

Operator's Manual

AMAZONE

C-Drill 3000, C-Drill 4000

Seed Drill



MG1479
BAG0033.0 07.06
Printed in Germany



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



Reading the instruction

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

Leipzig-Plagwitz 1872. Rud. Sark.

Identification data

Manufacturer: AMAZONEN-WERKE
H. DREYER GmbH & Co. KG

Machine-Ident-No.:

Type: **C-Drill**

Permissible system pressure bar:

Year of construction :

Factory:

Power kW:

Basic weight kg:

Allowable total weight kg:

Address of manufacturer

AMAZONEN-WERKE
H. DREYER GmbH & Co. KG
P. O. Box 51
D-49202 Hasbergen
Tel.: + 49 (0) 5405 50 1-0
Fax.: + 49 (0) 5405 501-234
E-mail: amazone@amazone.de

Spare parts ordering

AMAZONEN-WERKE
H. DREYER GmbH & Co. KG
P. O. Box 51
D-49202 Hasbergen
Tel.: + 49 (0) 5405 501-290
Fax.: + 49 (0) 5405 501-106
E-mail: et@amazone.de
Spare parts online catalogue: www.amazone.de
When ordering spare parts please always state the serial number of your machine.

Formal remarks to this operator's manual

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AMAZONEN-WERKE H. DREYER GmbH & Co. KG.

Preface

Preface

Dear Customer,

You decided to purchase one of our high quality machines from the comprehensive range of farm machinery produced by AMAZONEN-WERKE, H. DREYER GmbH & Co. KG. Thank you for your confidence.

When receiving the machine, please check immediately that no damage has been caused in transit and that all parts are present. Please check whether all parts mentioned in the delivery note including the ordered optional equipment are present. Only the immediate reportage of damage will be considered for compensation.

Before the first operation, please read and adhere to this operator's manual and the safety advice. After having thoroughly read the operator's manual you can make fullest use of the advantages of your recently purchased machine.

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

In case of any questions or problems, please refer to this operator's manual or just call us.

Maintenance and in regular intervals and the exchange of worn or damaged parts in time increases the life expectancy of your machine.

User's review

Dear reader,

Our operator's manuals are regularly updated. With your suggestions for improvement you will help to create an always user friendly operator's manual. Please send your suggestions by fax.

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H. DREYER GmbH & Co. KG

P. O. Box 51

D-49202 Hasbergen

Tel.: + 49 (0) 5405 50 1-0

Fax.: + 49 (0) 5405 501-234

E-mail: amazone@amazone.de

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1 User advice

The chapter "User advice" provides information for dealing with the operator's manual

1.1 Purpose of the document

The present operator's manual

- describes the operation and the maintenance for the machine.
- gives important hints for a safety conscious and efficient operation with the machine.
- is part of the implement and should be kept so that it is always to hand on the machine or in the towing vehicle.
- should be kept for future use.

1.2 Information about directions in this operator's manual

All information about direction in this operator's manual are to be understood in direction of travel.

1.3 Illustrations used

Operational action and react

The steps of operation to be carried out by the operational staff are described in a numbered list. Adhere to the sequence of the steps. The reactions on the individual operational step are marked with an arrow. Example:

1. Operational action step 1
→ Reaction of the machine on operational action step 1
2. Operational action step 2

Enumerations

Enumerations without indispensable sequence are described as a list with enumeration items. Example:

- Item 1
- Item 2

Position figures in illustrations

Figures in round brackets refer to position figures in illustrations. The first figure refers to the illustration, the second figure refers to the item number in the illustration.

Example (Fig. 3/6)

- Figure 3
- Item 6

2 General safety advice

This chapter contains important hints for the safety conscious operation of the machine.

2.1 Obligations and liability

Observe the advice given in this operator's manual

The knowledge of the basic safety advice and safety regulations are the pre-condition for the safety conscious dealing with the machine and its trouble free operation.

Obligation of the user

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

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

The owner commits himself

- to keep all warning signs on the machine in well readable condition.
- to replace damaged warning signs.

Obligation of the operator

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

- observe the basic regulations regarding the operational safety and accident prevention.
- to read and to adhere to the chapter "Safety".
- to read and to adhere to the chapter "Warning signs and other signs on the machine" (Page 15).
- In case of queries, please contact the manufacturer.

Danger when dealing with the machine

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

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

Only use the machine

- for the purpose it has been designed for.
- in a perfect safety engineering condition.

Immediately remedy all failures affecting the safety.

Warranty and liability

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

- not designed use of the machine.
- improper fitting, taking into operation, operating and maintenance of the machine.
- operating the machine with defect safety facilities or not properly fitted or not functioning safety devices and guards.
- not adhering to the operator's manual regarding putting into operation, operation and maintenance.
- arbitrary changes on the machine.
- poor monitoring of the wearing parts of the machine.
- improper repair work.
- in an emergency due to alien elements and force majeure.

2.2 Illustration of safety advice

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



Danger!

Direct imminent danger for life and health of persons (severe injuries or death).

Not adhering to this advice will cause severe damage to health up to life threatening injuries.



Warning!

Possible danger for life and health of persons.

Not adhering to these hints may cause severe adverse health effects up to life threatening injuries.



Caution!

Possible dangerous situation (slight injuries, material damage).

Not adhering to these hints may cause slight injuries or material damage.



Important!

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

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



Hint!

Hint for use and particularly useful information.

These hints will help you to optimally make use of the functions on your machine.

2.3 Organising measures

The operator must ensure the availability of the personal protective equipment, e.g.:

- safety glasses,
- safety shoes,
- protective clothing,
- skin protecting agent, etc..



Important!

The operator's manual

- **should always be kept at the place where the machine is operated!**
- **should always be available for the operator and the servicing staff!**

Regularly check all existing safety devices!

2.4 Safety device and guards

Only operate the machine with all safety devices and guards fitted and properly functioning. Regularly check all safety devices and guards.

Defective safety devices

Defective or missing safety device and guards will cause dangerous situations.

2.5 Informal safety measures

Besides the safety advice in this operator's manual observe and adhere to the national, local and generally valid advice for operational safety, accident prevention and environmental care.

Please particularly observe the accident prevention prescriptions of your national authorised trade association.

2.6 Training of the staff

Only people who are trained and familiarised may operate with/on the machine. The responsibility of persons for operation and maintenance should clearly be prescribed.

A trainee may only operate the machine under the supervision of a skilled person.

Action \ Personnel	Particularly trained persons	Instructed operator	Persons with specialist training (authorised workshop)
Loading/Transport	X	X	X
Putting into operation	--	X	--
Installation, setting up	--	--	X
Operation	--	X	--
Maintenance	--	--	X
Searching for faults and remedy	X	--	X
Disposal	X	--	--

Legend: X allowed --..not allowed

*) All maintenance and repair work which has been marked with the addendum "authorised workshop" must be carried out in an authorised specialist workshop. Only the personnel of a specialist authorised workshop has the necessary knowledge and is provided with the appropriated aids (tools, lifting and supporting devices) for the proper and safety relevant execution of these maintenance and repair work.

2.7 Safety measures and normal operation

Operate the machine only with all safety devices and guards properly functioning.

Check the machine at least once a day for externally recognisable damage and for function of the safety devices and guards.

2.8 Danger from residual power

Observe the incidence of mechanic, hydraulic, pneumatic, and electric/electronic residual power on the machine.

Undertake appropriate measures when instructing the operating staff. Detailed hints are again given in the relevant chapters of this operator's manual.

2.9 Maintenance and repair, remedy of faults

Carry out all prescribed setting-, maintenance and servicing work in due time.

Secure all operating systems like compressed air and hydraulics against unintended starting.

When exchanging larger components carefully affix them to the hoisting implement.

Check slackened screw joints for tightness. After having finished maintenance work, carefully check all safety devices for proper function.

2.10 Constructional changes

Never carry out any alterations or fittings or changes on the machine without approval of the AMAZONEN-WERKE. This also applies for welding work on bearing parts.

All fitting or alteration measures require the written approval of AMAZONEN-WERKE. Only use the conversion and optional parts approved by Messrs. AMAZONEN-WERKEN so that the operating permit remains valid according to national and international regulations.

Vehicles and devices plus implements, connected with a vehicle with an official operating permit for road traffic according to the traffic law should correspond to the condition as stipulated by the relevant permit.



Important!

Prohibited on principle is

- boring on the frame or the chassis.
- re-boring existing holes on the frame or the chassis.
- welding on bearing parts.

2.10.1 Spare parts and wearing parts and auxiliary parts

Only use original-**AMAZONE**-spare- and wearing parts or the parts approved by Messrs. AMAZONEN-WERKEN so that the operating permit remains valid according to the national and international regulations. When using spare and wearing parts from other manufacturers it is not ensured that they have been designed and manufactured to fulfil the operational stress and safety demands.

The AMAZONEN-WERKE do not accept any liability for damage by using not approved spare or wearing parts or auxiliary parts.

2.11 Cleaning and disposal

Utilise agents and materials and dispose them in the appropriate manner particularly

- when working with greasing systems and devices and
- when cleaning with solvent agents..

2.12 Workplace of the operator

The machine may only be operated by one single person from the seat in the tractor cab.

2.13 Safety symbols and other identifications on the machine



Important!

Always keep all safety symbols on the machine clean and in well readable condition! Replace not readable safety symbols. Ask your dealer for warning signs stating the relevant order number (e.g. MD 075).

Warning signs - composition

Warning signs indicate dangerous points on the machine and warn about danger. At these points permanently existing or unexpectedly occurring danger prevail.

The warning sign consists of 2 fields:



Field 1

Gives a vivid description of the danger and is surrounded by a triangle safety symbol.

Field 2

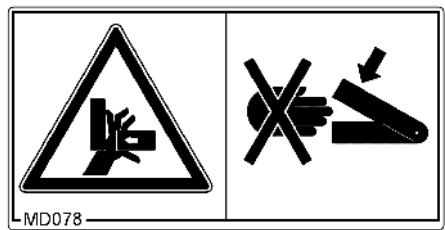
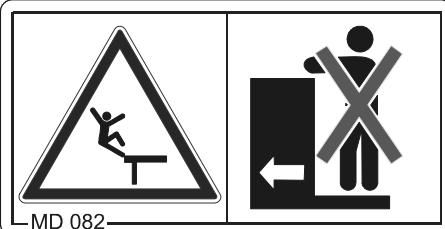
Gives the vivid instruction to avoid these dangers.

Warning sign - Explanation

The column **Order Number and explanation** provides the description to the opposite warning sign. The description of the warning sign is always the same and states in the sequence indicated:

1. Description of danger.
For example: Danger from cutting or cutting off!
2. Consequences when not adhering to the given advice how to avoid dangers.
For example: will cause severe injury on finger or hand.
3. The advice to avoid danger.
For example: Touch machine parts only then when they have come to a full standstill.

General safety advice

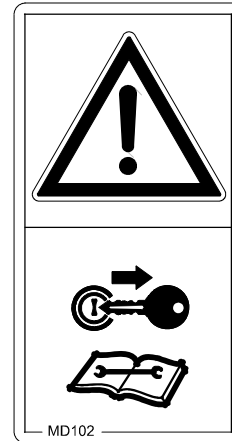
Picture No. and Explanation	Warning signs
<p>MD 095</p> <p>Before commencing operation read thoroughly operators manual and safety advice!</p>	 <p>MD095</p>
<p>MD 078</p> <p>Danger of squeezing!</p> <p>Will cause severe injury for finger or hand.</p> <p>Never reach into the squeezing danger zone.</p> <p>There id danger of squeezing as long as parts are still moving.</p>	 <p>MD078</p>
<p>MD 082</p> <p>Danger of falling for persons.</p> <p>Will cause severe injury for the entire body.</p> <p>Riding on the machine during transport travel and/or climbing up running machines is prohibited. This applies also to machines with boards or platforms.</p>	 <p>MD 082</p>
<p>MD 083</p> <p>Danger from getting pulled in or getting caught.</p> <p>Causes severe injury on arm or upper body.</p> <p>Never open or remove guards from conveying augers whilst the tractor engine is running, the PTO shaft is engaged and the hydraulic drive is running.</p>	 <p>MD 083</p>
<p>MD 100</p> <p>Fixing point for lifting strap when loading.</p>	 <p>MD100</p>

MD 102

Danger from unintended starting the machine.

Will cause severe injury on the entire body or fatal injury.

- Before commencing any maintenance and repair work, stop the tractor engine and remove the ignition key.
- Read and adhere to this advice in the technical manual before commencing any maintenance and repair work.



2.13.1 Positioning of warning decals and other identifications

Warning decals

The following illustrations show the arrangement of the warning decals.

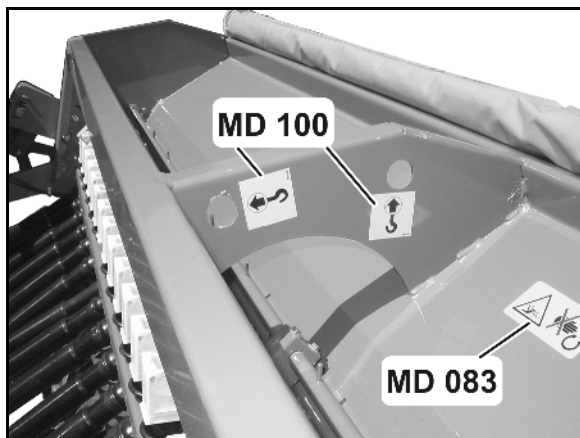


Fig. 1

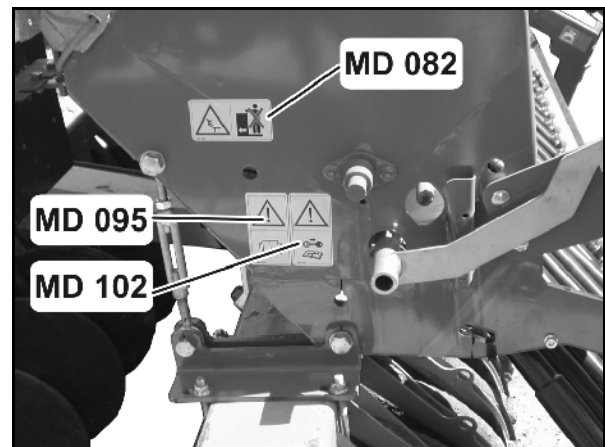


Fig. 2



Fig. 3

2.14 Danger when not adhering to the safety advice

Not adhering to the safety advice

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

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

- Danger to persons not excluded from operational areas.
- Failure of important functions within the machine.
- Failure of carrying out prescribed measures of maintenance and repair.
- Danger to persons through physical or chemical contact.
- Danger to persons, or the environment by leaking hydraulic oil.

2.15 Safety conscious operation

Besides the safety advice in this operator's manual additionally, the national, and generally valid operation safety and accident prevention advice of the authorised trade association are binding.

Adhere to the advice given on the warning signs to avoid danger.

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

2.16 Safety advice for the operator



Warning!

Always check traffic and operational safety before putting the machine to operation!

2.16.1 General safety and accident prevention advice

- Adhere to the general rules of health- and safety precautions besides the advice in this operator's manual!
- The fitted warning- and advising decals give important hints for a safe operation. Adhering to them protects your own safety!
- Before beginning to move, check surrounding area (children etc.)! Ensure sufficient visibility!
- Riding or any transport on the machine is prohibited.

Coupling and uncoupling the machine

- The machine should only be transported and driven by a tractor which fulfils the power requirements.
- When fitting to the three-point linkage the mounting categories at the tractor and the implement must be compatible!
- By mounting implements at the front or in the rear of a tractor, do not exceed
 - the permissible tractor total weight
 - the permissible tractor axle loads
 - the permissible tyre carrying capacity of the tractor tyres
- Secure the tractor and the machine against unintended rolling away before mounting or dismounting the machine.
- Allow nobody to stand between tractor and implement while the tractor is backing up.

Any assistants may only stay at the side of the vehicle and help to direct it. Only when the vehicles have come to a full standstill they are allowed to step between them.
- Before mounting and dismounting the machine to the three-point linkage secure the control lever for the tractor hydraulics in such a position that an unintended lifting or lowering is impossible.
- When attaching or removing the machine bring any parking or storing devices into the corresponding position (standing safety)!
- Danger of squeezing and shearing when actuating the supporting device.
- Special care should be taken when coupling the machines on or off the tractor. There exist squeezing and shearing points at the coupling points between tractor and implement.
- Standing between tractor and implement when the three point hydraulic is actuated is prohibited.
- Attach implements as advised and couple the machine in the appropriate manner to the prescribed devices.
- The release ropes for quick coupler should hang freely and in the low position must not release the quick coupling by themselves.
- Park uncoupled machines safely.



Operation of the machine

- Become acquainted with the machine controls and functions before beginning the operation. Doing this during operation would be too late.
- Wear close-fitting clothes. Wearing loose-fitting clothes would increase the danger of getting caught by the drive shafts.
- Only start the machine with all guards fitted and in serviceable condition.
- Observe the maximum payload of the mounted / trailed machine and the permissible axle and support loads of the tractor. If necessary, only travel with partly filled hopper.
- The standing of persons within the operational range of the machine is prohibited.
- Standing of persons within the pivot and swivel area of the machine is prohibited.
- On all hydraulically actuated pivoting parts exists danger of injury by bruising and trapping.
- Machine parts may only be hydraulically actuated when persons observe sufficient clearance to the machine.
- Before leaving the tractor
 - lower the machine to the ground
 - stop the tractor engine
 - remove the ignition key
- Always park the uncoupled machine safely.

Transport of the machine

- When travelling on public roads observe your legal national traffic regulations.
- Always ensure sufficient steering braking of the tractor.

Steering and braking of the tractor are influenced by mounted or trailed machines and front or rear ballast weights.
- If necessary, use ballasts weights.

The tractor front axle load must be at least 20 % of the tractor's net weight in order to ensure a sufficient steering.
- Attach the front or rear ballast weights in the appropriate manner on the fixing points provided.
- Observe the max. payload of the mounted / trailed machine and the permissible axle and support loads of the tractor.
- The tractor must provide the prescribed brake lag for the laden combination (tractor plus mounted / trailed machine).
- Before starting to travel on public roads, check function of brakes.
- When driving round bends note the width of the mounted or trailed machine and the gyrating mass of the machine.
- Before starting to travel on public roads ensure the sufficient lateral locking of the tractor lower link arms when the machine is fixed to the three point hydraulics or the lower link arms of the tractor.

- Before starting to travel get all swivelling machine parts into transport position.
- Before starting to travel secure all swivelling machine parts in transport position against dangerous movement from their position. For this use the intended transport securing devices.
- Before starting to travel secure the lever of the three point hydraulics against unintended lifting or lowering of the mounted or trailed machine.
- Before any transport travel ensure that the required transport device is correctly fitted on the machine, as, e.g. traffic lights, warning devices, guards.
- Adapt your travelling speed to the prevailing conditions.
- Choose a lower gear when driving down hill.
- As a matter of principle switch off the single wheel braking (lock the pedal) before starting any transport travel.

2.16.2 Hydraulic system

- The hydraulic system is under high pressure!
- Connect hydraulic hoses to the hydraulic rams and motors according to the advice in the instructions!
- When fitting the hydraulic hoses to the tractor hydraulic sockets always ensure that the hydraulic system on the tractor as well as on the implement is without pressure!
- It is prohibited to block spool valves on the tractor if hydraulic functions are carried out directly via these spool valves, for example, folding-, swivelling- and shifting procedures. When the relevant spool valve is released the relevant hydraulic function must stop automatically.
- Before starting to do repair work to the hydraulic system,
 - lower machine to the ground,
 - release the pressure and
 - stop tractor engine.
- All hydraulic hoses must be checked for their operational safety by a skilled person at least once a year. In case of damage or ageing replace the hydraulic hoses. Only use original **AMAZONE** hydraulic hoses.
- The period of use of any hose circuit should not exceed six years including a possible storing period of two years maximum. Also when stored and used properly hoses and hose circuits do age. Therefore their longevity and period of use is limited. Deviations from the above may be accepted by the Health- and Safety Authorities depending on the experience they have had and the danger potential. For hoses and hose circuits made of thermoplasts other guide lines may prevail.
- Danger of infection! Liquids leaking under high pressure (hydraulic oil) can penetrate the skin and cause severe injury! When injured see a doctor immediately!
- When searching for leaks appropriate aids should be used because of the danger of injury!

2.16.3 Electric outfit

- When working on the electric system always disconnect the battery (negative pole).
- Use prescribed fuses only. When using too strong fuses the electric circuit may be damaged - danger of fire.
- Make sure the polarity is correctly fitted. First connect positive pole and then negative pole. - When disconnecting vice versa.
- Always provide plus pole with supplied cover. At accidental earth contact there is danger of explosion!
- Danger of explosion! Avoid sparks and open fire near the battery!
- The function of the implements' electronic components and parts may be affected by the electro magnetic transmittance of other devices. Such affects may endanger third parties when the following safety advice has not been adhered to:
 - When retrofitting electric and electronic devices and/or components to the implement with a connection to the tractor's on-board electric circuit, the onus is on the user to ensure that the installation will not cause any disturbance to either the tractor's electronics or other components.
 - Special attention must be paid that the retrofitted electric and electronic parts correspond to the EMV-guideline 89/336/EC in the relevant valid edition and that they bear the CE-mark.

2.16.4 Maintenance, repair- and care-work

- Repair-, maintenance- and cleaning operations as well as the remedy of function faults should principally be conducted with
 - drive stopped
 - engine stopped
 - remove ignition key
 - implement plugs removed from the on-board computer
- Check nuts and bolts for tightness and retighten if necessary!
- Before carrying out any maintenance-, repair- and cleaning work ensure the lifted implement or lifted implement parts against unintended lowering.
- When exchanging operational tools with cutting edges use appropriate tools and wear gloves.
- Dispose of oil, grease and filters in the appropriate manner.
- Before conducting any electric welding on the tractor and the mounted implements remove the cable from generator and tractor battery.
- Any spare parts fitted must, as a minimum meet with the implement manufacturers' fixed technical standards! Using original - **AMAZONE**- spare parts for example ensures this!

2.16.5 Seed drill operation

- Observe the permissible filling quantities for the seed hopper (contents seed hopper)!
- Riding on the machine during operation is forbidden!
- When carrying out the calibration test, bear in mind danger areas caused by rotating and oscillating machine parts.
- Do not place any parts into the seed hopper!

3 Loading

Loading with a hoist crane / Forklift truck:



Danger!

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



Danger!

Minimum tensile strength per lifting belt for 200kg!



Important!

Before loading, open the hopper cover.

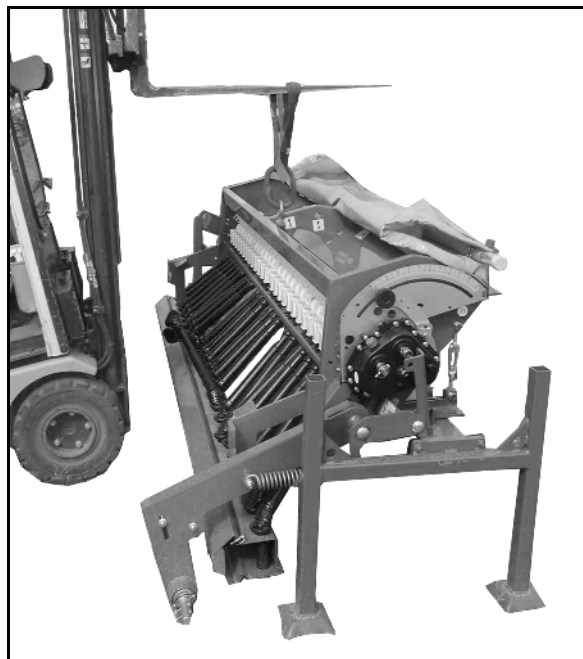


Fig. 4

4 Product description

This chapter

- provides you with a comprehensive survey about the design of the machine.
- provides the descriptions of the individual components and parts.

Read this chapter when standing at the machine. In this way you will get optimally acquainted to the machine.

The machine consists of the main components:

- Seed box
- metering unit

4.1 Overview – components

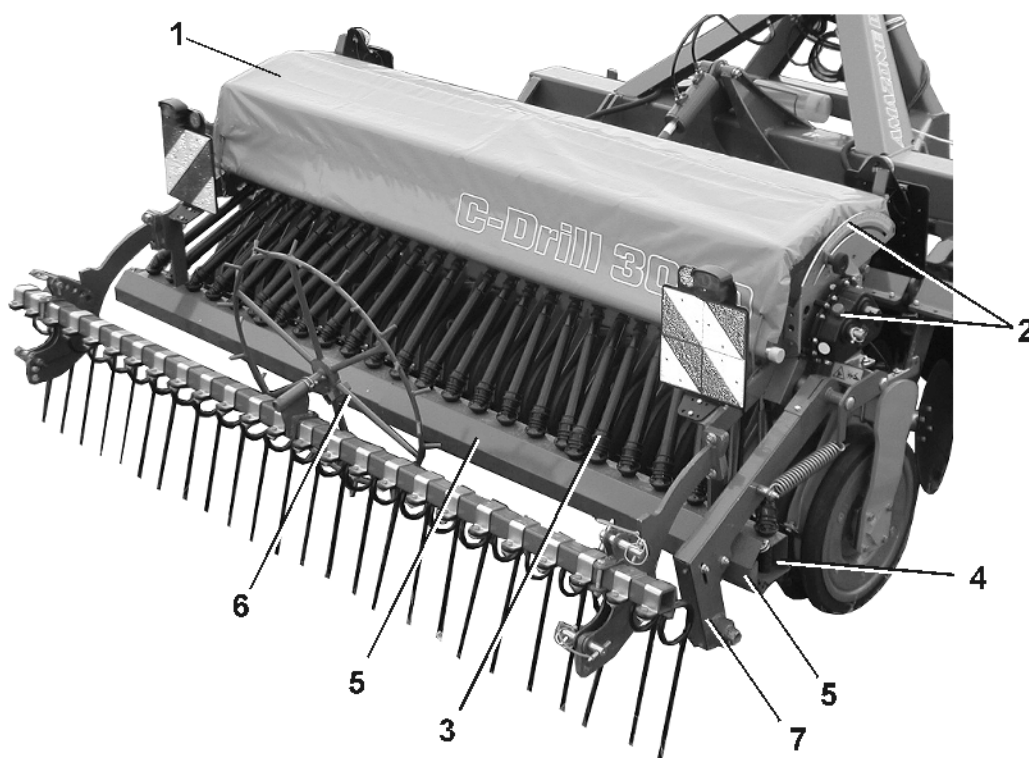


Fig. 5

- | | |
|------------------------------|--|
| (1) Seed box with cover | (5) Calibration tray |
| (2) Vario-gearbox with scale | (6) Star wheel (in transport position) |
| (3) Outlet tubes | (7) Drive star wheel |
| (4) Outlet rail | |

4.2 Designated use of the machine

The seed drill of the type **C-Drill**

- is designed for metering and sowing commercial fine seeds and catch crop.
- is fitted on to **AMAZONE** – soil tillage implements **Catros 3001 / 4001, Cenius 3000 / 3001** or **KG / KE** with wedge ring roller before starting operation.

Operating on slopes is possible under following conditions

- When operating across slopes
maximum angle of machine in the direction of travel to the left 20 %
maximum angle of machine in the direction of travel to the right 20 %
- When operating up and down hill
uphill 20 %
downhill 20 %

The designated use also includes:

- observing all hints in this operator's manual.
- adhering the service and maintenance work.
- the exclusive use of original **-AMAZONE-** spare parts.

Other use than that stipulated is prohibited and is no longer considered as designated use.

For damage resulting from not designed use

- the operator himself will carry the full risk,
- the manufacturer will not accept any responsibility..

4.3 Danger zones

Within these zones permanently existing danger or unexpectedly arising danger exist. Safety symbols identify these danger zones. Here particular safety advices are valid. Please refer to chapter "General safety advice", page 15.

Danger zones prevail:

- within the operational range of moving parts
- when climbing on to the machine
- in the swivel range of the sprayer booms

4.4 Conformity

Guide lines- / Standard terms

The machine fulfils the:

- Machine guide line 98/37/EG
- EMV- guide line 89/336/EWG

4.5 Type plate and CE declaration

The following illustrations show the arrangement of the type plate and the CE declaration.

The type plate (Fig. 6/1) and the CE declaration (Fig. 6/2) are located on the right hand machine side next to the vario gearbox.

On the type plate are mentioned:

- Machine-Ident-Nr.:
- Type
- Year of construction
- Factory
- Basic weight kg
- Fill load

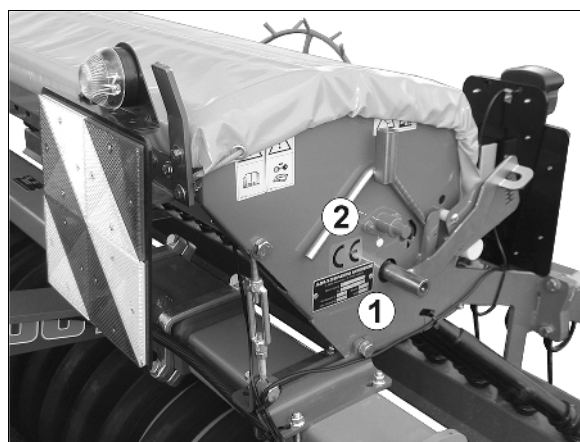


Fig. 6

4.6 Technical data

		C-Drill 3000	C-Drill 4000
Working width	[m]	3	4
Number of sowing coulters		24	32
Row spacing of coulters	[cm]	12,5	12,5
Capacity of seed box	[l]	160	225
Basic weight	[kg]	130	175
Max. fill load	[kg]	120	170
Transport width	[m]	3	4

4.7 Required tractor equipment

In order to be able to operate the machine, the tractor must fulfil the power requirements and must be provided with the necessary electric, hydraulic and brake connections for the brake system..

Electrical system

- | | |
|--------------------|---------------|
| Battery voltage: | • 12 V (Volt) |
| Socket for lights: | • 7-polig |

4.8 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.

5 Assembly and function

The following chapter informs you about the assembly of the machine and the functions of the individual components.

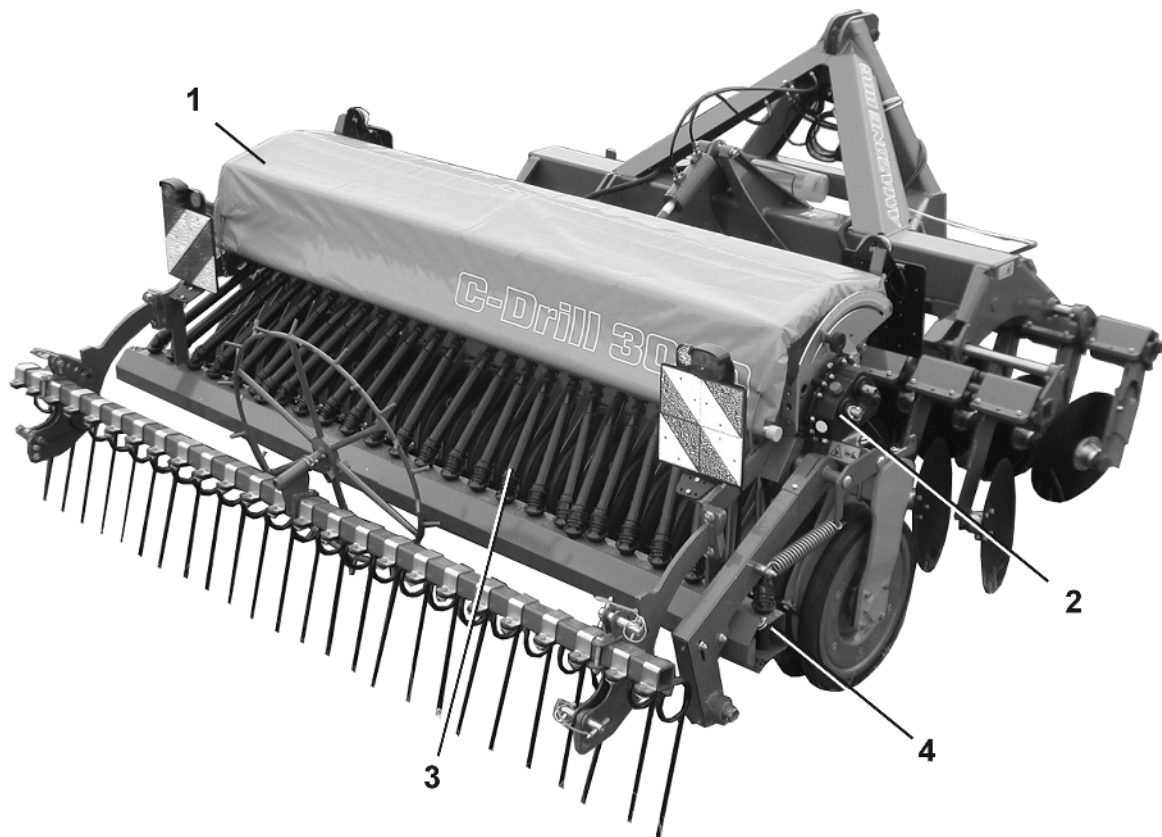


Fig. 7

The **C-Drill** seed drill allows sowing fine seeds and catch crop during soil tillage with **AMAZONE Catros** or **Cenius**.

The seed is transported in the seed hopper (Fig. 7/1).

The application rate is adjusted via the gearbox (Fig. 7/2) and the shutter slides.

The seed wheel meter the adjusted seed rate.

The seed is delivered via the outlet tubes (Fig. 7/3) to the outlet rail (Fig. 7/4) and in this way it gets into the soil.

5.1 Agitator shaft

The agitator shaft (**Fehler! Verweisquelle konnte nicht gefunden werden.**/1) prevents seed blockages inside the seed box which may cause incorrect seed rates.

For sowing certain seeds, the agitator shaft should, however, be disengaged.

Especially when sowing rape the intensive agitation of the agitator shaft may cause seed damage, resulting in the rape seed sticking together. Therefore, when sowing e. g. rape or similar small seed, the drive of the agitator shaft should be disengaged.

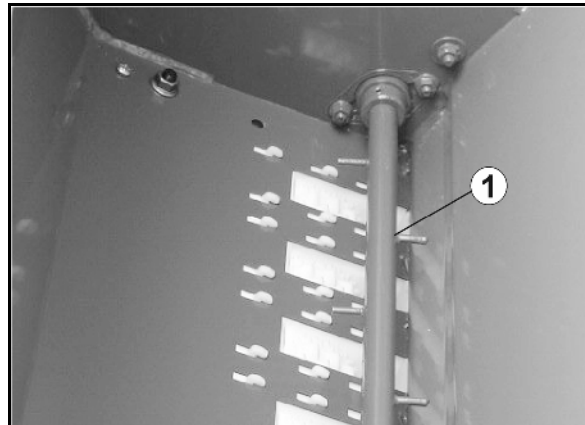


Fig. 8

5.2 Star wheel

Via the vario gearbox the star wheel (Fig. 9/1) the seed wheels.

For operation insert the star wheel into the drive and secure using a lynch pin.

During the calibration test the star wheel is manually turned with the aid of the calibration crank.

For transport travel the star wheel is fixed on the harrow (Fig. 10) and secured using a lynch pin.

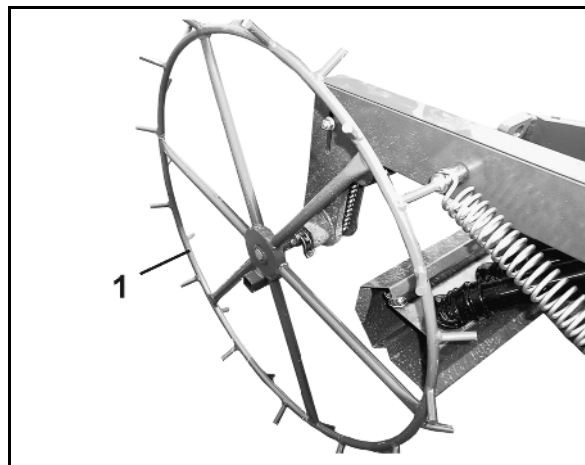


Fig. 9

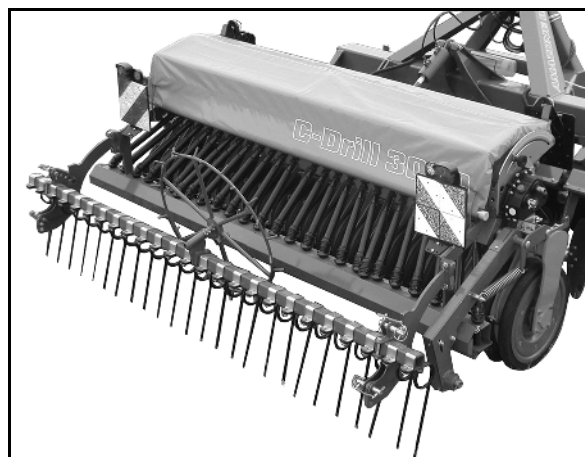


Fig. 10

5.3 Vario gearbox

Set the desired seed rate on the gearbox (Fig. 11/1).

The gearbox setting lever (Fig. 11/2) allows the setting of the rev. speed of the seed wheels and thus the sowing rate.

The higher the figure on which the pointer (Fig. 11/3) will be set on the scale (Fig. 11/4) the bigger the seed rate will be.



Important!

Carry out a calibration test!

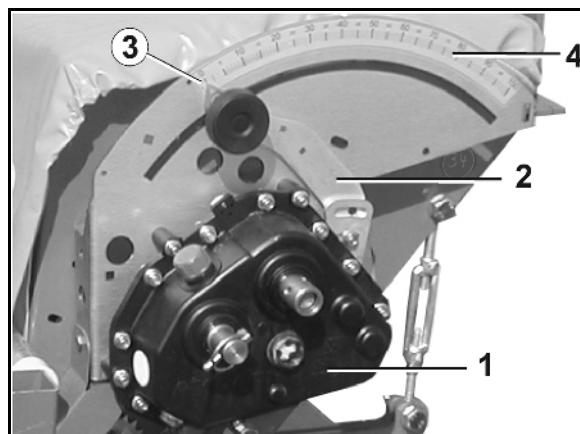


Fig. 11

5.4 Seed wheels and shutter slides

The seed wheels consists of

- o A normal seed wheel (Fig. 12/1) and
- o A fine seed wheel (Fig. 12/2).
- For sowing normal seeds both seed wheels are connected via a pin and are jointly driven.
- For sowing fine seeds only the fine seed wheel is driven. The connection with the pin to the normal seed wheels must be interrupted.

The shutter slides (Fig. 12/3) allow the setting in 3 positions and require adjustment according to the kind of seed.

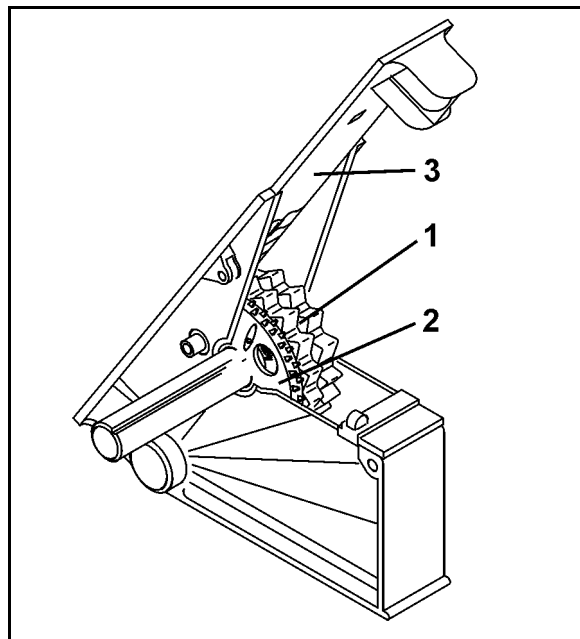


Fig. 12

5.5 Bottom flap

The bottom flap (Fig. 13/1) allows setting in 8 positions and requires adjustment according to the kind of seed.

(Fig. 13/2) Bottom flap setting lever.

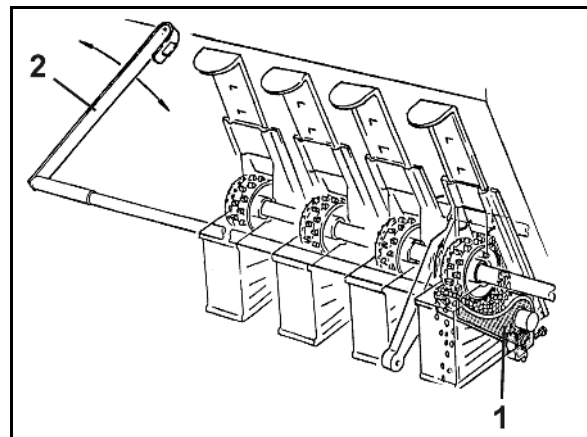


Fig. 13

5.6 Parking support

The **C-Drill**, having been removed from the soil tillage implement, can be placed on a level surface using the parking support.

Also refer to Chapter 6!

1. Remove the star wheel.
2. If present, remove any lights.
3. Open the cover.
4. Secure the **C-Drill** using a lifting belt and suitable lifting device.
5. Release the clamping brace from the soil tillage implement.
6. Lift the **C-Drill** using the lifting device and lower it just enough onto a level surface so that it is possible to attach the parking support (Fig. 14/1).

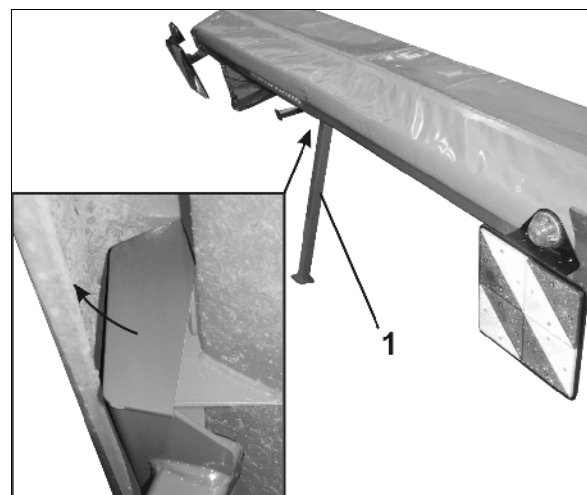


Fig. 14



Caution!

Position the parking support behind the front hopper wall and pull them forward (Fig. 14).

7. Lower the **C-Drill** the rest of the way using the lifting device.
8. Before removing the lifting belt, verify that the **C-Drill** is lowered and stable.

6 Fitting

Workshop job

6.1 Attaching the **C-Drill** to **Catros / Cenius**

1. Remove from the soil tillage implement:
 - o Slacken clamping brace and dismount the front (Fig. 15/1) and rear (Fig. 15/2) lights.
 - o Remove cable ties as far as necessary!

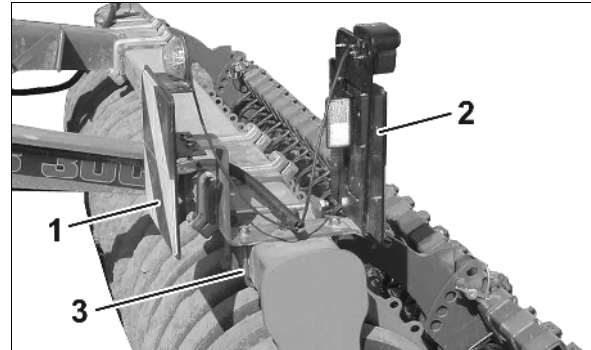


Fig. 15

- o Slacking the clamping brace (Fig. 16/2) on the left and right hand side and remove the harrow with carrier (Fig. 16/1).



Caution!

Caution at dismounting / mounting!
Harrow weight approx. 90kg!

2. Remove all packing material from the **C-Drill**.

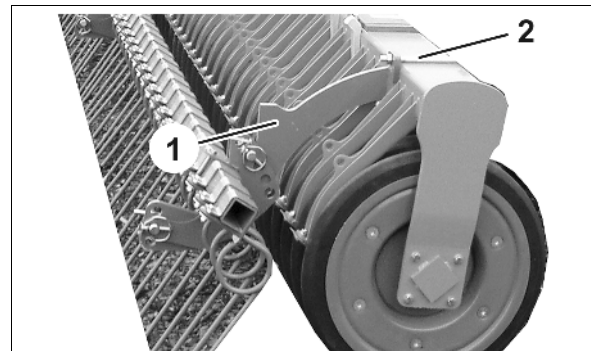


Fig. 16



Caution!

For mounting make use of an appropriate lifting device!

The required minimum tensile strength of the lifting belt is 200kg

3. Secure the machine using the lifting belt t (Fig. 17/1) of the lifting device.



Caution!

Make use of the marked fixing points (Fig. 17/2) on the machine.

4. Slacken five clamping braces on the transport frame.
5. With the aid of the lifting device lower the machine centrally on the roller frame.



Caution!

Do not yet loosen the lifting belt.

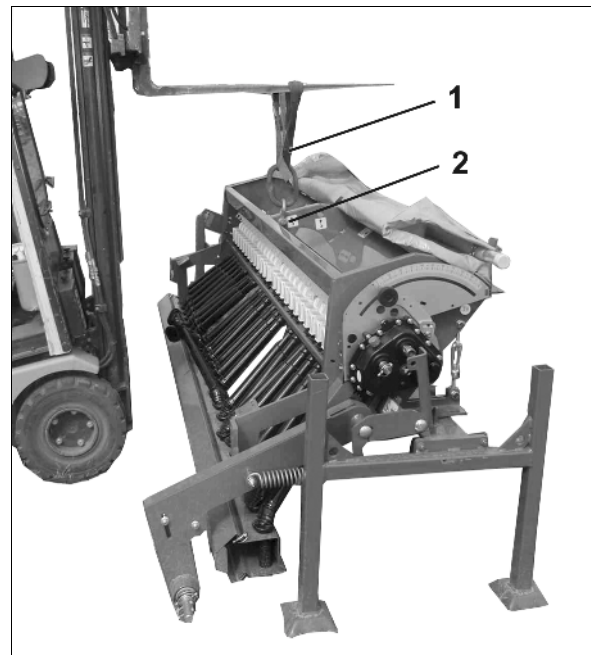


Fig. 17

Fitting

6. Affix the machine by using four clamping braces (Fig. 18/1).
7. Affix the star wheel using clamping braces (Fig. 18/2).



Fig. 18

8. Affix lights with warning plate at the front of the **C-Drill**.



Fig. 19

9. Affix lights with warning plate in the rear of the **C-Drill**.

Secure cables using cable ties.



Fig. 20

10. Mount the harrow with carrier (Fig. 21/1) on to the **C-Drill**.

11. Mount the star wheel carrier (Fig. 21/2) on to the harrow bar.

Insert the star wheel and secure using a lynch pin (Fig. 21/3).

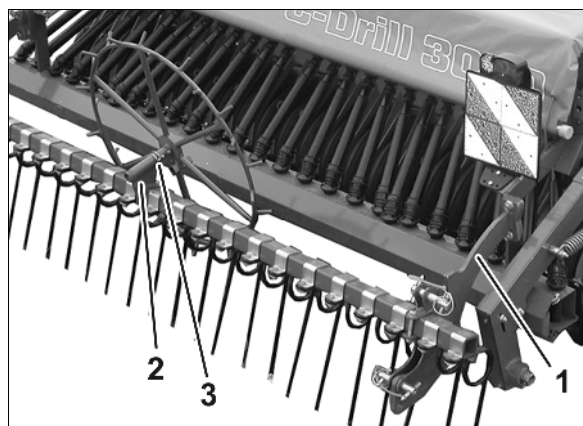


Fig. 21

6.2 Attaching the **C-Drill** to **KG / KE** with a wedge ring roller



Warning!

Never connect the C-Drill to a **KG / KE** unless a wedge ring roller is installed!

Tipping hazard!

1. Attach the left and right-hand coupling parts to the square tubes of the wedge ring roller.
 - 1.1 At the front (Fig. 22/1) use clamping braces.
 - 1.2 At the rear (Fig. 22/2) use a clamping plate and screws.



Caution!

For mounting make use of an appropriate lifting device!

The required minimum tensile strength of the lifting belt is 200kg!

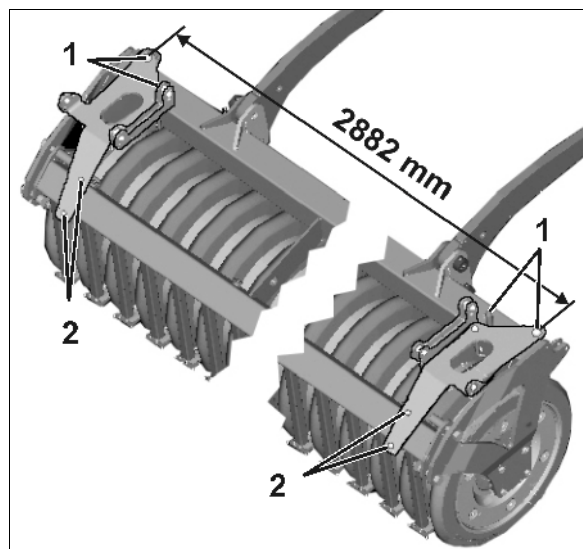


Fig. 22

2. Secure the implement using the lifting belt (Fig. 23/1) of the lifting device.



Caution!

Make use of the marked fixing points (Fig. 23/2) on the machine.

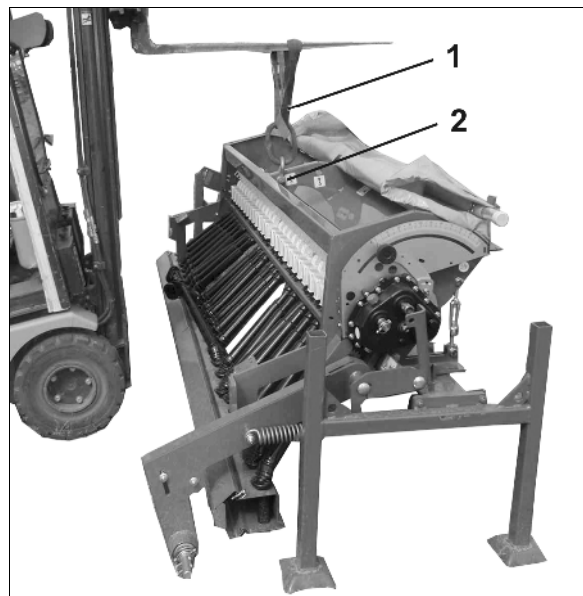


Fig. 23

3. Remove the existing coupling parts from the **C-Drill**.
 - 3.1 Left : Unscrew 2 screw connections (Fig. 24/1) and remove 2 coupling parts (Fig. 24/2).

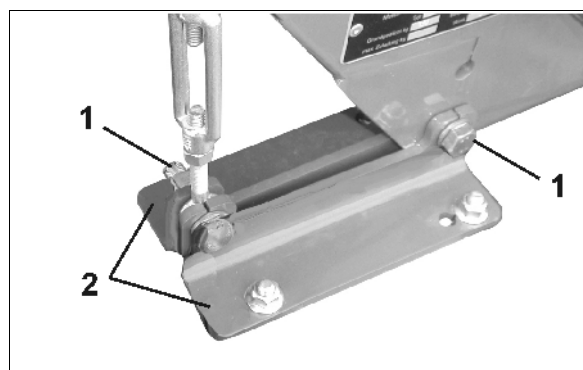


Fig. 24

Fitting

- 3.2 Right: Unscrew 3 screw connections (Fig. 25/1) and remove 3 coupling parts (Fig. 25/2).

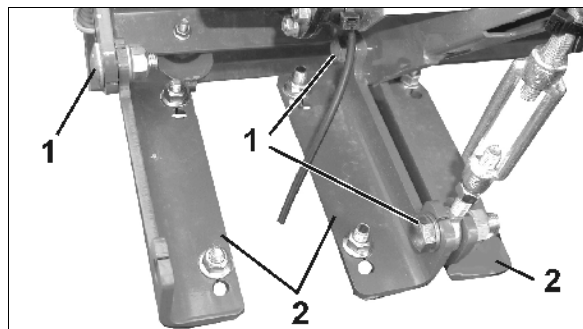


Fig. 25

4. Lower the implement onto the roller frame using the lifting device so that it is centred.



Caution!

Do not yet loosen the lifting belt.

5. Install the **C-Drill** onto the coupling parts of the wedge ring roller.

- 5.1 Left: Install the 2 screw connections (Fig. 26/1).

- 5.2 Right: Install the 3 screw connections (Fig. 27/1).

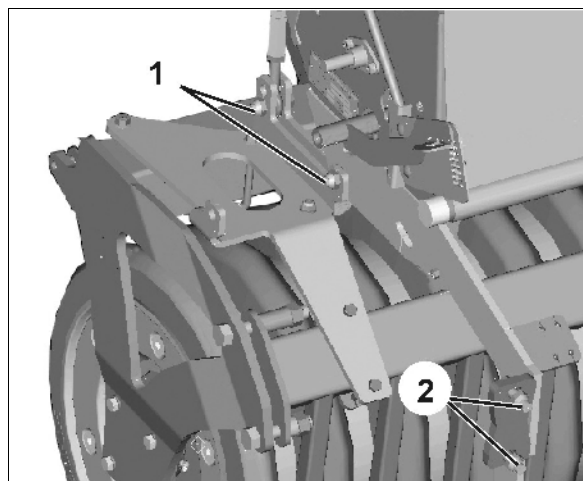


Fig. 26



(Fig. 26/2): Mounting point for harrow.

For harrow attachment, see Fig. 21.

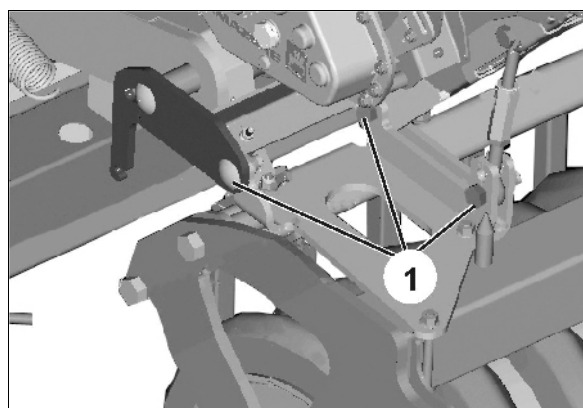


Fig. 27

6. Insert the star wheel and secure it using the lynch pin (Fig. 28/3).



Warning!

Remove the star wheel for transport!

Risk of accident

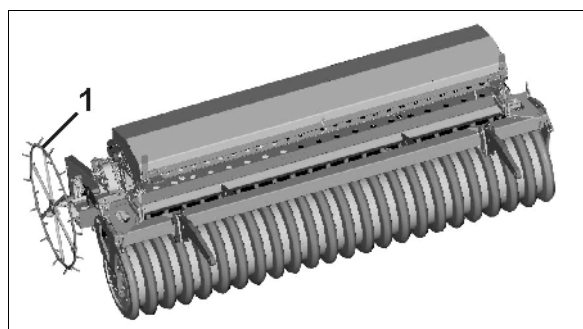


Fig. 28

7 Putting into operation

In this chapter you will find information for putting your machine into operation.



Danger!

- **Before putting the machine into operation ensure that the operator has read and understood the operator's manual.**
- **Before hitching the machine on or off read the chapter "Safety advice for the operator", page 19**
 - **Transport of the machine**
 - **Operation of the machine**
- **Observe the max. payload of the mounted or trailed machine and the axle loads of the tractor. If necessary travel with only partly filled hopper.**

8 Settings



Danger!

Make settings only when the PTO shaft is disengaged, the engine is switched off and the ignition key has been removed.

8.1 Setting table for various seeds

Seed	Elite-metering wheel	Throttle flap position	bottom flap-position		Agitator shaft
			TKG up to 50g	from 50g	
Dinkel	Main metering wheel	open	-	2	driven
Oats	Main metering wheel	open	-	2	driven
Ray	Main metering wheel	open	1	2	driven
Ray	Fine seed metering wheel	open	1	-	driven
Summer barley	Main metering wheel	open	1	-	driven
Wheat	Main metering wheel	open	1	2	driven
Winter barley	Main metering wheel	open	1	2	driven
Beans, small (TGW* up to 600g)	Main metering wheel	¾ open	6		driven
Peas	Main metering wheel	¾ open	4		driven
Flax (dressed)	Main metering wheel	¾ open	1		driven
Grass seed	Main metering wheel	open	2		driven
Millet	Main metering wheel	¾ open	1		driven
Lupine	Main metering wheel	¾ open	4		driven
Lucerne	Main metering wheel	¾ open	1		driven
Lucerne	Fine seed metering wheel	¾ open	1		driven
Oil linnen (dressed moist)	Main metering wheel	¾ open	1		disengaged
Oil linnen (dressed moist)	Fine metering wheel	¾ open	1		disengaged
Oil radish	Main metering wheel	¾ open	1		disengaged
Oil radish	Fine seed metering wheel	¾ open	1		disengaged
Phacelia	Main metering wheel	¾ open	1		driven
Phacelia	Fine seed metering wheel *	¾ open	1		driven
* Sow seed rates of more than 12 kg/ha with main metering wheel					
Rape	Fine seed metering wheel	¾ open	1		disengaged
Red clover	Fine seed metering wheel	¾ open	1		disengaged
Mustard	Fine seed metering wheel	¾ open	1		disengaged
Soya	Main metering wheel	¾ open	4		driven
Sun flowers	Main metering wheel	¾ open	2		driven
Late turnip	Fine seed metering wheel	¾ open	1		disengaged
Vetches	Main metering wheel	¾ open	2		driven

8.2 Setting the bottom flap

Set the bottom flap centrally by using the bottom flap setting lever (Fig. 29/1).

The bottom flap allows the setting in 8 positions and requires adjustment according to the kind of seed.

Secure every setting by using a clip pin.



Hint!

Take the required position of the bottom flap setting lever from the table (on page 38) and set the bottom flap setting lever accordingly.



Fig. 29

8.3 Setting the fine seed wheel / normal seed wheel

• for normal seeds

For sowing with main seed metering wheels, the main seed metering wheel and the fine seed metering wheel are combined. Both rotate.

If, after having sown with the fine seed metering wheels, it is desired to use the main seed metering wheels again, proceed as follows:

1. Turn the main seed metering wheel (Fig. 30/1) on the seed shaft until the pin in the metering wheel can be seen.
2. Press at every seed metering wheel the pin against the fine seed metering wheel as illustrated in Fig. 30.

Then check for correct connection by attempting to rotate one half against the other!

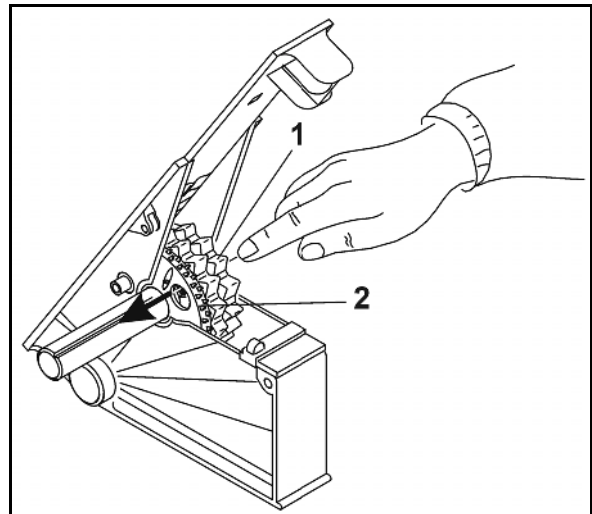


Fig. 30

• for fine seeds

For sowing with the fine seed metering wheels, slacken the connection of main seed metering wheel and fine seed metering wheel at every seed metering wheel:

1. Move the gearbox setting lever (Fig. 31/2) repeatedly up and down until the holes (Fig. 31/1) of the fine seed metering wheels are visible.
2. At every seed metering wheel press the pin behind the hole until the stop into the main seed metering wheel until the main seed metering wheel can rotate freely on the seed shaft. Then check free wheel drive!



Hint!

See table on page 38.

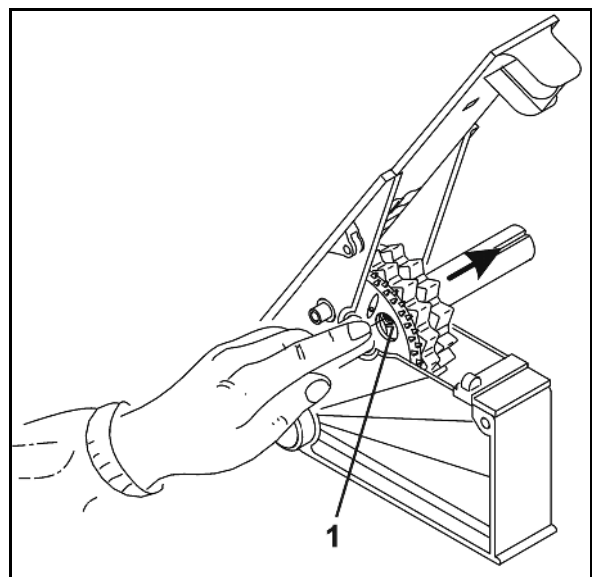


Fig. 31

8.4 Setting the shutter slide

The shutter slides of the seed housings can be brought into three positions (see Fig. 32):

- A = shut
- B = 3/4 open
- C = open



Hint!

Take the required shutter slide position from the table (on page 38)!



Important!

Keep the shutter slides closed on the two emptying units (metering units without seed wheels)!

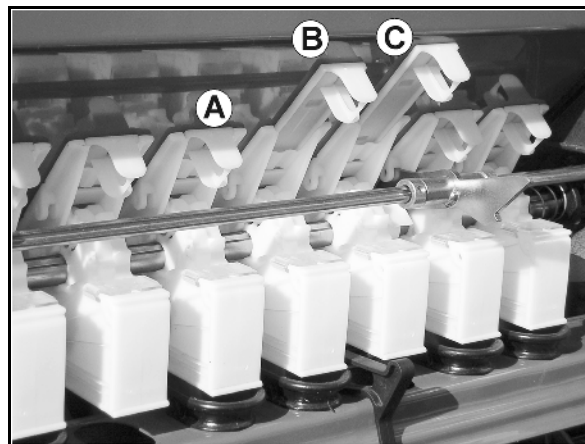


Fig. 32

8.5 Driving the agitator shaft / Disengagement of drive

Disengagement of agitator shaft drive:

Pull the clip pin (Fig. 33/1) out of the gearbox tubular shaft (Fig. 33/2) and insert into the hole of the auxiliary shaft as illustrated. Hereby the drive of the agitator shaft is disengaged.



Hint!

Please take from the table (on page 38), which seeds should be sown with the agitator shaft disengaged and set the agitator shaft accordingly.

Driving the agitator shaft:

Insert the lynch pin (Fig. 33/1) into the gear bow hollow shaft (Fig. 33/2).



Hint!

Turn the star wheel until the lynch pin can be fitted.

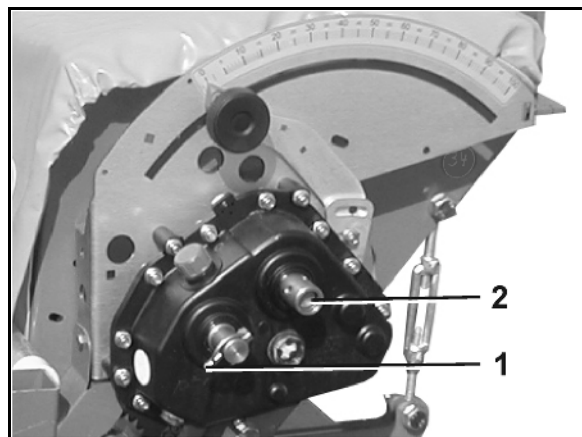


Fig. 33

8.6 Setting the seed rate on the gearbox

1. Slacken the locking knob (Fig. 34/1) of the gearbox setting lever.
2. Move the pointer of the gearbox setting lever (Fig. 34/2) to the desired gearbox setting.
3. Tighten locking knob (Fig. 34/1).



Important!

After every alteration to the gearbox setting lever a calibration test should be carried out to confirm that the seed drill is sowing the desired seed rate.

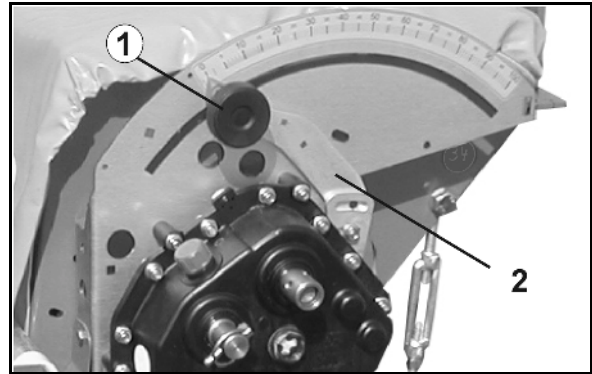


Fig. 34

This calibration test should also be re-checked

- when the setting of the shutter slides had been changed
- when the setting of the bottom flap is changed
- when changing from normal seed metering wheels to fine seed metering wheel or vice versa.
- when the agitator shaft is disengaged or engaged again.
- before sowing a new supply of seed (reason: deviations in grain size, grain shape, bulk density and dressing agent).

8.7 Calibration test

During the calibration test the coincidence between the adjusted and the actual seed rate is checked.

The calibration test must always be carried out

- when changing the type of seed
- when the type of seed is the same, however grain size, grain shape, specific weight deviate and the dressing is different.

Caution!

Prior to starting the calibration test:

1. Stop the tractor engine
2. Apply the parking brake
3. Remove the ignition key.



1. Filling the seed hopper:
 - o at least 1/3 of the hopper volume
 - o for fine seeds correspondingly less
2. Pull the left and right hand calibration tray off the outlet rail and place them below the outlet rail (Fig. 36).



Hint!

If necessary clean the outlet rail before commencing the calibration procedure!

3. Carry out the gearbox setting:
For sowing with:

<u>Metering wheels</u>	<u>Gearbox setting</u>
Normal metering wheels	50
Fine seed metering wheels	15

Tabelle 1

4. Lift the soil tillage implement until the star wheel gets free.

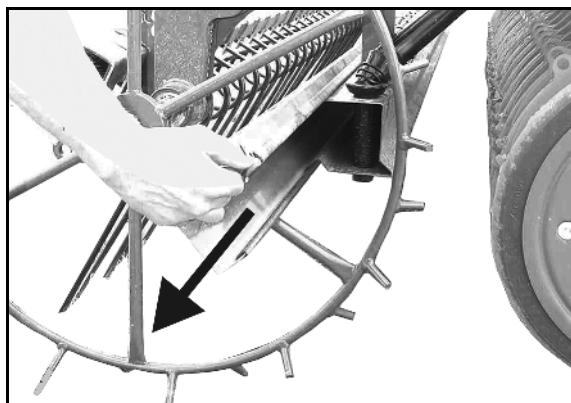


Fig. 35

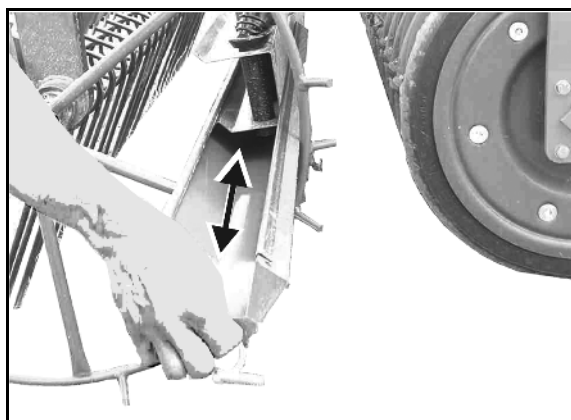


Fig. 36

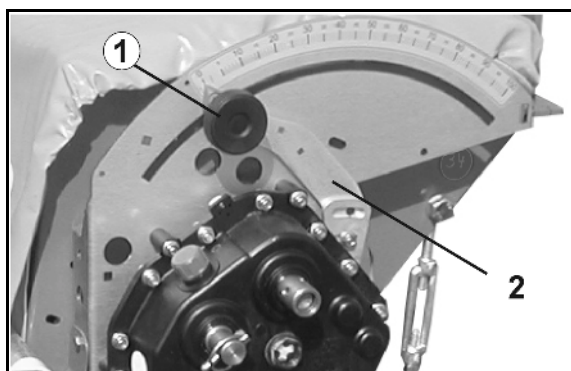


Fig. 37

5. Take the calibration crank (Fig. 38/1) out of the transport retainer.
6. Put the calibration crank (Fig. 38/1) on to the star wheel.
7. Turn the star wheel by using the calibration crank in direction of arrow (Fig. 39) until an even flow of seed is delivered to the calibration trays.
8. Empty the calibration trays and place them below the outlet rail again.
9. Carry out the number of crank turns according to table 2 in direction of arrow (Fig. 39)
 - o The number of crank turns depends on the working width of the sowing rail.
 - o The number of crank turns is related to an area of 1/40ha (250m²) or 1/10ha (1000m²).
 - o Usually used is the crank turn for 1/40ha. For very small seed rates, e.g. for rape, we recommend to carry out the crank turn for 1/10ha.
10. Weigh the seed collected in the collecting trays under consideration of the weight of the bucket and multiply either by
 - o factor "40" (for 1/40 ha) or
 - o 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]



Fig. 38

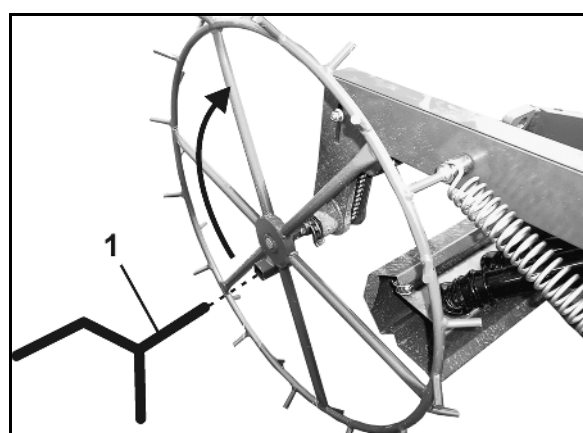


Fig. 39

Working width	Crank turns	
	1/40 ha	1/10 ha
3 m	29,5	118
4 m	22	89,0

Table 2

11. After the calibration test:
 - o Get the calibration crank and calibration trays into transport position. (Fig. 35 / Fig. 38).

8.7.1.1 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. 40/1) for all seed rates above 30 kg/ha and an inner white scale (Fig. 40/2) for all seed rates below 30 kg/ha. On the central, coloured scale (Fig. 40/3) gearbox settings from 1 to 100 are printed.

Example:

Wanted is a seed rate of 125 kg/ha.

1. At the first setting, the gearbox setting lever is brought to the "gearbox setting position 50" (it is possible to choose also any other gearbox setting figure). In this case a seed rate of 125 kg/ha has been calculated.
2. Align the seed rate 125 kg/ha (Fig. 40/A) and the "gearbox setting position 50" (Fig. 40/B) on the disc rule.
3. Now read off the disc rule the gearbox setting figure for the desired seed rate of 175 kg/ha (Fig. 40/C). In our example that is the "gearbox setting position 70" (Fig. 40/D).
4. Recheck the gearbox setting figure which you have determined by the disc rule as described under on page 42

After the calibration test:

1. Place the calibration crank (Fig. 38/1) into the transport retainer.
2. Get the left and right hand calibration trays into transport position.



Hint!

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

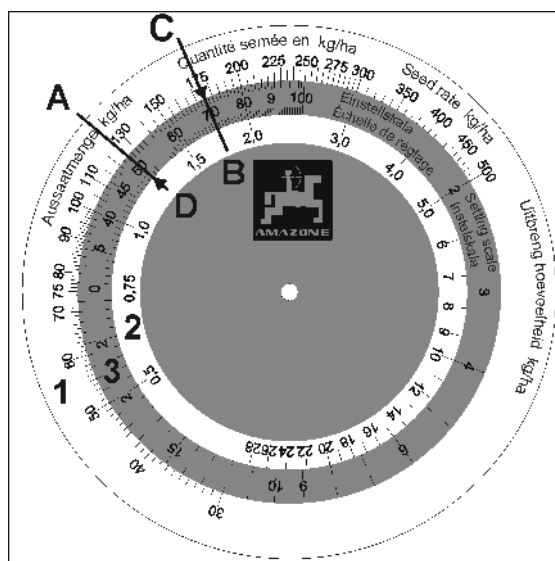


Fig. 40

9 Transport travel

Danger!

- When operating the machine observe the chapter "Safety advice for the operator", page 19.

When travelling on public roads and ways tractor and implement have to correspond to the national road transport and traffic rules and the applicable national accident prevention advice (in Germany the advice of the trade association).

The vehicle owner and operator are responsible for adhering to the legal traffic rules!.

In addition adhere to the advice in this chapter before and during any travelling.



Important!

Adhere to the prescription for accident prevention in public road traffic!

For transporting the machine the tractor front axle load must be at least 20 % of the tractor's net weight in order to ensure a sufficient steering.

When driving round bends note the wide protrusion and the gyrating mass of the machine.

Riding and transport on the machine is not allowed



Caution!

Prior to transport travel get the star wheel into transport position.

10 Operation of the machine



Danger!

- **When operating the machine observe the chapter "Safety advice for the operator", page 19.**
- **Observe the warning signs on the machine. The warning signs provide you with important hints for the safe operation of the machine. Adhering to these hints serves your safety!**

10.1 Filling the seed hopper

Fill the seed hopper from the sides and use appropriate tools to distribute the seed across the entire hopper.

10.2 Starting operation

When commencing operation:

1. Advise persons to leave the danger area.
2. Get the machine into operational position at the beginning of the field.
3. Get the star wheel into operational position.
4. Start driving.
5. After 100 m check and re-adjust if necessary:
 - o placement depth of the seed
 - o operational intensity of the harrow.



Hint!

Dressed seed is very poisonous to birds!

The seed must entirely be incorporated or covered with soil.

When lifting the coulters, avoid the after trickling of seed.

Immediately remove spilled seed!

10.3 Empty the seed hopper



Important!

Before cleaning, empty the seed hopper!

The emptying is carried out via 2 emptying units (metering units without seed wheels).

1. Prior to the emptying the seed hopper place collecting buckets below the openings of the emptying tubes (Fig. 40/1).
 2. Open shutter slides.
- The remaining seed is emptied via the emptying tubes into the collecting buckets.
3. When the hopper is empty, close the shutter slides again.

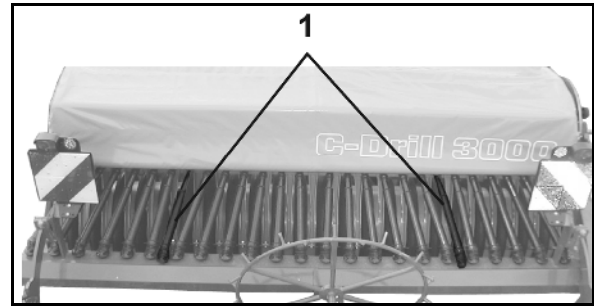


Fig. 41



Danger!

Bear a protective mask. Do not inhale poisonous dressing agent dust when removing the dressing agent dust with the aid of compressed air.



Hint!

Leave the bottom flaps opened when you do not need your seed drill for a long periods of time. When the bottom flaps remain closed, especially in winter, the danger exists that mice try to get into the seed box in their search for grain even when the seed box is empty. When the bottom flaps are closed, the mice might nibble at the bottom flaps and seed metering wheels.

11 Maintenance, repair and care



Danger!

When carrying out any maintenance, repair and care work, observe the chapter "Safety advice for the operator", on page 22.

The maintenance intervals are valid for normal strain. Under difficult conditions shorter maintenance intervals will be necessary.

Thoroughly clean the machine prior to prolonged operational breaks.

The work identified with "authorised workshop" must only be carried out in an authorised workshop.

After any maintenance-, repair- and cleaning work safety devices and guards must be fitted again.

11.1 Cleaning



Important!

- Monitor brake-, air and hydraulic hoses with special care.
- Never ever treat brake-, air- and hydraulic hoses with petrol, benzole, paraffin or mineral oils..
- After cleaning grease the machine, especially after cleaning with a high pressure cleaner / steam jet or fat soluble agents.
- Observe the legal prescriptions for the handling and disposal of cleaning agents.

Cleaning by using a high pressure cleaner / steam jet



Important!

- Implicitly observe the following points when using a high pressure cleaner / steam jet for cleaning:
 - Do not clean any electric parts.
 - Do not clean any chromium plated parts.
 - Never point with the cleaning jet of the cleaning nozzle of the high pressure cleaner / steam jet directly at grease or bearing points.
 - Always ensure a minimum distance between the cleaning jet of the high pressure cleaner or steam jet and the machine.
 - Observe the safety advice for operating with high pressure cleaners.

11.2 Checking the oil level inside the vario gearbox

Oil change not necessary!

Checking the oil level in the vario gearbox:

1. Park the machine on level ground.
2. The oil level must be visible inside the gauge glass (Fig. 42/1).
3. Check the gearbox for leaks.
4. In case of leaks have the vario gearbox repaired in an authorised workshop.
5. Take the necessary gearbox oil types from the table.
6. Fill the vario gearbox via the oil filler neck (Fig. 42/2) with gear oil up to the oil gauge glass (Fig. 42/1).
7. After filling cover the oil filler neck by using the cap (Fig. 42/2).

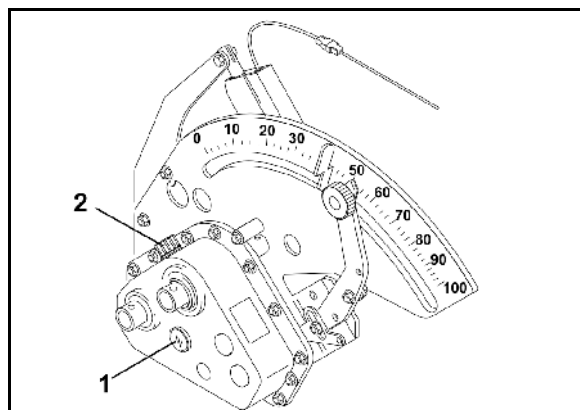


Fig. 42

Hydraulic oil types and filling amounts for the vario gearbox	
Total amount of filling:	0,9 litres
Gear oil (at random):	Wintershall Wintal UG22 WTL-HM (factory)
	Fuchs Renolin MR5 VG22

Table 3

11.3 Setting the bottom flaps

Incorrectly set bottom flaps (Fig. 26.2/1) may lead to inaccurate seed flow (over application) during sowing operation. Therefore, check the bottom flaps every six months or before every sowing season. This must be carried out with an empty seed box and empty seed housings.

1. Empty the seed box.
2. Bring bottom flap setting lever (Fig. 43/2) at the setting plate into position "1" of the quadrant plate and secure.
3. Check bottom flaps (Fig. 43/1) for easy operation.
4. Check whether the prescribed spacing of 0.1 mm to 0.5 mm (see Fig. 43) between the bottom flap (Fig. 43/1) and metering wheel (Fig. 43/2) of each metering wheel housing is maintained. For this, the metering wheel to be checked should be turned by hand on the seed shaft.
5. In case of deviations set the prescribed spacing at the spring tensioning screw (Fig. 43/3).

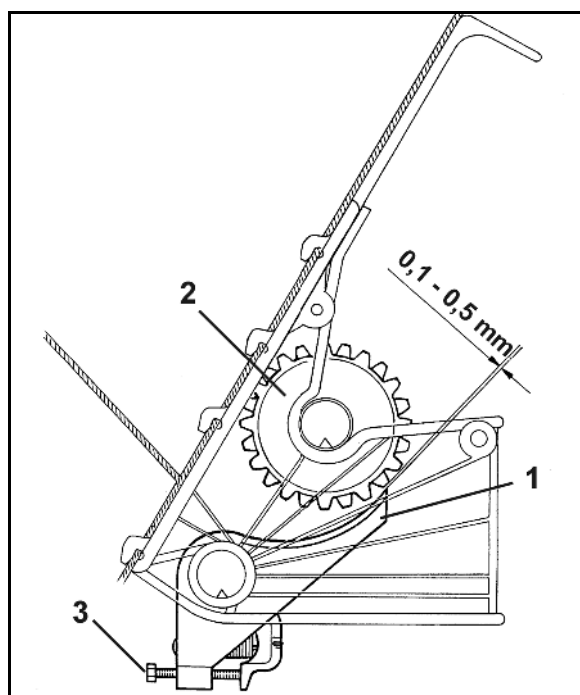


Fig. 43

11.4 Bolt torques

Thread	Spanner size [mm]	Torques [Nm] depending on bolt / nut quality		
		8.8	10.9	12.9
M 8	13	25	35	41
M 8x1		27	38	41
M 10	16 (17)	49	69	83
M 10x1		52	73	88
M 12	18 (19)	86	120	145
M 12x1,5		90	125	150
M 14	22	135	190	230
M 14x1,5		150	210	250
M 16	24	210	300	355
M 16x1,5		225	315	380
M 18	27	290	405	485
M 18x1,5		325	460	550
M 20	30	410	580	690
M 20x1,5		460	640	770
M 22	32	550	780	930
M 22x1,5		610	860	1050
M 24	36	710	1000	1200
M 24x2		780	1100	1300
M 27	41	1050	1500	1800
M 27x2		1150	1600	1950
M 30	46	1450	2000	2400
M 30x2		1600	2250	2700



AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

Postfach 51
D-49202 Hasbergen-Gaste
Germany

Tel.: + 49 (0) 5405 501-0
Telefax: + 49 (0) 5405 501-234
e-mail: amazone@amazone.de
[http:// www.amazone.de](http://www.amazone.de)



BBG Bodenbearbeitungsgeräte

Leipzig GmbH & Co.KG

Rippachtalstr. 10
D-04249 Leipzig
Germany

Branch factories in: D-27794 Hude • D-04249 Leipzig
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