

Operating Manual

AMAZONE

Large area seed drill

Citan 12001-C

Citan 15001-C



35c421

MG6035
BAH0094-4 04.2023

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

en



Reading the instruction

manual and adhering 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, subsequently purchase it, and to believe that now everything would work by itself. The person concerned would not only harm themselves but also make the mistake of blaming the implement for the reason of a possible failure instead of themselves. In order to ensure a good success, one must consider the design of the object; in other words, one must familiarise themselves with every aspect of the machine and gain practice in handling the machine. Only by doing so would one be satisfied both with the machine and also with oneself. To achieve this is the purpose of this instruction manual.

Leipzig-Plagwitz 1872. Rud. Stark.

Identification data

Please enter the identification data of the implement. The identification data can be found on the rating plate.

Implement ID No.:
(10-digit)

Type:

Citan 12001-C/15001-C

Permissible system pressure (bar): Maximum 210 bar

Year of manufacture:

Basic weight (kg):

Permissible total weight (kg):

Maximum load (kg):

Manufacturer's address

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Spare part orders

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

Please send orders to your AMAZONE dealer.

Formalities of the operating manual

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Preface

Foreword

Dear Customer,

You have chosen a quality product from the extensive 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 claimed immediately.

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

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

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

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

User evaluation

Dear Reader,

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

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1 User information

The User information section provides information concerning 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 viewed in the direction of travel.

1.3 Presentations used

Instructions and reactions

Activities to be carried out by the user are presented as numbered instructions. Always observe the sequence of the instructions. The reaction to instructions is indicated by an arrow where applicable. Example:

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

Lists

Listings without a mandatory sequence are presented as a listing with bullets. Example:

- Item 1
- Item 2

Item numbers in illustrations

Numbers in round brackets refer to the item numbers in the illustrations. 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 Information

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

2.1 Obligations and liability

Comply with the instructions in the operating manual

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

Obligations of the operator

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

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

The operator is obliged

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

Obligations of the user

Before starting work, anyone charged with working with/on the machine 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 markings on the machine", page 18 of this operating manual and to follow the safety instructions of the warning symbols when operating the implement
- to get to know the implement
- to read the sections of this operating manual, important for carrying out your work.

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

S

General Safety Information

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

- 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 Presentation 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 an immediate hazard with high risk, which will result in death or serious bodily harm (loss of limbs or long-term harm), if it is not avoided.

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 operating 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 protection 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.

Job \ Person	Person specially trained for the activity ¹⁾	Trained operator 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	—	—

Key: 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⁾ Persons with specialised 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 "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 assembly groups to lifting units 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 conversion 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 on load-bearing parts.

2.10.1 Spare and wear parts and aids

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

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

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

2.11 Cleaning and disposal

Handle and dispose of any materials used carefully, in particular

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

2.12 Workstation of the operator

The implement may be operated by only one person sitting in the driver's seat of the tractor.

2.13 Warning symbols and other markings on the machine



Always keep all the warning symbols of the implement clean and in a legible state. Replace illegible warning symbols. You can obtain 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. The risk avoidance instructions.
For example: only touch implement parts when they have come to a complete standstill.

Order number and explanation

Warning signs

MD 076

Risk of hands or arms being drawn in or entrapped by driven, unprotected chain or belt drives!

This danger causes serious injuries, including loss of body parts such as hand or arm.

Never open or remove protective equipment on chain or belt drives

- while the tractor engine is running and the universal joint shaft is connected / hydraulic drive is engaged
- if the ground wheel drive is moving.



MD 078

Risk of crushing of fingers/hand by accessible, moving parts of the implement!

This hazard can cause extremely serious injuries resulting in the loss of limbs.

Never reach into the hazardous area while the engine of the tractor with connected universal joint shaft/hydraulic system/electronic system is running.



MD 082

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.



General Safety Information

MD 083

Risk of arms or upper torso being drawn in or entrapped by driven, unprotected machine elements!

This danger causes serious injuries to arms or upper torso.

Never open or remove protective devices on driven implement elements while the tractor engine is running with the universal joint shaft connected or the hydraulic drive coupled.

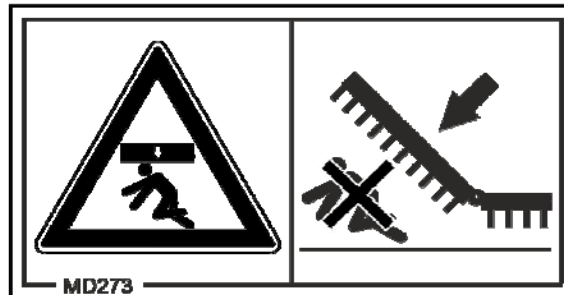


MD 084

Risk of crushing the entire body due to standing in the swivel range when implement parts are being lowered.

Causes serious, potentially fatal injuries anywhere on the body.

- It is forbidden to stand in the swivel range of the implement when implement parts are being lowered.
- Instruct personnel to leave the swivel range of any implement parts which can be lowered before you lower the parts.

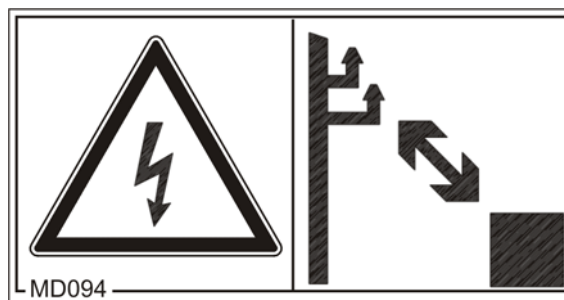


MD 094

Risk of electric shock or burns from accidentally touching overhead power lines or by coming within the prohibited distance of high voltage overhead power lines.

These dangers can cause extremely serious and potentially fatal injuries.

Maintain a sufficient distance from electrical overhead cables when swinging any parts of the implement in and out.

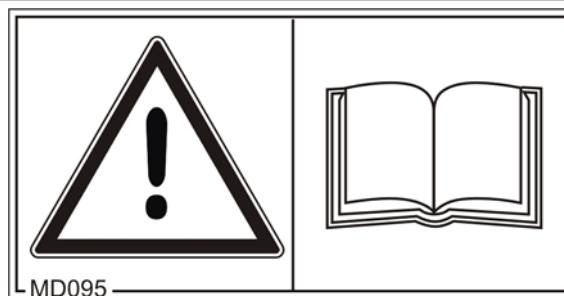


Rated voltage	Safety distance from transmission lines
---------------	---

up to 1 kV	1 m
over 1 up to 110 kV	3 m
over 110 up to 220 kV	4 m
over 220 up to 380 kV	5 m

MD 095

Before commissioning the machine read and observe the operating manual and the safety instructions carefully!

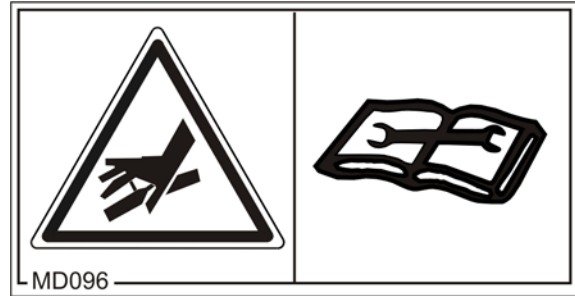


MD 096

Danger from escaping high-pressure hydraulic fluid due to leaking hydraulic hose lines.

This danger may cause serious injuries, perhaps even resulting in death, if escaping high-pressure hydraulic fluid passes through the skin and into the body.

- Never attempt to plug leaks in hydraulic hose lines with your hand or fingers.
- Read and observe the information in the operating manual before carrying out maintenance work on the hydraulic hose lines.
- If you are injured by hydraulic fluid, contact a doctor immediately.

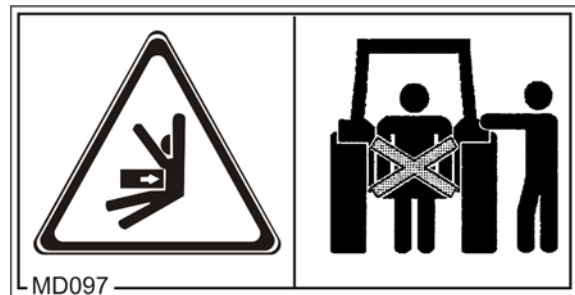


MD 097

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

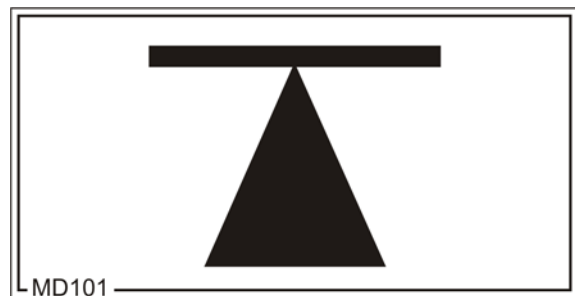
Causes serious, potentially fatal injuries anywhere on the body.

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



MD 101

This symbol indicates application points for using lifting gear (jack).



General Safety Information

MD 102

Danger from intervention in the implement, e.g. installation, adjusting, troubleshooting, cleaning, maintaining and repairing, due to the tractor and the implement being started unintentionally and rolling.

These dangers can cause extremely serious and potentially fatal injuries.

- Secure the tractor and the implement against unintentional start-up and rolling before any intervention in the implement.
- Depending on the type of intervention, read and understand the information in the relevant sections of the operating manual.



MD 104

Risk of crushing the entire body or impacts due to standing in the swivel range of laterally moving implement parts.

These dangers can cause extremely serious and potentially fatal injuries.

- Maintain an adequate safety distance from moving implement parts while the tractor engine is running.
- Ensure that all personnel maintain an adequate safety distance from moving implement parts.

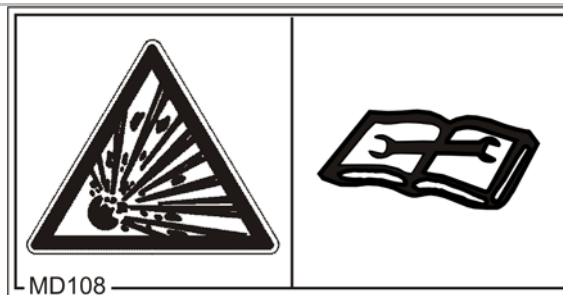


MD 108

Risk of explosion, or danger from hydraulic fluid escaping under high pressure, caused by the pressure accumulator which is under pressure from gas and oil.

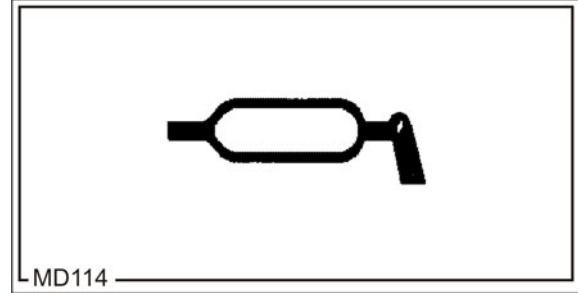
These dangers can cause serious and potentially fatal injuries if highly pressurised, escaping hydraulic fluid penetrates the skin and passes into the body!

- Read and observe the instructions in the operating manual before carrying out any maintenance or repair work.
- If you are injured by hydraulic fluid, contact a doctor immediately.



MD 114

This symbol indicates a lubrication point



MD 154

Danger of cuts for other road users caused by transport with unguarded, sharp harrow tines of the seed harrow!

This risk can cause the most serious injuries with potentially fatal injuries.

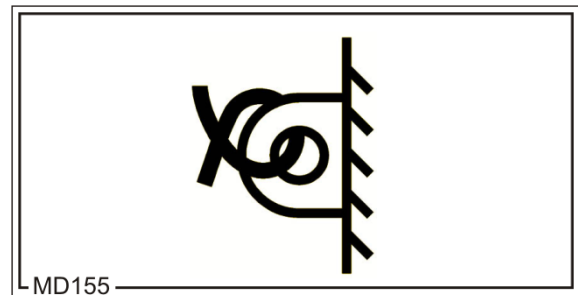
Transportation without a correctly fitted road safety bar is forbidden.



Install the road safety bar provided before starting transportation.

MD 155

This icon designates the restraint points for tying the implement to a transport vehicle allowing the implement to be transported in a safe manner.

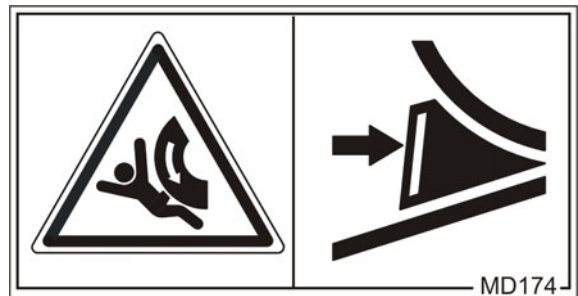


MD 174

Danger from unintended continued movement of the implement!

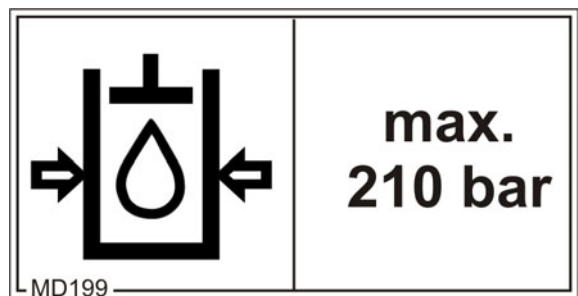
Will cause serious injuries anywhere on the body or death.

Secure the implement against moving away unintentionally before uncoupling the implement from the tractor. To do this, use the parking brake and/or the wheel chock(s).



MD 199

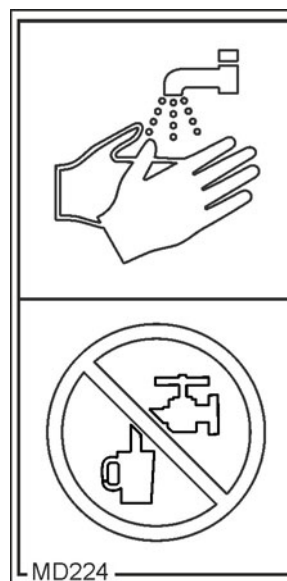
The maximum operating pressure of the hydraulic system is 210 bar.



MD 224

Health hazard due to water from the hand wash tank!

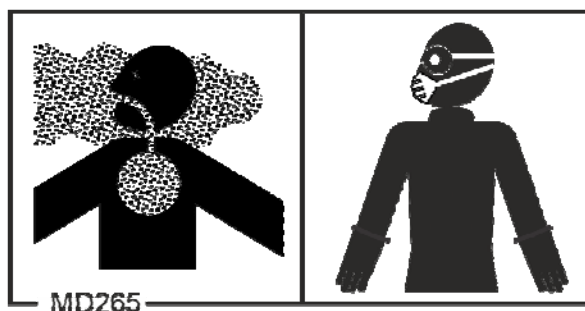
- Never use the water from the hand wash tank as drinking water.



MD 265

Risk of chemical burns by dressing dust!

- Do not breathe in the harmful substance.
- Avoid contact with eyes and skin.
- Before working with hazardous materials, put on the protective clothing recommended by the manufacturer.
- Follow the manufacturer's safety instructions for handling harmful substances.

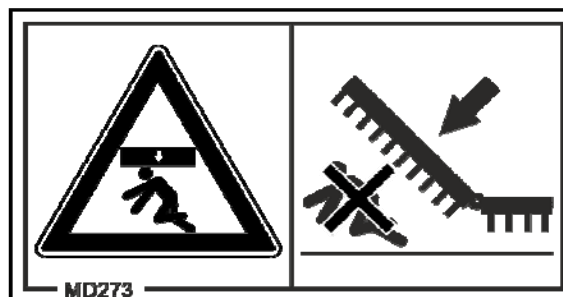


MD 273

Risk of crushing the entire body due to standing in the swivel range when implement parts are being lowered.

Causes serious, potentially fatal injuries anywhere on the body.

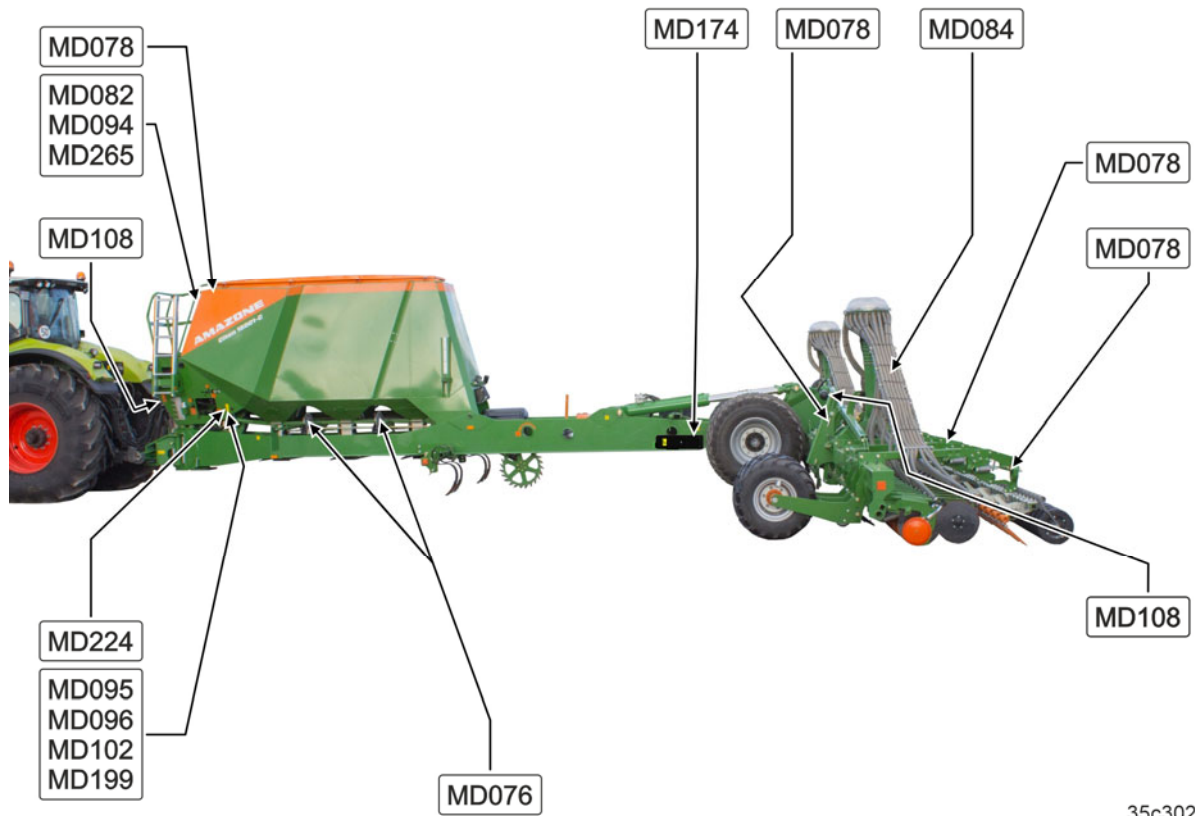
- It is forbidden to stand in the swivel range of the implement when implement parts are being lowered.
- Instruct personnel to leave the swivel range of any implement parts which can be lowered before you lower the parts.



2.13.1 Positions of warning symbols and other labels

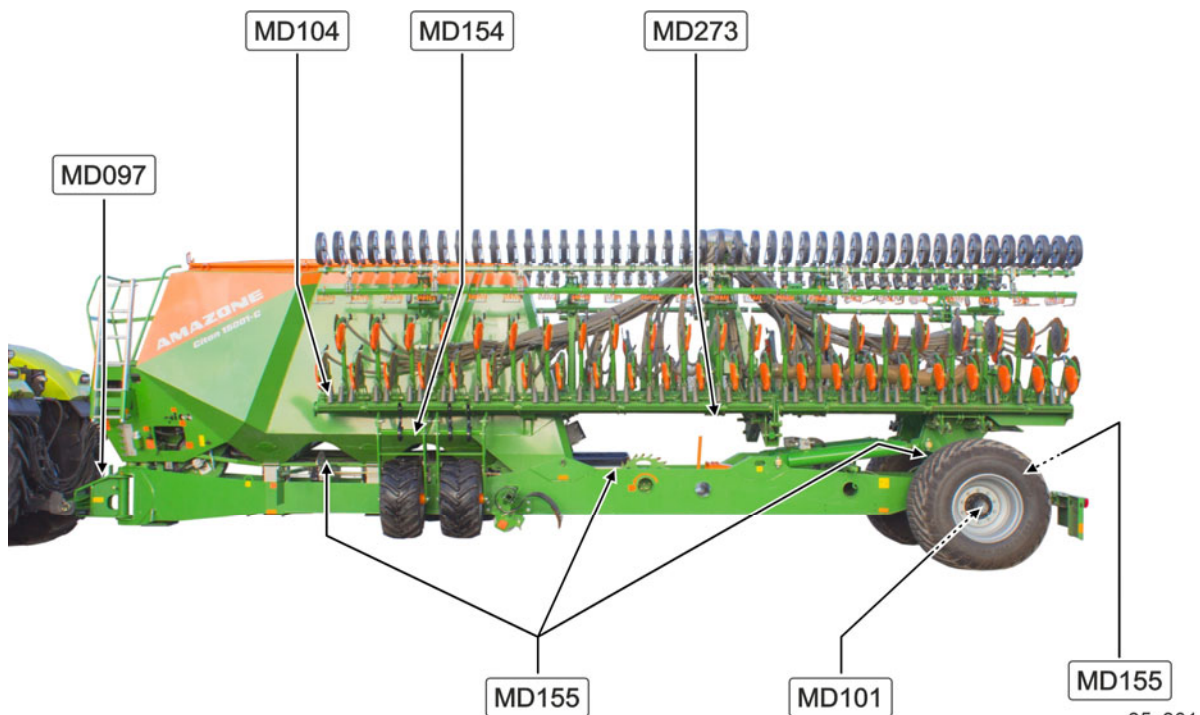
Warning signs

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



35c302

Fig. 1



35c301

Fig. 2



Fig. 3

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

Non-compliance with the safety instructions

- 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:

- Risks to persons due to insecure working area.
- Failure of important implement functions.
- failure of prescribed methods for maintenance and repair.
- hazard for personnel due to mechanical and chemical effects.
- environmental hazard through leakage of hydraulic fluid.

2.15 Safety-conscious working

In addition to the safety instructions in this operating manual, the generally applicable national occupational health and safety and accident prevention regulations are also binding.

Comply with the accident prevention instructions on the warning pictograms.

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 signs attached on the implement provide important instructions for safe operation of the machine. Compliance with these instructions is essential for your safety!
- Before moving off and starting up the implement, check the immediate area of the implement (children). Ensure that you can see clearly.
- It is forbidden to ride on the implement or use it as a means of transport!
- Drive in such a way that you always have full control over the tractor with the attached 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.

Coupling and uncoupling the implement

- Only connect and transport the implement with tractors suitable for the task.
- When connecting machines to the tractor three-point hydraulic system, the attachment categories of the tractor and the machine 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 approved load capacities of the tractor tyres
- Secure the tractor and the implement against unintentional rolling before coupling or uncoupling the implement.

General Safety Information

- 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 machine to or disconnecting the machine 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. It is too late to do this during working 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 machine.
- 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 brake and hydraulic systems shows no visible signs of defect
 - that the tractor parking brake is released completely
 - the function of the braking system.
- Always 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 tractor front axle must always be loaded with at least 20 % of the tractor tare 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 payload 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 installed 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).

2.16.2 Hydraulic system

- The hydraulic system is under 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 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 duration 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.

2.16.3 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 – connect the positive terminal first 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 observed.
 - 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.
- The cable clips must be checked for tight fit on a regular basis. Corrosion to cable connections will lead to the loss of tension. Clean and grease with acid-free Vaseline.
- The battery acid is highly corrosive and any contact to skin should therefore be avoided. If, however, acid should get into your eyes, rinse under running water immediately for 10 to 15 minutes and seek medical advice straight away.
- Replace damaged cables immediately.
- Old batteries must be disposed of according to regulations.

- Store the batteries in a dry area during the winter periods (corrosion).

2.16.4 Attached implements

- Comply with the approved combination options for the tractor hitch and the implement drawbar!
Only couple approved combinations of vehicles (tractor and attached implement).
- In the case of single axle implements, observe the maximum permitted drawbar load of the tractor on the hitch!
- Always ensure that the tractor has sufficient steering and braking power!
Implements connected to a tractor can influence your driving behaviour, as well as the steering and braking power of the tractor, in particular in the case of single axle implements with the drawbar load on the tractor.
- Only a specialist workshop may adjust the height of the drawbar on straight drawbars with a drawbar load!
- Implements without brake system:
 - Observe the national regulations for implements without brake system.

2.16.5 Brake system

- Only specialist workshops or recognised brake services can carry out adjustment and repair work on the brake system.
- Have the brake system checked regularly.
- If there are any functional faults in the brake system, stop the tractor immediately. Have any malfunctions rectified immediately.
- Before performing any work on the brake system, park the implement safely and secure the implement against unintentional lowering and rolling away (wheel chocks)!
- Be particularly careful with welding, burning and drilling work in the vicinity of brake lines!
- Always carry out a braking test after any adjusting or repair work on the braking system.

Pneumatic braking system

- Before coupling the implement, clean any dirt on the sealing rings on the coupling heads of the supply and brake lines!
- Only move off with the coupled implement when the pressure gauge on the tractor shows 5.0 bar!
- Before driving without the implement, seal the coupling heads on the tractor.
- Hang the coupling heads of the implement supply and brake lines in the appropriate empty couplings.
- When filling up or replacing the brake fluid, use the prescribed fluid. When replacing the brake fluid, comply with the appropriate regulations.
- Do not make any changes to the specified settings on the brake valves!
- Replace the air reservoir if:
 - The air reservoir can be moved in the tensioning belts.
 - The air reservoir is damaged.
 - The rating plate on the air reservoir is rusty, loose or missing.

Hydraulic brake system for export implements

- Hydraulic brake systems are not approved in Germany.
- When filling up or replacing the brake fluid, use the prescribed hydraulic fluids. When replacing the hydraulic fluids, comply with the appropriate regulations.

2.16.6 Tyres

- Repair work on tyres and wheels may only be carried out by specialists with suitable installation tools.
- Check the air pressure at regular intervals.
- Inflate tyres to the specified air pressure! If the air pressure in the tyres is too high, then there is a risk of explosions.
- Park the implement in a safe place and lock the implement against unintentional falling and rolling (parking brake, wheel chocks), before carrying out work on the tyres.
- Tighten or retighten all the fixing screws and nuts in accordance with the specifications of AMAZONEN-WERKE!

2.16.7 Operation of the seed drill

- Observe the permissible filling quantity of the hopper!
- Only use the steps and the platform when filling the hopper!
It is forbidden to ride on the implement during operation.
- During the calibration test, note the danger points from rotating and oscillating implement parts.
- Do not place any parts in the hopper.
- Lock the track marker (construction-dependent) in the transport position before road transport.

2.16.8 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 and the implement before performing electrical welding work on the tractor and mounted implements!
- Spare parts must meet at least the technical requirements specified by AMAZONEN-WERKE! This is ensured through the use of original AMAZONE spare parts.

3 Loading and unloading



DANGER

Depending on the equipment, the approved transport width of 3.0 m and the transport height of 4.0 m is exceeded when the implement is loaded on a transport vehicle.

See section 9, Transportation (page 165).



DANGER

Never stand underneath implements lifted by a crane.



DANGER

Only attach the lifting gear at the marked positions. Do not stand under suspended loads.

The pictogram (Fig. 4) marks the location at which the lifting gear is to be attached to the implement.

1. Attach three straps at the marked positions.
2. Place the implement on the transport vehicle and lash it down as prescribed.

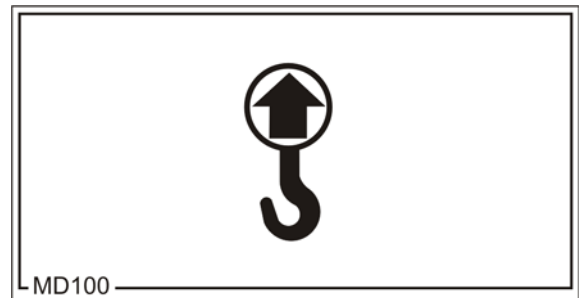


Fig. 4

The (Fig. 5) symbol marks the lashing points on the implement.

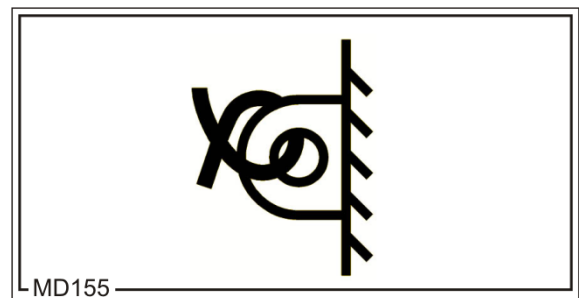


Fig. 5

Fig. 6/...

- (1) Front lashing points

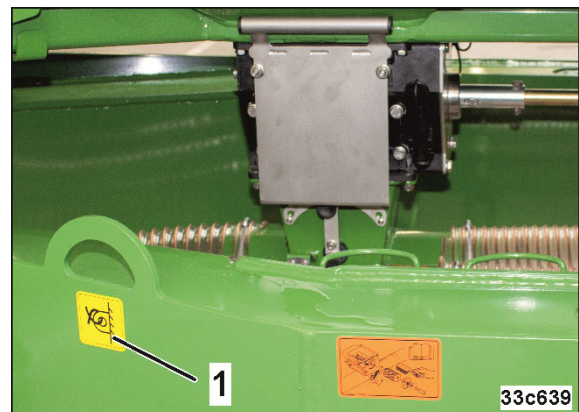


Fig. 6

Loading and unloading

Fig. 7/...

(1) Middle lashing points

(2/3) Rear lashing points

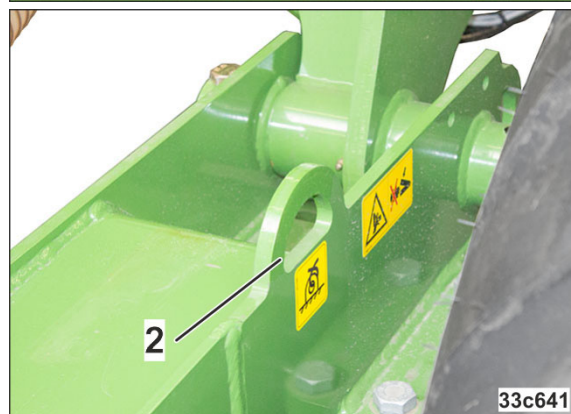
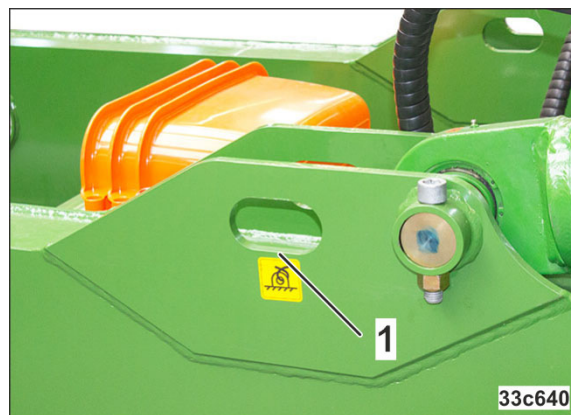


Fig. 7

4 Product description

This section:

- provides a comprehensive overview of the implement structure.
- provides the names of the individual assembly groups and operating controls.

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

Main assembly groups of the implement

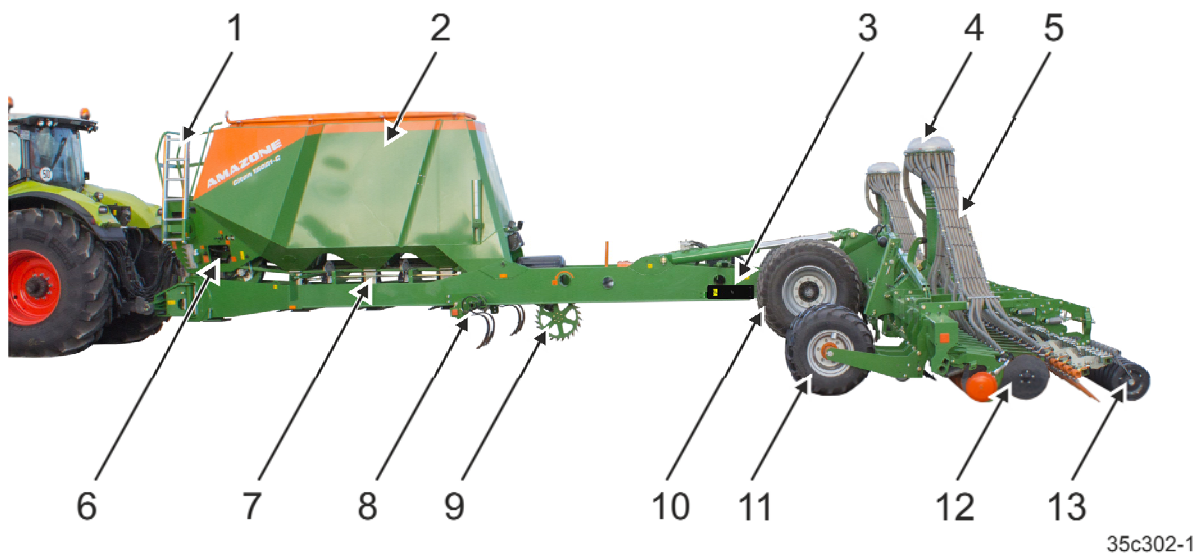


Fig. 8

- | | |
|--|-----------------------------------|
| (1) Loading board with ladder | (8) Tractor wheel mark eradicator |
| (2) Seed hopper, 3 chambers | (9) Star wheel (optional) |
| (3) Wheel chocks | (10) Running gear |
| (4) Distributor head for seed-fertiliser mixture | (11) Support wheel |
| (5) Seed hose | (12) RoTeC pro coulter |
| (6) Control centre | (13) Roller harrow |
| (7) Metering | |

4.1 Overview of assembly groups

Fig. 9/...

AMALOG⁺ control terminal

Depending on the implement equipment, the control terminal can vary or operation takes place through the tractor terminal.

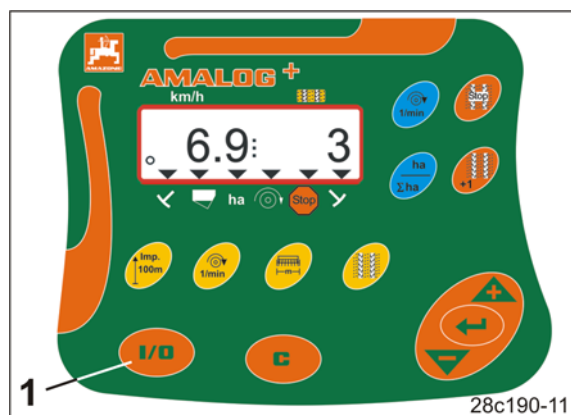


Fig. 9

Fig. 10/...

- (1) Tensioned crosspiece
- (2) Loading board with ladder

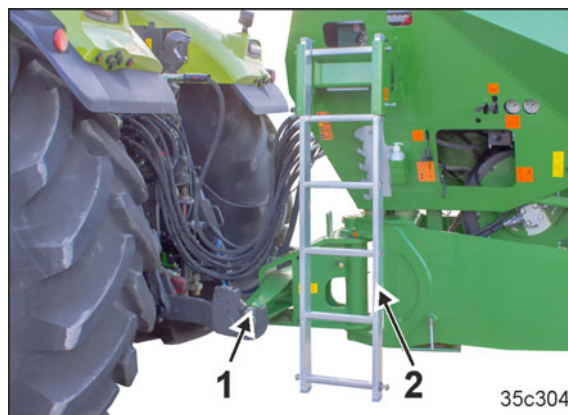


Fig. 10

Fig. 11/...

- (1) Mounting for supply lines

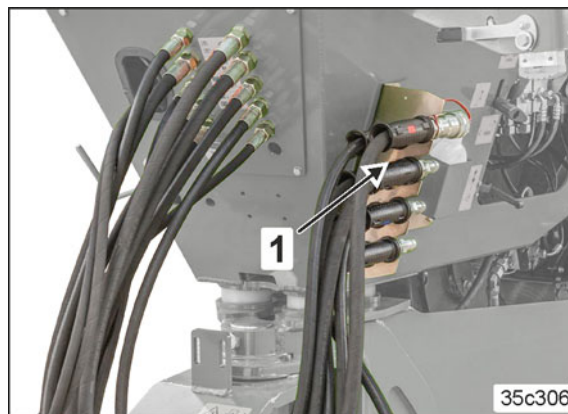


Fig. 11

Fig. 12/...

- (1) Vario gearbox (optional)
- (2) Metering unit with metering roller
- (3) Calibration trough
(in bracket for calibration test)

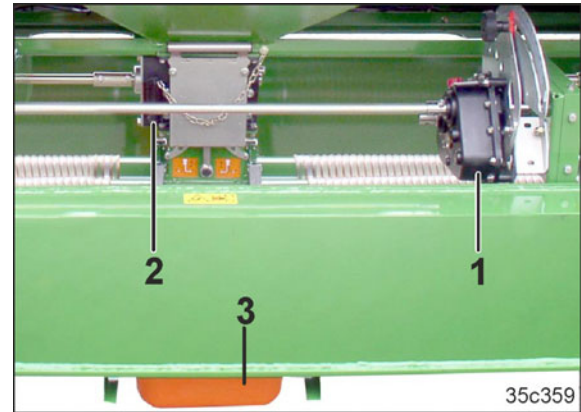


Fig. 12

Fig. 13/...

Optional (only without ISOBUS)

- (1) Star wheel (lifted)
- (2) Calibration crank

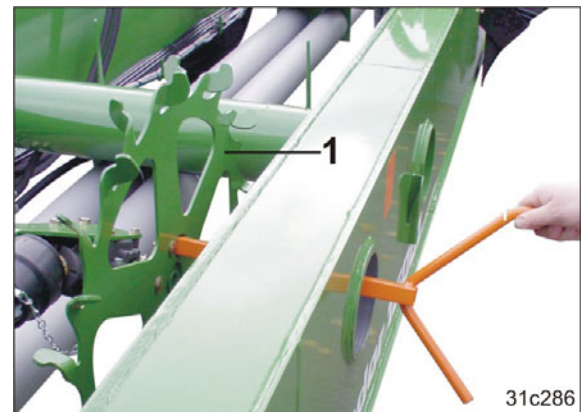


Fig. 13

Fig. 14/...

- RoTec pro coulter
- RoTec pro-S coulter (similar to RoTec pro coulter, without separate figure)



Fig. 14

Product description

Fig. 15/...

- (1) Hopper cover



Fig. 15

Fig. 16/...

- (1) Fill level sensor

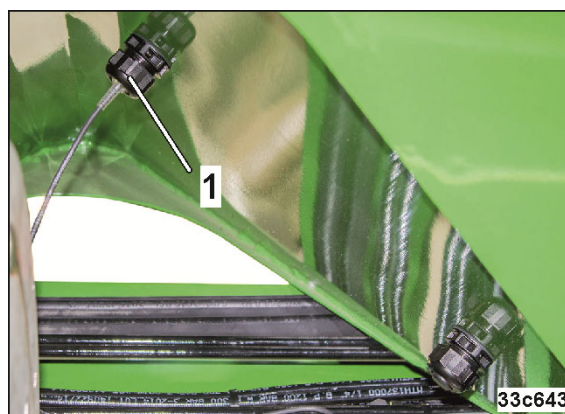


Fig. 16

Fig. 17/...

- (1) Seed tube monitoring (optional)

The seed tube hoses represent the connection between the distributor head and the coulters.

Each seed tube hose can be equipped with a sensor (Fig. 17/1) that detects the seed flow.

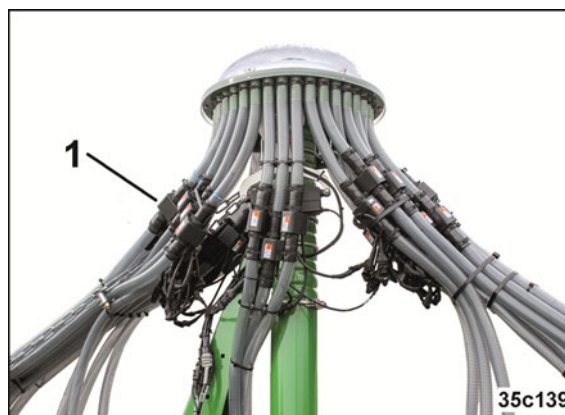


Fig. 17

4.2 Safety and protection equipment

Fig. 18/...

- (1) Charging sieve
(acts as guard screen in seed hopper)



Fig. 18

Fig. 19/...

- (1) Catch hooks
(for locking the implement sections during transportation)

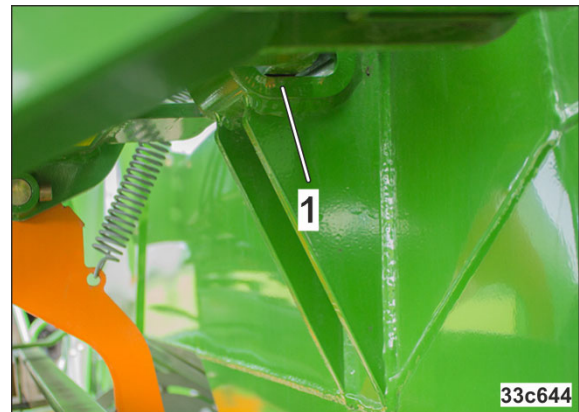


Fig. 19

Fig. 20/...

- (1) Wheel chock
(parking position on the main frame in front of the running gear tyres)

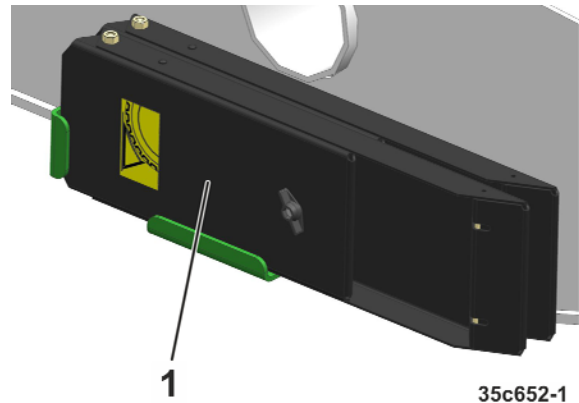


Fig. 20

4.3 Transportation equipment (optional)



When driving on public roads and ways, the lighting must comply with the national road traffic regulations (in Germany the StVZO and the StVO).

Depending on the national road traffic regulations, this also applies for non-public roads and ways.

Fig. 21/...

- (1) 2 rear-facing warning signs
- (2) 1 speed sign

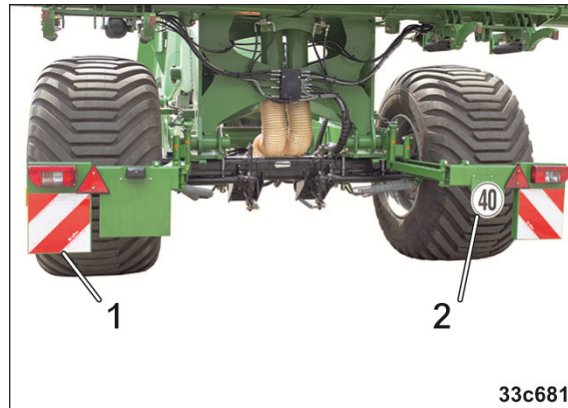


Fig. 21

Fig. 22/...

- (1) 2 rear-facing turn indicators
- (2) 2 reflectors, yellow.
- (3) 2 brake and rear lights
- (4) 1 light for number plate
- (5) 2 reflectors, triangular

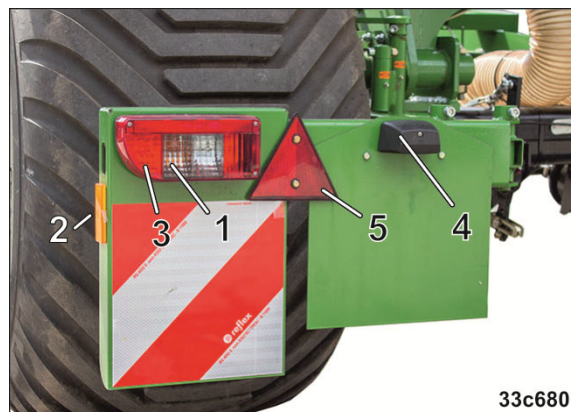


Fig. 22

Fig. 23/...

- (1) 2 forwards-facing marker lights
- (2) 2 forwards-facing warning signs

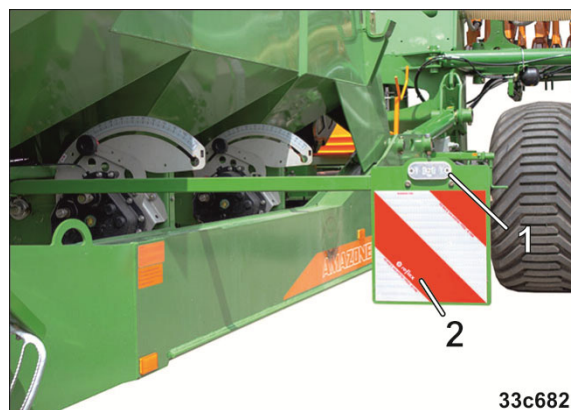


Fig. 23

Fig. 24/...

- (1) 2 x 4 reflectors, yellow,
(laterally with a max. spacing of 3 m)

Supplemental for identification according to
GostR (optional, not shown)

- 2 reflectors facing the front, white
- 2 reflectors facing the rear, red

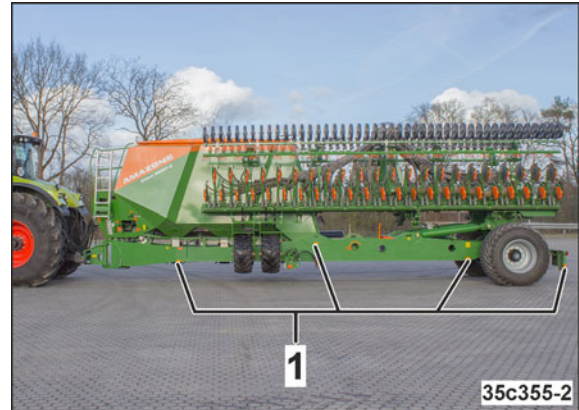


Fig. 24

4.4 Overview – Supply lines between the tractor and the implement

Fig. 25/...

- (1) Hydraulic connections
(2) Lighting connection (optional)

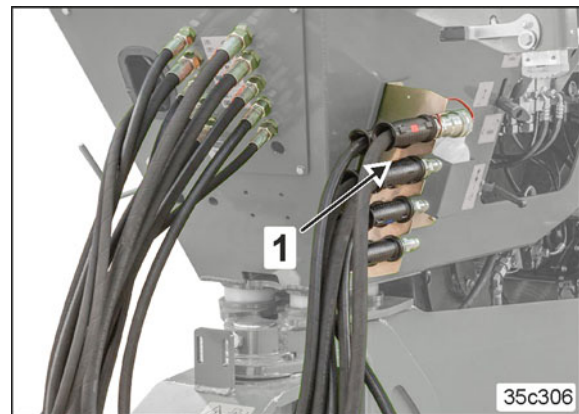


Fig. 25

Fig. 26/...

- (1) Hydraulic connections (option if applicable)
(2) Without illustration:
Lighting connection (optional)
Brake system supply line (optional)

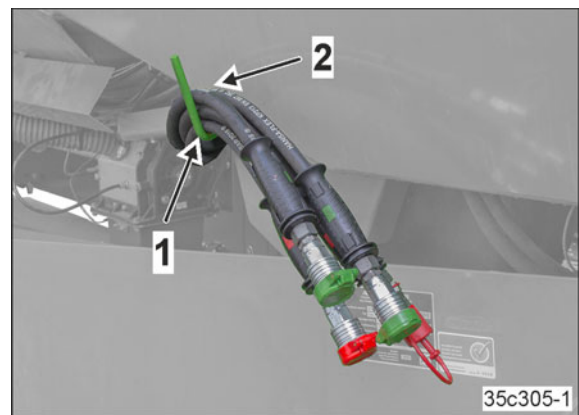


Fig. 26

4.5 Intended use

The implement

- is designed for metering and spreading customary seeds and fertilisers.
- is coupled to the tractor using the tractor's lower links and operated by an additional person.

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 sole responsibility
- AMAZONEN-WERKE accepts no liability.

4.6 Danger areas and danger points

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

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

Within the implement danger area, there are danger points with permanent or unexpected risks. Warning pictograms 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

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

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

Danger points exist:

- between the tractor and the implement, particularly when coupling and uncoupling and when filling the hopper.
- in the area of moving parts
- in the area of the swivelling implement sections
- in the area of the swivelling track marker
- underneath raised, unsecured implements or parts of implements.
- When folding and unfolding the implement sections near overhead power lines.

4.7 Type plate

The figure shows the placement of the rating plate (Fig. 27/1) on the implement.



Fig. 27

Machine rating plate

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

AMAZONE						
AMAZONEN-WERKE H. DREYER SE & Co. KG						
Am Amazonenwerk 9-13 D-49205 Hasbergen						
Maschinen-Nr.	1					
Fahrzeug-Ident-Nr.		2				
Produkt			3			
zul. techn. Maschinengewicht kg		4		Leergewicht kg	5	Modelljahr
						6
CE UK CA			Baujahr année de fabrication year of construction Год изготовления		7	

Additional rating plate

- (1) Note for type approval
- (2) Note for type approval
- (3) Vehicle identification number
- (4) Permissible technical total weight
- (5) Permissible technical trailer load for a drawbar trailer vehicle with pneumatic brake
- (A0) Permissible technical drawbar load A-0
- (A1) Permissible technical axle load for axle 1
- (A2) Permissible technical axle load for axle 2

AMAZONEN-WERKE H. DREYER SE & Co. KG						
1		2				
	3				4	kg
	T-1	T-2	T-3		A-0:	kg
B-2	-	-	-		A-1:	kg
B-4	5	-	-		A-2:	kg

4.8 Technical data

Citan		12001-C	15001-C
Working width	[m]	12.0	15.0
Row spacing of the coulter	[cm]	16.6 / 12.5	16.6
Number of seeding coulters		72 / 96	90
Hopper content	[l]	7800 / - / - 2400 / 2400 / 3000	7800 / - / - 2400 / 2400 / 3000
Payload (on the field)	KG	8000	8000
Working speed with RoTeC pro	[km/h]	8 - 16	8 - 16
Working speed with RoTeC pro-S			
Category of the coupling points		Cat. 3 (optional) Cat. 4N (optional) Cat. K700 (optional)	Cat. 3 (optional) Cat. 4N (optional) Cat. K700 (optional)
Tyres		700/55-26.5	700/55-26.5
Total length (in working position)	[mm]	10000	11500
Total height (in working position)	[mm]	3300	3300
Maximum drawbar load with full hopper (on the field)	KG	7000	8000
Service brake system (optional) ¹⁾ (connection on tractor)		Dual-circuit pneumatic braking system or hydraulic braking system ²⁾	
Electrical system (optional) ³⁾		On-board electrical system	
Battery		12 Volt 90 Ah	
Generator		12 Volt 120 A	

¹⁾ The implement may not be equipped with a brake system.

Operation without a brake system is not permitted in Germany and in some other countries.

²⁾ Operation with a hydraulic brake system is not permitted in Germany and in several other countries.

³⁾ The implement may not be equipped with an on-board electrical system.



Road transport only with empty hopper!

Road transport data

Large area seed drill			Citan 12001-C	Citan 15001-C
Total width (in transport position)		[m]	3.0	3.0
Total length (in transport position)		[m]	9.0	10.5
Total height (in transport position)		[m]	3.95	3.95
Tare weight (basic weight)		KG	≥ 9500	≥ 10500
Permissible total weight		KG	10500	11000
Maximum load for road travel		KG	500	500
Permissible rear axle load		KG	7000	7500
Perm. drawbar load (F _H) when driving on the road (see rating plate)		KG	4000	4500
Permissible max. speed	without brake system ¹⁾	[km/h]	10	10
	with dual-circuit pneumatic braking system	[km/h]	40	40
	with hydraulic brake system	[km/h]	25	25

1) Operation without a brake system is not permitted in Germany and in several other countries.

4.8.1 Payload

Payload	=	Permissible axle load	+	Permissible drawbar load	-	Basic weight
----------------	----------	------------------------------	----------	---------------------------------	----------	---------------------



DANGER

Exceeding the permissible payload is prohibited.

Risk of accident due to unstable driving conditions!

Carefully determine the payload, and therefore the permitted filling amount for your machine. Not all filling media can be used to fill the tank completely.



- Refer to the implement rating plate for the values for the permissible axle load and the permissible drawbar load.
- Weigh the implement to determine the basic weight.



Depending on the tyres, the tyre load capacity of both tyres can be lower than the permissible axle load.

In this case, the tyre load capacity limits the permissible axle load.

Tyre load capacity per wheel

- The load index on the tyre indicates the load capacity of the tyre.
- The speed index on the tyre indicates the maximum speed at which the tyre has the tyre load capacity according to the load index.
- The tyre load capacity is only achieved when the tyre inflation pressure matches the nominal pressure.

Load index	140	141	142	143	144	145	146	147
Tyre load capacity (kg)	2500	2575	2650	2725	2800	2900	3000	3075
Load index	148	149	150	151	152	153	154	155
Tyre load capacity (kg)	3150	3250	3350	3450	3550	3650	3750	3850
Load index	156	157	158	159	160	161	162	163
Tyre load capacity (kg)	4000	4125	4250	4375	4500	4625	4750	5000
Load index	164	165	166	167	168	169	170	171
Tyre load capacity (kg)	5000	5150	5300	5450	5600	5800	6000	6150
Load index	172	173	174	175	176	177	178	179
Tyre load capacity (kg)	6300	6500	6700	6900	7100	7300	7500	7750

Speed index	A5	A6	A7	A8	B	C	D	E
Permissible maximum speed (km/h)	25	30	35	40	50	60	65	70

Driving with reduced inflation pressure



- When the inflation pressure is lower than the nominal pressure, the tyre load capacity is reduced!
In that case, observe the reduced payload of the implement.
- Please also follow the specifications of the tyre manufacturer!



WARNING

Risk of accident!

In event of too low inflation pressure, the stability of the vehicle is no longer guaranteed.

4.9 Necessary tractor equipment

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

Tractor engine power	Citan 12001-C	from 170 kW (231 bhp) upwards
	Citan 15001-C	from 210 kW (286 bhp) upwards
Electrical equipment	Battery voltage	12 V (volts)
	Lighting socket (optional)	7-pin
	ISOBUS socket (optional)	45.0A continuous load
Hydraulic system	Tractor control units	see section 4.4, page 43
	Maximum operating pressure	210 bar
	Tractor pump capacity	At least 80 l/min at 150 bar
	Hydraulic oil for supplying the implement	Transmission/hydraulic fluid HLP68 The implement hydraulic/transmission fluid is suitable for the combined hydraulic/transmission fluid circuits of all standard makes of tractor.
Service brake system	Dual-circuit service braking system	1 hose coupling (red) for the supply line 1 hose coupling (yellow) for the brake line
	Hydraulic operating brake system	1 hydraulic coupling in accordance with ISO 5676



The hydraulic braking system is not allowed in Germany and several other EU countries!

4.10 Noise production data

The workplace-related emission value (acoustic pressure level) is 74 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

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

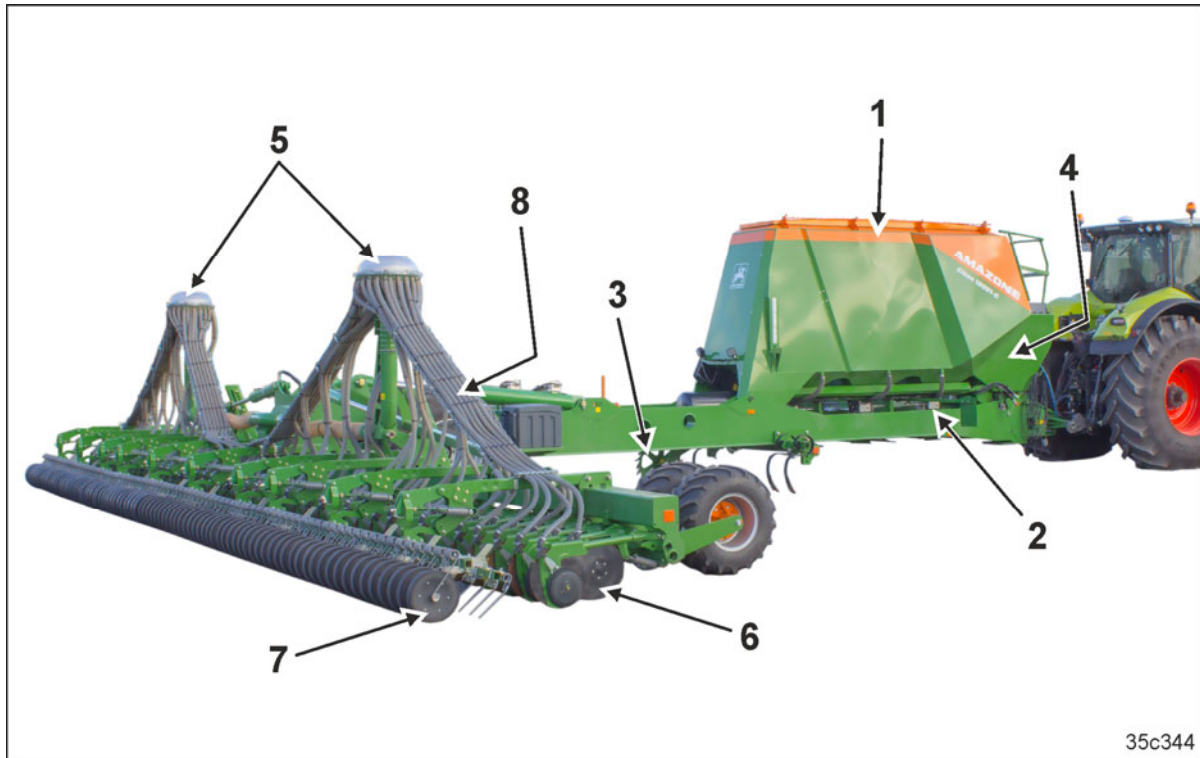


Fig. 28

The implement enables seeding with simultaneous fertiliser spreading.

The large hopper (Fig. 28/1) has three chambers for carrying seed and fertiliser.

From three metering units (Fig. 28/2), which are either driven by a star wheel (Fig. 28/3) or an electric motor, depending on the implement equipment, the metered seed/fertiliser quantity is carried into the air current generated by the fan (Fig. 28/4) and further to the distributor heads (Fig. 28/5), which evenly distribute the seed-fertiliser mix over all of the coulters (Fig. 28/6). The placement depth is adjustable. The implement has a closed system for the overpressure built up by the fan, which also includes the large hopper. The overpressure escapes at the coulter openings and allows the even distribution of the metered seed-fertiliser mix.

The coulters (RoTeC pro / RoTeC pro-S) optimise the seeding accuracy, area efficiency and service life.

The seed is covered with loose soil by the exact following harrow. If required, the seed pressure roller beam (Fig. 28/7) with the adjustable drag tines can be used.

The implement can be folded to a transport width of 3 m and transported on the running gear (Fig. 28/8).

5.1 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 in order to assign the respective hydraulic function to the pressure line of a tractor control unit!

Films are stuck on the implement for the markings that illustrate the respective hydraulic function.

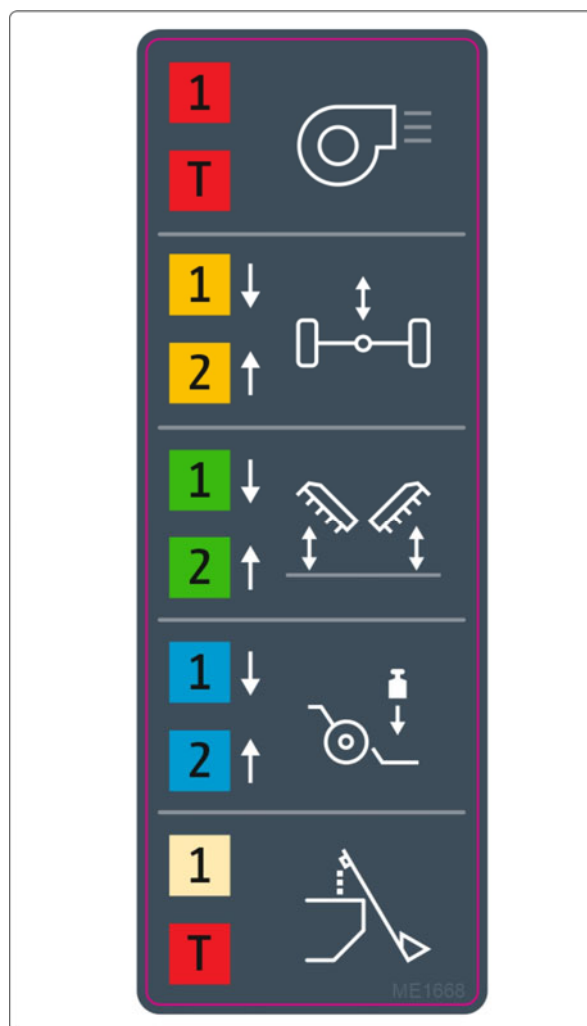


Fig. 29

5.2 Service brake system

The implement can be equipped

- with dual-circuit pneumatic service braking system
- with hydraulic service brake system.
The hydraulic service brake system is not approved in Germany and a few other EU countries.
- without service brake system.

In Germany, the implement is equipped with a dual-circuit pneumatic braking system.

The dual-circuit pneumatic braking system controls two brake cylinders, which actuate the brake shoes in the brake drums.

The tractor also has to be equipped with a dual-circuit pneumatic braking system.

5.2.1 Safety chain for implements without brake system (optional)

Depending on country-specific regulations, machines/implements without a brake system / with single-pipe brake are equipped with a safety chain.

The safety chain must be mounted at a suitable point on the tractor as prescribed before the trip.

Check the suitability of the tractor for operation without service brake system.

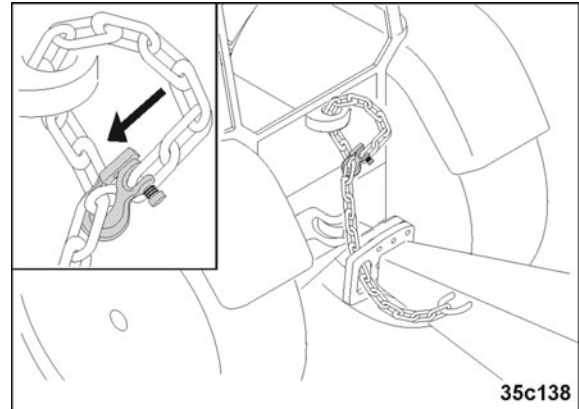


Fig. 30

5.2.2 Parking brake

Implements with a dual-circuit pneumatic service brake system and hydraulic service brake system are fitted with a parking brake.

The crank (Fig. 31/1) is used to activate the parking brake.

Engaging the parking brake:

Turn the crank to the right

Releasing the parking brake:

Turn the crank to the left

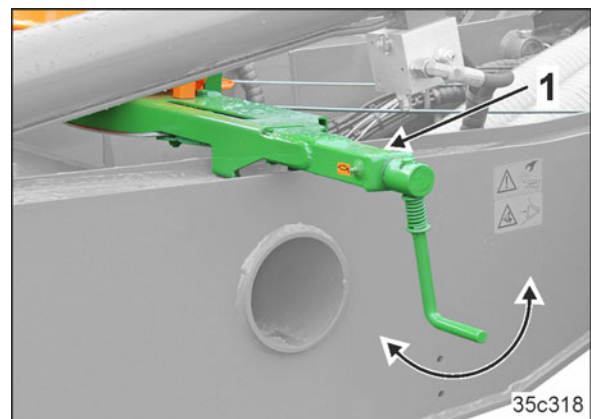


Fig. 31

5.2.3 Dual-circuit pneumatic braking system



Compliance with the maintenance intervals is essential for the correct function of the brake system.

The implement's service brake system responds when the tractor brake pedal or the tractor parking brake is actuated.

If the supply line (red) is disconnected from the tractor, the service brake system automatically acts as a parking brake on the implement.

When the supply line (red) is coupled to the tractor, the parking brake is released automatically as soon as the operating pressure has built up and the parking brake of the tractor is released.

The dual-circuit pneumatic braking system has

- a supply line (Fig. 32/1) with coupling head (red).
- a brake line (Fig. 32/2) with coupling head (yellow).

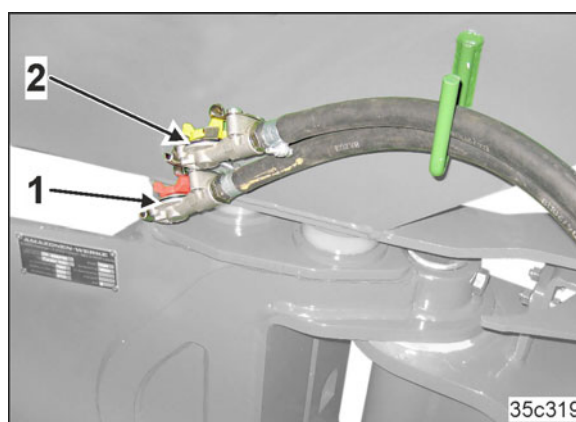


Fig. 32

- a trailer brake valve (Fig. 33/1).

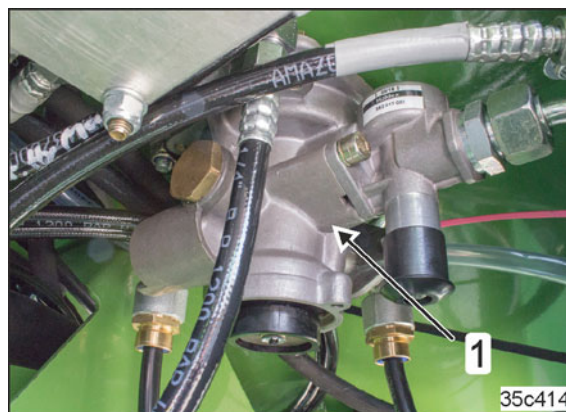


Fig. 33

5.2.4 Hydraulic operating brake system

The implement can be equipped with a hydraulic service brake system. The hydraulic service brake system is not allowed in Germany and a few other EU countries.

The hydraulic service braking system acts on two braking cylinders which actuate the brake shoes in the brake drums.

The tractor also has to be equipped with a hydraulic service brake system.

5.3 ISOBUS

Depending on the equipment, the implement has an ISOBUS job computer. The ISOBUS system controls the hydraulic cylinder and electric motors through a control terminal in the tractor cab. The control terminal is connected to the ISOBUS job computer, which receives the commands and controls the required hydraulic valves or actuates the electric motors of the implement.

The implement can be connected to any ISOBUS-compatible control terminal. If the tractor has an ISOBUS system, the AMAZONE job computer can also be connected to the existing ISOBUS socket of the tractor and operated with the on-board terminal. As an option, the combination can be delivered e.g. with the AMAZONE AMATRON 3 control terminal.

The AMATRON 3 control terminal (Fig. 34) can operate all implements that are equipped with the ISOBUS system.

Instructions for operating

- the AMAZONE job computer can be found in the "ISOBUS Software" operating manual
- the ISOBUS-compatible control terminal can be found in the "AMATRON 3" operating manual.



Fig. 34

5.3.1 TwinTerminal

Communication with the ISOBUS-compatible control terminal in the tractor cab takes place through the TwinTerminal. The TwinTerminal (Fig. 35) is located in the metering area and saves the tractor driver the walk over to the tractor cab, e.g. when starting the calibration procedure or entering the collected calibrated quantity.

Also during residual emptying of the hopper, the metering roller motor, which drives the metering roller in the metering unit, is switched on and off using the TwinTerminal. Like with the calibration test, the metered material is collected.

A flap protects the TwinTerminal from weather conditions.

For a more detailed description, refer to the "ISOBUS software" operating manual.



Fig. 35

5.3.2 On-board electrical system (optional)

As an option, the ISOBUS job computer is supplied through the on-board electrical system. The on-board electrical system consists of a generator (Fig. 36/1) and the hydraulic drive (Fig. 36/2). The hydraulic drive is switched on together with the fan.

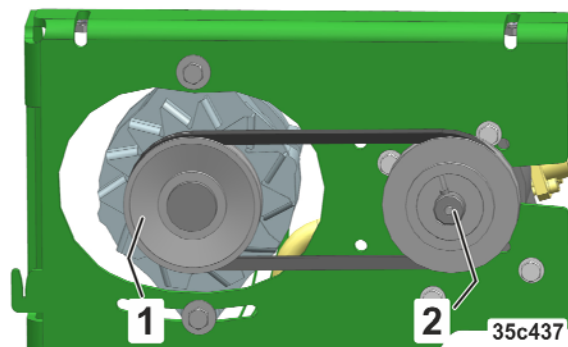


Fig. 36

As soon as the charging signal (Fig. 37/2) is turned off, the loading procedure begins and the electric energy is stored in the battery (Fig. 37/1).

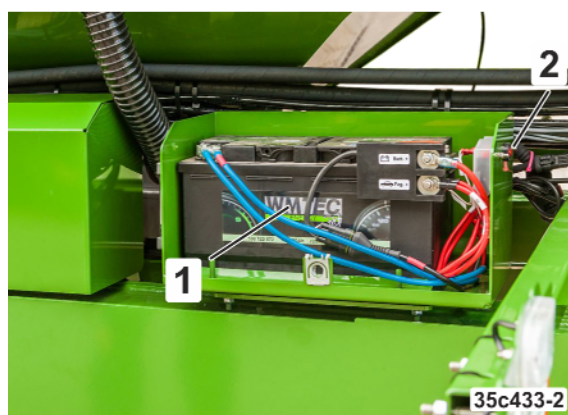


Fig. 37

5.4 Frame and implement sections

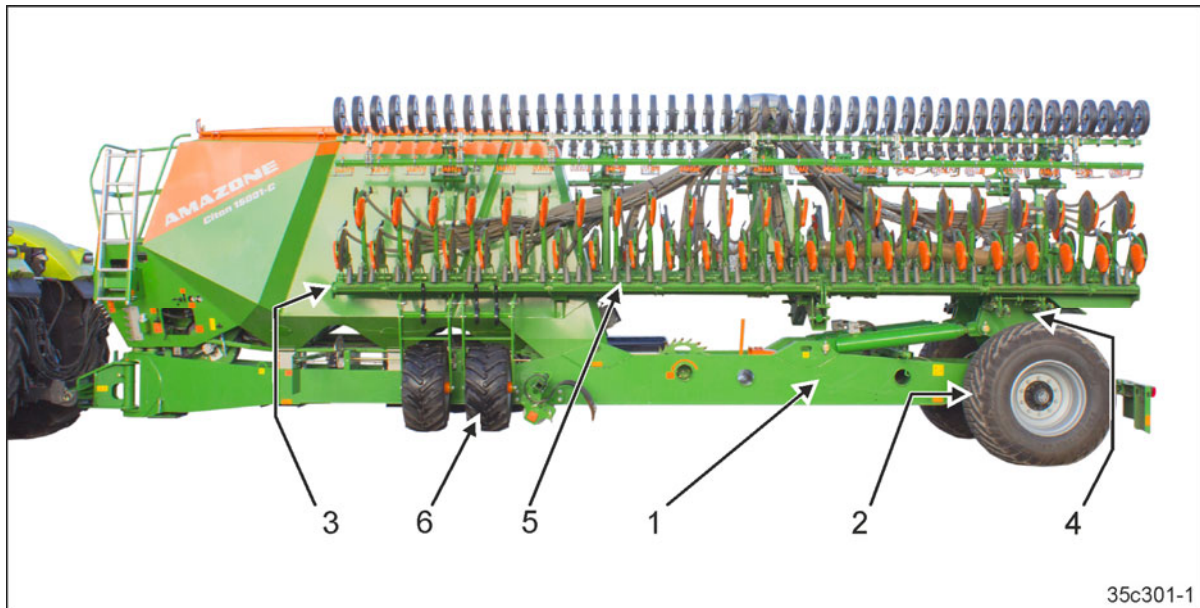


Fig. 38

The implement has

- a main frame (Fig. 38/1) with running gear (Fig. 38/2) and hopper (Fig. 38/3).
- a foldable rear frame (Fig. 38/4)
 - that lifts the coulter before turning at the end of the field.
 - that is nearly vertical before the implement sections are folded in.
- two implement sections that can be folded for transport (Fig. 38/5)
- Support wheels for the implement sections (Fig. 38/6).

5.5 Control centre

On implements with an on-board hydraulic system, the following control elements are grouped in the control centre:

- Cable pull for the parking support (Fig. 39/1)
- Control elements for the on-board hydraulic system (Fig. 39/2)
- Control elements for the section pressure adjustment (Fig. 39/3)
- In conjunction with ISOBUS, the TwinTerminal (Fig. 39/4)
- Control elements for the wheel mark eradicator folding (Fig. 39/5)

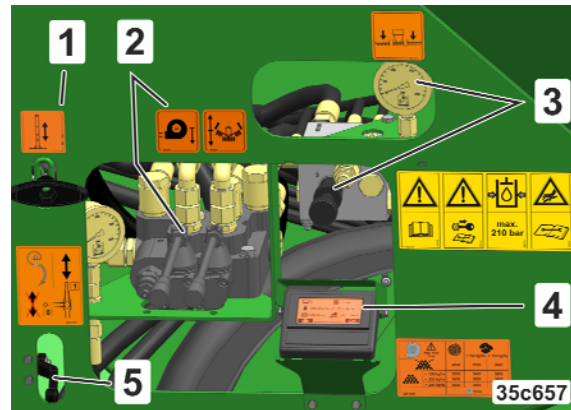


Fig. 39

On implements with track markers, the following control elements are grouped in the control centre:

- Cable pull for the parking support (Fig. 40/1)
- Control elements for implement folding (Fig. 40/2)
- Control elements for the section pressure adjustment (Fig. 40/3)
- In conjunction with ISOBUS, the TwinTerminal (Fig. 40/4)
- Control elements for the wheel mark eradicator folding (Fig. 40/5)

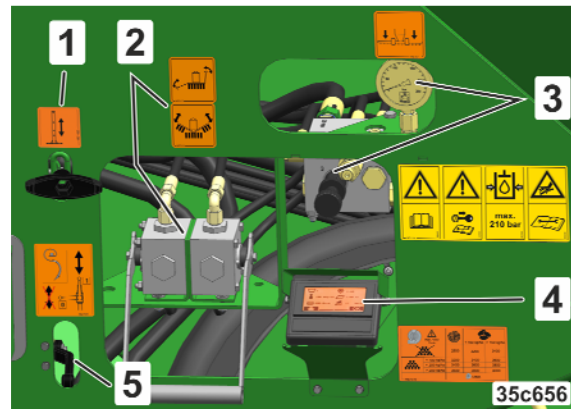


Fig. 40

5.6 Storage compartment

The storage compartment (Fig. 41/1) contains

- the accessories kit with the operating manual,
- the metering rollers in parking position,
- the scale for the calibration test
- the control terminal



Fig. 41

5.7 Reservoir

The large hopper has three chambers (Fig. 42/1...3) for carrying seed and fertiliser.

The hopper is easily accessible for filling, calibration and residual emptying.

The full-area opening of the hopper allows rapid filling (Fig. 43/2).

When the fan is running, the hopper cover (Fig. 43/1) must be firmly closed (see section "Filling the hopper", page 184).



Fig. 42

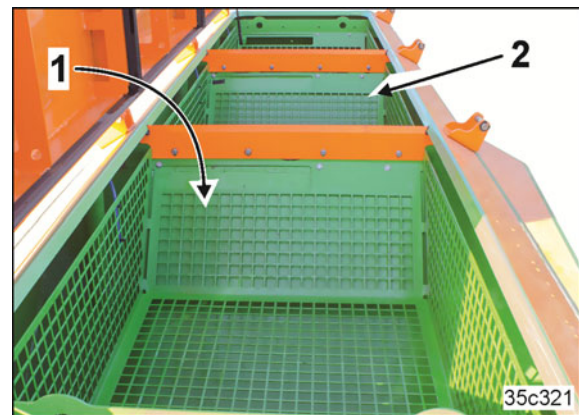


Fig. 43

Each hopper chamber is marked with a number (Fig. 44/1) on the metering unit.



Fig. 44

Layout and function

When the fan is switched on, an even pressure is built up in the hopper and the conveyor system.

The pressure gauges on the loading board (Fig. 45/1...3) indicate the pressures in the individual hopper chambers.



Fig. 45

The marks (Fig. 46/1) show the fill levels of the individual hopper chambers.

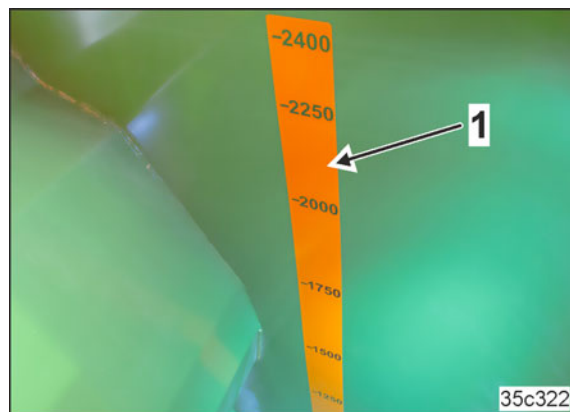


Fig. 46

5.7.1 Filling auger

The filling auger (Fig. 47/2), driven by a hydraulic motor, fills the hopper (Fig. 47/1).

The filling auger is hydraulically swivelled from transport to working position and vice-versa. The tractor engine must be running when swivelling and when filling the hopper.

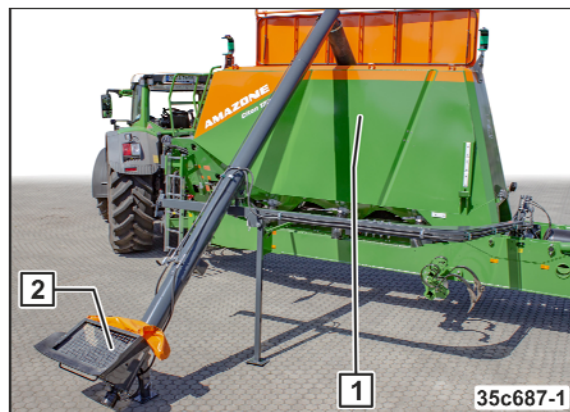


Fig. 47

5.7.2 Digital fill level monitoring

Each hopper chamber has a fill level sensor.

When the level reaches the fill level sensor

- A visual notification appears on the control terminal
- An alarm signal is issued. This alarm signal is intended to remind the tractor driver to refill the seed.

The height of the fill level sensor (Fig. 48/1) can be adjusted from the outside by fastening in one of the brackets.

Attach the fill level sensor according to the type of seed.

Grains and legumes:

Attach the sensor to the higher bracket.

Fine seed types (e.g. rapeseed):

Fasten the sensor in the lower bracket.

Fertilisers:

Attach the sensor in the upper or lower bracket, depending on the spread rate.

This allows the residual seed volume to be set, at which the warning message and the alarm signal is to be issued.

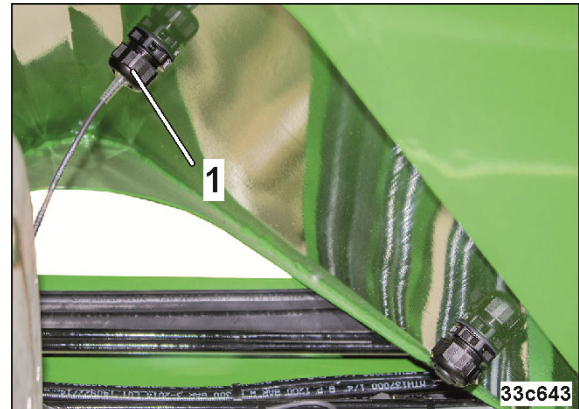


Fig. 48

5.8 Radar (optional)

Depending on the implement equipment, the working speed is determined from the radar pulses (Fig. 49). Other sources are also possible (refer to the "ISOBUS software" operating manual).

The working speed data is used to determine:

- the worked area (hectare counter)
- the required speed for the speed of the metering roller(s).

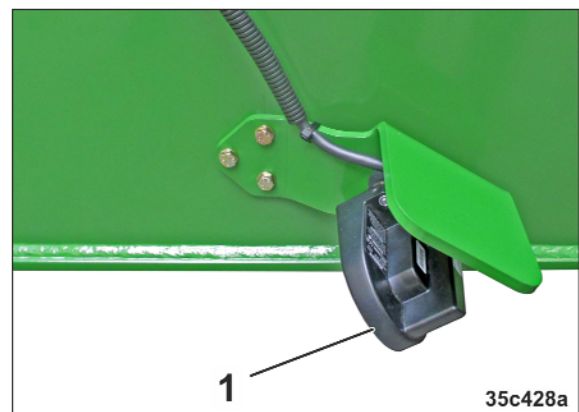


Fig. 49

5.9 Hand wash tank

Hand wash tank (20 l) for clear fresh water
For cleaning hands.

Fig. 50/...Hand wash tank

- (1) Filling connection
- (2) Filling opening

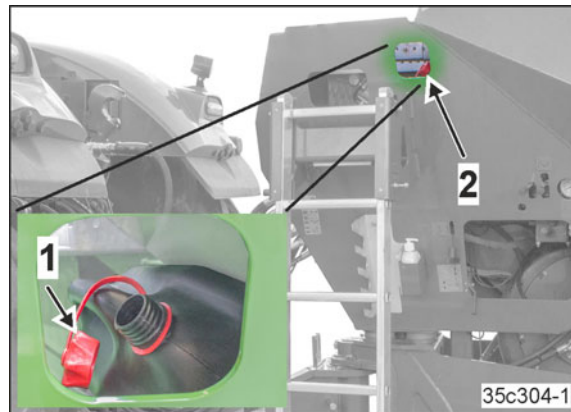


Fig. 50

Fig. 51/...

- (1) Stop tap
- (2) Discharge



WARNING

Danger of poisoning from using unclean water in the fresh water tank.

Never use the water from the hand wash tank as drinking water!

The materials used to construct the hand wash tank are not food-safe

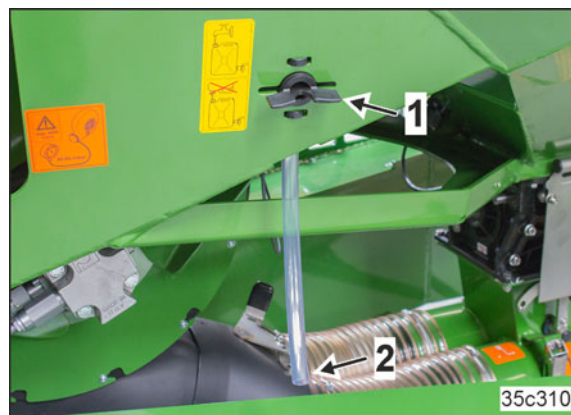


Fig. 51

5.10 Soap dispenser

Easily accessible, the soap dispenser is on the hose cabinet (Fig. 52/1).

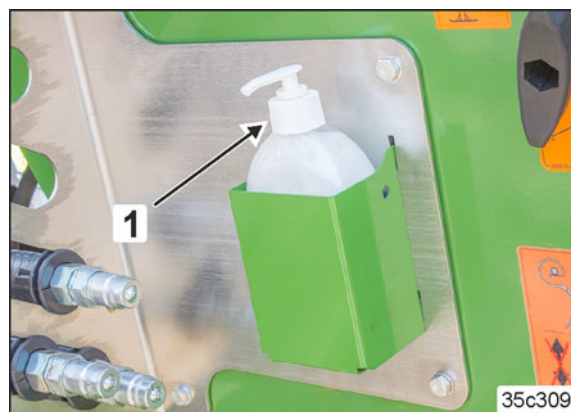


Fig. 52

5.11 Work lights (optional)



2 variants:

- Separate power supply from the tractor is required, operation via the control box.
- Power supply and operation via ISOBUS (only LED floodlights with a total power of 2x 48 W).

Fig. 53/...

- (1) 2x 24 W LED floodlights on the hopper

With independent power supply or supply and operation via ISOBUS.

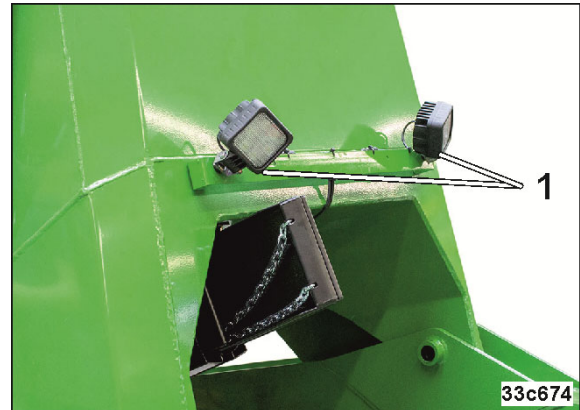


Fig. 53

Fig. 54/...

- (1) 2x 24 W LED on the distributor heads

In addition to the LED floodlights on the hopper; however, only when supplied and operated via ISOBUS.



Fig. 54

Fig. 55/...

- (1) Metering unit lighting

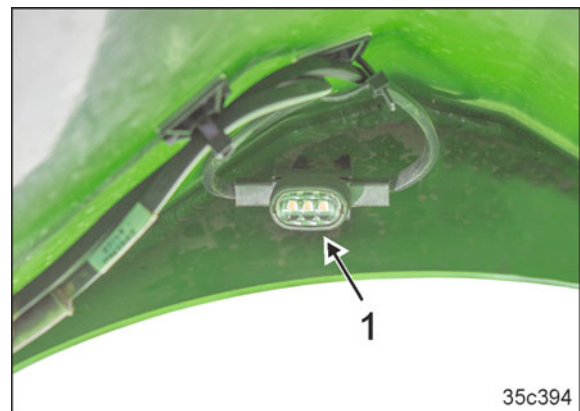


Fig. 55

Layout and function

Fig. 56/...

(1) Hopper interior lighting

The hopper interior lighting along with the viewing window (Fig. 56/2) allow quick checking of the fill level. If light can be seen through the viewing window, the fill level is lower than the viewing window.

Without illustration: Ascent lighting

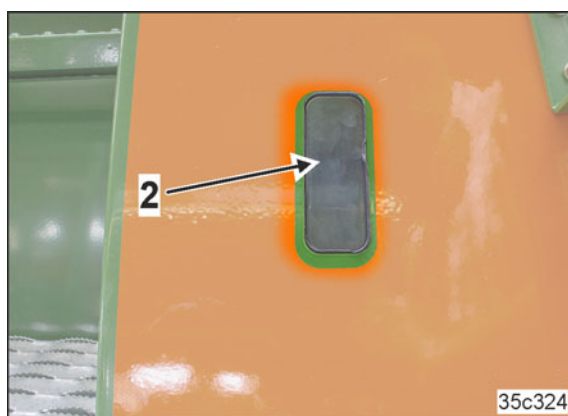
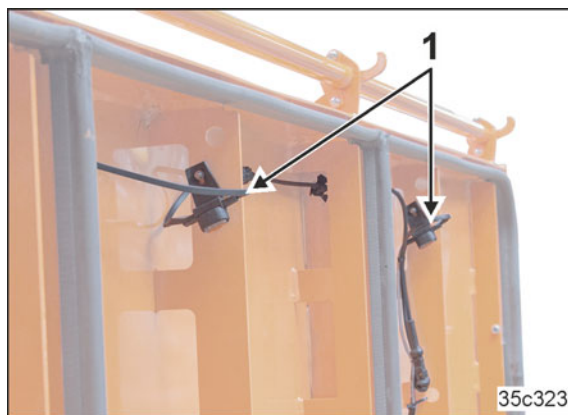


Fig. 56

5.12 Quick emptying (optional)



WARNING

The hopper chambers are under pressure when the fan is running. Before opening the quick emptying, switch off the fan.



Clean the sealing area of the quick emptying before putting back into operation.

The rotary connection cannot be sealed pressure tight if the filling seed level protrudes in the opening of the quick emptying. This is why the chamber must be emptied completely and the sealing area of the quick emptying has to be cleaned before being put back into operation.

1. Switch off the fan.
2. Hold the lever (Fig. 57/1) and undo the knurled screw (Fig. 57/2).
3. Route the emptying hose (Fig. 58/3) into a collection vessel.
4. Slowly open the quick emptying with the lever.
5. Clean the sealing area of the quick emptying before putting back into operation.
6. Close the quick emptying.
7. Secure the lever (Fig. 57/1) using the knurled screw (Fig. 57/2).

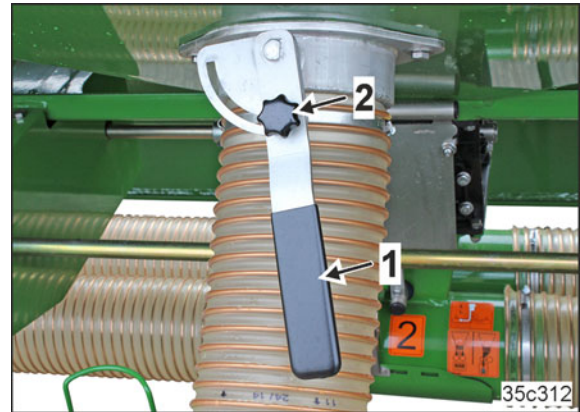


Fig. 57

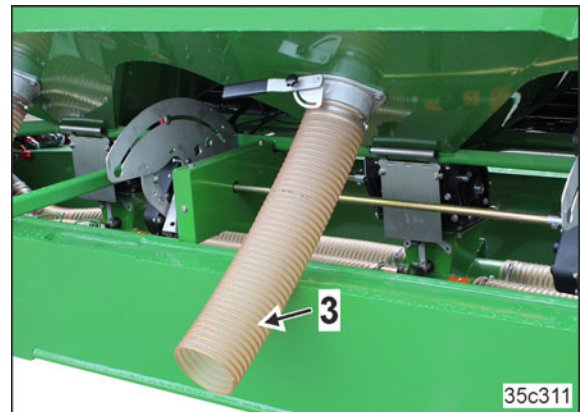


Fig. 58

5.13 Seed / fertiliser metering

The implement has 3 metering units (Fig. 59/1-3)

Each metering unit is equipped with a metering roller (see section "Metering Rollers Table", page 71).

Depending on the equipment, the metering rollers are driven by a star wheel (Fig. 60/4) or an electric motor (Fig. 61/1).

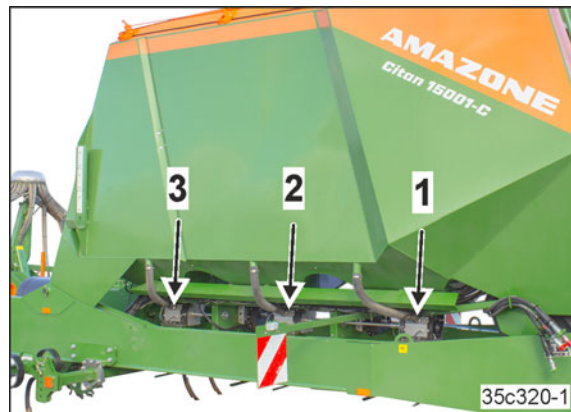


Fig. 59

With the mechanical drive, the star wheel (Fig. 60/4) also measures the distance covered. The control terminal requires this data to calculate the forward speed and worked area (hectare counter).

The star wheel controls the creation of tramlines. Approx. 5 seconds after each time the star wheel is swivelled up, e.g. before turning at the end of the field, the tramline counter is advanced.

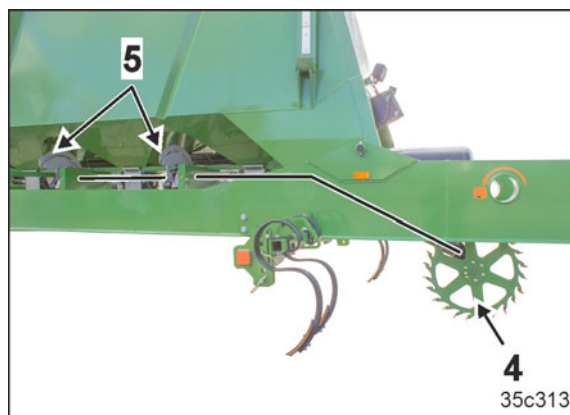


Fig. 60

Depending on the implement equipment, the desired spread rate is set on the control terminal (see "ISOBUS software" operating manual) or with the gearbox lever (Fig. 62/1) of the Vario gearbox.

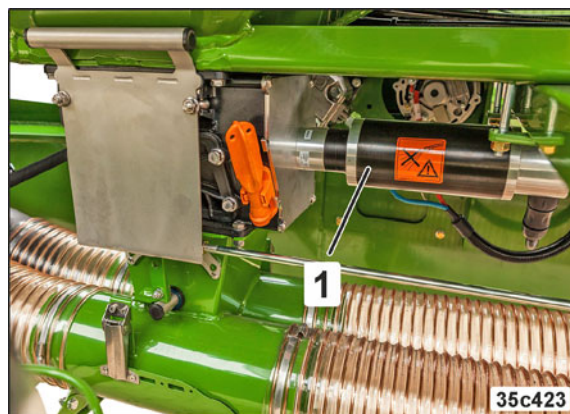


Fig. 61

The higher the number the gearbox lever points to on the scale (Fig. 62/2), the greater the application rate.

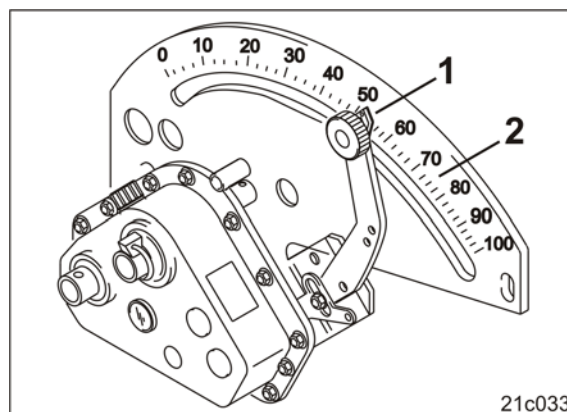


Fig. 62

The seed or fertiliser falls into the delivery tube (Fig. 63/1).

The air current generated by the fan conveys the seed/fertilizer mixture to the distributor head and then onto the coulters.

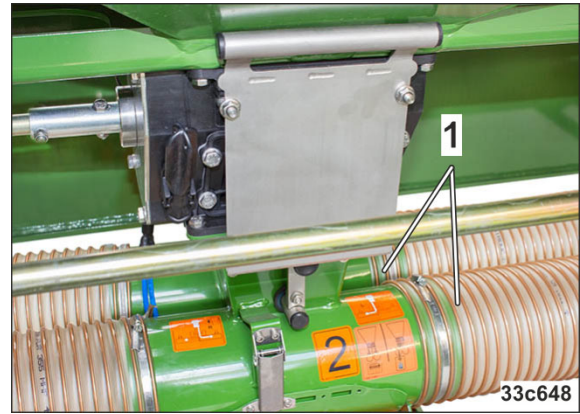


Fig. 63

For calibration and emptying, the seed/fertiliser is collected in a trough (Fig. 64/1) under the metering unit.

Each delivery tube has an opening at the bottom.

The tensioning hook (Fig. 64/2) closes the opening with a flap (Fig. 64/3).



Fig. 64

When not in use, the calibration troughs are inserted inside one another and secured in the transport bracket using a linch pin (Fig. 66/4).

- Citan 12001-C (Fig. 65/3)
- Citan 15001-C (Fig. 66/3)



Fig. 65

The calibration crank is inserted in the transport bracket in parking position.

- Citan 12001-C (Fig. 65/2)
- Citan 15001-C (Fig. 66/2)

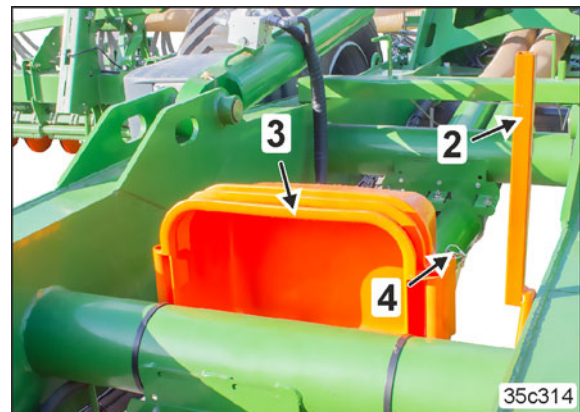


Fig. 66

5.14 Metering rollers

The metering units are equipped with an exchangeable metering roller. The metering roller selection depends on

- the metered material (seed/fertiliser),
- the spread rate.

On the front side of the metering roller, there are marks for the corresponding metering volume (Fig. 67/1).

The fertiliser metering unit is equipped with a fertiliser metering roller that is suitable for all fertiliser types (see Metering Rollers Table, page 71).

By repositioning the metering wheels, idler wheels and plates, the metering rollers can be adapted to the operating conditions with 120 cm³, 210 cm³ and 600 cm³.

For seeding particularly large seeds, e.g. beans, the chambers (Fig. 68/1) of the metering roller can be enlarged by repositioning the metering wheels and the plates.

Conversion as shown in section 5.14.1, page 70.

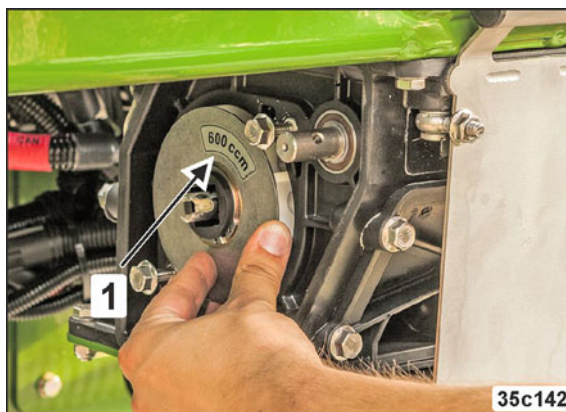


Fig. 67

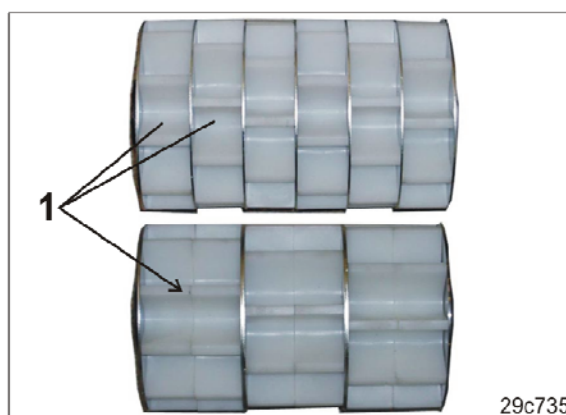


Fig. 68

For the seeding of catch crops or seed mixtures, the metering rollers with 120 cm³, 210 cm³ and 600 cm³ can be diminished by installing idler wheels (Fig. 69/2) to reduce the metered quantity.

Fig. 69/...

- (1) Metering wheels
- (2) Idler wheels

Conversion as shown in section 5.14.1, page 70.

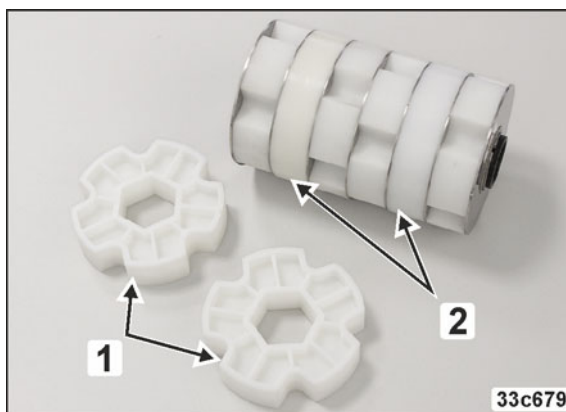


Fig. 69



Fit all of the seed metering units with the same metering roller.

Fit the fertiliser metering unit with the fertiliser metering roller.



7.5 cm³



20 cm³



40 cm³



120 cm³



210 cm³



350 cm³



600 cm³



660 cm³



880 cm³

Fig. 70

5.14.1 Converting the metering roller

Fig. 71/...

- (1) Remove the locking ring, remove the metering wheels from the drive shaft
- (2) Rearrange the metering wheels or replace by idler wheels. Ensure that the arrangement is symmetrical!
- (3) Position the metering wheels on the drive shaft, put on the locking ring

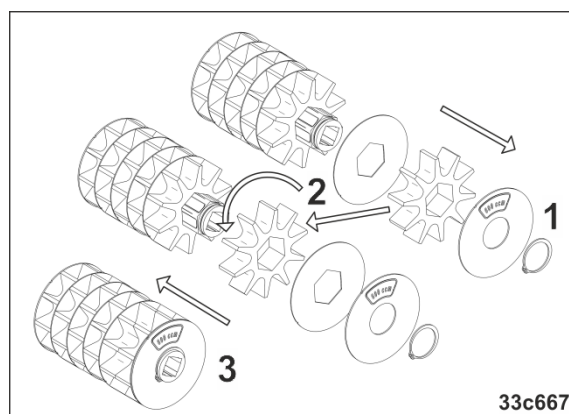


Fig. 71

5.15 Metering Rollers Table



The Metering Rollers Table serves as a reference aid! For seeds that are not listed in the table, select the metering rollers for a similar grain size that is listed in the table.

Seed	Metering rollers									
	7.5 cm ³	20 cm ³	40 cm ³	120 cm ³	210 cm ³	350 cm ³	600 cm ³	660 cm ³	880 cm ³	
Beans								X		
Buckwheat					X		X		X	
Spelt							X		X	
Fertiliser (granular)						X		X		
Peas								X		
Flax (dressed)		X	X	X	X					
Barley					X		X		X	
Grass seeds					X					
Oats							X		X	
Millet				X	X					
Caraway		X	X							
Lupines				X	X					
Lucerne		X	X	X	X					
Maize				X						
Poppy	X									
Oilseed (moist dressed)		X	X							
Fodder radish		X	X	X	X					
Phacelia		X	X	X						
Canola	X	X	X							
Rice						X				
Rye					X		X		X	
Red clover		X	X	X						
White mustard		X	X	X	X					
Soya							X	X		
Sunflowers				X	X					
Turnips		X	X							
Triticale					X		X		X	
Wheat					X		X		X	
Vetches					X					

5.16 calibration test

The calibration test checks whether the pre-set and actual spread rates are equivalent.

Always carry out a calibration test

- when changing the type of seed/fertiliser.
- if the same type of seed/fertiliser is used, but with a different grain size, grain shape and specific weight.
- if there is a change in the seed dressing.
- after changing the metering rollers.
- if the actual spread rate does not correspond to the spread rate that was determined by the calibration test.

During calibration, the metered seed or metered fertiliser drops into the calibration test (Fig. 72/1). The number of calibration troughs corresponds to the number of metering units.

A number of calibration tests are often necessary to determine the correct gearbox setting.

In combination with a mechanical drive, the required gearbox setting can be calculated from the values of the first calibration test using the calculator disc. Always check the value determined on the calculating disc rule with a further calibration test.

The calculator disc has three scales

- An outer white scale (Fig. 73/1) for all spread rates above 30 kg/ha
- An inner white scale (Fig. 73/2) for all spread rates below 30 kg/ha
- A coloured scale (Fig. 73/3) with all gearbox settings from 1 to 100.



Fig. 72

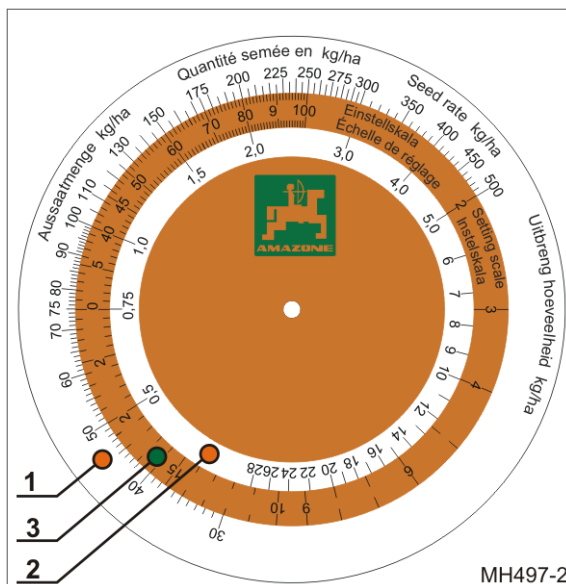


Fig. 73

5.17 Fan

The hydraulic motor (Fig. 74/2) drives the fan (Fig. 74/1) and generates the air current. The air current carries the seed to the coulters.

The fan speed determines the air volume of the air current. The higher the fan speed, the greater the air volume and system pressure that is generated.

An air preheater is available as an option. It reduces the air humidity in the delivery flow.

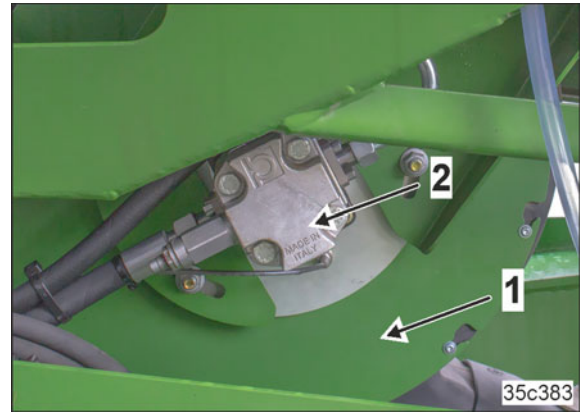


Fig. 74

The fan is equipped with a suction guard screen (Fig. 74/1).

The suction guard screen prevents the suction of straw residues into the fan under very dry conditions.



Fig. 75

The pressure gauges on the loading board (Fig. 76/1...3) indicate the pressures in the individual hopper chambers. The fan speed is set correctly when the indicator for the pressure gauge is between 45 and 60 mbar.



At an idle, pressures between 25 and 35 bar are reached in the individual hopper chambers.



Fig. 76

5.18 On-board hydraulic system (optional)

The on-board hydraulic system (optional) consists of a PTO shaft hydraulic pump and a hydraulic motor that drives the fan.

In combination with the on-board hydraulic system, an air preheater is equipped. The air preheater cools the oil circuit and simultaneously reduces the air humidity in the delivery flow.

Set the fan speed according to section 8.4.4.

The PTO shaft hydraulic pump (Fig. 77/1) is driven by the tractor PTO shaft.

In a closed circuit, the implement carries the hydraulic fluid in an oil tank.

Fig. 78/...

- (1) PTO shaft hydraulic pump in parking position

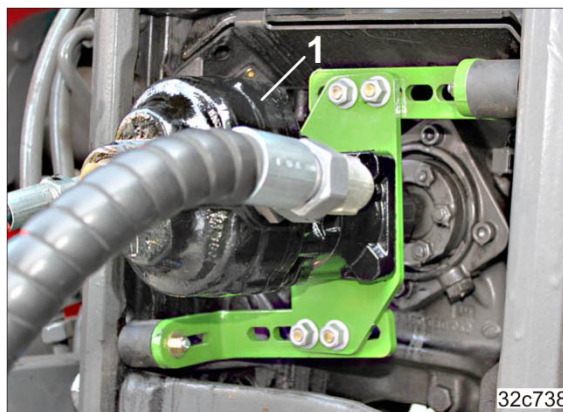


Fig. 77

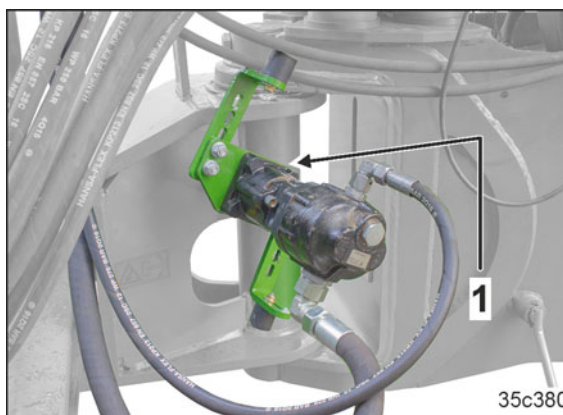


Fig. 78

5.19 Distributor head

In the distributor head (Fig. 79/1), the seed-fertiliser mix is distributed uniformly over all the seed coulters.

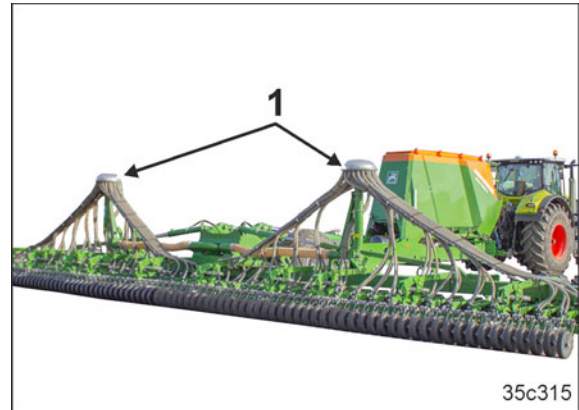


Fig. 79

5.19.1 Seed tube monitoring (optional)

The seed tube hoses represent the connection between the distributor head and the coulters.

Each seed tube hose can be equipped with a sensor (Fig. 80/1) that detects the seed flow.

If the seed flow is stopped in one of the seed tube hoses equipped with a sensor, a warning message is issued.

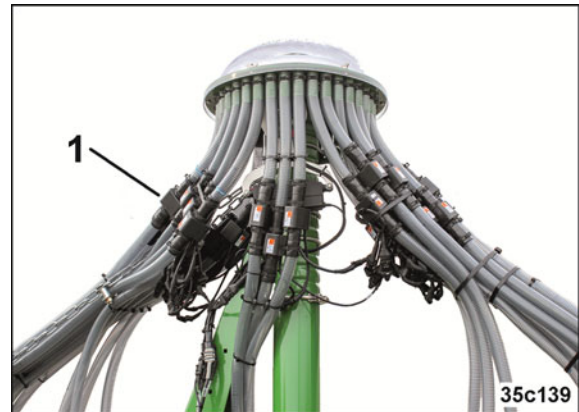


Fig. 80



If there is blockage at one of the coulters, the air escapes with the seed through the air separator. The seed line monitoring is not triggered. There is no warning message.

The warning message is only triggered if the seed line is blocked between the sensor and the air separator.

5.20 RoTeC pro coulters

The RoTeC-Pro coulters (working speed: 8 - 16 km/h) is used for the placement of seed and fertiliser on ploughed or mulched soil, even with larger quantities of straw and plant residues.

With the support of the RoTeC pro coulters on the shallow seeding or cleaning disc and the high coulters pressure, the coulters runs very smoothly and precisely maintains the seed placement depth.

The seed placement depth can be adjusted in five stages

The shallow seeding disc (Fig. 81/1) and the cleaning disc (see below) are used for

- limiting the seed placement depth
- cleaning the rear side of the steel disc (Fig. 81/2)

For limiting the seed placement depth, the discs can be adjusted in 4 positions. The handle (Fig. 81/3) is used for actuation.

The shallow seeding disc (Fig. 81/1) enables shallow seeding even on very light soils with increased coulters pressure.

The cleaning disc (Fig. 82/1) is used on heavy soils.

If the seed placement depth cannot be reached, the coulters discs can be removed from the coulters.

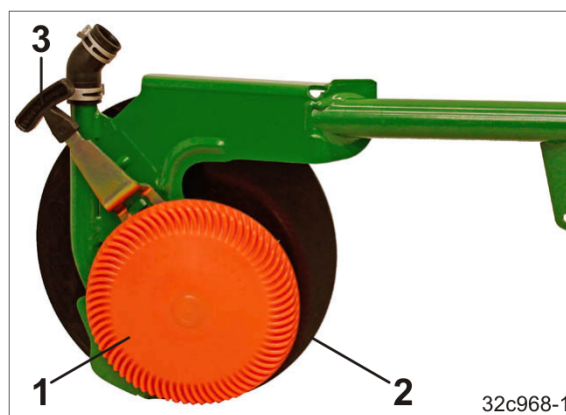


Fig. 81



Fig. 82

RoTeC pro S coulters

The RoTeC pro-S coulters is being developed and its function is comparable to the RoTeC pro coulters.

Thanks to a modified furrow former, the RoTeC pro-S coulters can achieve a greater seed placement depth.

5.20.1 Seed placement depth



The seed placement depth depends on different factors, such as the

- Soil type (light to heavy, dry to wet)
- Forward speed
- Position of the depth limiting discs
- coulter pressure
- Condition of the seedbed.

To adjust the seed placement depth, the depth limiting disc can be moved to the desired position or removed.

The plastic disc can be adjusted or removed without the need for tools by using the handle (Fig. 81/3).

The "Control 10" depth limiting disc (Fig. 83/1)

- limits the set seed placement depth
- cleans the rear side of the seeding disc
- improves the drive of the seeding disc by gripping the soil.

The "Control 25" depth limiting roller (Fig. 84)

- permits shallow seeding, even on very light soils, thanks to the wider tread surface.



Fig. 83



Fig. 84

5.20.2 Coulter pressure

With the hydr. coulter pressure adjustment, the coulter pressure is preset for two types of soil. This means that the coulter pressure can be adjusted to the soil during work, e.g., in event of a change from normal soil to heavy soil and vice versa.

Two pins (Fig. 85/1) in an adjuster segment limit the hydraulic cylinder. With increased coulter pressure, the stop (Fig. 85/2) of the hydraulic cylinder is at the top pin.

The implements are equipped with two adjuster segments.

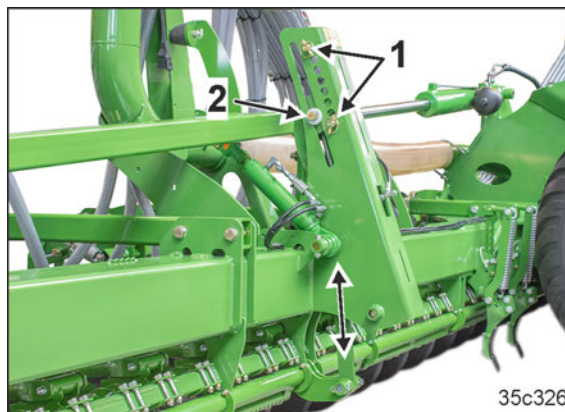


Fig. 85

The pressure gauge (Fig. 86/1) displays the status of the unit to the tractor driver.

If the pressure gauge is depressurised:

The coulters work with normal coulter pressure.

If the pressure gauge is pressurised:

The coulters work with increased coulter pressure.

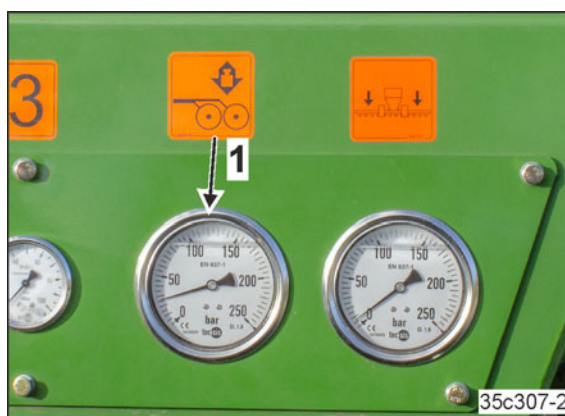


Fig. 86

Set the required coulter pressure with the *blue* tractor control unit.

5.21 Exact following harrow

The exact following harrow (Fig. 87/1) evenly covers the seeds deposited in the seed furrows with loose earth and smoothes the ground.

The following are adjustable

- the exact following harrow position (Fig. 88/1)
- the exact following harrow pressure (Fig. 88/2).
The exact following harrow pressure determines the working intensity of the exact following harrow and is independent of the soil type.

Set the exact following harrow pressure so that no earth bank remains on the field after seed coverage.

The tension springs that generate the exact following harrow pressure are pre-tensioned by a lever. The lever rests upon a pin in the adjuster segment.

The higher the pin is inserted in the group of holes, the greater the harrow pressure (see section 8.8, page 149).



Fig. 87

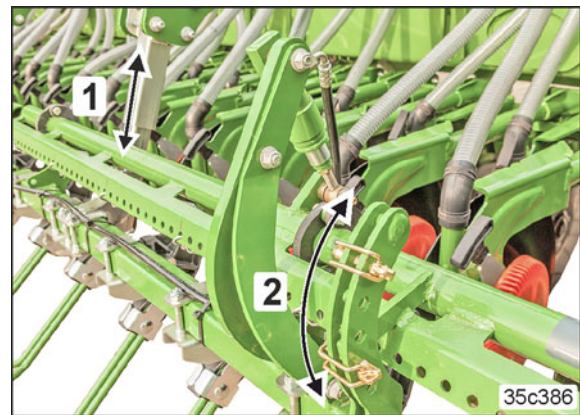


Fig. 88

5.21.1 Hydraulic exact following harrow pressure adjustment (optional)

The exact following harrow pressure can be adapted to the soil during drilling in the event of a change from normal soil to heavy soil and vice versa.

For hydraulic exact following harrow pressure adjustment the second pin (Fig. 88/3) is inserted as a stop above the lever (Fig. 88/1) in the adjuster segment.

The harrow pressure is increased as soon as the hydraulic cylinder applies pressure and the lever contacts the top pin.

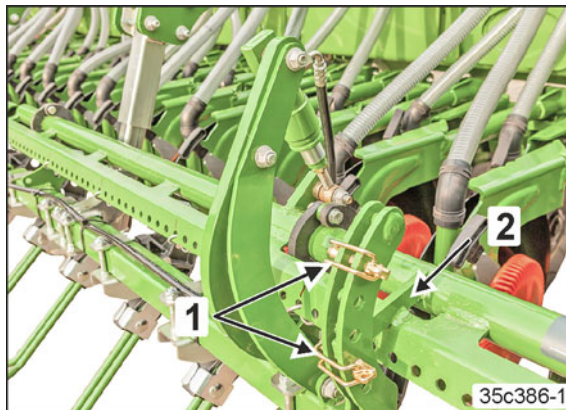


Fig. 89

5.22 Roller harrow (optional)

The roller harrow consists of

- harrow tines (Fig. 90/1),
- press rollers (Fig. 90/2).

The harrow tines close the seed furrows.

The press rollers press the seeds into the furrows. Better soil contact means more humidity is available for germination. Voids are closed and obstruct snails' access to the seed.

The following are adjustable

- the working depth of the harrow tines
- the angle of the harrow tines
- the roller pressure

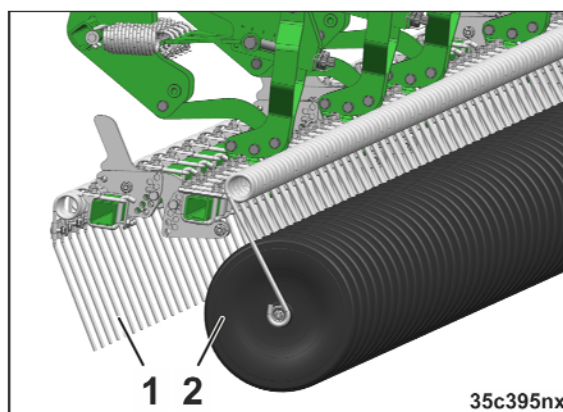


Fig. 90

5.23 Guide wheel harrow

The guide wheel harrow (Fig. 91/1) crumbles the soil behind the guide wheels, thereby producing the seedbed.

The following can be adjusted:

- the working depth of the guide wheel harrow
- the pitch of the guide wheel harrow
- the working position of the guide wheel harrow.

Adjust the guide wheel harrow so that a loose seedbed with sufficient fine earth is produced behind the guide wheels. The setting depends on the soil type.

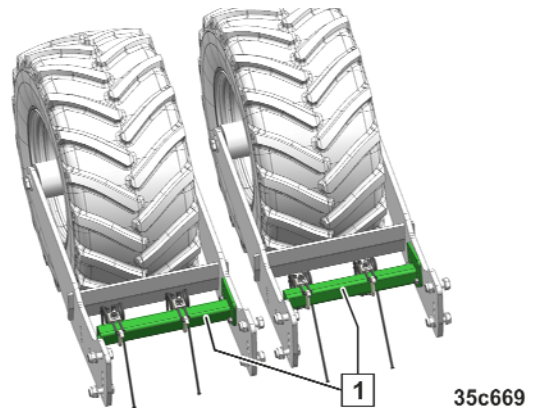


Fig. 91

5.24 Tractor wheel mark eradicator (optional)

The tractor wheel mark eradicators (Fig. 92) loosen soil compacted by the tractor tyres and produce fine earth for covering the seed furrow.

The wheel mark eradicators can be set horizontally and vertically. Horizontally, the wheel mark eradicators are infinitely adjustable.

When lifting the implement at the headlands or for road transport, the wheel mark eradicators are swivelled up by approx. 90°.

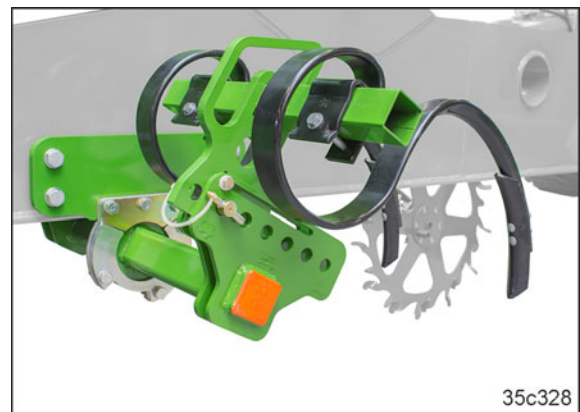


Fig. 92

Throwing the lever (Fig. 93/A) allows work to be performed without the tractor wheel mark eradicators.

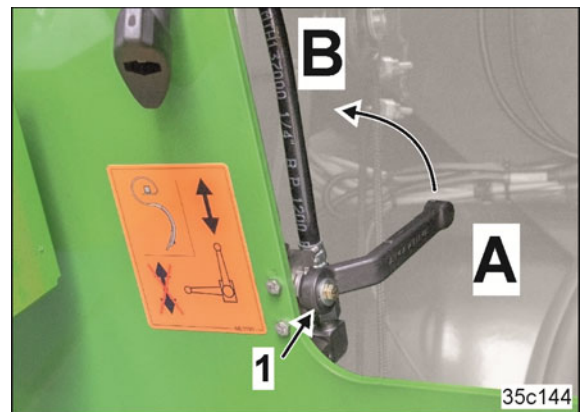


Fig. 93

5.25 Seed drill wheel mark eradicator (optional)

Wheel mark eradicator (Fig. 94/1) for eliminating the seed drill wheel tracks.

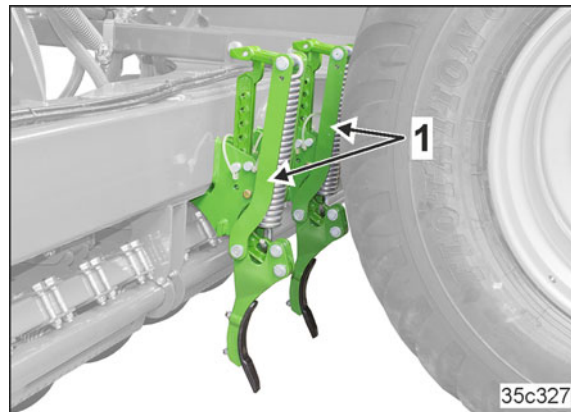


Fig. 94

5.26 Track marker (optional, only for Citan 12001-C)

The hydraulically-actuated track markers dig into the ground alternately on the left and the right of the implement. In doing so, the active track marker creates a mark. This mark serves as a reference for driving the next bout after turning at the headland. After turning, the tractor driver drives over the centre of the mark.

It is possible to set:

- the length of the track marker
- the working intensity of the track marker, depending on the type of soil.



5.27 Tramline marker (optional)

When tramlines are being created, the track discs (Fig. 95/1) lower automatically and mark the tramline that has just been created. This makes the tramlines visible before the seed has germinated.

The following are adjustable

- the track width of the tramline, (tractor wheelmark width)
- the working intensity of the track discs.

The track discs are raised if no tramline is created.

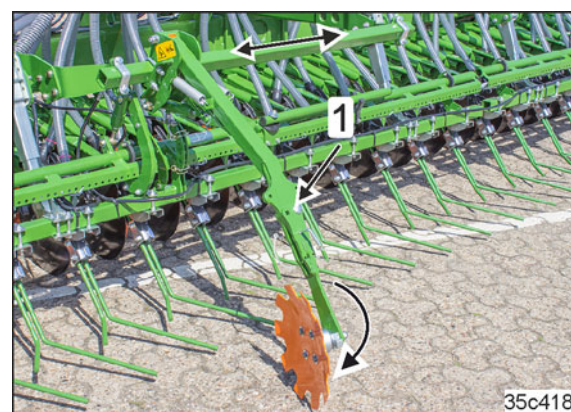


Fig. 95

5.28 One-sided switching off (part-width section)

With certain tramline rhythms it is necessary to start the seeding operation at the start of the field initially only at half the working width (part-width section).

One half-width of the implement (part-width section) can be switched off on the seed metering unit (see section "Implement one-sided switch-off", page 162).

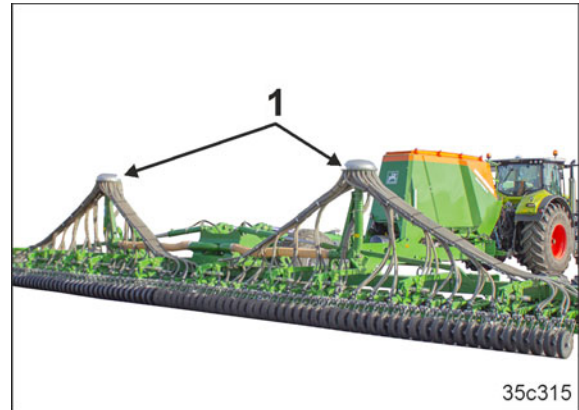


Fig. 96

On implements with 2 distributor heads (Fig. 97/1)

- one distributor head supplies one half of the implement.
- the implement sows one-sided as soon as one distributor head is no longer supplied.

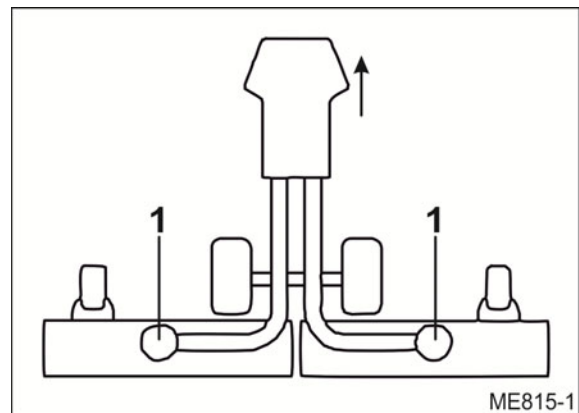


Fig. 97

If all coulters are working

- one metering unit (Fig. 98/1) supplies both distributor heads with seed or fertiliser at the same time.

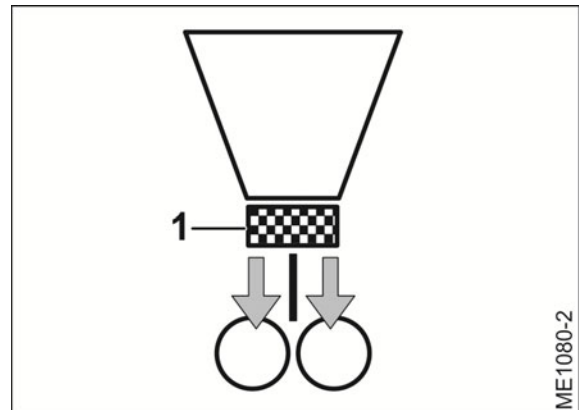


Fig. 98

5.29 Creating tramlines (Option)

The tramline control allows tramlines to be created at preselected intervals on the field. To set the different tramline spacings, appropriate tramline rhythms have to be entered on the control terminal.

Tramlines are seed-free tracks for fertilising and plant care implement used later.

In the seed-free tracks, the coulters do not spread any seed. In the distributor head, the seed supply to the seed lines of the tramline coulters is interrupted.



Fig. 99

When creating the tramlines

- the tramline control on the distributor head uses shutters (Fig. 100/1) to block the seed feeding lines to the seed lines (Fig. 100/2) of the tramline coulters.
- the tramline coulters do not deposit any seeds on the ground.

Seed supply to the tramline coulters is interrupted as soon as the electric motor (Fig. 100/3) closes the appropriate seed tubes (Fig. 100/2) in the distributor head.

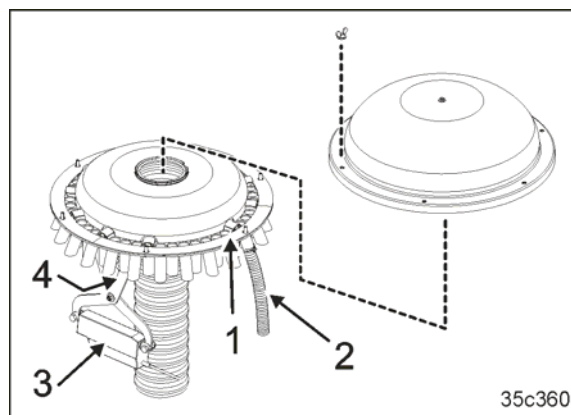


Fig. 100

When creating tramlines, the tramline counter indicates "0" on the control terminal.

The seed volume, which is reduced when creating a tramline, can be set. The implement must be equipped with electrically driven metering units.

A sensor (Fig. 100/4) checks whether the shutters (Fig. 100/1), which open the and close the seed line tubes (Fig. 100/2), are working properly.

An acoustic warning signal is issued if the position is faulty. The seed supply to the tramline coulters are marked with coloured labels (Fig. 101/1).

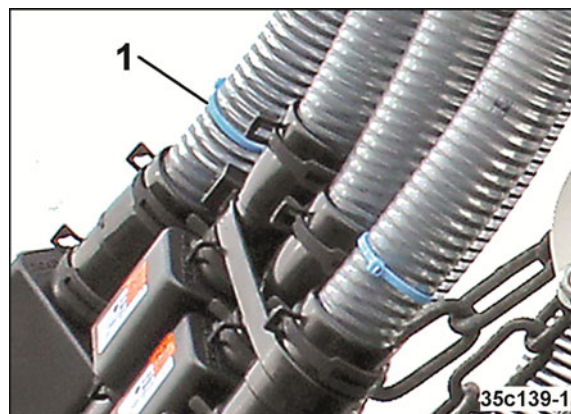


Fig. 101

Tramlines are seed-free tracks (Fig. 102/A) for fertilising and plant care implements used later.

The tramline spacing (Fig. 102/b) corresponds to the working width of the cultivating implements (Fig. 102/B), e.g. fertiliser spreader and/or field sprayer, which are used on sown fields.

To set the different tramline spacings (Fig. 102/b), appropriate tramline rhythms must be entered on the on-board computer¹⁾.

Fig. 102 shows the tramline rhythm 3. During operation, the field passes are numbered consecutively (tramline counter) and displayed on the on-board computer¹⁾. In tramline rhythm 3, the tramline counter shows the field runs in the following order: 2-0-1-2-0-1-2-0-1...etc.

When creating a tramline, the tramline counter indicates the number "0" on the control terminal.

The required tramline rhythm (see table Fig. 103) is derived from the required tramline spacing and the working width of the seed drill. Other tramline rhythms can be found in the control terminal operating manual.

The track width (Fig. 102/a) of the tramline corresponds to that of the cultivating tractor and is adjustable [see section "Adjusting the tramline to the track width/wheelmark width", page 160].

The wheelmark width (Fig. 102/c) of the tramline increases with an increasing number of tramline coulters fitted next to each other.

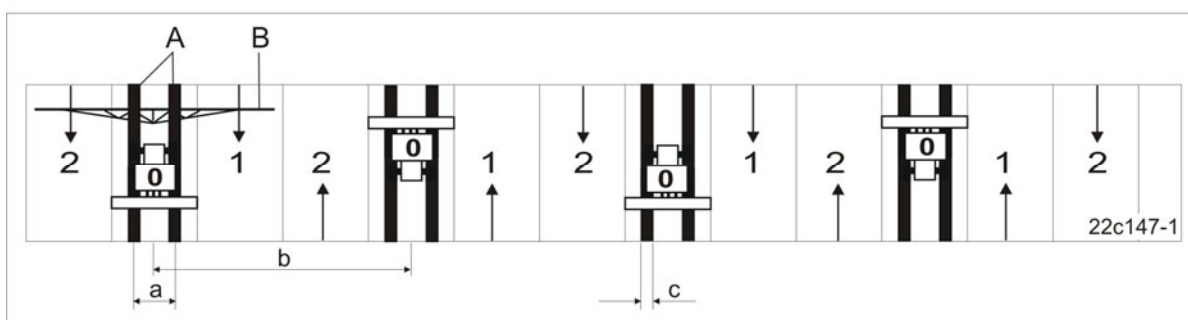


Fig. 102

Tramline rhythm	Seed drill working width	
	12.0 m	15.0 m
	Tramline spacing (working width of the fertiliser spreader and field sprayer)	
1	24 m	30 m
2	48 m	
3	36 m	45 m
24	30 m	
37	18 m	
43	42 m	

Fig. 103

Example for creating tramlines

The creation of tramlines is shown in Figure (Fig. 104) based on an example:

- A = Working width of the seed drill
- B = Tramline spacing
(= working width of fertiliser spreader/field sprayer)
- C = Tramline rhythm
(entry on control terminal)
- D = Tramline counter (the field passes are numbered consecutively during operation and are displayed on the control terminal)

Carry out inputs and displays based on the implement software operating manual.

Example for tramline rhythm no. 3 (C)

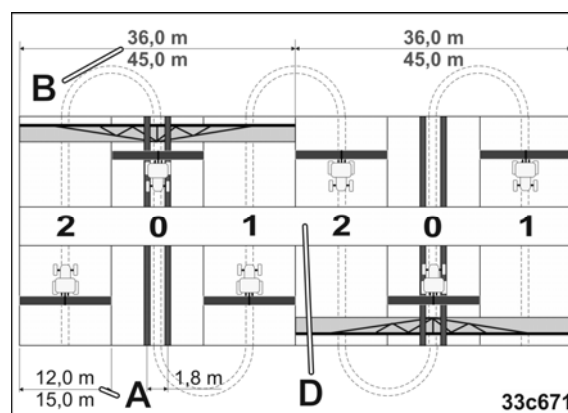


Fig. 104

5.29.1 Tramline rhythm no. 1

Tramline rhythm no. 1 requires the seed drill working with half the working width (part width section) during the first field pass (see section "Implement one-sided switch-off", page 162).

Working width of the seed drill (A)	12 m
Working width of the fertiliser spreader/field sprayer (B)	24 m
Tramline distance	24 m
Tramline counter display (D)	1/0

Working width of the seed drill (A)	15 m
Working width of the fertiliser spreader/field sprayer (B)	30 m
Tramline distance	30 m
Tramline counter display (D)	1/0

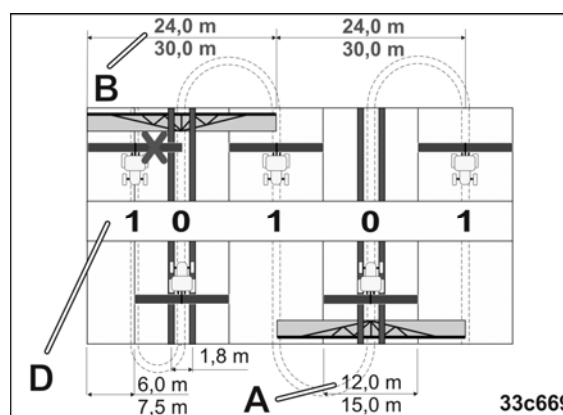


Fig. 105

5.29.2 Tramline rhythm no. 2

Working width of the seed drill (A)	12 m
Working width of the fertiliser spreader/ field sprayer (B)	48 m
Tramline distance	48 m
Tramline counter display (D)	2/0/0/1

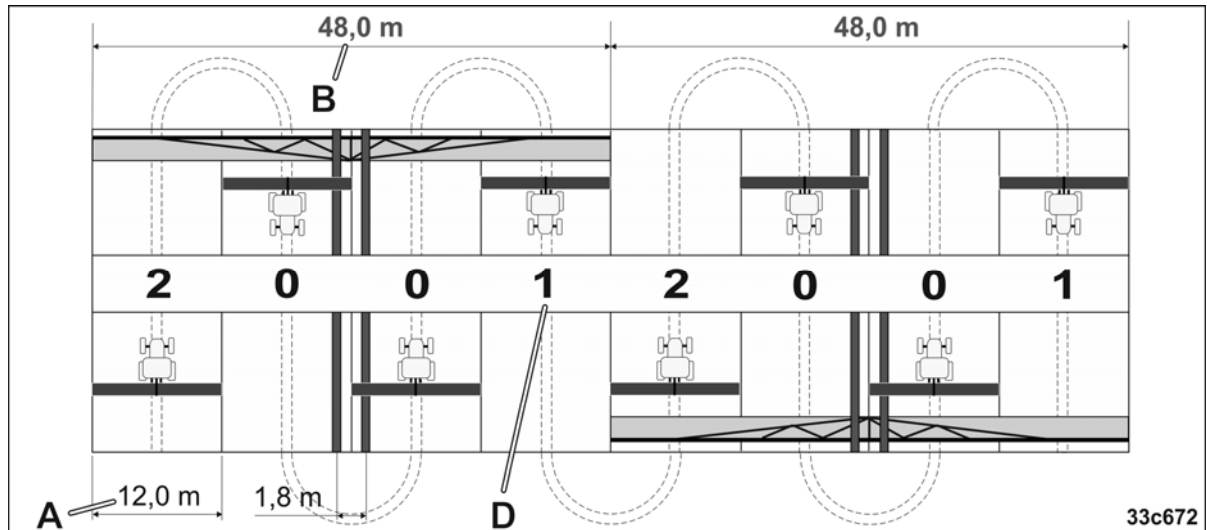


Fig. 106

5.29.3 Tramline rhythm no. 3

Working width of the seed drill (A)	12 m
Working width of the fertiliser spreader/ field sprayer (B)	36 m
Tramline distance	36 m
Tramline counter display (D)	2/0/1

Working width of the seed drill (A)	15 m
Working width of the fertiliser spreader/ field sprayer (B)	45 m
Tramline distance	45 m
Tramline counter display (D)	2/0/1

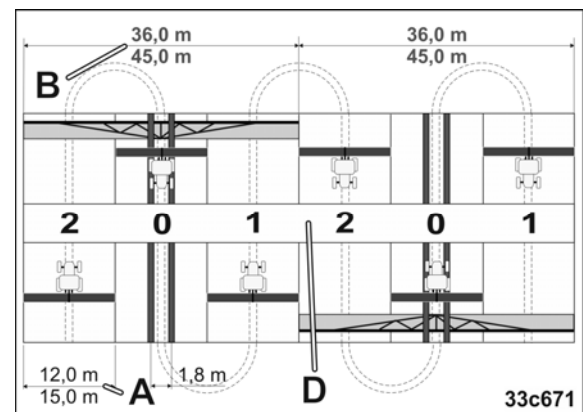


Fig. 107

5.29.4 Tramline rhythm no. 37

Working width of the seed drill (A)	12 m
Working width of the fertiliser spreader/ field sprayer (B)	18 m
Tramline distance	18 m
Tramline counter display, left (D)	1/2/0/0/5/6
Tramline counter display, right (D)	0/2/3/4/5/0

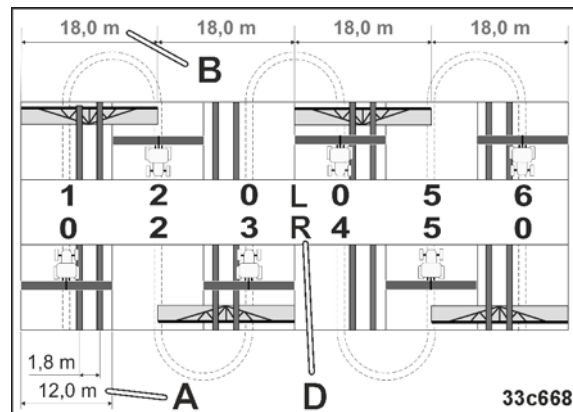


Fig. 108

5.29.5 Tramline rhythm no. 24

Working width of the seed drill (A)	12 m
Working width of the fertiliser spreader/ field sprayer (B)	30 m
Tramline distance	30 m
Tramline counter display, left (D)	1/2/3/0/5/6/0/8/9/10
Tramline counter display, right (D)	1/0/3/4/5/6/7/8/0/10

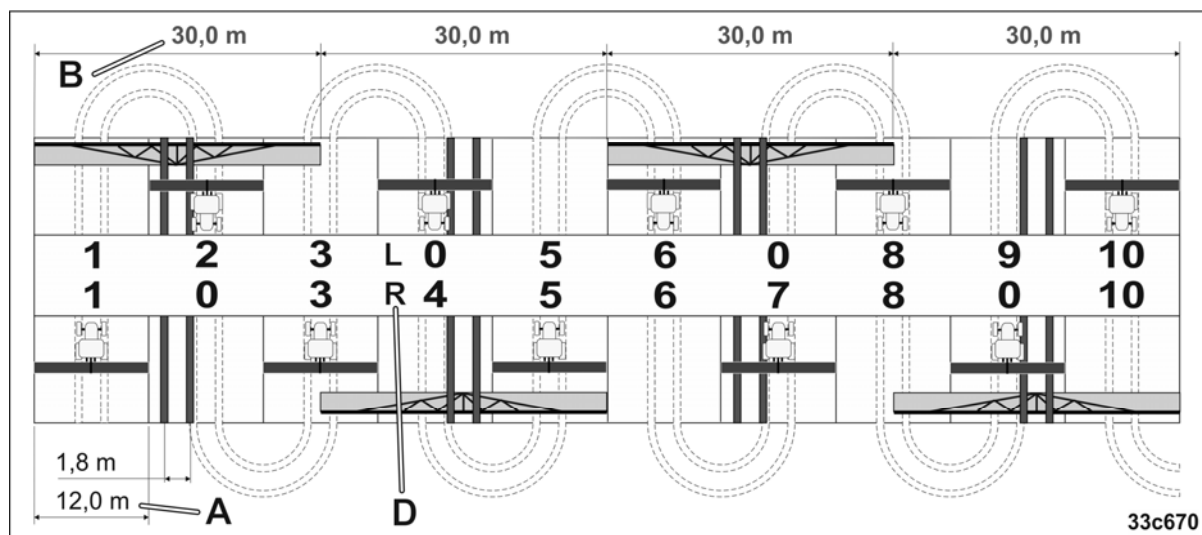


Fig. 109

5.29.6 Tramline rhythm no. 43

Working width of the seed drill (A)	12 m
Working width of the fertiliser spreader/ field sprayer (B)	42 m
Tramline distance	42 m
Tramline counter display, left (D)	1/0/3/4/5/6/7/8/9/10/11/12/0/13
Tramline counter display, right (D)	1/2/3/4/5/0/7/8/0/10/11/12/13/14

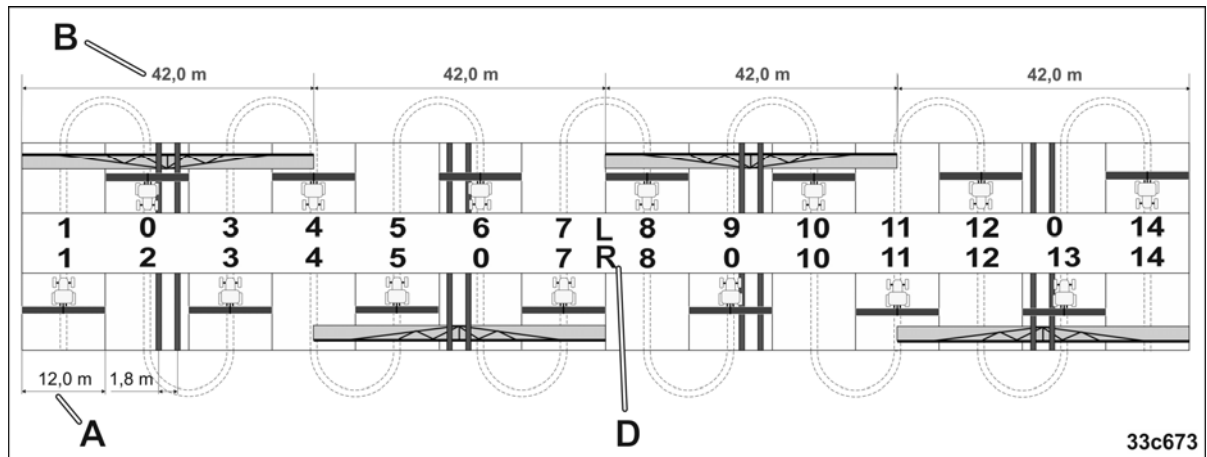


Fig. 110

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.
- Observe section "Safety information for users", starting on page 27, for
 - 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 machine connected.

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

- the permissible total weight
- the permissible axle loads
- the permissible drawbar load at the tractor 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 tare 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 tare weight
- ballast weight and
- total weight of the attached implement or drawbar load of the hitched implement.



This note 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 (hitched implement)

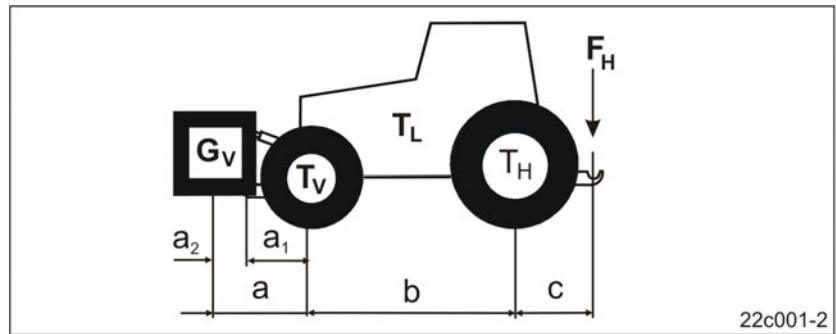


Fig. 111

T_L	KG	Tractor tare 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_V	KG	Front weight (if available)	See front weight in technical data, or weigh
F_H	KG	Drawbar load with full hopper	
F_H	KG	Maximum drawbar load	see section "Road transport data", page 48
a	[m]	Distance between the centre of gravity of the front implement mounting or the front weight and the centre of the front axle (total $a_1 + a_2$)	See technical data of tractor and front implement mounting or front weight or measurement
a_1	[m]	Distance from the centre of the front axle to the centre of the lower link connection	See tractor operating manual or measurement
a_2	[m]	Distance between the centre of the lower link connection point and the centre of gravity of the front-mounted implement or front ballast (centre of gravity distance)	See technical data of front implement mounting or front weight or measurement
b	[m]	Tractor wheel base	See tractor operating manual or vehicle documents or measurement
c	[m]	Distance between the centre of the rear axle and the centre of the lower link connection	See tractor operating manual or vehicle documents or measurement

Initial operation

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

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

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

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

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

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

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

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

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

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

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

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

6.1.1.6 Tyre load capacity

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

6.1.1.7 Table

	Actual value according to calculation	Approved value according to tractor operating manual	Double approved load capacity (two tyres)
Minimum ballast front/rear	/ 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 actually calculated values must be less than or equal to (≤) the permissible values!



WARNING

Risk of contusions, cutting, catching, drawing in and knocks 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 ($G_{V \min}$).



You must use a front weight, which is equal to at least the required minimum front ballast ($G_{V \min}$).

6.1.2 Requirements for tractor operation with towed implements

**WARNING**

Risk of breakage during operation of components through unapproved combinations of connecting equipment!

Ensure:

- that the connection device on the tractor has a sufficient permissible drawbar load for the drawbar load actually in question
- that the axle loads and weights of the tractor altered by the drawbar load are within the approved limits. If necessary, weigh them.
- that the static actual rear axle load of the tractor does not exceed the permissible rear axle load
- that the permissible total weight of the tractor is complied with
- that the approved load capacities of the tractor tyres are not exceeded.

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 hydraulic system is connected.
- if the ignition key is inserted in the tractor and the tractor engine could be started unintentionally while the hydraulic system is connected
- if the tractor and implement have not been prevented from unintentionally rolling off by engaging their respective parking brakes and/or securing tractor and implement with wheel chocks
- if moving parts are not blocked against unintentional movement.

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

1. Park the tractor and the implement on solid, level ground only.
2. Lower the raised, unsecured implement parts.
→ This is how to prevent unintentional lowering.
3. Shut down the tractor engine.
4. Remove the ignition key.
5. Apply the tractor parking brake.
6. Secure the implement with wheel chocks against unintentionally rolling away.

6.3 Installation regulations for the hydraulic fan drive connection

The back pressure of 10 bar must not be exceeded. The installation regulations therefore have to be complied with when connecting the hydraulic fan connection.

- Connect the hydraulic coupling of the pressure line (Fig. 112/5) to a single-acting or double-acting tractor control unit with priority.
- Connect the large hydraulic coupling of the return line (Fig. 112/6) only to an unpressurized tractor connection with direct access to the hydraulic fluid tank (Fig. 112/4). To prevent the back pressure from exceeding 10 bar, do not connect the return line to a tractor control unit.
- 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.

The tractor hydraulic pump output must be at least 80 l/min. at 150 bar.

Fig. 112/...

- (A) On the implement side
(B) On the tractor side
- (1) Hydraulic fan motor
 $N_{max.} = 4000 \text{ rpm}$
 - (2) Filter
 - (3) Single-acting or double-acting control unit
with priority
 - (4) Hydraulic fluid tank
 - (5) Feed line:
pressure line with priority
(marking: 1 cable tie, red)
 - (6) Return flow:
unpressurised line with "large" push-fit
coupling
(marking: 2 cable ties, red)

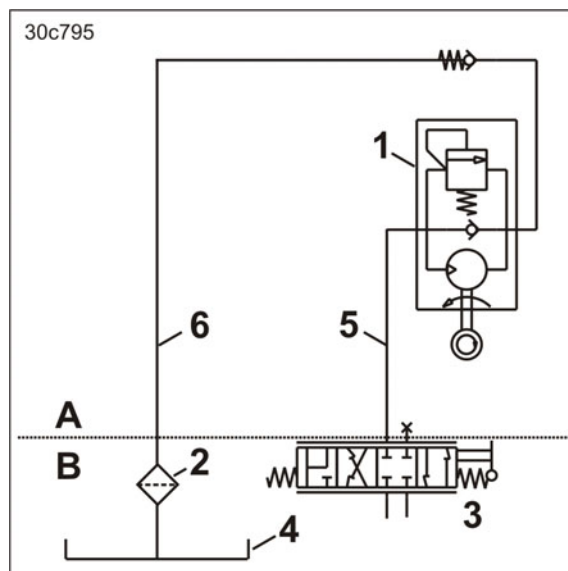


Fig. 112



The hydraulic fluid must not overheat.

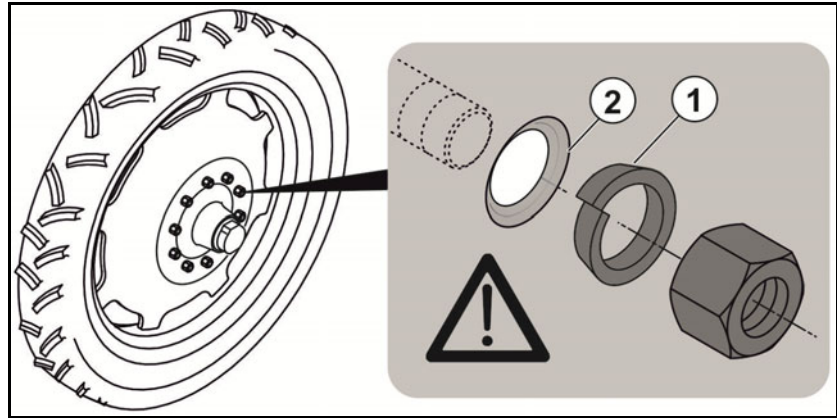
High oil flow rates in conjunction with small oil tanks encourage rapid heating-up of the hydraulic fluid. The capacity of the tractor's oil tank (Fig. 112/4) should be at least twice the oil flow rate. If the hydraulic fluid heats up excessively, the installation of an oil cooler is required at a specialist workshop.

6.4 Installing the wheels



To assemble the wheels, use:

- (1) conical rings in front of the wheel nuts.
- (2) only rims with a fitting countersink for the conical ring.



If the implement is equipped with emergency wheels, the running wheels must be installed before initial operation.

→ Workshop work



WARNING

The rims for the tyres must have a rim disc that has been fully welded all the way around!

1. Lift the implement slightly using a lifting crane.

**DANGER**

Use the marked attachment points for the slings.

For more information, see also section 3 (page 35).

2. Loosen the wheel nuts of the emergency wheels.
3. Remove the emergency wheels.

**CAUTION**

Be careful when removing the emergency wheels and putting on the running wheels!



Required tightening torque for wheel nuts: 510 Nm.

4. Put the running wheels onto the stud bolts.
5. Tighten the wheel nuts.
6. Lower the implement and remove the slings.
7. Retighten the wheel nuts after 10 operating hours.

7 Coupling and uncoupling the implement



When coupling and uncoupling the implement, observe section "Safety information for users", page 27.



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, see section 6.2, page 97.



WARNING

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

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

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

7.1 Replacing the lower link pins

1. Unscrew the nut (Fig. 113/2) and remove it.
2. Remove the guard plate (Fig. 113/1).
3. Remove the lower link pin (Fig. 113/3).
4. Replace the lower link pin with a lower link pin of the desired category.
5. Install the guard plate.
6. Put on the nut and tighten at 450 Nm.
7. Repeat the procedure for the second lower link pin.
8. Retighten the nuts after 10 operating hours.

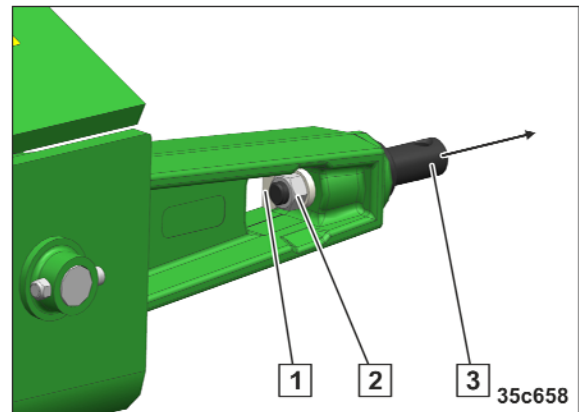


Fig. 113

7.2 Coupling 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 or mount it on tractors that are suitable for the purpose. For more information, see section "Checking the suitability of the tractor", page 91.

**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.

**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**

If the tractor has been separated from the implement, always

- **secure the implement with the service parking brake and also with 2 wheel chocks.**
- **secure the implement with 2 wheel chocks if it has no brake system!**

**DANGER**

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

**CAUTION**

Only establish the implement connections once the tractor and implement have been coupled, the tractor engine is shut down, the tractor parking brake is applied and the ignition key is removed!

Do not connect the supply line (red) of the service brake to the tractor until the tractor engine is shut down, the tractor parking brake is applied and the ignition key is removed!



The implements can be coupled or uncoupled when folded or unfolded.

**WARNING**

Do not remove the wheel chocks until the implement is connected to the tractor's lower links and the tractor parking brake is applied.

**CAUTION**

Danger of getting crushed in the area of the moving tensioned crosspiece.

1. Verify that the implement is secured with wheel chocks (Fig. 114/1).

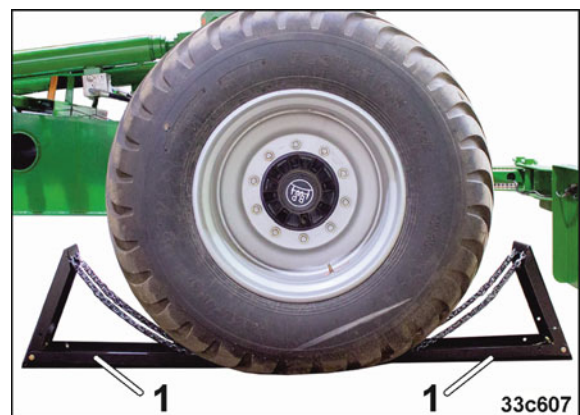


Fig. 114

Coupling and uncoupling the implement

2. Attach one ball sleeve (Fig. 115/1) with a collecting tray over each of the lower links pins of the drawbar and lock with a linch pin.

The ball sleeves depend on the tractor type (see tractor operating manual).



Fig. 115

3. Open the tractor lower link securing device, i.e. it must be ready for coupling.
4. Align the lower link hooks so that they are flush with the linking points of the implement.
5. Instruct people to leave the danger area between the tractor and the implement before you approach the implement.
6. Drive the tractor in reverse up to the implement so that the lower link hooks of the tractor automatically pick up the ball of the implement.

→ The lower link hooks lock automatically.

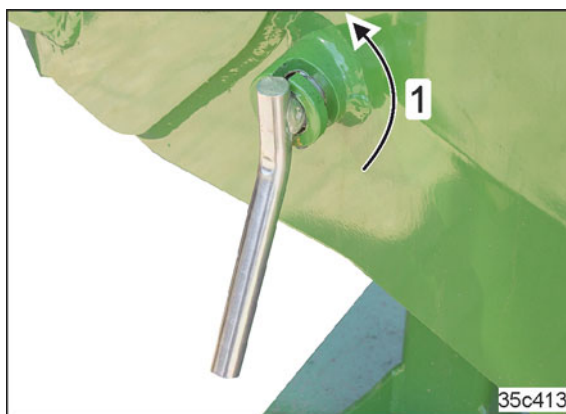


Fig. 116

7. Check whether the securing device of the tractor's lower link locking system is closed and secured (see tractor's operating manual).
8. Lift the tractor's lower link until the jack (Fig. 118/1) is free of the ground.
9. Secure the tractor against unintentional starting and unintentional rolling away.
10. Check whether the PTO shaft of the tractor is switched off.
11. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
12. Connect the supply lines to the tractor (see section 7.3 to 7.6, starting on page 106).



Fig. 117

13. Unlock the pin.
 - 13.1 Turn the locked pin (Fig. 116/1) by 180° until the clamping sleeve (see Fig. 117/1) is released.
14. Hold onto the cable pull (Fig. 118/1) and pull out the pin (Fig. 117/2).
15. Pull up the jack using the cable pull and peg the position with the pin.



Fig. 118

16. Lock the pin by turning (see Fig. 116).
17. Check the function of the braking and lighting system.
18. Stow the wheel chocks (Fig. 120/1) in the brackets and secure with a wing nut (Fig. 120/2).
19. Before commencing a run, perform a braking test.

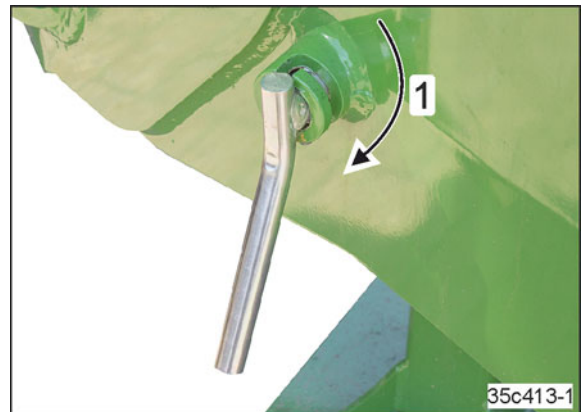


Fig. 119

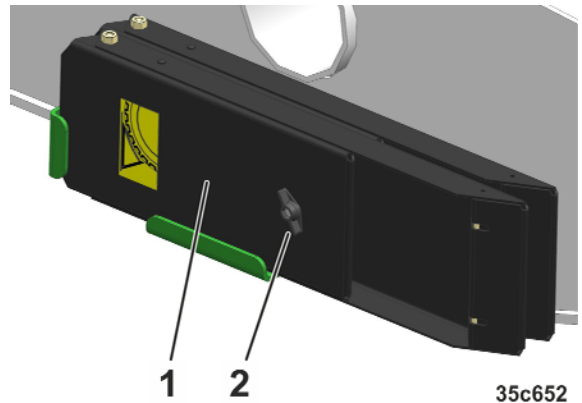


Fig. 120

7.3 Connecting the hydraulic connections



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.

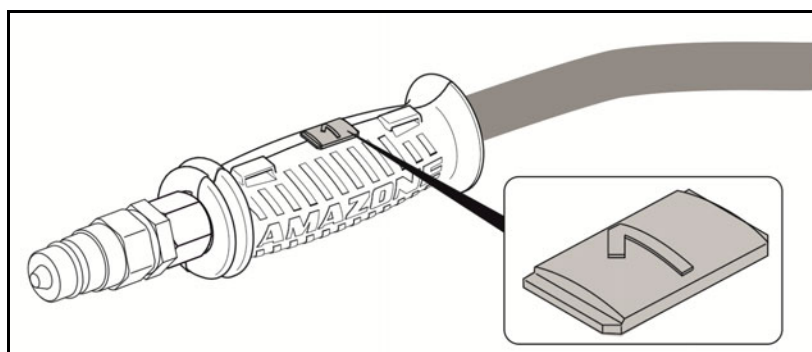
If you are injured by hydraulic fluid, contact a doctor immediately.



Clean the hydraulic couplings before connecting them to the tractor. Minor oil contamination with particles can cause a failure of the hydraulic system.

Identification of the hydraulic lines on the implement side

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



Films are stuck on the implement for the markings that illustrate the respective hydraulic function.

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

Latched, for a permanent oil circulation	
Tentative, activate until the action is executed	
Float position, free oil flow in the control unit	

Identification		Function			Tractor control unit	
yellow			Rear frame / Star wheel / Tractor wheel mark eradicator	Move into working position	Double acting	
				Move into transport position		
Green			Boom	Move into working position	Double acting	
				Move into transport position		
blue			coulter pressure	Increase	Double acting	
				Reduce		
red			Hydraulic motor fan	switch on	Simple	
				Return flow: unpressurised line ²⁾		
beige			Filling auger	switch on		

¹⁾ Pressure line with priority

²⁾ Unpressurised line (see section "Installation regulations for the hydraulic fan drive connection", page 98)

7.3.1 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.



Check the route of the supply lines.

The supply lines

- Must easily give way to all movements in bends without tensioning, kinking or rubbing.
- Must not chafe against other parts.



- During operation, the *yellow* tractor control unit is actuated more frequently than all of the other control units. Assign the connections of the *yellow* control unit to an easily accessible control unit in the tractor cabin.
- Tractors with constant pressure hydraulic systems are designed only conditionally for the operation of hydraulic motors. Observe of the recommendations of the tractor manufacturer.

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).

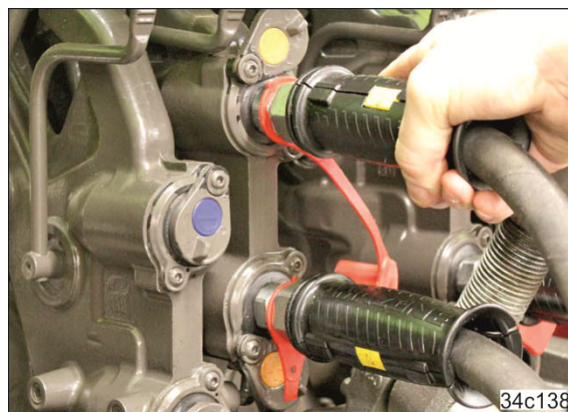


Fig. 121

7.3.2 On-board hydraulic system

1. Couple the additional hydraulic hose lines with the PTO shaft hydraulic pump (Fig. 123/1).

When equipped with an on-board hydraulic system, the function of the *green* and *red* tractor control unit is transferred to an implement control unit.

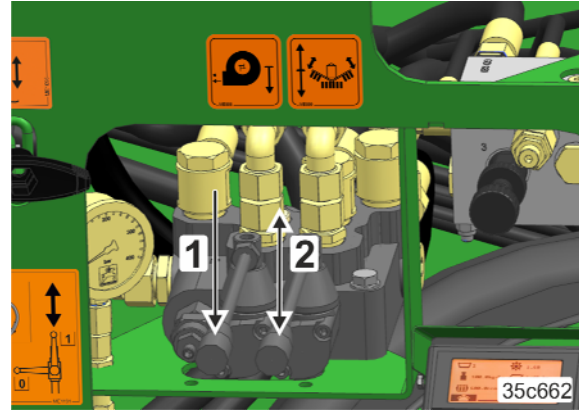


Fig. 122

Identification	Function (see Fig. 122)			Control unit	
2		Boom	Move into transport position	Double acting	
3			Move into working position		
1		Blower fan hydraulic motor	switch on	Single	

7.3.3 Uncoupling the hydraulic hose lines

1. Swivel the actuation lever on the control unit 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.

Depending on the implement equipment:

- Hose cabinet (Fig. 123/1)
- Hose cabinet (Fig. 124/1)

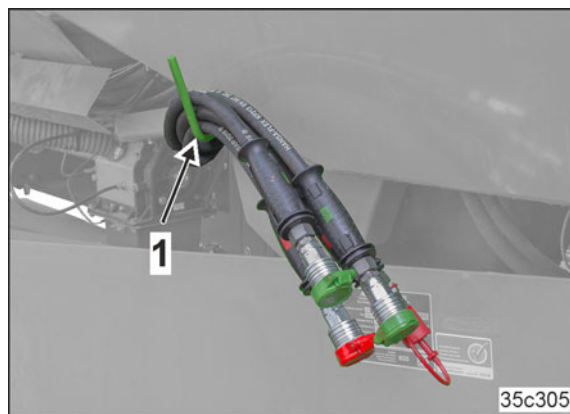


Fig. 123

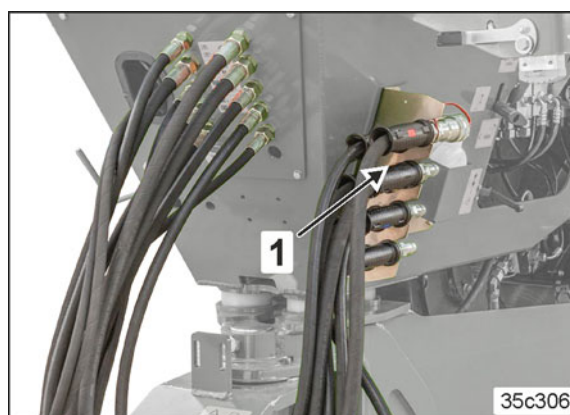


Fig. 124

7.4 Making further connections

Interface	Assembly group	Function	Instructions
Tractor	Plug (7-pin) (Fig. 25/8)	Road traffic lighting system (optional)	
Tractor	Plug (2-pin)	Work lights (optional)	
Terminal	Implement plug (Fig. 25/7)	Control terminal data cable (optional)	Connect the plug as described in the control terminal operating manual.

7.5 Connecting the dual-circuit pneumatic braking system



DANGER

Before uncoupling the implement from the tractor, secure it with wheel chocks and apply the implement's parking brake.

Only remove the wheel chocks once the implement has been coupled up to the tractor. Then release the implement's parking brake.



WARNING

If the implement, when uncoupled from the tractor, has full compressed air tanks, the compressed air from the air tanks acts on the implement brakes and the wheels are blocked.

The compressed air in the compressed air tank and hence the braking force will drop continuously until there is a complete brake failure, if the compressed air tank is not refilled. This is why the implement may only be parked using wheel chocks and with the implement's parking brake applied.

The implement brakes are released immediately with a full compressed air tank when the supply line (red) is connected to the tractor. For this reason, the implement must be connected to the lower links of the tractor and the parking brake of the implement and tractor must be applied before the supply line (red) is connected. Only then can the wheel chocks be removed.



Compliance with the maintenance intervals is essential for the correct function of the brake system.

Interface	Implement-side identification of the brake lines	Tractor connection	Function
Tractor	yellow	Brake line	Dual-circuit pneumatic braking system
	red	Supply line	

The dual-circuit pneumatic service brake system has:

- one supply line (125/1) with coupling head (red)
- one brake line with coupling head (yellow)

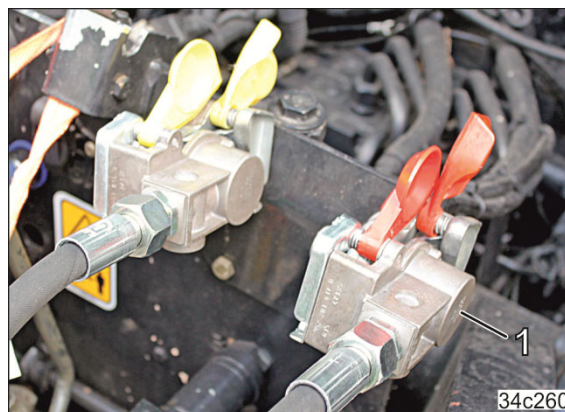


Fig. 125

Once the implement has been properly coupled, the implement service braking system responds when the tractor brake pedal and the tractor parking brake are applied.

If the implement is uncoupled with a full compressed air tank, the service brake system (emergency brake) automatically controls the implement.

The air slowly but continuously escapes from the compressed air tank. This causes the braking force to drop, leading to complete brake failure unless the compressed air tank is refilled. This is why the implement may be parked only with the implement's parking brake applied and using 2 wheel chocks. Only release the parking brake again after the implement has been coupled to the tractor.

If the implement is uncoupled with an empty compressed air tank, the implement has no braking effect if the supply line (red) is released.

If the implement is coupled up with a full compressed air tank, the emergency brake is released as soon as the supply line (red) is connected. The brake is not released if the implement's parking brake is applied.

To make sure that the implement is braked after uncoupling, apply the implement's parking brake beforehand. Only release the parking brake once the implement has been coupled up to the tractor.

7.5.1 Coupling the brake and supply lines

**WARNING**

Risk of contusions, cuts, dragging, catching or knocks from incorrectly functioning brake system.

- When coupling the brake and supply line, ensure that:
 - the sealing rings of the coupling heads are clean.
 - the sealing rings of the coupling heads form a proper seal.
- Always replace damaged seals immediately.
- Only move off with the implement connected when the pressure gauge on the tractor shows 5.0 bar!

**WARNING**

Risk of crushing, cutting, being caught or drawn in, or impact through the accidentally rolling implement, if the service brake is released.

Always first connect the hose coupling of the brake line (yellow), followed by the coupling head of the supply line (red).

The operating brake of the implement moves out of the brake position immediately the red coupling head has been coupled.

**DANGER**

Check the routing of the brake line. The brake line must not chafe on other parts.



On the tractor, couple

- the yellow coupling head first (brake line).
- and then the red coupling head (supply line).

1. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
 2. Open the cover of the coupling heads on the tractor.
 3. Check the sealing rings on the coupling head for damage and cleanliness.
 4. Clean the dirty sealing rings and replace any damaged sealing rings.
 5. Properly fasten the coupling head of the brake line (yellow) in the coupling marked in yellow on the tractor.
-
6. Remove the coupling head of the supply line (red) from the empty coupling.
 7. Check the sealing rings on the coupling head for damage and cleanliness.
 8. Clean the dirty sealing rings and replace any damaged sealing rings.
 9. Properly fasten the coupling head of the supply line (red) (Fig. 126/1) in the coupling marked red on the tractor.
- The black button is pushed out when the supply line (red) is coupled.
- If the tractor parking brake is:
- o engaged, the service brake of the implement is also engaged.
 - o released, the service brake of the implement is also released.

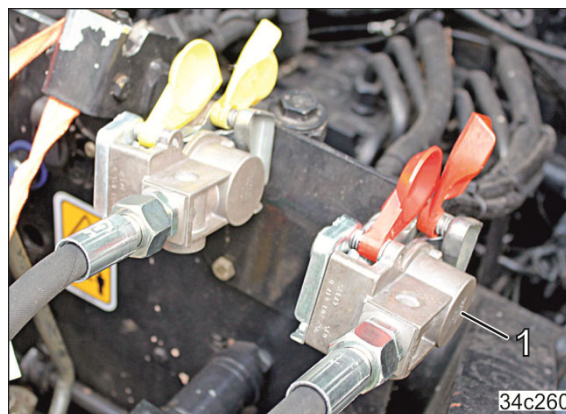


Fig. 126

7.5.2 Uncoupling the supply and brake line



WARNING

Risk of crushing, cutting, being caught or drawn in, or impact through the accidentally rolling implement, if the service brake is released.

Uncouple the couling head of the supply line (red) first, followed by the couling head of the brake line (yellow).

Always keep to this order, as otherwise the operating brake system will trip and may set the unbraked implement moving.

When the supply line (red) is uncoupled from the tractor, the service brake of the implement moves to braking position if the pressure tank is full. If the pressure tank is empty, the implement is unbraked when the supply line (red) is disconnected.

Apply the parking brake of the implement before uncoupling the implement from the tractor and do not release it until after the implement has been coupled to the tractor.



DANGER

First secure the implement with the wheel chocks (Fig. 127) before you uncouple the implement from the tractor!

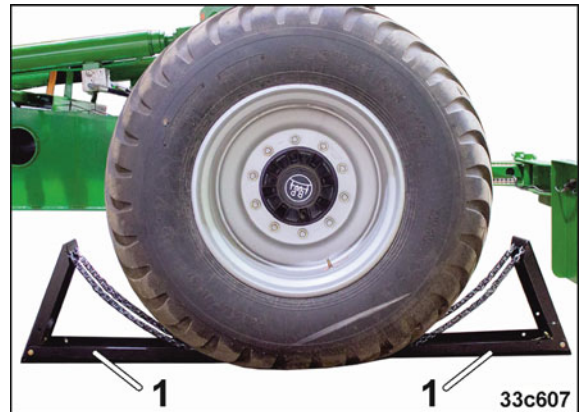


Fig. 127

Fig. 128/...

- (1) Wheel chock
(parking position on the main frame in front of the running gear tyres)

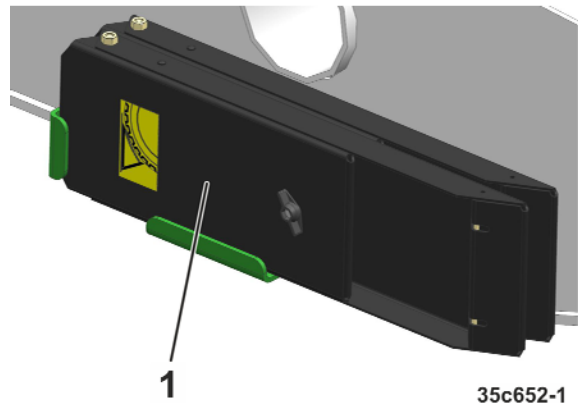


Fig. 128

Coupling and uncoupling the implement

1. Secure the implement against unintentionally rolling away. To do so, use the tractor parking brake and the wheel chocks.
2. Apply the implement's parking brake (Fig. 129/1).

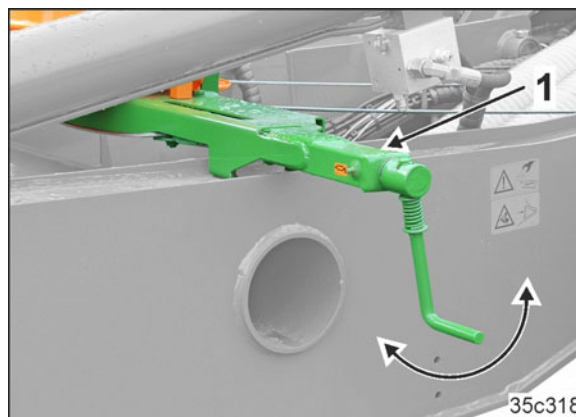


Fig. 129

3. Release the coupling head (Fig. 130) of the supply line (red).
4. Release the coupling head of the brake line (yellow).
5. Fasten the coupling heads in the empty couplings.
6. Close the covers of the coupling heads on the tractor.



Fig. 130

7.5.3 Control elements of the dual-circuit pneumatic braking system



DANGER

Never release the parking brake of the uncoupled implement on sloping ground.

If the implement is uncoupled from the tractor, the implement is braked

- via the parking brake.
- with the service brake (emergency brake), if the compressed air tank is filled.
The service brake can be released, e.g., for manoeuvring in a workshop.

Releasing the service brake:

Press the button (Fig. 131/1).

Engaging the service brake:

Pull out the button (Fig. 131/1).



The braking affect when actuating the button (Fig. 131/1) can only be achieved when the compressed air tank is filled. If the compressed air tank is empty, the implement is not braked.

With a full compressed air tank, the brakes are released immediately when the supply line (red) is connected to the tractor. The button (Fig. 131/1) can then no longer be moved.

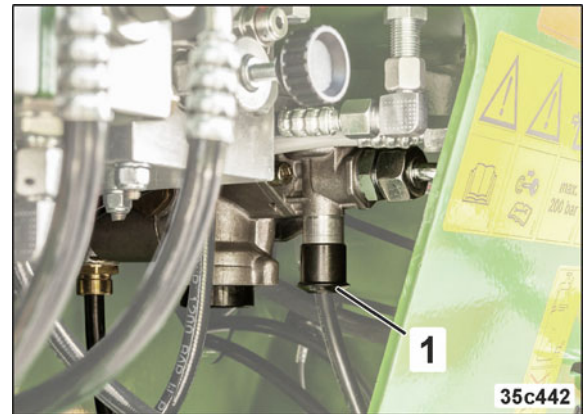


Fig. 131

7.6 Connecting the hydraulic service brake system



WARNING

If the hydraulic socket is decoupled from the tractor, the service brake system of the implement has no braking effect.

Before uncoupling the implement from the tractor, secure it with 2 wheel chocks and apply the implements parking brake.

After decoupling the implement, first fill the hydraulic accumulator. Then remove the wheel chocks and release the implement parking brake.



Compliance with the maintenance intervals is essential for the correct function of the brake system.

On the tractor side, a hydraulic brake system is required that controls the hydraulic brake system of the implement (not allowed in Germany and a few other EU countries).

Connect the hydraulic brake connection (Fig. 132) to the hydraulic tractor brake connection.



29c734

Fig. 132

7.6.1 Coupling the hydraulic service brake system



Only couple clean hydraulic connectors.



DANGER

Check the routing of the brake line. The brake line must not chafe on other parts.



The braking effect of the implement service brake system is not immediately available after coupling the hydraulic socket to the tractor.

After the implement has been coupled up and the hydraulic socket has been connected, actuate the tractor brake pedal for at least 10 seconds with the engine running. This fills the hydraulic accumulator.

When the hydraulic accumulator is full, the implement's service brake system responds when the tractor brake pedal or the tractor parking brake is applied.

The hydraulic service brake system is equipped with a hydraulic socket for coupling to the tractor.

1. Check if the implement is secured with two wheel chocks and the implement parking brake is applied.
2. Couple the implement to the tractor.
3. Apply the tractor parking brake, switch off the tractor engine, and remove the ignition key.
4. Clean the hydraulic socket (Fig. 133) and the tractor-side hydraulic plug.
5. Couple the hydraulic socket to the tractor.
6. Connect the break-away valve to the tractor via the cable (Fig. 134/1).

If the implement is separated from the tractor due to an accident, the implement will be braked.



Fig. 133

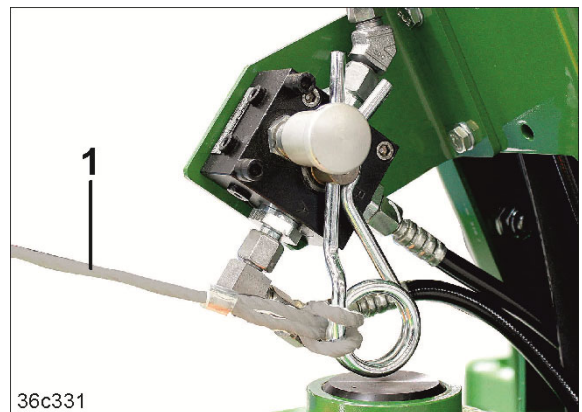


Fig. 134

7. The position of the break-away valve provides information about the position of the brake shoes.

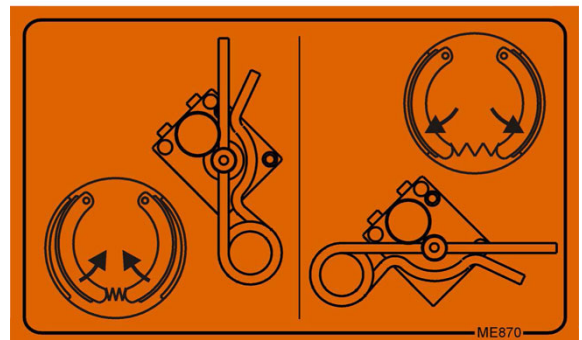


Fig. 135

Coupling and uncoupling the implement

8. Fill the hydraulic accumulator (Fig. 136) before moving off.
 - 8.1 Release the tractor parking brake.
 - 8.2 Press the brake pedal of the tractor for at least 10 seconds with the engine running.

This fills the hydraulic accumulator.



To ensure the full effectiveness of the service brake system, fill the hydraulic accumulator before moving off.



Fig. 136

9. Apply the tractor parking brake, switch off the tractor engine, and remove the ignition key.
10. Remove wheel chocks.
11. Release the implement parking brake.

7.6.2 Uncoupling the hydraulic service brake system



WARNING

If the hydraulic socket is decoupled from the tractor, the service brake system of the implement has no braking effect.

Before uncoupling the implement from the tractor, secure it with 2 wheel chocks and apply the implements parking brake.

1. Secure the implement with wheel chocks.
2. Apply the implement's parking brake.
3. Empty the hydraulic accumulator.
 - 3.1 Actuate the valve (Fig. 137/1). This empties the hydraulic accumulator.
4. Uncouple the hydraulic socket.

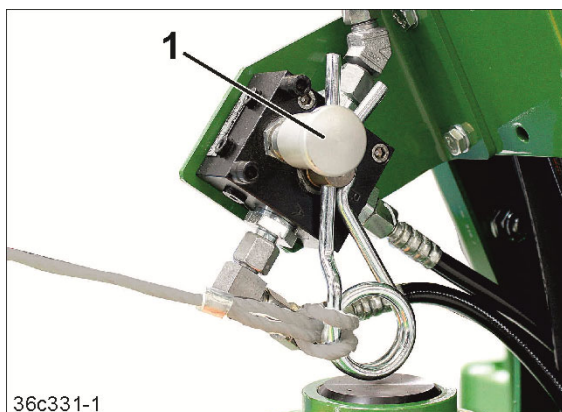


Fig. 137



The hydraulic socket cannot be coupled to the tractor again unless the hydraulic accumulator is empty.

5. Push the hydraulic socket onto the protective cap (Fig. 138/1). The protective cap is secured to the hose cabinet and protects the socket against soiling in the parking position.

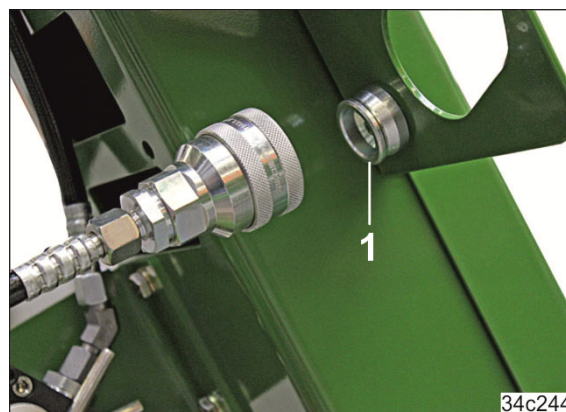


Fig. 138

7.7 Uncoupling the implement



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 horizontal parking area with a firm base.



CAUTION

Danger of getting crushed in the area of the moving tensioned crosspiece.



When uncoupling the implement, there must always be enough free space in front of the implement that the tractor can be aligned with the implement again during recoupling.

1. Align the tractor and implement so that they are straight on a horizontal parking surface with a firm substrate.
2. Fold the implement completely in or out.
3. Switch off the control terminal.
4. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.

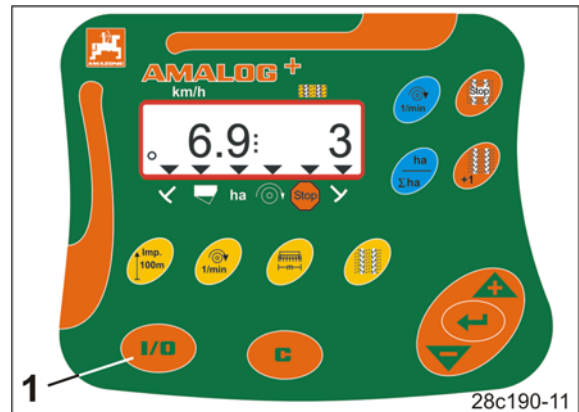


Fig. 139

5. Unlock the pin.
 - 5.1 Turn the locked pin (Fig. 140/1) by 180° until the clamping sleeve (see Fig. 142/1) is released.

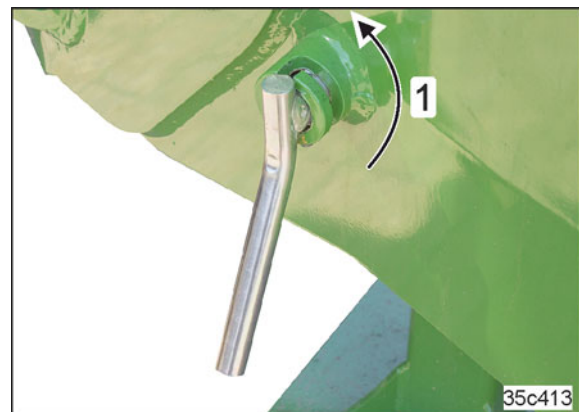


Fig. 140

Coupling and uncoupling the implement

6. Hold onto the cable pull (Fig. 141/1) and pull out the pin (Fig. 142/2).



Fig. 141

7. Lower the jack using the cable pull and secure with the pin
8. Lock the pin by turning (see Fig. 140)



Fig. 142

9. Remove the wheel chocks from the transport bracket(s)

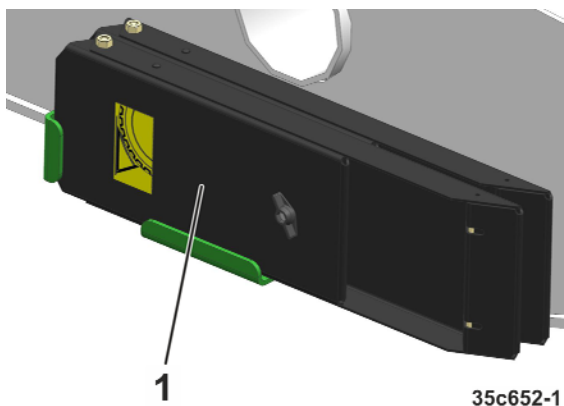


Fig. 143

10. Secure the implement wheels with two wheel chocks (Fig. 144/1)
11. Uncouple the supply line and the brake line from the tractor (see section "Uncoupling the supply and brake line", page 115)

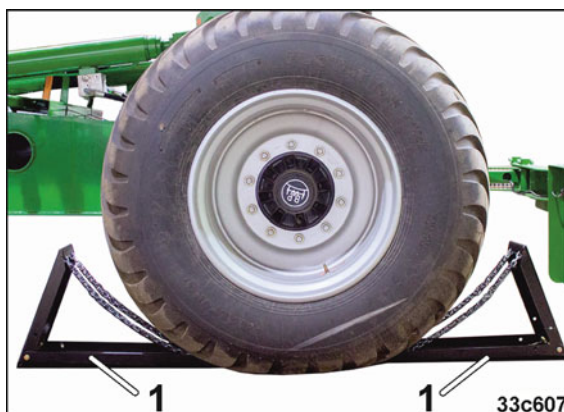


Fig. 144



When uncoupling the pneumatic brake lines first of all disconnect the red coupling head (supply line) and then the yellow coupling head (brake line) from the tractor!

12. Uncouple all supply lines from the tractor
13. Place the supply lines in the hose cabinet
14. Put the PTO shaft hydraulic pump into parking position (Fig. 145/1)

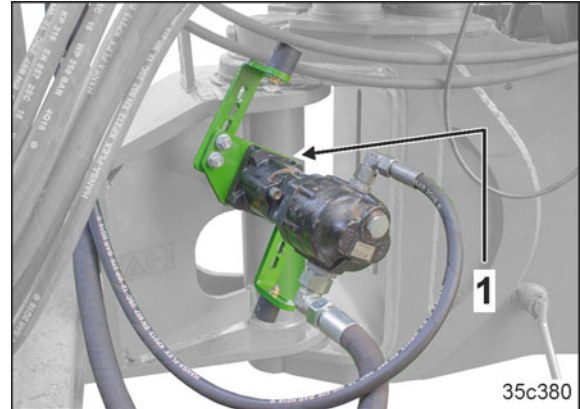


Fig. 145

15. Set the implement down on the jack.
16. Apply the parking brake

WARNING



Set the implement down on a horizontal, firm base only!

Ensure that the jack does not sink into the ground. If the jack sinks into the ground, it will be impossible to couple the implement again!

17. Open the securing device of the tractor's lower link (see tractor operating manual).
18. Uncouple the tractor's lower link.
19. Pull the tractor forwards.

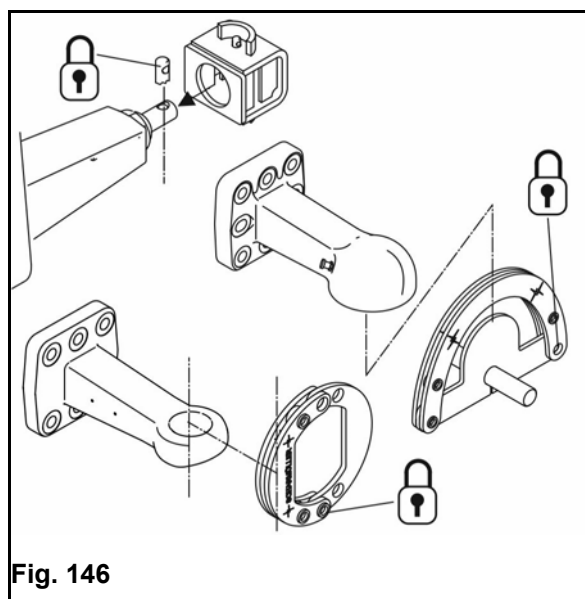


DANGER

While pulling the tractor forwards no personnel are allowed to be between the tractor and the implement!

7.8 Protect. device against unauthorised use

Lockable device for the drawbar eye, ball bracket, or lower link crosspiece, prevents unauthorised use of the machine.



8 Settings



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 make any adjustments to the implement, see section 6.2, page 97.



DANGER

Before adjustment tasks (unless otherwise specified):

- Unfold the implement sections (see section 10.1, page 173)
- Switch off the tractor's PTO shaft.
- Wait until the tractor's PTO shaft stops moving.
- Apply the tractor's parking brake
- Switch off the tractor's engine
- Remove the ignition key.

8.1 Repositioning the fill level sensor



Reposition the fill level sensor only when the hopper is empty. When the hopper is full, the seed or fertiliser runs out through the sensor holder as soon as the sensor is removed!

1. Disengage the tractor PTO shaft, apply the tractor parking brake, switch off the tractor engine, and remove the ignition key.
2. Release the nut (Fig. 147/1).
3. Detach the fill level sensor (Fig. 147/2) and insert it in the intended holder.

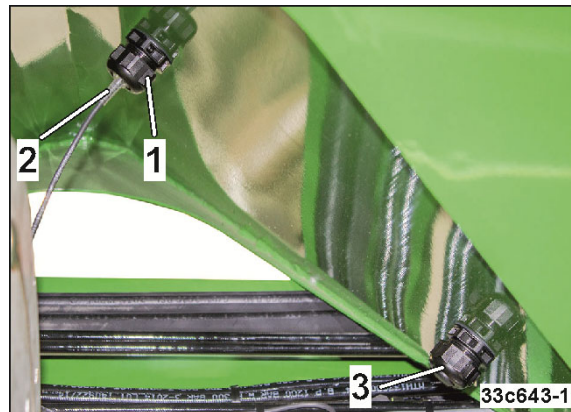


Fig. 147

4. Insert the fill level sensor into the holder until the cable output fits flush in the holder (Fig. 148/1).

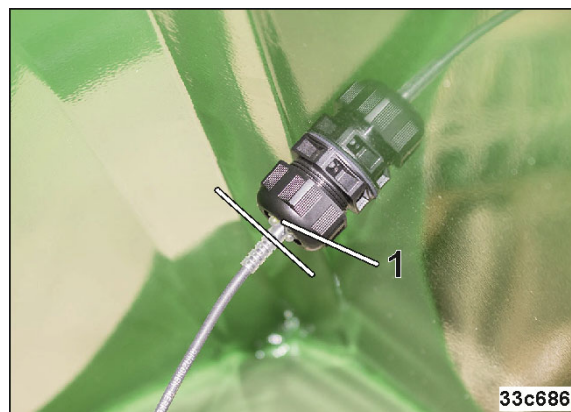


Fig. 148

→ This ensures that the sensor head (Fig. 149/2) protrudes into the seed or fertiliser.

5. Tighten up the nut (Fig. 147/1).



The close the opening, insert the dummy (Fig. 147/3) into the holder and clamp it firmly.



Fig. 149

8.2 Installing/removing the metering roller



The metering roller can be replaced more easily if the hopper is empty.

1. Disengage the tractor PTO shaft, apply the tractor parking brake, switch off the tractor engine, and remove the ignition key.
2. Close the opening to the hopper (only necessary when the hopper is full).
 - 2.1 Remove the spanner (Fig. 150/1) from the holder.
 - 2.2 Release two nuts (Fig. 151/1) but do not remove.

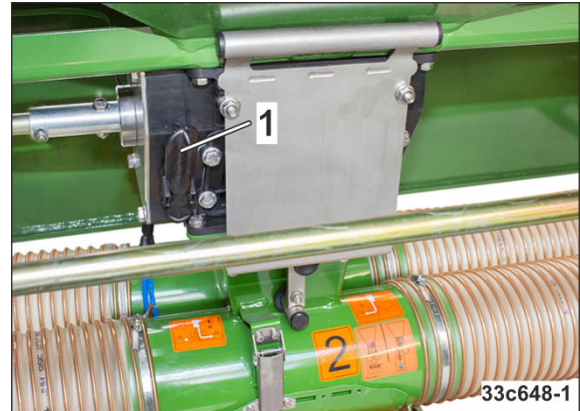


Fig. 150



Fig. 151

3. Swivel the bolts (Fig. 152/1).
4. Push the shutter (Fig. 152/2) into the dosing unit up to the stop.

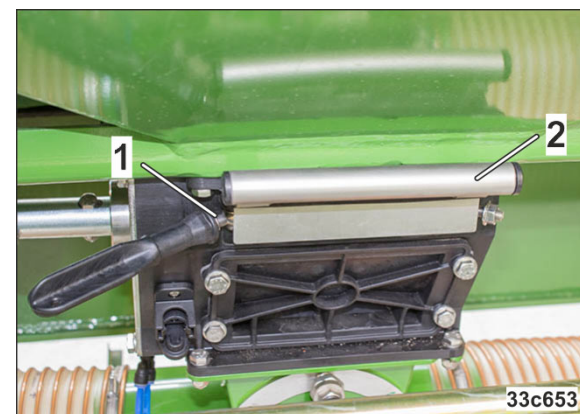


Fig. 152

Settings

5. Loosen the two bolts.
 - 5.1 Remove the spanner (Fig. 150/1) from the holder.
 - 5.2 Loosen the nuts (Fig. 153/1) but do not remove.



Fig. 153

6. Remove the bearing cover (Fig. 154/1).
 - 6.1 Turn the bearing cover (Fig. 154/2).
 - 6.2 Pull off the bearing cover (Fig. 154/2).



Fig. 154

7. Pull the metering roller out of the metering unit.



Install the metering roller in the reverse sequence.

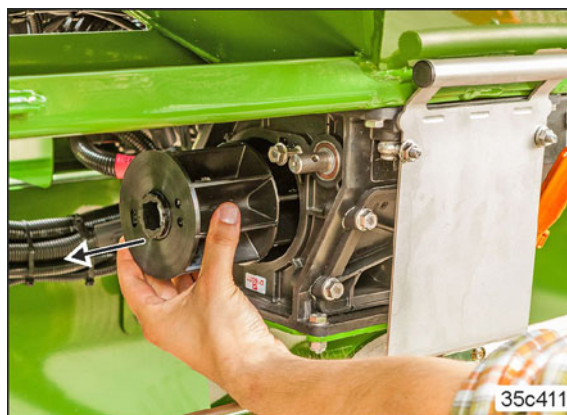


Fig. 155



Set the shutter to the parking position and secure with two bolts (see Fig. 151).

8.3 Calibrating the spread rate



The spread rate for seed and fertiliser depends on the working speed and the selected metering roller (see Metering Rollers Table, page 71). The spread rate is limited!

8.3.1 Preparing the implement

Regardless of the implement equipment, preparations must be made for calibration:

1. Unfold the implement into the working position (see section "Unfolding/folding the implement booms", page 173).
2. Disengage the tractor PTO shaft, apply the tractor parking brake, switch off the tractor engine, and remove the ignition key.
3. Fill the seed and fertiliser hopper (see section "Filling the hopper", page 184). The minimum filling quantity for the calibration test is 1/4 hopper content (correspondingly less for fine seed).
4. Put a calibration trough (Fig. 156/1) in the bracket under each metering unit.
5. Release the tensioning hooks and open the folding of the left conveyor section (Fig. 156/2).
6. Depending on the implement equipment, follow section 8.3.2 (see page 130) or section 8.3.3 (see page 135).

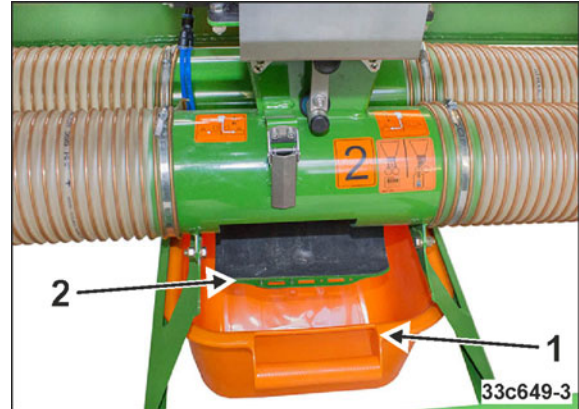


Fig. 156

8.3.2 Mechanical drive



Select the main setting and working range between 20 and 80.

Gearbox setting values for the first calibration test for spreading seed.

Metering roller	Gearbox position
7.5 cm ³	15
20 cm ³	
40 cm ³	
120 cm ³	50
210 cm ³	
350 cm ³	
600 cm ³	50
660 cm ³	
880 cm ³	

Fig. 157

8.3.2.1 Pre-selection of the metering roller

Based on the calculation formula, a metering roller can be pre-selected according to section 8.3.2.2 for the first calibration test.

$$D_{V...} = \frac{AB_D}{i_{...}} \cdot \frac{A_M}{G_L} \cdot \left[\frac{\frac{m \cdot \frac{kg}{ha} \cdot \frac{kg}{ha} \cdot 10000 cm^3}{1 \cdot \frac{kg}{m} \cdot 10000 m^2 \cdot \lambda}}{\frac{1}{m} \cdot \frac{kg}{\lambda} \cdot 10000 m^2 \cdot \lambda} \right] = \frac{AB_D}{i_{...}} \cdot \frac{A_M}{G_L} \cdot 0,1 cm^3$$

33c675

D_V Metering volume [cm³]

AB_D Working width per metering unit [m]

A_M Required spread rate [kg/ha]

i_{...} Gearbox position

G_L Litre weight [kg/L]

Conversion factors:

Gearbox position 20

[i₂₀] 0.088 rpm

Gearbox position 80

[i₈₀] 0.351 rpm

	Conversion Grains/m ² to kg/ha	$A_M [\text{kg/ha}] = \frac{G [\text{G/m}^2] \times \text{TGW} [\text{g/1000G}]}{\text{Germination capacity} [\%]}$
---	--	---

K Grains [G/m²]
 A_M Required spread rate [kg/ha]
 TGW Thousand grain weight [g/1000G]
 K_F Germination capacity [%]

8.3.2.2 Example for the calculation of metering volumes for wheat

175 kg/ha of wheat with a litre weight of 0.85 kg/l are to be metered with a Citan 12001-C.

Specification:

Litre weight [G_L] = 0.85 kg/L
 Working width per metering unit [A_B] = 6 m
 Required spread rate [A_M] = 175 kg/ha



The implement-specific conversion factors i_{80} and i_{20} serve to convert a distance into a rotation.

Which metering volume [D_V] is required?

- Determination of the smallest metering volume:
 - Gearbox position 80 : [i₈₀] = 0.351 rpm
 - $D_{V80} = 352 \text{ cm}^3$
- Determination of the largest metering volume:
 - Gearbox position 20 : [i₂₀] = 0.088 rpm
 - $D_{V20} = 1404 \text{ cm}^3$
- The metering volume [D_V] must be between 352 cm³ and 1404 cm³.
- The metering roller is selected based on the Metering Rollers Table (see page 71).

$$D_{V80} = \frac{A_{B_D}}{0,351} \cdot \frac{A_M}{G_L} \cdot 0,1 \text{ cm}^3$$

$$D_{V80} = \frac{6}{0,351} \cdot \frac{175}{0,85} \cdot 0,1 \text{ cm}^3 = \underline{\underline{352 \text{ cm}^3}}$$

$$D_{V20} = \frac{A_{B_D}}{0,088} \cdot \frac{A_M}{G_L} \cdot 0,1 \text{ cm}^3$$

$$D_{V20} = \frac{6}{0,088} \cdot \frac{175}{0,85} \cdot 0,1 \text{ cm}^3 = \underline{\underline{1404 \text{ cm}^3}}$$

8.3.2.3 Determining the gearbox setting using the calculating disc rule

Example:

Values from the calibration test

calculated spread rate: 175 kg/ha

gearbox setting: 70

desired seeding rate: 125 kg/ha.

1. Align the values from the calibration test
 - o Calculated application rate 175 kg/ha (Fig. 158/A)
 - o Gearbox setting 70 (Fig. 158/B)
 opposite one another on the calculating disc rule.
 2. Read the gearbox setting for the desired spread rate of 125 kg/ha (Fig. 158/C) from the calculator disc.
- Gearbox setting 50 (Fig. 158/D).
3. Set the gearbox lever to the value read from the disc.
 4. Check the gearbox setting by carrying out another calibration test according to section 8.3, page 129.

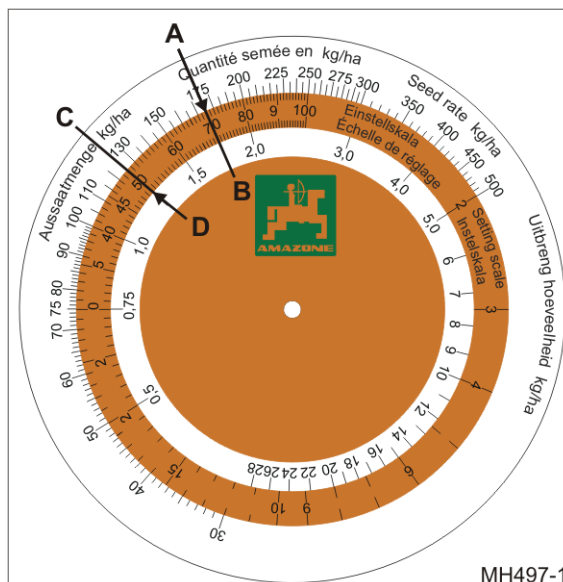


Fig. 158



The desired application rate is not generally achieved with the first calibration test. The correct gearbox setting can be determined using the calculator disc with the values from the first calibration test and the calculated application rate (see section "Determining the gearbox setting using the calculating disc rule", page 132).

8.3.2.4 Calibration procedure

The desired spread rate must be set on the gearbox.

The spread rate must be set for

- Seed
- Fertiliser

Perform a calibration test before setting the desired spread rate!

- Perform a calibration test for seed.
 - Perform a calibration test for fertiliser
1. The implement is prepared according to section 8.3 (see page 129).
 2. Throw the lever to the right (Fig. 159/1) and lock it.
 3. Release the locking knob (Fig. 160/1) on the Vario gearbox.
 4. Consult the table (Fig. 157, page 130) for the gearbox setting value for the first calibration test.
 5. Set the pointer (Fig. 160/2) of the gearbox lever **from below** to the gearbox setting value.
 6. Tighten the locking knob.
 7. The implement is equipped with two Vario gearboxes. Repeat the procedure as described.
 8. Push the calibration crank handle (Fig. 161/1) onto the star wheel (Fig. 161/2).
 9. Turn the star wheel with the calibration crank handle counterclockwise until all chambers of the metering rollers are filled with seed and a uniform seed stream flows into the calibration troughs.
 10. Empty the calibration trough and push it back under the metering unit.



Fig. 159

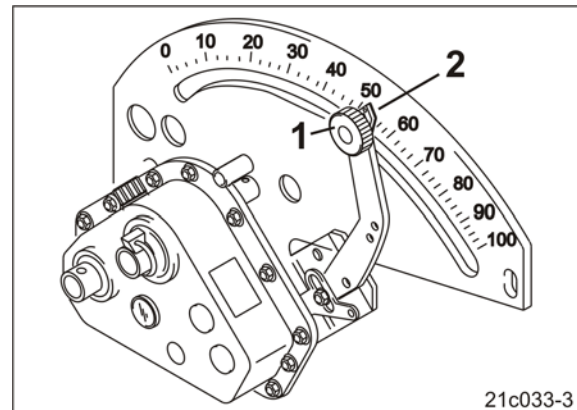


Fig. 160

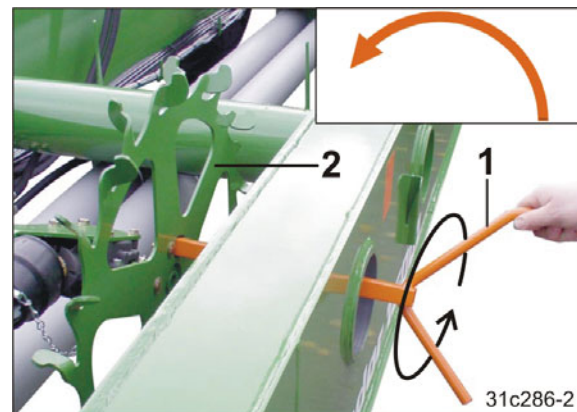


Fig. 161

Settings

11. Turn the star wheel to the left by the number of crank turns specified in the table (Fig. 162).

The number of crank turns on the star wheel depends on the seed drill working width (1).

The number of wheel revolutions (2) relates to an area of

- o 1/20 ha (500 m²) or
 - o 1/10 ha (1000 m²).
12. The usual area for the calibration test is 1/20 ha. With extremely small seeding rates, e.g. with rapeseed, it is advisable to perform the calibration test for 1/10 ha.

Example

Working width: 12.0 m

Number of crank turns

on 1/20 ha: 19.0

13. Weight the seed or fertiliser collected in the calibration trough (Fig. 163/1, take into account the container weight) and multiply:

- o Calibrating on 1/20 ha:

Spread rate [kg/ha] = calibrated quantity [kg/ha] x 20

- o Calibrating on 1/10 ha:

Spread rate [kg/ha] = calibrated quantity [kg/ha] x 10

Example:

calibrated quantity: 6.4 kg on 1/20 ha

Spread rate [kg/ha] = 6.4 [kg/ha] x 20 = 128 [kg/ha]

	1/40 ha	1/20 ha	1/10 ha
8,0 m	14,5	29,0	58,0
9,0 m	13,0	26,0	51,5
12,0 m		19,0	38,5
15,0 m		15,5	31,0

Fig. 162

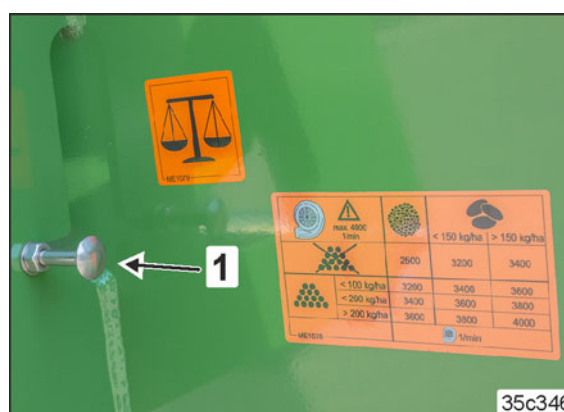


Fig. 163



Check the scales to ensure the display is accurate.

Set the scale to the desired units (kg or lb).

14. Repeat the calibration test until the desired application rate is achieved.
15. Secure the calibration trough on the transport bracket.
16. Close the openings under each metering unit.
17. Clip the calibration crank into its transport bracket.

8.3.3 Electric drive

When calibrating the spread rate, the weight of the collected metered quantity is entered on the control terminal. Using this value, the number of rotations of the electric motor that are required for the field work later on is calculated. A second calibration procedure is essential. The required seed quantity is usually produced with the second calibration procedure. Otherwise, repeat the calibration procedure until the required spread rate is achieved.

Calibrate the spread rate using this operating manual and the "ISOBUS software" operating manual.

1. The implement is prepared according to section 8.3 (see page 129).
2. Perform the calibration procedure according to the "ISOBUS software" operating manual.
3. If a hopper is called up in the Calibration menu, the one-sided switching automatically switches to the left conveyor section.

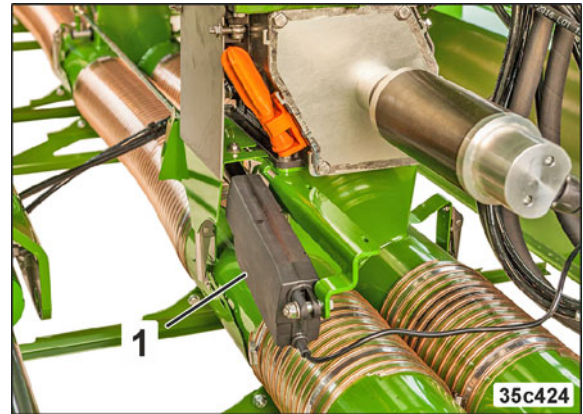


Fig. 164

4. Weigh the seed or fertiliser collected in the calibration trough (Fig. 163/1, take account of the container weight)
5. Enter the quantity of seed or fertiliser on the terminal.



Check the scales to ensure the display is accurate.

Set the scale to the desired units (kg or lb).

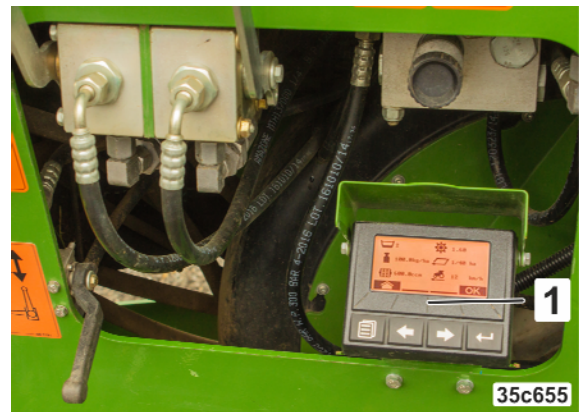


Fig. 165

6. Repeat the calibration test until the desired application rate is achieved.
7. Secure the calibration trough on the transport bracket.
8. Close the openings under each metering unit.

8.4 Adjusting fan speed



The maximum speed of 4000 rpm must never be exceeded.



Check and readjust the system pressure during operation.

The system pressure varies, depending on the quantity of seed/fertiliser and on the working speed.



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

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

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

The pressure gauges on the loading board (Fig. 166/1...3) indicate the pressures in the individual hopper chambers.

The fan speed is set correctly when the indicator for the pressure gauge is between 45 and 60 mbar.

The pressure difference between the individual hopper chambers may not exceed a maximum of 5 mbar!

If the system pressure is not reached, check the system for leaks.



At an idle, pressures between 25 and 35 bar are reached in the individual hopper chambers.



Fig. 166

8.4.1 Fan speed in multiple chamber systems

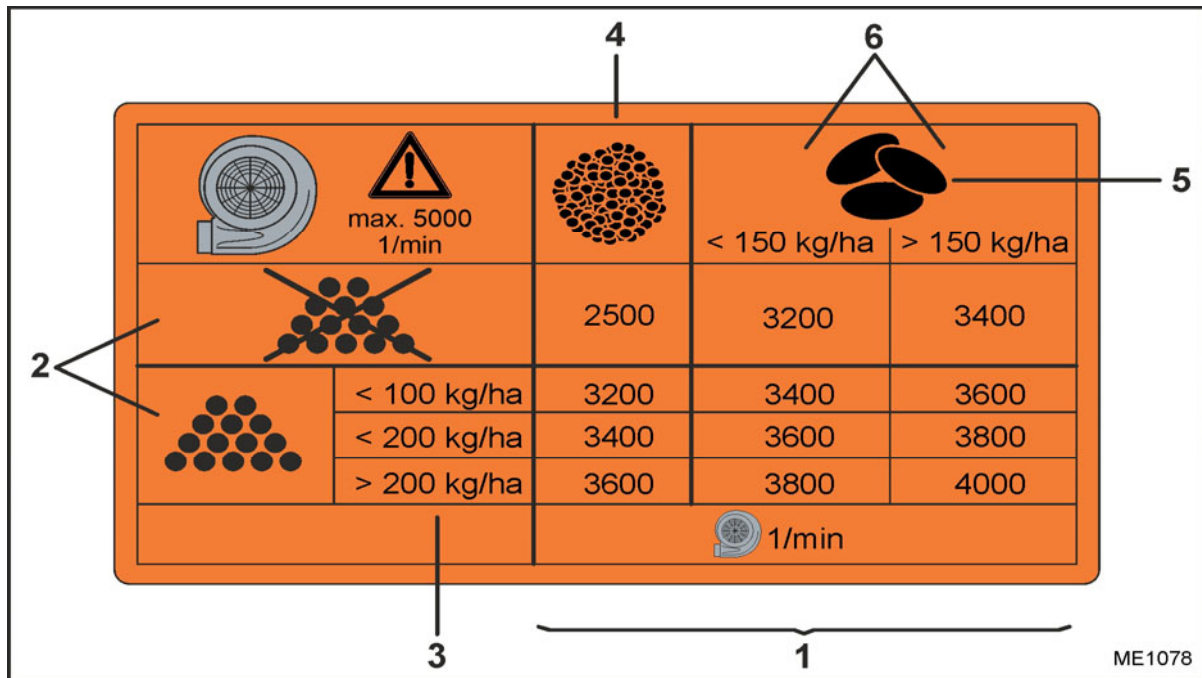


Fig. 167

The fan speed (Fig. 167/1) required depends on:

- the fertiliser
 - with or without fertiliser (Fig. 167/2)
 - from the fertiliser application rate (Fig. 167/3)
- the seed
 - fine seed types (Fig. 167/4), e.g. rapeseed or grass seed
 - grains or legumes (Fig. 167/5) and the spread rate (Fig. 167/6).

Example:

- fertiliser application rate: 150 kg/ha (Fig. 167/3)
- grain spread rate: 130 kg/ha (Fig. 167/6)

Required fan speed: 3600 rpm.

Set the target fan speed

- via the tractor's flow control valve
or (if not present)
- via the pressure relief valve of the fan hydraulic motor
if the tractor does not have a flow control valve.

Settings

1. Initially, set the fan speed
 - o at 3200 rpm for fine seeds
e.g., rapeseed
 - o at 3600 rpm for cereals.
- The control terminal shows the fan speed
(see control terminal operating manual).
2. Set the displayed fan speed that generates
the system pressure as the nominal speed
on the control terminal.
- The control terminal issues an alarm as
soon as the speed goes outside of the set
tolerance speed range (see control terminal
operating manual).
3. The pressure gauges (Fig. 168/1-3) indicate
the pressures in the individual hopper
chambers.

Required system pressure: 45 - 60 mbar

The pressure difference between the
individual hopper chambers may not
exceed a maximum of 5 mbar!

4. If the system pressure is not reached,
check the system for leaks.



Fig. 168

8.4.2 Setting the fan speed via the flow control valve of the tractor

1. Read the required fan speed from section 8.4 (see page 136).
2. Set the fan speed via the flow control valve of the tractor.

8.4.3 Setting the fan speed on tractors without flow control valve

1. Read the required fan speed from the speed table (see section 8.4, page 136).
2. Set the fan speed depending on the version of the pressure relief valve.

The fan is equipped with a pressure relief valve that is installed in two versions.

- 2.1 Pressure relief valve with round outer contour (Fig. 169/1)

See section 8.4.3.1. „Pressure relief valve with round outer contour“

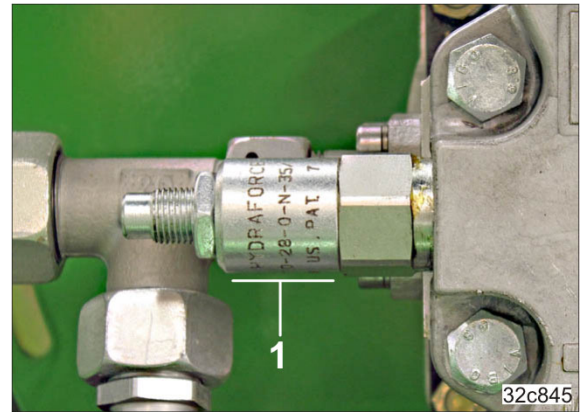


Fig. 169

- 2.2 Pressure relief valve with hexagonal outer contour (Fig. 170/1)

See section 8.4.3.2. „Pressure relief valve with hexagonal outer contour“

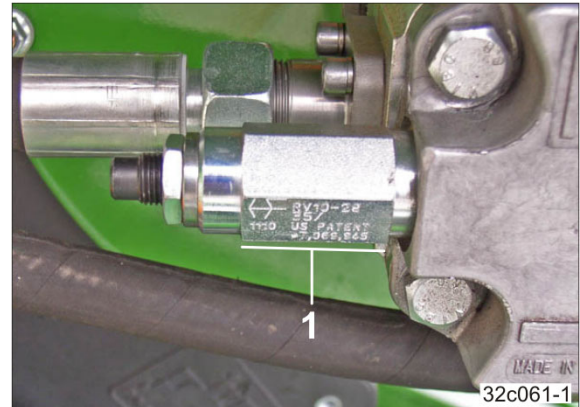


Fig. 170

8.4.3.1 Pressure relief valve with round outer contour

Basic settings

1. Loosen the lock nut (Fig. 171).
2. Adjust the pressure relief valve to the factory-set dimension "21 mm" (Fig. 172).
 - 2.1 Turn the bolt with the hexagon socket wrench (Fig. 171/1) accordingly.
3. Tighten the lock nut.

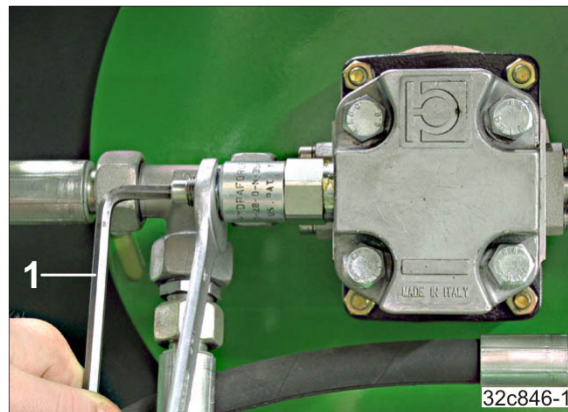


Fig. 171

Adjusting the fan speed

This setting should only be carried out when the fan hydraulic motor is connected to the tractor hydraulics and the tractor is equipped with a flow control valve.

1. Loosen the lock nut (Fig. 171).
2. Use the hexagon socket wrench (Fig. 171/1) to set the target blower fan speed on the pressure relief valve. Do not exceed the maximum fan speed of 4000 rpm.

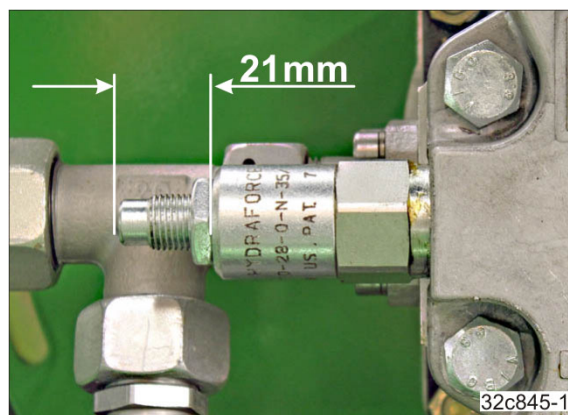


Fig. 172

Fan speed

- Turn to the right:
 - Increase the nominal fan speed
 - Turn to the left:
 - Reduce the nominal fan speed
3. Tighten the lock nut.

8.4.3.2 Pressure relief valve with hexagonal outer contour

Basic settings

1. Loosen the lock nut (Fig. 173).
2. Using a hexagon socket wrench, screw the bolt in completely (Fig. 173/1) (clockwise).
3. Using a hexagon socket wrench, unscrew the bolt back by 3 turns.
4. Tighten the lock nut.



Fig. 173

Adjusting the fan speed

This setting should only be carried out when the fan hydraulic motor is connected to the tractor hydraulics and the tractor is equipped with a flow control valve.

1. Loosen the lock nut (Fig. 173).
2. Use the hexagon socket wrench (Fig. 173/1) to set the target blower fan speed on the pressure relief valve. Do not exceed the maximum fan speed of 4000 rpm.



Fig. 174

Fan speed

- Turn to the right:
 - Increase the nominal fan speed
 - Turn to the left:
 - Reduce the nominal fan speed
3. Tighten the lock nut.

8.4.4 Setting the fan speed when connecting the hydraulic motor to the tractor PTO shaft

1. Perform the basic setting of the pressure relief valve according to section 8.4.3.1 or section 8.4.3.2 (depending on the version of the pressure relief valve).
2. Read the required fan speed from the speed table (see section 8.4, page 136).
3. Set the fan speed during operation by adjusting the tractor PTO shaft speed.

Do not exceed the following speeds:

- max. 1000 rpm PTO shaft speed,
- max. 4000 rpm fan speed.

The fan speed is displayed on the control terminal.

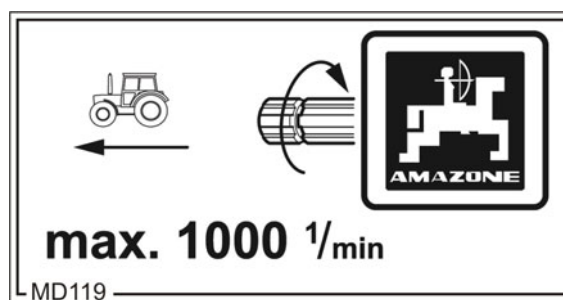


Fig. 175

8.5 Setting the sections pressure

The implement sections must be positioned horizontally during operation. The horizontal position can be adjusted using the pressure relief valve.

Fig. 176/1: Section pressure is too high

Fig. 176/2: Section pressure is too low

Fig. 176/3: Optimal section pressure

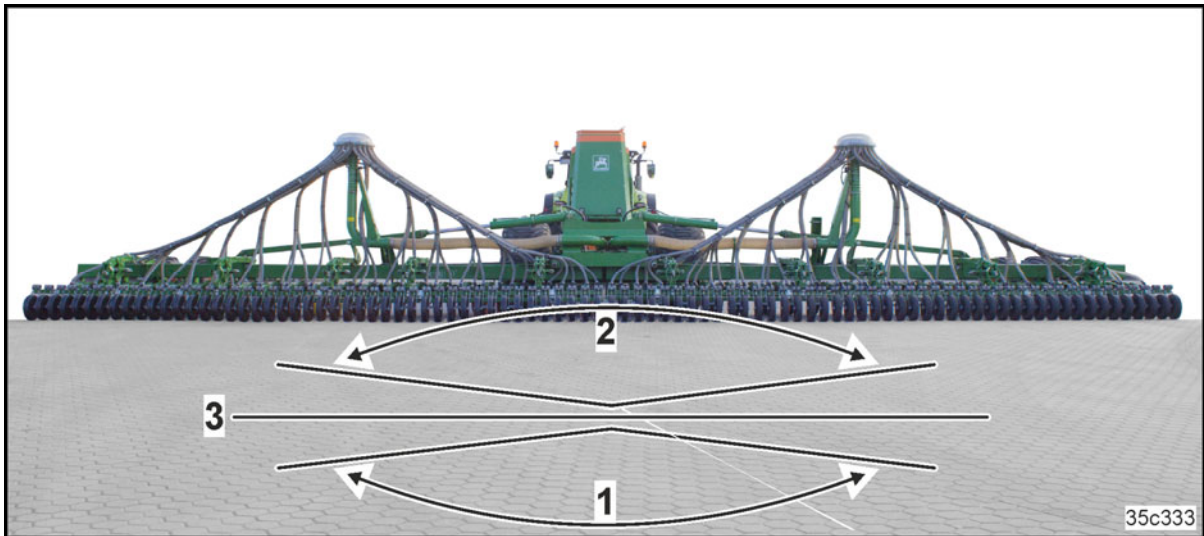


Fig. 176

Fig. 177/...

- (1) Pressure relief valve under the operation platform
- (2) Adjustment screw for the sections pressure
- (3) The pressure gauge shows the set section pressure.



Fig. 177



The sections pressure setting depends on the

- Soil texture
- Coulter pressure
- Forward speed

Settings

1. Start the fan and allow to rotate with 3500 rpm.
 2. Undo the lock nut of the pressure relief valve (Fig. 177/1) and unscrew the adjustment screw.
- The pressure gauge for loading the sections (Fig. 178/1) is now at 0 bar.
3. Screw in the adjustment screw of the pressure relief valve (Fig. 177/2) until the pressure gauge displays 40 bar.
- 3.1 The booms move up on the outside:
Increase the pressure on the booms by 5 bar.
 - 3.2 Support wheels of the booms are exposed to high loads:
Reduce the pressure on the booms by 5 bar.
4. The pressure gauge (Fig. 178/1) shows the set section pressure.
 5. Tighten the lock nut.

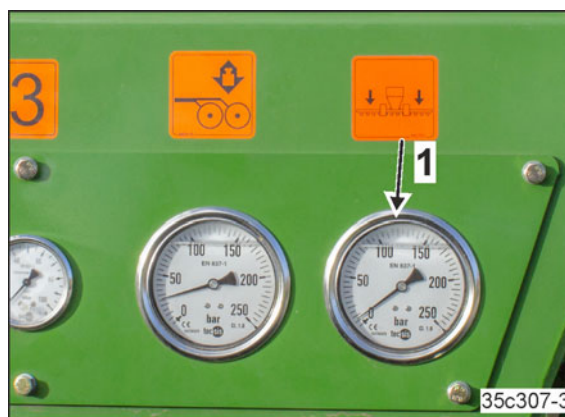


Fig. 178

8.6 Adjusting the seed placement depth

Supported on the depth limiting discs, the RoTeC pro / RoTeC pro S coulters constantly maintain the set seed placement depth.



Check the placement depth of the seed (see section "Checking the seed placement depth", page 191),

- after each seed placement depth adjustment
- after each coulter pressure adjustment
- after each change in the working speed
- after changing from light soil to heavy soil and vice-versa.
- after the soil has changed due to different seedbed production or precipitation

1. Allow the handle (Fig. 179/1) to engage in the desired position.

The specified values (see section 8.6.1) are to be considered as reference values!

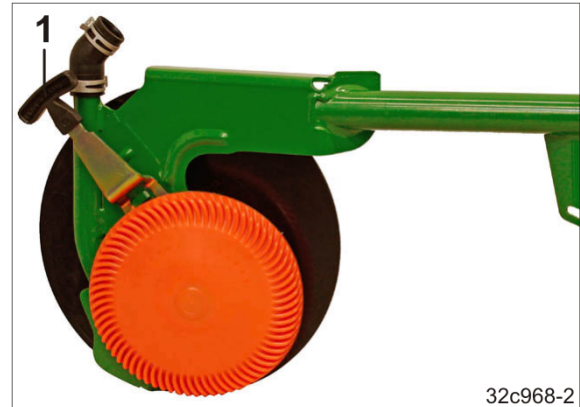


Fig. 179

8.6.1 Positioning the depth limiting discs

The seed placement depth depends on different factors, such as the

- Position of the depth limiting disc
- Soil type (light to heavy, dry to wet)
- Forward speed
- coulter pressure
- Condition of the seedbed.



The specified values represent reference values!

Engagement position	Placement depth [cm]	
	RoTeC pro	RoTeC pro-S*
1	1 – 3	2 – 4
2	2 – 4	3 – 5
3	3 – 5	4 – 6
4	4 – 6	5 – 7
Without depth limiting disc	> 4 – 6	> 5 – 7

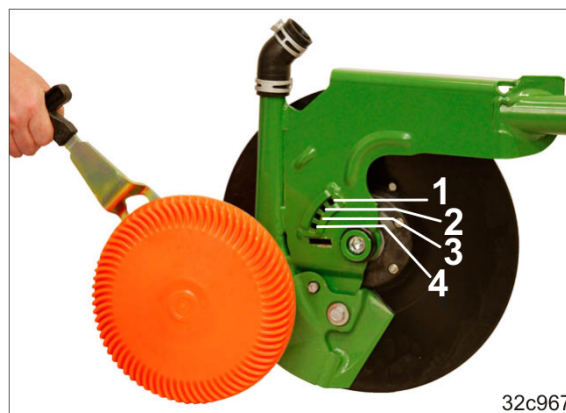


Fig. 180

*) Because of the modified furrow former geometry, the RoTeC pro-S coulter reaches greater placement depths than the RoTeC pro coulter.

8.6.2 Seeding without plastic disc

1. Turn the handle beyond the engagement catch (Fig. 181/1) and remove the plastic disc from the RoTeC coulter.

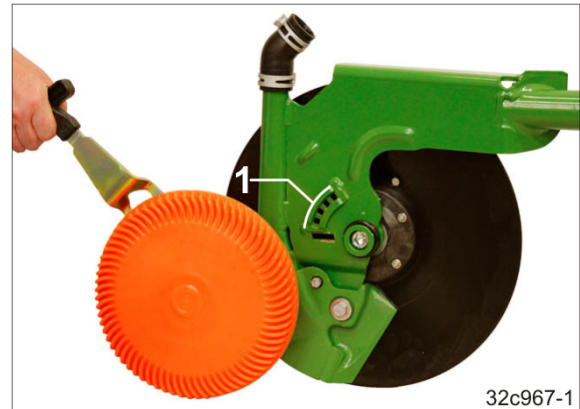


Fig. 181

Installing the plastic disc



Secure the plastic disc with the designation

- "K" to the short coulter
- "L" on the long coulter.

1. Push the plastic disc from below against the catch on the RoTeC pro coulter. The shoulder must grip in the slot.
2. Pull the handle to the rear and upwards beyond the notches. A light knock on the centre of the disc helps to latch it into position.

8.7 Setting the coulter pressure



WARNING

Direct people out of the danger area.



To pre-select hydraulic functions, observe the "ISOBUS software" operating manual.



This setting influences the placement depth of the seed.
Check the placement depth of the seed after each adjustment.

1. Put the coulter pressure to the desired position
 - o Put it in float position (Fig. 182/1).
 - o Apply pressure by actuating the *blue* control unit (Fig. 182/2).

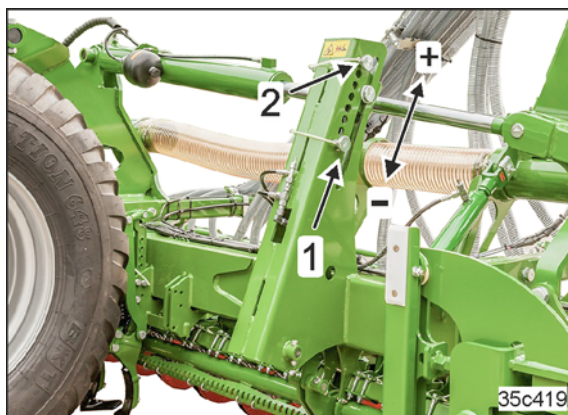


Fig. 182

2. The higher the pin is inserted in the adjustment scale (Fig. 183/1), the greater the coulter pressure.
3. The pressure gauge (Fig. 184/1) indicates if the coulters are pressurised with increased pressure.



Fig. 183

- The pressure gauge is unpressurised:
 - The coulters are working with normal coulter pressure (Fig. 182/1).
- Pressure is applied to the pressure gauge:
 - The coulters are working with increased coulter pressure (Fig. 182/2).

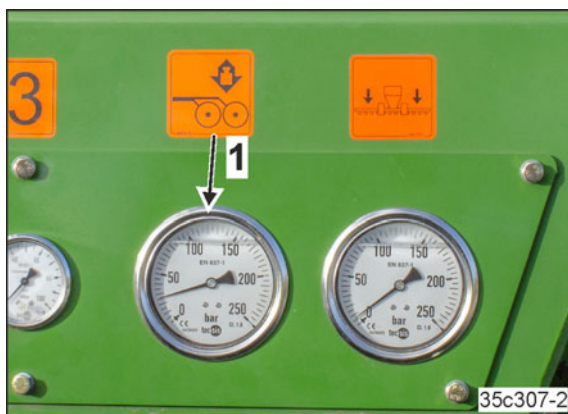


Fig. 184

8.8 Adjusting the exact following harrow



Check the work results after each adjustment.

8.8.1 Adjusting the harrow tines

When correctly set, the harrow tines of the exact following harrow should:

- lie horizontally on the ground and
- have 5-8 cm clearance beneath.

Distance "A"	230 to 280 mm
--------------	---------------

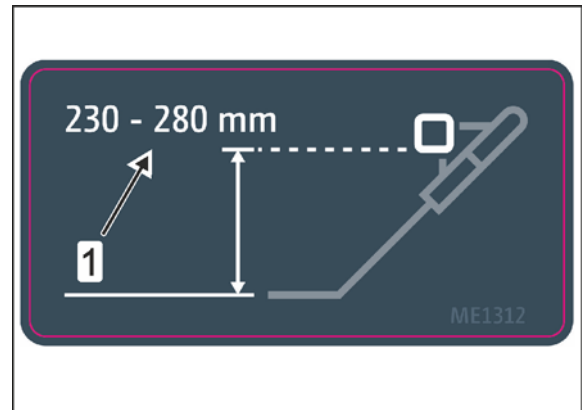


Fig. 185

It is adjusted by turning the adjustable spindle (Fig. 186/2) on all adjuster segments.

1. Move the implement into working position on the field (see section "Use of the implement", page 172).
2. Disengage the tractor PTO shaft, engage the tractor parking brake, shut off the tractor engine and remove the ignition key.
3. Remove the linch pin (Fig. 186/1)

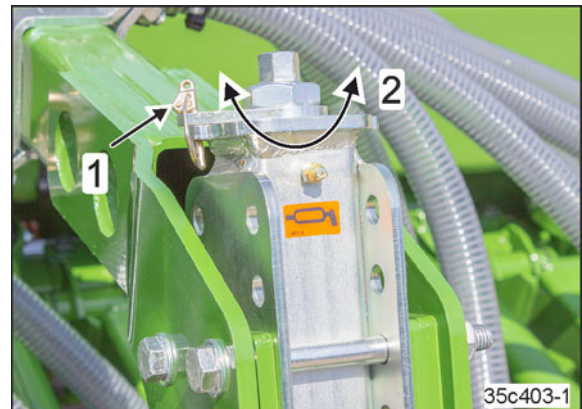


Fig. 186

4. Move the adjustable spindle to the desired position (Fig. 186/2) and secure with a linch pin
5. Carry out the same settings (Fig. 187/3) on all adjuster segments.



Fig. 187

8.8.2 Setting the exact following harrow pressure

1. Swivel the setting lever out of the parking position (Fig. 188/1)

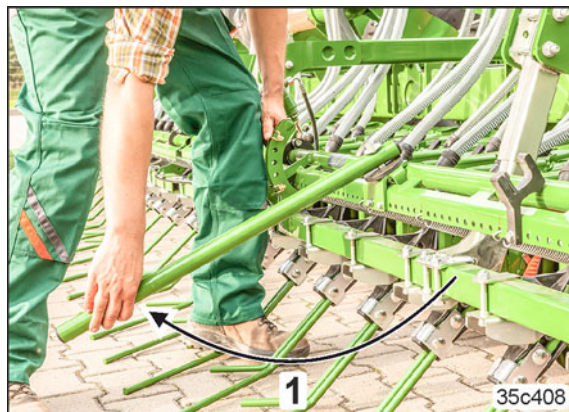


Fig. 188

2. Relieve the pin (Fig. 189/2)
3. Open the spring cotter pin and remove the pin (Fig. 189/3)
4. Adjust the exact following harrow pressure (Fig. 189/2)



Fig. 189

5. Insert the pin into the desired hole underneath the lever (Fig. 190/4) and secure (Fig. 190/5)
6. The higher the pin is inserted in the adjustment scale (Fig. 190/1+), the greater the exact following harrow pressure.
7. Apply the same setting to all adjuster segments.

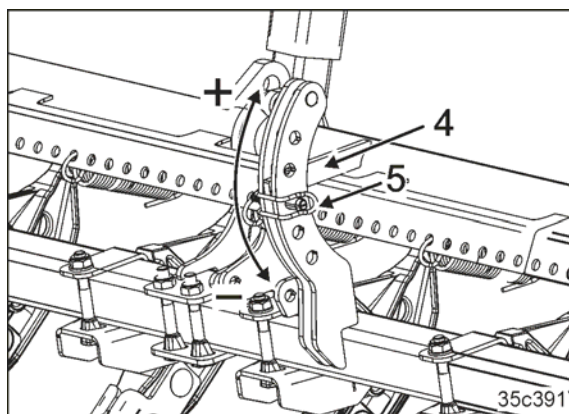


Fig. 190

8.8.2.1 Setting the exact following harrow pressure (hydraulic adjustment)



WARNING

Direct people out of the danger area.

The exact following harrow pressure is adjusted centrally via a hydraulic cylinder that is connected to the control unit together with the hydraulic coulter pressure adjustment.

When increasing the coulter pressure by actuating the *blue* control unit, the exact following harrow pressure increases automatically.

1. Insert one pin each under and over the lever into the adjuster segment and secure it with spring cotter pins.
2. The higher the pins are inserted in the adjustment scale (Fig. 191/1+), the greater the exact following harrow pressure.

- Lever in position 1 (Fig. 192/1)
→ Exact following harrow works with normal pressure.
- Lever in position 2 (Fig. 192/2)
→ Exact following harrow works with increased pressure.

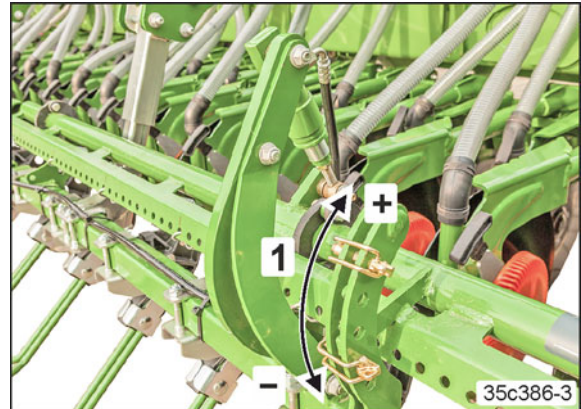


Fig. 191

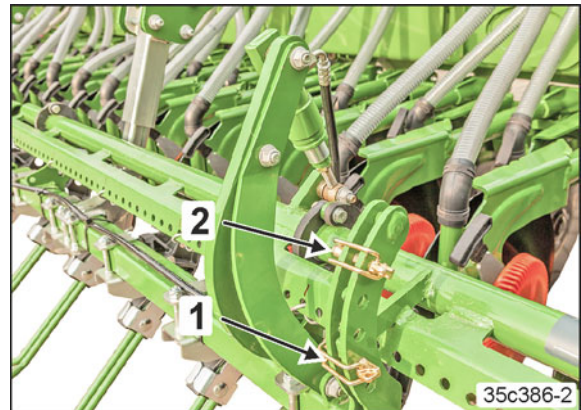


Fig. 192

8.9 Roller harrow



DANGER

Carry out the adjustments only with the tractor PTO shaft shut off, the tractor parking brake applied, the engine shut off and the ignition key removed!



Check the work results after each adjustment.

8.9.1 Setting working depth and pitch of harrow tines

1. Raise the implement only until the harrow tines are directly above the ground, but not touching it.
2. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
3. Hold the harrow tines beam by the carrier handle (Fig. 193/3).
4. Set the working depth of the harrow tines by positioning the carrying arm with the pin (Fig. 193/1)
 - o in all segments
 - o in the same hole.

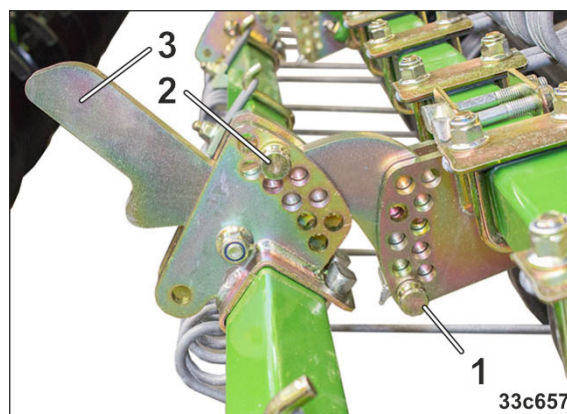


Fig. 193

The lower the pin is inserted in the adjuster segment, the greater the working depth.

5. After each repositioning, secure the bolt with a spring cotter pin.
6. Change the pitch of the harrow tines to the ground by repositioning the pin (Fig. 193/2)
 - o in all segments
 - o in the same hole.

Ensure that the pin (Fig. 193/2) is positioned below the carrier (Fig. 193/3) in the adjuster segment.

The lower the pin (Fig. 193/2) is inserted in the adjuster segment, the flatter the pitch.

7. After each repositioning, secure the pin (Fig. 193/2) with a spring cotter pin.

8.9.2 Adjusting the roller pressure

1. Move the implement on the field to the working position.
2. The roller contact pressure is adjusted by evenly repositioning the spindles (Fig. 194/1).
3. Remove the safety pin for the tube (Fig. 195/1).
4. Adjust the roller pressure.
 - To increase the roller pressure, turn the adjustable spindle (Fig. 195/2) towards the right.
 - The closer the spring support (Fig. 195/3) gets to the plus symbol, the greater the roller contact pressure on the soil.
 - To reduce the roller pressure, turn the adjustable spindle (Fig. 195/2) towards the left.
 - The closer the spring support (Fig. 195/3) gets to the minus symbol, the smaller the roller contact pressure on the soil.
5. Secure the setting with a safety pin for the tube (Fig. 195/1).
6. Check the roller contact pressure to the soil, e.g. with a spring balance (see Fig. 196).

Roller diameter D [mm]	Roller contact pressure F [kg]
330 mm	max. 35 kg



The roller contact pressure "F" must not exceed the table value.
Higher pressures than indicated may damage the roller harrow.



Fig. 194

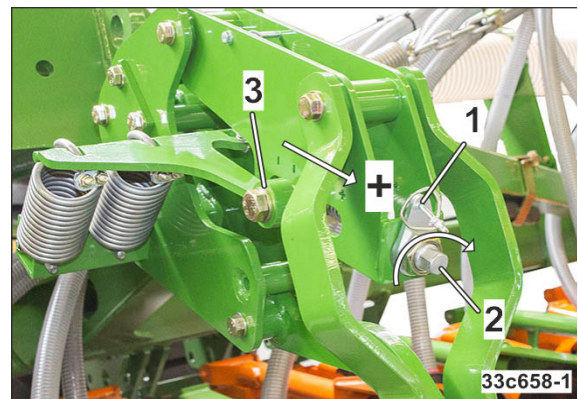


Fig. 195

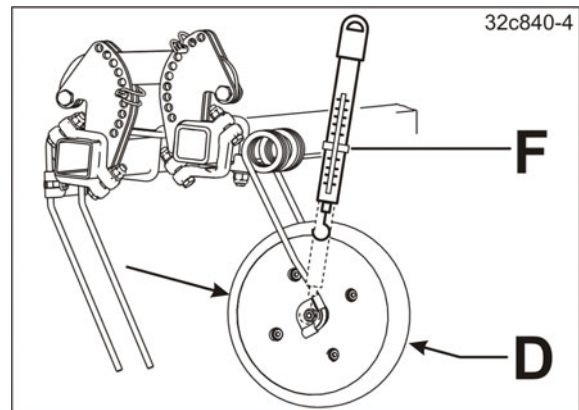


Fig. 196

8.10 Adjusting the seed drill wheel mark eradicator

1. To adjust the wheel mark eradicator tines, raise the rear frame slightly using the tractor hydraulic system and use suitable supports.
2. Put the working depth in the desired position by repositioning the wheel mark eradicators (Fig. 197/1)
3. Unlock the pin (Fig. 198/2), grab the wheel mark eradicator by the handle (Fig. 198/3), remove the pin and move the working depth to the desired position.
4. Insert the pin (Fig. 198/2) and secure with a linch pin.

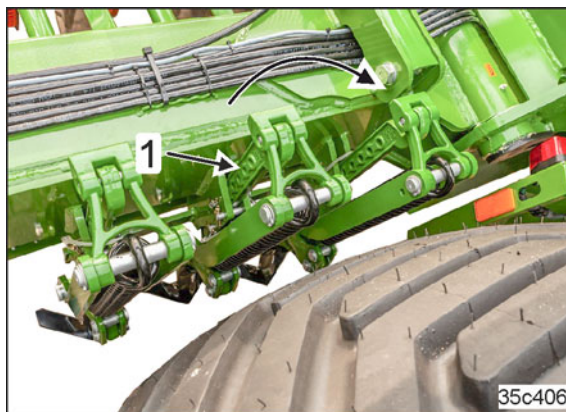


Fig. 197



For road transport, secure the wheel mark eradicators in the topmost position.

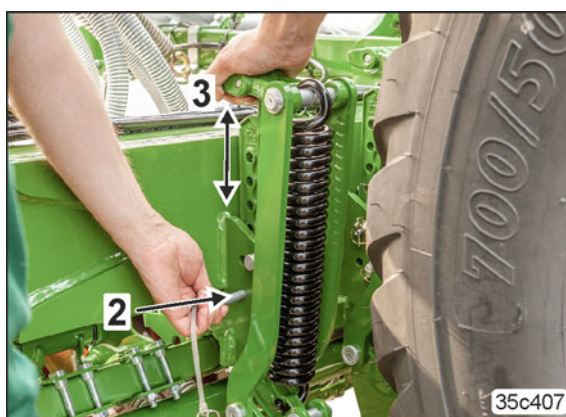


Fig. 198

8.11 Adjusting the guide wheel harrow



Check the adjustment of the guide wheel harrow during field operation:

- after changing from light soil to heavy soil and vice-versa.
- after the soil has changed due to different seedbed production or precipitation

8.11.1 Adjusting the working depth of the guide wheel harrow

Increase working depth:	+
Reduce working depth:	-

1. Loosen the nuts (Fig. 199/1) and remove them.
2. Move the harrow arm (Fig. 199/2) to the desired position.
3. Put on the nuts and tighten them.

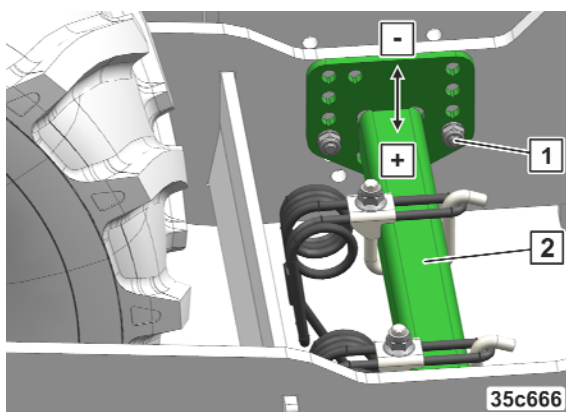


Fig. 199

8.11.2 Adjusting the pitch of the guide wheel harrow

Setting the pitch steeper:	+
Setting the pitch flatter:	-

1. Loosen the nut (Fig. 200/2).
2. Loosen the bolt (Fig. 200/1) and remove it.
3. Move the harrow arm (Fig. 199/3) to the desired position.
4. Insert the bolt and tighten it.
5. Put on the nut and tighten it.

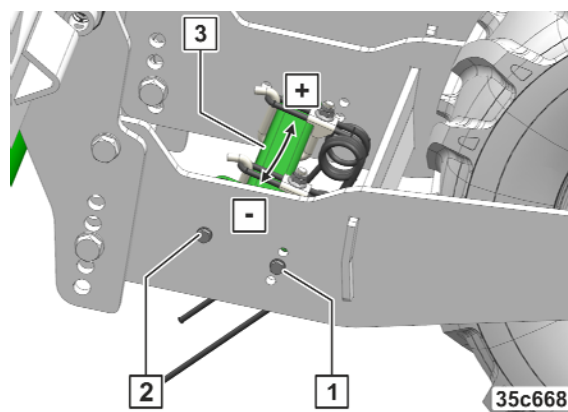


Fig. 200

8.11.3 Adjusting the working position of the guide wheel harrow

1. Loosen the nut (Fig. 201/1).
2. Move the harrow arm (Fig. 201/2) to the desired position.
3. Tighten the nut.

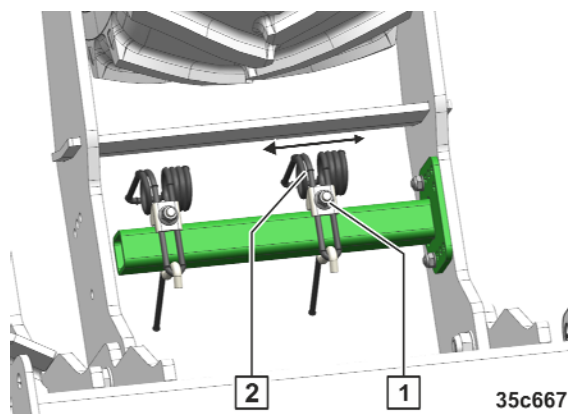


Fig. 201

8.12 Adjusting the tractor wheel mark eradicator (optional)

Horizontal adjustment

1. Tighten and lock the bolt (Fig. 202/3) after adjusting the wheel mark eradicator.

Vertical adjustment

1. Hold the wheel mark eradicator by the handle (Fig. 202/1).
2. Remove the pins (Fig. 202/2).
3. Adjust the wheel mark eradicator as follows:
 - o Adjust in a vertical direction.
 - o Locate with the pin.
 - o Secure with the linch pin supplied.

Locking the hydraulic valve (Fig. 204/A) allows working with the tractor wheel mark eradicators swivelled up (Fig. 203/1).

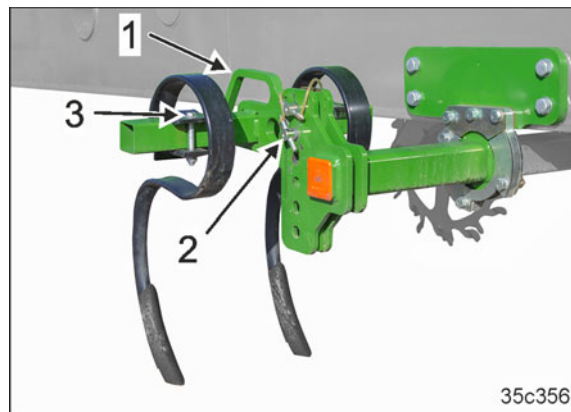


Fig. 202

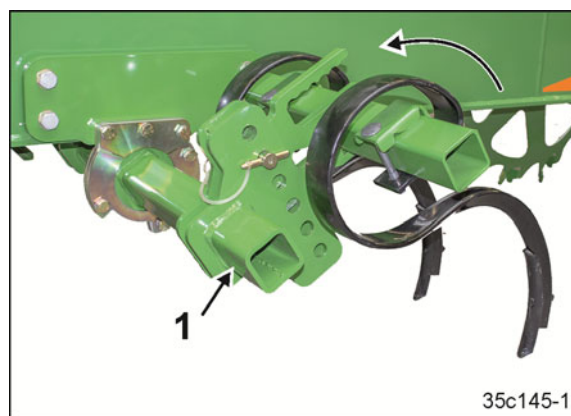


Fig. 203

By moving the valve lever to the transport position, it is also possible to work without the tractor wheel mark eradicator.

Fig. 204

Valve lever position A: Transport position

Valve lever position B: Working position

Putting the valve lever into position A prevents accidental swivelling of the tractor wheel mark eradicators from transport position into working position.

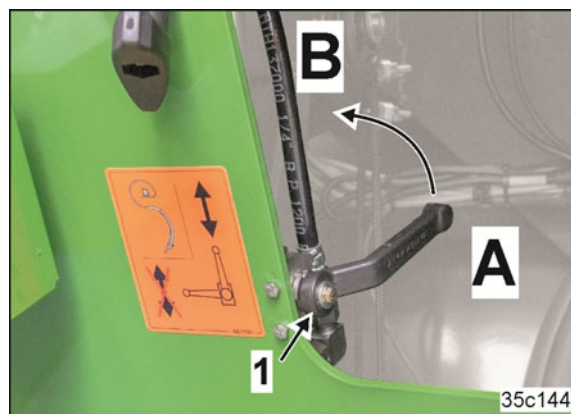


Fig. 204

8.13 Adjusting the support wheel height



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 rolling away before you perform any cleaning, maintenance or repair work on the implement (see page 97).

By setting the height of the support wheel, the frame height is adapted to the seeding conditions. The section is guided parallel to the ground. The setting of the support wheel height depends on different factors, such as the

- Soil type (light to heavy, dry to wet)
- Condition of the seedbed.



Check the setting of the support wheel height during field operation:

- after changing from light soil to heavy soil and vice-versa.
- after the soil has changed due to different seedbed production or precipitation

The support wheel height is adjusted using the setting grid:

1. Loosen the upper nuts (Fig. 205/2)



DANGER

Prop up the support wheel arm before removing the bolts (Fig. 205/2)!

2. Loosen the lower nuts, remove the bolts (Fig. 205/1)
3. Swivel the support wheel arm to the desired position

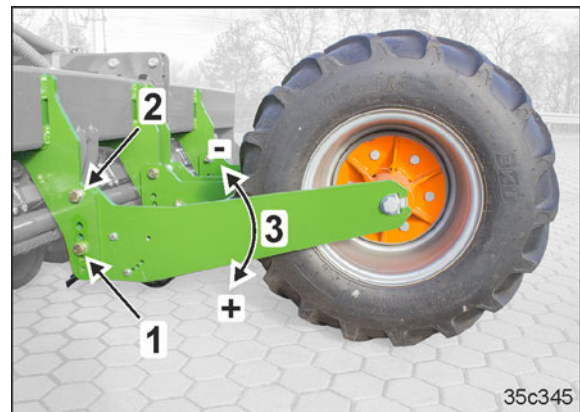


Fig. 205

Position of the bolt (Fig. 205/1)	Height [mm] (Fig. 205/3)
- 2	- 50
- 1	- 25
Centre setting	0
+ 1	+ 25

4. Secure the support wheel arm with bolts (Fig. 205/1) and tighten with nuts
5. Tighten the upper nuts (Fig. 205/2)

8.14 Adjusting the track marker (optional, only for Citan 12001-C)



DANGER

It is forbidden to stand in the swivelling area of the track marker!

1. Direct people out of the danger area.
2. Unfold one track marker.
The simultaneous unfolding of both track markers makes the adjustment work easier.
3. Drive several metres in the field.
4. Disengage the tractor PTO shaft, apply the tractor parking brake, switch off the tractor engine, and remove the ignition key.
5. Loosen the bolts (Fig. 206/1)
6. Turn the track marker disc (Fig. 206/2) to adjust the working intensity of the track marker so that it runs roughly parallel to the direction of travel on light soils and is set more on-grip on heavier soils.
7. Tighten the bolts (Fig. 206/1)
8. Adjust the track marker length:
9. Loosen the bolts (Fig. 207/3)
10. Adjust the track marker length by moving (Fig. 207) to distance "A" (Fig. 208).
11. Tighten the bolts (Fig. 207/4)
12. If the adjustment range is not sufficient:
13. Loosen the bolts (Fig. 207/4)
14. Adjust the track marker length by moving (Fig. 207) to distance "A" (Fig. 208).
15. Tighten the bolts (Fig. 207/4)

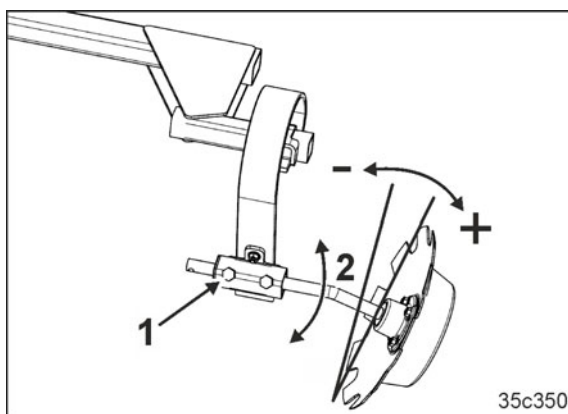


Fig. 206

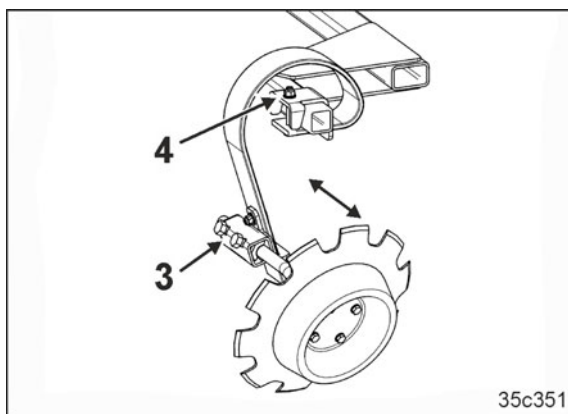


Fig. 207

The table values specify the distance "A"

- from the centre of the implement,
- up to the contact surface of the track marker disc.

Implement working widths	Distance "A"
12.0 m	12.0 m
15.0 m	Only without track marker

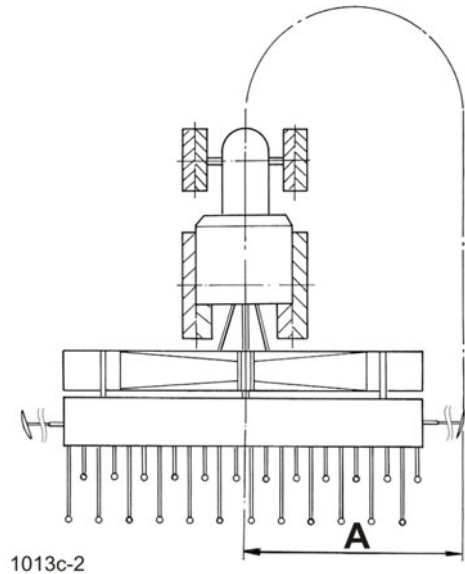


Fig. 208

8.15 Setting the tramline rhythm/counter (optional)

1. Read the required tramline rhythm from the table (Fig. 103, page 85) and enter on the control terminal.
2. Refer to the illustration (Fig. 104, page 86) for the tramline counter for the first field pass and enter it on the control terminal.
3. Set the seed rate reduction (%) for creating tramlines on the control terminal¹⁾ (only in combination with electrically driven metering units).
4. Switch the interval tramline control on or off on the control terminal¹⁾.

¹⁾ Refer to the control terminal operating manual



The tramline counter is coupled with the working position sensor on the star wheel. Each time the implement or the star wheel is lifted, the tramline counter advances by one digit.



Pressing the STOP button before lifting the star wheel prevents the tramline counter from advancing.

8.16 Adjusting the tramline to the track width/wheelmark width (specialist workshop)



WARNING

- Switch off the fan.
- Direct persons out of the danger area
 - before unfolding the implement sections
 - before folding down the distributor heads.
- Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.

8.16.1 Adjusting the track discs for the tractor track width

Track width:

When the implement is delivered or when buying a new cultivating tractor, check that the tramline is set to the wheelmark width (Fig. 209/a) of the tractor.

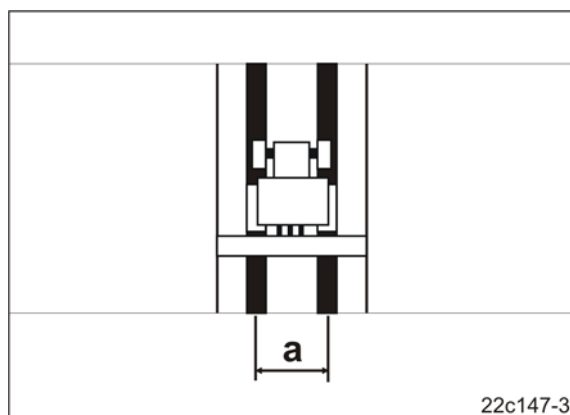


Fig. 209

The seed line tubes (Fig. 210/1) of the tramline coulters must be attached to the distributor head openings, which can be closed by the shutters (Fig. 210/2). If necessary, interchange the seed line tubes.

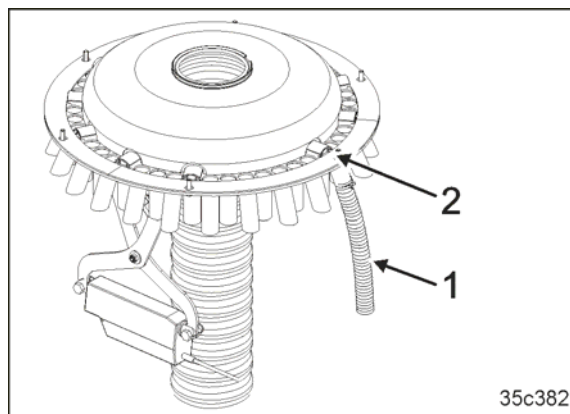


Fig. 210



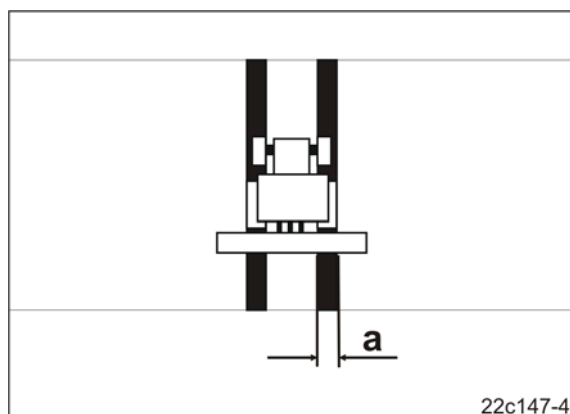
Set the track discs of the tramline marker (if present) to the new track width.

Wheelmark width:

The wheelmark width changes with the number of coulters not outputting seed when the tramlines are created. A maximum of 10 openings on the distributor head can be closed by the shutters (Fig. 210/2).

Deactivate any shutters (Fig. 210/2) that are not needed (see page 161). Deactivated shutters do not close the feed lines to the tramline coulters.

Always activate or deactivate pairs of shutters positioned opposite each other on the base plate.



8.16.2 Activating / deactivating shutters

1. Unfold the implement sections (see section 10.1, page 173).
2. Before working on the distributor heads (Fig. 279/1), fold them to the rear over the frame of the implement sections.
3. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
4. Set the tramline counter to "0" on the control terminal, as when creating tramlines.
5. Switch off the control terminal.
6. Remove the outer distributor cover (Fig. 212/1).
7. Remove the ring (Fig. 212/2).
8. Remove the inner distributor cover (Fig. 212/3).
9. Remove the foam insert (Fig. 212/4) and sealing ring (Fig. 212/5).



Fig. 211

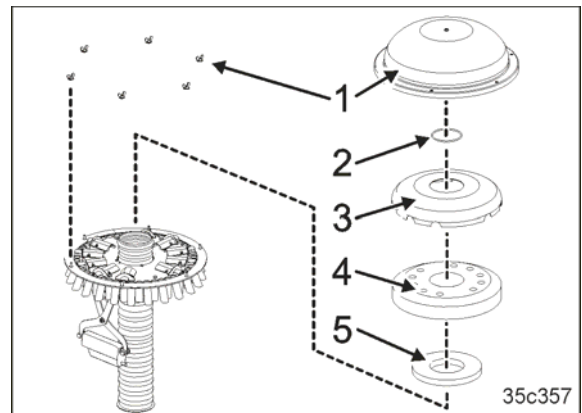


Fig. 212

10. Loosen the bolts (Fig. 213/1).
11. Remove the shutter tunnel (Fig. 213/2).

Activating the shutters:

12. The shutter (Fig. 213/3) is inserted in the guide.

Deactivating the shutters:

13. Turn the shutters around (Fig. 213/3) and push them into the drill hole (Fig. 213/4).
14. Screw the shutter tunnel (Fig. 213/2) onto the base plate.

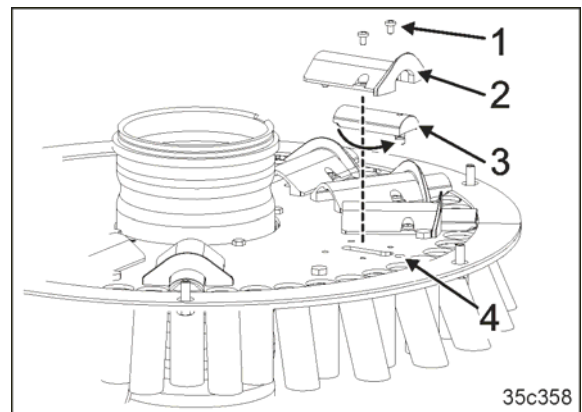


Fig. 213

Settings

15. Install the foam insert (Fig. 214/1) and sealing ring (Fig. 214/2).
16. Install the inner distributor cover (Fig. 214/3).
17. Install the ring (Fig. 214/4).
18. Install the outer distributor cover (Fig. 214/5).
19. Check the function of the tramline control.

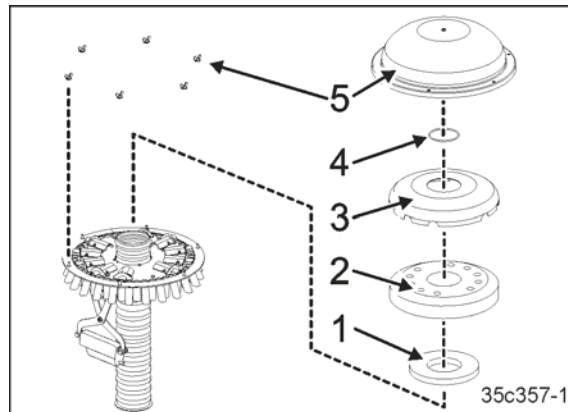


Fig. 214

8.17 Implement one-sided switch-off



To actuate the electric one-sided switching, observe the "ISOBUS software" operating manual.



Do not forget to switch the half-width of the implement back on again after turning at the end of the field.

1. Unfold the implement sections (see section "Unfolding/folding the implement booms", page 173).
2. Disengage the tractor PTO shaft, apply the tractor parking brake, switch off the tractor engine, and remove the ignition key.



DANGER

Switch off the tractor PTO shaft, apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

3. Throw the lever to the right (Fig. 215/1) and lock it:
 - the right side of the implement is switched off.
 - requires the halving of the application rate.

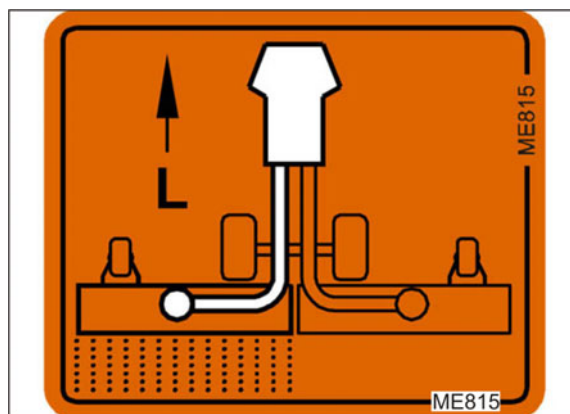


Fig. 215

4. Throw the lever to the left (Fig. 216/2) and lock it:
 - the left side of the implement is switched off.
 - requires the halving of the application rate.

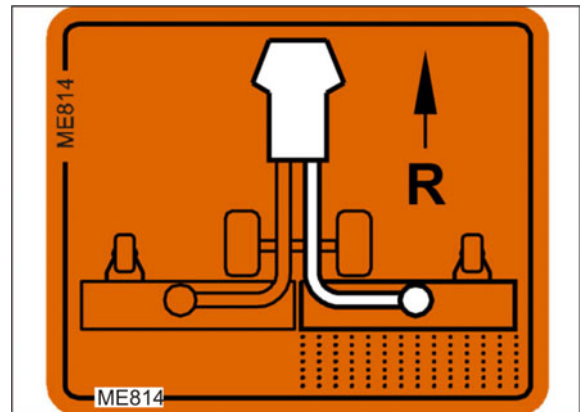


Fig. 216

5. Reduce the seeding rate to half. Adjust the gearbox setting lever (Fig. 217/1) accordingly.

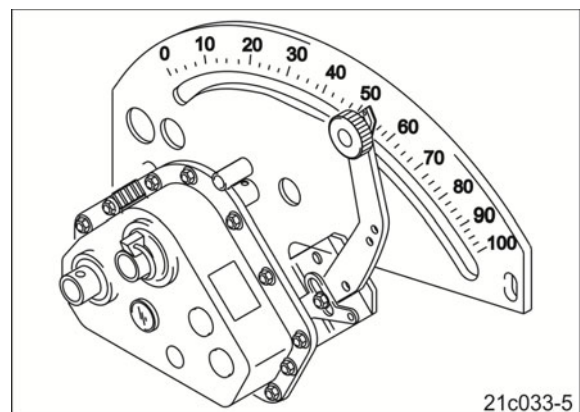


Fig. 217

Optionally, a setting motor (Fig. 218/1) actuates the electronic one-sided switching.

If the one-sided switching is actuated electrically, the application rate is set automatically.

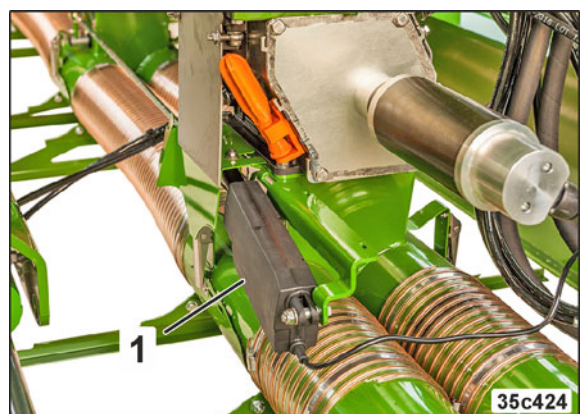


Fig. 218

8.18 Adjusting the tramline marker

Adjust the track width of the tramline marker:

1. Loosen the nuts (Fig. 219/1), but do not remove them.
2. Move the tramline marker (Fig. 219/2) to the desired position.
3. Tighten the nuts (Fig. 219/1).
4. Repeat the procedure for the second tramline marker.

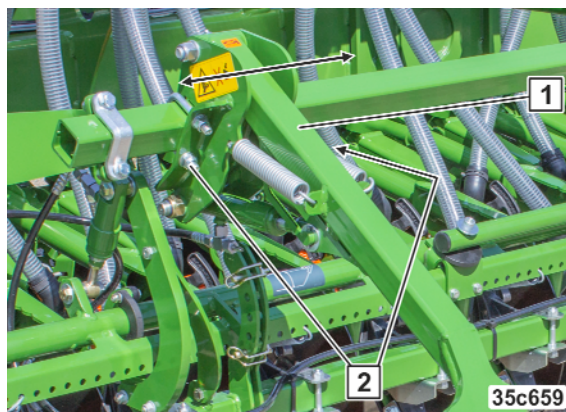


Fig. 219

Adjust the effect of the tramline marker:

1. Set the track marker more or less on grip.
2. Loosen the nut (Fig. 220/1) and rotate the track marker disc together with the wedges (Fig. 220/2).
3. Tighten the nut.
4. Repeat the procedure for the second track marker disc.

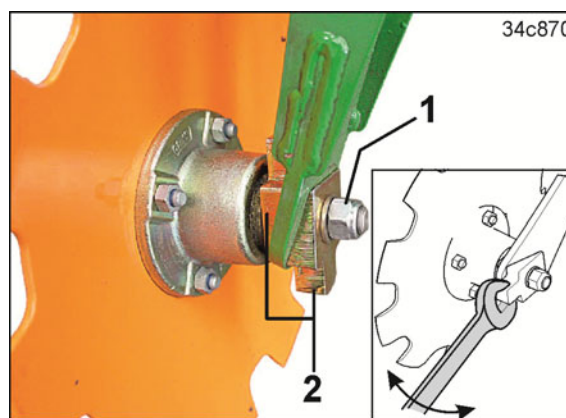


Fig. 220

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.



- For road transport, observe section "Safety information for users", page 27.
- Before moving off, check:
 - that the supply lines are connected correctly
 - the lighting system for damage, function and cleanliness.
 - the brake and hydraulic system for visible damage.
 - the functioning of the brake system.
 - that the tractor parking brake is released completely.



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.



WARNING

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

Before transportation, visually check that the lower links are properly secured against accidental loosening.



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 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.
- Before road transport, fasten the side locking of the tractor lower links, so that the mounted or towed implement cannot swing back and forth.



DANGER

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

These risks pose serious injuries or death.

Observe the maximum load of the attached implement and the permissible axle and drawbar loads of the tractor.

Drive on roads only with an empty hopper. The brake system is designed for driving with an empty hopper only.



WARNING

Risk of slipping, stumbling or falling due to unauthorised climbing onto the implement and/or carrying persons on the implement, the loading board or the steps.

It is fundamentally forbidden for persons to ride on the implement and/or climb on the implement when it is in operation.

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



DANGER

Lock the tractor control units during road transport!



DANGER

In bends take into consideration the wide sweep and the centrifugal mass of the implement.

9.1 Set the implement to road transport mode



WARNING

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

- unintentional lowering of the implement raised using the tractor's lower link hydraulic system.
- unintentional lowering of raised, unsecured implement parts.
- Unintentional start-up and rolling of the tractor-implement combination.

Secure the tractor with the attached implement against unintentional starting and rolling away before you make any adjustments to the implement (see section 6.2, page 97).

Move the implement hitched on the tractor into transport position:

1. Switch off the on-board computer.
2. Empty the hopper (see section "Emptying the hopper and/or metering unit.", page 193).
3. Close the hopper cover (see section "Filling the hopper", page 184).
4. Pivot the ladder to the inclined position (see section "Filling the hopper", page 184).
5. Fold the implement sections (see section "Unfolding/folding the implement booms", page 173).
6. Move the seed drill wheel mark eradicator to the highest position (see section "Adjusting the seed drill wheel mark eradicator", page 154).
7. Lock the tractor control unit.
8. Check the lighting system for correct operation. The warning signs and yellow reflectors must be clean and undamaged (see section "Transportation equipment (optional)", page 42).
9. Switch the work lights off during transport to avoid blinding other motorists.



DANGER

Lock the tractor control units during road transport!

By moving the valve lever to the transport position, it is also possible to work without the tractor wheel mark eradicator.

Fig. 221

Valve lever position A: Transport position

Valve lever position B: Working position

Putting the valve lever into position A prevents accidental swivelling of the tractor wheel mark eradicators from transport position into working position.

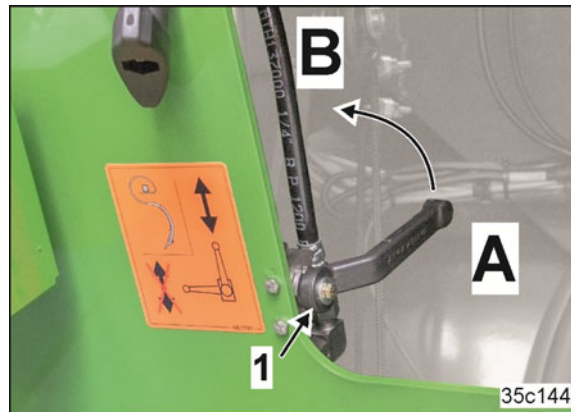


Fig. 221

1. Take the road safety bars (Fig. 222/2) out of the storage compartment.
 2. Install the road safety bars (Fig. 222/2).
- Hook the tension cables (Fig. 222/3) onto the harrow tines (Fig. 222/1).

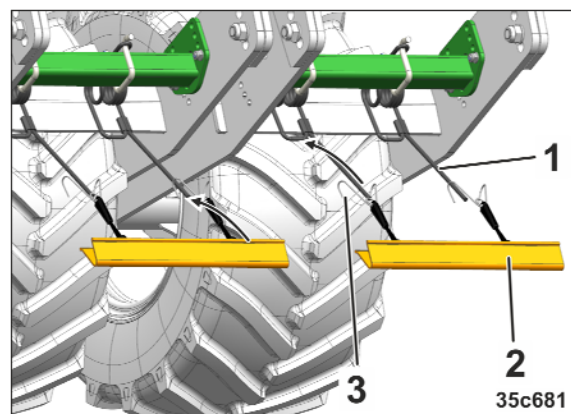


Fig. 222

9.2 Legal regulations and safety

When driving on public roads and ways 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.

Transport width/Transport height

In Germany and in many other countries, the maximum transport width of the implement combination mounted on the tractor is approved up to 3.0 m.

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

Max. permissible speed



- Depending on the equipment of the implement, the permitted maximum speed¹⁾ is as follows:
 - 40 km/h (with dual-circuit pneumatic braking system).
 - 25 km/h with hydraulic brake system
 - 10 km/h (without brake system ²⁾)

Note: In Russia and in several other countries, the permissible maximum speed is 10 km/h.

Particularly on poorly maintained roads or paths, you must always drive at a substantially lower speed than that specified!

- Switch on the warning beacon (if present), which is subject to authorisation, prior to starting a journey and check for operability.

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

²⁾ The implement is not permitted in Germany and in several other countries without its own brake system.

Revolving beacon

In several countries, the implement and/or the tractor must be equipped with a revolving beacon. Ask your local importer/implement dealer about the legal guidelines. The revolving beacon is subject to approval in Germany.



Before starting a journey, read the section "Safety information for the operator" and check:

- that the permissible weight is not exceeded
- that the supply lines are connected correctly
- the lighting system for damage, function and cleanliness
- that the warning signs and yellow reflectors are clean and undamaged
- the brake and hydraulic system for visible defects
- that the brake system functions properly
- that the tractor parking brake is completely released.

**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 properly fastened.

**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 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.
- Before road transport, fasten the side locking of the tractor lower links, so that the mounted or towed implement cannot swing back and forth.

**WARNING**

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

These risks pose serious injuries or death.

Comply with the maximum load of the mounted / towed 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.

**DANGER**

Switch off the control terminal during road transport.

**DANGER**

Lock the tractor control units during road transport!

**WARNING**

During road transport, risk of stabbing injuries to other road users from uncovered, sharp spring tines of the exact following harrow!

Transportation without a correctly fitted road safety bar is forbidden.

**WARNING**

Risk of stabbing from transporting with outer harrow elements folded out!

When transporting, the outer harrow elements extended protrude to the side in the area of the traffic and put other road users at risk. Moreover, the permissible transport width of 3 m is exceeded.

Push the outer harrow elements into the main tube of the exact following harrow before you perform any transport journeys.



In bends take into consideration the wide sweep and the centrifugal mass of the implement.

10 Use of the implement



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

- "Warning symbols and other markings on the machine", starting on page 18 and
- "Safety information for users", page 27.

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 hitched implement and the approved axle and drawbar loads of the tractor. Drive only with an empty 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 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 influence of the mounted or attached 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 cabin!

10.1 Unfolding/folding the implement booms



DANGER

Before you fold or unfold the implement sections and track markers, instruct people to leave the swivel area

- of the implement sections.
- of the rear frame.



Align the tractor and implement straight on a flat surface before you fold or unfold the implement sections.

Drive the tractor in front of the implement at a slight angle. This makes the catch hooks (Fig. 225/1) for the implement sections more visible.

10.1.1 Unfolding the implement sections

1. In combination with track markers, set the valve lever (Fig. 223/1) to position "A".
- The valve switches to unfold the implement booms.

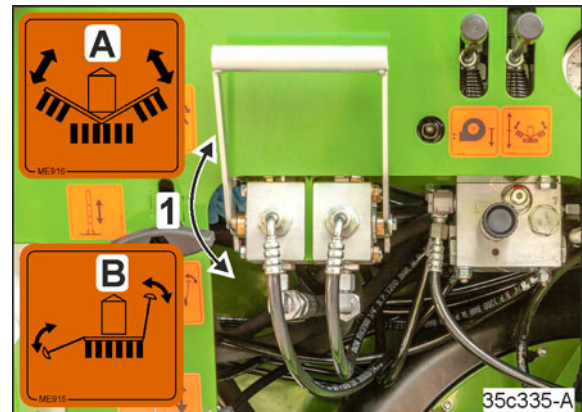


Fig. 223

2. Lift the implement sections out of the transport socket (Fig. 224/1).



Fig. 224

Use of the implement

3. Keep actuating the *yellow* control unit until both implement sections are released from the transport sockets (Fig. 225/1).

4. Unfold the implement sections.

Keep actuating the *green 1* control unit until the implement sections (Fig. 225/2) and the distributor heads are unfolded (Fig. 226/1).

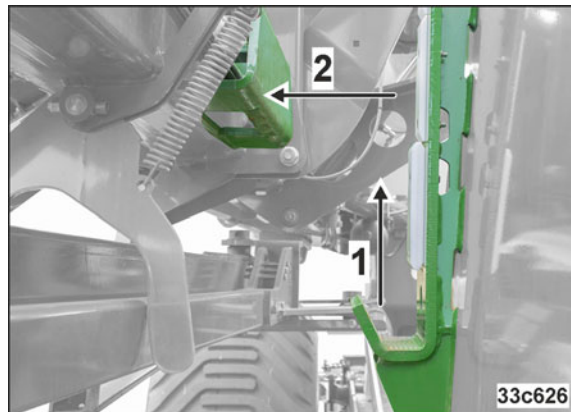


Fig. 225

5. Put the *green 1* tractor control unit into the neutral position and leave it in the neutral position during operation.

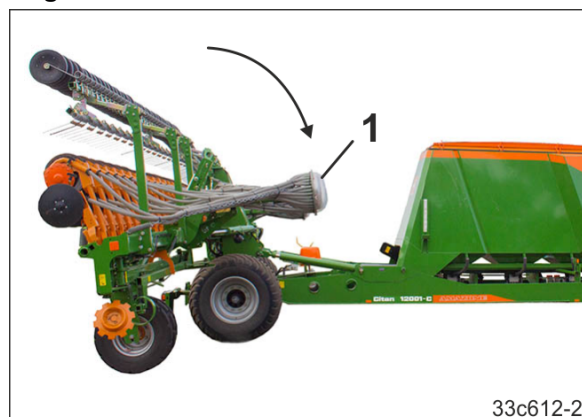


Fig. 226

6. Unfold the rear frame into working position.
Keep actuating the *yellow* control unit until the rear frame is completely unfolded (Fig. 227/1), i.e. the rear frame is in working position.

The star wheel (Fig. 227/2) and the tractor wheel mark eradicater (optional) are lowered when the rear frame is unfolded.

7. Put the *yellow* tractor control unit into the neutral position and leave it in the neutral position during operation.

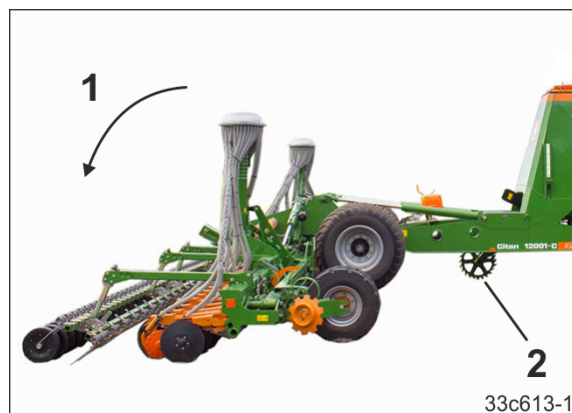


Fig. 227

8. Set the valve lever (Fig. 228/1) to position "B" and leave it in position "B" during operation.

→ The valve switches to actuate the track markers.

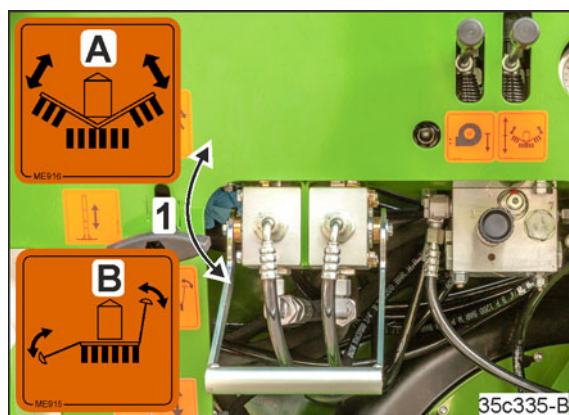


Fig. 228

10.1.2 Folding the implement sections

1. The valve lever (Fig. 229/1) is in position "B".
2. Keep actuating the *green 2* control unit until both track markers are folded (parking position).
3. Set the valve lever (Fig. 229/1) to position "A".

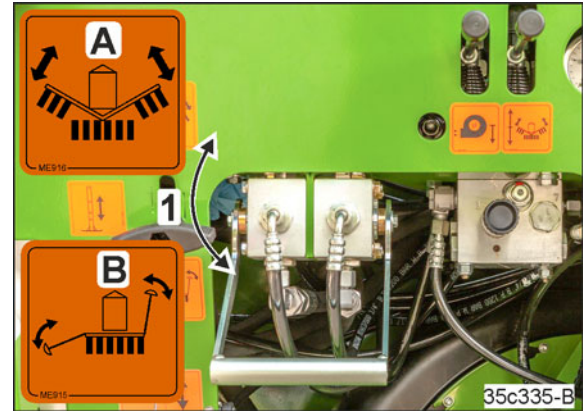


Fig. 229

4. Keep actuating the *green 1* control unit until the rear frame is approx. 10° before the vertical position (see Fig. 230).

Actuation of the *yellow* control unit causes the star wheel and the tractor wheel mark eradicator to be lifted

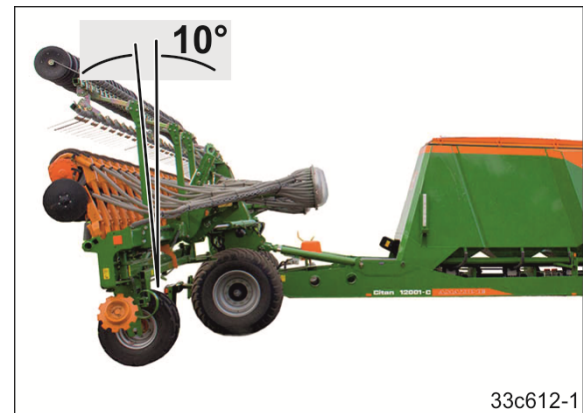


Fig. 230

5. Fold the implement sections.
Keep actuating the *green 2* control unit until
 - o the distributor heads are folded (see Fig. 231)
 - o the implement sections (Fig. 232/1) are resting on the skids (Fig. 232/2) of the lock hooks.



Fig. 231



Beware of possible collisions of the implement sections with the implement.

Correct the tilt of the rear frame (see Fig. 230) if necessary.

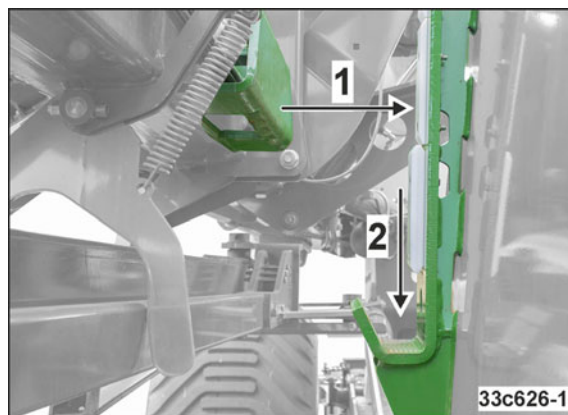


Fig. 232

6. Keep actuating the *yellow* control unit until both implement sections are resting in the transport socket.



Fig. 233



The lock hooks (Fig. 233) act as the mechanical transport locking mechanism for the implement booms.



DANGER

Check that the lock hooks are fitted correctly (Fig. 233).

7. Move the implement into a horizontal position by actuating the tractor lower links.



The implement requires sufficient ground clearance in all driving situations.

8. Set the valve lever in the down position.
9. Switch off the control terminal.



Fig. 234

10.2 Folding / unfolding the track marker (only Citan 12001-C)

The track markers can be put in three positions:

- Working position
- Parking position
- Transport position

The valve lever (Fig. 235/2) is used to pre-set the desired track marker changing (Fig. 235/1).

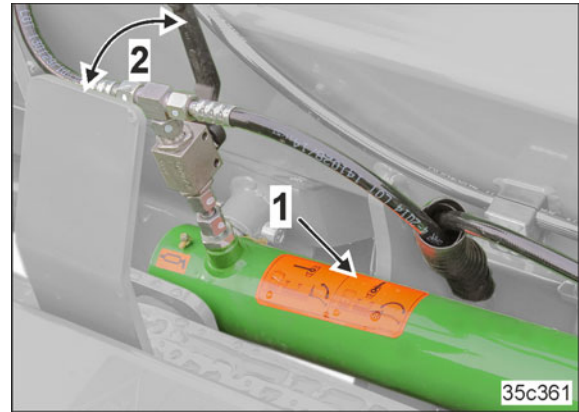


Fig. 235

1. Put the valve lever (Fig. 223/1) to position "B".
- The valve switches the *green* tractor control unit on the track markers.

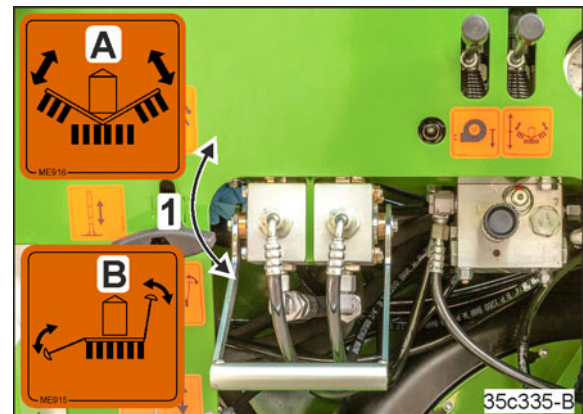


Fig. 236

10.2.1 Unfolding track marker

The implement sections are unfolded. The rear frame is lowered. Both track markers are in road transport position.

1. Actuate the *green 1* tractor control unit.
- The active track marker is folded into working position, the inactive track marker remains in transport position.

10.2.2 Folding the track markers during operation



Transport position is preferred at the field edge, because the track marker represents an obstacle when in the vertical parking position!

Changing between transport and parking position

1. The valve lever (Fig. 235/2) is in position 1 (Fig. 237/1)
 2. Actuate the *green 2* tractor control unit.
- The active track marker is folded from working to parking position.
3. The valve lever (Fig. 235/2) is in position 2 (Fig. 237/2)
 4. Actuate the *green 2* tractor control unit.
- The active track marker is folded from working to transport position.

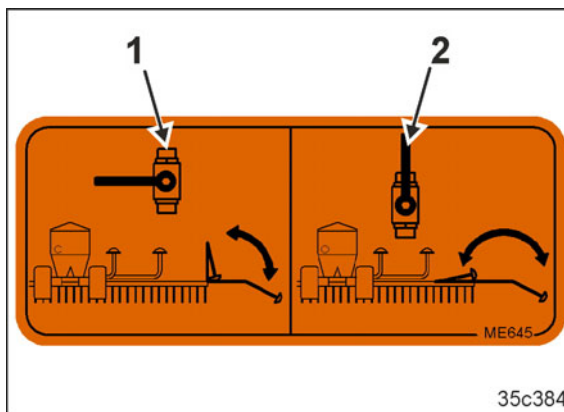


Fig. 237

10.2.3 Folding in the track markers after operation

The implement sections are unfolded. The rear frame is lowered. One track marker is in working position, the second is in parking position.

1. Both valve levers (Fig. 235/2) are in position 2 (Fig. 237/2).
 2. Actuate the *green 2* tractor control unit.
- The active track marker is folded from working to transport position.
- The parked track marker is folded from parking to transport position.

10.3 Folding/unfolding the tractor wheel mark eradicators

10.3.1 Moving the tractor wheel mark eradicators into working position

1. Swivel the tractor wheel mark eradicators into working position (**Fig. 238/1**):
2. Turn the valve to working position "B" (see section "Adjusting the tractor wheel mark eradicator (optional)", page 156).
3. Actuate the tractor control unit (yellow).
When unfolding the implement, swivel the tractor wheel mark eradicators from transport position into working position.
4. Adjust the wheel mark eradicators to the desired working depth (see section "Adjusting the tractor wheel mark eradicator (optional)", page 156)

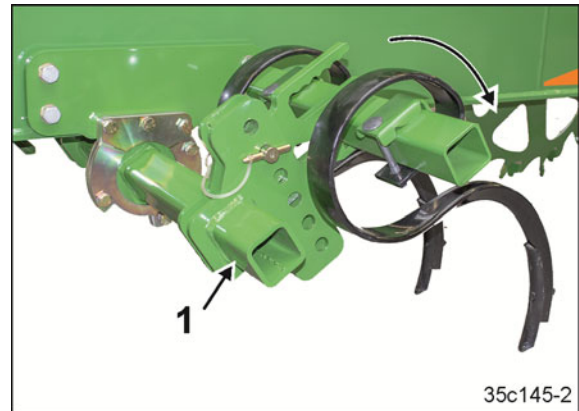


Fig. 238

10.3.2 Moving the tractor wheel mark eradicator into transport position

1. Swivel the tractor wheel mark eradicators into transport position (**Fig. 238/1**):
2. Put the wheel mark eradicators into the topmost position (see section "Adjusting the tractor wheel mark eradicator (optional)", page 156).
3. Actuate the tractor control unit (yellow).
When folding the implement, the tractor wheel mark eradicators swivel from working position into transport position.
4. To lock the actuation, turn the valve to lock position "A" (see section "Adjusting the tractor wheel mark eradicator (optional)", page 156).

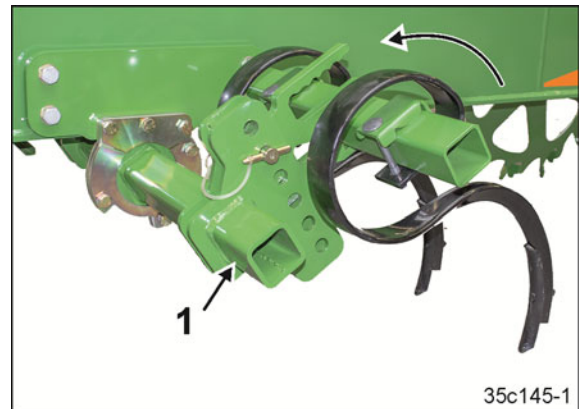


Fig. 239



WARNING

Before road transport, move the valve lever to position A (see Fig. 204, page 156) to prevent accidental swivelling of the tractor wheel mark eradicators.

10.4 Folding / unfolding the tramline marker



WARNING

Direct people out of the danger area.

The hydraulic cylinder of the track marker and of the tramline marker can be actuated simultaneously.

10.4.1 Move the tramline marker to working position

1. Position the implement on the field.
2. Pull out the pin (Fig. 240/1) and fold the section (Fig. 240/2) with the track disc into working position.

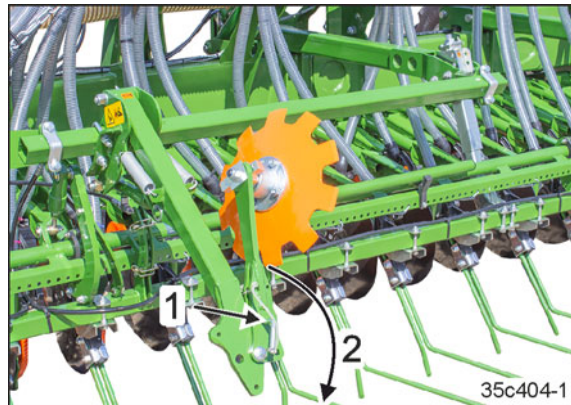


Fig. 240

3. Secure the connection by inserting the pin (Fig. 241/1) and locking it.
4. Repeat the setting on the second boom.

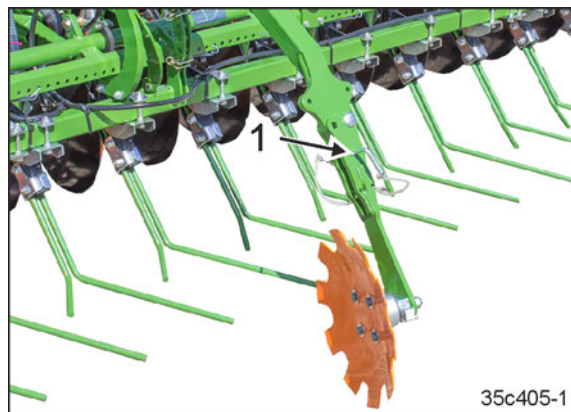


Fig. 241

10.4.2 Move the tramline markers to the transport position

1. Direct people out of the swivel area of the track marker and the tramline marker.
2. The control terminal may not display the symbol for creating tramlines.
3. Actuate the tractor control unit (yellow 1) to lift the track disc carrier.
4. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.

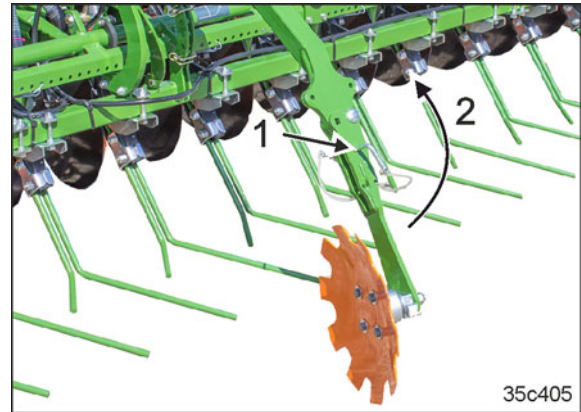


Fig. 242

5. Pull out the pin (Fig. 242/1) and fold the section (Fig. 242/2) with the track disc into transport position.
In transport position, both sections may only be folded towards the middle of the implement and secured with the track disc carriers.
6. Secure the connection by inserting the pin (Fig. 243/1) and locking it.
7. Repeat the setting on the second boom.

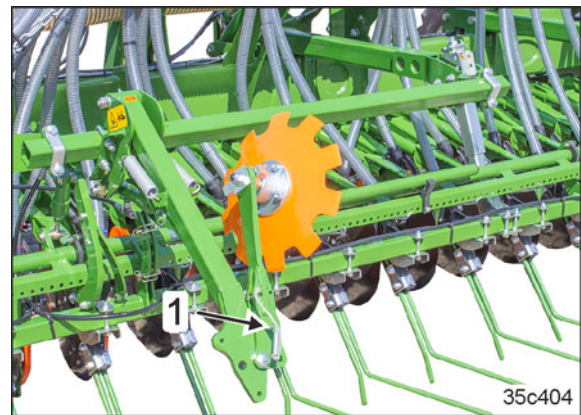


Fig. 243

10.5 Operating the filling auger

1. Move the filling auger (Fig. 244/1) into working position.

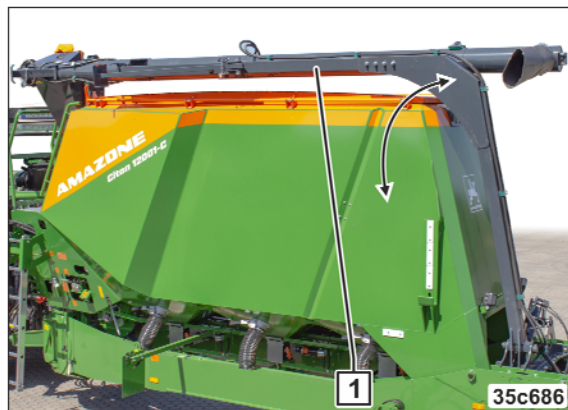


Fig. 244



DANGER

There should be no one standing on the loading board.

2. Actuate the control unit (Fig. 245/1).

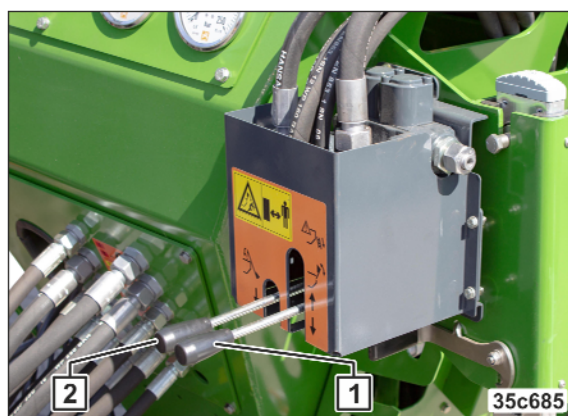


Fig. 245

3. Release the (Fig. 246/1) locking mechanism.

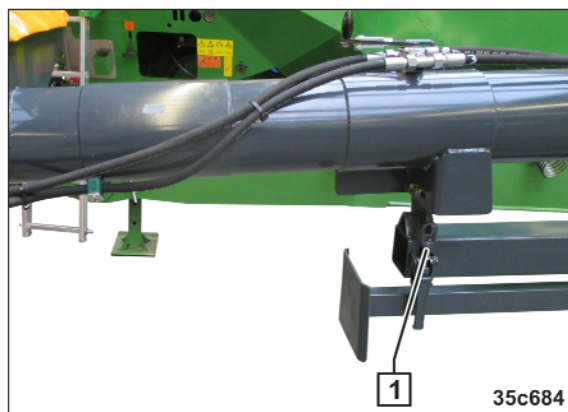


Fig. 246

4. Release locking mechanism (Fig. 247/1).
5. Swivel the jack (Fig. 247/2) down and lock it.
6. Swivel the jack (Fig. 247/3) down and lock it.
7. Using the handle, swivel the filling auger (Fig. 247/4) into working position.
8. Open the funnel tarp (Fig. 247/5).

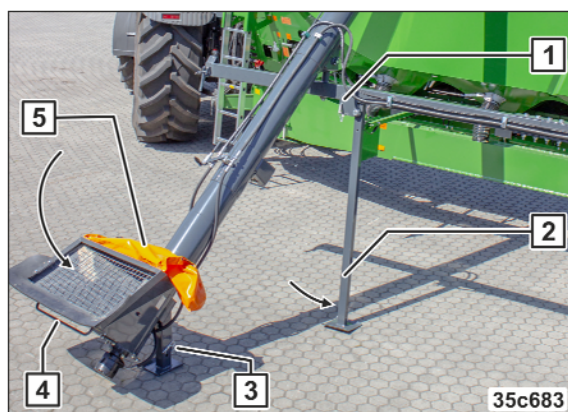


Fig. 247

9. Actuate the control unit (Fig. 248/2).

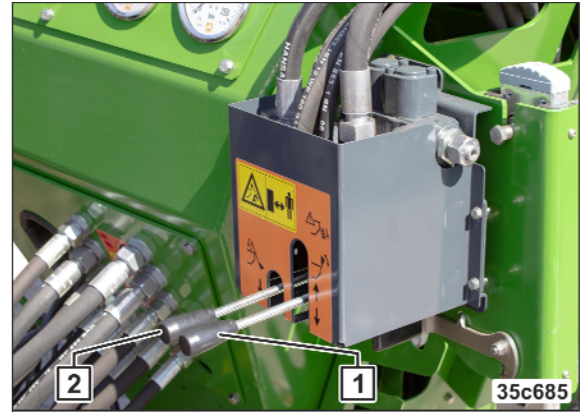


Fig. 248

10. Adjust the filling auger speed on the valve (Fig. 249/3).
11. The outlet (Fig. 249/1) is positioned over the desired hopper chamber by swivelling the filling auger using the handle (Fig. 249/2).
12. After the filling procedure, empty the filling auger completely into the hopper.
13. Close the funnel tarp (see Fig. 247/5).
14. Swivel the jack up and lock it (see Fig. 247/2).
15. Swivel the jack up and lock it (see Fig. 247/3).
16. Swivel the filling auger over the frame and lock it (see Fig. 246/1).
17. Actuate the control unit (see Fig. 245/1) and fold the filling auger into transport position.

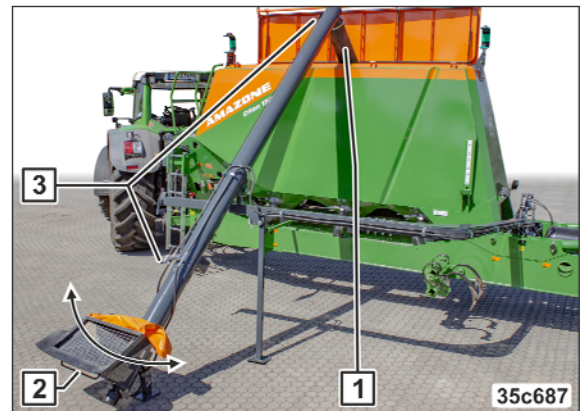


Fig. 249

10.6 Filling the hopper

**DANGER**

- Transportation on roads and paths with filled hoppers is prohibited. The brake system is designed only for an empty implement.
- Observe the approved filling levels and total weights.

**DANGER**

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

**CAUTION**

Before opening the hopper cover, switch off the fan.

When the fan is running and the cover is closed, the hopper is under pressure.

1. Couple the implement to the tractor (see section "Coupling and uncoupling the implement", page 101).
2. Before opening the hopper cover, switch off the fan.
When the fan is running and the cover is closed, the hopper is under pressure.
3. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
4. Determine the seed metering roller(s) based on the Table (Metering Rollers Table, page 71) and install (see section "Installing/removing the metering roller", page 127).
5. Adjust the fill level sensors of the hopper chambers (see section "Repositioning the fill level sensor", page 126).

Moving the ladder into working position

1. Actuate the lever (Fig. 250/1) and unlock the ladder.
2. Pull the ladder down (Fig. 250/2).

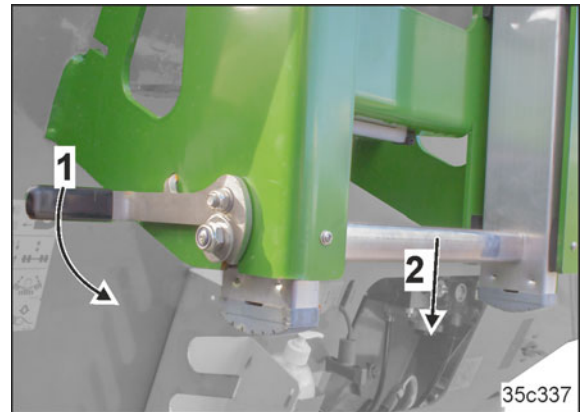


Fig. 250

3. Push the ladder into working position. Make sure that the ladder reaches the end position.
4. Climb on the loading board via the ladder.



Fig. 251

Opening the hopper cover

1. Unlock the pin (Fig. 252/1)



Fig. 252

2. Unlock the lever (Fig. 253/1)

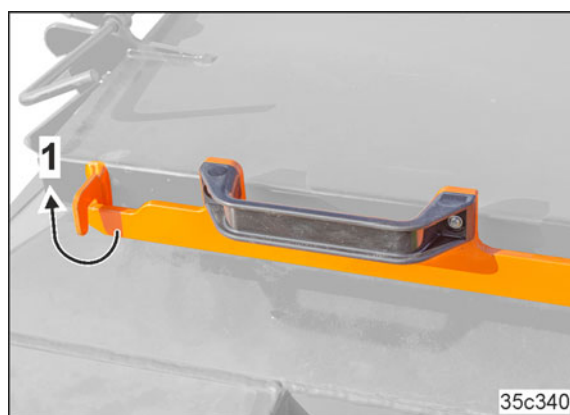


Fig. 253

3. Swivel the lever upwards. Ensure that the spring-loaded pin engages (Fig. 254/1).
The two handles (Fig. 254/2) are used for opening the hopper cover.

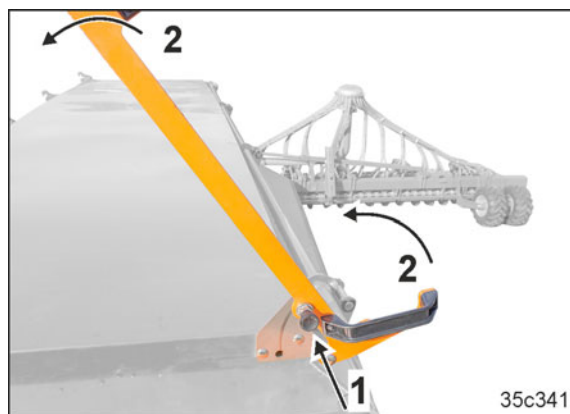


Fig. 254

4. Open the hopper cover (Fig. 255). Ensure that the hopper cover engages in the open position (Fig. 256/1).

If necessary, remove other parts from the sieves in the hopper.



DANGER

- Hold on to the grips (Fig. 255/1) of the hopper cover when standing on the sieves.
- You must not step on the sieve when the hopper is full and the transported material covers the sieve.

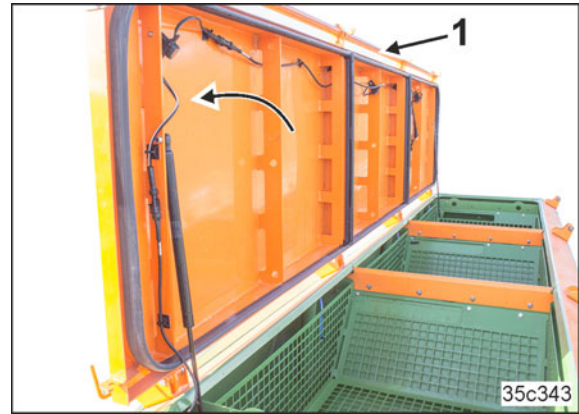


Fig. 255



Fig. 256

5. Fill the chambers of the hopper (Fig. 257)
 - o with the optional filling auger
 - o with a filling auger from a supply vehicle
 - o from bulk bags.



DANGER

- Never step between the supply vehicle and the implement!
- Never stand under suspended loads!



Fig. 257

Closing the hopper cover

1. Release the cover lock (Fig. 258/1)
2. Close the hopper cover.
The handles (Fig. 254/2) are used to close the hopper cover.

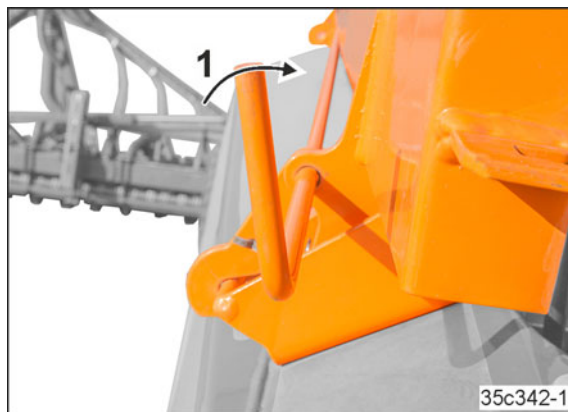


Fig. 258

3. Pull out the spring-loaded pin (Fig. 259/1) and swivel the lever (Fig. 259/2) downwards.

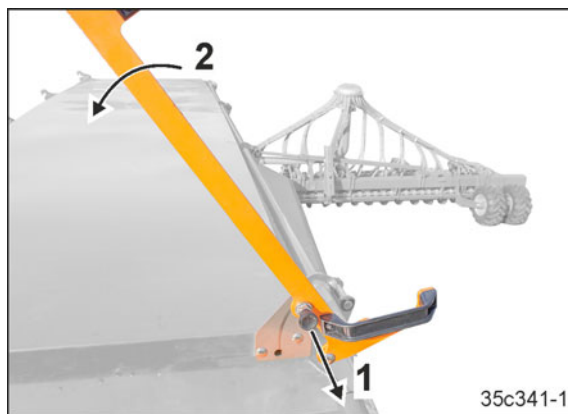


Fig. 259

4. Make sure that the spring-loaded pin engages (Fig. 260/1).

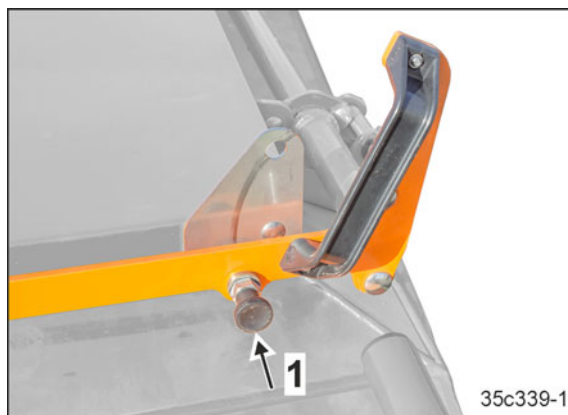


Fig. 260

5. Lock the lever (Fig. 261/1).

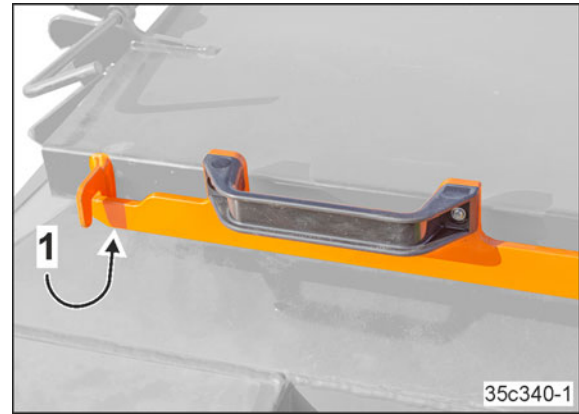


Fig. 261

Moving the ladder to parking position



The ladder must be moved to the parking position when not in use!

In working position, the ladder can be damaged by the drawbar or tractor when turning the implement.

1. Push the ladder up (Fig. 262/1).
2. Ensure that the spring-loaded locking device engages (Fig. 262/2).

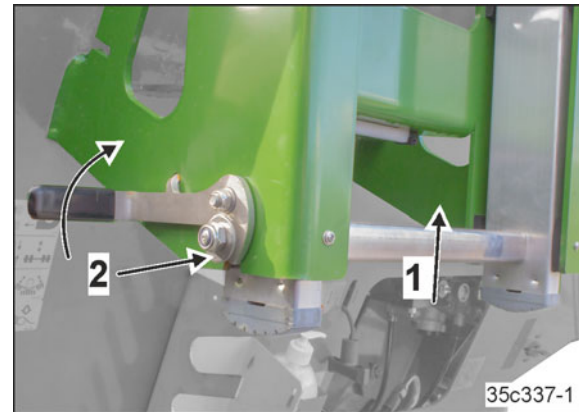


Fig. 262

10.7 Work commencement



DANGER

Direct persons out of the danger area of the implement, in particular from the swivel zone of the implement sections and the rear frame.

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

1. Unfold the implement and the star wheel into working position (see section "Unfolding/folding the implement booms", page 173).



When lowering the rear frame, pull the implement forward slightly.

2. Actuate the *red* tractor control unit.
→ Switch on the fan.
3. Check the fan speed and correct if necessary (see section "Adjusting fan speed", page 136).
4. Align the implement approximately horizontal.
 - 4.1 Lower/raise the tractor lower links.
5. Check the tramline rhythm/tramline counter and correct if necessary (see "ISOBUS software" / control terminal operating manual).
6. Start.
7. Check the placement depth of the seed and correct if necessary (see section "Checking the seed placement depth", page 191)
 - o after 100 m
 - o after changing from light to heavy soil and vice-versa.

10.7.1 Checking the seed placement depth

1. Spread seed for approx. 100 m at working speed on the field.
Drive ca. 100 m at working speed.
2. Expose the seed at a number of points, including the area of the outside coulters.
3. Check the seed placement depth.

10.8 During operation

The tyres can lose air during operation. Incorrect tyre inflation pressure impedes the spreading and placement.

Ensure that the proper tyre pressure is maintained during operation:

- Check the inflation pressure of the running gear tyres (see section 12.12.1)
- Check the tyre inflation pressure on the support wheels (see section 12.12.2).

Switching off the tramline counter

If the tramline counter is prevented from advancing when work is interrupted, press the STOP button (see "ISOBUS software" / control terminal operating manual).

Visual inspection of the distributor heads



Contamination, e.g. with fertiliser and seed residues, can block the distributor heads and must be removed immediately (see section "Clean the distributor head", page 203).

Visual inspection of the delivery lines



The delivery lines may not sag! Accumulations of e.g. fertiliser and seed residues cause increased wear and must be removed immediately.

10.8.1 Turning at end of the field

Before turning at the end of the field

1. Slow down your travel speed.
2. Do not reduce the tractor's rotational speed too far so that the hydraulic functions continue without interruption at the headland.
3. Keep actuating the *yellow* tractor control unit until the following are completely lifted:
 - o the rear frame (Fig. 263/1)
 - o the star wheel (optional)
 - o the tractor wheel mark eradicator (optional, Fig. 263/2)
4. Turn the implement.

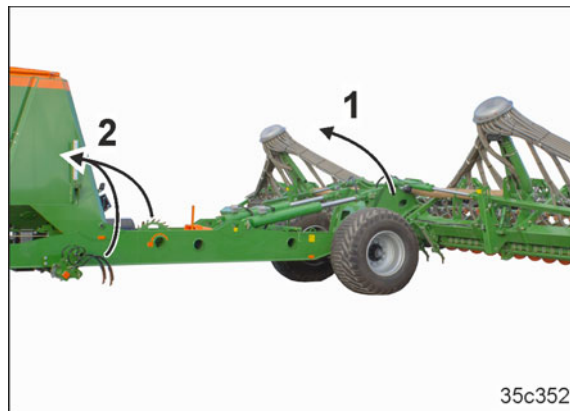


Fig. 263

When turning at the end of the field



Do not switch off the hydraulic blower fan drive while turning! If necessary, reduce the fan speed (minimum 1000 rpm), however, do not reduce it so far as to cause blockage in the conveyor section.

After turning at the end of the field

1. Keep actuating the *yellow* tractor control unit until the following are completely lowered:
 - o the coulters
 - o the star wheel.
2. Continue actuating the *yellow* tractor control unit for another 15 seconds and then put into neutral position

During the work, operate the *yellow* tractor control unit in neutral position.



The pressure gauge (Fig. 264/1) indicates the pressure that is applied to the hydraulic cylinders.

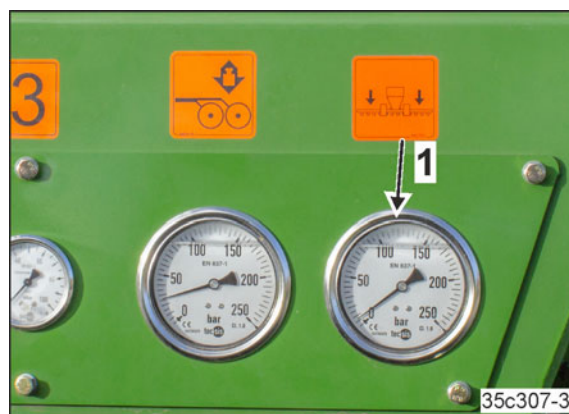


Fig. 264

10.9 End of work on the field



Seed residues left in the seed metering units can swell or germinate, if the seed metering unit is not completely emptied!

As a result, rotation of the metering rollers is blocked and damage can be caused to the drive!



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

1. Switch off the fan.
2. Empty the hopper and the metering units (see section 10.9.1, page 193).
3. Move the implement into transport position (see section 10.1, page 173).
4. Empty the filling auger (see section 12.2.2, page 204).
5. Switch off the control terminal.

10.9.1 Emptying the hopper and/or metering unit.



DANGER

Switch off the fan, apply the tractor parking brake, switch the tractor engine off and remove the ignition key.



CAUTION

When the fan is running and the cover is closed, the hopper is under pressure.



Empty and clean the metering unit after use!

In metering units that are neither emptied nor cleaned,

- a viscous to solid mass may form there if water enters under the metering roller. The metering roller is braked strongly and deviations may occur between the preset and actual seeding rates.
- seed residues and fertiliser may swell or germinate in the metering units. As a result, rotation of the metering rollers is blocked and damage can be caused to the drive!

10.9.2 Emptying the metering unit

The sticker (Fig. 265/1) should remind the tractor driver to empty and clean the metering unit after finishing the seeding work.

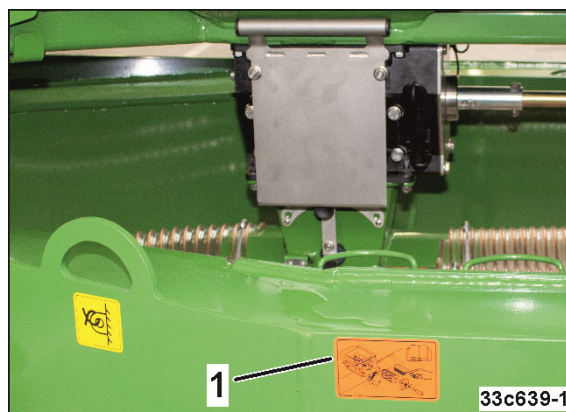


Fig. 265



The metering unit must be emptied and cleaned after completing the seeding work in all cases.

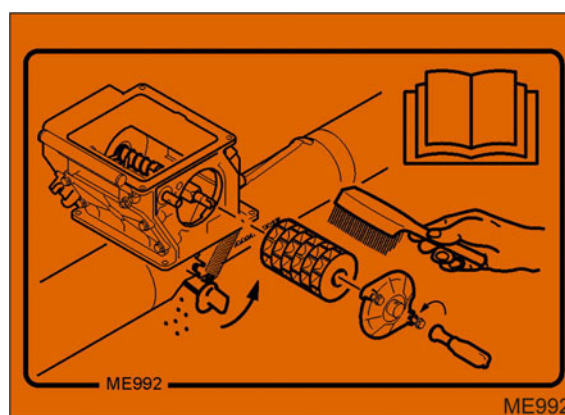


Fig. 266

1. Push a calibration trough (Fig. 267) into the bracket under the metering unit.



Fig. 267

2. Close the opening of the hopper above the metering unit with the shutter (Fig. 268/1) (see section "Installing/removing the metering roller", page 127).



Fig. 268

3. Loosen both tensioning hooks (Fig. 269/1) and open the folding on both delivery tubes.
- The seed drops into the calibration trough (Fig. 269/2).

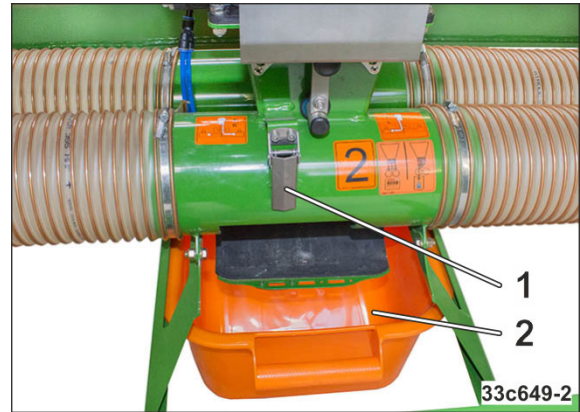


Fig. 269

4. Remove the metering roller (see section "Installing/removing the metering roller", page 127).
 5. Close the housing cover (Fig. 270/1).
 6. Pull the shutter (Fig. 268/1) slowly out of the metering unit.
- The seed drops into the calibration trough.
7. Reassembly occurs in the reverse sequence.
 8. Secure the calibration trough(s) (Fig. 72) on the transport bracket.

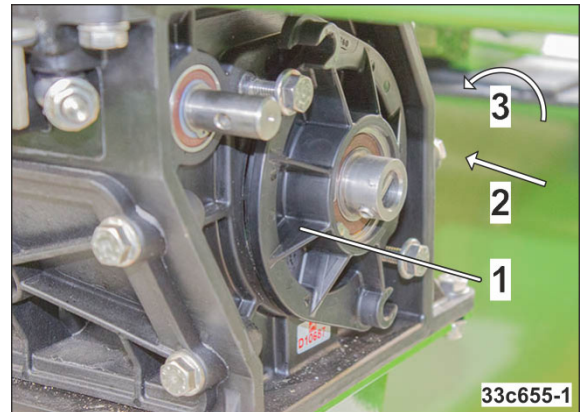


Fig. 270

11 Fault indications



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 away, before you eliminate any faults on the implement (see section 6.2, page 97).

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

11.1 Fault table

Fault	Possible cause	Remedy
Fan sensor alarmed	Alarm limit is not correctly set	Alter the alarm limit
	Oil volume too low or too high	Set the oil volume
	Fan sensor defective	Replace the fan sensor
Distance sensor not functioning (star wheel/Vario gearbox)	Distance sensor defective	Replace the distance sensor
Shutters in the distributor head (tramline control) not functioning	Tramline control is soiled	Clean the distributor head
		Clean the control disc
Charging signal is not turned off	V-belt is torn Generator is defective	Check V-belt Check generator
After establishing the electrical connection, the charging control signal is not turned on.	Charging control lamp is defective	Replace the charging control lamp
	Total discharge of the battery	Charge the battery with a charger
	Battery isolating relay is defective	Replace the battery isolating relay
One-sided switching	Resistance when switching	Check the folding in the metering unit and actuation rods for ease of movement.

11.2 Triggering the track marker safety (Citan 12001-C)

To pass obstacles, the active track marker can be folded and unfolded on the field. If the track marker still encounters a solid obstacle, a shear bolt shears off (Fig. 271/2) and thus protects the track marker from damage.

Only use original bolts (Fig. 271/3) as a replacement (see online spare parts list).

(Fig. 271/...)	Function	Tightening torque
1	Pivot point	210 Nm
2	Shear bolt	20 Nm

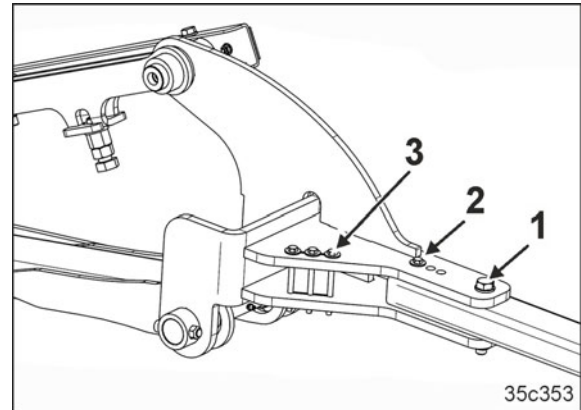


Fig. 271

11.3 Checking the fuses

The ISOBUS is protected by a fuse in the battery compartment (Fig. 272/1).

Amperage	Function
50 A	ISOBUS load circuit

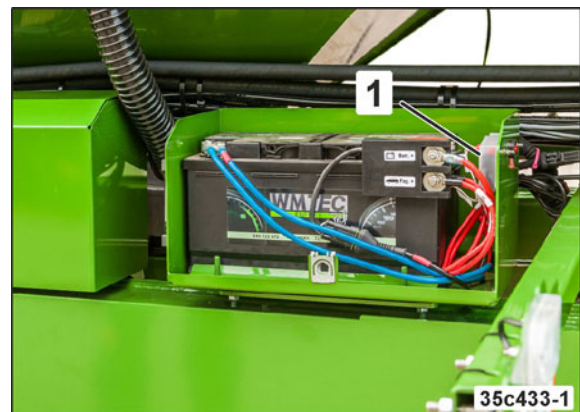


Fig. 272

The work lights are protected by a fuse in the switch (Fig. 273/1).

Amperage	Function
6.3 A	Independent work lights

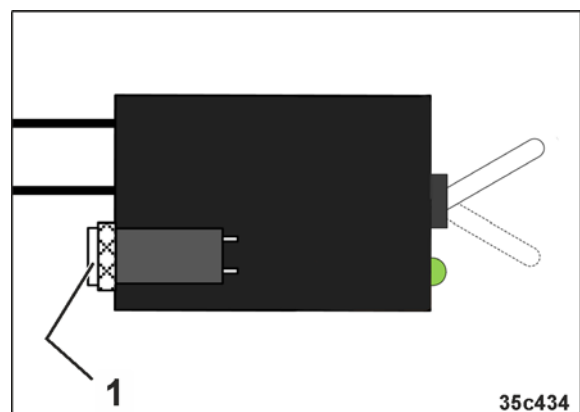


Fig. 273

11.4 Residual quantity display

When the seed level reaches the fill level sensor

- An alarm signal is issued.
- A message box appears on the control terminal. For example, the control symbol for the fill level is marked on the AMALOG⁺ (Fig. 274/1).

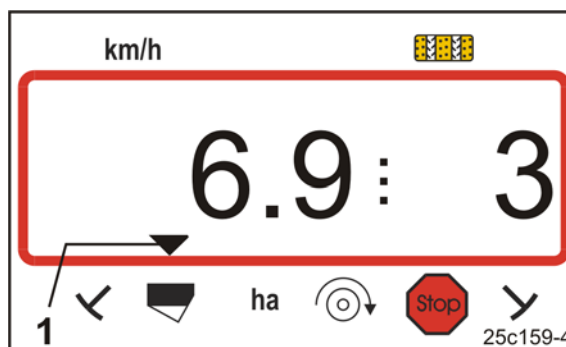


Fig. 274

11.5 Roller bar spring

Fig. 275/...

- (1) Roller bar spring
- (2) Spring support

Only use original parts as a replacement (see the online spare parts list).

(Fig. 275/...)	Function	Tightening torque
2	Spring support	10 Nm

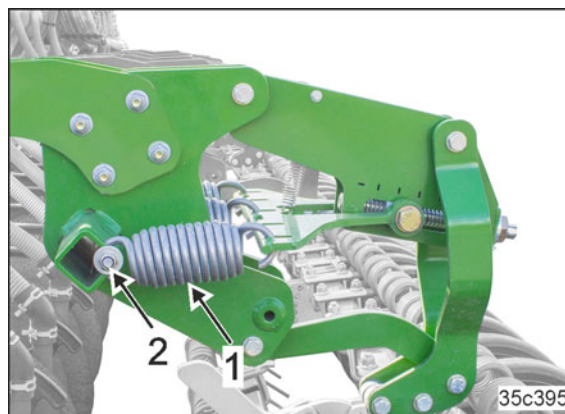


Fig. 275

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 away before you perform any cleaning, servicing or maintenance work on the implement. See page 97.



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 implement sections are unfolded (see section 10.1, page 173)
- The rear frame is fully lowered.
- 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 Securing the connected implement

Before working on the implement, place the implement coupled to the tractor on the jack (Fig. 276) to prevent unintentional lowering of the tractor's lower link.



Fig. 276

12.2 Cleaning the machine



DANGER

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

When emptying the hopper and metering housing or when removing dressing dust, e.g. with compressed air, wear a protective suit, face mask, safety goggles and gloves.



DANGER

**Completely unfold or fold the implement before cleaning it.
Never clean the implement if the rear frame and implement sections are not completely folded.**



- Pay particular attention to the brake, air and hydraulic hoses!
- Never treat brake, air and hydraulic hoses with petrol, 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 handling 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 cleaning nozzle of the high pressure cleaner/steam jet directly on lubrication points, bearings, rating plate, 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.



Empty the hopper of the metering unit before cleaning.



Clean the dirty fan guard screen to ensure an unobstructed air flow.

If the required quantity of air is not reached, faults may occur in the seed delivery and distribution.



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



The pictogram serves as a reminder never to aim the cleaning jet of the high-pressure cleaner/steam cleaner directly on

- electrical components
- lubrication points and bearings
- the rating plate, warning symbols, stickers and design foils.

The components can be damaged.



Fig. 277

1. Unfold or fold the implement completely before cleaning it (see section 10.1, page 173).
Never clean the implement if the rear frame and implement sections are not completely folded.
2. To clean, always place the implement coupled to the tractor on the jack (Fig. 276).
3. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.
4. Empty the hopper and the metering units (see section "Emptying the hopper and/or metering unit.", page 193).
5. Clean the distributor head (see section "Clean the distributor head", page 203).
6. Clean the implement with water or with a high pressure cleaner.

12.2.1 Clean the distributor head



WARNING

- Switch off the fan.
- Direct persons out of the danger area
 - before unfolding the implement sections
 - before folding down the distributor heads.
- Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.

1. Before working on the distributor heads, fold them to the rear over the frame of the implement sections:
2. The valve lever (Fig. 278/1) is in position "A".
3. Keep actuating the *green* control unit until both distributor heads are folded (Fig. 279/1, parking position).
4. Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.

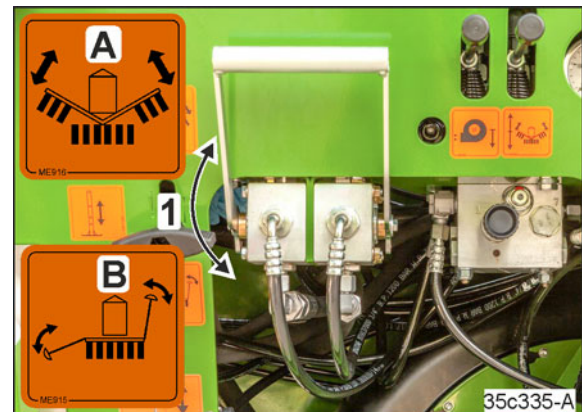


Fig. 278

5. Slacken the winged nuts (Fig. 280/1) and remove the clean plastic flap (Fig. 280/2) from the distributor head.
6. Remove any impurities with a brush, and wipe out the distributor head and plastic cap with a dry cloth.
7. Clean impurities between the base plate (Fig. 280/A) with compressed air.



Fig. 279

8. Install the plastic cap (Fig. 280/2).
9. Fix the plastic cap with winged nuts (Fig. 280/1).



Intensive cleaning requires the shutters to be removed. See section "Adjusting the tramline to the track width/wheelmark width", page 160.

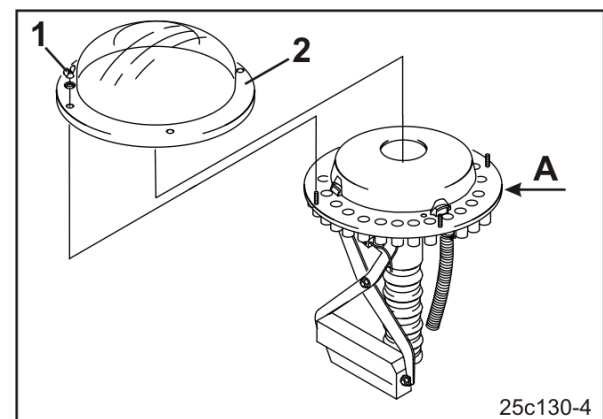


Fig. 280

12.2.2 Residual emptying of the filling auger

1. Put a suitable collecting bucket under the opening.
2. Remove the nut and disc (Fig. 281/1).
3. Open the flap (Fig. 281/3).
4. Collect the residual quantity.
5. Close the flap.
6. Put the nut and disc back on.

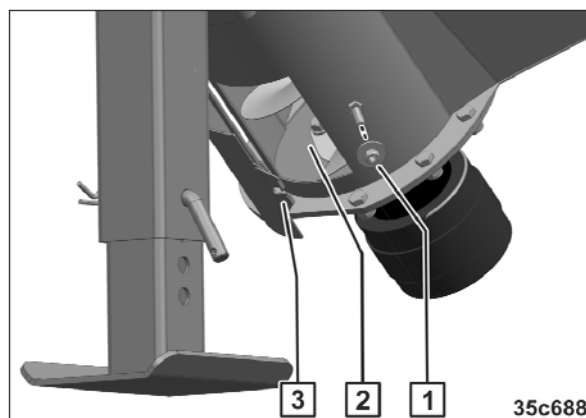


Fig. 281

12.3 Lubrication specifications



WARNING

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

The lubrication points on the implement are marked with a foil sticker (Fig. 282).

Carefully clean the grease nipple and grease gun before lubrication so that no dirt is pressed into the bearings. Press the dirty grease completely out of the bearings and replace with new grease!

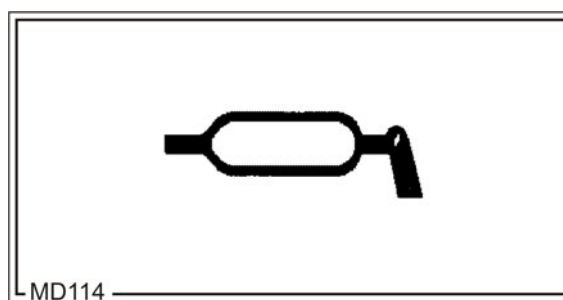


Fig. 282



During the first operating hours, the excess grease will be pressed out and a light oil film forms on the bearing.

After the first heating up, no more grease/oil should escape.

Lubricants



For lubrication work use a lithium saponified multipurpose grease with EP additives:

Company	Lubricant designation
ARAL	Aralub HL2
FINA	Marson L2
ESSO	Beacon 2
SHELL	Retinax A

12.3.1 Overview of lubrication points

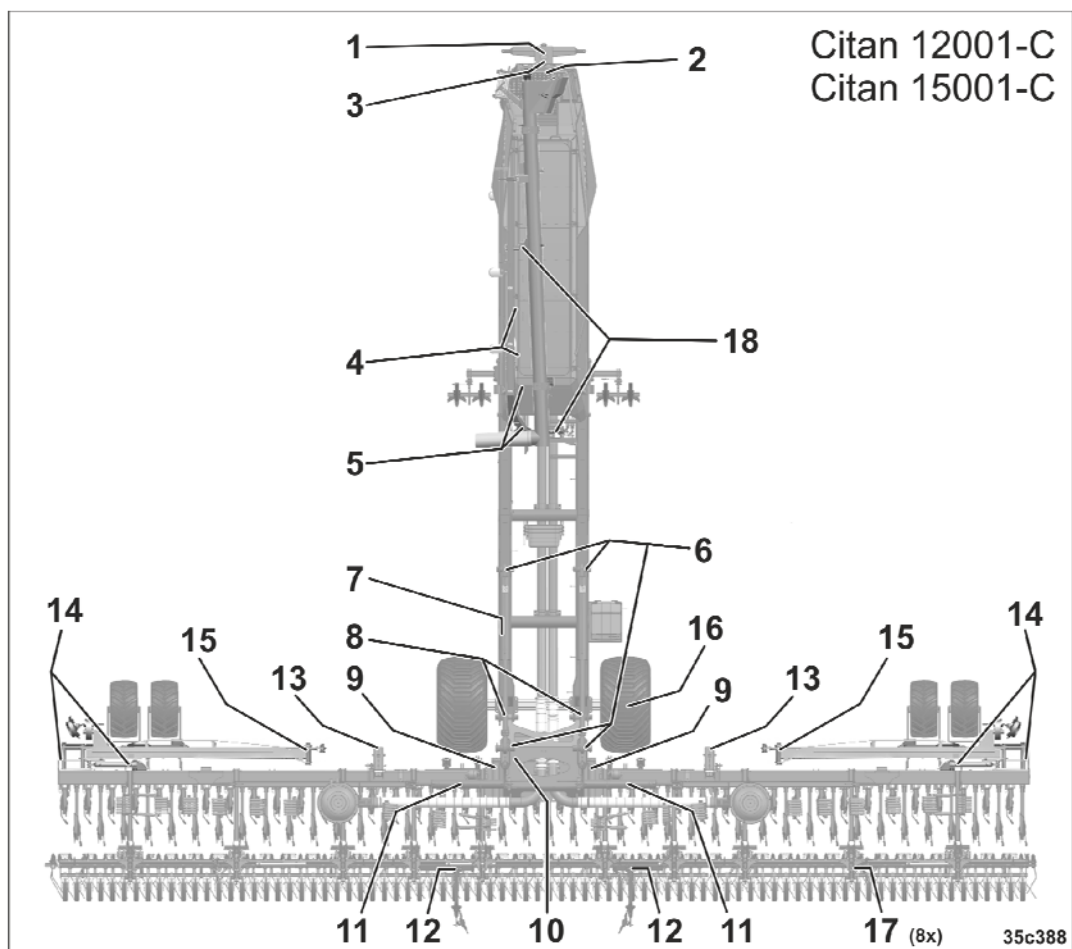


Fig. 283

Fig. 283/...	Assembly group	Number	see Figure	Lubrication interval [h]
1	Tensioned crosspiece	5	Fig. 284/1	25
2			Fig. 285/1	
3			Fig. 286/1	
4	Tractor wheel mark eradicator	2	Fig. 296/1...2	25
5	Star wheel / drive	2	Fig. 294/1 to Fig. 295/1	25
6	Hydraulic cylinder pivot points	4	Fig. 288/1 to Fig. 289/1	25
7	Parking brake (optional, not shown)	1	Fig. 293/1	25
8	Rear frame pivot point	2	Fig. 287/1	25
9	Implement section pivot points	4	Fig. 292/1	25
10	Lighting (optional)	4	Fig. 300/1...2	25
11	Hydraulic cylinder pivot points	6	Fig. 290/1 to Fig. 291/1	25
12	Tramline marker (optional)	2	Fig. 302/1	25
13	Coulter pressure adjustment pivot point	2	Fig. 301/1	25
14	Track marker (optional, only for Citan 12001-C)	8	Fig. 297/1...3 to Fig. 298/1	25
15		6	Fig. 299/1...3	25
16	Axle	6	See section 12.14.1	Page 221
17	Setting spindle (only on the exact following harrow)	8	Fig. 303/1	25
18	Filling auger section	3	Fig. 304/1...3	25
	Filling auger pivot point		Fig. 305/1	25



Fig. 284

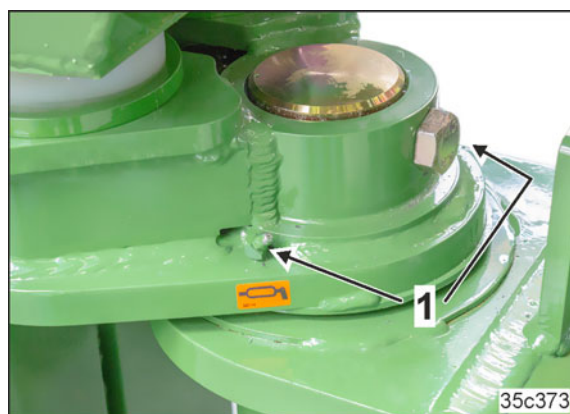


Fig. 285



Fig. 286

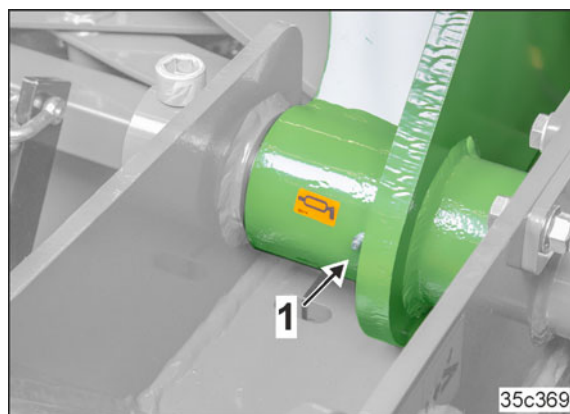


Fig. 287

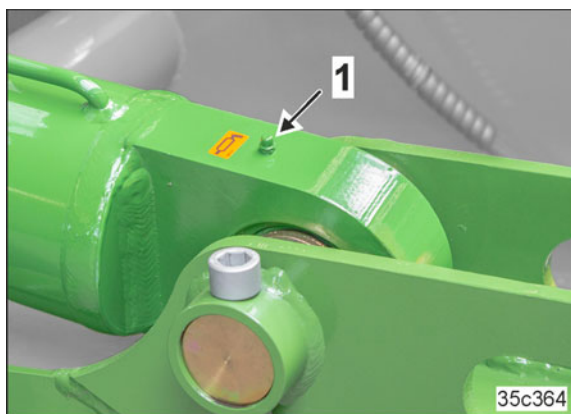


Fig. 288

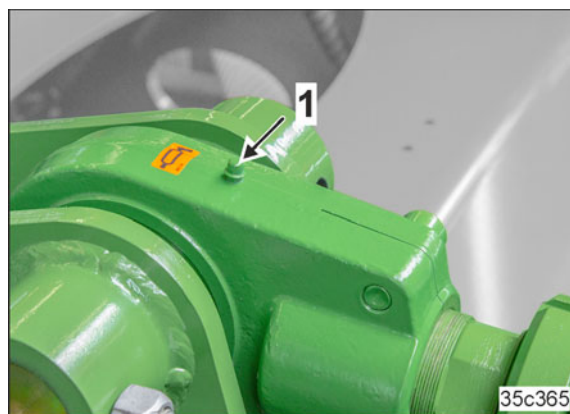


Fig. 289

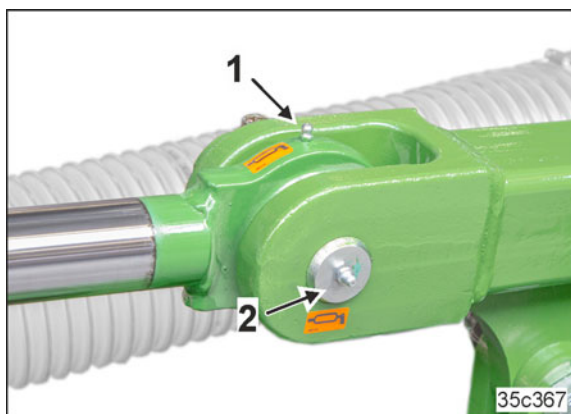


Fig. 290

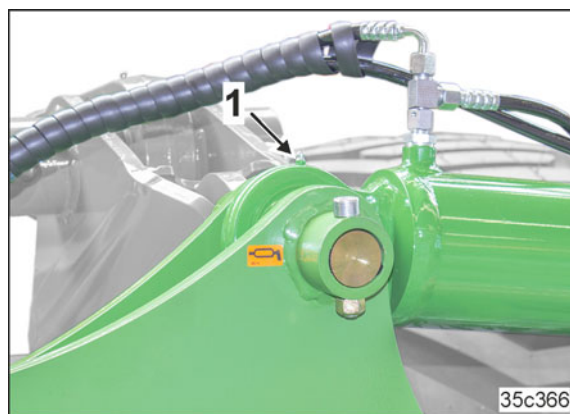


Fig. 291

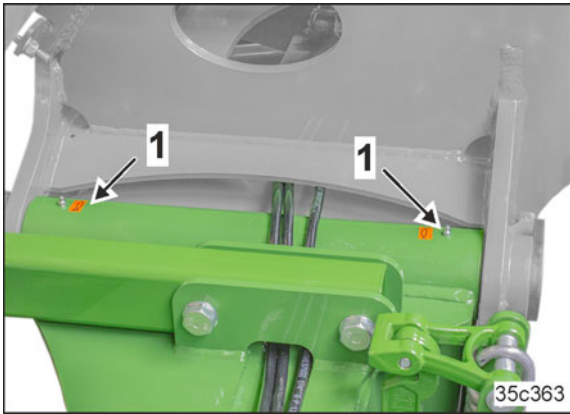


Fig. 292

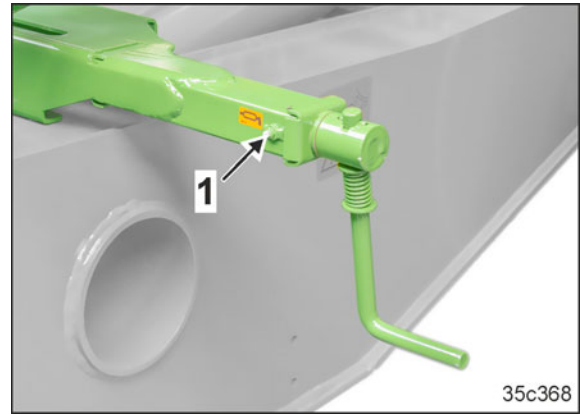


Fig. 293

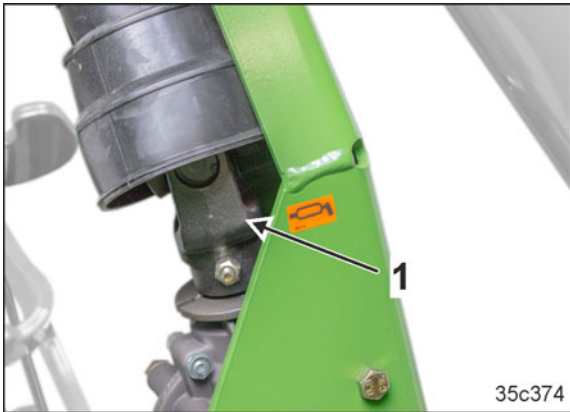


Fig. 294

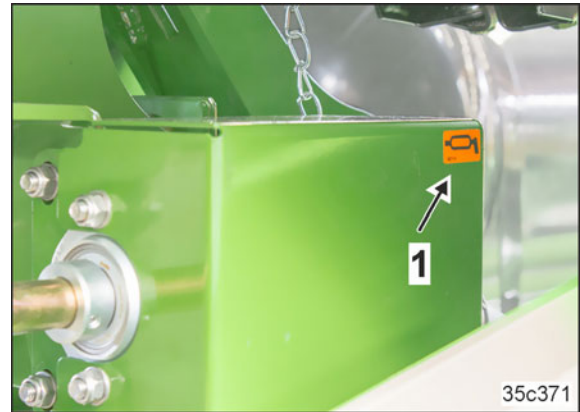


Fig. 295

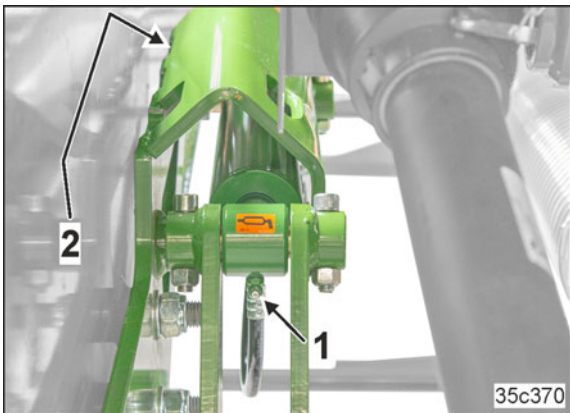


Fig. 296

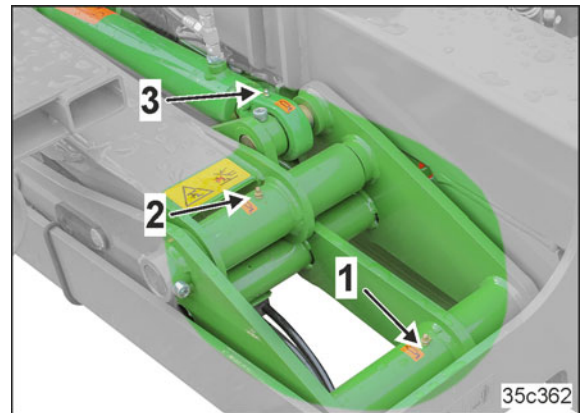


Fig. 297

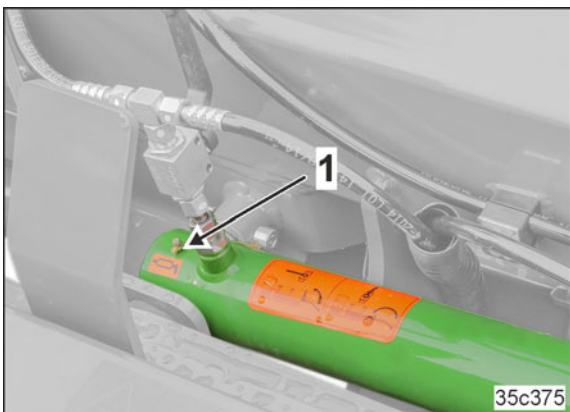


Fig. 298

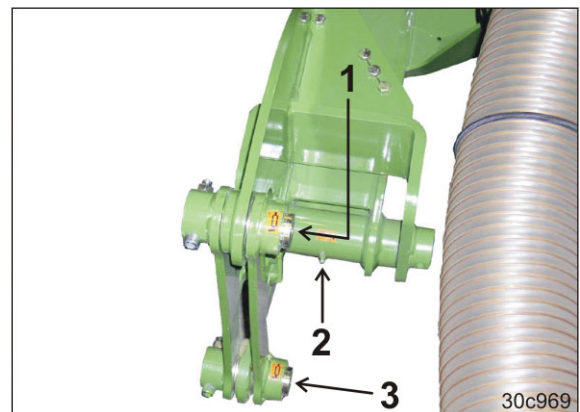


Fig. 299

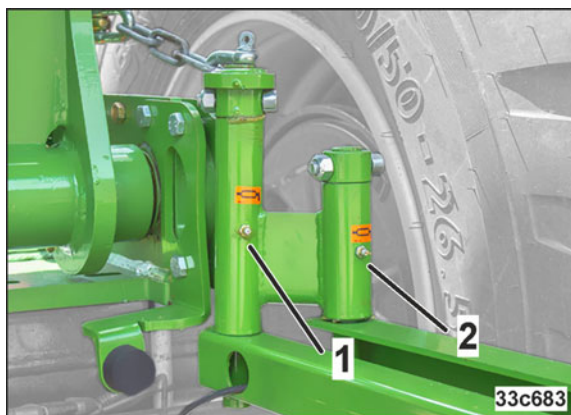


Fig. 300



Fig. 301

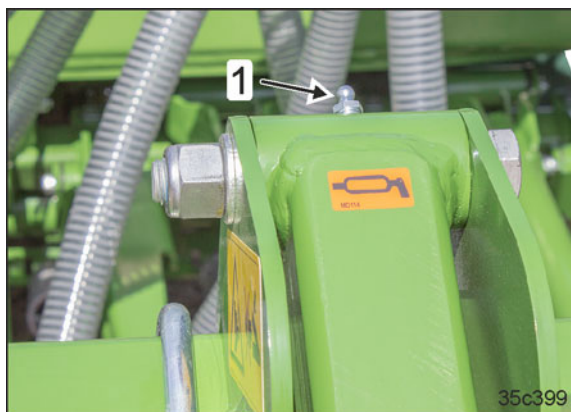


Fig. 302



Fig. 303

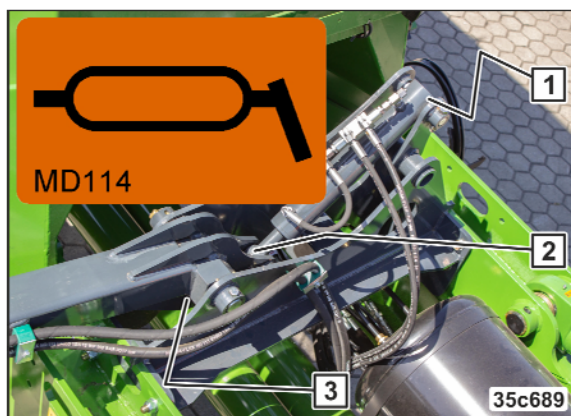


Fig. 304

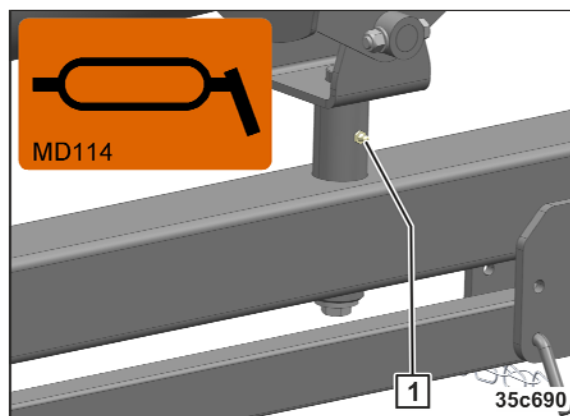


Fig. 305

12.4 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.

Before initial operation (before the season starts)		
Specialist workshop	Check and service the hydraulic hose lines. See section "Inspection criteria for hydraulic hose lines". The inspection has to be recorded by the owner/operator.	Section 12.16.2
	Checking the oil level in the Vario gearbox	Section 12.10
	Check the inflation pressure of the running gear tyres	Section 12.12.1
	Check the tyre inflation pressure on the support wheels	Section 12.12.2
	General visual inspection of the service brake system	Section 12.14.3.1
	Tension the V-belt generator (optional)	Section 12.9.3
	Install the metering rollers	Section 8.2
	Close the sluices of the metering unit housing	Section 8.3.1
After the first 10 operating hours		
Specialist workshop	Check Tightening torques	Section 12.13
	Check and service the hydraulic hose lines. See section "Inspection criteria for hydraulic hose lines". The inspection has to be recorded by the owner/operator.	Section 12.16.2
After the first 20 operating hours		
Specialist workshop	Check all bolted connections for a secure fit.	Section 12.17
Before each start-up (daily)		
	Check and service the hydraulic hose lines. See section "Inspection criteria for hydraulic hose lines". The inspection has to be recorded by the owner/operator.	Section 12.16.2
	Visual inspection of the dual-circuit pneumatic braking system	Section 12.14.4.1
	Visual inspection of the tensioned crosspiece	Section 12.6
Immediately after beginning work		
	Checking the seed placement depth	Section 10.7.1

Hourly (e.g. when refilling the seed hopper)		
	Checking the seed placement depth	Section 10.7.1
	Check distributor head(s) for impurities and clean if necessary (see section "Clean the distributor head")	Section 12.2.1
	Check metering unit for impurities and clean if necessary (see section "Emptying the hopper and/or metering unit.")	Section 10.9.1
	Check for and remove any impurities in the conveyor sections and hoses	
	Check for and remove any impurities on the fan suction protective screen	Section 12.11
After finishing work (daily)		
	Emptying the metering unit	Section 10.9.2
	Clean the oil cooler (optional) with compressed air (danger of overheating). Under extremely dusty conditions, clean the oil cooler several times daily.	
	Clean the fan (risk of unbalancing)	
	Cleaning the machine (as required)	Section 12.2
	Clean the distributor head	Section 12.2.1
	Residual emptying of the filling auger	Section 12.2.2
Every week, at least every 50 operating hours		
	Check and service the hydraulic hose lines. See section "Inspection criteria for hydraulic hose lines". The inspection has to be recorded by the owner/operator.	Section 12.16.2
Every 2 weeks (at least every 100 operating hours)		
Specialist workshop	Check and service the hydraulic hose lines. See section "Inspection criteria for hydraulic hose lines". The inspection has to be recorded by the owner/operator.	Section 12.16.2
	Checking the oil level in the Vario gearbox	Section 12.10
	Check the inflation pressure of the running gear tyres	Section 12.12.1
	Check the tyre inflation pressure on the support wheels	Section 12.12.2
	General visual inspection of the service brake system	Section 12.14.3.1
	Check the on-board hydraulic system (oil quantity and oil filter)	Section 12.15

Every 2 weeks (at least every 200 operating hours)		
	Lubrication points on the axle	Section 12.14.1
	Checking the tightening torques of the section struts	Section 12.13.3
Every 3 months, at the latest every 500 operating hours		
Specialist workshop	Brake inspection (specialist workshop)	Section 12.14.5
	Checking the pressure in the compressed air tank of the dual-circuit pneumatic braking system (specialist workshop)	Section 12.14.5.1
	Leak test of the dual-circuit pneumatic braking system (specialist workshop)	Section 12.14.5.2
	Cleaning the line filters	Section 12.14.5.3
	Exterior inspection of the compressed air tank (dual-circuit pneumatic braking system)	Section 12.14.4.2
Every 6 months (after the season ends)		
	Servicing roller chains and chain wheels	Section 12.8
	Relieve the V-belt generator (optional)	Section 12.9.3
Every 6 months, at the latest every 1000 operating hours		
Specialist workshop	Adjustment on the slack adjuster (specialist workshop)	Section 12.14.5.4
	Checking/adjusting the bearing clearance of the wheel hubs (specialist workshop)	Section 12.14.2
	Checking the brake drum for dirt (specialist workshop)	Section 12.14.3.4
	Brake pad check	Section 12.14.3.5
	Lubrication points on the axle	Section 12.14.1
	Check Tightening torques	Section 12.13
After changing the tyres		
Specialist workshop	10 hours after a wheel change, Check tightening torques of wheel nuts	Section 12.13.1
	Check the inflation pressure of the running gear tyres	Section 12.12.1
	Check the tyre inflation pressure on the support wheels	Section 12.12.2

12.5 Winter storage and long periods out of operation

1. Park the implement on firm and level ground (see section 7, page 101).
2. Clean and dry the implement thoroughly (see section 12.2, page 200).
3. To prevent rust, protect the seeding coulters with an environmentally friendly anti-corrosion agent.
4. To allow condensation water to escape, the metering rollers must be removed (see section 8.2, page 127) and the sluices of the metering unit housing must remain open (see section 8.3.1, page 129).
5. Lubricate the implement (see section 12.3, page 204).
6. Servicing roller chains and chain wheels (section 12.8, page 216).
7. Check the inflation pressure of the running gear tyres (section 12.12.1, page 218).
8. Depending on the implement equipment: Disconnecting the power supply, store the battery in the dry place for the winter (section 12.9.2, page 216).
9. Depending on the implement equipment: Relieve the V-belt generator (section 12.9.3, page 217).

12.6 Visual inspection of the tensioned crosspiece



WARNING

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

Check the tensioned crosspiece and the drawbar for visible defects whenever the implement is coupled. Have any visible defects fixed without delay in a specialist workshop.

Fig. 306/...

- (1) Thorough visual inspection of the drawbar for the beginning of cracks.

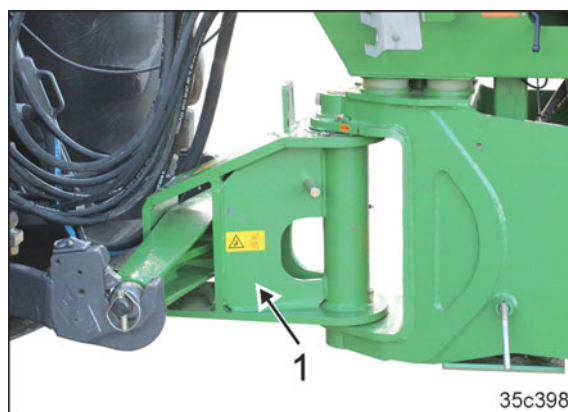


Fig. 306

12.7 Replacing the grid on the RoTeC pro Control coulter

Replace the grid in case of wear:

1. Remove the depth control disc/wheel (Fig. 307/1).
2. Loosen the socket head bolt 16X 45 (Fig. 308/1)
 - o Tightening torque: 220 Nm.
3. Remove the coulter disc (Fig. 308/2).
4. Loosen 2 lock nuts M 8 (Fig. 309/1)
5. Replace the grid (Fig. 309/2).
6. Put on 2 lock nuts M 8 (Fig. 309/1) and tighten them
 - o Use new lock nuts
 - o Tightening torque: 25 Nm.
7. Install the coulter disc (Fig. 308/2).
8. Put on a socket head bolt 16X 45 (Fig. 308/1) and tighten it
 - o Tightening torque: 220 Nm.
9. Install the depth control disc/wheel (Fig. 307/1) and move to the desired position.

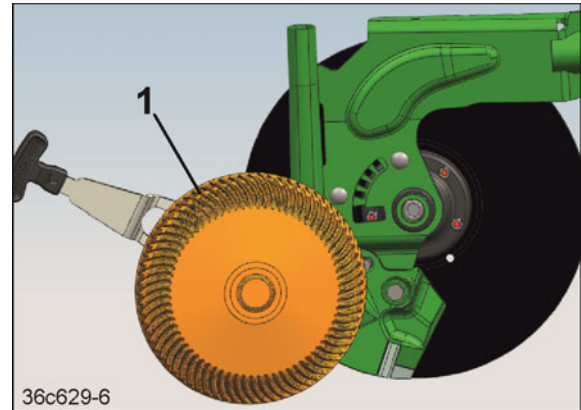


Fig. 307

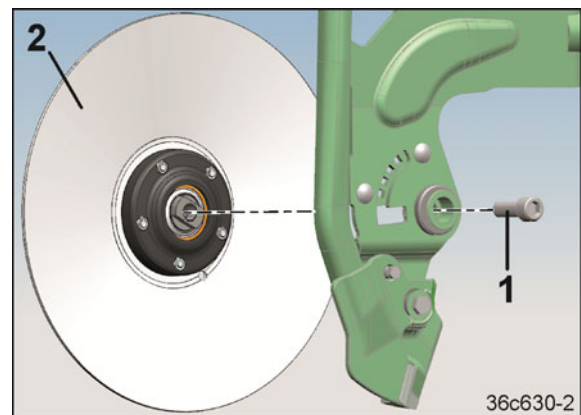


Fig. 308

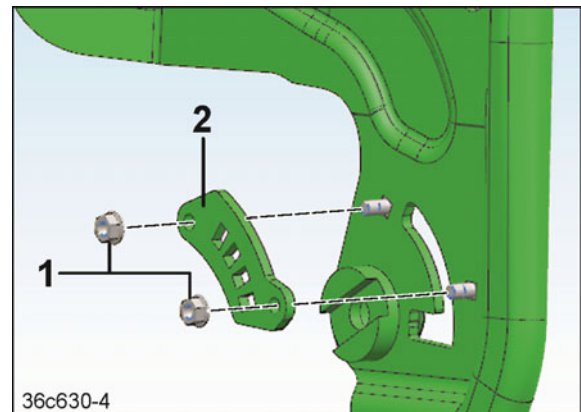


Fig. 309

12.8 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).

12.9 On-board electrical system maintenance

A well conducting connection must always be established between the generator and the ground connection of the battery. All parts of the system such as the cable, connector, etc. must be connected correctly. The cable insulation must not be damaged.



DANGER

Repair damaged cables immediately!

12.9.1 Battery

The battery (Fig. 310/1) and the fuse (Fig. 310/2) are located under the flap on the right side of the implement.

- The battery is maintenance free.
- If the battery has to be charged using a quick charger, first remove the pole terminals!



During welding work on the machine.

- Always disconnect the power supply from the tractor.
- Disconnect the battery cable.

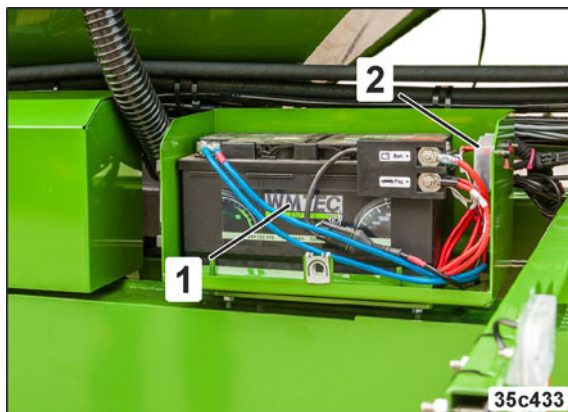


Fig. 310

12.9.2 Disconnecting the power supply

- Ensure that the battery is connected correctly – connect the positive terminal first 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 risk of explosion
- Store the batteries in a dry area during the winter periods (corrosion).

12.9.3 V-belt generator



WARNING

- Only carry out work / functional checks on the belt drive when the engine is stopped!
- Apply the tractor parking brake, switch the tractor engine off and remove the ignition key.

Before the season starts, when required or following replacement, tension the V-belt using the tensioning device.

1. Open the housing
2. Loosen the bolts (Fig. 311/1)
3. Tension the V-belt using the generator (Fig. 311/2)
4. Tighten the bolts.
5. Close the housing

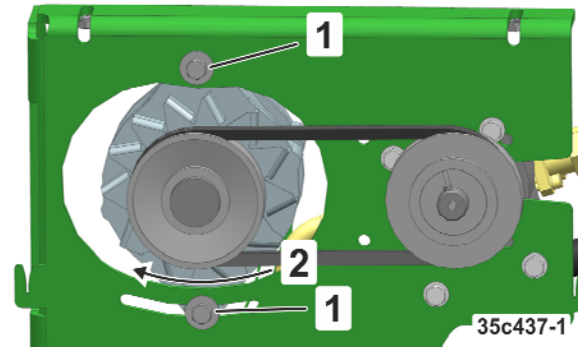


Fig. 311

12.10 Checking the oil level in the Vario gearbox

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



The oil level must be visible in the oil sight glass (Fig. 312/1).

There is no need to change the oil.

3. Top up the oil if necessary.



The oil filler neck (Fig. 312/2) is used to top up the Vario gearbox.

Refer to the table (Fig. 313) for the grade of transmission oil required.

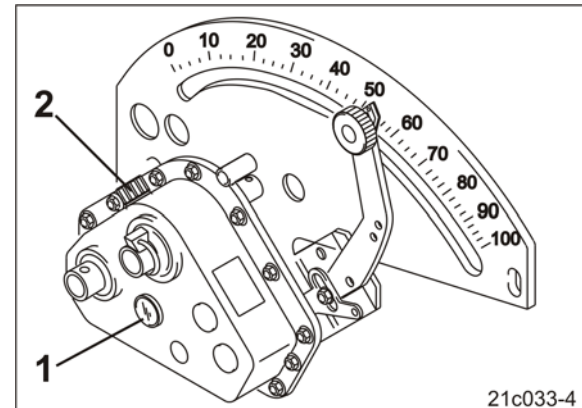


Fig. 312

Hydraulic fluid grades and fill level of the Vario gearbox

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

Fig. 313

12.11 Cleaning the oil cooling / air pre-warming

1. Position the implement on a horizontal surface.
2. Clean the fan suction protective screen (Fig. 314/3).
3. Loosen and remove all of the knurled nuts (Fig. 314/1).
4. Remove the fan suction protective screen.
5. Clean the heat exchanger (Fig. 314/2).
6. Install the screen basket.
7. Put on all of the knurled nuts and tighten by hand.

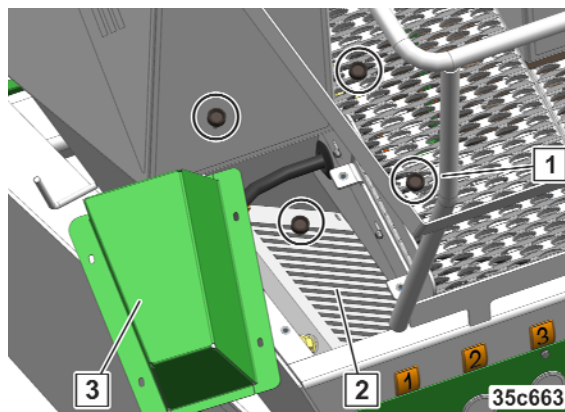


Fig. 314

12.12 Wheels / tyres



Adhere to the inspection intervals
(see section Maintenance schedule – overview, page 211).

12.12.1 Check the inflation pressure of the running gear tyres



Inflate the tyres with the indicated nominal pressure.

- The value for the nominal pressure can be read on the rim.
- The value for the nominal pressure can be obtained from the tyre manufacturer.



- Check the tyre pressure regularly when the tyres are cold, i.e. before starting to drive, see page 49.
- The difference in pressure between the tyres on one axle must be no greater than 0.1 bar.
- Tyre pressure can be raised by up to 1 bar after a fast run or in warm weather. Tyre pressure should never be reduced in this case, as it is then too low when the tyres cool down.

12.12.2 Check the tyre inflation pressure on the support wheels

Check compliance with specified tyre pressure
(see table Fig. 315).

Tyres	Nominal tyre inflation pressure
400/50-15.5	2.5 bar
31 x 15.5-15	4.3



Fig. 315

12.13 Tightening torques



Adhere to the inspection intervals
(see section Maintenance schedule – overview, page 211).

12.13.1 Check tightening torques of wheel nuts

Check compliance with tightening torques
(see table Fig. 316).

	Wheel nut	Tightening torque
(1)	M22x1.5...10.9	400 Nm



Fig. 316

Fig. 317

12.13.2 Checking the tightening torques of the axle bolts

Fig. 318/...

(1) Axle bolts with clamping plates

Check the bolts for tightness.

Required tightening torque: 592 Nm

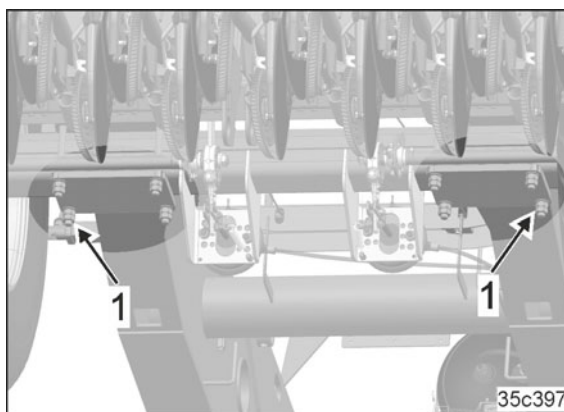


Fig. 318

12.13.3 Checking the tightening torques of the section struts

Check compliance with tightening torques
(see table Fig. 317).

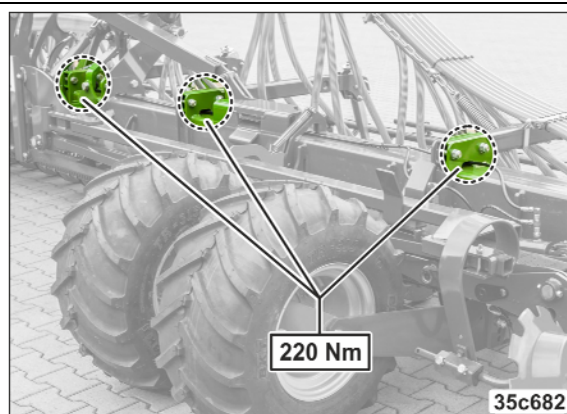
	Section brace	Tightening torque
(1)	M24x1.5...8.8	714 Nm



12.13.4 Check the tightening torques of the roller harrow holding arms

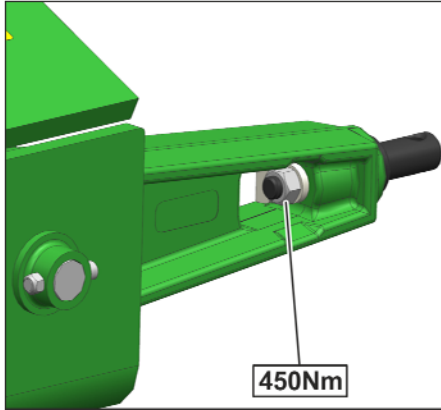
Check compliance with tightening torques
(see table Fig. 317).

	Roller harrow holding arms	Tightening torque
(1)	M20x110 8.8	220 Nm



12.13.5 Check the tightening torques of the lower link pins

	Wheel nut	Tightening torque
(1)	M22x1.5...10.9	450 Nm



450Nm

35c658-1

12.14 Axle and brake

12.14.1 Lubrication points on the axle

Fig. 319/...	Designation	Quantity	Lubrication interval
1	Brake shaft bearings	4	200
2	Automatic slack adjuster	2	1000
3	Renew the wheel hub bearing grease (Check for wear on the taper roller bearings)	2	1000

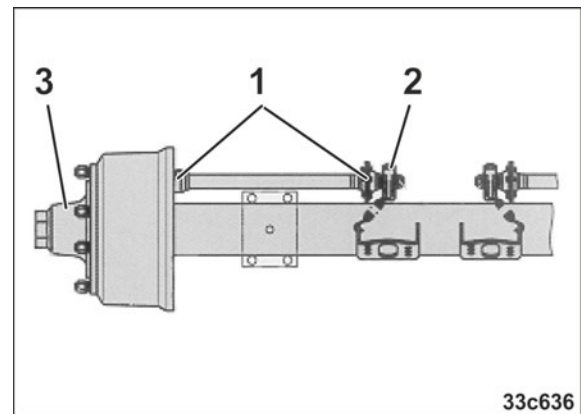


Fig. 319



Use only lithium-soap-based grease with a drop point above 190° C.



DANGER

Grease and oil must not get into the brake.

The cam bearing for the brake is, depending on the series, not sealed.

12.14.2 Checking/adjusting the bearing clearance of the wheel hubs (specialist workshop)

Checking the bearing clearance of the wheel hubs:

1. Raise the axle until the tyres come free.
2. Release the brake.
3. Place two levers between the tyre and the ground and check the bearing clearance.
4. Adjust the bearing if there is a noticeable bearing clearance.

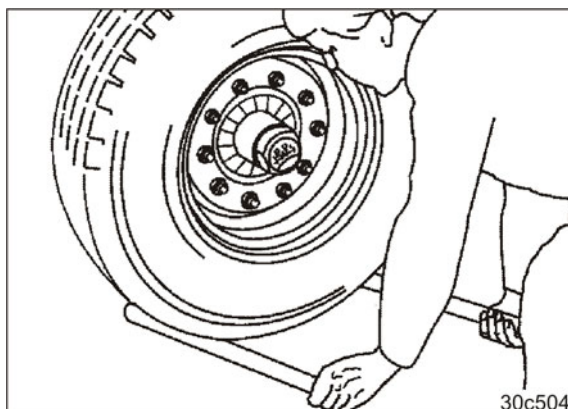


Fig. 320

Adjusting the bearing clearance of the wheel hubs:

1. Remove the dust or hub cap.
2. Remove the cotter pin from the axle nut.
3. Tighten the wheel nut by simultaneously turning the wheel until the run of the wheel hub is lightly braked.
4. Turn the axle nut back to the next possible lynch pin hole.
If there is congruence, to the next hole (max. 30°).
5. Replace the cotter pin with an identical one.
6. Insert the cotter pin and bend it up slightly.
7. Replenish the dust cap with some long-term grease and pound or screw it into in the wheel hub.

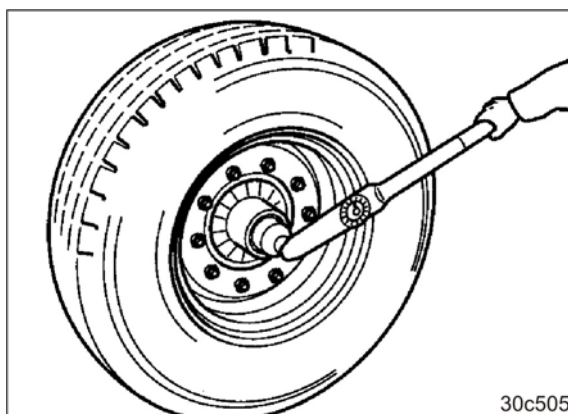


Fig. 321

12.14.3 Service brake system (all variants)

valid for

- Dual-circuit pneumatic service brake system
- Hydraulic service brake system

12.14.3.1 General visual inspection of the service brake system

Perform the general visual inspection at regular intervals (see section Maintenance schedule – overview, page 211).

Test points:

- Piping, hose lines and coupling heads must not be externally damaged or rusted.
- Connecting rods, e.g. on fork heads, must be properly secured, easy to move, and not worn out.
- Ropes and cables
 - must be properly run
 - must have no visible cracks
 - may not be knotted.
- Check the brake cylinder piston stroke.



If the visual inspection, function or action testing of the service brake system shows any signs of deficiencies, have a thorough inspection of all components performed immediately at a specialist workshop.



DANGER

Only specialist workshops or recognised brake service companies may perform adjustment and repair work on the brake system.

12.14.3.2 General function check of the service brake system

Carry out a brake test at regular intervals (see section Maintenance schedule – overview, page 211) to check whether the tractor achieves the required braking delay with the trailed implement.



DANGER

Perform the brake test on non-public roads or tracks and make sure to avoid rear-impact crashes with other road users.

Never perform a brake test when other road users are following you.

12.14.3.3 Checking the service brake system for safe operating condition (specialist workshop)

Have the service brake system checked for safe operating condition by a specialist workshop at regular intervals (see section Maintenance schedule – overview, page 211).



In Germany Section 57 of the regulation BGV D 29 of the industrial injuries mutual insurance organisation requires as follows: the keeper has to have vehicles tested as required, however at least once annually, by an expert as to their safe operating condition.

Observe the legal regulations for all service work. Only genuine spare parts may be used.

12.14.3.4 Checking the brake drum for dirt (specialist workshop)

1. Unscrew the two cover plates (Fig. 322/1) on the inside of the brake drum.
2. Remove any dirt and plant residue.
3. Refit the cover plates.

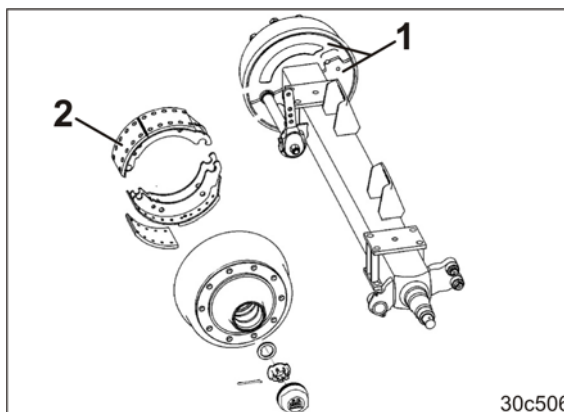


Fig. 322



CAUTION

Penetrating dirt may clog the brake linings (Fig. 322/2), which considerably reduces the braking power.

Risk of accident!

If there is dirt in the brake drum, the brake linings must be checked by a specialist workshop.

For this purpose, the wheel and brake drum must be detached.

12.14.3.5 Brake pad check

To check the brake pad thickness, open the inspection hole (Fig. 323/1) by opening the rubber tab.

Changing the brake pads → Workshop work

Criterion for changing the brake pads:

- Minimum pad thickness of 5 mm was reached.
- Wear edge (Fig. 323/2) was reached.

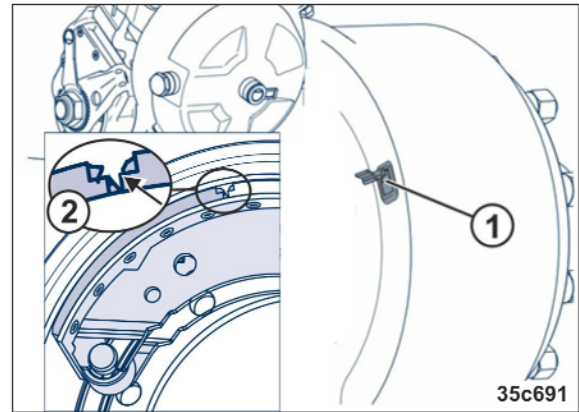


Fig. 323

12.14.4 Dual-circuit pneumatic braking system



For optimum brake performance with a minimum of wear, we recommend that the brakes on the tractor are balanced with those on the implement. After the service braking system has been run in for a suitable period, arrange for the brakes to be synchronised by a specialist workshop.

To avoid problems with the brakes, adjust all vehicles in accordance with EC Guideline 71/320 EEC.



DANGER

- Only specialist workshops or recognised brake services may perform adjustment and repair work on the brake system.
- Have the brake system checked thoroughly on a regular basis (see section "Maintenance schedule – overview", page 211).
- Be particularly careful with welding, burning and drilling work in the vicinity of brake lines!
- No welding or soldering may be performed on valve chests or pipes. Any damaged parts must be replaced.
- Always perform a braking test after any adjusting or repair work on the braking system.
- For maintenance and repair work on the braking system, observe section "Safety information for users", page 27.
- The brake system may require adjustment when adding or removing accessories due to the resulting change in the total weight and/or axle load of the implement.

Please contact your specialist workshop.

12.14.4.1 Visual inspection of the dual-circuit pneumatic braking system

Before moving off, check the brake system to ensure that the following criteria are met:

- Piping, hose lines and coupling heads must not be externally damaged or rusted.
- Connecting rods, e.g. on fork heads, must be properly secured, easy to move, and not worn out.
- Ropes and cables
 - o must be properly run
 - o must have no visible cracks
 - o may not be knotted.
- Check the brake cylinder piston stroke.
Only 2/3 of the stroke of the brake cylinder may be utilised.
Otherwise, readjust the brake (specialist workshop).
- Replace damaged dust covers.
- Carry out an exterior inspection of the compressed air tank (see section "Exterior inspection of the compressed air tank", page 226).



If the visual inspection, function or action testing of the service brake system shows any signs of deficiencies, have a thorough inspection of all components performed immediately at a specialist workshop.

12.14.4.2 Exterior inspection of the compressed air tank (dual-circuit pneumatic braking system)

Exterior inspection of the compressed air tank (Fig. 324/1).

If the compressed air tank moves in the tensioning belts (Fig. 324/2)

→ tension or replace the compressed air tank.

If the compressed air tank has any external corrosion damage or is damaged

→ replace the compressed air tank.

If the rating plate (Fig. 324/3) is rusty, loose or the rating plate is missing from the compressed air tank:

→ replace the compressed air tank.

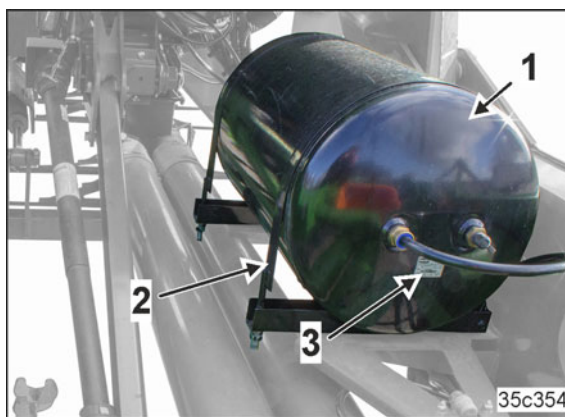


Fig. 324



The compressed air tank may be replaced in a specialist workshop only.

12.14.5 Brake inspection (specialist workshop)

Work that must be carried out every 3 months, at the latest every 500 operating hours¹⁾, in a specialist workshop:

- Check the service brake system for safe operating condition
- Check the wear of the brake linings.

Replace the brake shoes when the remaining lining thickness is less than 2.0 mm (bonded linings). Use only original brake shoes with type-tested brake linings. When doing so, the shoe return springs may also have to be replaced.

- Checking the pressure in the compressed air tank (see page 228).
- Leak test of the dual-circuit pneumatic braking system (see page 228).
- Cleaning the line filters (see page 228)

¹⁾ This servicing interval is a recommendation. Depending on the use, e.g. constant driving on hilly terrain, this may have to be shortened.



CAUTION

Observe the legal regulations for all service work.

Only genuine spare parts may be used.

The settings on the brake valves defined by the manufacturer may not be changed.



In Germany Section 57 of the regulation BGV D 29 of the industrial injuries mutual insurance organisation requires as follows: the keeper has to have vehicles tested as required, however at least once annually, by an expert as to their safe operating condition.

12.14.5.1 Checking the pressure in the compressed air tank of the dual-circuit pneumatic braking system (specialist workshop)

1. Connect a pressure gauge to the test connection on the compressed air tank.
2. Run the tractor engine (approx. 3 mins.) until the compressed air tank has filled.
3. Check whether the pressure gauge is displaying the setpoint range 6.0 to 8.1 bar.
4. If the reading drops below or exceeds the setpoint range, have the defective parts of the braking system replaced in a specialist workshop.

12.14.5.2 Leak test of the dual-circuit pneumatic braking system (specialist workshop)

- Test all connections, pipe, hose and bolted connections for seal-tightness.
- Eliminate any abrasion points on pipes and hoses.
- Replace any porous and damaged hoses (specialist workshop).
- The dual-circuit pneumatic braking system is considered free of leaks if the pressure drop within 10 minutes with the engine shut down is no greater than 0.10 bar, i.e. about 0.6 bar per hour.
- If the values are not maintained, have the leakage sealed or the defective components of the brake system replaced at a specialist workshop.

12.14.5.3 Cleaning the line filters (specialist workshop)

The dual-circuit pneumatic braking system has a line filter (Fig. 325/3) for the brake and supply line in each of the coupling heads.



The unit is under spring tension.

Cleaning the line filters:

1. Remove the bolts (Fig. 325/1) and dust cap
2. Remove the bolts (Fig. 325/2), open the coupling head
3. Remove the gasket and filter insert (Fig. 325/3), clean the filter insert with petrol or thinner (rinse out) and dry with compressed air.
4. Reassemble in the inverse sequence and make sure that the O-ring seal is not twisted.
5. Observe the tightening values of the bolts!
Fig. 325/2, 2 Nm
Fig. 325/1: 5 Nm

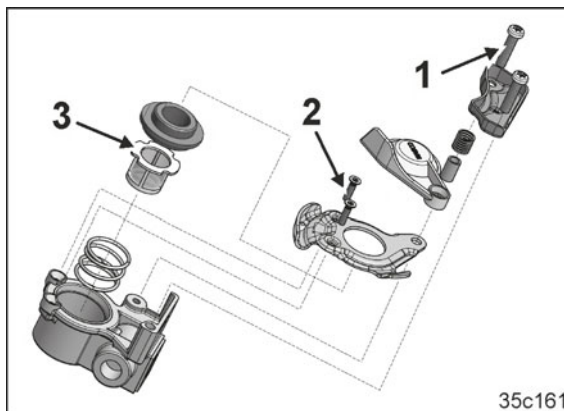


Fig. 325

12.14.5.4 Adjustment on the slack adjuster (specialist workshop)

Manually actuate the slack adjuster in the push direction. If the free travel of the long-stroke diaphragm cylinder pressure rod is max. 35 mm, the wheel brake must be readjusted.

The setting is carried out on the hexagonal adjusting screw of the slack adjuster. Set the free travel "a" (Fig. 326/a) to 10-12% of the connected brake lever length "B" (Fig. 326/B),

e.g. lever length 150 mm = free travel 15 - 18 mm.

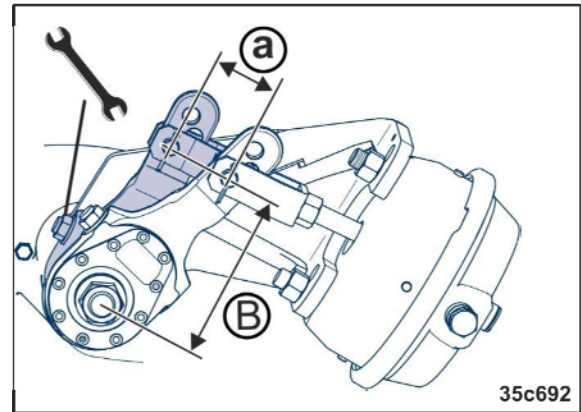


Fig. 326

12.14.5.5 Checking the function of the automatic slack adjuster

1. Secure the machine against rolling away and release the service brake and parking brake.
2. Manually actuate the slack adjuster.

The free travel "a" (Fig. 327/a) may not exceed 10- 15% of the connected brake lever length "B" (Fig. 327/B) (e.g. brake lever length 150 mm = free travel 15 – 22 mm).

Readjust the slack adjuster if the free travel is outside of the tolerance. → Workshop work

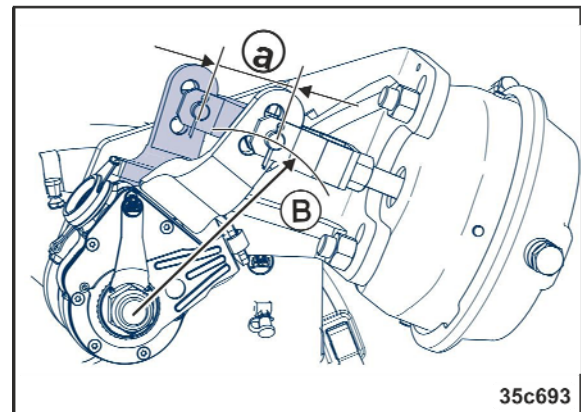


Fig. 327

12.14.6 Hydraulic brakes

Check of the hydraulic brake

- Check all brake hoses for wear
- check all screw unions for seal tightness
- renew any worn or damaged parts.

Venting the hydraulic brake system (workshop work)

After each brake repair, for which the system has been opened, bleed the brake system because air may have entered the pressure lines.

1. Slightly loosen the vent valve.
 2. Actuate the tractor brake.
 3. Close the ventilation valve as soon as oil escapes.
- Collect the escaping oil.
4. Perform a brake check.

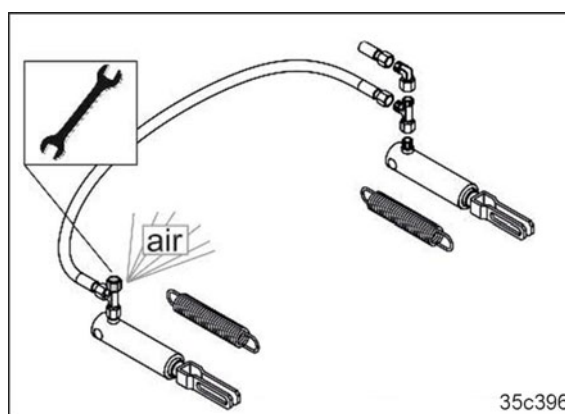


Fig. 328

12.15 On-board hydraulics – Oil check and oil filter change

Check the filling level in the oil tank of the on-board hydraulics (fan connection on the tractor PTO shaft) when the implement is parked horizontally.

The oil level must be visible in the window (Fig. 329/1).

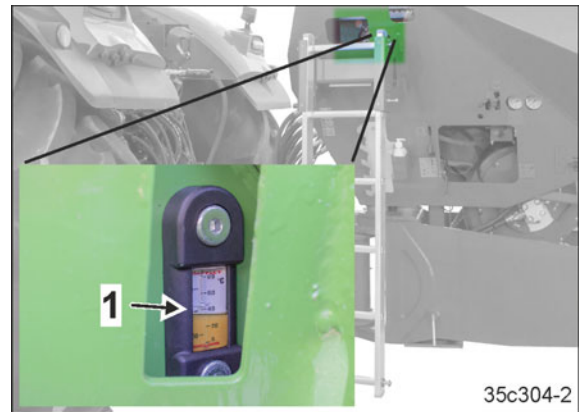


Fig. 329

Refill hydraulic fluid HLP 68, DIN 51524 as required in the oil filler neck (Fig. 330/1).

There is no need to change the oil.

The filling plug on the bottom side serves to empty the oil tank. Collect the escaping oil in a tray.



Fig. 330

12.15.1 Oil filter change

The on-board hydraulic system has an oil tank with an oil filter change indicator (Fig. 331/1).

During operation, the indicator is in the green area.

The indicator changing to the red area indicates that the oil filter must be replaced.

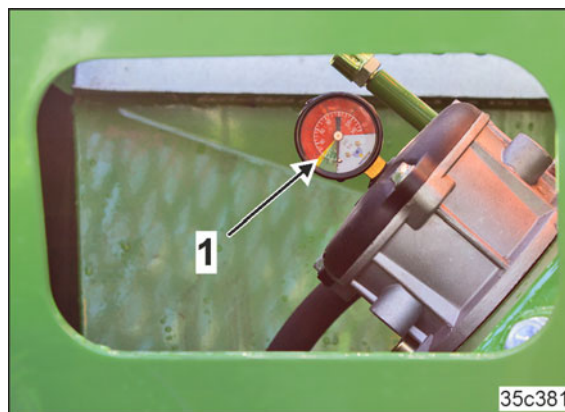


Fig. 331

Replace the oil filter:

1. Loosen the two hexagon bolts 6x25 (Fig. 332/1).
2. Lift the cover (Fig. 332/2)
3. Pull the oil filter out of the oil tank and replace. Collect the escaping oil in a tray.

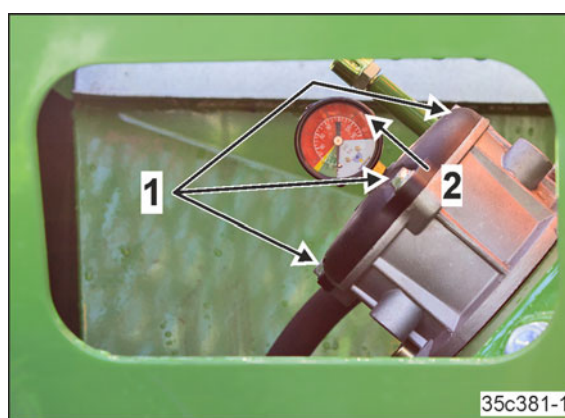


Fig. 332

12.16 Hydraulic system (specialist workshop)



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 duration 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.

12.16.1 Labelling of hydraulic hose lines

The valve chest identification provides the following information:

Fig. 333/...

- (1) Manufacturer's marking on the hydraulic hose line (A1HF)
- (2) Date of manufacture of the hydraulic hose line (10/02 = Year / Month = February 2010)
- (3) Maximum approved operating pressure (210 BAR).

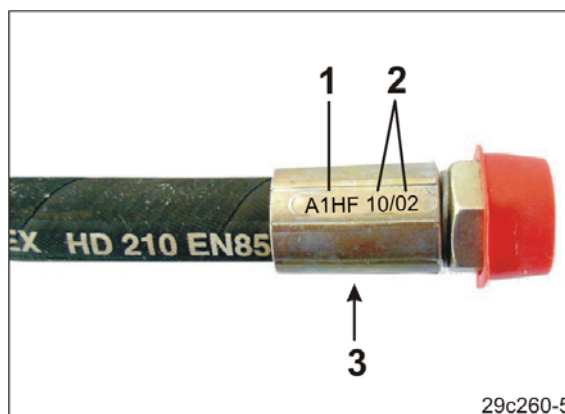


Fig. 333

12.16.2 Inspection criteria for hydraulic hose lines



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

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.

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 valve chest.
- Corrosion of valve chest, reducing the function and strength rating.
- Installation requirements not complied with.
- Life span of 6 years has been exceeded.

The date of manufacture of the hydraulic hose line on the valve chest plus six years is decisive. If the date of manufacture on the assembly is "2010", then the hose should not be used after February 2016. For more information, see "Labelling of hydraulic hose lines".

12.16.3 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!**
- **Always 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 compression for 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!**

12.16.4 Repairs to the pressure tank (workshop)

In the event of a repair observe the following:

The hydraulic system and the pressure tank (Fig. 334/1) connected to it are under a constant high pressure (approx. 100 bar).

Release of the hydraulic hose lines or the unscrewing or opening of the pressure tank in the event of a repair may be performed only in a specialist workshop with suitable auxiliary means.

For all work on the pressure tank and the hydraulic system connected to it observe the standard EN 982 (safety requirements for fluid systems).



Fig. 334



DANGER

The hydraulic system and the pressure tank connected to it are under a constant high pressure (approx. 100 bar).

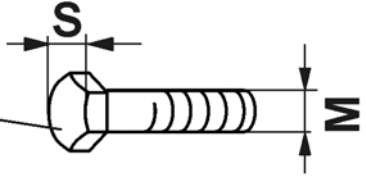
12.17 Bolt tightening torques



Observe the specific data for tightening torques in the maintenance section.

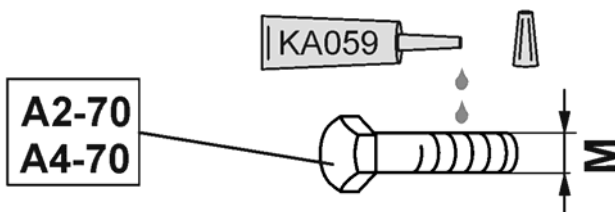


The table shows the permissible maximum values for bolted connections with a friction coefficient of $\mu=0.12$ and does not include any other safety factors. The listed tightening values are to be considered as reference values!

8.8 10.9 12.9		$\mu=0,12$		
M	S	Nm		
		8.8	10.9	12.9
M 8	13	25	36	42
M 8x1		27	38	41
M 10	16 (17)	48	71	83
M 10x1		52	73	88
M 12	18 (19)	84	123	144
M 12x1,5		90	125	150
M 14	22	133	195	229
M 14x1,5		150	210	250
M 16	24	206	302	354
M 16x1,5		225	315	380
M 18	27	295	421	492
M 18x1,5		325	460	550
M 20	30	415	592	692
M 20x1,5		460	640	770
M 22	32	567	807	945
M 22x1,5		610	860	1050
M 24	36	714	1017	1190
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



The specified tightening values represent reference values!



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



Tightening torques for the wheel and hub screws (see Table Fig. 316, page 219).

13 Hydraulic diagram

13.1 Standard hydraulic system

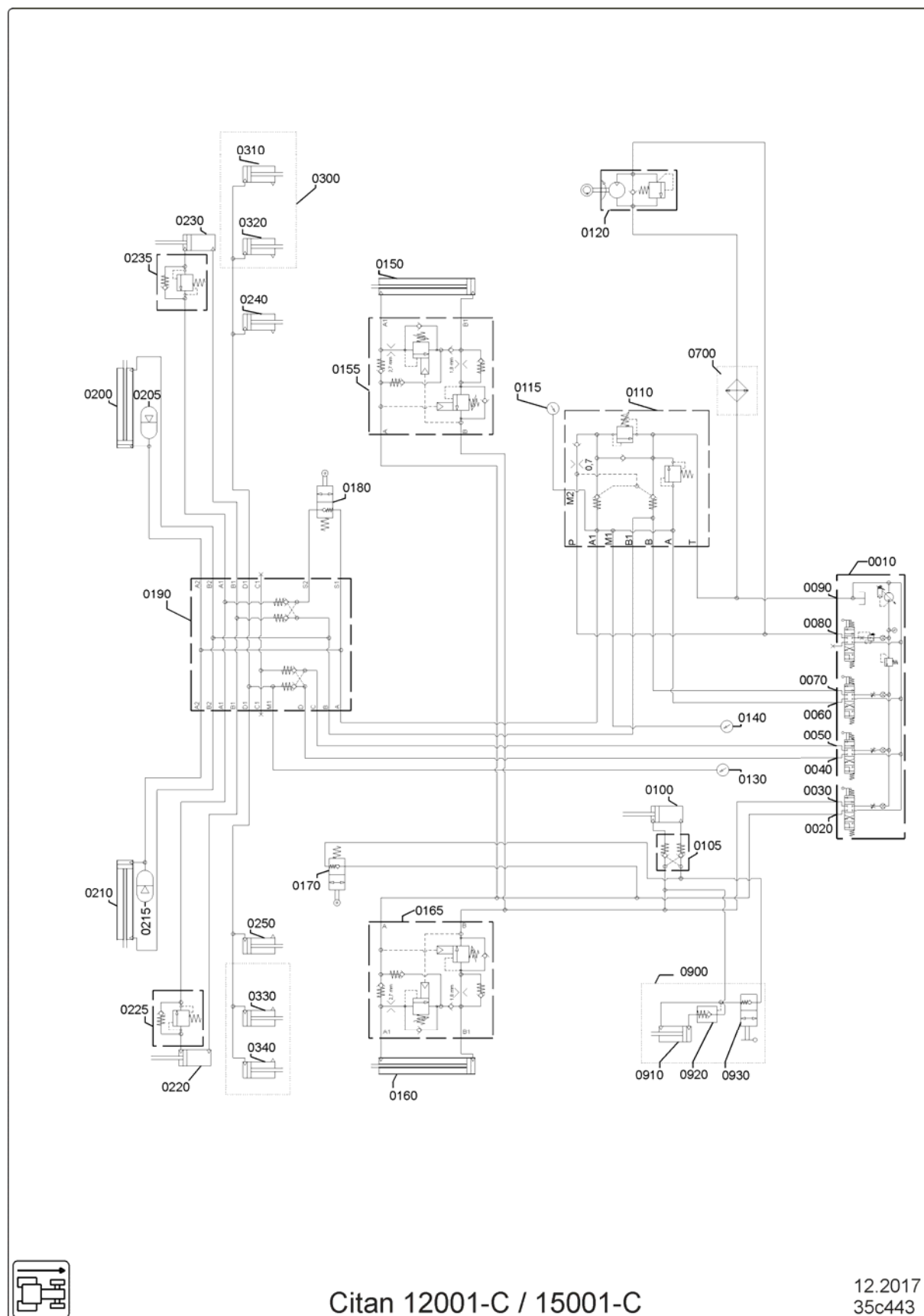


Fig. 335

Fig. 335/...	Designation	Note
10	Tractor hydraulic system	
20	yellow 2	
30	yellow 1	
40	blue 1	
50	blue 2	
60	green 1	
70	green 2	
80	red 1	
90	red T	
100	Star wheel lift-out	
105	Star wheel locking block	
110	Frame load control block	
115	Sections pressure gauge	
120	fan drive	
130	Coulter pressure gauge	
140	Sections pressure gauge	
150	Lift-out, left	
155	Fast lowering control block	
160	Lift-out, right	
165	Fast lowering control block	
170	Star wheel control valve	
180	Distributor folding control valve	
190	Distributor control block	
200	Folding on the left	
205	Hyd. accumulator, folding on the left	
210	Folding on the right	
215	Hyd. accumulator, folding on the right	
220	Distributor head folding, right	
230	Distributor head folding, left	
240	Coulter pressure, left	
250	Coulter pressure, right	
300	Harrow pressure	Option
310	Harrow pressure, left	
320	Harrow pressure, left	
330	Harrow pressure, right	
340	Harrow pressure, right	
700	Radiator	Option
900	Tractor wheel mark eradicator	Option
910	Wheel mark eradicator cylinder	
920	Wheel mark eradicator check valve	
930	Wheel mark eradicator switching valve	

All position specifications in direction of travel

13.2 Hydraulic system with on-board hydraulic system / on-board electrical system

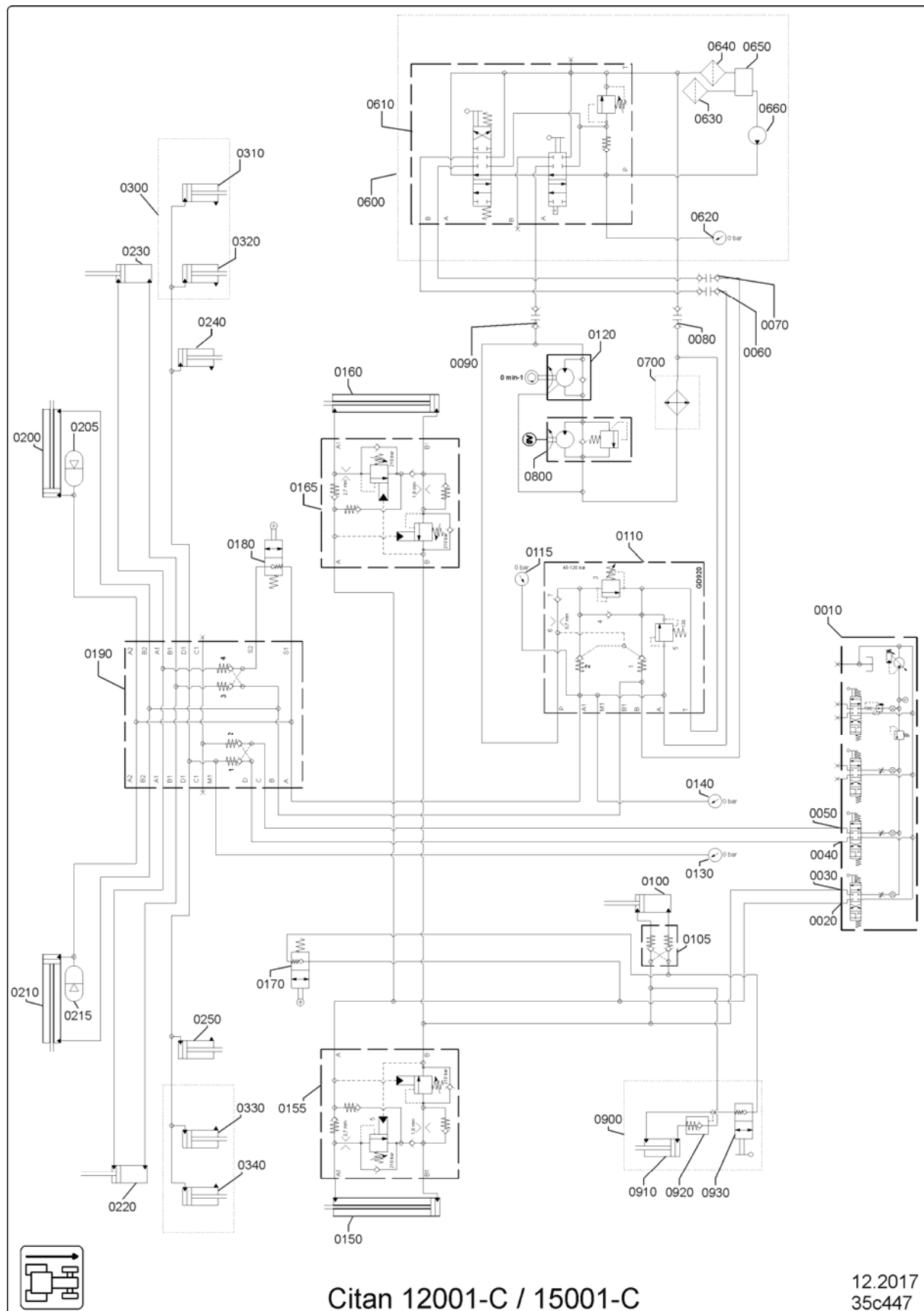


Fig. 336

Fig. 336/...	Designation	Note
10	Tractor hydraulic system	
20	yellow 2	
30	yellow 1	
40	blue 1	
50	blue 2	
60	green 1	
70	green 2	
80	red T	
90	red 1	
100	Star wheel lift-out	
105	Star wheel locking block	
110	Frame load control block	
115	Sections pressure gauge	
120	fan drive	
130	Coulter pressure gauge	
140	Sections pressure gauge	
150	Lift-out, right	
155	Fast lowering control block	
160	Lift-out, left	
165	Fast lowering control block	
170	Star wheel control valve	
180	Distributor head folding control valve	
190	Distributor control block	
200	Folding on the left	
205	Hyd. accumulator, folding on the left	
210	Folding on the right	
215	Hyd. accumulator, folding on the right	
220	Distributor head folding, right	
230	Distributor head folding, left	
240	Coulter pressure, left	
250	Coulter pressure, right	
300	Harrow pressure	Option
310	Harrow pressure, left	
320	Harrow pressure, left	
330	Harrow pressure, right	
340	Harrow pressure, right	
600	On-board unit	
610	Manual directional valve	
620	Blower fan pressure gauge	
630	Ventilation filter	
640	Return filter	
650	Oil tank	
660	Pump	
700	Radiator in combination with on-board unit	
800	Generator drive	Option
900	Tractor wheel mark eradicator	Option
910	Wheel mark eradicator cylinder	
920	Wheel mark eradicator check valve	
930	Wheel mark eradicator switching valve	

All position specifications in direction of travel

13.3 Hydraulic system with on-board electrical system

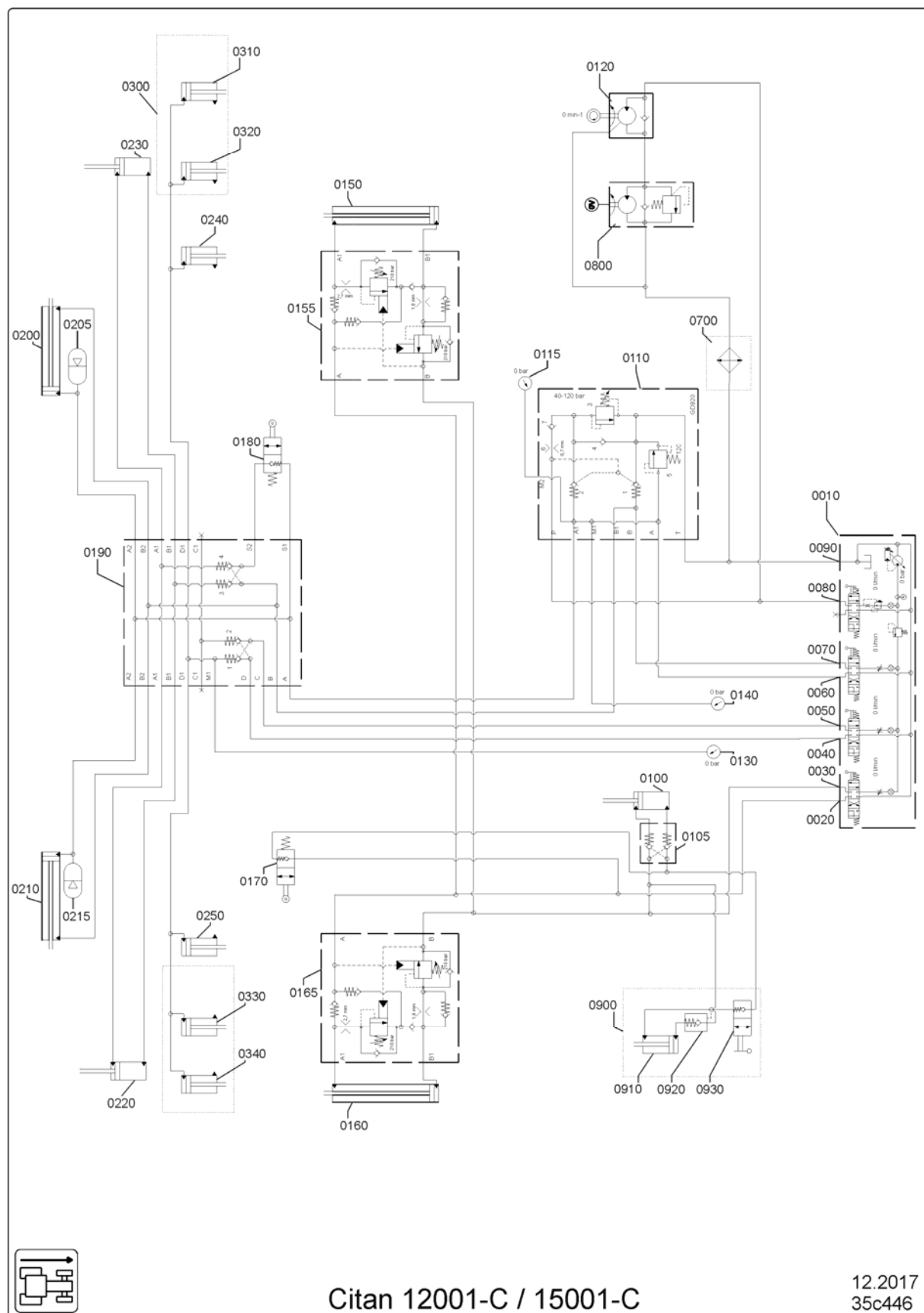


Fig. 337

Fig. 337/...	Designation	Note
10	Tractor hydraulic system	
20	yellow 2	
30	yellow 1	
40	blue 1	
50	blue 2	
60	green 1	
70	green 2	
80	red 1	
90	red T	
100	Star wheel lift-out	
105	Star wheel locking block	
110	Frame load control block	
115	Sections pressure gauge	
120	fan drive	
130	Coulter pressure gauge	
140	Sections pressure gauge	
150	Lift-out, left	
155	Fast lowering control block	
160	Lift-out, right	
165	Fast lowering control block	
170	Star wheel control valve	
180	Distributor folding control valve	
190	Distributor control block	
200	Folding on the left	
205	Hyd. accumulator, folding on the left	
210	Folding on the right	
215	Hyd. accumulator, folding on the right	
220	Distributor head folding, right	
230	Distributor head folding, left	
240	Coulter pressure, left	
250	Coulter pressure, right	
300	Harrow pressure	Option
310	Harrow pressure, left	
320	Harrow pressure, left	
330	Harrow pressure, right	
340	Harrow pressure, right	
700	Radiator	Option
800	Generator drive	Option
900	Tractor wheel mark eradicator	Option
910	Wheel mark eradicator cylinder	
920	Wheel mark eradicator check valve	
930	Wheel mark eradicator switching valve	

All position specifications in direction of travel

13.4 Hydraulic system with track marker (12001-C)

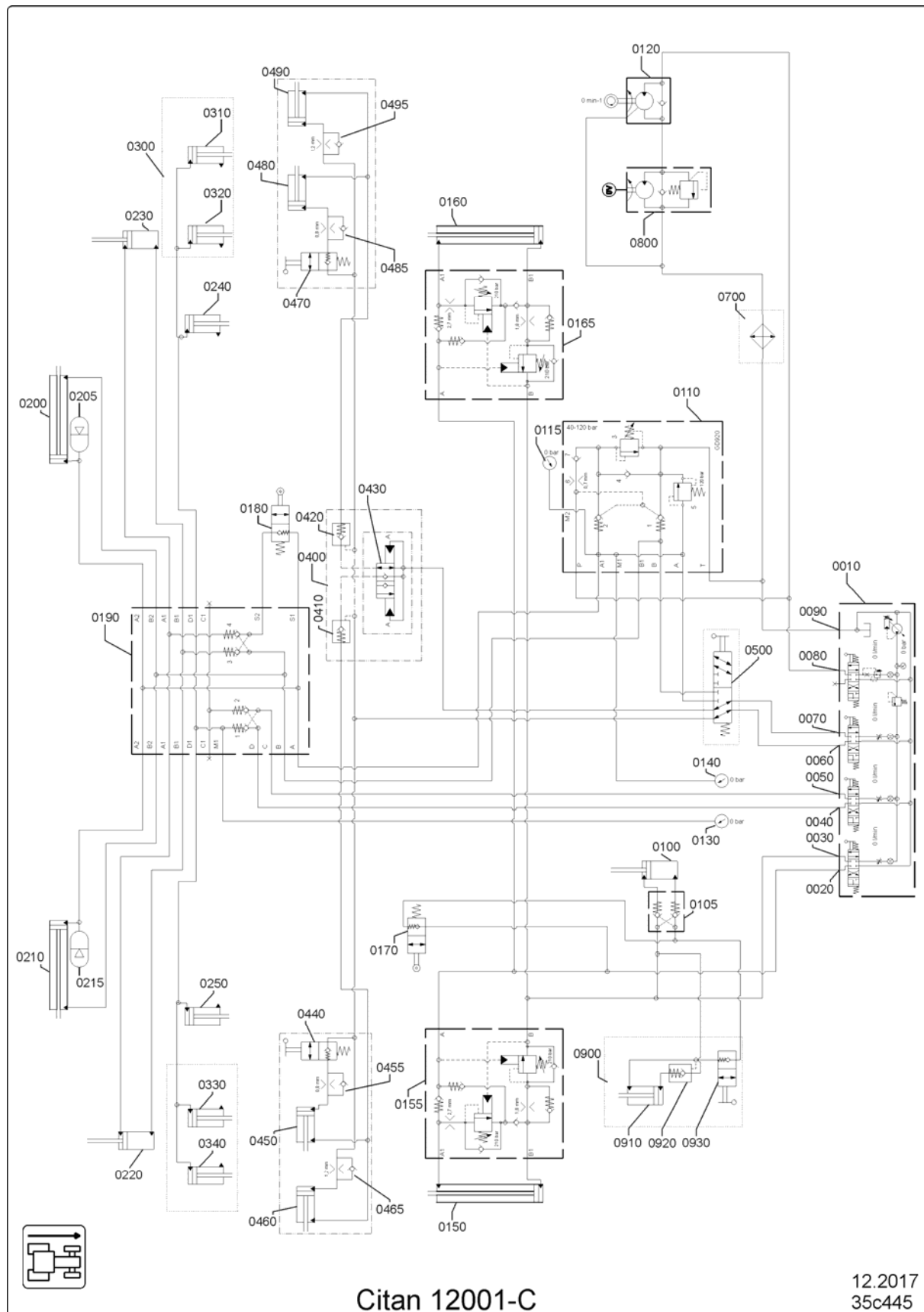


Fig. 338

Fig. 338/...	Designation	Note
10	Tractor hydraulic system	
20	yellow 2	
30	yellow 1	
40	blue 1	
50	blue 2	
60	green 1	
70	green 2	
80	red 1	
90	red T	
100	Star wheel lift-out	
105	Star wheel locking block	
110	Frame load control block	
115	Sections pressure gauge	
120	fan drive	
130	Coulter pressure gauge	
140	Sections pressure gauge	
150	Lift-out, right	
155	Fast lowering control block	
160	Lift-out, left	
165	Fast lowering control block	
170	Star wheel control valve	
180	Distributor head folding control valve	
190	Distributor control block	
200	Folding on the left	
205	Hyd. accumulator, folding on the left	
210	Folding on the right	
215	Hyd. accumulator, folding on the right	
220	Distributor head folding, right	
230	Distributor head folding, left	
240	Coulter pressure, left	
250	Coulter pressure, right	
300	Harrow pressure	Option
310	Harrow pressure, left	
320	Harrow pressure, left	
330	Harrow pressure, right	
340	Harrow pressure, right	
400	Track marker	Option
410	Track marker check valve, right	
420	Track marker check valve, left	
430	Track marker shuttle valve	
440	Stop valve 85° position right	
450	Hyd. cyl. 1, right track marker	
455	Throttle check valve 0.8 mm	
460	Hyd. cyl. 2, right track marker	
465	Throttle check valve 1.2 mm	
470	Stop valve 85° position, left	
480	Track marker, left 1	
485	Throttle check valve 0.8 mm	
490	Track marker, left 2	
495	Throttle check valve 1.2	
500	Folding / track marker control valve	
700	Radiator	Option
800	Generator drive	Option
900	Tractor wheel mark eradicator	Option
910	Wheel mark eradicator cylinder	
920	Wheel mark eradicator check valve	
930	Wheel mark eradicator switching valve	

All position specifications in direction of travel



14 Notes



Space for your notes:

[illegible]



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Check list Citan 01-C



Pay attention to the safety instructions in the operating manual!

Tasks	See assembly instructions	See operating manual, page
• HGV transport		35
• Seed drill assembly	MM273	
• Initial operation		102
• Couple the tractor		
o On-board hydraulic system K700	MM188	
o Install the pressure gauge and control terminal on the tractor		111
• Function test		
o Unfolding/folding		173
o 100m, control terminal calibration		
• Insert the matching metering roller		127
• Fill the seed hopper		184
• Clean the cover gasket and close the cover pressure tight: leaking covers lead to seeding errors.		
• Calibrate the seed		129
• Calibrating the fertiliser		129
• Adjust the fan speed depending on the crop		73 137
• Check the placement depth		152
• Implement is positioned horizontally: check lower link		
• Adjust the tramlining rhythm where required		159
• Switch off the fan		
• Coulter pressure adjustment, adjust the coulter pressure per hydraulic system and move to "Float position".		148
• Lower the rear frame completely: the cylinder must be extended completely		
• Check/adjust the sections pressure		143