Operating Manual

AMAZONE

Cayena 6000

MG3146
BAH0029.0 09.08

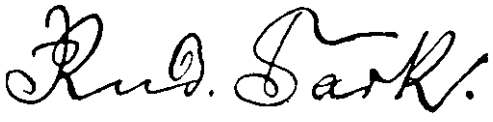
CE

Please read this operating manual before first commissioning.
Keep it in a safe place for future use.

GB

Reading the instruction

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

Leipzig-Plagwitz 1872. 

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 6000**
Permissible system pressure in bar:	Maximum 200 bar
Year of manufacture:	
Basic weight (kg):	
Approved total weight (kg):	
Maximum load (kg):	

Manufacturer's address

AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

Postfach 51

D-49202 Hasbergen

Tel.: + 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

Tel.: + 49 (0)5405 501-290

Fax: + 49 (0)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:	MG3146
Compilation date:	09.08

Foreword

Dear Customer,

You have chosen one of the quality products from the wide product range of AMAZONEN-WERKE, H. DREYER GmbH & Co. KG. We thank you for your 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 equipment. Damage can only be rectified if problems are signalled immediately!

Before first commissioning, read and understand this operating manual, and particularly the safety information. Only after careful reading will you be able to benefit from the full scope of your newly purchased machine.

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

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

H. DREYER GmbH & Co. KG

Postfach 51

D-49202 Hasbergen

Tel.: + 49 5405 501-0

Fax: + 49 5405 501-234

E-mail: amazone@amazone.de

1 User Information 9
1.1 Purpose of the document 9
1.2 Locations in the operating manual 9
1.3 Diagrams used 9

2 General Safety Instructions 10
2.1 Obligations and liability 10
2.2 Representation of safety symbols 12
2.3 Organisational measures 13
2.4 Safety and protection equipment 13
2.5 Informal safety measures 13
2.6 Training of personnel 14
2.7 Safety measures in normal operation 15
2.8 Dangers from residual energy 15
2.9 Maintenance and repair work, fault elimination 15
2.10 Constructive changes 16
2.10.1 Spare and wear parts and aids 17
2.11 Cleaning and disposal 17
2.12 User workstation 17
2.13 Warning pictograms and other signs on the machine 18
2.13.1 Positioning of warning pictograms and other labels 25
2.14 Dangers if the safety information is not observed 27
2.15 Safety-conscious working 27
2.16 Safety information for users 28
2.16.1 General safety and accident prevention information 28
2.16.2 Hydraulic system 32
2.16.3 Electrical system 33
2.16.4 Attached machines 33
2.16.5 Brake system 34
2.16.6 Tyres 34
2.16.7 Operation of the seed drill 35
2.16.8 Universal joint shaft operation 35
2.16.9 Cleaning, maintenance and repairs 36

3 Loading and unloading 37
3.1 Loading the Cayena 38
3.2 Unloading the Cayena 38

4 Product description 39
4.1 Overview of subassemblies 40
4.2 Safety and protection equipment 42
4.3 Overview – Supply lines between the tractor and the machine 43
4.4 Transportation equipment 44
4.5 Intended use 46
4.6 Danger area and danger points 47
4.7 Rating plate and CE mark 48
4.8 Technical Data 49
4.9 Conformity 50
4.10 Necessary tractor equipment 50
4.11 Noise production data 51

5 Design and function 52
5.1 Hydraulic hose lines 53
5.1.1 Coupling the hydraulic hose lines 53
5.1.2 Uncoupling the hydraulic hose lines 54

5.2 Hydraulic service brake system ... 54
5.2.1 Coupling the hydraulic service brake system ... 54
5.2.2 Uncoupling the hydraulic service brake system ... 55
5.3 Operating terminal AMALOG+ ... 56
5.4 Frame and machine extension arms ... 57
5.5 Roller holder ... 57
5.6 Seed hopper ... 58
5.6.1 Digital fill level monitoring ... 59
5.7 Seed dosing and injector sluice ... 60
5.7.1 Dosing rollers ... 61
5.7.2 Table Seed dosing rollers ... 62
5.7.3 Seed rate adjustment at Vario gearbox ... 63
5.7.4 Calibration test ... 64
5.8 Blower fan ... 65
5.8.1 Blower fan connection to tractor hydraulics ... 66
5.8.2 Blower fan connection at the tractor universal joint shaft (optional) ... 67
5.9 Distributor head ... 68
5.10 Star wheel ... 68
5.11 Tine coulter and planting depth ... 69
5.12 Exact harrow ... 70
5.13 Markers ... 71
5.14 Creation of tramlines ... 72
5.14.1 Examples for creating tramlines ... 74
5.14.2 Tramline rhythm 4, 6 and 8 ... 76
5.14.3 Tramline rhythm 2 plus and 6 plus ... 77

6 Commissioning ... 78

6.1 Checking the suitability of the tractor ... 79
6.1.1 Calculating the actual values for the total tractor weight, tractor axle loads and load capacities, as well as the minimum ballast ... 80
6.1.1.1 Data required for the calculation (hitched machine) ... 81
6.1.1.2 Calculation of the required minimum ballasting at the front $G_{V\ min}$ of the tractor for assurance of the steering capability ... 82
6.1.1.3 Calculation of the actual front axle load of the tractor $T_{V\ tat}$ ... 82
6.1.1.4 Calculation of the actual total weight of the combined tractor and machine ... 82
6.1.1.5 Calculation of the actual rear axle load of the tractor $T_{H\ tat}$ ... 82
6.1.1.6 Tyre load capacity ... 82
6.1.1.7 Table ... 83
6.1.2 Requirements for tractor operation with attached machines ... 84
6.2 Securing the tractor / machine against unintentional start-up and rolling ... 85
6.3 Installation instructions for blower fan connection to tractor hydraulics ... 86

7 Coupling and uncoupling the machine ... 87

7.1 Coupling the machine ... 87
7.1.1 Connecting the hydraulic joints ... 92
7.1.2 Connecting the electrical connections ... 93
7.1.3 Connecting the hydraulic service brake system ... 93
7.2 Uncoupling the machine ... 94
7.3 Connecting the hydraulic pump (optional) ... 97
7.3.1 Connecting the hydraulic pump ... 97
7.3.2 Uncoupling the hydraulic pump ... 98

8 Settings ... 99

8.1 Repositioning the level sensor ... 99
8.2 Installing/removing the dosing roller ... 100
8.3 Setting the sowing rate with a calibration test ... 102
8.3.1 Determining the gearbox setting using the calculating disc rule ... 105
8.4 Adjusting the planting depth ... 106

8.5 Adjusting the exact harrow 107
8.5.1 Setting the harrow tines 107
8.5.2 Setting the exact harrow pressure 108
8.6 Adjusting the track marker length and working intensity 109
8.7 Adjusting blower fan speed 110
8.7.1 Setting the blower fan speed via the flow control valve of the tractor 110
8.7.2 Adjusting the blower fan speed on the machine's pressure relief valve 111
8.8 Setting the tramline rhythm/counter 111

9 Transportation 112

10 Use of the machine 116

10.1 Folding the machine extension arms out/in 118
10.1.1 Folding out the machine extension arms 118
10.1.2 Folding in the machine extension arms 120
10.2 Filling the seed hopper 122
10.2.1 Filling the seed hopper with a filling auger 123
10.2.2 Filling the seed hopper from bulk bags 123
10.3 Starting work 124
10.4 Checking the seed planting depth 125
10.5 During the work 126
10.6 Turning at end of the field 126
10.7 End of work in the field 127
10.8 Emptying the seed hopper and/or dosing unit 128

11 Faults 130

11.1 Residual volume indicator 130
11.2 Fault table 130

12 Cleaning, maintenance and repairs 131

12.1 Securing the connected machine 132
12.2 Securing the raised machine (workshop) 132
12.3 Cleaning the machine 133
12.3.1 Clean the distributor head 134
12.4 Lubrication regulations 135
12.4.1 Lubricants 135
12.4.2 Lubrication point overview 136
12.4.2.1 Lubricating the lubrication nipples when the machine is folded out and lowered 136
12.5 Maintenance schedule – overview 138
12.5.1 Check the inflation pressure of the wedge ring tyres 140
12.5.2 Checking the inflation pressure of the stabilising wheels 140
12.5.3 Retighten wheel and hub screws (specialist workshop) 141
12.5.4 Servicing roller chains and chain wheels 141
12.5.5 Servicing sowing shaft bearings 141
12.5.6 Check oil level in Vario gearbox 142
12.5.7 Visual inspection of the lower link pins 142
12.6 Hydraulic system 143
12.6.1 Labelling hydraulic hose lines 144
12.6.2 Maintenance intervals 144
12.6.3 Inspection criteria for hydraulic hose lines 144
12.6.4 Installation and removal of hydraulic hose lines 145
12.7 Hydraulic service brake system 146
12.7.1 Brake inspection (specialist workshop) 147
12.7.2 Checking the brake drum for dirt (specialist workshop) 148
12.7.3 Brake lining inspection (specialist workshop) 148
12.7.4 Grease replacement of the wheel hub bearings (specialist workshop) 149
12.8 Workshop settings and repair work 150
12.8.1 Setting the tramline to the tractor's track (specialist workshop) 150
12.8.1.1 Adjusting the wheelmark spacing of the cultivating tractor (specialist workshop) 150

12.8.1.2 Setting the tramline to the track width of the cultivating tractor (specialist workshop)..... 151
12.8.2 Setting the track marker for correct fitting in the transport bracket (workshop)..... 153
12.8.3 Repairs to the pressure tank (workshop)..... 154
12.9 Screw tightening torques..... 155
13 Hydraulic diagram..... 156
13.1 Hydraulic diagram **Cayena 6000**..... 156

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 the operating manual are always seen from the direction of travel.

1.3 Diagrams used

Handling instructions and reactions

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

1. Handling instruction 1

→ Reaction of the machine to handling instruction 1

2. Handling instruction 2

Lists

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

- Point 1
- Point 2

Number items in diagrams

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

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 immediately which could impair safety.

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.
- Disasters through the impact of foreign bodies and acts of God.

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:

DANGER

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.

WARNING

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

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

CAUTION

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

IMPORTANT

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

Non-compliance with these instructions can cause faults on the machine or in the environment.

NOTE

Indicates handling tips and particularly useful information.

These instructions will help you to use all the functions of your machine to the optimum.

2.3 Organisational measures

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

- Protective 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.

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

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) A person shall be considered as having been instructed, if they have been instructed in the tasks they have to carry out and in the possible risks in the case of improper behaviour and also 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 on 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 good time.

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 contusions, cuts, dragging, catching or knocks from support parts.

It is forbidden to:

- Drill holes in the frame or on the running gear.
- Increasing the size of existing holes on the frame or the running gear.
- Welding 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. The use of wear and spare parts from third parties does not guarantee that they have been constructed in a way as to meet the requirements placed on them.

AMAZONEN-WERKE accepts no liability for damage arising from the use of non-released 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 symbols - 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.

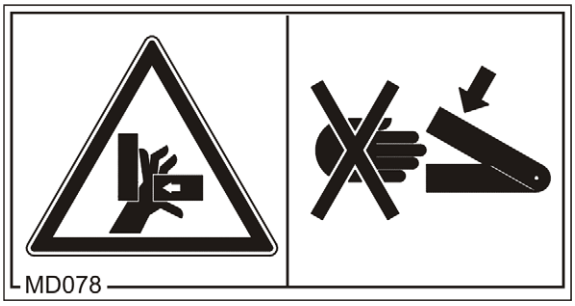
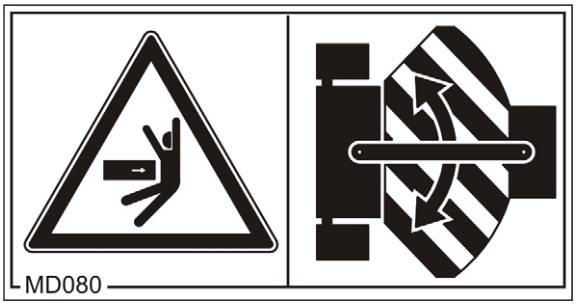
   For example: danger of cutting!

2. The consequence of non-compliance with the danger protection 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.

Order number and explanation	Warning pictograms
MD 076 **Danger of your hand or arm being drawn in or caught by a power driven, unprotected chain or belt drive!** This hazard can cause extremely serious injuries with the loss of parts of the hand or arm. Never open or remove the guard devices on chains or belt drives • as long as the tractor engine is running with the PTO shaft connected / hydraulic drive engaged • or the ground wheel drive is moving.	
MD 078 **Risk of contusions for fingers or hands through accessible moving machine parts!** This danger would cause extremely serious injuries with the loss of body parts such as fingers or hands. Never reach into the danger area when the tractor engine is running with cardan shaft / hydraulic system connected.	
MD 080 **Risk of contusions to torso in the bend area of the drawbar due to sudden steering movements!** This danger will cause serious injuries to the torso or death. It is forbidden to stand in the danger area between the tractor and the machine for as long as the tractor engine is running and the tractor is unprotected against unintentional rolling.	

MD 082

Risk of falling from treads and platforms when riding on the machine.

This danger will cause serious injuries anywhere on the body or death.

It is forbidden to ride on the machine and/or climb the running machine. This ban also applies to machines with treads or platforms.

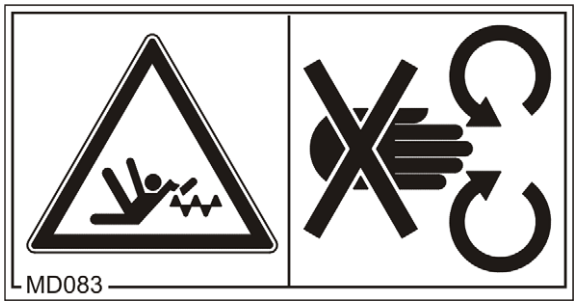
Ensure that no-one rides with the machine.

MD 083

Risk of your arm or upper torso being drawn in or caught by power driven, unprotected machine elements.

This danger can cause extremely serious injuries to the arm or upper torso.

Never open or remove guard devices from driven machine elements when the tractor engine is running with the PTO shaft connected / hydraulic drive engaged.



MD 084

Risk of contusions over the whole body from machine parts moving down from above!

This danger will cause serious injuries anywhere on the body or death.

It is forbidden to stand in the swivel area of moving machine parts.

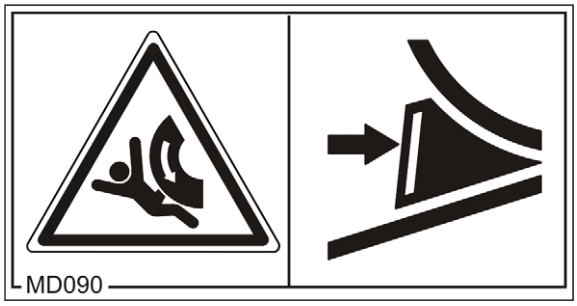
Instruct people to leave the swivel area of moving machine parts before the machine parts move down.

MD 090

Risk of contusions from unintentional rolling of the uncoupled, unsecured machine!

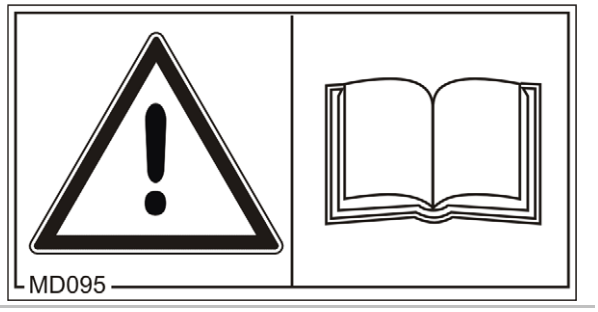
This danger will cause serious injuries anywhere on the body or death.

Secure the machine against unintentional rolling, before uncoupling the machine from the tractor. For this, use the tractor 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

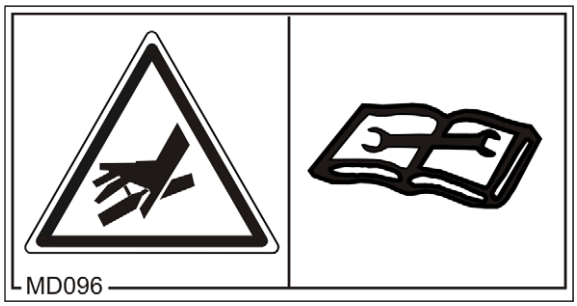
Danger of infection to the whole body from liquids escaping at a high pressure (hydraulic fluid)!

This danger will cause serious injuries over the whole body, 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 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 097

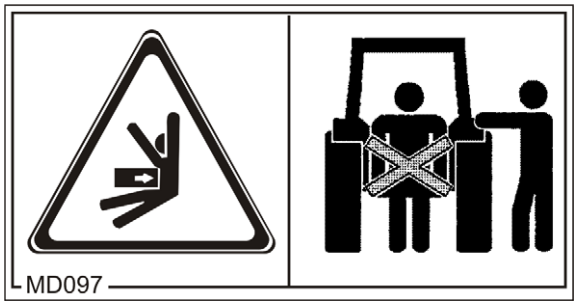
Danger of crushing your torso in the stroke range of the three-point suspension due to the narrowing spaces when the three-point hydraulic system is actuated!

This danger causes extremely serious injuries and even death.

Personnel are prohibited from entering the stroke area of the three-point suspension when the three-point hydraulics are actuated.

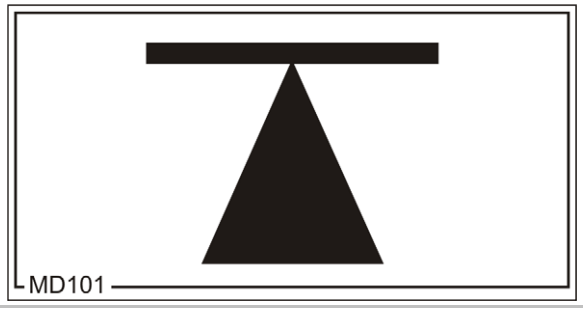
Only actuate the operator controls for the tractor's three-point hydraulic system

- from the intended workstation.
- if you are outside of the danger area between the tractor and the machine.



MD 101

This pictogram shows application points for lifting gear (jack).

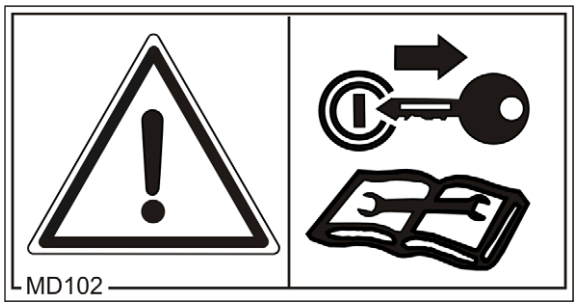


MD 102

Danger from unintentional machine starting and rolling during intervention in the machine, e.g. installation, adjusting, trouble-shooting, cleaning, maintaining and repairing.

This danger will cause serious injuries anywhere on the body or death.

- 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

Danger of your torso getting crushed by laterally swivelling machine parts!

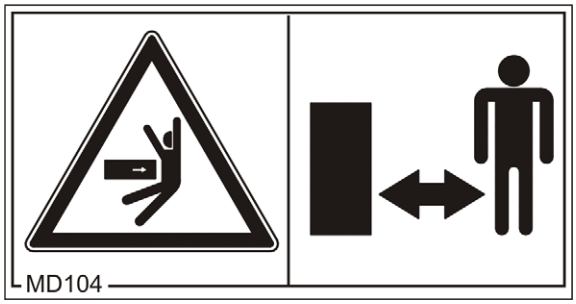
This danger will cause serious injuries to the torso or death.

Maintain a sufficient safety distance between you and any moving machinery parts.

It is forbidden to stand in the swivel area of moving machine parts.

Ensure that all personnel maintain a sufficient safety distance from moving machine parts.

Instruct personnel to leave the swivelling area of any moving machine parts before you swivel the machine parts.



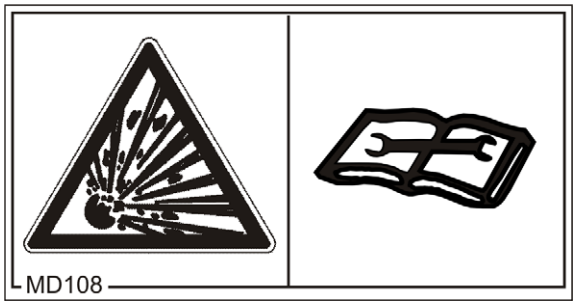
MD 108

Danger from accumulators under gas or oil pressure!

This danger will cause serious injuries over the whole body, if hydraulic fluid escaping at high pressure passes through the skin and into the body.

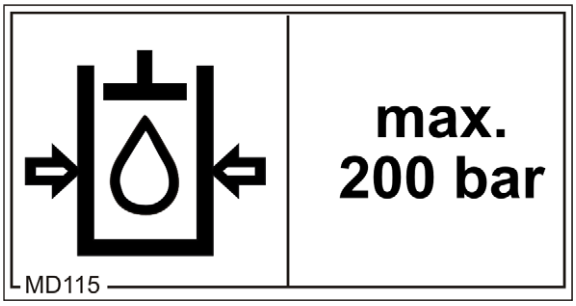
Prior to all work on the hydraulic system read and take heed of the directions in the operating manual.

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



MD 115

The maximum operating pressure of the hydraulic system is 200 bar.



MD 181

Check the security of wheel nuts 10 operating hours after a wheel change.

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.

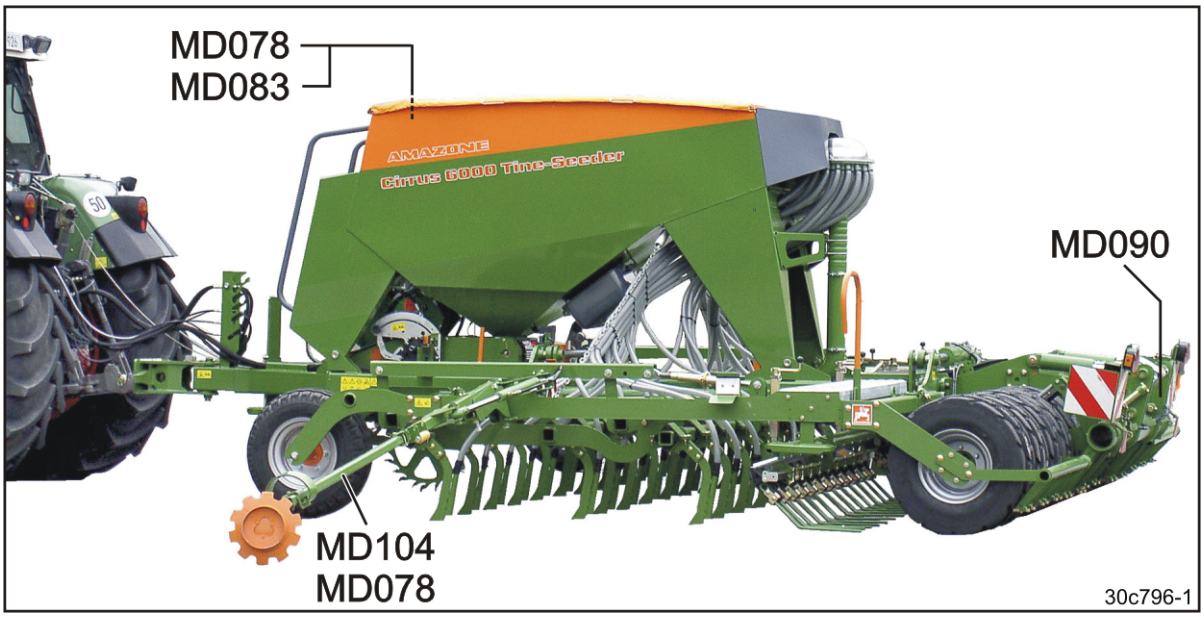


Fig. 1

Fig. 2

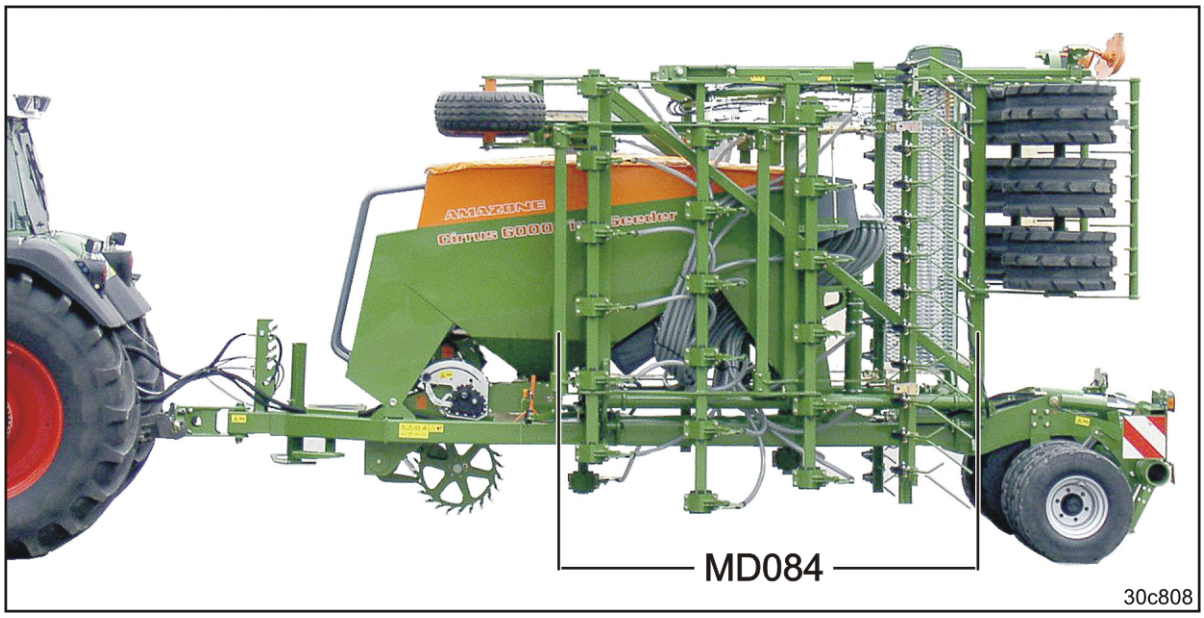


Fig. 3

Fig. 4

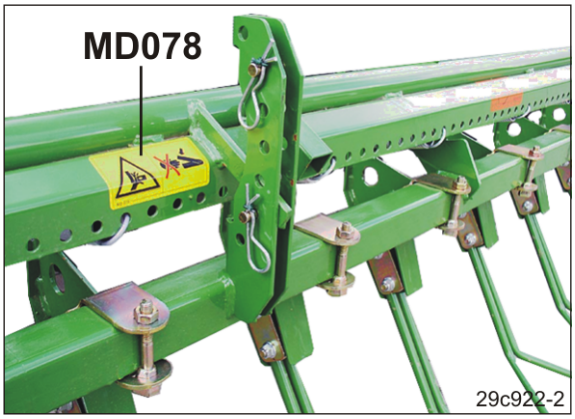


Fig. 5

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 traffic 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 machine.

Connecting and disconnecting the machine

- Only connect and transport the machine with tractors suitable for the task.
- When connecting machines to the tractor's 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.
- Secure the operating lever of the tractor hydraulic system so that unintentional raising or lowering is impossible, before connecting the machine to or disconnecting the machine from the tractor

three-point hydraulic system.

- 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.
  - May not scour 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 over being caught by drive shafts!
- Only start-up the machine, when 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 when you are sure that there is no-one within a sufficient distance from the machine.
- Secure the tractor against unintentional start-up and rolling, before you leave the tractor.

  For this:
  - Lower the machine onto the ground.
  - Apply the tractor parking brake.
  - Switch off the tractor engine.
  - Remove the ignition key.

Machine transportation

- Comply with the national road traffic regulations when using public highways.
- Before moving off, check:
  - The correct connection of the supply lines
  - the lighting system for damage, function and cleanliness
  - The brake and hydraulic system for visible damage.
  - That the tractor parking brake is released completely.
  - The function of the brake system.
- Ensure that the tractor has sufficient steering and braking power.

  Any 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 load 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 safety catches 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 driving 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:
  - Are continuous or
  - Are automatically locked or
  - Require a float position or pressure position due to their function.
- Before working on the hydraulic system
  - Lower the machine.
  - Depressurise the hydraulic system.
  - Switch off the tractor engine.
  - Apply the tractor parking brake
  - Take out the ignition key.
- Have the hydraulic hose lines checked at least once a year by a specialist for proper functioning.
- Replace the hydraulic hose 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 connections made from thermoplastics, other guide values may be decisive.
- Never attempt to plug leaks in hydraulic 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 service 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, burning 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.

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 Universal joint shaft operation

- You may only attach or detach the machine from the universal joint shaft if
  - The universal joint shaft is switched off
  - The tractor engine is switched off
  - The ignition key has been removed
- Always ensure that the machine is correctly fitted and secured.
- Before switching on the universal joint shaft, check whether
  - People are present in the danger area of the machine
  - The selected universal joint shaft speed of the tractor corresponds to the permissible drive speed of the machine
- When work is being carried out on the universal joint shaft, personnel must
  - Stay clear of the rotating universal joint shaft
  - Stay clear of the danger area of the machine
- Never switch on the universal joint shaft when the tractor engine is not running.
- Caution: Once the universal joint shaft is switched off, the subsequent inertia of rotating machine parts poses a risk of injury.

  Stay clear of the machine during this time. You should only start work on the machine once all machine parts are at a complete standstill.
- You may only clean, lubricate or adjust universal joint shaft-driven machines if
  - The universal joint shaft is switched off
  - The tractor engine is switched off
  - The ignition key has been removed
- Once the machine has been detached, mount the protective sleeve on the universal joint shaft stub.
- When using the travel-dependent universal joint shaft, note that the universal joint shaft speed depends on the drive speed, and

that the direction of rotation reverses when you drive in reverse.

2.16.9 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.

Connect the Cayena to a suitable tractor to load it on, or unload it from, a transport vehicle (see section "Commissioning", on page 78 and section "Coupling and uncoupling the machine", on page 87).

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 control terminal AMALOG+ is not required.

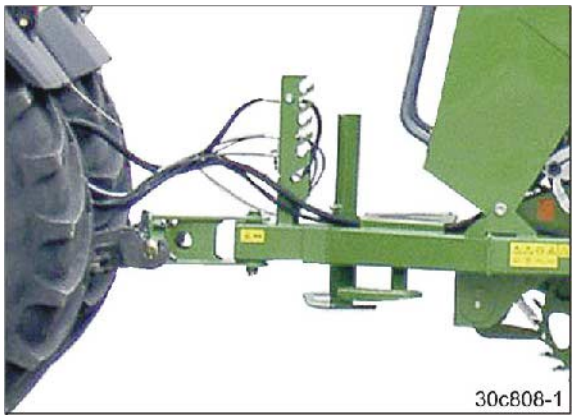


Fig. 6

WARNING

A marshalling person is required for the loading and unloading.

3.1 Loading the Cayena

1. Put the Cayena in the transport position (see section "Transportation", on page 112).
2. Lift the Cayena completely via the integrated running gear (via control unit 1, see section 7.1.1, on page 92).
3. Push the Cayena carefully backwards onto the transport vehicle.
   A marshalling person is required for loading.

Fig. 7

4. Lower the Cayena fully (control unit 1, see section 7.1.1, on page 92) as soon as the Cayena has reached its transport position on the transport vehicle.
5. Secure the Cayena in accordance with the instructions.

   Bear in mind that the Cayena has no parking brake.
6. Disconnect the tractor from the machine.

Fig. 8

3.2 Unloading the Cayena

1. Couple the Cayena to the tractor (see section "3", on page 37).
2. Remove the transport safety catch.
3. Raise the complete Cayena via the integrated running gear and pull it carefully off the transport vehicle.
   A marshalling person is required for unloading.
4. After unloading uncouple the machine from the tractor (see section 7.1.1, on page 92).

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

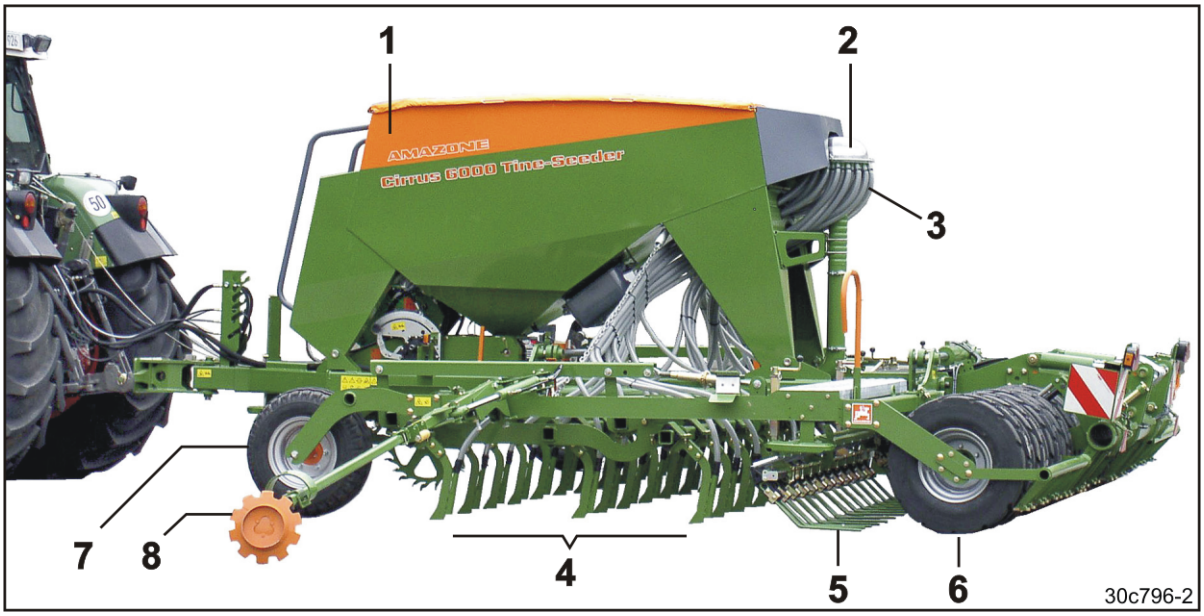


Fig. 9

(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) Support wheel (optional)

(8) Track marker

4.1 Overview of subassemblies

Fig. 10/...

AMALOG+ Operator terminal

Fig. 10

Fig. 11/...

(1) Tensioned crosspiece

(2) Drawbar, extendable

(3) Sustainer, extendable

(4) Star wheel

(5) Step

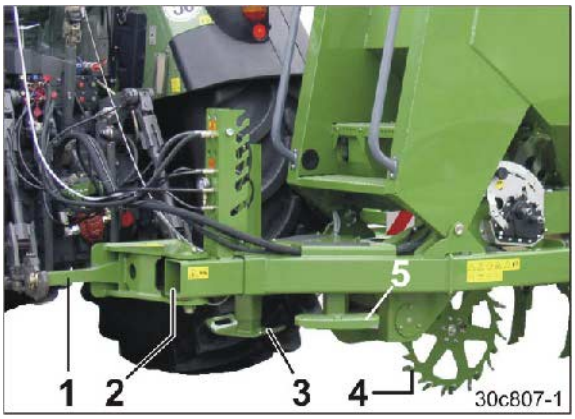


Fig. 11

Fig. 12/...

Fixtures for supply lines

Fig. 12

Fig. 12/...

(1) Roller holder for stowing

- of the operating manual
- of the dosing rollers
- of the digital scales.

Fig. 13

Fig. 14/...

Tine coulter

Fig. 14

Fig. 15/...

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

Fig. 15

Fig. 16/...

(1) Vario gearbox

(2) Calibration crank (in transport bracket)

(3) Injector sluice

(4) Calibration trough (in mounting for calibration test)

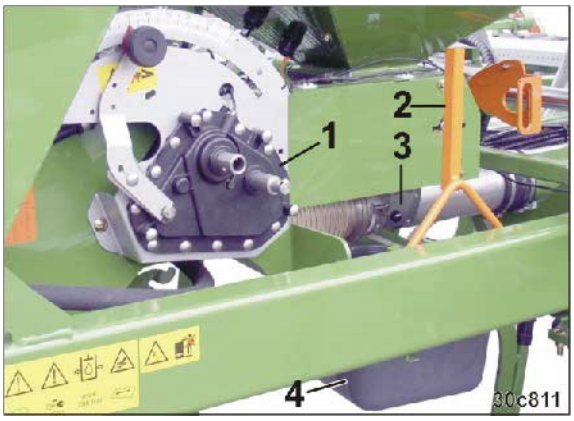


Fig. 16

Fig. 17/...

(1) Seed dosing unit

(2) Injector sluice

Fig. 17

4.2 Safety and protection equipment

Fig. 18/…

(1) Guard screen

Fig. 18

Fig. 19/…

(1) Charging sieve
(serves as guard screen in seed hopper)

Fig. 19

Fig. 20/…

(1) Machine extension arm lock for transportation

Fig. 20

4.3 Overview – Supply lines between the tractor and the machine

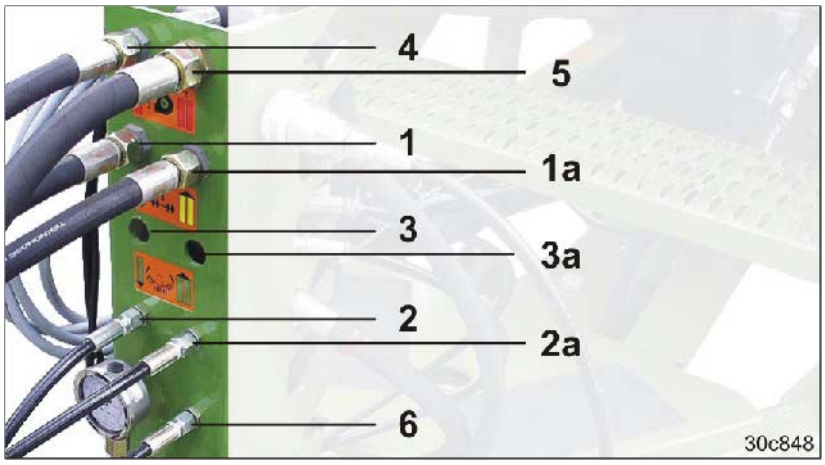


Fig. 21

Tractor side			Machine side (Cayena)			
			Fig. 21/…	Running direction	Marking	Function
Tractor control unit	1	Double-acting	(1)	Feed line	1 cable tie, yellow	• Lowering / lifting integrated running gear • Lowering / lifting the star wheel
			(1a)	Return line	2 cable ties, yellow	
	2	Double-acting	(2)	Feed line	1 cable tie, green	• Folding the machine extension arms • Lowering / lifting the track marker
			(2a)	Return line	2 cable ties, green	
	3	Double-acting	(3)	Feed line	1 cable tie, blue	Working depth adjustment of tine coulters (optional)
			(3a)	Return line	2 cable tie, blue	
	4	Single-acting or double-acting	(4)	Feed line [1]	1 cable tie, red	Hydraulic fan motor
Pressureless line			(5)	Return line [2]	2 cable ties, red	

Hydraulic line

[1] Pressure hose with priority

[2] Pressureless hose (see section "Installation instructions for blower fan connection to tractor hydraulics", on page 86).

Fig. 21/…	Designation	Marking	Function
(6)	Hydraulic brake line		Hydraulic brake system:
(7)	Machine plug		On-board computer AMALOG+
(8)	Connector (7-pin)		Road traffic lighting system

4.4 Transportation equipment

Fig. 22/...

(1) 2 rear-facing warning signs

(2) 1 speed sign

Fig. 22

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

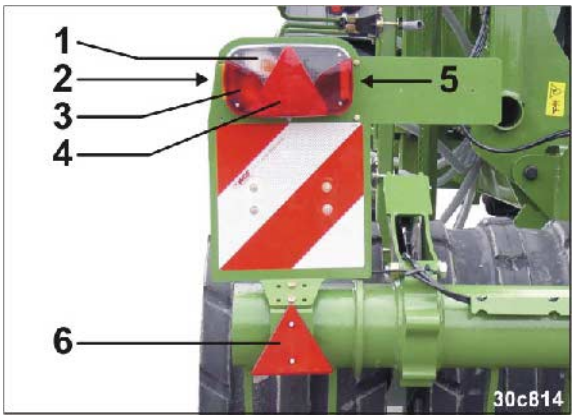


Fig. 23

Fig. 24/...

(1) 2 forwards-facing warning signs

Fig. 24

Fig. 25/...

(1) 2 limiting lights pointing forwards

(2) 2 forwards-facing turn indicators

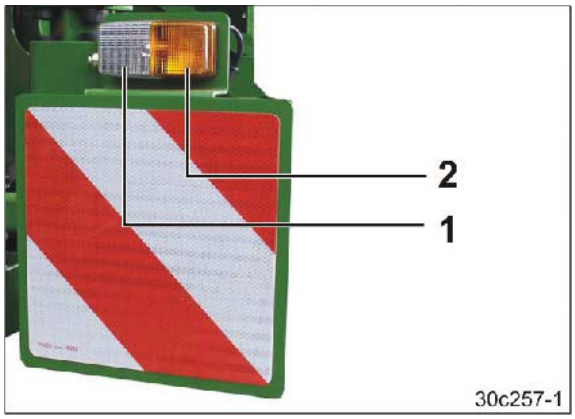


Fig. 25

Fig. 26/...

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

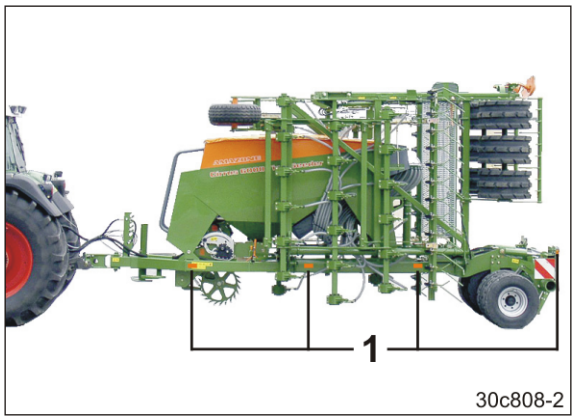


Fig. 26

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 travelled

- Along the contours

  Direction of travel to left 10 %

  Direction of travel to right 10 %

- Along the gradient

  Up the slope 10 %

  Down the slope 10 %

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 bodies thrown out of 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 the machine, particularly when coupling and uncoupling and when filling the seed hopper
- In the area of moving parts.
- In the area of the swivelling machine extension arms.
- In the area of the swivelling track marker.
- In the area of the swivelling tapered ring tyres.
- 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 type plate shows:

- 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
- Permissible system pressure, bar
- Factory

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

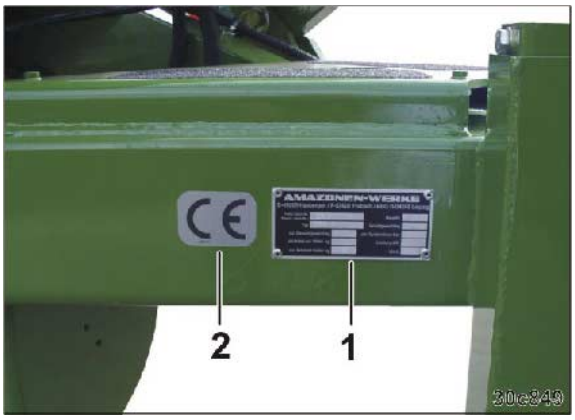


Fig. 27

Fig. 28

4.8 Technical Data

		Cayena 6000
Working width	[m]	6.0
Row spacing of the coulter	[cm]	16,6
Number of sowing units		36
Seed hopper capacity	[l]	2800
Payload (on field)	[kg]	3000
Working speed	[km/h]	8 - 15
Power requirement (from)	[kW/bhp]	100 / 136
Oil flow rate (minimum)	[l/min]	80
Max. hydraulic working pressure	[bar]	200
Electrical system	[V]	12 (7-pin)
Gearbox/hydraulic fluid		Transmission/hydraulic fluid Utto SAE 80W API GL4
Coupling point category		Cat. III
Transport running gear		Integrated with 4 running wheels
Number of tapered ring tyres		12
Continuous acoustic pressure level	[dB(A)]	74
Total length (in working position)	[mm]	6850
Total height (in working position)	[mm]	2630
Maximum drawbar load with full seed hopper (on the field)	[kg]	3000
Service brake system (connection to tractor)		Hydraulic braking system [1)]

[1)] Not allowed in Germany and in several other countries.

Road transport data (only with an empty seed hopper!)

		Cayena 6000
Total width (in transport position)	[m]	2,9
Total length (in transport position)	[m]	6,85
Total height (in transport position)	[m]	3,9
Empty weight (basic weight)	[kg]	5500
Permissible total weight	[kg]	6000
Perm. axle load	[kg]	4100
Perm. drawbar load (FH) when driving on the road (see rating plate)	[kg]	2200
Maximum payload for transport journeys	[kg]	220
Perm. maximum speed on all non-public roads, public roads and public ways.	[km/h]	25

4.9 Conformity

The machine fulfils the:

Directives / standards

- Machines directive 98/37/EC
- EMC directive 89/336/EEC

4.10 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 6000 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 power:	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

Hydraulic brake system:	1 hydraulic coupling in accordance with ISO 5676

The hydraulic braking system is not permitted in Germany and several other EU countries.

4.11 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.

5 Design and function

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

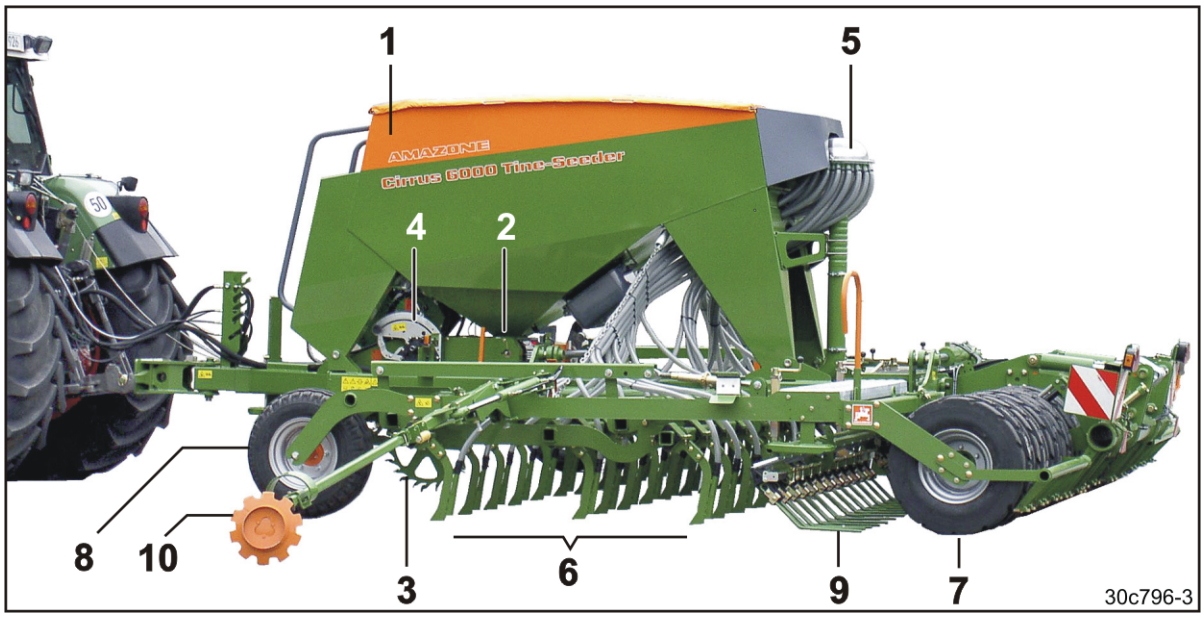


Fig. 29

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

The seed is carried along in the seed hopper (Fig. 29/1).

The preset seed volume passes from the seed doser (Fig. 29/2), which is driven by a star wheel (Fig. 29/3) via the Vario gearbox (Fig. 29/4), into the air stream generated by the fan.

The air stream conveys the seed to the distributor head (Fig. 29/5), which distributes the seed uniformly onto all the tine coulters (Fig. 29/6).

For seed placement, the "on grip" tine coulters push into the soil. In this way the tine coulters, supported on the following wedge ring roller (Fig. 29/7) and the support wheels (optional, Fig. 29/8), 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. 29/9).

The track markers (Fig. 29/10) mark the field connection run in the centre of the tractor.

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 crushing, cutting, being trapped or drawn in, or impact through faulty hydraulic functions when hydraulic hose lines are incorrectly connected.

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

- 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) perceivably lock(s).
- Check the coupling points of the hydraulic hose lines for a correct, tight seat.

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

Fig. 30

5.1.2 Uncoupling the hydraulic hose lines

1. Swivel the actuation lever on the control valve 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 Hydraulic service brake system

To control the Cayena hydraulic service brake system, the tractor requires hydraulic braking equipment (not allowed in Germany and several other EU countries).

5.2.1 Coupling the hydraulic service brake system

Prevent oil contamination through unclean hydraulic couplings.

1. Remove the protective cap (Fig. 34/1).
2. If necessary, clean the hydraulic connectors (Fig. 32) and hydraulic socket.
3. Connect the hydraulic socket on the machine face with the hydraulic connector on the tractor face.

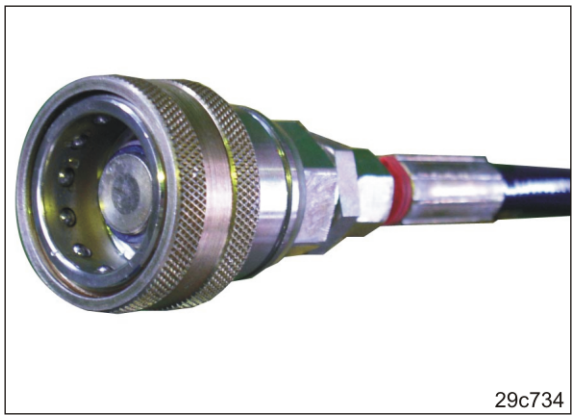


Fig. 32

DANGER

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

5.2.2 Uncoupling the hydraulic service brake system

DANGER

The machine has no parking brake!

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

1. Secure the wedge ring tyre with two wheel chocks.

Fig. 33

2. Unlock the hydraulic connectors from the hydraulic sockets.
3. Secure the hydraulic connectors and hydraulic socket with protective caps (Fig. 34/1) against soiling.
4. Place the hydraulic hose line in the hose cabinet.

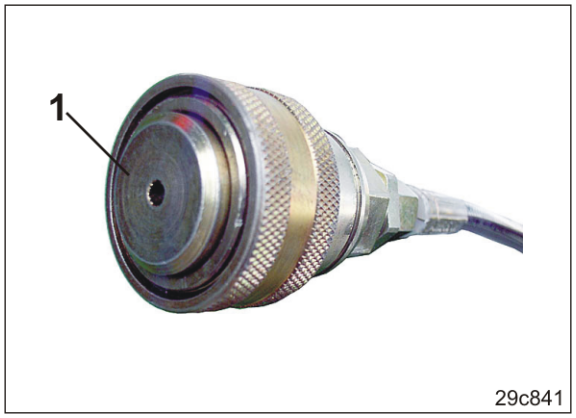


Fig. 34

5.3 Operating terminal AMALOG+

The AMALOG+ consists of the operating terminal (Fig. 35) and the basic equipment (cables and fastening material).

Secure the operating terminal in the tractor cab using the operating manual AMALOG+.

Fig. 35

The AMALOG+ (Fig. 35)

- is intended for entering machine-specific data before beginning work.
- measures the covered part area [ha].
- saves the total area cultivated [ha].
- indicates the travel speed [km/h].
- initiates an alarm when the set minimum seed quantity is reached in the hopper.
- indicates the current blower fan speed.
- triggers an alarm if the blower fan speed deviates from the target value.
- switches the tramlines.

5.4 Frame and machine extension arms

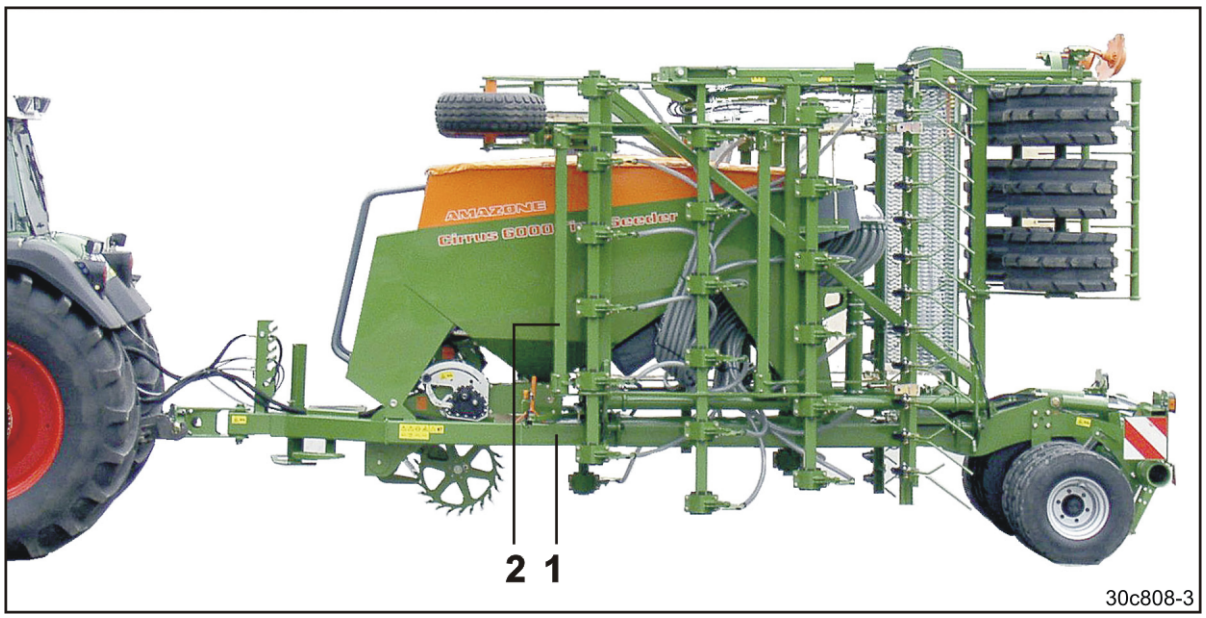


Fig. 36

The machine has

- a main frame (Fig. 36/1) with integrated running gear and seed hopper.
- two machine extension arms which can be folded in for transport (Fig. 36/2).

5.5 Roller holder

The roller holder (Fig. 37/1) contains

- the pack with operating manual
- the dosing rollers in parking position
- the scales for the calibration test.

Fig. 37

5.6 Seed hopper

The seed hopper (Fig. 38/1) 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. 38/1) protects the seed being carried from rainwater.

Fig. 38

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

Fig. 39

5.6.1 Digital fill level monitoring

A level sensor monitors the seed level in the seed hopper.

If the seed level reaches the level sensor,

- the control character marks (Fig. 40/1) the fill level symbol in the AMALOG+.
- an alarm signal sounds.
  This alarm signal is intended to remind the tractor driver to fill up the seeds again.

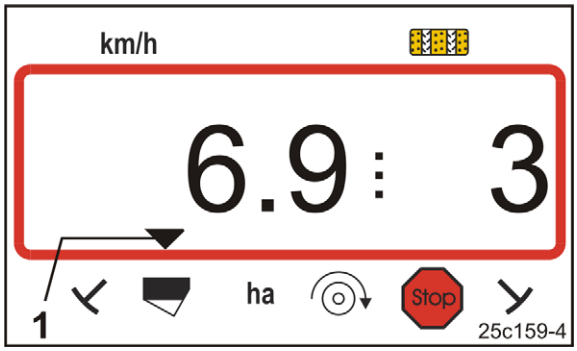


Fig. 40

The height of the level sensor (Fig. 41/1) 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.

Fig. 41

5.7 Seed dosing and injector sluice

The dosing unit (Fig. 42/1) doses the required seed volume.

The dosing unit is equipped with a dosing roller (see section "Dosing rollers", on page 61). The dosing roller is driven by the star wheel via the Vario gearbox.

The seed falls out of the dosing unit into the injector sluice (Fig. 42/2) and is directed by the air flow to the distributor head and then to the coulters.

Fig. 42

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. 43). 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).

Lever position (1):	Closed
Lever position (2):	Open

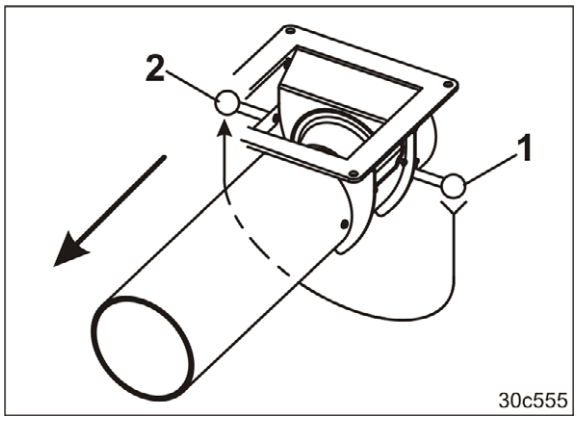


Fig. 43

5.7.1 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 5.7.2, on page 62):

- Fine dosing roller (Fig. 44/1) for fine seeds.
- Medium dosing roller (option, Fig. 44/2) for medium-sized seeds with medium spread rates.
- Coarse dosing roller (Fig. 44/3) for coarse seeds and high spread rates.

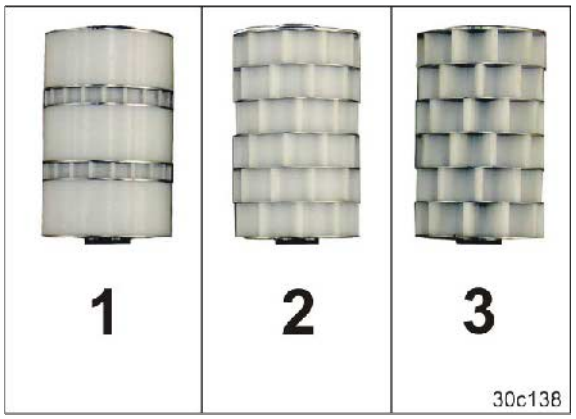


Fig. 44

For sowing particularly large seeds, e.g. beans, the chambers (Fig. 45/1) of the coarse dosing roller can be enlarged by repositioning the wheels and the plates.

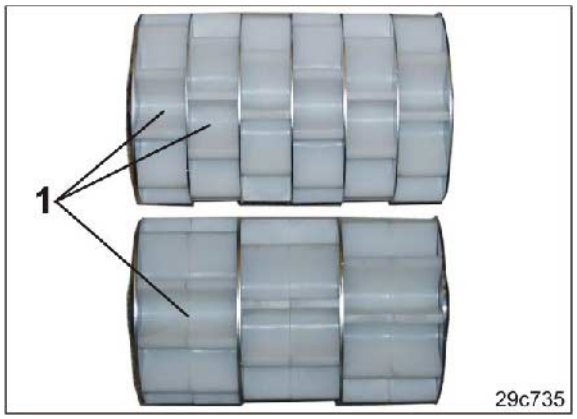


Fig. 45

5.7.2 Table Seed dosing rollers

Seed	Dosing roller
Spelt wheat	Coarse dosing roller
Oats	Coarse dosing roller
Rye	Coarse dosing roller or medium dosing roller
Summer barley	Coarse dosing roller
Winter barley	Coarse dosing roller
Wheat	Coarse dosing roller or medium dosing roller
Beans	Coarse dosing roller
Peas	Coarse dosing roller
Flax (dressed)	Medium dosing roller or fine dosing roller
Grass seed	Medium dosing roller
Millet	Medium dosing roller
Lupins	Medium dosing roller
Alfalfa	Medium dosing roller or fine dosing roller
Linseed (wet dressed)	Medium dosing roller or fine dosing roller
Fodder radish	Medium dosing roller or fine dosing roller
Phacelia	Medium dosing roller or fine dosing roller

Seed	Dosing roller
Rapeseed	Fine dosing roller
Caraway	Fine dosing roller
Red clover	Fine dosing roller
Mustard	Medium dosing roller or fine dosing roller
Soya	Medium dosing roller
Sunflowers	Medium dosing roller
Turnips	Fine dosing roller
Vetches	Medium dosing roller

Fig. 46

The requisite dosing roller is dependent on the seed type and spread rate, see the table (Fig. 46, 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.

5.7.3 Seed rate adjustment at Vario gearbox

The sowing rate required is set using the gearbox lever (Fig. 47/1) of the Vario gearbox.

Adjusting the lever changes the sowing rate. The higher the number the gearbox lever points to on the scale (Fig. 47/2), the greater the sowing rate.

Carry out a calibration test to determine whether the gearbox lever is correctly set and whether the sowing rate is correct in later sowing.

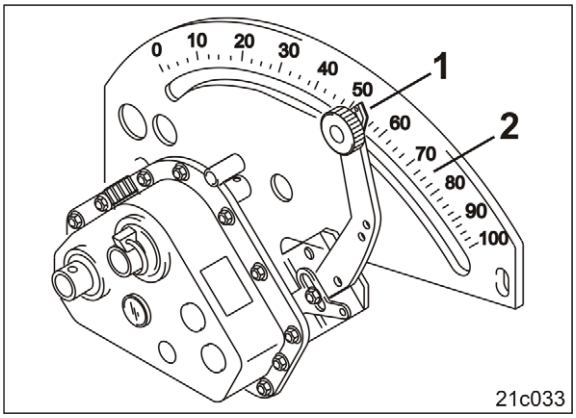


Fig. 47

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

The gearbox setting can be calculated from the values of the first calibration test using the calculating disc rule. Always check the value determined on the calculating disc rule with a further calibration test.

The calculating disc rule has three scales

- An outer white scale (Fig. 48/1) for all sowing rates over 30 kg/ha.
- An inner white scale (Fig. 48/2) for all sowing rates below 30 kg/ha.
- A coloured scale (Fig. 48/3) with all gearbox settings from 1 to 100.

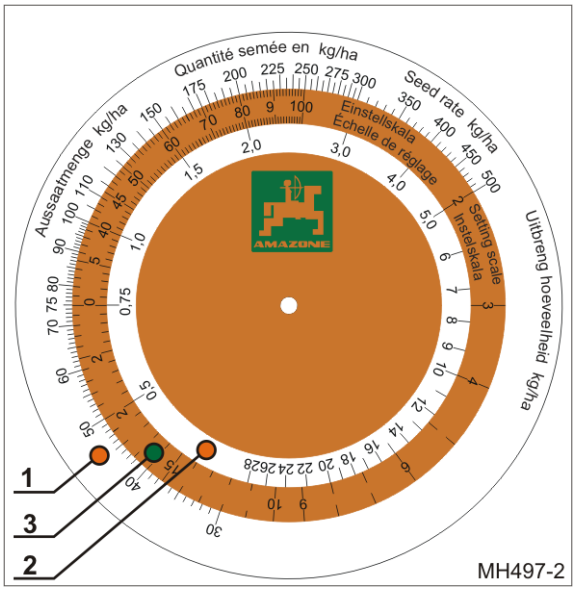


Fig. 48

5.7.4 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 roller.
- If the actual sowing rate does not match the sowing rate that was measured by the calibration test.

The seed drops into the calibration trough during the calibration test (Fig. 49/1).

The calibration crank (Fig. 49/2) is in the parking position in the transport bracket.

Fig. 49

The calibration trough is secured with a clip pin (Fig. 50/1) on the rear wall of the seed hopper.

Fig. 50

5.8 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. 51/1) generating the air flow is driven by a hydraulic motor (Fig. 51/2).

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.

Fig. 51

The AMALOG+ shows the blower fan speed, e.g. 3900 rpm (see Fig. 52) and in event of deviation initiates an alarm.

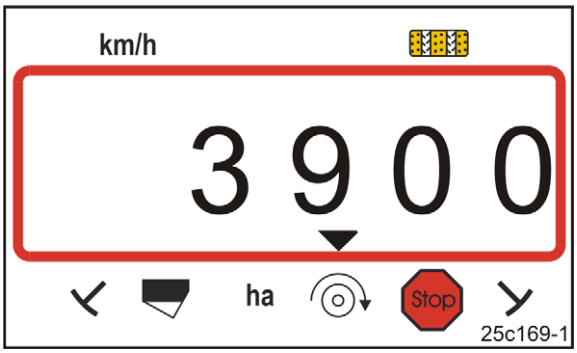


Fig. 52

5.8.1 Blower fan connection to tractor hydraulics

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. 53, 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)

  or (if not present)

- at the pressure relief valve (Fig. 51/3) of the hydraulic motor (see section).

The blower fan speed (rpm) is dependent on

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

Example:

Cayena 6000

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

Required
blower fan speed: 3900 rpm.

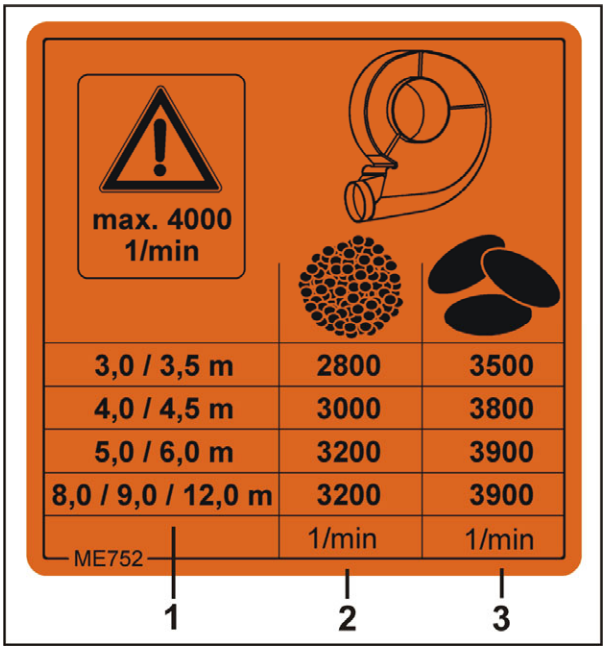


Fig. 53

5.8.2 Blower fan connection at the tractor universal joint shaft (optional)

A hydraulic pump (Fig. 54/1) fitted on the tractor's universal joint shaft drives the hydraulic motor of the blower fan.

Fig. 54

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

Tractor universal joint shaft speed:
1,000 rpm.

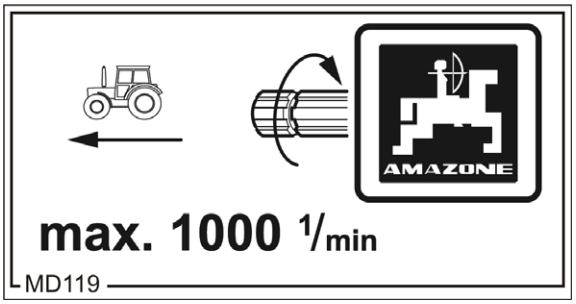


Fig. 55

Lower the universal joint shaft speed to reduce the blower fan speed.

5.9 Distributor head

In the distributor head (Fig. 56/1) the seed is distributed uniformly over all the sowing coulters.

A seed dosing unit always supplies one distributor head.

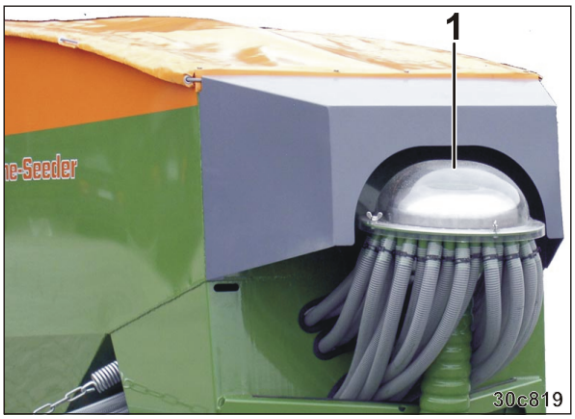


Fig. 56

5.10 Star wheel

The star wheel (Fig. 57/1) drives the dosing rollers via the Vario gearbox.

The distance covered is measured via the star wheel. The AMALOG+ requires this data to calculate the drive speed and area cultivated (hectare counter).

Fig. 57

The star wheel controls the creation of the tramlines.

The tramline counter indexes approx. 5 seconds after each upswing of the star wheel, e.g. before turning at the end of the field.

5.11 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 following wedge ring roller and the tractor lower links, maintain the adjustable seed placement depth at a constant level.

Fig. 58

The machine has 2 adjuster segments 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. 59/1).

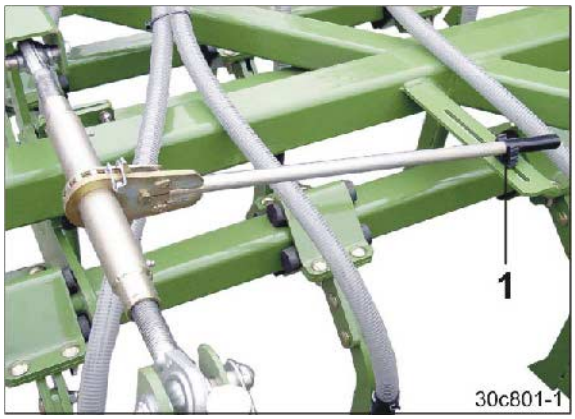


Fig. 59

The numbers on the scale (Fig. 60) are for the purpose of orientation for setting the planting depth.

Always perform the same settings on both adjusting segments.

The higher the number selected on the scale, the greater the planting depth.

The maximum placement depth is 8 cm.

Fig. 60

Check the planting depth of the seed after every adjustment (see "Checking the seed planting depth", on page 125).

5.12 Exact harrow

The exact harrow (Fig. 61/1) covers the seeds deposited in the sowing furrows with loose earth and smoothes the ground.

The following are adjustable

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

  The exact harrow pressure determines the working intensity of the exact harrow and is independent of the soil type.

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

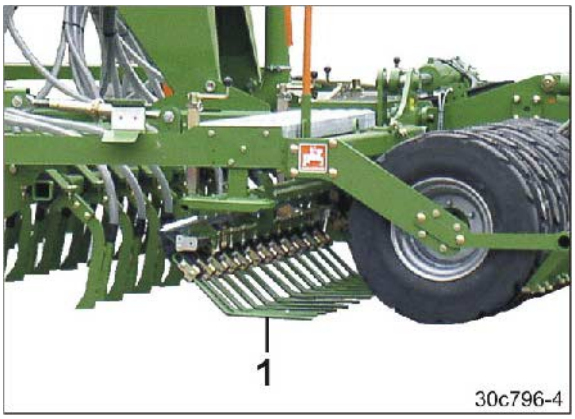


Fig. 61

The exact harrow pressure is generated by tension springs that are tensioned centrally using a lever (Fig. 62/1).

The lever is in contact with a pin (Fig. 62/2) in the adjuster segment. The higher the pin is inserted in the group of holes, the greater the exact harrow pressure.

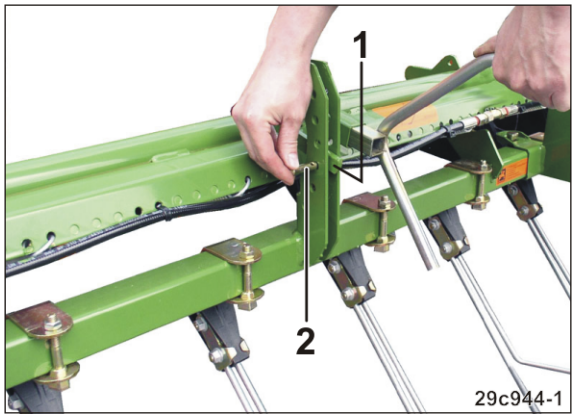


Fig. 62

5.13 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.

Fig. 63

It is possible to set:

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

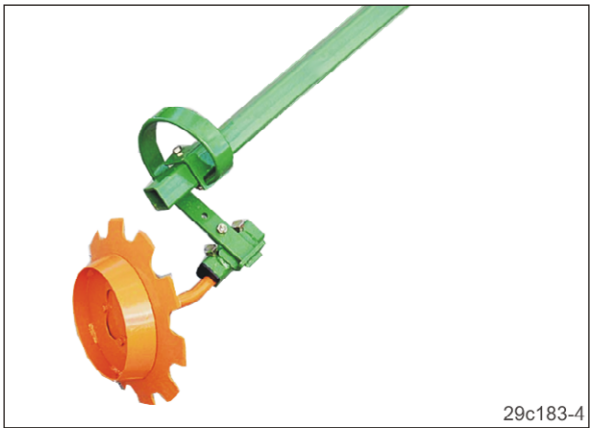


Fig. 64

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 Stop button (AMALOG+) 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 Stop button after the obstacle has been passed.

5.14 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 computer[1].

[1] AMALOG+

When the tramlines are being created:

- The tramline control on the distributor head uses shutters (Fig. 65/1) to block the seed feeding lines to the seed lines (Fig. 65/2) 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. 65/3) closes the appropriate seed tubes (Fig. 65/2) in the distributor head.

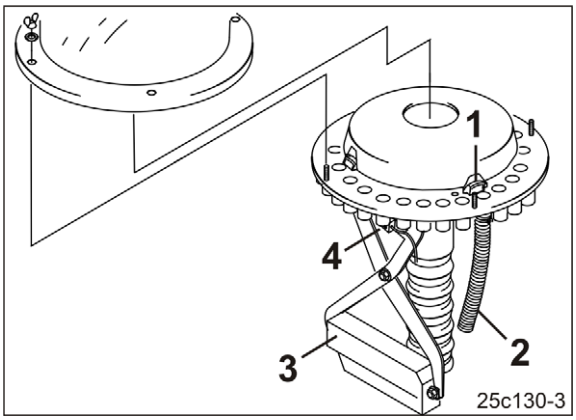


Fig. 65

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

A sensor (Fig. 65/4) checks whether the shutters (Fig. 65/1), which open the and close the seed tubes (Fig. 65/2), are working properly.

If the setting is wrong, the on-board computer[1] emits an alarm.

[1] AMALOG+

The tramline selection allows the creation of tramlines at preselected intervals on the field.

Tramlines are seed-free tracks (Fig. 66/A) for fertilising and plant care machines used later.

The tramline spacing (Fig. 66/b) corresponds to the working width of the care machines (Fig. 66/B), e.g. fertiliser spreader and/or field sprayer, which are used on sown fields.

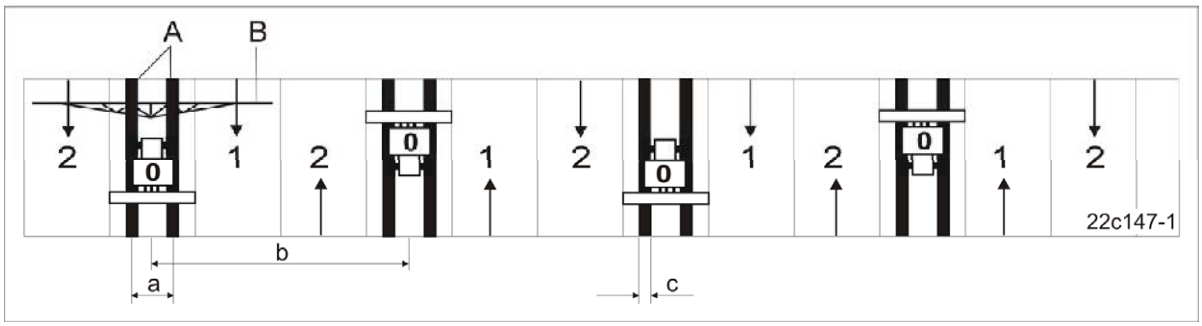


Fig. 66

To set the different tramline spacings (Fig. 66/b), appropriate tramline rhythms must be entered on the on-board computer[1)].

The figure (Fig. 66) 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. 67) 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. 66/a) of the tramline corresponds to that of the cultivating tractor and is adjustable [see chapter "Setting the tramline to the track width of the cultivating tractor", on page 151].

The track width (Fig. 66/c) of the tramline increases with an increasing number of tramline coulters fitted next to each other.

[1)] AMALOG+

Tramline rhythm	Seed drill working width 6.0 m Tramline spacing (working width of the fertiliser spreader and field sprayer)
1	12m
3	18m
4	24m
5	30m
6	36m
7	42 m
2 plus	24m
6 plus	36m

Fig. 67

5.14.1 Examples for creating tramlines

The creation of tramlines is shown in Figure (Fig. 68) 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,
fertiliser spreader or
field sprayer: ..... 18 m = 18 m tramline spacing.

1. In the adjacent table (Fig. 68) 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)] AMALOG+

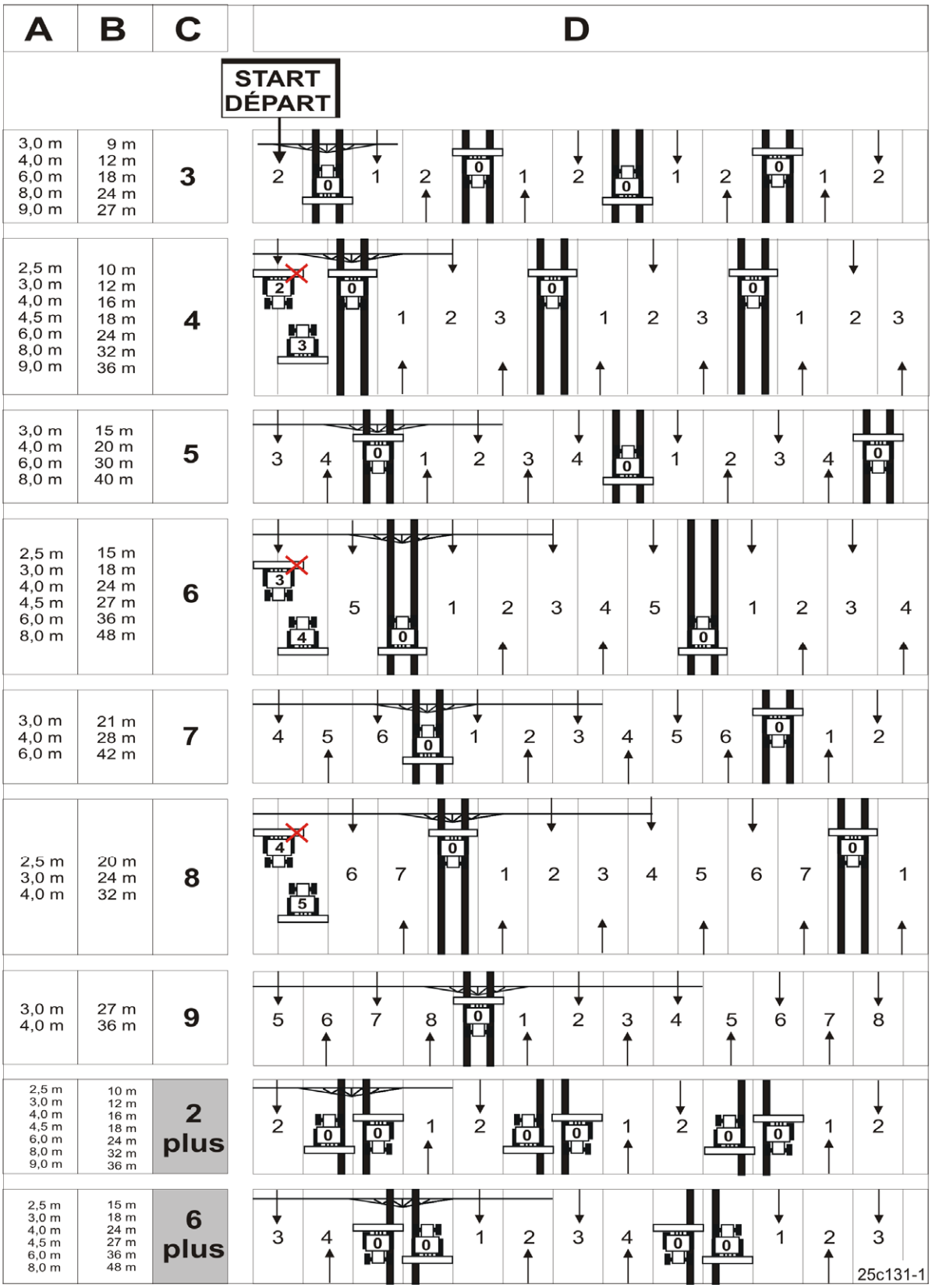

A
B
C
D
START
DÉPART
3,0 m 4,0 m 6,0 m 8,0 m 9,0 m
9 m 12 m 18 m 24 m 27 m
3
2,5 m 3,0 m 4,0 m 4,5 m 6,0 m 8,0 m 9,0 m
10 m 12 m 16 m 18 m 24 m 32 m 36 m
4
3,0 m 4,0 m 6,0 m 8,0 m
15 m 20 m 30 m 40 m
5
2,5 m 3,0 m 4,0 m 4,5 m 6,0 m 8,0 m
15 m 18 m 24 m 27 m 36 m 48 m
6
3,0 m 4,0 m 6,0 m
21 m 28 m 42 m
7
2,5 m 3,0 m 4,0 m
20 m 24 m 32 m
8
3,0 m 4,0 m
27 m 36 m
9
2,5 m 3,0 m 4,0 m 4,5 m 6,0 m 8,0 m 9,0 m
10 m 12 m 16 m 18 m 24 m 32 m 36 m
2 plus
2,5 m 3,0 m 4,0 m 4,5 m 6,0 m 8,0 m
15 m 18 m 24 m 27 m 36 m 48 m
6 plus
25c131-1

Fig. 68

5.14.2 Tramline rhythm 4, 6 and 8

Figure (Fig. 68) shows 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 6000 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. 69).

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!

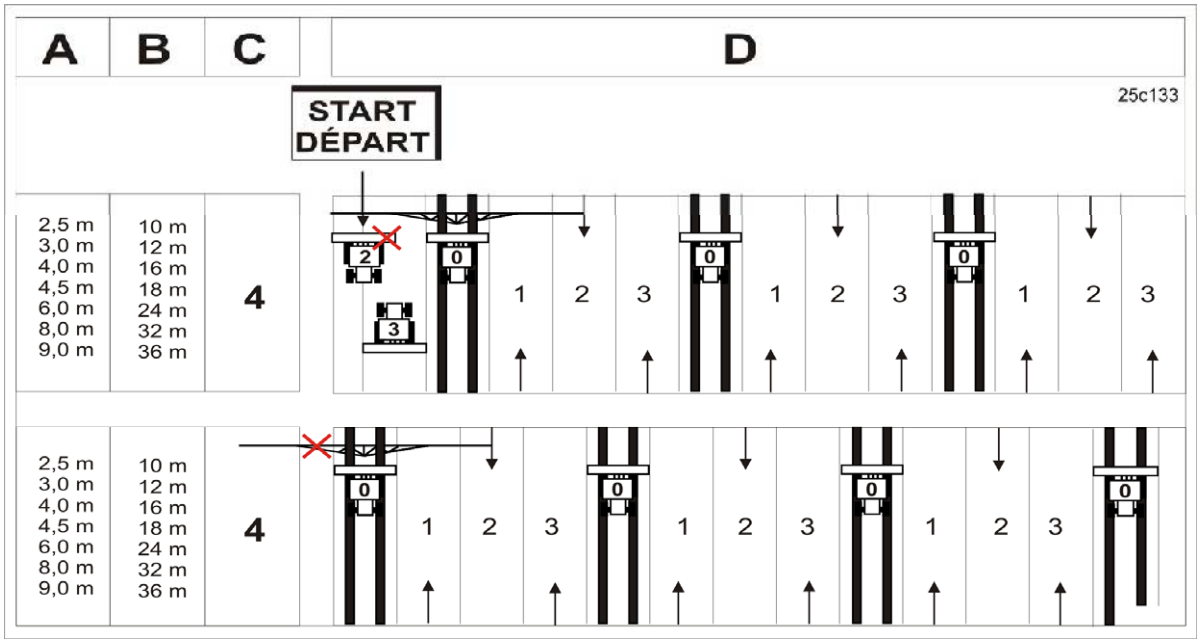


Fig. 69

5.14.3 Tramline rhythm 2 plus and 6 plus

Figure (Fig. 68) shows examples of tramline creation with tramline rhythms 2 plus and 6 plus.

When tramlines are created with the tramline rhythm 2 plus and 6 plus (Fig. 70), 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.

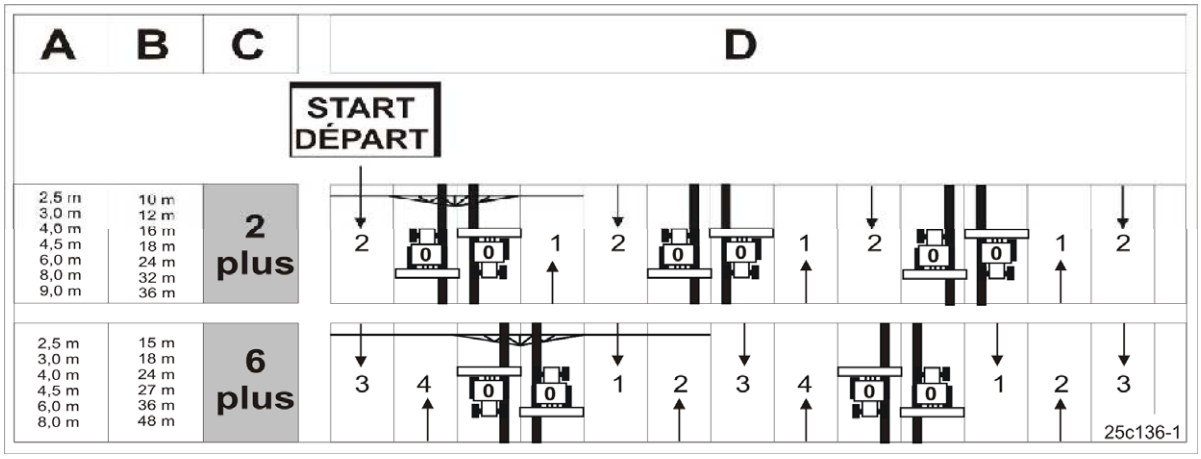


Fig. 70

6 Commissioning

This section contains information

- on commissioning your machine
- on checking how you may attach the machine to your tractor

- Before commissioning the machine, the operator must have read and understood the operating manual.
- Take heed of section "Safety information for users", from on page 28 onwards on
  - connecting and disconnecting the machine
  - transporting the machine
  - using 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

Risk of crushing, shearing, cutting, and being drawn in or trapped in the vicinity of hydraulically or electrically actuated components.

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

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

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 approved 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 approved 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)

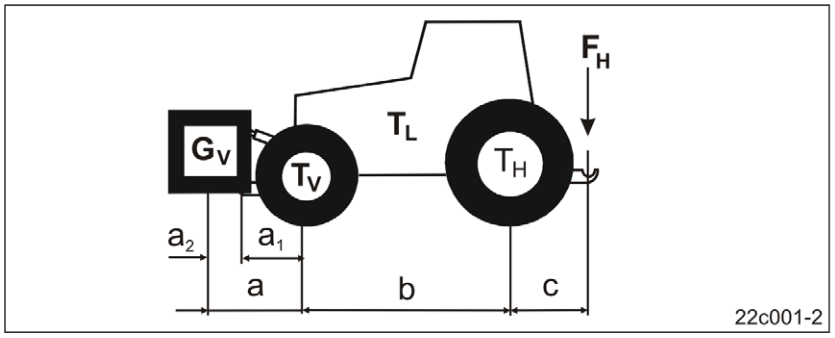


Fig. 71

T_L	[kg]	Tractor empty weight	See tractor operating manual or vehicle documentation.
T_V	[kg]	Front axle load of the empty tractor	
T_H	[kg]	Rear axle load of the empty tractor	
G_V	[kg]	Front weight (if available)	See front weight in technical data, or weigh.
F_H	[kg]	Maximum drawbar load	See section "Technical Data", on page 49.
a	[m]	Distance between the centre of gravity of the front machine mounting or the front weight and the centre of the front axle (total $a_1 + a_2$)	See technical data of tractor and front machine mounting or front weight or measurement.
a_1	[m]	Distance from the centre of the front axle to the centre of the lower link connection	See tractor operating manual or measurement
a_2	[m]	Distance between the centre of the lower link connection point and the centre of gravity of the front machine mount or front weight (centre of gravity distance)	See technical data of front machine mounting or front weight or measurement
b	[m]	Tractor wheel base	See tractor operating manual or vehicle documents or measurement
c	[m]	Distance between the centre of the rear axle and the centre of the lower link connection	See tractor operating manual or vehicle documents or measurement

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

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

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

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

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

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

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

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 $T_{H\ tat}$

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

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

6.1.1.6 Tyre load capacity

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

6.1.1.7 Table

	Actual value according to calculation		Approved value according to tractor instruction manual		Double approved load capacity (two tyres)
Minimum ballast front / rear	/ kg		--		--
Total weight	kg	≤	kg		--
Front axle load	kg	≤	kg	≤	kg
Rear axle load	kg	≤	kg	≤	kg

- You can find the approved values for the total tractor weight, axle loads and load capacities in the tractor registration papers.
- The 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 ($G_{V\,min}$).

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

6.1.2 Requirements for tractor operation with attached machines

WARNING

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

Ensure:

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

6.2 Securing the tractor / 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. 72/5) to a single-acting or double-acting tractor control unit with priority.
- Connect the large hydraulic coupling of the return line hose (Fig. 72/6) only to an unpressurised tractor connection with direct access to the hydraulic fluid tank (Fig. 72/4).
  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.

Fig. 72/...

(A)	On the machine face
(B)	On the tractor face
(1)	Hydraulic fan motor $N_{max.}$ = 4000 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)

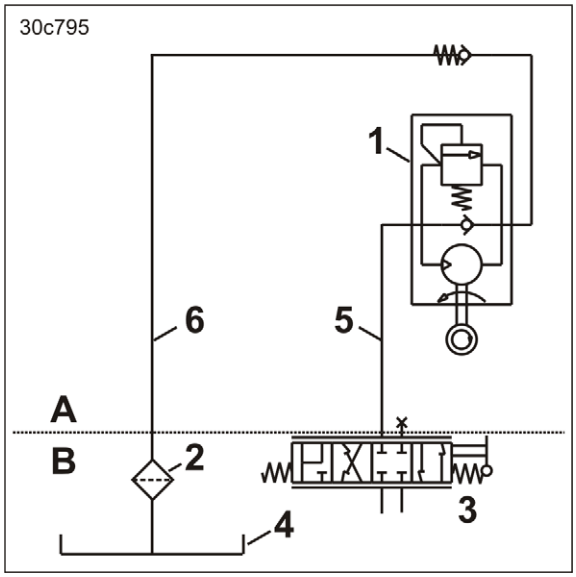


Fig. 72

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. 72/4) 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.

7 Coupling and uncoupling the machine

When coupling and uncoupling the machine take heed of the section "Safety information for users", on page 28.

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 85.

WARNING

Risk of crushing 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 79.

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.

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 linkage of the tractor and the machine are the same.

WARNING

Risk of energy supply failure between the tractor and the machine through damaged power lines.

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

- must give slightly without tension, bending or rubbing on all movements of the connected machine.
- may not scour 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!

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 wheel chocks (Fig. 73/1).

Fig. 73

2. The drawbar is equipped with lower link pins Cat. III.
   Install a ball sleeve (Fig. 74/1) on each lower link pin of the drawbar and secure with a clip pin.

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

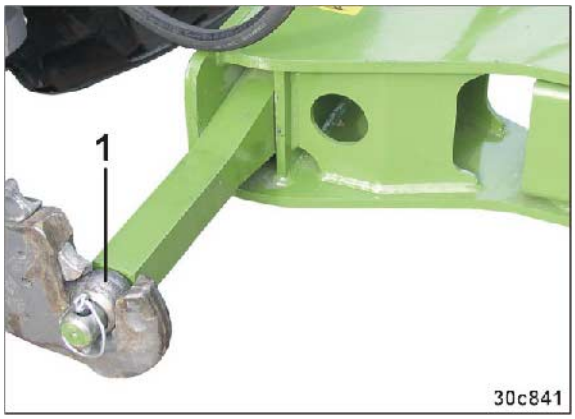


Fig. 74

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. 76/1) 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. Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
12. Connect the supply lines to the tractor (see section 7.1.1 to 5.2.1, from on page 92).

13. Route the cable connected with the valve lever (Fig. 75/1) into the tractor cabin.

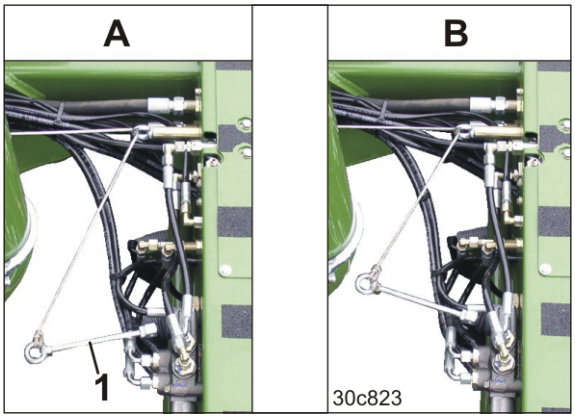


Fig. 75

14. Hold the sustainer (Fig. 76/1) tight and remove the positioning bolt (Fig. 76/2).
15. Push up the sustainer by the handle (Fig. 76/1) and position it with the positioning bolt.
16. Secure the positioning bolt with the lynch pin provided.

Fig. 76

Check the route of the supply lines.

The power lines

- must easily give way to all movements in bends without tensioning, kinking or rubbing
- must not scour other parts.

17. Check the function of the braking and lighting system.
18. Stow the wheel chocks in the mountings and secure them with spring tensioners (Fig. 77/1).
19. Before commencing a run, perform a braking test.

Fig. 77

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.

Tractor side		Machine side (Cayena)			
		Fig. 21/…	Running direction	Marking	Function
Tractor control unit 1	Double-acting	(1)	Feed line	1 cable tie, yellow	• Lowering / lifting integrated running gear • Lowering / lifting the star wheel
		(1a)	Return line	2 cable ties, yellow	
2	Double-acting	(2)	Feed line	1 cable tie, green	• Folding the machine extension arms • Lowering / lifting the track marker
		(2a)	Return line	2 cable ties, green	
3	Double-acting	(3)	Feed line	1 cable tie, blue	Working depth adjustment of tine coulters (optional)
		(3a)	Return line	2 cable tie, blue	
4	Single-acting or double-acting	(4)	Feed line [1]	1 cable tie, red	Hydraulic fan motor
Pressureless line		(5)	Return line [2]	2 cable ties, red	

Hydraulic line

[1] Pressure hose with priority

[2] Pressureless hose (see section "Installation instructions for blower fan connection to tractor hydraulics", on page 86).

- 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 Connecting the electrical connections

Connection/function	Installation information
Plug (7-pin) for the road traffic lighting system	
Machine connector AMALOG+	Connect the plugs to the terminal as described in the AMALOG+ operating manual.

7.1.3 Connecting the hydraulic service brake system

Connect the hydraulic service brake system as described above (see section "Coupling the hydraulic service brake system", on page 54).

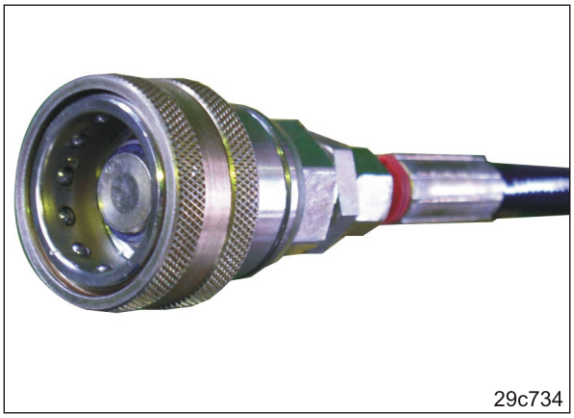


Fig. 78

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. Switch off the tractor's universal joint shaft.
2. Align the tractor and machine so that they are straight on a horizontal parking surface with a firm substrate.
3. Fold the machine completely in or out.
4. Switch off the AMALOG+.

   4.1 Press the (Fig. 79/1) button.
5. Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

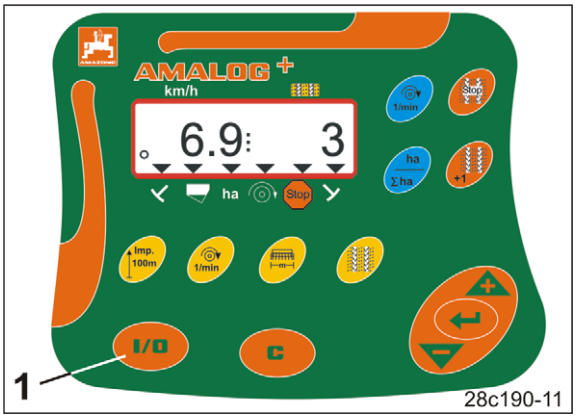


Fig. 79

6. Hold the sustainer (Fig. 80/1) tight and remove the positioning bolt (Fig. 80/2).
7. Lower the sustainer and pin it with the positioning bolt provided.
8. Secure the positioning bolt with the lynch pin provided.

Fig. 80

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

   9.1 Release the spring pins (Fig. 81/1) and remove the wheel chocks from the transport bracket.

Fig. 81

10. Secure the machine tyre with two wheel chocks (Fig. 82/1).

Fig. 82

11. Disconnect the coupling of the hydraulic service brake system from the tractor (see section "Uncoupling the hydraulic service brake system", on page 55).

12. Uncouple all supply lines from the tractor.
13. Close the hydraulic connectors with protective caps.
14. Place the supply lines in the hose cabinet (Fig. 83).

Fig. 83

15. Place the machine on the stand (Fig. 84/1).

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!

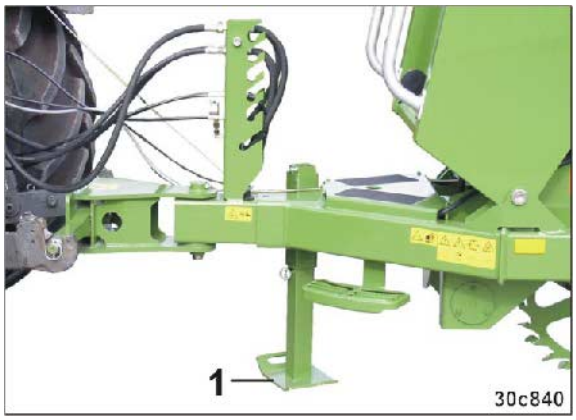


Fig. 84

16. Open the securing device (Fig. 85) of the tractor's lower link (see tractor operating manual).
17. Uncouple the tractor's lower link.
18. Pull the tractor forwards.

DANGER

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

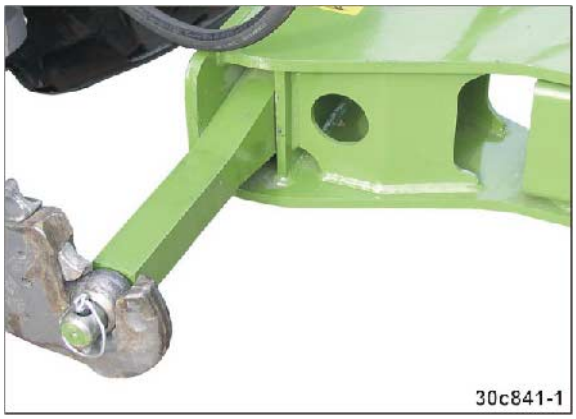


Fig. 85

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. 86/1) 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. 86/2) rests against it.

Fig. 86

7.3.2 Uncoupling the hydraulic pump

DANGER

- **Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.**
- **The hydraulic pump contains hot components that may inflict burns. Wear gloves.**

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 85.

DANGER

Before adjustment tasks (if not described otherwise)

- **Fold out the machine extension arms (see section 10.1, on page 118)**
- **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. 87/1).
3. Detach the level sensor (Fig. 87/2) and insert in the intended connection.
4. Tighten the nut.
5. Fit the dummy (Fig. 87/3), which has no function, into the vacated opening and secure.

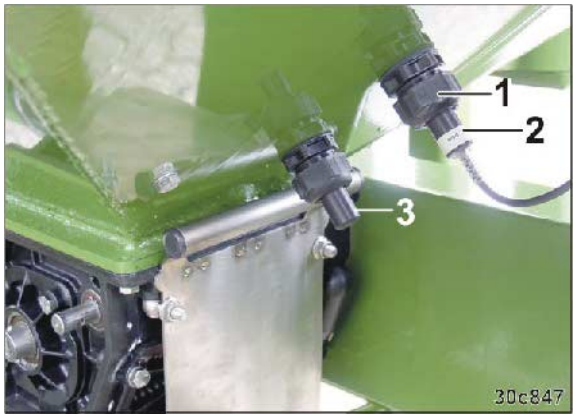


Fig. 87

8.2 Installing/removing the dosing roller

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

Fig. 88

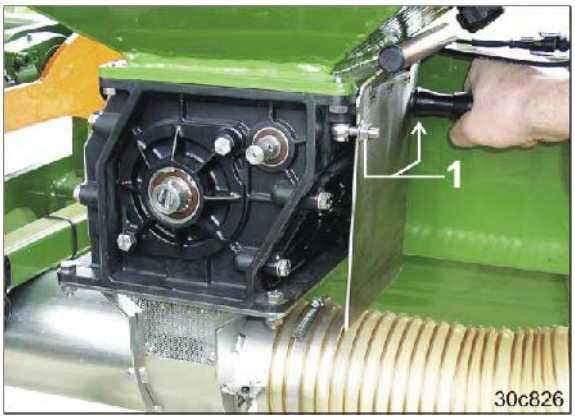


Fig. 89

1. Close the seed hopper opening (only necessary when the seed hopper is full).

   1.1 Remove the key (Fig. 88/1) from the holder.

   1.2 Release two nuts (Fig. 89/1) but do not remove.

1.2 Turn the screws (Fig. 90/1).

1.3 Push the shutter (Fig. 90/2) into the dosing unit up to the stop.

Fig. 90

Fig. 91

Fig. 92

2. Loosen both screws (Fig. 91/1).
3. Twist and remove the bearing cover (Fig. 92).
4. Pull the dosing roller out of the dosing unit.

Install the dosing roller in the reverse sequence.

Fig. 93

Set the shutter to the parking position and secure with two screws (see Fig. 89).

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 122).
2. Fold out the machine into the working position (see section "Folding the machine extension arms out/in", on page 118).

3. Insert the calibration trough (Fig. 94/1) into the holder beneath the dosing unit.

Fig. 94

4. Open the rotary slide of the injector sluice (see section "Seed dosing and injector sluice", on page 60).

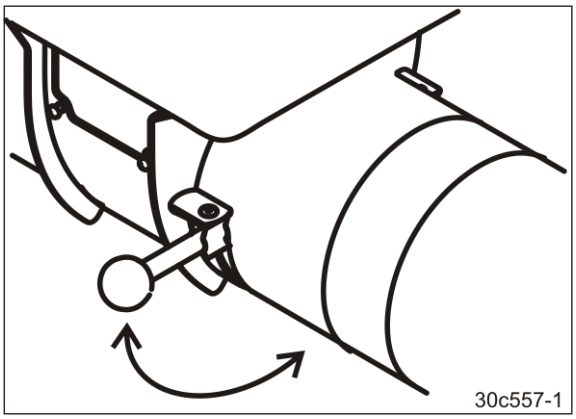


Fig. 95

1. Undo the locking button (Fig. 96/1).
2. Consult the table (Fig. 97, below) for the gearbox setting value for the first calibration test.
3. Set the pointer (Fig. 96/2) of the gearbox leaver **from below** to the gearbox setting value.
4. Tighten the locking button.

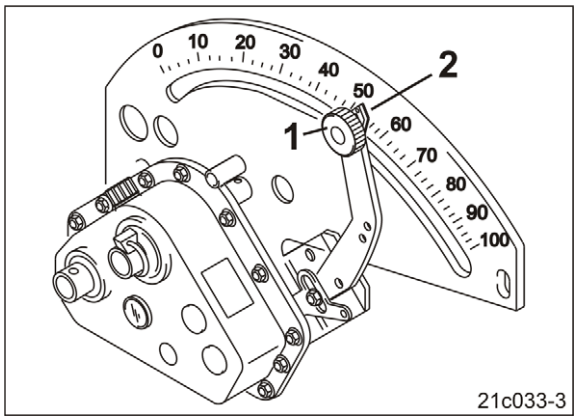


Fig. 96

Gearbox setting values for the first calibration test
Sowing with the coarse dosing roller: Gearbox setting "50"
Sowing with the medium dosing roller: Gearbox setting "50"
Sowing with the fine dosing roller: Gearbox setting "15"

Fig. 97

5. Push the calibration crank handle (Fig. 98/1) onto the star wheel (Fig. 98/2).
6. Turn the star wheel with the calibration crank handle counterclockwise until all chambers of the dosing roller are filled with seed and a uniform seed stream flows into the calibration trough.
7. . Empty the calibration trough and push it back under the dosing unit.
8. Turn the star wheel anticlockwise the number of crank turns specified in the table (Fig. 99).

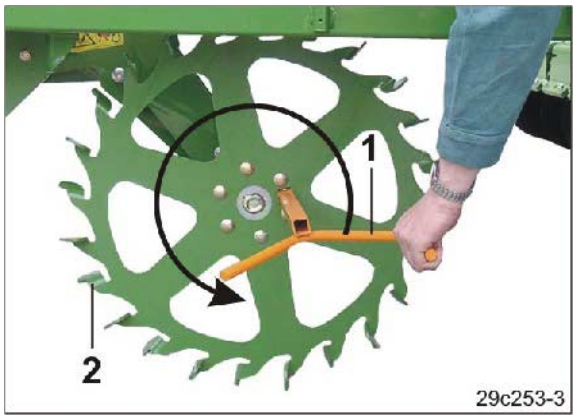


Fig. 98

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

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

- 1/40 ha (250 m^2) or
- 1/10 ha (1000 m^2).

A calibration test for 1/40 ha is usual. In the case of very small sowing rates, e.g. when sowing rapeseed, it is recommended that the calibration test for 1/10 ha be performed.

Example

Working width:.....6.0 m

Number of crank turns
to 1/40 ha:.....19.5

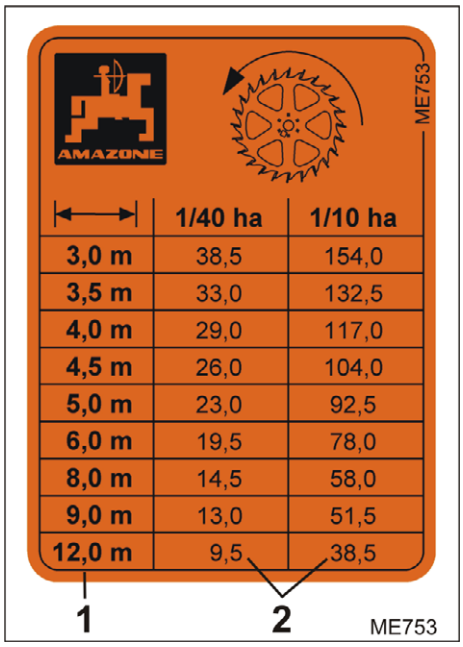


Fig. 99

9. Weigh the volume of seed caught in the calibration trough (taking the container weight into consideration) and multiply

o by a factor of 40 (for 1/40 ha).

o by a factor of 10 (for 1/10 ha).

Check the accuracy of the scales display.

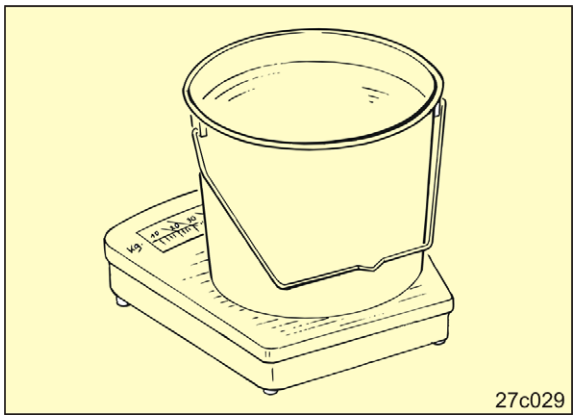


Fig. 100

Calibrating on 1/40 ha:

Sowing rate [kg/ha] = volume of seed in test [kg/ha] x 40

Calibrating on 1/10 ha:

Sowing rate [kg/ha] = calibrated seed quantity [kg/ha] x 10

Example:

calibrated seed quantity: 3.2 kg on 1/40 ha

Sowing rate [kg/ha] = 3.2 [kg/ha] x 40 = 128 [kg/ha]

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

10. Repeat the calibration test until the desired spread rate is achieved.
11. Secure the calibration trough to the seed hopper.
12. Close the rotary slide of the injector sluice (Fig. 95).
13. Clip the calibration crank into its transport bracket.

8.3.1 Determining the gearbox setting using the calculating disc rule

Example:

Calibration test values

Calculated spread rate:	175 kg/ha
Gearbox setting:	70
Desired sowing rate:	125 kg/ha.

1. Line up the values from the calibration test
   - o Calculated spread rate 175 kg/ha (Fig. 101/A)
   - o Gearbox setting 70 (Fig. 101/B)

   opposite one another on the calculating disc rule.
2. Read the gearbox setting for the desired spread rate of 125 kg/ha (Fig. 101/C) from the calculating disc rule.

→ Gearbox setting 50 (Fig. 101/D).

3. Set the gearbox lever to the value read from the disc.
4. Check the gearbox setting with another calibration test (see "8.3", on page 102).

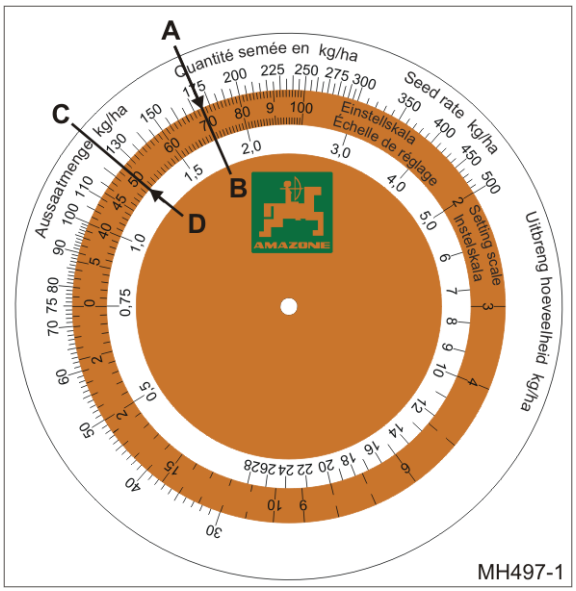


Fig. 101

8.4 Adjusting the planting depth

1. Set the machine on the field to its working position (see section "Use of the machine", on page 116).
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. 103).
4. Set the planting depth with the switchable ratchet (Fig. 102).
5. Lock the setting using the clip pin (see Fig. 103).
6. The machine has two adjuster segments. Repeat the operation as described.

Fig. 102

Lock each setting using the clip pin (Fig. 103/1).

The ratchet is reset by actuating the lever (Fig. 103/2).

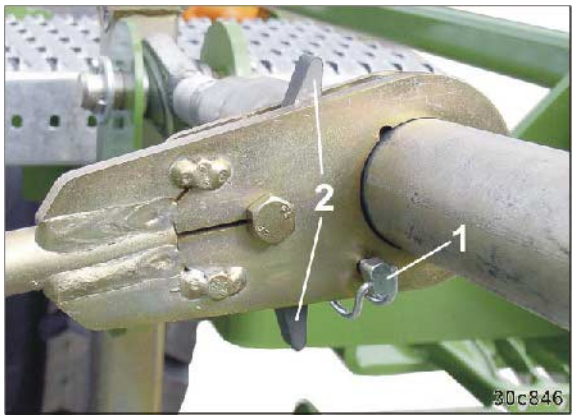


Fig. 103

8.5 Adjusting the exact harrow

Check the work results after each adjustment.

8.5.1 Setting the harrow tines

Set the harrow tines [see table (Fig. 105), below].

To set, turn the crank handle (Fig. 104/1) on all adjuster segments.

1. Set the machine on the field to its working position (see section "Use of the machine", on page 116).
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.

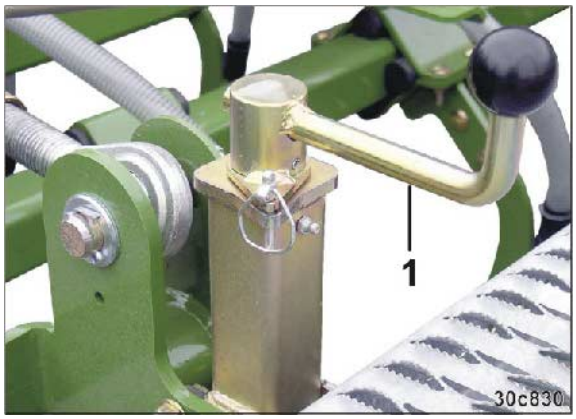


Fig. 104

Distance "A"	**230 to 280 mm**

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.

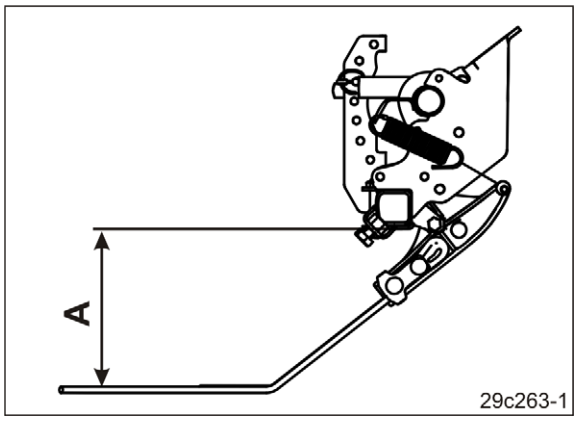


Fig. 105

8.5.2 Setting the exact harrow pressure

1. Tension the lever (Fig. 106/1) with the calibration crank.
2. Insert the pin (Fig. 106/2) 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.

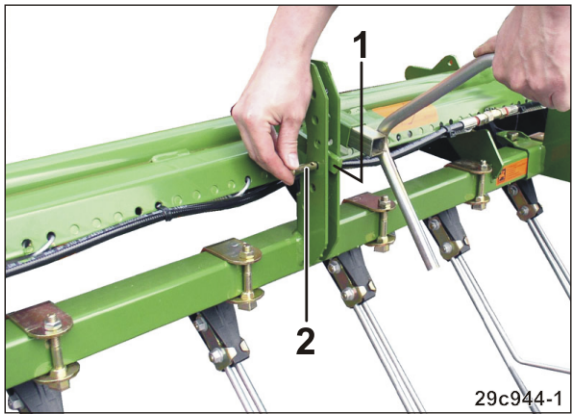


Fig. 106

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 the track marker on the field and drive for a few 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. 107/1).
5. Set the track marker length to distance "A" (see table, Fig. 108, below).
6. Tighten the bolt (Fig. 107/1) securely.

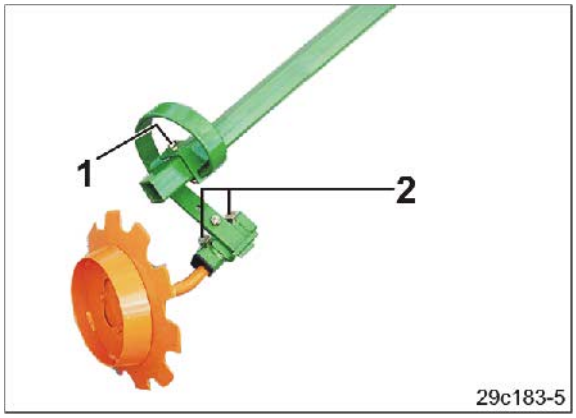


Fig. 107

7. Release both screws (Fig. 107/2).
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. 107/2).
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.

	Distance "A"
Cayena 6000	6.0m

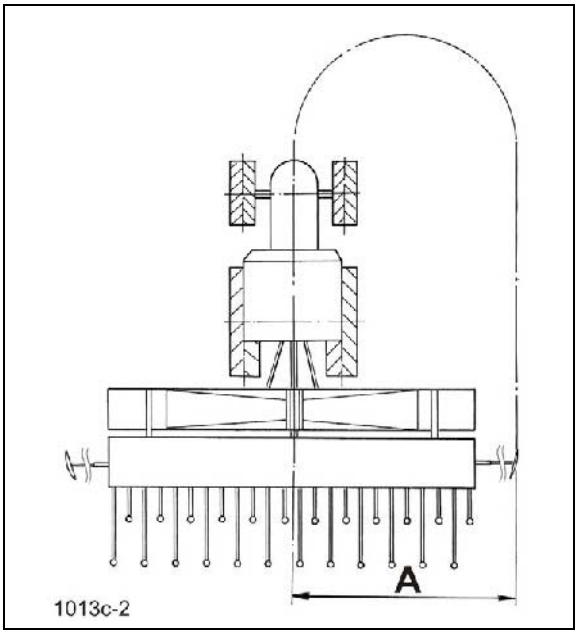


Fig. 108

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 section "Blower fan", on page 65)

- 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.

Adjust the following in the AMALOG+:

- the desired blower fan speed
- the deviation from the desired blower fan speed (as a percentage) at which the alarm is to be triggered.

Fig. 109

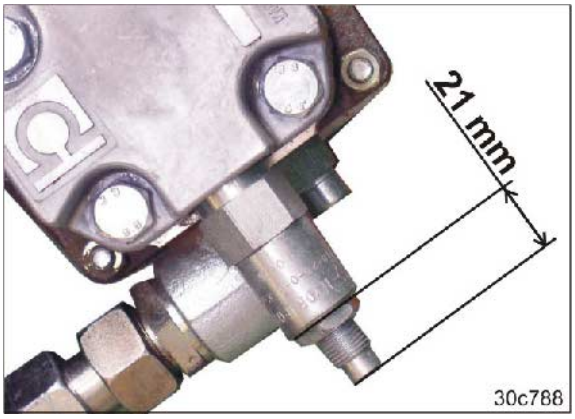


Fig. 110

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

1. Release the lock nut (Fig. 109/2).
2. Set the pressure relief valve (Fig. 109/1) to the factory setting "21 mm" (Fig. 110).
   2.1 Turn the screw with the hexagon socket wrench accordingly.
3. Set the desired blower fan speed at the flow control valve of the tractor.
4. Tighten the lock nut (Fig. 109/2).

8.7.2 Adjusting the blower fan speed on the machine's pressure relief valve

1. Release the lock nut (Fig. 109/2).
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. 110)!

Fan speed

Turning clockwise: increases the desired fan speed.

Turning anticlockwise: reduces the desired fan speed.

3. Tighten the lock nut (Fig. 109/2).

8.8 Setting the tramline rhythm/counter

1. Refer to the table (Fig. 67, on page 74) for the required tramline rhythm and enter it into the on-board computer [1].
2. Refer to the figure (Fig. 68, on page 75) for the tramline counter for the first field run and enter it on the on-board computer [1].

[1] see operating manual AMALOG+

The tramline counter is coupled with the operating position sensor on the star wheel. Each time the machine or the star wheel is raised, the tramline counter switches up a number.

Pressing the Stop button 

before the star wheel is raised prevents the tramline counter from shifting on (see operating manual for on-board computer [1]).

[1] AMALOG+

9 Transportation

When driving on public roads and ways 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.

The Cayena is equipped with a hydraulic service brake system. In Germany and some other EU countries, transportation on public roads and paths with a hydraulic service brake system is prohibited.

- For transport journeys take heed of the section "Safety information for users", on page 28.
- 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 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 angebauten / 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.

DANGER

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

1. Empty the seed hopper (see section "Emptying the seed hopper and/or dosing unit", on page 128).
   The brake system is designed for driving with an empty hopper only.

2. Close the roller cover (Fig. 111).

Fig. 111

3. Fold in the machine extension arms (see section "Folding the machine extension arms out/in", on page 118).
4. Check the lighting system for operation (see section "Transportation equipment", on page 44).
5. Lock the tractor control unit.

Fig. 112

DANGER

Lock the tractor control units during transport!

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

- The permissible maximum speed[1)] is 25 km/h

  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.

10 Use of the machine

When using the machine, observe the information in the sections

- "Warning pictograms and other signs on the machine", as of on page 18 and
- "Safety information for users", on page 28.

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.

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.

Switch off the tractor universal joint shaft before folding in and only switch back on (only for universal joint shaft driven blower fan drive) when the machine extension arms are completely folded out.

10.1.1 Folding out the machine extension arms

1. Release the lock.
   1.1 Pull the lock (Fig. 113/1) until the spacer (Fig. 113/2) releases the lock.

Fig. 113

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. 114/1).

Actuate control unit 1 until the machine is fully raised.

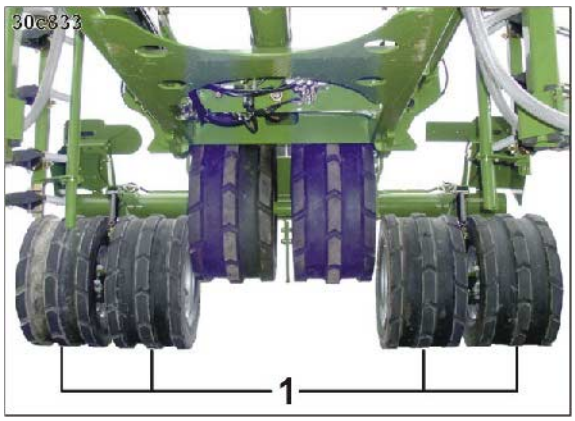


Fig. 114

4. Pull the cable connected to the valve lever (Fig. 115/1) and hold.

→ The 6/2-way valve switches to fold out the machine extension arms.

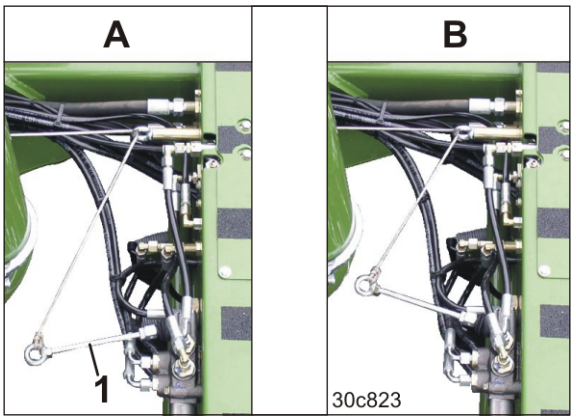


Fig. 115

5. Actuate the control unit 2 (with valve lever pulled).

→ The machine extension arms fold out.

6. Actuate the control unit 2 until the pressure gauge (Fig. 116/1) indicates a pressure of between 90 and 100 bar.

   The specified working pressure in the pressure tank is then achieved (see section "Functional description of the pressure tank", on page 154).

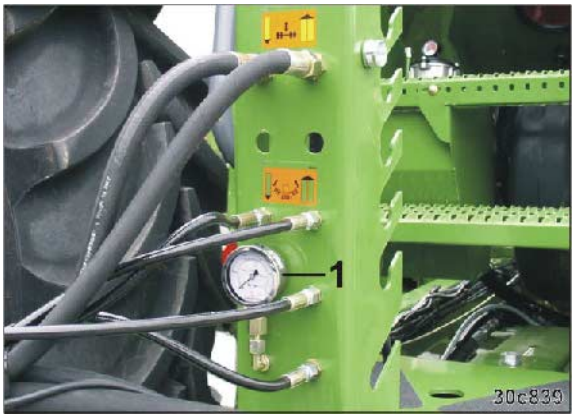


Fig. 116

7. Release the cable connected to the valve lever (Fig. 115/1).

→ The 6/2-way valve switches to actuate the track marker.

8. Operate control unit 1.

→ The machine is lowered via the integrated running gear (Fig. 114/1).

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. 117/1).

→ The star wheel is raised.

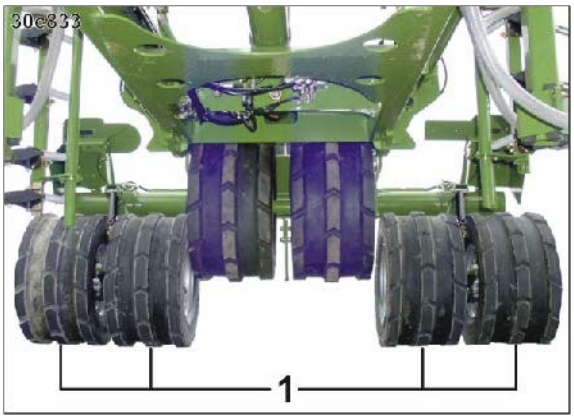


Fig. 117

Actuate control unit 1 until the machine is fully raised.

4. Pull the cable connected to the valve lever (Fig. 118/1) and hold.

→ The 6/2-way valve switches to fold in the machine extension arms.

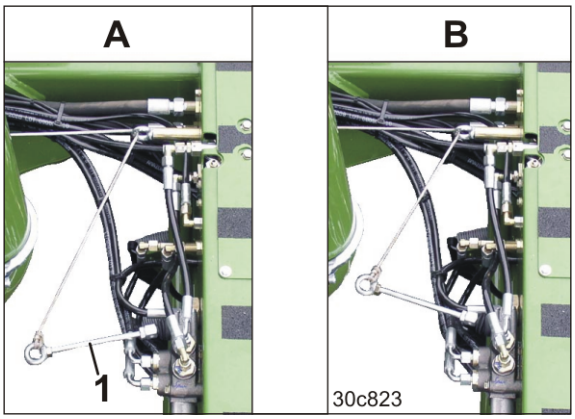


Fig. 118

5. Actuate the control unit 2 (with valve lever pulled).

→ The machine extension arms fold in.

. Actuate control unit 2 until the machine extension arms are fully folded in.

6. Release the cable connected to the valve lever.
7. Switch off the AMALOG+
   (see AMALOG+ operating manual).

The locking plate (Fig. 119/1) forms the mechanical transportation lock. The extension arms are locked when the pin is inserted into the hole of the locking plate (Fig. 119/2).

DANGER

Check that the pin (Fig. 119/1) is correctly inserted into the locking plate after the extension arms are folded in.

Fig. 119

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.

Ensure that the machine has sufficient ground clearance in all driving situations.

Fig. 120

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 87).
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

DANGER

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

3. Determine and fit the dosing roller(s) with the aid of the table (Fig. 46, on page 62) (see section. "Installing/removing the dosing roller", on page 100).

4. You can access the filling opening of the seed hopper by means of the steps.
5. Release the belt and hold.

→ The roller cover opens as the belt is released.

6. Secure the belt in an eye.
7. If necessary, remove foreign bodies from the seed hopper.

Fig. 121

8. Load the seed hopper
   - o with a filling auger from a supply vehicle (see section "10.2.1", on page 123)
   - o from bulk bags (see section "10.2.2", on page 123).
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. 122

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. 123

DANGER

Never move between the supply vehicle and the machine.

Never stand under suspended loads.

10.3 Starting work

Fig. 124

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.**
- **Actuate the tractor's control units only in the tractor cab.**

1. Fold out the machine extension arms (see section "Folding the machine extension arms out/in", on page 118).

When lowering, pull the machine forward slightly.

2. Operate control unit 4.

→ Switch on the blower fan.

3. Check the fan speed and correct it as necessary.

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 35.
- 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

→ Lower the star wheel.

Actuate the control unit 1 until the integrated running gear is fully retracted.

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 operating manual AMALOG+).

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 "Creation of tramlines", on page 72).

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 on-board computer operating manual).
8. Check the tramline counter on the on-board computer, correct if necessary (see on-board computer operating manual).
9. Start.

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 (STOP key)

If the tramline counter is prevented from indexing when there is a work interruption, press the STOP button (see section "Setting the tramline rhythm/counter", on page 111).

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 "Clean the distributor head", on page 134].

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

→ The star wheel is raised.

3. Actuate control unit 2.

→ The active track marker is raised.

4. Turn the combination as soon as the machine is raised.

Fig. 125

After turning at the end of the field

1. Actuate control unit 1.

→ The machine is lowered.

→ The star wheel 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 3.

→ Switch off the blower fan.

4. Actuate control unit 1.

→ Raise the star wheel.

→ Raise the machine via the integrated running gear.

When the machine is raised or lowered, if the tramline counter is to be prevented from shifting on, press the STOP key as soon as the star wheel is raised (see section "Setting the tramline rhythm/counter", on page 111

5. Empty the seed hopper (see section "10.8", below).

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 Cirrus in the transport position (see section "Folding the machine extension arms out/in", on page 118).
7. Switch off the AMALOG+.

10.8 Emptying the seed hopper and/or dosing unit

DANGER

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

1 . Insert a calibration trough (Fig. 126/1) into the holder beneath the dosing unit.

Fig. 126

2. Close the opening of the seed hopper above the dosing unit with the shutter (Fig. 127/1) (see section "Installing/removing the dosing roller", on page 100).

Fig. 127

3. Open the rotary slide of the injector sluice (see section "Seed dosing and injector sluice", on page 60).

→ The seed drops into the calibration trough.

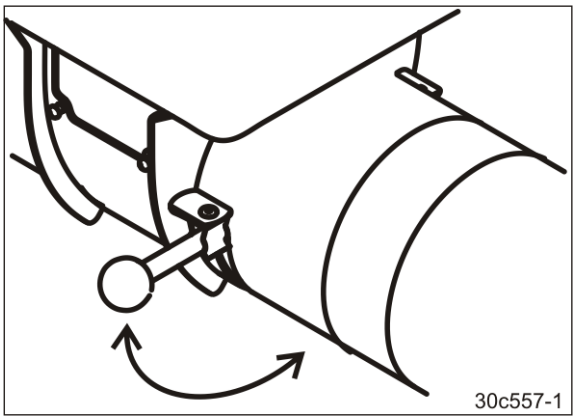


Fig. 128

4. Remove the dosing roller (see section "Installing/removing the dosing roller", on page 100).
5. Close the housing cover (Fig. 129/1).
6. Pull the shutter (Fig. 129/2) slowly out of the dosing unit.

→ The seed drops into the calibration trough.

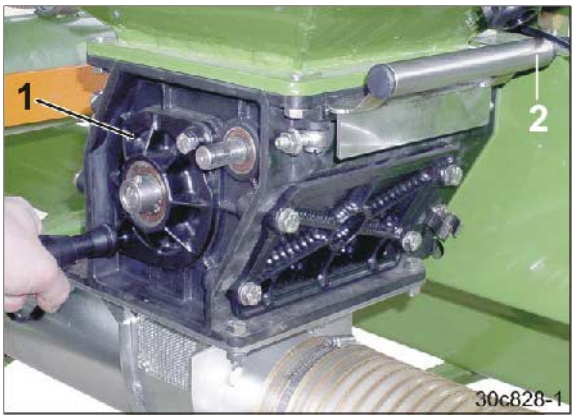


Fig. 129

7. Reassembly occurs in the reverse sequence.

Seed remains in the dosing unit may swell or germinate if the dosing unit is not completely emptied. This may block the rotation of the dosing roller, causing damage to the drive.

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 away, before you eliminate any faults on the machine. On this subject see section 6.2 on page 85.

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

11.1 Residual volume indicator

If the seed level reaches the level sensor,

- The control character marks (Fig. 130/1) the fill level symbol in the AMALOG+.
- An alarm signal sounds.

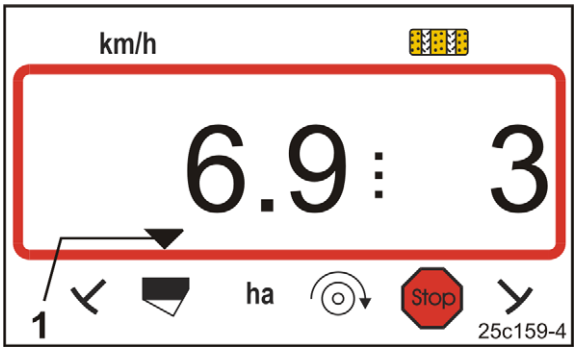


Fig. 130

11.2 Fault table

Fan sensor alarmed	Alarm limit wrongly set	Alter the alarm limit
	Oil volume too low or too high	Set the oil volume
	Fan sensor defective	Replace the fan sensor
Distance sensor (star wheel/Vario gearbox) not functioning	Path sensor defective	Replace the distance sensor

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 85.

WARNING

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

- Mount protective equipment, which you removed when cleaning, maintaining and repairing the 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 118).
- 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. 131/1) to prevent unintentional lowering of the tractor's lower link.

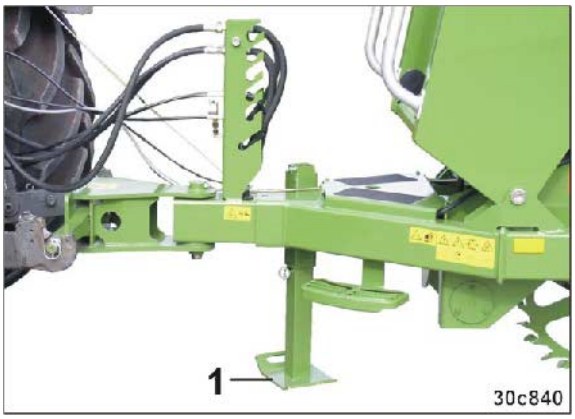


Fig. 131

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. 132/1) from the transport bracket.

   The pin is secured with a pipe clip pin (Fig. 132/2).

Fig. 132

4. Insert the pin (Fig. 133/1) as shown into the hole and secure the pin with a pipe clip pin (Fig. 133/2).
5. The machine has two pins. Repeat the operation as described.

Fig. 133

After completion of the cleaning, maintenance and repair work

1. Secure the two pins (Fig. 132/1) in the transport brackets.
2. Secure each pin with a pipe clip pin.
3. 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 cleaning nozzle of the pressure washer/steam jet directly on lubrication and bearing points.
- Always maintain a minimum jet distance of 300 mm between the pressure washer or steam jet cleaning nozzle and the machine.
- Comply with safety regulations when working with pressure washers.

1. To clean, always place the machine connected to the tractor on the stand (see section "Securing the connected machine", on page 132).
2. Fold out the machine (see section Folding the machine extension arms out/in, on page 118) and lower the machine by moving in the integrated running gear completely.
3. Empty the seed hopper and seed dosing unit (see section 10.8, on page 128).
4. Clean the distributor head [see section "Clean the distributor head", on page 134].
5. Clean the machine with water or with a high-pressure cleaner.
6. When you raise the machine, secure the raised machine as described in section Securing the raised machine, on page 132, before you start with the cleaning.

12.3.1 Clean the distributor head

7. Direct people away from the danger area.
8. Fold out the machine (see section Folding the machine extension arms out/in, on page 118) and lower the machine 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. 134/1).

Fig. 134

WARNING

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

12. Slacken the winged nuts (Fig. 135/1) and remove the clean plastic flap (Fig. 135/2) 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. 135/A) with compressed air.
15. Install the plastic cap (Fig. 135/2).
16. Fix the plastic cap with winged nuts (Fig. 135/1).

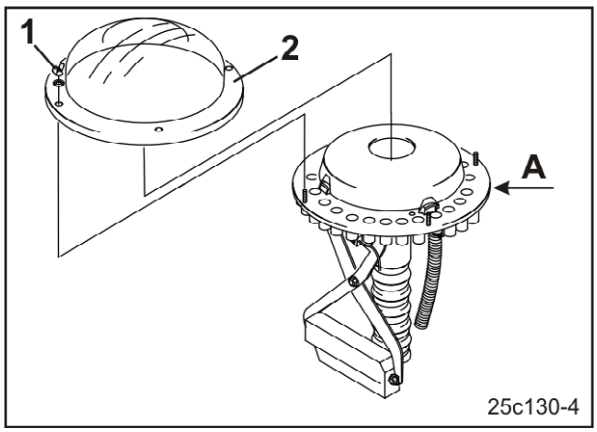


Fig. 135

Intensive cleaning requires the distributor head shutters to be removed in accordance with section "Setting the tramline to the track width of the cultivating tractor", on page 151.

12.4 Lubrication regulations

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. 136).

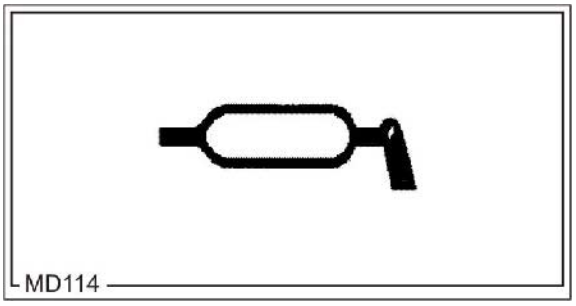


Fig. 136

12.4.1 Lubricants

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

Company	Lubricant designation
ARAL	Aralub HL2
FINA	Marson L2
ESSO	Beacon 2
SHELL	Ratinax A

12.4.2 Lubrication point overview

Cayena 6000	Number of lubrication nipples	Lubrication interval	Notes
Fig. 138/1	1	25 h	
Fig. 138/2	1	25 h	
Fig. 139/1	2	25 h	
Fig. 139/2	2	25 h	
Fig. 140/1	2	25 h	
Fig. 140/2	2	25 h	
Fig. 140/3	2	25 h	
Fig. 141/1	4	25 h	
Fig. 141/2	4	25 h	
Fig. 142/1	2	25 h	
Fig. 142/2	2	25 h	
Fig. 143/1	2	25 h	

Fig. 137

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 118).
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. 137).

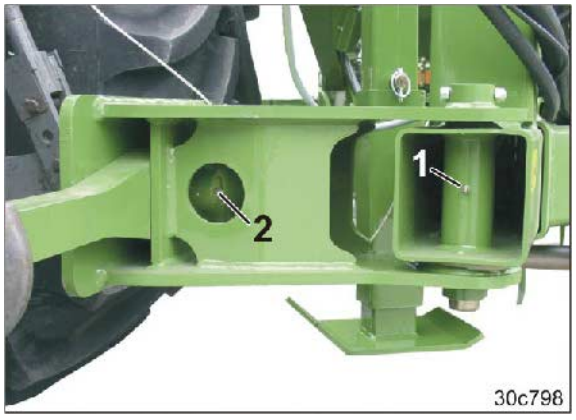


Fig. 138

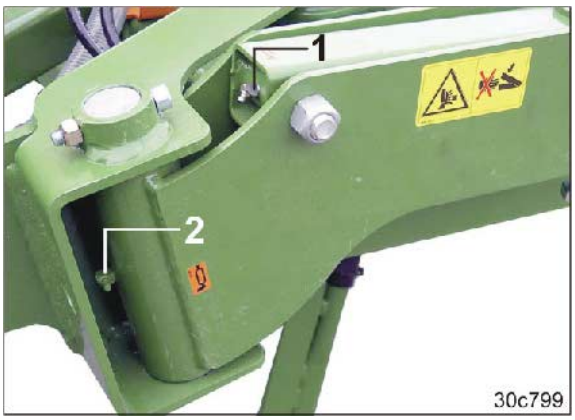


Fig. 139

Fig. 140

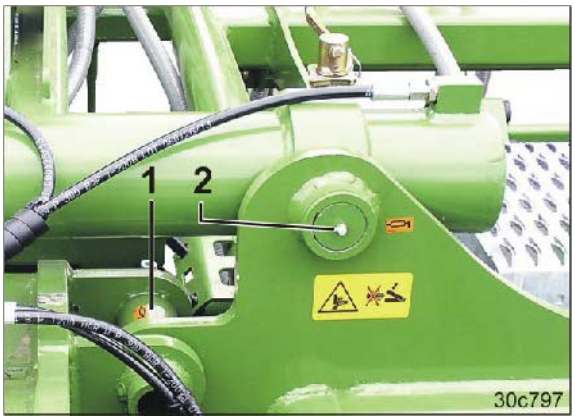


Fig. 141

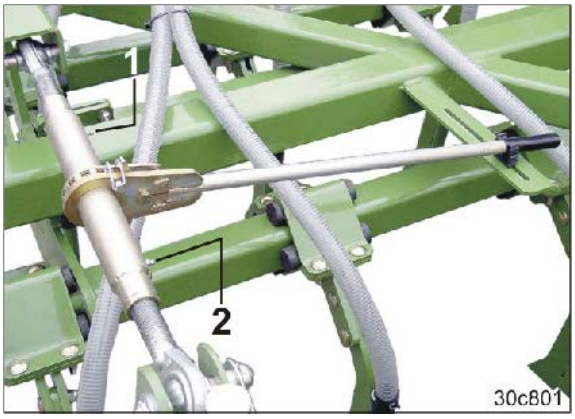


Fig. 142

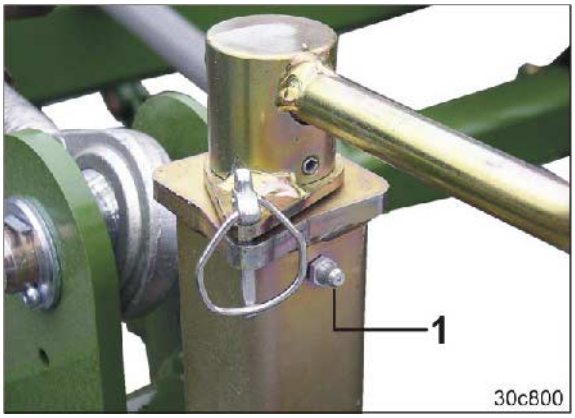


Fig. 143

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.

Initial operation	**Before initial operation**	Specialist workshop	Check and service the hydraulic hose lines. This inspection has to be recorded by the operator.	Section 12.6
			Check oil level in Vario gearbox	Section 12.5.6
			Check the inflation pressure of the wedge ring tyres	Section 12.5.1
			Checking the inflation pressure of the stabilising wheels	Section 12.5.2
	After the first 10 operating hours	Specialist workshop	Check and service the hydraulic hose lines. This inspection has to be recorded by the operator.	Section 12.6
		Specialist workshop	Verify that all bolted connections fit securely.	Section 12.9
		Specialist workshop		Section 12.5.3

before starting work **(daily)**		Visual inspection of the lower link pins	Section 12.5.7
hourly		Checking the seed planting depth	Section 10.4
(e.g. for refilling the seed hopper)		Inspection and elimination of contaminants • Seed dosing unit • Seed hoses • Distributor head • Blower fan intake guard screen	
after completion of work		Emptying seed dosing unit	Section 10.8
(daily)		Cleaning the machine (as required)	Section 12.3

each week **(at least every 50 operating hours)**	Specialist workshop	Check and service the hydraulic hose lines. This inspection has to be recorded by the operator.	Section 12.6
	Specialist workshop	Clean blower fan (Eliminate risk of imbalance).	Section 12.3
every 2 weeks	Specialist workshop	Check the inflation pressure of the wedge ring tyres	Section 12.5.1
		Checking the inflation pressure of the stabilising wheels	Section 12.5.2
		Check oil level in Vario gearbox	Section 12.5.6
every 3 months **(at least every 500 operating hours)**	Specialist workshop	Brake inspection (specialist workshop)	Section 12.7.1
before the start of the season	Specialist workshop	Check and service the hydraulic hose lines. This inspection has to be recorded by the operator.	Section 12.6
after the end of the season		Servicing roller chains and chain wheels	Section 12.5.4
		Servicing sowing shaft bearings	Section 12.5.5
Every 12 months	Specialist workshop	Check the service brake system for safe operating condition. This inspection has to be recorded by the operator.	

12.5.1 Check the inflation pressure of the wedge ring tyres

Check compliance with specified tyre pressure
(see table Fig. 144).

Observe inspection intervals
(see section Maintenance schedule – overview, on page 138).

Tyres	Rated air pressure of tyres
400/55-15.5 139A8	4.3 bar

Fig. 144

12.5.2 Checking the inflation pressure of the stabilising wheels

Check compliance with specified tyre pressure
(see table Fig. 145).

Observe inspection intervals
(see section Maintenance schedule – overview, on page 138).

Tyres	Rated air pressure of tyres
10.0/75-15	3.5 bar

Fig. 145

12.5.3 Retighten wheel and hub screws (specialist workshop)

Tighten the wheel and hub screws and check tightening torques (see table Fig. 146).

Observe inspection intervals
(see section Maintenance schedule – overview, on page 138).

	Bolt	Tightening torque
(1)	Wheel bolt M18 x 1.5	325 Nm
(2)	Bolt M16x1.5 8.8	450 Nm

Fig. 146

12.5.4 Servicing roller chains and chain wheels

After the season, make sure all roller chains are

- cleaned (including the chain wheels and chain tensioner)
- checked
- lubricate with low-viscosity mineral oil (SAE30 or SAE40).

12.5.5 Servicing sowing shaft bearings

Lightly grease the seat of the sowing shaft bearing with a thin mineral oil (SAE 30 or SAE 40).

Fig. 147

12.5.6 Check oil level in Vario gearbox

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

The oil level must be visible in the oil sight glass (Fig. 148/1).

There is no need to change the oil.

The oil filler neck (Fig. 148/2) is used to top up the Vario gearbox.

Refer to the table (Fig. 149) for the grade of transmission oil required.

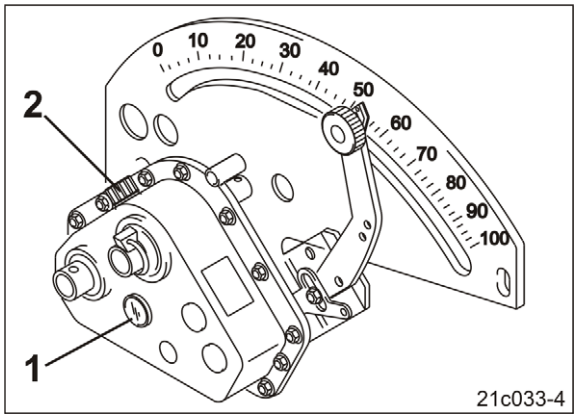


Fig. 148

Hydraulic fluid grades and fill level of the Vario gearbox	
Total filling level:	0.9 litres
Transmission fluid (alternatives):	Wintershall Wintal UG22 WTL-HM (ex-works)
	Fuchs Renolin MR5 VG22

Fig. 149

12.5.7 Visual inspection of the lower link pins

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 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 connections made from thermoplastics, other guide values may be decisive.
- 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. 150/...

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

(2) Date of manufacture of the hydraulic hose line
(08/02 = Year / Month = February 2008)

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

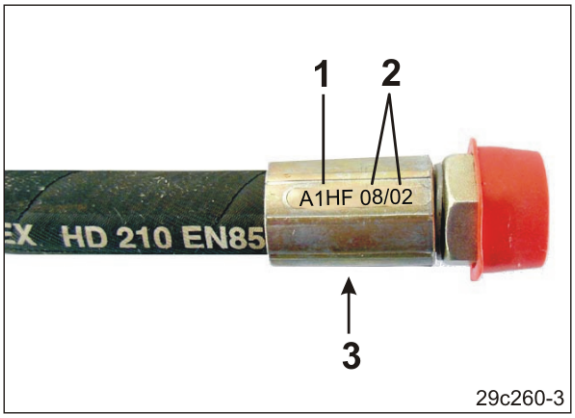


Fig. 150

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).
- Brittleness 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).
- Untight points.
- Damage or deformation of the hose assembly (sealing function restricted); minor surface damage is not a reason for replacement.
- Movement of the hose out of the assembly.

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

  The date of manufacture of the hydraulic hose line on the assembly is decisive for determining these six years. If the date of manufacture on the assembly is "2008", then the hose should not be used beyond February 2014. 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 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 overtensioned.
- 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 Hydraulic service brake system

DANGER

- **Only specialist workshops or recognised brake services may perform adjustment and repair work on the brake system.**
- **Regularly have the brake system inspected thoroughly (see section "Maintenance schedule – overview", on page 138).**
- **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 28.**

WARNING

The service brake system does not have a parking brake!

Always use wheel chocks before uncoupling the machine from the tractor.

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.

12.7.1 Brake inspection (specialist workshop)

Observe inspection intervals
(see section Maintenance schedule – overview, on page 1381).

[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.

12.7.2 Checking the brake drum for dirt (specialist workshop)

1. Unscrew the two cover plates (Fig. 151/1) inside the brake drum.
2. Remove any dirt and plant residue.
3. Refit the cover plates.

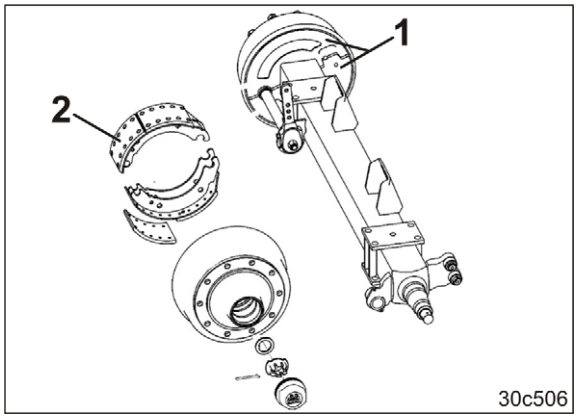


Fig. 151

CAUTION

Penetrating dirt may clog the brake linings (Fig. 151/2), 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.

12.7.3 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. 152/1) in the inspection hole.

Then reinsert the rubber plug.

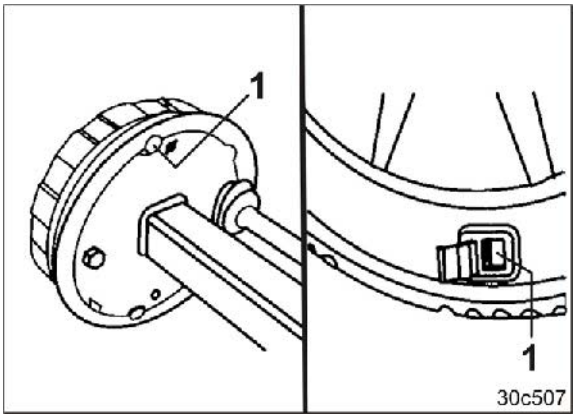


Fig. 152

12.7.4 Grease replacement of the wheel hub bearings (specialist workshop)

1. Safely jack up the machine at the marked points (Fig. 153).

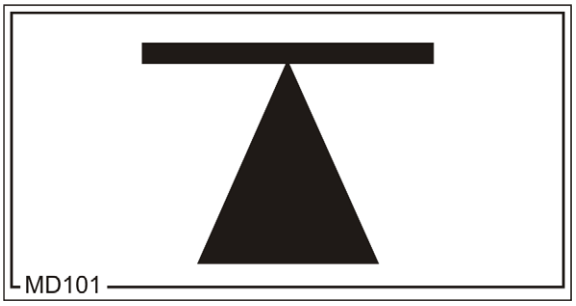


Fig. 153

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. 154/1) with brake drum, tapered roller bearing and sealing elements from the stub axle.

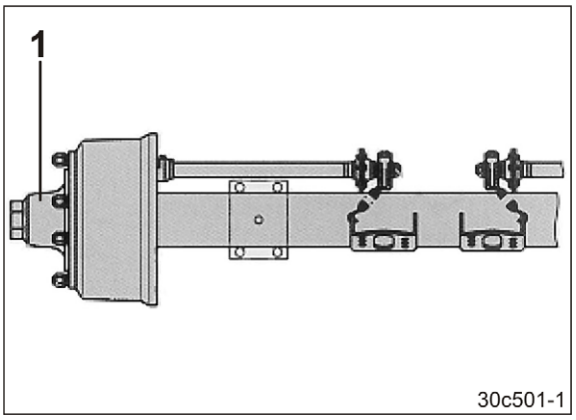


Fig. 154

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

Switch off the tractor universal joint shaft and apply the tractor parking brake, switch 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. 155/a) of the cultivating tractor.

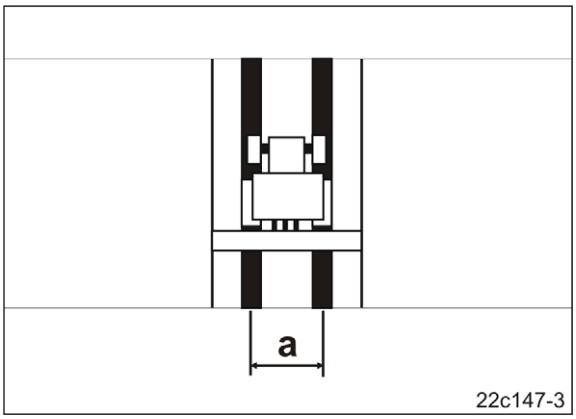


Fig. 155

The seed tubes (Fig. 156/1) of the tramline coulters must be fixed to the distributor head openings, which can be closed by the shutters (Fig. 156/2).
If necessary, interchange the seed line tubes.

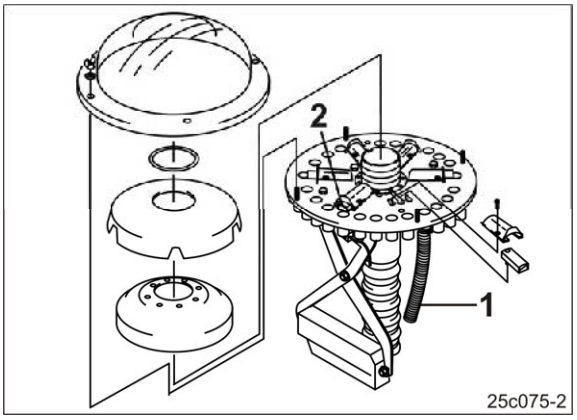


Fig. 156

12.8.1.2 Setting the tramline to the track width 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. 157/a) of the cultivating tractor.

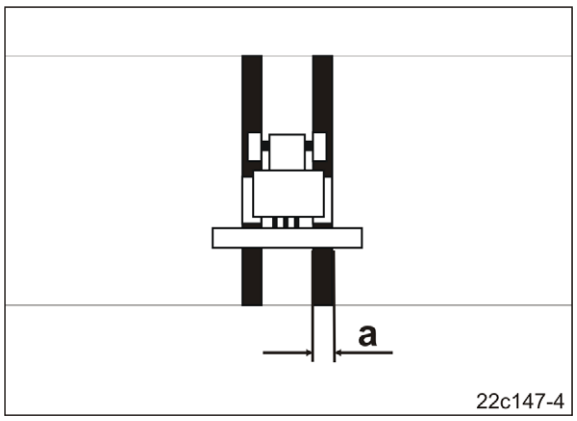


Fig. 157

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. 156/2):

- for machines with 6m working width up to 6 openings.

Deactivate any non-required shutters (Fig. 156/2) (see on page 152). 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 AMALOG+, as when creating tramlines.
3. Switch off the AMALOG+.
4. Remove the outer distributor cover (Fig. 158/1).
5. Remove the ring (Fig. 158/2).
6. Remove the inner distributor cover (Fig. 158/3).
7. Remove the foam insert (Fig. 158/4).
8. Slacken the screws (Fig. 159/1).
9. Remove the slider tunnel (Fig. 159/2).

Activating the sliders:

10. The shutters (Fig. 159/3) is in the guide, as shown in the diagram.

Deactivating the sliders:

11. Turn the shutters around (Fig. 159/3) and push them into the drill hole (Fig. 159/4).
12. Screw the slider tunnel (Fig. 159/2) onto the base plate.

13. Install the foam insert (Fig. 160/1).
14. Install the inner distributor cover (Fig. 160/2).
15. Install the ring (Fig. 160/3).
16. Install the outer distributor cover (Fig. 160/4).
17. Check the function of the tramline control.

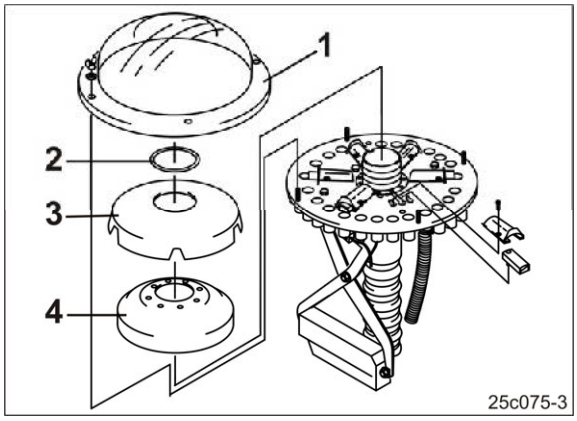


Fig. 158

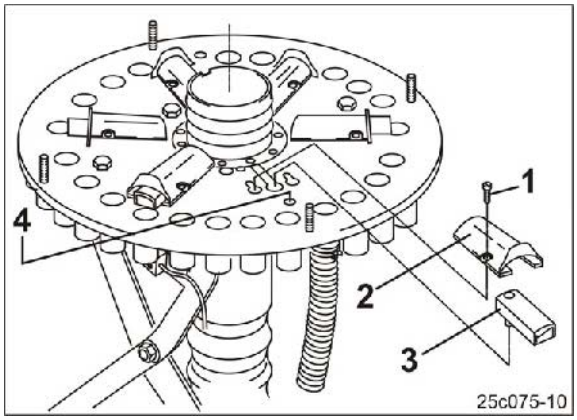


Fig. 159

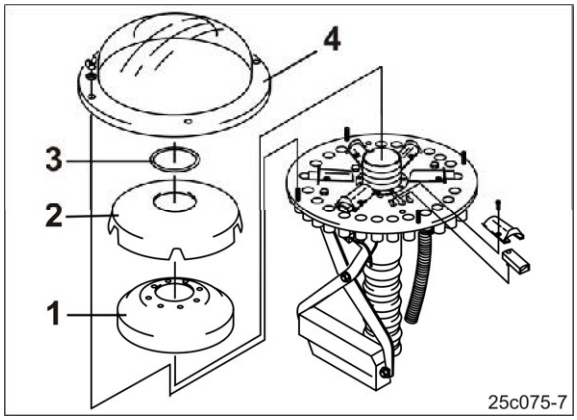


Fig. 160

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. 161/1) runs on the raceway (Fig. 161/2) 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. 161/3) until the roller (Fig. 161/1) of the track marker is running properly over the raceway (Fig. 161/2) into the mounting.
4. Tighten the lock nut.

Fig. 161

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 (workshop)

Functional description of the pressure tank

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 outer tapered 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. 162/1).

In the event of a repair observe the following

The hydraulic system and the pressure tank connected to it (Fig. 162/1) are under a constant high pressure (approx. 100 bar).

Release of the hydraulic hose lines or the unscrewing or opening of the pressure tank in the event of a repair may be performed only in a specialist workshop with suitable auxiliary means.

For all work on the pressure tank and the hydraulic system connected to it observe the standard EN 982 (safety requirements for fluid systems).

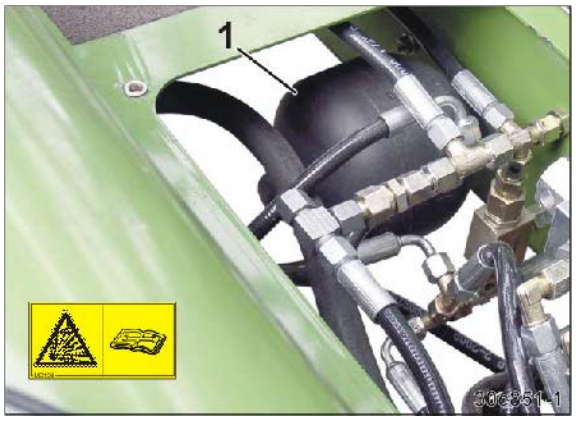


Fig. 162

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

Thread	Width across flats [mm]	Tightening torques [Nm] depending on the quality of the nuts/bolts		
		8.8	10.9	12.9
M 8	13	25	35	41
M 8x1		27	38	41
M 10	16 (17)	49	69	83
M 10x1		52	73	88
M 12	18 (19)	86	120	145
M 12x1.5		90	125	150
M 14	22	135	190	230
M 14x1.5		150	210	250
M 16	24	210	300	355
M 16x1.5		225	315	380
M 18	27	290	405	485
M 18x1.5		325	460	550
M 20	30	410	580	690
M 20x1.5		460	640	770
M 22	32	550	780	930
M 22x1.5		610	860	1050
M 24	36	710	1000	1200
M 24x2		780	1100	1300
M 27	41	1050	1500	1800
M 27x2		1150	1600	1950
M 30	46	1450	2,000	2400
M 30x2		1600	2250	2700

For the tightening torques of the wheel and hub bolts, see section 12.5.3, on page 141.

13 Hydraulic diagram

13.1 Hydraulic diagram Cayena 6000

Fig. 163/...	Designation	Fig. 163/...	Designation
T1	Tractor	T30	Anti-fracture device, rear
T2	Switch for track marker flaps	T31	Anti-fracture device, front
T3	Shutoff valve, track marker	T32	Throttle non-return valve lift, right
T4	Shut-off valve, pretensioning pressure	T33	Throttle non-return valve lift, left
T5	Pressure limiter, track marker	T34	1 cable tie, red
T6	Track marker shuttle valve	T35	2 cable tie, blue
T7	Track marker fastener	T36	1 cable tie, blue
T8	Pressure gauge, pretensioning pressure	T37	2 cable ties, green
T9	Pressure accumulator, pretensioning pressure	T38	1 cable tie, green
T10	Star wheel throttle	T39	2 cable ties, yellow
T11	Star wheel switch valve	T40	1 cable tie, yellow
T14	Track marker, right	T41	2 cable ties, red
T15	Track marker, left	T42	Pressure limiter, flaps
T16	Star wheel lift	T43	Bypass non-return valve
T17	Tramline marker, left (optional)	T44	Bypass throttle
T18	Tramline marker, right (optional)	T45	Bypass switch valve
T19	Valve, tramline marker (optional)	T46	Hyd. on-board unit, universal joint shaft drive (optional)
T20	Lift, right		
T21	Lift, left		
T22	Flaps, rear		
T23	Flaps, front		
T24	Adjustment of tine section, right (optional)		
T25	Adjustment of tine section, left (optional)		
T27	Protective valve, blower fan drive		
T28	Blower fan drive		

All position specifications in direction of travel

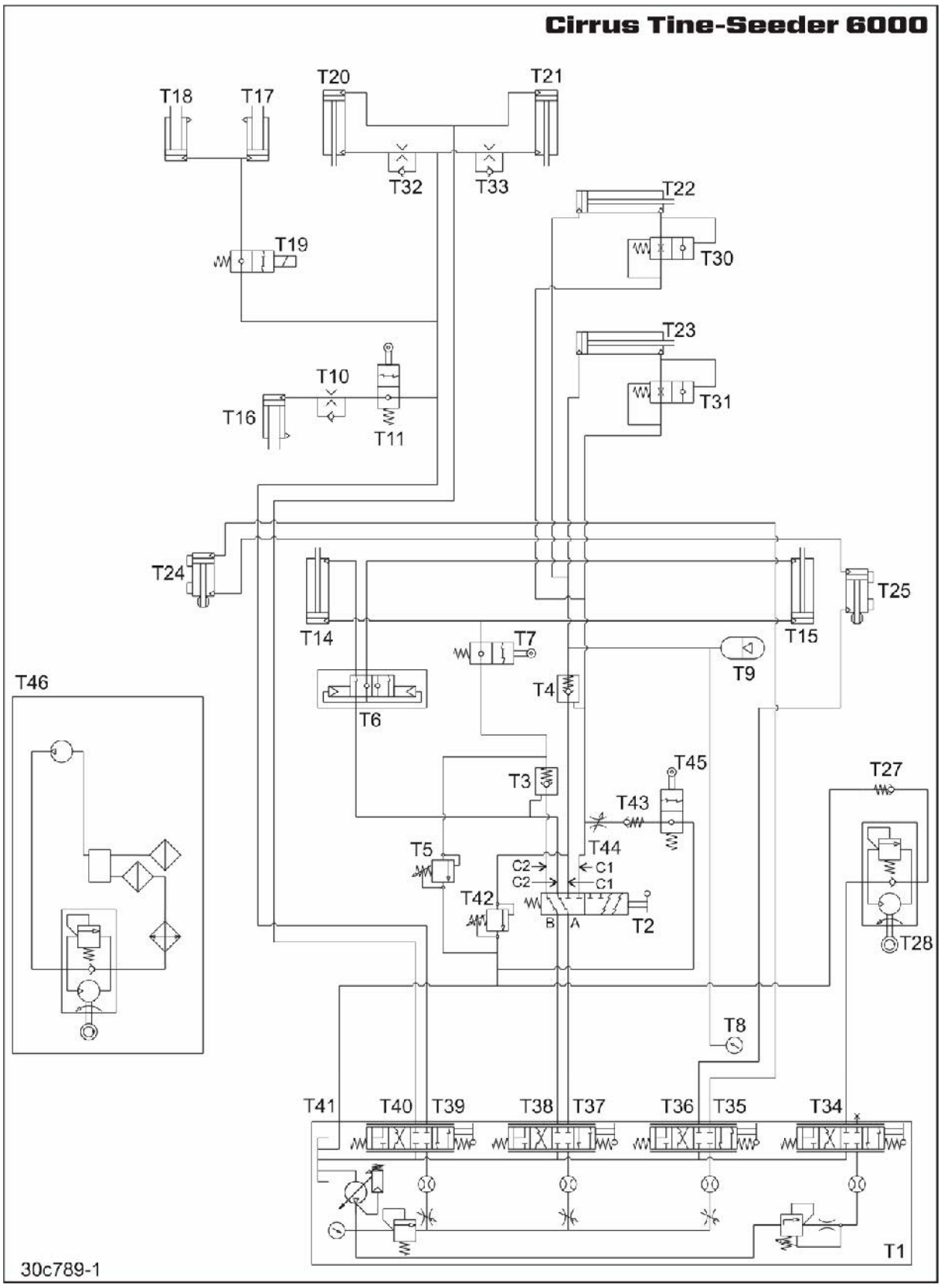

Cirrus Tine-Seeder 6000
T18
T17
T20
T21
T32
T33
T22
T19
T30
T23
T10
T16
T11
T31
T24
T25
T14
T15
T7
T9
T46
T6
T4
T3
T45
T27
T43
T5
T44
C2
C1
C2
C1
T42
B
A
T2
T28
T8
T41
T40
T39
T38
T37
T36
T35
T34
T1
30c789-1

Fig. 163

AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

Postfach 51
D-49202 Hasbergen-Gaste
Germany

Phone: + 49 (0) 5405 501-0
Fax: + 49 (0) 5405 501-234
e-mail: amazone@amazone.de
http:// www.amazone.de

Plants: D-27794 Hude • D-04249 Leipzig • F-57602 Forbach
Branches in England and France

Manufacturers of mineral fertiliser spreaders, field sprayers, seed drills, soil cultivation machines, multipurpose warehouses and communal units