Please read and follow this operating manual before putting the machine into operation. Keep it in a safe place for future use.
Reading the instruction

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

Identification data

Enter the machine identification data here. You will find the identification data on the rating plate.

Machine identification number: (ten-digit)

Type: Cayena

Permissible system pressure in bar: Maximum 200 bar

Year of manufacture: 

Basic weight (kg): 

Permissible total weight (kg): 

Maximum load (kg): 

Manufacturer’s address

AMAZONEN-WERKE
H. DREYER GmbH & Co. KG
Postfach 51
D-49202 Hasbergen, Germany
Phone: +49 5405 501-0
Fax: +49 5405 501-234
E-mail: amazone@amazone.de

Spare part orders

AMAZONEN-WERKE
H. DREYER GmbH & Co. KG
Postfach 51
D-49202 Hasbergen, Germany
Phone: +49 5405 501-290
Fax: +49 5405 501-106
E-mail: et@amazone.de
Online spare parts catalogue: www.amazone.de

When ordering spare parts, please always specify the number of your machine.

Formalities of the operating manual

Document number: MG3365
Compilation date: 07.11

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Dear Customer,

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

On receiving the machine, check to see if it was damaged during transport or if parts are missing. Using the delivery note, check that the machine was delivered in full including the ordered special optional equipment. Replacement will be made only if a claim is filed immediately!

Please read and follow this operating manual—in particular, the safety instructions—before putting the machine into operation. Only after careful reading will you be able to benefit from the full scope of your newly purchased machine.

Please ensure that all the machine operators have read this operating manual before they put the machine 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 machine.

User evaluation

Dear Reader,

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

AMAZONEN-WERKE
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1 User Information

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

1.1 Purpose of the document

This operating manual

- Describes the operation and maintenance of the machine.
- Provides important information on safe and efficient handling of the machine.
- Is a component part of the machine and should always be kept with the machine or in the tractor vehicle.
- Keep it in a safe place for future use.

1.2 Locations in the operating manual

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

1.3 Diagrams used

Instructions for action and reactions

Tasks to be carried out by the operator are presented as numbered instructions. Always keep to the order of the instructions. The reaction to instructions is given by an arrow. Example:

1. Instruction for action 1
   → Reaction of the machine to instruction for action 1
2. Instruction for action 2

Lists

Lists without a mandatory sequence are presented as a list with bullet points. Example:

- Point 1
- Point 2

Item numbers in diagrams

Numbers in round brackets refer to the item numbers in the diagrams. The first digit refers to the diagram; the second digit, to the item number in the illustration.

Example (Fig. 3/6)

- Figure 3
- Item 6
2 General safety instructions

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

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 machine operation.

Obligations of the operator

The operator is obliged only to let those people work with/on the machine who
- Are aware of the basic workplace safety information and accident prevention regulations.
- Have received instruction in working with/on the machine.
- Have read and understood this operating manual.

The operator is obliged
- To keep all the warning pictograms on the machine in a legible state.
- To replace damaged warning pictograms.

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 pictograms and other signs on the machine", on page 18 of this operating manual and to follow the safety instructions of the warning symbols when operating the machine.
- To get to know the machine.
- To read the sections of this operating manual, important for carrying out your work.

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

The machine has been constructed to the state-of-the-art and the recognised rules of safety. However, there may be risks and restrictions which occur when operating the machine

- For the health and safety of the user or third persons.
- For the machine.
- For other goods.

Only use the machine

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

Eliminate any faults that could impair safety immediately.

Guarantee and liability

Our "General conditions of sales and business" 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 goods will be excluded if they can be traced back to one or more of the following causes:

- Improper use of the machine.
- Improper installation, commissioning, operation and maintenance of the machine.
- Operation of the machine with defective safety equipment or improperly attached or non-functioning safety equipment.
- Non-compliance with the instructions in the operating manual regarding commissioning, operation and maintenance.
- Unauthorised constructive changes to the machine.
- Insufficient monitoring of machine parts which are subject to wear.
- Improperly executed repairs.
- Catastrophic events as a result of the impact of foreign objects or force majeure.
# 2.2 Representation of safety symbols

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

<table>
<thead>
<tr>
<th>Safety Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![DANGER]</td>
<td><strong>DANGER</strong> Indicates an immediate high risk, which will result in death or serious physical injury (loss of body parts or long term damage) if not avoided. If the instructions are not followed, then this will result in immediate death or serious physical injury.</td>
</tr>
<tr>
<td>![WARNING]</td>
<td><strong>WARNING</strong> 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.</td>
</tr>
<tr>
<td>![CAUTION]</td>
<td><strong>CAUTION</strong> Indicates a low risk, which could incur minor or medium-level physical injury or damage to property if not avoided.</td>
</tr>
<tr>
<td>![IMPORTANT]</td>
<td><strong>IMPORTANT</strong> Indicates an obligation to special behaviour or an activity required for proper machine handling. Non-compliance with these instructions can cause faults on the machine or in the environment.</td>
</tr>
<tr>
<td>![NOTE]</td>
<td><strong>NOTE</strong> Indicates handling tips and particularly useful information. These instructions will help you to use all the functions of your machine to the optimum.</td>
</tr>
</tbody>
</table>
2.3 **Organisational measures**

The operator must provide the necessary personal protective equipment, such as:

- Safety glasses
- Protective shoes
- Protective suit
- Skin protection, etc.

The operating manual

- Must always be kept at the place at which the machine 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 each commissioning of the machine, all the safety and protection equipment must be properly attached and fully functional. Check all the 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, then you should comply with the statutory road traffic regulations.
2.6 Training of personnel

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

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

<table>
<thead>
<tr>
<th>Activity</th>
<th>People</th>
<th>Person specially trained for the activity ¹</th>
<th>Trained person ²</th>
<th>Person with specialist training (specialist workshop) ³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loading/Transport</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Commission</td>
<td>—</td>
<td>X</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Set-up, tool installation</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>X</td>
</tr>
<tr>
<td>Operation</td>
<td>—</td>
<td>X</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Maintenance</td>
<td>—</td>
<td>X</td>
<td>—</td>
<td>X</td>
</tr>
<tr>
<td>Troubleshooting and fault elimination</td>
<td>—</td>
<td>X</td>
<td>—</td>
<td>X</td>
</tr>
<tr>
<td>Disposal</td>
<td>X</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Legend: X..allowed —..not allowed

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

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

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

Comment:
A qualification equivalent to specialist training can be obtained through long term activity in the appropriate field of work.

Only a specialist workshop may carry out maintenance and repair work on the machine, 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 machine in a way which is both appropriate and safe.
2.7 Safety measures in normal operation

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

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

2.8 Dangers from residual energy

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

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 a timely manner.

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

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

Check all the screw connections for a firm seat. On completing maintenance work, check the function of safety and protection equipment.
2.10 Constructive changes

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

Any expansion or modification work shall require the written approval of AMAZONEN-WERKE. Only use the modification and accessory parts released by AMAZONEN-WERKE so that the operating permit, 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 being crushed, cut, caught, drawn in or struck if supporting parts break.

It is forbidden to:

- Drill holes in the frame or on the chassis.
- Increase the size of existing holes on the frame or the chassis.
- Weld support parts.
2.10.1  Spare and wear parts and aids

Immediately replace any machine 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 accepts no liability for damage arising from the use of unapproved spare parts, wear parts or auxiliary materials.

2.11  Cleaning and disposal

Handle and dispose of any materials used carefully, in particular:

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

2.12  User workstation

The machine may be operated by only one person sitting in the driver's seat of the tractor.
2.13 Warning pictograms and other signs on the machine

Always keep all the warning pictograms of the machine clean and in a legible state. Replace illegible warning pictograms. You can obtain the warning pictograms from your dealer using the order number (e.g. MD 075).

Warning pictograms - structure

Warning pictograms indicate dangers on the machine and warn against residual dangers. At these points, there are permanent or unexpected dangers.

A warning pictogram consists of two fields:

Field 1
is a pictogram describing the danger, surrounded by triangular safety symbol.

Field 2
is a pictogram showing how to avoid the danger.

Warning pictograms - explanation

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

1. A description of the danger.
   For example: danger of cutting!

2. The consequence of non-compliance with the risk avoidance instructions.
   For example: causes serious injuries to fingers or hands.

3. Instructions for avoiding the danger.
   For example: only touch machine parts when they have come to a complete standstill.
General safety instructions

Order number and explanation

**MD 076**
Risk of drawing-in/entrapment for hand or arm due to moving force-transmission parts!
This danger can cause extremely serious injuries resulting in the loss of limbs.

Never open or remove protective equipment, 
- while the tractor engine is running with the PTO shaft or hydraulic/electronic system connected
- or the ground wheel drive is moving.

**Warning pictograms**

**MD 078**
Risk of crushing of fingers/hand by accessible, moving parts of the machine!
This danger can cause extremely serious injuries resulting in the loss of limbs.

Never reach into the danger area when the tractor engine is running with the PTO shaft or hydraulic/electrical system connected.

**MD 080**
Risk of crushing of the entire body due to standing in the swivel range of the drawbar between the tractor and the attached machine!
This danger can cause extremely serious and potentially fatal injuries.

- Standing or walking in the danger area between the tractor and machine is prohibited whenever the tractor engine is running and the tractor is not secured against unintentional rolling.
- Instruct people to leave the danger area between the tractor and the machine whenever the engine of the tractor is running and the tractor is not secured against unintentional rolling.
MD 082
Risk of falling when riding the machine on treads or platforms!
This danger can cause extremely serious and potentially fatal injuries.
It is forbidden to ride on the machine or climb the machine when it is running. This ban also applies to machines with treads or platforms.
Ensure that no one rides with the machine.

MD 084
Risk of crushing the entire body due to standing in the swivel range when machine parts are being lowered.
This danger can cause extremely serious and potentially fatal injuries.
- It is forbidden to stand in the swivel range of the machine when machine parts are being lowered.
- Instruct personnel to leave the swivel range of any machine parts which can be lowered before you lower the parts.

MD 090
Danger of the entire body being rolled over caused by unintended rolling of the parked, unsecured machine!
This danger can cause extremely serious and potentially fatal injuries.
Secure the machine against unintentional rolling before uncoupling the machine from the tractor or parking it. For this, use the parking brake and/or the wheel chock(s).
MD 095
Read and understand the operating manual safety information before starting up the machine!

MD 096
Danger from escaping high-pressure hydraulic fluid due to leaking hydraulic hose lines.
This can inflict serious injuries with potentially fatal consequences if hydraulic fluid escaping at high pressure passes through the skin and into the body.
- Never attempt to plug leaks in hydraulic hose lines using 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 due to standing in the stroke area of the three-point suspension when the three-point hydraulic system is actuated.
This danger can cause extremely serious and potentially fatal injuries.
- Personnel are prohibited from entering the stroke area of the three-point suspension when the three-point hydraulic system is actuated.
- Only actuate the operator controls for the tractor's three-point hydraulic system:
  - From the intended workstation.
  - Under no circumstances if you are in the stroke area between the tractor and machine.
General safety instructions

MD 101
This symbol indicates jacking points for lifting gear (jack).

MD 102
Danger during intervention in the machine, e.g. installation, adjusting, troubleshooting, cleaning, maintaining and repairing, due to the tractor and the machine being started unintentionally and rolling.
These dangers can cause extremely serious and potentially fatal injuries.

- Secure the tractor and the machine against unintentional start-up and rolling before any intervention in the machine.
- 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 machine parts.
These dangers can cause extremely serious and potentially fatal injuries.

- Maintain an adequate safety distance from moving machine parts while the tractor engine is running.
- Ensure that all personnel maintain an adequate safety distance from moving machine parts.
MD 108

Danger from explosion or hydraulic fluid escaping at high pressure caused by the pressure reservoir under gas and oil pressure!

These can inflict serious injuries with potentially fatal consequences if hydraulic fluid escaping at high pressure passes through the skin and into the body.

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

MD 115

The maximum operating pressure of the hydraulic system is 200 bar.
2.13.1 Positioning of warning pictograms and other labels

Warning pictograms

The following diagrams show the arrangement of the warning pictograms on the machine.

Fig. 1

Fig. 2
2.14 Dangers if the safety information is not observed

Nonobservance of the safety information

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

Seen individually, non-compliance with the safety information could pose the following risks:

- Danger to people through non-secured working areas.
- Failure of important machine functions.
- Failure of prescribed methods of maintenance and repair.
- Danger to people through mechanical and chemical impacts.
- Risk to environment through leakage of hydraulic fluid.

2.15 Safety-conscious working

Besides the safety information in this operating manual, the national general workplace safety and accident prevention regulations are 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 machine and the tractor, always check their roadworthiness and operational safety.

### 2.16.1 General safety and accident prevention information

- Beside these instructions, comply with the general valid national safety and accident prevention regulations.
- The warning pictograms and labels attached to the machine provide important information on safe machine operation. Compliance with this information guarantees your safety!
- Before moving off and starting up the machine, check the immediate area of the machine (children)! Ensure that you can see clearly!
- It is forbidden to ride on the machine or use it as a means of transport!
- Drive in such a way that you always have full control over the tractor with the attached 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 machine.

### Connecting and disconnecting the machine

- Only connect and transport the machine 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 machine to the prescribed equipment in accordance with the specifications.
- When coupling machines to the front or the rear of the tractor, the following may not be exceeded:
  - The approved total tractor weight
  - The approved tractor axle loads
  - The approved load capacities of the tractor tyres.
- Secure the tractor and the machine against unintentional rolling away before coupling or uncoupling the machine.
- It is forbidden for people to stand between the machine to be coupled and the tractor, whilst the tractor is moving towards the machine!

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 machines, 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 machine to the tractor or uncoupling it from the tractor! There are contusion and cutting points in the area of the coupling point between the tractor and the machine.

- It is forbidden to stand between the tractor and the machine 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 machines are stable!
Use of the machine

- Before starting work, ensure that you understand all the equipment and actuation elements of the machine and their function. There is no time for this when the machine is already in operation!
- Do not wear loose-fitting clothing! Loose clothing increases the risk of being caught by drive shafts!
- Only start up the machine if all the safety equipment has been attached and is in the safety position!
- Comply with the maximum load of the connected machine and the approved axle and drawbar loads of the tractor. If necessary, drive only with a partially filled seed hopper.
- It is forbidden to stand in the working area of the machine.
- It is forbidden to stand in the turning and rotation area of the machine.
- There are contusion and cutting points at externally actuated (e.g. hydraulic) machine points.
- Only actuate externally actuated machine parts if you are sure that there is no one within a sufficient safety distance from the machine!
- Secure the tractor against unintentional start-up and rolling before you leave the tractor.
  For this:
  o Lower the machine onto the ground.
  o Apply the tractor parking brake.
  o Switch off the tractor engine.
  o Remove the ignition key.

Machine transportation

- When using public highways, national road traffic regulations must be observed.
- Before moving off, check:
  o The correct connection of the supply lines
  o The lighting system for damage, function and cleanliness
  o The brake and hydraulic system for visible damage
  o That the tractor parking brake is released completely.
  o That the brake system functions properly.
- Ensure that the tractor has sufficient steering and braking power. Any machines and front/rear weights connected to the tractor influence the driving behaviour and the steering and braking power of the tractor.
- If necessary, use front weights. The front tractor axle must always be loaded with at least 20% of the empty tractor weight, in order to ensure sufficient steering power.
- Always fix the front or rear weights to the intended fixing points according to regulations.
- Comply with the maximum payload of the connected machine.
and the approved axle and drawbar loads of the tractor.

- The tractor must guarantee the prescribed brake delay for the loaded vehicle combination (tractor plus connected machine).
- Check the brake power before moving off.
- When turning corners with the machine connected, take the broad load and balance weight of the machine into account.
- Before moving off, ensure sufficient side locking of the tractor lower links, when the machine is fixed to the three-point hydraulic system or lower links of the tractor.
- Before moving off, move all the swivel machine parts to the transport position.
- Before moving off, secure all the swivel machine parts in the transport position against risky position changes. Use the transport locks intended for this.
- Before transporting, secure the operating lever of the three-point hydraulic system against the unintentional raising or lowering of the connected/hitched machine.
- Check that the transport equipment, e.g. lighting, warning equipment and protective equipment, is correctly mounted on the machine.
- Before transportation, carry out a visual check that the upper and lower link pins are firmly fixed with the lynch pin against unintentional release.
- Adjust your forward speed to the prevailing conditions.
- Before driving downhill, switch to a low gear.
- Before moving off, always switch off the independent wheel braking (lock the pedals).
2.16.2 Hydraulic system

- The hydraulic system is under a high pressure.
- Ensure that the hydraulic hose lines are connected correctly.
- When connecting the hydraulic hose lines, ensure that the hydraulic system is depressurised on both the machine and tractor sides.
- 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:
  o Are continuous or
  o Are automatically controlled or
  o Require a float position or pressure position due to their function.
- Before working on the hydraulic system
  o Lower the machine.
  o Depressurise the hydraulic system.
  o Switch off the tractor engine.
  o Apply the tractor parking brake
  o 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 line if it is damaged or worn. Only use original AMAZONE hydraulic hose lines.
- The hydraulic hose lines should not be used for longer than six years, including any storage time of maximum two years. Even with proper storage and approved use, hoses and hose connections are subject to natural ageing, thus limiting the length of use. However, it may be possible to specify the length of use from experience values, in particular when taking the risk potential into account. In the case of hoses and hose lines made from thermoplastics, other guide values may be authoritative.
- 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. Danger 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 – danger of fire!
- Ensure that the battery is connected correctly - firstly connect the positive terminal and then connect the negative terminal. When disconnecting the battery, disconnect the negative terminal first, followed by the positive terminal.
- Always place the appropriate cover over the positive battery terminal. If there is accidental earth contact, there is a danger of explosion!
- Danger of explosion! Avoid the production of sparks and naked flames in the vicinity of the battery!
- The machine can be equipped with electronic components, the function of which may be influenced by electromagnetic interference from other units. Such interference can pose risks to people, if the following safety information is not followed.
  - In the case of retrofitting of electrical units and/or components on the machine, with a connection to the on-board power supply, the user must check 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 89/336/EEC in the appropriate version and carry the CE mark.

2.16.4 Attached machines

- Comply with the approved combination options for the attachment equipment on the tractor and the machine drawbar. Only couple approved combinations of vehicles (tractor and attached machine).
- In the case of single axle machines, observe the maximum permitted drawbar load of the tractor on the attachment equipment.
- Ensure that the tractor has sufficient steering and braking power. Machines 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 machines with the drawbar load on the tractor.
- Only a specialist workshop may adjust the height of the drawbar on yoke bars with a drawbar load.
2.16.5 Brake system

- Only specialist workshops or recognised brake services may 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 braking system, park the machine safely and secure the machine against unintentional lowering and rolling away (wheel chocks)!
- Be particularly careful when carrying out any welding, torch cutting or drilling work in the area of the brake lines.
- After carrying out any adjusting and repair work on the brake system, always carry out a brake test.

Pneumatic braking system

- Before coupling the machine, clean any dirt on the sealing rings on the hose couplings of the supply and brake lines.
- Only move off with the machine connected when the pressure gauge on the tractor shows 5.0 bar.
- Drain the compressed air tank every day.
- Before driving without the machine, lock the hose couplings on the tractor.
- Hang the hose couplings of the machine supply and brake lines in the appropriate idle 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 compressed air tank if:
  - The compressed air tank can be moved in the tensioning belts
  - The compressed air tank is damaged
  - The rating plate on the compressed air tank is rusty, loose or missing
Hydraulic brake system

- 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.
- Observe the specified air pressure. If the air pressure in the tyres is too high, then there is a risk of explosions!
- Park the machine in a safe place and lock the machine 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 seed hopper.
- Only fill the seed hopper using the ladder and the platform. It is forbidden to ride on the machine during operation!
- During the calibration test, note the danger points from rotating and oscillating machine parts.
- Do not place any parts in the seed hopper.
- Before transportation, lock the track marker (construction-dependent) in the transport position.
2.16.8 Cleaning, maintenance and repairs

- Only carry out cleaning, maintenance and repair work on the machine when:
  - The drive is switched off
  - The tractor engine is at a standstill
  - The ignition key has been removed
  - The machine's connector 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 machine and/or raised machine parts against unintentional lowering before performing any cleaning, maintenance or repair work on the machine!

- When replacing work tools with blades, use suitable tools and gloves.

- Dispose of oils, greases and filters in the appropriate way.

- Disconnect the cable to the tractor generator and battery, before carrying out electrical welding work on the tractor and on attached machines.

- Spare parts must meet at least the specified technical requirements of AMAZONEN-WERKE! This is ensured through the use of original AMAZONE spare parts.
3 Loading and unloading

Loading and unloading with a tractor

**WARNING**
There is a risk of an accident when the tractor is unsuitable and the machine brake system is not connected to the tractor or is filled.

- Correctly couple the machine to the tractor, before loading the machine onto a transport vehicle or unloading it from a transport vehicle.
- You may only couple and transport the machine with a tractor for loading and unloading, as long as the tractor fulfils the power requirements.

If the machine is to be loaded onto a transportation vehicle or unloaded from such a vehicle, it must be connected to a suitable tractor (see section on "Commissioning", on page 86 and section on "Coupling and uncoupling the machine", on page 96).

Make the following connections on the tractor:
- all service brake connections
- all hydraulic connections
- the free return line of the hydraulic fan connection.

Connection of the AMATRON control terminal is not required.

**WARNING**
A marshalling person is required for the loading and unloading.
3.1 Loading the machine

1. Put the machine in the transport position (see section "Transportation", on page 121).

2. Lift the machine completely via the integrated running gear (via control unit 1, see section 7.1.1, on page 102).

3. Push the machine carefully backwards onto the transport vehicle.
   A marshalling person is required for loading.

4. Lower the machine completely (control unit 1, see section 7.1.1, on page 102) as soon as the machine has reached its transport position on the transport vehicle.

5. Manually engage the parking brake (if present) of the machine.

6. Secure the machine according to instructions.
   Bear in mind that the machine might not have a parking brake.

7. Disconnect the tractor from the machine.

In Germany, the permitted total height of the loaded lorry is 4.0 m.

3.2 Unloading the machine

1. Couple the machine to the tractor (see section 3, on page 36).

2. Remove the transport safety catch.

3. Release the parking brake of the machine.

4. Raise the complete machine via the integrated running gear and pull it carefully off the transport vehicle.
   A person is required to help with manoeuvring when unloading.

5. After unloading, uncouple the machine from the tractor (see section 7.1.1, on page 102).
4 Product description

This section:

- Provides a comprehensive overview of the machine structure.
- Provides the names of the individual modules and controls.

Read this section when actually at the machine. This helps you to understand the machine better.

Main assemblies of the machine

![Diagram of the machine with labels](image)

Fig. 10

1. Seed hopper
2. Seed distributor head
3. Seed hoses
4. Tine coulter
5. Exact harrow tines (to close the seed furrow)
6. Tapered tyres with integrated running gear
7. Leading roller feelers (optional)
8. Track marker
9. Pre-emergence marker
4.1 Overview of subassemblies

Fig. 11/

AMATRON® control terminal

Fig. 12/

(1) Tensioned crosspiece
(2) Drawbar, extendable
(3) Stand, foldable
(4) Step

Fig. 13/

Fixtures for supply lines
Fig. 14/...
(1) Case for stowing
- of the operating manual
- of the dosing rollers
- of the digital scale
- of the ratchet for actuating the exact harrow and the parking brake

Fig. 15/...
Tine coulter

Fig. 16/...
Blower fan for seed delivery with oil cooler (optional, in combination with universal joint shaft drive)

Fig. 17/...
(1) Seed dosing unit
(2) Injector sluice
(3) Electric motor (with the "Full dosing" equipment, the electric motor powers the seed dosing unit)
4.2 Safety and protection equipment

Fig. 18/…
(1) Guard screen

Fig. 19/…
(1) Charging sieve
(serves as guard screen in seed hopper)

Fig. 20/…
(1) Machine extension arm lock for transportation
### 4.3 Overview – Supply lines between the tractor and the machine

![Fig. 21](image)

<table>
<thead>
<tr>
<th>Tractor side</th>
<th>Machine side (Cayena)</th>
<th>Marking</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tractor control unit</strong></td>
<td><strong>Running direction</strong></td>
<td><strong>Feed line</strong></td>
<td><strong>Return line</strong></td>
</tr>
<tr>
<td>1 Double-acting</td>
<td>Feed line 1</td>
<td>Return line 1</td>
<td>Yellow</td>
</tr>
<tr>
<td>2 Double-acting</td>
<td>Feed line 2</td>
<td>Return line 2</td>
<td>Green</td>
</tr>
<tr>
<td>3 Double-acting</td>
<td>Feed line 3</td>
<td>Return line 3</td>
<td>Blue</td>
</tr>
<tr>
<td>4 Single-acting or double-acting</td>
<td>Feed line 4</td>
<td>Return line 4</td>
<td>Blue</td>
</tr>
<tr>
<td><strong>Pressureless line</strong></td>
<td>Return line 5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) Pressure hose with priority
2) Pressureless hose (see section on “Installation instructions for blower fan connection to tractor hydraulics”, on page 94).

<table>
<thead>
<tr>
<th>Designation</th>
<th>Marking</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 Brake line (compressed air)</td>
<td>Yellow</td>
<td>Dual-circuit pneumatic service braking system</td>
</tr>
<tr>
<td>7 Supply line (compressed air)</td>
<td>Red</td>
<td>Hydraulic service brake system</td>
</tr>
<tr>
<td>8 Hydraulic brake line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Machine connector</td>
<td></td>
<td>AMATRON* on-board computer</td>
</tr>
<tr>
<td>10 Connector (7-pin)</td>
<td></td>
<td>Road traffic lighting system</td>
</tr>
</tbody>
</table>
4.4 Transportation equipment

Fig. 22/...
(1) 8 Road safety bars
    for covering
    o the harrow tines
    o the tine coulters
(2) 2 rear-facing warning signs
(3) 1 speed sign

Fig. 23/...
(1) 2 rear-facing turn indicators
(2) 2 reflectors, yellow.
(3) 2 brake and rear lights
(4) 2 red reflectors
(5) 1 light for licence plate
(6) 2 reflectors, triangular
Fig. 24/...
(1) 2 forwards-facing warning signs

Fig. 25/...
(1) 2 limiting lights pointing forwards
(2) 2 forwards-facing turn indicators

Fig. 26/...
(1) 2 x 3 spotlights, yellow,
(laterally with a max. spacing of 3 m)
4.5 Intended use

The machine
- Is designed for metering and placing customary seeds.
- Is coupled to a tractor using the lower tractor links and is operated by an additional person.

Slopes can be navigated as follows:
- 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 %

The intended use also includes:
- Compliance with all the instructions in this operating manual.
- Compliance with inspection and maintenance specifications.
- Exclusive use of original AMAZONE spare parts.

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

For any damage resulting from improper use:
- The operator bears the sole responsibility.
- AMAZONEN-WERKE assumes no liability whatsoever.
4.6 Danger area and danger points

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

- By work movements made by the machine and its tools.
- By materials or foreign objects ejected by the machine.
- By tools rising or falling unintentionally.
- By unintentional rolling of the tractor and the machine.

Within the machine 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 stand in the machine danger area:

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

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

Danger points exist:

- Between the tractor and machine, particularly
  - When coupling and uncoupling.
  - When loading the seed tank.
- In the area of moving parts.
  - In the area of the swivelling machine extension arms.
  - In the area of the swivelling track marker.
  - Underneath raised, unsecured machines or parts of machines.
4.7 Rating plate and CE mark

The following illustrations show the arrangement of the rating plate (Fig. 27/1) and of the CE mark (Fig. 27/2).

The rating plate shows the following information:

- Vehicle ID No.
  (machine ID No.)
- Type
- Year of manufacture
- Basic weight, kg
- Perm. laden weight, kg
- Perm. axle load, front / support load, kg
- Perm. axle load, kg
- Factory

The CE mark (Fig. 28) on the machine signalises compliance with the stipulations of the valid EU directives.
## 4.8 Technical Data

<table>
<thead>
<tr>
<th>Specification</th>
<th>Cayena 6001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working width [m]</td>
<td>6.0</td>
</tr>
<tr>
<td>Row spacing of the coulter [cm]</td>
<td>16.6</td>
</tr>
<tr>
<td>Number of sowing units</td>
<td>36</td>
</tr>
<tr>
<td>Seed hopper capacity [l]</td>
<td>3600</td>
</tr>
<tr>
<td>Payload (on field) [kg]</td>
<td>3000</td>
</tr>
<tr>
<td>Working speed [km/h]</td>
<td>8 - 15</td>
</tr>
<tr>
<td>Power requirement (from) [kW/bhp]</td>
<td>100 / 136</td>
</tr>
<tr>
<td>Oil flow rate (minimum) [l/min]</td>
<td>80</td>
</tr>
<tr>
<td>Max. hydraulic working pressure [bar]</td>
<td>200</td>
</tr>
<tr>
<td>Electrical system [V]</td>
<td>12 (7-pin)</td>
</tr>
<tr>
<td>Gearbox/hydraulic fluid</td>
<td>Transmission/hydraulic fluid Utto SAE 80W API GL4</td>
</tr>
<tr>
<td>Coupling point category</td>
<td>Category III</td>
</tr>
<tr>
<td>Transport running gear</td>
<td>Integrated with 4 running wheels</td>
</tr>
<tr>
<td>Number of tapered ring tyres</td>
<td>12</td>
</tr>
<tr>
<td>Total length (in working position) [mm]</td>
<td>6700</td>
</tr>
<tr>
<td>Total height (in working position) [mm]</td>
<td>2900</td>
</tr>
<tr>
<td>Maximum drawbar load with full seed hopper (on the field) [kg]</td>
<td>3000</td>
</tr>
</tbody>
</table>
| Service brake system (connection to tractor)       | Dual-circuit pneumatic braking system or hydraulic braking system ¹)

¹) Not allowed in Germany and in several other countries.
Road transport data (only with an empty seed hopper!)

<table>
<thead>
<tr>
<th></th>
<th>Cayena 6001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total width (in transport position) [m]</td>
<td>2.9</td>
</tr>
<tr>
<td>Total length (in transport position) [m]</td>
<td>6.71</td>
</tr>
<tr>
<td>Total height (in transport position) [m]</td>
<td>3.9</td>
</tr>
<tr>
<td>Empty weight (basic weight) [kg]</td>
<td>5700</td>
</tr>
<tr>
<td>Permissible total weight [kg]</td>
<td>6000</td>
</tr>
<tr>
<td>Perm. axle load [kg]</td>
<td>4500</td>
</tr>
<tr>
<td>Perm. drawbar load (FH) when driving on the road (see rating plate) [kg]</td>
<td>3000</td>
</tr>
<tr>
<td>Maximum payload for transport journeys [kg]</td>
<td>220</td>
</tr>
<tr>
<td>Perm. maximum speed on all non-public roads, public roads and public ways.</td>
<td></td>
</tr>
<tr>
<td>• With dual-circuit pneumatic braking system [km/h]</td>
<td>40</td>
</tr>
<tr>
<td>• with hydraulic brake system [km/h]</td>
<td>25</td>
</tr>
</tbody>
</table>

4.9 Necessary tractor equipment

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

Tractor engine power

Cayena 6001 from 100 kW (136 bhp) upwards

Electrical system

Battery voltage: 12 V (volts)
Lighting socket: 7-pin
Hydraulic system

Maximum operating pressure: 200 bar
Tractor pump capacity: At least 80 l/min at 150 bar
Machine hydraulic fluid: Transmission/hydraulic fluid Utto SAE 80W API GL4

The machine hydraulic/transmission fluid is suitable for the combined hydraulic/transmission fluid circuits of all standard makes of tractor.

Control unit 1: Double-acting control unit
Control unit 2: Double-acting control unit
Control unit 3: Double-acting control unit (optional)
Control unit 4: 1 single-acting or double-acting control unit with priority control for the feed line

1 unpressurised return line with a large plug coupling (DN 16) for the pressure-free oil return flow. In the return line the banking-up pressure must be 10 bar at the maximum.

Service brake system

Dual-circuit pneumatic service braking system 2 coupling heads

Hydraulic service brake system\(^1\) 1 hydraulic coupling in accordance with ISO 5676

\(^1\) The hydraulic brake 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 cabin closed.

Measuring unit: OPTAC SLM 5.

The noise level is primarily dependent on the vehicle used.
The following section provides information on the machine structure and the functions of the individual components.

The Cayena allows sowing with or without previous soil cultivation in a single work process. The tine coulters (Fig. 29/1) allow sowing on firm soils that are sometimes unsuitable for traditional coulters.

The seed is carried along in the seed hopper (Fig. 29/2).

From the seed dosing unit (Fig. 29/3), the configured seed volume in the injector sluice reaches the air current generated by the blower fan (Fig. 29/4).

The air stream conveys the seed to the distributor head (Fig. 29/5), which distributes the seed uniformly onto all the coulters (Fig. 29/1).

The seed dosing unit is driven by an electric motor. The rotational drive speed of the dosing roller is determined by the working speed and the preset sowing rate. The AMATRON+ on-board computer measures the working speed and the distance from the impulses of the radar.

For seed placement, the "on grip" tine coulters (Fig. 29/1) push into the soil. In this way the tine coulters, supported on the following wedge ring roller (Fig. 29/6) and the leading roller feelers (optional, Fig. 29/7), maintain a constant seed placement depth. The seed placement depth is adjustable. The seed is covered with loose soil by the adjustable exact harrow (Fig. 29/8).

The track markers (Fig. 29/9) mark the field connection run in the centre of the tractor. Before germination of the seed, the tramline marker (Fig. 29/10) marks the tramlines.

The machine can be folded up to a transport width of 3 m.
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 machine and tractor sides.

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

5.1.1 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 machine to the hydraulic system of the tractor.
- Do not mix any mineral oils with biological oils.
- Observe the maximum approved hydraulic fluid pressure of 200 bar.
- Only couple clean hydraulic connectors.
- Push the hydraulic push-fit connector(s) into the hydraulic sockets until the hydraulic connector(s) perceiving lock(s).
- Check the coupling points of the hydraulic hose lines for a correct, tight seat.

1. Swivel the actuation lever on the spool 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).
5.1.2 Uncoupling the hydraulic hose lines

1. Swivel the actuation lever on the control unit on the tractor to float position (neutral position).
2. Unlock the hydraulic connectors from the hydraulic sockets.
3. Safeguard the hydraulic connectors and hydraulic connector sockets against soiling with the dust protection caps.
4. Place the hydraulic hose lines in the hose cabinet.

Fig. 31
5.2 Dual-circuit pneumatic service braking system

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

The dual-circuit pneumatic service 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 service braking system.

The machine has a parking brake. Actuate the parking brake using the provided ratchet, which is attached as a crank.

**Engaging the parking brake:**
Turn the crank towards the right

**Releasing the parking brake:**
Turn the crank towards the left

![Fig. 32]

CAUTION
Engage the parking brake before uncoupling the machine and do not disengage it until after coupling the machine to the tractor.
The dual-circuit pneumatic service braking system has:

- A supply line (Fig. 33/1) with coupling head (red)
- A brake line (Fig. 33/2) with coupling head (yellow)

![Fig. 33](image)

After the machine is coupled, the service brake system of the machine is activated when the tractor brake pedal and the tractor parking brake are actuated.

If the supply line (red) is disconnected from the tractor, the service brake system (emergency brake) automatically controls the machine provided the compressed air tank is filled.

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

To ensure that the machine is braked after uncoupling, engage the parking brake (see Fig. 32) of the machine. Do not disengage the parking brake until after coupling the machine to the tractor.

**DANGER**

If the supply line (red) is disconnected from the tractor, the service brake system controls the machine only if the pressure tank is filled. The pressure tank is unbraked if the supply line (red) is disconnected.

**Compliance with the maintenance intervals is essential for the correct function of the brake system.**
5.2.1 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 hose couplings are clean
  - the sealing rings of the hose couplings form a proper seal.
- Always replace damaged seals immediately.

WARNING
Risk of contusions, cuts, dragging, catching or knocks from unintentionally rolling machine with the operating brake released!

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

The operating brake of the machine moves out of the brake position immediately the red hose coupling has been coupled.

1. Couple the tractor and machine.
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
3. Open the covers (Fig. 34/1) of the hose couplings on the tractor.
4. Check the sealing rings of the hose couplings for damage and cleanliness.
5. Clean the dirty sealing rings and replace any damaged sealing rings.
6. Fasten the hose coupling of the brake line (yellow) in compliance with regulations in the coupling marked yellow (Fig. 34/2) on the tractor.
7. Fasten the hose coupling of the supply line (red) in the coupling marked red on the tractor in accordance with regulations.
8. Release the parking brake (see Fig. 32).
5.2.2 Uncoupling the supply and brake line

DANGER
Always secure the machine with the wheel chocks before you uncouple the machine from the tractor!

WARNING
Risk of contusions, cuts, dragging, catching or knocks from unintentionally rolling machine with the operating brake released!

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

When the supply line (red) is uncoupled from the tractor, the service brake of the machine moves to braking position.

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

1. Secure the machine against unintentionally rolling away by:
   - Applying the tractor parking brake
   - Using the wheel chocks
2. Release the hose coupling (Fig. 35) of the supply line (red).
3. Release the hose coupling of the brake line (yellow).
4. Fasten the hose couplings in the empty coupling points.
5. Close the covers of the coupling heads on the tractor.

Fig. 35
5.2.3 Control element of the dual-circuit pneumatic service braking system

If the machine is uncoupled from the tractor, the machine is braked:

- Via the parking brake (see Fig. 32).
- Via the service brake (emergency brake), if the compressed air tank is filled.

The service brake can be released, for example for manoeuvring in a workshop (see Fig. 36).

**Releasing the service brake:**
Press the button (Fig. 36/1).

**Engaging the service brake:**
Pull out the button (Fig. 36/1).

Actuation is possible only if the compressed air tank is filled. If the compressed air tank is empty, the machine is unbraked.

**DANGER**
Never release the service brake of the uncoupled machine on sloping ground.
5.3 Hydraulic service brake system

The machine 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 brake system controls two brake cylinders, which actuate the brake shoes in the brake drums.

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

The machine has a parking brake. Actuate the parking brake using the provided ratchet, which is attached as a crank.

<table>
<thead>
<tr>
<th>Engaging the parking brake:</th>
<th>Releasing the parking brake:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn the crank towards the right</td>
<td>Turn the crank towards the left</td>
</tr>
</tbody>
</table>

Fig. 37

CAUTION

Engage the parking brake before uncoupling the machine and do not disengage it until after coupling the machine to the tractor.

Compliance with the maintenance intervals is essential for the correct function of the brake system.
5.3.1 Coupling the hydraulic service brake system

1. Apply the parking brake (see Fig. 37).
2. Couple the tractor and machine (see section "Coupling and un-coupling the machine", on page 96).

3. Remove the protective cap (Fig. 42/1).
4. If necessary, clean the hydraulic socket (Fig. 38) and/or the tractor-side hydraulic connector.
5. Couple the hydraulic socket and hydraulic connector.

![Fig. 38](image)

**Couple only clean hydraulic sockets (Fig. 38) and hydraulic connectors.**

**DANGER**

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

7. Release the parking brake (see Fig. 37).

8. Connect the break-away valve to the tractor via the cable (Fig. 39/1). If the machine is separated from the tractor due to an accident, the machine is braked.

![Fig. 39](image)
9. Fill the hydro reservoir (Fig. 40/1) before moving off.
   9.1 Press the brake pedal of the tractor for at least 10 seconds. This fills the hydro reservoir.

To ensure the full effectiveness of the service brake system, fill the hydro reservoir before moving off.

5.3.2 Uncoupling the hydraulic service brake system

1. Drain the hydro reservoir (Fig. 40/1) before uncoupling the hydraulic socket (Fig. 42).
   1.1 Actuate the valve (Fig. 41/1). This drains the hydro reservoir.

The hydraulic socket (Fig. 42) cannot be coupled to the tractor again unless the hydro reservoir is empty.

2. Apply the parking brake (see Fig. 37).
3. Uncouple the hydraulic socket.
4. Secure the hydraulic socket and hydraulic connector with protective caps (Fig. 42/1) against soiling.
5. Place the hydraulic line in the holder for the supply lines.
5.4 AMATRON+ control terminal

The AMATRON+ consists of the control terminal (Fig. 43), the basic equipment (cable and fastening materials) and the job computer on the machine.

Fasten the control terminal in the tractor cab according to the AMATRON+ operating manual.

Fig. 43

The following are carried out via the operator control terminal (Fig. 43):

- input of the machine-specific data
- input of the job-related data
- control of the machine to change the sowing rate during sowing operation (electronic seed rate adjustment is necessary)
- switching clear of the hydraulic functions before the hydraulic functions can be executed via the appropriate control unit
- monitoring of the seed drill during sowing operation.

The AMATRON+ measures:

- The current forward speed [km/h]
- The current sowing rate [kg/ha]
- The distance [m] remaining until the seed tank is emptied of seed
- The actual seed tank content [kg].

Once a job has been started, the AMATRON+ stores:

- the daily and total seed volume output [kg]
- the daily and total area cultivated [ha]
- the daily and total sowing time [h]
- the average work performance [ha/h]
Design and function

For communication purposes, the AMATRON\textsuperscript{*} includes the:

- the menu "Work"
- the main menu with 4 submenus
  - the menu "Job"
  - the menu "Seed drill calibration"
  - the menu "Machine data"
  - the menu "Setup".

the menu "Work"
- indicates the required data for sowing operation
- is for the purpose of operating the seed drill during work.

In the menu "Job"
- the sowing rate is entered
- jobs are created and the data determined from up to 20 processed jobs is stored
- the desired job is started.

In the menu "Seed drill calibration"
- the sowing rate entered is checked by way of a calibration test
  and the transmission setting is corrected as necessary (optional).

In the menu "Machine data"
- the machine-specific settings are entered, selected or determined via a calibration process.

In the menu "Setup"
- the input and output of diagnostic data and the selection and input of basic machine data is performed. These jobs are reserved exclusively for customer service personnel.
5.5 Frame and machine extension arms

The machine has
- a main frame (Fig. 44/1) with integrated running gear and seed hopper.
- two machine extension arms which can be folded in for transport (Fig. 44/2).

5.6 Cases

The cases (Fig. 45/1) contain:
- the pack with operating manual
- the dosing rollers in parking position
- the scales for the calibration test.
- the ratchet for actuating the exact harrow and the parking brake
5.7 Seed hopper

The seed hopper (Fig. 46/1) is well accessible for filling, calibrating and residue draining.

The shape of the hopper ensures an unobstructed view of the tools during the work.

The full area opening of the seed hopper allows rapid filling.

The roller cover (Fig. 46/2) protects the seed being carried from rainwater.

The interior lighting of the seed hopper is coupled with the driving lights of the tractor.

Fig. 46

Fig. 47
5.7.1 Digital fill level monitoring (optional)

The level sensors monitor the seed level in the seed tank.

If the seed level reaches the level sensor, the AMATRON® displays the warning message (Fig. 48). An alarm is sounded at the same time. This alarm signal is intended to remind the tractor driver to fill up the seeds again.

The height of the level sensor (Fig. 49/1) can be adjusted from the outside by securing it to one of the connections.

Fit the level sensor according to the type of seed.

**Grain and pulses:**
Fit the sensor to the higher connection

**Fine seeds (e.g. rape):**
Fit the sensor to the lower connection.

The residual seed volume can be set, at which the warning message and the alarm signal is to be emitted.
5.8 Seed dosing

In the seed dosing unit, the seed is dosed by a dosing roller (Fig. 50/1).

The dosing roller is driven by an electric motor (Fig. 51/1).

The seed falls into the injector sluice (Fig. 51/2) and is directed by the air flow to the distributor head and then to the coulters.

For the calibration test and for emptying, the seed falls through an opening in the floor of the injector sluice. A rotary slide closes the opening. The rotary slide is actuated by means of a lever (Fig. 52). Ensure that the lever engages when opening and closing.

The opening at the bottom of the injector sluice is closed when the lever (1) points to the left in the direction of travel (arrow).

<table>
<thead>
<tr>
<th>Lever position (1):</th>
<th>Closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lever position (2):</td>
<td>Open</td>
</tr>
</tbody>
</table>

Fig. 50

Fig. 51

Fig. 52
Design and function

5.8.1 Dosing rollers

The seed dosing unit is equipped with an exchangeable dosing roller.
The dosing roller selection is dependent on
- The seed type.
- The spread rate.

The dosing rollers are used on the basis of the table (section 5.8.2, on page 69):
- Fine dosing roller (Fig. 53/1) for fine seeds.
- Medium dosing roller (option, Fig. 53/2) for medium-sized seeds with medium spread rates.
- Coarse dosing roller (Fig. 53/3) for coarse seeds and high spread rates.

For sowing particularly large seeds, e.g. beans, the chambers (Fig. 54/1) of the coarse dosing roller can be enlarged by repositioning the wheels and the plates.
5.8.2 Table Seed dosing rollers

<table>
<thead>
<tr>
<th>Seed</th>
<th>Dosing roller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spelt wheat</td>
<td>Coarse dosing roller</td>
</tr>
<tr>
<td>Oats</td>
<td>Coarse dosing roller</td>
</tr>
<tr>
<td>Rye</td>
<td>Coarse dosing roller or medium dosing roller</td>
</tr>
<tr>
<td>Summer barley</td>
<td>Coarse dosing roller</td>
</tr>
<tr>
<td>Winter barley</td>
<td>Coarse dosing roller</td>
</tr>
<tr>
<td>Wheat</td>
<td>Coarse dosing roller or medium dosing roller</td>
</tr>
<tr>
<td>Beans</td>
<td>Coarse dosing roller</td>
</tr>
<tr>
<td>Peas</td>
<td>Coarse dosing roller</td>
</tr>
<tr>
<td>Flax (dressed)</td>
<td>Medium dosing roller or fine dosing roller</td>
</tr>
<tr>
<td>Grass seed</td>
<td>Medium dosing roller</td>
</tr>
<tr>
<td>Millet</td>
<td>Medium dosing roller</td>
</tr>
<tr>
<td>Lupins</td>
<td>Medium dosing roller</td>
</tr>
<tr>
<td>Alfalfa</td>
<td>Medium dosing roller or fine dosing roller</td>
</tr>
<tr>
<td>Linseed (wet dressed)</td>
<td>Medium dosing roller or fine dosing roller</td>
</tr>
<tr>
<td>Fodder radish</td>
<td>Medium dosing roller or fine dosing roller</td>
</tr>
<tr>
<td>Phacelia</td>
<td>Medium dosing roller or fine dosing roller</td>
</tr>
</tbody>
</table>

The requisite dosing roller is dependent on the seed type and spread rate, see the table (Fig. 55, above).

For seed not listed in the table select the dosing roller of one of the seed types listed in the table of a similar grain size.
5.8.3 Seed rate adjustment with full dosing

For machines with full dosing, each dosing roller is driven by an electric motor (Fig. 56/1). The speed of the dosing rollers is determined by the preset sowing rate in the AMATRON+ and the working speed.

The AMATRON+ measures the working speed and the distance from the impulses of the radar (Fig. 57/1). Each setting must be checked with a calibration test.

The speed of the dosing rollers:

- determines the sowing rate. The higher the speed of the electric motor, the greater the sowing rate.
- adapts automatically with changing working speed.

As soon as the machine is lifted, e.g. when turning at the end of the field, the electric motor switches off.
Seed predosing

The seed rate predosing, which doses the seeds in the air flow, can be cut in before the machine starts up.

The run time of the seed predosing is adjustable.

Seed predosing is used when corners are to be sowed which can only be reached when the machine is reversed.

Start-up ramp

The start-up ramp can be cut in with which the seed rate is adjusted to the machine acceleration after the turning operation.

After turning and actuating the control unit 1, the machine goes to its working position. As soon as the machine has been lowered into working position, the seed is metered into the delivery line. The "start-up ramp" compensates for system-specific reductions in seed rate during the acceleration phase. The factory default values can be adapted.

For this purpose, the probable working speed set in the calibration menu is used. The starting speed and the time until the probable working speed is reached can be set as a percentage of the probable working speed.

This time and the percentage value depend on the respective tractor acceleration and prevent the dosing of insufficient seed during the acceleration phase.

Example

Values that can be configured in the AMATRON+:

Probable working speed: ..................10 km/h
Starting speed: .....................50 %
Time to achieve working speed: ..8 seconds

Fig. 58
5.8.4 Calibration test

It is tested by means of the calibration test whether the preset and actual sowing rates are equivalent.

Always carry out a calibration test:

- when the seed type is changed
- If the seed type is identical, but grain size, grain shape, specific weight and dressing are different.
- after exchanging the dosing rollers
- if there are any differences between the sowing rate determined by the AMATRON™ and the actual sowing rate.

5.8.5 Calibrating troughs

The seed drops into the calibration trough during the calibration test.

The calibration trough is suspended in a transport bracket and secured with a lynch pin (Fig. 59/1).

Fig. 59

The sowing rate can be increased during drilling in the event of a change from normal soil to heavy soil by pressing the corresponding key in the AMATRON™.
5.9 Blower fan

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

Clean the dirty blower fan guard screen to ensure an unobstructed air flow.
If the required air quantity is not achieved, there may be problems with the seed distribution.

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

Check the seed placement at all coulters before starting work and at regular intervals, at the latest after refilling the seed hopper.
Dirty seed delivery channels may result in deficient sowing.

The blower fan (Fig. 60/1) generating the air flow is driven by a hydraulic motor (Fig. 60/2).
The air current conveys the seed from the injector sluice to the coulters.
The blower speed determines the air volume of the air current. The higher the blower fan speed, the greater is the air volume generated.
AMATRON+ displays the current blower fan speed and sends an alarm in the event of any deviation.

The hydraulic motor (Fig. 60/2) can be driven:
- By the tractor hydraulics (see section on "Blower fan connection to tractor hydraulics, on page 74)
- By a hydraulic pump mounted on the tractor universal joint shaft (see section on "Blower fan connection at the tractor universal joint shaft (optional), on page 75).
5.9.1 Blower fan connection to tractor hydraulics

The hydraulic motor of the blower fan can be driven by the tractor hydraulics.

The correct connection of the hydraulic lines is required (see section on "Installation instructions for blower fan connection to tractor hydraulics, on page 94).

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 blower fan speed is not attained until the hydraulic fluid has heated up to working temperature.

Please refer to the table (Fig. 61, below) for the required blower fan speed. The blower fan speed depends on the machine working width and the seed.

The blower fan speed can be regulated:

- at the flow control valve of the tractor (see section "Setting the blower fan speed via the flow control valve of the tractor, on page 117).
  or (if not present)
- at the pressure relief valve (Fig. 60/3) of the hydraulic motor (see section "Adjusting the blower fan speed on the machine's pressure relief valve, on page 118).

The blower fan speed (rpm) is dependent on

- The machine working width (1).
- The seed
  - Fine seed types (2), e.g. rape or grass seed.
  - Grain and pulses (3).

**Example:**

Cayena 6001

- Working width 6.0 m (1).
- Cereal seed (3).

Required blower fan speed: 3900 rpm.

![Fig. 61](image_url)
5.9.2 Blower fan connection at the tractor universal joint shaft (optional)

A hydraulic pump (Fig. 62/1) fitted on the tractor's universal joint shaft drives the hydraulic motor of the blower fan.

Set the speed of the tractor's universal joint shaft to 1,000 rpm.

**Tractor universal joint shaft speed:**
1,000 rpm.

---

**DANGER**

Do not exceed the maximum fan speed of 4000 rpm.

If necessary, lower the universal joint shaft speed to reduce the blower fan speed.
5.10 Distributor head

In the distributor head (Fig. 64/1) the seed is distributed uniformly over all the sowing coulters.

5.11 Radar

The radar (Fig. 65/1) measures the covered distance. AMATRON* requires this data to calculate the travel speed and area cultivated (hectare counter).
5.12 Tine coulter and planting depth

The tine coulter optimises area efficiency and ensures long service life.

For seed placement, the "on grip" tine coulters push into the soil. In this way the tine coulters, supported on the trailing wedge ring roller and the tractor lower links, maintain the adjustable seed placement depth at a constant level.

The machine has 2 adjuster segments (Fig. 67/1) for setting the seed planting depth.

The working can be easily adjusted by means of the switchable ratchet. When not in use, secure the control lever of the ratchet in the holder (Fig. 67/2).

The notches (Fig. 67/3) are for the purpose of orientation for setting the planting depth.

Always perform the same settings on both adjusting segments.

The maximum placement depth is 8 cm. (Fig. 68)

Check the planting depth of the seed after every adjustment (see section on "Checking the seed planting depth", on page 135).
5.13 Exact harrow

The exact harrow (Fig. 69/1) covers the seeds deposited in the sowing furrows with loose earth and smooths the ground.

The following are adjustable:

- the position of the harrow tines
- the exact harrow pressure.

The exact harrow pressure determines the working intensity of the exact harrow and depends on the soil type.

**Position of the harrow tines**

<table>
<thead>
<tr>
<th>Distance &quot;A&quot;</th>
<th>230 to 280 mm</th>
</tr>
</thead>
</table>

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

- lie horizontally on the ground and
- have 5 - 8 cm free floating space beneath.

The exact harrow pressure is generated by tension springs that are tensioned centrally using a lever (Fig. 71/1).

The lever is in contact with a pin (Fig. 71/2) in the adjuster segment. The higher the pin is inserted in the group of holes, the greater the exact harrow pressure.

Adjust the exact harrow pressure so that all seed rows are evenly covered with earth.
5.14 Markers

The hydraulically-actuated track markers dig into the ground alternately on the left and the right of the machine.

In so doing, the active track marker creates a mark. This mark serves as an orientation aid for the next run after turning.

On the next run, 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.

To pass obstacles the active track marker can be folded in and out on the field.

Before the track marker is folded in, actuate the obstacle button (AMATRON®) so that the tramline counter of the seed wheel tramline control does not shift on.

If the track marker still encounters hard obstacles, the overload protection system of the hydraulic system responds and the hydraulic cylinder gives way to the obstacle and thus protects the track marker against damage.

After passing the obstacle the tractor driver folds the track marker out again by actuating the control unit.

Deactivate the obstacle button after the obstacle has been passed.
5.15 Creation of tramlines

The tramline selection allows the creation of tramlines at preselected intervals on the field. To set the different tramline distances, appropriate tramline rhythms have to be entered into the on-board computer1).

1) AMATRON™

When the tramlines are being created:

- The tramline control on the distributor head uses shutters (Fig. 74/1) to block the seed feeding lines to the seed lines (Fig. 74/2) 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. 74/3) closes the appropriate seed tubes (Fig. 74/2) in the distributor head.

Upon creating a tramline, the tramline counter indicates the number “0” on the on-board computer1). The seed volume, which is reduced when creating a tramline, can be set.

A sensor (Fig. 74/4) checks whether the shutters (Fig. 74/1), which open the and close the seed tubes (Fig. 74/2), are working properly.

If the setting is wrong, the on-board computer1) emits an alarm.

1) AMATRON™
The tramline selection allows the creation of tramlines at preselected intervals on the field.

Tramlines are seed-free tracks (Fig. 75/A) for fertilising and plant care machines used later.

The tramline spacing (Fig. 75/b) corresponds to the working width of the care machines (Fig. 75/B), e.g. fertiliser spreader and/or field sprayer, which are used on sown fields.

To set the different tramline spacings (Fig. 75/b), appropriate tramline rhythms must be entered on the on-board computer 1).

The figure (Fig. 75) shows the tramline rhythm 3. During work, the field runs are numbered consecutively (tramline counter) and displayed on the on-board computer 1).

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.

Upon creating a tramline, the tramline counter indicates the number "0" on the on-board computer 1).

The required tramline rhythm (see table Fig. 76) is derived from the required tramline spacing and the working width of the seed drill. Further tramline rhythms can be seen in the operating manual of the on-board computer 1).

The track width (Fig. 75/a) of the tramline corresponds to that of the cultivating tractor and is adjustable (see section on "Setting the tramline to the track width of the cultivating tractor, on page 162). The track width (Fig. 75/c) of the tramline increases with an increasing number of tramline coulters fitted next to each other.

1) AMATRON®
### Design and function

#### Seed drill working width

<table>
<thead>
<tr>
<th>Tramline rhythm</th>
<th>Seed drill working width</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0 m</td>
<td></td>
</tr>
</tbody>
</table>

#### Tramline spacing (working width of the fertiliser spreader and field sprayer)

<table>
<thead>
<tr>
<th>Tramline rhythm</th>
<th>Tramline spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 m</td>
<td>1</td>
</tr>
<tr>
<td>18 m</td>
<td>3</td>
</tr>
<tr>
<td>24 m</td>
<td>4</td>
</tr>
<tr>
<td>30 m</td>
<td>5</td>
</tr>
<tr>
<td>36 m</td>
<td>6</td>
</tr>
<tr>
<td>42 m</td>
<td>7</td>
</tr>
<tr>
<td>24 m</td>
<td>2 plus</td>
</tr>
<tr>
<td>36 m</td>
<td>6 plus</td>
</tr>
</tbody>
</table>

Fig. 76

### 5.15.1 Examples for creating tramlines

The creation of tramlines is shown in Figure (Fig. 77) using various examples:

- **A** = Working width of the seed drill.
- **B** = Tramline spacing (= working width of fertiliser spreader / field sprayer).
- **C** = Tramline rhythm (input on the on-board computer\(^1\)).
- **D** = Tramline counter (during work, the field runs are numbered consecutively and displayed on the on-board computer\(^1\)).

Perform any inputs and outputs with the aid of the operating manual of the on-board computer\(^1\).

**Example:**

- Working width of seed drill: 6 m
- Working width of fertiliser spreader or field sprayer: 18 m = 18 m tramline spacing

1. In the adjacent table (Fig. 77) look for the following:
   - in column A the seed drill's working width (6 m) and
   - in column B the tramline spacing (18 m).

2. On the same line in column "C", take the reading for the tramline rhythm (tramline rhythm 3) and enter this on the on-board computer\(^1\).

3. On the same line in column "D" under the inscription "START", take the reading of the tramline counter for the first field run (tramline counter 2) and enter it on the on-board computer\(^1\). Input this value directly before commencing the first field trip.

\(^1\) AMATRON"
Fig. 77
The illustration (Fig. 77) shows, among other information, examples for creating tramlines with the tramline rhythm 4, 6 and 8.

It shows work with the seed drill at half width (partial width) during the first field trip.

On the Cayena 6001 it is not possible to switch a part of the width.

Another option for creating tramlines with the tramline rhythm 4, 6 and 8 is to begin with the full working width and the creation of a tramline (see Fig. 78).

In this case, the care machine works at half working width during the first field trip.

After the first field trip, reset the full machine working width!
5.15.3  Tramline rhythm 2 plus and 6 plus

The illustration (Fig. 77) shows, among other information, examples for creating tramlines with the tramline rhythm 2 plus and 6 plus.

When tramlines are created with the tramline rhythm 2 plus and 6 plus (Fig. 79), tramlines are created during the trips forward and backward over the field.

On machines with

- tramline rhythm 2 plus, the seed feed to the tramline coulters may only be interrupted on the left side.
- tramline rhythm 6 plus, the seed feed to the tramline coulters may only be interrupted on the left side.

the seed feed to the tramline coulters is interrupted.

Work always starts on the right hand edge of the field.

Fig. 79

5.15.4  Tramline marker (optional)

When tramlines are being created, the track discs (Fig. 80) lower automatically and mark the tramline that has just been created. Due to this the tramlines already become visible before the seed has been sown.

It is possible to set:

- the wheelmark spacing of the tramline (Fig. 75/a)
- the working intensity of the track discs

The track discs are raised if no tramline is created.

Fig. 80
6 Commissioning

This section contains information
- on commissioning your machine
- on checking how you may attach the machine to your tractor.

- Before operating the machine for the first time, the operator must have read and understood the operating manual.
- Take heed of section "Safety information for users", from on page 27 onwards on
  - Coupling and uncoupling the machine
  - Machine transportation
  - Use of the machine
- Only couple and transport the machine to/with a tractor which is suitable for the task.
- The tractor and machine must meet the national road traffic regulations.
- The operator and the user shall be responsible for compliance with the statutory road traffic regulations.

**WARNING**

Danger of crushing, shearing, cutting, or being caught and drawn in 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 controlled 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 machine to the tractor.
  
  You may only connect the machine 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 approved axle loads
- The approved drawbar load at the tractor coupling point
- The load capacity of the installed tyres
- The approved trailer load must be sufficient

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

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

The tractor must achieve the brake delay specified by the tractor manufacturer, even with the machine 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's empty weight
- ballast weight and
- total weight of the attached machine or noseweight of the hitched machine.

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

[Fig. 81]

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Unit</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>$T_L$</td>
<td>[kg]</td>
<td>Tractor empty weight</td>
<td>See tractor operating manual or vehicle documentation.</td>
</tr>
<tr>
<td>$T_V$</td>
<td>[kg]</td>
<td>Front axle load of the empty tractor</td>
<td></td>
</tr>
<tr>
<td>$T_H$</td>
<td>[kg]</td>
<td>Rear axle load of the empty tractor</td>
<td></td>
</tr>
<tr>
<td>$G_V$</td>
<td>[kg]</td>
<td>Front weight (if available)</td>
<td>See front weight in technical data, or weigh.</td>
</tr>
<tr>
<td>$F_H$</td>
<td>[kg]</td>
<td>Maximum drawbar load</td>
<td>See section on &quot;Technical Data&quot;, on page 48</td>
</tr>
<tr>
<td>$a$</td>
<td>[m]</td>
<td>Distance between the centre of gravity of the front machine mounting or the front weight and the centre of the front axle (total $a_1 + a_2$)</td>
<td>See technical data of tractor and front-mounted machine or front weight or measurement.</td>
</tr>
<tr>
<td>$a_1$</td>
<td>[m]</td>
<td>Distance from the centre of the front axle to the centre of the lower link connection</td>
<td>See tractor operating manual or measurement</td>
</tr>
<tr>
<td>$a_2$</td>
<td>[m]</td>
<td>Distance between the centre of the lower link connection point and the centre of gravity of the front machine mount or front weight (centre of gravity distance)</td>
<td>See technical data of front machine mounting or front weight or measurement</td>
</tr>
<tr>
<td>$b$</td>
<td>[m]</td>
<td>Tractor wheel base</td>
<td>See tractor operating manual or vehicle documents or measurement</td>
</tr>
<tr>
<td>$c$</td>
<td>[m]</td>
<td>Distance between the centre of the rear axle and the centre of the lower link connection</td>
<td>See tractor operating manual or vehicle documents or measurement</td>
</tr>
</tbody>
</table>
6.1.1.2 Calculation of the required minimum ballasting at the front \( G_{V\text{min}} \) of the tractor for assurance of the steering capability

\[
G_{V\text{min}} = \frac{F_H \cdot c - T_V \cdot b + 0.2 \cdot T_L \cdot b}{a + b}
\]

Enter the numeric value for the calculated minimum ballast \( G_{V\text{min}} \) 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 machine

\[
G_{\text{tat}} = G_V + T_L + F_H
\]

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

<table>
<thead>
<tr>
<th>Minimum ballast front / rear</th>
<th>Actual value according to calculation</th>
<th>Approved value according to tractor operating manual</th>
<th>Double approved load capacity (two tyres)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total weight</th>
<th>kg ≤</th>
<th>kg</th>
<th>--</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Front axle load</th>
<th>kg ≤</th>
<th>kg</th>
<th>≤</th>
<th>kg</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Rear axle load</th>
<th>kg ≤</th>
<th>kg</th>
<th>≤</th>
<th>kg</th>
</tr>
</thead>
</table>

- 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 machine 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 (\(G_{V_{\text{min}}}\)).

You must use a front weight, which is equal to at least the required minimum front ballast (\(G_{V_{\text{min}}}\)).
6.1.2 Requirements for tractor operation with attached machines

**WARNING**

Risk of breakage during operation of components through un-approved 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 / machine against unintentional start-up and rolling

**WARNING**

Risk of contusions, cutting, catching, drawing in and knocks when making interventions in the machine through

- Unintentional lowering of the unsecured machine when it is raised via the three-point hydraulic system of the tractor
- Unintentional lowering of raised, unsecured parts of the machine
- Unintentional start-up and rolling of the tractor-machine combination.

Secure the tractor and the machine against unintentional start-up and rolling before any intervention in the machine.

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

- while the machine is being driven.
- when the tractor's engine is running and the tractor's universal joint shaft/hydraulic system is connected.
- if the ignition key is inserted in the tractor when the tractor's universal joint shaft/hydraulic system is connected and the tractor engine could be started unintentionally.
- if the tractor and machine have not each been prevented from unintentionally rolling away by applying their parking brakes and/or securing them 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 with the machine on firm flat ground only.
2. Lower any raised, unsecured machine parts.
   → This is how to prevent unintentional falling.
3. Shut down the tractor engine.
4. Remove the ignition key.
5. Apply the tractor parking brake.
6. Secure the machine with wheel chocks against unintentionally rolling away.
6.3 Installation instructions for blower fan connection to tractor hydraulics

The banking-up 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 hose (Fig. 82/5) to a single-acting or double-acting tractor control unit with priority.

- Connect the large hydraulic coupling of the return line hose (Fig. 82/6) only to an unpressurised tractor connection with direct access to the hydraulic fluid tank (Fig. 82/4). In order that the banking-up pressure of 10 bar is not exceeded, do not connect the return line hose to a tractor control unit.

- For retrofitting of the tractor return line hose, use only piping with DN 16, e.g. 20 id. x 2.0 mm with a short return path to the hydraulic fluid tank.

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

---

The hydraulic fluid must not overheat.

High oil flow rates in conjunction with small oil tanks encourage rapid heating-up of the hydraulic fluid. The capacity of the tractor's oil tank (Fig. 82/4) 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.

---

**Fig. 82**

(A) On the machine face
(B) On the tractor face

1. Hydraulic fan motor
   \( N_{\text{max}} = 4000 \text{ rpm} \)

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 line:
   - unpressurised line with "large" push-fit coupling
     (marking: 2 cable ties, red)
6.4 Initial installation of the holders for the road safety bars

Screw on the two holders (Fig. 83/1) as shown in the illustration (Fig. 84).

Connect the road safety bars (Fig. 85/2) to each other and fasten them to the holders (Fig. 85/1) during work.
When coupling and uncoupling the machine take heed of the section "Safety information for users", on page 27.

**WARNING**

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

Secure the tractor and machine against unintentional start-up and rolling away before entering the danger area between the tractor and machine to couple or uncouple the machine. On this subject see section 6.2, on page 93.

**WARNING**

Danger of being crushed between the rear of the tractor and the machine when coupling and uncoupling the machine!

Only actuate the operator controls for the tractor's three-point hydraulic system:
- from the workplace provided
- if you are outside of the danger area between the tractor and the machine.

### 7.1 Coupling the machine

**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 machine to tractors suitable for the purpose. On this subject see the section "Checking the suitability of the tractor", on page 87.

**WARNING**

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

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

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

WARNING
Risk of contusions, cutting, catching, drawing in and knocks when the machine unexpectedly releases from the tractor!
- Use the intended equipment to connect the tractor and the machine in the proper way.
- When coupling the machine to the tractor's three-point hydraulic system, ensure that the tractor mount categories of the tractor and the machine are the same.

WARNING
Risk of energy supply failure between the tractor and the machine through damaged supply lines!
During coupling, check the course of the supply lines. The supply lines
- must give slightly without tension, bending or rubbing on all movements of the connected machine.
- Must not chafe against other parts.

DANGER
If the tractor has been separated from the machine, always
- Secure the machine with the service parking brake as well as 2 wheel chocks.

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

CAUTION
Do not make any machine connections until the tractor and machine are coupled, the tractor motor is shut down, the tractor parking brake applied and the ignition key removed!

CAUTION
Do not connect the supply line (red) of the dual-circuit pneumatic service braking system to the tractor until the tractor engine is shut down, the tractor parking brake is applied and the ignition key is removed!
The machine can be coupled or uncoupled whether it is folded in or out.

Always retract the integrated running gear beforehand (lower the machine). When the machine is uncoupled and the running gear is extended (machine raised) the pressure in the supply line can increase so much that later coupling to the tractor becomes impossible.

**WARNING**

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

1. Verify that the machine is secured with 2 wheel chocks (Fig. 86/1).

2. Secure one ball sleeve (Fig. 87/1) above each lower link pin (Cat. III) of the draw bar and secure it with a clip pin.

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

**CAUTION**

Danger of getting crushed in the area of the moving tensioned crosspiece.
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 hinging points of the machine.

5. Direct people out of the danger area between the tractor and machine before you approach the machine with the tractor.

6. Drive the tractor in reverse up to the machine so that the lower link hooks of the tractor automatically pick up the ball sleeves of the machine.
   → The lower link hooks lock automatically.

7. Check whether the securing device of the tractor's lower link locking system is closed and secured (see tractor's operating manual).

8. Lift the tractor's lower link until the sustainer (Fig. 89/1) is free of the ground.

9. Secure the tractor against unintentional starting and unintentional rolling away.

10. Check whether the universal joint shaft of the tractor is switched off.

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

12. Connect the hydraulic pump (optional, see section on "Connecting the hydraulic pump" on page 107).

13. Depending on the equipment configuration, couple the following to the tractor:
   - The brake and supply line of the dual-circuit pneumatic service braking system (see section on "Coupling the brake and supply lines", on page 56)
   - The hydraulic connector of the hydraulic service brake system (see section on "Hydraulic service brake system", on page 59).

14. Connect the supply lines to the tractor (see section 7.1.1 to 7.1.2 on on page 102).

15. Guide the cable (Fig. 88/2) connected to the valve lever (Fig. 88/1) through the eyelet (Fig. 88/3) and on into the tractor cab.
16. Remove the bolt (Fig. 89/1).

17. Hold the stand by the handle (Fig. 90/1) and fold it up.

18. Locate the stand using the pin (Fig. 90/2), then secure with the lynch pin.

19. Push the wheel chocks into the mountings and secure them with lynch pins (Fig. 91/1).
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.

20. Release the parking brake of the machine, see section on
   - "Dual-circuit pneumatic service braking system", on page 54
   - "Hydraulic service brake system", on page 59.

21. Before moving off:
   - Check the function of the braking and lighting system.
   - Carry out a brake test.
### 7.1.1 Connecting the hydraulic joints

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

<table>
<thead>
<tr>
<th>Tractor control unit</th>
<th>Tractor side</th>
<th>Machine side (Cayena)</th>
<th>Running direction</th>
<th>Marking</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Double-acting</td>
<td>Feed line 1</td>
<td>Yellow</td>
<td>1</td>
<td>Lowering / lifting integrated running gear</td>
</tr>
<tr>
<td></td>
<td>Double-acting</td>
<td>Return line 1</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Double-acting</td>
<td>Feed line 2</td>
<td>Green</td>
<td>1</td>
<td>Folding the machine extension arms</td>
</tr>
<tr>
<td></td>
<td>Double-acting</td>
<td>Return line 2</td>
<td></td>
<td>2</td>
<td>Lowering / lifting the track marker</td>
</tr>
<tr>
<td>3</td>
<td>Double-acting</td>
<td>Feed line 3</td>
<td>Blue</td>
<td>1</td>
<td>Working depth adjustment of tine coulters (optional)</td>
</tr>
<tr>
<td></td>
<td>Single-acting or double-acting</td>
<td>Return line 3</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Single-acting or double-acting</td>
<td>Feed line 4) 1)</td>
<td>Red</td>
<td>1</td>
<td>Hydraulic fan motor</td>
</tr>
<tr>
<td></td>
<td>Pressureless line</td>
<td>Return line 2)</td>
<td></td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

1) Pressure hose with priority
2) Pressureless hose (see section on "Installation instructions for blower fan connection to tractor hydraulics", on page 94).

- During work the tractor control unit 1 is actuated more frequently than any other control units. Assign the connections of control unit 1 to an easily reachable control unit in the tractor cab.
- Tractors with constant pressure hydraulic systems are designed only conditionally for the operation of hydraulic motors. Take heed of the recommendations of the tractor manufacturer.

### 7.1.2 Making additional connections

<table>
<thead>
<tr>
<th>Connection/function</th>
<th>Installation information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug (7-pin) for the road traffic lighting system</td>
<td></td>
</tr>
<tr>
<td>AMATRON® machine connector</td>
<td>Plug the connector into the terminal as described in the AMATRON® operating manual.</td>
</tr>
</tbody>
</table>
7.2 Uncoupling the machine

WARNING
Risk of contusions, cutting, catching, drawing in and knocks through insufficient stability and possible tilting of the uncoupled machine!

Set the empty machine down on a horizontal parking area with a firm base.

When uncoupling the machine, there must always be enough space in front of the machine, so that you can align the tractor with the machine if necessary.

1. Align the tractor and machine straight and park the empty machine on a horizontal parking surface with a firm base.

2. Check whether the universal joint shaft of the tractor is switched off.

3. Switch off the tramline counter.
   3.1 Press the tramline STOP button (see operating manual for on-board computer)
   → Pressing the tramline STOP button prevents the tramline counter from shifting on.

4. Retract the integrated running gear (lower the machine). Here the machine can be coupled or uncoupled.

5. Press the button (Fig. 92/1).
   → Switch off the AMATRON+.

Fig. 92
6. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

7. Engage the parking brake of the machine, see section on
   - "Dual-circuit pneumatic service braking system", on page 54
   - "Hydraulic service brake system", on page 59.

8. Fold down the stand and position it using the bolt (Fig. 93/1).

9. Secure the bolt with the lynch pin.

10. Remove the lynch pins (Fig. 94/1) and remove the wheel chocks from the transport brackets.
11. Secure the machine using two wheel chocks (Fig. 95/1).

**DANGER**
Always secure the machine with 2 wheel chocks before you un-couple the machine from the tractor!

12. Depending on the equipment configuration, uncouple the following from the tractor:
   - The supply line and the brake line of the dual-circuit pneumatic service braking system (see section on "Uncoupling the supply and brake line", on page 57)
   - The hydraulic connector of the hydraulic service brake system (see section on "Hydraulic service brake system", on page 59).

When uncoupling the dual-circuit pneumatic service braking system, first disconnect the red hose coupling (supply line) and then the yellow hose coupling (brake line) from the tractor!

13. Disconnect all supply lines.
14. Close the hydraulic connectors with protective caps.
15. Place the supply lines in the hose cabinet (Fig. 96).
16. Place the machine on the stand (Fig. 97/1).

**WARNING**

Park the machine on a horizontal, firm substrate only!
Ensure that the sustainer does not sink into the ground. If the sustainer does sink into the ground, it will be impossible to recouple the machine!

17. Open the securing device (Fig. 98) 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 machine!

**CAUTION**

Danger of getting crushed in the area of the moving tensioned crosspiece.
7.3 Connecting the hydraulic pump (optional)

WARNING
Risk of crushing from the tractor and machine unintentionally starting up or rolling.

Only couple/uncouple the hydraulic pump and tractor universal joint shaft if the tractor and machine are secured to prevent unintentional starting and rolling.

7.3.1 Connecting the hydraulic pump

1. Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Clean and grease the tractor's universal joint shaft.
3. Couple the tractor and machine.
4. Secure the tractor against unintentional starting and unintentional rolling away.
5. Couple the hydraulic pump (Fig. 99/1) to the tractor's universal joint shaft. The hydraulic pump is equipped with a QC fastener. Make sure the QC fastener has engaged correctly.
6. Set the adjuster segment so that the buffer (Fig. 99/2) rests against it.
7.3.2 Uncoupling the hydraulic pump

<table>
<thead>
<tr>
<th>DANGER</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Switch off the tractor universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.</td>
</tr>
<tr>
<td>● The hydraulic pump contains hot components that may inflict burns. Wear gloves.</td>
</tr>
</tbody>
</table>

1. Park the machine on level, solid ground.
2. Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

   Wait until the universal joint shaft stops moving.

3. Pull the hydraulic pump off of the tractor's universal joint shaft.
8 Settings

WARNING
Risk of contusions, cutting, catching, drawing in and knocks through
- Unintentional falling of the machine raised using the tractor's three-point hydraulic system.
- Unintentional falling of raised, unsecured machine parts.
- Unintentional start-up and rolling of the tractor-machine combination.

Secure the tractor and the machine against unintentional starting and rolling away before you make any adjustments to the machine. On this subject see section 6.2, on page 93.

DANGER
Before adjustment tasks (if not described otherwise)
- Fold out the machine extension arms (see section 10.1, on page 127)
- Switch off the tractor's universal joint shaft
- Wait until the tractor's universal joint shaft stops moving
- Apply the tractor's parking brake
- Switch off the tractor's engine
- Remove the ignition key.

8.1 Repositioning the level sensor

1. Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

2. Release the nut (Fig. 100/1).

3. Detach the level sensor (Fig. 100/2), insert it in the intended connection and secure it in place.

4. Fit the dummy (Fig. 100/3), which has no function, into the vacated opening and secure.

Fig. 100
8.2 Installing/removing the dosing roller

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

1. Close the seed hopper opening (only necessary when the seed hopper is full).
   1.1 Remove the key (Fig. 101/1) from the holder.
   1.2 Release two nuts (Fig. 102/1) but do not remove.
   1.2 Turn the screws (Fig. 103/1).
   1.3 Push the shutter (Fig. 103/2) into the dosing unit up to the stop.
2. Loosen both screws (Fig. 104/1).
3. Twist and remove the bearing cover (Fig. 105).

4. Pull the dosing roller out of the dosing unit.

Install the dosing roller in the reverse sequence.

Set the shutter to the parking position and secure with two screws (see Fig. 102).
8.3 Setting the sowing rate with a calibration test

1. Fill the seed hopper with at least 200 kg of seed (correspondingly less for fine seed) (see section "Filling the seed hopper", on page 131).

2. Fold in the machine extension arms (see section "Folding the machine extension arms out/in", on page 127).

3. Lower the machine fully by moving in the integrated running gear completely.

4. Insert the calibration trough (Fig. 107/1) into the holder beneath the dosing unit.

5. Open the rotary slide of the injector sluice [see Figure (Fig. 52), on page 67].
6. Adjust the desired sowing rate in the AMATRON®.
   6.1 Open the menu "Job".
   6.2 Select the job number.
   6.3 Enter the job name (optional).
   6.4 Enter job notes (optional).
   6.5 Enter the seed type.
   6.7 Enter the desired sowing rate.
   6.8 Start the job (press the "Start job" button).
   6.9 Adjust the sowing rate with calibration test as described in the AMATRON® operating manual (see section on "Calibrating machines with electric full dosing").

<table>
<thead>
<tr>
<th>i</th>
<th>The number of engine revolutions for the calibration test until the signal tone sounds is governed by the sowing rate:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 14.9 kg → Engine revolutions to 1/10 ha</td>
<td></td>
</tr>
<tr>
<td>15 to 29.9 kg → Engine revolutions to 1/20 ha</td>
<td></td>
</tr>
<tr>
<td>30 kg or more → Engine revolutions to 1/40 ha</td>
<td></td>
</tr>
</tbody>
</table>

7. Fasten the calibration trough to the transport mounting and secure it with a lynch pin (see section on "Calibrating troughs", on page 72).
8. Also close the injector sluice flap(s) [see Figure (Fig. 52), on page 67].
8.4 Adjusting the planting depth

1. Set the machine on the field to its working position (see section on "Use of the machine", on page 125).

2. Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

3. Remove the clip pin (see Fig. 110).

4. Set the planting depth with the switchable ratchet (Fig. 109).

5. Lock the setting using the clip pin (see Fig. 110).

6. The machine has two adjuster segments. Repeat the operation as described.

![Fig. 109](image1)

Lock each setting using the clip pin (Fig. 110/1).
The ratchet is reset by actuating the lever (Fig. 110/2).

![Fig. 110](image2)

This setting influences the placement depth of the seed.
Check the placement depth of the seed after each adjustment.
8.5 Adjusting the exact harrow

Check the work results after each adjustment.

8.5.1 Setting the harrow tines

The harrow tines are adjusted [see Table (Fig. 70), on page 78] by rotating them using the crank provided (Fig. 111/1) at all adjuster segments.

1. Set the machine on the field to its working position (see section "Use of the machine", on page 125).
2. Switch off the tractor universal joint shaft, apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
3. Perform the same settings on all adjuster segments.
4. Secure each setting using a lynch pin (Fig. 111/2).

8.5.2 Setting the exact harrow pressure

1. Clamp the lever (Fig. 112/1).
2. Insert the pin (Fig. 112/2) into a hole under the lever.
3. Relieve the lever.
4. Secure the pin with a safety splint.
5. Apply the same setting to all adjusting segments.
8.6 Adjusting the track marker length and working intensity

**DANGER**

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

1. Direct people away from the danger area.
2. Fold out both track markers simultaneously on the field (see AMATRON® operating manual) and drive several metres.
3. Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
4. Undo the bolt (Fig. 113/1).
5. Set the track marker length to distance "A" (see table, Fig. 114, below).
6. Tighten the bolt (Fig. 113/1) securely.

7. Release both screws (Fig. 113/2).
8. Turn the track marker disc to adjust the working intensity of the track marker so that it runs roughly parallel to the direction of travel on light soil and is more attuned to grip on heavier soil.
9. Tighten the screws (Fig. 113/2).
10. The machine is equipped with two track markers. Repeat the operation as described.

The table values specify the distance "A"
- from the centre of the machine
- up to the contact surface of the track marker disc.

<table>
<thead>
<tr>
<th>Distance &quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cayena 6001</td>
</tr>
</tbody>
</table>

Fig. 113

Fig. 114
8.7 Adjusting blower fan speed

This setting is not required if the blower fan is driven from the tractor universal joint shaft.

Set the desired blower fan speed [see Table (Fig. 61), on page 74]
- via the tractor's flow control valve
- at the pressure relief valve of the blower fan hydraulic motor, if the tractor has no flow control valve.

Set the following in the AMATRON⁺:
- the desired blower fan speed
- the deviation from the desired blower fan speed (as a percentage) at which the alarm is to be triggered.

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

1. Release the lock nut (Fig. 115/2).
2. Set the pressure relief valve (Fig. 115/1) to the factory setting "21 mm" (Fig. 116).
   2.1 Turn the screw accordingly using the hexagon socket wrench (Fig. 115/3).
3. Tighten the lock nut (Fig. 115/2).
4. Set the desired blower fan speed at the flow control valve of the tractor.
8.7.2 Adjusting the blower fan speed on the machine's pressure relief valve

1. Release the lock nut (Fig. 115/2).
2. Set the desired blower fan speed at the pressure relief valve using the hexagon socket wrench.

Do not exceed the dimension "21 mm" (Fig. 116)!

Fan speed
Turning clockwise: increases the desired fan speed.
Turning anticlockwise: reduces the desired fan speed.

3. Tighten the lock nut (Fig. 115/2).

8.8 Setting the tramline rhythm/counter

1. Refer to the table (Fig. 76, on page 82) for the required tramline rhythm and enter it into the on-board computer\(^1\).
2. Refer to the illustration (Fig. 77, on page 83) for the tramline counter for the first field run and enter it on the on-board computer\(^1\).
3. Set seed volume reduction (%) when creating tramlines in the Machine Data menu in the on-board computer\(^1\).
4. Switch on/off the interval tramline switch in the Work menu in the on-board computer\(^1\).

\(^1\) see AMATRON\(^+\) operating manual

---

The tramline counter is coupled with the operating position sensor. Each time the machine is lifted the tramline counter indexes by one digit.

Pressing the tramline STOP button prevents the tramline counter from shifting on (see operating manual for on-board computer).
8.9 Moving the track disc carrier of the tramline marker to the operational/transport position

---

DANGER

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

The track disc carriers of the tramline marker are moved hydraulically if the tramline counter is switched over:

- To the digit "zero" or
- From "zero" to another number.

---

8.9.1 Moving the track disc carrier to the working/transport position

The machine has two track disc carriers.

Swivel the track disc carriers into working or transport position manually.

**Transport position**

The illustration (Fig. 117) shows the transport position of the track disc carriers.

Locate the track disc carrier in transport position using a pin (Fig. 117/1) and secure it using a lynch pin.

![Fig. 117](image1)

**Working position**

The illustration (Fig. 118) shows the working position of the track disc carriers.

Locate the track disc carrier in working position using a pin (Fig. 118/1) and secure it using a lynch pin.

![Fig. 118](image2)
8.9.2 Adjusting the track discs

1. Set the track discs (Fig. 119/1) so that they mark the tramline.

2. Turn the track marker discs to adjust the working intensity of the track discs so that they run roughly parallel to the direction of travel on light soil and are more "on grip" on heavier soil.

3. Tighten the screws (Fig. 119/2) firmly.

When working with tramline rhythm 2 plus and tramline rhythm 6 plus (see also section 5.15.3, on page 85), bring only one of the two track discs into transport position.

The track width of the cultivating tractor is then scored on the field on a back and forth run.
9 Transportation

When driving on public streets or roads, the tractor and machine 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 transport journeys take heed of the section "Safety information for users", on 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.
  - That the brake system functions properly.
  - That the tractor parking brake is released completely.

**WARNING**

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

- On folding machines, check that the transport locks are locked correctly.
- Secure the machine against unintentional movements before starting transportation.
WARNING
Risk of contusions, cuts, dragging, catching or knocks from tipping and insufficient stability.

- Drive in such a way that you always have full control over the tractor with the attached machine.
  In so doing, take your personal abilities into account, as well as the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the connected or coupled machine.
- Before transportation, fasten the side locking of the tractor lower link, so that the connected or coupled machine 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.

Observe the maximum load of the attached machine and the permissible axle and drawbar loads of the tractor. Drive with an empty hopper only.

WARNING
Risk of falling from the machine if riding against regulations!

It is forbidden to ride on the machine and/or climb the running machine.

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

DANGER
Empty the hopper.

The brake system is designed for driving with an empty hopper only.
Moving the machine to transport position on the field after work

1. Fold in both track markers (see AMATRON® operating manual).
2. Fold in the machine extension arms (see section "Folding the machine extension arms out/in", on page 127).
3. Empty the seed hopper (see section on "Emptying the seed hopper and/or dosing unit", on page 137). The brake system is designed for driving with an empty hopper only.

4. Close the roller cover.
5. Secure the roller cover using two tension elements (Fig. 120/1).

6. Use the road safety bars to cover the tine coulters and harrow tines that extend out into the road area.

7. Check the lighting system for proper function (see section on "Transportation equipment", on page 43).
8. Lock the tractor control unit.
DANGER
Lock the tractor control units during transport!

The warning signs and yellow reflectors must be clean and undamaged.

- Depending on the equipment of the machine, the permitted maximum speed\(^1\) is as follows:
  - 25 km/h (with hydr. service brake system\(^2\))
  - 40 km/h (with dual-circuit pneumatic service braking system).

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

- Switch on the all round lighting (if available), which is subject to authorisation, prior to starting a journey and check operation.

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

\(^1\) The permissible maximum speed for attached work equipment differs in the various countries according to national traffic regulations. Ask your local importer / machine dealer about the maximum permissible speed on public roads.

\(^1\) not permitted in Germany and some other EU countries
Use of the machine

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

- "Warning pictograms and other signs on the machine", as of on page 18 and
- "Safety information for users", on 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!

Observe the maximum load of the attached machine and the permissible axle and drawbar loads of the tractor. If necessary, drive only with an empty or partially filled seed hopper.

**WARNING**

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

Drive in such a way that you always have full control over the tractor and 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 influence of the attached machine.

**WARNING**

Risk of crushing, being caught and/or drawn in and trapped if the intended protective equipment is not used during machine operation.

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

**WARNING**

Only actuate the tractor control units from inside the tractor cab.
**WARNING**
Risk of being crushed, caught or struck by damaged components or foreign objects ejected from the machine.
Before switching on, check that the tractor's universal joint shaft speed corresponds to the permissible drive speed of the machine.

---

**WARNING**
Risk of crushing, entrapment and entanglement and risk of foreign objects being hurled out in the danger area of the driven universal joint shaft.

- Direct people away from the danger area of the machine before switching on the tractor's universal joint shaft.
- Stay at a safe distance from the driven universal joint shaft.
- Direct people away from the danger area of the driven universal joint shaft.
- Switch off the tractor engine immediately if a dangerous situation occurs.
10.1  Folding the machine extension arms out/in

**DANGER**
Instruct people to leave the swivel area of machine’s extension arms and track markers before you fold the machine’s extension arms out or in.

Align the tractor and machine straight on a flat surface before you fold the machine's extension arm out or in.

Always raise the machine completely by moving the integrated running gear out fully before you fold the machine extension arm in or out. Only when fully raised does the machine have sufficient ground clearance and is protected from damage.

10.1.1  Folding out the machine extension arms

1. Release the lock.
   1.1 Pull the lock (Fig. 123/1) until the spacer (Fig. 123/2) releases the lock.

2. Release the tractor parking brake and take your foot off the brake pedal.
   Never leave the tractor cab with the parking brake released.

3. Operate control unit 1.
   → The machine is raised via the integrated running gear (Fig. 124/1).

   **!** Actuate control unit 1 until the machine is fully raised.
4. Pull the cable connected to the valve lever (Fig. 125/1) and hold.
   → The 6/2-way valve switches to fold out the machine extension arms.

5. Actuate the control unit 2 (with valve lever pulled).
   → The machine extension arms fold out.

---

Actuate the control unit 2 until the pressure gauge (Fig. 126/1) indicates a pressure of between 90 and 100 bar.

The specified working pressure in the pressure tank is then achieved (see section on "Functional description of the standard factory-installed pressure tank", on page 165).

6. Release the cable connected to the valve lever (Fig. 125/1).
   → The 6/2-way valve switches to actuate the track marker.

7. Operate control unit 1.
   → The machine is lowered via the integrated running gear (Fig. 124/1).
10.1.2  Folding in the machine extension arms

1. Operate control unit 2.
   → The active track marker folds in.

2. Release the tractor parking brake and take your foot off the brake pedal. Never leave the tractor cab with the parking brake released.

3. Operate control unit 1.
   → The machine is raised via the integrated running gear (Fig. 127/1).

   ![Actuate control unit 1 until the machine is fully raised.]

4. Pull the cable connected to the valve lever (Fig. 128/1) and hold.
   → The 6/2-way valve switches to fold in the machine extension arms.

5. Actuate the control unit 2 (with valve lever pulled).
   → The machine extension arms fold in.

   ![Actuate control unit 2 until the machine extension arm is fully folded in.]

6. Release the cable connected to the valve lever.

7. Switch off the AMATRON™ (see AMATRON™ operating manual).
Use of the machine

The locking plate (Fig. 129/1) forms the mechanical transportation lock. The extension arms are locked when the pin (Fig. 129/2) is inserted into the hole of the locking plate.

![Fig. 129](image1)

**DANGER**

Check that the pin (Fig. 129/2) is correctly inserted into the locking plate (Fig. 129/1) after the extension arms are folded in.

![Fig. 130](image2)

8. Align the machine horizontally.
   8.1 Operate control unit 1.
   8.2 Lower the machine via the integrated running gear until the machine is horizontal.

![Fig. 130](image3)

Ensure that the machine has sufficient ground clearance in all driving situations.
10.2 Filling the seed hopper

DANGER
- Transportation of the machine on roads and paths with filled hoppers is prohibited. The brake system is designed for an empty machine only.
- Observe the permissible fill levels and total weights.

1. Couple the machine to the tractor (see section "Coupling and uncoupling the machine", on page 96).
2. Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

DANGER
Disengage the tractor universal joint shaft, engage the tractor parking brake, shut off the tractor engine and remove the ignition key.

3. Determine and fit the dosing roller(s) with the aid of the table (Fig. 55, on page 69) (see section on "Installing/removing the dosing roller", on page 110).

4. You can access the filling opening of the seed hopper by means of the steps.
5. The roller cover is secured using two tension elements (see Fig. 120).
6. Slowly pull the belt out of the belt holder.
   → The roller cover opens as the belt is released.
7. If necessary, remove foreign bodies from the seed hopper.

8. Load the seed hopper
   - with a filling auger from a supply vehicle (see section 10.2.1, on page 132)
   - from bulk bags (see section 10.2.2, on page 132).
9. Close and secure the roller cover.
10.2.1 Filling the seed hopper with a filling auger

1. Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Approach the machine carefully with the supply vehicle.
3. Load the seed hopper via the filling auger in consideration of the manufacturer's instructions.

![Fig. 132](image)

**CAUTION**

Never move between the supply vehicle and the machine.

10.2.2 Filling the seed hopper from bulk bags

1. Set the machine down on a flat surface.
2. Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
3. Approach the machine carefully with the bulk bag.
4. Climb onto the loading board.
5. Unload the bulk bag into the seed hopper.

![Fig. 133](image)

**DANGER**

Never move between the supply vehicle and the machine.
Never stand under suspended loads.
10.3 Starting work

DANGER

- Direct people out of the danger area of the machine, in particular from the swivel zone of the machine extension arms and the track markers.
- Only actuate the tractor control units from inside the tractor cab.

1. Fold out the machine extension arms [see section on "Folding the machine extension arms out/in", on page 127].

When lowering, pull the machine forward slightly.

2. Bring the blower fan to nominal speed, i.e. depending on the equipment:
   - Actuate control unit 4 [see section on "Blower fan connection to tractor hydraulics", on page 74] or
   - Switch on the tractor universal joint shaft and bring the blower fan to nominal speed [see section on "Blower fan connection at the tractor universal joint shaft (optional)", on page 75].

3. Check the fan speed and correct it as necessary.
Use of the machine

Information to be observed on working with the universal joint shaft-driven hydraulic pump.

- Before switching on the universal joint shaft, observe the safety instructions relevant to operation of the universal joint shaft in the section entitled "Safety information for users", on page 27.
- Observe the permissible drive speed of the tractor's universal joint shaft.
- In tractors equipped with a hydraulically or pneumatically switchable universal joint shaft, the universal joint shaft must only be switched on when the engine is idling to prevent damage to the hydraulic pump.

4. Operate control unit 1.
   → Lower the machine via the integrated running gear

5. Operate control unit 2.
   → The active track marker folds out.

   The on-board computer optionally indicates the active track marker that folds out when the control unit is activated (see AMATRON® operating manual).

   In the distributor head, the seed tubes to the tramline coulters are closed when the tramline counter displays the number "0" on the on-board computer (see section on "Creation of tramlines", on page 80).

6. Lower/raise the tractor's lower link until the machine is approximately horizontal.
7. Check the tramline rhythm on the on-board computer, correct if necessary (see operating manual for on-board computer).
8. Check the tramline counter on the on-board computer, correct if necessary (see operating manual for on-board computer).
10.4 Checking the seed planting depth

After 100 m, check the planting depth, correct as necessary.
1. Sow approximately 100 m at working speed.
2. Expose the seed at several points and check the placement depth.

10.5 During the work

Switching off the tramline counter (tramline STOP button)
Pressing the tramline STOP button prevents the tramline counter from shifting on (see operating manual for on-board computer).

Folding the track marker in before any obstructions
Fold in the active track marker before an obstacle.

Visual inspection of the distributor heads
From time to time, check the distributor heads for impurities.

Contamination and seed remains can block up the distributor heads and have to be removed immediately [see section on "Clean the distributor head", on page 143].

10.6 Turning at end of the field

Before turning at the end of the field
1. Slow down your travel speed.
2. Actuate control unit 1.
   → The machine is raised via the integrated running gear
3. Actuate control unit 2.
   → The active track marker is raised.
4. Turn the combination as soon as the machine is raised.

Fig. 135
After turning at the end of the field

1. Actuate control unit 1.
   → The machine is lowered.
2. Actuate control unit 2.
   → The opposite track marker is lowered.
3. Start the field run as soon as the tine coulters touch the ground.

**DANGER**

After turning, if control unit 2 is actuated, the opposite track marker is moved to the working position.

10.7 End of work in the field

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

1. Switch off the tractor universal joint shaft (optional, for blower fan universal joint shaft drive).
2. Actuate control unit 2.
   → The active track marker is raised.
3. Actuate control unit 4.
   → Switch off the blower fan.
4. Actuate control unit 1.
   → Raise the machine via the integrated running gear.

**Pressing the tramline STOP button prevents the tramline counter from shifting on (see operating manual for on-board computer).**
5. Empty the seed hopper (see section on 10.8, below).

![Warning]

Seed residues left in the seed dosing units can swell or germinate, if the seed dosing unit is not completely emptied!
As a result, rotation of the dosing rollers is blocked and damage can be caused to the drive!

6. Put the machine in the transport position (see section on Folding the machine extension arms out/in, on page 127).
7. Switch off the AMATRON®.

10.8 Emptying the seed hopper and/or dosing unit

![DANGER]

Disengage the tractor universal joint shaft, engage the tractor parking brake, shut off the tractor engine and remove the ignition key.

1. Insert a calibration trough (Fig. 136/1) into the holder beneath the dosing unit.

![Fig. 136]

2. Close the opening of the seed hopper above the dosing unit with the shutter (Fig. 137/1) (see section on "Installing/removing the dosing roller", on page 110).

![Fig. 137]
3. Open the rotary slide of the injector sluice (see illustration (Fig. 52), on page 67).
   → The seed drops into the calibration trough.

4. Remove the dosing roller (see section on "Installing/removing the dosing roller", on page 110).

5. Close the housing cover (Fig. 139/1).

6. Pull the shutter (Fig. 139/2) slowly out of the dosing unit.
   → The seed drops into the calibration trough.

7. Reassembly occurs in the reverse sequence.
11 Faults

### WARNING

Risk of contusions, cutting, catching, drawing in and knocks through
- Unintentional falling of the machine raised using the tractor's three-point hydraulic system.
- Unintentional falling of raised, unsecured machine parts.
- Unintentional start-up and rolling of the tractor-machine combination.

Secure the tractor and the machine against unintentional start-up and rolling before eliminating faults on the machine. See section 6.2, on page 93.

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

11.1 Residual seed volume indicator

When volume drops below the residual seed volume, if the level sensor is correctly set, on the AMATRON* display, a warning message (Fig. 140) appears with an acoustic signal.

The residual seed volume should be large enough to avoid fluctuations or gaps in the output rate.

![Image of Level too low message](29c214-GB)

**Fig. 140**

11.2 Fault table

<table>
<thead>
<tr>
<th>Condition</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan sensor alarmed</td>
<td>Alarm limit wrongly set</td>
</tr>
<tr>
<td></td>
<td>Oil volume too low or too high</td>
</tr>
<tr>
<td></td>
<td>Fan sensor defective</td>
</tr>
</tbody>
</table>
Cleaning, maintenance and repairs

12 Cleaning, maintenance and repairs

**WARNING**
Risk of contusions, cutting, catching, drawing in and knocks through
- Unintentional falling of the machine raised using the tractor’s three-point hydraulic system.
- Unintentional falling of raised, unsecured machine parts.
- Unintentional start-up and rolling of the tractor-machine combination.

Secure the tractor and machine against unintentional starting and unintentional rolling away before you perform any cleaning, servicing or maintenance work on the machine. On this subject see on page 93.

**WARNING**
Danger of crushing, shearing, cutting, being caught or drawn in, winding and knocks through unprotected danger points!
- Mount protective equipment, which you removed when cleaning, maintaining and repairing the machine.
- Replace defective protective equipment with new equipment.

**Danger**
Carry out cleaning, maintenance and repair work (if not otherwise specified) only when
- The machine extension arms are folded out (see section 10.1, on page 127)
- The tractor parking brake is applied.
- The tractor universal joint shaft is shut off.
- The tractor engine is shut off.
- The ignition key has been removed.
12.1 Securing the connected machine

Before working on the machine, place the machine connected to the tractor on the sustainer (Fig. 141/1) to prevent unintentional lowering of the tractor's lower link.

Fig. 141

12.2 Securing the raised machine (workshop)

DANGER
Secure the machine raised above the integrated running gear with two pins against unintended lowering before you work on the machine.

1. Direct people out of the danger area.
2. Raise the machine fully by moving the integrated running gear out completely.
3. Remove the pin (Fig. 142/1) from the transport bracket.
   The bolt is secured using a lynch pin.

Fig. 142

4. Insert the pin (Fig. 143/1) as shown into the hole and secure the pin using a tube clip (Fig. 143/2).
5. The machine has two pins. Repeat the operation as described.

Fig. 143
Cleaning, maintenance and repairs

After completion of the cleaning, maintenance and repair work

1. Secure the two pins (Fig. 142/1) in the transport brackets.
2. Lower the machine completely.

12.3 Cleaning the machine

DANGER
Wear a face mask. Do not inhale toxic dressing dust when removing dressing dust by means of compressed air.

- Pay particular attention to the brake, air and hydraulic hose lines.
- Never treat brake, air and hydraulic hose lines with petrol, benzene, petroleum or mineral oils.
- After cleaning, grease the machine, in particular after cleaning with a high pressure cleaner / steam jet or liposoluble agents.
- Observe the statutory requirement for the handling and removal of cleaning agents.

When cleaning with a high-pressure cleaner / steam jet, observe the following:

- Do not clean any electrical components.
- Do not clean any chromed components.
- Never aim the cleaning jet from the nozzle of the high pressure cleaner/steam jet directly on lubrication and bearing points.
- Always maintain a minimum jet distance of 300 mm between the high pressure cleaning or steam jet cleaning nozzle and the machine.
- Comply with safety regulations when working with high pressure cleaners.

1. To clean, always place the machine connected to the tractor on the stand (see section on "Securing the connected machine", on page 141).
2. Fold out the machine (see section on Folding the machine extension arms out/in", on page 127) and lower the machine fully by moving in the integrated running gear completely.
3. Empty the seed hopper and seed dosing unit (see section 10.8, on page 137).
4. Clean the distributor head [see section "Clean the distributor head", on page 143].
5. Clean the machine with water or with a high-pressure cleaner.
6. If you lift the machine for cleaning, secure the lifted machine (see section on "Securing the raised machine", on page 141).
12.3.1 Clean the distributor head

7. Direct people away from the danger area.
8. Fold out the machine (see section on "Folding the machine extension arms out/in", on page 127) and lower the machine fully by moving in the integrated running gear completely.
9. Extend the left track marker.
10. Switch off the tractor’s universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
11. Use safety walkway to access the distributor head (Fig. 144/1).

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disengage the tractor universal joint shaft, engage the tractor parking brake, shut off the tractor engine and remove the ignition key.</td>
</tr>
</tbody>
</table>

12. Slacken the winged nuts (Fig. 145/1) and remove the clean plastic flap (Fig. 145/2) from the distributor head.
13. Remove any impurities with a brush, and wipe out the distributor head and plastic cap with a dry cloth.
14. Clean impurities between the base plate (Fig. 145/A) with compressed air.
15. Install the plastic cap (Fig. 145/2).
16. Fix the plastic cap with winged nuts (Fig. 145/1).

| Intensive cleaning requires the distributor head shutters to be removed according to the section on "Setting the tramline to the track width of the cultivating tractor", on page 162. |
12.4 Lubrication specifications

Lubricate the machine in accordance with the specifications of the manufacturer.
Carefully clean the lubrication nipple and grease gun before lubrication so that no dirt is pressed into the bearings. Press the dirty grease completely into the bearings and replace it with new grease.

The lubrication points on the machine are marked with a foil sticker (Fig. 146).

12.4.1 Lubricants

For lubrication work use a lithium saponified multipurpose grease with EP additives:

<table>
<thead>
<tr>
<th>Company</th>
<th>Lubricant designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARAL</td>
<td>Aralub HL2</td>
</tr>
<tr>
<td>FINA</td>
<td>Marson L2</td>
</tr>
<tr>
<td>ESSO</td>
<td>Beacon 2</td>
</tr>
<tr>
<td>SHELL</td>
<td>Ratinax A</td>
</tr>
</tbody>
</table>

Fig. 146
12.4.2 Lubrication points – overview

<table>
<thead>
<tr>
<th>Cayena 6001</th>
<th>Number of lubrication nipples</th>
<th>Lubrication interval</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fig. 148/1</td>
<td>1</td>
<td>25 h</td>
<td></td>
</tr>
<tr>
<td>Fig. 148/2</td>
<td>1</td>
<td>25 h</td>
<td></td>
</tr>
<tr>
<td>Fig. 149/1</td>
<td>2</td>
<td>25 h</td>
<td></td>
</tr>
<tr>
<td>Fig. 149/2</td>
<td>2</td>
<td>25 h</td>
<td></td>
</tr>
<tr>
<td>Fig. 150/1</td>
<td>2</td>
<td>25 h</td>
<td></td>
</tr>
<tr>
<td>Fig. 150/2</td>
<td>2</td>
<td>25 h</td>
<td></td>
</tr>
<tr>
<td>Fig. 150/3</td>
<td>2</td>
<td>25 h</td>
<td></td>
</tr>
<tr>
<td>Fig. 151/1</td>
<td>1</td>
<td>25 h</td>
<td></td>
</tr>
<tr>
<td>Fig. 151/2</td>
<td>1</td>
<td>25 h</td>
<td></td>
</tr>
<tr>
<td>Fig. 151/3</td>
<td>1</td>
<td>25 h</td>
<td></td>
</tr>
<tr>
<td>Fig. 152/1</td>
<td>1</td>
<td>25 h</td>
<td></td>
</tr>
<tr>
<td>Fig. 152/2</td>
<td>1</td>
<td>25 h</td>
<td></td>
</tr>
<tr>
<td>Fig. 152/3</td>
<td>1</td>
<td>25 h</td>
<td></td>
</tr>
<tr>
<td>Fig. 153/1</td>
<td>2</td>
<td>25 h</td>
<td></td>
</tr>
<tr>
<td>Fig. 153/2</td>
<td>2</td>
<td>25 h</td>
<td></td>
</tr>
<tr>
<td>Fig. 154/1</td>
<td>4</td>
<td>25 h</td>
<td></td>
</tr>
</tbody>
</table>

Fig. 147

12.4.2.1 Lubricating the lubrication nipples when the machine is folded out and lowered

1. Fold out the machine extension arms (see section "Folding the machine extension arms out/in", on page 127).
2. Lower the machine fully by moving in the integrated running gear completely.
3. Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
4. For lubrication intervals, refer to the table (Fig. 147).
# 12.5 Maintenance schedule – overview

Carry out maintenance work when the first interval is reached.
The times, continuous services or maintenance intervals of any third party documentation shall have priority.

<table>
<thead>
<tr>
<th>Before initial operation</th>
<th>Initial operation</th>
<th>After the first 10 operating hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist workshop</td>
<td>Check and service the hydraulic hose lines. This inspection has to be recorded by the operator.</td>
<td>Check and service the hydraulic hose lines. This inspection has to be recorded by the operator.</td>
</tr>
<tr>
<td></td>
<td>Check the inflation pressure of the wedge ring tyres</td>
<td>Checking the inflation pressure of the leading roller feelers (optional)</td>
</tr>
<tr>
<td></td>
<td>Checking the tyre inflation pressure of the leading roller feelers (optional)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Specialist workshop</td>
<td>Verify that all bolted connections fit securely.</td>
</tr>
<tr>
<td></td>
<td>Specialist workshop</td>
<td>Checking the tightening torques of the wheel and hub screws</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>before starting work (daily)</th>
<th>Visual inspection of the lower link pins</th>
<th>Section 12.5.4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Draining the compressed air tank of the</td>
<td>Section 12.7.1.1</td>
</tr>
<tr>
<td>hourly (e.g. for refilling the seed hopper)</td>
<td>Checking the seed planting depth</td>
<td>Section 10.4</td>
</tr>
<tr>
<td></td>
<td>Inspection and elimination of contaminants</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Seed dosing unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Seed hoses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Distributor head</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Blower fan intake guard screen</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>after completion of work (daily)</th>
<th>Emptying seed dosing unit</th>
<th>Section 10.8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cleaning the machine (as required)</td>
<td>Section 12.3</td>
</tr>
</tbody>
</table>
### Cleaning, maintenance and repairs

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Task Description</th>
<th>Workshop Required</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>each week</strong></td>
<td>Check and service the hydraulic hose lines.</td>
<td>Specialist workshop</td>
<td>12.6</td>
</tr>
<tr>
<td></td>
<td>This inspection has to be recorded by the operator.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clean blower fan (Eliminate risk of imbalance).</td>
<td>Specialist workshop</td>
<td>12.3</td>
</tr>
<tr>
<td><strong>every 2 weeks</strong></td>
<td>Check the inflation pressure of the wedge ring tyres</td>
<td>Specialist workshop</td>
<td>12.5.1</td>
</tr>
<tr>
<td></td>
<td>Checking the tyre inflation pressure of the leading roller feelers (optional)</td>
<td></td>
<td>12.5.2</td>
</tr>
<tr>
<td><strong>every 3 months</strong></td>
<td>Brake inspection (specialist workshop)</td>
<td>Specialist workshop</td>
<td>12.7.3</td>
</tr>
<tr>
<td>(at least every 500 operating hours)</td>
<td>Checking the brake lining thickness (specialist workshop)</td>
<td>Specialist workshop</td>
<td>12.7.2.2</td>
</tr>
<tr>
<td></td>
<td>Exterior inspection of the compressed air tank of the</td>
<td></td>
<td>12.7.1.2</td>
</tr>
<tr>
<td></td>
<td>Checking the pressure in the compressed air tank of the dual-circuit pneumatic service braking system (specialist workshop)</td>
<td>Specialist workshop</td>
<td>12.7.1.3</td>
</tr>
<tr>
<td></td>
<td>Leak test of the dual-circuit pneumatic service braking system (specialist workshop)</td>
<td>Specialist workshop</td>
<td>12.7.1.4</td>
</tr>
<tr>
<td></td>
<td>Cleaning the line filters of the dual-circuit pneumatic service braking system (specialist workshop)</td>
<td>Specialist workshop</td>
<td>12.7.1.5</td>
</tr>
<tr>
<td><strong>before the start of the season</strong></td>
<td>Check and service the hydraulic hose lines.</td>
<td>Specialist workshop</td>
<td>12.6</td>
</tr>
<tr>
<td></td>
<td>This inspection has to be recorded by the operator.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Every 12 months</strong></td>
<td>Checking the brake lining thickness (specialist workshop)</td>
<td>Specialist workshop</td>
<td>12.7.2.2</td>
</tr>
<tr>
<td></td>
<td>Check the service brake system for safe operating condition.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>This inspection has to be recorded by the operator.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
12.5.1 Check the inflation pressure of the wedge ring tyres

Check compliance with specified tyre pressure (see table Fig. 155).

Observe inspection intervals (see section on Maintenance schedule – overview, on page 147).

<table>
<thead>
<tr>
<th>Tyres</th>
<th>Rated air pressure of tyres</th>
</tr>
</thead>
<tbody>
<tr>
<td>400/55-15.5</td>
<td>139A8 4.3 bar</td>
</tr>
</tbody>
</table>

Fig. 155

12.5.2 Checking the tyre inflation pressure of the leading roller feelers (optional)

Check compliance with specified tyre pressure (see table Fig. 156).

Observe inspection intervals (see section on Maintenance schedule – overview, on page 147).

<table>
<thead>
<tr>
<th>Tyres</th>
<th>Rated air pressure of tyres</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0/75-15</td>
<td>3.5 bar</td>
</tr>
</tbody>
</table>

Fig. 156
12.5.3 Checking the tightening torques of the wheel and hub screws (specialist workshop)

Check the wheel and hub screws to ensure that the correct tightening torques have been observed (see Table Fig. 157).

![Bolt Tightening torque]

<table>
<thead>
<tr>
<th>Bolt</th>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Wheel bolt M18 x 1.5</td>
<td>325 Nm</td>
</tr>
<tr>
<td>(2) Bolt M16x1.5 8.8</td>
<td>450 Nm</td>
</tr>
</tbody>
</table>

Fig. 157

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

Check the lower link pin for conspicuous defects whenever the machine is coupled. Replace the drawbar if there are any clear signs of wear to the lower link pin.
12.6 Hydraulic system

**WARNING**
Risk of infection through the high pressure hydraulic fluid of the hydraulic system entering the body!

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

Escaping high pressure fluid (hydraulic fluid) may pass through the skin and ingress into the body, causing serious injuries!
If you are injured by hydraulic fluid, contact a doctor immediately. Risk of infection!

- When connecting the hydraulic hose lines to the hydraulic system of connected machines, 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 line if it is damaged or worn. Only use original AMAZONE hydraulic hose lines.
- The hydraulic hose lines should not be used for longer than six years, including any storage time of maximum two years. Even with proper storage and approved use, hoses and hose connections are subject to natural ageing, thus limiting the length of use. However, it may be possible to specify the length of use from experience values, in particular when taking the risk potential into account. In the case of hoses and hose lines made from thermoplastics, other guide values may be authoritative.
- Dispose of old oil in the correct way. 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.
12.6.1 Labelling hydraulic hose lines

The valve chest identification provides the following information:

Fig. 158/...

1. Manufacturer's marking on the hydraulic hose line (A1HF)
2. Date of manufacture of the hydraulic hose line
   (09/02 = Year / Month = February 2009)
3. Maximum approved operating pressure
   (210 BAR).

12.6.2 Maintenance intervals

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

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

Before each start-up

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

12.6.3 Inspection criteria for hydraulic hose lines

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

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

- Damage to the outer layer up to the ply (e.g. scouring points, cuts, cracks).
- Britteness of the outer layer (crack formation of the hose material).
- Deformations which do not match the natural shape of the hose or the hose line. Both in a depressurised and pressurised state or when bent (e.g. layer separation, bubble formation, pinching, bends).
- Leak points.
- Damage or deformation of the hose assembly (sealing function restricted); minor surface damage is not a reason for replacement.
- Movement of the hose out of the assembly.
Cleaning, maintenance and repairs

- Corrosion of assembly, reducing the function and tightness.
- Installation requirements not complied with.
- Life span of 6 years has been exceeded.

The date of manufacture of the hydraulic hose line on the assembly is decisive for determining these six years. If the date of manufacture on the assembly is "2009", then the hose should not be used beyond February 2015. See also "Labelling of hydraulic hose lines".

12.6.4 Installation and removal of hydraulic hose lines

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

- Only use original AMAZONE hydraulic hose lines.
- Ensure cleanliness.
- You must always install the hydraulic hose lines so that, in all states of operation:
  - There is no tension, apart from the hose's own weight.
  - There is no possibility of jolting on short lengths.
  - Outer mechanical influences on the hydraulic hose lines are avoided.
    Use appropriate arrangements and fixing to prevent any scouring of the hoses on components or on each other. If necessary, secure hydraulic hose lines using protective covers. Cover sharp-edged components.
  - The approved bending radii may not be exceeded.
- When connecting a hydraulic hose line to moving parts, the hose length must be appropriate so that the smallest approved bending radius is not undershot over the whole area of movement and/or the hydraulic hose line is not over-tensioned.
- Fix the hydraulic hose lines to the intended fixing points. Avoid using hose clips at points where the natural movement and changes in length of the hose will be restricted.
- It is forbidden to paint over hydraulic hose lines.
12.7 Service brake system

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.

**CAUTION**

- Observe the legal regulations for all service work.
- Only genuine spare parts may be used.
- The brake valve settings laid down by the manufacturer must not be altered.

**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", on page 147).
- Be particularly careful with welding, burning and drilling work in the vicinity of brake lines.
- No welding or soldering may be performed on valve fittings or pipes. Any damaged parts must be replaced.
- Always perform a braking test after any adjusting or repair work on the braking system.
- For servicing and maintenance work on the braking system observe the section "Safety information for users", on page 27.

**WARNING**

- Always use wheel chocks before uncoupling the machine from the tractor.
12.7.1 Dual-circuit pneumatic service braking system

12.7.1.1 Draining the compressed air tank of the dual-circuit pneumatic service braking system

1. Run the tractor engine (approx. 3 mins.), until the compressed air reservoir (Fig. 159/1) has filled.
2. Switch off the tractor engine, apply the tractor parking brake and remove the ignition key.
3. Pull the drain valve (Fig. 159/2) in a sideways direction by the ring until no more water escapes from the compressed air reservoir.
4. If the escaping water is dirty, let off air, unscrew the drainage valve from the compressed air tank and clean the compressed air tank.
5. Fit the drainage valve and check the compressed air reservoir for seal tightness (see section 12.7.1.4, on page 156).

12.7.1.2 Exterior inspection of the compressed air tank of the dual-circuit pneumatic service braking system

Exterior inspection of the compressed air tank (Fig. 160/1).

If the compressed air tank moves in the tensioning bands (Fig. 160/2)
→ 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. 160/3) is rusty, loose or the rating plate is missing from the compressed air tank:
→ replace the compressed air tank.

The compressed air tank may be replaced in a specialist workshop only.
12.7.1.3 Checking the pressure in the compressed air tank of the dual-circuit pneumatic service 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 displays 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.

12.7.1.4 Leak test of the dual-circuit pneumatic service braking system (specialist workshop)

- Test all connections, pipe, hose and screw unions for seal-tightness
- Eliminate any abrasion points on pipes and hoses
- Replace any porous and damaged hoses (specialist workshop)
- The dual-circuit pneumatic service 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 braking system replaced at a specialist workshop.

12.7.1.5 Cleaning the line filters of the dual-circuit pneumatic service braking system (specialist workshop)

The dual-circuit pneumatic service braking system is equipped with two line filters (Fig. 161/1). Clean both line filters as described above.

To clean the line filters:

1. Press the two lugs (Fig. 161/2) together and take out the closure piece complete with O-ring, pressure spring and filter insert.
2. Clean (rinse out) the filter insert with petrol or thinner and then dry it with compressed air.
3. When re-assembling in the reverse order, ensure that the O-ring does not jam in the guide slot.
12.7.2  Service brake system (general)

valid for
- Dual-circuit pneumatic service braking system
- Hydraulic service brake system

General visual check

Carry out a general visual check of the brake system. Observe and check the following criteria:

- Piping, hose lines and hose couplings must not be externally damaged or rusted.
- Hinges, e.g. on fork heads, must be properly secured, easy to move, and not worn out.
- Ropes and cables
  - Must be properly run.
  - May not have any visible cracks.
  - May not be knotted.
- Check the piston stroke on the brake cylinders, and adjust as necessary.

12.7.2.1  Checking the service brake system for safe operating condition (specialist workshop)

Have the safe operating condition of the service brake system checked in a specialist workshop.

Piping, hose lines and hose couplings must not be externally damaged or rusted.

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.

12.7.2.2  Checking the brake lining thickness (specialist workshop)

The brake linings must be checked for wear every 500 operating hours or at least once before the start of the season.

This servicing interval is a recommendation. Depending on the deployment, e.g. constant driving on hilly terrain, this may have to be shortened.

If the remaining brake pad is less than 1.5 mm, replace the brake shoes (only use original brake shoes with type-tested brake pads). When you do this, the shoe return springs may have to be renewed.
12.7.3 Brake inspection (specialist workshop)

Observe inspection intervals
(see section on Maintenance schedule – overview, on page 147)\(^1\).

\(^1\) This servicing interval is a recommendation. Depending on the deployment, e.g. constant driving on hilly terrain, this may have to be shortened.

Have the following work carried out by a specialist workshop:

- Check the safe operating condition of the service brake system.
- Check the wear of 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, also replace the shoe return springs if necessary.

CAUTION

Observe the legal regulations for all service work.

Only genuine spare parts may be used.

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.
12.7.4 Checking the brake drum for dirt (specialist workshop)

1. Unscrew the two cover plates (Fig. 162/1) inside the brake drum.
2. Remove any dirt and plant residue.
3. Refit the cover plates.

**CAUTION**

Penetrating dirt may clog the brake linings (Fig. 162/2), 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.

12.7.5 Brake lining inspection (specialist workshop)

Replace the brake lining when the remaining lining thickness is

- 5 mm for riveted linings.
- 2 mm for bonded linings.

Remove the rubber plug (Fig. 163/1) in the inspection hole.

Then reinsert the rubber plug.
12.7.6  Grease replacement of the wheel hub bearings (specialist workshop)

1. Safely jack up the machine at the marked points (Fig. 164).

2. Release the brake.

3. Remove the wheels and dust caps.

4. Remove the lynch pin and unscrew the axle nut.

5. Use a suitable puller to pull off the wheel hub (Fig. 165/1) with brake drum, tapered roller bearing and sealing elements from the stub axle.

6. Label removed wheel hubs and bearing cages, so that they are not mixed up when installed.

7. Check tapered roller bearing for wear, replace if necessary.

8. Clean the brake, check it for wear, make sure it is intact and functions and replace worn parts. The interior of the brake must be kept free from lubricants and dirt deposits.

9. Thoroughly clean the inside and outside of the wheel hubs. Remove old grease completely. Thoroughly clean the bearings and seals (diesel oil) and check for reusability. Before refitting the bearings, lightly grease the bearing seats and then refit all parts in the reverse order. Carefully drive parts onto press fits with tube bushings without jamming or damaging them. The bearings, the wheel hub cavity between the bearings and the dust cap must be smeared with grease before fitting. The grease quantity should fill approx. a quarter to a third of the space in the installed hub.

10. Install the axle nut and adjust the bearings and brakes. Finally, carry out a function check and an appropriate test run and rectify any detected faults.
12.8 Workshop settings and repair work

12.8.1 Setting the tramline to the tractor's track (specialist workshop)

**WARNING**
Disengage the tractor universal joint shaft, engage the tractor parking brake, shut off the tractor engine and remove the ignition key.

12.8.1.1 Adjusting the wheelmark spacing of the cultivating tractor (specialist workshop)

When the machine is delivered or when buying a new cultivating tractor, check that the tramline is set to the track width (Fig. 166/a) of the cultivating tractor.

The seed tubes (Fig. 167/1) of the tramline coulters must be fixed to the distributor head openings, which can be closed by the shutters (Fig. 167/2). If necessary, interchange the seed line tubes.
When the machine is delivered or when buying a new cultivating tractor, check that the tramline is set to the track width (Fig. 168/a) of the cultivating tractor.

The track changes with the number of coulters not outputting seed when the tramlines are created.

To create two tracks, in the distributor head it is possible to close the sliders (Fig. 167/2):
- for machines with 6m working width up to 6 openings.

Deactivate any non-required shutters (Fig. 167/2) (see on page 163). 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.
Activating or deactivating shutters

1. Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Set the tramline counter to "0" in the AMATRON®, as when creating tramlines.
3. Switch off the AMATRON®.
4. Remove the outer distributor cover (Fig. 169/1).
5. Remove the ring (Fig. 169/2).
6. Remove the inner distributor cover (Fig. 169/3).
7. Remove the foam insert (Fig. 169/4).
8. Slacken the screws (Fig. 170/1).
9. Remove the slider tunnel (Fig. 170/2).

**Activating the sliders:**

10. The shutters (Fig. 170/3) is in the guide, as shown in the diagram.

**Deactivating the sliders:**

11. Turn the shutters around (Fig. 170/3) and push them into the drill hole (Fig. 170/4).
12. Screw the slider tunnel (Fig. 170/2) onto the base plate.

13. Install the foam insert (Fig. 171/1).
14. Install the inner distributor cover (Fig. 171/2).
15. Install the ring (Fig. 171/3).
16. Install the outer distributor cover (Fig. 171/4).
17. Check the function of the tramline control.
12.8.2 Setting the track marker for correct fitting in the transport bracket (workshop)

When the track marker is folded in, the roller (Fig. 172/1) runs on the raceway (Fig. 172/2) into the mounting.

To set the track marker:

1. Switch off the tractor’s universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Release the lock nut.
3. Adjust the screw (Fig. 172/3) until the roller (Fig. 172/1) of the track marker is running properly over the raceway (Fig. 172/2) into the mounting.
4. Tighten the lock nut.

DANGER
Apply the tractor parking brake, switch off the tractor engine and remove the ignition key before working on the track marker.
12.8.3 Repairs to the pressure tank (specialist workshop)

The machine can have up to two pressure tanks:
- One standard factory-installed pressure tank (Fig. 173/1)
- One pressure tank (Fig. 174/1) installed with the hydraulic service brake system (see section on "Hydraulic service brake system", on page 59).

Functional description of the standard factory-installed pressure tank (Fig. 173/1)

For re-compaction of the soil the tapered ring tyres are subjected to the weight of the machine.

Part of the machine's weight is transmitted via the folding cylinders to the wedge ring tyres. As the hydraulic fluid is almost non-compressible, the pressure does not remain constant even when the folding cylinders are shut off, i.e. when the oil is cooling down. The folding cylinders retract by several millimetres. In order to compensate for the volume loss, during the folding out procedure oil is stored at a pressure of approx. 100 bar in a pressure tank filled with nitrogen (Fig. 173/1).

In the event of a repair observe the following

The hydraulic system and the pressure tank 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).

DANGER

The hydraulic system and the pressure tank connected to it are under a constant high pressure (approx. 100 bar).
## 12.9 Screw tightening torques

<table>
<thead>
<tr>
<th>Thread</th>
<th>Width across flats [mm]</th>
<th>Tightening torques [Nm] depending on the quality of the nuts/bolts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>8.8</td>
</tr>
<tr>
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For the tightening torques of the wheel and hub bolts, see section 12.5.3, on page 150.
## 13 Hydraulic diagram

### 13.1 Hydraulic diagram – Cayena 6001

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<td>Lift, left</td>
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<td>Throttle, lift</td>
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<td>Lift, right</td>
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<td>PEM valve</td>
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<td>Blower fan drive by on-board hydraulics, equipment option</td>
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All position specifications in direction of travel
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