

Operating Manual

AMAZONE

Deep loosener

TL 3001



35c154

MG3868
BAH0044-2 03.18

**Please read this operating
manual before initial operation.
Keep it in a safe place for
future use!**

en



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 instruction manual.

Leipzig-Plagwitz 1872. Rud. Sack.

Identification data

Please insert the identification data of the implement. The identification data are arranged on the rating plate.

Implement ID No.:
(10-digit)

Type:

TL 3001

Year of manufacture:

Basic weight (kg):

Permissible total weight (kg):

Maximum load (kg):

Manufacturer's address

AMAZONEN-WERKE

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Spare part orders

Spare parts lists are freely accessible in the spare parts portal at www.amazone.de.

Please send orders to your AMAZONE dealer.

Formalities of the operating manual

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Foreword

Foreword

Dear Customer,

You have chosen one of the quality products from the wide product range of AMAZONEN-WERKE, H. DREYER SE & Co. KG. We thank you for your trust in our products

On receiving the implement, check to see if it has been damaged during transport or if parts are missing. Using the delivery note, check that the implement has been delivered in full, including any special equipment ordered. Damage can only be rectified if problems are signalled immediately.

Before initial operation, read and observe this operating manual, and particularly the safety information. Only after careful reading will you be able to benefit from the full scope of your newly purchased implement.

Please ensure that all the implement operators have read this operating manual before they put the implement into operation.

Should you have problems or queries, please consult this operating manual or give us a call.

Regular maintenance and timely replacement of worn or damaged parts increases the lifespan of your implement.

User evaluation

Dear Reader

We update our operating manuals regularly. Your suggestions for improvement help us to create ever more user-friendly operating manuals. Send us your suggestions by fax.

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1	User information	7
1.1	Purpose of the document.....	7
1.2	Locations in the operating manual	7
1.3	Diagrams	7
2	General safety instructions.....	8
2.1	Obligations and liability	8
2.2	Representation of safety symbols.....	10
2.3	Organisational measures	11
2.4	Safety and protective equipment	11
2.5	Informal safety measures.....	11
2.6	User training.....	12
2.7	Safety measures in normal operation	13
2.8	Danger from residual energy	13
2.9	Maintenance and repair work, fault elimination	13
2.10	Design changes	14
2.10.1	Spare and wear parts and aids	15
2.11	Cleaning and disposal.....	15
2.12	User workstation	15
2.13	Warning symbols and other labels on the implement.....	16
2.13.1	Positions of warning symbols and other labels	18
2.14	Dangers in case of non-observance of the safety instructions	19
2.15	Safety-conscious working	19
2.16	Safety information for users	20
2.16.1	General safety instructions and accident prevention instructions.....	20
2.16.2	Mounted implements.....	23
2.16.3	Cleaning, maintenance and repair	24
3	Loading and unloading	25
4	Product description	26
4.1	Overview of assembly groups.....	26
4.2	Transportation equipment.....	27
4.3	Proper use.....	28
4.4	Danger areas and danger points	29
4.5	Rating plate and CE mark.....	30
4.6	Threaded cartridge.....	30
4.7	Technical data	31
5	Layout and function.....	32
5.1	Wing share	34
5.2	Soil guide share	34
5.3	Side guide plate extension.....	35
6	Initial commissioning	36
6.1	Checking the suitability of the tractor	37
6.1.1	Calculating the actual values for the total tractor weight, tractor axle loads and load capacities, as well as the minimum ballast	37
6.1.1.1	Data required for the calculation (attached implement).....	38
6.1.1.2	Calculation of the required minimum ballasting at the front $G_{V\ min}$ of the tractor to ensure steering capability	39
6.1.1.3	Calculation of the actual front axle load of the tractor $T_{V\ tat}$	39
6.1.1.4	Calculation of the actual total weight of the combined tractor and implement	39
6.1.1.5	Calculation of the actual rear axle load of the tractor $T_{H\ tat}$	39
6.1.1.6	Tractor tyre load capacity.....	39
6.1.1.7	Table	40

Table of Contents

6.2	Securing the tractor/implement against unintentional start-up and rolling	41
6.2.1	Adjusting the length of the universal joint shaft to the tractor (specialist workshop)	42
6.2.2	Fitting the hydraulic hose extension (option) and hose carrier (option).....	42
6.2.3	Fitting the side guide plate extensions	43
6.2.3.1	optional, only with KE/KX/KG 3000	43
6.2.3.2	optional, only with KE Super/KX/KG 3001	43
7	Coupling and uncoupling the implement	44
7.1	Coupling the subsoiler to the tractor	45
7.2	Coupling the rotary cultivator / harrow-combination on to the subsoiler	48
7.3	Calibrating the working position sensor (optional, seed drill combination)	50
8	Settings	51
8.1	Adjusting the working depth of the subsoiler	51
9	Transportation	53
9.1	Set the implement to road transport mode.....	55
10	Use of the implement	56
10.1	Work commencement	57
10.2	Turning at end of the field	57
11	Faults.....	58
11.1	Incorporation of large amounts of straw.....	58
12	Cleaning, maintenance and repair	59
12.1	Cleaning the implement	60
12.1.1	Parking the subsoiler for a long period of time.....	61
12.2	Visual inspection of the lower link pins.....	61
12.3	Screw tightening torques.....	61

1 User information

The User Information section provides information on use of the operating manual.

1.1 Purpose of the document

This operating manual

- describes the operation and maintenance of the implement.
- provides important information on safe and efficient handling of the implement.
- is a component part of the implement and should always be kept with the implement or the towing vehicle.
- must be kept in a safe place for future use.

1.2 Locations in the operating manual

All the directions specified in the operating manual are always seen in the direction of travel.

1.3 Diagrams

Instructions and responses

Activities to be carried out by the user are given as numbered instructions. Always keep to the order of the instructions. The reaction to the handling instructions is given by an arrow. Example:

1. Instruction 1
→ Reaction of the implement to handling instruction 1
2. Instruction 2

Lists

Lists without an essential order are shown as a list with bullets. Example:

- Point 1
- Point 2

Item numbers in diagrams

Numbers in round brackets refer to the item numbers in the diagrams. The first number refers to the diagram and the second number to the item.

Example: (Fig. 3/6):

- Figure 3
- Item 6

2 General safety instructions

This section contains important information on safe operation of the implement.

2.1 Obligations and liability

Comply with the instructions in the operating manual

Knowledge of the basic safety information and safety regulations is a basic requirement for safe handling and fault-free implement operation.

Obligations of the operator

The operator is obliged only to let those people work with/on the implement who

- are aware of the basic workplace safety information and accident prevention regulations.
- have been trained in working with/on the implement.
- have read and understood this operating manual.

The operator is obliged

- to keep all the warning symbols on the implement in a legible state.
- to replace damaged warning symbols.

If you still have queries, please contact the manufacturer.

Obligations of the user

Before starting work, anyone charged with working with/on the implement is obliged

- to comply with the basic workplace safety instructions and accident prevention regulations.
- to read and understand the "General safety information" section of this operating manual.
- to read the section "Warning symbols and other labels on the implement", Seite 16 of this operating manual and to follow the safety instructions of the warning symbols when operating the implement.
- to get to know the implement.
- to read the sections of this operating manual, important for carrying out your work.

If the user discovers that a function is not working properly, then they must eliminate this fault immediately. If this is not the task of the user or if the user does not possess the appropriate technical knowledge, then they should report this fault to their superior (operator).

Risks in handling the implement

The implement has been constructed to the state-of-the art and the recognised rules of safety. However, operating the implement may cause risks and restrictions to

- the health and safety of the user or third parties,
- the implement,
- other property.

Only use the implement

- for the purpose for which it was intended.
- in a perfect state of repair.

Eliminate any faults immediately which could impair safety.

Guarantee and liability

Our "General conditions of sales and delivery" are always applicable. These shall be available to the operator, at the latest on the completion of the contract. Guarantee and liability claims for damage to people or property will be excluded if they can be traced back to one or more of the following causes:

- Improper use of the implement.
- Improper installation, commissioning, operation and maintenance of the implement.
- Operation of the implement with defective safety equipment or improperly attached or non-functioning safety equipment.
- Non-compliance with the instructions in the operating manual regarding commissioning, operation and maintenance.
- Unauthorised design changes to the implement.
- Insufficient monitoring of implement parts which are subject to wear.
- Improperly executed repairs.
- Disasters due to the effects of foreign objects and force majeure.

2.2 Representation of safety symbols

Safety instructions are indicated by the triangular safety symbol and the highlighted signal word. The signal word (DANGER, WARNING, CAUTION) describes the severity of the risk, and carries the following meaning:

**DANGER**

Indicates a direct threat at high risk which will result in death or most serious bodily harm (loss of limbs or long-term harm), should it not be prevented.

If the instructions are not followed, then this will result in immediate death or serious physical injury.

**WARNING**

Indicates a medium risk, which could result in death or (serious) physical injury if not avoided.

If the instructions are not followed, then this may result in death or serious physical injury.

**CAUTION**

Indicates a low risk which could cause minor or medium level physical injury or damage to property if not avoided.

**IMPORTANT**

Indicates an obligation to special behaviour or an activity required for proper implement handling.

Non-compliance with these instructions can cause faults on the implement or disturbance to the environment.

**NOTE**

Indicates handling tips and particularly useful information.

These instructions will help you to use all the functions of your implement in the best way possible.

2.3 Organisational measures

The operator must provide the necessary personal protective equipment as per the information provided by the manufacturer of the crop protection agent to be used, such as:

- Safety glasses
- Protective shoes
- Chemical-resistant overalls
- Skin protection, etc.



The operating manual

- must always be kept where the implement is operated
- must always be easily accessible to the operator and maintenance personnel.

Check all the available safety equipment regularly.

2.4 Safety and protective equipment

Before starting up the implement each time, all the safety and protection equipment must be properly attached and fully functional. Check all safety and protection equipment regularly.

Faulty safety equipment

Faulty or disassembled safety and protection equipment can lead to dangerous situations.

2.5 Informal safety measures

As well as all the safety information in this operating manual, comply with the general, national regulations pertaining to accident prevention and environmental protection.

When driving on public roads and routes you should comply with the statutory road traffic regulations.

2.6 User training

Only those people who have been trained and instructed may work with/on the implement. The operator must clearly specify the responsibilities of the people charged with operation and maintenance work.

People being trained may only work with/on the implement under the supervision of an experienced person.

Person Activity	Person specially trained for the activity ¹⁾	Trained person ²⁾	Person with specialist training (specialist workshop) ³⁾
Loading/Transport	X	X	X
Initial commissioning	—	X	—
Set-up, tool installation	—	—	X
Operation	—	X	—
Maintenance	—	—	X
Troubleshooting and fault elimination	—	X	X
Disposal	X	—	—

Legend: X..permitted —..not permitted

¹⁾ A person who can assume a specific task and who can carry out this task for an appropriately qualified company.

²⁾ Instructed persons are those who have been instructed in their assigned tasks and in the possible risks in the case of improper behaviour, have been trained if necessary, and have been informed about the necessary protective equipment and measures.

³⁾ People with specialist technical training shall be considered as a specialist. Due to their specialist training and their knowledge of the appropriate regulations, they can evaluate the work with which they have been charged and detect possible dangers.

Comment:

A qualification equivalent to specialist training can be obtained from several years' experience in the relevant field.



If maintenance and repair work on the implement is additionally marked "Workshop work", only a specialist workshop may carry out such work. The personnel of a specialist workshop shall possess the appropriate knowledge and suitable aids (tools, lifting and support equipment) for carrying out the maintenance and repair work on the implement in a way which is both appropriate and safe.

2.7 Safety measures in normal operation

Only operate the implement if all the safety and protection equipment is fully functional.

Check the implement at least once a day for visible damage and check the function of the safety and protection equipment.

2.8 Danger from residual energy

Note that there may be residual mechanical, hydraulic, pneumatic and electrical/electronic energy on the implement.

Use appropriate measures to inform the operating personnel. You can find detailed information in the relevant sections of this operating manual.

2.9 Maintenance and repair work, fault elimination

Carry out prescribed setting, maintenance and inspection work in good time.

Secure all media such as compressed air and the hydraulic system against unintentional start-up.

Carefully fix and secure larger assemblies to lifting gear when carrying out replacement work.

Check all the bolted connections for tightness. On completion of the maintenance work, check the function of the safety devices.

2.10 Design changes

You may make no changes, expansions or modifications to the implement without the authorisation of AMAZONEN-WERKE. This also applies when welding support parts.

Any expansion or modification work shall require the written approval of AMAZONEN-WERKE. Only use modification and accessory parts approved by AMAZONEN-WERKE so that the type approval, for example, remains valid in accordance with national and international regulations.

Vehicles with an official type approval or with equipment connected to a vehicle with a valid type approval or approval for road transport according to the German road traffic regulations must be in the state specified by the approval.



WARNING

Risk of crushing, cutting, being trapped or drawn in, or impact through the failure of support parts.

It is strictly forbidden to

- Drill holes in the frame or the chassis.
- Increasing the size of existing holes on the frame or the chassis.
- Welding on load-bearing parts.

2.10.1 Spare and wear parts and aids

Immediately replace any implement parts which are not in a perfect state.

Use only genuine AMAZONE spare and wear parts or the parts cleared by AMAZONEN-WERKE so that the operating permit retains its validity in accordance with national and international regulations. If you use wear and spare parts from third parties, there is no guarantee that they have been designed and manufactured in such a way as to meet the requirements placed on them.

AMAZONEN-WERKE shall accept no liability for damage caused by the use of non-approved spare and wear parts or aids.

2.11 Cleaning and disposal

Handle and dispose of any materials used carefully, in particular

- when carrying out work on lubrication systems and equipment and
- when cleaning using solvents.

2.12 User workstation

The implement must be operated by only one person from the driver's seat of the tractor.

2.13 Warning symbols and other labels on the implement



Always keep all the warning symbols of the implement clean and in a legible state. Replace illegible warning symbols. Ask your dealer for warning signs stating the relevant order number (e.g. MD 075).

Warning symbols – structure

Warning symbols indicate danger areas on the implement and warn against residual dangers. At these points, there are permanent or unexpected dangers.

A warning symbol consists of two fields:



Field 1

is a symbol describing the danger, surrounded by triangular safety symbol.

Field 2

is a symbol showing how to avoid the danger.

Warning symbols – explanation

The column **Order number and explanation** provides an explanation of the neighbouring warning symbol. The description of the warning symbols is always the same and specifies, in the following order:

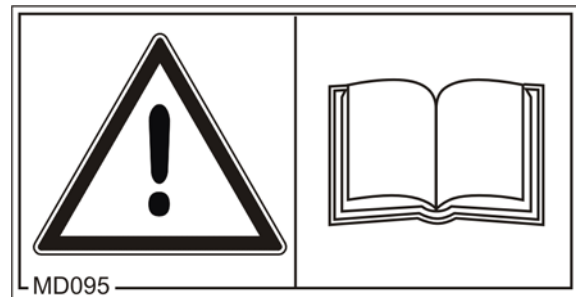
1. A description of the danger.
For example: risk of cutting
2. The consequence of non-compliance with the risk avoidance instructions.
For example: causes serious injuries to fingers or hands.
3. Risk avoidance instructions.
For example: only touch implement parts when they have come to a complete standstill.

Order number and explanation

Warning symbols

MD095

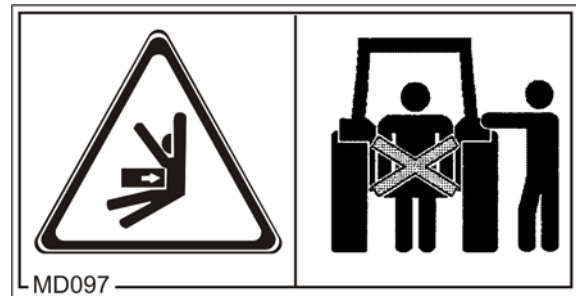
Read and follow the operating manual and safety information before starting up the implement!


MD 097

Risk of crushing the entire body by entering/remaining in the lifting area of the three-point linkage when the three-point hydraulic system is operated!

Causes serious, potentially fatal injuries anywhere on the body.

- It is prohibited to stand within the lifting zone of the three-point linkage when operating the three-point hydraulic system.
- Actuate the operating controls for the tractor's three-point hydraulic system
 - only from the designated workstation.
 - under no circumstances if you are in the lifting area between the tractor and implement.



2.13.1 Positions of warning symbols and other labels

Warning symbols

The following diagrams show the arrangement of the warning symbols on the implement.

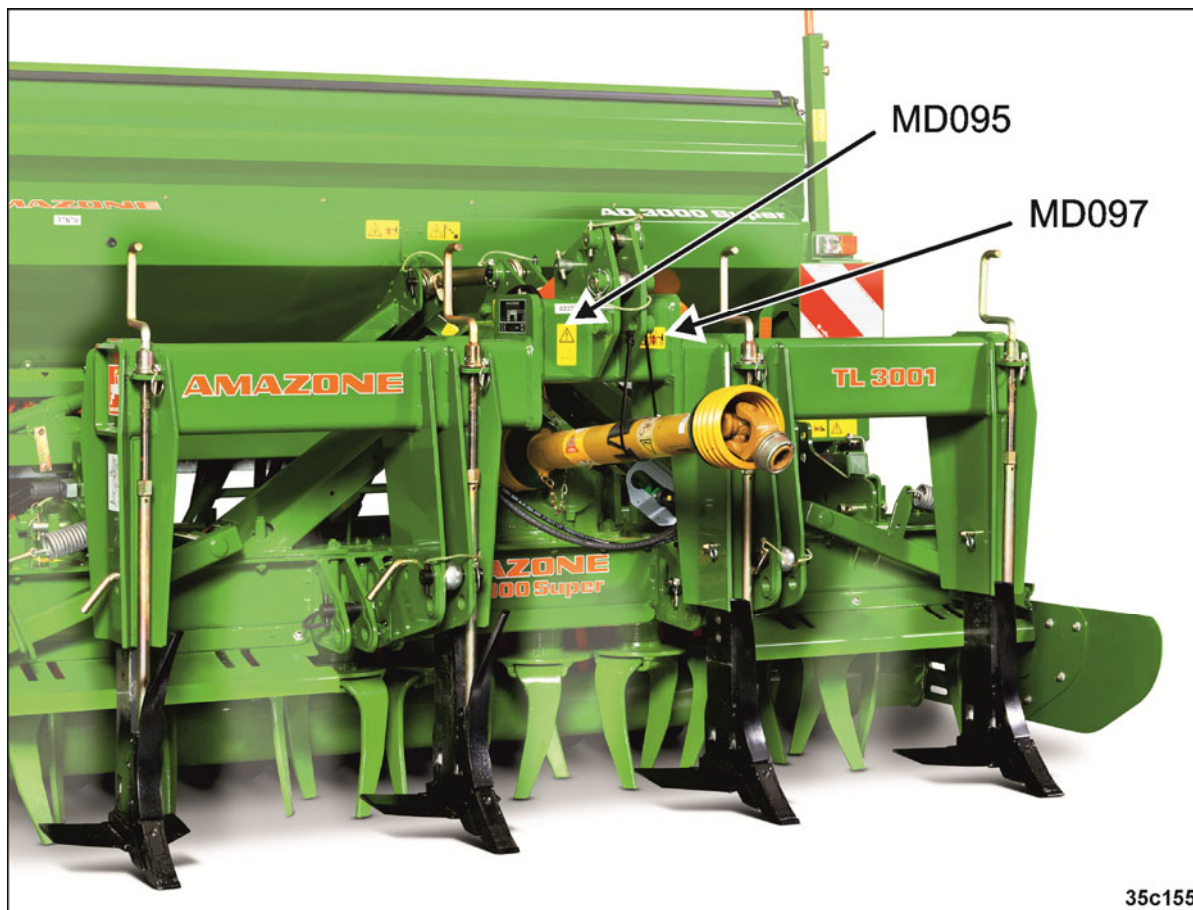


Fig. 1

2.14 Dangers in case of non-observance of the safety instructions

Non-compliance with the safety information

- can pose both a danger to people and to the environment and implement.
- Can lead to the loss of all warranty claims.

In particular, non-compliance with the safety information could pose the following risks:

- Risk to people from working in an unsafe working environment.
- Failure of important implement functions.
- Failure of prescribed methods of maintenance and repair.
- Risk to people through mechanical and chemical influences.
- Risk to the environment through leakage of hydraulic fluid.

2.15 Safety-conscious working

Besides the safety information in this operating manual, the generally applicable national workplace safety and accident prevention regulations are binding.

Comply with the accident prevention instructions on the warning symbols.

When driving on public roads and routes, comply with the appropriate statutory road traffic regulations.

2.16 Safety information for users



WARNING

Risk of crushing, cutting, being trapped or drawn in, or impact through inadequate roadworthiness and operational safety.

Before starting up the implement and the tractor, always check their traffic and operational safety.

2.16.1 General safety instructions and accident prevention instructions

- In addition to these instructions, also comply with the generally valid national and safety and accident prevention regulations!
- The warning and information signs attached on the implement provide important instructions for safe operation of the implement. Compliance with these instructions is essential for your safety!
- Before moving off and starting up the implement, check the immediate area of the implement (children). Ensure that you can see clearly.
- It is forbidden to ride on the implement or use it as a means of transport!
- Drive in such a way that you always have full control over the tractor with the attached implement.
In so doing, take your personal abilities into account, as well as the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the connected or coupled implement.

Coupling and uncoupling the implement

- Only connect and transport the implement with tractors suitable for the task.
- When coupling implements to the tractor's three-point hydraulic system, the attachment categories of the tractor and the implement must always be the same!
- Connect the implement to the prescribed equipment in accordance with the specifications.
- When coupling implements to the front or the rear of the tractor, the following may not be exceeded:
 - The permissible total tractor weight
 - The permissible tractor axle loads
 - The permissible load capacities of the tractor tyres
- Secure the tractor and the implement against unintentional rolling before coupling or uncoupling the implement.
- It is forbidden for people to stand between the implement to be coupled and the tractor while the tractor is moving towards the implement.
Any helpers may only act as guides standing next to the vehicles, and may only move between the vehicles when both are at a standstill.
- Before connecting the implement to or disconnecting the implement from the tractor's three-point hydraulic system, secure the operating

lever of the tractor hydraulic system so that unintentional raising or lowering is prevented.

- When coupling and uncoupling implements, move the support equipment (if available) to the appropriate position (stability).
- When actuating the support equipment, there is a danger of injury from contusion and cutting points!
- Be particularly careful when coupling the implement to the tractor or uncoupling it from the tractor! There are nip and shear points in the area of the coupling point between the tractor and the implement.
- It is forbidden to stand between the tractor and the implement when actuating the three-point hydraulic system.
- Coupled supply lines:
 - must give without tension, bending or rubbing on all movements when travelling round corners.
 - must not chafe against other parts.
- The release ropes for quick action couplings must hang loosely and may not release themselves when lowered.
- Also ensure that uncoupled implements are stable!

Use of the implement

- Before starting work, ensure that you understand all the equipment and actuation elements of the implement and their function. There is no time for this when the implement is already in operation!
 - Wear tight-fitting clothing! There is an increased risk of loose clothing getting caught or entangled on drive shafts!
 - Only place the implement in service after all protective devices have been attached and are in protective position!
 - Comply with the maximum load of the connected implement and the permissible axle and drawbar loads of the tractor. If necessary, drive only with a partially filled hopper.
 - It is forbidden to stand in the working area of the implement.
 - It is forbidden to stand in the turning and swivel range of the implement.
 - There are crushing and shearing hazards on implement parts actuated by external force (e.g. hydraulically)!
 - Only actuate implement parts actuated by external force if personal are maintaining an adequate safety distance to the implement!
-
- Secure the tractor against unintentional start-up and rolling, before you leave the tractor.
For this:

General safety instructions

- Lower the implement onto the ground.
- Apply the parking brake.
- Switch off the tractor engine.
- Remove the ignition key.

Implement transportation

- When using public roads, national road traffic regulations must be observed.
- Before moving off, check:
 - the correct connection of the supply lines,
 - the lighting system for damage, function and cleanliness,
 - that the brake and hydraulic equipment shows no visible signs of defect,
 - that the parking brake is completely released,
 - the functioning of the brake system.
- Ensure that the tractor has sufficient steering and braking power. Any implements and front/rear weights connected to the tractor influence the driving behaviour and the steering and braking power of the tractor.
- If necessary, use front weights.
The front tractor axle must always be loaded with at least 20 % of the empty tractor weight, in order to ensure sufficient steering power.
- Always fix the front or rear weights to the intended fixing points according to regulations.
- Comply with the maximum load of the connected implement and the permissible axle and drawbar loads of the tractor.
- The tractor must guarantee the prescribed brake delay for the loaded vehicle combination (tractor plus connected implement).
- Check the brake power before moving off.
- When turning corners with the implement coupled, take the wide sweep and centrifugal mass of the implement into account.
- Before moving off, ensure sufficient side locking of the tractor lower links, when the implement is fixed to the three-point hydraulic system or lower links of the tractor.
- Before road transport, move all the swivel implement parts to the transport position.
- Before road transport, secure all the swivel implement parts in the transport position against risky position changes. Use the transport locks intended for this.
- Before road transport, secure the operating lever of the three-point hydraulic system against unintentional raising or lowering of the coupled implement.
- Check that the transport equipment, e.g. lighting, warning equipment and protective equipment, is correctly mounted on the implement.
- Before road transport, carry out a visual check that the upper and lower link pins are firmly fixed with the linch pin against unintentional release.

- Adjust your forward speed to the prevailing conditions.
- Before driving downhill, switch to a low gear.
- Before road transport, always switch off the independent wheel braking (lock the pedals).

2.16.2 Mounted implements

- When attaching to the three-point linkage, the attachment categories on tractor and implement must be compatible or an adapter must be used!
- Take note of the manufacturer's instructions.
- Before attaching implements to or removing them from the three-point suspension, shift the operating equipment to a position in which unintended raising or lowering is impossible.
- There is a danger of crushing or shearing injury around the three-point linkage.
- The implement may be transported and towed only by the tractors intended for this purpose.
- There is a risk of injury when implements are coupled to and uncoupled from the tractor.
- Do not step between tractor and implement when operating the external control for the three-point attachment!
- There is a danger of crushing and shearing injury when operating the support devices.
- When mounting implements at the front or rear of a tractor, do not exceed
 - The permissible total tractor weight
 - The permissible tractor axle loads
 - The approved load capacities of the tractor tyres
- Observe the max. working load of the mounted implement and the permissible axle loads of the tractor!
- Always ensure that the tractor lower links are adequately locked against sideways movement before transporting the implement.
- The operating lever for the tractor lower links must be secured against lowering when the implement is being towed on the road.
- Shift all equipment into the transport position before travelling on the road.
- Any mounted implements and ballast weights affect the handling, steering and braking of the tractor!
- The front tractor axle must always be loaded with at least 20 % of the empty tractor weight, in order to ensure sufficient steering power. Apply front weights if necessary!
- Only ever carry out any servicing, maintenance or cleaning operations or remedy malfunctions with the ignition key removed.
- Leave safety devices attached and always position them in the protective position.

2.16.3 Cleaning, maintenance and repair

- Only carry out cleaning, maintenance and repair work on the implement when:
 - the drive is switched off.
 - the tractor engine is at a standstill.
 - the ignition key has been removed.
 - the implement plug has been disconnected from the on-board computer!
- Regularly check the nuts and bolts for a firm seat and retighten them as necessary.
- Secure the raised implement and/or raised implement parts against unintentional lowering before performing any cleaning, maintenance or repair work on the implement!
- When replacing work tools with blades, use suitable tools and gloves.
- Dispose of oils, greases and filters in the appropriate way.
- Disconnect the cable to the tractor generator and battery, before carrying out electrical welding work on the tractor and on attached implements.
- Spare parts must meet at least the specified technical requirements of AMAZONEN-WERKE! This is ensured through the use of original AMAZONE spare parts.

3 Loading and unloading

Loading by crane

The icon (Fig. 2) marks the location at which the chain for lifting the implement with a crane is to be secured.

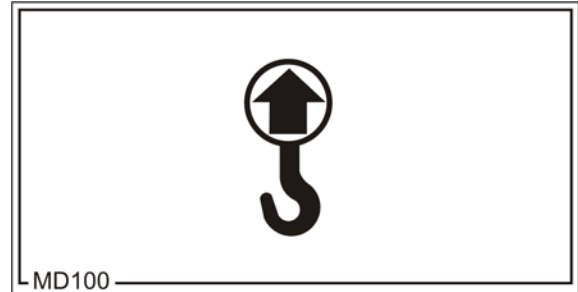
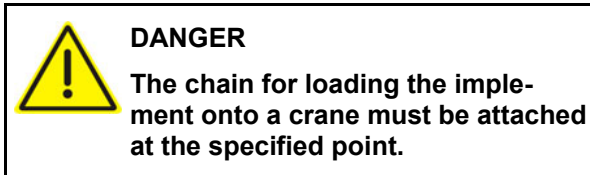
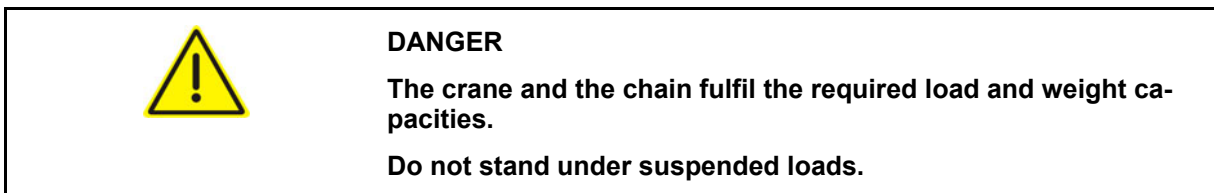


Fig. 2



1. Attach a chain at the specified points on the implement (see Fig. 3).
2. Lift the implement with a crane to load onto a transport vehicle.
3. Secure the implement properly on the transport vehicle.

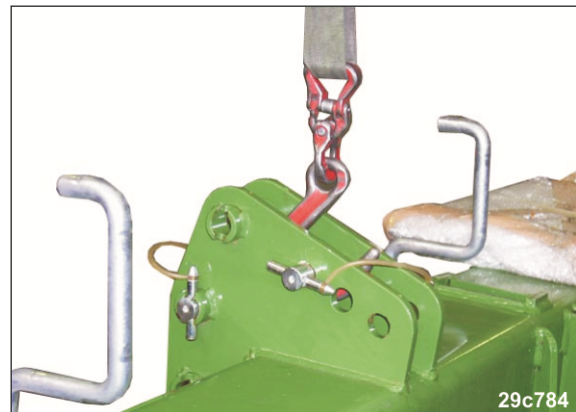


Fig. 3

4 Product description

This section:

- provides a comprehensive overview of the implement's structure.
- provides the names of the individual modules and controls.

If possible, read this section when actually at the implement. This helps you to understand the implement better.

4.1 Overview of assembly groups

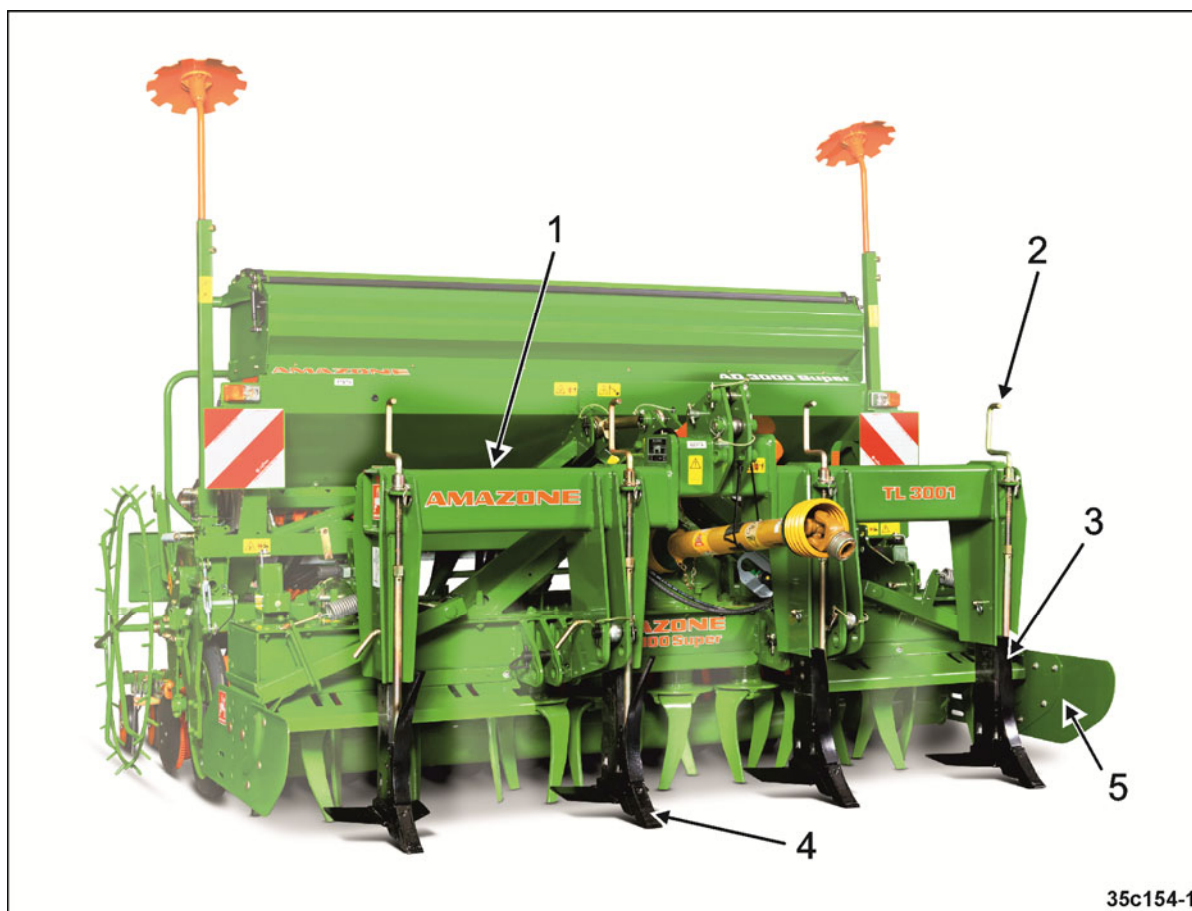


Fig. 4

Fig. 4/...

- | | |
|---|--------------------------------|
| (1) Main frame | (3) Soil guide share |
| (2) Crank for setting the working depth | (4) Wing coulter |
| | (5) Side guide plate extension |

4.2 Transportation equipment

The subsoiler may only be transported on public roads and tracks in combination with the rotary cultivator / harrow with the rear roller, with or without mounted or pack-top seed drill attached.

The traffic safety equipment is attached to the mounted or pack top seed drill. For combinations without the seed drill, the traffic safety equipment is attached to the rotary cultivator / harrow.

You can find information about the traffic safety equipment in the instruction manual for your seed drill or your rotary cultivator / harrow.

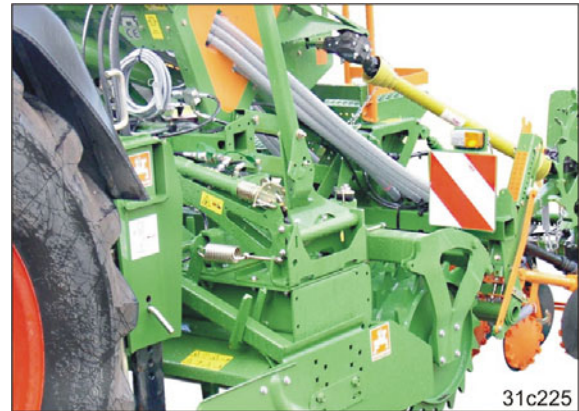


Fig. 5



Fig. 6

4.3 Proper use

The TL deep loosener

- Is designed for soil tillage in combination with the AMAZONE rotary cultivator / harrow with roller and with or without mounted or pack top seed drill.
- is suited for the initial tillage and stubble working.
- is coupled to the tractor using the tractor three-point hitch and controlled by an operator.

You will find information on driving across or up and down slopes in the instruction manual for your seed drill or rotary cultivator / harrow.

"Intended use" also covers:

- Compliance with all the instructions in this operating manual.
- Adherence of inspection and maintenance work.
- Exclusive use of original AMAZONE spare parts.

Other uses to those specified above are forbidden and shall be considered as improper.

For any damage resulting from improper use

- the operator bears the sole responsibility.
- AMAZONEN-WERKE accepts no liability.

4.4 Danger areas and danger points

The danger area is the area around the implement in which people can be caught:

- by work movements made by the implement and its tools.
- by materials or foreign bodies thrown out of the implement.
- by tools rising or falling unintentionally.
- by unintentional rolling of the tractor and the implement.

Within the implement danger area, there are danger points with permanent or unexpected risks. Warning symbols indicate these danger points and warn against residual dangers, which cannot be eliminated for construction reasons. Here, the special safety regulations of the appropriate section shall be valid.

No-one may stand in the implement danger area:

- as long as the tractor engine is running with a connected universal joint shaft/hydraulic system.
- as long as the tractor and implement are not protected against unintentional start-up and running.

The operating person may only move the implement or switch or drive the tools from the transport position to the working position or vice-versa when there is no-one in the implement danger area.

Danger points exist:

- between the tractor and the implement, particularly during coupling and uncoupling operations.
- in the area of moving parts.
- by climbing onto the implement.
- underneath raised, unsecured implements or parts of implements.

4.5 Rating plate and CE mark

The diagram shows the position (Fig. 7/1) of the rating plate and the CE mark on the implement.

The CE marking on the indicates compliance with the stipulations of the valid EU directives.

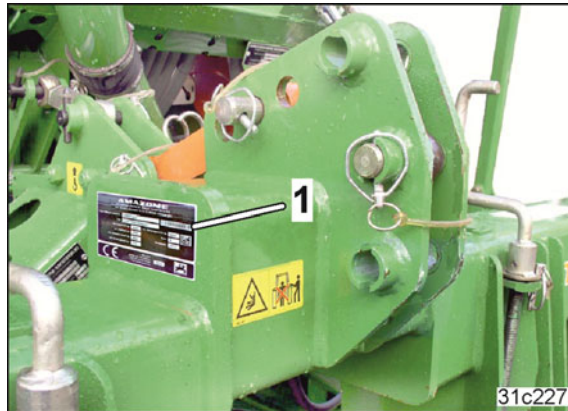


Fig. 7

The following information is specified on the rating plate and the CE mark:

- (1) Implement number
- (2) Vehicle identification number
- (3) Product
- (4) Permissible technical implement weight
- (5) Model year
- (6) Year of manufacture



Fig. 8

4.6 Threaded cartridge

Fig. 9/...

1. Threaded cartridge
To store the operating manual in



Fig. 9

4.7 Technical data

Technical data		TL 3001 deep loosener
Working width	[m]	3.0
Transport width	[m]	3.0
Number of wing shares		4
Width of wing shares	[mm]	300 or 600 (optional)
Basic weight	KG	530
Tractor power requirement for combinations including pack-top seed drill		from 88 kW (120 HP)

Technical data for calculating the tractor weights and tractor axle loads (see Seite 38)

3-m combination	Total weight G_H [kg]	Distance d [m]
<ul style="list-style-type: none"> TL 3001 deep loosener KG rotary cultivator KW wedge ring roller 	2185	1.05
<ul style="list-style-type: none"> TL 3001 deep loosener KG rotary cultivator KW wedge ring roller AD top pack seed drill with RoTeC coulters (full seed hopper) 	2970	1.33

5 Layout and function

The following section provides information on the implement structure and the functions of the individual components.



Fig. 10

The subsoiler is used in agricultural fields to cultivate the soil.

The subsoiler is used

- with a rotary cultivator / harrow and rear roller
- as part of a cultivation combination
 - with a rotary cultivator / harrow and rear roller and
 - with a mounted or pack-top seed drill.

The TL subsoiler allows for no-till cultivation methods even in heavy trash conditions.

The widely breaking up wing shares allow for large distances between the tools and result blockage free operation even where large amounts of straw prevail.

The compact, close-coupled design only slightly increases the required lifting power of the sowing combination.

Stubble working – deep loosening - sowing

For the initial stubble working pass, the deep loosener and rotary cultivator / harrow should operate only at a working depth of 6 to 8 cm.

In the following second pass deep loosening of 15 to 25 cm, deep straw mix and the removal of volunteer grain and weeds is then carried out.

For sowing a deep loosening is not required.

Incorporation of straw and sowing in one operational pass

Where short crop rotations do not allow for prior stubble cultivation, the subsoiler operates at a working depth of 15 to 25 cm in one pass in combination with the rotary cultivator / harrow, wedge ring roller and pack top seed drill with RoTeC blades.

5.1 Wing share

The subsoiler is equipped with 300 mm-wide wing shares (Fig. 11/1).

At large working depths of between 15 and 25 cm, the soil is loosened across the entire working width. The soil between the wing shares breaks open diagonally towards the surface and is also loosened.

The 600 mm wide wing shares (Fig. 11/2, option) should only be used for a shallow working depth of between 5 and 10 cm.

With the use of the 600 mm wide wing shares for stubble working the roots are cut across the entire working width and the soil is broken up.

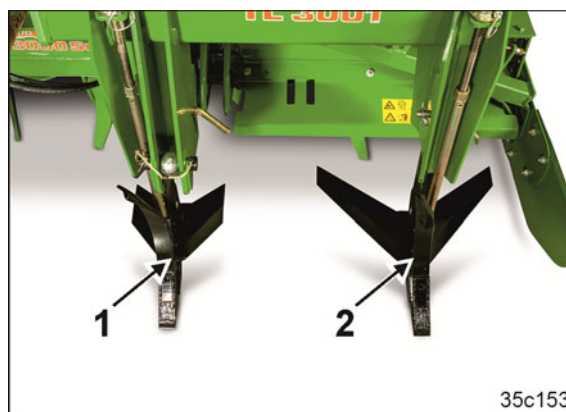


Fig. 11



For mulch sowing winter wheat after late crop like sugar beet or maize, we recommend to operate the deep loosener with the 300 mm wide wing coulter.

5.2 Soil guide share

The soil guide shares (Fig. 12/1) provide rising soil ridges and eject them diagonal to the front towards the machine centre. In this way the soil-straw mixture will not escape from the operational range of the combination.

Where straw prevails the soil guide shares improve the mixing effect in stubble working.

The arising soil ridges clean the shares from long straw and reduce danger of blocking.



Fig. 12

5.3 Side guide plate extension

The side guide plates of the rotary cultivator / harrow prevent the worked soil from escaping from the working area of the rotary cultivator / harrow.

The side plate extensions hold back the worked soil within the subsoiler's working area.

Fig. 13/...

(1) optional, only with KE/KX/KG 3000



Fig. 13

Fig. 14/...

(1) optional, only with KE Super/KX/KG 3001

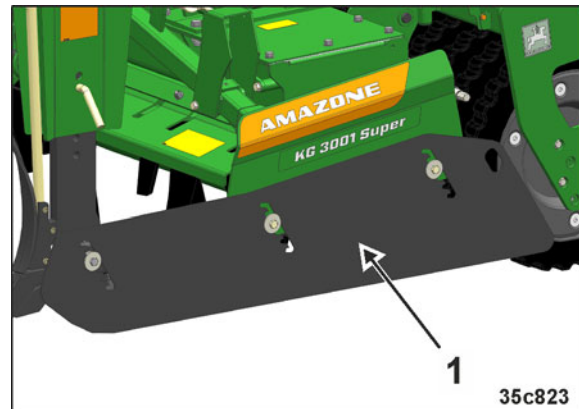


Fig. 14

6 Initial commissioning

This section contains information

- on initial operation of your implement.
- on checking how you may couple the implement to your tractor.



- Before operating the implement for the first time the operator must have read and understood the operating manual.
- Take heed of section "Safety information for users", from Seite 20 onwards on
 - Coupling and uncoupling the implement
 - Implement transportation
 - Use of the implement
- Only couple and transport the implement to/with a tractor which is suitable for the task.
- The tractor and implement must meet the national road traffic regulations.
- The operator and the user shall be responsible for compliance with the statutory road traffic regulations.



WARNING

Risk of contusions, cutting, catching, drawing in and knocks in the area of hydraulically or electrically actuated components.

Do not block the operator controls on the tractor which are used for hydraulic and electrical movements of components, e.g. folding, swivelling and pushing movements. The movement must stop automatically when you release the appropriate control. This does not apply to equipment movements that:

- are continuous or
- are automatically locked or
- require a float position or pressure position due to their function

6.1 Checking the suitability of the tractor



WARNING

Danger of breaking during operation, insufficient stability and insufficient tractor steering and braking power on improper use of the tractor!

- Check the suitability of your tractor before you attach or hook up the implement.
You may only connect the implement to tractors suitable for the purpose.
- Carry out a brake test to check whether the tractor achieves the required braking delay with the implement connected.

Requirements for the suitability of a tractor are, in particular:

- the permissible total weight
- the permissible axle loads
- the permissible drawbar load at the tractor's coupling point
- the permissible tyre load capacity of the mounted tyres
- the permissible trailer load must be sufficient

You can find this data on the rating plate or in the vehicle documentation and in the tractor operating manual.

The front axle of the tractor must always be subjected to at least 20 % of the empty weight of the tractor.

The tractor must achieve the brake delay specified by the tractor manufacturer, even with the implement connected.

6.1.1 Calculating the actual values for the total tractor weight, tractor axle loads and load capacities, as well as the minimum ballast



The permissible total tractor weight, specified in the vehicle documentation, must be greater than the sum of the

- tractor empty weight,
- ballast weight and
- total weight of the mounted implement or drawbar load of the hitched implement



This notice applies only to Germany:

If, having tried all possible alternatives, it is not possible to comply with the axle loads and/or the permissible total weight, then a survey by an officially recognised motor traffic expert can, with the approval of the tractor manufacturer, be used as a basis for the responsible authority to issue an exceptional approval according to § 70 of the German Regulations Authorising the Use of Vehicles for Road Traffic and the required approval according to § 29, paragraph 3 of the German Road Traffic Regulations.

6.1.1.1 Data required for the calculation (attached implement)

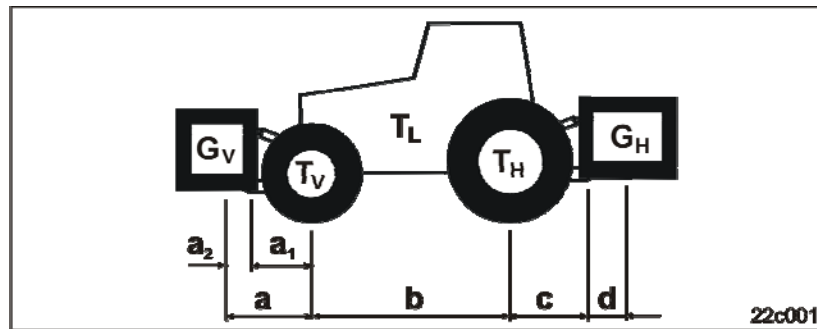


Fig. 15

T_L	KG	Tractor empty weight	See tractor operating manual or vehicle documentation
T_V	KG	Front axle load of the empty tractor	
T_H	KG	Rear axle load of the empty tractor	
G_H	KG	Total weight of rear-mounted implement or rear ballast	See section "Technical data", Seite 31, or rear ballast
G_V	KG	Total weight of front-mounted implement or front ballast	See technical data for front-mounted implement or front ballast
a	[m]	Distance between the centre of gravity of the front mounting implement or the front weight and the centre of the front axle (total $a_1 + a_2$)	See technical data of tractor and front implement mounting or front weight or measurement
a_1	[m]	Distance from the centre of the front axle to the centre of the lower link connection	See tractor operating manual or measurement
a_2	[m]	Distance between the centre of the lower link connection point and the centre of gravity of the front-mounted implement or front ballast (centre of gravity distance)	See technical data of front implement mounting or front weight or measurement
b	[m]	Tractor wheel base	See tractor operating manual or vehicle documents or measurement
c	[m]	Distance between the centre of the rear axle and the centre of the lower link connection	See tractor operating manual or vehicle documents or measurement
d	[m]	Distance between the centre of the lower link connection point and the centre of gravity of the rear-mounted implement or rear ballast (centre of gravity distance)	See section "Technical data", Seite 31

6.1.1.2 Calculation of the required minimum ballasting at the front $G_{V \min}$ of the tractor to ensure steering capability

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

Enter the numeric value for the calculated minimum ballast $G_{V \min}$, required on the front side of the tractor, in the table (section 6.1.1.7).

6.1.1.3 Calculation of the actual front axle load of the tractor $T_{V \text{ tat}}$

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

Enter the numeric value for the calculated actual front axle load and the approved tractor front axle load specified in the tractor operating manual in the table (section 6.1.1.7).

6.1.1.4 Calculation of the actual total weight of the combined tractor and implement

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

Enter the numeric value for the calculated actual total weight and the approved total tractor weight specified in the tractor operating manual in the table (section 6.1.1.7).

6.1.1.5 Calculation of the actual rear axle load of the tractor $T_{H \text{ tat}}$

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

Enter the numeric value for the calculated actual rear axle load and the approved tractor rear axle load specified in the tractor operating manual in the table (section 6.1.1.7).

6.1.1.6 Tractor tyre load capacity

Enter the double value (two tyres) of the approved load capacity (see, for example, tyre manufacturer's documentation) in the table (section 6.1.1.7).

6.1.1.7 Table

	Actual value according to calculation	Approved value according to tractor operating manual	Double approved load capacity (two tyres)
Minimum ballast front/rear	<div style="border: 1px solid black; padding: 5px; display: inline-block;">/ kg</div>	--	--
Total weight	<div style="border: 1px solid black; padding: 5px; display: inline-block;">kg</div>	\leq <div style="border: 1px solid black; padding: 5px; display: inline-block;">kg</div>	--
Front axle load	<div style="border: 1px solid black; padding: 5px; display: inline-block;">kg</div>	$($ <div style="border: 1px solid black; padding: 5px; display: inline-block;">kg</div> \leq <div style="border: 1px solid black; padding: 5px; display: inline-block;">kg</div>	
Rear axle load	<div style="border: 1px solid black; padding: 5px; display: inline-block;">kg</div>	$($ <div style="border: 1px solid black; padding: 5px; display: inline-block;">kg</div> $($ <div style="border: 1px solid black; padding: 5px; display: inline-block;">kg</div>	



- You can find the approved values for the total tractor weight, axle loads and tyre loads in the tractor registration papers.
- The actual calculated values must be less than or equal to (\leq) the permissible values!



WARNING

Risk of contusions, cutting, catching, drawing in and impact through insufficient stability and insufficient tractor steering and brake power.

It is forbidden to couple the implement to the tractor used as the basis for calculation, if

- one of the actual, calculated values is greater than the approved value.
- there is no front weight (if required) attached to the tractor for the minimum front ballast ($G_{V \min}$).



- Ballast your tractor with weights at the front or rear if the tractor axle load is exceeded on only one axle.
- Special cases:
 - If you do not achieve the minimum ballast at the front ($G_{V \min}$) from the weight of the front-mounted implement (G_V), you must use ballast weights in addition to the front-mounted implement.
 - If you do not achieve the minimum ballast at the rear ($G_{H \min}$) from the weight of the rear-mounted implement (G_H), you must use ballast weights in addition to the rear-mounted implement.

6.2 Securing the tractor/implement against unintentional start-up and rolling



WARNING

Risk of crushing, shearing, cutting, being caught and/or drawn in, or impact when making interventions in the implement, through

- **unintentional lowering of the unsecured implement when it is raised via the three-point hydraulic system of the tractor.**
- **unintentional falling of raised, unsecured machine parts.**
- **unintentional start-up and rolling of the tractor-implement combination.**
- Secure the tractor and the implement against unintentional start-up and rolling before any intervention in the machine.
- It is forbidden to make any intervention in the machine, such as installation, adjustment, troubleshooting, cleaning, maintenance and repairs
 - while the implement is being driven
 - as long as the tractor engine is running with a connected PTO shaft / hydraulic system.
 - if the ignition key is inserted in the tractor and the tractor engine can be started unintentionally with the PTO shaft / hydraulic system connected
 - if the tractor and implement are not each secured with their parking brakes against accidentally rolling away
 - If moving parts are not blocked against unintentional movement

When carrying out such work, there is a high risk of contact with unsecured components.

1. Park the tractor and the implement on solid, level ground only.
2. Lower any raised, unsecured implement/raised, unsecured implement parts.
→ This is how to prevent unintentional falling:
3. Shut down the tractor engine.
4. Remove the ignition key.
5. Apply the tractor parking brake.

6.2.1 Adjusting the length of the universal joint shaft to the tractor (specialist workshop)

The universal joint shaft transmits the tractor drive to the rotary cultivator / harrow.

Coupling and uncoupling the subsoiler changes the distance between the rotary cultivator / harrow and the tractor and requires the universal joint shaft length to be adjusted.

You will find information in the operating manual for your rotary cultivator / harrow on how to adjust and handle the universal joint shaft, and in particular safety information when dealing with the universal joint shaft.

The highest level of safety precautions are required when working with the PTO shaft.

For your own safety, ensure compliance with the basic rules when working with the PTO shaft.

If any defects are noted on the PTO shaft, the PTO shaft must not be used.

6.2.2 Fitting the hydraulic hose extension (option) and hose carrier (option)

1. Relief the hydraulic system of the seed drill from pressure (please see operator's manual for the seed drill).
2. Uncouple the rotary cultivator / harrow and seed drill-combination from the tractor (please see operating manual for the rotary cultivator / harrow).
3. Attach the hose carrier (Fig. 16/1) to the tower of the rotary cultivator / harrow (see Fig. 17).
4. Equip the hydraulic hoses of the seed drill which are connected with the tractor spool valves with hydraulic hose extensions (Fig. 16/2).
5. Hook the hydraulic hoses and cables into the hose carrier (Fig. 17/1).

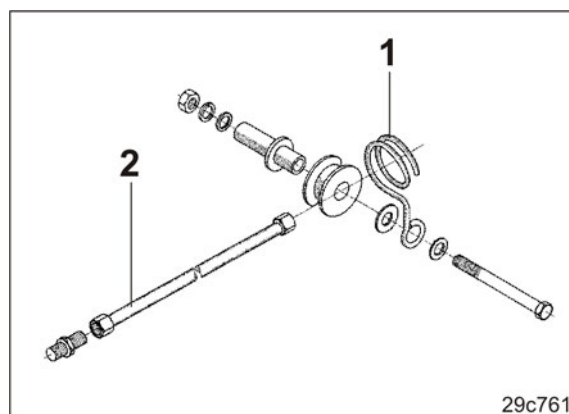


Fig. 16

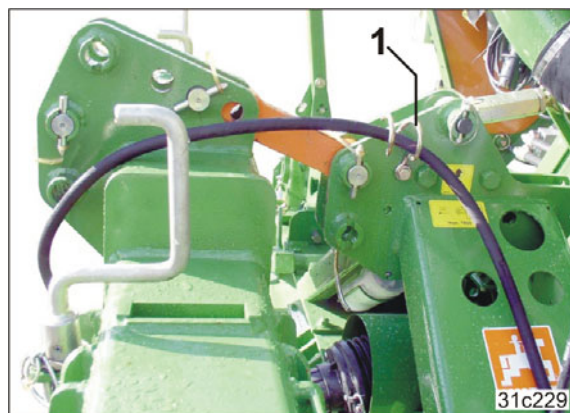


Fig. 17

6.2.3 Fitting the side guide plate extensions

6.2.3.1 optional, only with KE/KX/KG 3000

1. Bolt the side guide plate extensions (Fig. 18/1) on to the side guide plates (Fig. 18/2) of the rotary cultivator / harrow.

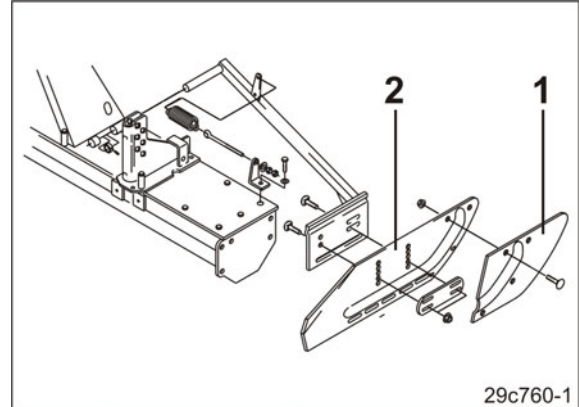


Fig. 18

6.2.3.2 optional, only with KE Super/KX/KG 3001

Bolt the side guide plate extensions (Fig. 19/1) onto the rotary cultivator / harrow.

1. Raise the implement and secure with suitable supports.
2. Apply the parking brake, switch the tractor engine off and remove the ignition key.
3. Dismantle the side guide plates on both sides
4. Move the counter holder behind the mount into position (Fig. 19/2)
5. Hold the side guide plate extensions (Fig. 19/1) on the mount of the KE Super / KX/KG 3001 and fasten with the bolts (Fig. 19/3) on the counter holder.
6. Use spacers for the front bolted connection (Fig. 19/4).
7. To adjust the side guide plate height, observe the operating manual of the rotary cultivator / harrow.

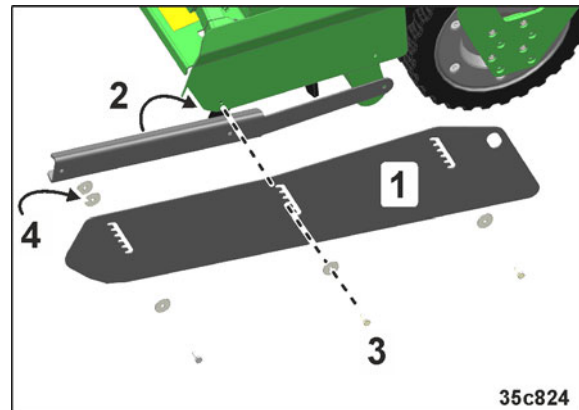


Fig. 19

7 Coupling and uncoupling the implement



When coupling and uncoupling the implement take heed of the section "Safety information for users", Seite 20.



WARNING

Risk of contusions from unintentional starting and rolling of the tractor and implement when coupling or uncoupling the implement!

Secure the tractor and implement to prevent unintentional starting and rolling before entering the danger area between the tractor and implement to couple or uncouple the implement. For more information, see section 6.2, Seite 41.



WARNING

Risk of contusions between the rear of the tractor and the implement when coupling and uncoupling the implement!

Actuate the operating controls for the tractor's three-point hydraulic system

- only from the designated work station.
- never if you are in the hazard zone between the tractor and the implement.



WARNING

Risk of contusions when coupling the implement and standing between the tractor and the implement!

Instruct people to leave the danger area between the tractor and the implement before you approach the implement.

Any helpers may only act as guides standing next to the tractor and the implement, and may only move between the vehicles when both are at a standstill.

7.1 Coupling the subsoiler to the tractor



WARNING

Danger of breaking during operation, insufficient stability and insufficient tractor steering and braking power on improper use of the tractor!

You may only connect the implement to tractors suitable for the purpose. On this subject see the section "Checking the suitability of the tractor", Seite 37.



WARNING

Risk of contusions, cutting, catching, drawing in and knocks when the implement unexpectedly releases from the tractor!

- Use the intended equipment to connect the tractor and the implement in the proper way.
- When coupling the implement to the tractor's three-point hydraulic system, it is vital to ensure that the tractor mount categories of the tractor and the implement are the same.
- Only use the upper and lower link pins provided for coupling the implement.
- Check the upper and lower link pins for visible damage each time you couple the implement. Replace the upper and lower link pins if there are clear signs of wear.
- Use Inch pins to secure the upper and lower link pins against accidentally loosening.



WARNING

Risk of energy supply failure between the tractor and the implement through damaged power lines!

During coupling, check the course of the power lines. The supply lines

- must be able to move and bend freely without tension, kinking or chafing as the implement moves when mounted or towed
- must not chafe on any other parts.

Coupling and uncoupling the implement

1. Fit the upper and lower link pins with ball bushings.
- The subsoiler is equipped with Cat III upper and lower link pins to couple with the tractor.
- The ball bushings depend on the type of tractor (see tractor operating manual).
2. Secure the upper and lower link pins with linch pins
3. Open the tractor lower link securing device, i.e. it must be ready for coupling.
4. Align the lower link hooks so that they are flush with the linking points of the implement.
5. Direct people out of the danger area between the tractor and implement before you approach the implement with the tractor.
6. Drive the tractor in reverse up to the implement so that the lower link hooks of the tractor automatically pick up the ball of the implement.
- The lower link hooks lock automatically.
7. Check whether the securing device of the tractor's lower link locking system is closed and secured (see tractor's operating manual).

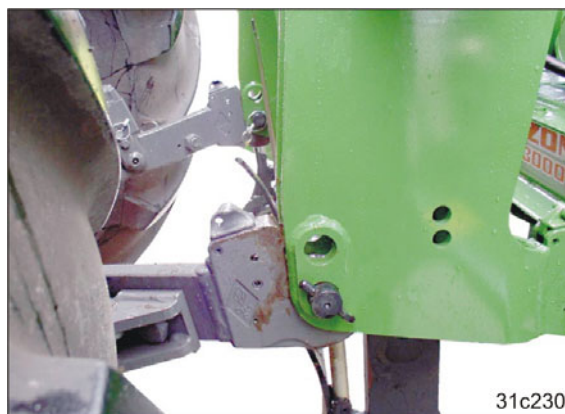


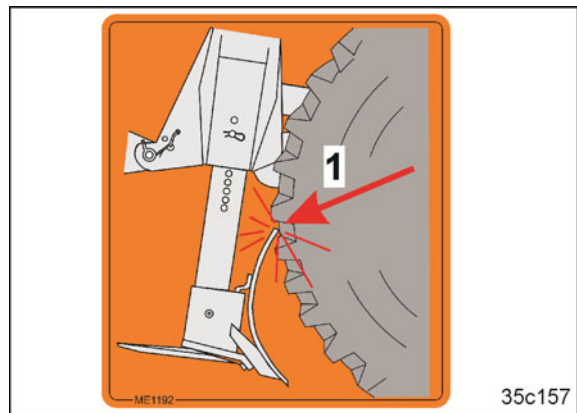
Fig. 20

8. Connect the tractor upper link arm (Fig. 21/1).
9. Set the upper link arm in such a way that the deep loosener is in about horizontal operational position.

**Fig. 21**

Ensure that the soil guide shares do not touch the tractor tyres when the subsoiler is lifted (see Fig. 22/1).

The notice (Fig. 22) on your subsoiler should remind you of this.

**Fig. 22**

7.2 Coupling the rotary cultivator / harrow-combination on to the subsoiler

1. The tools of the subsoiler and the rotary cultivator / harrow generally operate at different depths in the soil. Before coupling the two implements, adjust the tools of the subsoiler to the level of the rotary cultivator / harrow (see chapter "Adjusting the working depth of the subsoiler", Seite 51).
2. Slide the supplied ball sleeves onto the rotary cultivator's / harrow's Cat III lower link pins.
3. Secure the lower link pins with linch pins.

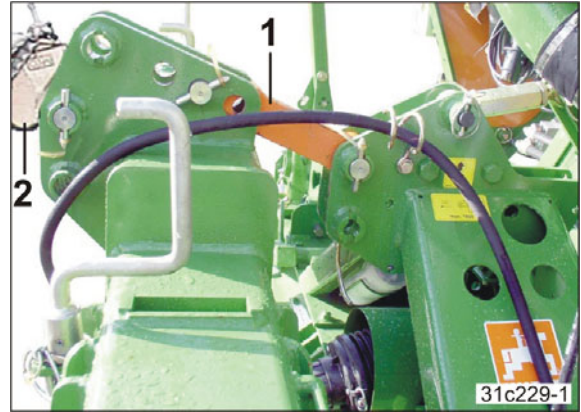
→ The subsoiler is quipped with Cat. III lower lift arm link hooks.

4. Open the safety catches on the subsoiler's link hooks.
 - 4.1 Pull the link hook's safety mechanism upwards until it clicks into place. The subsoiler link hooks are now ready for coupling.
 5. Instruct people to vacate the hazard zone between the subsoiler and rotary cultivator / harrow.
 6. Drive the subsoiler backwards towards the rotary cultivator / harrow.
 7. Pick up the rotary cultivator's / harrow's ball sleeves with the subsoiler's hooks.
- The link hooks will lock automatically.
8. Check that the hook lock safety mechanism is closed.



Fig. 23

9. Switch off the PTO shaft, apply the hand brake, stop the engine and remove the ignition key.
10. Connect the connector piece (Fig. 24/1) to both implements.
11. Secure the pins with linch pins.
12. Set the length of the tractor's top link (Fig. 24/2) such that the rotary cultivator / harrow is roughly horizontal when in working position.
13. Connect the universal joint shaft of the rotary cultivator / harrow with the tractor PTO shaft (please see operating manual for the rotary cultivator / harrow).

**Fig. 24**

Equip the rotary cultivator / harrow with a longer universal joint shaft if the rotary cultivator / harrow was previously working directly behind the tractor.

Prior to the first coupling on to the tractor and when changing the tractor type, always match the universal joint shaft length (see operating manual for the rotary cultivator / harrow).

**CAUTION**

Before uncoupling the combination from the tractor, adjust the tools of the subsoiler to the level of the rotary cultivator / harrow (see chapter "Adjusting the working depth of the subsoiler", Seite 51).

7.3 Calibrating the working position sensor (optional, seed drill combination)



When operating a seed drill combination with ISOBUS, a working position sensor is required.

Hook the tensioning element (Fig. 25/1) onto the top link bracket (Fig. 25/2).

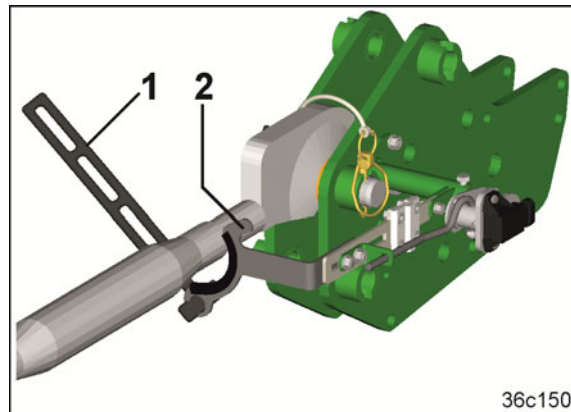


Fig. 25

The potentiometer (Fig. 26/1) supplies a pulse to switch the electric motor on the sowing shaft on and off.

The working and transport position of the combination must be calibrated after every coupling of tractor and implement.

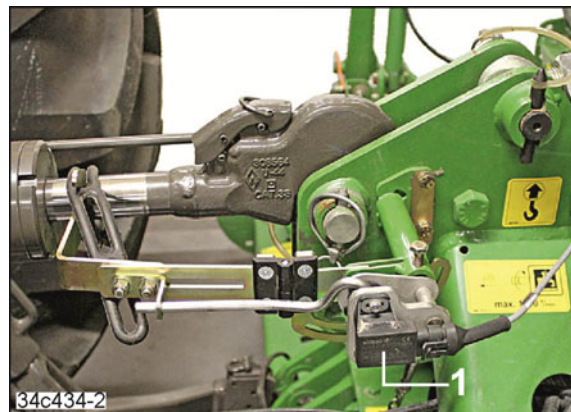


Fig. 26

Calibrate the working position (A) and transport position (B) on the field using the operating manual "ISOBUS Software".

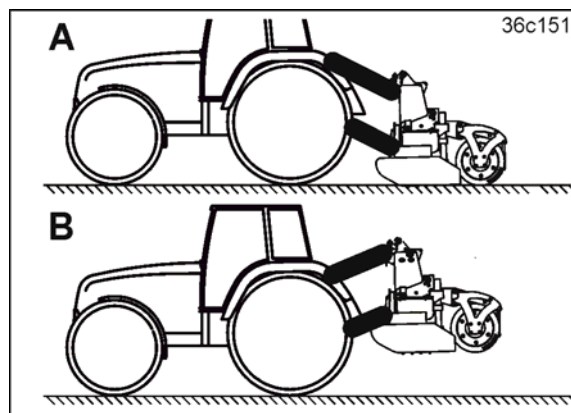


Fig. 27

8 Settings

8.1 Adjusting the working depth of the subsoiler



CAUTION

Before adjusting the working depth couple the deep loosener on to the tractor.



DANGER

Traktor-Zapfwelle abschalten, Apply the tractor parking brake, switch off the engine and remove the ignition key.

1. Lift the combination with the subsoiler.
2. Disengage the tractor PTO shaft, apply the tractor parking brake, switch off the tractor engine, and remove the ignition key.
3. Remove the linch pin (Fig. 28/1).
4. Pull out the pin (Fig. 28/2). The pin is secured with a spring cotter pin.
5. Set the desired working depth of the share by turning the crank (Fig. 28/3).

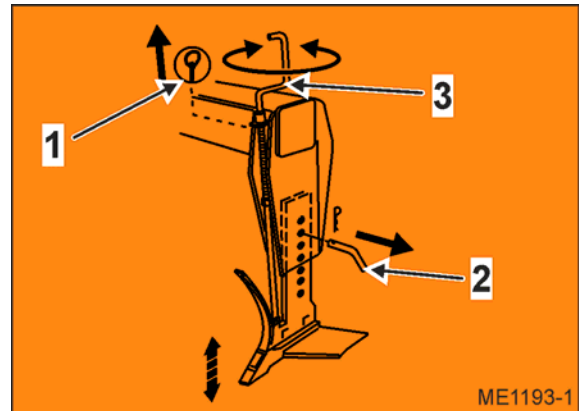


Fig. 28

Crank turn

Turn to the right:	reduce working depth
Turn to the left:	increase working depth

6. Insert the pin (Fig. 29/1) and secure using a spring cotter pin (Fig. 29/2).
The pin is the mechanical securing of the share leg.

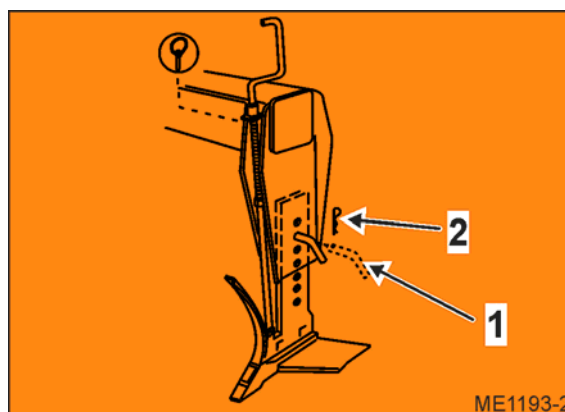


Fig. 29

7. Turn the crank (Fig. 30/1) counter clockwise once.
The distance "A" between crank and bracket must be clearly visible. The crank must not rest on the bracket.
8. Secure the crank against turning by using a linch pin (Fig. 30/2).
9. Adjust all shares to the same working depth.

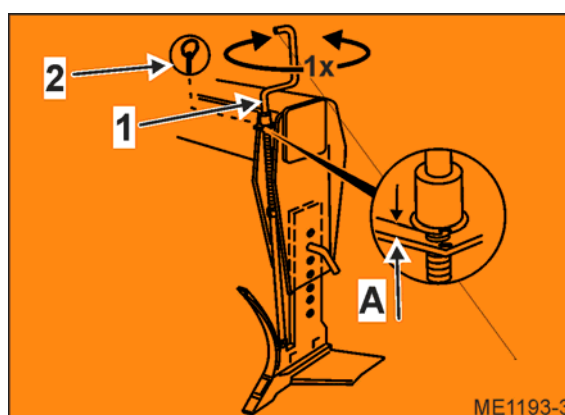


Fig. 30

9 Transportation



Fig. 31



Fig. 32

The subsoiler may only be transported on public roads and tracks in combination with the rotary cultivator / harrow with the rear roller, with or without mounted or pack-top seed drill attached.

The traffic safety equipment is attached to the mounted or pack top seed drill. For combinations without the seed drill, the traffic safety equipment is attached to the rotary cultivator / harrow.

You can find information about the traffic safety equipment in the instruction manual for your seed drill or your rotary cultivator / harrow.

When driving on public streets or roads, the tractor and implement must comply with the national road traffic regulations (in Germany the StVZO and the StVO) and the accident prevention regulations (in Germany those of the industrial injury mutual insurance organisation).

The vehicle keeper and driver are responsible for compliance with the statutory stipulations.

Furthermore, the instructions in this section have to be complied with prior to starting and during travel.

The maximum permitted speed¹⁾ is:

40 km/h for tractors with mounted tilling implements and trailing roller with or without mounted or pack top seed drill.

In particular on bad roads and ways driving may only take place at a considerably lower speed than specified!

¹⁾ The permissible maximum speed for mounted work implements differs in the various countries according to national traffic regulations. Ask your local importer/implement dealer about the maximum permitted speed for road travel.



- For transport journeys take heed of the section "Safety information for users", Seite 20.
- Before moving off, check:
 - the correct connection of the supply lines,
 - the lighting system for damage, function and cleanliness,
 - that the hydraulic equipment shows no visible signs of defect
 - that the tractor parking brake is released completely.



WARNING

Risk of being crushed, cut, caught, drawn in or struck if the implement is unintentionally released from its attached or hitched position.

Carry out a visual check that the top and lower link pins are firmly secured with original linch pins against unintentional release.



WARNING

Risk of crushing, cutting, being caught and/or drawn in, or impact from tipping and insufficient stability.

- Drive in such a way that you always have full control over the tractor with the attached machine.
In so doing, take your personal abilities into account, as well as the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the connected or coupled implement.
- Before road transport, fasten the side locking of the tractor lower link, so that the connected or coupled implement cannot swing back and forth.



WARNING

Danger of breaking during operation, insufficient stability and insufficient tractor steering and braking power on improper use of the tractor!

These risks pose serious injuries or death.

Comply with the maximum load of the connected implement and the approved axle and drawbar loads of the tractor.

**WARNING**

Risk of falling when riding on the implement, contrary to instructions.

It is forbidden to ride on the implement and/or climb the implement while it is running.

**WARNING**

Secure the implement against any accidental movement before transportation.

9.1 Set the implement to road transport mode

**WARNING**

Danger of crushing, shearing, cutting, being caught or drawn in, winding and knocks through:

- **unintentional falling of the implement raised using the tractor's three-point hydraulic system.**
- **unintentional lowering of raised, unsecured implement parts.**
- **unintentional start-up and rolling of the tractor-implement combination.**

Secure tractor and implement against unintentional starting and rolling away (see section "6.2", Seite 41).

Set the combination mounted on the tractor to transport mode:

You will find information on this in the operating manual for your seed drill or rotary cultivator / harrow.

**DANGER**

- **Lock the tractor control units during road transport.**
- **When turning corners, take into consideration the wide sweep and the centrifugal mass of the implement.**

10 Use of the implement



When using the implement, observe the information in the following sections:

- "Warning symbols and other labels on the implement", as of Seite 16 and
- "Safety information for users", Seite 20.

Observing this information is important for your safety.



WARNING

Risk of being crushed, cut, caught, drawn in or struck if the implement is unintentionally released from its attached or hitched position.

Before every use of the implement, perform a visual check that the top and lower link pins are firmly secured with linch pins against unintentional release.



WARNING

Crush hazard exists between the bearing arms of the tillage implement and the support for the trailing roller as well as between the bearing arms and the depth setting pins when raising and lowering the implement.

These hazards may cause serious injury to fingers and hands.

Instruct persons to vacate the implement's hazard zone before raising or lowering the implement.



WARNING

Risk of contusions, cutting, catching, drawing in and knocks through insufficient stability and tipping of the tractor and/or the connected implement.

Drive in such a way that you always have full control over the tractor with the mounted or trailed implement.

In so doing, take your personal abilities into account, as well as the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the connected or coupled implement.

10.1 Work commencement

1. Adjust the working depth of the deep loosener (see chapter "Adjusting the working depth of the subsoiler", Seite 51)
2. Lower the combination until the shares of the deep loosener are just above the soil.
In this position, the angle of the rotary cultivator / harrow universal joint shaft must be within the tolerance range.
3. Drive the tractor PTO shaft speed with the prescribed rev. speed of the rotary cultivator / harrow.
4. Start driving and lower the combination.



- When the combination is lifted, the down angle of the running universal joint shaft should be within the range of tolerance, otherwise switch off the tractor PTO shaft.
- Switch off the tractor's PTO shaft if the rotary cultivator / harrow runs unevenly when lifted up.

10.2 Turning at end of the field

If it is intended that the universal joint shaft of the rotary cultivator / harrow continues to run when turning or when the combination is lifted, ensure that the shares are lifted out of the soil and that the down angle of the universal joint shaft is within the range of tolerance.



Switch off the universal joint shaft before turning if

- the down angle of the universal joint shaft is beyond the range of tolerance
- the rotary cultivator / harrow runs unevenly when lifted up.

11 Faults



WARNING

Danger of crushing, shearing, cutting, being caught or drawn in, winding and knocks through:

- **Accidental lowering of the implement when raised via the tractor's three-point hydraulic system.**
- **unintentional lowering of raised, unsecured implement parts.**
- **unintentional starting or rolling away of the tractor-implement combination.**

Secure the tractor and the implement against unintentional start-up and rolling, before you eliminate any faults on the implement. On this subject see section 6.2, Seite 41.

11.1 Incorporation of large amounts of straw

With normal amounts of straw on the field surface and normal forward speed the straw/soil mix is lifted and inverted by the soil guide shares (Fig. 12/1) of the deep loosener. The rotary cultivator mulchs the straw at the surface.

Large amounts of straw, large working depth and high forward speeds may cause problems of blockage directly in front of the rotary cultivator. The soil/straw mix has not yet settled sufficiently and is bulldozed by the frame of the rotary cultivator.

This can be remedied by reducing the forward speed.

Lock the levelling bar of the rotary cultivator in the upper most position.

12 Cleaning, maintenance and repair



WARNING

Danger of crushing, shearing, cutting, being caught or drawn in, winding and knocks through:

- **unintentional falling of the implement raised using the tractor's three-point hydraulic system.**
- **unintentional lowering of raised, unsecured implement parts.**
- **unintentional start-up and rolling of the tractor-implement combination.**

Secure the tractor and implement against unintentional starting and unintentional rolling before you perform any cleaning, servicing or maintenance work on the implement, see Seite 41.



WARNING

Risk of crushing, shearing, cutting, being caught and/or drawn in, or impact through unprotected danger points.

- Mount protective equipment, which you removed when cleaning, maintaining and repairing the implement.
- Replace defective protective equipment with new equipment.



Danger

Carry out cleaning, maintenance or repair work (unless otherwise specified) only after the following conditions are fulfilled:

- the PTO shaft is turned off (wait until the tool carriers have come to a complete stop)
- implement is fully lowered
- the tractor parking brake is applied
- The tractor engine is switched off
- The ignition key is removed.



When carrying out any maintenance, repair and care work, observe the section "Cleaning, maintenance and repair", Seite 24.

Thoroughly clean the implement prior to prolonged breaks of operation.

12.1 Cleaning the implement

Clean the machine with a jet of water, a high pressure cleaner or with the aid of compressed air.

Check the shares and share tips after cleaning. Replace damaged shares.



- Pay particular attention to the brake, air and hydraulic hose lines.
- Never treat brake, air and hydraulic hose lines with fuel, benzene, petroleum or mineral oils.
- After cleaning, grease the implement, in particular after cleaning with a high pressure cleaner/steam jet or liposoluble agents.
- Observe the legal regulations for handing and disposing of cleaning agents.



What should be observed when cleaning with a high-pressure cleaner/steam cleaner:

- Do not clean any electrical components.
- Do not clean any chromed components.
- Never aim the cleaning jet from the nozzle of the high pressure cleaner/steam jet directly on lubrication points, bearings, rating plates, warning signs, and stickers.
- Always maintain a minimum jet distance of 300 mm between the high pressure cleaning or steam jet cleaning nozzle and the implement.
- The set pressure of the high-pressure cleaner/steam jet must not exceed 120 bar.
- Comply with safety regulations when working with high pressure cleaners.
- Completely dispose of fertiliser residue. Fertiliser residues harden up and can damage rotating components on the next use.

12.1.1 Parking the subsoiler for a long period of time

1. Thoroughly clean and dry the coulters.
2. Paint the coulters (Fig. 33) with strip paint to prevent the formation of rust.



Fig. 33

12.2 Visual inspection of the lower link pins



WARNING

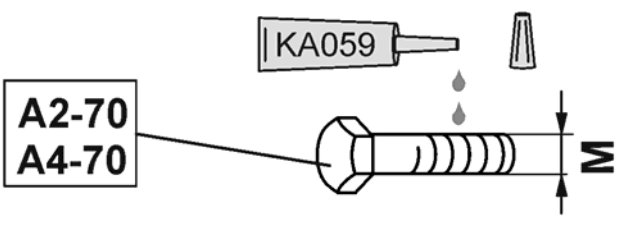
Risk of contusions, catching, and knocks when the implement unexpectedly releases from the tractor!

Check the lower link pin for conspicuous defects whenever the implement is coupled. Replace the drawbar, if there are any clear signs of wear to the lower link pins.

12.3 Screw tightening torques



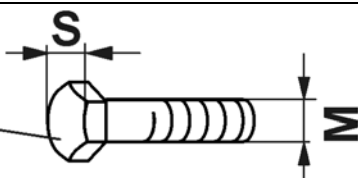
The specified tightening values represent reference values!

												
M	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
Nm	2.3	4.6	7.9	19.3	39	66	106	162	232	326	247	314



The table shows the permissible maximum values for bolted connections with a friction coefficient of $\mu=0.12$ and does not include any other safety factors. The listed tightening values are to be considered as reference values!

8.8
10.9
12.9



$\mu=0,12$

M	S	Nm		
		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



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