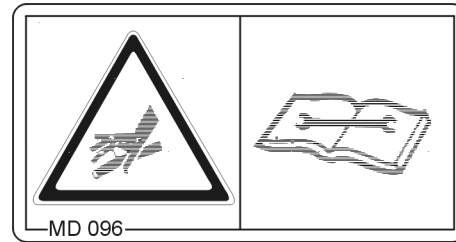
Explanation: Danger of injury when getting into touch with power lines when folding out and in.

Carefully ensure sufficient distance to the power lines when folding out and in.



Picture No.: MD 096

Explanation: Look out for escaping high pressure liquid.

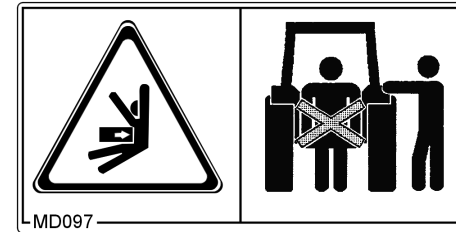


Picture No.: MD 097

Explanation: Danger of bruising while standing between tractor and implement.

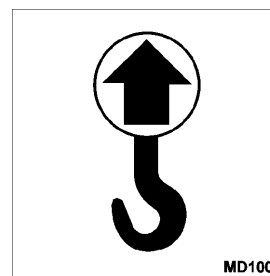
When coupling the combination to the tractor no persons may stay between tractor and machine.

Do not stay between tractor and implement while actuating the three point linkage outside the tractor cab.



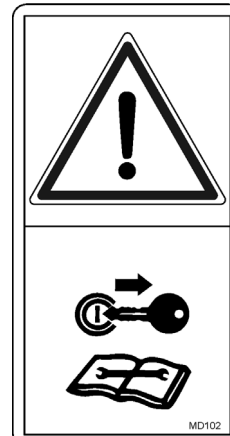
Picture No.: MD 100

Explanation: Tools for fixing loading equipment.



Picture No.: MD 102

Explanation: Stop the engine before carrying out any maintenance work.



Picture No.: MD 113

Explanation: When carrying out any maintenance and repair work observe the hints in the operator's manual.

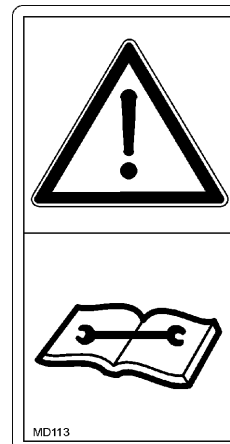
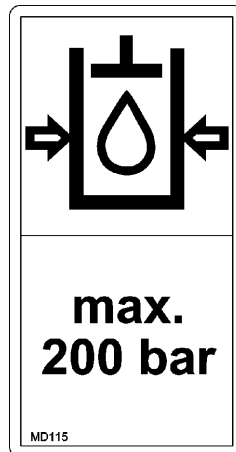


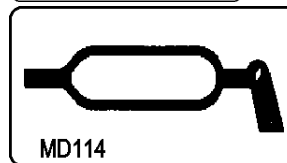
Bild Nr.: MD 115

Explanation:

The operational pressure of the hydraulic system must not exceed 200 bar.

**Bild Nr.: MD 114**

Explanation: Greasing point



2.5 Safety conscious operation

In addition to the safety advice in this operation manual the national, and general operational safety and accident preventive descriptions of the authorised trade association are binding, especially UVV 3.1, UVV 3.2 and UVV 3.3.

Adhere to the safety advice on the labels on the implement.

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

2.6 General safety and accident preventive advice

Basic principle:

Always check traffic and operational safety before putting the implement into any operation!

1. Adhere to the general rules of health- and safety precautions as well as to the hints in this instruction manual!
 2. The warning- and hint signs fixed to the machine give important hints for the safe operation of the machine. Adhering to them serves your safety.
 3. When making use of public roads adhere to the applicable traffic rules.
 4. Become acquainted with all devices and controlling elements as well as their function before commencing work. Doing this during operation would be too late.
 5. The clothing of the operator should fit tight. Avoid wearing loose clothing.
 6. To avoid risk of fire keep the machine clean.
 7. Before beginning to drive check your surroundings (children). Ensure sufficient visibility.
 8. Sitting or standing on the implement during operation or during transport is prohibited.
 9. Mount the implement only with the prescribed tools.
 10. Special care should be taken when the implement is coupled to or from the tractor.
 11. When mounting or dismounting bring parking supports into their correct position (otherwise danger of tipping over).
 12. Affix any ballast weights always as prescribed to the correct fixing points.
 13. Check maximum permissible axle loads, total weights and transport dimensions.
 14. Do not exceed maximum permissible transport measurements of the traffic department.
 15. Check and fit equipment for road transport, e. g. traffic lights, warning plates and road safety guards.
 16. The release ropes for quick couplings must be hanging freely without any possibility of being actuated and releasing the quick couplings by themselves.
 17. Never leave the tractor seat during driving!
 18. The machines stability, steering and braking are affected by mounted implements, trailers and ballast weights. Therefore, take account of these effects and allow for changes to the steering and to stopping distances when braking.
 19. When lifting the implement the front axle load of the tractor is reduced by differing amounts depending on the size of the tractor. Always check that the necessary front axle load of the tractor (20 % of the tractor's net weight) is maintained. (Please also adhere to the instruction manual of the tractor manufacturer.)
-



20. When driving into corners and/or bends watch out for the projection to the sides and the gyrating mass of the implement.
21. Operate the implement only when all guards are fixed in position.
22. Never allow yourself or others to stay within the operational area!
23. Filling the seed box may only be carried out with the tractor engine stopped, a removed ignition key and the parking brake applied.
24. Do not stay within the operational range of rotating and swivelling parts of the implement.
25. Hydraulically folding parts may only be actuated when there is nobody standing within the moving range.
26. On all hydraulically actuated pivoting parts there exists danger of injury by bruising and trapping.
27. Before leaving the tractor lower the implement to the ground. Actuate the parking brakes, stop the engine and remove the ignition key.
28. Nobody should stand between tractor and implement unless the tractor is secured against rolling away by engaging the parking brake and/or by the use of wheel chocks with engine switched off and ignition key removed.
29. Lock track markers in transport position.

2.7 General safety and accident preventive laws for mounted implements

1. Before mounting- and dismounting implements to the three-point-linkage bring all control levers in such a position that an unintended lifting or lowering is impossible.
2. When fitting to the three-point-linkage the mounting categories on the tractor and the implement must coincide.
3. Within the range of the three-point-linkage danger of bruising and shearing.
4. When actuating the control levers for the three-point linkage never step between tractor and implement.
5. In transport position always take care for a sufficient lateral locking of the tractor's three point.
6. When driving on public roads with lifted implement the control lever has to be locked against unintended lowering.
7. Mount and dismount implements as prescribed. Check braking systems for function. Mind manufacturer advice.
8. Working implements should only be transported and driven on tractors which are designed to do this.

2.7.1 General safety and accident prevention advice regarding the operation of seed drills

1. During calibration be aware of the danger created by rotating and oscillating implement parts.
 2. Use platforms only for filling. Standing on them during transport or operation is prohibited.
 3. Before road transport remove the carriers and marker discs of the pre-emergence marker.
 4. When filling the seed box observe the hints of the implement manufacturer.
 5. Lock markers in transport position.
 6. Do not place any parts into the seed box.
 7. Observe the permissible filling quantity.
-

2.7.2 General safety and accident prevention advice regarding the hydraulic system

1. The hydraulic system is under high pressure!
2. When connecting hydraulic rams and motors the described connection of the hydraulic hoses has to be followed!
3. When connecting the hydraulic hoses to the tractor's hydraulics take care that the hydraulics are pressure less on the tractor as well as on the implement side!
4. At hydraulic function connections between tractor and implement, the sockets and plugs should be colour coded in order to avoid incorrect operation.
5. When mixing up connections, there is a danger of reverse function, e. g. lifting instead of lowering. Danger of accident.
6. Regularly check hydraulic hoses and exchange them in cases of damage or ageing. The replacement hoses have to correspond to the technical demands of the implement manufacturer!
7. When searching for leaks appropriate aids should be used due to danger of injury!
8. Liquids (hydraulic oil) under high pressure may penetrate the skin and cause severe injuries!



In case of injuries immediately consult a doctor. Danger of infection!

9. Before starting to do any repair work on the hydraulic system, lower implement to the ground, switch off the engine, relieve the hydraulic system from pressure and switch off the engine.
10. The period of use of any hose circuit should not exceed six years including a storage period of two years in maximum. Even when stored and used properly, hoses and hose circuits age. Therefore, their longevity and period of use is limited. Deviations from the above may be accepted depending on the experience made and the danger potential. For hoses and hose circuits made of thermoplastics other guide lines may prevail.

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

1. Maintenance, repair and cleaning operations together with rectification of operating defects should only be carried out when the drive and the engine have been disconnected. Remove the ignition key.
2. Check nuts and bolts regularly for tightness and re-tighten if necessary.
3. When servicing a raised unit always ensure it is secured by suitable supports.
4. Remove oil, grease and filters correctly!
5. Always disconnect power before starting work on the electrical system.
6. Disconnect cable to the tractor generator and battery when carrying out electric welding work on the tractor and the mounted units.
7. Any spare parts fitted must in minimum meet with the implement manufacturer's fixed technical standards. This is, for example, ensured by using original AMAZONE spare parts.



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

The function of the implement's 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/EWG 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.

The use of portable or mobile devices inside the tractor cab is only permissible with a connection to a firmly installed external antenna.

Install the transmitter spaced apart from the tractor's electronic.

When installing the antenna ensure an appropriate installation with proper earth connection between antenna and tractor earth.

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

3. Loading

Loading with a hoist crane



Danger!

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



Danger!

The minimum tensile strength per lifting strap must be 1000 kg.



Important!

Before loading open the swivel hopper cover.

Front tank:

For loading, please make use of the

- 2 fixing points at the rear inside the hopper (Fig. 7) and
- 1 fixing point at the front inside the hopper (Fig. 8).

Front tank with front tyre packer:

For loading, please make use of the

- 2 points at the rear inside the hopper (Fig. 7) and
- 1 fixing point on the packer roller.

Packer sowing rail:

For loading, please use the fixing point Fig. 9.

Packer sowing rail with KG

For loading, please make use of the fixing points Fig. 9 and Fig. 10.



Danger!

Do not stand underneath a lifted un-secured load.



Fig. 7



Fig. 8

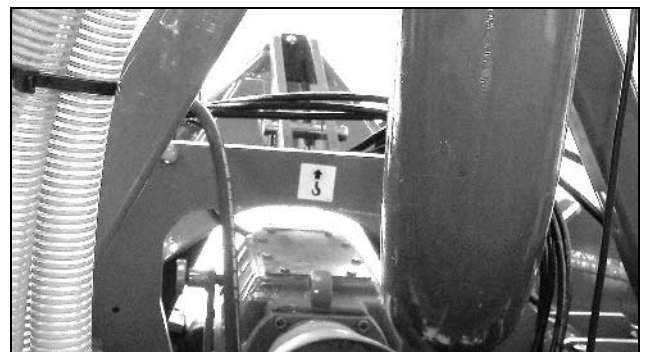


Fig. 9

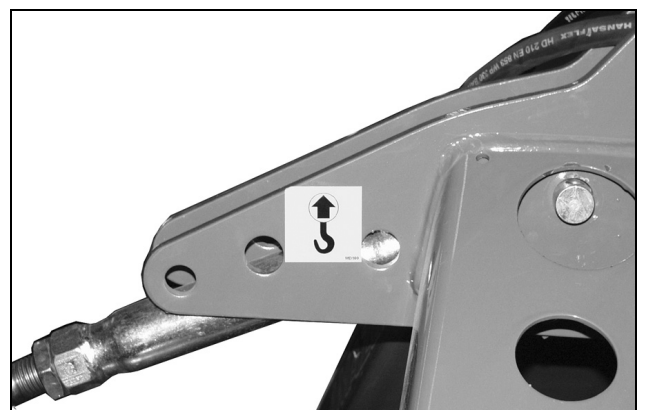


Fig. 10

4. Description of product

This chapter provides you with a comprehensive survey about the design of the machine. Read this chapter face to face with the machine. In this way you will get optimally acquainted to the machine.

The sowing combination consists of the main components

- Front seed hopper with blower fan and metering device and hose lines
- Frame of packer seed drill
- Rotary cultivator



Please also refer to the operator's manual for the rotary cultivator.

- Tooth packer roller
- Sowing coulters
- Distributor

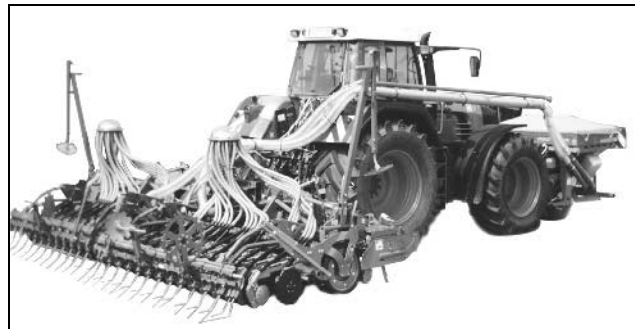


Fig. 11

4.1 Assembly

Front frame seed hopper (FRS) Fig. 12\...

- 1 Seed hopper
- 2 Star wheel to drive the metering device and for creating the Imp./100 m required for the calculation of the operational speed.
- 3 Metering
- 4 Foldable loading board
- 5 Hopper cover
- 6 Front lights
- 7 Calibration tray

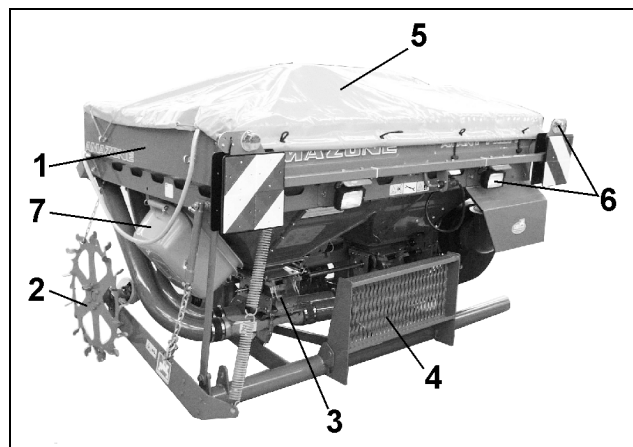


Fig. 12

Front packer seed hopper (FPS) Fig. 13\...

- 1 Steered front tyre packer
- 2 Gearbox for the seed rate adjustment
- 3 Blower fan for the seed delivery
- 4 Support to park the front packer seed hopper

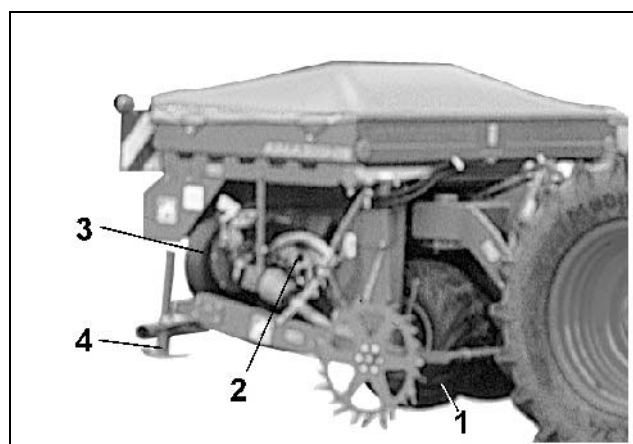


Fig. 13

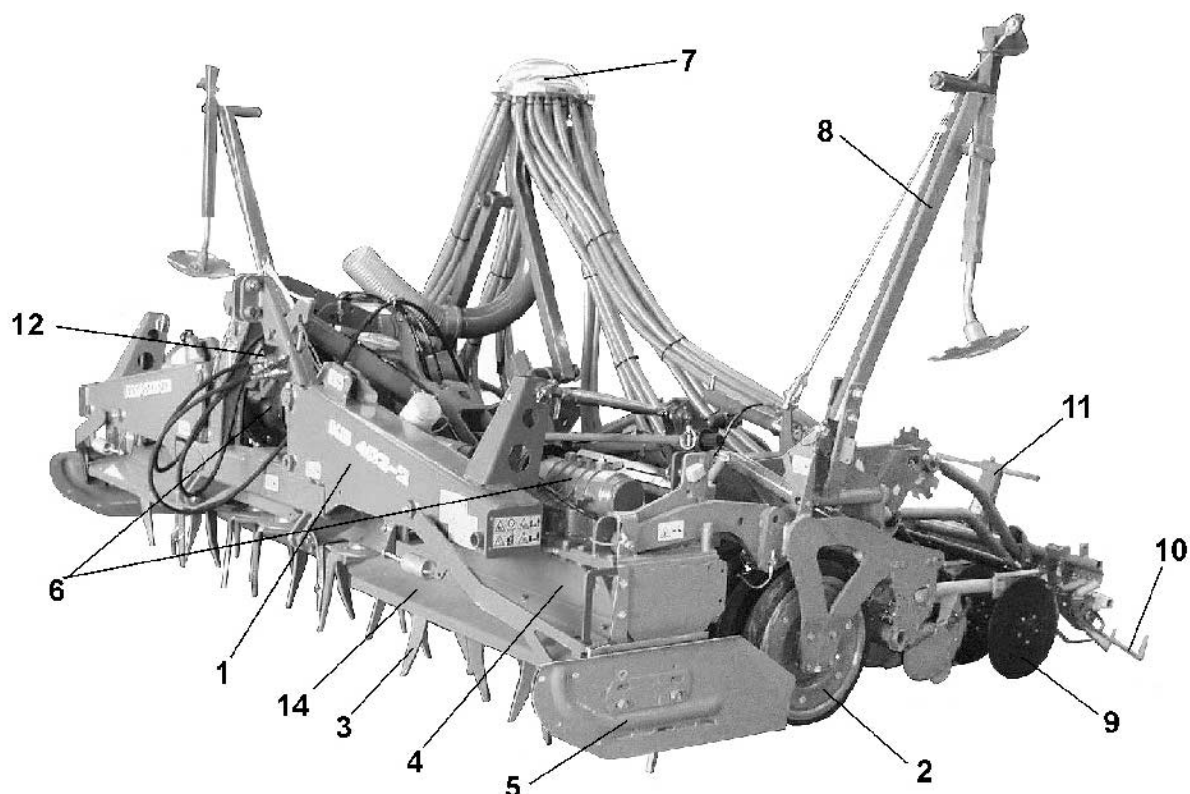


Fig. 14

1. Folding frame (alternatively rigid frame)
3. Rotary cultivator tines
4. Rotary cultivator trough
6. Gearbox with ratchet clutch
7. Seed distributor
8. Track marker
9. Sowing coulter
10. Extra coverage following harrow
11. Pre emergence marker
12. Retainer for hydraulic hoses
13. Levelling bar left and right hand side

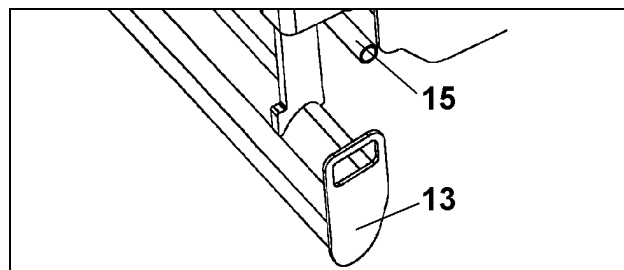


Fig. 15

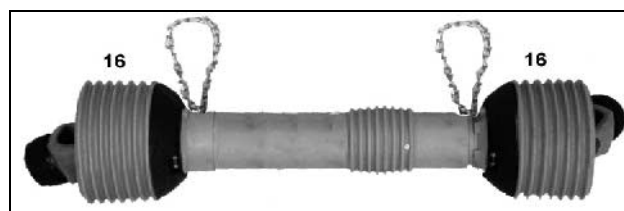


Fig. 16

4.2 Safety devices

2. Wedge ring roller / tooth packer roller
5. Side plates
13. Levelling bar left and right hand side
14. Rotary cultivator front guard plates left and right hand side
15. Rear guard tubes on rotary cultivator
16. PTO shaft guard
17. Cover for road transport



Fig. 17

4.3 Way of function

During operation the seed is transported in the large seed hopper. Each hopper is provided with.

- one (working width 4 m) or
 - two (working width 6 m)
- metering units.

The metering units are driven with the aid of the star wheel fixed on the front tank or with the aid of an electric motor.

Also the star wheel creates the Imp/100m to determine the operational speed. With machines with electric drive the star wheel is fixed on the sowing rail.

Fix the front tank on to the front hydraulic of your tractor

The front packer seed hopper FPS rides on a steering tyre packer. The tyre packer rolls the soil in a width of 1.60 m in front of the tractor. During operation the tractor front axle is not burdened by the seed hopper. The self steering of the tyre packer follows the steering of the tractor operator and allows driving round curves. For turning at the headlands the front packer seed hopper should be raised.

The seed bed preparation is provided by the tractor rear mounted AMAZONE rotary cultivator with roller.

For the application of the seed the packer seed drill is at random equipped with WS (Suffolk) coulters, with RoTeC coulters or with RoTeC+ coulters.

The seed which is delivered from the seed hopper to the seed drill is evenly distributed to all coulters within the distributor head attached to the seed rail.

• RoTeC-coulter / RoTeC +-coulter

- RoTeC-coulter (Fig. 19/2)
- RoTeC +-coulter (Fig. 19/1)

The AMAZONE RoTeC-coulter can be safely used for both mulch and conventional drilling. Seed furrow former made from hard cast alloy. The elastic polyurethane (PU) depth limiting cleaning disc keeps the inner disc surface clean (Fig. 19/4) The naps (Fig. 19/5) provide additional drive.

The PU depth limiting disc (Fig. 19/4) precisely controls the depth of the seed furrow via three settings from 2 to 4 cm. (Kap.9.5.2). For work deeper than 4 cm the depth limiting disc can be instantly removed without any tool.

Note: As far as possible use the coulter pressure for depth setting. If possible leave the PU disc in its lowest position.



Fig. 18

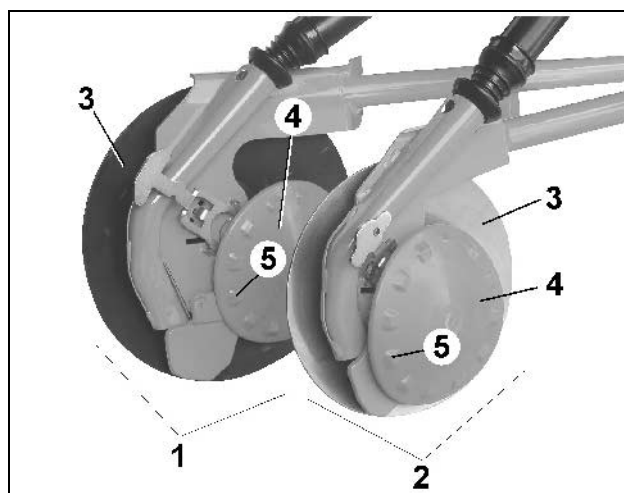


Fig. 19

• WS-(Suffolk)coulter

Drag coulter with interchangeable coulter tip. The AMAZONE WS-coulter (Fig. 20) is provided with an exchangeable coulter tip (Fig. 20/1) made from hard cast alloy. Worn coulter tips can be exchanged. The back up flap (Fig. 20/2) protects the guide funnel from blockage even if the machine is lowered on wet soil. During operation the back up flap is swivelled to the rear.

On light soils or where little crop residue prevail the WS coulter tip can be replaced by a sabre coulter tip.

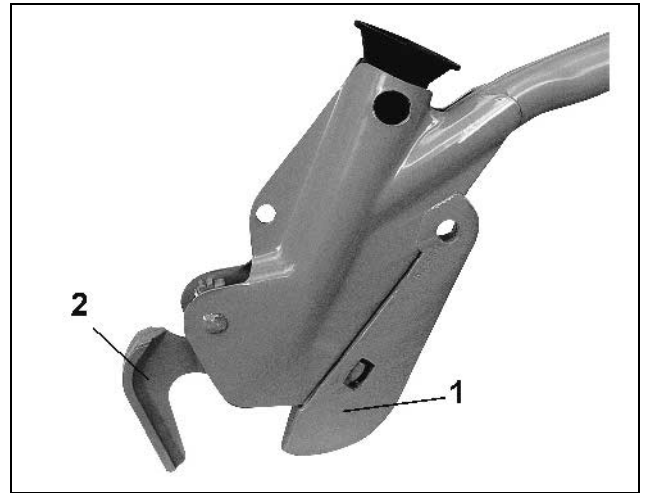


Fig. 20

• Track markers

The machine is equipped with track markers (Fig. 21/1) for marking a trace in the soil in line with the tractor's centre.

The trace is marked during sowing from one marker disc (Fig. 21/1).

After turning at the headlands the tractor follows the centrally marked trace when travelling the next bout.

During one drive up and down in the field both track markers will operate one after the other. One track marker is always located close to the side part of the seed rail.

The track markers are lifted by two hydraulic rams.

The hydraulic rams are connected to the track marker shuttle valve.

Only actuate the track marker shuttle valve from the tractor cab with one single acting tractor Control valve. When pressurising the track marker shuttle valve the operating marker is lifted, in floating position the second track marker is lowered.

If both track markers are raised and the tractor Control valve is actuated four times:

1. the first track marker is brought into operating position
2. the first track marker is lifted
3. the second track marker is brought into operating position
4. the second track marker is lifted.

Lift both track markers

- before turning at the headlands
- before obstacles in the field
- before transport.

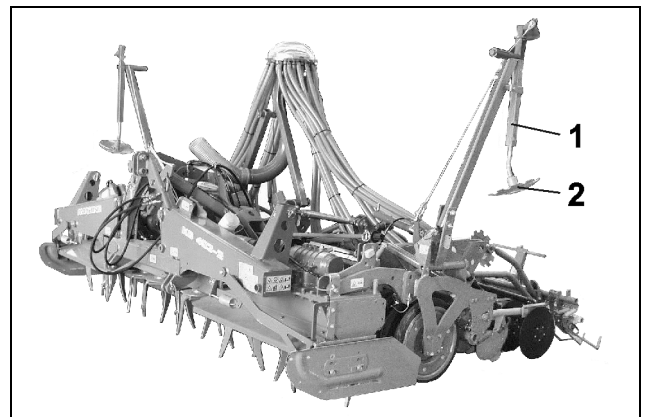


Fig. 21



It is prohibited to stay within the swinging area of the marker arms.

When actuating the control valves simultaneously, several hydraulic rams may start to function simultaneously, depending on the switching position.

Ask people to leave the danger area.

Danger of injury from moving parts.

• AMATRON+ on board computer

The AMATRON+ on board computer controls and monitors the machine.

AMATRON+ controls the tramline system, indicates the sown area, the blower fan speed and the rev. speed of the seed shaft.

It allows the electric metering and adjustment of the seed rate, e.g. in 10 % steps.

20 jobs with order related data can be stored.



Fig. 22

• Blower fan with hydraulic drive

Do not create other connections than shown in the circuit diagram (Fig. 23).

On the pressure side the blower fan hydrostatic motor (Fig. 23/1) may be connected to either a single or to a double acting Control valve (Fig. 23/8).

In order not to damage the hydrostatic motor, the oil pressure in the return flow (Fig. 23/6) must not exceed 10 bar. Therefore, never connect the return flow to the Control valve (Fig. 23/8) but to a non-pressurised return flow with a large plug coupling (included in the scope of delivery) (Fig. 23/11).

Should it become necessary to install a new return flow tubing, use only tubes DN 16, e.g. Ø20 x 2,0 mm and short return flow ways.

The hydraulic oil must be guided through an oil filter (Fig. 23/7) at any place of choice.

The return flow hydraulic oil must never be guided through Control valves as the oil pressure would then exceed the maximum pressure of 10 bar.

The check valve (Fig. 23/4) allows the blower fan to run after as soon as the Control valve (Fig. 23/8) has been shut off.

Ensure that the hydraulic oil does not get too hot. If large amounts of oil are fed into small oil tanks the hydraulic oil will heat up. The capacity of the oil tank (Fig. 23/9) should at least have the double of the oil delivery amount. If the oil gets too hot, the installation of an oil cooler on the tractor by a professional workshop is necessary.

Particles of dirt may damage the blower fan hydrostatic motor (Fig. 23/1) and the pressure relief valve (Fig. 23/3). For this reason, always keep clean the coupling parts when connecting the blower fan hydrostatic motor to the tractor's hydraulic to avoid the hydraulic oil becoming dirty.

Should it be necessary to drive besides the blower fan hydrostatic motor yet another hydrostatic motor, both motors should be switched parallel. When switching both motors in line the maximum permissible oil pressure of 10 bar will be always exceeded behind the first motor.

If the blower fan hydrostatic motor has to be connected to different tractors, make sure that the type of oil in the hydraulic circuits is compatible. Impermissible mixing of various hydraulic oils may lead to defects on hydraulic components.

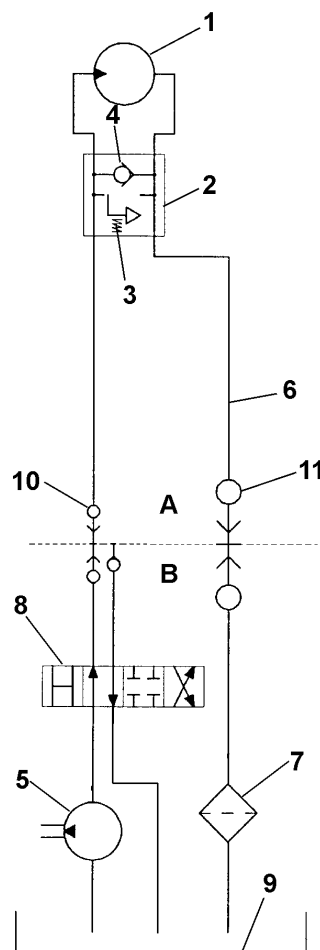
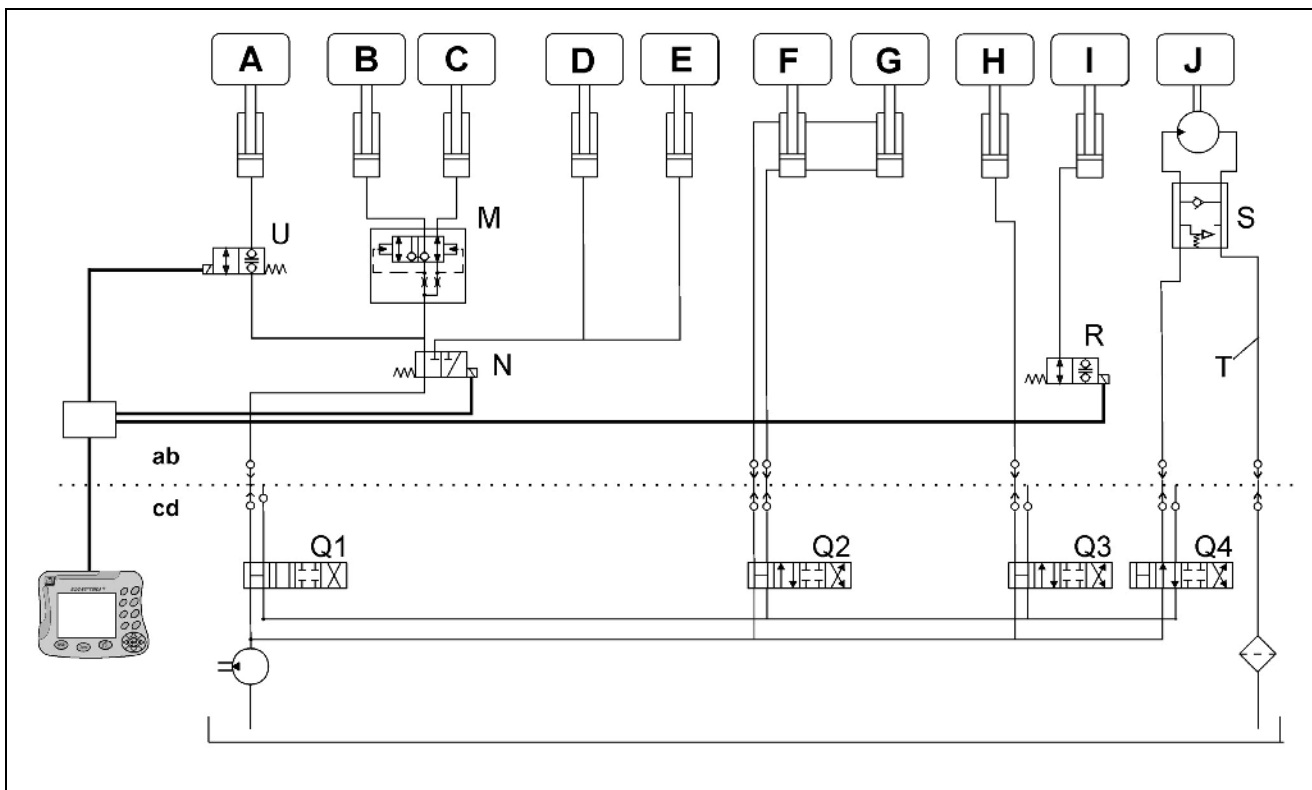


Fig. 23

Nr.	Description
1	Blower fan hydraulic motor Nmax. = 4000 R.P.M.
2	DBV-valve with hydraulic freewheel
3	Adjustable pressure relief valve
4	Check valve
5	Tractor hydraulic pump (the capacity of the tractor hydraulic pump must be in minimum 40 l/m at 150 bar)
6	Free return flow <ul style="list-style-type: none"> - Tube nominal width min. Ø16 mm - Use couplings with sufficiently large diameter - The pressure in the return flow must not exceed 10 bar.
7	Filter
8	Single or double acting Control valve
9	Hydraulic oil reservoir
10	Plug coupling
11	Plug coupling "large"

Table 1

4.4 Hydraulic circuit diagram



Description:

ab = implement side

cd = tractor side

Tractor Control valves:

Q1 to Q4

(Q4 for hydraulic blower fan drive with "priority", required approx. 30 l/min.).

Hydraulic rams

A = Pre emergence marker

B = Marker left hand side

C = Marker right hand side

D = Coulter pressure adjustment

E = Exact harrow pressure adjustment

F = Folding frame left hand side

G = Folding frame right hand side

H = Tractor front hydraulics

I = Star wheel lift

Hydraulic drive

J = Blower fan hydraulic motor Nmax = 4000 R.P.M.

M = Track marker shuttle valve

S = DBV-valve with hydraulic free wheel

T = free return flow (in minimum DN16)

U = 3/2-stop valve

P = electric manual switch
only required when no tractor Control valve is left.

N = 3/2 way solenoid valve

R = 3/2-stop valve

Permissible hydraulic oils:

HD-SAE20W-20 according to MIL-L-2104 C or API-CD

STOU-SAE15W-30 according to MIL-L-2105 or API-GL4



**Max. permissible hydraulic oil pressure:
200 bar**



Before conducting any work on the hydraulic system make it pressure less via the tractor hydraulics.

4.5 Danger zones

Danger zones exist:

- between tractor and machine, especially while coupling and uncoupling.
- In the area of moving parts:
- On the moving machine.
- Underneath a lifted, not secured machine or machine parts
- When folding out and in the machine.
- When folding out and in the track markers.
- When folding in / lifting the machine within the range of power lines by touching them.

In these zones always danger prevails or unexpected danger may occur. Safety symbols mark these danger zones.

5. On receipt of the machine

Check that no damage has been caused in transit and all parts are present. Otherwise no responsibility can be accepted by us or the carrier..

Before commencing work, remove all packing material, wire etc!

6. Initial operation

6.1 Fitting data

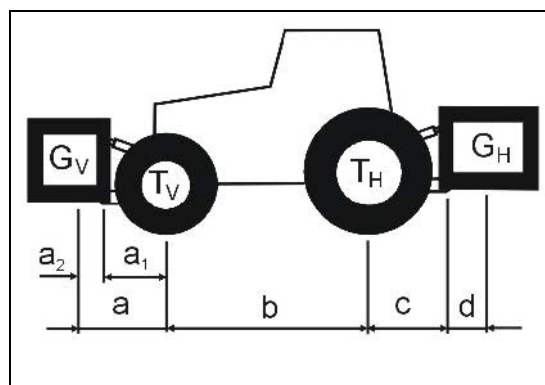
Before starting to operate determine the axle loads and tyre load capacities as well as the required minimum ballast weight at the combination tractor / mounted machine.

The spacing "a" results from the sum of the spacing a1 and a2.

a1 = Distance from centre front axle till centre lower tractor link point. Please take this value from the tractor instruction book.

a2 = Centre lower tractor link point until centre of gravity front mounting machine.

d = 0,62 m





Fitting data for the front tank sowing combination:

Packer seed drill	PSKW; PSPW
Distance d	0,8 m

Front tank	FPS 103 / FPS 203 FRS 103 / FRS 203
Distance a2	0,8 m

For calculation you need the following data

TL [kg]	Net weight of tractor	❶
TV [kg]	Front axle load of the empty tractor	❶
TH [kg]	Rear axle load of the empty tractor	❶
GH [kg]	Total weight rear mounted implement / rear ballast weight	❷
GV [kg]	Total weight front mounted implement / front ballast weight	❷
a [m]	Distance between centre of gravity of the front mounted implement / front ballast weight and centre of the front axle	❷ ❸
b [m]	Tractor wheel base	❶ ❸
c [m]	Distance between rear axle centre and lower link ball centre	❶ ❸
d [m]	Distance between lower link ball centre and centre of gravity rear mounted implement / rear ballast weight	See above

- ❶ see tractor instruction book
- ❷ see price list and/or instruction manual of the implement
- ❸ take measurements

Rear mounted implements or front-/rear-mounted combinations:

1. Calculation (see Fig. 3.7) of the minimum ballast weights front $G_{V \min}$

Insert the calculated minimum ballast weight which is required in the front of the tractor into Table 2.

$$G_{V \min} = \frac{G_H \cdot (c+d) - T_V \cdot b + 0,2 \cdot T_L \cdot b}{a+b}$$

Front mounted implement

2. Calculation (see Fig. 3.8) of the minimum ballast weights rear $G_{H \min}$

Insert the calculated minimum ballast weight which is required in the rear of the tractor into Table 2. Take "x" from the indications of the tractor manufacturer. If no data available, insert for "x" = 0.45.

$$G_{H \min} = \frac{G_V \cdot a - T_H \cdot b + x \cdot T_L \cdot b}{b+c+d}$$

3. Calculating (see Fig. 3.9) of the actual front axle load $T_{V \text{ real}}$

If with the front mounted implement (GV)) the required minimum ballast weights front ($G_{V \min}$) will not be achieved, the weight of the front mounted implement must be increased so that it is equal the minimum ballast weight in the front!

$$T_{V \text{ real}} = \frac{G_V \cdot (a+b) + T_V \cdot b - G_H \cdot (c+d)}{b}$$

Insert the calculated actual front axle load and the permissible axle load indicated in the instruction manual for your tractor into Table 2.

4. Calculation of the actual total weight G_{tat}

If with the rear mounted implement (GH) the required minimum ballast weight rear ($G_{H \min}$) will not be achieved, the weight of the rear mounted implement must be increased so that it is equal to the minimum ballast weight in the rear!

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

Insert the calculated actual total weight and the permissible total weight indicated in the instruction manual for your tractor into Table 2.

5. Calculation of the rear actual rear axle load $T_{H \text{ tat}}$

Insert the calculated actual axle load and the permissible axle load indicated in the instruction manual for your tractor into Table 2 .

$$T_{H \text{ tat}} = G_{\text{tat}} - T_{V \text{ tat}}$$

6. Tyre carrying capacity

Insert double the value (two tyres) of the permissible tyre carrying capacity (see e. g. documentation of the tyre manufacturer) into the table.



The minimum ballast has to be applied as a mounted unit or a ballast weight to the tractor!

The calculated values must be smaller or equal to the permissible values.

Table	Actual value according to calculation	Permissible value according to instruction manual	Double permissible tyre load capacity (two tyres)
Minimum ballast Front / rear	<div> / kg</div>	---	---
Total weight	<div> kg</div>	<div> kg</div>	---
Front axle load	<div> kg</div>	<div> kg</div>	<div> kg</div>
Rear axle load	<div> kg</div>	<div> kg</div>	<div> kg</div>

Table 2

6.2 Mounting the extra coverage

- Bolt on swing-metal buffers (Fig. 24/7).
 - Fit carrying tubes (Fig. 24/2) with pins (Fig. 24/3) to the retainers (Fig. 24/4) of the extra coverage following harrow and secure with clip pins (Fig. 24/5).
 - Fix carrying tubes (Fig. 24/2) with pins (Fig. 24/6) on the pockets (Fig. 24/1) and secure using clip pins (Fig. 24/8).
- Make use of the fixing points (Fig. 25/1) when using WS or ROTEC-coulters.
 - Make use of the fixing points (Fig. 25/2) when using ROTEC+-coulters..

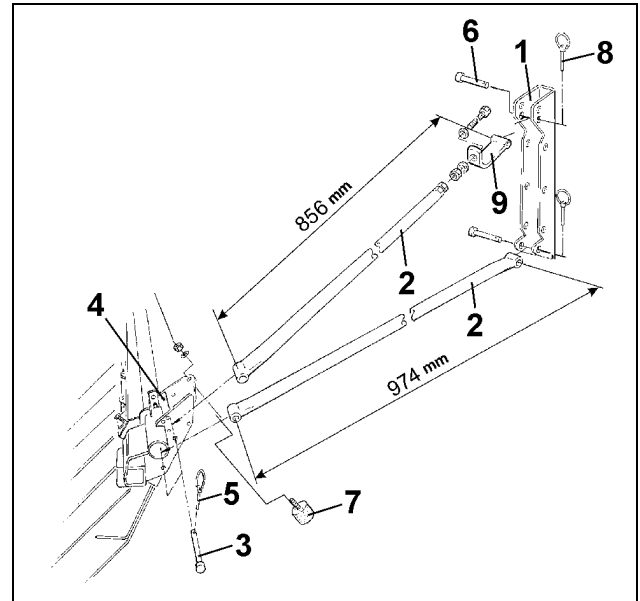


Fig. 24

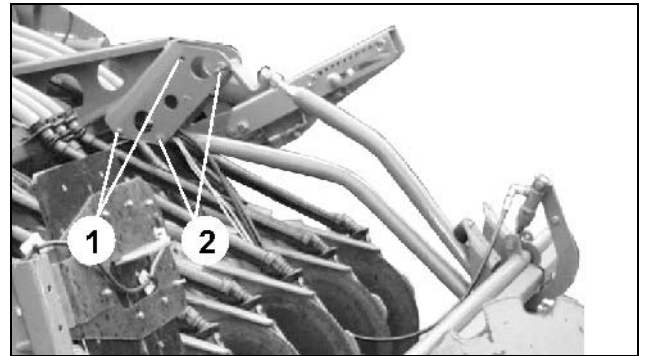


Fig. 25

Connecting hydraulic ram (option)

The hydraulic ram (Fig. 26/1) is fitted to the extra coverage harrow when supplied. Connect the hydraulic hose (Fig. 26/2) to the hydraulic ram (Fig. 26/1).



Allow the hydraulic hose (Fig. 26/2) to have a sufficiently large loop in it when fitting to the pivoting points of the link arms of the extra coverage following harrow to prevent the hose being torn apart by movement of the extra coverage following harrow.



The hydraulic pressure adjustment of the extra coverage following harrow is coupled to the hydraulic coulter pressure adjustment (if existing). If the coulter pressure is increased simultaneously also the pressure of the extra coverage harrow tines is increased.

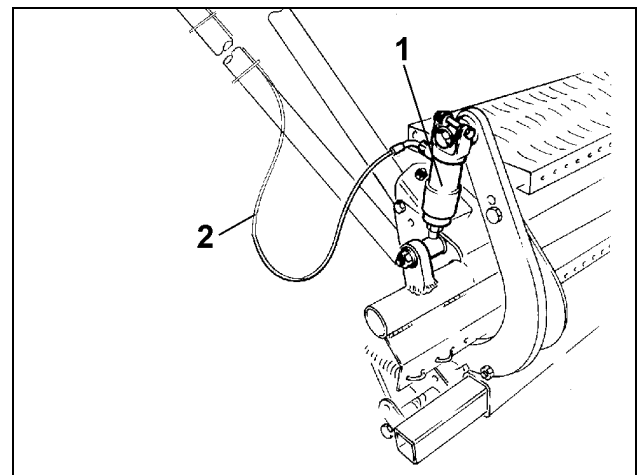


Fig. 26

7. Mounting and dismounting



Remove ignition key. Secure the implement against unintended operation and rolling away.



Danger of tipping over!

When coupling ensure sufficient free space for the lower link arms.



Only lift the implement with fitted upper link.

7.1 Mounting

7.1.1 PTO shaft



Only use the PTO shaft prescribed by the manufacturer.



Before fitting the PTO shaft clean and grease the gearbox input shaft.



On tractor and implement only use PTO shaft with complete guard and additional guard. Replace guards immediately once they have been damaged.



The max. angling of the universal joint on the PTO shaft should not exceed 25 °.



Also note the fitting- and maintenance advice of the PTO shaft manufacturer



To avoid damage engage PTO shaft slowly at low tractor engine speed.



During operation attach the PTO shaft bracket on the frame carrier and secure by using a lynch pin.

7.1.2 Coupling the sowing combination



When coupling the sowing combination, adhere to the safety advice for implements mounted on to the tractors' three point hydraulics according to para. 2.7



When mounting the soil tillage implement to the tractor observe the safety advice according to para. 2.7!



The distance between the tractor's PTO shaft and the lower hitching points is different for each tractor type. Tractors with a smaller distance require a shorter PTO shaft than those with a greater distance.



If the tractor cannot lift the combination of soil tillage implement, roller and seed drill attach the top link as low as possible to the soil tillage implement and as high as possible to the tractor. This prevents the combination from tilting forward too much when lifting; it may even tilt slightly backwards. Less lifting power is required in this case.

Check whether the lifting height is sufficient to ensure an appropriate clearance between the soil tillage implement, roller, seed drill and the ground.

Mount the implement to the rear hydraulic three point linkage of the tractor in the usual manner.

Attach lower and upper link arms of the tractor according to figure (Fig. 27). Secure the top- and lower link pins using lynch pins.

Set the top link (Fig. 27/1) so that the soil tillage implement stands horizontally in the working position and the top link runs more or less parallel to the lower link (Fig. 27/2) or drops towards the tractor. When the implement is raised using the tractor's hydraulics it tilts forward and the roller and seed drill have adequate ground clearance.

The packer seed drill is equipped with upper and lower link pins (Fig. 27/3) of cat. III for fitting to the tractor upper and lower link.



Fig. 27 .

7.1.3 Coupling the front seed hopper

Couple the front seed hopper as usual to the front hydraulics of your tractor

The lower link arm cat. II (Fig. 28/1) can be adjusted in its height and adapted to any type of tractor. Ensure that the lower link arm is locked (Fig. 28/2), secured against twisting (Fig. 28/3) and fixed with setting rings (Fig. 28/3) which should be firmly pressed on to the brackets (Fig. 5.1/5).

Affix the top link (Fig. 28/6) with top link pins cat. II (Fig. 28/7) and secure by using a clip pin. Adjust the top link length to align the front seed hopper.

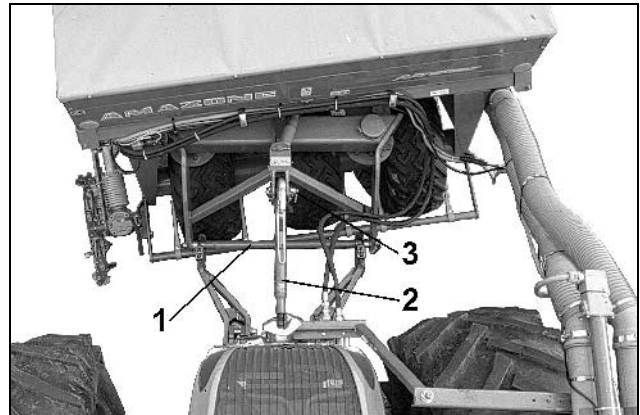


Fig. 28



When coupling the front tank read and adhere the safety advice for implements mounted on to the tractor three point hydraulic according to para. 2.7



Observe when fitting the front seed hopper.

The tractor lower links must be equipped with a pendulum equalisation to compensate terrain undulations and to avoid FPS frame deformation.

The lower link arms of the tractor must have only little lateral play.



Hints for top link fixing

The tractor can lift the front seed hopper easier when the top link is fitted to the front seed hopper as low as possible and on the tractor as high as possible. Check whether the lifting height is bit enough.

Install seed guide tubes and electric cables only after the combination has been fixed to the tractor.

Via one or two seed guide tubes (Fig. 29/2) the seed is delivered from the front seed tank (Fig. 29/1) to the distributor(s) (Fig. 29/2) of the seed rail

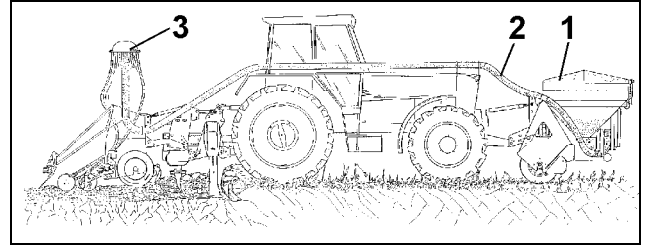


Fig. 29

Affix the seed guide tubes (Fig. 30/1) to the tractor with at least one bracket in front (Fig. 30/2) and one bracket at the rear (Fig. 30/1). Make these brackets suitable for your tractor type and fix them on the tractor.

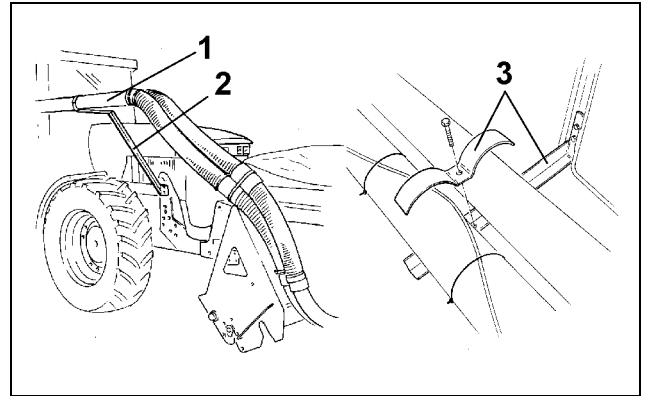


Fig. 30

Insert the seed guide tubes into one another and secure by using quick couplings (Fig. 31/1).

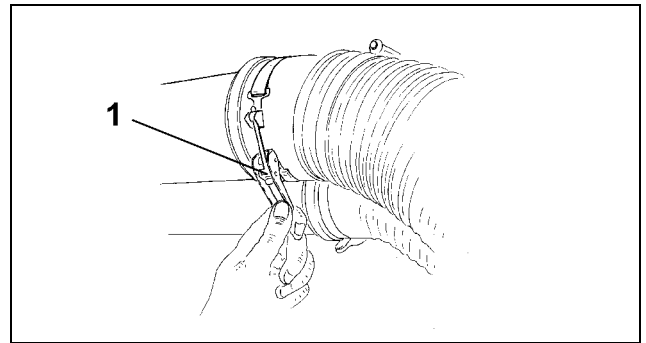


Fig. 31



When installing the seed guide tubes between front seed hopper and distributor(s) take care for short distances.



Route the seed guide tubes in such a way that they will not be damaged during operation.



After coupling the front seed hopper to the tractor push the FPS-support stand (Fig. 32) upwards and before uncoupling the front seed hopper off the tractor in downwards.

After any re-adjustment lock the support stand with the earlier slackened pin and secure using a clip pin.

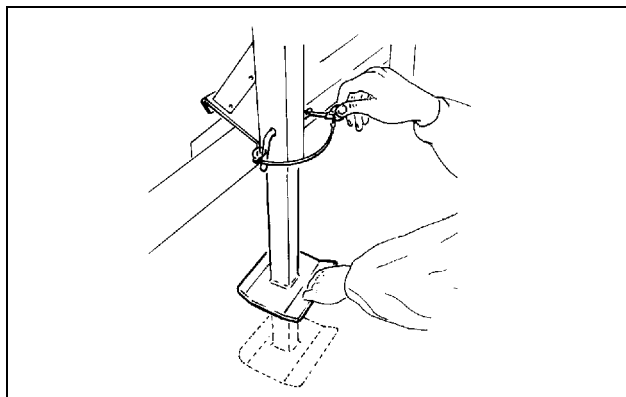


Fig. 32

Install and affix to the tractor both the seed guide tubes and the set of cables (Fig. 33).

- Connect combi-plug (Fig. 33/1, Fig. 34) of the front tank with the cable harness
- Connect the plug of the seed drill with the cable harness (Fig. 33/3).
- Connect the cable harness with the aid of the implement plug with the tractor basic equipment for AMATRON+ (Fig. 33/3, Fig. 35).

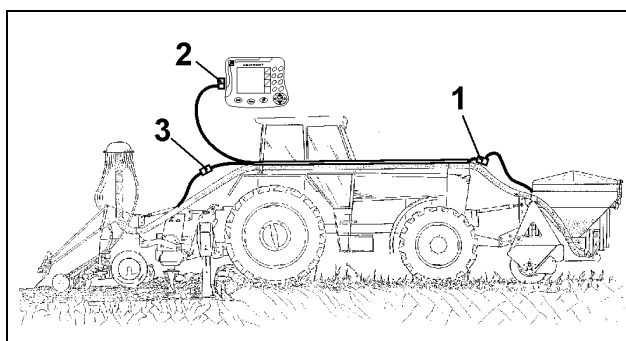


Fig. 33

Front plug connections:

Connect the combi-plug (Fig. 34/1) on the seed hopper with the set of cables (Fig. 34/2) on the tractor.

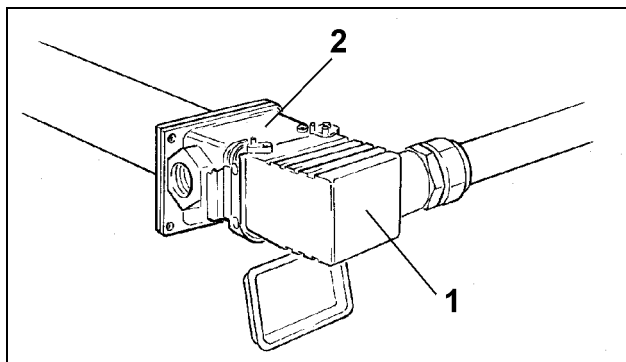


Fig. 34

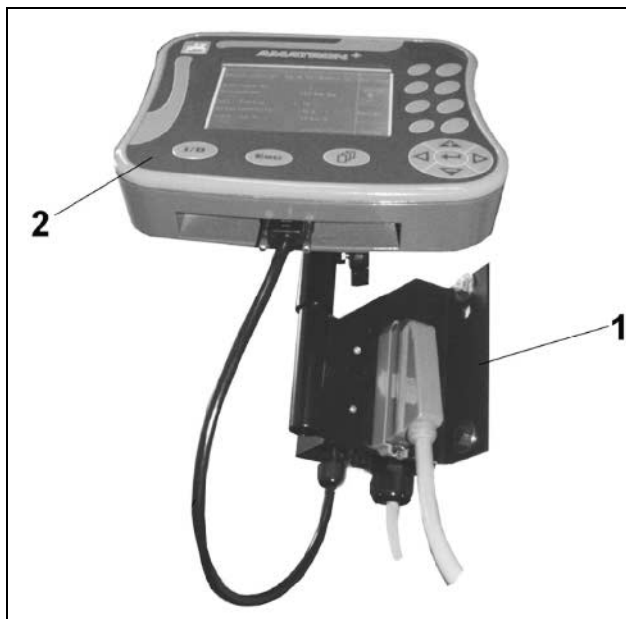


Fig. 35

7.2 Hydraulic connections



Warning - The hydraulic system is under high pressure!



When connecting the hydraulic hoses to the tractor hydraulic system take care that both the tractor and broadcaster hydraulic system are pressure free!



All hydraulic hoses are provided with coloured marks in order to assign the relevant hydraulic functions to the tractor control valve.



Max. permissible hydraulic oil pressure: 200 bar



Max. permissible hydraulic oil pressure in the pressure free return flow: 10 bar



It is useful to combine the star wheel actuation and the lifting of the front tank via a control unit.

- **Control valve 1: double acting**
 - PS 403-2, 603-2: Folding in (Hose mark 2x green)-, Folding out (Hose mark 1x green), the seed drill.
- **Control valve 2: double acting**
 - For FPS: Connect the lifting and lowering of the front tank and star wheel lift with a control valve.
- **Control valve 3: single acting**
 - For FRS: Connect the lifting and lowering of the front tank and the star wheel lift (hose mark natural) with a control valve.
- **Control valve 4: single acting (Hose mark yellow):**
 - Folding in and out the track markers, actuation of the pre emergence marker (special option), setting the coulter pressure (special option)(, extra coverage following harrow (special option).
- **Control valve 5: single acting (Hose mark 1x red) and**
- **1 pressure free return flow (Hose mark 2x red):**
 - Blower fan drive.



FPS: Joint actuation of front tank and star wheel



After the hydraulic setting of the front tank height, close the hydraulic hose to the front tank and make use of the Control valve for actuating the star wheel.

7.3 Fitting the traffic lights

Connect light cable with plug with the 12 V-tractor plug.

7.4 Uncoupling



Before uncoupling the machine from the tractor ensure that the coupling points (upper- and lower links) are relieved..

Pull the FPS-support stand before uncoupling the front seed hopper off the tractor in downwards.

After any re-adjustment lock the support stand with the earlier slackened pin and secure using a clip pin.

Park the machine on level ground.

- Uncouple the front tank.
- Uncouple the packer seed drill.
- Remove the PTO shaft.
- Remove the seed tubes.
- Disconnect the electric dabbles.

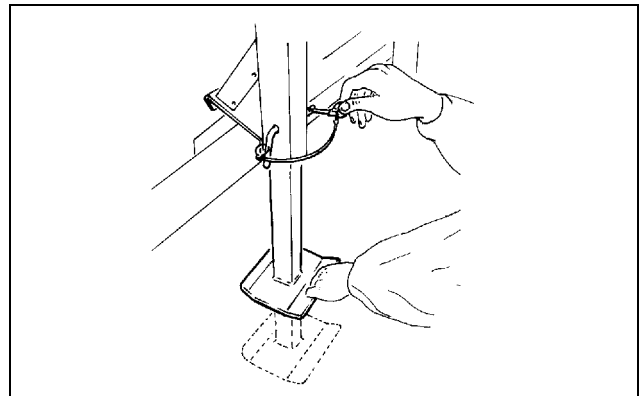


Fig. 36

8. Transport on public roads and ways



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



Vehicle owner as well as the operator are responsible for adhering to the legal traffic regulations.

According to the harmonised European traffic regulations traffic light units and warning plates are required on agricultural and forestry implements mounted to tractors. The regulations are (slight national differences may be possible):

- If the prescribed rear lights, the indicators or the registration number are hidden by the broadcaster they will have to be repeated on the mounted implement. If the sides of the mounted implements protrude more than 400 mm the outer edge of the light emitting source of the limiting or rear lights of the tractor, extra parking warning plates and side lights are required. If the mounted implement protrudes more than 1 m beyond the rear lights of the tractor, parking warning plates, rear light units and rear reflectors are required. The light units and possibly required parking warning plates and –foils according to DIN 11030 can be obtained from the manufacturer of the implement or from your dealer. As always the latest edition of the national traffic regulations is valid, please verify them at your local traffic office.



The traffic light kit must correspond to your national traffic law..



Standing on the implement or the transport of goods on the implement is prohibited!

If the total length of the mounted combination including tractor is more than 6 m, please follow your national legal traffic rules regarding proper traffic lights, e.g. yellow rear lights and yellow flash light.



When travelling on public roads with a yellow flash light, please follow your national traffic regulations.

The permissible tractor axle loads, the permissible total weight of the tractor and the permissible load capacity of the tractor tyres must not be exceeded. Please determine the permissible tractor axle loads, the permissible total weight of the tractor and the permissible load capacity of the tractor tyres according to para. 6.1. Only use towing vehicles which correspond to your national traffic regulations.



When lifting the machine the front axle load of the tractor is relieved by different amounts depending on the size of the tractor. Always check that the necessary front axle load of the tractor (20 % of the tractor's net weight) is maintained.!

If the rear mount combination is transported without seed hopper, the front axle load reduction varies according to the tractor size. If necessary, use front axle weights.

Moving behaviour, steering and braking are influenced by mounted implements, trailers and ballast weights. Therefore check sufficient steering and braking.

In the transport position of the implement ensure that the tractor three-point linkage is locked against movement to the sides. When driving round bends note the width of the machine and/or the changing centre of gravity of the implement.



When travelling on public roads with a lifted machine lock the control lever of the three point hydraulic against unintended lowering.

Raise the seed rail for road transport only so much that the following spacings are not exceeded:

Get the warning plates and traffic light kit of the Pack Top sowing rail PS into the transport position.

Distance between rear traffic light upper edge towards the road max. 155 cm, distance of the rear reflectors towards the road max. 90 cm.



The transport on public roads is only allowed with empty seed hopper.

Apply for a special permission for the second pair of head lamps if required by the traffic regulations in force in your country.

Repeat the possibly hidden registration number of the tractor on the rear mount combination.

As standard the packer seed drill is equipped with the in Germany legally prescribed rear warning plates and traffic light kit (Fig. 48/2).



Transporting the mounted rigid packer seed drills PSKW 403 and PSPW 403 on public roads is prohibited as their transport width is 4 m.

The spacing between steering wheel centre and the front edge of the front seed hopper exceeds 3.50 m. Therefore, in case of poor visibility ask an escorting person for help.

The front tank is equipped with limiting lights (Fig. 37/1). If the tractor front lights are hidden by the seed hopper, they must be repeated. For the second pair of head lamps (Fig. 40.5/3) a special permission might be necessary.

The warning plates (red/white striped) (Fig. 37/2) which are supplied as standard, may not be removed. They should be fixed with a max. distance towards the outer edge of the machine of 10 cm in a max. height of 150 above ground.

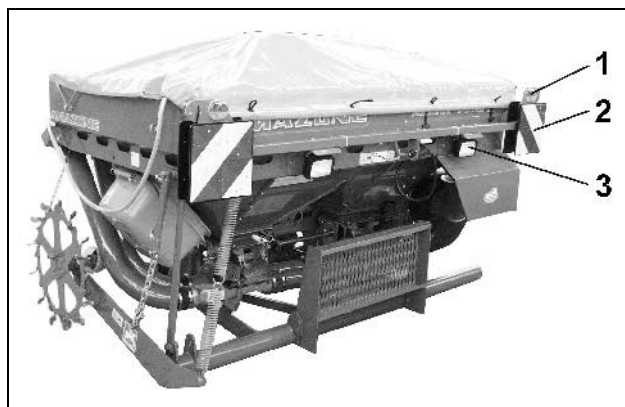


Fig. 37

8.1 Adjustments on tractor and machine for transport on public road



Do not exceed the maximum permissible transport width (in Europe 3m)



When the machine is lifted for road transport, the distance between the upper edge of the rear lights and the road surface must never exceed 900 mm.

- **Getting the star wheel into the transport position:**

Star wheel front tank: Fig. 38

During road transport the star wheel (Fig. 38/1) must be lifted and fixed to the frame with a chain (Fig. 38/2).

The step (Fig. 38/3) must be folded upwards.

Star wheel seed drill with electric metering: Fig. 39

For road transport lift the star wheel (Fig. 39/1) and secure using a lynch pin.

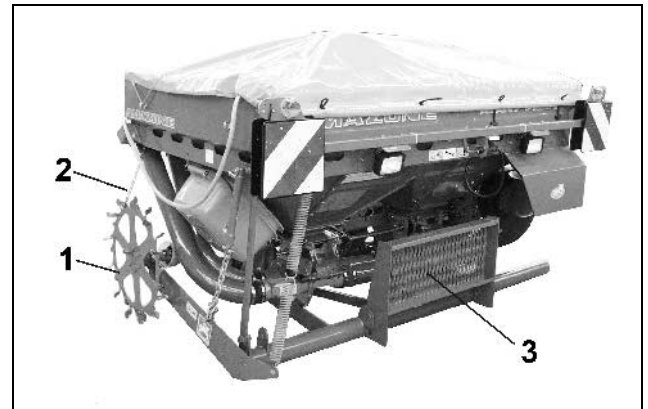


Fig. 38

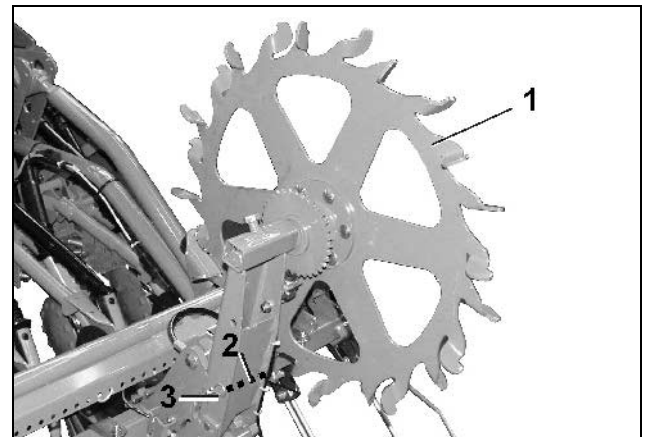


Fig. 39

- **Getting the pre emergence marker into the transport position:**

If your machine is equipped with a pre emergence marker (Fig. 40) cover the track marker discs (Fig. 40/1) with the canvass (Fig. 48/1) (option). For this, slacken the pins (Fig. 40/2) and carefully swivel the arms (Fig. 40/3) with the marker discs downwards behind the canvass.

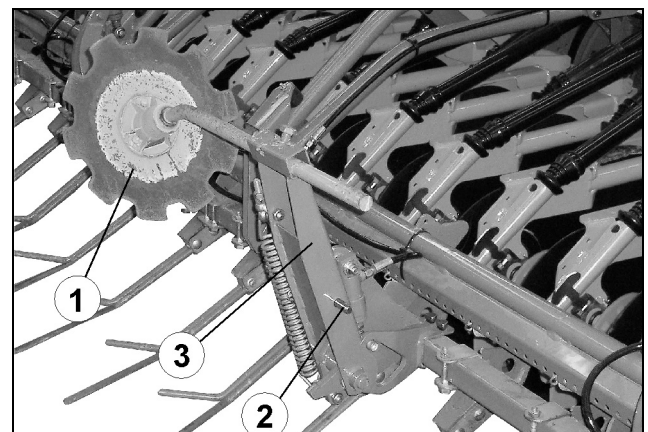


Fig. 40

- Bring marker arms into transport



Danger of injury!

Before travelling on non public or public roads and ways secure both marker arms (Fig. 41/1) with clip pins (Fig. 41/2) against unintended lowering.

This also applies when changing from one field to the other.

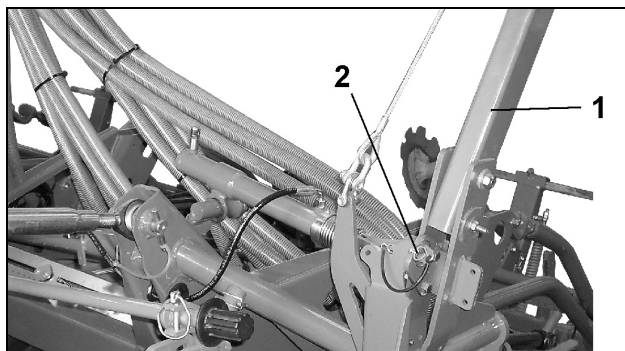


Fig. 41

- Folding in the machine:



When folding in the machine ensure that the locking device (Fig. 42/1) catches on the left and right hand side.



To avoid damage when the packer seed drill is folded, ensure sufficient lifting of the machine.

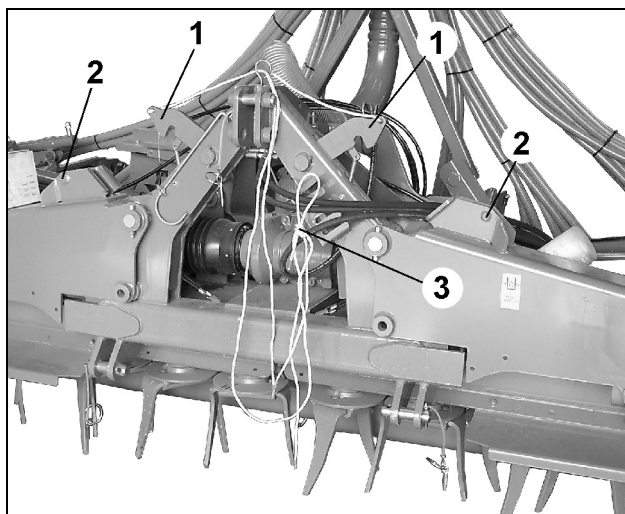


Fig. 42

- Getting the traffic light kit into the transport position:

As soon as the combination is folded for transport, bring the arms (Fig. 43/1) with the traffic light kits and the warning plates into road transport position.

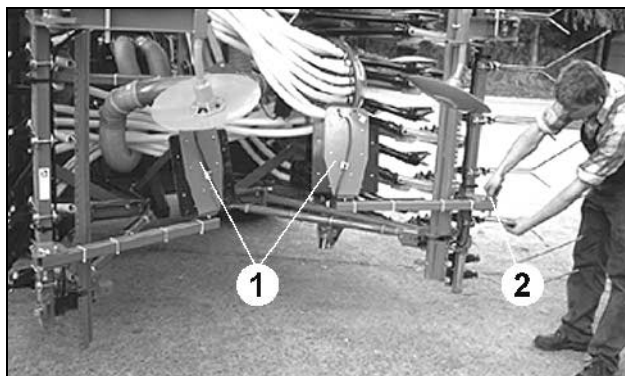


Fig. 43

Remove the pin (Fig. 43/1) secured by a clip pin and swivel the arm (Fig. 44) with the warning plates and the traffic light kit into road transport position

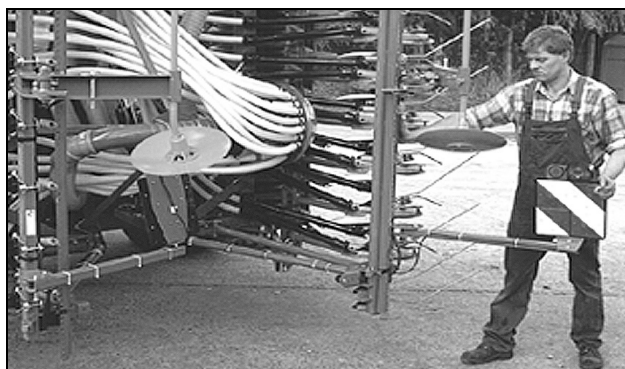


Fig. 44

Lock the arm with the prior slackened pin (Fig. 45) and secure using a clip pin.

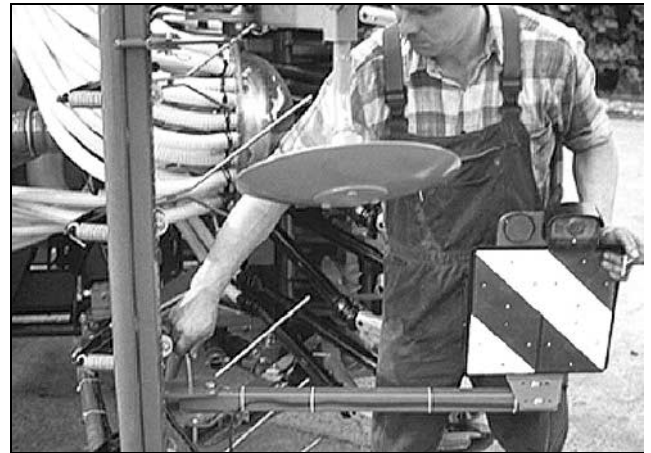


Fig. 45

- **Getting the extra coverage following harrow into the transport position:**

Swivel in the extra coverage following harrow (Fig. 46) and secure with the supplied tensioning belt (Fig. 47).

- **Apply guard covering canvass:**

Before going on the road cover the coulters with a covering canvass (Fig. 48/1) (option).

- **Connection of traffic light kit:**

Plug the light cable into the tractor's socket and check traffic lights for function. Route the cables in such a way that they will not be damaged.



Before getting the combination into operational position again, mount the traffic equipment in vice versa order!

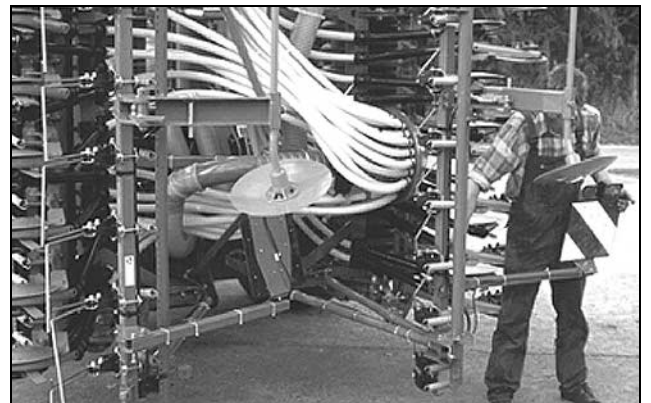


Fig. 46

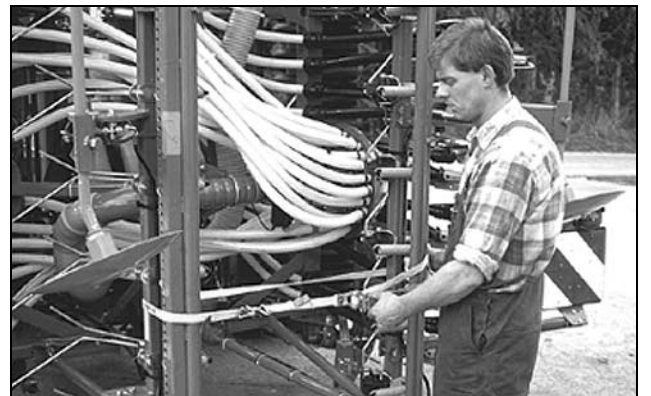


Fig. 47

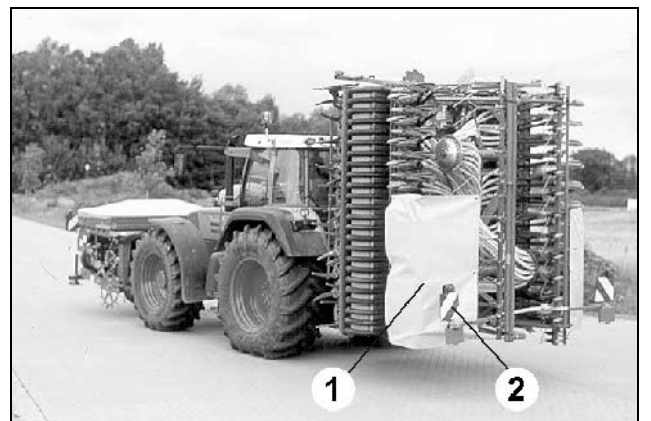


Fig. 48

9. Creating tramlines with the AMATRON+-tramline control

With the aid of the tramline control tramlines are created in the field so that other implements, e.g. fertiliser broadcasters or field sprayers, may travel accurately.

Tramlines are marks (Fig. 49/1), in which no seed is sown.

The spacing between the tracks corresponds to the track width between the wheels of the husbandry tractor and can be adjusted

The spacing between sets of tramlines corresponds to the working widths of later used machinery (Fig. 49/2), as e.g.

- Fertiliser spreaders and/or
- field sprayer.

The rhythm for creating tramlines is governed by the AMATRON+-computer. The desired tramline distance may only be created on seed drills with particular working widths. A choice of these tramline distances is shown in Table 3.

The required rhythm (see Fig. Fig. 49) results from the desired tramline distance and the working width of the seed drill.

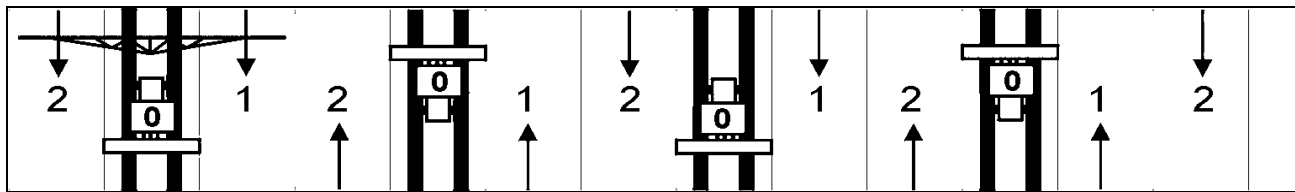


Fig. 49

Switching rhythm	Working width of the machine		
	4,0 m	5,0	6,0 m
	Tramline spacing		
3	12 m	15 m	18 m
4	16 m	20 m	24 m
5	20 m	25 m	30 m
6	24 m	30 m	36 m
7	28 m	35 m	42 m
8	32 m		
9	36 m		
2	16 m	20 m	24 m
6 plus	24 m		24 m 36 m
18 right hand	18 m		
18 left hand			

Table 3

9.1 Way of function

On delivery of your seed drill the tramline metering wheels are set to the wheel mark of your husbandry tractor (as ordered by you).

When creating tramlines the seed supply to the tramline coulters is interrupted. With the aid of shutters (Fig. 50/3) an electric motor (Fig. 50/1) shuts off the outlets of the tramline coulters inside the distributor head.

With the aid of the sensor (Fig. 50/2) AMATRON+ monitors the shutter position and sends an alarm in case of a wrong position.

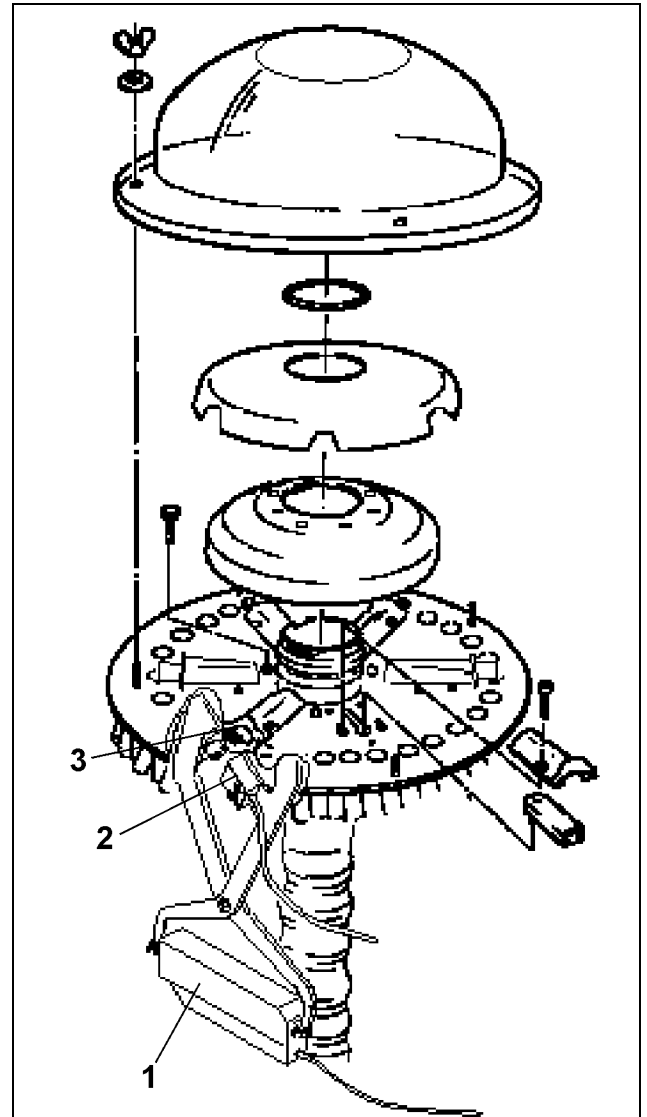


Fig. 50

For shifting on the tramline counter AMATRON+ receives the necessary information

- on implements with track markers from the sensors (Fig. 51/1) when changing the track marker
- on implements without track markers as soon as the distance sensor (Fig. 51/1) does not send any impulses, e.g. when raising the implement at the headlands or at a standstill in the field.



The shutter control in the distributor head is coupled with the hydraulically actuated pre emergence marker (if existent).

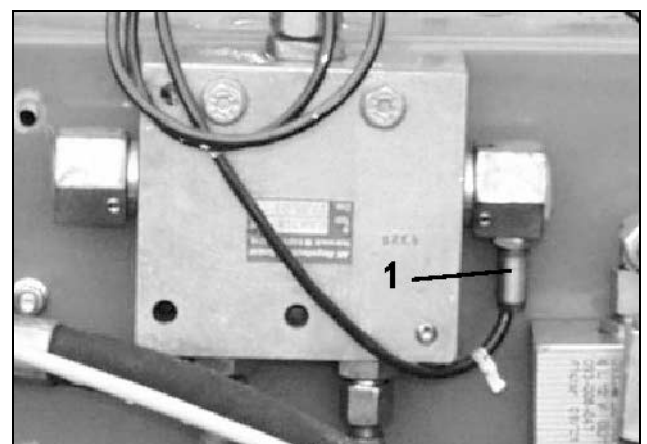


Fig. 51

9.1.1 Entering the switching rhythm and start figure prior to the begin of operation

The procedure of some switching rhythms is shown in Fig. Fig. 53.

Hints for Fig. 53:

- A = Working width of the seed drill
- B = Tramline spacing (= Working width of the fertiliser spreader or the field sprayer)
- C = Switching position
- D = Number of field travel, shown in the AMATRON+ tramline counter.

Please enter the desired switching rhythm in the AMADOS computer as described in the AMADOS instruction manual. Additional switching rhythms not shown in this instruction manual may be found in the instruction manual AMATRON+.

During operation the field travels are counted. Prior to operation the number of the first travel in the field should be entered into the tramline counter of the AMADOS computer. Please determine the number of the first travel in the field according to Fig. Fig. 53 as follows:

Move to column "C" to the selected switching rhythm and find the figure for the first field travel in column "D" under "START".




Before setting the tramline counter for the first operation ensure that the correct track marker is lowered when starting to operate. If necessary actuate the track marker control once more before setting the tramline counter.

Prior to operation ensure that AMATRON+ displays in the tramline counter the correct figure for the first operation.

9.1.2 Interrupting the sowing operation or folding in the markers during the sowing operation (Stop-Key)

In case if becomes necessary


- to raise the track markers, e.g. when giving way to obstacles
- or
- at seed drills without track marker to interrupt the sowing operation, e.g. by stopping in the middle of the field

beforehand press key 

to avoid an unintended advancing the tramline counter.

After pressing the stop key the tramline counter (e.g. "3") on the AMATRON+ display flicks.

Immediately after continuing the sowing operation

press key 

The tramline counter does not flick any longer in the operation display (Fig. 52).

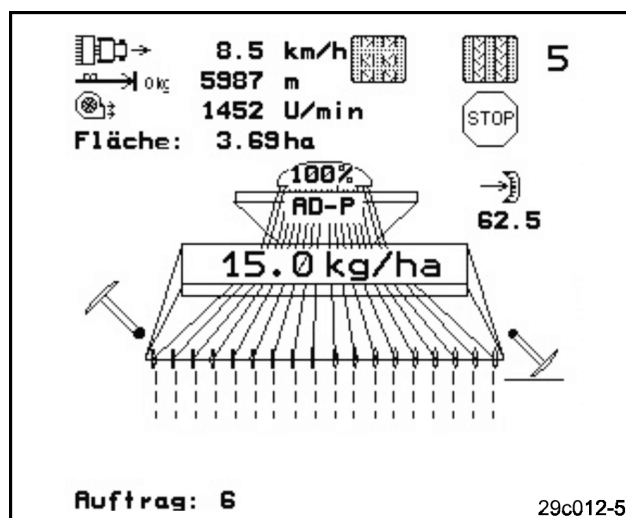


Fig. 52

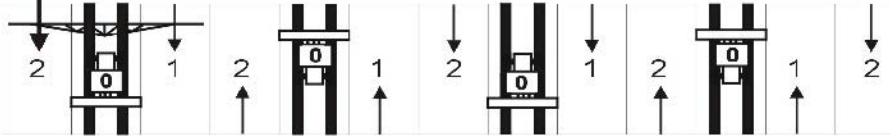
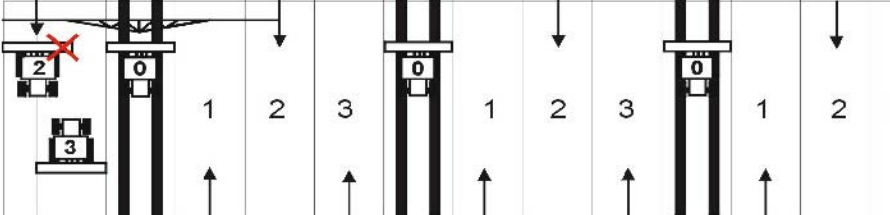
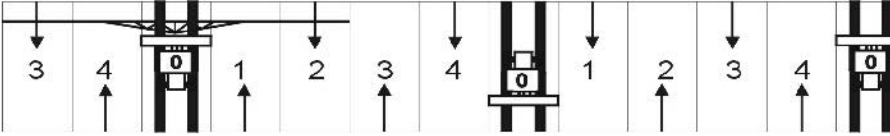
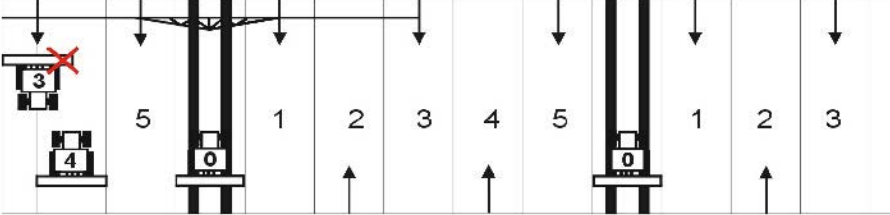
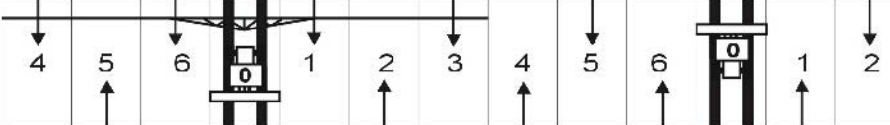
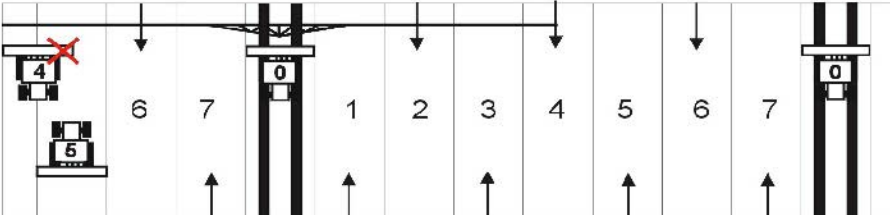
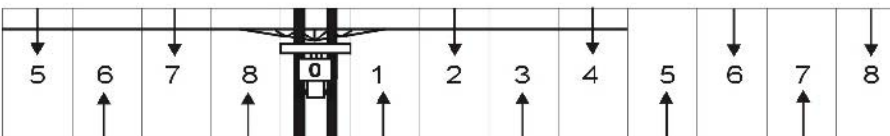
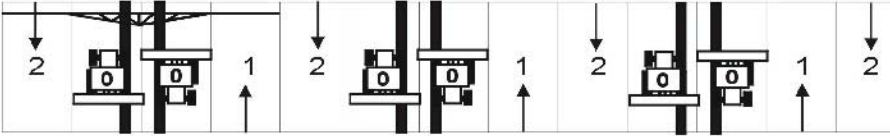
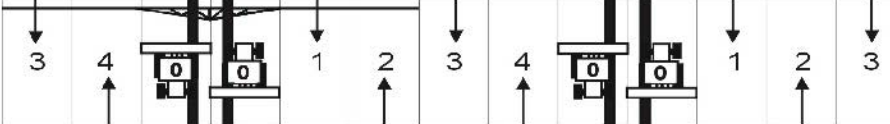
A	B	C	D
			START DÉPART
3,0 m 4,0 m 6,0 m	9 m 12 m 18 m	3	
2,5 m 3,0 m 4,0 m 4,5 m 6,0 m	10 m 12 m 16 m 18 m 24 m	4	
3,0 m 4,0 m 6,0 m	15 m 20 m 30 m	5	
2,5 m 3,0 m 4,0 m 4,5 m	15 m 18 m 24 m 27 m	6	
3,0 m 4,0 m	21 m 28 m	7	
2,5 m 3,0 m 4,0 m	20 m 24 m 32 m	8	
3,0 m	27 m	9	
2,5 m 3,0 m 4,0 m 4,5 m	10 m 12 m 16 m 18 m	2	
2,5 m 3,0 m 4,0 m 4,5 m 6,0 m	15 m 18 m 24 m 27 m 36 m	6 plus	

Fig. 53

9.2 Hints for creating tramlines with 4-, 6- and 8-fold switching rhythm

Fig. 53 shows among others examples for creating tramlines with 4-, 6- and 8-fold switching. In our example the seed drill operates during the first run in the field with half its working width. The second possibility is to start operation at the entire working width and by creating a tramline (see Fig. 54). In this case the fertiliser broadcaster should spread to one side with boundary spreading devices during the first run in the field. On field sprayers one sprayer boom is switched off during the first run in the field.



Please do not forget after the seed drill's first run in the field to reset the fertiliser broadcaster or field sprayer to their full working width.

9.2.1 Operating with half the working width

Only for machines up to 4.5 m working width:

For operating a seed drill up to 4.5 m working width, the insert for half-sided shut off the outlets in the distributor head should be used. The operation has always to start on the right hand side of the field.

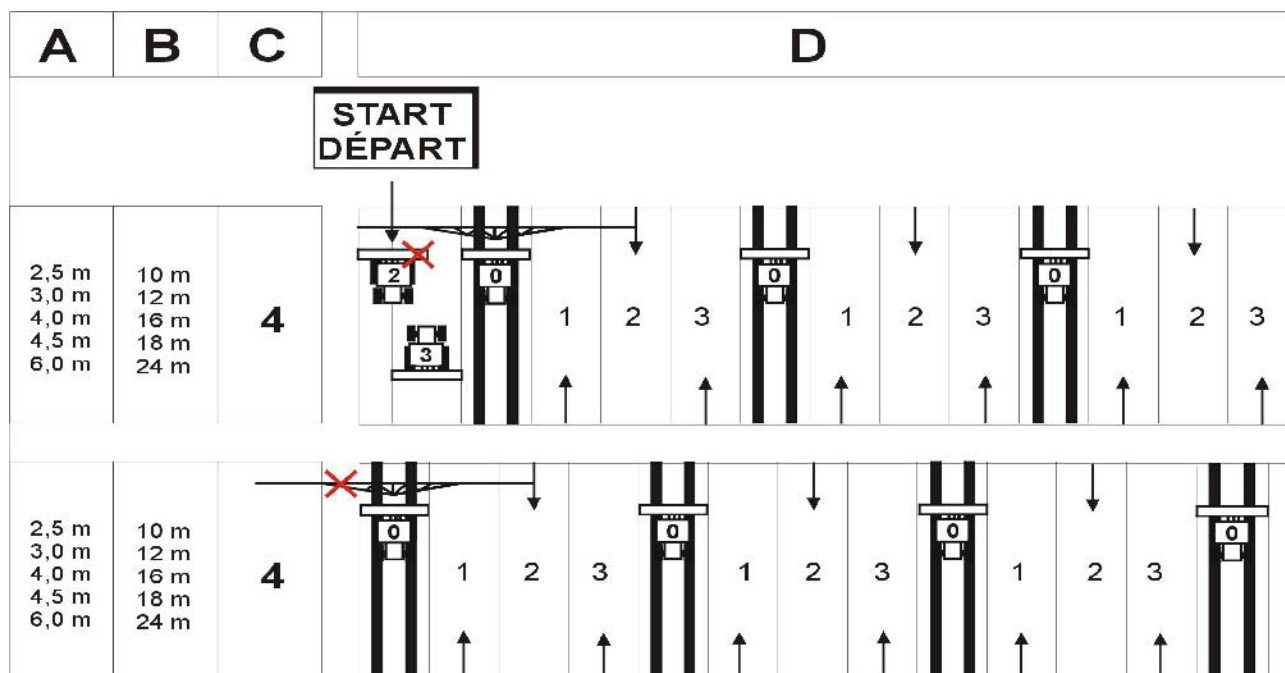


Fig. 54

Only for machines from 6 m working width:

On 6 m combinations the metering drive of the left hand implement side can be disengaged by pulling the clip pin (Fig. 55/1) out of the connecting tube of both metering units. The operation has always to start on the right hand side of the field.

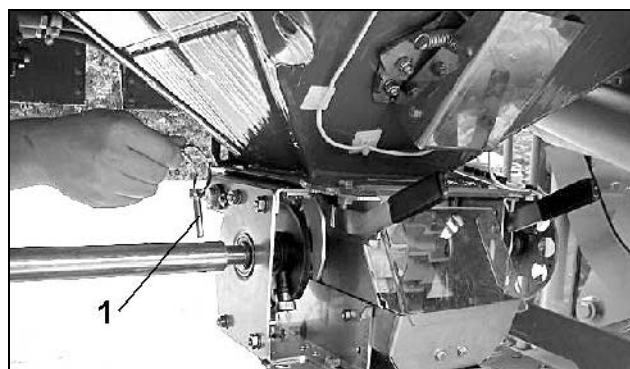


Fig. 55

9.2.2 Insert for half-side shutting off the outlets inside the distributor head

Only for machines with 4 m working width.

With the insert (Fig. 56/1) for the half-side shutting of the outlets in the distributor head the seed flow is guided to half of the outlets (Fig. 56/3) and thus to half of the coulters. This way, at random, the seed delivery to the coulters can be interrupted on the right or left hand implement side and you can sow with the other implement half.

Fitting and handling the insert

- Remove distributor hood (Fig. 56/4).
- set the insert (Fig. 56/1 or Fig. 57/1) on to the distributor plate (Fig. 56/2 or Fig. 57/2) that the desired outlets will be shut off by the insert.
- In top view (see Fig. 57)
- shut off, not hatched outlets (Fig. 57/3) are on the side behind the corrugated tube (Fig. 57/4)
- open, hatched outlets (Fig. 57/5) are on the side in front of the corrugated tube (Fig. 57/4).
- In any case check the routing of the seed guide tubes (Fig. 56/5) to ensure that the insert shuts off the seed flow to the correct coulters.
- Mark the position of the insert with a suited pencil on the distributor plate (Fig. 57/2) so that you may quickly find the correct position of the insert on the distributor plate later on.
- Fix the distributor hood (Fig. 56/4) on the distributor head. When fixing the distributor hood the insert (Fig. 56/1) is clamped.
- Take the disc rule and determine the gearbox setting for half the seed rate. If your seed drill is equipped with the AMATRON+ seed rate remote control, set half the seed rate as described in the AMATRON+ instruction manual.
- If necessary carry out a new calibration test with the determined gearbox setting.

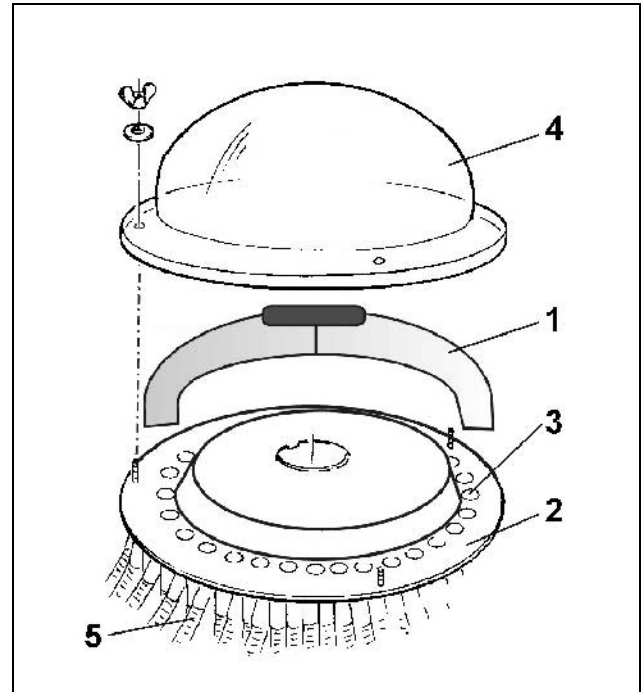


Fig. 56

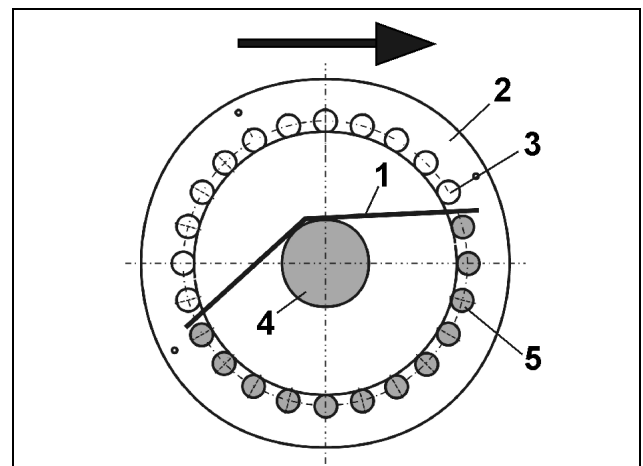


Fig. 57

Removing the insert is done in the adverse order.



In order to avoid that the open outlets are provided with the double amount of seed, reduce the seed rate on the gearbox by its half.



Never create tramlines when sowing with half the working width.



After having removed the insert, reset the gearbox to the full seed rate n.

9.2.3 Hints for creating tramlines with 2-bout and 6-plus bout switching rhythm

The tramlines with 2-bout and 6-plus bout rhythm (see Fig. 54) are created during one run in the field up and down.

The flow of seed to the coulters responsible for creating tramlines must only be interrupted on seed drills with

- 2-bout switching rhythm on the right hand implement side
- 6-plus bout switching rhythm on the left hand implement side.

Always start to operate on the right hand field side.

9.2.4 Setting the tramline to the wheel marks of the husbandry tractor

On supply of the seed drill the tramline kit has been set to the wheel marks of your husbandry tractor. However, should it be necessary, e.g. when purchasing a new husbandry tractor, to set your tramline system onto the wheel marks of the new tractor, the seed tubes (Fig. 58/8) have to be interchanged for one another on the distributor head. Thereby it should be noted that the tramline coulters are fixed to such outlets which can be shut by the shutter slides (Fig. 58/9).

For creating a tramline up to 3 seed outlets per track can be shut off in the distributor head.

Not needed shutter slides can be "parked" in the distributor head as described in para. 9.2.5.



If your machine is equipped with a pre-emergence marker unit, adjust the marker discs accordingly.

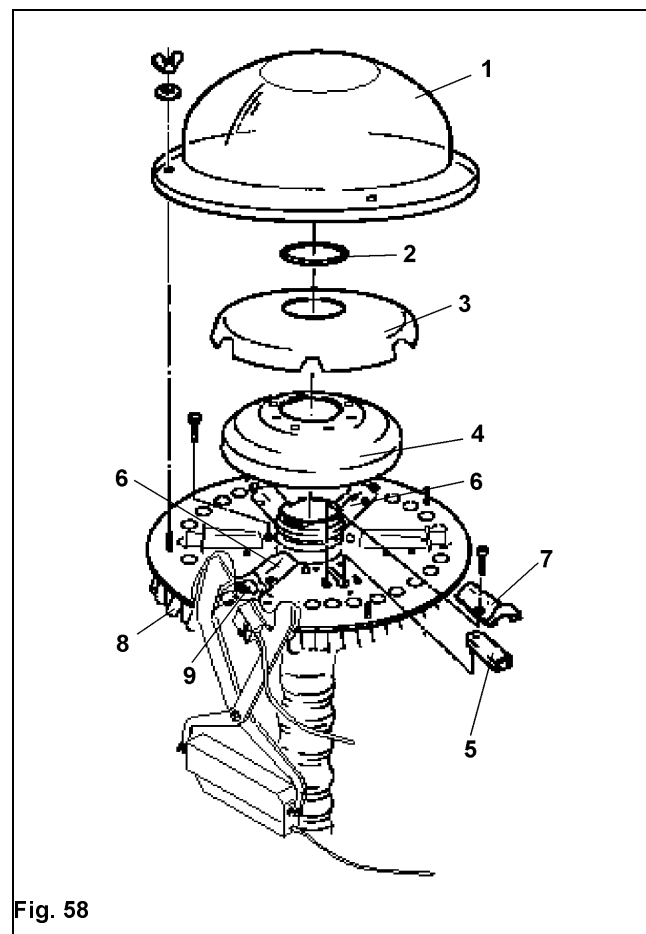


Fig. 58

9.2.5 Setting the width of the wheel marks

If it is wanted to change the number of tramline coulters, fit as many shutter slides to the distributor head as tramline coulters are required. The shutter slides interrupt the flow of seed to the tramline coulters when creating tramlines.

Shutter slides not in use should be deactivated and can be “parked” inside the distributor head.

Activate or deactivate shutter slides:

- Relieve pressure from hydraulic system remove
- Outer distributor hood (Fig. 58/1)
- O-Ring (Fig. 58/2)
- Inner distributor hood (Fig. 58/3) and
- Foam material insert (Fig. 58/4).

It is possible to fit up to 6 shutter slides. Always two shutter slides (Fig. 58/6) should be fitted on the base plate opposing each other. For mounting or dismounting the shutter slide (Fig. 58/5) the shutter slide funnel (Fig. 58/7) must be removed.

Insert not needed shutters (Fig. 58/1) in reverse order into the holes (Fig. 58/2) (parking position).

After the mounting is completed, check function of tramline control.

10. Settings

10.1 Setting the metering unit to a particular seed

Every metering unit is provided with

- a white coloured main seed wheel (Fig. 59/1)
- an orange coloured main seed wheel (Fig. 59/2)
- a red/black coloured fine seed wheel (Fig. 59/3).

The required metering wheel(s) may be taken from the Table 4)

For seeds which have not been mentioned in the Table 4 please refer to a seed with a similar grain size when choosing the seed wheel.

When the table indicates: "Main seed wheels" ("Hauptsäräder") (see Table 4) always sow with both main seed wheels at the same time.

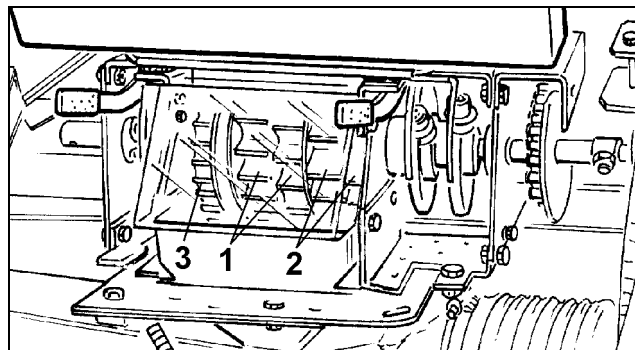


Fig. 59

Seed	Säräder	
	Main seed wheels	Fine seed wheel
Rye	Main seed wheels	Fine seed wheel
Triticale	Main seed wheels	Fine seed wheel
Barley	Main seed wheels	Fine seed wheel
Wheat	Main seed wheels	Fine seed wheel
Spelt	Main seed wheels	Fine seed wheel
Oats	Main seed wheels	Fine seed wheel
Rape	Fine seed wheel	-
Mustard	Fine seed wheel	-
Oil radish	Main seed wheels	Fine seed wheel
	Fine seed wheel	-
Phacelia	Main seed wheels	Fine seed wheel
	Fine seed wheel	-
Late turnip	Fine seed wheel	-
Grass	Main seed wheels	Fine seed wheel
Beans	Main seed wheels	-
Peas	Main seed wheels	-
Flax (dressed)	Main seed wheels	Fine seed wheel
Millet	Main seed wheels	Fine seed wheel
Lupines	Main seed wheels	-
Lucerne	Main seed wheels	Fine seed wheel
	Fine seed wheel	-
Oil seed (moist dressed)	Main seed wheels	Fine seed wheel
	Fine seed wheel	-
Red clover	Fine seed wheel	-
Soya	Main seed wheels	-
Sun flower	Main seed wheels	-
Vetches	Main seed wheels	-

Table 4

10.1.1 Switching the metering wheels on and off

- In the position “metering wheel on” (“Särad ein”) the thumb bolt (Fig. 60/1) is driven in till the stop.
- In Position “metering wheel off” (“Särad aus”) the thumb bolt (Fig. 60/1) has been driven out till the stop (Fig. 60/2).



Drive the thumb bolts either in position “metering wheel on” or “metering wheel off”.

Never tighten thumb bolts too firmly or drive them too tightly to the stop (Fig. 60/2).

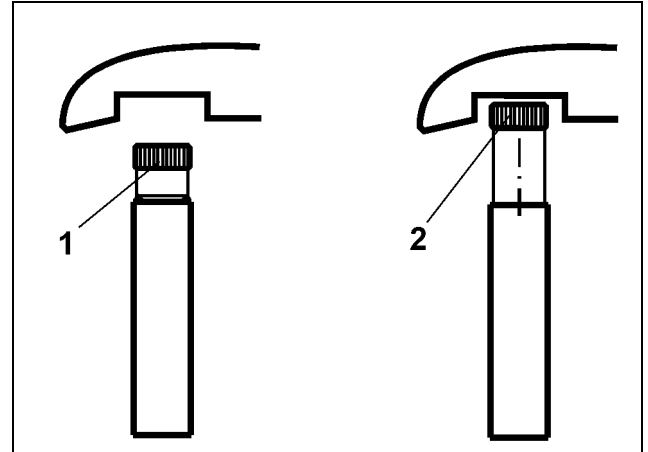


Fig. 60

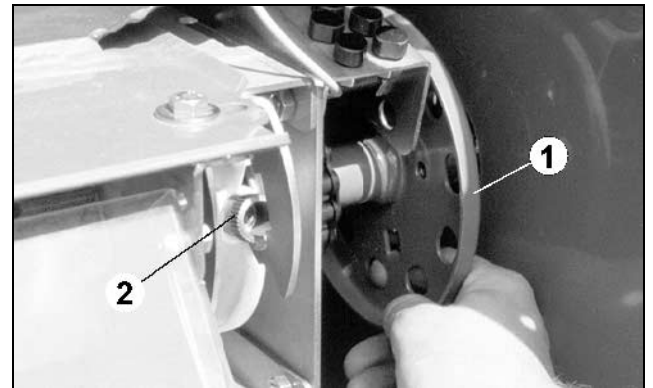


Fig. 61

10.1.2 Sowing with both main metering wheels

For sowing with both metering wheels (Fig. 62/1)

- Turn the hand wheel (Fig. 109/1) until the thumb bolts (Fig. 109/2) can be seen
- Drive in thumb bolts (Fig. 62/2) of the main metering wheels
- Drive out thumb bolt (Fig. 62/3) of the fine seed metering wheel.

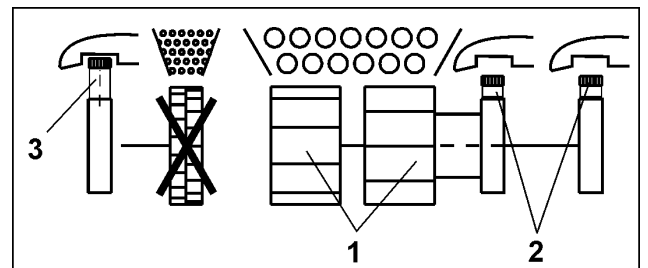


Fig. 62

10.1.3 Sowing with the fine seed metering wheel

When sowing with the fine seed metering wheel (Fig. 63/1)

- Turn hand wheel (Fig. 109/1) until the thumb bolts (Fig. 109/2) can be seen
- Drive in thumb bolt (Fig. 63/2) of the fine seed metering wheel
- Drive out thumb bolts (Fig. 63/3) of both main metering wheels.

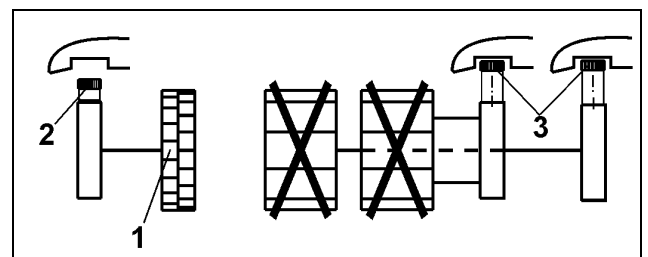


Fig. 63

10.2 Determining the gearbox setting for the desired seed rate

The desired seed rate is set by the gearbox setting lever (Fig. 64/1).

By the gearbox setting lever (Fig. 64/2) the speed of the metering shaft and thus the seed rate can infinitely variably be set. The higher the figure on the scale (Fig. 64/4) has been chosen by the pointer (Fig. 64/3), the higher the seed rate will get.



If your machine is equipped with the seed rate remote control, set the desired gearbox position according to AMATRON+.

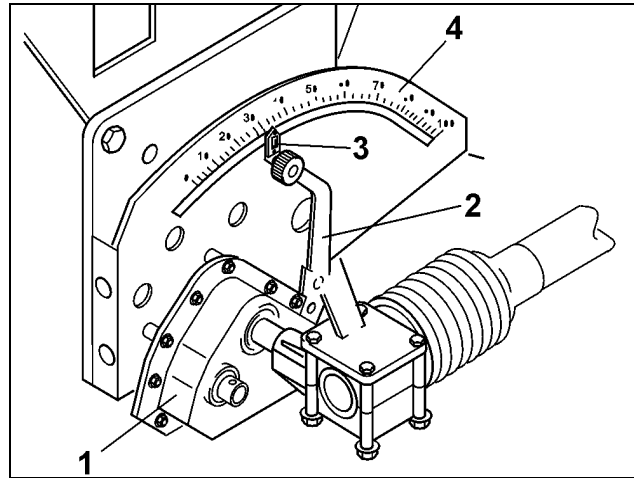


Fig. 64

10.3 Setting the seed rates with the aid of AMATRON+

for

- Electric full metering with an electric motor as direct drive (Fig. 65).
- Seed rate remote control: The rev. speed of the seed wheels and thus the seed rate is infinitely variably set with the aid of the gearbox setting lever (Fig. 66/1).

For setting the seed rate the setting motor (Fig. 66/2), which actuates the gearbox setting lever is accessed via the AMATRON+. The adjusted seed rate and the scale figure can be read from the AMATRON+ display.

Before starting the sowing operation adjust the seed rate on the stopped machine as follows:

- Carry out a calibration test and enter here the desired seed rate (please see the operator's manual for AMATRON+).



Fig. 65

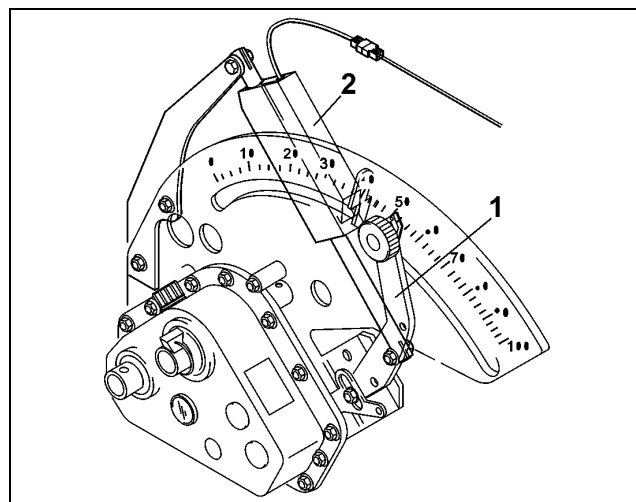


Fig. 66

10.4 Calibration test



Fill the seed hopper with seed to 1/4 of its capacity.



For machines with seed rate remote control or electronic full metering, please refer to the operator's manual AMATRON+.



After every setting on the gearbox setting lever check and confirm by a calibration test that at the later sowing the desired seed rate is obtained.

This test should also be conducted

- when changing from e.g. main seed metering wheel to the fine seed metering wheel.
 - before sowing a new supply of seed (reason: deviations in grain size, grain shape, bulk density and seed dressings).
- Place a calibration tray (Fig. 67/1) below every metering unit and open the injector sluice flap (Fig. 67/2) on every metering unit.
- The calibration trays (Fig. 68/3) are held in a retainer and are secured with a clip pin (Fig. 68/1).
- Slacken the star knob (Fig. 69/1) of the gearbox setting lever.
 - Move the gearbox setting lever (Fig. 69/2) to one of the following gearbox settings:
 - For sowing by both main metering wheels: gearbox setting "50"
 - For sowing with the fine seed metering wheel: gearbox setting "15".
 - Tighten star knob (Fig. 69/1).

In the past usually the values for the first gearbox setting were indicated in a sowing table. However, these values heavily differ depending on grain properties and especially depending on dressing agents and dressing procedures that the use of a sowing table has not got any advantage. The correct gearbox setting can be determined quickly by using the calculating disc rule, described in para.10.4.1.

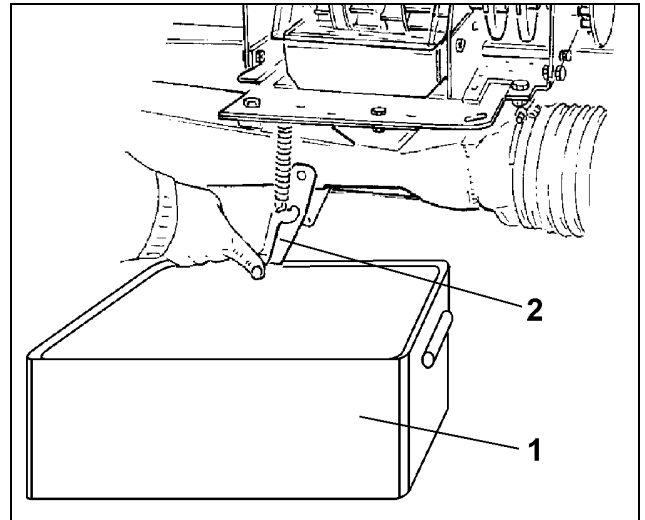


Fig. 67

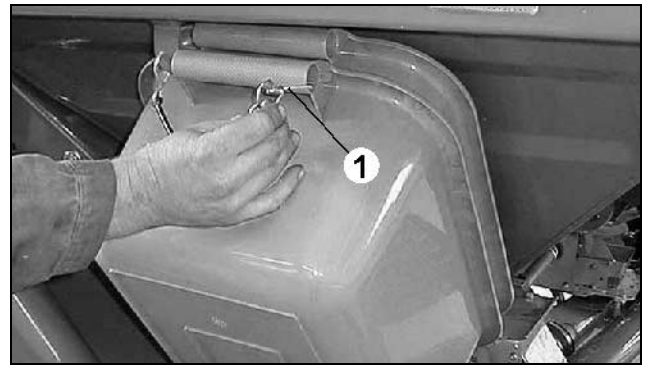


Fig. 68

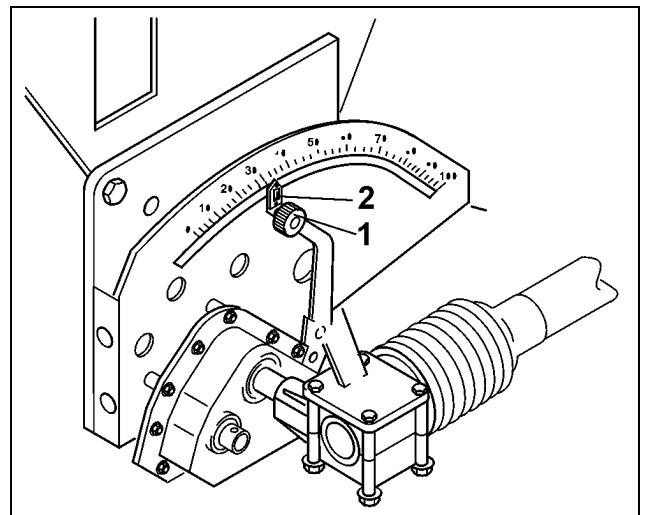


Fig. 69

- Take the calibration crank (Fig. 70/1). The calibration crank is located in a retainer on the frame.
- Use square end neck (Fig. 70/2, Fig. 71/2) to push the calibration crank on to the star wheel (Fig. 70/3, Fig. 71/3).

FPS (Fig. 70): Turn the star wheel in left direction.

FRS (Fig. 71): Turn the star wheel to the right.

- With the calibration crank (Fig. 71/1) turn the star wheel until all metering wheel housings of the seed metering wheel(s) have been filled with seed and a uniform flow of seed runs into the calibration tray(s) (Fig. 67/1). Empty the contents of the calibration tray into the seed hopper and turn the crank in times taken from the Table 2.
- The number of crank turns depends on the working width of the seed rail.

The number of crank turns refers to an area of 1/40 ha (250m²) or 1/10ha (1000m²).

Usually the crank turns for 1/40 ha are used. At extremely small seed rates, e.g. for rape, we recommend that you take the crank turns for 1/10 ha.

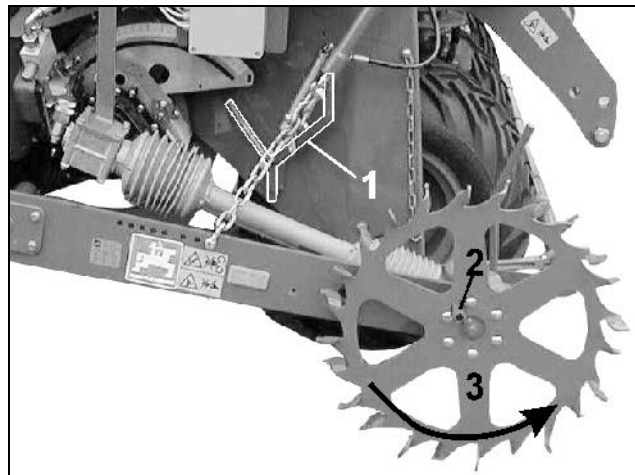


Fig. 70

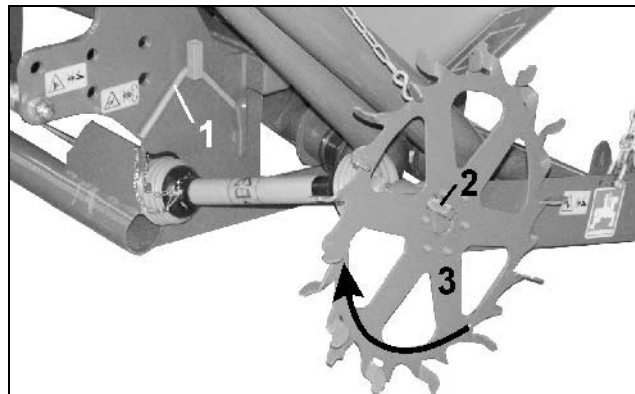


Fig. 71

- Weigh the seed collected in the collecting trays (Fig. 12.2) under consideration of the weight of the bucket (Fig. 12.9) and multiply either by
 - factor "40" (for 1/40 ha) or
 - factor "10" (for 1/10 ha).

Calibrating for 1/40 ha:

Seed rate [kg/ha] = collected seed [kg/ha] x 40

Calibrating for 1/10 ha:

Seed rate [kg/ha] = collected seed [kg/ha] x 10

Example: Calibrating for 1/40 ha collected seed 3,2 kg.

Seed rate [kg/ha] = 3,2 [kg] x 40 [1/ha] = 128 [kg/ha]


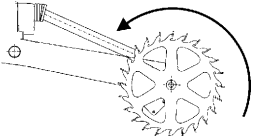
 956268		
	1/40 ha	1/10 ha
4,0 m	29,0	117,0
5,0m	23	92,5
6,0 m	19,5	78,0
Working width	Crank turns on the star wheel	

Table 2

After having determined the correct gearbox setting

- place the calibration crank (Fig. 70/1) back into the retainer
- fix calibration tray (Fig. 68.3) to the bracket and secure with a clip pin
- shut off injector sluice flap (Fig. 67/2) .



The desired seed rate usually is not obtained after the first calibration test. However, with the aid of the disc rule according to para. 10.4.1 it is possible to determine the correct gearbox setting by using the gearbox setting figure of the first calibration test at the calculated seed rate.

10.4.1 Determining the gearbox setting with the aid of the disc rule

The desired seed rate usually is not obtained after the first calibration test. However, with the aid of the disc rule it is possible to determine the correct gearbox setting by using the gearbox setting figure of the first calibration test at the calculated seed rate.

The disc rule consists of three scales: One outer white scale (Fig. 72/1) for all seed rates above 30 kg/ha and an inner white scale (Fig. 72/2) for all seed rates below 30 kg/ha. On the central, coloured scale (Fig. 72/3) gearbox settings from 1 to 100 are printed.

Example:

Wanted is a seed rate of 125 kg/ha.

- At the first setting, the gearbox setting lever is brought to the "gearbox setting position 25" (it is possible to choose also any other gearbox setting figure). In this case a seed rate of 175 kg/ha has been calculated.
- Align the seed rate 175 kg/ha (Fig. 72/A) and the "gearbox setting position 25" (Fig. 72/B) on the disc rule.
- Now read off the disc rule the gearbox setting figure for the desired seed rate of 125 kg/ha (Fig. 72/C). In our example that is the "gearbox setting position 17.8" (Fig. 72/D).
- Recheck the gearbox setting figure which you have determined by the disc rule as described under para.10.2.

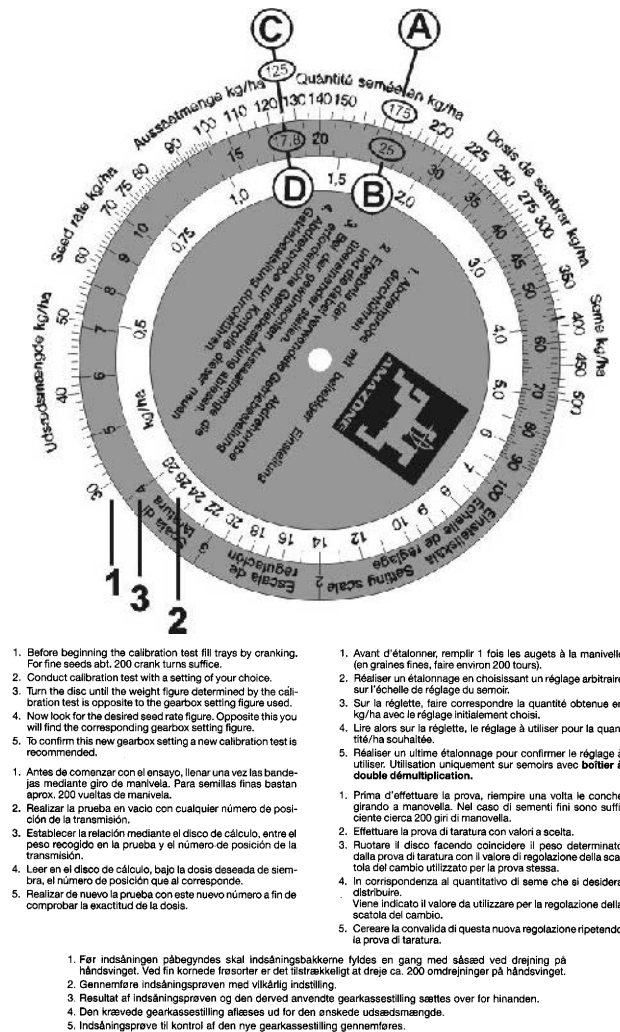


Fig. 72

10.4.2 Seed rate deviations between the setting and sowing

To avoid deviations between the setting of the seed and the later sowing and to achieve a uniform distribution of the seed to all coulters, please note the following hints:

When sowing dressed seeds

The distributor head should be regularly checked and cleaned.

When sowing moist dressed seeds

The seed should "age" at least for one week (better two weeks) after moist dressing and sowing, to avoid deviations between the calibration test and the seed rate.

In case of wheel slip

In case of wheel slip the drive wheel for the metering units turns on very light and loose soil less as at a same distance on very firm cloddy soils. In case of high wheel slippage the number of crank turns for determining the gearbox setting should newly be determined.

For this one measures on the field an area of 250 m². This corresponds to a machine with

4,00 m working width = 62,5 m travelled distance
6,00 m working width = 41,7 m travelled distance

The number of crank turns is then counted when travelling the measured travelled distance. With this number of crank turns then the gearbox setting should be determined according to para.9.2.

10.5 Setting the placement depth of the seed

The placement depth depends on coulter pressure, forward speed and soil condition. Your seed drill is equipped as standard with a central coulter pressure adjustment which applies an even pressure to all coulters.



Check the seed placement depth always before starting to drill:

Travel with the seed drill in the field approx. 30 m at operational speed, check the placement depth of the seed and readjust if necessary.

The central coulter pressure adjustment is actuated with hydraulic rams (Fig. 73/1).

If the soil is changing from normal to heavy or vice versa, with the aid of the hydraulic rams the coulter pressure can be adapted to the soil during operation.



Fig. 73

10.5.1 Setting the placement depth of the seed by a hydraulic motor

Connect the hydraulic ram (Fig. 75/1) to a single acting tractor Control valve and actuate the Control valve only from the tractor cab.



The hydraulic coulter pressure adjustment is coupled with the hydraulic extra coverage following harrow adjustment (if existing). If the coulter pressure is increased, the extra coverage following harrow pressure will be increased automatically.



The coulter pressure display Fig. 74

allows checking the coulter pressure from the tractor cab.



Actuate the Control valves only from the tractor cab.

When actuating the Control valves several hydraulic rams may start actuation simultaneously, depending on the switching position.

Advise people to leave the danger area.

Danger of injury from moving parts!

Two pins (Fig. 75/3 and Fig. 75/4) function as stroke limiters for the stroke of the hydraulic ram (Fig. 75/1) placed within the setting segment. When the hydraulic ram is without pressure the top of it rests on the pin (Fig. 75/3) and when the hydraulic ram is pressurised it rests on the pin (Fig. 75/4).

Setting the normal coulter pressure

- Pressurise hydraulic ram (Fig. 75/1).
- Insert the pin (Fig. 75/3) into one of the holes of the quadrant plate and secure by using a clip pin (Fig. 75/2).

Each hole of the quadrant plate is marked with a figure. An increasing figure indicates an increase in the coulter pressure.

Increasing the coulter pressure

- Relieve the hydraulic ram (Fig. 76/1) from pressure.
- Insert the pin (Fig. 76/3) into one of the holes of the quadrant plate and secure by using a clip pin (Fig. 76/2).

Each hole of the quadrant plate is marked with a figure. An increasing figure indicates an increase in the coulter pressure.

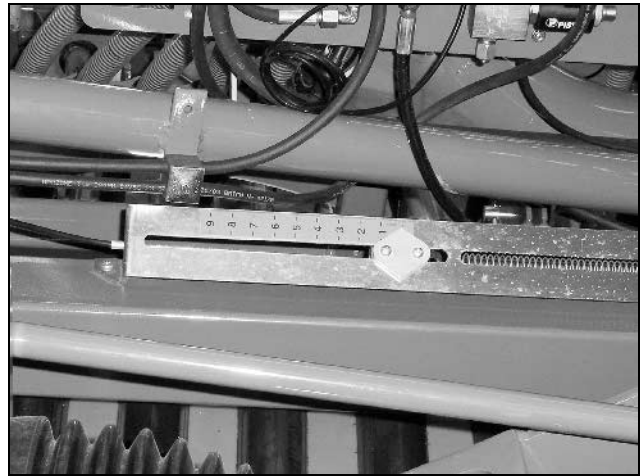


Fig. 74

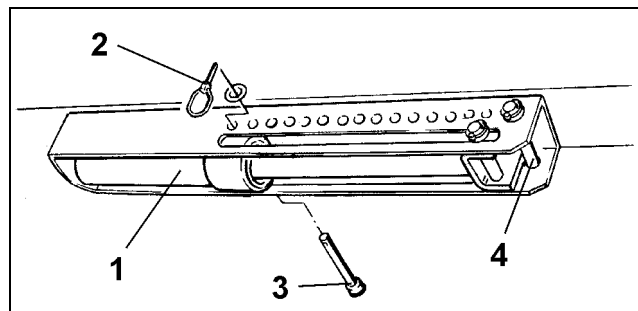


Fig. 75

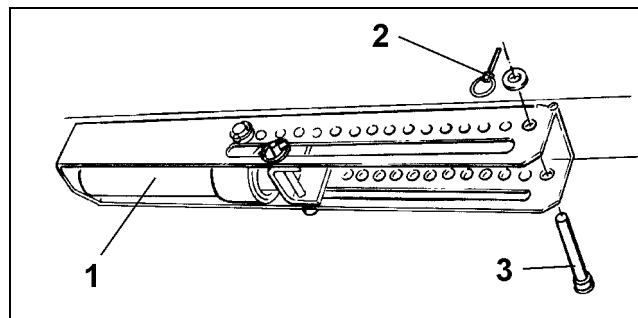


Fig. 76

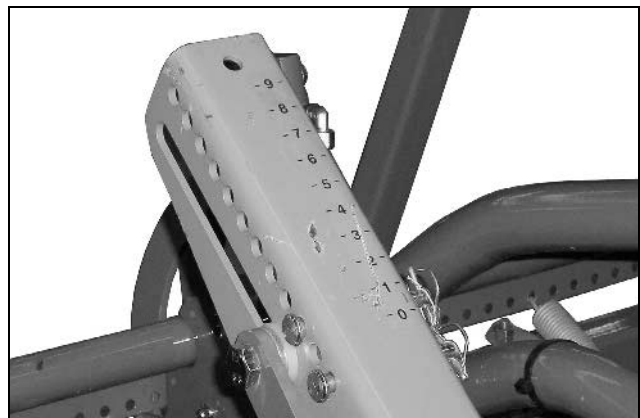


Fig. 77

Seed drills with RoTeC-coulters

If your seed drill is equipped with RoTeC-(roll disc) coulter and depth limiters (special option) and the desired placement depth cannot be achieved by replacing the pins, all RoTeC depth limiter discs would have to be re-adjusted evenly according to para.9.5.3.

The fine tuning then is again conducted by re-inserting the pins.



Check the seed placement depth always before starting the operation:

Travel with the machine in the field approx. 30 m at operational speed, check the placement depth of the seed and readjust if necessary.

10.5.2 Setting the placement depth of the seed by resetting the RoTeC-depth limiting discs (special option)

To ensure that the seed depth placement will be maintained throughout the field even under changing soil conditions, the RoTeC disc coulter can be equipped with depth limiting (Fig. 78 /1).

When having ordered the seed drill with depth limiting discs they have been set by the factory in position 1 (see para.9.5.3) for a placement depth of approx. 2 cm for medium heavy soils. For slightly increasing the placement depth the coulter pressure may be increased with the aid of the coulter pressure adjustment according to para.10.5.1. Before every operation check the correct position of the depth limiting discs and the placement depth of the seed.

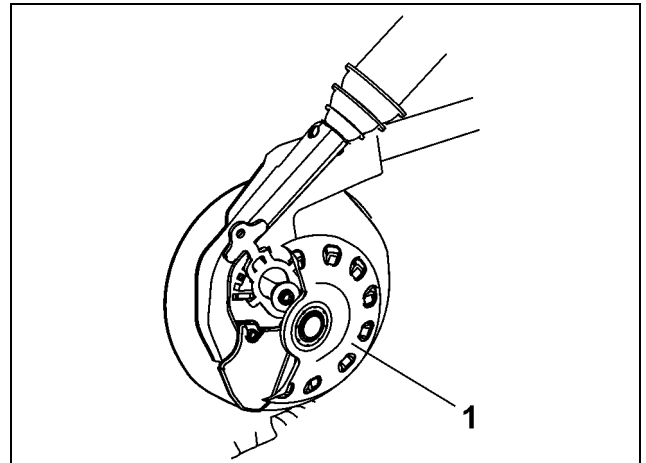


Fig. 78

10.5.3 Fitting and setting the RoTeC-depth limiting discs

- **First fitting**

Take the RoTeC-depth limiting disc (Fig. 79/1) by its grip (Fig. 79/2) and press the depth limiting disc (Fig. 80/1) from below against the locking (Fig. 80/2) of the RoTeC-coulter. The collar (Fig. 79/3) must catch into the detent slit (Fig. 80/3). Then pull the grip to the rear. A slight tap on the discs centre facilitates engagement.

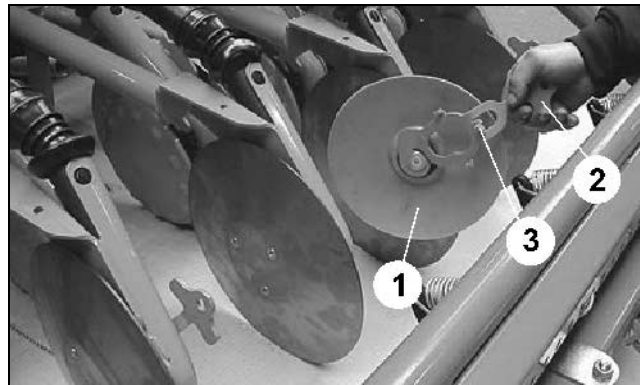


Fig. 79

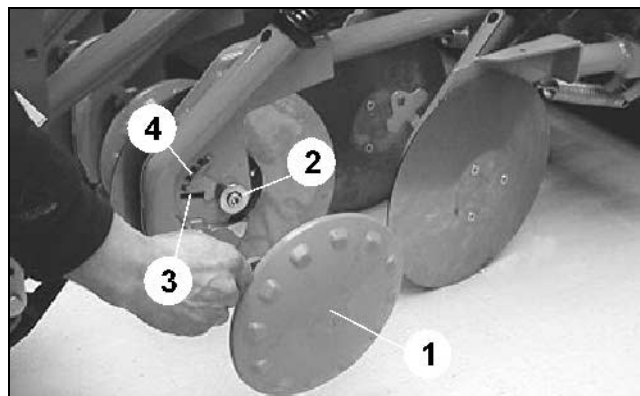


Fig. 80

For setting the working depth pull the grip upwards (Fig. 80/4) over the locking pawl (Fig. 81).

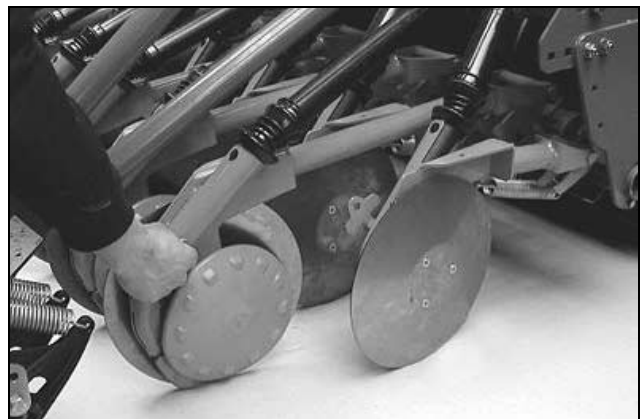


Fig. 81

- **Setting the depth limiters**

The RoTeC-limiting disc (Fig. 83/1) can be set in 4 positions:

- Positions 1: shallow placement depth
- Positions 2,3: deeper placement depth
- w.o. depth limiting disc: max. placement depth

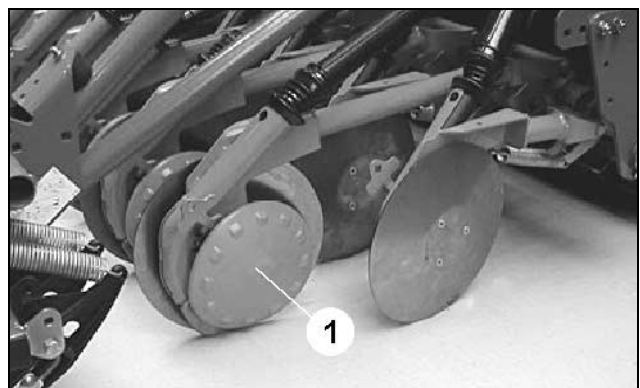


Fig. 82



Check the placement depth of the seed after every setting as described in para.9.5.

Slight changes in the placement depth of the seed may then be set with the aid of the coulter pressure adjustment according to para. 10.5.1.

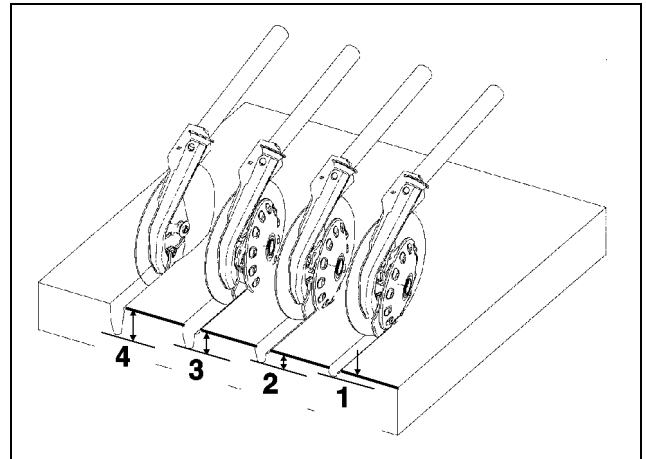


Fig. 83

10.5.4 Position of harrow tines

The spring tines (Fig. 84) of the extra coverage following harrow have to be set in the field in such a way that they lay about horizontally on the soil and still can move downwards by about 5 to 8 cm. The spacing between the soil and the square tube should then measure between 230 and 280 mm, depending on type of soil.

The extra coverage following harrow is adjusted via the upper carrying tubes of the harrow brackets..

For this adjust the length of the upper carrying tubes on the straps (Fig. 85/1).

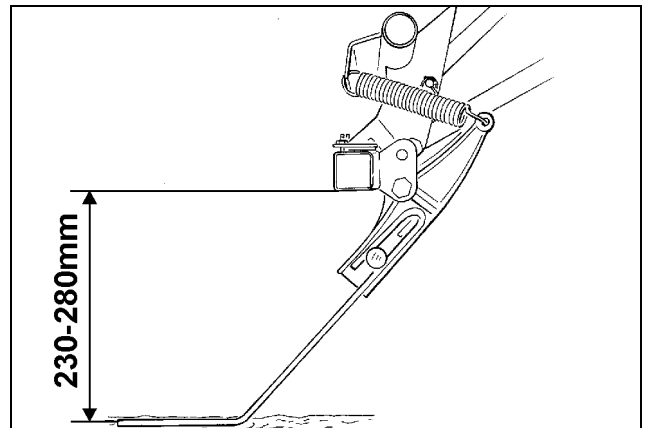


Fig. 84



Check the settings before commencing work.

Travel with your machine at operational speed a distance of approx. 30 m in the field to be sown and check whether the seed is evenly covered with soil and no soil ridge remains visible in the field.

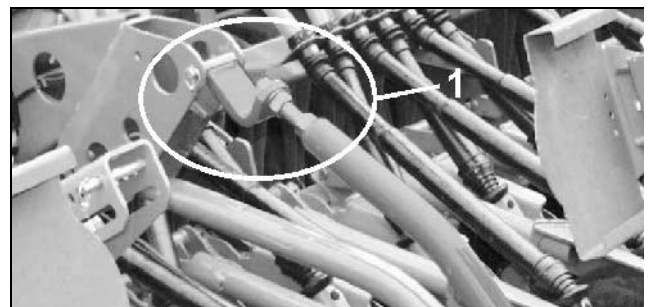


Fig. 85

10.5.5 Setting the harrow pressure on extra coverage following harrow without hydraulic ram.

The pressure at which the spring tines (Fig. 86/1) of the extra coverage following harrow are pressing on to the soil should be set so that after seed coverage no ridge of soil remains visible in the field.

Set the harrow tine pressure as follows:

Pull the stop lever (Fig. 86/2) upwards. Insert the pin (Fig. 86/3) into a hole below the stop lever (Fig. 86/2) and secure by using a clip pin (Fig. 86/4). The higher the pin is inserted into the quadrant plate, the higher the pressure of the extra coverage following harrow will be. The stop lever (Fig. 86/2) is actuated with the coulter pressure adjustment crank (Fig. 87/1).



Check the settings before commencing work.

Travel with your machine at operational speed a distance of approx. 30 m in the field to be sown and check whether the seed is evenly covered with soil and no soil ridge remains visible in the field.

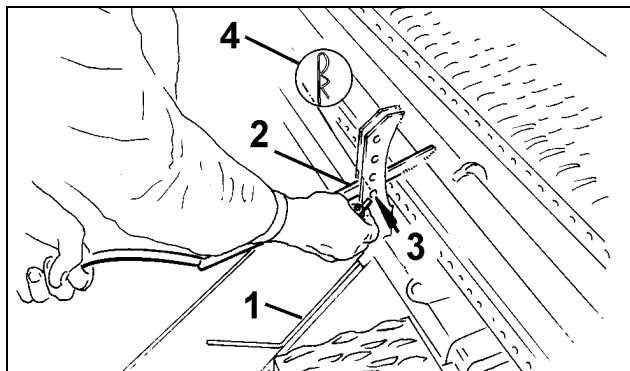


Fig. 86

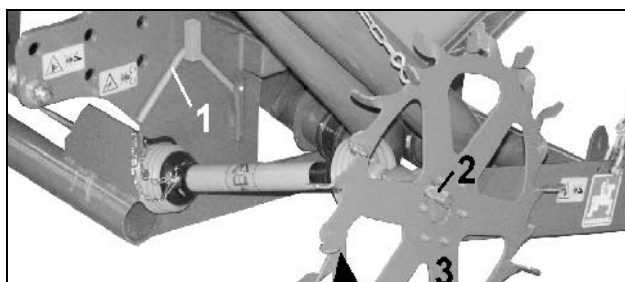


Fig. 87

10.5.6 Setting the harrow tine pressure on the extra coverage following harrow with hydraulic ram

The pressure by which the spring tines (Fig. 86/1) of the extra coverage following harrow are pressing on to the soil should be set in such a way that after the seed has been covered no ridge remains visible in the field. In fields that have many varying soil types, the harrow pressure can be increased on heavier soil with the aid of the optional harrow pressure adjustment.

When changing from normal soil to heavy soil or vice versa, the coulter pressure is readjusted by a hydraulic ram (Fig. 88/1).

Two pins (Fig. 89/1 and 2) are placed as a stop for the lever (Fig. 89/3) in the setting segment. The lever, which is actuated by the hydraulic ram rests on the pin I (Fig. 88/1) when the hydraulic ram is without pressure and it stops on pin II (Fig. 89/2) when the hydraulic ram has been pressurised.

For setting the increased harrow pressure

- Relieve the hydraulic ram (Fig. 88/1) from pressure.
- Insert pin II (Fig. 89/2) into a hole above the lever (Fig. 89/3) in the setting segment and secure by using a clip pin (Fig. 89/4).

For setting the normal harrow pressure

- Pressurise hydraulic ram (Fig. 88/1).
- Insert pin I (Fig. 89/1) into a hole in the setting segment under the lever (Fig. 89/3) and secure by using a clip pin (Fig. 89/4).



The higher you insert a pin into the hole segment, the higher the harrow pressure will get.



Checking settings prior to operation

Travel with your machine a distance in the field of approx. 30 m at operational speed and check whether the seed on light to medium soils is covered with a normal harrow pressure and on heavy soils with increased pressure evenly with soil and that no ridge of soil is visible in the field.

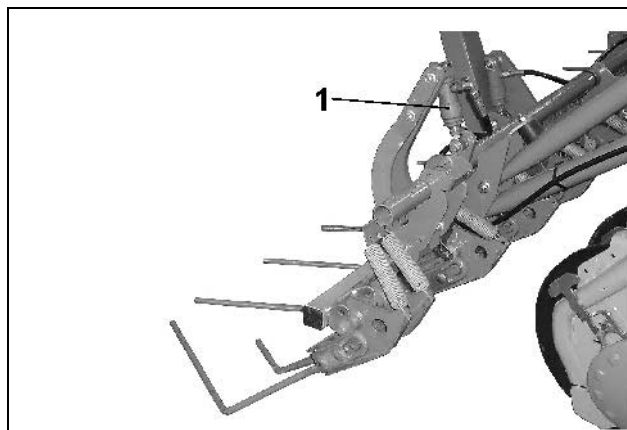


Fig. 88

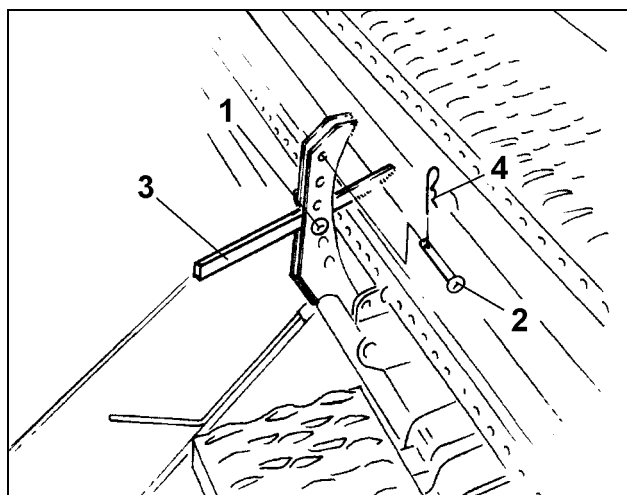


Fig. 89

10.5.7 Setting the markers to the correct length

The seed rail is equipped with markers for marking a trace in the tractor centre.

Please find the spacing "A" (Fig. 90) track marker disc to machine's centre.

- Working width 4m: A = 4 m
- Working width 6m: A = 6 m

The marker discs can be moved in the track marker arm. Prior to it two hex. bolts (Fig. 91) should be slackened and retightened firmly.



When setting up the angle of the marker discs please note that they should be set for light soil about parallel with the direction of operation and more "on grip" on heavier soils.

Fix the wire cable (Fig. 92/1) on the track marker arm in such a way that the working depth of the marker disc is limited between 60 and 80 mm.

If, due to the tensioning force of the tensioning spring (Fig. 92/2), the marking trace in the soil is too deep

- the tensioning spring must be relieved.
- turn the track marker discs

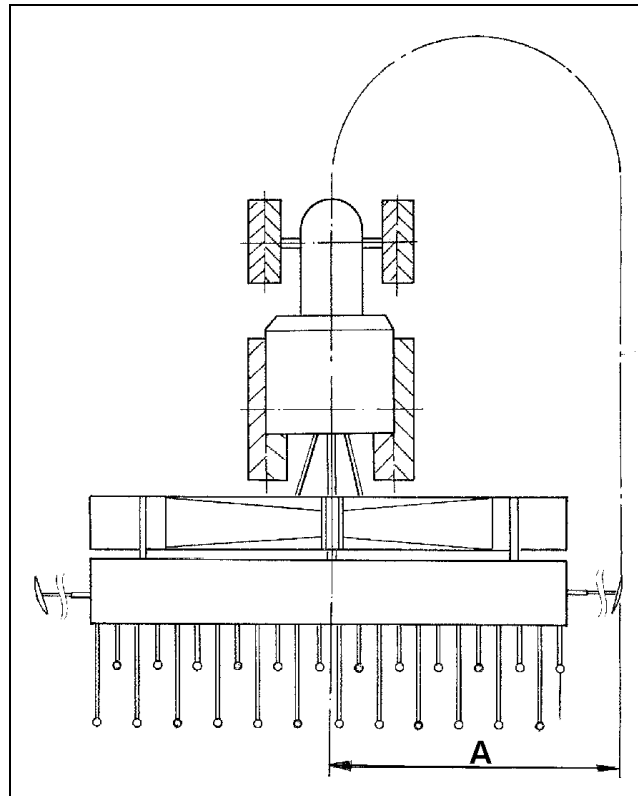


Fig. 90

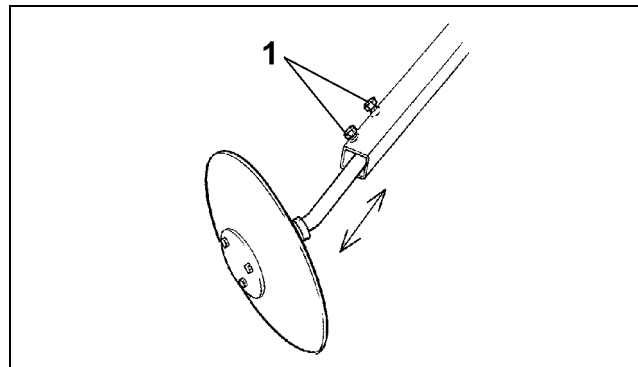


Fig. 91

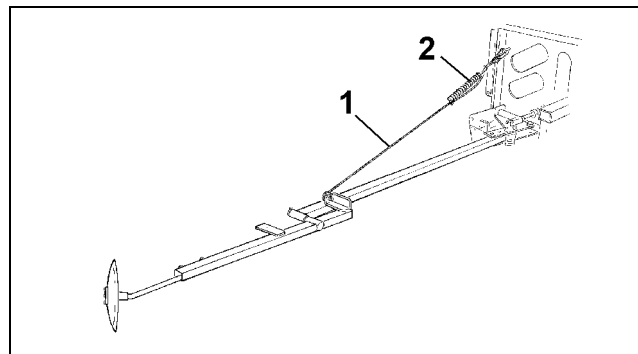


Fig. 92

10.6 Setting the levelling bar

For conventional soil tillage set the operational height of the levelling bar in such a way that a little earth ridge is pushed forward to eliminate prevailing soil undulations. For mulch sowing the levelling bar (Fig. 93/1) can be located in the upper most position.

Setting the height of the levelling bar:

- Slacken the clip pin (Fig. 94/1)
- Pull the lever extension (Fig. 94/2) off the lever (Fig. 94/3).
- _Turn the lever extension and affix on the lever (Fig. 94) using a clip pin.
- Pull the extended lever in direction of the arrow and in this way lift the levelling bar.
- By inserting pins (Fig. 94/4) in quadrant plate set the desired height of the levelling bar.

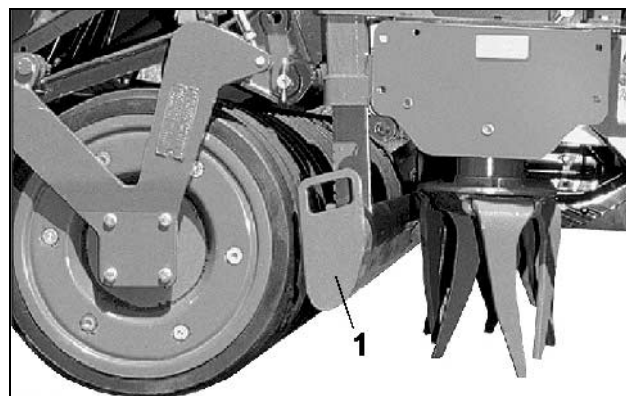


Fig. 93

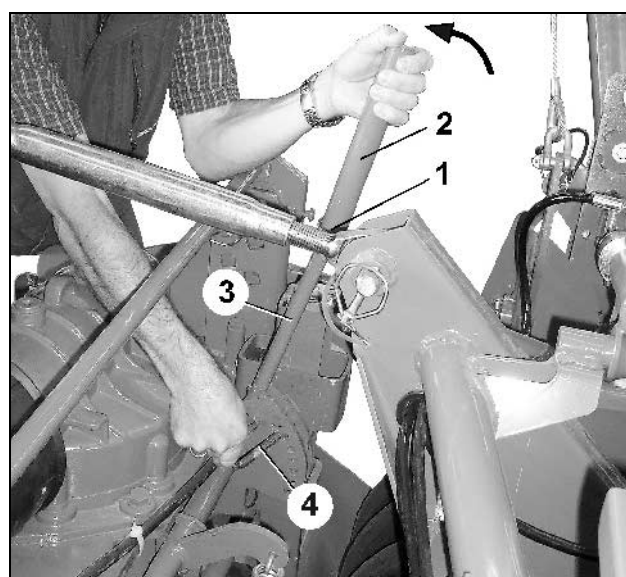


Fig. 94

10.7 Setting the blower fan speeds

The air flow for the seed delivery from the injector sluice to the coulters is provided by a blower fan.



For safety advice please observe chapter 2.7.2



Do not exceed the maximum blower fan speed of 4000 R.P.M.

The speed of the blower fan hydrostatic motor can be monitored by the electronic monitoring-, controlling and governing system AMATRON+.

Please find the required blower fan speed in the table (Table 5). Set the blower fan speed on the pressure relief valve (Fig. 95/2) or on the current regulating valve on the tractor (see below).

For setting the blower fan speed on the pressure relief valve:

- remove dust cap (Fig. 95/1)
- slacken counter nut
- set the speed on the valve with a screw driver as follows:
 - Turn to the right = speed is increased
 - Turn to the left = speed is reduced.
- After setting, secure the valve with counter nut and cover with dust cap.

On tractors with controllable hydraulic pump (Fig. 23/5) the necessary oil volume should be set at the current regulating valve and the pressure relief valve (Fig. 23/3) in such a way that the oil volume is as little as possible.

For this completely turn in the valve with the aid of a screw driver (turn to the right) and then half a turn to the left.

Larger oil volumes than necessary are led back into the oil tank by the pressure relief valve and result in unnecessary heating up of the hydraulic oil.

The blower fan speed is changing until the hydraulic oil has reached its operational temperature. At the first use the blower fan speed should be corrected until the operational temperature of the hydraulic oil has been reached. If the blower fan is used after a prolonged period of standstill, the reset blower speed will only be reached after the hydraulic oil has reached the operational temperature.

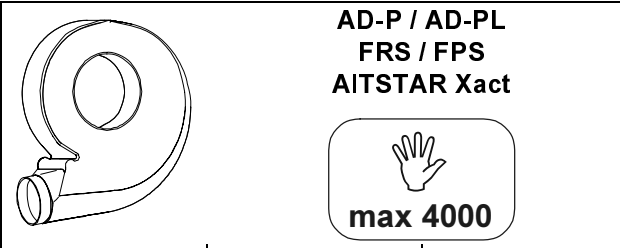
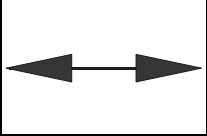
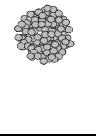
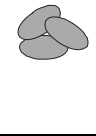
AD-P / AD-PL FRS / FPS AITSTAR Xact		
		
		
	3000	3800
	3200	3900
6,0m	3200	3900
Working width	Blower fan rev. speed (R.P.M.)	
	Fine seeds (rape)	Legumes (grain)

Table 5

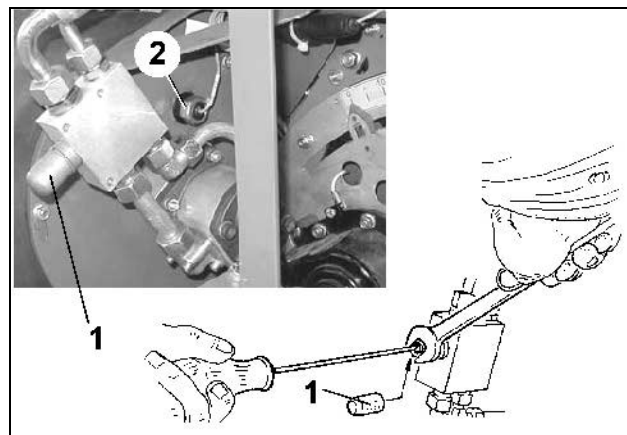


Fig. 95

11. Operation



Carefully read and adhere to the instruction manual and safety advice before putting your seed drill into operation!



Acquaint yourself with the correct methods of handling and with all operating devices. Never allow the machine to be operated by persons that have not been informed about the operation of the machine.



Maintain your machine in a good operational order. Changes to the machine that are not approved by the manufacturer may endanger the functionality and/or safety and may reduce the life span of the machine. Claims for warranty on the machine and / or for spare parts will be rejected in cases of operational errors.



Observe the safety advice according to para. 2.7.2.

Only actuate the Control valves inside the tractor cab.

When actuating the control valves, the hydraulic rams for actuating the track markers, the switch box of the tramline control and the tramline marker unit are pressurised, depending on the switching position.

Ask people to leave the danger area.

Danger of injury from moving parts.



Never stay or allow any one to stay within the operating area.

Carrying passengers whilst driving or operating the machine is not permitted.

Danger from flinging foreign particles. Do not allow persons to stay in the danger area.



Never leave the operator's seat whilst driving.

After switching off the PTO shaft the implement may still continue to run by its dynamic masses. During this period never come too close to the implement. Begin to work only after the rotors have come to a full standstill and the ignition key has been removed.

Remedy function faults immediately before starting to operate with the implement.

11.1 Filling the seed hopper

The seed hopper is rain proof covered by the folding cover canvass. The folding cover canvass is secured with rubber strips (Fig. 96/2).

The seed hopper can be filled from a tipping trailer or from big bags. The seed hopper can conveniently be filled from the loading board (Fig. 96/1).



Refill the seed hopper early enough!

Never drive the drill until the seed hopper is completely empty. The seed level in the seed hopper can be monitored with the electr. seed level indicator AMFÜME.

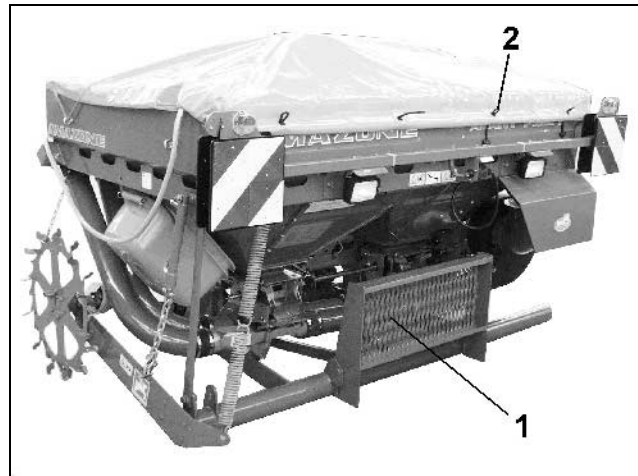


Fig. 96

11.2 Bring the machine into operating position

- Take cover canvass off the coulters.
- Remove the tensioning belt on the extra coverage following harrow and swivel the extra coverage following harrow from the transport position outwards.
- Swivel the traffic lights into the transport position.
- Fold down the machine. Before hand release the locking with the aid of the rope from the tractor cab. (Fig. 97/3).

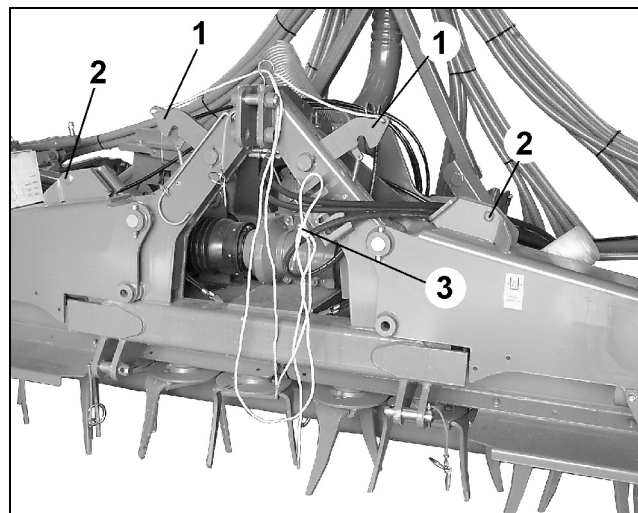


Fig. 97

- Release the locking track markers from their transport position.
 - hold track marker arm (Fig. 98/1) and remove the clip pin (Fig. 98/2) (necessary for transport)
 - when not needed, insert the clip pin into one of the holes of the link (Fig. 98/3)



After removal of the clip pin (Fig. 98/2) the marker arm is tilting slightly to the side.



Ask people to leave the danger area and bring the marker arms to operational position by actuating the tractor Control valve inside the tractor cab.

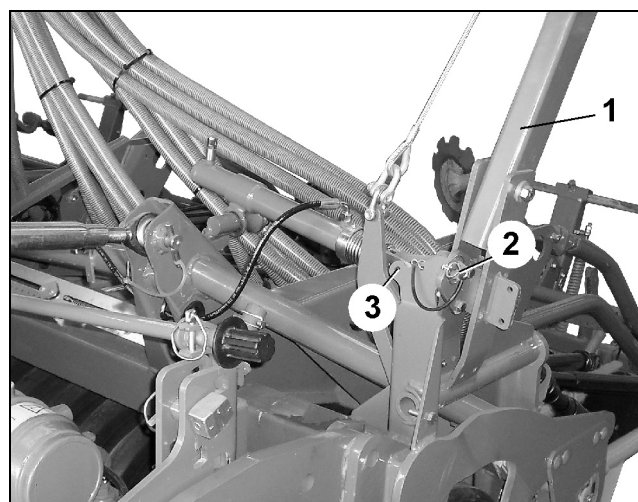


Fig. 98

- **Release the locking of the front tank star wheel from its transport position.**

For road transport the star wheel (Fig. 93/1) is lifted fixed to the frame using a chain

Pressurise the hydraulic ram so that the star wheel is lifted.

- Briefly lift the star wheel by hand, remove the chain and lower.

- **Release the seed drill star wheel from its transport position.**

Pressurise the hydraulic ram so that the star wheel is lifted.

- Briefly lift the star wheel by hand (Fig. 100/1), slacken the lynch pin (Fig. 100/3) pull out the pin (Fig. 100/2) and lower the star wheel.
- Retighten pin and lynch pin in the star wheel arm.

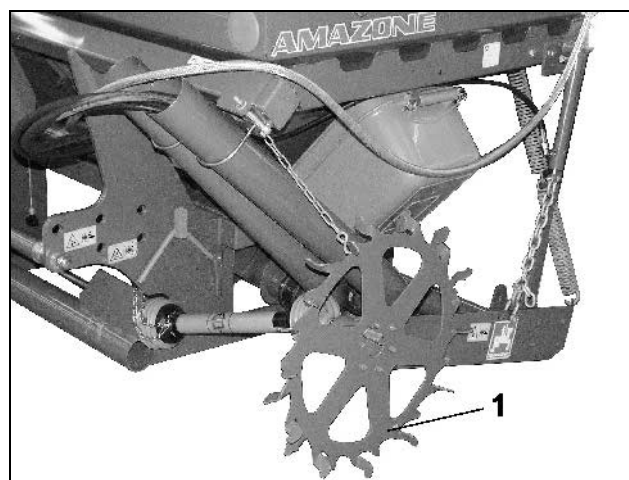


Fig. 99

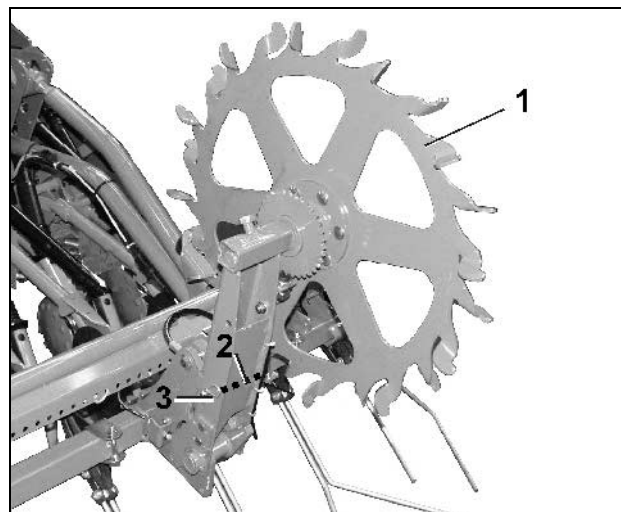


Fig. 100



11.3 Starting operation

Before commencing work, switch on the AMATRON+.

- Create a job and start.
- Enter the machine date / recheck.
- If necessary calibrate the forward speed sensor (Imp./100m).
- Carry out a calibration test..

1. Getting the blower fan to the correct rev. speed.

2. only FPS: Lower the seed hopper

Lower the seed hopper with the front packer roller to the ground and bring Control valve into floating position.

3. Lowering the star wheel

For FPS: Preferably the star wheel actuation is coupled with the lifting / lowering of the front tank with the aid of a Control valve.

For FRS: Before commencing work lower the star wheel by actuating the Control valve in the tractor cab.

The star wheel drives the metering units, or creates the Imp./100 m.

4. Lowering the packer seed drill

Immediately before using the rotary cultivator in the field, it is to be lowered using the tractor's hydraulic system until the rotary cultivator's tines are just over the soil but do not touch it.

5. Bring track marker into operational position

Set the markers in such a way that they mark on the correct side.

6. Set the working depth

7. Start moving the tractor

While the tractor commences driving, lower the rotary entirely

The tines of the soil tillage implement start to operate in the soil. While the tractor is moving on the coulters get into touch with the soil where the soil tillage has been started.

11.4 Turning at the headlands

If it is intended to interrupt sowing at the headlands, raise the star wheel and/or the seed hopper by actuating the Control valve. Ensure that the seed supply from the metering unit to the injector sluice is interrupted, however the coulters will still go on sowing until all seed tubes are empty.



To avoid a loss of seed and damage on the star wheel, lift the star wheel before turning at the headlands.

Also ensure that before turning the rear mount combination is lifted from the ground sufficiently to avoid damage on the coulters.

11.5 Check after the first 30m of operation

Travel 30 m in the field in the later forward speed and check the following settings:

- Placement depth of the seed
- Seed coverage of the extra coverage following harrow
- Operation intensity of the track marker discs

11.6 During operation

11.6.1 Monitoring the seed shaft

The sensor (Fig. 101/1) monitors the seed shaft. If the seed shaft stops during operation AMATRON+ sends a fault message. In the display "Error 2" appears together with an audible signal.

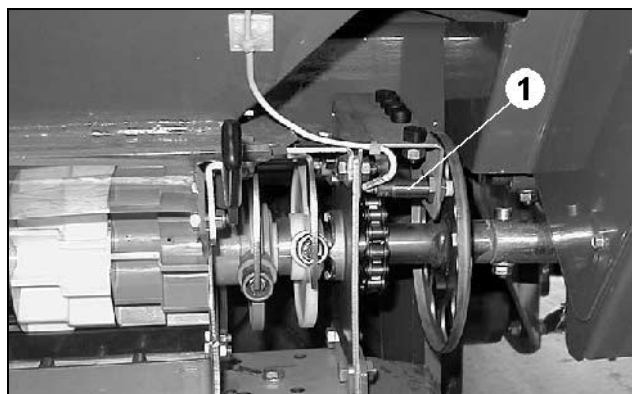


Fig. 101

11.6.2 Monitoring the seed level

The seed level inside the seed hopper (Fig. 101/1). can be checked with the electr. seed level indicator AMFÜME. Set the seed level indicator so that an empty alarm is triggered early enough. In any case, the seed hopper must never be emptied completely in order to avoid seed rate deviations.



Refill the seed hopper early enough (never empty completely) to avoid seed rate deviations!

11.6.3 Emptying the seed hopper



Stop the tractor engine, apply the parking brake and remove the ignition key.



After sowing operation implicitly empty and clean the seed hopper and the metering wheels.

If the metering wheels are not emptied completely seed residue may swell or germinate even in the metering wheels. The metering wheels would block up and damage on drive or gearbox would be the result.

- For emptying the seed hopper place (Fig. 102/1) calibration buckets below the metering unit(s) (Fig. 102/2).
- Press the lever (Fig. 102/4) downwards and lock. With the lever an outlet in the rear of the metering unit is opened and the seed hopper empties (if necessary close the outlet again in between and empty the collecting bucket).
- Then open the injector sluice flap (Fig. 102/3) to empty the injector.
- For star wheel drive: In the same way as with the calibration crank turn the metering wheels several times. Afterwards reposition the calibration crank in the retainer.
- For electric full metering: Briefly run the electric motor.
- Briefly run the blower fan to remove all seed residue.



Danger of squeezing when opening and closing the injector sluice flap (Fig. 102/1).

Only hold the injector sluice flap on the strap. Otherwise danger of injury when the spring loaded flap shuts.

Never ever reach with your hand between the injector sluice flap and the injector sluice.

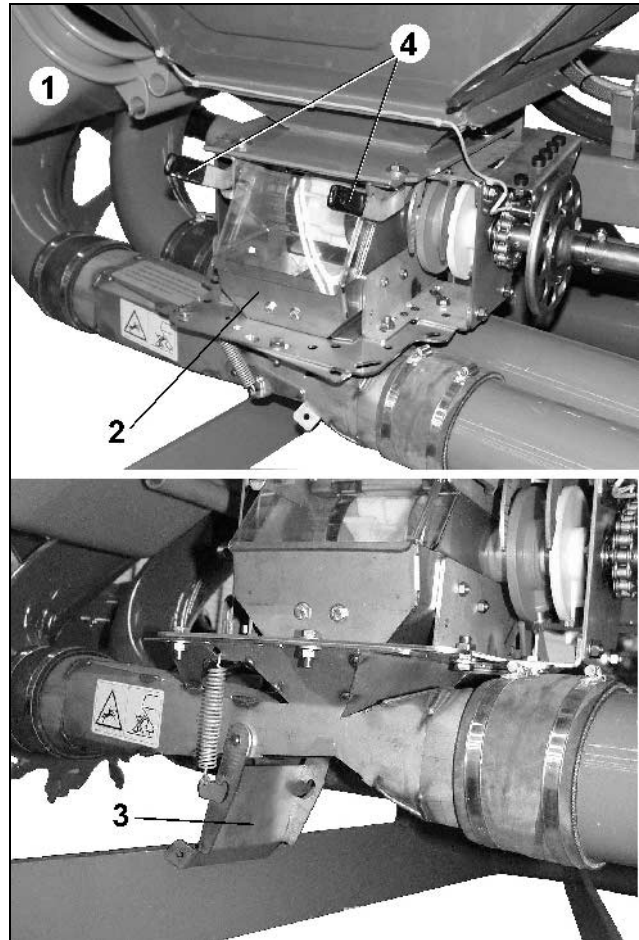


Fig. 102

12. Cleaning, maintenance and repair



Observe the general safety and accident prevention advice according to para. 2.7.3 when carrying out maintenance and care

12.1 Maintenance work after the first 10 hours of operation



All bolted connections of the implement should be checked after the first 10 hours of operation and tightened if necessary.

12.2 Checking the oil level in the vario gearbox

Check the oil level inside the vario gearbox at the oil gauge window (Fig. 103/1) on the seed drill horizontally. It is not necessary to change the gearbox oil.

For refilling oil unbolt the seal cap (Fig. 103/2):

- Filling quantity: 0,9 litres

Only use the following grades of oil:

- Hydraulic oil WTL 16,5 CST/500 C
- or
- engine oil SAE 10 W.

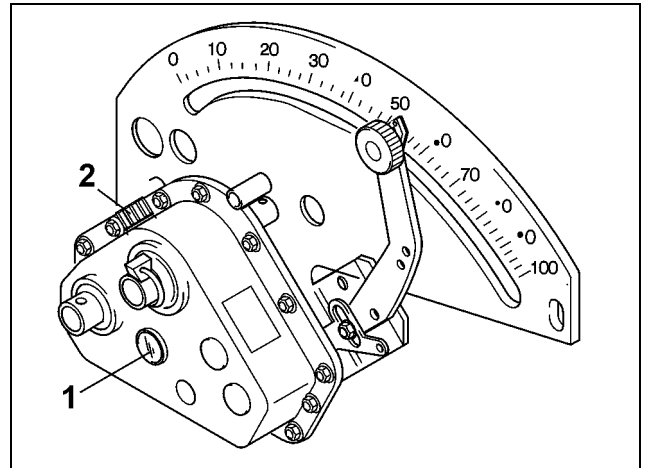


Fig. 103

12.3 Checking the air pressure

Please find the correct air pressure for the front packer tyres in table.

Maintaining the indicated tyre air pressure ensures the best cleaning work of the tyre with the relevant weight load by the front packer.

Weight Front tank with seed	Air pressure at 10 km/h
1500 kg	1,0 bar
2200 kg	1,5 bar
2700 kg	2,1 bar

12.4 Cleaning the implement

The implement can be cleaned with a jet of water or a high pressure cleaner.



In case you wish to use air pressure to clean the seed hopper, please be reminded that the dust of seed dressing is poisonous and must not be inhaled.



Regularly remove seed residue from the metering unit(s). Beforehand empty the seed hopper.

Swollen or germinated seed residues inside the metering unit may affect the seed rate or block the movement of the seed wheels and lead to their breakage.

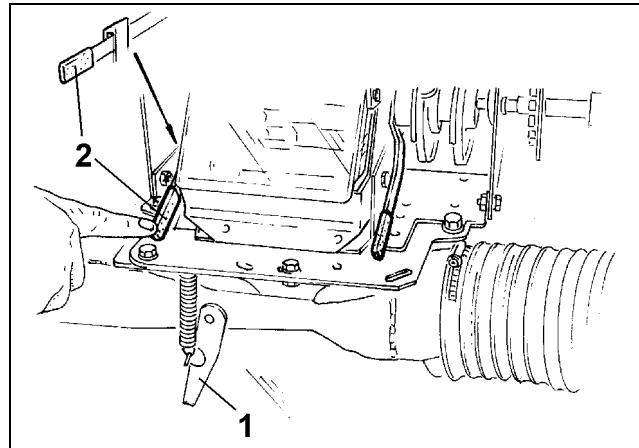


Fig. 104

For cleaning the metering unit open

- the translucent plastic flap (Fig. 108/1)
- the injector sluice flap (Fig. 104/1) and
- the emptying flap.

For opening the emptying flap behind the metering unit, press lever (Fig. 104/2) downwards and arrest.

Empty metering wheels by some turn on the calibration crank, or electric motor.

12.5 Checking roller chain (workshop job)

Drive via electric motor (Fig. 105/1):

After season or before a prolonged break of operation clean the roller chains (Fig. 105/2), check them and grease with bonding lubricant.

Remove chain guard (Fig. 105/3) before and put on back onto place afterwards.

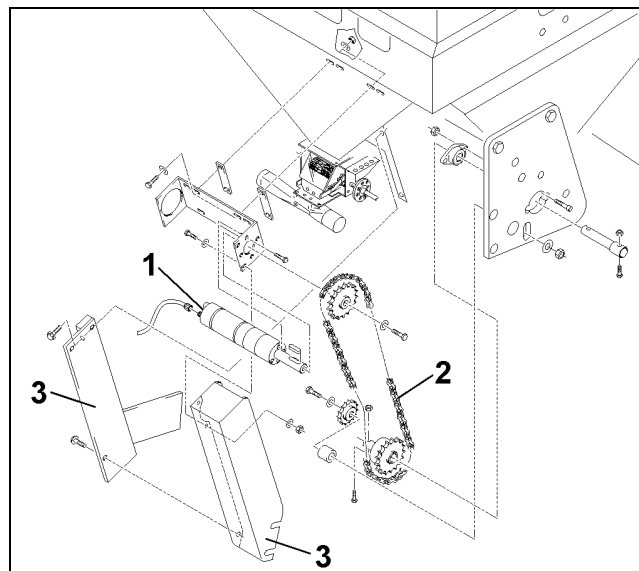
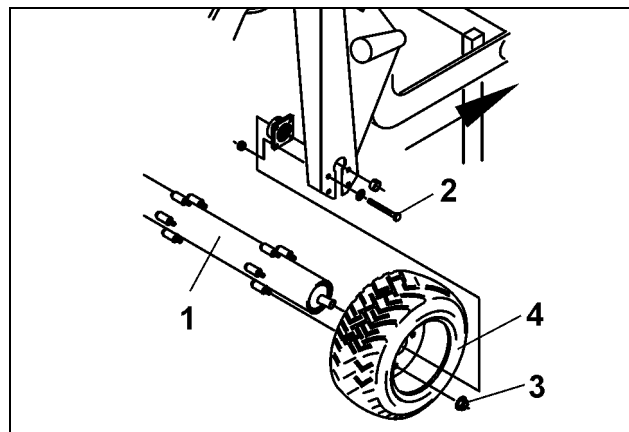


Fig. 105

12.6 Exchanging a defective tyre (workshop job)

Carefully clean the roller before exchanging any tyre.

- Couple front packer seed hopper onto the tractor
- Secure roller by chocks against unintended rolling away and remove the roller (Fig. 106/1) For this remove the fixing bolt (Fig. 106/2) on both sides.
- Raise the seed hopper with the aid of the tractor's hydraulics from the roller
- Remove hex. nuts (Fig. 106/3) and pull the tyre (Fig. 106/4) off the roller.



Assembling the roller is done in the reverse order

Fig. 106

12.7 Setting the spring loaded steering (workshop job)

After a repair reset the spring loaded steering of the front packer.

Two strong springs (Fig. 107/1) prevent the seed hopper from swinging when being raised.

After a repair hook both springs in the turnbuckle (Fig. 107/2) and tension the spring with 10 turns of the turnbuckle. Secure the turnbuckle by using a counter nut (Fig. 107/3).



When the steering is pulled to the side the springs are tensioned by two ropes (Fig. 107/4). The U-bolts (Fig. 107/5) with which the ropes are tensioned must not be adjusted.

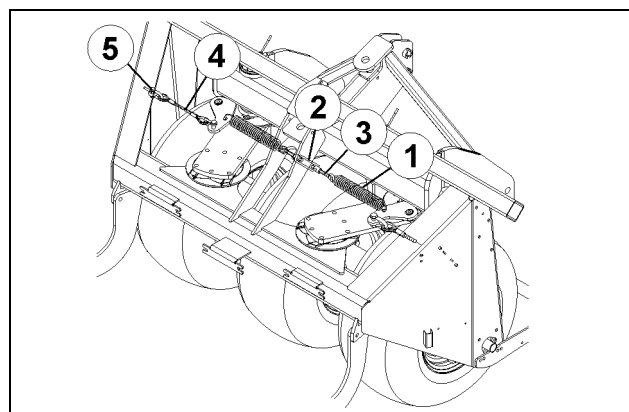


Fig. 107

12.8 Checking the distributor head for cleanliness (workshop job)

Check the distributor head in regular intervals during operation from the tractor cab by looking through the translucent distributor hood and after operation from outside for cleanliness. Remove pollution and seed residue immediately. Swollen or germinated seed residue may cause blockage.

- For cleaning the distributor head remove outer hood (Fig. 108/1) of the distributor head.

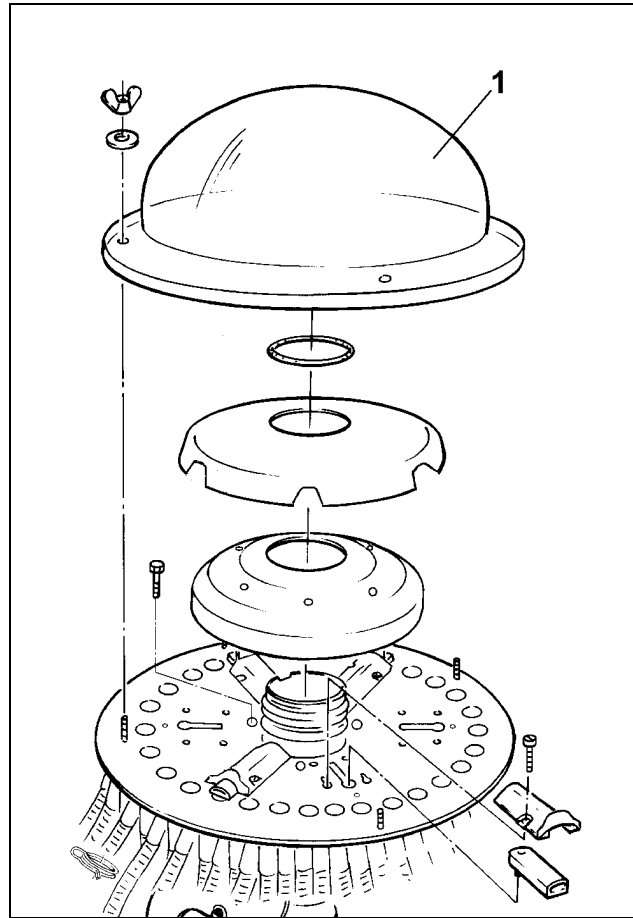


Fig. 108

12.9 Hydraulic hose circuit

12.9.1 Checking when starting and during operation

When starting and during operation the ordinary condition of the hoses should be checked by a skilled person.

If the hoses are found defective in any way, exchange them immediately.

The maintenance of the checking intervals should be recorded by the operator.

- **Checking intervals**

- for the first time when putting to operation
- thereafter at least once a year.

- **Checking points**

- Check hose casing for damage (kinks, cuts and abrasion, trapping, rubbing points)
- Check whether the hose casing is brittle
- Check hose for deformation (bubbles, buckling, squeezing, separation of layers)
- Check for leakage
- Check the appropriate fitting of the hoses
- Check the hose for firm seating in the armature
- Check connecting armature for damage and deformation
- Check for corrosion between connecting armature and hose
- Do not exceed the permissible period of use.

12.9.2 Exchange intervals (workshop job)

The period of use of any hydraulic hose circuit should not exceed 6 years (including a possible storing period of two years maximum).

12.9.3 Marking (workshop job)

Hydraulic hoses are marked as follows:

- Name of the manufacturer
 - Date of production
 - maximum dynamic operational pressure.
-

12.9.4 When working on the hydraulic



Before working in the hydraulic, read and adhere to para.2.7.2.

Affix the hydraulic hoses on the fixing points given by the manufacturer .

- Always ensure that hydraulic parts and connections are clean.
- Fit the hoses in such a way that their natural placement and movement are not hindered.
- During operation the hoses should not be under tension, twisted or strained by external forces.
- The permissible bending radius must be observed
- The hoses should not be painted.

12.10 Shear off safety

In order to avoid damage on driving components in case of blockage of the seed wheels, the connection of drive and metering unit is protected by a shear off safety bolt.

In case of blockage of the seed wheels a plastic bolt (Fig. 110/1) shears off and the power supply to the metering unit is interrupted. After removal of the blockage and replacement of the shear off bolt, the machine is ready for operation again. You will find 5 replacement shear off bolts (Fig. 11.8/2) in a retainer above the hand wheel. (Fig. 110/2).



For a faultless function only use a plastic shear off bolt M8 (order No. 917420).

In case of a standstill of the metering wheels during operation a warning is given on the AMATRON+ - display. The warning is released by a sensor (Fig. 110/3)

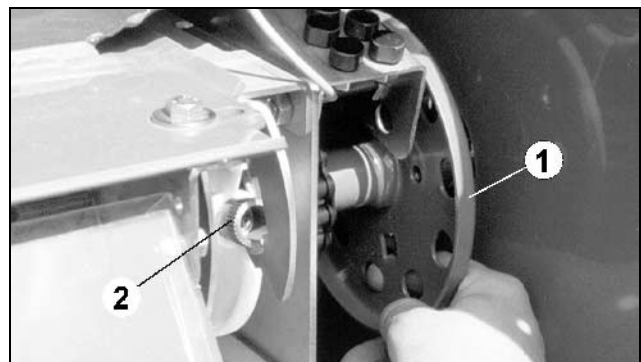


Fig. 109

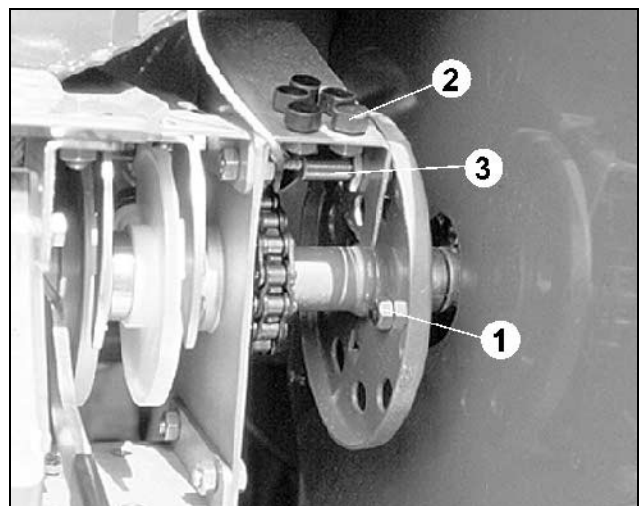


Fig. 110

12.11 Shear off safety

To avoid damage, the track markers should be raised before hitting an obstacle in the field.

If a marker hits an obstacle during operation the marker arm can give way to the obstacle by moving to the rear. In this case a hex. bolt M6 x 90, 8.8 DIN 931 (Fig. 111/1) will shear off.

Affix the track marker arm as shown in figures (Fig. 111).

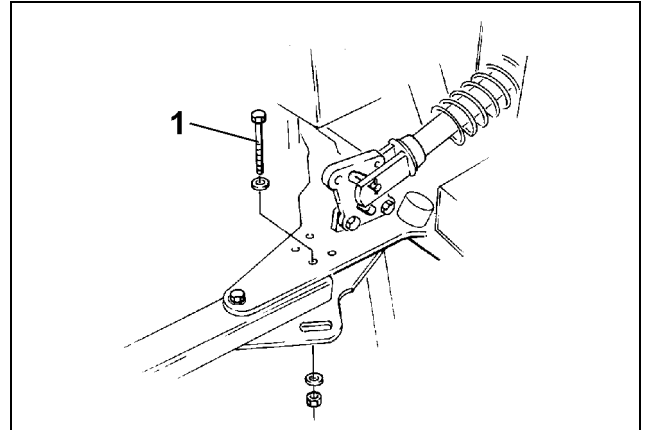


Fig. 111

12.12 Greasing points

The greasing points on the machine are identified by stickers (Fig. 112).

Only use lithium saponified multi-purpose lubricants with EP additives.

To prevent dirt from entering the bearings, clean the grease gun and the grease nipples carefully before greasing. All dirty grease must be forced out of the bearings and replaced by new grease.

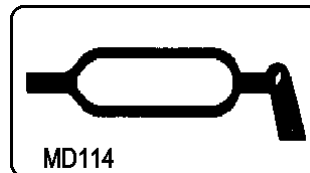


Fig. 112

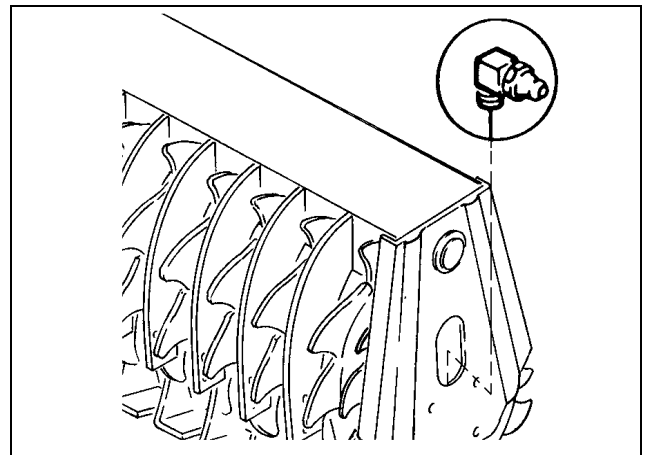


Fig. 113

13. Special option

13.1 Pre-emergence marker

With the aid of the tramline control, during sowing operation, tramlines are created with determined spacings in which later on fertiliser broadcasters or field sprayers may travel. The marker discs (Fig. 114/1) of the pre-emergence marker mark these tramlines. The tramlines are visible in the field prior to the seed emergence. After sowing, it is then possible to travel along the tramlines which are not yet visible by the seed, e.g. for pre-emergence spraying.

If whilst creating tramlines the tramline coulters do not deliver any seed, both marker discs (Fig. 28.1/1) of the pre-emergence marker drop into work, marking the soil and creating tramlines.

The marker discs (Fig. 114/1) of the pre-emergence marker are lifted out of work when no new tramlines are created..

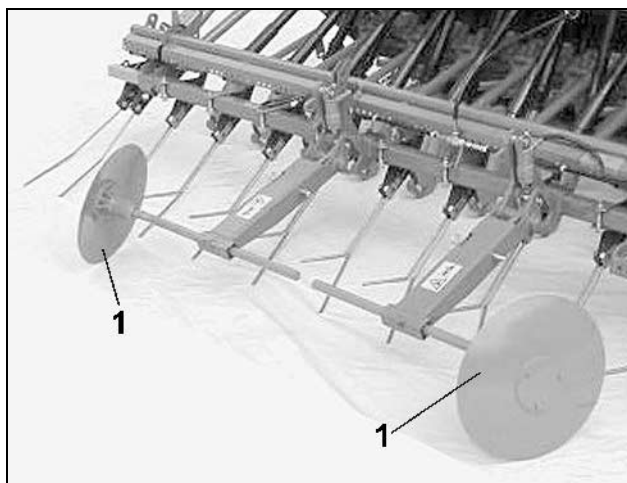


Fig. 114



The hydraulically actuated pre-emergence marker and the hydraulically actuated track markers are coupled together (please refer to hydraulic circuit diagram at the beginning of this instruction manual). Connect the hydraulic rams on the tractor with a single acting Control valve.



Actuate the Control valves only from the tractor cab.



When actuating the Control valves several hydraulic rams may start functioning simultaneously, depending on their switching position.

Advise people to leave the danger area.

Danger of injury from moving parts.

13.1.1 Fitting Pre-emergence marker

The pre-emergence marker unit is delivered pre-assembled by the factory

- Attach the extra coverage following harrow
- Attach two fixing brackets (Fig. 115/1) to the extra coverage following harrow
- Mount the marker disc carrier arm (Fig. 115/3) by means of the pins (Fig. 115/4) and expansion pin (Fig. 115/5) and secure.
- Insert the marker discs (Fig. 115/6) into the marker disc carriers (Fig. 115/3) and clamp by using hex. bolts (Fig. 115/7).
- Connect the hydraulic hoses (Fig. 115/8) to both hydraulic rams (Fig. 115/9) and connect together with the hydraulic ram for the tramline shutter inside the distributor head with the electr.-hydraulic valve.
- Attach hydraulic hoses to the seed drill by using cable binders.



Guide the hydraulic hoses in such a way that they will not be torn off or damaged by the movement of the extra coverage following harrow.

- Connect hydraulic rams on the tractor to a single acting Control valve.
- Check hydraulic hoses for leakage.

Hints for 2-bout switching rhythm and 6-plus switching rhythm

Tramline control units with 2-bout switching rhythm or 6-plus switching rhythm are equipped in such a way that the track width of the husbandry tractor is traced when once driving up and down in the field. Therefore only fit one of the two marker discs (Fig. 114/1) when using these switching rhythms.

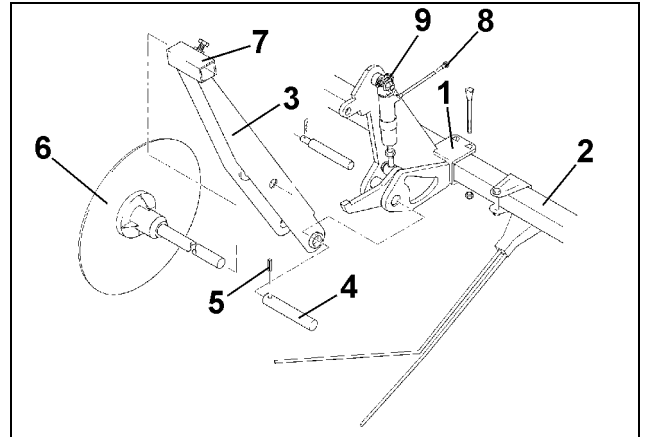


Fig. 115



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