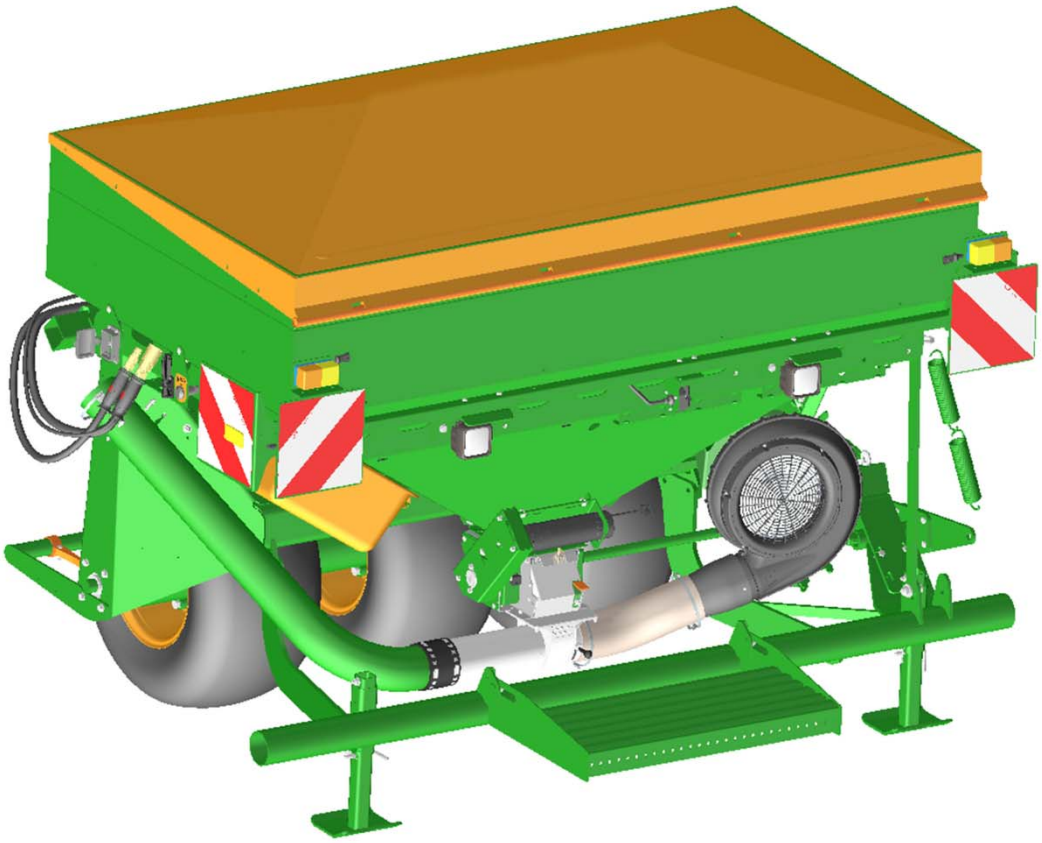
Operating instructions

AMAZONE

Front hopper

FRU 104 FPU 104



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

MG5544
BAH0084.1 06.16

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. Sark.

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:	FRU/FPU front hopper
Permissible system pressure (bar):	maximum 210 bar
Year of manufacture:	
Basic weight (kg):	
Permissible total weight (kg):	
Maximum load (kg):	

Manufacturer's address

AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

Postfach 51

D-49202 Hasbergen, Germany

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

Fax: + 49 (0) 5405 501-234

E-mail: amazone@amazone.de

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

Document number: MG5544

Compilation date: 06.16

Foreword

Dear Customer,

You have chosen one of the quality products from the wide product range of AMAZONEN-WERKE, H. DREYER GmbH & 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 any questions or problems, please read through this operating manual or contact your local service partner.

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 manuals. Send us your suggestions by fax.

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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

→ Implement response to 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 acquainted with the basic regulations regarding health and safety at work and accident prevention
- have received instruction in working with/on the implement
- have read and understood this instruction manual

The operator is obliged

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

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 17 of this operating manual and to follow the safety instructions of the warning symbols when operating the machine.
- 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 persons.
- the implement itself.
- 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 and protective 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 agents etc.

The operation manual

- must always be kept at the place at which the implement is operated.
- must always be easily accessible for the user 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 operation	—	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.

Only a specialist workshop may carry out maintenance and repair work on the implement, if such work is additionally marked "Specialist workshop". 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 on the running gear.
- increase the size of existing holes on the frame or the running gear.
- weld support 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 may be operated by only one person sitting in 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. You can request the warning symbols from your dealer using the 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.

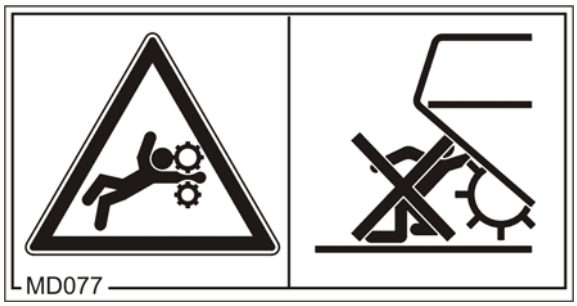
   For example: risk of cutting

2. The consequence of non-compliance with the risk avoidance instructions.

   For example: causes serious injuries to fingers or hands.

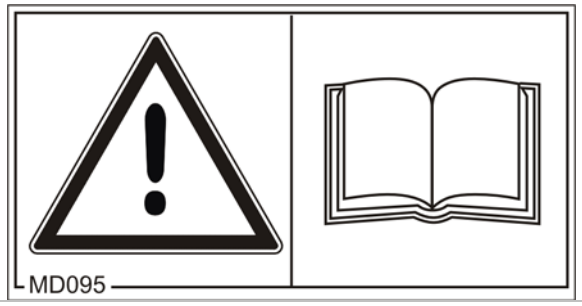
3. Risk avoidance instructions.

   For example: only touch implement parts when they have come to a complete standstill.

Order number and explanation	Warning symbols
MD077 **Risk of arms being caught or drawn into the implement, caused by accessible, moving parts involved in the work process.** Causes serious, potentially fatal injuries anywhere on the body. Never reach into the danger area, • while the tractor engine is running with the universal joint shaft or hydraulic/electronic system connected. • if the ground wheel drive is moving.	
MD078 **Risk of crushing of fingers/hand by accessible, moving parts of the implement!** This hazard can cause the most severe injuries with loss of body parts. Never reach into the hazardous area while the engine of the tractor with connected universal joint shaft/hydraulics/electronic system is running.	
MD082 **Risk of falling when riding the implement on treads or platforms!** Causes serious, potentially fatal injuries anywhere on the body. It is forbidden to ride on the implement or climb the implement when it is running. This prohibition also applies to implements with step surfaces or platforms. Make sure that nobody is riding on the implement.	
MD083 **Danger of arms being drawn in and/or caught by moving parts involved in the working process!** This hazard can cause the most severe injuries with loss of body parts. Never open or remove protective devices while the tractor engine is running with the universal joint shaft/hydraulic or electronic systems connected.	

MD095

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

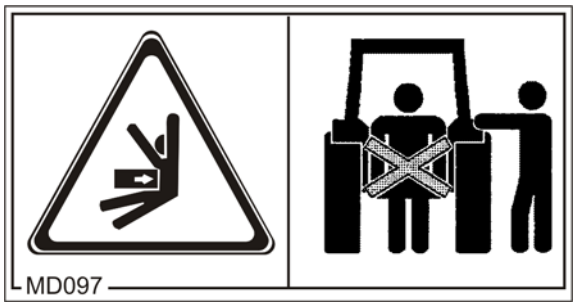


MD097

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!

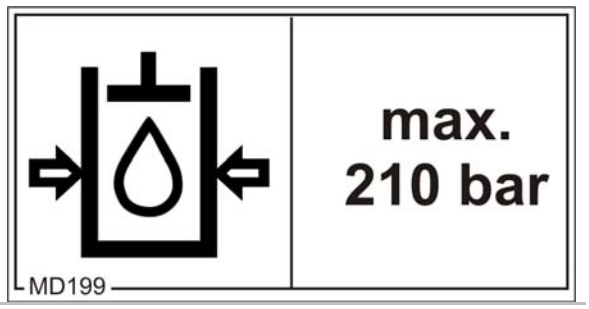
Causes serious, potentially fatal injuries anywhere on the body.

- 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 work station.
  - never if you are in the lifting zone between the tractor and the implement.



MD 199

The maximum operating pressure of the hydraulic system is 210 bar.



2.13.1 Positions of warning symbols and other labels

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

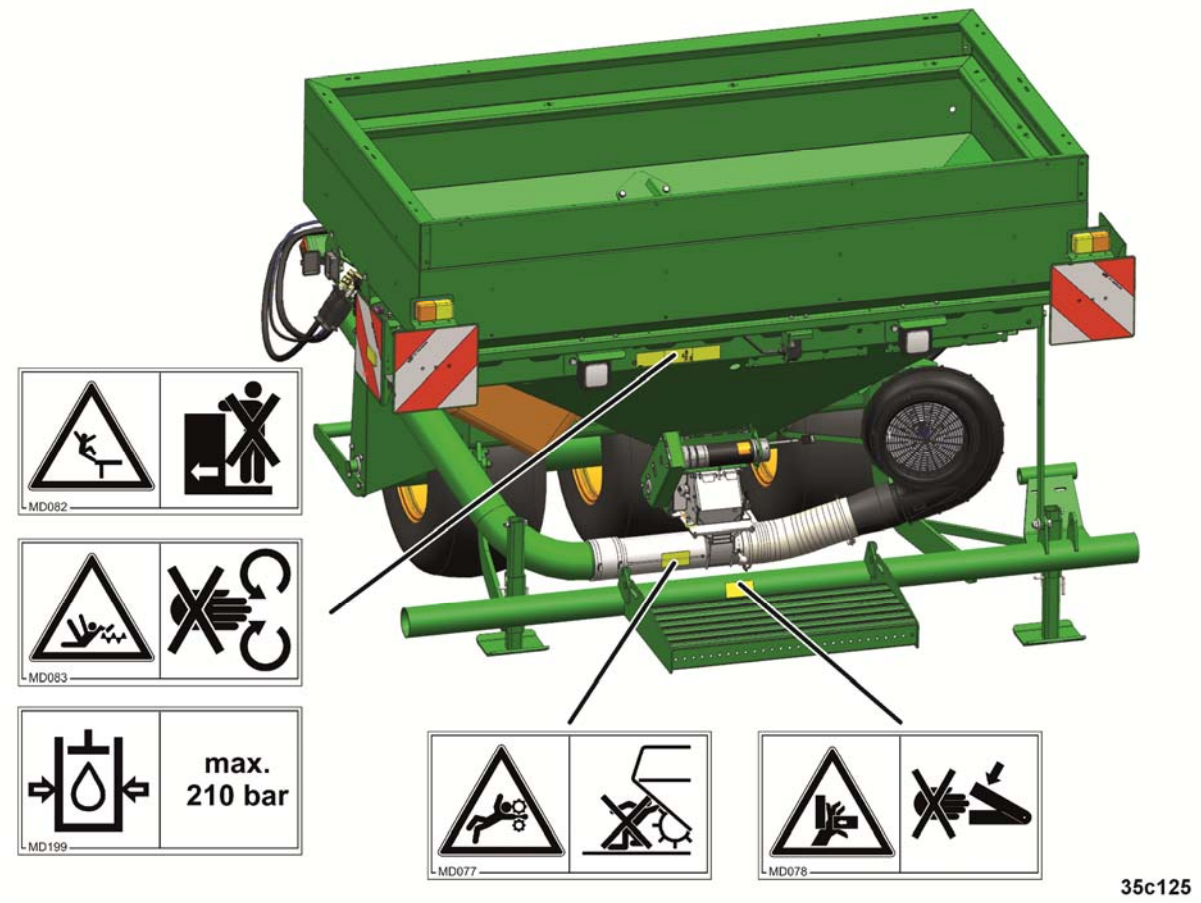


Fig. 1

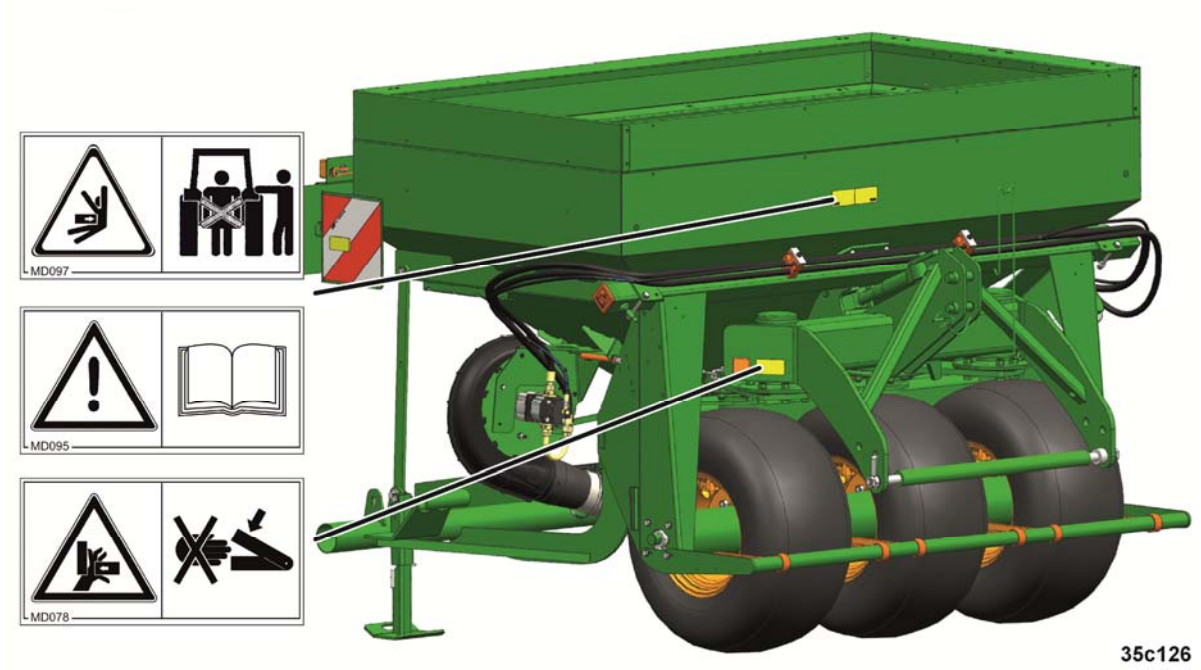


Fig. 2

2.14 Dangers if the safety information is not observed

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 machine 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 approaching 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 easily give way to all movements in bends without tensioning, kinking or rubbing.
  - 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:
  - Lower the implement onto the ground.
  - Apply the tractor 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 hydraulic equipment shows no visible signs of defect
  - that the tractor parking brake is released completely.
  - the function 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 top 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).
- Observe the maximum permissible total weight. Only transport the implement when the front hopper is empty.

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!
- Observe the manufacturer's instructions.
- Before coupling and uncoupling the implement at the three-point linkage, secure the controls in such a position that accidental raising or lowering is impossible.
- Pinching or shearing hazard within the operating range of the three-point linkage.
- The implement should only be transported and driven with a suitable tractor.
- Risk of injury when coupling and decoupling implements to and from the tractor.
- It is forbidden for people to stand between tractor and implement when operating the external controls for the three-point linkage.
- There is risk of pinching and shearing when operating the support equipment.
- 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 Hydraulic system

- The hydraulic system is under a high pressure.
- Ensure that the hydraulic hose lines are connected correctly.
- When connecting the hydraulic hose lines, ensure that the hydraulic system is depressurised on both the implement and tractor.
- It is forbidden to 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.
- Before working on the hydraulic system,
  - Lower the implement.
  - Depressurise the hydraulic system.
  - Switch off the tractor engine.
  - Apply the tractor parking brake.
  - Take out the ignition key.
- Have the hydraulic hose lines checked at least once a year by a specialist for proper functioning.
- Replace the hydraulic hose lines if they are damaged or worn. Only use original AMAZONE hydraulic hose lines.
- The hydraulic hose lines should not be used for longer than six years, including any storage time of maximum two years. Even with proper storage and approved use, hoses and hose connections are subject to natural aging, thus limiting the length of use. However, it may be possible to specify the length of use from experience values, in particular when taking the risk potential into account. In the case of hoses and hose lines made of thermoplastics, other guide values may be decisive.
- Never attempt to plug leaks in hydraulic hose lines using your hand or fingers.

  Escaping high pressure fluid (hydraulic fluid) may pass through the skin and ingress into the body, causing serious injuries!

  If you are injured by hydraulic fluid, contact a doctor immediately. Risk of infection.
- When searching for leakage points, use suitable aids, to avoid the serious risk of infection.

2.16.4 Electrical system

- When working on the electrical system, always disconnect the battery (negative terminal).
- Only use the prescribed fuses. If fuses are used that are too highly rated, the electrical system will be destroyed – risk of fire.
- Ensure that the battery is connected correctly – firstly connect the positive terminal and then connect the negative terminal. When disconnecting the battery, disconnect the negative terminal first, followed by the positive terminal.
- Always place the appropriate cover over the positive battery terminal. If there is accidental earth contact, there is a danger of explosion!
- Risk of explosion. Avoid sparking and naked flames in the area of the battery.
- The implement may be equipped with electronic components whose function is influenced by electromagnetic interference from other units. Such interference can pose risks to people, if the following safety information is not followed.
  - In the case of retrofitting electrical units and/or components on the implement, with a connection to the on-board power supply, the operator is responsible for checking whether the installation might cause faults on the vehicle electronics or other components.
  - Ensure that the retrofitted electrical and electronic components comply with the EMC directive 2004/108/EEC in the appropriate version and carry the CE mark.

2.16.5 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 pictogram (Fig. 3) marks the location at which the belt for lifting the implement with a crane is to be secured.

DANGER

The straps for loading the implement with a crane must be attached at the specified points.

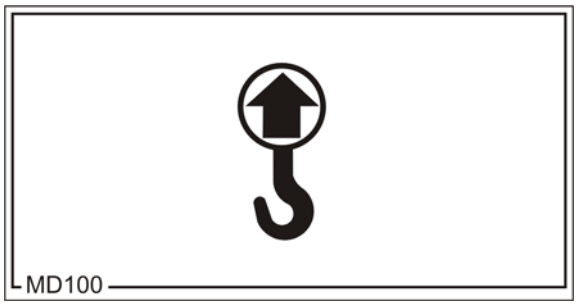


Fig. 3

Loading the front hopper

- Secure the 2 crane hooks to the eyelets (Fig. 4/1) in the hopper

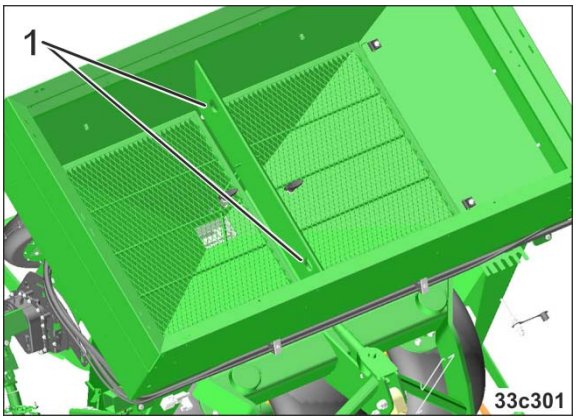


Fig. 4

- The required tensile strength of the straps is 3.000 kg.
- The front hopper must not be filled when loading.
- Lash the implement down on the transport vehicle in accordance with regulations.

DANGER

Do not stand under suspended loads.

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

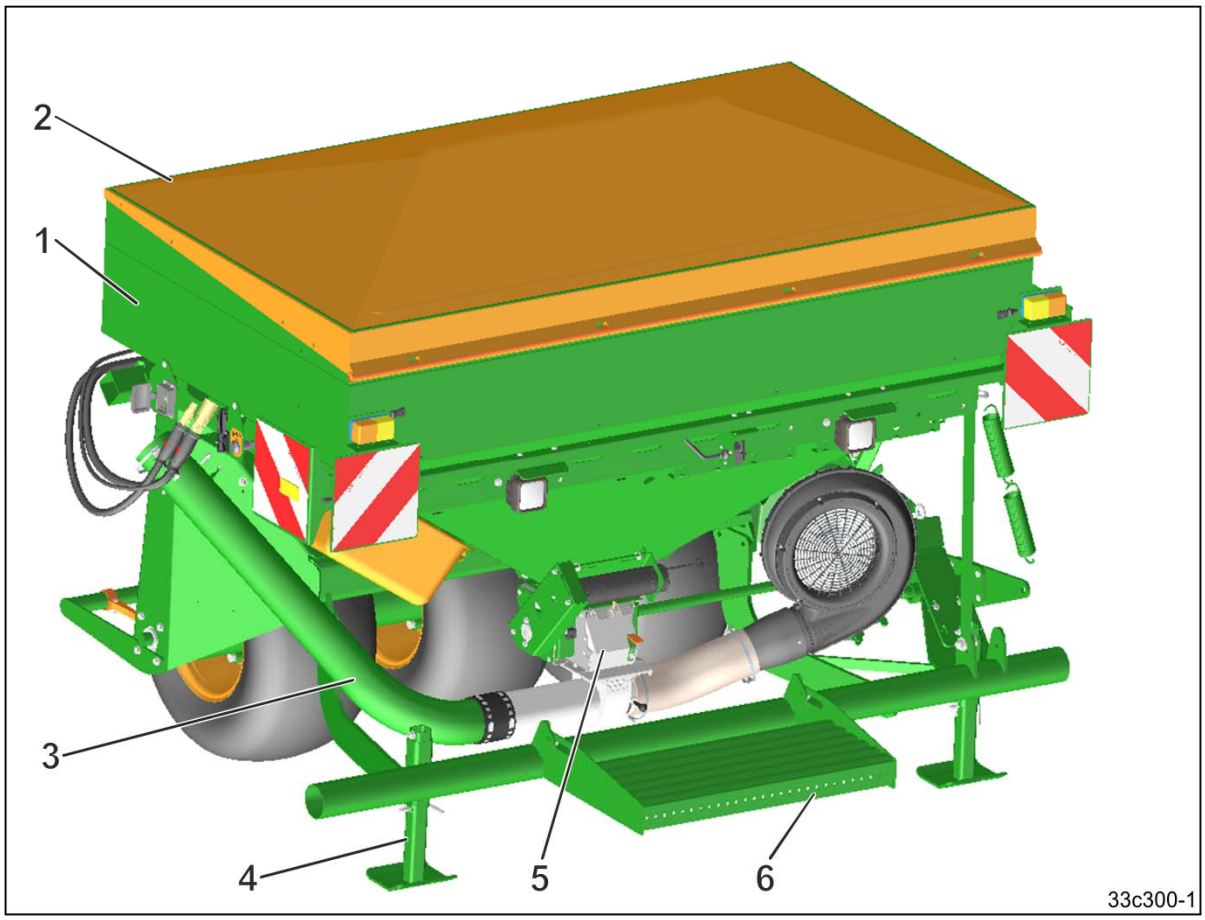


Fig. 5

(1) Front hopper
(2) Hopper cover
(3) Conveyor section
(4) Parking support
(5) Metering unit
(6) Folding loading board

Fig. 6/…

(7) Work lights

(8) Blower fan for transporting the metered material

(9) Gearbox for setting the metered material quantity

(10) Star wheel (for mechanical drive of the metering unit)

- Only with independent control terminal: generation of the pulses/100 m for calculating the working speed

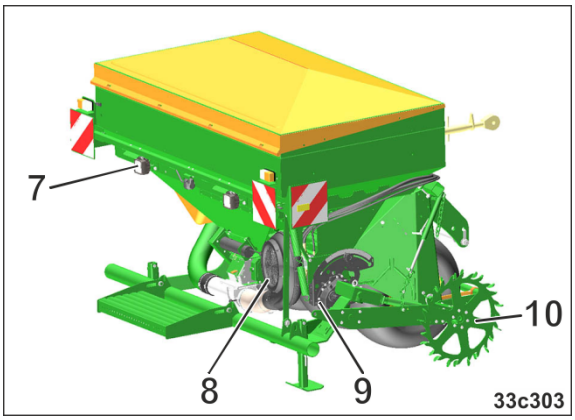


Fig. 6

Fig. 7/…

(11) Front hopper with steered front tyre packer (FPU)

(12) Lower link mounting

(13) Calibration trough

(14) Front lighting

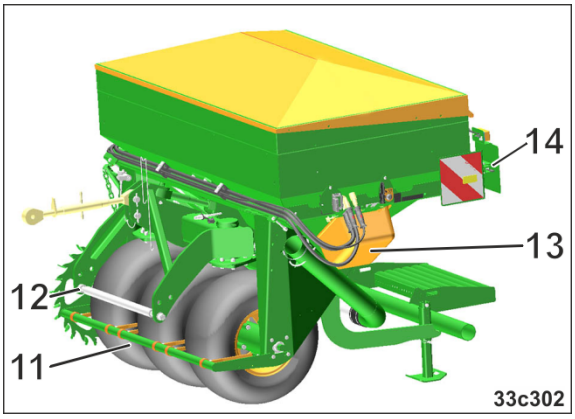


Fig. 7

Fig. 8/…

(1) Case for stowing

- of the operating manual
- the metering roller

Fig. 8

4.2 Safety and protective equipment

Fig. 9/…

(1) Jack
Required for parking the implement and for adjustment work.

(2) Positioning pin in parking position

(3) Parking position for jack

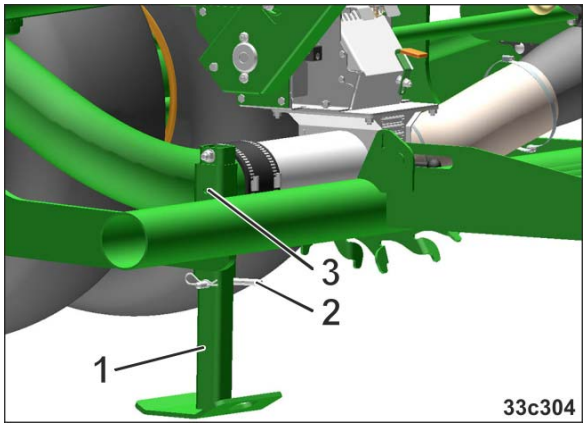


Fig. 9

Fig. 10/…

(1) Calibration button

(2) Removable handle

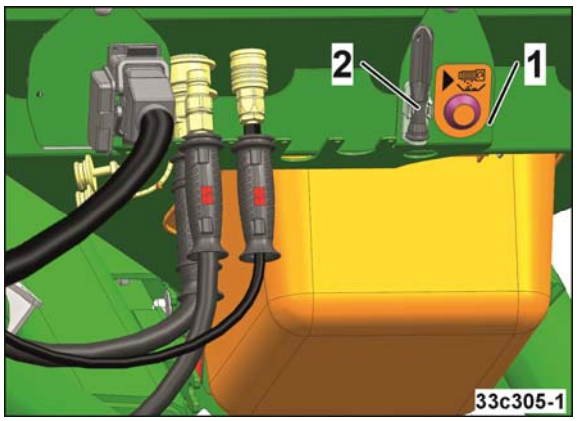


Fig. 10

Fig. 11/…

(1) Protective screen

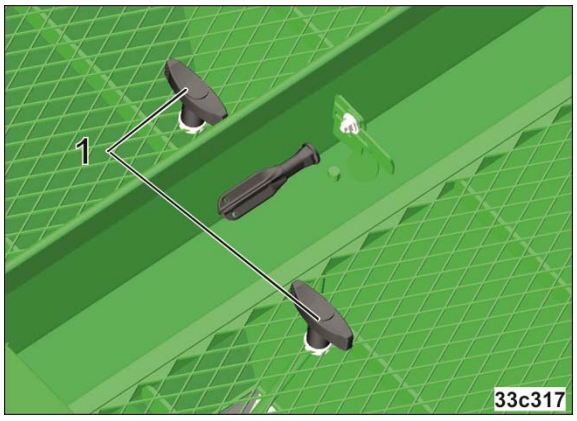


Fig. 11

4.3 Ballast weights (optional, only FRU)

To increase the front axle load of the tractors, the FRU front hopper can be equipped with ballast weights (maximum 900 kg).

The use of ballast weights requires

- Parking supports, to park the FRU safely
- Three-point extension.

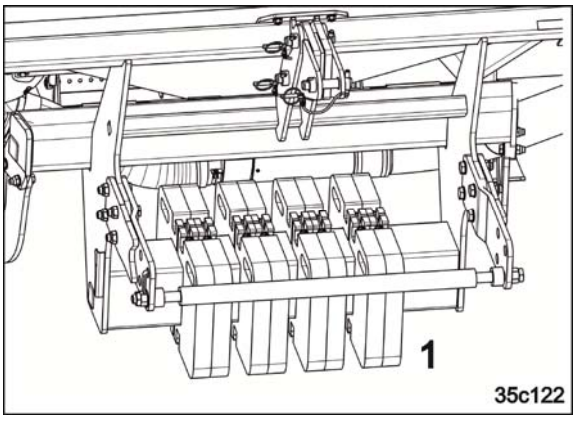


Fig. 12

4.3.1 Three-point hitch extension (optional, only with FRU)

Alternatively, only the three-point hitch extension can be installed to increase the front axle load on the tractor.

(1) Lower link extension

(2) Upper link extension

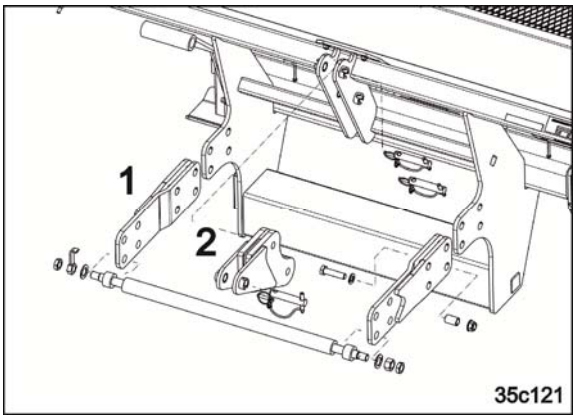


Fig. 13

4.4 500L attachment (optional)

To increase the efficiency, the hopper volume can be expanded to 2000 litres with an extension (Fig. 14/1).

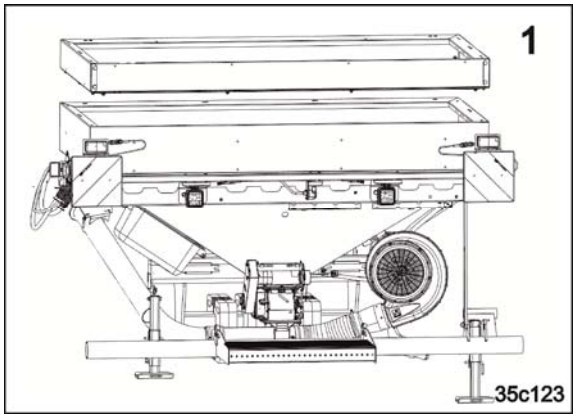


Fig. 14

4.5 Supply lines between the tractor and the implement

Supply line in parking position:

(1) Hydraulic hose lines

(2) Data cable

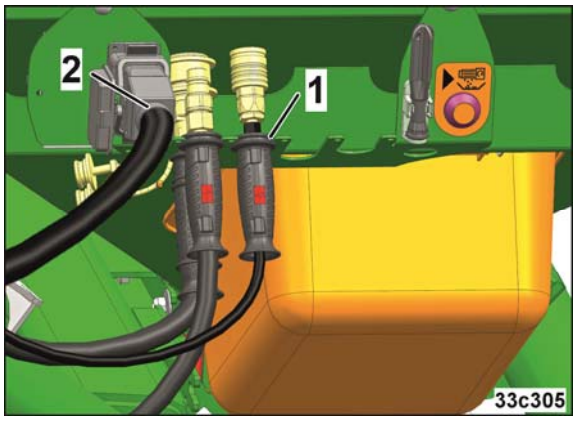


Fig. 15

4.6 Traffic safety equipment

Fig. 16/…

(1) 2 forwards-facing warning signs

(2) 2 forwards-facing work floodlights

Note: use of the work floodlights is only permitted on the field.

(3) Warning signs on the sides (optional, not for all countries)

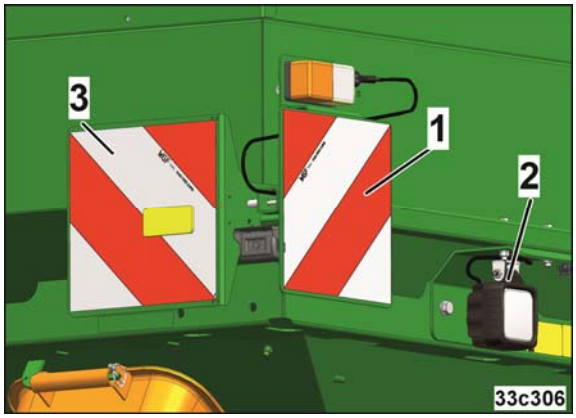


Fig. 16

Fig. 17/…

(1) 2 forwards-facing limiting lights

(2) 2 forwards-facing turn indicators

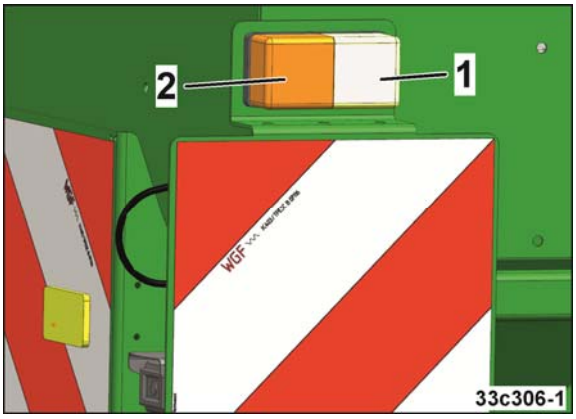


Fig. 17

Fig. 18/…

(1) Camera system for front hopper

→ The components that protrude far to the front over the tractor restrict the view. A camera at the front on each side of the front hopper and a monitor that displays these images simultaneously always ensure for an optimal all-round view – of course, the usual regulations for road traffic still apply.

Fig. 18

4.7 Proper use

The implement

- is designed for carrying and metering commercially-available seeds and fertilisers.
- is coupled to the tractor's front hydraulic system using the three-point hitch attachment and is controlled by an operator.

Slopes can be travelled

- Along the contours

Direction of travel to left	10 %
Direction of travel to right	10 %

- Along the gradient

Up the slope	10 %
Down the slope	10 %

"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.

4.8 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 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 remain in the danger area of the implement

- while the tractor engine is running with the PTO shaft hydraulic system connected.
- 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 machine, particularly during coupling and uncoupling operations.
- when loading the hopper.
- in the area of moving parts.
- underneath raised, unsecured implements or parts of implements.
- when climbing onto the machine.

4.9 Rating plate and CE mark

The following illustrations show the arrangement of the rating plate and the CE mark.

The rating plate shows:

- Implement ID No.:
- Type
- Basic weight (kg)
- Perm. system pressure bar
- Perm. total weight kg
- Factory
- Model year

Fig. 19

4.10 Technical data

		FRU front hopper (without tyre packer) for rear implements up to 6 m working width	FPU front hopper (with tyre packer) for rear implements up to 6 m working width
Number of metering units/distributor heads		1	1
Net weight	KG	605	1195
Overall width	[mm]	2670	2670
Tank volume without extension	[l]	1500	1500
Tank volume with extension	[l]	2000	2000
Filling height	[mm]	1280	1510
Blower fan drive		hydraulic	hydraulic

4.10.1 Technical data for the calculation of tractor weights and tractor axle load

	Total weight G_V (see Seite 49)	Distance a_2 (see Seite 49)
FRU front hopper without extension with full hopper	2300 kg	0.8 m
FRU front hopper with extension with full hopper	2850 kg	0.8 m
FPU front hopper without extension with full hopper	2825 kg	1.0 m
FPU front hopper with extension with full hopper	3375 kg	1.0 m

4.11 Necessary tractor equipment

For operation of the implement in compliance with the intended use the tractor must fulfil the following requirements.

Electrical system

Required output of the tractor alternator:	12V at 30 A
Lighting socket:	7-pin

Hydraulic system

Maximum operating pressure:	210 bar
Tractor pump capacity:	At least 80 l/min at 180 bar
Implement hydraulic fluid:	Transmission/hydraulic fluid Utto SAE 80W API GL4
	The implement hydraulic/transmission fluid is suitable for the combined hydraulic/transmission fluid circuits of all standard makes of tractor.
Control unit:	Depending on the equipment, see page 61.

4.12 Noise production data

The workplace-related emission value (acoustic pressure level) is 70 dB(A), measured in operating condition at the ear of the tractor driver with the cab closed.

Measuring unit: OPTAC SLM 5.

The noise level is primarily dependent on the vehicle used.

5 Layout and function

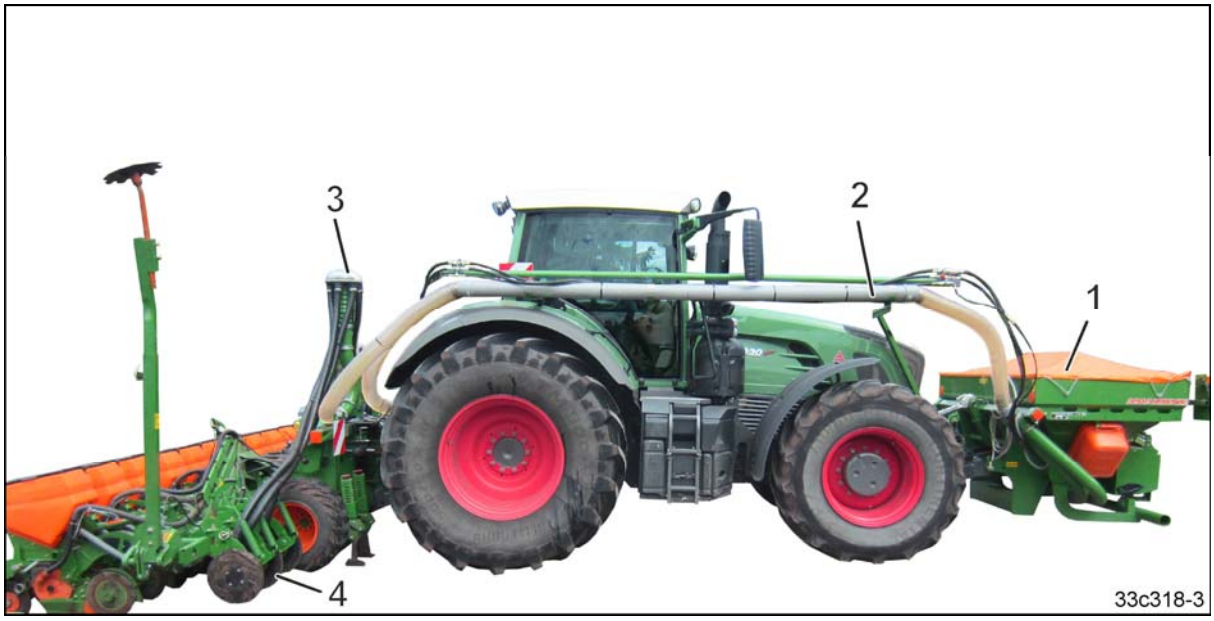


Fig. 20

The front hopper (Fig. 20/1) is attached to the tractor's front hydraulic system and serves to carry fertiliser or seed.

The FPU front hopper is mounted on a steered tyre packer. The tyre packer rolls on the soil in front of the tractor over a width of approx. 1.60 m. The tractor front axle is not loaded by the front hopper during operation. The self-steering of the tyre packer follows the steering angle of the tractor and enables easy manoeuvring of curves. The FRU front hopper does not have a tyre packer.

The desired spread rate is measured in the metering unit by a metering roller. The working speed and the set metered quantity determine the drive speed of the metering roller.

The metering roller can be driven by an electric motor.

If the metering roller is not electrically driven, the star wheel serves as a drive wheel for the metering roller and for calibration. The Vario gearbox is then responsible for the drive. The star wheel also serves to measure the travelled distance.The front hopper has a blower fan that produces the air current for delivering the metered material. The blower fan hydraulic motor is driven by the tractor hydraulic system. The metered material is delivered by the injector sluice through the hose package (Fig. 20/2) to the distributor head (Fig. 20/3), and from there, evenly onto all of the coulters.

The metered material is deposited in the soil by the coulters (Fig. 20/4).

5.1 Metering rollers

As an option, the metering unit can be equipped with different metering rollers. The metering rollers must be matched to the metered material. The metering roller selection is dependent on

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

The polyurethane metering roller is recommended for granular fertiliser!

The metering rollers are driven by

- a star wheel
- an electric motor

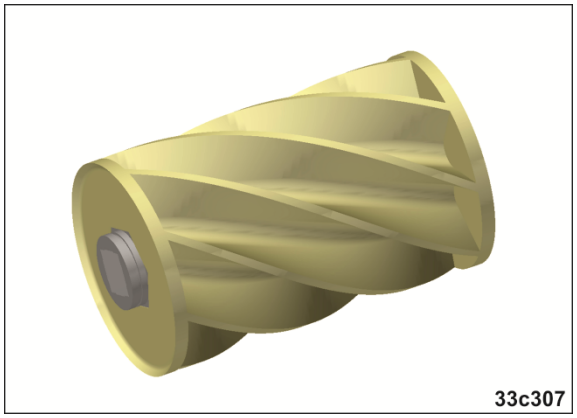


Fig. 21

5.2 Mechanical metering

5.2.1 Star wheel

Via the Vario gearbox, the star wheel (Fig. 22/1) drives the metering roller in the metering unit.

With an independent control terminal, a sensor can be connected to calculate the hectare output (optional).

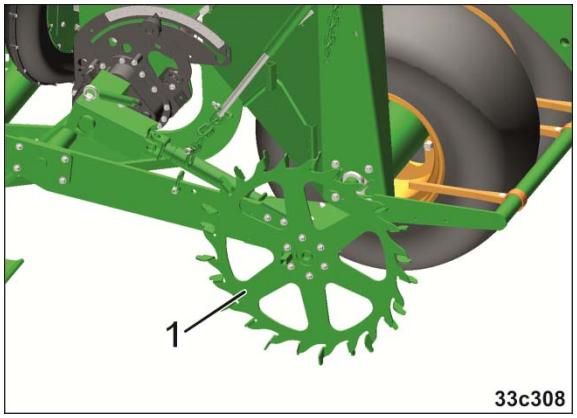


Fig. 22

5.2.2 Vario gearbox

To adjust the seed rate, the gear setting lever (Fig. 23/2) is set manually. The higher the scale value, the greater the seed rate.

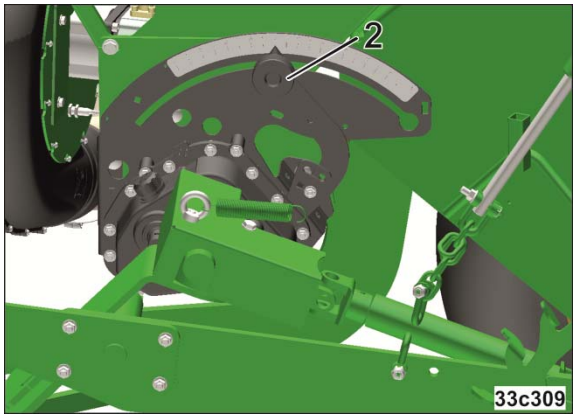


Fig. 23

5.3 Electric metering

For the electric metering unit, an electric motor (Fig. 24/1) drives the metering roller.

The opening flap is protected by a safety lever (Fig. 24/2). Release with the socket wrench only when the drive is at a standstill (see Fig. 10/2).

The rotational drive speed of the metering roller

- can be infinitely adjusted using the control terminal.
- determines the seed rate. The higher the rotational drive speed of the electric motor, the greater the respective seed rate.
- automatically adjusts to changing working speeds.

The seed pre-metering can be activated e.g. at the headlands. The run time of the seed pre-metering is adjustable.

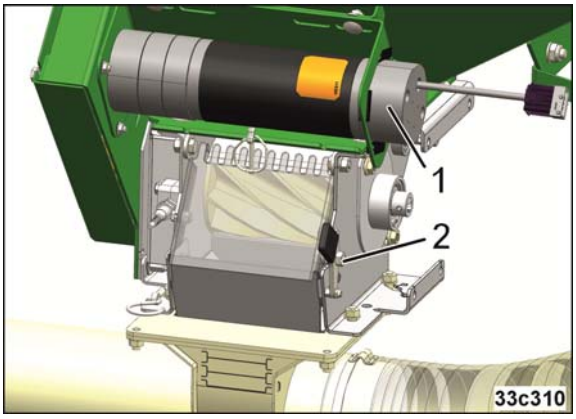


Fig. 24

5.4 Blower fan

The hydraulic motor (Fig. 25/2) drives the blower fan (Fig. 25/1) and generates the air current. The air current carries the seed from the injector sluice to the coulters.

The blower fan speed determines the air volume of the air current.

The faster the blower fan speed, the greater the air volume that is generated.

Please refer to the table (Fig. 61, Seite 78) for the required blower fan speed. Spreading fertiliser requires a blower fan speed of up to 4000 rpm.

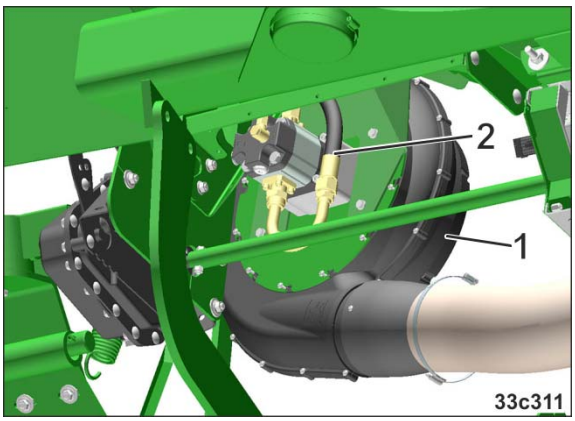


Fig. 25

5.5 Distributor head

In the distributor head (Fig. 26/1), the seed is distributed uniformly over all the connected coulters. The distributor head is attached to the rear implement.

Fig. 26

5.6 Fill level indicator (optional)

A capacitive sensor (Fig. 27/1), connected to the control terminal, monitors the fill level in the hopper. If the sensor is no longer immersed in the metered material, an acoustic signal is issued.

The front hopper should never be allowed to run empty to prevent fluctuations in the application rate.

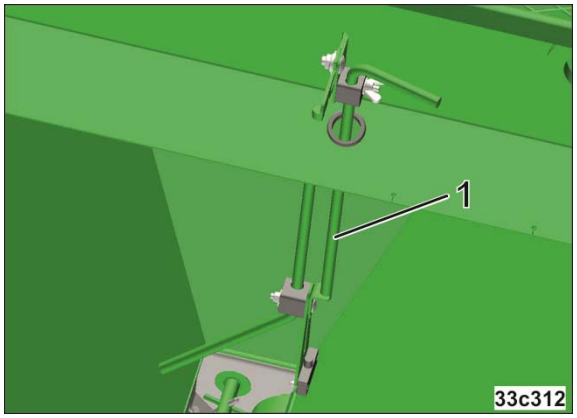


Fig. 27

6 Initial operation

This section contains information

- on initial operation of your implement.
- on checking how you may tow 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 22 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 hitch the implement to the tractor.

  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 hydr. pump output of the tractor must be at least 80 l/min.
- 12 V at 110 Ah output of the tractor alternator
- The permissible total weight
- The permissible axle loads
- The permissible drawbar load at the tractor coupling point
- The load capacity of the installed 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 attached 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)

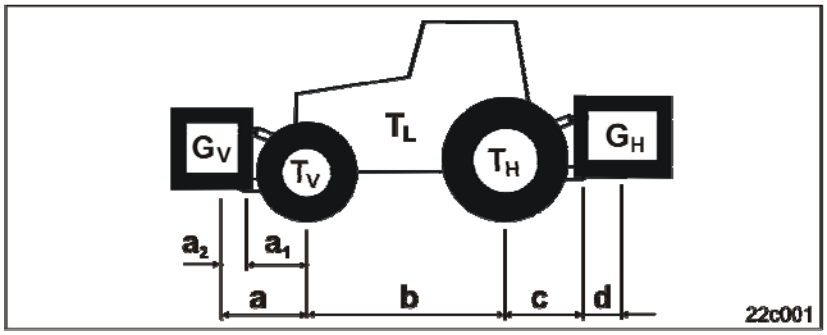


Fig. 28

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 technical data for the rear-mounted implement
G_V	KG	Total weight of front-mounted implement or front ballast	See section "Technical data for the calculation of tractor weights and tractor axle load", Seite 40
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)	
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 section "Technical data for the calculation of tractor weights and tractor axle load", Seite 40 or front ballast 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 technical data for the rear-mounted implement

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

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

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 $T_{V\ tat}$

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

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

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

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 $T_{H\ tat}$

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

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 instruction manual		Double approved load capacity (two tyres)
Minimum ballast front/rear	/ kg		--		--
Total weight	kg	≤	kg		--
Front axle load	kg	≤	kg	≤	kg
Rear axle load	kg	≤	kg	≤	kg

- You can find the approved values for the total tractor weight, axle loads and load capacities in the tractor registration papers.
- The actual calculated values must be less than or equal to (≤) 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 lowering of raised, unsecured parts of the implement.
- 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 implement.

It is forbidden to make any intervention in the implement, such as installation, adjustment, troubleshooting, cleaning, maintenance and repairs

- while the implement is being driven.
- when the tractor's engine is running and the tractor's PTO shaft/hydraulic system is connected.
- if the ignition key is inserted in the tractor when the tractor's PTO shaft/hydraulic system is connected and the tractor engine could be started unintentionally.
- if the tractor has not been prevented from unintentionally rolling away by applying the parking brake and/or securing it with wheel chocks.
- if moving parts are not blocked against unintentional movement.
- When carrying out such work, in particular, there is a high risk of contact with unsecured components.

1. Park the tractor and the implement on solid, level ground only.
2. Lower the 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.

6.3 Installation instructions for blower fan connection to tractor hydraulics

Do not exceed a back pressure of 5 bar in the leak oil connection. The installation regulations therefore have to be complied with when connecting the hydraulic fan connection.

- Connect the hydraulic coupling of the pressure line (see also section 7.2.1.1, page 63) to a single-acting or double-acting tractor control unit with priority.
- Connect the large hydraulic coupling for the return line (see also section 7.2.1.1, page 63) only to an unpressurized tractor connection with direct access to the hydraulic fluid tank. To prevent the back pressure from exceeding 10 bar, do not connect the return line to a tractor control unit.
- ED xx00-2FC: In combination with a hydraulic seeding unit drive, the blower fan return flow from the front hopper must be fed into the seeding unit drive. This is not unpressurised. In this case, an additional leak oil connection is available (see also section 7.2.1.1, page 63).
- For retro-installation of the tractor return line, use only piping with ND 16, e.g. 20 id. x 2.0 mm with a short return path to the hydraulic fluid tank.

For operation of all hydraulic functions, the tractor hydraulic pump output should be at least 80 l/min. at 150 bar.

The hydraulic fluid must not overheat.

High oil flow rates in conjunction with small oil tanks encourage rapid heating-up of the hydraulic fluid. The capacity of the tractor's oil tank should be at least twice the oil flow rate. If the hydraulic fluid heats up excessively, the installation of an oil cooler is required at a specialist workshop.

6.4 Adjusting the hose package to the tractor

The hose package consists of

- A steel tube (Fig. 29/1) in which the metered material is conveyed from the front hopper to the rear-mounted implement.
- Hydraulic lines and data cables (Fig. 29/2).

The delivery tube must be attached horizontally or slightly slanted down towards the front hopper with at least two brackets at the front and the rear on the tractor.

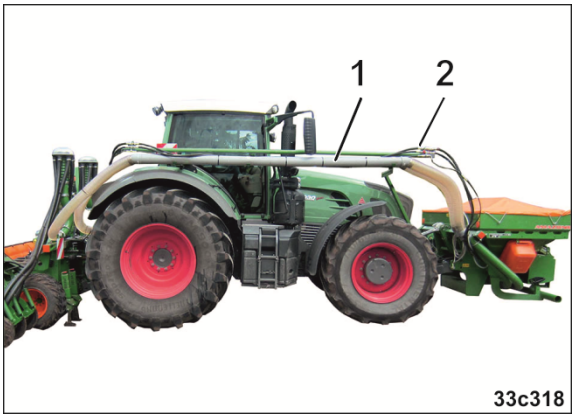


Fig. 29

Installation instruction:

The interface (Fig. 30/1) of the data cable (Fig. 30/2) is located at both ends of the hose package. The front end of the hose package is located where the hydraulic couplings are attached.

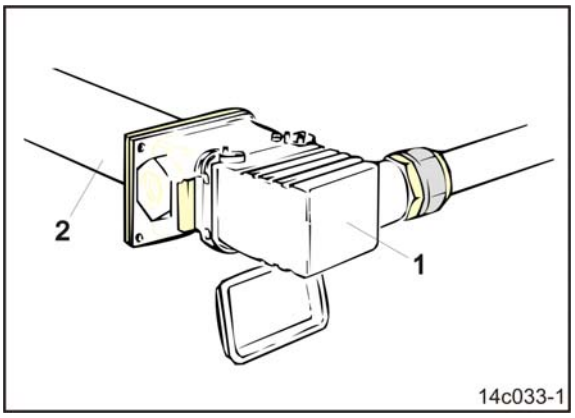


Fig. 30

Hose package brackets

The illustrated brackets (Fig. 31) are not included in the scope of delivery. To facilitate mounting, the hose package contains various adapter plates for assembly.

Fig. 31

For tractors with cab suspension, observe the instructions from the tractor manufacturer. The brackets must not be mounted on the suspended cab.

Fig. 32

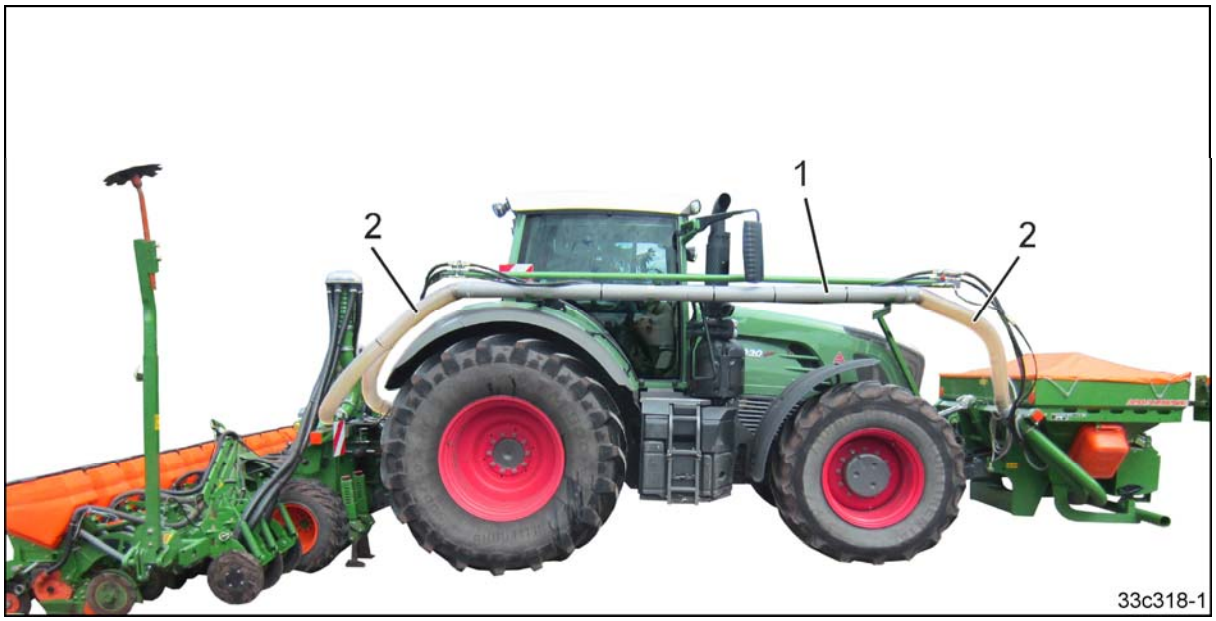


Fig. 33

Connect the steel tube (Fig. 33/1) with the flexible hose (Fig. 33/2) to the front hopper and the rear-mounted implement.

Adjust the length of the flexible hose and dimension it so that it does not bend or get pinched when

- raising and lowering the mounted implements for turning and for transport,
- driving over crests during operation,
- driving through depressions during operation,
- Folding the rear-mounted implement.

Check that the steering axles can travel freely in all operating states.

7 Coupling and uncoupling the implement

When coupling and uncoupling the implement take heed of the section "Safety information for users", Seite 22.

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 52.

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

- from the workplace provided.
- if you are outside of the danger area between the tractor and the implement.

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 47.

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.

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 defects whenever the implement is coupled. Replace the upper and lower link pins if there are clear signs of wear.
- Secure the top link pin and the lower link pins against unintentional detachment using linch pins.

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 give slightly without tension, bending or rubbing on all movements of the connected implement.
- must not chafe against other parts.

DANGER

The lower link of the tractor must not have any lateral play so that the implement always runs centrically behind the tractor and does not knock back and forth!

The height of the Cat II lower link rod (Fig. 34/1) can be adjusted.

Depending on the adjustment, the lower link rod must be locked against turning with setting rings, which are pressed firmly against the brackets.

7.1 Coupling the implement

DANGER

Couple the front hopper to the tractor before filling.

1. Check whether the linkage categories of the implement and the tractor are identical.
   - o Cat II lower link rod (Fig. 34/1)
   - o Cat. II top link pin (Fig. 34/3).
2. Secure the top link pin with a linch pin.
3. Direct people out of the danger area between the tractor and implement before you approach the implement with the tractor.
4. Engage the lower pivot points of the implement using the tractor lower links. The lower link hooks lock automatically.
5. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
6. Couple the tractor top link (Fig. 34/2) with the top pivot point of the implement. The top link hook locks automatically.
7. Bring the implement into a straight position by adjusting the top link.
8. Secure the top link against twisting.
9. Check that the upper and lower link hooks are locked correctly.
10. Couple the supply lines to the tractor (see section 4.5, Seite 35).
11. Attach the rear implement to the tractor.

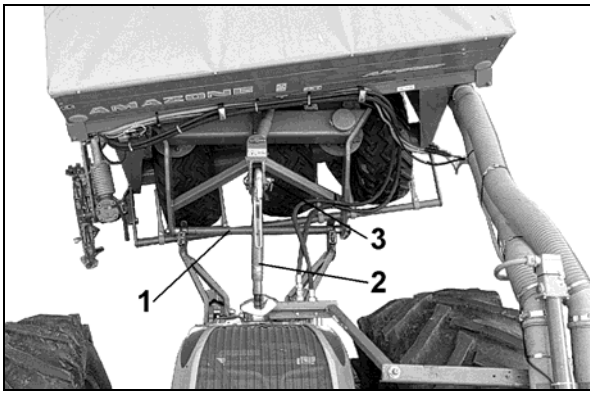


Fig. 34

Installation instructions

- The front tractor lower links must be equipped with pendulum compensation to compensate for ground undulations and to prevent damage to the frame due to bending.
- The tractor lower links may not have too much lateral play.
- It is easier for the tractor to raise the front hopper when the top link is mounted as low as possible on the front hopper and as high as possible on the tractor. Check whether the lifting height is sufficient.

12. Insert the flexible hose into the steel tube and secure with quick release fasteners (Fig. 35/1).

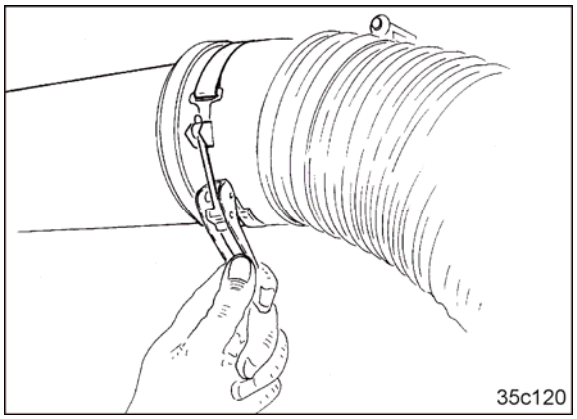


Fig. 35

13. Push the jack (Fig. 36) up and position it with the previously released pin, and then lock with a spring cotter pin.
14. Connect the combined plug from the front hopper to the wiring harness.
15. Connect the plug of the rear implement to the wiring harness.

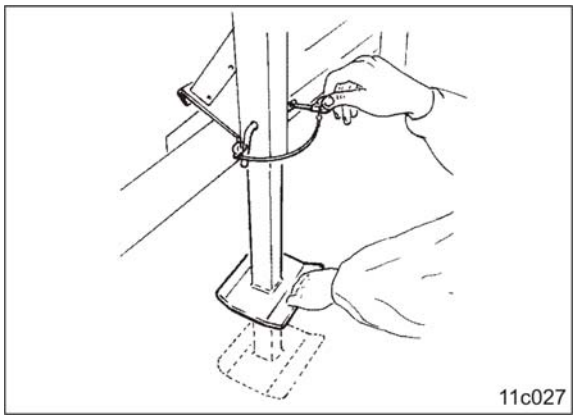


Fig. 36

7.2 Hydraulic hose lines

WARNING

Danger of infection from escaping hydraulic fluid at high pressure!

When coupling and uncoupling the hydraulic hose lines, ensure that the hydraulic system is depressurised on both the implement and tractor sides.

If you are injured by hydraulic fluid, contact a doctor immediately.

All hydraulic hose lines are equipped with handles. Coloured markings with a code number or code letter have been applied to the handles to assign the respective hydraulic function to the pressure line of a tractor control unit!

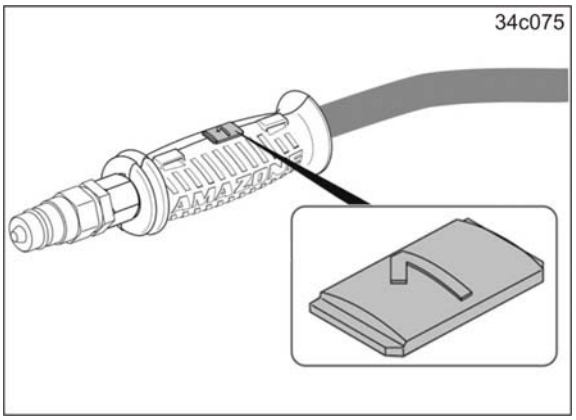


Fig. 37

The tractor control unit must be used in different modes of activation, depending on the hydraulic function.

Latched,
for permanent fluid circulation

Tentative,
activate until the action is executed

Float position,
free flow of oil in the control unit

7.2.1 Coupling the hydraulic hose lines

WARNING

Risk of being crushed, cut, caught, drawn in or struck due to faulty hydraulic functions when the hydraulic hose lines are connected incorrectly!

When coupling the hydraulic hose lines, observe the coloured markings on the hydraulic connectors.

- Check the compatibility of the hydraulic fluids before connecting the implement to the hydraulic system of the tractor.
  Do not mix any mineral oils with biological oils.
- Observe the maximum approved hydraulic fluid pressure of 210 bar.
- Only couple clean hydraulic connectors.
- Push the hydraulic push-fit connector(s) into the hydraulic sockets until the hydraulic connector(s) perceivably lock(s).
- Check the coupling points of the hydraulic hose lines for a correct, tight seat.

1. Swivel the actuation lever on the control valve on the tractor to float position (neutral position).
2. Clean the hydraulic connectors of the hydraulic hose lines before you couple the hydraulic hose lines to the tractor.
3. Connect the hydraulic hose line(s) to the tractor control unit(s) and/or the rear-mounted implement.

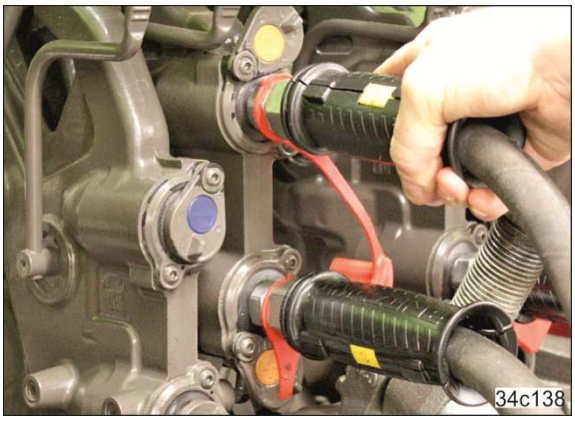


Fig. 38

7.2.1.1 FRU/FPU in combination with ED xx00-2 FC

Marking		Function			Tractor control unit	
Beige	1		Star wheel actuation	Raising	Single-acting	
Red	1		Blower fan hydraulic motor Pressure line with priority [1] (approx. 38 l/min.)	Switch on	Single-acting	
	2	Only with FRU/FPU: Connection of metering unit to hydraulic motor in series with the blower fan hydraulic motor		Switch on		
	T	Unpressurised return flow [1] Pressure-free line (see section "Installation instructions for blower fan connection to tractor hydraulics", Seite 53)				

(1) ED xx00-2FC: In combination with a hydraulic seeding unit drive, the blower fan return flow from the front hopper must be fed into the seeding unit drive (Fig. 40/2). This is not unpressurised. In this case, an additional leak oil connection is available (Fig. 40/3).

- Going from the tractor to the front hopper:
  - Control unit (*red*), blower fan hydraulic motor pressure line with priority [1] (approx. 38 l/min.)
  - Star wheel lift-out (*beige*) (Fig. 39), only with standard and comfort hydraulic systems
- Going from the implement to the front hopper:
  - Star wheel lift-out (*beige*) (Fig. 39 on Fig. 40/1), only for Profi hydraulic system
  - Metering hydraulic motor (*red*), (Fig. 40/2)
  - Leak oil connection (*red*), (Fig. 40/3), in combination with a hydraulic seeding unit drive.

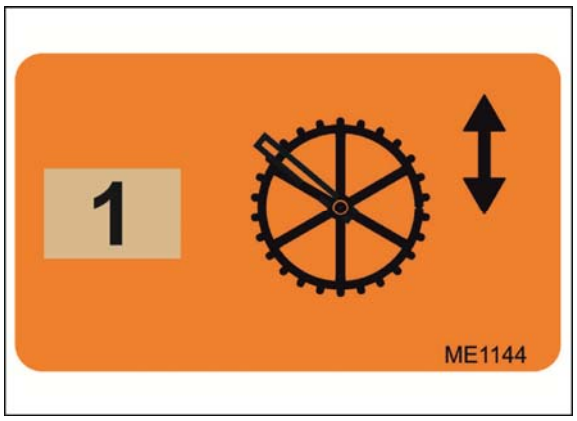


Fig. 39

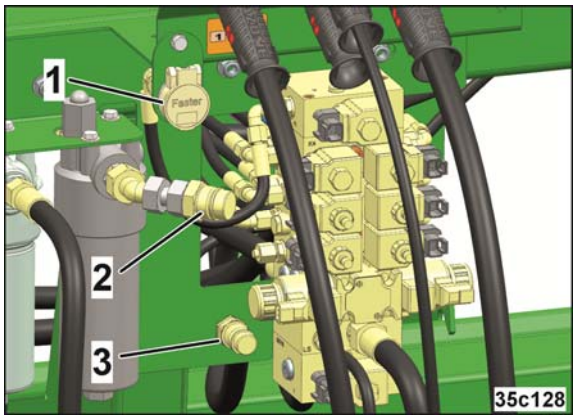


Fig. 40

7.2.2 Uncoupling the hydraulic hose lines

1. Swivel the actuation lever on the control valve on the tractor to float position (neutral position).
2. Release the hydraulic connectors from the hydraulic sockets.
3. Place the hydraulic hose lines in the hose cabinet.

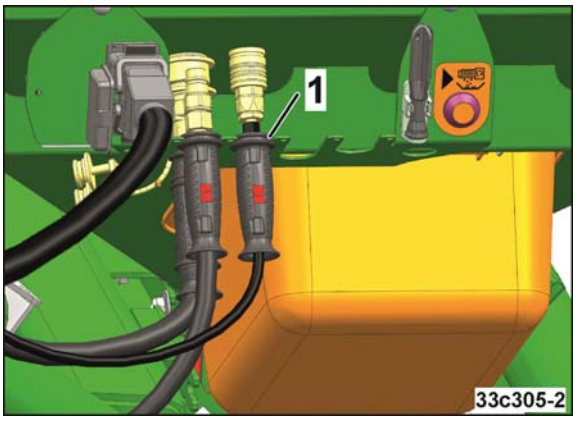


Fig. 41

When coupling and uncoupling the implement take heed of the section "Safety information for users", Seite 22.

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 52.

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

- from the workplace provided.
- if you are outside of the danger area between the tractor and the implement.

7.2.3 Connecting the pressure gauge

Only in combination with mechanical drive:

→ Connect the pressure gauge (Fig. 42/1) to the hose (Fig. 42/2).

Fig. 42

7.2.4 Electrical connections

The electric coupling procedure can vary depending on the implement equipment. Connect the electrical line(s) with the tractor(s) and/or the rear-mounted implement.

7.2.4.1 FRU/FPU in combination with ED xx00-2 FC

Assembly:	Function	Notes
Implement plug	Road traffic lighting system (connect to the rear of the tractor)	Standard
	Data cable for AMASCAN^{+} control terminal	(option)
	Data cable for ISOBUS job computer (AMATRON 3, CCI 100, tractor terminal)	(option)
	Camera plug for monitoring camera	(option)

1. Connect the front hopper plug (Fig. 43/1) to the data cable from the hose package.
2. Connect the seeder plug to the data cable from the hose package.

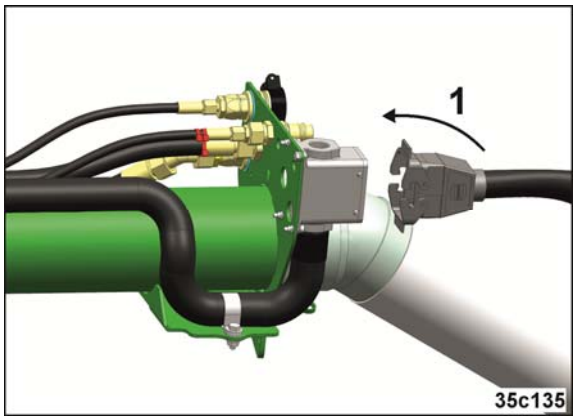


Fig. 43

7.3 Uncouple the implement from the tractor

WARNING

Danger of being crushed, cut, caught, drawn in or struck through insufficient stability and possible tilting of the uncoupled implement!

Set the empty implement down on a level parking area with a firm base.

DANGER

Empty the front hopper before uncoupling from the tractor.

1. Push the jack (Fig. 36) down and position it with the previously released pin, and then lock with a spring cotter pin.
2. Park the front hopper on a level surface with solid ground.
3. Disconnect the wiring harness and the pipes.
4. Release the top link. Adjust the upper link length accordingly.
5. Decouple the lower link hooks, working from the tractor cab.
6. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
7. Place the disconnected supply lines in the hose cabinet.
   - Hydraulic hose lines (Fig. 45/1, see section "Uncoupling the hydraulic hose lines", Seite 64)
   - Data cable parking position (Fig. 45/2)

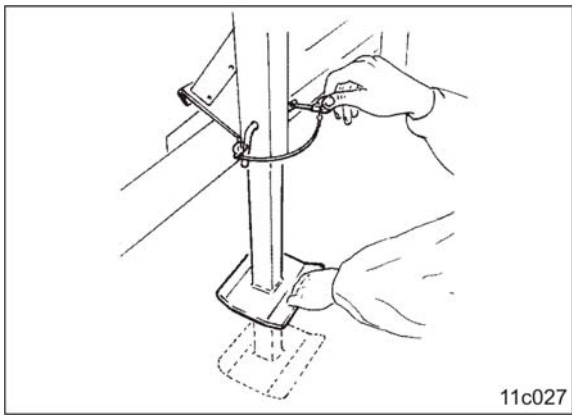


Fig. 44

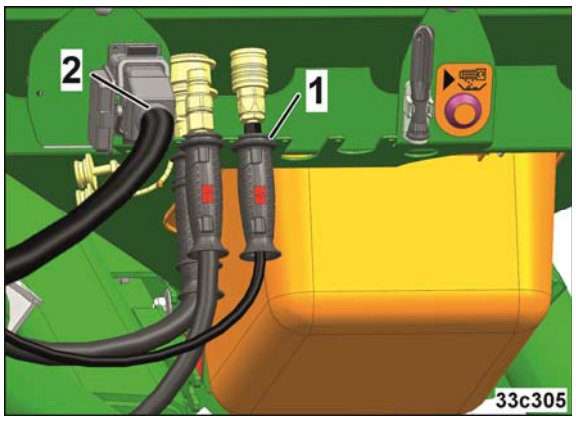


Fig. 45

DANGER

While reversing with the tractor, there should be no one standing between the tractor and the implement and behind the implement!

8 Settings

DANGER

Carry out the adjustments only if the following apply:

- **lowered and unfolded.**
- **The tractor parking brake is applied.**
- **The tractor engine is switched off.**
- **The ignition key is removed.**

WARNING

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

- **Unintentional lowering of the implement raised using the tractor's three-point hydraulic system**
- **Unintentional lowering 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 you make any adjustments to the implement, see section 6.2, Seite 52.

8.1 Installing/removing the metering roller

Before filling, check which metering roller is attached. If required, change the metering roller!

Recommendation for fertiliser metering: Polyurethane metering roller

Replacing the metering roller when the hopper is full:

1. Loosen the nuts (Fig. 46/1) and open the locking mechanism (Fig. 46/2).
2. Swivel the viewing window inwards (Fig. 46/3).
3. Remove the linch pin (Fig. 46/4).

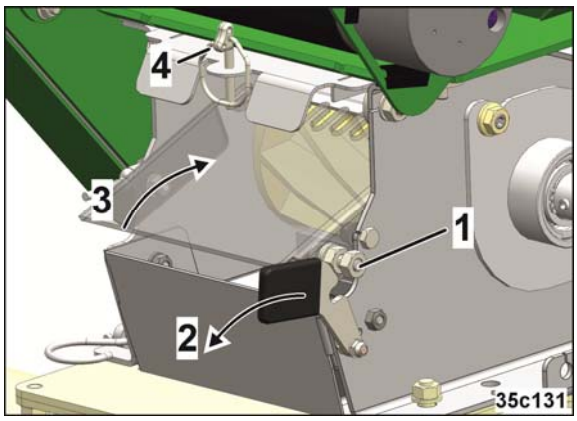


Fig. 46

4. Push the slider (Fig. 47/1) into the dosing unit up to the stop.

→ The shutter seals the hopper. Fertiliser cannot pour out inadvertently when the metering roller is being replaced.

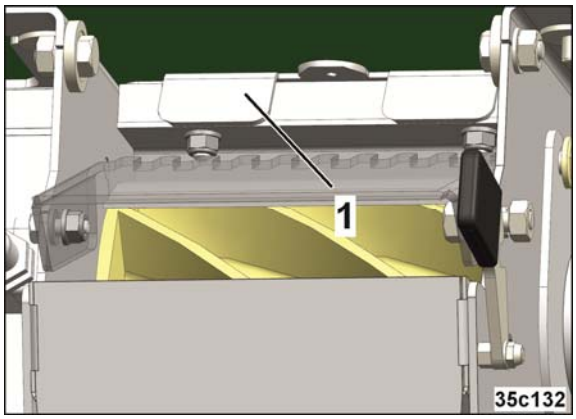


Fig. 47

5. Loosen two nuts (Fig. 48/1) with the removable handle (see Fig. 10/2), but do not remove.
6. Twist (Fig. 48/2) and remove (Fig. 48/3) the bearing cover.

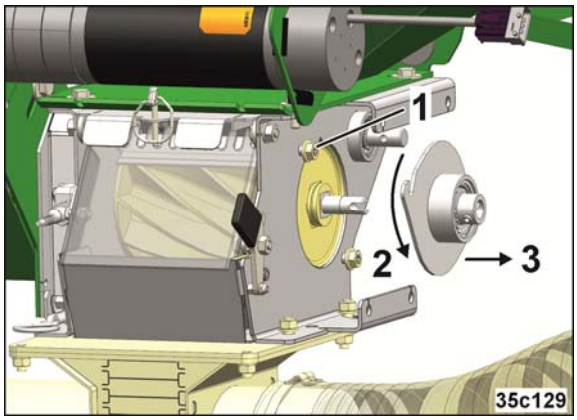


Fig. 48

7. Pull the metering roller out of the metering unit.
8. Fit the desired metering roller in the reverse sequence.
9. Open the shutter (Fig. 47/1) and secure (linch pin Fig. 46/4).

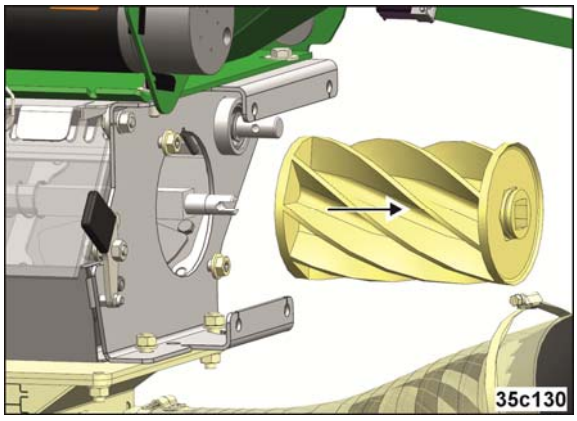


Fig. 49

8.2 Adjusting the metered quantity

Depending on the implement equipment, calibration of the spread rate requires adjustments on the

- metering unit,
- Vario gearbox,
- or the control terminal.

8.2.1 Mechanical metering drive

Test each adjustment with a calibration test (see section "Calibration test", Seite 71).

1. Carry out the calibration test (see section "Calibration test", Seite 71).
2. Read the gear setting number for the desired fertiliser spread rate according to section "Determining the gearbox setting using the calculating disc rule".
3. Loosen the rotary knob (Fig. 50/1).
4. Set the pointer (Fig. 50/2) from below to the gearbox setting number on the scale (Fig. 50/3).
5. Tighten up the rotary knob
6. Repeat the calibration test (see section "Calibration test", Seite 71).

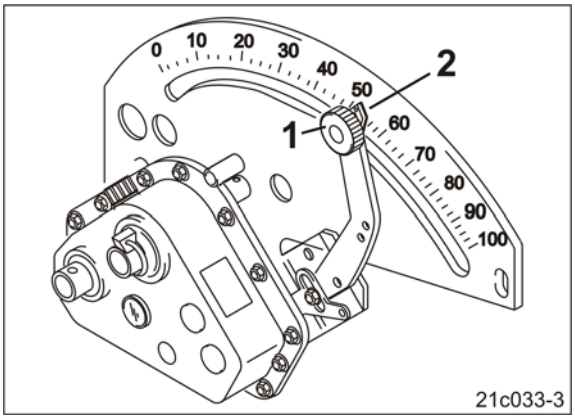


Fig. 50

8.2.1.1 Calibration test

Check if the desired metered quantity is being applied using the calibration test.

1. Fill the front hopper to at least 1/4 with fertiliser.
2. Take the collection buckets from the transport bracket.

   The collection buckets (Fig. 51/2) are secured with a linch pin for transport (Fig. 51/1).

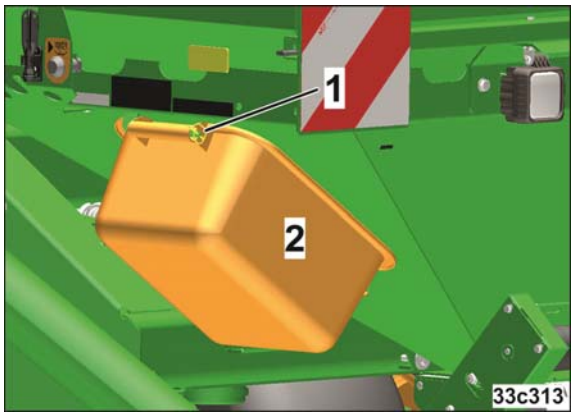


Fig. 51

3. Place a collection bucket under each metering unit (Fig. 52/1).
4. Open the injector sluice flap (Fig. 52/2).

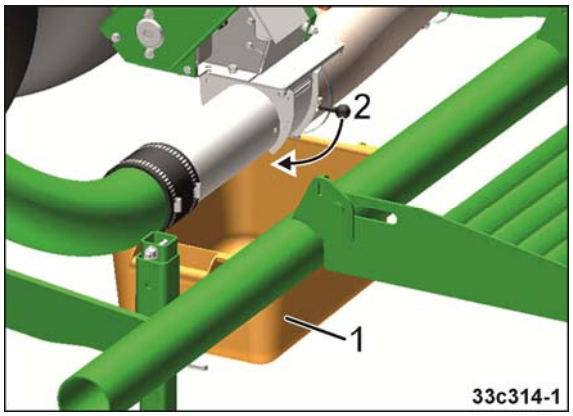


Fig. 52

WARNING

Risk of crushing when opening and closing the injector sluice flap (Fig. 52/1)!

Only hold the injector sluice flaps on the tab (Fig. 52/2), otherwise there is a risk of injury when the spring-loaded injector sluice flap closes.

Never put your hand between the injector sluice flap and the injector sluice!

5. Take the calibration crank from the parking position (Fig. 53/1) and insert into the square hole of the star wheel (Fig. 53/2).
6. Turn the star wheel with the calibration crank counterclockwise (see Fig. 53) until all chambers of the metering wheels are filled with metered material and an even stream of material falls into the collection bucket.
7. Empty the collection bucket (not into the fertiliser hopper with the blower fan running).
8. Put the collection buckets back under the metering unit.
9. The required number of crank turns is determined from:
   - o The working width (Fig. 54/1)
   - o The number of crank turns on the star wheel for 1/10 or 40 ha (Fig. 54/2).

Crank turns for working widths which are not listed, can be calculated as shown below.

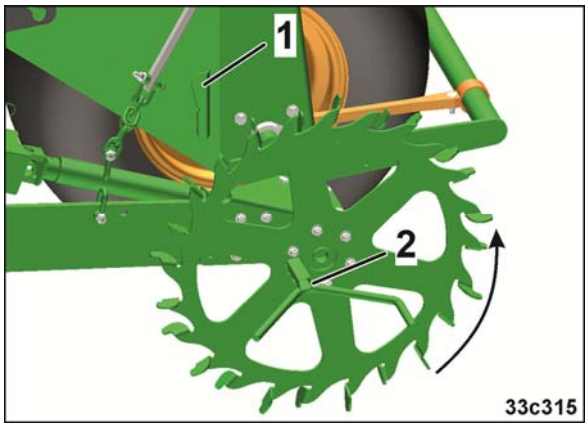


Fig. 53

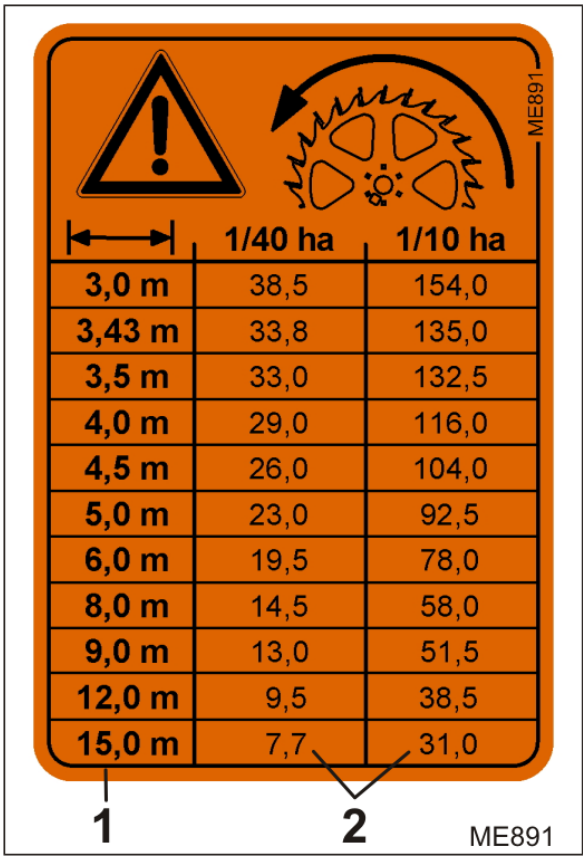


Fig. 54

Example:

Data to calculate the crank turns on the star wheel	
Working width:	8.40 m
Calibration:	to 1/40 ha
Crank turns on the star wheel:	calculate

Data from the table (Fig. 54)	
Working width:	8 m
Calibration:	to 1/40 ha
Crank turns on the star wheel:	14.5

$$\text{Crank turns} = 14.5 \times \frac{8\ [\text{m}]}{8.4\ [\text{m}]} = 14.0$$

10. Turn the crank clockwise for the number of crank turns listed in the table (Fig. 54).
11. Weigh (Fig. 55/1) the collected metered quantity taking account of the weight of the bucket on the intended attachment point (Fig. 55/2) and depending on the selected table column, multiply with the factor "10" or "40".

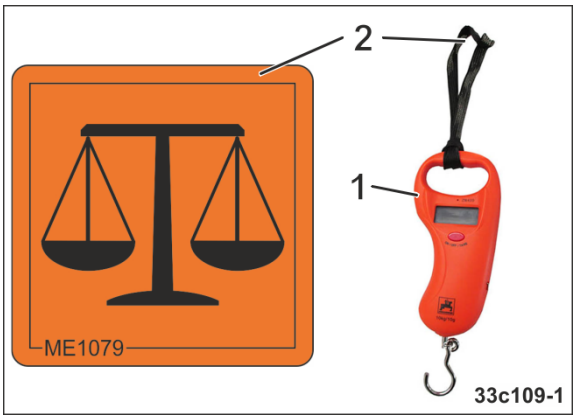


Fig. 55

Example:

Collected metered quantity: 4.37 kg (calibrated to 1/40 ha)

$$\text{Spread rate in [kg/ha]} = 4.37 \frac{\text{kg}}{\text{1/40 ha}} \times 40 = 174.8 \frac{\text{kg}}{\text{ha}}$$

12. If the desired fertiliser spread rate [kg/ha] is not achieved during the calibration test, calculate the gearbox setting using the calculating disc rule (section 8.2.1.2, page 74).

    Repeat the calibration test until the desired spread rate is achieved.
13. After the calibration test
    - Insert the calibration crank into its transport bracket.
    - Close the injector sluice flap very carefully (see Fig. 52, page 71),
    - Fasten the collection buckets (Fig. 51) into the transport bracket and secure with a linch pin.

8.2.1.2 Determining the gearbox setting using the calculating disc rule

Example:

Values from the calibration test

Calculated application rate:	~ 175 kg/ha
Gearbox position:	70
Desired application rate:	125 kg/ha.

1. The values from the calibration test
   - o Calculated application rate 175 kg/ha (Fig. 56/A)
   - o Gearbox setting 70 (Fig. 56/B)

   opposite one another on the calculating disc rule.
2. Read the gearbox setting for the desired seeding rate of 125 kg/ha (Fig. 56/C) from the calculating disc rule.

→ Gearbox setting 50 (Fig. 56/D).

3. Set the gearbox lever to the value read from the disc.
4. Check the gearbox setting by performing another calibration test.

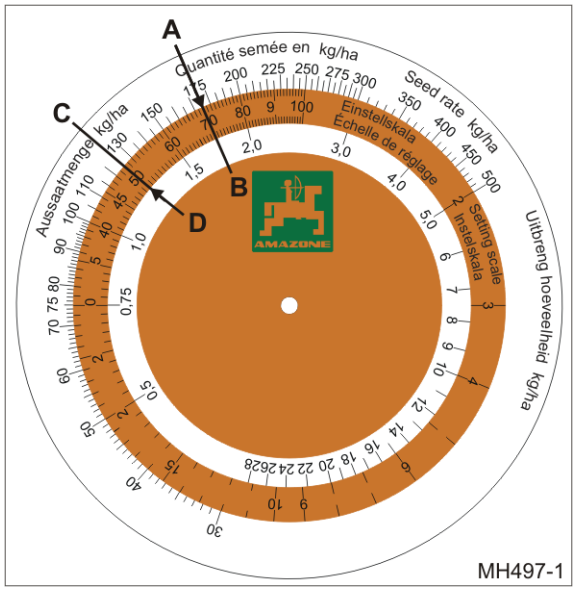


Fig. 56

8.2.2 Electric metering drive

To calibrate the metered quantity using the control terminal, it is absolutely necessary to observe the corresponding operating manual!

1. Fill the hopper to at least 1/4 with fertiliser.
2. Take the collection buckets from the transport bracket.

   The collection buckets (Fig. 57/2) are secured with a linch pin for transport (Fig. 57/1).

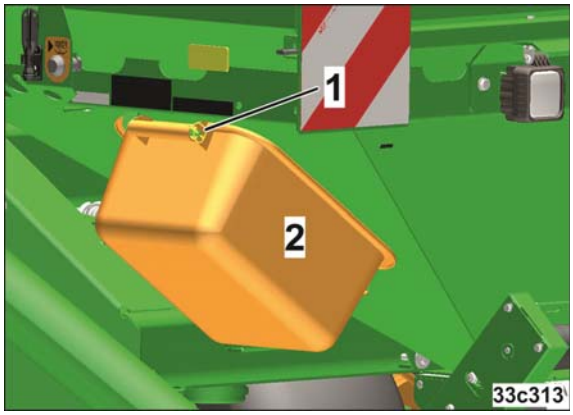


Fig. 57

3. Place the collection bucket (Fig. 58/1) under the metering unit.
4. Open the injector sluice flap (Fig. 58/2).

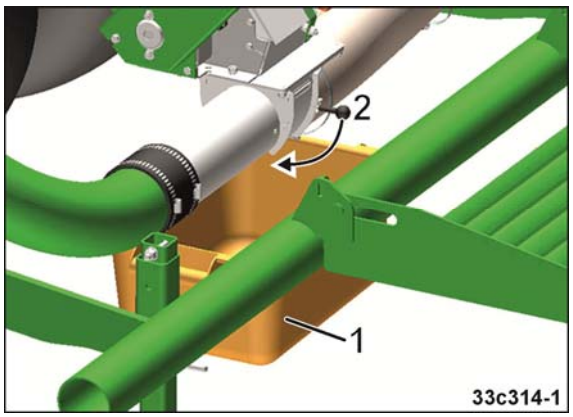


Fig. 58

5. For filling the metering cells, observe the operating manual for the implement software.
6. Empty the collection bucket (not into the fertiliser hopper with the blower fan running).
7. Put the collection buckets back under the metering unit.
8. Perform the calibration test according to the operating manual for the implement software.
   - o Calibration button (Fig. 59/1)
   - o Metering drive (Fig. 59/2)
9. Repeat the calibration test until the desired spread rate is achieved.
10. After the calibration test:
    - o Close the injector sluice flap very carefully (see Fig. 52, page 71),
    - o Fasten the collection buckets (Fig. 51) into the transport bracket and secure with a linch pin.

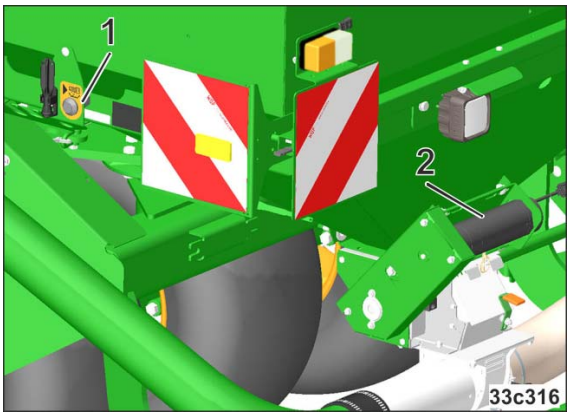


Fig. 59

8.2.3 Adjustment instructions for the spread rate

The spread rate can vary depending on the fertiliser type and properties. Each change in the type and settings must be tested by calibration.

8.2.3.1 Diammonium phosphate 18 – 46 – 0 / 0.97 kg/l

The maximum spread rate of the FRU104/FPU104 is only achieved when the implement is aligned horizontally and with the maximum blower fan speed (4000 rpm).

Maximum spread rate:

- 24 kg/min diammonium phosphate 18 – 46 – 0 (6 rows)
- 31 kg/min diammonium phosphate 18 – 46 – 0 (8 rows)
- 36 kg/min diammonium phosphate 18 – 46 – 0 (12 rows)

Working width	6.4 m 8 rows	6.0 m 8 rows	6.0 m 12 rows	5.6 m 8 rows	5.4 m 12 rows	4.8 m 6 rows	4.5 m 6 rows	4.2 m 6 rows
Maximum spread rate (kg/ha) at 10 km/h	297							
	/	317						
	/	/	360					
	/	/	/	340				
	/	/	/	/	400			
	/	/	/	/	/	300		
	/	/	/	/	/	/	320	
	/	/	/	/	/	/	/	342

Fig. 60

8.3 Adjusting blower fan speed

DANGER

Do not exceed the maximum blower fan speed of 4000 rpm.

The blower fan speed alters until the hydraulic fluid has reached its working temperature.

On initial operation correct the blower fan speed up to attainment of the working temperature.

If the fan is put back into operation after a long stoppage period, the preset blower fan speed is not attained until the hydraulic fluid has heated up to working temperature.

Set the target blower fan speed on the flow control valve of the tractor

If the speed of the compressed air blower fan is set correctly, no fertiliser should be blown out of the fertiliser furrow.

The blower fan speed (rpm) is dependent on

- the desired spread rate
- the working width (1) of the rear implement
- the metered material
  - o Fine seed types (2), e.g. rapeseed or grass seed.
  - o Cereals and legumes (3) and fertiliser.

Example:

- Rear implement with 6 m working width
- Legume metering

→ Required blower fan speed: 3900 rpm

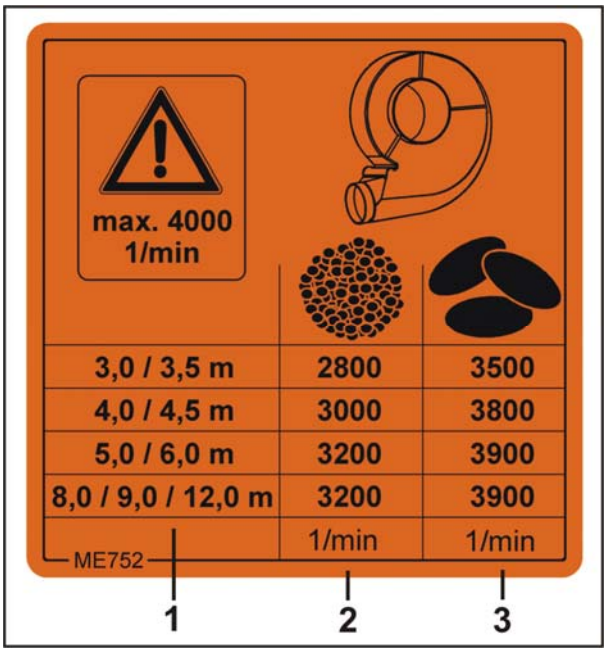


Fig. 61

When metering fertiliser, the blower fan speed must be set to max. 4000 rpm.

8.3.1 Setting the blower fan speed via the flow control valve of the tractor

1. Fill the fertiliser hopper.
2. Start the tractor engine and run at high rpm.
3. Let the seeding units run up to speed and fill the singling discs with seed grains
4. Set the oil quantity (using the tractor operating manual) on the tractor control unit.
5. Check the blower fan speed using the control terminal.

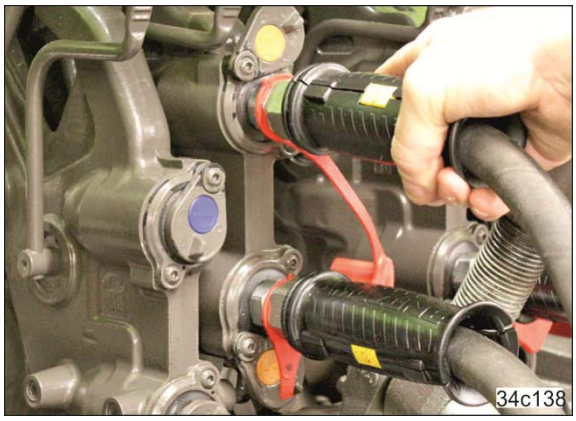


Fig. 62

8.3.1.1 Setting the blower fan speed monitoring

The on-board computer monitors the blower fan speed. Set the target blower fan speed in the on-board computer.

If the actual speed deviates by more than 10 % from the target speed, an acoustic signal is issued along with a screen display.

It is possible to set the percent deviation (only on the AMATRON 3 on-board computer).

8.3.1.2 Checking the blower fan speed without a control terminal

If there is no on-board computer, a pressure gauge (Fig. 63) in the tractor cab indicates the maintenance of the required blower fan speed.

The blower fan speed is set correctly when the pressure gauge pointer

- is in the green range (Fig. 63/1) for cereals, legumes and fertiliser,
- is in the green range (Fig. 63/2) for fine seeds (e.g. rapeseed or grass seeds).

Set the required blower fan speed using the pressure gauge.

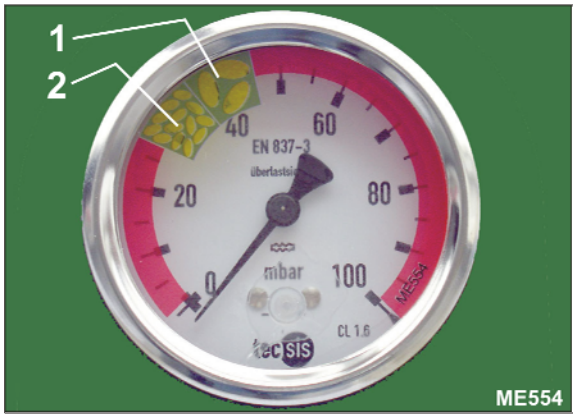


Fig. 63

Outside the specified green areas, there may be inaccuracies with regard to distribution of the metered material and damage to the blower fan.

8.4 Setting the fill level sensor

The height of the fill level sensor can only be adjusted when the front hopper is empty:

1. Unscrew the wing nut (Fig. 64/2).
2. Adjust the height of the fill level sensor (Fig. 64/1) according to the desired residual material quantity using the handle (Fig. 64/3).
3. Tighten the wing nut.

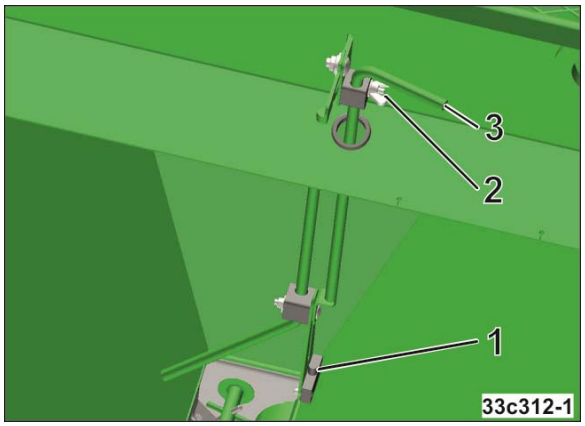


Fig. 64

The fill level sensor must not touch the wall of the hopper!

9 Transportation

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.

In Germany and in many other countries, the transportation of a implement combination up to 3.0 m wide mounted on the tractor is permissible.

The max. transport height of 4.0 m must not be exceeded!

The max. permissible speed[1)] is 40 km/h for tractors with mounted work equipment.

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 22.
- Before moving off, check:
  - that the permissible weight is not exceeded,
  - 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 may lead to 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.

Instruct people to leave the loading site before approaching the implement.

WARNING

Risk of contusions, cutting, catching, drawing in and knocks when making interventions in the implement through unintentional implement movements.

- On folding implements, check that the transport locks are locked correctly.
- Secure the implement against unintentional movements before starting transportation.

9.1 Move the implement in the transport position

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 machine against unintentional starting and rolling away (see section "6.2", Seite 52).

1. Switch off the blower fan.
2. Switch off the on board computer.
3. Fold up the step.
4. Put the star wheel (Fig. 65/1) into transport position and secure it with the chain (Fig. 65/1).
5. Check the lighting system for correct operation.
6. Lock the tractor control units during road transport.

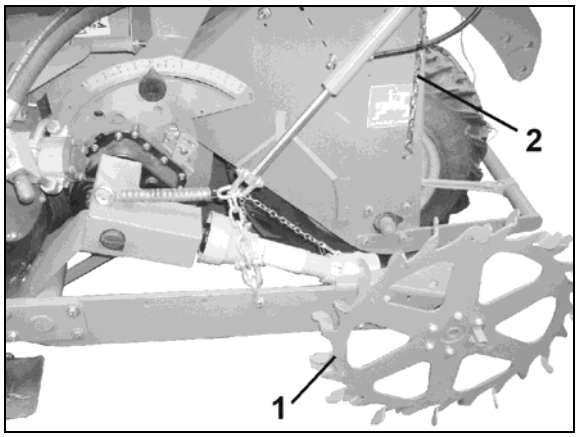


Fig. 65

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.**

- The warning signs and yellow reflectors must be clean and undamaged.
- Switch on the warning beacon (if present), which is subject to authorisation, prior to starting a journey and check for operability.

The distance from the middle of the steering wheel to the front edge of the front hopper exceeds 3.50 m. This can impede the field of vision.

In case of restriction of the field of vision, an accompanying person must help on public roads, e.g. a marshalling person.

The front hopper is equipped with limiting lights (Fig. 66/1).

If the driving lights on the tractor are hidden by the front hopper, the second pair of headlights on the tractor cab must be switched on. The headlights (Fig. 66/3) on the front hopper are work floodlights and may only be switched on when on the field.

The distance from the warning sign (Fig. 66/2) to the outer edge of the implement must not exceed 10 cm, and max. 150 cm to the road surface.

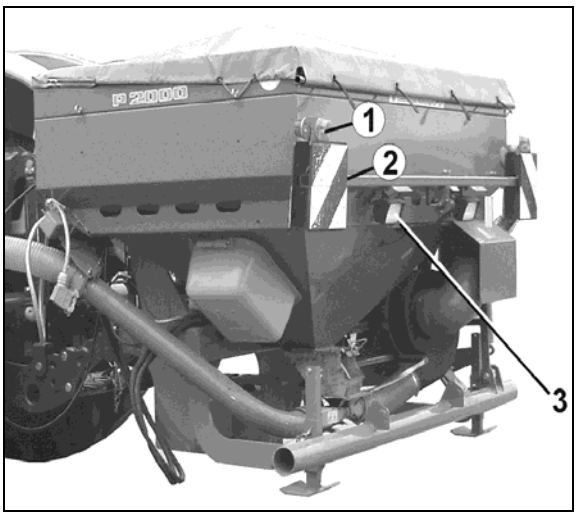


Fig. 66

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 17 and
- "Safety information for users", Seite 22.

Observing this information is important for your safety.

WARNING

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

Comply with the maximum load of the connected implement and the approved axle and drawbar loads of the tractor. If necessary, drive only with an empty or partially filled front hopper.

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 angebauter oder 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.

WARNING

Risk of contusions, drawing in and catching during implement operation without the intended protective equipment!

Only ever start up the implement when the protective equipment is fully installed.

Only actuate the tractor control units from inside the tractor cab!

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.

10.1 Filling the hopper

DANGER

Risk of tipping: Only fill the front hopper when it is mounted on the tractor.

1. Lift the step (Fig. 67/1) and fold down (Fig. 67/2). The front hopper can be loaded from a supply vehicle or from Big Bags.
2. Seal the front hopper against rain with the tarpaulin.
3. Secure the tarpaulin with rubber loops.

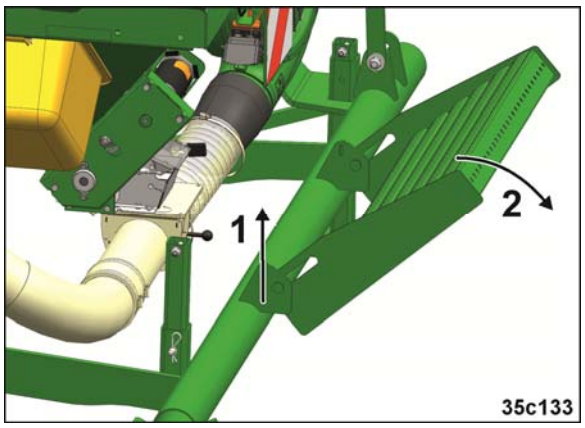


Fig. 67

10.2 Work commencement

1. Just before starting operation, the star wheel (Fig. 68/1) must be unlocked (Fig. 68/2) and lowered (*beige* control unit), and the control unit must be put into float position.

The star wheel actuation is preferably coupled with the lifting/lowering of the front hopper using a control unit.

2. Run the blower fan up to the correct speed (*red* control unit).
3. Lower the front hopper and move the control unit into float position

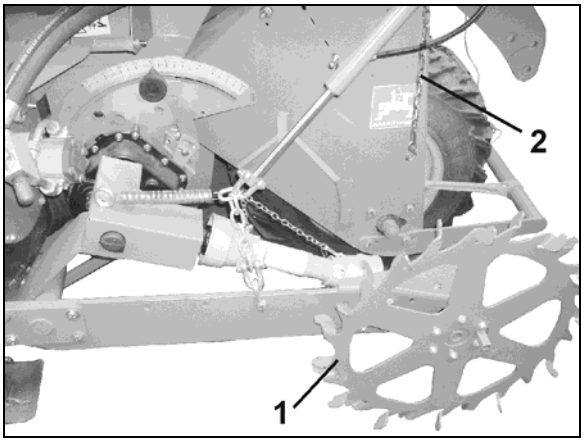


Fig. 68

10.3 Turning at end of the field

Metered material is deposited by the coulters until the entire delivery section is empty.

10.3.1 Mechanical metering

To prevent damage, the star wheel must be lifted out before turning at the end of the field.

10.3.2 Electric metering

If the seeder is lifted at the end of the field, the metering unit on the front hopper is switched off automatically.

10.4 Check after the first 30m

After the first 30 m on the field that were travelled at working speed, check the placement depth of the metered material.

10.5 During the work

10.5.1 Blower fan speed sensor

A sensor (optional, depending on the equipment) monitors the conveyor blower fan speed in the front hopper.

When the conveyor blower fan comes to a standstill during operation, an alarm is issued on the control terminal.

10.5.2 Metering shaft speed sensor

A sensor (optional, depending on the equipment) monitors the metering shaft speed in the front hopper.

When the metering shaft comes to a standstill during operation, an alarm is issued on the control terminal.

10.5.3 Fill level sensor for the front hopper

Fill the front hopper in due time (never let it run empty) to prevent fluctuations in the metered quantities!

The electrical fill level indicator monitors the fill level in the hopper (optional). When the residual quantity is undercut, a warning message appears on the control terminal. (see Fig. 69).

The display can differ on alternative terminals.

Fig. 69

10.6 End of work in the field

Move the implement into transport position (see section 9.1, page 83).

10.7 Emptying the front hopper and/or metering unit

1. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
2. Close the shutter (Fig. 70/1) if only the metering unit and not the front hopper is to be emptied

   See section "Installing/removing the metering roller", Seite 68

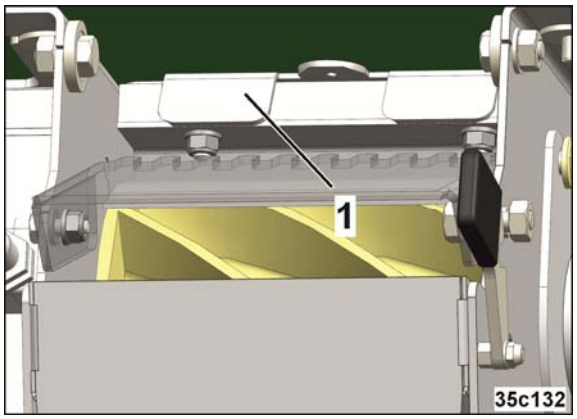


Fig. 70

3. Place the calibration trough under the metering unit (Fig. 71/1).
4. Open the injector sluice flap (Fig. 71/2) so that the remaining metered material can flow into the calibration trough.

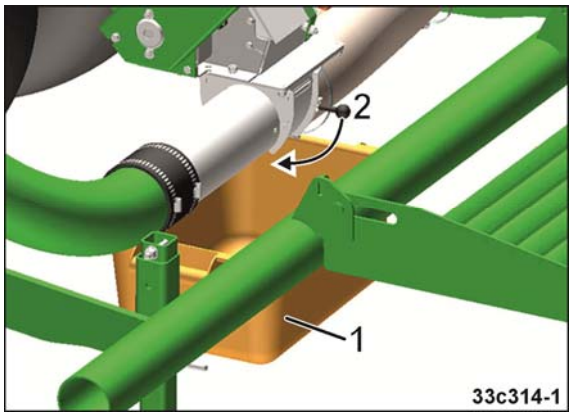


Fig. 71

5. Open the residue emptying flap by turning the handle (Fig. 72/1).
6. Completely empty the metering rollers and metering unit:
   - o With mechanical drive, turn the star wheel to the left with the calibration crank (Fig. 73/2), like for the calibration test.
   - o With electric drive, activate the calibration menu and let the metering unit run briefly using the calibration button.
7. For complete cleaning, e.g. in the event of a change in metered material, remove the metering rollers (see section "Installing/removing the metering roller", Seite 68) and clean them together with the metering unit.
8. Carefully close the residue emptying flap (Fig. 72/1) and injector sluice flap (Fig. 71/1) and secure the calibration trough on the transport bracket.
9. Pull the shutter (Fig. 70/1) out of the metering unit (see section "Installing/removing the metering roller", Seite 68) and secure with a linch pin.

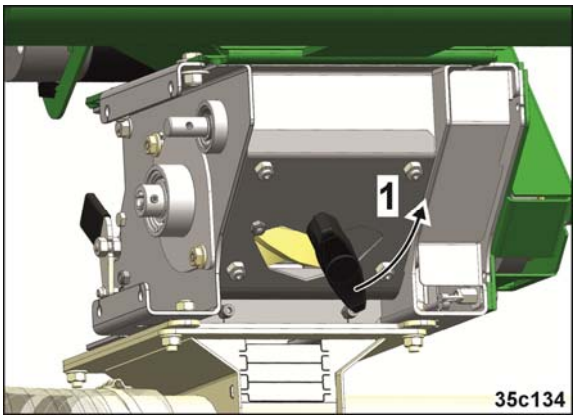


Fig. 72

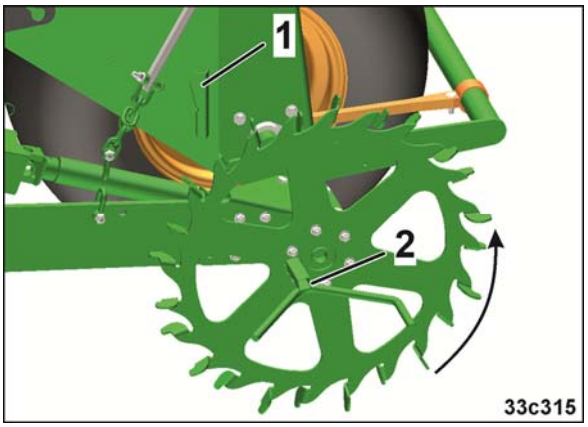


Fig. 73

10.7.1 Cleaning the metering roller

The sticker (Fig. 74/1) should remind the tractor driver to empty and clean the metering roller after finishing the seeding work.

The metering roller must be emptied and cleaned after completing the seeding work in all cases. See section "Installing/removing the metering roller", Seite 68.

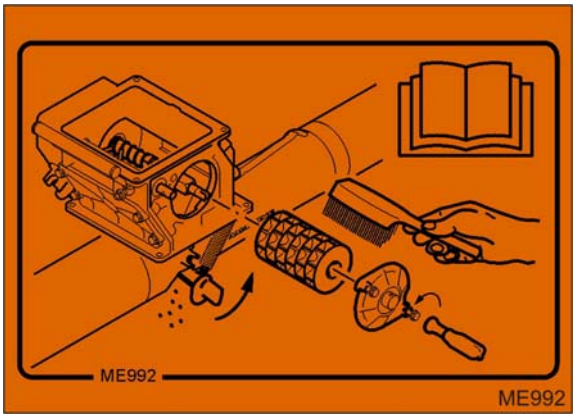


Fig. 74

11 Faults

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 the implement against unintentional start-up and rolling, before you eliminate any faults on the implement. On this subject see section 6.2, Seite 52.

Wait for the implement to stop, before entering the implement danger area.

11.1 Blower fan speed sensor

Fault:	The control terminal displays a blower fan speed error.
Error:	The blower fan speed is to slow or too fast
Correction:	Check the blower fan speed Refer to the operating manual of the control terminal

11.2 Metering shaft speed sensor

Fault:	The control terminal displays a metering shaft speed error.
Error:	Metering speed is too slow
Correction:	Check the metering speed Refer to the operating manual of the control terminal

11.3 Fill level sensor for the front hopper

Fault:	The control terminal displays a fill level error.
Error:	Fill level too low
Correction:	Check the setting of the fill level sensor Refer to the operating manual of the control terminal

12 Cleaning, maintenance and repairs

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 52.

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 tractor parking brake is applied.
- The tractor PTO shaft is shut off.
- The tractor engine is switched off.
- The ignition key is removed.

12.1 Cleaning the implement

DANGER

Dressing dust is toxic and must not be inhaled or come into contact with body parts.

When emptying the seed hopper and the singling device or when removing dressing dust, e.g. with compressed air, wear a protective suit, face mask, safety glasses and gloves.

DANGER

Fully extend or retract the implement before cleaning it.

Never clean the implement with incompletely folded implement booms.

- 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.

1. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
2. Empty the front hopper and the metering unit.
3. Clean the distributor heads.

Fig. 75

4. Clean the implement with water or with a high-pressure cleaner.

→ Marked components (Fig. 76/1) must **not** be cleaned with a high-presser cleaner.

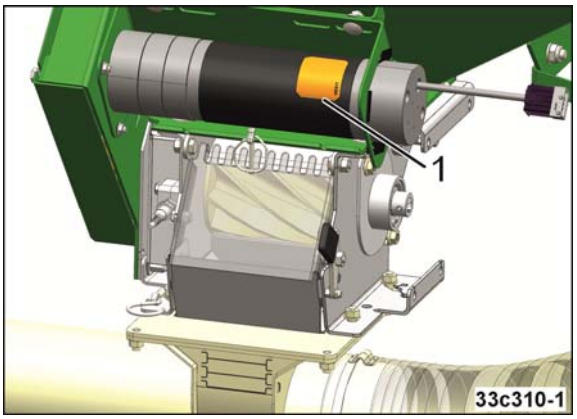


Fig. 76

12.1.1 Cleaning the blower fan

DANGER

Water will be ejected out of the fan exhaust during cleaning.

Wear safety glasses.

DANGER

Do not reach into the open suction connection.

Do not hold the lance of the high-pressure cleaner in the opening of the suction connection.

Dressing dust can be sucked in by the suction air blower, be deposited on the suction air blower fan rotor and cause the air blower to become unbalanced. This can cause the air blower to be destroyed. Clean the suction air blower fan rotor regularly.

Clean the suction air blower fan rotor:

1. Remove the cap of a free suction connection.
2. Apply the tractor parking brake.
3. Switch on the exhaust fan
4. Put on safety glasses.
5. Position a water jet into the free suction connection and remove the deposits with the fan blower running.

Clean the blower fan guard screen to ensure unobstructed air flow.

If the required quantity of air is not reached, faults may occur in the metered material distribution.

Clean the blower fan of any deposits. Deposits lead to imbalance and damage to the bearing.

12.2 Maintenance schedule – overview

Carry out maintenance work when the first interval is reached.

The times, continuous services or maintenance intervals specified in any third party documentation shall have priority.

Initial operation	**Before initial commissioning**	Specialist workshop	Check and service the hydraulic hose lines. This inspection has to be recorded by the operator.	Section 12.2.7
			Checking the tyre inflation pressure for the tyre packer	Section 12.2.3
	After the first 10 operating hours	Specialist workshop	Check and service the hydraulic hose lines. This inspection has to be recorded by the operator.	Section 12.2.7
		Specialist workshop	Check all bolted connections for a secure fit.	Section 12.3

Maintenance work to be performed daily

Before starting work		Visual check of the lower and top link pins	Section 12.2.5
Hourly **(e.g. for refilling the metered material/front hopper)**		Check and eliminate dirt: • Metering unit • Fertiliser hoses • Distributor head • Blower fan intake guard screen	
During the work		If only small quantities are metered yet at regular intervals (hourly), check the metering unit for dirt.	
After completion of work		Cleaning the implement (as required)	Section 12.1

Maintenance work to be performed at intervals

Each week **(at least every 50 operating hours)**	Specialist workshop	Check and service the hydraulic hose lines. The inspection has to be recorded by the owner/operator.	Section 12.2.7
Every 2 weeks		Checking the tyre inflation pressure for the tyre packer	Section 12.2.3
Every 6 months **(Before the start of the season)**	Specialist workshop	Check and service the hydraulic hose lines. The inspection has to be recorded by the owner/operator.	Section 12.2.7
Every 6 months **(after the end of the season)**		Servicing roller chains and chain wheels	Section 12.2.6

12.2.1 Foreign objects in the hopper

There are foreign objects in the hopper under the screen (Fig. 77/1). To be able to remove them, proceed as follows:

(1) Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

(2) Release the screen locks (Fig. 78/2) using the handle (Fig. 78/3)

(3) The screens can be removed with the handles (Fig. 78/1)

(4) Clean the hopper

(5) Reinstall the screen in the reverse sequence.

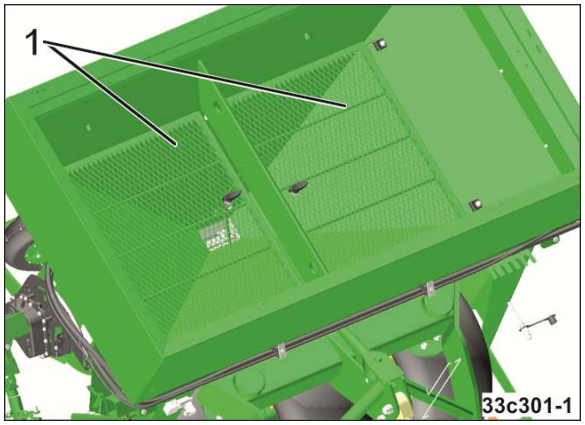


Fig. 77

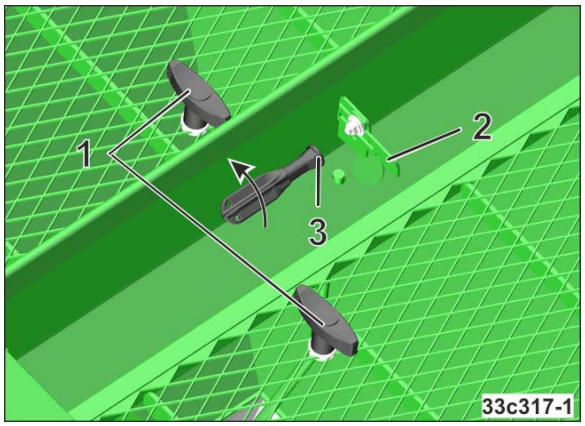


Fig. 78

12.2.2 Wheel bolt tightening torques

Tyres	Wheel bolt tightening torques
400/60-15.5	350 Nm

Fig. 79

12.2.3 Checking the tyre inflation pressure for the tyre packer

Check compliance with specified tyre inflation pressure

Adhere to the inspection intervals
(see section on Maintenance schedule – overview, Seite 96).

Tyres	400/60-15.5
Nominal tyre inflation pressure	1.8 bar

Fig. 80

12.2.4 Checking the oil level in the setting gearbox

Check the oil level in the setting gearbox:

1. Position the implement on a horizontal surface.
2. Check the oil level.

→ The oil level should be visible in the oil sight glass (Fig. 81/1).

3. The oil filler neck (Fig. 81/2) serves to refill the gearbox oil

- There is no need to change the oil.

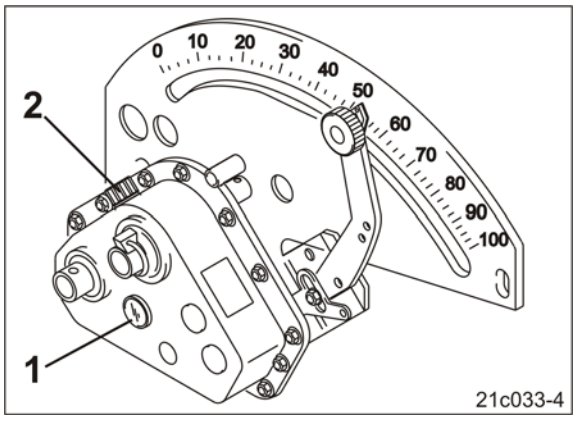


Fig. 81

Total filling quantity:	0.9 litres
Gear oil (selectable):	Wintershall Wintal UG22 WTL-HM (ex-works)
	Fuchs Renolin MR5 VG22

Fig. 82

12.2.5 Visual check of the lower and top link pins

WARNING

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

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

12.2.6 Servicing roller chains and chain wheels

On all roller chains, at the end of the planting season

- Clean (including the chain wheels and chain tensioner)
- Check
- Lubricate with low-viscosity mineral oil (SAE30 or SAE40).

12.2.7 Hydraulic system

WARNING

Risk of infection through the high pressure hydraulic fluid of the hydraulic system entering the body.

- Only a specialist workshop may carry out work on the hydraulic system.
- Depressurise the hydraulic system before carrying out work on the hydraulic system.
- When searching for leak points, always use suitable aids.
- Never attempt to plug leaks in hydraulic hose lines using your hand or fingers.

  Escaping high pressure fluid (hydraulic fluid) may pass through the skin and ingress into the body, causing serious injuries!

  If you are injured by hydraulic fluid, contact a doctor immediately. Risk of infection!

- When connecting the hydraulic hose lines to the hydraulic system of connected implements, ensure that the hydraulic system is depressurised on both the drawing vehicle and the trailer.
- Ensure that the hydraulic hose lines are connected correctly.
- Regularly check all the hydraulic hose lines and couplings for damage and impurities.
- Have the hydraulic hose lines checked at least once a year by a specialist for proper functioning.
- Replace the hydraulic hose lines if they are damaged or worn. Only use our original AMAZONE hydraulic hose lines.
- The hydraulic hose lines should not be used for longer than six years, including any storage time of maximum two years. Even with proper storage and approved use, hoses and hose connections are subject to natural aging, thus limiting the length of use. However, it may be possible to specify the length of use from experience values, in particular when taking the risk potential into account. In the case of hoses and hose lines made of thermoplastics, other guide values may be decisive.
- Dispose of old oil in compliance with regulations. If you have problems with disposal, contact your oil supplier.
- Keep hydraulic fluid out of the reach of children!
- Ensure that no hydraulic fluid enters the soil or waterways.

12.2.7.1 FRU/FPU in combination with ED xx00-2 FC

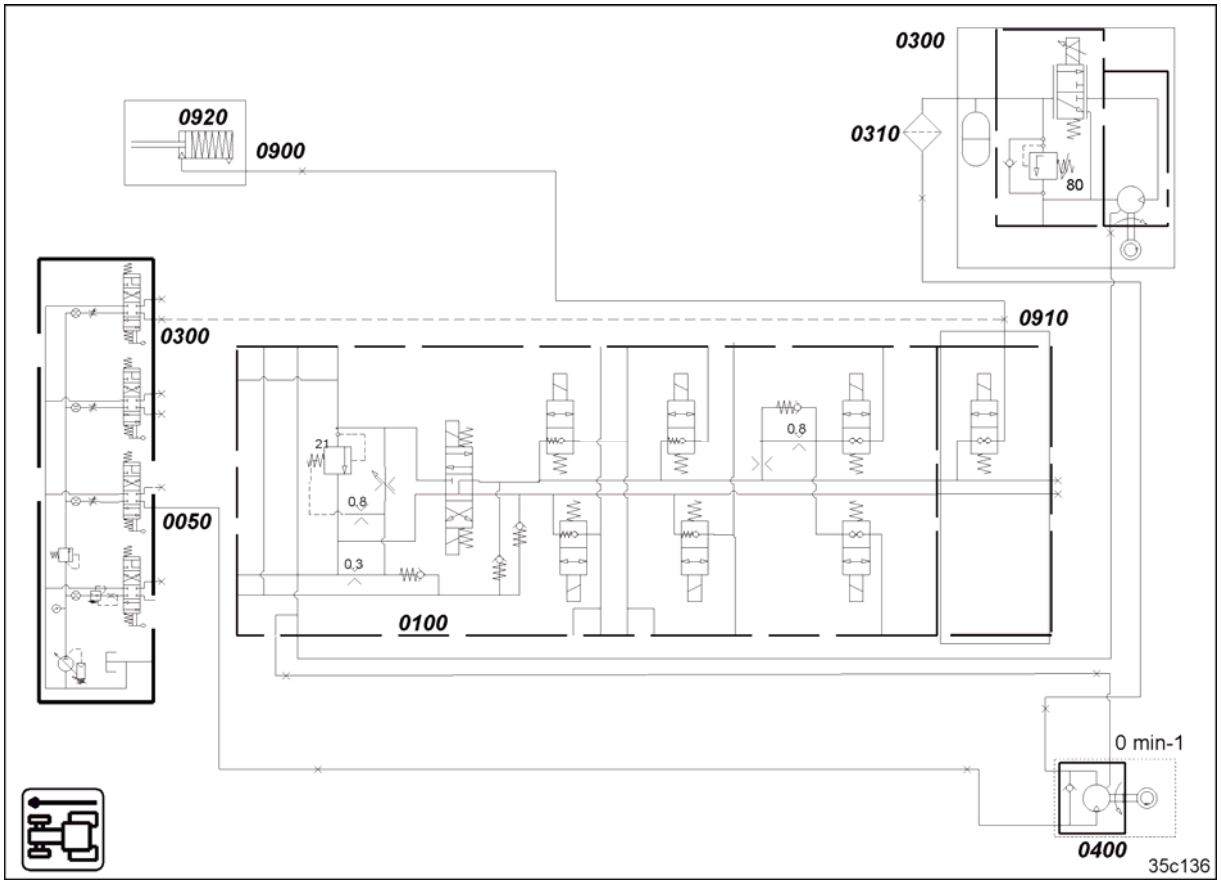


Fig. 83

Fig. 83/…	Designation	Note
0050	Flow pipe: pressure line with priority	
0100	ED Profi control block	
0300	Lay shaft drive	Optional equipment: Return flow of 400, pressure-free line with "large" push-fit coupling
0310	Suction filter	
0400	Hydraulic blower drive	Hydraulic blower fan motor $N_{max.}$ = 4000 rpm.
0900	Star wheel excavation	Option
0910	ED star wheel control block	Only for Profi hydraulic system
0030	Handle No. 1 – beige, ED star wheel	Only for standard and comfort hydraulic systems
0920	Star wheel lift-out cylinder	

All position specifications in direction of travel

[1] In combination with ED: the return flow can also be fed into the hydraulic seeding unit drive. This is not unpressurised. In this case, an additional leak oil connection is available (see also section 7.2.1.1, page 63).

12.2.7.2 Labelling of hydraulic hose lines

The valve chest identification provides the following information:

Fig. 84/...

(1) Manufacturer's marking on the hydraulic hose line (A1HF)

(2) Date of manufacture of the hydraulic hose line (11/02 = year/month = February 2011)

(3) Maximum approved operating pressure (210 BAR).

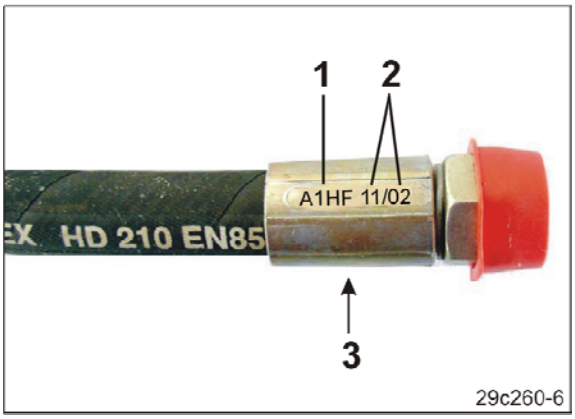


Fig. 84

12.2.7.3 Maintenance intervals

After the first 10 operating hours, and then every 50 operating hours

1. Check all the components of the hydraulic system for tightness.
2. If necessary, tighten screw unions.

Before each start-up:

1. Check hydraulic hose lines for visible damage.
2. Eliminate any scouring points on hydraulic hose lines and pipes.
3. Replace any worn or damaged hydraulic hose lines immediately.

12.2.7.4 Inspection criteria for hydraulic hose lines

For your own safety, comply with the following inspection criteria!

Replace hydraulic hose lines, on determining any of the following during the inspection:

- Damage to the outer layer up to the ply (e.g. scouring points, cuts, cracks).
- Brittleness of the outer layer (crack formation of the hose material).
- Deformations which do not match the natural shape of the hose. Both in a depressurized and pressurised state or when bent (e.g. layer separation, bubble formation, pinching, bends).
- Leak points.
- Damage or deformation of the hose assembly (sealing function restricted); minor surface damage is not a reason for replacement.
- Movement of the hose out of the assembly.
- Corrosion of assembly, reducing the function and tightness.
- Installation requirements not complied with.
- Life span of 6 years has been exceeded.

  The date of manufacture of the hydraulic hose line on the assembly plus six years is decisive. If the date of manufacture on the assembly is "2011", then the hose should not be used after February 2017. For more information, see "Labelling of hydraulic hose lines".

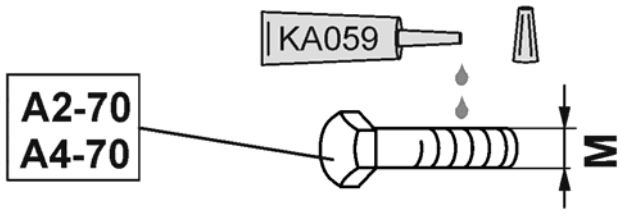
12.2.7.5 Installation and removal of hydraulic hose lines

When installing and removing hydraulic hose lines, always observe the following information:

- Only use original AMAZONE hydraulic hose lines
- Ensure cleanliness.
- You must always install the hydraulic hose lines so that, in all states of operation:
  - There is no tension, apart from the hose's own weight.
  - There is no possibility of jolting on short lengths.
  - Outer mechanical influences on the hydraulic hose lines are avoided.

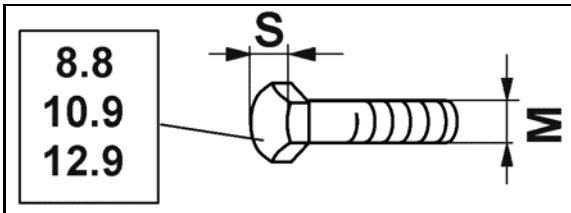
    Use appropriate arrangements and fixing to prevent any scouring of the hoses on components or on each other. If necessary, secure hydraulic hose lines using protective covers. Cover sharp-edged components.
  - The approved bending radii may not be exceeded.
- When connecting a hydraulic hose line to moving parts, the hose length must be appropriate so that the smallest approved bending radius is not undershot over the whole area of movement and/or the hydraulic hose line is not over-tensioned.
- Fix the hydraulic hose lines to the intended fixing points. There, avoid hose clips, which impair the natural movement and length changes of the hose.
- It is forbidden to paint over hydraulic hose lines!

12.3 Screw tightening torques



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

tightening torques for the wheel bolts (see section "Wheel bolt tightening torques", Seite 98).



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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