

# **AMAZONE**

## **Operator's Manual**

### **Pack Top Seed Drill**

### **AD-P 303 Super**

### **AD-P 403 Super**



MG 1019  
DB 705. 3 (GB) 05.06  
Printed in Germany



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



## Preface

Dear customer,

The AD-P Super Pack Top seed drill 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 Pack Top seed drill 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 Pack Top seed drills

AD-P Super

AMAZONEN-WERKE

H.DREYER GmbH & Co. KG

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## 1. Details about the machine

### 1.1 Range of application

In combination with an **AMAZONE** –rotary cultivator or rotary harrow, the Pack Top seed drill is suited for storing, metering and sowing of all commercially available seeds.

### 1.2 Manufacturer

#### **AMAZONEN-WERKE**

H. DREYER GmbH & Co. KG

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

### 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

Type plate on the machine.

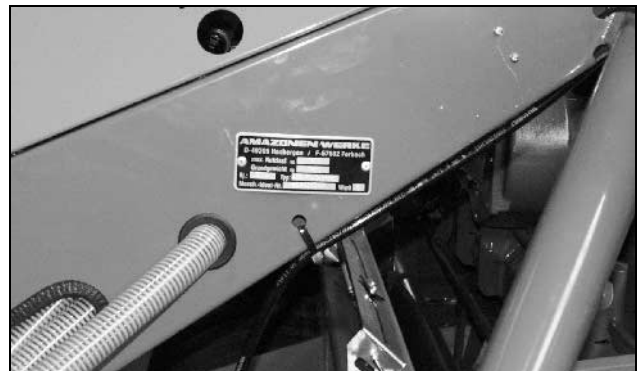


Fig. 1



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

## 1.6 Technical data

Type	AD-P 303 Super	AD-P 403 Super
Working width (mm)	3000	4000
Transport width (mm)	3,025	4,025
Pay load (kg)	1400	1400
Total height (mm)	2670	2670
Hopper capacity (l)	1500	1500
- with extension (l)	2000	2000
Width of hopper (mm)	2292	2292
Number of sowing rows	24	32
Row spacing (cm)	12,5	12,5
Filling height (mm)	2030	2030
- with extension (mm)	2195	2195
Blower fan drive	hydraulic	

Weights (kg)	AD-P 303	AD-P 403
AD-P with KW 580	1450	1850
AD-P with PW 600	1500	1920
Rotary cultivator	1090	1345
Rotary harrow	980	1200

The empty weight results from the sum of the individual weights.

The permissible total weight results from the sum of empty weight and payload.

### 1.6.1 Standard of the hydraulic system on the tractor

---

- Depending on equipment up to 4 control valves
- 1 pressure free return flow



**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 Intended use

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The AMAZONE AD-P is designed for the exclusive use in combination with an approved AMAZONE rotary cultivator or AMAZONE rotary harrow for the common soil cultivation, for 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 "intended 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.



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## **2. Safety**

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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 damage.

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**

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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**

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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 symbols**

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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**

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

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## 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.)

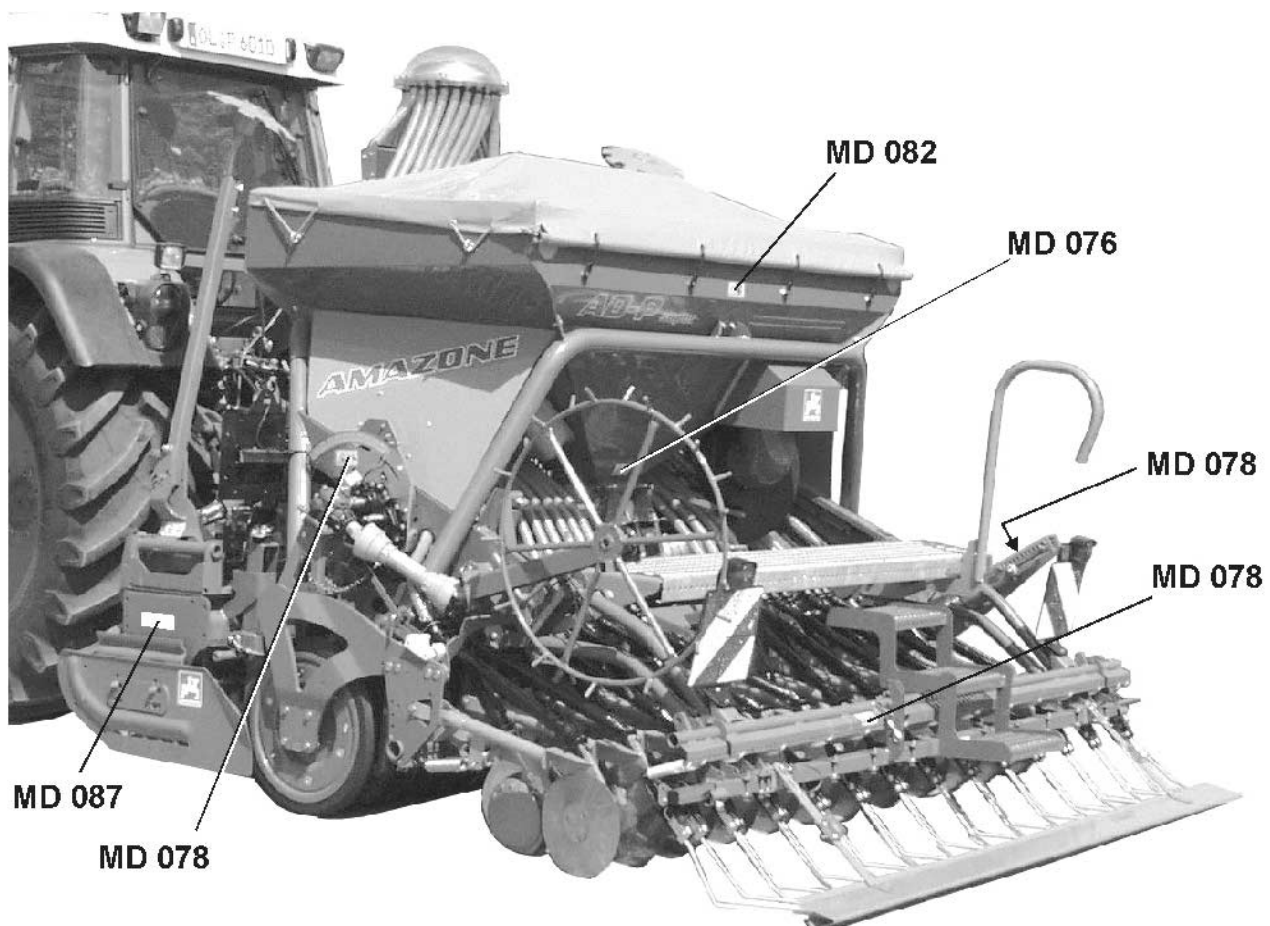


Fig. 2

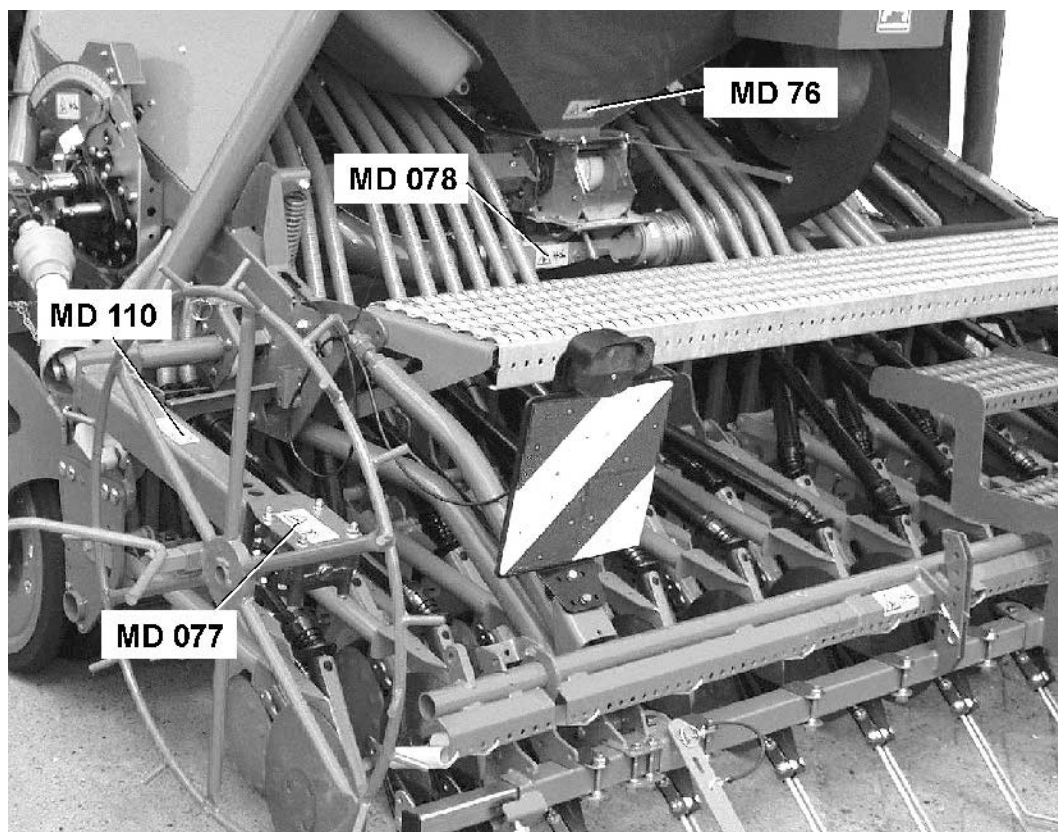


Fig. 3

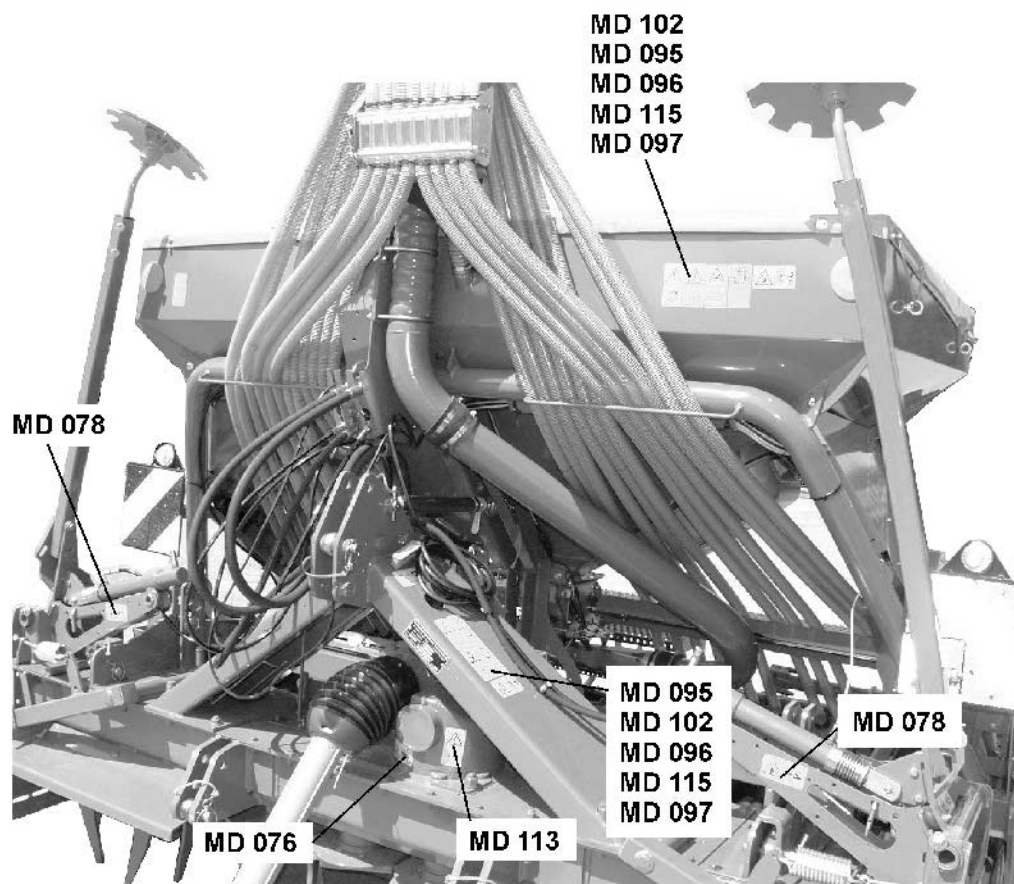
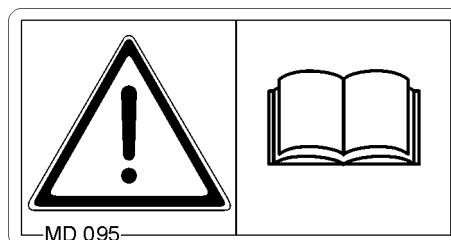


Fig. 4

**Picture No.: MD 095**

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

**Picture No.: 911888**

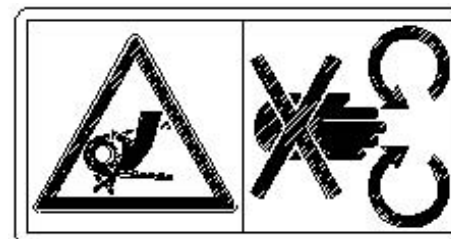
**Explanation:** The CE-mark indicates, that the machine fulfills the requirements of the EC-guide lines Machine 89/392/EEG and the corresponding additional guide lines.

**Picture No.: MD076****Explanation:**

Only start to operate with the implement with guards fitted.

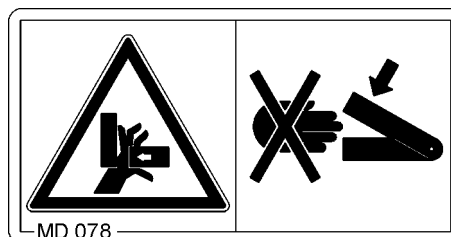
Do not remove guards when the engine is running.

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.

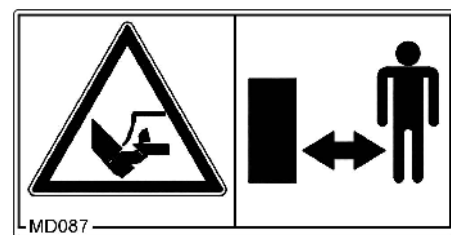
Advise people to leave the danger area!

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

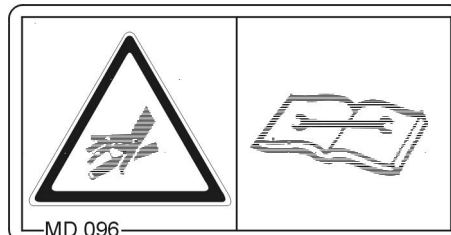
Sitting or standing on the implement during operation or road transport is not permitted!

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

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

**Picture No.: MD 096**

**Explanation:** Look out for escaping high pressure liquid.

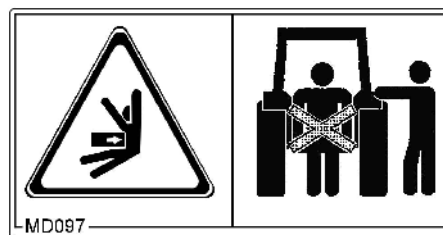


## Picture No.: MD 097

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

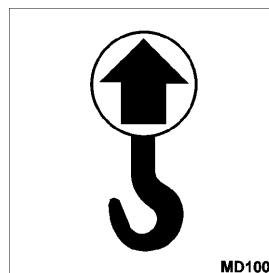
When coupling the combination to the tractor no persons may stay between tractor and machine.

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.



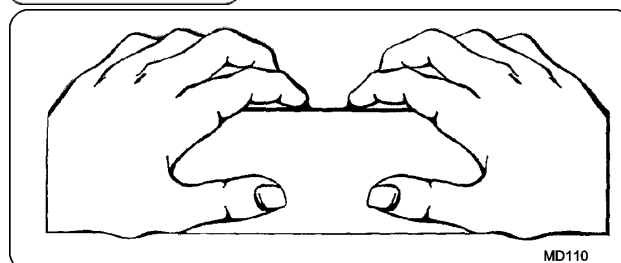
## Picture No.: MD 102

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



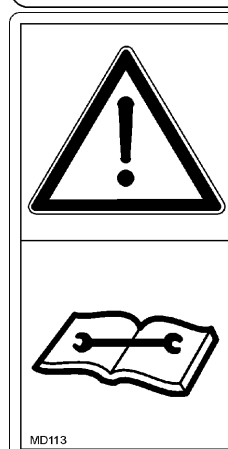
## Picture No.: MD 110

**Explanation:** Finger area



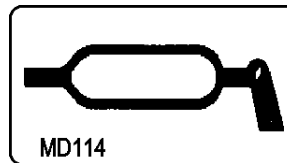
## Picture No.: MD 113

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

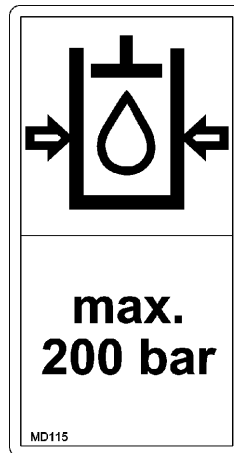


**Picture No.: MD 114**

**Explanation:** Greasing points.

**Picture No.: MD 115****Explanation:**

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



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## 2.5 Safety conscious operation

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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..

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## 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. Repair, maintenance- and cleaning operations as well as the correction and remedy of a function or fault should in principal be conducted with the engine and drive to the implement stopped. Remove ignition key.
2. As a matter of principle only carry out repair-, maintenance- and cleaning
3. work as well as remedy of function faults on the parked machine.
4. By no means allow persons to stay underneath a raised machine, as the
5. possible unintended lowering of the machine is extremely dangerous.
6. Check nuts and bolts regularly for tightness and retighten if necessary.
7. When doing maintenance work on a raised implement make sure that it is secured by proper supports.
8. When exchanging parts with cutting edges use appropriate tools and wear gloves.
9. Dispose of oil, grease and filters in the appropriate environmentally approved manner.
10. Before doing any repair work on the electric disconnect power supply.
11. Before conducting electric welding operations on tractor or on the mounted implement, remove cable from generator and battery.
12. Any spare parts fitted, as a minimum requirement, must meet with the implement manufacturers' 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/EEG 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



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



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



Before loading open the swivel hopper cover.

#### ADP Super basic machine:

For loading, please make use of the

- 2 fixing points at the rear inside the hopper (Fig. 5) and
- 1 fixing point at the front inside the hopper (Fig. 6).

#### AD-P Super basic machine with mounted rotary harrow / cultivator :

For loading, please make use of the

- 2 points at the rear inside the hopper (Fig. 5) and
- 1 fixing point on the rotary harrow/cultivator (Fig. 7).



Do not stand underneath a lifted un-secured load.



Fig. 5



Fig. 6

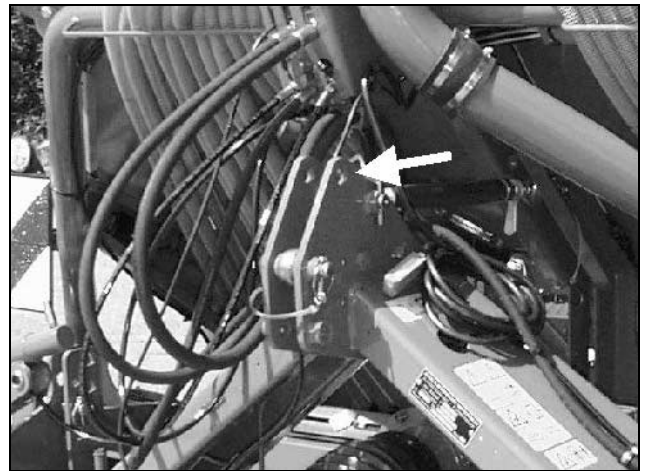


Fig. 7

## 4. Description of product

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

The sowing combination consists of the main components:

- Rotary cultivator or rotary harrow
- Wedge ring roller or tooth packer roller
- Seed drill

### 4.1 Overview – Component groups

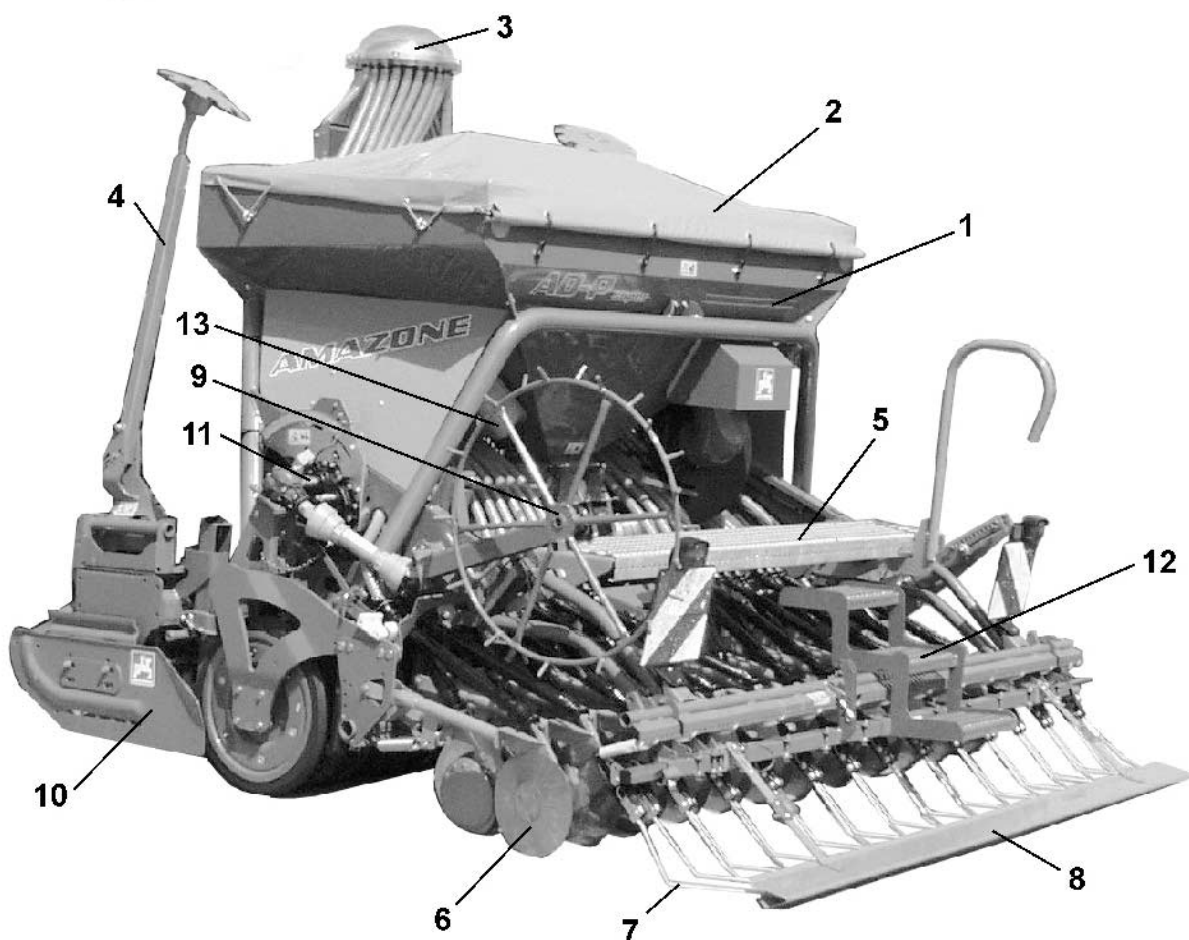


Fig. 8

- 1 Seed hopper
- 2 Hopper cover
- 3 Distributor
- 4 Track marker
- 5 Loading board
- 6 Sowing coulters
  - WS
  - RoTeC
  - RoTeC+

- 7 Extra coverage following harrow
- 8 Traffic safety board
- 9 Star wheel
- 10 Side plates
- 11 Vario gear box
- 12 Stair
- 13 Calibration tray

Fig. 9/...

- 1 Lower link fixing points
- 2 Top link fixing points
- 3 Rotor
- 4 Hydraulic coulters pressure adjustment
- 5 Seed tubes
- 6 Tramline control
- 7 Supply tubes in parking position
- 8 Guard plates

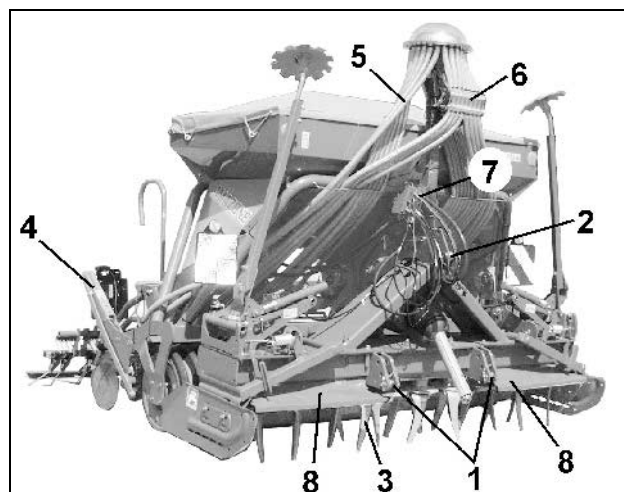


Fig. 9

Fig. 10/...

- 1 Blower fan
- 2 Metering device
- 3 Injector
- 4 Suction range of the blower fans

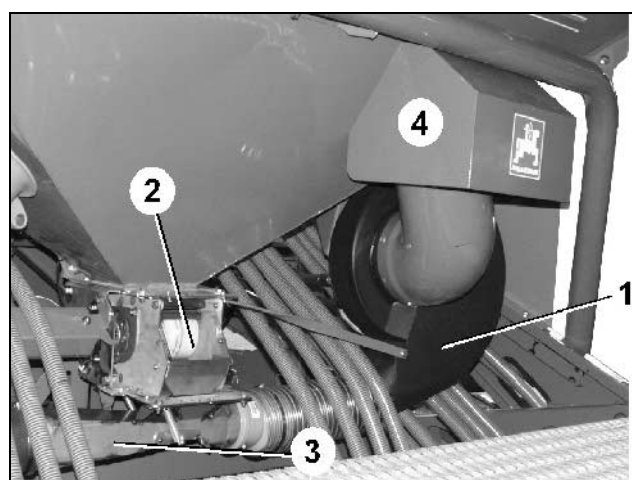


Fig. 10

Fig. 11/...

- 1 Machine computer

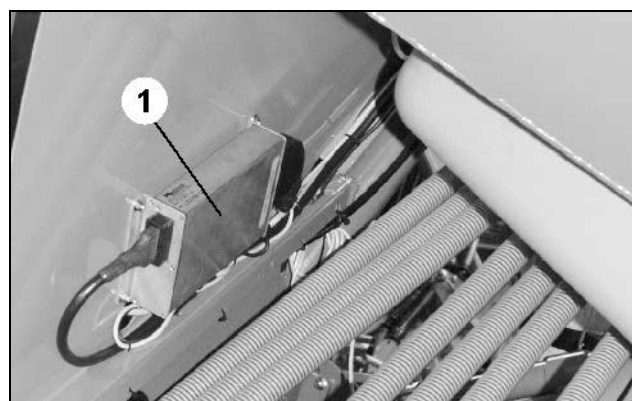


Fig. 11

Fig. 12/...

- 1 Height adjustable levelling bar
- 2 Guard tube

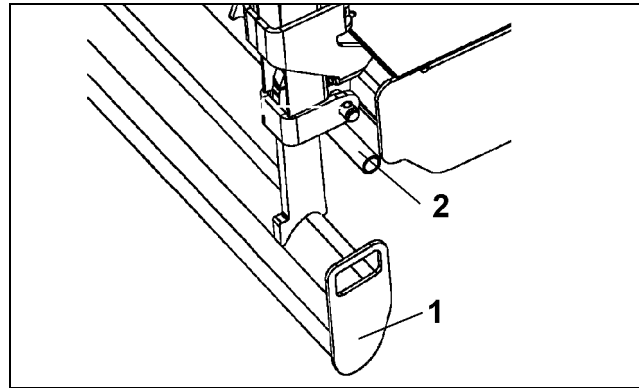


Fig. 12

## 4.2 Safety devices

- 1 Levelling bars (Fig. 12/1)
- 2 Guard plate rotary cultivator / rotary harrow
- 3 Guard tubes in the rear of the rotary cultivator (Fig. 12/2)
- 4 Side plates rotary cultivator / rotary harrow (Fig. 8/10)
- 5 following packer roller
- 6 PTO shaft guard
- 7 Guard screen in the hopper (at electric full metering)



**Only operate the machine with all safety devices properly fitted.**

## 4.3 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 track marker arms.
- When the machine is lifted within the zone of power lines by touching them.

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

## 5. Assembly and function

### 5.1 Way of function

Via two carrying arms and one top link the AMAZONE AD-P Super is attached to the AMAZOJE soil tillage implement KG (rotary cultivator) or KE (rotary harrow).

When the working depth of the soil tillage implement is changed, the seed placement depth of the AMAZONE combination is maintained.

The metering unit is driven via the star wheel and the vario gearbox or via an electric motor (electric full metering).

The blower fan delivers the seed from the injector to the translucent distributor head which is located within the height of the tractor cab. It evenly distributes the seed to all coulters. This position of the distributor head allows the operator a permanent check of the seed flow.



Fig. 13

### 5.2 RoTeC-coulter / RoTeC +-coulter

- RoTeC-coulter (Fig. 14/2)
- RoTeC +-coulter (Fig. 14/1)

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. 14/4). The naps (Fig. 14/5) provide additional drive.

The PU depth limiting disc (Fig. 14/4) precisely controls the depth of the seed furrow via three settings from 2 to 4 cm. (Kap.9.5.3). For work deeper than 4 cm the depth limiting disc can be instantly removed without any tool.

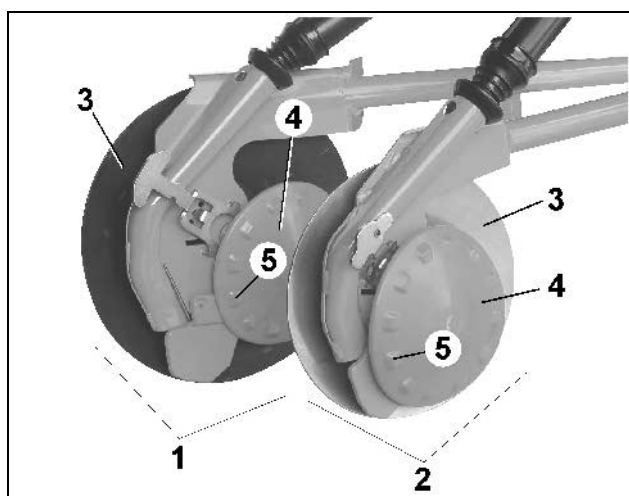


Fig. 14

### 5.3 WS-(Suffolk)coulter

Drag coulter with interchangeable coulter tip. The AMAZONE WS-coulter (Fig. 15) is provided with an exchangeable coulter tip (Fig. 15/1) made from hard cast alloy. Worn coulter tips can be exchanged. The back up flap (Fig. 15/2) 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.

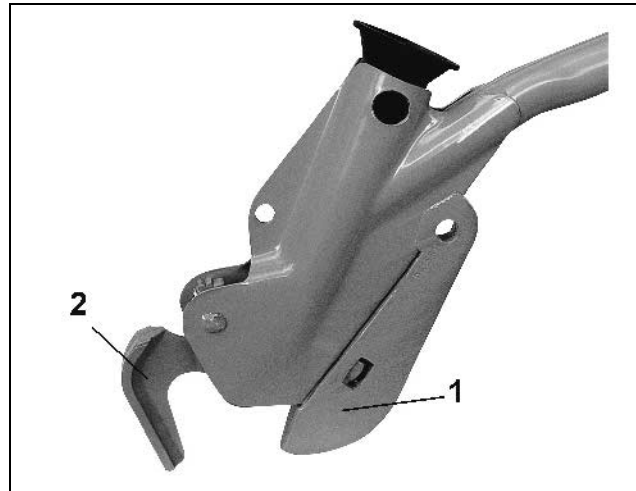


Fig. 15

### 5.4 Seed press roller (option)

3 Adjustment of the pressure of the seed press roller (Fig. 16/1) in three positions.

#### Setting the seed press roller:

1. To release the locking lever (Fig. 16/2) swivel it upwards.

By toothing the seed press roller (Fig. 16/1) can be set in 3 positions.

2. Getting the seed press roller into the desired position.
  - **A** – no pressure
  - **B** – medium pressure
  - **C** – max. pressure
3. Set the locking lever into the desired position and swivel it downwards.

#### Dismounting the seed press roller:

1. Swivel the locking lever (Fig. 16/2) upwards to release it.
2. Remove the lynch pin (Fig. 16/4).
3. Pull off seed press roller with spring to the front.

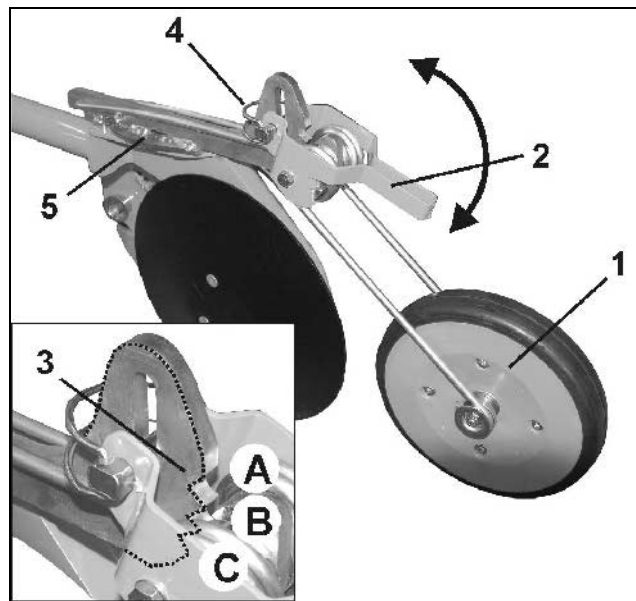


Fig. 16



## 5.5 Metering rollers

The seed metering units are equipped with exchangeable metering rollers. The type of metering roller depends on

- the grain size of the seed and
- the seed rate.

Utilise the metering rollers following the table (on page 55):

- Coarse metering roller (Fig. 17/1) for coarse seeds and big seed rates
- Medium metering rollers (option, Fig. 18/1) for medium size seeds and medium seed rates
- Fine metering rollers (Fig. 19/1) for fine seeds.

The metering rollers are driven at random

- with the aid of a star wheel via the Vario gear-box
- with the aid of an electric motor (full metering).

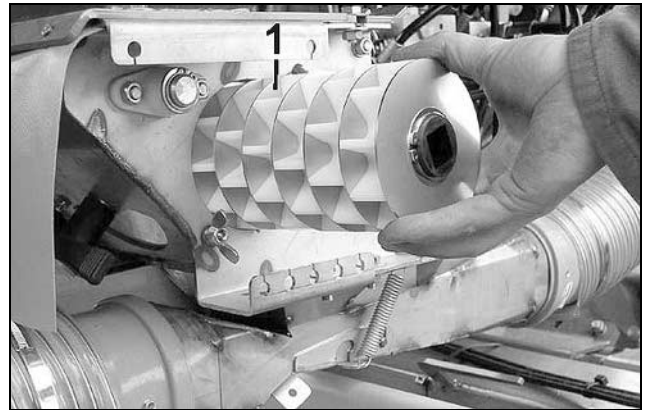


Fig. 17

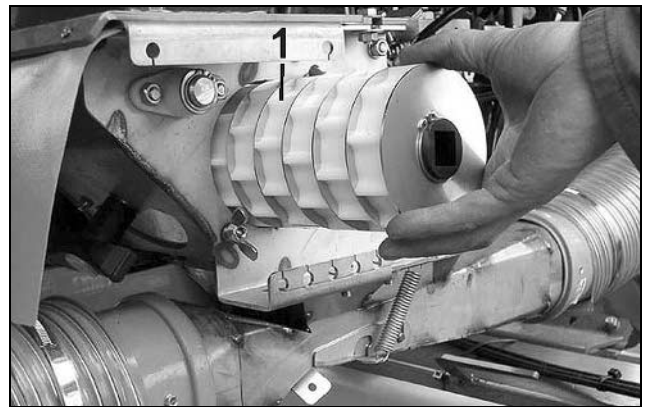


Fig. 18

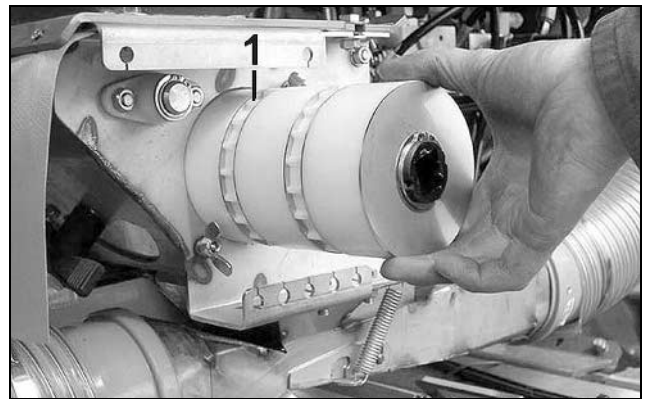


Fig. 19

For sowing seeds with particularly big grains, e.g. large beans, the compartments (Fig. 20/1) of the coarse metering rollers can be increased by resetting the wheels and divider plates.

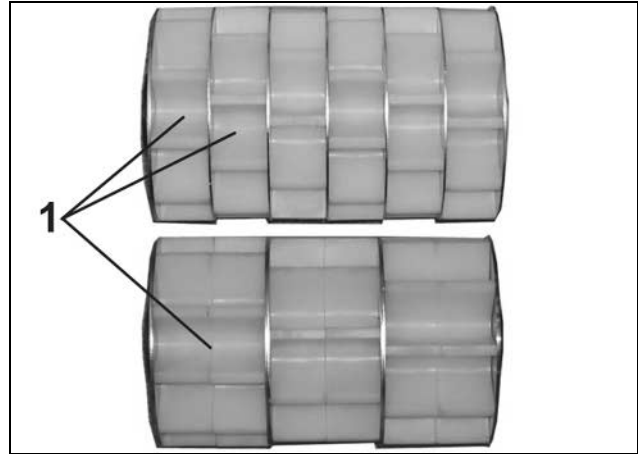


Fig. 20

## 5.6 Vario gearbox

### Not for full electric metering system!

For setting the seed rate

- the gearbox setting lever (Fig. 21/2) is manually adjusted. The higher the scale figure is, the bigger the seed rate will be.
- the setting motor (Fig. 21/1) adjusts the gearbox setting lever I (Fig. 21/2) (option).



**Carry out a calibration test!**

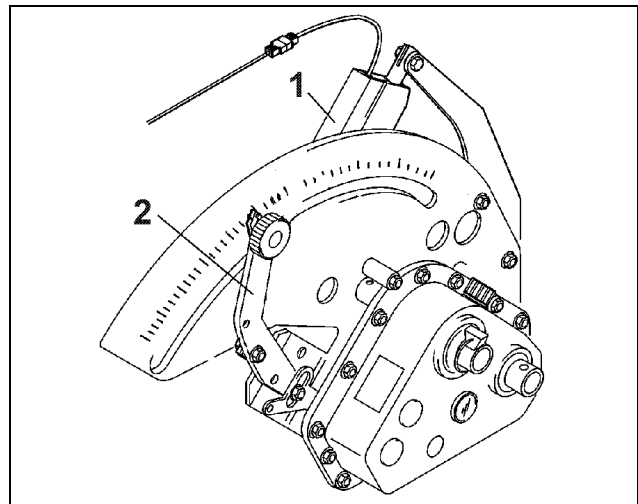


Fig. 21

## 5.7 Full electric metering system

With the full electric metering system each one electric motor (Fig. 22/1) drives a metering roller.

The seed rate is infinitely variably set via **AMATRON+**.

The drive rev. speed of the metering roller

- can infinitely be set via **AMATRON+**.
- determines the seed rate. The higher the drive rev. speed of the electric motor, the bigger the relevant seed rate will be.
- automatically adapts to the changing forward speeds.

The additional seed pre-metering is possible, e.g. at the headlands. The running time of the seed pre-metering is settable..



**Carry out a calibration test!**

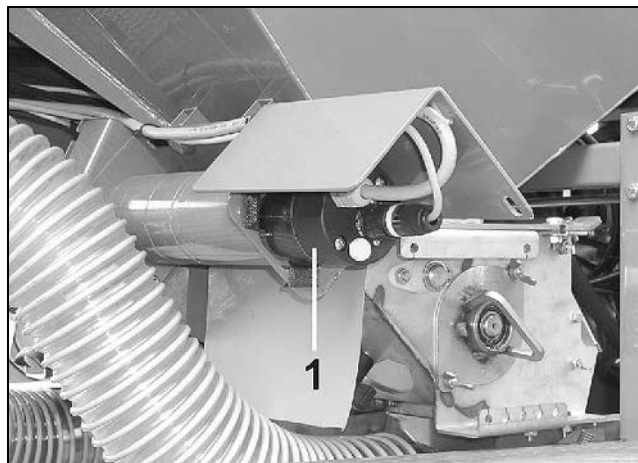


Fig. 22

## 5.8 Star wheel

- Via the Vario gearbox the star wheel (Fig. 24/1) drives the metering rollers in the seed metering system
- Via the star wheel the travelled distance can be measured. **AMATRON<sup>+</sup> / AMALOG<sup>+</sup>** requires these data to calculate the forward speed and the worked area (hectare counter).

Fig. 23 – Star wheel in transport position

Fig. 24 – Star wheel in operating position

Fig. 25 – Star wheel in calibrating position

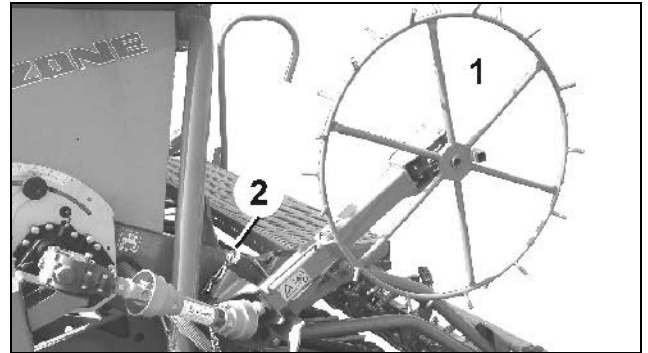


Fig. 23

### Getting the star wheel into the transport position:

- Pull the lynch pin (Fig. 24/1).
- Lift the star wheel, slide in completely and lock.
- Lock in transport position using the lynch pin (Fig. 23/2).

### Gettint the star wheel into operating position: (Star wheel / machine must be lifted)

- Pull the lynch pin and release the transport locking (Fig. 23/2).
- Lift the star wheel and completely pull outwards. **Ensure that the star wheel catches on the catching unit (Fig. 26/1)!**
- Lower the star wheel and secure using a lynch pin (Fig. 24/1).

### Getting the star wheel into operating position:

- Pull the lynch pin and release the transport locking (Fig. 23/2).
- Lift the star wheel, pull outwards and deposit on the rest (Fig. 25/1).

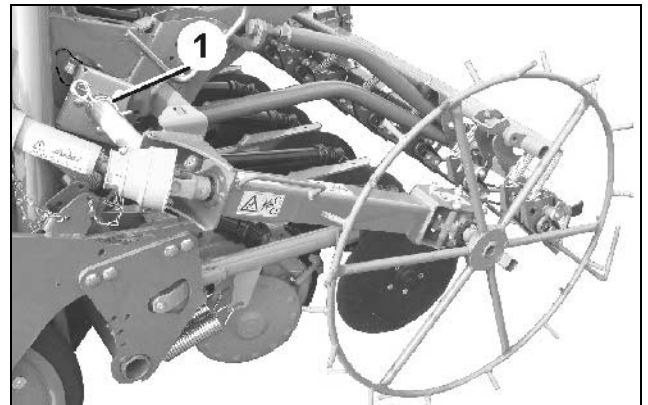


Fig. 24

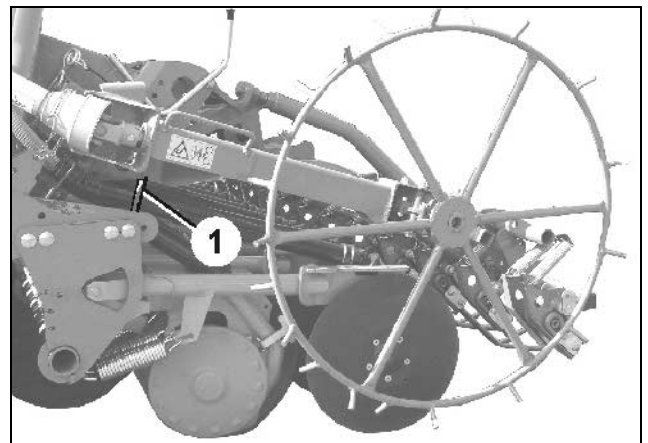


Fig. 25

Turning the bolt (Fig. 26/2) allows the max. working depth setting of the star wheel. After setting secure the bolt.

The hydraulic star wheel lifting (option) required one single acting control valve on the tractor.

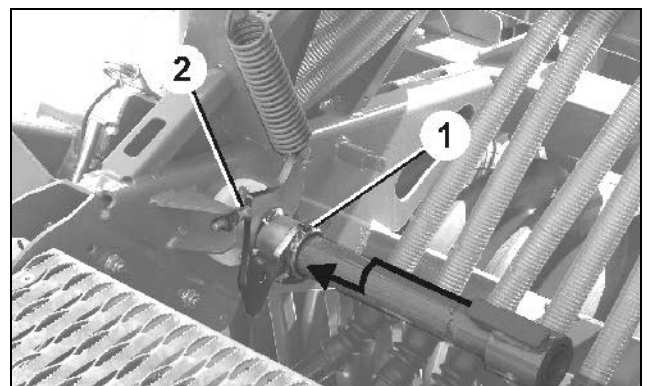


Fig. 26

## 5.9 Track markers

The machine is equipped with track markers (Fig. 27/1) 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. 27/1).

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 spool valve. When pressurising the track marker shuttle valve the operating marker is lifted, in floating position the second track marker is lowered.

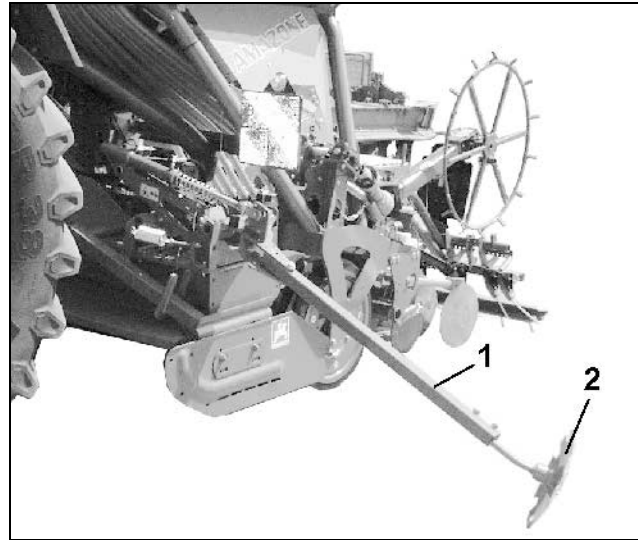


Fig. 27

If both track markers are raised and the tractor control spool 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.



**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.**

- **Bring marker arms into transport:**



**Danger of injury!**

Before travelling on non public or public roads and ways secure both marker arms (Fig. 28/1) with clip pins (Fig. 28/2) against unintended lowering.

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

- **Releasing the track markers from the transport position.**
  - hold track marker arm (Fig. 28/1) and remove pin and the clip pin (Fig. 28/2)
  - when not needed, insert the pin with clip pin into the hole (Fig. 28/3)



After removal of the clip pin (Fig. 28/2) the marker arm is tilting slightly to the side.

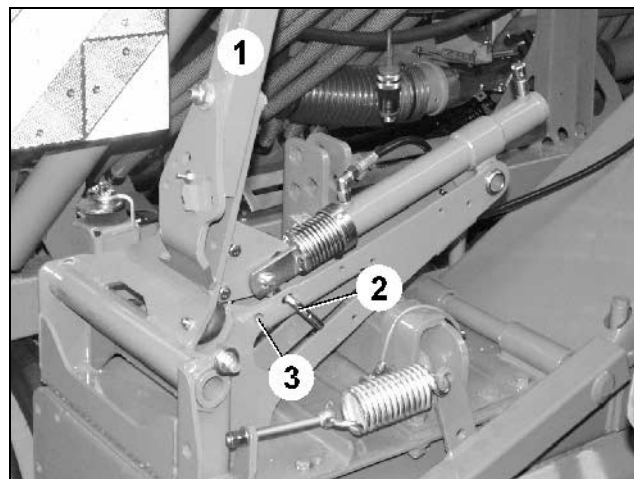


Fig. 28

## 5.10 Exact harrow

The exact harrow (Fig. 29/1) covers the seed in the seed furrows evenly with loose soil levels the soil. Adjustable functions

- the exact harrow position for matching the pre-set seed placement depth.
- the exact harrow pressure.
- **Get the outer harrow tines into the operational position.**
  - Depending on the forward speed and soil condition the packer roller and the coulters of the sowing rail differently push the soil outwards.
  - Set the outer harrow tines (Fig. 29/1) in such a way that the soil is guided inwards in order to achieve a track free seed bed.
  - The higher the forward speed, the more the square tube (Fig. 29/2) should be pushed outwards.
  - After any setting secure the square tubes with the outer harrow tines by using clamping bolts (Fig. 29/3).

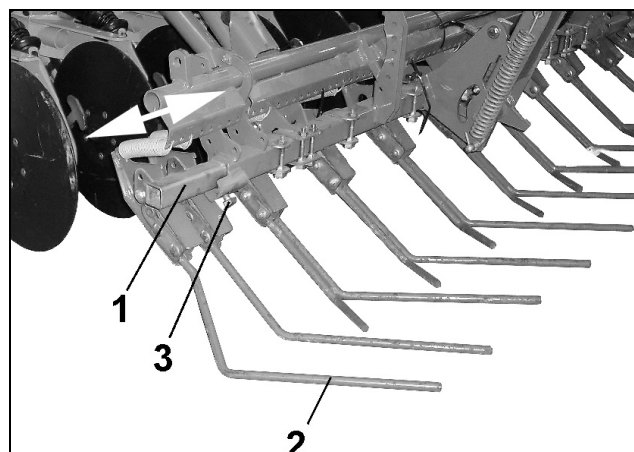


Fig. 29

- **Getting the outer harrow tines into the transport position:**

For the transport on public roads push the carrying tubes (Fig. 29/1) with the outer harrow tines (Fig. 29/2) into the harrow carrying tube right up to the stop. Beforehand slacken the clamping bolt (Fig. 29/3) and firmly retighten afterwards.



**For transport on public roads push the carrying tubes with the outer harrow tines into the harrow carrying tube right up to the stop and secure using clamping bolts.**

- **Fitting the traffic safety board for road transport..**

Affix the traffic safety board (Fig. 30/1) by using tensioning hooks above the tines of the exact following harrow.

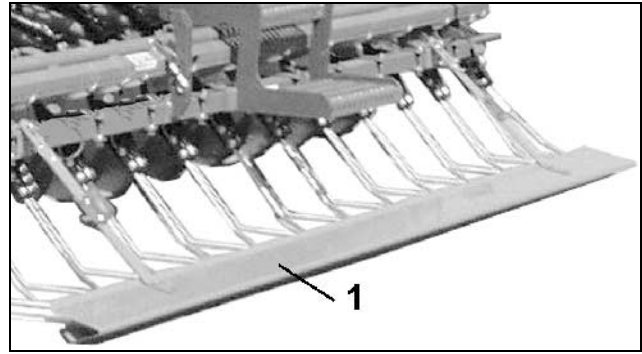


Fig. 30

### 5.11 Hydraulic coulters lift (option)

The hydraulic lifting of the coulters on the operating machine allows stopping the sowing procedure and to continue the soil tillage operation.

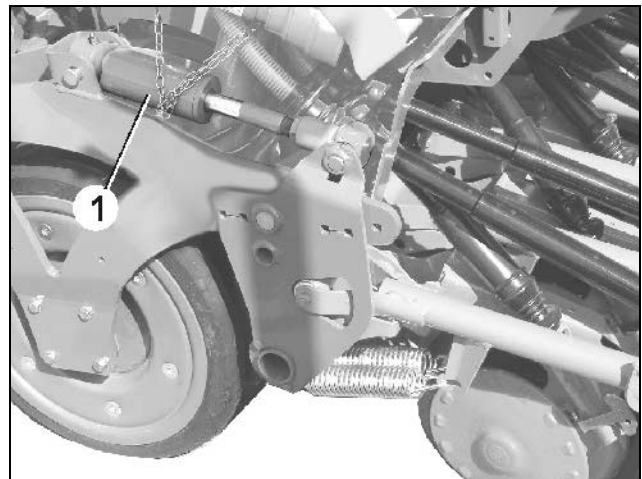


Fig. 31

## 5.12 On board computer

- **AMATRON+**
- **AMALOG+**

The on board computer controls and monitors the machine.

- **AMATRON+** / **AMALOG+** controls the tramline system, indicates the area sown, the fill-level and the speed of the seed shaft.
- Additionally **AMATRON+** allows for an electric metering and adjustment of the seed rate, e.g. in 10 % steps. 20 jobs with order related data can be stored.

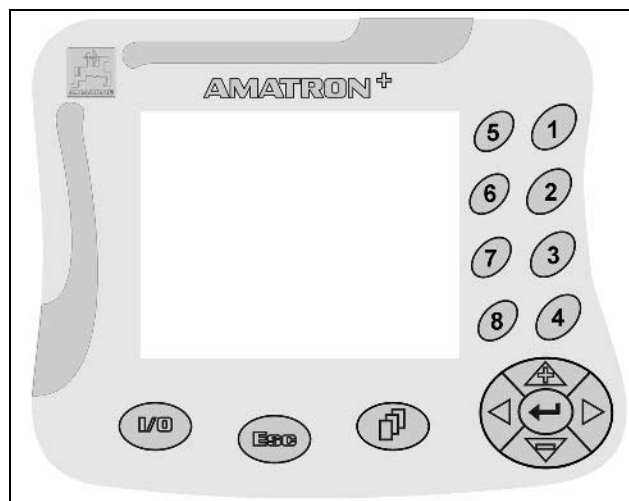


Fig. 32

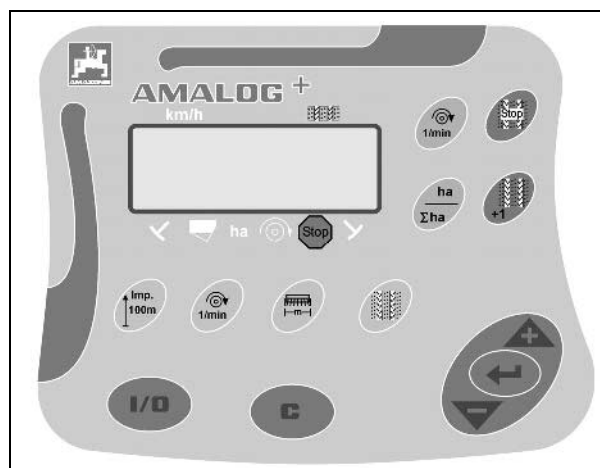


Fig. 33

## 5.13 Hydraulic system connections



All the hydraulic hose lines possess the following coloured markings to allow assignment of the appropriate hydraulic function to the pressure line of a tractor control valve.!

- One hose mark: Getting into operating position.
- Two hose marks: Getting into transport position.

Control valve	Function	Hose marking
1 single acting	- Track marker - Pre-emergence marker	yellow
<b>Depending on the execution:</b>		
2 single acting	- Coulter pressure, exact harrow pressure	blue
double acting	- Coulter lift - Coulter pressure, exact harrow pressure The function can be selected via switching valve!	
3 single acting	- Star wheel lift	natural
4 single acting	- Blower fan drive	1 x red
5 pressure free return flow		2 x red

## 5.14 Blower fan with hydraulic drive

- **Do not create other connections than shown in the circuit diagram (Fig. 34).**

On the pressure side the blower fan hydrostatic motor (Fig. 34/1) may be connected to either a single or to a double acting control spool valve (Fig. 34/8).

In order not to damage the hydrostatic motor, the oil pressure in the return flow (Fig. 34/6) must not exceed 10 bar. Therefore, never connect the return flow to the control spool valve (Fig. 34/8) but to a non-pressurised return flow with a large plug coupling (included in the scope of delivery) (Fig. 34/11). Should it become necessary to install a new return flow tubing, use only tubes DN16, e.g. Ø20 x 2,0 mm and short return flow ways.

The hydraulic oil must be guided through an oil filter (Fig. 34/7) at any place of choice.

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

The check valve (Fig. 34/4) allows the blower fan to run after as soon as the control spool valve (Fig. 34/8) 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. 34/9) 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. 34/1) and the pressure relief valve (Fig. 34/3). 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.

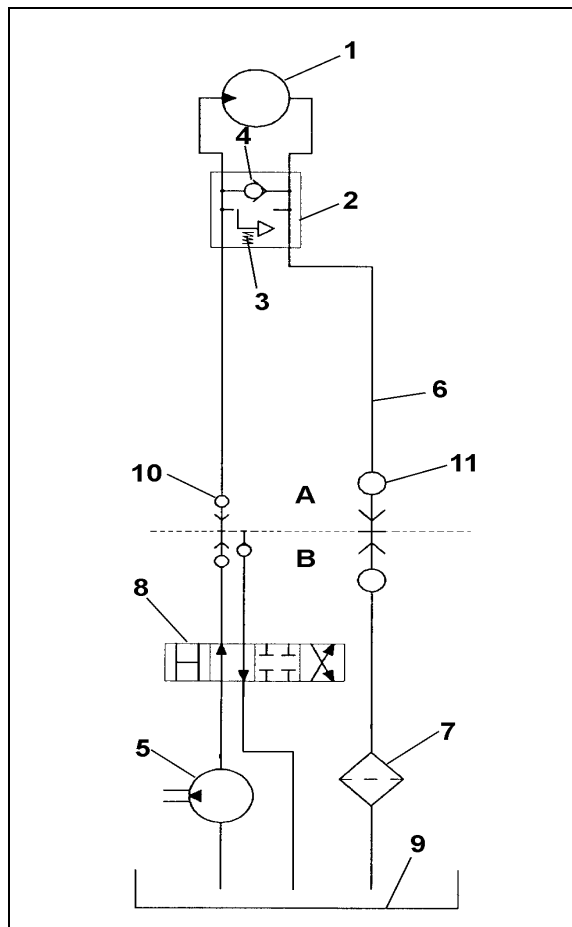


Fig. 34

Nr.	Description
1	Blower fan hydraulic motor $N_{max} = 4000 \text{ R.P.M.}$
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"> <li>- Tube nominal width min. Ø16 mm</li> <li>- Use couplings with sufficiently large diameter</li> <li>- The pressure in the return flow must not exceed 10 bar.</li> </ul>
7	Filter
8	Single or double acting control spool valve
9	Hydraulic oil reservoir
10	Plug coupling
11	Plug coupling "large"

Tabelle 1



HD-SAE20W-20 according to MIL-L-2104 C API-CD  
STOU-SAE15W-30 according to MIL-L-2105 or API-GL4

## 5.16 Electr. seed level indicator AMFÜME

A capacitive sensor (Fig. 35/1) which is connected to **AMATRON<sup>+</sup>** / **AMALOG<sup>+</sup>** monitors the seed level in the seed tank. If the sensor does not dip in the seed any more an audible signal sounds and the black triangle above the tank symbol flicks on the display:

The seed tank should never be emptied completely as this may result in differing seed rates. For changing the seed residue in the seed tank move the carrier (Fig. 35) with the sensor accordingly. The sensitiveness of the sensor can be adapted to the individual seeds by adjusting the setting screw (Fig. 35/2).

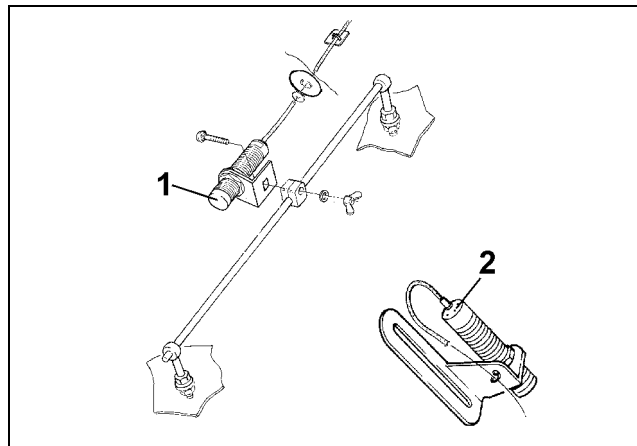


Fig. 35

## 5.17 Pre-emergence marker

With the aid of the tramlining control, during sowing operation, tramlines are created with determined spacing in which later on fertiliser broadcasters or field sprayers may travel. The marker discs (Fig. 36/1) 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. 36/1) of the pre-emergence marker are lifted out of work when no new tramlines are created..

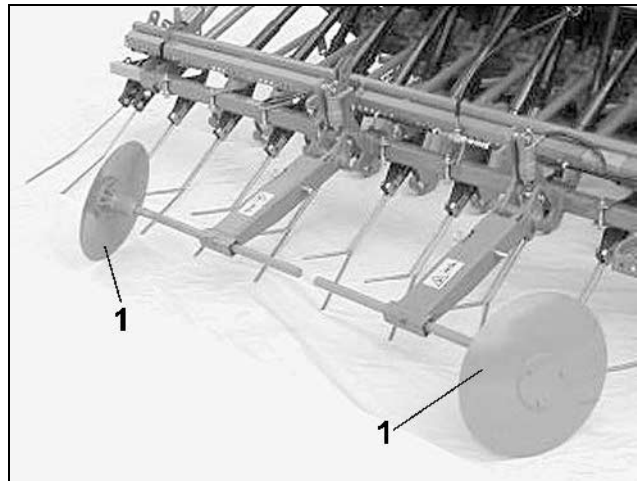


Fig. 36



**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 spool valve.**



**Actuate the control spool valves only from the tractor cab.**



**When actuating the control spool 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.**

## 5.17.1 Getting the pre emergence marker into the transport position:

For transport the marker disc carriers (Fig. 37/1) should be locked on the fitting brackets (Fig. 37/2) by pins (Fig. 37/3) and secured by using clip pins (Fig. 37/4). The marker disc carriers are then completely folded upwards and are positioned with the marker discs vertically above the extra coverage following harrow. If the seed drill shall be transported on public roads, remove the marker discs (Fig. 37/5).



**Before any transport on public roads remove the marker discs from the marker disc carriers.**

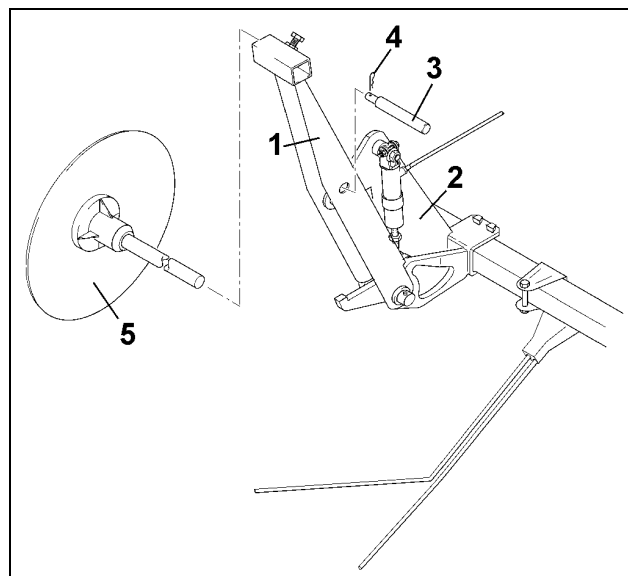


Fig. 37

## 5.17.2 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. 38/1) to the extra coverage following harrow
- Mount the marker disc carrier arm (Fig. 38/3) by means of the pins (Fig. 38/4) and expansion pin (Fig. 38/5) and secure.
- Insert the marker discs (Fig. 38/6) into the marker disc carriers (Fig. 38/3) and clamp by using hex. bolts (Fig. 38/7).
- Connect the hydraulic hoses (Fig. 38/8) to both hydraulic rams (Fig. 38/9) 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.**

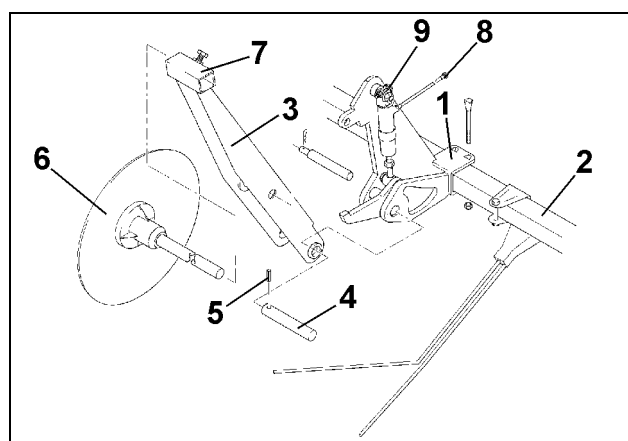


Fig. 38



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

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

Tramlining 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. 36/1) when using these switching rhythms.

## **6. 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!

## 7. Initial putting into operation

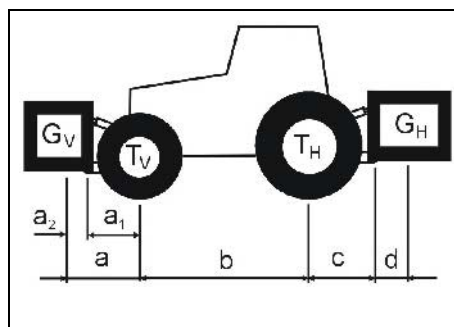
### 7.1 Fitting data

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.



**Mounting data for the sowing combination AD-P with rotary cultivator / rotary harrow:**

Distance d	0,9m
------------	------

For calculation you need the following data

T <sub>L</sub> [kg]	Net weight of tractor	❶
T <sub>V</sub> [kg]	Front axle load of the empty tractor	❶
T <sub>H</sub> [kg]	Rear axle load of the empty tractor	❶
G <sub>H</sub> [kg]	Total weight rear mounted implement / rear ballast weight	❷
G <sub>V</sub> [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
a <sub>1</sub> [m]	Tractor wheel base	❶ ❸
a <sub>2</sub> [m]	Distance between rear axle centre and lower link ball centre	❷
b [m]	Distance between lower link ball centre and centre of gravity rear mounted implement / rear ballast weight	❶ ❸
c [m]	Net weight of tractor	❶ ❸
d [m]	Front axle load of the empty tractor	❷

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 ( $G_V$ ) 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!

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

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  $G_{\text{tat}}$** 

If with the rear mounted implement ( $G_H$ ) 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 than 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 style="border: 1px solid black; padding: 10px; display: inline-block;"> <div style="text-align: center;">  </div> <div style="text-align: right;">kg</div> </div>	---	---
Total weight	<div style="border: 1px solid black; padding: 10px; display: inline-block;"> <div style="text-align: right;">kg</div> </div> $\leq$	<div style="border: 1px solid black; padding: 10px; display: inline-block;"> <div style="text-align: right;">kg</div> </div>	---
Front axle load	<div style="border: 1px solid black; padding: 10px; display: inline-block;"> <div style="text-align: right;">kg</div> </div> $\leq$	<div style="border: 1px solid black; padding: 10px; display: inline-block;"> <div style="text-align: right;">kg</div> </div> $\leq$	<div style="border: 1px solid black; padding: 10px; display: inline-block;"> <div style="text-align: right;">kg</div> </div>
Rear axle load	<div style="border: 1px solid black; padding: 10px; display: inline-block;"> <div style="text-align: right;">kg</div> </div> $\leq$	<div style="border: 1px solid black; padding: 10px; display: inline-block;"> <div style="text-align: right;">kg</div> </div> $\leq$	<div style="border: 1px solid black; padding: 10px; display: inline-block;"> <div style="text-align: right;">kg</div> </div>

Table 2

## 7.2 Mounting rotary cultivator / rotary harrow

Move with the soil tillage implement towards the AD-P so that both machines can be connected with the aid of the lower link pins.

- Insert the lower link fixing (Fig. 39/1) on the left and right hand side and secure with the aid of a fillister head screw and a nut.
- Turn the top link until the top link pin can be inserted.
- Insert the top link pin (Fig. 39/2) and secure using a lynch pin.



**The AD-P must only be combined with approved AMAZONE soil tillage implements.**



**Set the top link in such a way that the soil tillage implement and the seed drill are parallel to one another.**

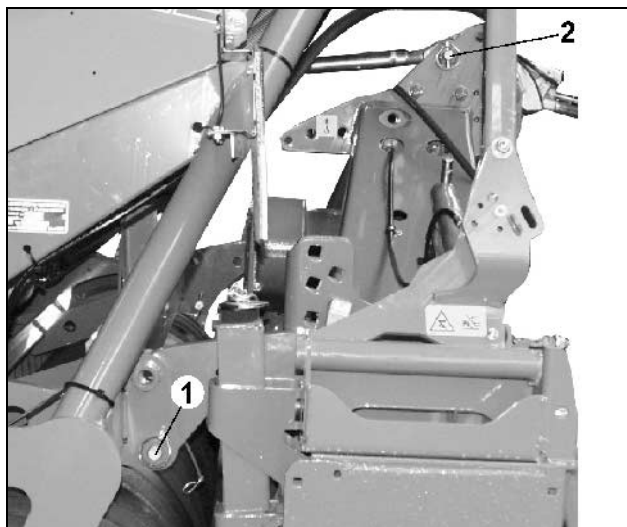


Fig. 39

## 7.3 Fitting the track markers

Attention: Authorised workshop job!

Fitting the track markers AD-P to existing **AMAZONE KG/KE** approved for the combination with **AD-P**.

- Bolt the track markers on the left and right hand side with each 6 bolts (Fig. 40/1) on to the KG/KE.
- Fit the pre-assembled hydraulic block according to Fig. 19 to the left hand side track marker.
- Route the hydraulic hoses:
  - Connection track marker left hand side (Fig. 40/2).
  - Connection track marker right hand side (Fig. 40/3).
  - Connection control spool valve tractor (Fig. 40/4).

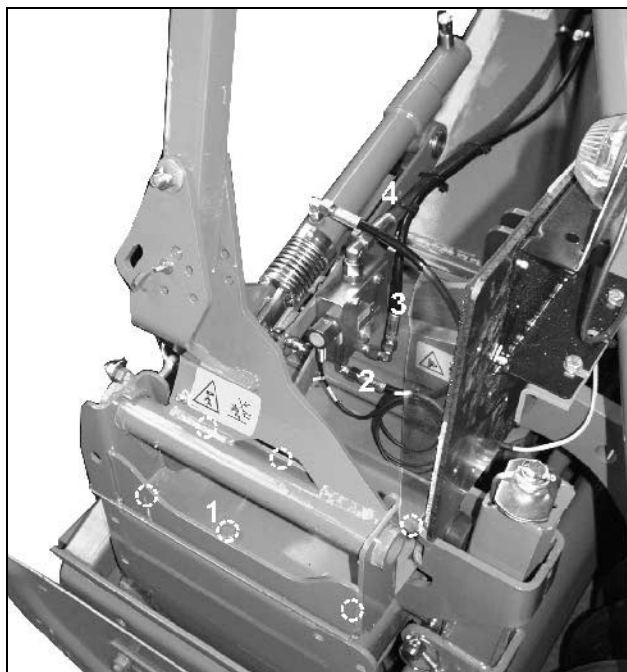


Fig. 40



## 7.4 Mounting the exact following harrow

Attention: Authorised workshop job!

- Bolt on swing-metal buffers (Fig. 41/1).
- Bolt the carrying tubes (Fig. 41/2) by using bearing sleeves (Fig. 41/3) on to the brackets (Fig. 42/1, 2) and sockets (Fig. 41/4) of the exact harrow.
- Make use of the fixing points (Fig. 42/1) when using WS or ROTEC-coulters.
- Make use of the fixing points (Fig. 42/2) when using ROTEC+-coulters.

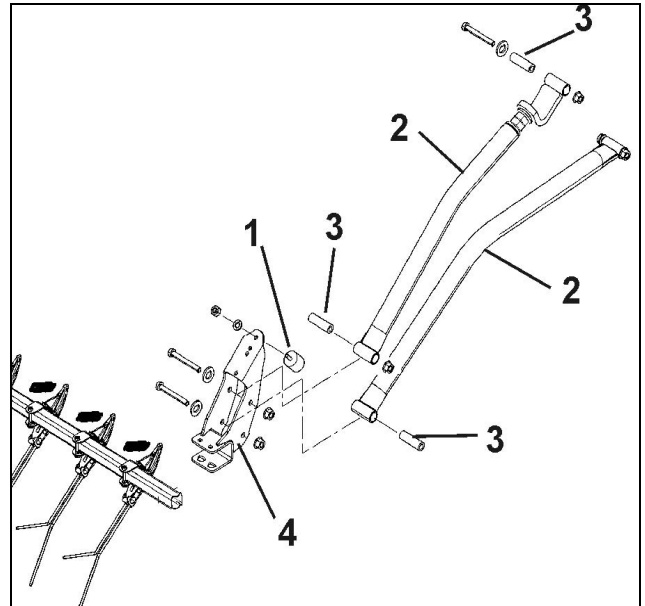


Fig. 41

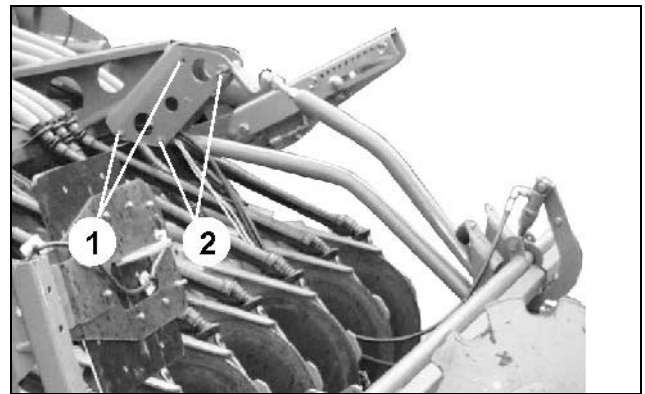


Fig. 42

Connecting hydraulic ram (option)

The hydraulic ram (Fig. 43/1) is fitted to the exact harrow when supplied. Connect the hydraulic hose (Fig. 43/2) to the hydraulic ram (Fig. 43/1).



**Allow the hydraulic hose (Fig. 43/2) 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 exact harrow tines is increased.**

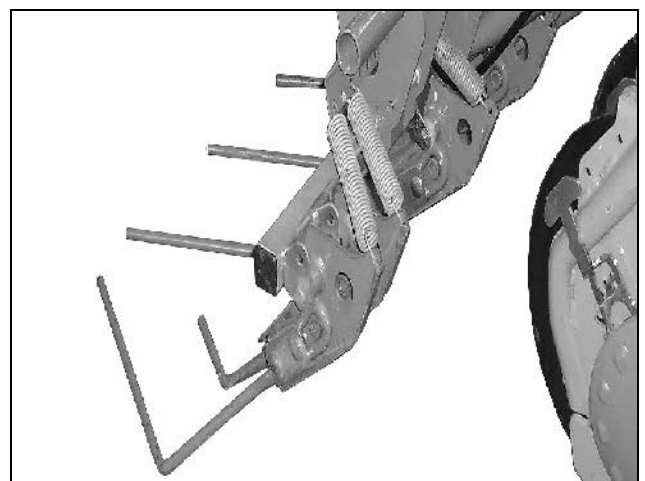


Fig. 43

## 8. Mounting and dismounting

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Remove ignition key. Secure the implement against unintended movement 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.

### 8.1 Mounting

#### 8.1.1 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.

### 8.1.2 Coupling the machine



When coupling the machine observe the safety advice for mounting implements on to the tractor's three point hydraulics 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 three point hydraulic linkage of the tractor in the usual manner.

Attach lower and upper link arms of the tractor according to figure (Fig. 44). Secure the top- and lower link pins using lynch pins.

Set the top link (Fig. 44/1) 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. 44/2) 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 machine is equipped with upper and lower link pins (Fig. 44/3) cat. III for fitting to the tractor top and lower link.

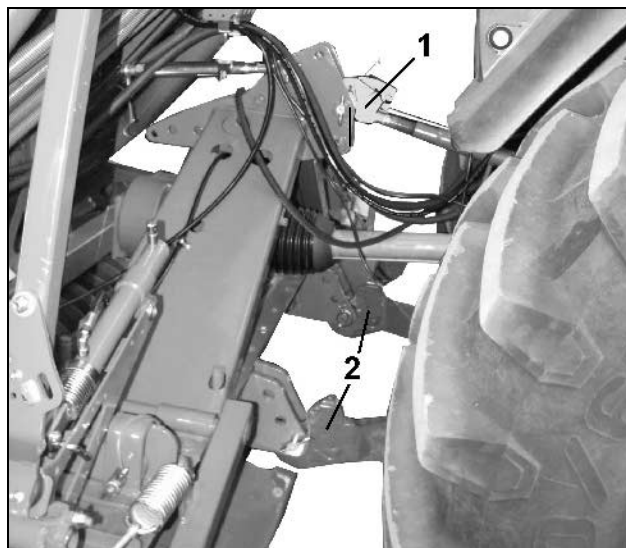


Fig. 44

### 8.1.3 Connecting the on board computer

Connect the cable harness with the aid of the implement plug with the tractor basic equipment (Fig. 45/1) of **AMATRON<sup>+</sup>** (Fig. 45/2) / **AMALOG<sup>+</sup>**.

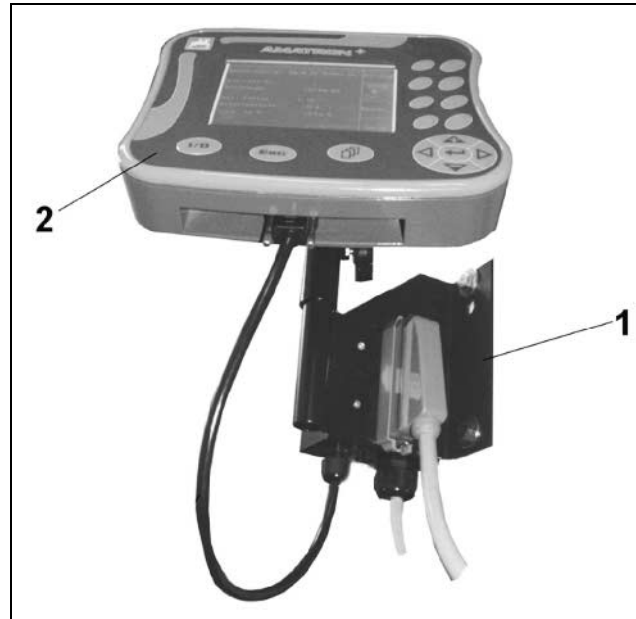


Fig. 45

### 8.1.4 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!**



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



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

1. Set the tractor control valve to float (neutral) position.
2. Prior to coupling clean the hydraulic plug of the hydraulic hose lines.
3. Couple the hydraulic hose line(s) with the tractor control valve(s).

### 8.1.5 Fitting the traffic lights

---

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

## 8.2 Uncoupling

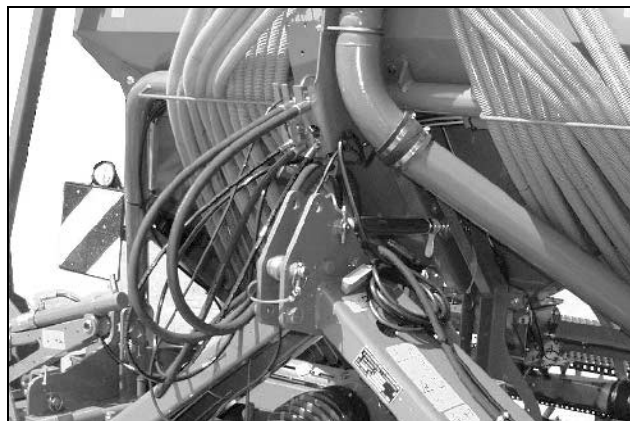
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**Before uncoupling the machine from the tractor ensure that the coupling points (upper- and lower links) are relieved.**

Park the machine on level ground

- Uncoupling the sowing combination.
- Remove the hydraulic hoses from the tractor and locate them in their parking position (Fig. 46).
- Remove the PTO shaft.
- Remove electric cable connections.



**Fig. 46**

## 9. 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. 7.1. 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.!**

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 spacing are not exceeded:

Bring warning plates and traffic light kit of the PS Pack Top sowing rail 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 machine is **not** equipped with the in Germany legally prescribed rear warning plates and traffic light kit. (option)



**Transporting the AD-P 403 Pack Top seed drill on public roads is prohibited as its transport width is 4 m.**

## 9.1 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:, see on page 27.
- Getting the pre emergence marker into the transport position, see on page 35.
- Bring marker arms into transport on page 29.
- Getting the outer harrow tines into the transport position on page 30.
- Mount the traffic safety board, please refer to on page 30.
- Fitting the 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.

## 10. Creating tramlines

With the aid of the tramlining control tramlines are created in the field allowing other implements, e.g. fertiliser broadcasters or field sprayers, to travel accurately.

Tramlines are marks (Fig. 47/1), 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. 47/2), as e.g.

- Fertiliser spreaders and/or
- field sprayer.

The rhythm for creating tramlines is governed by the **AMATRON<sup>+</sup>**-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. 47) results from the desired tramline distance and the working width of the seed drill.

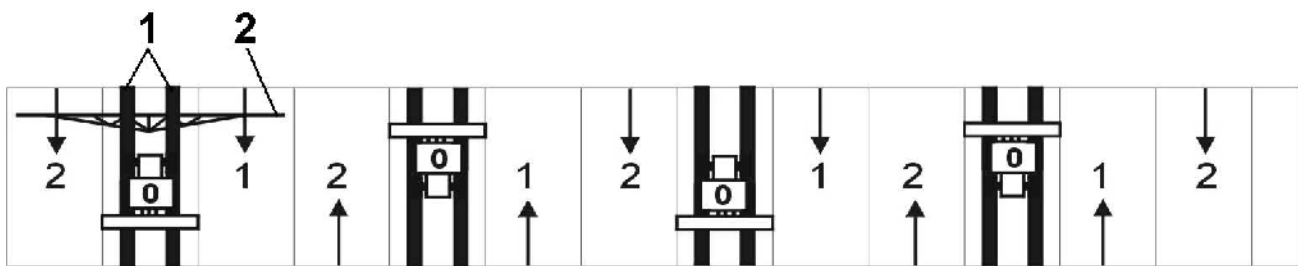


Fig. 47

	Working width of the machine	
	3,0 m	4,0 m
Switching rhythm	Tramline spacing (Working width of the fertiliser spreader and the sprayer)	
3	9 m	12 m
4	12 m	16 m
5	15 m	20 m
6	18 m	24 m
7	21 m	28 m
8	24 m	32 m
9	27 m	36 m
2	12 m	16 m
6 plus	18 m	24 m

Table 3



## 10.1 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).

An electric lifting spindle motor (Fig. 48/1) or a Bowden control which is connected with the switch box, actuate the mechanism inside the tramline flap box (Fig. 48/2) which shuts the outlets (Fig. 48/3) towards the tramline coulters and which leads the seed through a tube (Fig. 48/4) back into the seed box..

When creating tramlines the seed in the flap box (Fig. 48/2) is not delivered to the tramline coulters but returned to the seed hopper. Tramlines are created.

Through the flap box the seed is delivered towards 8 coulters which can be used as tramline coulters. If it is desired that when creating tramlines the seed flow should not be interrupted on all 8 coulters, the 8 tramline coulters may be converted to normally sowing coulters at any random number or vice versa. For this the relevant flap (Fig. 49/1) inside the flap box should be deactivated (Fig. 49/A, for normally sowing coulters) or activated (Fig. 49/B, for tramline coulters).

The on board computer checks the setting of the tramline flap box with the aid of a sensor and triggers an alarm in case of a wrong setting.

The on board computer receives the impulses for switching forward the tramline control by the track marker shuttle valve or by the marker arm sensors.

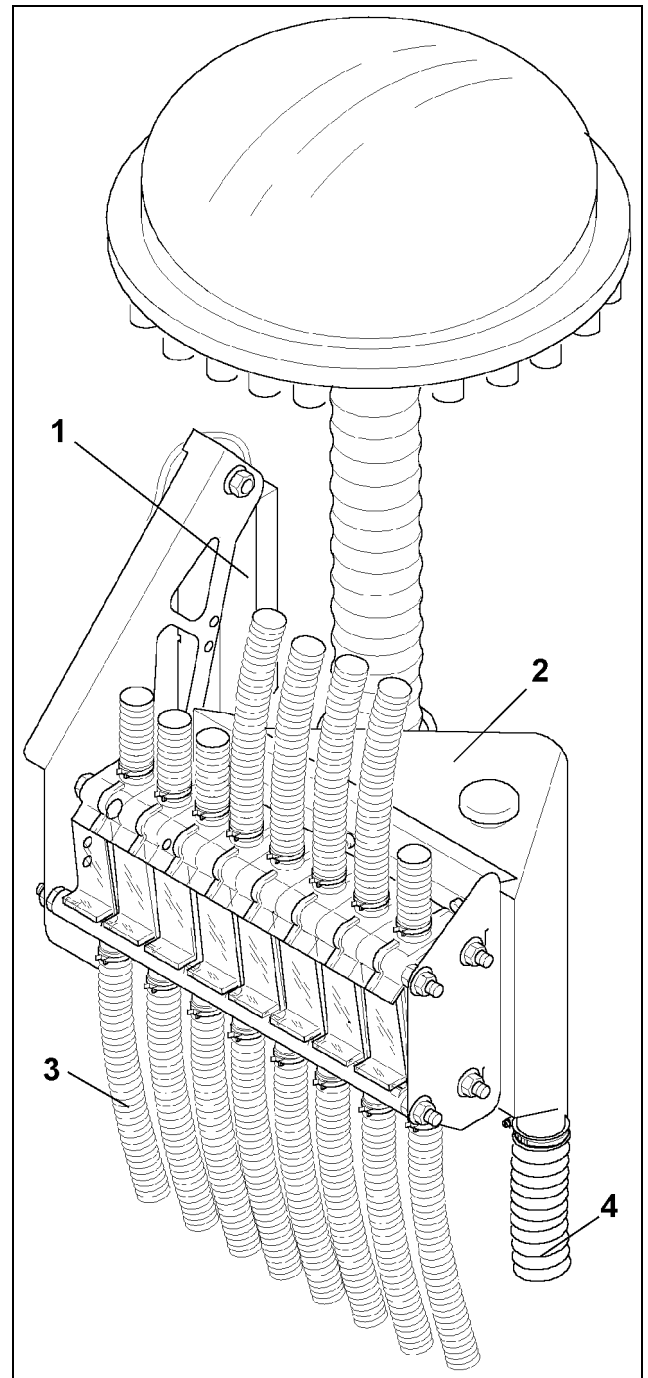


Fig. 48

## 10.2 Starting the operation

Take the "starting figure" from the tramline schedules (Fig. 51) and set the "starting figure" on the display of the on board computer prior to starting the operation.

Example:

"Starting figure" of switching rhythm "3". In column "C" move to figure "3" (switching rhythm 3). Change to column "D". The operation in the field starts with the first figure below the letters "START" in column "D". In our example with "3-fold rhythm" the operation begins with the figure "2" (start figure)



**The setting mechanism of the tramline flap box switching is coupled with the hydraulically actuated track markers. Prior to setting the starting figure note, that the correct track marker arm lowers when starting the operation. If necessary, switch once more the track marker actuation before setting the starting figure.**

The on board computer receives the necessary information for switching ahead the tramline control when the track marker is raised at the headlands but also when the track markers are raised in the field, e. g. in front of obstacles.

### 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<sup>+</sup>** display flicks.

Immediately after continuing the sowing operation

press key 

The tramline counter does not flick any longer in the operation display (Fig. 50).

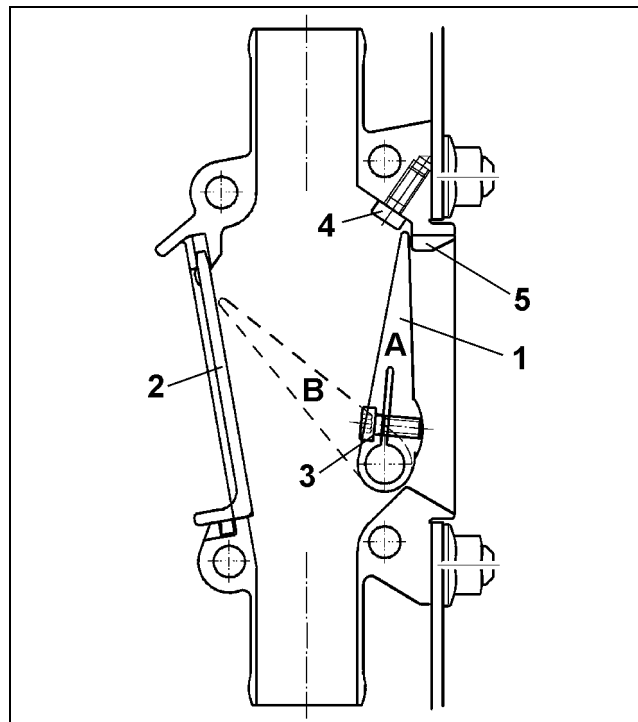


Fig. 49

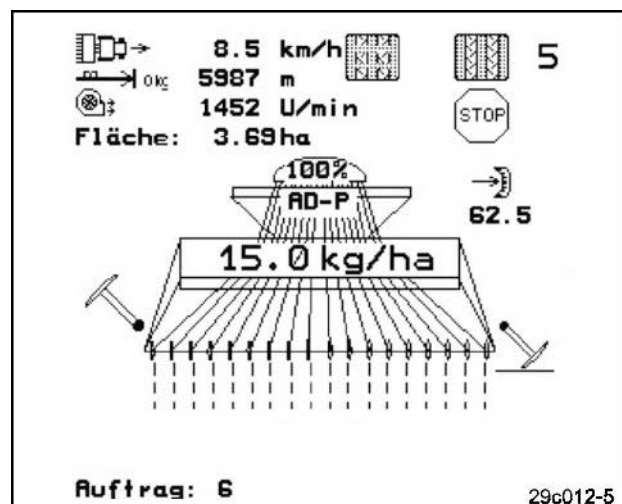


Fig. 50

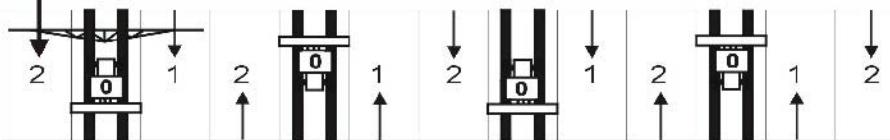
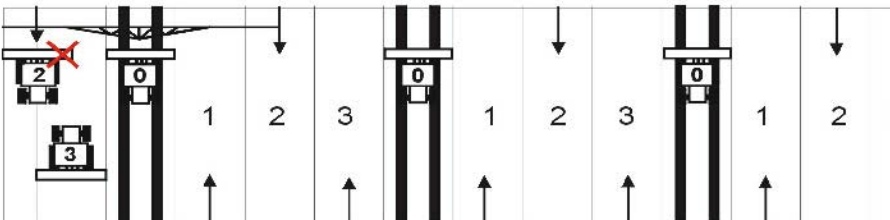
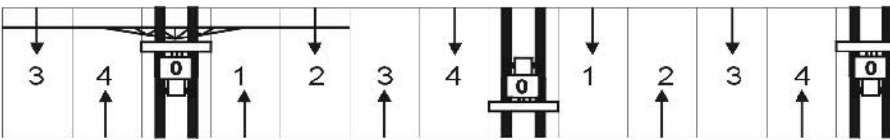
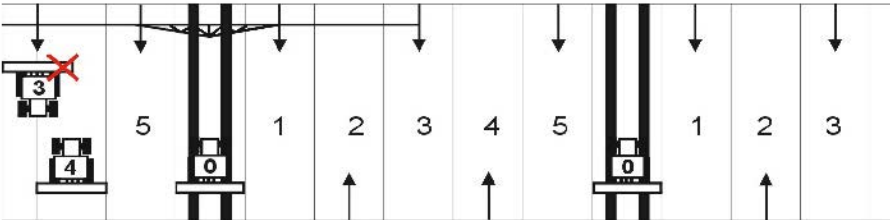
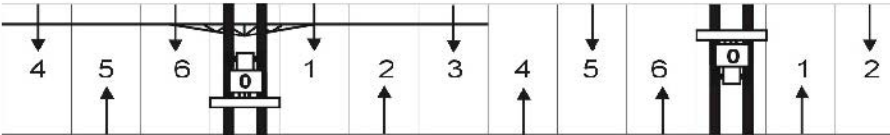
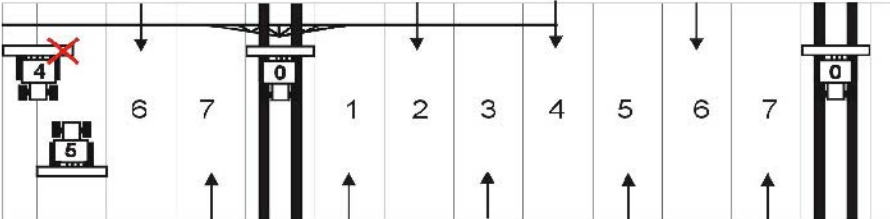
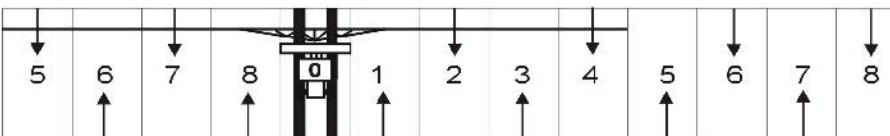
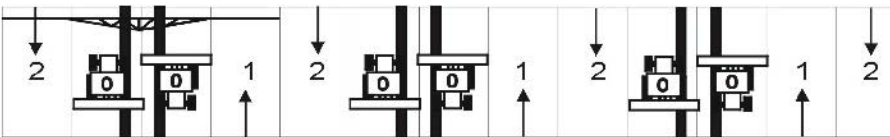
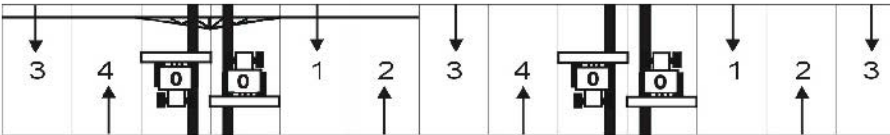
A	B	C	D
			START DÉPART
3,0 m 4,0 m 6,0 m	9 m 12 m 18 m	3	
2,5 m 3,0 m 4,0 m 4,5 m 6,0 m	10 m 12 m 16 m 18 m 24 m	4	
3,0 m 4,0 m 6,0 m	15 m 20 m 30 m	5	
2,5 m 3,0 m 4,0 m 4,5 m	15 m 18 m 24 m 27 m	6	
3,0 m 4,0 m	21 m 28 m	7	
2,5 m 3,0 m 4,0 m	20 m 24 m 32 m	8	
3,0 m	27 m	9	
2,5 m 3,0 m 4,0 m 4,5 m	10 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. 51

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

Fig. 51 illustrates examples for creating tramlines with 4-, 6- and 8fold switching rhythms. The seed drill operates with half its working width during the first run in the field. Necessary for this is the insert (Fig. 52/1) for the half-side shut-off of the outlets inside the distributor head which is available as special option.

However, the first run in the field may also start by creating a tramline (see Fig. 53). If the operation is started with full working width and creating a tramline

- the fertiliser spreaders spread to one side with the aid of a border spreading disc or a border spreading device during the first run in the field.
- on field sprayers one boom is switched off during the first run in the field.

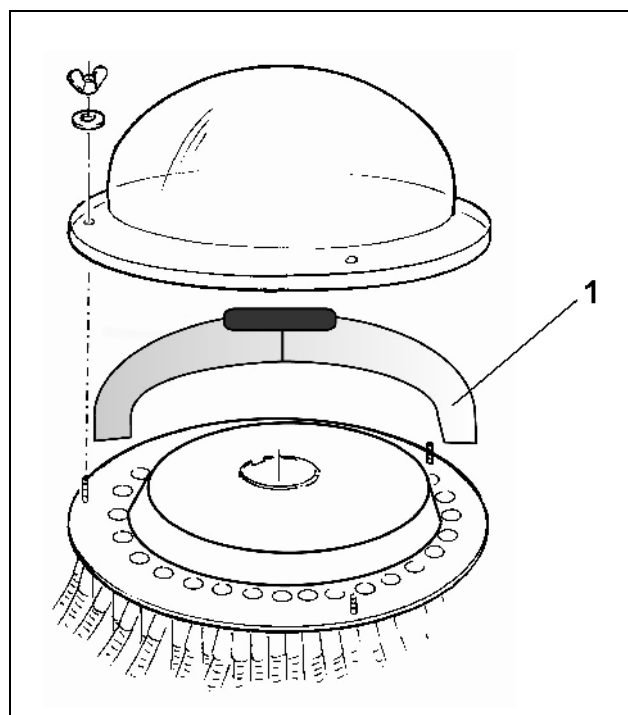


Fig. 52

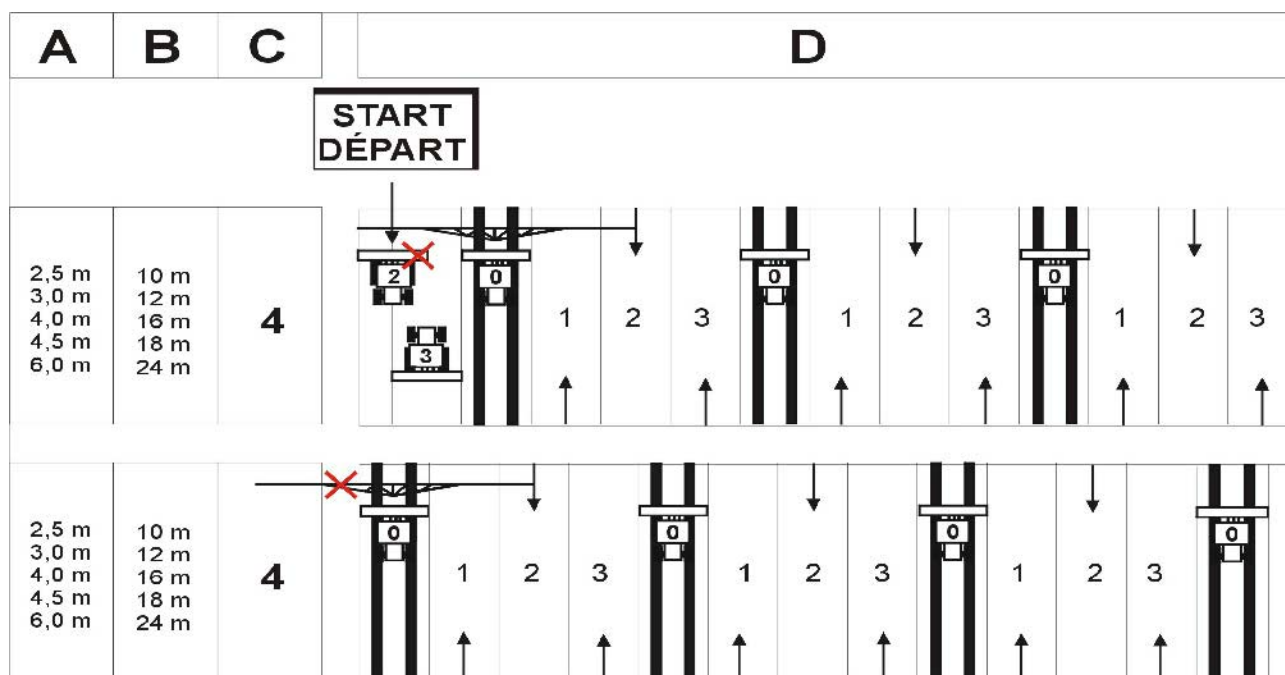





Fig. 53

-  Seed drills with 2-fold switching rhythm have to be equipped with tramline coulters only on the right hand side of the seed drill.
-  Seed drills with 6-plus switching rhythm have to be equipped with tramline coulters only on the left hand side of the seed drill.
-  If your seed drill is equipped with a pre-emergence marker kit, adjust the marker discs accordingly.

## 10.6 Matching with the tyre width

If the number of tramline coulters should be changed, activate or deactivate flaps inside the tramline flap box (Fig. 48/1) according to the required tramline coulters.

### • Activate flap (Fig. 55/B, for tramline coulters)

Every individual flap (Fig. 55/1) can be activated inside the flap box. In order to reach the flap, remove the relevant fitting window (Fig. 55/2). For this, push the fitting window upwards and remove it to the front.

Affix the flap to be activated (Fig. 55/1) with the inner hex. bolt (Fig. 55/3) on the shaft. When tightening the bolt, AMADOS/AMALOG or the switch box must not be in position "0" and the flap must be pressed – e. g. with your finger as shown in Fig. 55, against the stop (Fig. 55/5). Do not tighten the bolt too firmly so that the flap will not be strained.

Drive in the fixing bolt (Fig. 55/4) free of strain so that the flap may easily pass the bolt head.

Shut the fitting window.

### • Deactivate flap (Fig. 55/A, for a normal sowing coulters)

Every individual flap may be deactivated (Fig. 55/1). In order to reach the flap, remove the relevant fitting window (Fig. 55/2). For this, push the fitting window upwards and remove it to the front.

AMADOS/AMALOG or the flap box may not be in switching position "0". Press the flap, e. g. with your finger, as illustrated in Fig. 55/A against the stop (Fig. 55/5) and slacken the inner hex. bolt (Fig. 55/3) with which the flap to be deactivated is fixed onto the shaft until the flap can be moved freely on the shaft.

Turn out fixing bolt (Fig. 55/4) for approx. 5mm so that the deactivated flap cannot open and the opening towards the seed box remains shut.

Shut the fitting window.

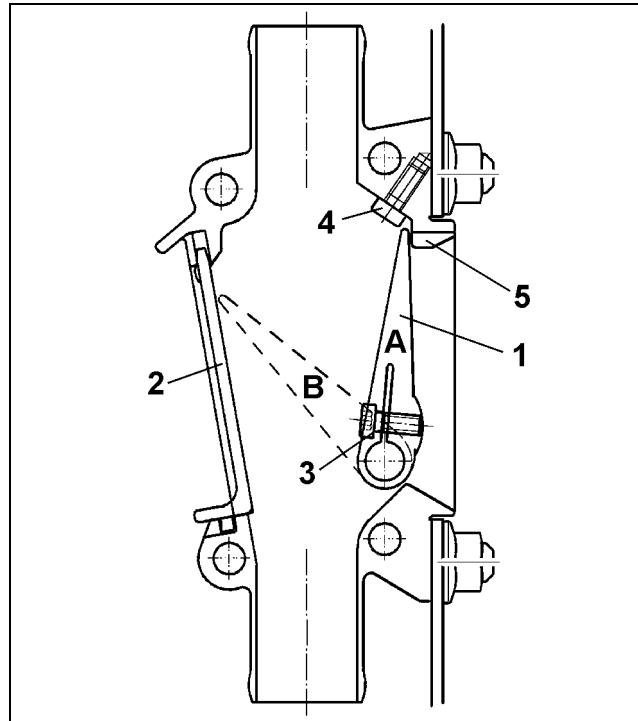


Fig. 55

## 11. Settings



Before doing any setting work:

Remove the ignition key, secure the vehicle against unintended operation and rolling away.

### 11.1 Setting the metering unit to a particular seed

- **Selection of metering wheels**

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

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

Seed	Metering wheels
Spelt	Coarse -metering wheel
Oats	Coarse -metering wheel
Rye	Medium -metering wheel or Medium -metering wheel
Summer Barley	Coarse -metering wheel
Winter Barley	Coarse -metering wheel
Wheat	Coarse -metering wheel or Medium -metering wheel
Beans	Coarse -metering wheel
Peas	Coarse -metering wheel
Flax (dressed)	Medium -metering wheel or fine metering wheel
Grass	Medium - metering wheel
Millet	Medium - metering wheel
Lupines	Medium - metering wheel

Seed	Metering wheels
Rape	Fine metering wheel
Red clover	Fine metering wheel
Mustard	Medium - metering wheel or Fine metering wheel
Soya	Medium - metering wheel
Sun flower	Medium - metering wheel
Late turnip	Fine metering wheel
Vetches	Medium - metering wheel
Lucerne	Medium - metering wheel or fine metering wheel
Oil seed (moist dressed)	Medium - metering wheel or fine metering wheel
Oil radish	Medium - metering wheel or fine metering wheel
Phacelia	Medium - metering wheel or fine metering wheel

Table 4

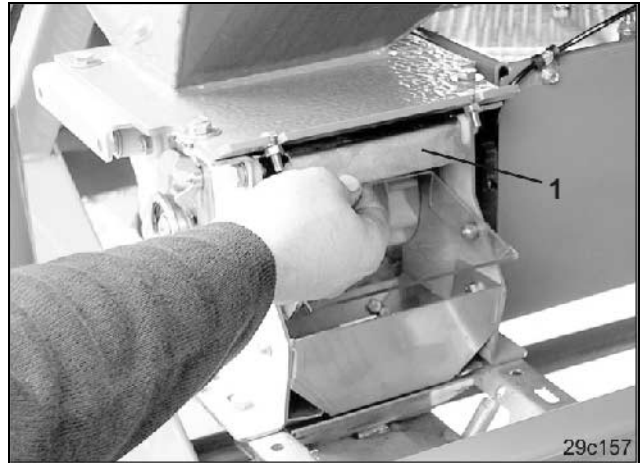
- **Exchanging the metering wheel**



**It is easier to exchange the metering wheels when the seed hopper is empty.**

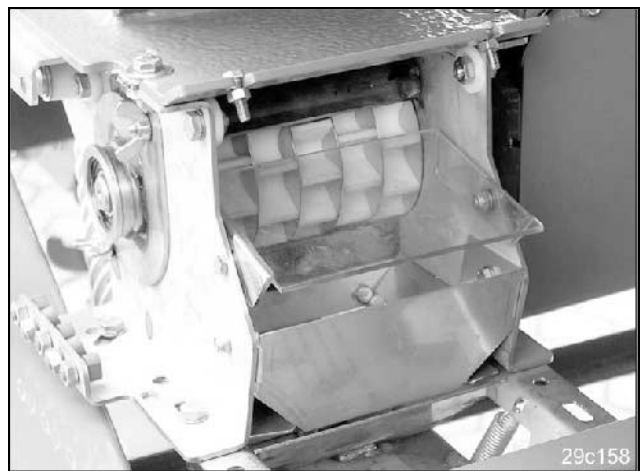
Exchanging the metering wheel in the metering unit:

- Close the shutter slide (Fig. 56/1), so that no seed can escape from the seed hopper.
- Figure (Fig. 56) shows the opened shutter slide.



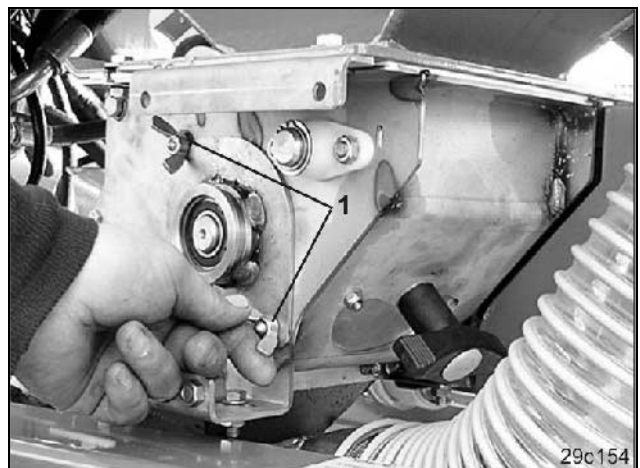
**Fig. 56**

- Figure (Fig. 57) shows the closed shutter slide.



**Fig. 57**

- Just slacken the two thumb nuts (Fig. 58/1), but do not remove them.



**Fig. 58**



- Turn the bearing and pull off.

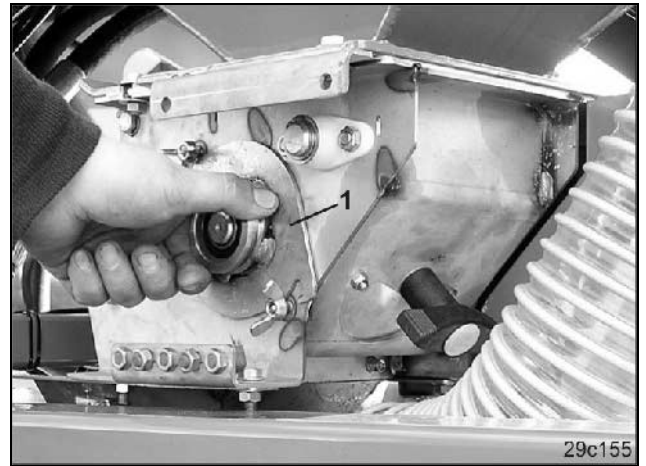


Fig. 59

- Pull the metering wheel off the metering unit.
- Take the required metering wheel from table (Table 4) and assemble in the opposite order.
- Provide all other metering units with the same metering wheel.



**Open the shutter slide (Fig. 56/1).**

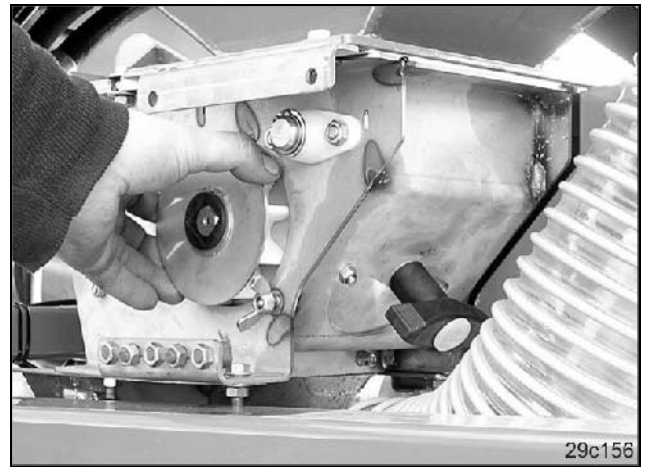


Fig. 60

## 11.2 Determining the gearbox setting for the desired seed rate

The desired seed rate is set by the gearbox setting lever (Fig. 61/1).

By the gearbox setting lever (Fig. 61/2) the speed of the metering shaft and thus the seed rate can infinitely variably be set. The higher the figure on the scale (Fig. 61/4) has been chosen by the pointer (Fig. 61/3), 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<sup>+</sup>**.

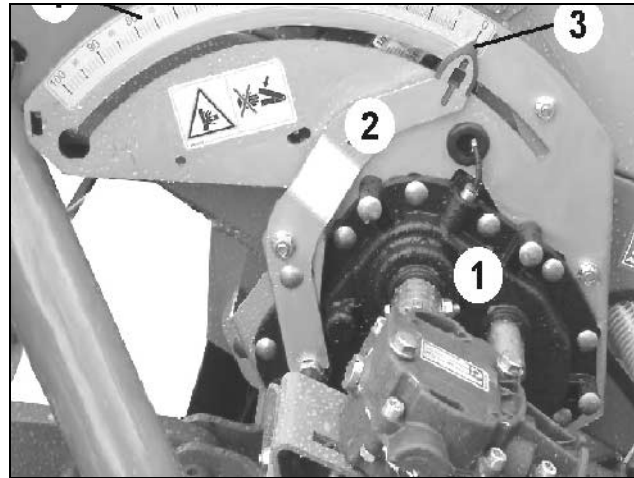


Fig. 61

## 11.3 Setting the seed rate with the aid of **AMATRON<sup>+</sup>**

For setting the seed rate the setting motor (Fig. 62/1), which actuates the gearbox setting lever (Fig. 62/2) is accessed via the **AMATRON<sup>+</sup>**. The seed rate and the scale figure are shown in the **AMATRON<sup>+</sup>**-display.

Stop the machine and proceed as follows to set the seed rate:

- Carry out the calibration test and enter here the desired seed rate (please refer to the operator's manual for **AMATRON<sup>+</sup>**).

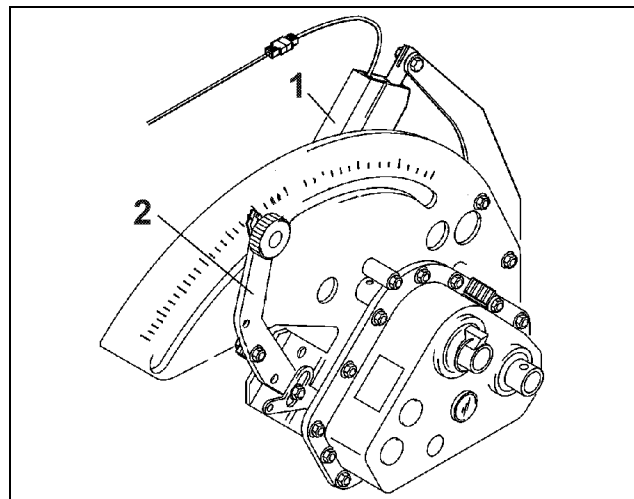


Fig. 62



Fig. 63

## 11.4 Calibration test



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



For machines with seed rate remote control, please refer to the operator's manual for **AMATRON<sup>+</sup>**.



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. 64/1) below every metering unit and open the injector sluice flap (Fig. 64/2) on every metering unit.

The calibration trays (Fig. 65/3) are held in a retainer and are secured with a clip pin (Fig. 65/1)..

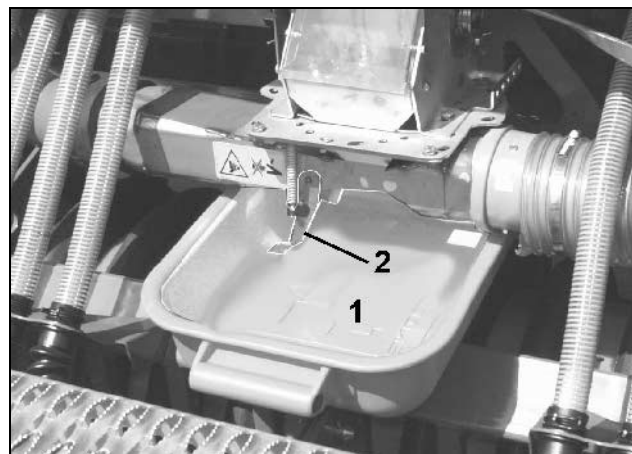


Fig. 64

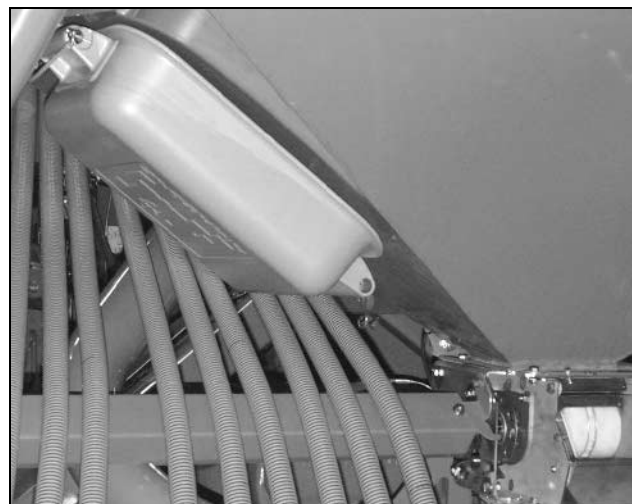


Fig. 65

- Slacken the star knob (Fig. 66/1) of the gearbox setting lever.
- Move the gearbox setting lever (Fig. 66/2) to one of the following gearbox settings:
- Sowing with  
Coarse **metering wheel** – gearbox position **50**  
Medium **metering wheel** – gearbox position **50**  
Fine **metering wheel** – gearbox position **15**
- Tighten star knob (Fig. 66/1).



Fig. 66

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.11.4.1.

Getting the star wheel into the calibration position:

- Slacken the lynch pin (Fig. 67/1)
- Pull the star wheel outwards according to Fig. 67.

Calibration:

- Take the calibration crank (Fig. 68/1). The calibration crank is placed on left hand side on the harrow tine pocket, seen in direction of driving.
- With the calibration crank (Fig. 69/1) 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. 64/1).
- Empty the contents of the calibration tray into the seed tank and turn the crank in times taken from 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 (250m<sup>2</sup>) or 1/10ha (1000m<sup>2</sup>).

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. 67

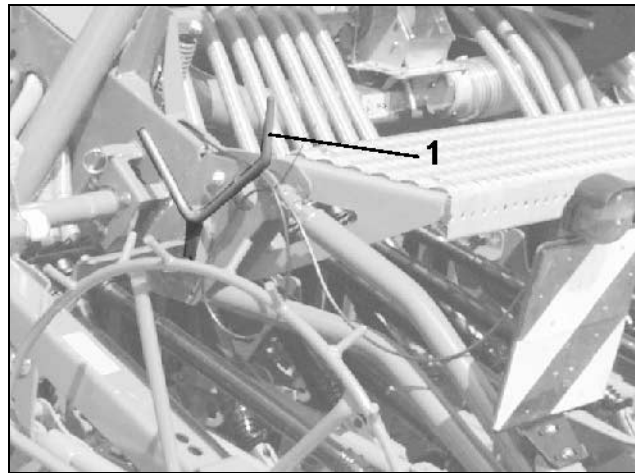


Fig. 68

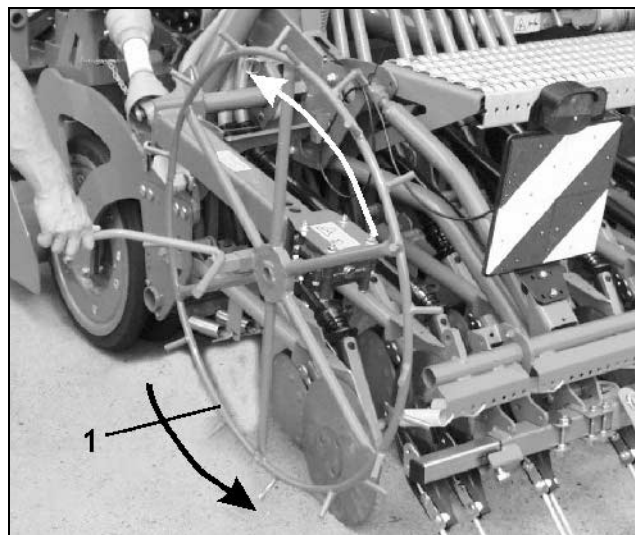


Fig. 69

- 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:


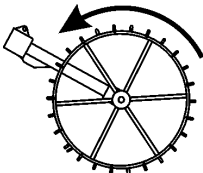
Seed rate [kg/ha] = collected seed [kg/ha] x 40

### 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]

		
	1/40 ha	1/10 ha
3,0 m	<b>29,5</b>	<b>118,0</b>
4,0 m	<b>22,0</b>	<b>89,0</b>
Working width	<b>Crank turns on the star wheel</b>	

<b>Table 2</b>
----------------

After having determined the correct gearbox setting

- place the calibration crank (Fig. 68/1) back into the retainer
- shut off injector sluice flap (Fig. 64/2)
- fix calibration tray (Fig. 65.3) to the bracket and secure with a clip pin
- For transport position push the star wheel inwards and secure with the aid of a lynch pin.



**The desired seed rate usually is not obtained after the first calibration test. However, with the aid of the disc rule according to para. 11.4.1 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..**

### 11.4.1 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. 70/1) for all seed rates above 30 kg/ha and an inner white scale (Fig. 70/2) for all seed rates below 30 kg/ha. On the central, coloured scale (Fig. 70/3) 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. 70/A) and the "gearbox setting position 25" (Fig. 70/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. 70/C). In our example that is the "gearbox setting position 17.8" (Fig. 70/D).
- Recheck the gearbox setting figure which you have determined by the disc rule as described under para.11.2.

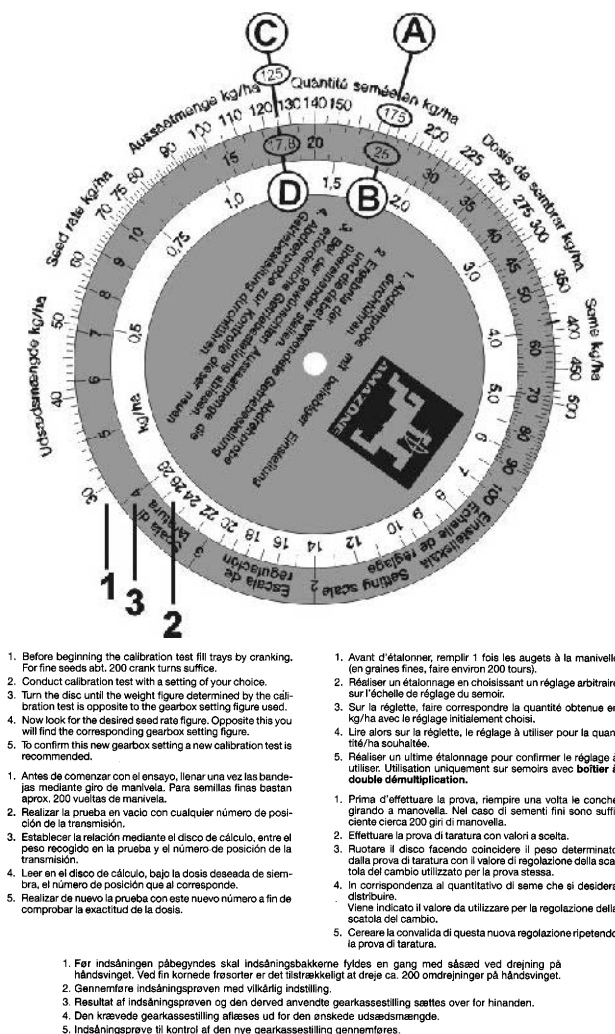


Fig. 70

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### 11.4.2 Seed rate deviations between the setting and sowing

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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 m<sup>2</sup>. This corresponds to a machine with

3,00 m working width = 83,3 m travelled distance

4,00 m working width = 62,5 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.

---

## 11.5 Setting the placement depth of the seed

One of the most important preconditions for high yields is maintaining a constant 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
- after every coulter pressure adjustment
- after re-adjustment of the RoTeC or RoTeC+ depth limiting discs
- when changing the forward speed
- in changing soil conditions.

**Travel with your 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. 71/1).

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.

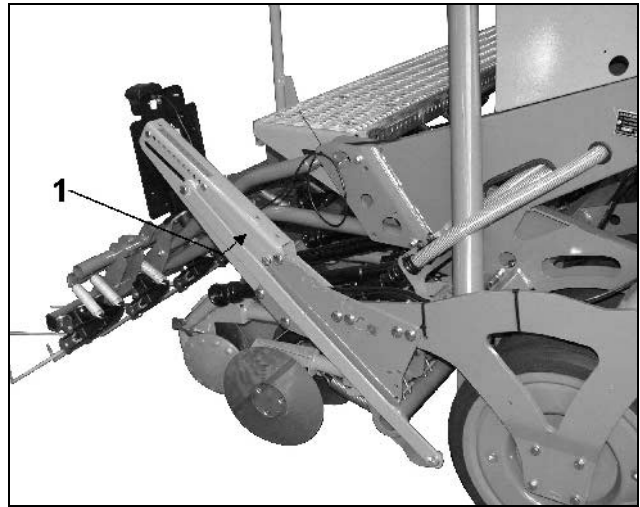


Fig. 71

### 11.5.1 Setting the placement depth of the seed by the adjustment spindle

The coulter pressure and thus the placement depth of the seed is increased by turning the spindle (Fig. 72/1) clockwise, by turning it counter clockwise it is reduced.

For actuating the adjustment spindle (Fig. 73/1) the crank has to be plugged onto the adjustment spindle. The crank is placed in a retainer on the left hand frame part.

If the RoTeC-coulters (option) are equipped with depth limiters (option) and if the desired placement depth cannot be achieved by turning the adjustment spindle, then all RoTeC disc coulter depth limiters can be readjusted according.

The fine adjustment then is again conducted by the adjustment spindle.

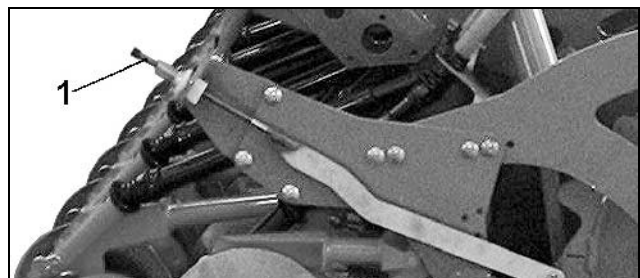


Fig. 72

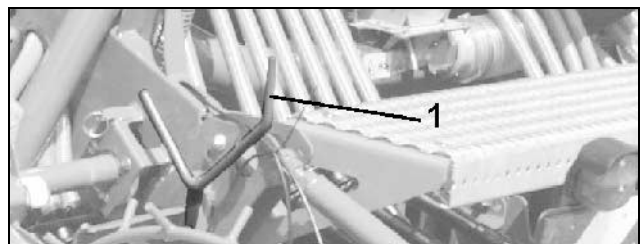


Fig. 73



## 11.5.2 Setting the placement depth of the seed with the aid of a hydraulic ram

Actuate the control spool 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 for checking the coulter pressure from the tractor cab.



Actuate the control spool valves only from the tractor cab.

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

Advise people to leave the danger area.

**Danger of injury from moving parts!**

Two pins (Fig. 75/3 und 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

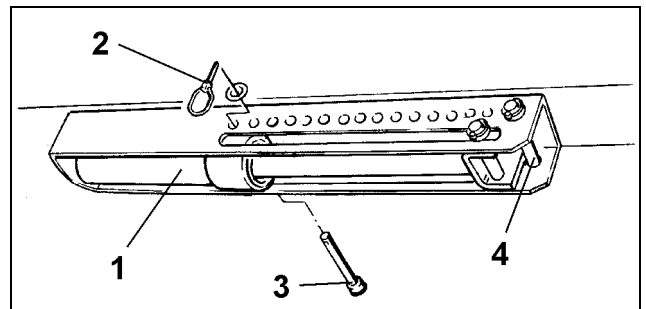


Fig. 75

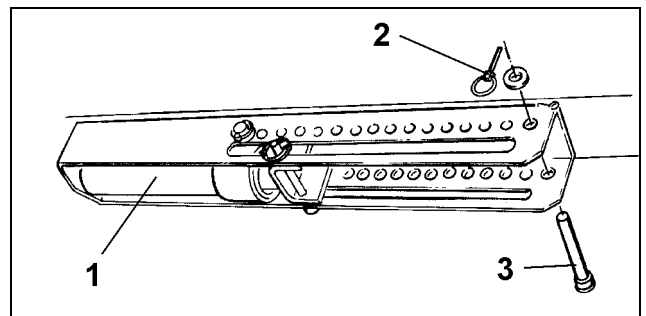


Fig. 76

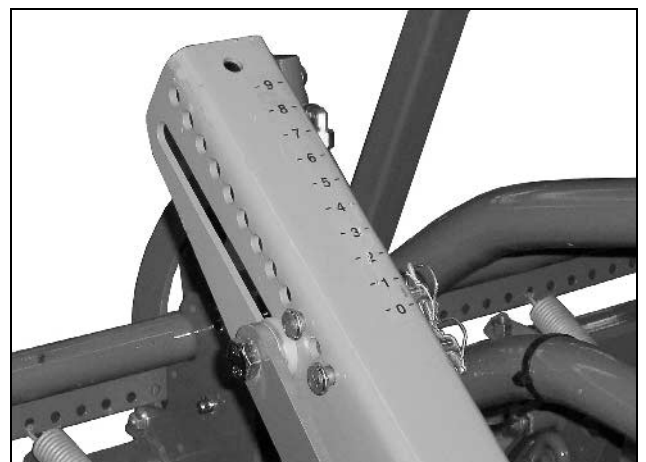


Fig. 77

### Seed drills with RoTeC-coulters

If your seed drill is equipped with RoTeC-(roll disc) coulters 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.**

### 11.5.3 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 coulters 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.11.5.4) for a placement depth of approx. 2 cm for medium heavy soils. For slightly increasing the placement depth the coulters pressure may be increased with the aid of the coulters pressure adjustment according to para.11.5.1. Before every operation check the correct position of the depth limiting discs and the placement depth of the seed.

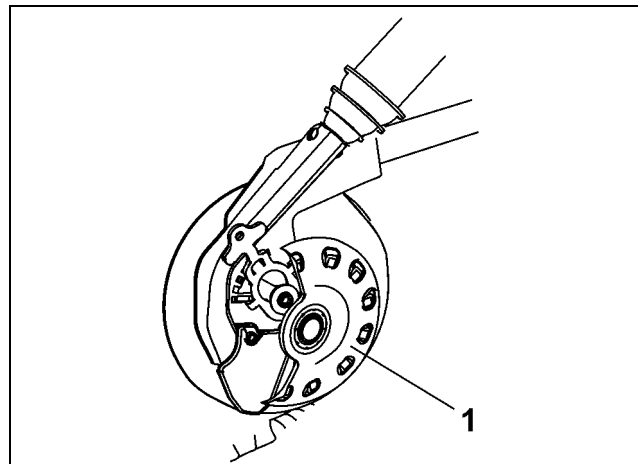


Fig. 78

## 11.5.4 Fitting and setting the RoTeC-depth limiting discs

### • Initial 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.

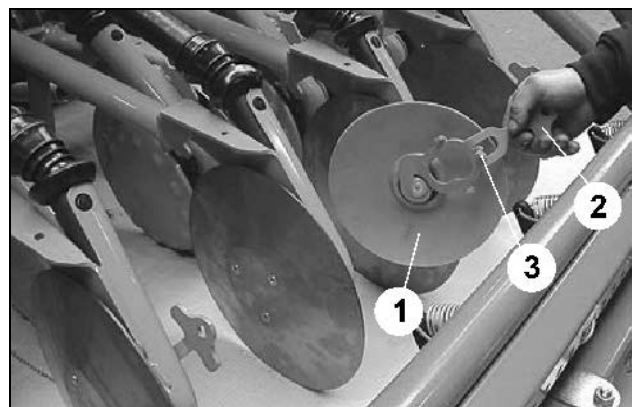


Fig. 79

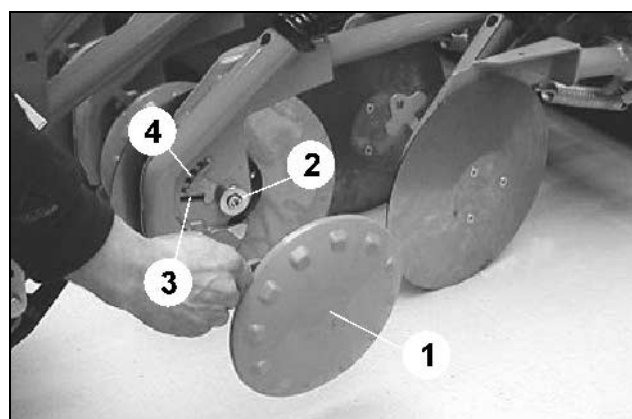


Fig. 80

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. For medium soils the following placement depths result (see Fig. 83):

- Positions 1: Placement depth approx. 2cm
- Positions 2: Placement depth approx. 3cm
- Positions 3: Placement depth approx. 4cm
- Without depth-limiting disc: Placement depth > 4cm

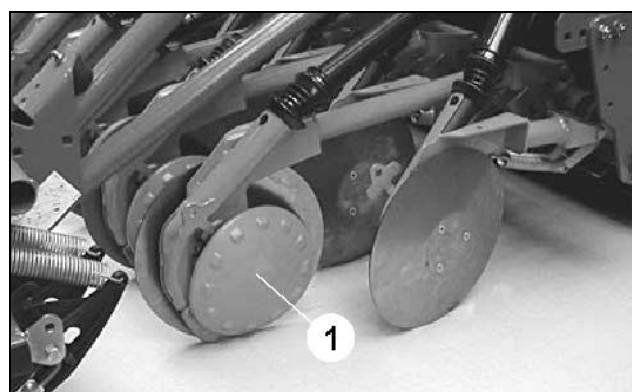


Fig. 82



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. 11.5.1.

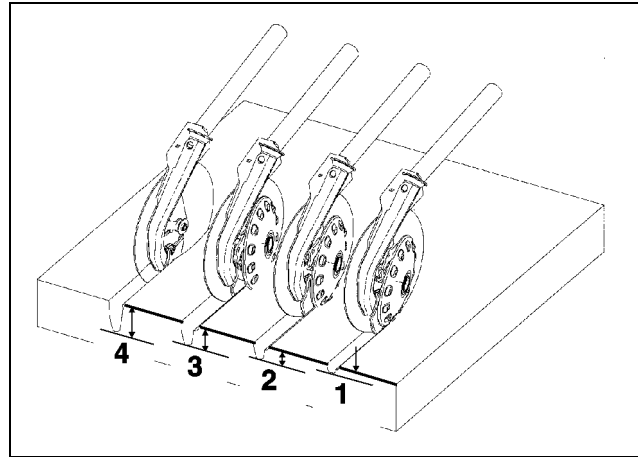


Fig. 83

## 11.6 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 setting is carried out by extending or shortening the upper harrow suspension (Fig. 85/1):

1. Get the implement into operating position in the field.
2. Apply the parking brake, stop the tractor engine and remove the ignition key.
3. Slacken the counter nuts (Fig. 85/2).
4. Set the upper harrow suspension on all fixing points to the same length. To do this evenly screw all bolts (Fig. 85/3).
5. After setting retighten the locking nuts (Fig. 85/2).
6. Recheck the operational performance of the exact harrow.

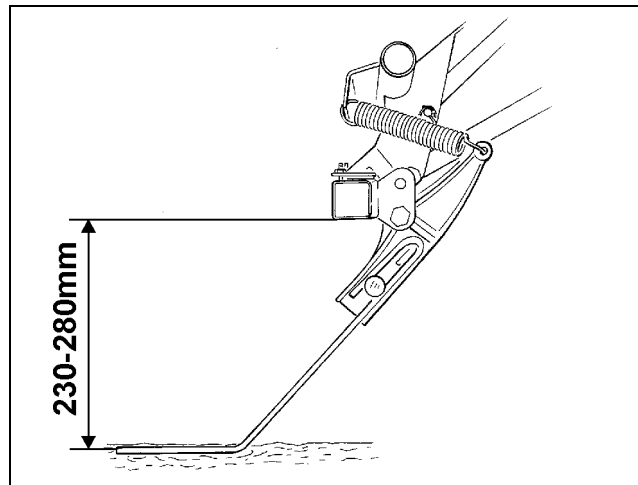


Fig. 84

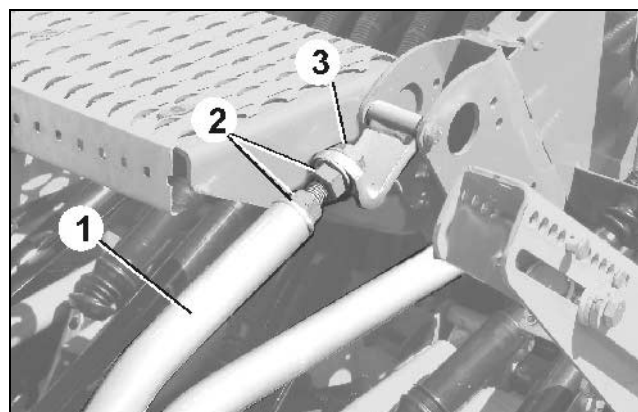


Fig. 85

Setting the harrow pressure on extra coverage following harrow without hydraulic ram. The pressure at which the spring tines 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. 86/1) upwards. Insert the pin (Fig. 86/2) into a hole below the stop lever and secure by using a clip pin. 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 is actuated with the coulter pressure adjustment crank (Fig. 86/3).

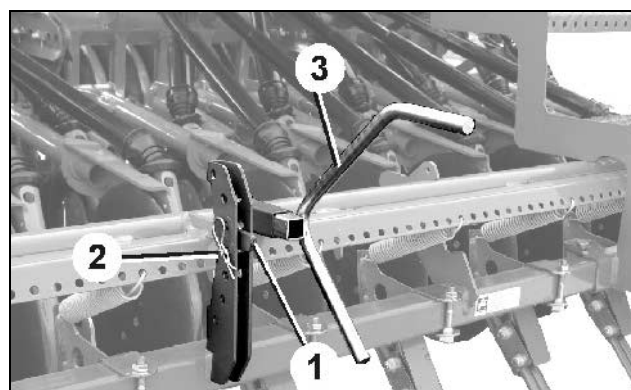


Fig. 86



**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.**

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

The pressure by which the spring tines 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. 87/1).

Two pins (Fig. 88/1 and 2) are placed as a stop for the lever (Fig. 88/3) in the setting segment. The lever, which is actuated by the hydraulic ram rests on the pin I (Fig. 87/1) when the hydraulic ram is without pressure and it stops on pin II (Fig. 88/2) when the hydraulic ram has been pressurised.

#### For setting the increased harrow pressure

- Relieve the hydraulic ram (Fig. 87/1) from pressure.
- Insert pin II (Fig. 88/2) into a hole above the lever (Fig. 88/3) in the setting segment and secure by using a clip pin (Fig. 88/4).

#### For setting the normal harrow pressure

- Pressurise hydraulic ram (Fig. 87/1).

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



**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.

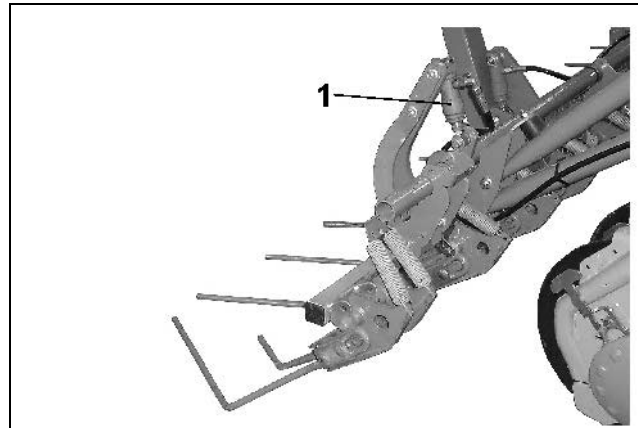


Fig. 87

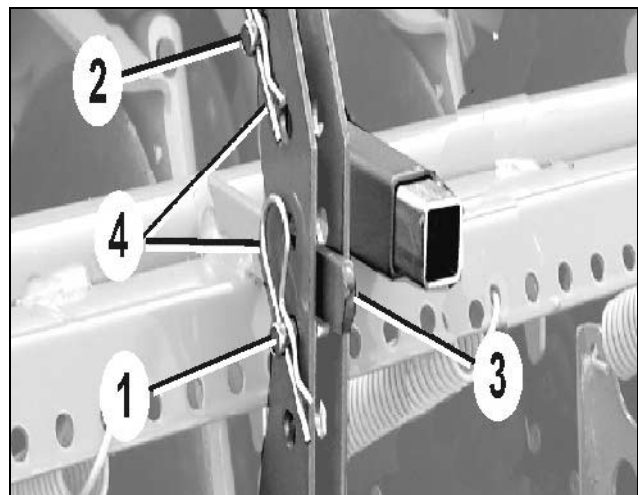


Fig. 88

## 11.7 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. 89) track marker disc to machine's centre.

- Working width 3m: A = 3 m
- Working width 4m: A = 4 m

The marker discs can be moved in the track marker arm. Prior to it two hex. bolts (Fig. 90) 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.**

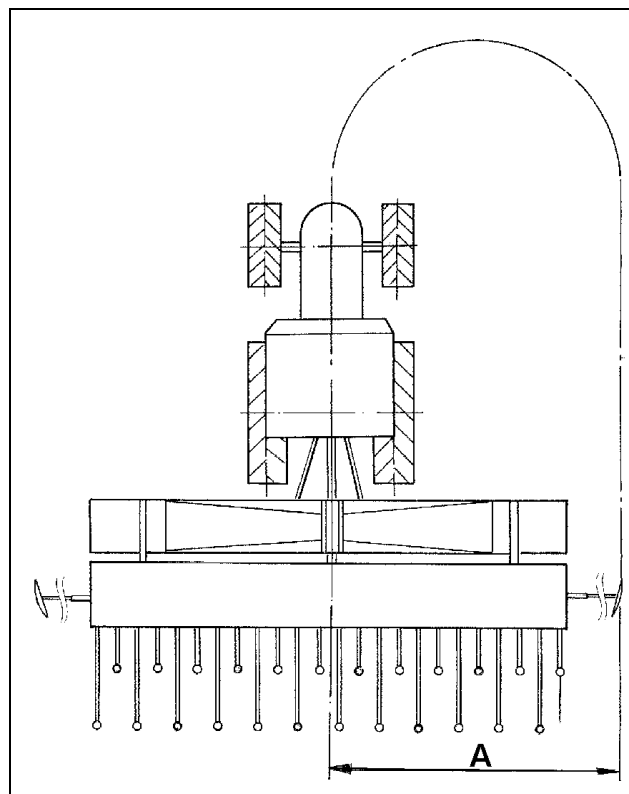


Fig. 89

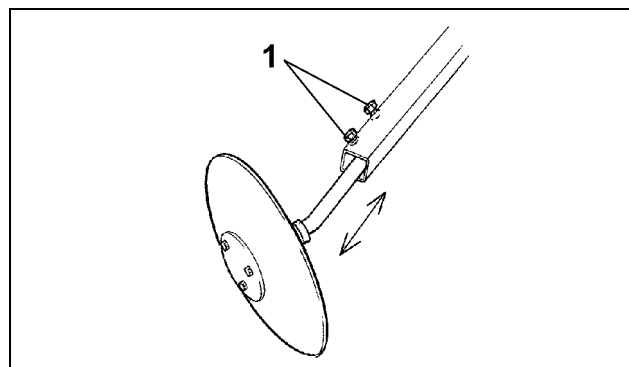


Fig. 90

## 11.8 Setting the blower fan speeds

The air flow for the seed delivery from the injector sluice to the coulter 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<sup>+</sup>**, **AMALOG<sup>+</sup>** or a manometer.

Please find the required blower fan speed in the table (Table 5). Set the blower fan speed on the pressure relief valve (Fig. 91/2) 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. 91/1)
- slacken locking nut
- set the speed on the valve with a screw driver as follows:
  - Turn to the right hand side = speed is increased
  - Turn to the left hand side = speed is reduced.

After setting, secure the valve with locking nut and cover with dust cap.

On tractors with controllable hydraulic pump (Fig. 34/5) the necessary oil volume should be set at the current regulating valve and the pressure relief valve (Fig. 34/3) in such a way that the oil volume is as little as possible. 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.

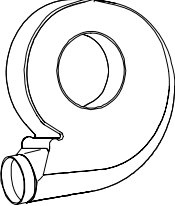




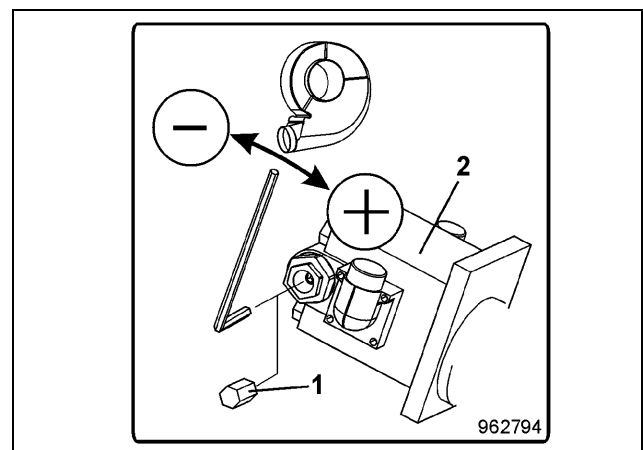
			<b>AD-P / AD-PL FRS / FPS AITSTAR Xact</b>		
					
					
3,0m			2800		3500
4,0m			3000		3800
<b>Working width</b>			<b>Blower fan rev. speed (R.P.M.)</b>		
			<b>Fine seeds (rape)</b>		<b>Legumes (grain)</b>

Table 5



**Fig. 91**



### 11.8.1 Pressure gauge

The back pressure in the injector sluice is shown on the pressure gauge. This pressure gauge is connected with a jet which is fixed in a hole in the injector sluice.

Depending on the seed to be sown, the back pressure should be between

- 25 and 35 mbar (Fig. 92/1) or
- 35 and 45 (Fig. 92/2) mbar.

The range between 25 and 35 mbar is marked on the scale of the pressure gauge in **light green** colour.



The range between 35 and 45 mbar is marked on the scale of the pressure gauge in **dark green** colour.



All other ranges are marked in red colour.



**When the pointer of the pressure gauge is within the red range the even distribution of the seed may be affected. Within the red range the max. blower fan rev. speed of 3800 R.P.M. could be exceeded.**



**In case the indication of the pressure gauge deviates from the ordinary values, remedy by cleaning the jet.**

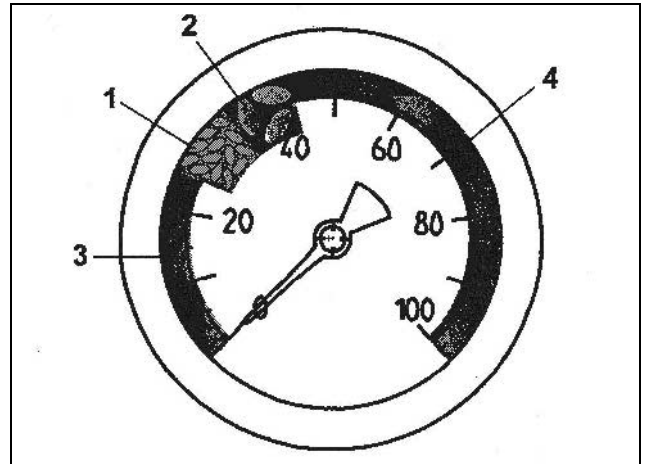


Fig. 92

## 11.9 Setting the fill level sensor

Setting the level of the fill level sensor is only possible when the seed box is empty.:

1. Slacken the thumb nut (Fig. 93/2).
- 2 Set the level of the fill level sensor (Fig. 93/1) according to the desired seed residual amount.
- 3 Retighten the thumb nut.



### Important!

The fill level sensor must not touch the hopper.



### Hint!

The seed residual amount which triggers the alarm can be increased according to

- the coarser the seed is
- the bigger the seed rate is
- the bigger the working width is.

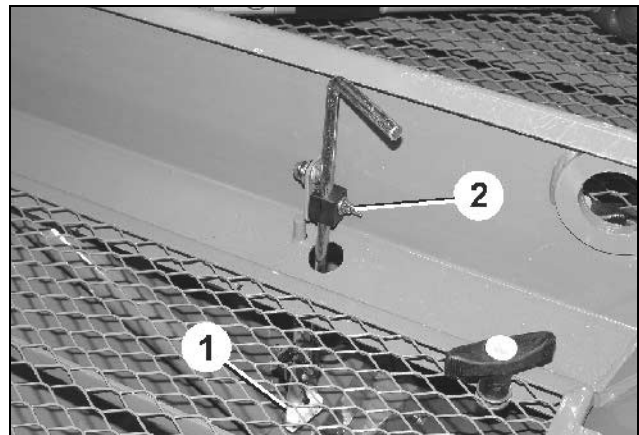


Fig. 93

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## 12. Operation

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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 spool valves inside the tractor cab.

When actuating the control valves, the hydraulic rams for actuating the track markers, the switch box of the tramlining 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.



Note the minimum length of the tines. When working at great depth replace the tines before they reach the minimum length. Worn tines can regain their original length with the aid of weld-on tips.



As the wear of the tines increases, the setting of the rotary cultivator's working depth should be corrected (see para.9.5) and the side plates should be adapted to the new working depth.

---

## 12.1 Filling the seed tank

The seed tank is rain proof covered by the folding cover canvass. The folding cover canvass is secured with rubber strips (Fig. 94/2).

The seed tank can be filled from a tipping trailer or from big bags. The seed tank can conveniently be filled from the loading board (Fig. 94/1), the railing can at random be fixed on the right hand or left hand side.



**Refill the seed tank early enough!**

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



Fig. 94

## 12.2 Setting the machine into operating position

- Remove the transport safety board.
- Get the outer harrow tines into the operational position, see on page 29.
- Release the track marker from the transport position, see on page 29.
- Get the star wheel into operating position, see on page 27.

---

## 12.3 Starting operation

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Before commencing work

- switch on the **AMATRON<sup>+</sup>**.
  - Create job and start ( only AMATRON+).
  - Enter the machine data / recheck.
- switch on the **AMALOG**.
  - If necessary calibrate the forward speed sensor (Imp./100m).
  - Carry out a calibration test.

### 1. Get the blower fan to the correct rev. speed

### 2. Hydraulic lowering of the star wheel (special option)

The star wheel drives the metering units

### 3. Lowering the machine

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.

### 4. Bring track marker into operational position

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

### 5. Set the working depth

### 6. 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.

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---

## 12.4 Turning at the headlands

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Lift the sowing combination at the headlands. 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

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## 12.5 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

## 12.6 During operation

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### 12.6.1 Monitoring the seed shaft

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The sensor monitors the seed shaft. If the seed shaft stops during operation **AMATRON<sup>+</sup>** sends a fault message. In the display "Error 2" appears together with an audible signal.

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### 12.6.2 Monitoring the seed level

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The seed level inside the seed tank 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 tank must never be emptied completely in order to avoid seed rate deviations..



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

## 12.7 Empty metering units or seed hopper and metering unit



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

For emptying the metering units or the seed hopper and the metering units proceed as follows:

- Attach the seed collecting tray underneath the metering unit(s).
- Close the outlet opening between seed hopper and metering unit in case it is intended to empty only the metering unit and not the seed hopper.

The opening is opened when the shutter slide has been pulled out of the metering unit as shown in Fig. 82/1.

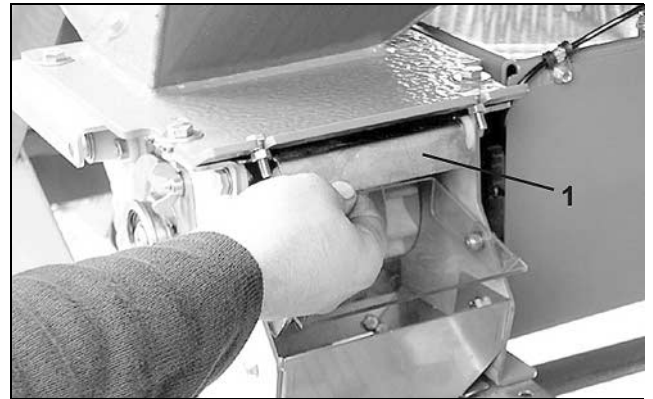


Fig. 95



**The outlet opening is closed when the shutter is pushed in the metering unit according to the opposite illustration (Fig. 96).**



Fig. 96

Open the injector sluice flap (Fig. 97/1) to allow the seed to flow into the seed collecting trays.



**Danger of squeezing when opening and closing the injector sluice flap (Fig. 97/2).**

**Only hold the injector sluice flap at the strap (Fig. 97/1) as otherwise danger of injury exists when the spring loaded flap shuts.**

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

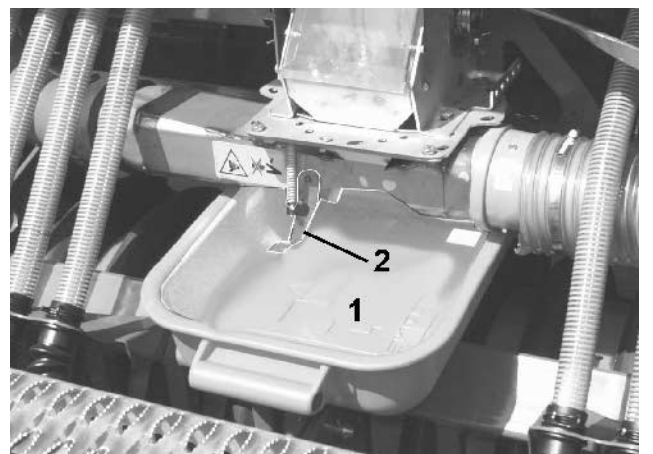


Fig. 97

- Open the residual emptying flap R (Fig. 98/2) by turning the handle (Fig. 98/1).

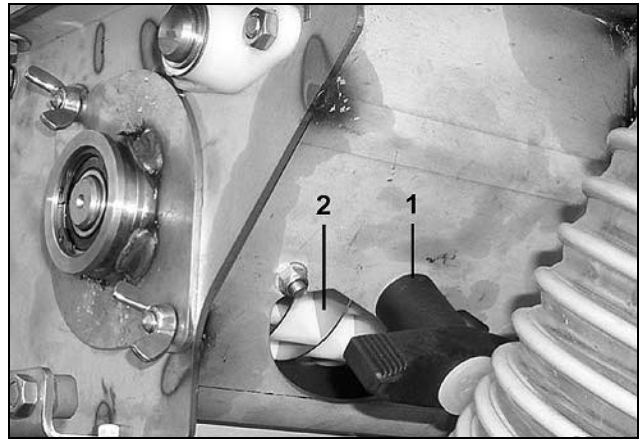


Fig. 98

- Get the star wheel (Fig. 99) into the operational position.
- Turn the star wheel (Fig. 99), in the same way as mentioned for the calibration test, with the crank to the left until the metering wheels and the metering unit are completely empty.
- For the careful cleaning when changing the type of weed, remove the metering wheels and clean together with the metering unit.
- Restentleerungsklappe (Fig. 98/2) schließen und den leeren Saatgut-Auffangbehälter am Saatgut-Behälter befestigen.
- Push the star wheel into the transport position and secure by using a clip pin (Fig. 99/1).



Fig. 99



**Seed residue in the metering units may swell and germinate when the metering units have not been emptied completely.**

**This will cause blockage of the metering wheels and damage to the drive.**

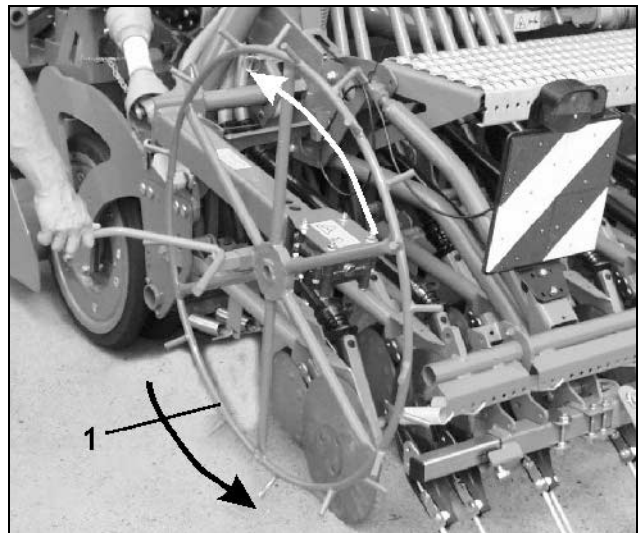


Fig. 100



## 13. Cleaning, maintenance and repair



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



Before commencing any cleaning and maintenance work:

Remove the ignition key, secure the vehicle from unintended movement and rolling away.

### 13.1 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.

### 13.2 Uncoupling rotary cultivator / rotary harrow

- Pull out the pins for the lower link fixing (Fig. 101) on the left and right hand side. Beforehand slacken the clip pin.
- Turn the upper link until the upper linkage point has been relieved.
- Pull out pins on the upper link (Fig. 101/2), beforehand slacken the clip pin.



Before uncoupling reduce the coulter pressure as otherwise the machine might tilt to the front.



Special care should be taken when coupling and uncoupling rotary cultivators. Danger of injury due to moving components.

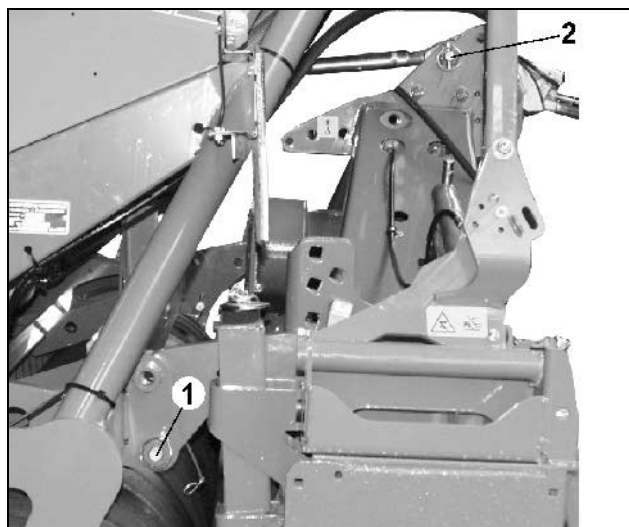


Fig. 101

### 13.3 Checking the oil level in the vario gearbox

Check the oil level inside the vario gearbox at the oil gauge window (Fig. 102/1) on the seed drill horizontally. It is not necessary to change the gearbox oil.

For refilling oil unbolt the seal cap (Fig. 102/2):

- **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.**

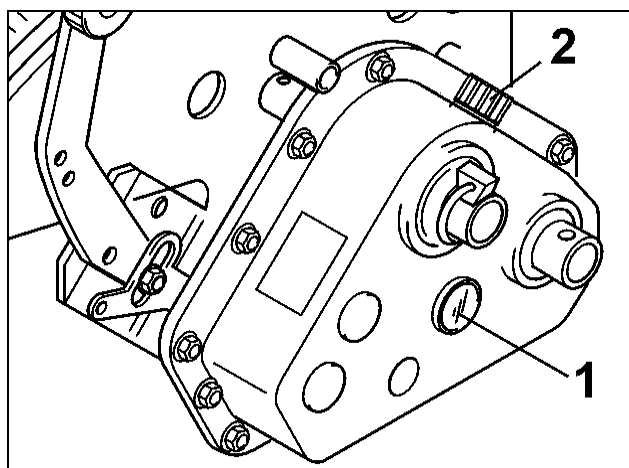


Fig. 102

### 13.4 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 tank, 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 tank.**

**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.**

**AD-P with electric full metering:**

**For cleaning and maintenance work the guard screen inside the hopper can be opened.**

- Slacken the bolt.
- Move the locking plate in the slotted hole.
- Open the guard screen with the aid of the handle.
- After cleaning / maintenance close the guard screen again and secure from opening using the locking plate.

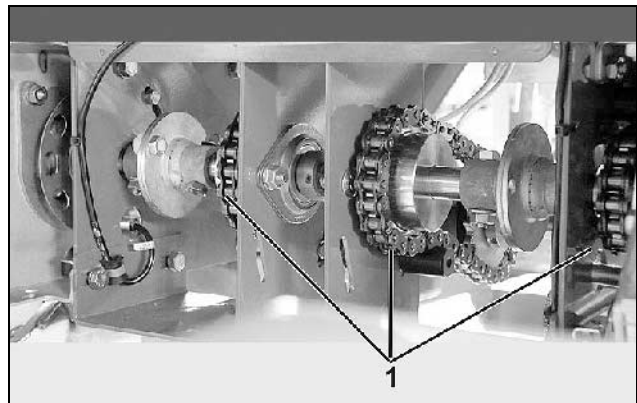


Fig. 103

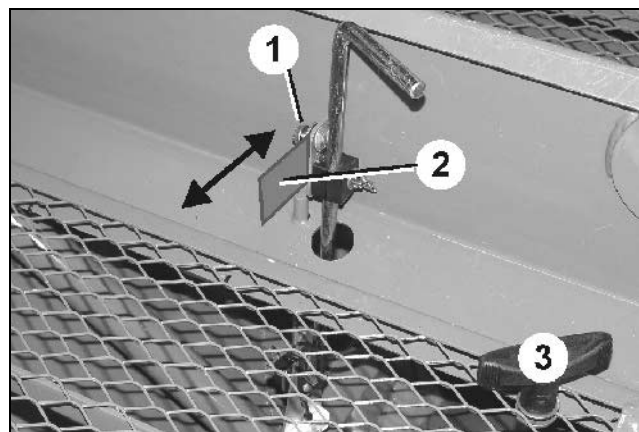


Fig. 104

### 13.5 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:

- Relieve the hydraulic system from pressure.
- remove outer hood (Fig. 105/1) of the distributor head.

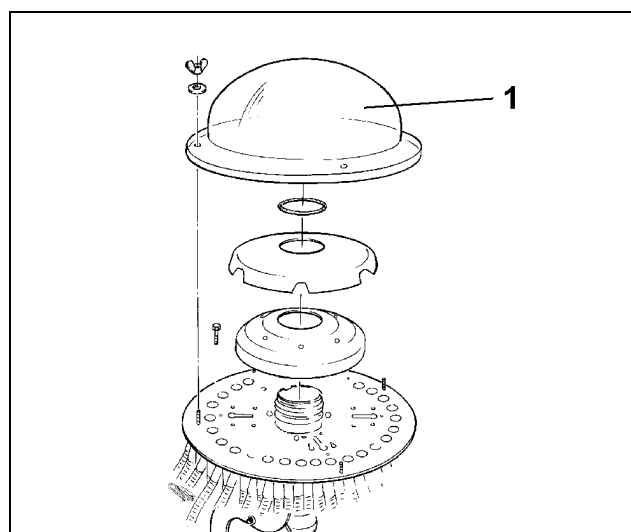


Fig. 105

## 13.6 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. 106/1) will shear off..

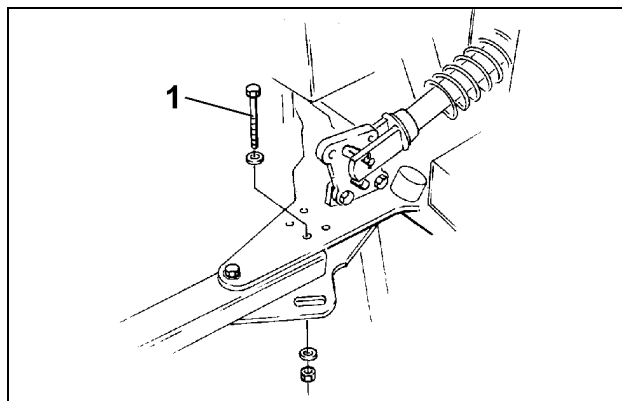


Fig. 106

## 13.7 Hydraulic hose circuit

### 13.7.1 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.

### 13.7.2 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).



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### 13.7.3 Marking (workshop job)

---

Hydraulic hoses are marked as follows:

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

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### 13.7.4 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.
-

### 13.8 Greasing points

The greasing points on the machine are identified by stickers (Fig. 107)

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.

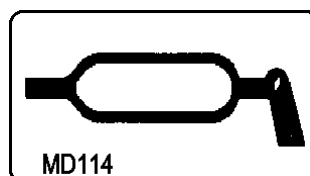


Fig. 107

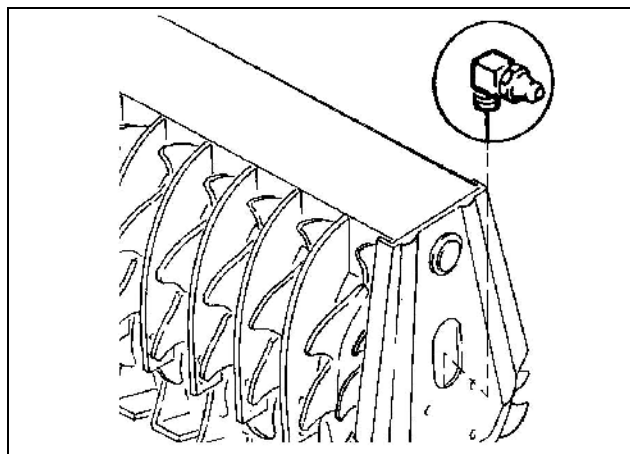


Fig. 108

- **Seat shaft bearings**

Seed shaft bearings:

Slightly apply oil to the seating of the seed shaft bearings by using a light mineral oil (SAE 30 or SAE 40).

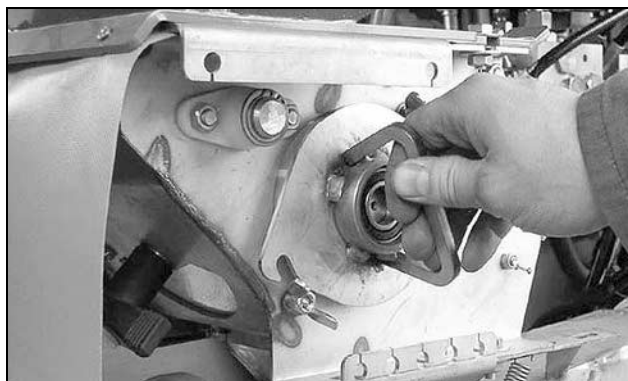


Fig. 109

- **Greasing the chain**

Elektric full metering:

Grease the chain in regular intervals!

After greasing remount the chain guard.

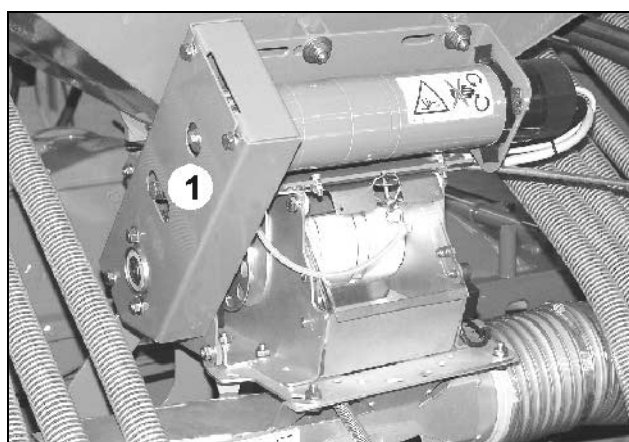


Fig. 110



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