

Operating Manual

AMAZONE

Cirrus Special

3001 / 4001 / 6001



MG 1747
BAH0009.3 03.08
Printed in Germany



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



Reading the instruction

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

Leipzig-Plagwitz 1872. Rud. Stark.

Identification data

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

Machine identification number:
(ten-digit)

Type:

Cirrus Special

Year of manufacture:

Basic weight (kg):

Approved total weight (kg):

Maximum load (kg):

Manufacturer's address

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Spare part orders

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E-mail: et@amazone.de

Online spare parts catalogue: www.amazone.de

When ordering spare parts, always specify the (ten-digit) machine identification number.

Formalities of the operating manual

Document number: MG 1747

Compilation date: 03.08

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Foreword

Foreword

Dear Customer,

You have chosen one of the quality products from the wide product range of AMAZONEN-WERKE, H. DREYER 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.

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1	User Information	10
1.1	Purpose of the document.....	10
1.2	Locations in the operating manual	10
1.3	Diagrams used	10
2	General Safety Instructions	11
2.1	Obligations and liability	11
2.2	Representation of safety symbols.....	13
2.3	Organisational measures	14
2.4	Safety and protection equipment	14
2.5	Informal safety measures.....	14
2.6	User training.....	15
2.7	Safety measures in normal operation	16
2.8	Dangers from residual energy.....	16
2.9	Maintenance and repair work, fault elimination	16
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	26
2.14	Dangers if the safety information is not observed.....	29
2.15	Safety-conscious working	29
2.16	Safety information for users.....	30
2.16.1	General safety and accident prevention information	30
2.16.2	Hydraulic system.....	34
2.16.3	Electrical system	35
2.16.4	Attached machines	35
2.16.5	Brake system	36
2.16.6	Tyres	37
2.16.7	Operation of the seed drill.....	37
2.16.8	Cleaning, maintenance and repairs	38
3	Loading and unloading	39
3.1	Loading the Cirrus.....	40
3.2	Unloading the Cirrus	41
4	Product description	42
4.1	Overview of subassemblies	43
4.2	Safety and protection equipment	46
4.3	Overview – Supply lines between the tractor and the machine.....	47
4.4	Transportation equipment.....	48
4.5	Intended use	50
4.6	Danger area and danger points	51
4.7	Type plate and CE labelling.....	52
4.8	Technical data.....	53
4.9	Conformity.....	54
4.10	Necessary tractor equipment.....	54
4.11	Noise production data	55
5	Structure and function	56
5.1	Electrohydraulic control blocks	57
5.2	Hydraulic hose lines.....	57
5.2.1	Coupling the hydraulic hose lines	57
5.2.2	Uncoupling the hydraulic hose lines	58

5.3	Dual-circuit pneumatic service braking system	59
5.3.1	Coupling the brake and supply lines	60
5.3.2	Uncoupling the brake and supply lines	61
5.4	Hydraulic operating brake system	62
5.4.1	Coupling the hydraulic operating brake system	62
5.4.2	Uncoupling the hydraulic operating brake system	62
5.5	Operator control terminal AMATRON⁺	63
5.6	Roller holder	65
5.7	Seed hopper	65
5.7.1	Digital fill level monitoring (optional)	66
5.8	Seed dosing	67
5.8.1	Dosing rollers	67
5.8.2	Table Seed dosing rollers	68
5.8.3	Seed rate adjustment at Vario gearbox	69
5.8.4	Seed rate adjustment, electronic at Vario gearbox (optional)	70
5.8.5	Seed rate adjustment with full dosing (optional)	70
5.8.6	Increasing sowing rate, coulter pressure and harrow pressure	72
5.8.7	Calibration test	72
5.8.8	Calibrating troughs	72
5.9	Blower	73
5.9.1	Blower speed table	74
5.9.2	Distributor head	75
5.10	Star wheel	75
5.11	Tapered ring tyres	76
5.12	Seed planting	76
5.12.1	RoTeC and RoTeC⁺ coulter	77
5.12.2	Coulter pressure	78
5.13	Exact harrow	79
5.14	Roller harrow (optional)	80
5.15	Two-row disc array	81
5.16	Track loosener (optional)	82
5.17	Markers	83
5.18	Creation of tramlines	84
5.18.1	Examples for creating tramlines	86
5.18.2	Tramline rhythm 4, 6 and 8	88
5.18.3	Tramline rhythm 2 plus and 6 plus	89
5.18.4	Half-sided switching off (part width)	90
5.18.5	Tramline marker (option)	90
6	Commissioning	91
6.1	Checking the suitability of the tractor	92
6.1.1	Calculating the actual values for the total tractor weight, tractor axle loads and load capacities, as well as the minimum ballast	92
6.1.1.1	Data required for the calculation (hitched machine)	93
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	94
6.1.1.3	Calculation of the actual front axle load of the tractor $T_{V \text{ tat}}$	94
6.1.1.4	Calculation of the actual total weight of the combined tractor and machine	94
6.1.1.5	Calculation of the actual rear axle load of the tractor $T_{H \text{ tat}}$	94
6.1.1.6	Tyre load capacity	94
6.1.1.7	Table	95
6.1.2	Requirements for tractor operation with attached machines	96
6.1.3	Machines without their own brake system	96
6.2	Securing the tractor / machine against unintentional start-up and rolling	97
6.3	Installation regulations for the hydraulic fan drive connection	98
6.4	Initial installation of the AMATRON⁺	99
7	Coupling and uncoupling the machine	100
7.1	Coupling the machine	100

7.1.1	Connecting the hydraulic connections	105
7.1.2	Connecting the electrical connections	106
7.1.3	Connecting the pneumatic service brake system	106
7.1.4	Connecting the hydraulic service brake system	107
7.2	Uncoupling the machine	108
8	Settings.....	111
8.1	Setting the level sensor.....	111
8.2	Installing/removing the dosing roller	113
8.3	Setting the sowing rate with a calibration test.....	115
8.3.1	Adjusting sowing rate with calibration test on machines with Vario gearbox without electronic seed rate adjustment.....	117
8.3.1.1	Determining the gearbox setting using the calculating disc rule.....	120
8.3.2	Adjusting sowing rate with calibration test on machines with Vario gearbox with electronic seed rate adjustment.....	121
8.3.3	Adjusting sowing rate with calibration test on machines with full dosing.....	123
8.4	Adjusting blower fan speed.....	124
8.4.1	Setting the fan speed via the flow control valve of the tractor	124
8.4.2	Adjust the blower speed on the machine pressure limiting valve	124
8.4.3	Setting the fan speed monitoring on the AMATRON⁺	125
8.4.3.1	Triggering of the alarm, if the fan speed differs from the setpoint	125
8.5	Setting the coulter pressure	126
8.5.1	Setting the RoTeC plastic discs	127
8.6	Adjusting the exact harrow.....	129
8.6.1	Adjusting the spring tines.....	129
8.6.2	Setting the exact harrow pressure	130
8.6.2.1	Setting the exact harrow pressure (hydraulic adjustment)	130
8.7	Roller harrow.....	131
8.7.1	Setting working depth and angle of harrow tines.....	131
8.7.2	Adjusting roller pressure	132
8.8	Adjusting the disc array (on the field)	133
8.8.1	Adjusting disc array working depth with machine setting "Turning on the axle".....	133
8.8.2	Adjusting disc array working depth with machine setting "Turning on the roller"	134
8.8.3	Setting the length of the outer disc struts	135
8.8.4	Adjusting the outside hollow discs	135
8.9	Setting the wheel mark eradicator (on the field)	136
8.10	Adjusting the track marker length and working intensity	137
8.10.1	Setting the tramlining rhythm/meter on the AMATRON⁺	138
8.11	Half-sided switching off	139
8.11.1	Moving the track disc carrier of the tramline marker to the operational/transport position.....	140
8.11.2	Move the track disc carrier from the transport to the operational position.....	140
8.11.3	Set the track disc carrier to transport position	141
9	Transportation	142
10	Use of the machine.....	151
10.1	Folding the machine extension arm in/out (except Cirrus 3001)	152
10.1.1	Folding out the machine's extension arms.....	152
10.1.2	Folding in the machine's extension arms.....	154
10.2	Removing the transport safety bar.....	156
10.3	Filling the seed hopper.....	157
10.3.1	Load the seed hopper with sacked merchandise from a supply vehicle	160
10.3.2	Loading the seed hopper with a filling auger	160
10.3.3	Loading the seed hopper from bulk bags	161
10.3.4	Enter the filling volume on the AMATRON⁺	161
10.4	Remove the transport safety catch of the track markers (only Cirrus 3001 Special)	162
10.5	Work commencement.....	163
10.6	Checks	164

Table of Contents

10.6.1	Checking the seed planting depth.....	164
10.7	During the work.....	165
10.8	Turning at end of the field	166
10.8.1	Turning on the axle.....	167
10.8.2	Turning on the roller (except Cirrus 3001)	167
10.9	End of work on the field.....	168
10.10	Emptying the hopper and/or dosing unit	169
10.10.1	Emptying the seed hopper	169
10.10.2	Emptying the dosing unit.....	169
11	Faults.....	172
11.1	Residual seed volume indicator	172
11.2	Failure of the AMATRON⁺ during work	173
11.3	Deviations between the preset and actual sowing rates.....	176
11.4	Fault table.....	177
12	Cleaning, maintenance and repairs	178
12.1	Securing the connected machine.....	178
12.2	Securing the raised machine (workshop).....	179
12.3	Cleaning the machine	180
12.3.1	Cleaning the distributor head (workshop)	182
12.3.2	Shutdown of the machine over a long period of time.....	182
12.4	Lubrication regulations	183
12.4.1	Lubricants.....	183
12.4.2	Lubrication point overview.....	184
12.4.2.1	Lubricating the lubrication nipples when the machine is folded out and lowered	185
12.4.2.2	Lubricating the lubrication nipples when the machine is folded out and lowered	186
12.5	Service plan – overview	187
12.5.1	Retighten wheel and hub screws (workshop)	189
12.5.2	Servicing sowing shaft bearing	189
12.5.3	Checking tyre pressure (workshop)	190
12.5.4	Servicing roller chains and chain wheels	190
12.5.5	Checking the oil level in the Vario gearbox.....	191
12.5.6	Hydraulic system.....	192
12.5.6.1	Labelling hydraulic hose lines	193
12.5.6.2	Maintenance intervals	193
12.5.6.3	Inspection criteria for hydraulic hose lines	193
12.5.6.4	Installation and removal of hydraulic hose lines	194
12.5.7	Service brake system: dual-circuit pneumatic braking system - hydraulic braking system.....	195
12.5.7.1	Checking the service brake system for safe operating condition (specialist workshop).....	196
12.5.8	Dual-circuit pneumatic braking system	197
12.5.8.1	Draining the compressed air tank of the dual-circuit magnetic braking system.....	197
12.5.8.2	External testing of the compressed air tank of the dual-circuit pneumatic braking system.....	197
12.5.8.3	Checking the pressure in the compressed air tank of the dual-circuit pneumatic braking system (workshop)	198
12.5.8.4	Leak test of the dual-circuit pneumatic braking system (workshop)	198
12.5.8.5	Cleaning the line filter of the dual-circuit pneumatic braking system (workshop)	198
12.5.9	Hydraulic braking system	199
12.5.9.1	Checking the brake fluid level	199
12.5.9.2	Changing the brake fluid (workshop)	199
12.5.9.3	Brake check on the hydraulic part of the braking system (specialist workshop).....	200
12.5.9.4	Checking the brake lining thickness (specialist workshop).....	200
12.5.9.5	Venting the hydraulic braking system (workshop)	200
12.6	Workshop settings and repair work.....	202
12.6.1	Adjusting the wheelmark spacing / track width (specialist workshop)	202
12.6.1.1	Adjusting the wheelmark spacing of the cultivating tractor (specialist workshop)	202
12.6.1.2	Adjusting the track width of the cultivating tractor (specialist workshop).....	203

12.6.2	10 operational hours after a wheel change (workshop).....	205
12.6.3	After brake repairs (workshop).....	205
12.6.4	Setting the track marker for correct fitting in the transport bracket (workshop).....	205
12.6.5	Repairs to the pressure tank (workshop).....	206
12.6.6	Checking lock nut tightening torque after repairs to the machine extension arm (workshop)	206
12.6.7	Replacing the RoTeC coulter wear tip (workshop)	207
12.7	Lower link pin	208
12.8	Bolt tightening torques	209
13	Hydraulic system diagrams	210
13.1	Hydraulic system diagram of the Cirrus 3001 Special	210
13.2	Hydraulic system diagram of the Cirrus 4001 Special / 6001 Special	212

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 the traction 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 been trained 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.

If you still have queries, please contact the manufacturer.

Duties of the operator

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 section "General safety information" 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).



General Safety Instructions

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.
- Independently-executed construction 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 agents etc.



The operation 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 User training

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.

Activity \ People	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 pictograms - explanation

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

1. A description of the danger.

For example: danger of cutting!

2. The consequence of nonobservance of 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

- while the tractor engine is running with hydraulic drive engaged
- or the ground wheel drive is moving.

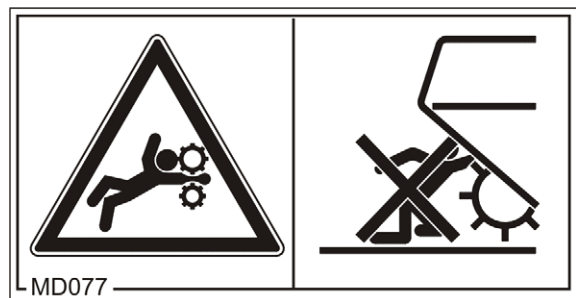


MD 077

Danger of catching and pulling arms through motorised feed rollers!

This danger would cause extremely serious injuries with the loss of body parts on arms.

Never reach into the feed rollers while the tractor engine is running with the hydraulic system connected.



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 while the tractor engine is running with the hydraulic system connected.



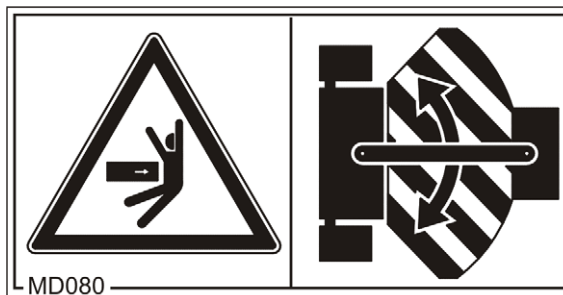
General Safety Instructions

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.



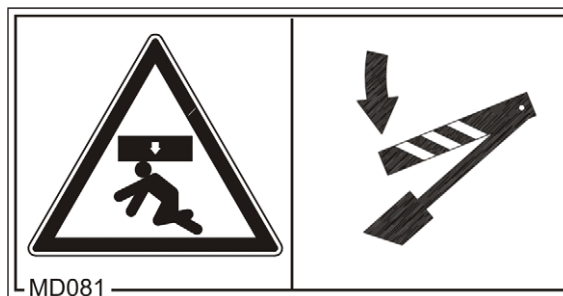
MD 081

Danger of getting crushed for the whole body by machine parts that are raised by lifting cylinders and unintentionally lowered!

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

Secure the machine parts raised by the lifting cylinder against unintentional lowering before you enter the danger zone under raised machine parts.

To do so, use the mechanical lifting cylinder support or the hydraulic blocking device.



MD 082

Danger 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.

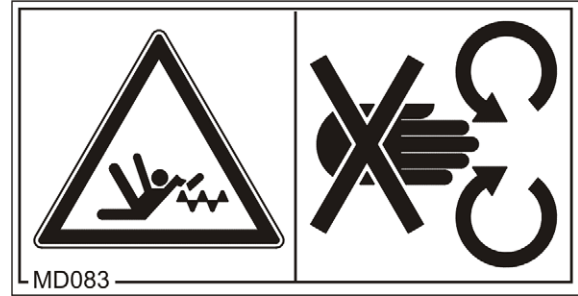


MD 083

Danger 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 hydraulic drive engaged.



MD083

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.



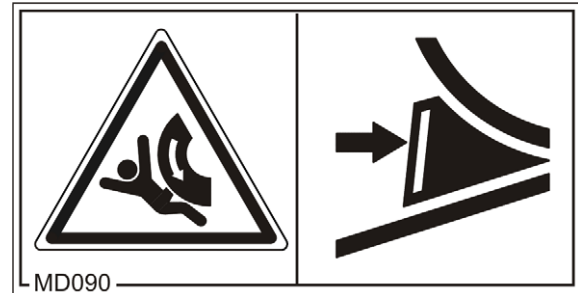
MD084

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).



MD090

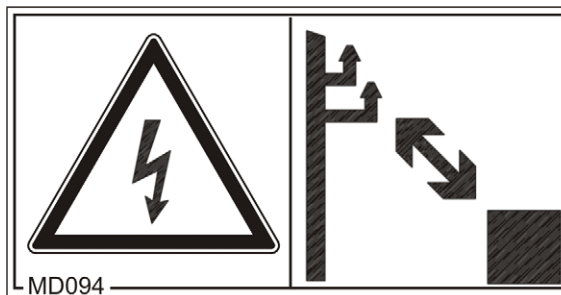
General Safety Instructions

MD 094

Danger of electric shock due to unintentionally touching electrical overhead transmission cables!

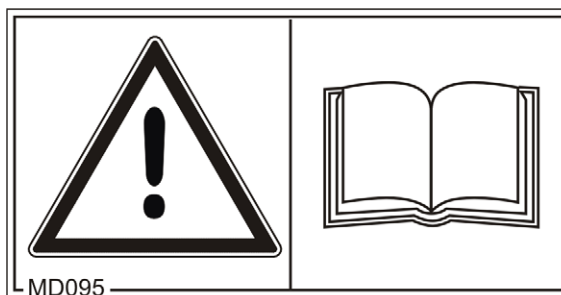
This danger will cause serious injuries anywhere on the body or death.

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



MD 095

Read and understand the operating manual safety information before starting up the machine!



MD 096

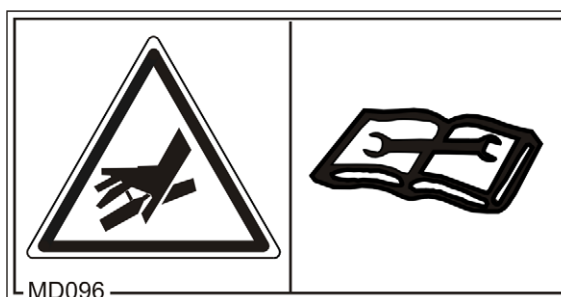
Danger of infection to the whole body from liquids escaping at a high pressure (hydraulic fluid)!

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 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

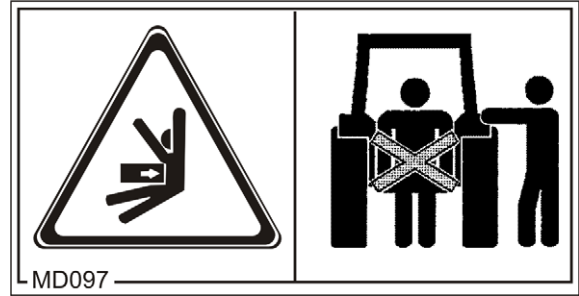
Danger of crushing your torso in the stroke range of the three-point suspension due to the narrowing spaces when the three-point hydraulic system is actuated!

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

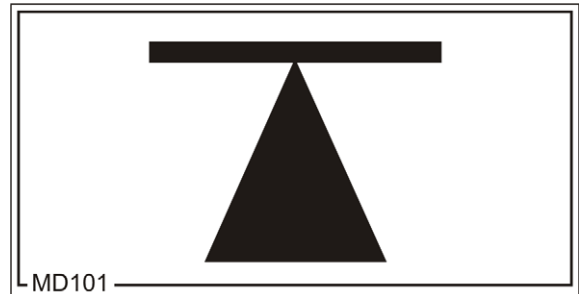
- from the intended workstation.
- if you are outside of the danger area between the tractor and the machine.



MD097

MD 101

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



MD101

MD 102

Danger from unintentional machine starting and rolling during intervention in the machine, e.g. installation, adjusting, troubleshooting, 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.



MD102

General Safety Instructions

MD 104

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

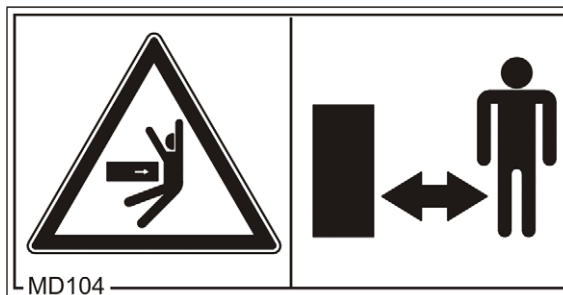
This danger will cause serious injuries to the torso or death.

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.



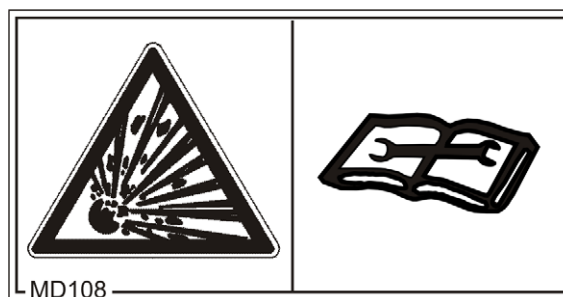
MD 108

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.

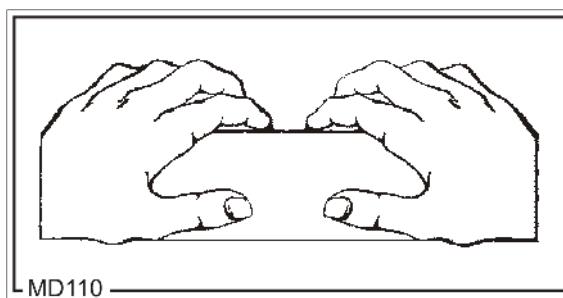
Prior to all work on the hydraulic system read and take heed of the directions in the operating manual.

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



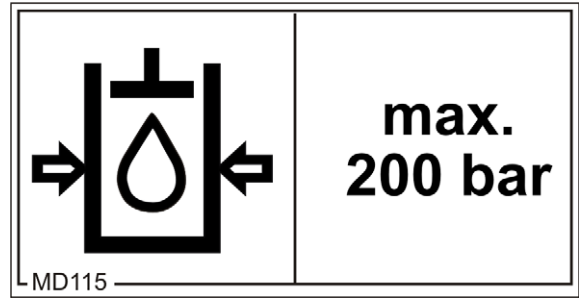
MD 110

This pictogram shows the machine parts that serve as a holding point.



MD 115

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



MD 150

Danger of cutting or cutting off fingers or hand by unprotected driven parts of the machine!

This danger could cause extremely serious injuries with the loss of body parts such as fingers or hands.

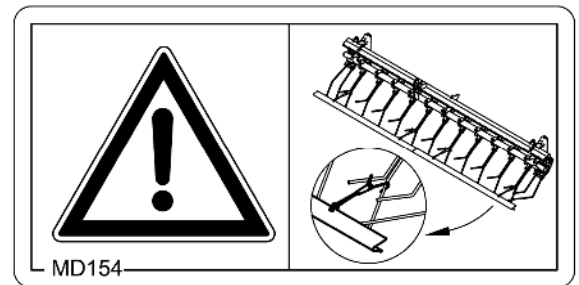
Never open or remove guard devices from driven machine parts when the tractor engine is running with the PTO shaft connected / hydraulic drive engaged.



MD 154

Risk of stabbing other road users during transportation from uncovered, sharp spring tines of the exact harrow pointing backwards!

Transportation without a correctly fitted transport guard rail is forbidden.



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.

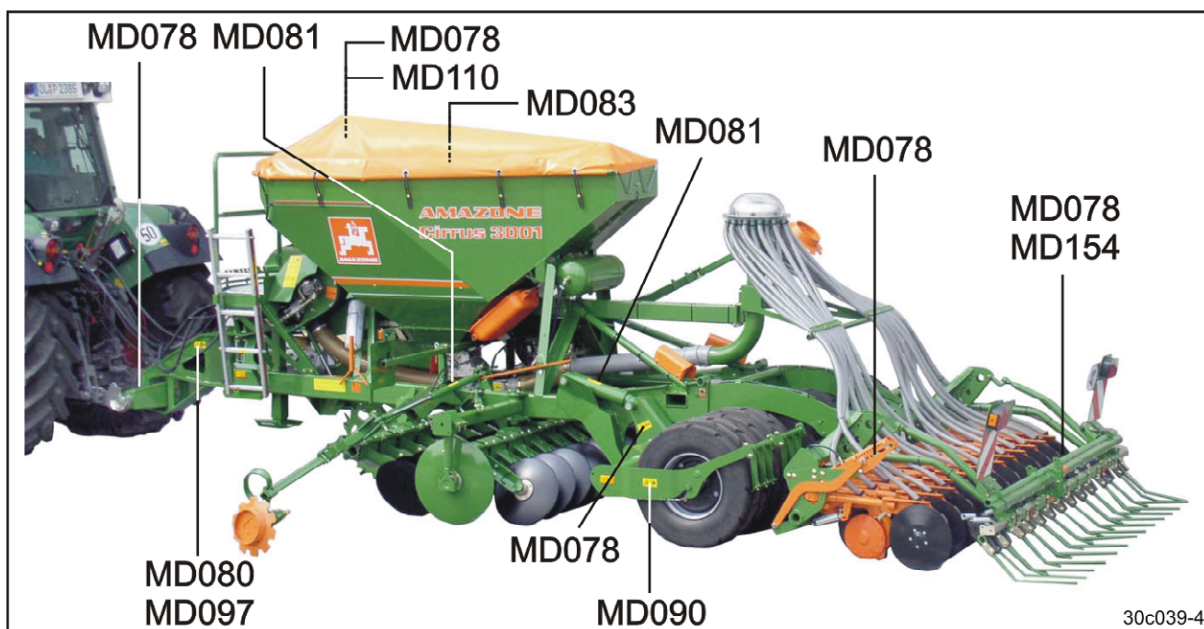


Fig. 1



Fig. 2



Fig. 3



Fig. 4

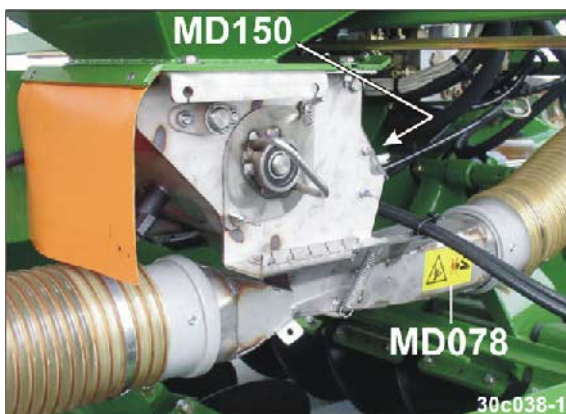


Fig. 5



Fig. 6



Fig. 7



Fig. 8

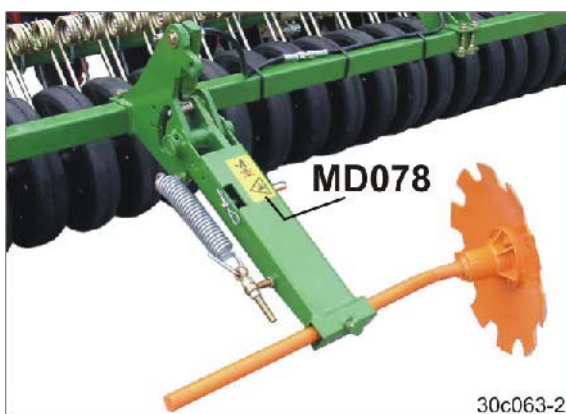


Fig. 9



Fig. 10



Fig. 11



Fig. 12

The following illustrations show warning symbols that are located only on the folding machines.



Fig. 13

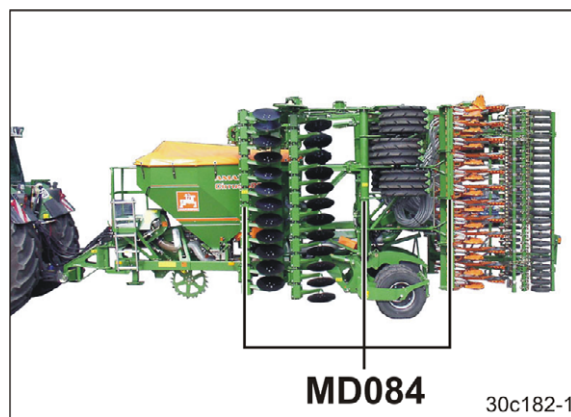


Fig. 14

2.14 Dangers if the safety information is not observed

Nonobservance of the safety information

- Can pose both a danger to people and also 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 contusions, cuts, dragging, catching or knocks from insufficient traffic 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, 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's

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 give without tension, bending or rubbing on all movements when travelling round corners.
 - 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 support loads of the tractor. If necessary, drive only with a partially-filled hopper.
- It is forbidden to stand in the working area of the machine.
- It is forbidden to stand in the turning and 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 support loads of the tractor.

- The tractor must guarantee the prescribed brake delay for the loaded vehicle combination (tractor plus connected machine).
- Check the brake power before moving off.
- When turning corners with the machine connected, take the broad load and balance weight of the machine into account.
- Before moving off, ensure sufficient side locking of the tractor lower links, when the machine is fixed to the three-point hydraulic system or lower links of the tractor.
- Before moving off, move all the swivel machine parts to the transport position.
- Before moving off, secure all the swivel machine parts in the transport position against risky position changes. Use the transport locks intended for this.
- Before moving off, secure the operating lever of the three-point hydraulic system against unintentional raising or lowering of the connected 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 bolts 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 line 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 label.

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.

Compressed air brake system

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

Hydraulic braking system for export machines

- 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.
- Comply with the prescribed 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

- Comply with the permitted filling volumes of the seed hopper (seed hopper content).
- When filling the seed hopper, only use the ladder and the loading board.
It is forbidden to ride on the machine during operation!
- During the calibration test, note the danger points from rotating and oscillating machine parts.
- Before transportation, remove the thrust collars of the tramline marker.
- Do not place any parts in the seed hopper.
- Before transportation, lock the track marker (construction-dependent) in the transport position.

2.16.8 Cleaning, maintenance and repairs

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

3 Loading and unloading

Loading and unloading with a tractor

**WARNING**

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



- Correctly couple the machine to the tractor, before loading the machine onto a transport vehicle or unloading it from a transport vehicle.
- You may only couple and transport the machine with a tractor for loading and unloading, as long as the tractor fulfils the power requirements.
- Compressed air brake system:
Only move off with the machine connected when the pressure gauge on the tractor shows 5.0 bar!

Connect the Cirrus to a suitable tractor for loading onto or unloading off a transport vehicle (see section "Commissioning", on page 91 and section "Coupling and uncoupling the machine", on page 100).

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 **AMATRON⁺** is not required.



Fig. 15

**WARNING**

A marshalling person is required for the loading and unloading.

3.1 Loading the Cirrus

1. Put the Cirrus in its transport position (see section "Transportation", on page 142).
2. Raise the Cirrus via the integrated running gear up to a middle position (via control unit 1, see section 7.1.1, on page 105).
3. Push the Cirrus carefully backwards onto the transport vehicle.
A marshalling person is required for loading.



Fig. 16

4. Lower the Cirrus fully (control unit 1, see section 7.1.1, on page 105) as soon as the Cirrus has reached its transport position on the transport vehicle.



Fig. 17

5. Secure the Cirrus in compliance with regulations.

Bear in mind that the Cirrus has no parking brake.

Additionally clamp the booms of the foldable machines at the lugs (Fig. 18/1).

6. Disconnect the tractor from the machine.



Fig. 18

3.2 Unloading the Cirrus

1. Couple the Cirrus to the tractor (see section 3, on page 39).
2. Remove the transport securing device.
3. Raise the Cirrus via the integrated running gear up to a middle position 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 7.2, on page 108).



Fig. 19

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

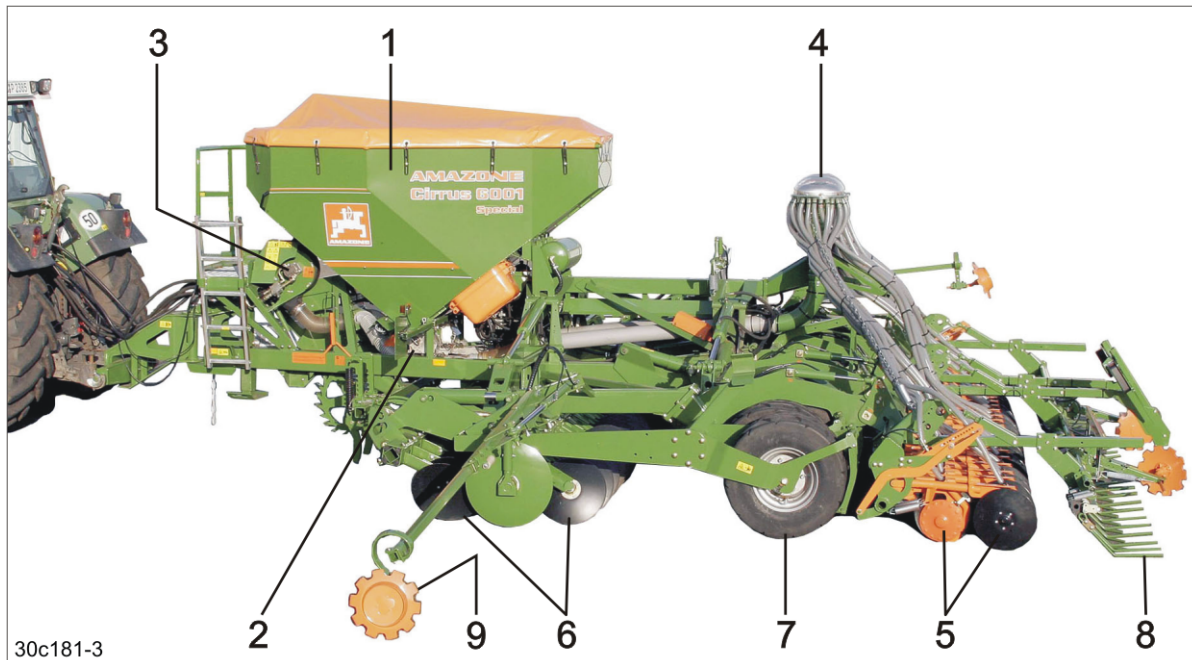


Fig. 20

Fig. 20/...

- | | |
|---------------------------|--|
| (1) Seed hopper | (5) RoTeC +Coulter |
| (2) Central dosing | (6) Two-row disc array |
| (3) Blower fan | (7) Tapered tyres with integrated running gear |
| (4) Seed distributor head | (8) Exact harrow |
| | (9) Track marker |

4.1 Overview of subassemblies

Fig. 21/...

AMATRON⁺ operator terminal



Fig. 21

Fig. 22/...

- (1) Draw rail
- (2) Sustainer, extendable



Fig. 22

Fig. 23/...

- (1) Mounting for supply lines
 - o of the operating manual
 - o of the dosing rollers
 - o of the digital scales.
- (2) Roller holder for stowing



Fig. 23

Fig. 24/...

- (1) Star wheel
- (2) Wheel chocks
- (3) Loading board with ladder
- (4) Holding point



Fig. 24

Product description

Fig. 25/...

- (1) Swivel cover
- (2) Cover hook



Fig. 25

Fig. 26/...

- (1) Vario gearbox



Fig. 26

Fig. 27/...

- (1) Calibration crank (in transport mounting)
- (2) Seed doser
- (3) Calibration trough (in mounting for calibration test)
- (4) Injector housing

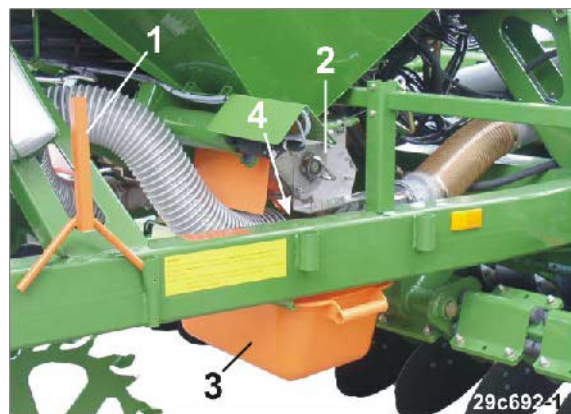


Fig. 27

Fig. 28/...

- (1) Sieve grate
- (2) Level sensor



Fig. 28

Fig. 29/...

Tramline marker

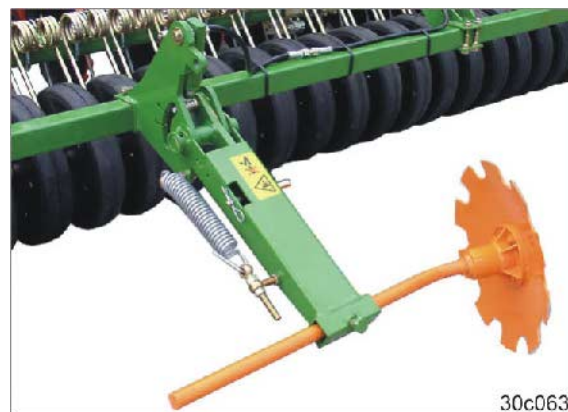


Fig. 29

Fig. 30/...

- (1) Brake valve with release valve
(viewed from below)



Fig. 30

Fig. 31/...

- (1) Electrohydraulic control blocks
- (2) Hydraulic accumulator with nitrogen filling
for pretensioning the outswung machine extension arms

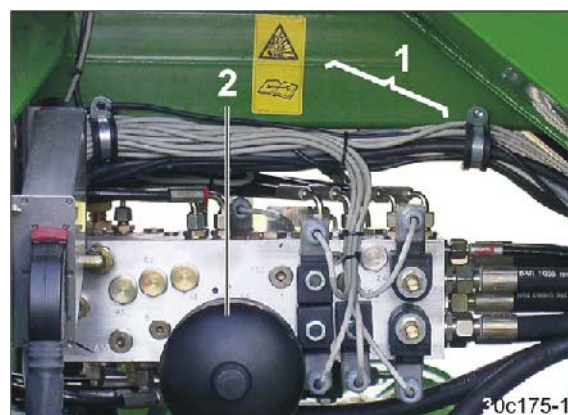


Fig. 31

Fig. 32/...

- (1) RoTeC coulter
- (2) **RoTeC+** coulter

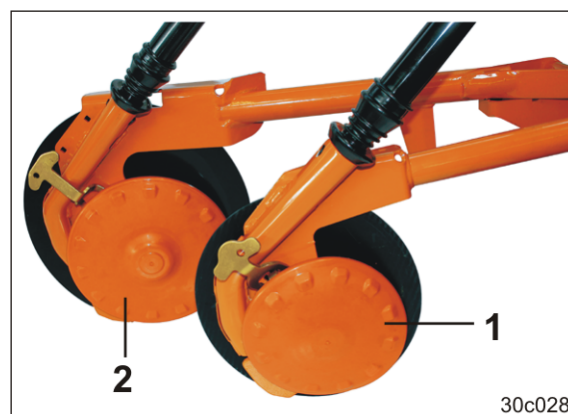


Fig. 32

4.2 Safety and protection equipment

Fig. 33/...

- (1) Fan guard



Fig. 33

Fig. 34/...

- (1) Sieve grate lock
(for full dosing)



Fig. 34

Fig. 35/...

- (1) Dosing window lock.
Interruption of the roller drive when the dosing window is opened (Fig. 35/2) with full dosing.

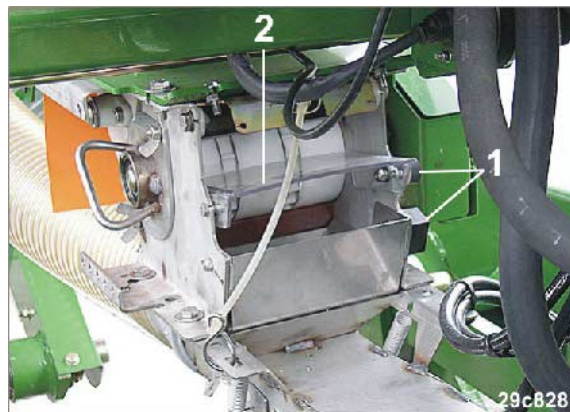


Fig. 35

Fig. 36/...

- (1) Spacer for safeguarding the axle rocker prior to servicing work.



Fig. 36

4.3 Overview – Supply lines between the tractor and the machine

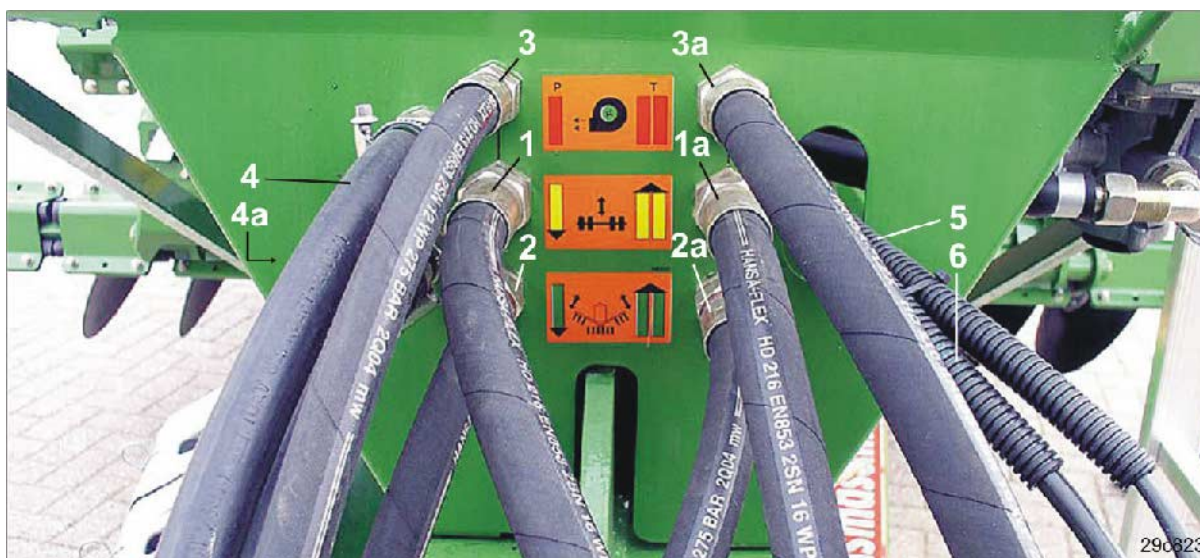


Fig. 37

Fig. 37/...	Designation		Marking
(1)	Hydraulic line 1	Feed line	1 cable tie, yellow
(1a)		Return line	2 cable ties, yellow
(2)	Hydraulic line 2	Feed line	1 cable tie, green
(2a)		Return line	2 cable ties, green
(3)	Hydraulic line 3	Pressure line with priority	1 cable tie, red
(3a)		Pressureless line	2 cable ties, red
(4)	Brake line (compressed air)		Yellow
(4a)	Supply line (compressed air)		Red
(5)	Plug (7-pin) for the road traffic lighting system		
(6)	Implement plug for on-board computer AMATRON⁺		
No Fig.	Hydraulic brake line (see section 7.1.4, on page 107) ¹⁾		

¹⁾ not permitted in Germany and some other EU countries

4.4 Transportation equipment

Fig. 38/...

- (1) 2 rear-facing warning boards
- (2) 1 speed sign
- (3) Licence plate holder

Cirrus 4/6001 with exact harrow:

- (4) Transport safety bar, two-part

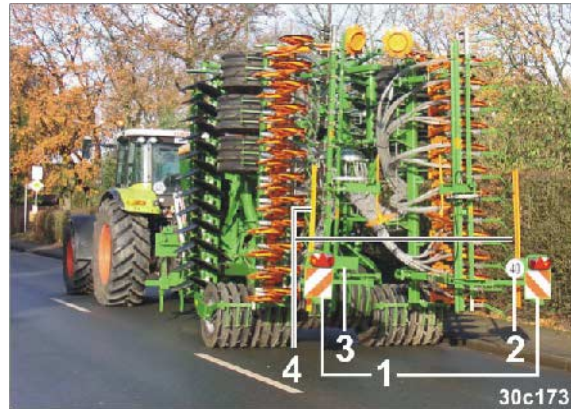


Fig. 38

Fig. 39/...

- (1) 2 rear-facing turn signals
- (2) 2 reflectors, yellow.
- (3) 2 brake and tail lamps
- (4) 2 red reflectors
- (5) 1 light for licence plate
- (6) 2 reflectors, triangular

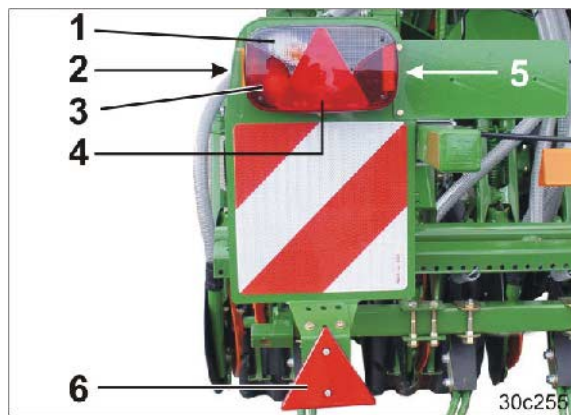


Fig. 39

Fig. 40/...

Cirrus 3001 with exact harrow:

- (1) Transport safety bar, two-part

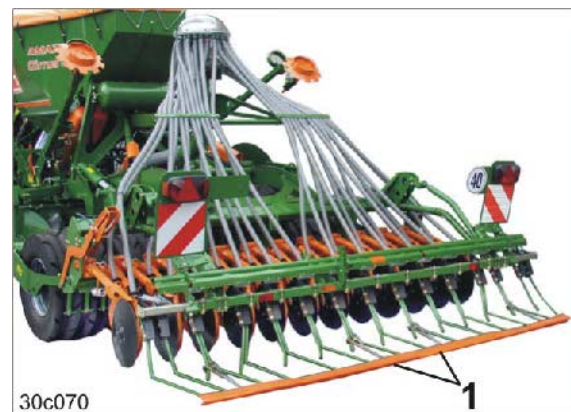


Fig. 40

Fig. 41/...

- (1) 2 forwards-facing warning boards



Fig. 41

Fig. 42/...

- (1) 2 side lights pointing forwards
- (2) 2 forwards-facing turn signals



Fig. 42

Fig. 43/...

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

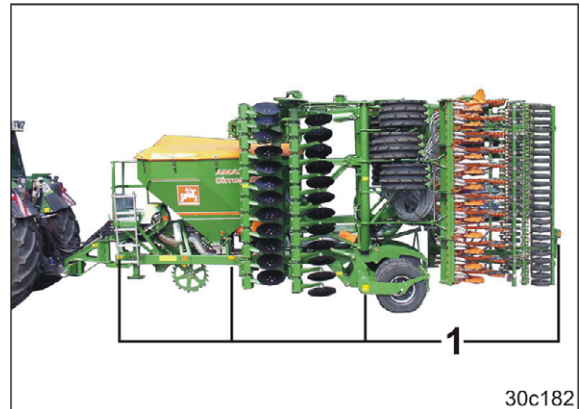


Fig. 43

4.5 Intended use

The machine

- is constructed for the seedbed preparation of agriculturally used arable land and for the dosing and output of commonly available seeds.
- This is coupled to the tractor using the lower tractor line 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 %

Intended use also comprises:

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

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

For any damage resulting from improper use:

- the operator bears the sole responsibility,
- **AMAZONEN-WERKE** 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:

- as long as the tractor engine is running with a connected hydraulic system.
- 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:

- in the area of the swivelling machine extension arm
- in the area of the swivelling track marker
- in the area of the swivelling tapered ring tyres.

4.7 Type plate and CE labelling

The following illustrations show the arrangement of the type plate (Fig. 44/1) and of the CE labelling (Fig. 44/2).

The type plate shows:

- Mach. ident. no.
- Type
- Permissible system pressure, bar
- Year of manufacture
- Factory
- Power output, kW
- Basic weight, kg
- Perm. laden weight, kg
- Perm. axle load, kg
- Perm. axle load, front / support load, kg.

The CE labelling (Fig. 45) on the machine signals compliance with the stipulations of the valid EU directives.



Fig. 44



Fig. 45

4.8 Technical data

Cirrus Special			3001	4001	6001
Working width		[m]	3.0	4.0	6.0
Total length ¹⁾		[m]	7,59	8,09	8,09
Fill level	without extension	[m]	2350	2350	2500
	with extension		2540	2540	2690
Hopper volume	without extension	[l]	2200	2200	3000
	with extension		2800	2800	3600
Full load (on field)	without extension	[kg]	1800	1800	2400
	with extension		2300	2300	2900
Number of sowing units			24	32	48
Row spacing		[cm]	12.5		
Continuous acoustic pressure level		[dB(A)]	74		
Working speed		[km/h]	12 to 16		
Ground coverage		[ha/h]	approx. 2.4	approximately 3.0	approx. 4.8
Power requirement (from)		[kW/bhp]	90/120	110/150	147/200
Oil flow rate (minimum).		[l/min]	80		
Max. hydraulic working pressure		[bar]	200		
Electrical system		[V]	12 (7-pin)		
Transmission/hydraulic fluid			Transmission/hydraulic fluid Utto SAE 80W API GL4		
Coupling point category		Category	III		
Transport running gear			Integrated with 4 running wheels		
Number of tapered ring tyres			6	8	12
Maximum drawbar load with full seed hopper (on the field)	without extension	[kg]	2200	2500	2800
	with extension		2500	2800	3100
Service brake system (connection to tractor)			Dual-circuit pneumatic braking system or hydraulic braking system ²⁾		
Effective brake in the integrated running gear			Hydraulically acting		

¹⁾ with exact harrow, without tramline marker

²⁾ Not allowed in Germany and in several other countries.



Product description

Road transport data (only with an empty seed hopper)

Cirrus Special		3001	4001	6001
Transport width	[m]	3.0		
Overall height in transport position (folded in from 4 m working width upwards)	[mm]	2700	2700	3700
Empty weight (basic weight)				
Running gear tyre without polyurethane filling	[kg]	3900	5890	7600
with polyurethane filling	[kg]	4300	6290	8000
Permissible total weight				
Running gear tyre without polyurethane filling	[kg]	4200	6200	8000
with polyurethane filling	[kg]	4600	6600	8400
Permissible axle load				
Running gear tyre without polyurethane filling	[kg]	3500	5500	6900
with polyurethane filling	[kg]	3900	5900	7300
Perm. drawbar load (F_H) when driving on the road (see rating plate)	[kg]	1100	1500	2000
Maximum payload for transport journeys	[kg]	220		
Perm. maximum speed on all non-public roads, public roads and public ways.	[km/h]	40		

4.9 Conformity

Directives / standards

The machine fulfils the:

- 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

Cirrus 3001 Special	from	90 kW (120 bhp) upwards
Cirrus 4001 Special	from	110 kW (150 bhp) upwards
Cirrus 6001 Special	from	147 kW (200 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:

- 1 single-acting or double-acting control unit with priority control for the feed line
- 1 unpressurised return line with a large push-fit coupling (ND 16) for the unpressurised oil return line. In the return line the banking-up pressure must be 10 bar at the maximum.

Operational brake system

- Dual-circuit service braking system:
 - 1 hose coupling (red) for the supply line
 - 1 hose coupling (yellow) for the brake line
- Hydraulic braking system: 1 hydraulic coupling in accordance with ISO 5676



The hydraulic braking system is not allowed 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 Structure and function

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

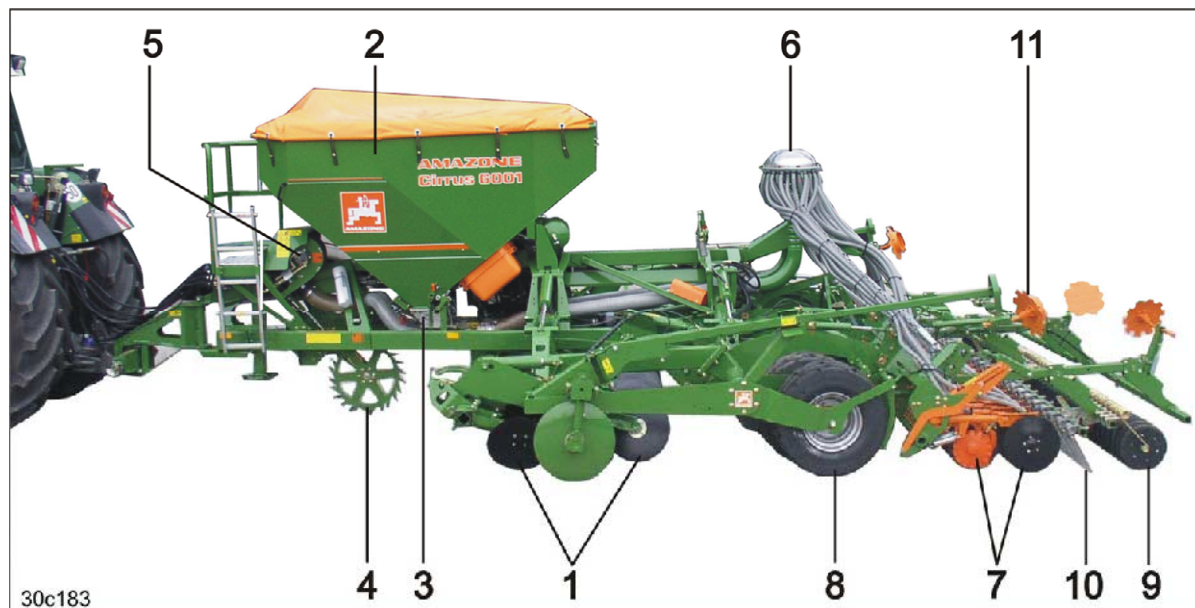


Fig. 46

The **Cirrus Special** allows sowing with or without previous soil cultivation in a single work process.

With the disc array (Fig. 46/1) mulch seeding and conventional plough seeding is possible.

The seed is carried in the seed hopper (Fig. 46/2).

The preset seed volume passes from the seed doser (Fig. 46/3), which is driven by a star wheel (Fig. 46/4) or an electric motor, into the air stream generated by the fan (Fig. 46/5).

The air stream conveys the seed to the distributor head (Fig. 46/6), which distributes the seed uniformly onto all the coulters (Fig. 46/7).

The seed is embedded into the strips in the soil, compacted in strips by the tapered ring tyres (Fig. 43/8), and covered with loose soil by the exact harrow (Fig. 46/8). If required, the seed pressure beam (Fig. 46/9) with the adjustable drag tines (Fig. 46/10) can be used.

The field connection run is marked in the centre of the tractor by the track markers (Fig. 46/11).

Machines from a working width of 4 m upwards can be folded together to a transport width of 3 m.

5.1 Electrohydraulic control blocks

The hydraulic functions of the machine are actuated via the electrohydraulic control blocks.

Initially the desired hydraulic function has to be selected on the **AMATRON⁺** (see section 5.5, on page 63) before the hydraulic function can be executed via the appropriate control unit.

This switching clear of the hydraulic functions in the **AMATRON⁺** allows operation of all hydraulic functions with only

- 2 tractor control units for the machine functions
- 1 tractor control unit for the blower fan.



Fig. 47

5.2 Hydraulic hose lines



WARNING

Danger of infection from escaping hydraulic fluid at high pressure!

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

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

5.2.1 Coupling the hydraulic hose lines



WARNING

Risk of contusions, cutting, catching, drawing in and knocks from faulty hydraulic functions when the hydraulic hose lines are connected incorrectly!

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.

Structure and function

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. 48

5.2.2 Uncoupling the hydraulic hose lines

1. Swivel the actuation lever on the control valve on the tractor to float position (neutral position).
2. 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. 49

5.3 Dual-circuit pneumatic service braking system



DANGER

The machine has no parking brake!

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



Compliance with the maintenance intervals is essential for the correct function of the two-line operating brake system.

Fig. 50/...

- (1) Supply line with hose coupling (red); fastened in compliance with regulations in the mounting.
- (2) Brake line with hose coupling (yellow); fastened in compliance with regulations in the mounting.



Fig. 50

Fig. 51/...

- (1) Line filter of the supply line
- (2) Line filter of the brake line
- (3) Trailer brake valve
- (4) Actuation knob for release valve
 - o push in up to the stop and the service brake is released (see danger notice, below)
 - o pull out up to the stop and the machine is braked by the supply pressure in the compressed air reservoir (see danger notice below).

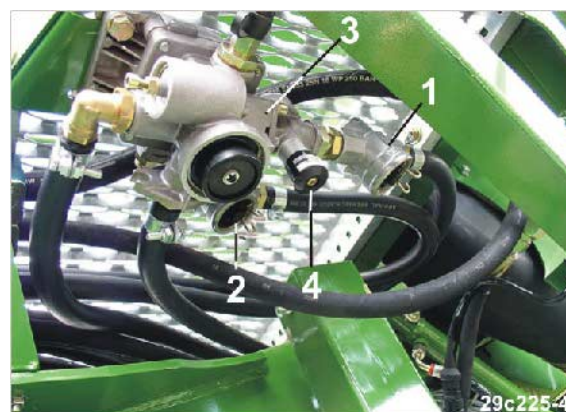


Fig. 51



DANGER

Press the actuation knob (Fig. 51/4) for the release valve only in the workshop to manoeuvre the machine with a suitable tractor without a connection facility for the pneumatic braking system. Bear in mind that the machine has no parking brake and when the actuation knob is pulled out the machine shows no braking effect with an empty compressed air reservoir.

5.3.1 Coupling the brake and supply lines



WARNING

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

- When coupling the brake and supply line, ensure that:
 - the sealing rings of the hose couplings are clean
 - the sealing rings of the hose couplings form a proper seal.
- Always replace damaged seals immediately.
- Drain the air tank before the first journey each day.
- Only move off with the machine connected when the pressure gauge on the tractor shows 5.0 bar.



WARNING

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

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

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

1. Open the covers (Fig. 52/1) of the hose couplings on the tractor.
2. Check the sealing rings on the hose coupling for damage and cleanliness.
3. Clean the dirty sealing rings and replace any damaged sealing rings.
4. Fasten the hose coupling of the brake line (yellow) in compliance with regulations in the coupling marked yellow (Fig. 52/2) on the tractor.

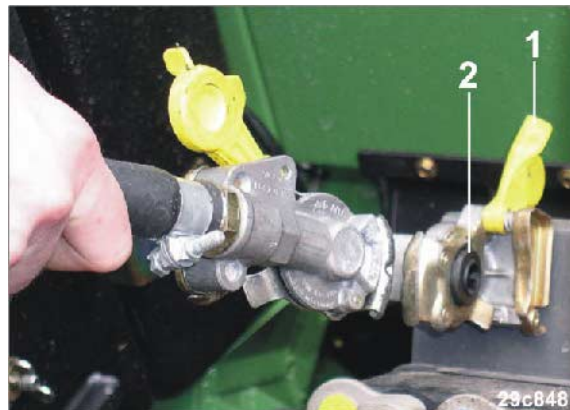


Fig. 52

5. Remove the hose coupling of the supply line (red) from the empty coupling.
6. Check the sealing rings on the hose coupling for damage and cleanliness.
7. Clean the dirty sealing rings and replace any damaged sealing rings.
8. Fasten the hose coupling of the supply line (red) in the coupling marked red on the tractor in accordance with regulations.
- On coupling the supply line (red), the supply pressure coming from the tractor automatically pushes out the button for the release valve on the trailer brake valve.
9. Remove the wheel chocks.

5.3.2 Uncoupling the brake and supply lines



WARNING

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

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

The operating brake of the machine only moves into the brake position when the red hose coupling has been uncoupled.

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

1. Secure the machine against unintentionally rolling away. For this purpose, use the chocks.
2. Release the hose coupling (Fig. 53) of the supply line (red).
3. Release the hose coupling of the brake line (yellow).
4. Fasten the hose couplings in the empty coupling points.
5. Close the covers of the coupling heads on the tractor.

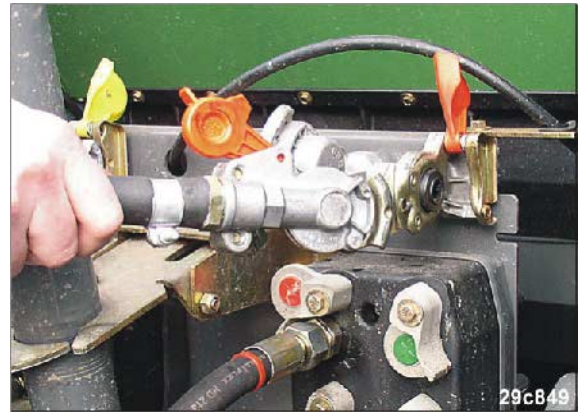


Fig. 53



DANGER

Use the wheel chocks!

Bear in mind that the machine has no parking brake and shows no braking effect if the compressed air reservoir is empty.

5.4 Hydraulic operating brake system

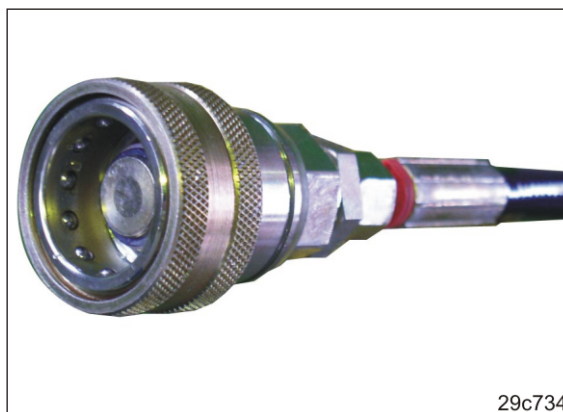
To control the hydraulic operating brake system, the tractor requires hydraulic braking equipment.

5.4.1 Coupling the hydraulic operating brake system



Only couple clean hydraulic couplings.

1. Remove the protective cap (Fig. 55/1).
2. If necessary, clean the hydraulic connectors (Fig. 54) and hydraulic connector socket.
3. Connect the hydraulic connector socket on the machine face with the hydraulic connector on the tractor face.

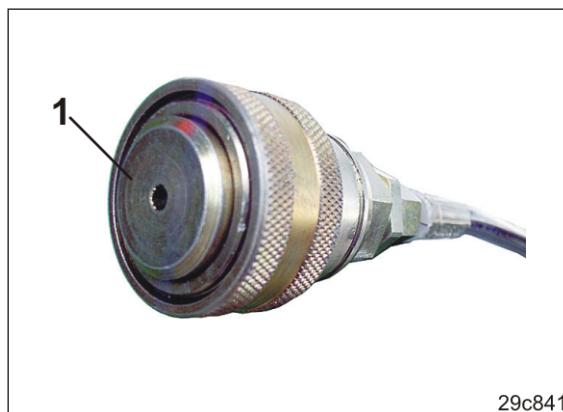


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Fig. 54

5.4.2 Uncoupling the hydraulic operating brake system

1. Unlock the hydraulic connectors from the hydraulic sockets.
2. Secure the hydraulic connectors and hydraulic connector socket with protective caps (Fig. 55/1) against soiling.
3. Place the hydraulic hose line in the hose cabinet.



29c841

Fig. 55

5.5 Operator control terminal **AMATRON⁺**

The **AMATRON⁺** consists of the operator control terminal (Fig. 56), the basic equipment (cable and fastening material) and the job computer on the machine.

The following are performed via the operator control terminal

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



Fig. 56

The **AMATRON⁺** determines

- the instantaneous travel speed [km/h]
- the instantaneous sowing rate [kg/ha]
- the distance [m] remaining until the seed hopper is emptied of seed
- the actual seed hopper content [kg].

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

- the day and total seed volume output [kg]
- the day and total area cultivated [ha]
- the day and total sowing time [h]
- the average performance [ha/h].

For communication purposes the **AMATRON⁺** includes

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

the menu "Work"

- indicates the requisite data for sowing operation
- is for the purpose of operating the seed drill during the work.

In the menu "Job"

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

In the menu "Seed drill calibration"

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

In the menu "Machine data"

- the machine-specific settings are entered, selected or determined via a calibration process.

In the menu "Setup"

- the input and output of diagnostic data and the selection and input of basic machine data is performed. These jobs are reserved exclusively for customer service personnel.

5.6 Roller holder

The roller holder (Fig. 57/1) contains

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



Fig. 57

5.7 Seed hopper

The seed hopper (Fig. 58/1) is well accessible for filling, calibrating and residue draining.

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

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



Fig. 58

5.7.1 Digital fill level monitoring (optional)

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

When the seed level reaches the level sensor a warning signal appears (Fig. 59) on the **AMATRON⁺** display and an alarm signal sounds simultaneously. This alarm signal is intended to remind the tractor driver to fill up the seeds again.

machine type:	Cirrus	Order
order No.:	6	drill calibr.
tramline rhythm No.:	15	machine
working width:	6.0m	Setup
level too low		29c214_GB

Fig. 59

The height of the level sensor can be adjusted (Fig. 60/1) in the seed hopper. The residual seed volume can be set, at which the warning message and the alarm signal is to be emitted.

You can only adjust the height of the level sensor when the seed hopper is empty.



Fig. 60

5.8 Seed dosing

In the seed dosing unit (Fig. 61/1) the seed is dosed by a dosing roller.

The dosing roller can be driven

- by the star wheel via the Vario gearbox
- by an electric motor (full dosing).

The seed falls into the injector sluice (Fig. 61/2) and is directed by the air flow to the distributor head and then to the coulters.

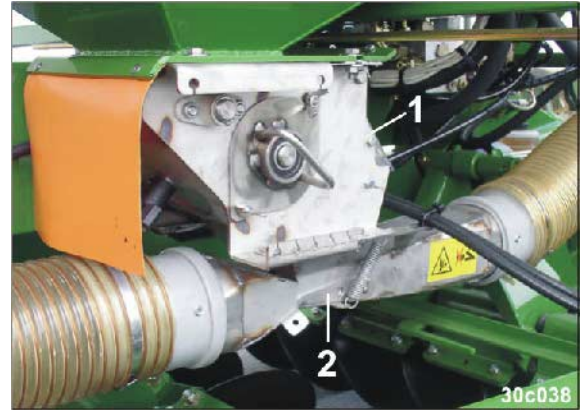


Fig. 61

5.8.1 Dosing rollers

The seed dosing unit is equipped with a replaceable dosing roller. The dosing roller selection is dependent on

- The grain size of the individual seeds
- The volume of seeds.

The dosing rollers are used on the basis of the table (section 5.8.2, on page 68):

- Fine dosing roller (Fig. 62/1) for fine seeds.
- Medium dosing roller (option, Fig. 62/2) for medium-sized seeds with the medium output levels
- Coarse dosing roller (Fig. 62/3) for coarse seeds and high application rates

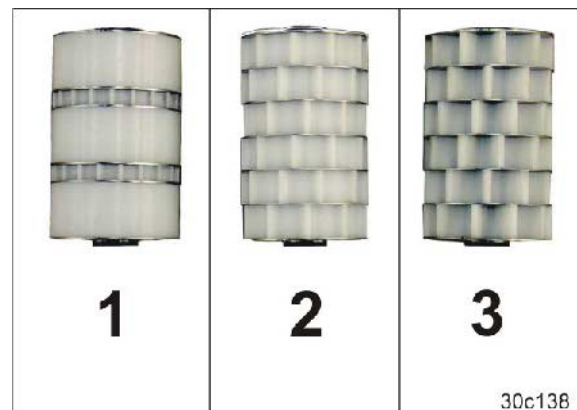


Fig. 62

For sowing particularly large seeds, e.g. beans, the chambers (Fig. 63/1) of the coarse dosing roller can be enlarged by repositioning the wheels and the plates.

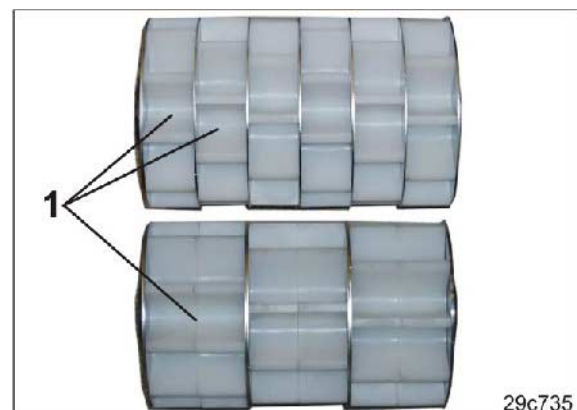


Fig. 63

5.8.2 Table Seed dosing rollers

Seed	Dosing roller	Seed	Dosing roller
Spelt wheat	Coarse dosing roller	Rapeseed	Fine dosing roller
Oats	Coarse dosing roller	Red clover	Fine dosing roller
Rye	Coarse dosing roller or medium dosing roller	Mustard	Medium dosing roller or fine dosing roller
Spring barley	Coarse dosing roller	Soy	Medium dosing roller
Winter barley	Coarse dosing roller	Sunflowers	Medium dosing roller
Wheat	Coarse dosing roller or medium dosing roller	Turnips	Fine dosing roller
Beans	Coarse dosing roller	Vetches	Medium 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		

Fig. 64



The requisite dosing roller is dependent on the seed type and application rate, see the table (Fig. 64, above).

For seed not listed in the table select the dosing roller of one of the seed types listed in the table of a similar grain size.

5.8.3 Seed rate adjustment at Vario gearbox

The sowing rate required is set using the lever (Fig. 65/1) of the Vario gearbox.

Adjusting the lever changes the sowing rate. The higher the number the gearbox lever points to on the scale (Fig. 65/2), the greater the sowing rate.

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

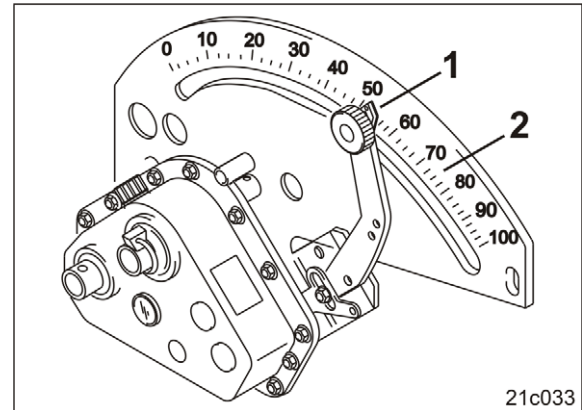


Fig. 65

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. 66/1) for all sowing rates over 30 kg/ha
- an inner white scale (Fig. 66/2) for all sowing rates below 30 kg/ha
- a coloured scale (Fig. 66/3) with all gearbox settings from 1 to 100.

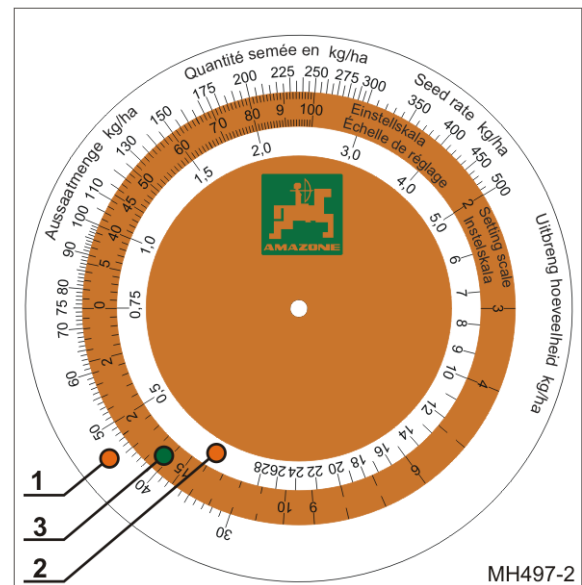


Fig. 66

5.8.4 Seed rate adjustment, electronic at Vario gearbox (optional)

An electric setting motor (Fig. 67/1), controlled by the **AMATRON⁺**, sets the gearbox lever (Fig. 67/2) to the desired sowing rate.

With the values from the first calibration test, the **AMATRON⁺** calculates the required position and automatically sets the gearbox lever. This setting must be checked with an additional calibration test.

The display of the **AMATRON⁺** shows the scale setting of the lever.

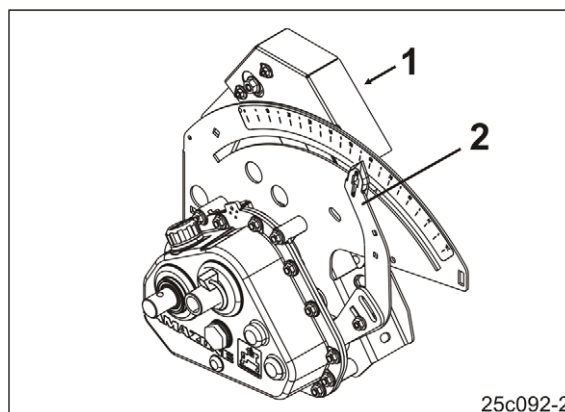


Fig. 67

5.8.5 Seed rate adjustment with full dosing (optional)

With machines with full dosing one electric motor (Fig. 68/1) each drives a dosing roller. The machines do not have Vario gearboxes.

The rotational drive speed of the dosing roller is determined by the working speed and the preset sowing rate. A star wheel determines the working speed and the distance covered.

The sowing rate is set in the **AMATRON⁺**. Each setting must be checked with a calibration test.



Fig. 68

The rotational drive speed of the dosing roller

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

Seed predosing

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

The run time of the seed predosing is adjustable.

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

Start-up ramp

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

After turning and actuating the control unit 1, the machine goes to its operational position. As soon as the star wheel has reached its operational position, the seed is metered into the delivery line. In order to compensate system-specific reductions in seed rate during the acceleration phase, the start-up ramp can be cut in.

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

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

Example

Values adjustable in the **AMATRON⁺**

Probable working speed:10 km/h

Starting speed:50 %

Time to achieve working speed:8 seconds

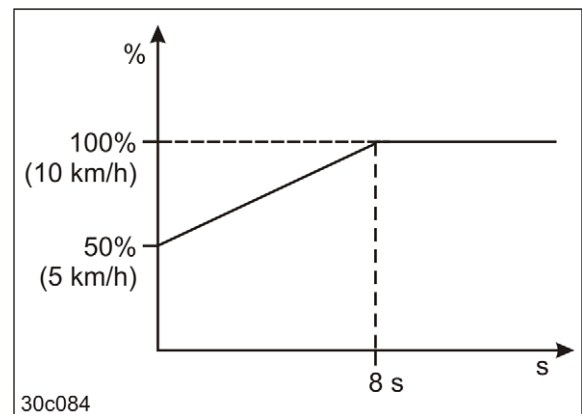



Fig. 69

5.8.6 Increasing sowing rate, coulter pressure and harrow pressure

The sowing rate is increased during the work by entry in the **AMATRON⁺**.

If the coulter pressure and harrow pressure are also to be increased,

the coulter pressure button  in the **AMATRON⁺** must be selected. Actuating the control valve 2 then increases the coulter pressure and the harrow pressure. Individual functions can be cut out by repositioning the pins (see chapter "Coulter pressure", on page 78 and chapter "Exact harrow" on page 79).

It is necessary to equip the machine with

- the electr. seed rate adjustment or full dosing
- the hydr. coulter pressure adjustment
- the hydr. exact harrow pressure adjustment.

5.8.7 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 size grain, grain shape, specific weight and dressing are different
- after exchanging the dosing rollers
- if there are any differences between the determined and actual sowing rates **AMATRON⁺**.

5.8.8 Calibrating troughs

The seed incurred in the calibration test drops into the calibration troughs.

The number of calibration troughs is equal to the number of seed dosers.

The calibration troughs are nested for transport and fastened to the rear wall of the hopper secured with a linch pin (Fig. 70/1).



Fig. 70

5.9 Blower

The hydraulic motor (Fig. 71/2) drives the blower (Fig. 71/1) and generates an air current. The air current conveys the seeds from the injector sluice to the coulters.

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

The higher the fan speed, the greater is the air volume generated.

Please refer to the table (Fig. 72, on page 74) for the requisite fan speed.

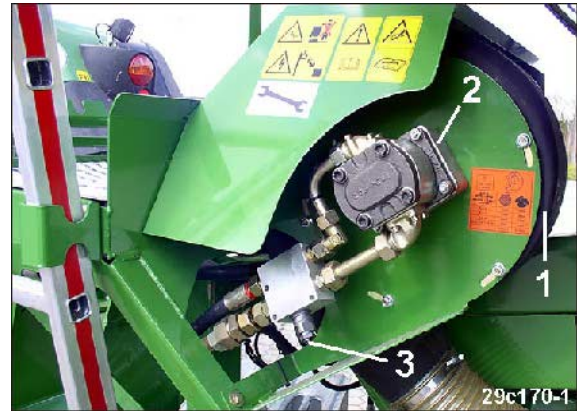


Fig. 71

The blower speed can be regulated:

- via the tractor's flow control valve
or (if not present)
- via the pressure relief valve (Fig. 71/3) of the hydraulic motor.

The **AMATRON⁺** monitors compliance with the fan speed.

5.9.1 Blower speed table

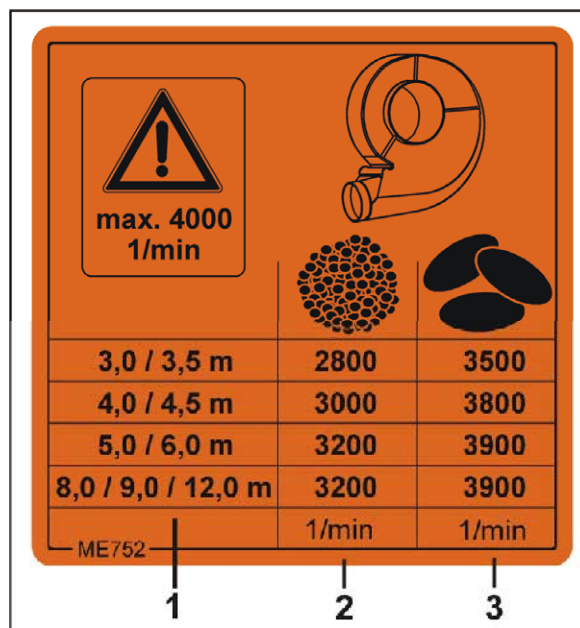
The fan speed (rpm) is dependent on

- The machine working width (Fig. 72/1)
- The seed
 - Fine seed types, e.g. rape (Fig. 72/2) or grass seed
 - Grain and pulses (Fig. 72/3).

Example:

- Cirrus 4001
- Cereal seed

Required fan speed: 3800 rpm







 max. 4000 1/min		
		
	3,0 / 3,5 m	2800 3500
	4,0 / 4,5 m	3000 3800
	5,0 / 6,0 m	3200 3900
8,0 / 9,0 / 12,0 m	3200	3900
ME752	1/min	1/min
	1	2 3

Fig. 72



DANGER

Do not exceed the maximum fan speed of 4000 rpm.



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

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

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

5.9.2 Distributor head

In the distributor head (Fig. 73/1) the seed is distributed uniformly over all the seed coulters. The number of distributor heads depends on the machine working width. A seed doser always supplies one distributor head.



Fig. 73

5.10 Star wheel

Via the Vario gearbox the star wheel (Fig. 74/1) drives the dosing rollers in the seed doser.

With full dosing the star wheel is the roller feeler for distance.

The distance covered is measured via the star wheel. The **AMATRON⁺** requires this data to calculate the drive speed and area cultivated (area meter).

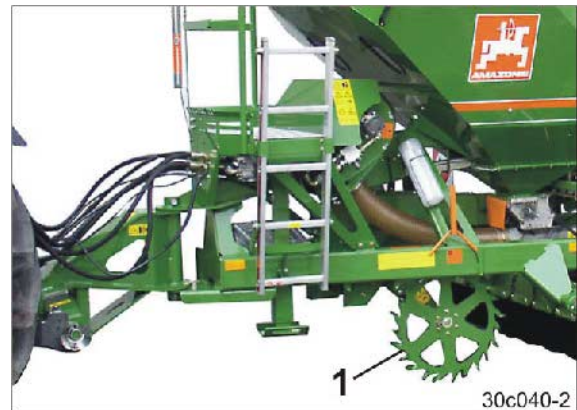


Fig. 74

The star wheel controls

- the creation of the tramlines.
The tramline counter indexes approx. 5 seconds (time settable via the **AMATRON⁺**) after each upswing of the star wheel, e.g. before turning at the end of the field.
- the track marker change (depending on the setting on the **AMATRON⁺**).

5.11 Tapered ring tyres

The tapered ring tyres (Fig. 75/1)

- are arranged adjacent to each other
- secure the cultivated soil in strips in which the seed is placed
- form the integrated running gear for transport journeys



Fig. 75

The turning procedure occurs, as required

- on the axle
- on the roller

Turning the Cirrus 3001 is only possible on the axle.

Turning on the axle

The integrated running gear raises the machine.

Turning on the roller

The machine turns on all tapered ring tyres with raised coulter frame and raised disc array.

5.12 Seed planting

The tapered ring tyres (Fig. 76/1) produce highly compacted strips in which the coulters lay the seed.

The strips have soil zones of differing compactness.

Zone ①: highly compact soil in which the coulters place the seed.

Zone ②: medium compactness.

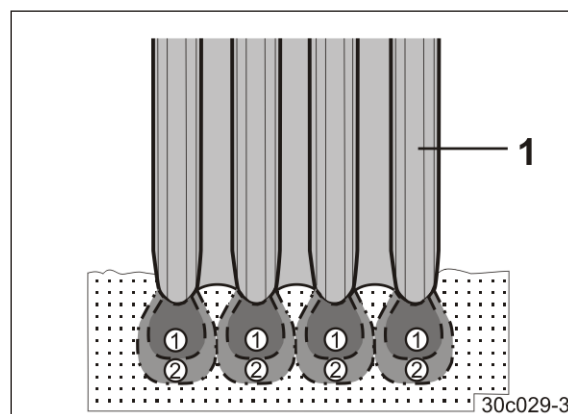


Fig. 76

5.12.1 **RoTeC** and **RoTeC⁺** coulters

The **RoTeC** coulters (Fig. 77/1) and the **RoTeC⁺** coulters (Fig. 77/2)

- form a sowing slit in the soil compacted in strips by the tapered ring tyres.
- deposit the seed in the sowing slit.

The flexible plastic disc (Fig. 77/3)

- limits the seed planting depth
- cleans the rear side of the sowing disc (Fig. 77/4)
- improves the drive of the sowing disc by gripping the soil.

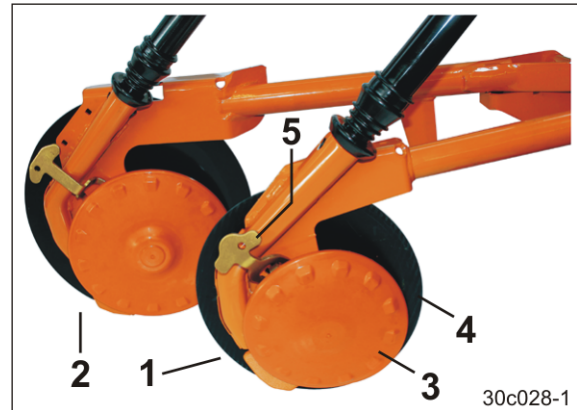


Fig. 77

The **RoTeC** and **RoTeC⁺** coulters are used for ploughing and mulch sowing.

Also on fields with large quantities of straw and plant remains, mulch sowing is possible with **RoTeC** and **RoTeC⁺** coulters.

At high travel speeds, the sowing disc (Fig. 77/4), which is inclined with respect to the direction of travel, shifts little soil.

The steady coulters ride and the precise seed placement result from the high coulters pressure and the support of the coulters on the plastic disc.

The flat sowing disc (Fig. 78) allows very shallow sowing, e.g. in particularly light sandy soils.



Fig. 78

Structure and function

The plastic disc can be fitted in three positions or it can be removed to limit the seed placement depth (Fig. 79/1 - 4).

The plastic disc can be adjusted or removed without the need for tools by using the handle (Fig. 77/5).

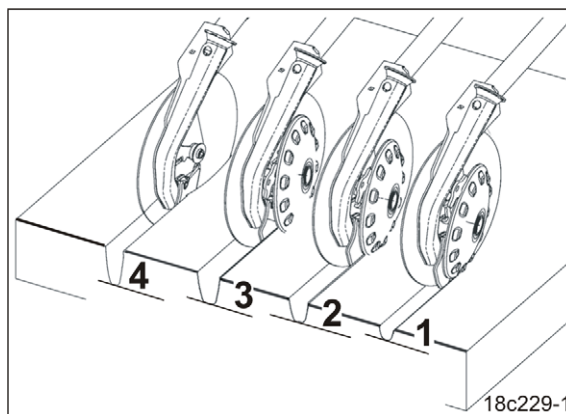


Fig. 79

5.12.2 Coulter pressure



The seed planting depth depends on three factors

- the condition of the soil
- the coulter pressure
- the travel speed

With the hydr. coulter pressure adjustment, the coulter pressure can be preset for two types of soil. This means that the coulter pressure can be adjusted to the soil during the work, e.g. in event of a change from normal soil to heavy soil and vice versa (see also chapter "Increasing sowing rate, coulter pressure and harrow pressure", on page 72).

Two pins (Fig. 80/1) in an adjusting segment limit the hydraulic cylinder. With increased coulter pressure, the stop (Fig. 80/2) of the hydraulic cylinder is at the top pin.

The numbers on the scale (Fig. 80/3) are provided for guidance. The higher the number, the greater the coulter pressure.

The foldable machines are equipped with two adjusting segments.

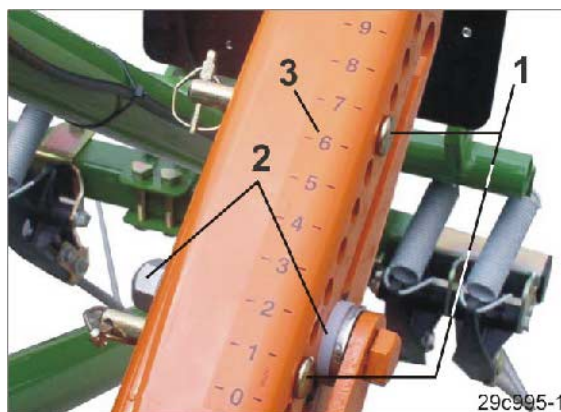


Fig. 80

5.13 Exact harrow

The exact harrow (Fig. 81/1) covers the seeds deposited in the sowing furrows with loose earth and smooths the ground.

The following are adjustable

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

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

The draw springs that create the exact harrow pressure are pretensioned by a lever (Fig. 82/1).

The lever (Fig. 82/1) is applied in the adjusting segment by way of a bolt (Fig. 82/2).

The higher the bolt is inserted in the group of holes, the greater is the harrow pressure.

For hydraulic exact harrow adjustment the second bolt (Fig. 82/3) is inserted as a stop above the lever (Fig. 82/1) in the adjusting segment.

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



Fig. 81

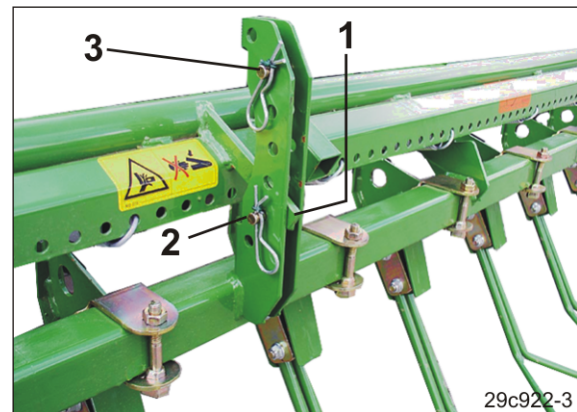


Fig. 82

5.14 Roller harrow (optional)

The roller harrow consists of

- Harrow tines (Fig. 83/1)
- Press rollers (Fig. 83/2).

The harrow tines close the seed furrows.

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

The following are adjustable

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

The roller harrow (Fig. 84/1) can be rapidly replaced with the exact harrow (Fig. 84/2).

The tramline marker (Fig. 84/3) can be used in combination with both devices.

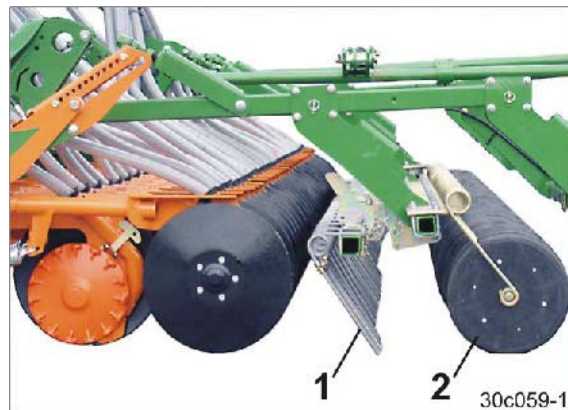


Fig. 83

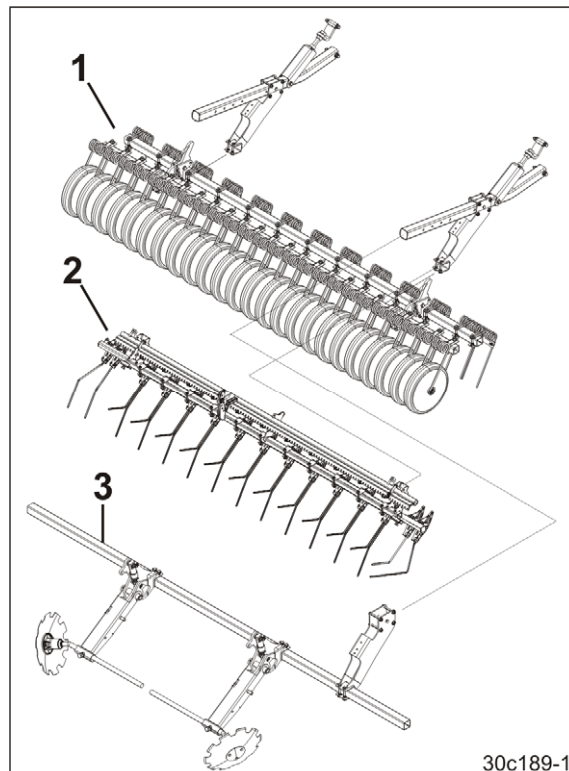


Fig. 84

5.15 Two-row disc array

The discs, which are set obliquely to the direction of travel (Fig. 85/1), prepare the seedbed.

The following are adjustable

- the working intensity of the discs over the working depth of the disc array
- the length of the outer discs for adaptation to varying soil conditions
- the two outside hollow discs (Fig. 85/2) in vertical direction.

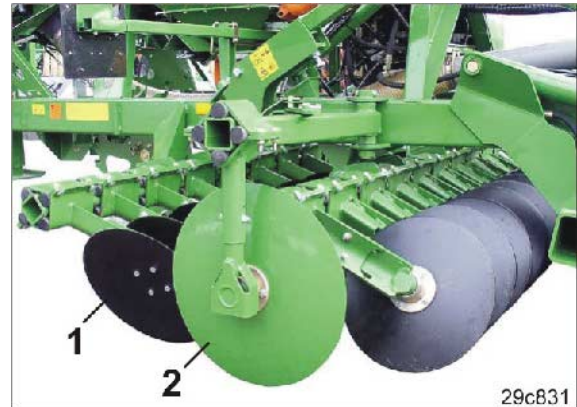


Fig. 85

Correctly set outer discs and outside hollow discs prevent the cultivated soil from egressing laterally from the working area of the machine.

The elastic rubber sprung suspension of the individual discs enables

- adaptation to soil unevenness
- evasion by the discs when hard obstacles are encountered, e.g. stones. This protects the individual discs against damage.

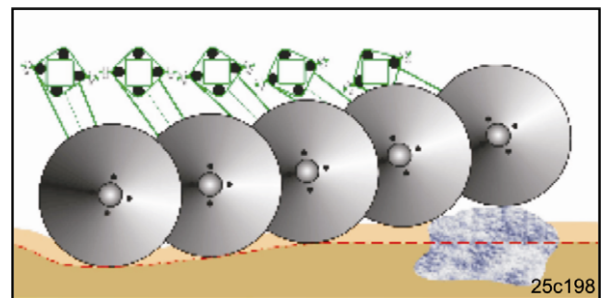


Fig. 86

The numbers on the scale (Fig. 87/1) are for the purpose of orientation for setting different disc working depths. The higher the number, the greater the disc working depth.



Fig. 87

Structure and function

The scale (Fig. 88/1) of the Cirrus 3001 is located on the loading plate.



Fig. 88

5.16 Track loosener (optional)

If the function of the disc array is not sufficient to eliminate the tracks of the tractor, the track looseners (Fig. 89) are used.

The track looseners are adjustable horizontally and vertically.



Raise the wheel mark eradicators after working on the field to avoid damaging the wheel mark eradicators.

Place the wheel mark eradicators in the operational position only when in the field.



Fig. 89

5.17 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.

Lifting of the star wheel at the end of the field automatically triggers the switchover procedure for the track markers.



Fig. 90

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. 91

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

Before folding in the track marker, actuate the obstacle button (**AMATRON⁺**) so that the tramline counter of the sowing wheel tramline control does not shift on or the automatic process is not initiated before the turning procedure (see section "Turning at end of the field", on page 166).

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

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



Deactivate the obstacle button after the obstacle has been passed.

5.18 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 **AMATRON⁺**.

When creating the tramlines:

- The tramline circuit on the distributor head uses sliders (Fig. 92/1) to block the seed feeding lines to the seed lines (Fig. 92/2) of the tramline coulter
- The tramline coulter does not deposit any seeds on the ground.

Seed supply to the tramline coulter is interrupted as soon as the electric motor (Fig. 92/3) closes the appropriate seed tubes (Fig. 92/2) in the distributor head.

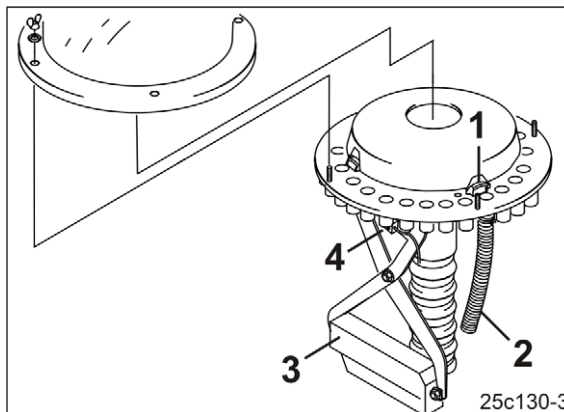


Fig. 92

When creating a tramline, the tramline counter shows the figure "0" in the **AMATRON⁺**. The seed quantity reduced when creating a tramline is adjustable. It is necessary to equip the machine with electrical seed volume adjustment or full dosing.

A sensor (Fig. 92/4) checks whether the sliders (Fig. 92/1), which open the and close the seed line tubes (Fig. 92/2), are working properly.

If the setting is wrong, the **AMATRON⁺** emits an alarm.

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

Tramlines are seed-free tracks (Fig. 93/A) for fertilising and plant care machines used later.

The tramline spacing (Fig. 93/b) corresponds to the working width of the care machines (Fig. 93/B), e.g. fertiliser spread and/or sprayer, which are used on sown fields.

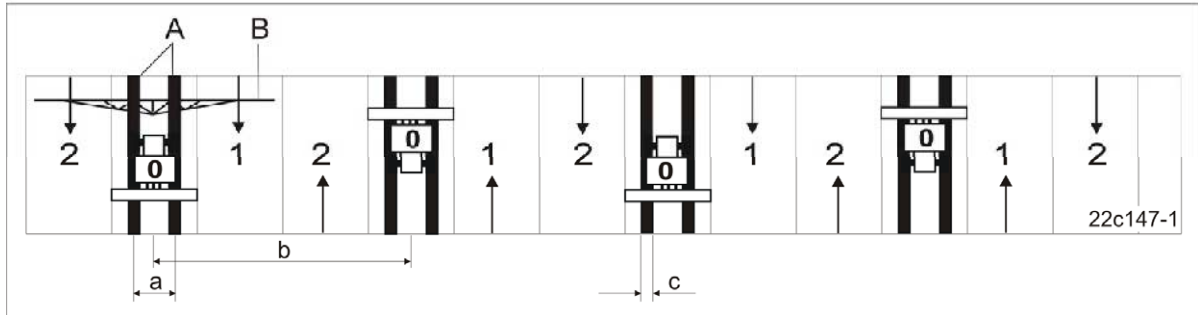


Fig. 93

To set the different tramline spacings (Fig. 93/b), appropriate tramline rhythms must be entered on the **AMATRON⁺**.

The figure (Fig. 93) shows the tramline rhythm 3. During the work the field runs are numbered consecutively (tramline counter) and displayed in the **AMATRON⁺**.

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 **AMATRON⁺**.

The required tramline rhythm (see table Fig. 94) is derived from the required tramline spacing and the working width of the seed drill. Further tramline rhythms can be seen in the **AMATRON⁺** operating manual.

The wheelmark spacing (Fig. 93/a) of the tramline corresponds to that of the cultivating tractor and is adjustable [see chapter "Adjusting the track width of the cultivating tractor", on page 203].

The track width (Fig. 93/c) of the tramline increases with an increasing number of tramline coulters fitted next to each other.

Tramline rhythm	Seed drill working width		
	3.0 m	4.0 m	6.0m
	Tramline spacing (working width of the fertiliser spreader and field sprayer)		
1			12 m
3	9 m	12 m	18 m
4	12 m	16 m	24 m
5	15 m	20 m	30m
6	18 m	24 m	36 m
7	21 m	28 m	42m
8	24 m	32 m	
9		36 m	
2 plus	12 m	16 m	24 m
6 plus	18 m	24 m	36 m

Fig. 94

5.18.1 Examples for creating tramlines

The creation of tramlines is shown in Figure (Fig. 95) 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 **AMATRON⁺**)
- D = Tramline counter (during work the field runs are number consecutively and displayed on the **AMATRON⁺**).

Perform any inputs and outputs with the aid of the **AMATRON⁺** operating manual.

Example:

Working width of seed drill: ... 6 m

Working width, fertiliser

spreader/field sprayer: 18m = 18m tramline spacing

1. In the adjacent table (Fig. 95) 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 set this on the **AMATRON⁺**.
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 this figure on the **AMATRON⁺**. Input this value directly before commencing the first field trip.

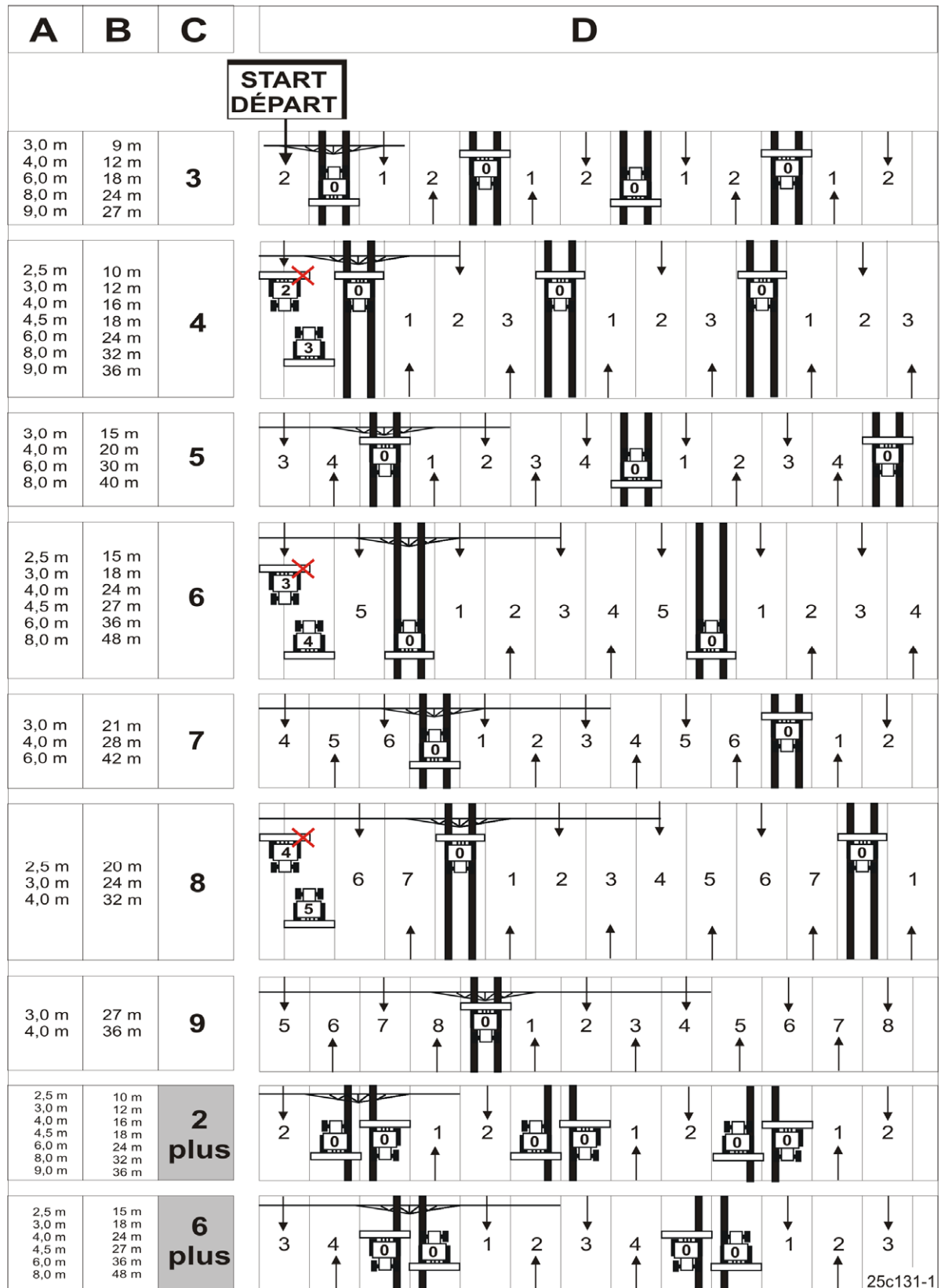


Fig. 95

5.18.2 Tramline rhythm 4, 6 and 8

Figure (Fig. 95) 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.

During work with partial width switched off, the drive of the appropriate dosing roller is interrupted. Please refer to the instruction manual for an exact description **AMATRON⁺**.

On the Cirrus 3001/4001 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. 96).

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

After the first field run, reset the full machine working width!

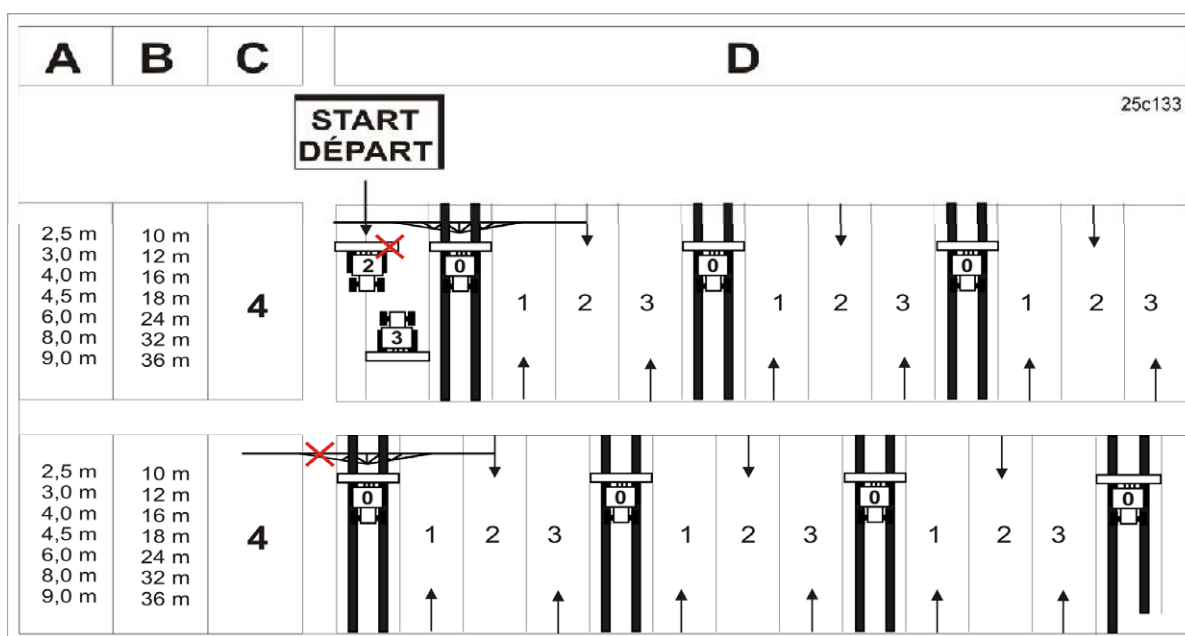


Fig. 96

5.18.3 Tramline rhythm 2 plus and 6 plus

Figure (Fig. 95) 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. 97), 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.

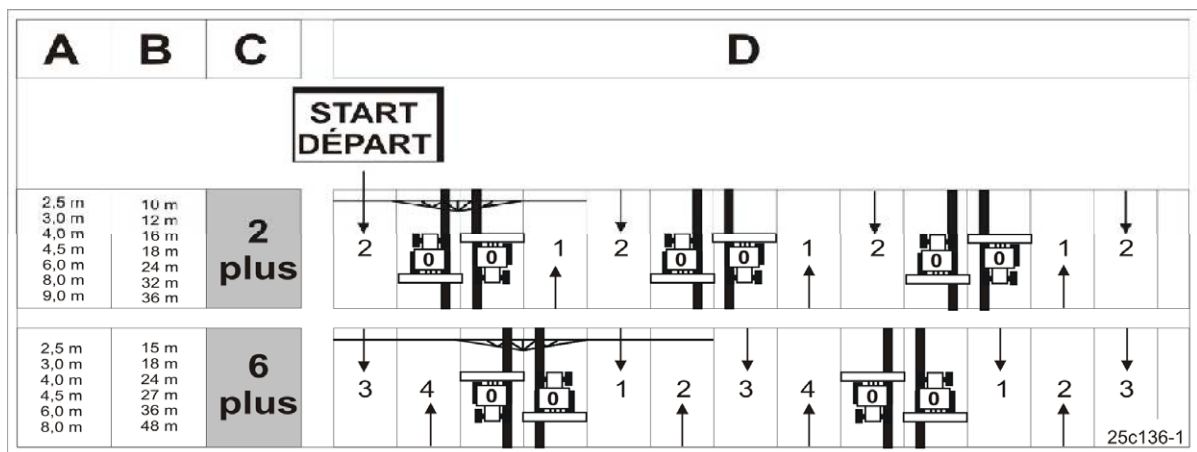


Fig. 97

5.18.4 Half-sided switching off (part width)

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

The seed supply to the coulters of the machines can be cut out on one side by means of two distributor heads

- Cirrus 6001.

On seed drills with two distributor heads (Fig. 98)

- one distributor head supplies seed to the sowing coulters of one half of the machine.
- the seed dosing of one half of the machine (part width) can be switched off. To do so
 - with star wheel drive remove the clip pin
 - with full dosing switch off the motor.

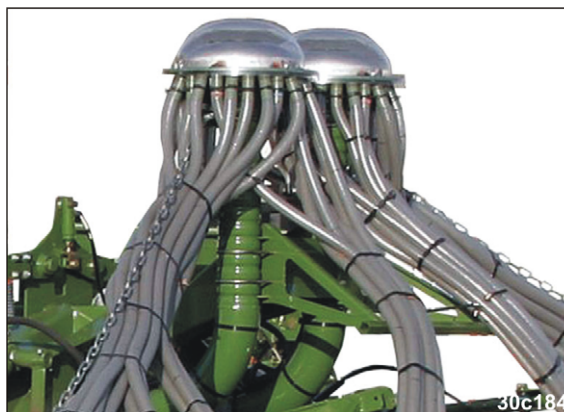


Fig. 98

5.18.5 Tramline marker (option)

When tramlines are being created, the track discs (Fig. 99) lower automatically and mark the tramline that has just been created. Due to this the tramlines already become visible before the seed has been sown.

It is possible to set:

- the wheelmark spacing of the tramline (Fig. 93/a)
- the working intensity of the track discs.

The track discs are raised if no tramline is created.

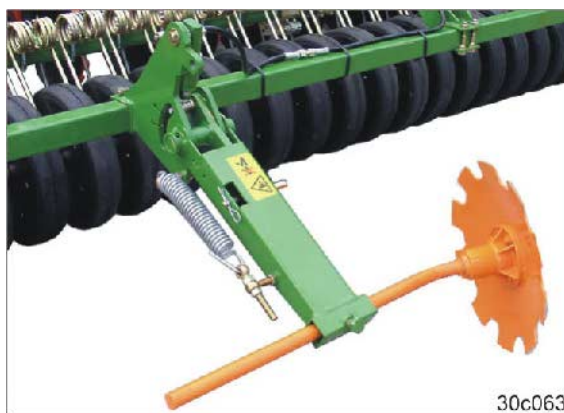


Fig. 99

6 Commissioning

This section contains information

- on initial operation of your machine
- on checking how you may attach the machine to your tractor.



- Before operating the machine for the first time the operator must have read and understood the operating manual.
- Take heed of section "Safety information for users", from on page 30 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 contusions, cutting, catching, drawing in and knocks in the area of hydraulically or electrically actuated components.

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

- are continuous or
- are automatically locked or
- 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 approved 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 type 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)

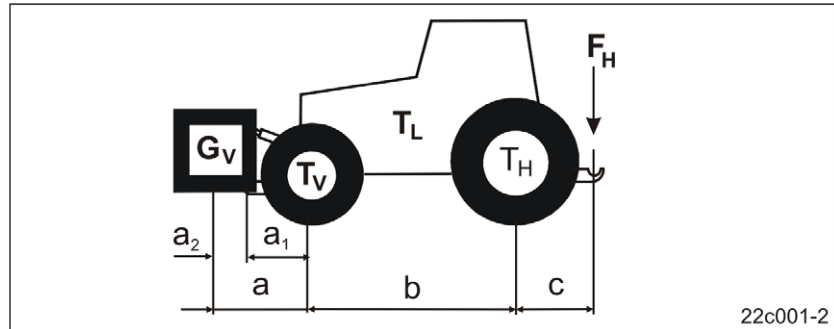


Fig. 100

T_L	[kg]	Tractor empty weight	See tractor operating manual or vehicle documentation
T_V	[kg]	Front axle load of the unladen tractor	
T_H	[kg]	Rear axle load of the unladen 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 53
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-mounted machine or front ballast (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

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

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

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

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

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

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

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

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

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

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

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

6.1.1.6 Tyre load capacity

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

6.1.1.7 Table

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



- You can find the approved values for the total tractor weight, axle loads and 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 noseweight for the noseweight 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.

6.1.3 Machines without their own brake system

The Cirrus is not permitted in Germany or in several other countries without its own braking system.

**WARNING**

Risk of contusions, cuts, dragging, catching or knocks from insufficient tractor brake power.

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

If the machine does not possess its own brake system:

- Then the actual tractor weight must be greater than or equal to (\geq) the actual weight of the connected machines.
- The maximum movement speed is 25 km/h.

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
 - as long as the tractor engine is running with a connected hydraulic system.
 - if the ignition key is inserted in the tractor and the tractor engine can be started unintentionally with the hydraulic system connected
 - if the tractor and machine are not secured with chocks against unintentional rolling
 - 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 the raised, unsecured machine / raised, unsecured parts of the machine.
→ 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 regulations for the hydraulic fan drive connection

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 line (Fig. 101/5) to a single-acting or double-acting tractor control unit with priority.
- Connect the large hydraulic coupling of the return line (Fig. 101/6) only to an unpressurised tractor connection with direct access to the hydraulic fluid tank (Fig. 101/4). In order that the banking-up pressure of 10 bar is not exceeded, do not connect the return line to a tractor control unit.
- For retro-installation of the tractor return line, use only piping with ND 16, e.g. 20 id. x 2.0 mm with a short return path to the hydraulic fluid tank.

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

Fig. 101/...

(A) On the machine face

(B) On the tractor face

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

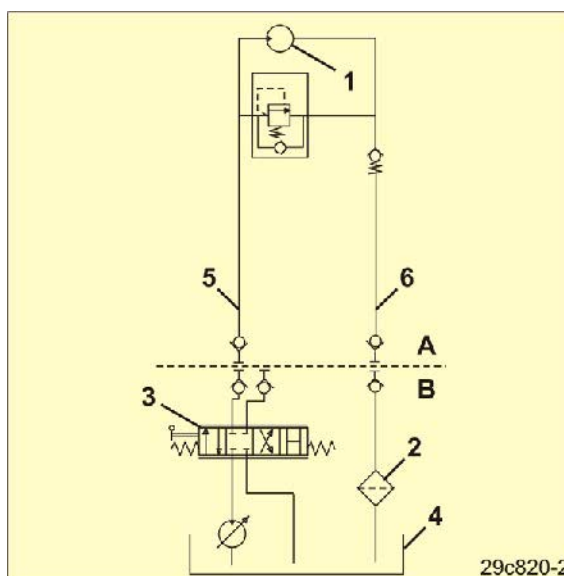


Fig. 101



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. 101/4) 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.

If a second hydraulic motor is driven besides the hydraulic fan motor, both motors have to be wired in parallel. If both motors are wired in series, the permissible oil pressure of 10 bar is always exceeded behind the first motor.

6.4 Initial installation of the **AMATRON⁺**

Install the terminal (Fig. 102) of the **AMATRON⁺** in the tractor cab with the aid of the **AMATRON⁺** operating manual .



Fig. 102

7 Coupling and uncoupling the machine



When coupling and uncoupling the machine take heed of the section "Safety information for users", on page 30.



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 97.



WARNING

Risk of contusions 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 92.



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 attachment categories 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**

When separated from the tractor the machine must always be secured by means of 4 wheel chocks (see section "Uncoupling the machine", on page 108) because the Cirrus has no parking brake!

**DANGER**

The lower link of the tractor must not have any lateral play so that the machine always runs centrally 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!

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



The Cirrus can be coupled or uncoupled whether it is folded in or out (except Cirrus 3001).

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

If the Cirrus is parked uncoupled from the tractor with a full compressed air tank, the compressed air of the compressed air tank acts on the brakes and the wheels are then blocked.

The compressed air in the compressed air tank and hence the braking force will drop continuously until there is a complete brake failure, if the compressed air tank is not refilled. The Cirrus must therefore be parked only with wheel chocks.

The brakes are released immediately with a full compressed air tank when the supply line (red) is connected to the tractor. Before connection of the supply line (red) the Cirrus must therefore be connected to the tractor's lower links and the tractor parking brake must be applied. The wheel chocks must also not be removed until the Cirrus is connected to the tractor's lower links and the tractor parking brake is applied.

Coupling the machine:

1. Check whether the Cirrus is secured with 2 2 x 2 wheel chocks (1Fig. 103) on each side of the machine under the outer tapered ring tyres.



Fig. 103

2. Secure a ball (Fig. 104/1) with trap bowl above the lower link pin (cat. III) of the draw bar and secure it with a clip pin.

The balls of the lower linkage are dependent on the tractor type (see tractor operating manual).

Cirrus 3001 and Cirrus 4001 can be equipped with lower link pins (cat. II).



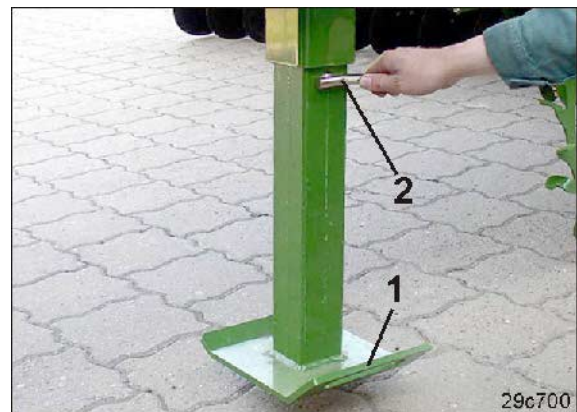
Fig. 104



CAUTION

Danger of getting crushed in the area of the moving draw rail.

3. Open the tractor lower link securing device, i.e. it must be ready for coupling.
 4. Align the lower link hooks so that they are flush with the linking points of the 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 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. 105/1) is free of the ground.
 9. Secure the tractor against unintentional starting and unintentional rolling away.
 10. Check whether the PTO shaft of the tractor is switched off.
 11. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
 12. Connect the supply lines (see section 7.1.1 to 7.1.4, from on page 105) to the tractor.
13. Hold the sustainer (Fig. 105/1) tight and remove the positioning bolt (Fig. 105/2).
 14. Push up the sustainer by the handle (Fig. 105/1) and position it with the positioning bolt.
 15. Secure the positioning bolt with a linch pin.

**Fig. 105**



Check the route of the supply lines.

The power lines

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

16. Check the function of the braking and lighting system.
17. Stow the wheel chocks in the mountings and secure them with spring tensioners (Fig. 106/1).
18. Before commencing a run, perform a braking test.



Fig. 106

7.1.1 Connecting the hydraulic connections



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

Tractor control unit		Connection	Marking	Function
1	Double-acting	Feed line	1 cable tie, yellow	<ul style="list-style-type: none"> Lowering / lifting integrated the running gear Lowering / lifting the star wheel Lowering / lifting the track marker Lowering / lifting the pre-emergence marker Turning on the roller: <ul style="list-style-type: none"> Lowering / lifting the coulter frame Lowering / lifting the disc array
		Return line	2 cable ties, yellow	

Tractor control unit		Connection	Marking	Function
2	Double-acting	Feed line	1 cable tie, green	<ul style="list-style-type: none"> Folding the machine extension arms Adjusting the exact harrow pressure Disc array depth adjustment
		Return line	2 cable ties, green	

Tractor control unit		Connection	Marking	Function
3	Single-acting or double-acting	Feed line ¹⁾	1 cable tie, red	Hydraulic fan motor
		Return line ²⁾	2 cable ties, red	

¹⁾ Pressure line with priority

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



- 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	
AMATRON⁺ machine plug	Connect the plugs to the terminal as described in the AMATRON⁺ operating manual.

7.1.3 Connecting the pneumatic service brake system

Tractor connection		Function
Connection	Marking	
Brake line	Yellow	Pneumatic braking system
Supply line	Red	



Couple to the tractor

- first of all the yellow hose coupling (brake line)
- then the red hose coupling (supply line).

Make sure that they engage correctly!

The brake is released immediately from braked position (braked position possible only if the compressed air tank is full) when the red hose coupling is coupled.

Before coupling the brake line or supply line ensure that the

- hose couplings are clean
- the sealing rings of the hose couplings are in perfect condition
- the seals are clean and undamaged.

7.1.4 Connecting the hydraulic service brake system

Required on the tractor face is a hydraulic braking device that drives the hydraulic braking system of the Cirrus (not allowed in Germany and several other EU countries).

Connect the hydraulic brake connection (Fig. 107) to the tractor's hydraulic brake connection.



Fig. 107



Check the hydraulic connection for cleanliness before coupling.



DANGER

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

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.

Uncoupling the machine:

1. Align the tractor and machine straight and park the empty machine on a horizontal parking surface with a firm base.
2. Lock the star wheel (see **AMATRON⁺** operating manual).
3. Retract the integrated running gear (lower the machine). Here the machine can be coupled or uncoupled.
4. Press the button (switch off Fig. 108/1) (**AMATRON⁺**).
5. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
6. Release the spring pins (Fig. 109/1) and remove the 4 wheel chocks from the mountings at the front of the machine.



Fig. 108



Fig. 109

7. Secure the Cirrus on each side of the machine by placing 2 wheel chocks each (Fig. 110/1) under the outer tapered ring tyres.



DANGER

Always secure the machine with 4 wheel chocks before you uncouple the machine from the tractor! The wheel chocks replace the machine's parking brake!



Fig. 110

8. Uncouple all supply lines between the tractor and the machine.



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



Fig. 111

9. Seal the hydraulic connectors and hose couplings of the supply line and brake line with protective caps.
10. Fasten all supply lines to the mountings (Fig. 111).
11. Hold the sustainer (Fig. 112/1) tight and remove the positioning bolt (Fig. 112/2).
12. Lower the sustainer and position it with the positioning bolt.
13. Secure the positioning bolt with the linch pin.



Fig. 112

Coupling and uncoupling the machine

14. Set the machine down on the sustainer.



WARNING

Set the machine down on a horizontal, firm base 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. 113

15. Open the securing device (Fig. 114) of the tractor's lower link (see tractor operating manual).
16. Uncouple the tractor's lower link.
17. Pull the tractor forwards.



DANGER

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



Fig. 114



CAUTION

Danger of getting crushed in the area of the moving draw rail.

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 97.



DANGER

Before adjusting (unless otherwise described)

- Fold out the booms (see section 10.1, on page 152)
- Lower the machine, i.e. move in the integrated running gear.

8.1 Setting the level sensor

1. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Climb the steps (Fig. 115) into the seed hopper.



Fig. 115

Settings

3. Release the wing nuts (Fig. 116/2).
4. Adjust the height of the level sensor (Fig. 116/1) to the required seed volume.

AMATRON⁺ emits an alarm when the level sensor is no longer covered with seed.

5. Tighten the wing nuts (Fig. 116/2).



Fig. 116

Only machines with two metering units:

6. Repeat the setting on the second level sensor.
Fasten the two level sensors at the same height in the seed hopper.



Increase the residual seed volume which triggers the alarm:

- the coarser the seeds
- the greater the sowing rate
- the greater the working width.

8.2 Installing/removing the dosing roller

1. Remove the clip pin (Fig. 117/2) (only necessary when the seed hopper is full to seal the hopper with the slider (Fig. 117/1).



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

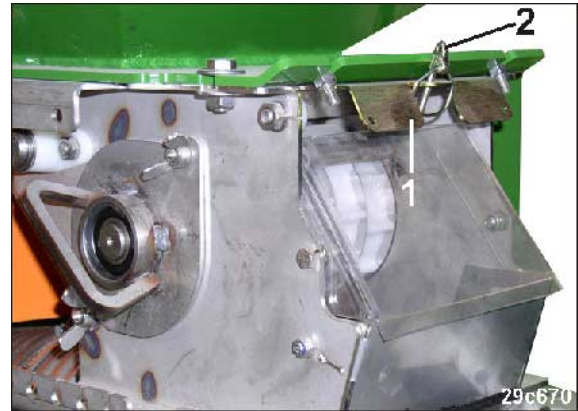


Fig. 117

2. Push the slider (Fig. 118/1) into the dosing unit up to the stop.
- The slider seals the seed hopper. Seed cannot pour out inadvertently when the dosing roller is replaced.

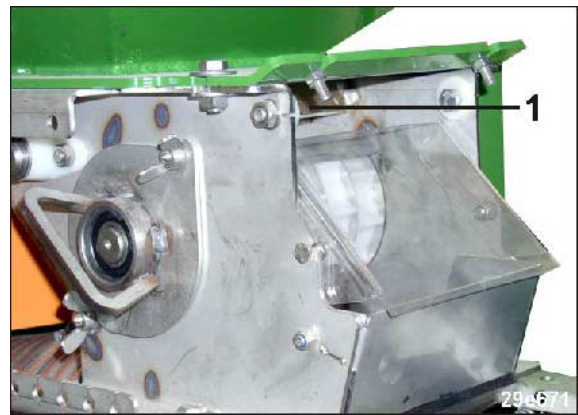


Fig. 118

Settings

3. Slacken but do not unscrew the two winged nuts (Fig. 119/1).
4. Turn the bearing cover and pull it off.

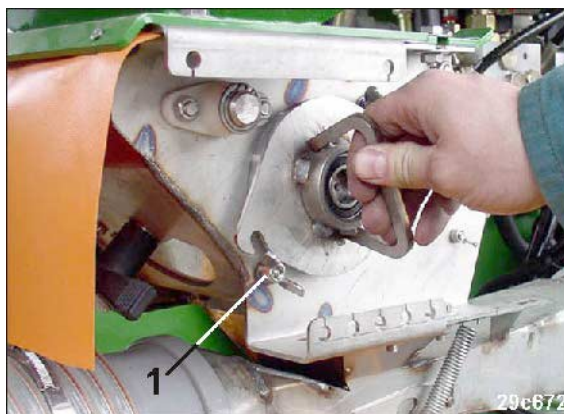


Fig. 119

5. Pull the dosing roller out of the seed doser.
6. Refer to table (Fig. 64, on page 68) for the requisite dosing roller and install in the reverse order.

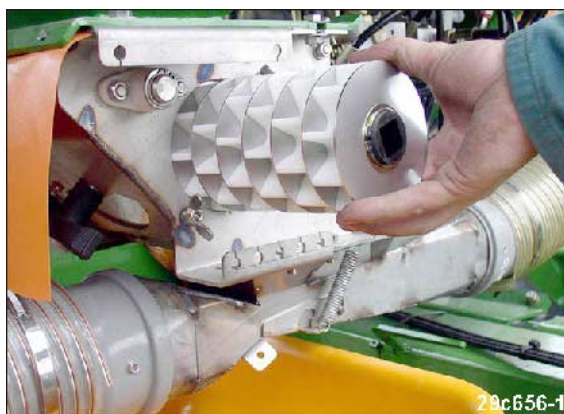


Fig. 120

7. Repeat the procedure for the second dosing unit (if fitted). Equip both seed dosing units with the same dosing roller.



Don't forget to open all sliders (Fig. 117/1).
Secure each slider with a linch pin (Fig. 117/2).

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 157).
2. Lower the machine fully by inserting the integrated running gear completely. Here the machine can be coupled or uncoupled.
3. Apply the handbrake, switch the tractor engine off and remove the ignition key.
4. Remove the calibration troughs from the transport mounting on the rear wall of the hopper.



Fig. 121

The calibration troughs are nested for transport and fastened to the rear wall of the hopper secured with a linch pin (Fig. 121/1).



CAUTION

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

5. Push a calibration trough into the mounting under each seed doser.



Fig. 122

Settings

6. Open the injector sluice flap (Fig. 123/1) on all seed dosing units.



CAUTION

Risk of contusions on opening and closing the injector sluice flap (Fig. 123/1)!

Hold the injector sluice flap only by the lug (Fig. 123/2), otherwise there is a danger of injury when the spring-loaded injector sluice flap snaps closed.

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

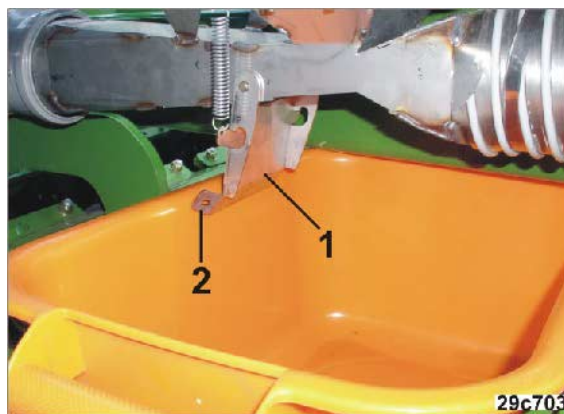


Fig. 123



Adjust the sowing rate with subsequent calibration test, depending on the machine equipment, as described in the following sections.

8.3.1 Adjusting sowing rate with calibration test on machines with Vario gearbox without electronic seed rate adjustment

1. Set in the **AMATRON⁺**,
Seed rate remote control: none
2. If required, set a job in the **AMATRON⁺**.
 - 2.1 Open the menu "Job".
 - 2.2 Select the job number.
 - 2.3 Enter the job name (optional).
 - 2.4 Enter job notes (optional).
 - 2.8 Start the job (press the "Start job" button).
3. Undo the locking button (Fig. 124/1).
4. Consult the table (Fig. 125, below) for the gearbox setting value for the first calibration test.
5. Set the pointer (Fig. 124/2) of the gearbox lever **from below** to the gearbox setting value.
6. Tighten the locking button.

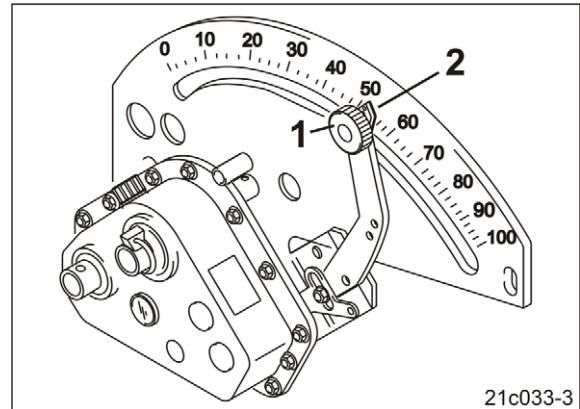


Fig. 124

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. 125

7. Remove the calibration crank (Fig. 126/1) from the transport bracket.



Fig. 126

Settings

8. Push the calibration crank handle (Fig. 127/1) onto the star wheel (Fig. 127/2).
9. Turn the star wheel with the calibration crank handle counterclockwise until all chambers of the dosing rollers are filled with seed and a uniform seed stream flows into the calibration troughs.
10. Close the injector sluice flaps (Fig. 123/1) with special care (danger of crushing, see danger notice).
11. Empty the calibration troughs and push them back under the seed dosing units.

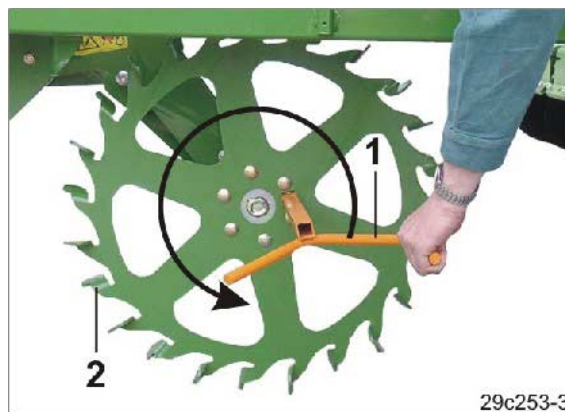


Fig. 127



12. Open the injector sluice flaps (Fig. 123/1).
13. Turn the star wheel anticlockwise the number of crank turns specified in the table (Fig. 128).

The number of crank turns on the star wheel depends on the seed drill working width (Fig. 128/1).

The number of wheel revolutions (Fig. 128/2) relates to an area of

- 1/40 ha (250 m²) or
- 1/10 ha (1000 m²).

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.

		
	1/40 ha	1/10 ha
3,0 m	38,5	154,0
4,0 m	29,0	115,5
6,0 m	19,5	77,0
8,0 m	14,5	58,0
9,0 m	13,0	51,5
12,0 m	9,5	38,5

1

2

ME533

Fig. 128

14. Weigh the volume of seed caught in the calibration troughs (taking the container weight into consideration) and multiply
 - o by a factor of 40 (for 1/40 ha) or
 - o by a factor of 10 (for 1/10 ha).



Check the accuracy of the scales display.

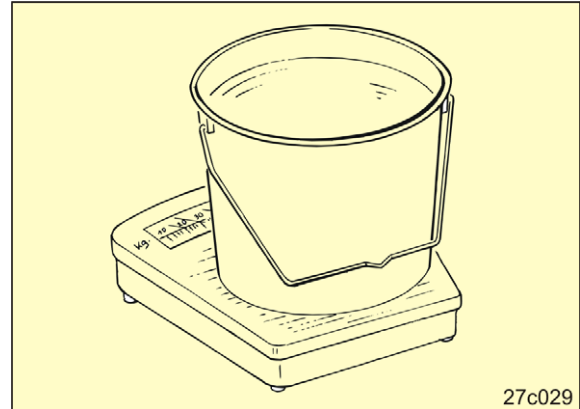


Fig. 129

Calibrating on 1/40 ha:

$$\text{Sowing rate [kg/ha]} = \text{volume of seed in test [kg/ha]} \times 40$$

Calibrating on 1/10 ha:

$$\text{Sowing rate [kg/ha]} = \text{volume of seed in test [kg/ha]} \times 10$$

Example:

Volume of seed in test: 3.2 kg on 1/40 ha

$$\text{Sowing rate [kg/ha]} = 3.2 \text{ [kg/ha]} \times 40 = 128 \text{ [kg/ha]}$$



The desired sowing 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 sowing rate calculated from that (see "Determining the gearbox setting using the calculating disc rule", on page 120).

15. Repeat the calibration test until the desired sowing rate is achieved.
16. Secure the calibration troughs on the seed hopper.
17. Close the injector sluice flap with special care (see danger notice [Fig. 123]).
18. Clip the calibration crank into its transport bracket.

8.3.1.1 Determining the gearbox setting using the calculating disc rule

Example:

Values from the calibration test

computed sowing rate: 175 kg/ha

gearbox setting: 70

Desired sowing rate: 125 kg/ha.

1. Line up the values from the calibration test
 - o computed sowing rate 175 kg/ha (Fig. 130/A)
 - o gearbox setting 70 (Fig. 130/B)
 opposite one another on the calculating disc rule.
 2. Read the gearbox setting for the desired sowing rate of 125 kg/ha (Fig. 130/C) from the calculating disc rule.
- Gearbox setting 50 (Fig. 130/D).
3. Set the gearbox lever to the value read from the disc.
 4. Check the gearbox setting with another calibration test (see 8.3.1, on page 117).

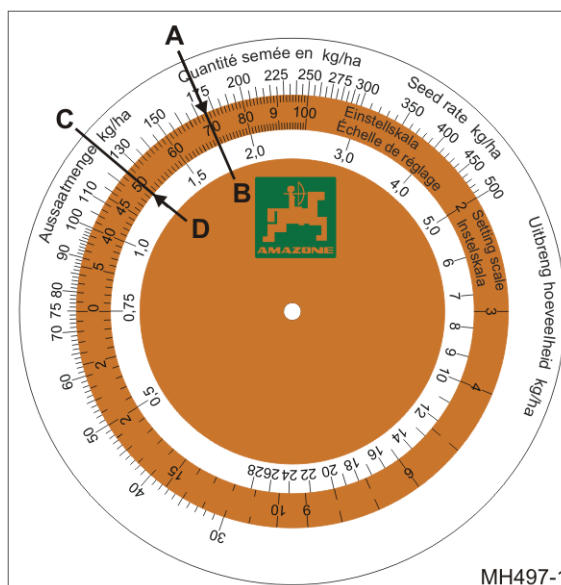


Fig. 130

8.3.2 Adjusting sowing rate with calibration test on machines with Vario gearbox with electronic seed rate adjustment

1. Adjust the desired sowing rate in the **AMATRON⁺**.
 - 1.1 Open the menu "Job".
 - 1.2 Select the job number.
 - 1.3 Enter the job name (optional).
 - 1.4 Enter job notes (optional).
 - 1.5 Enter the seed type.
 - 1.6 Enter the 1000 grain weight (required only with a grain meter).
 - 1.7 Enter the desired sowing rate.
 - 1.8 Start the job (press the "Start job" button).

2. Remove the calibration crank (Fig. 131/1) from the transport bracket.



Fig. 131

3. Push the calibration crank handle (Fig. 132/1) onto the star wheel (Fig. 132/2).
4. Turn the star wheel with the calibration crank handle counterclockwise until all chambers of the dosing rollers are filled with seed and a uniform seed stream flows into the calibration troughs.
5. Close the injector sluice flap (Fig. 123/1) with special care (danger of crushing, see danger notice).
6. Empty the calibration troughs and push them back under the seed dosing units.

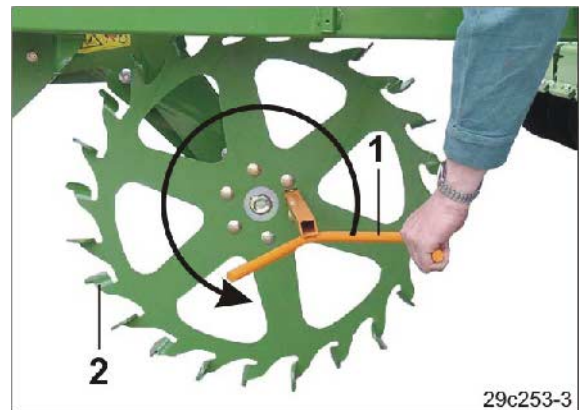


Fig. 132

7. Open the injector sluice flaps (Fig. 123/1).
8. Adjust the sowing rate with calibration test as described in the **AMATRON⁺** operating manual.



During the calibration test the **AMATRON⁺** requests that the calibration crank handle be turned counterclockwise until a signal tone sounds.

The number of crank handle turns for the calibration test until the signal tone sounds is governed by the sowing rate:

0 to 14.9 kg → Crank turns to 1/10 ha

15 to 29.9 kg → Crank turns to 1/20 ha

from 30 kg → Crank turns to 1/40 ha.

9. Secure the calibration troughs on the seed hopper.
10. Close the injector sluice flaps with special care (see danger notice [Fig. 123]).
11. Clip the calibration crank into its transport bracket.

8.3.3 Adjusting sowing rate with calibration test on machines with full dosing

1. Adjust the desired sowing rate in the **AMATRON⁺**.
 - 1.1 Open the menu "Job".
 - 1.2 Select the job number.
 - 1.3 Enter the job name (optional).
 - 1.4 Enter job notes (optional).
 - 1.5 Enter the seed type.
 - 1.6 Enter the 1000 grain weight (required only with a grain meter).
 - 1.7 Enter the desired sowing rate.
 - 1.8 Start the job (press the "Start job" button).
 - 1.9 Adjust the sowing rate with calibration test as described in the operation manual **AMATRON⁺** (see section "Calibrating machines with electr. full dosing").



The number of engine revolutions for the calibration test until the signal tone sounds is governed by the sowing rate:

- 0 to 14.9 kg → Engine revolutions to 1/10 ha
- 15 to 29.9 kg → Engine revolutions to 1/20 ha
- from 30 kg → Engine revolutions to 1/40 ha.

2. Secure the calibration troughs on the seed hopper.
3. Close the injector sluice flaps with special care (see danger notice [Fig. 123]).

8.4 Adjusting blower fan speed

The pressure relief valve (Fig. 133) on the fan blower hydraulic motor.

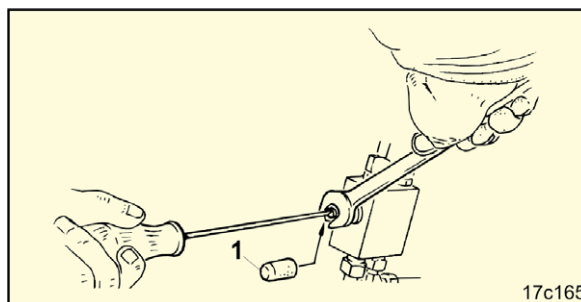


Fig. 133

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

1. Remove the protective cap (Fig. 133/1).
2. Release the lock nut.
3. Close the pressure control valve.
To do so, turn the screwdriver clockwise.
4. Open the pressure control valve by half a turn.
To do so, turn the screwdriver counterclockwise by half a turn.
5. Tighten the lock nut.
6. Put on the protective cap.
7. Set the requisite fan speed on the flow control valve of the tractor.
The fan speed is displayed on the Machine Data menu (see section 8.4.3, on page 125) and on the Work menu

8.4.2 Adjust the blower speed on the machine pressure limiting valve

1. Remove the protective cap (Fig. 133/1).
2. Release the lock nut.
3. Set the fan speed with a screwdriver on the pressure relief valve.

Fan speed

Turning clockwise: increases the fan speed

Turning to the left: reduces the fan speed.

The fan speed is displayed on the Machine Data menu (see section 8.4.3, on page 125) and on the Work menu

4. Tighten the lock nut.
5. Put on the protective cap.

8.4.3 Setting the fan speed monitoring on the **AMATRON⁺**

Set the fan speed monitoring on the Machine Data menu (see **AMATRON⁺** operating manual)

- input the fan speed (rpm) that is to be monitored or
- adopt the current fan speed (rpm) during operation as the speed to be monitored.

8.4.3.1 Triggering of the alarm, if the fan speed differs from the setpoint

Setting of the alarm, if the fan speed differs from the setpoint in the Basic Data menu (see **AMATRON⁺** operating manual).


The gradual percentage deviation [± 10 (%)] from the setpoint has to be set.

8.5 Setting the coulter pressure



WARNING

Direct people out of the danger area.

1. Select the coulter button  on the **AMATRON⁺** and by actuating control unit 2
 - o admit pressure to the hydraulic cylinder or
 - o put it in float position.
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
3. Insert one pin (Fig. 134/1) below and above the stop (Fig. 134/2) into the adjusting segment and secure with clip pins.

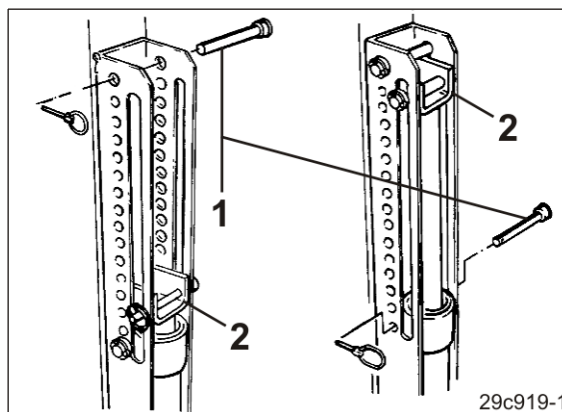


Fig. 134

Each of the holes is identified with a number.

The greater the number of holes into which the pin is inserted, the greater the coulter pressure.



This setting influences the planting depth of the seed.

Check the planting depth of the seed after every adjustment (see "Checking the seed planting depth", on page 164).

8.5.1 Setting the RoTeC plastic discs

If it is not possible to achieve the desired planting depth as described in section “Setting the coulter pressure”, on page 126, adjust all RoTeC plastic discs evenly in accordance with the table (Fig. 135).

Each plastic disc can engage in three positions on the RoTeC coulter or be removed from the RoTeC coulter.

Then again adjust the planting depth as described in section “Setting the coulter pressure”, on page 126.



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

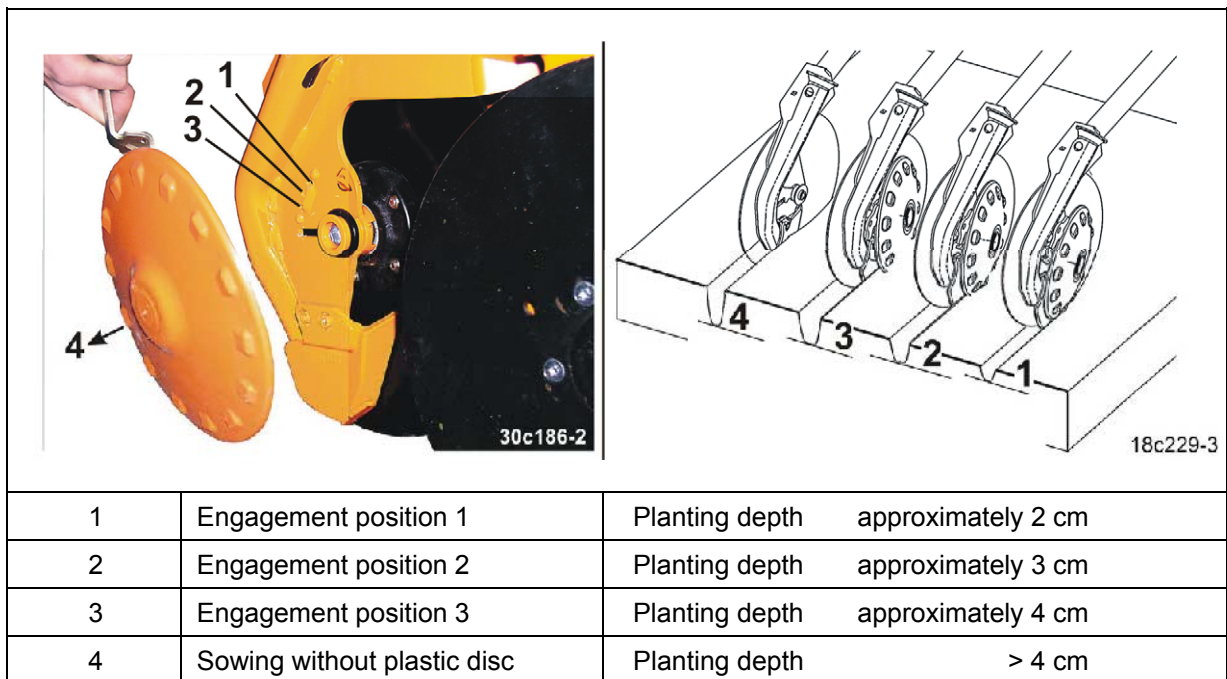


Fig. 135

Engagement position 1 to 3

1. Engage the handle (Fig. 136/1) in one of the 3 positions.



Fig. 136

Sowing without plastic disc

1. Turn the handle beyond the engagement catch (Fig. 137/1) and remove the plastic disc from the RoTeC coulter.

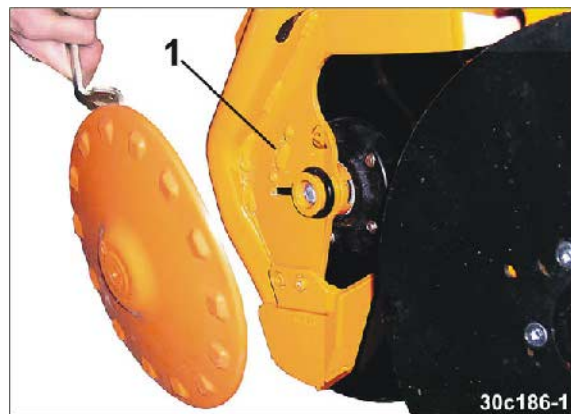


Fig. 137

Installing RoTeC plastic disc



Secure the RoTeC plastic disc with the designation

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

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

8.6 Adjusting the exact harrow



Check the work results after each adjustment.

8.6.1 Adjusting the spring tines

Adjust the spring tines in accordance with Table (Fig. 139).

Adjustment is made by changing the distance "X" (Fig. 138) on all segments with the screw (Fig. 138/1).

1. Set the machine on the field to its working position (see section "Use of the machine", on page 151).
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
3. Release the two lock nuts (Fig. 138/2).

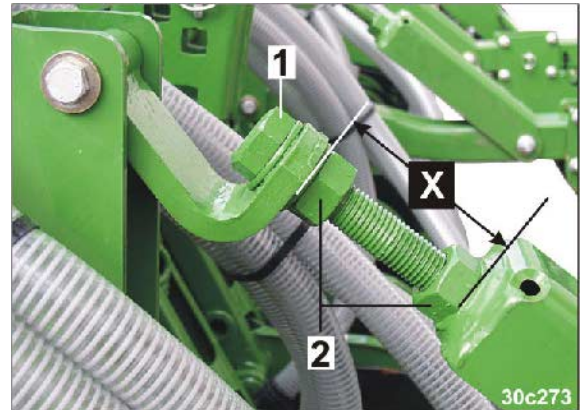


Fig. 138

4. Set the required distance "A".

Reduce distance "A": Increase distance "X".

Increase distance "A": Reduce distance "X".

5. Firmly tighten counter nuts (Fig. 138/2).
6. Apply the same setting to all segments.

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

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

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

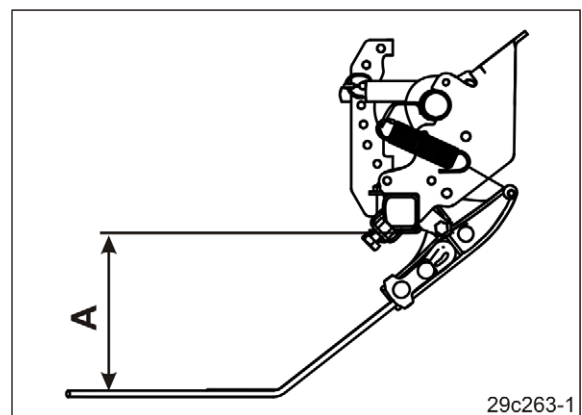


Fig. 139

8.6.2 Setting the exact harrow pressure

1. Tension the lever (Fig. 140/1) with the calibration crank.
2. Insert the bolt (Fig. 140/2) into a boring under the lever.
3. Relieve the lever.
4. Secure the bolt with a spring pin.
5. Apply the same setting to all adjusting segments.



Fig. 140

8.6.2.1 Setting the exact harrow pressure (hydraulic adjustment)



WARNING

Direct people out of the danger area.


1. Select the coulters button  on the **AMATRON⁺** and by actuating control unit 2
 - o admit pressure to the hydraulic cylinder or
 - o put it in float position.
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
3. Insert one pin each (Fig. 141/1) under and over the lever into the adjusting segment and secure it with safety splints.



Fig. 141

8.7 Roller harrow



DANGER

Only make adjustments when the integrated running gear is moved in, i.e. the machine is fully lowered.



DANGER

Make adjustments only when the tractor parking brake is applied, the engine switched off and the ignition key removed.

8.7.1 Setting working depth and angle of harrow tines

1. Raise the machine above the integrated running gear only enough so that the harrow tines are immediately above the ground, but not touching it.
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
3. Hold the harrow tines beam by the carrier handle (Fig. 142/3).
4. Set the working depth of the harrow tines by positioning the carrying arm with the bolt
 - o in all segments
 - o in the same hole.

The deeper the pin is inserted in the adjusting segment, the greater the work depth.

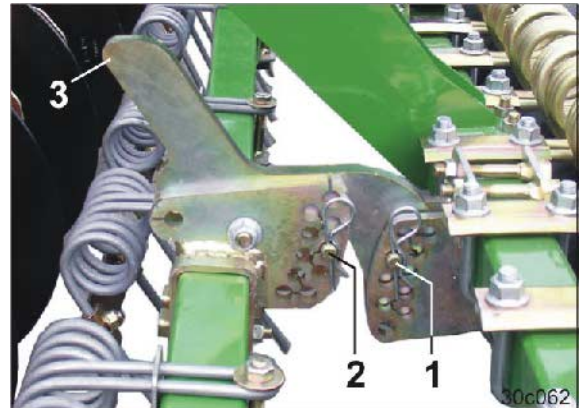


Fig. 142

5. After each repositioning, secure the pin with safety splint.

Settings

6. Change the angle of the times to the ground by repositioning the bolt (Fig. 143/2)
 - o in all segments
 - o in the same hole.

Ensure that the pin (Fig. 143/2) is positioned below the carrier (Fig. 143/3) in the adjusting segment.

The deeper the pin (Fig. 143/2) is inserted in the adjusting segment, the flatter the angle.

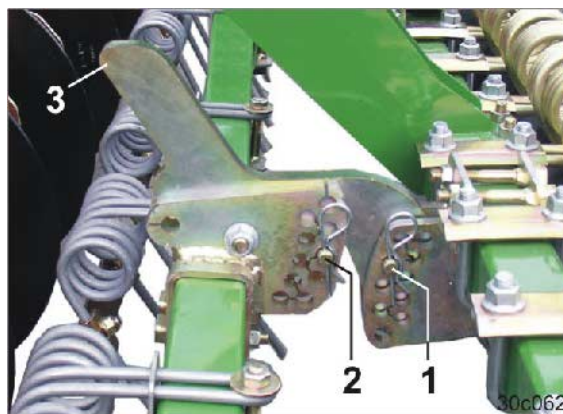


Fig. 143

7. After each repositioning, secure the pin (Fig. 143/2) with safety splint.
8. Move in the integrated running gear, i.e. lower the machine completely.

8.7.2 Adjusting roller pressure

The roller pressure is adjusted by changing the distance "X" (Fig. 144) on all segments with the screw (Fig. 144/1).

1. Set the machine on the field to its working position (see section "Use of the machine", on page 151).
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
3. Release the two lock nuts (Fig. 144/2).

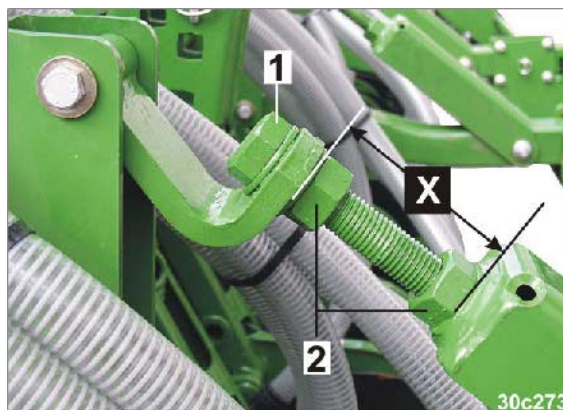


Fig. 144

4. Set the required distance "X".

Increase roller pressure: Increase distance "X"

Reduce roller pressure: Reduce distance "X"

5. Firmly tighten counter nuts (Fig. 144/2).
6. Apply the same setting to all segments.
7. Check the work results.

8.8 Adjusting the disc array (on the field)

8.8.1 Adjusting disc array working depth with machine setting "Turning on the axle"





Adjust the disc array working depth immediately before starting work on the field.

Correct the setting, if necessary without interruption during work.




DANGER

Direct people out of the danger area.

1. Select the  button
(see operating manual **AMATRON⁺**).
- The symbol  appears on the display.
2. Actuate control unit 2 until the desired disc array working depth is reached.

The working depth of the discs array determines the working intensity.



When the symbol  disappears from the display, the disc array actuation is deactivated.

The disc array actuation is deactivated as soon as another selection is made, e.g. harrow pressure adjustment.

8.8.2 Adjusting disc array working depth with machine setting "Turning on the roller"



Turning the Cirrus 3001 on the roller is not possible.

1. Set the disc array working depth (see section 8.8.1, on page 133).
2. Leave the disc array in operational position and stop the tractor.
3. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.



DANGER

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

4. Release the wing nuts (Fig. 145/1).
5. Position the sensor (Fig. 145/2) and the magnet (Fig. 145/3) one above the other.
6. Tighten the wing nut by hand.

Pushing the sensor in the direction of the arrow increases the working depth of the disc array.

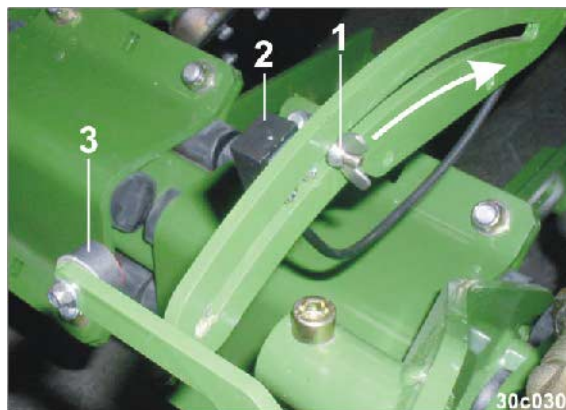


Fig. 145



The disc array

- is raised before turning at the end of the field, and always assumes the operational position set with the sensor after turning.
- can be adjusted during work (see section 8.8.1, on page 133).

8.8.3 Setting the length of the outer disc struts

In each disc row the length of the outer disc struts is adjustable.

Shorten the disc struts

- of the front row of discs, if the outer discs are conveying too much soil outwards.
- of the rear row of discs, if the outer discs are conveying too much soil inwards.

Firmly tighten the nuts after adjustment.



Fig. 146

8.8.4 Adjusting the outside hollow discs

Adjust the outside hollow discs (Fig. 147/1) so that they just contact the ground surface.

Tighten the screws (Fig. 147/2) firmly after adjustment.

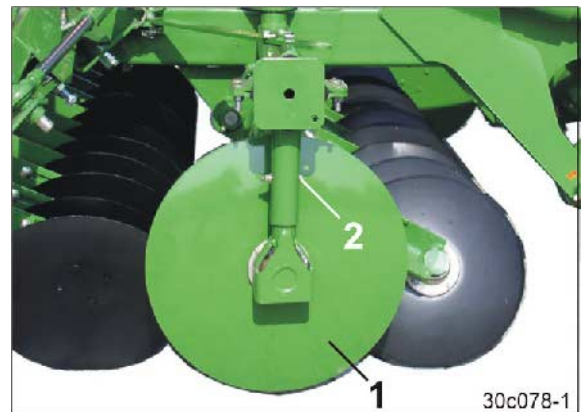


Fig. 147



CAUTION

Danger of getting crushed when adjusting the outside hollow discs.



The outside hollow discs of the Cirrus 3001 are folded inwards for transport (see section "Transportation", on page 142).

8.9 Setting the wheel mark eradicator (on the field)



DANGER

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

To set the track loosener horizontally:

1. Release the screws (Fig. 148/1) and slide the track loosener horizontally.
2. Tighten the screws.

To set the track loosener vertically:

1. Hold the track loosener by the handle (Fig. 148/2).
2. Remove the bolt (Fig. 148/3).
3. Put the track loosener in vertical position, position it with the bolt and secure it with a linch pin.

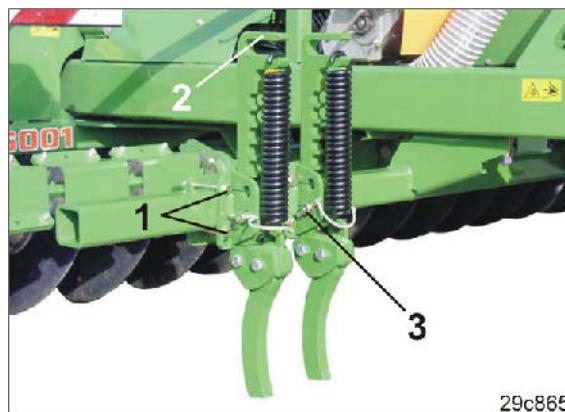


Fig. 148

8.10 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 out of the danger area.
2. Fold out both track markers simultaneously on the field (see **AMATRON⁺** operating manual) and drive several metres.
3. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
4. Slacken the wedge bolt (Fig. 149/1).
5. Set the track marker length to distance "A" (see table, Fig. 150, below).
6. Tighten the wedge bolt (Fig. 149/1).

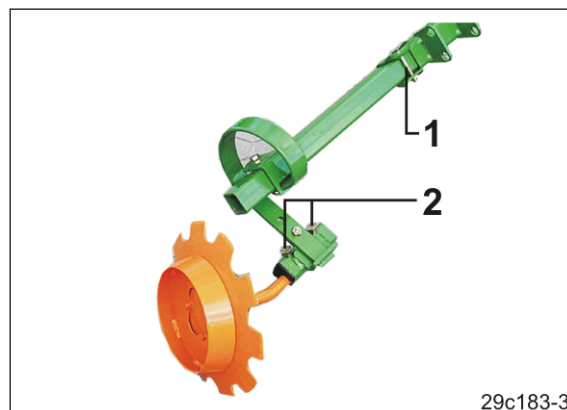


Fig. 149

7. Release both screws (Fig. 149/2).
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. 149/2).
10. Repeat the operation on the second track marker.

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"
Cirrus 3001	3.0 m
Cirrus 4001	4.0 m
Cirrus 6001	6.0m

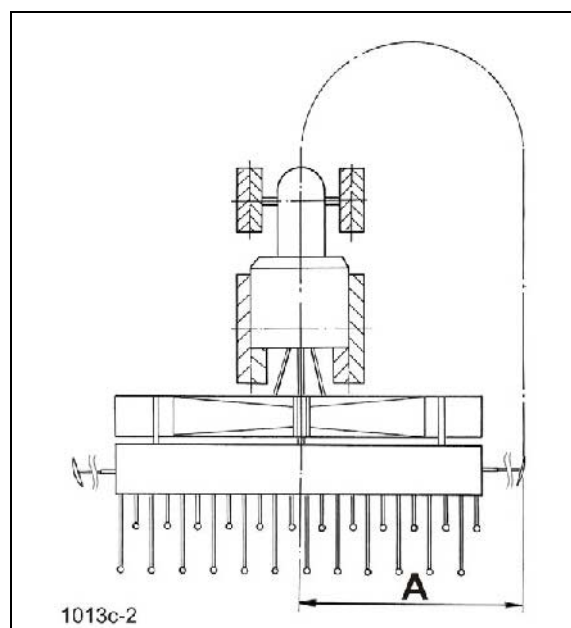


Fig. 150

8.10.1 Setting the tramlining rhythm/meter on the **AMATRON⁺**

1. Select the tramlining rhythm
(see table, Fig. 94, on page 86).
2. Set the tramlining rhythm on the Machine Data menu (see **AMATRON⁺** operating manual).
3. Refer to Fig. (Fig. 95 on page 87) for the tramline counter of the first field run.
4. Enter the tramline counter of the first field run in the Work menu (see **AMATRON⁺** operating manual).
5. Set seed volume reduction (%) when creating tramlines in the Machine Data menu (see **AMATRON⁺** operating manual).
6. Switch on/off the interval tramline switch in the Work menu (see **AMATRON⁺** operating manual).



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



→ prevents the tramline counter switching up a number before the machine is raised (see **AMATRON⁺** operating manual).



Blocking the star wheel or switching off the **AMATRON⁺**

→ prevents the tramline counter switching up a number before the folded-in machine is lowered (see **AMATRON⁺** operating manual). The star wheel is locked when **AMATRON⁺** is switched off.

8.11 Half-sided switching off

Machines without full dosing

1. Fold out the machine (see section "Folding the machine extension arm in/out", on page 152).
2. Lower the machine fully by moving in the integrated running gear completely.
3. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.



DANGER

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

4. Remove one of the two lynch pins (Fig. 151/1).

Switch off the right side of the machine:
remove the right lynch pin.

Switch off the left side of the machine:
remove the left lynch pin.

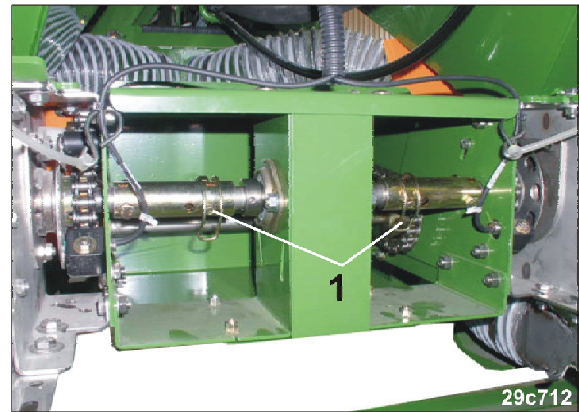


Fig. 151

Machines with full dosing

For half-sided switching-off of the machines with full dosing please refer to the **AMATRON+** operating manual.

8.11.1 Moving the track disc carrier of the tramline marker to the operational/transport position

8.11.2 Move the track disc carrier from the transport to the operational position

1. Secure the track disc carrier (Fig. 152/1).
2. Remove the lynch pin (Fig. 152/2).
3. Withdraw the pin (Fig. 152/3).
4. Swivel the track disc carrier down.
5. Repeat the operation on the second track disc carrier.

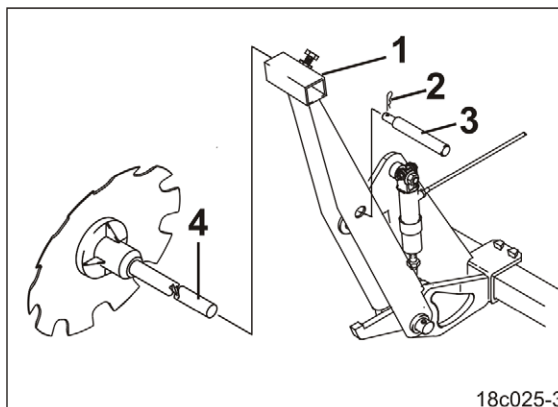


Fig. 152



DANGER

Direct people out of the danger area.

6. Set the tramline counter to "zero" (see **AMATRON⁺** operating manual).
7. Operate control unit 1.
→ The track ring carriers are lowered to the operational position.
8. Apply the tractor parking brake, switch off the engine and remove the ignition key.
9. Insert the track discs (Fig. 152/4) into the track disc carriers.

10. Set the track discs so that they mark the tramline created by the tramline coulters.
11. Adapt the work intensity to the soil by turning the discs (position the discs on light soils roughly parallel to the direction of travel and on heavy soils more on in a forward position).
12. Tighten the screws (Fig. 153/1) firmly.

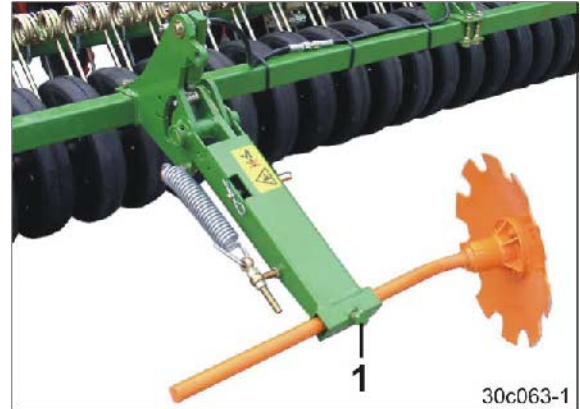


Fig. 153



When working with tramline rhythm 2 and tramline rhythm 6 plus (see also section 5.18.3, on page 89) fit only one of the two track marker discs.

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

8.11.3 Set the track disc carrier to transport position

Set the track disc carrier to transport position in reverse sequence to that described in section 8.11.2, on page 140.



During transport, store the track discs (Fig. 152/4) in a suitable stowing space.

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.



- For transport journeys take heed of the section "Safety information for users", on page 32.
- 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
 - The function of the brake system.



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.

Comply with the maximum load of the connected machine and the approved axle and support loads of the tractor. Drive only with empty hopper.

**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.

**WARNING**

Risk of stabbing other road users during transportation from uncovered, sharp spring tines of the exact harrow on the central part of the machine pointing backwards!

Transportation without a correctly fitted transport guard rail is forbidden.

Moving the Cirrus to transport position on the field after work

1. Fold in both track markers (see **AMATRON⁺** operating manual).
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

**DANGER**

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

Cirrus 3001 only

3. Fit the lug (Fig. 154/1) on the journal (Fig. 154/2) of the marker and secure the connection with a clip pin (Fig. 154/3).



The marker secured with a lug cannot swivel during transport.

4. Repeat the operation on the second track marker.

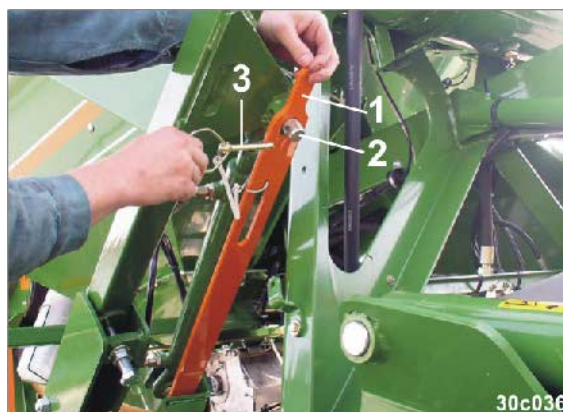


Fig. 154



DANGER

Secure the marker before transport against unintended swiveling.



During the work, the lug (Fig. 155/1) is located on the bracket (Fig. 155/2) and is secured with the clip pin (Fig. 155/3).



Fig. 155

5. Put the right-hand outside hollow disc (Fig. 156/1) in transport position by shifting the lever (Fig. 156/2).



CAUTION

Danger of getting crushed.
Hold the side disc (Fig. 156/1) only by the lever (Fig. 156/2).

6. Secure the side disc in transport and operational position with a pin (Fig. 156/3) in the holes (Fig. 156/4).
7. After each repositioning, secure the pin with a clip pin.
8. Swivel the left-hand outside hollow disc (Fig. 157/1) to transport position.

The outside hollow disc is fastened in transport position and in operating position to the lug (Fig. 157/2), positioned with a bolt (Fig. 157/3) and secured with a linch pin.



Fig. 156



Fig. 157



WARNING

Put the outside hollow discs in transport position prior to transport.

Otherwise the outside hollow discs extend laterally into the traffic area during transport journeys and endanger other road users.

In addition the permissible transport width of 3 m is exceeded.

Transportation

9. Release the screw.
10. Insert the outside harrow element (Fig. 158/1) to transport width (3.0 m).
11. Tighten the screw firmly.
12. Repeat the operation on the second outside harrow element.



Fig. 158



WARNING


Danger of cuts during transport journeys with the outer harrow elements extended!

Extended outer harrow elements extend laterally into the traffic area during transport journeys and endanger other road users. In addition the permissible transport width of 3 m is exceeded.

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

All types

13. Drain the seed hopper (see section "Emptying the hopper and/or dosing unit", on page 169).



DANGER

Empty the seed hopper on the field.

Transport journeys on roads and ways are prohibited when the seed hopper is filled. The brake system is designed for an empty machine only.



Fig. 159

14. Close the hopper cover and secure it with rubber loops (Fig. 160/1) against unintentional opening during travel.

Use the cover hook (Fig. 160/2).



Fig. 160

When not in use the cover hook (Fig. 161/1) remains inserted in the transport mounting (Fig. 161/2) on the lighting beam.

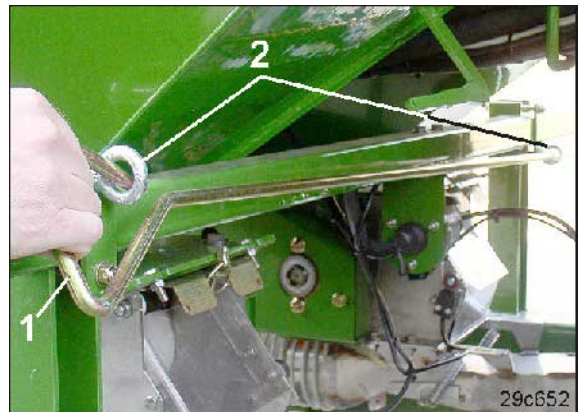



Fig. 161

Transportation

15. Lift up and lock the ladder (Fig. 162).



CAUTION
Danger of getting crushed. Hold the ladder only at the marked positions.



Fig. 162



Push the ladder (Fig. 162) up and lock it after each use or before transport and prior to working. This avoids damaging the ladder.

The draw bar can damage the lowered ladder when the machine is turned!

16. Move the track disc carrier (Fig. 163/1) to the transport position (see section "Moving the track disc carrier of the tramline marker to the operational/transport position", on page 140).
17. Pull the track discs (Fig. 163/2) out of the track disc carrier and carry them with you in a suitable stowing space.

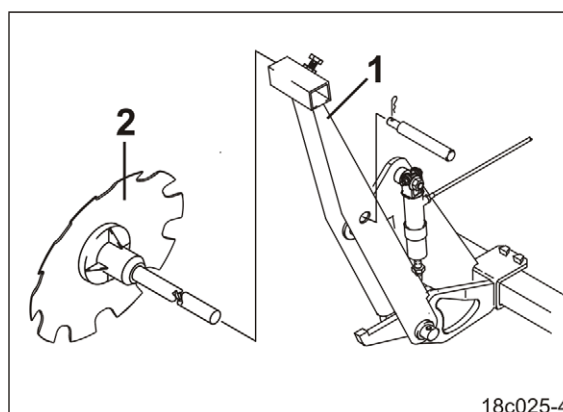
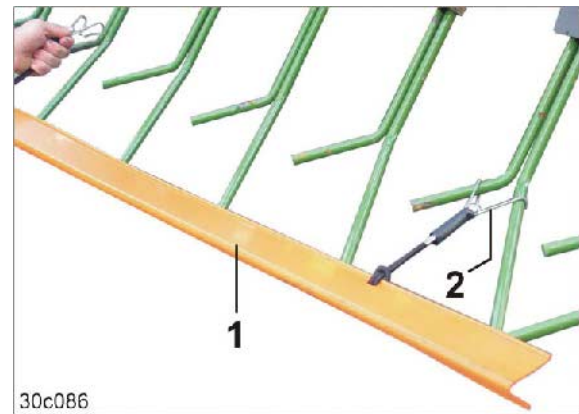


Fig. 163

18. Push the two-part transport securing bar (Fig. 164/1) over the tine tips of the exact harrow.
Install the road safety bars, starting from the middle of the machine, on the foldable machine.
19. Fasten the transport securing bar with spring holders (Fig. 164/2) to the exact harrow.
20. Fold in the machine's extension arm (see section "Folding the machine extension arm in/out", on page 152).
21. Block the tractor control units.

**Fig. 164****Fig. 165**

Lock the tractor's control units during transport!

Transportation

22. Switch off the **AMATRON⁺**.
(see **AMATRON⁺** operating manual).



DANGER

Switch off the **AMATRON⁺** during transport.



Fig. 166

23. Check the lighting system for operation (see section "Transportation equipment", on page 48).



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



Fig. 167



- The permissible maximum speed of the machine is 40 km/h¹⁾. In particular on bad roads and ways 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 30.

Observing this information is important for your safety.



WARNING

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

Comply with the maximum load of the connected machine and the approved axle and support loads of the tractor. Drive only with empty 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 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 driver and the attached machine.



WARNING

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

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



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

10.1 Folding the machine extension arm in/out (except Cirrus 3001)



DANGER

Instruct people to leave the swivel area of machine's extension arm before you fold the machine's extension arm 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 the machine is fully raised do the soil cultivating tools have sufficient ground clearance and are thus protected against damage.

10.1.1 Folding out the machine's extension arms

1. Switch on the **AMATRON⁺** (see **AMATRON⁺** operating manual).
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. Raise the machine fully by moving the integrated running gear (Fig. 168/1) out completely.
 - 3.1 Actuate control unit 1 until the machine is fully raised.

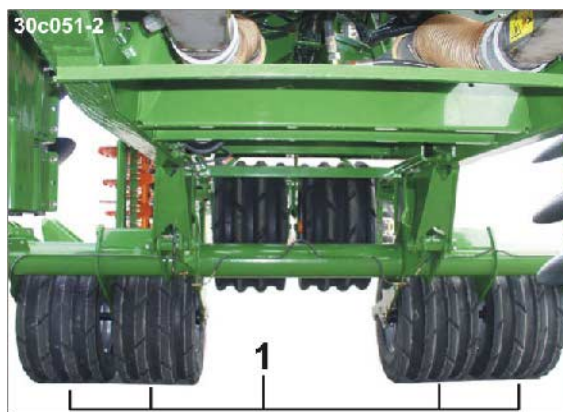



Fig. 168

4. Apply the tractor parking brake.
5. Call the Work menu on the **AMATRON⁺**.
6. Press the shift key (key on the rear side of the **AMATRON⁺**).
7. Press the  key.

→ The "Fold" menu appears on the display.
8. Select the "Unfold machine extension arm" submenu and follow the instructions on the display.



Follow the instructions on the display before you confirm the instructions in order to prevent any collisions of the machine components.

9. Fold in the lighting (Fig. 169/1), position it with a pin (Fig. 169/2) and secure with a clip pin.



Fold in the lighting in order to prevent damage when folding out the machine extension arm.

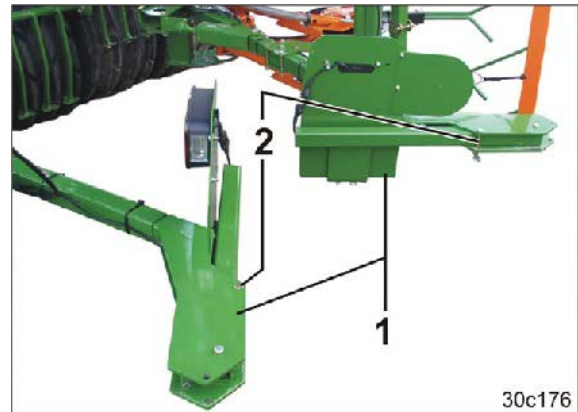


Fig. 169

10. Fold out the machine extension arms completely.
 - 10.1 Actuate control unit 2 until the machine extension arms are fully folded out.
 - 10.2 Actuate control unit 2 for a further 3 seconds so that the hydraulic accumulator (Fig. 231) is filled with hydraulic fluid.



Fig. 170



The locking hooks (Fig. 171/1) open automatically before folding out the machine's extension arm.

Position control unit 2 briefly on "Fold in" and then again on "Fold out", should the locking hooks not open.



Fig. 171

11. Exit the "Folding" menu.
12. Put the Cirrus in its working position (see section "Work commencement", on page 163).

10.1.2 Folding in the machine's extension arms

1. Release the tractor parking brake and take your foot off the brake pedal.
Never leave the tractor cab with the parking brake released.
2. Raise the machine fully by moving the integrated running gear (Fig. 172/1) out completely.
- 2.1 Actuate control unit 1 until the machine is fully raised.

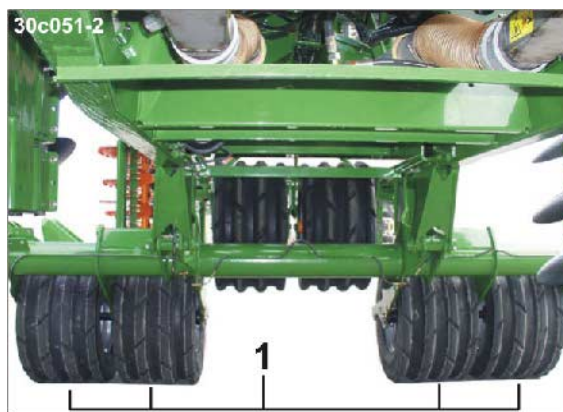



Fig. 172

3. Apply the tractor parking brake.
4. Call the Work menu on the **AMATRON⁺**.
5. Press the shift key
(key on the rear side of the **AMATRON⁺**).
6. Press the  key.
- The "Fold" menu appears on the display.
7. Select the "Fold in machine extension arm" submenu and follow the instructions on the display.



Follow the instructions on the display before you confirm the instructions in order to prevent any collisions of the machine components.



The disc array automatically moves to the transport position.

8. Fold in the machine's extension arms completely.
- 8.1 Actuate control unit 2 until the machine extension arms are fully folded in.
- 8.2 Switch off the **AMATRON⁺**
(see **AMATRON⁺** operating manual).



Fig. 173



DANGER

Check whether the coulter frame has been folded in to transport width.

The locking hooks (Fig. 174/1) form the mechanical transport locking device and engage onto the locking spigot (Fig. 174/2).



DANGER

Check whether the bars (Fig. 174/1) are engaged properly after folding in the extension arms.



Fig. 174

9. Fold out the lighting (Fig. 175/1), position with pins (Fig. 175/2) and secure with clip pins.

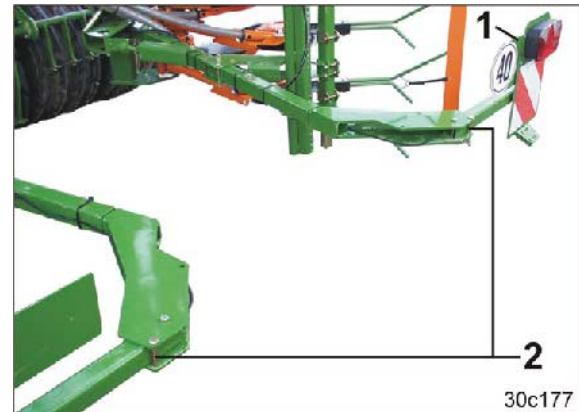


Fig. 175

10. Move in the integrated running gear until the machine is horizontal.
 - 10.1 Actuate control unit 1 until the machine is in a horizontal position.



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



Fig. 176

10.2 Removing the transport safety bar

1. Release the spring holders (Fig. 177/2) and remove the road safety bar (Fig. 177/1).

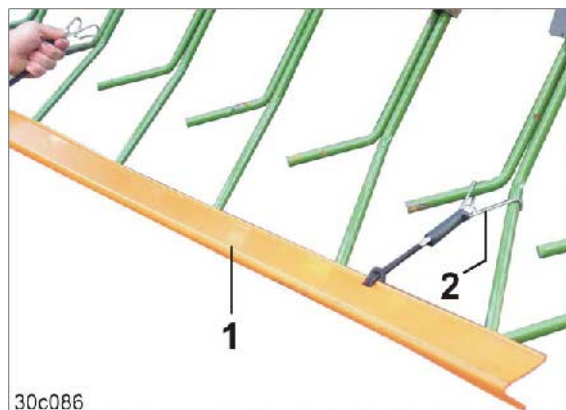


Fig. 177

2. Insert the two parts of the transport safety bar (Fig. 178/1) into each other and secure it on the transport bracket (Fig. 178/2) with the spring holders.



Fig. 178

Only Cirrus 3001 with exact harrow

3. Undo the bolt and push the outside harrow element (Fig. 179/1) outwards.
4. Tighten the bolt.
5. Repeat the operation on the outside harrow element.

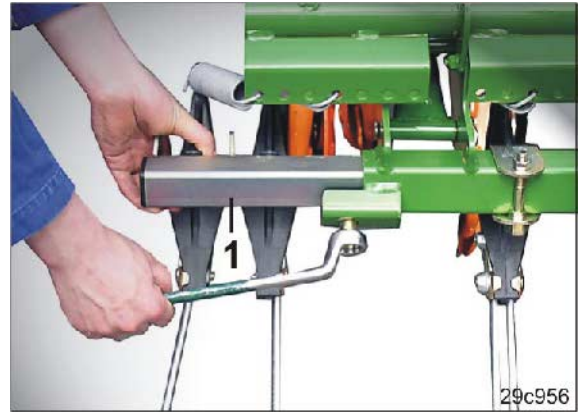


Fig. 179



The coulters on the seed drill force the soil outwards to different extents depending on the travel speed and condition of the soil. Push the outside harrow element further outwards at higher travel speeds.

Set the outside harrow elements such that the soil is guided back and a trackless seed bed is created.

Check the settings before starting work.

10.3 Filling the seed hopper



DANGER

Fill the seed hopper on the field only!

Transport journeys on roads and ways are prohibited when the seed hopper is filled. The brake system is designed only for an empty machine.

Before filling the seed hopper apply the tractor parking brake, switch off the tractor engine and remove the ignition key!

Observe the approved filling levels and total weights!

To fill the seed hopper:

1. Couple the Cirrus to the tractor (see section 7, on page 100).
2. 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. 64, on page 68) (see section. "Installing/removing the dosing roller", on page 113).

Use of the machine

4. Release the rubber loops (Fig. 180/1) together with the cover hook (Fig. 180/2).



Fig. 180

5. Lift the ladder (Fig. 181/) out of its locking device and lower it to the stop.



CAUTION

Danger of getting crushed. Hold the ladder only at the marked positions.



Fig. 181

6. Climb on the loading plate via the ladder.
7. Release the rubber loops on the end face.
8. Open the swivel cover.
9. If necessary, remove foreign bodies in the seed hopper.
10. Adjust the level sensor(s) in the seed hopper (see section "Setting the level sensor", on page 111).



Fig. 182

11. Load the seed hopper
 - o with sacked merchandise from a supply vehicle (see section "10.3.1", on page 160)
 - o with a filling auger from a supply vehicle (see section "10.3.2", on page 160)
 - o from bulk bags (see section "10.3.3", on page 161).

12. Switch the interior lighting of the seed hopper on and off for night-time working.

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



Fig. 183

13. Close the swivel cover and secure it with rubber loops.
14. Pull the ladder (Fig. 181) up and lock it.



Push the ladder (Fig. 181) up and lock it after each use or before transport and prior to working. This avoids damaging the ladder.

The draw bar can damage the lowered ladder when the machine is turned!

10.3.1 Load the seed hopper with sacked merchandise from a supply vehicle

1. Approach the open loading edge of the trailer with the Cirrus.
2. Put the tractor on an extreme steering lock (approx. 90° to the machine).
3. Reverse onto the supply vehicle until the loading plate is lying up against the supply vehicle with no gap, but is not touching the vehicle (marshalling person required).
4. Raise / lower the tractor's lower link until the loading plate and the loading area of the trailer are level.
5. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
6. Fill the seed hopper from the loading plate only and constantly ensure firm support when transporting the sacked merchandise.



Fig. 184



DANGER

Manoeuvring the Cirrus requires a marshalling person.

Never stand between the supply vehicle and the machine.

Always hold tight when crossing the loading plate and supply vehicle (danger of stumbling).

10.3.2 Loading the seed hopper with a filling auger

1. 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. 185



CAUTION

Never move between the supply vehicle and the machine.

10.3.3 Loading the seed hopper from bulk bags

1. Set the Cirrus down on a flat surface.
2. 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 plate.
5. Unload the bulk bag into the seed hopper.



Fig. 186



DANGER

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

10.3.4 Enter the filling volume on the **AMATRON⁺**

If the exact filling volume is known, enter the filling volume on the **AMATRON⁺** (see **AMATRON⁺** operating manual).

It is then possible to input the amount (kg) remaining in the seed hopper in which the level alarm is to be triggered.

The **AMATRON⁺** triggers an alarm, if

- the theoretically calculated remaining amount is reached and the level sensor is logged off on the **AMATRON⁺** or
- the level sensor is no longer covered with seed.

10.4 Remove the transport safety catch of the track markers (only Cirrus 3001 Special)

1. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Fit the lug (Fig. 187/1) on the clamp (Fig. 187/2) and secure with the clip pin (Fig. 187/3).
3. Repeat the operation on the second track marker.



Fig. 187

10.5 Work commencement



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. 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.
 2. Fold the machine extension arms out (see section "Folding the machine extension arm in/out (except Cirrus 3001)", on page 152).
 3. Operate control unit 3.
- Switch on the blower fan.
4. Check the fan speed and correct it as necessary.
 5. Actuate control unit 1 until the machine is lowered, i.e. the integrated running gear is completely moved in.



When lowering, pull the machine forward slightly.

Actuating control unit 1 not only lowers the machine, but also carries out the following hydraulic functions:

- Lowering the star wheel
- Folding out the active track marker, i.e. the one indicated on the display (see operating manual **AMATRON⁺**)
- Lowering the coulter frame (only with machine setting "Turning on the roller" [see section 8.8.2, on page 134])
- Lowering the disc array (only with machine setting "Turning on the roller" [see section 8.8.2, on page 134])
- Closing the seed tubes in the distributor head, if the tramline counter indicates "0" on the **AMATRON⁺** display (see section "Creation of tramlines", on page 84).
- Lowering the discs of the tramline marker, if the tramline counter indicates "0" on the **AMATRON⁺** display (see section "Tramline marker (option)", on page 90).

6. Lower/raise the tractor's lower link until the machine is approximately horizontal. As an orientation aid, there is a chain beside the draw rail.
 7. Check the tramline rhythm on the **AMATRON⁺** display, correct if necessary (see operating manual **AMATRON⁺**).
 8. Check the tramline counter on the **AMATRON⁺** display, correct if necessary (see operating manual **AMATRON⁺**).
 9. Operate control unit 2
(only with machine setting "Turning on the axle").
- Actuate control unit 2 until the required disc array working depth is reached.
10. Start.

10.6 Checks

After 100 m check and correct as necessary the:

- Working intensity of the disc array
- Planting depth of the seed
(see section "Checking the seed planting depth", below).
- Working intensity (depending on the equipment)
 - of the exact harrow,
 - of the drag tines
 - of the seed pressure rollers.

Check on a change from light soil to heavy soil and vice versa

- Planting depth of the seed
(see section "Checking the seed planting depth", below).

10.6.1 Checking the seed planting depth

1. Sow approximately 100 m at working speed.
2. Uncover the seed at several points and check the placement depth.

10.7 During the work

Changing the sowing rate

on machines with

- electr. seed rate adjustment
- full dosing

During the work, the sowing rate (100%) in the work menu can be

- increased as a percentage (e.g. +10%) or
- reduced as a percentage (e.g. -10%) or
- reset to 100%.

The rate increment (e.g. 10 %), which has to be set prior to work commencement in the Machine Data menu, changes the sowing rate percentually. (see **AMATRON⁺** operating manual).

Changing hydr. exact harrow pressure

for machines with hydr. exact harrow pressure adjustment.

During work on changing soils, the exact harrow pressure can be increased on heavy soils (see operating manual **AMATRON⁺**).

Locking the star wheel

When there is a work interruption, if the star wheel is prevented from lifting or lowering when control unit 1 is actuated, lock the star wheel actuation in the Work menu (see **AMATRON⁺** operating manual).

Switching off the tramline counter (STOP button)

If the tramline counter is prevented from indexing when there is a work interruption, press the STOP button in the Work menu (see **AMATRON⁺** operating manual).

Locking the track marker actuation

The track marker actuation can be locked in the Work menu (see **AMATRON⁺** operating manual).

Folding the track marker in before any obstructions

After the obstacle button has been actuated, the track markers can be folded in, e.g. before an obstacle, in order to prevent damage to the track marker caused by hitting the obstacle (see operating manual **AMATRON⁺**).

With active obstacle button

- the field continues to be seeded
- the star wheel, the machine, the coulter frame and the disc array are not raised.

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 "Cleaning the distributor head (workshop)", on page 182].

Seeding with difficult soil conditions

Mud holes can be passed through and seeded by partially or fully raising the disc array and the coulter frame. During this procedure, the star wheel remains in operational position (see operating manual **AMATRON⁺**).

10.8 Turning at end of the field

Before turning at the end of the field

1. Slow down your travel speed.
2. Do not reduce the tractor's rotational speed too far so that the hydraulic functions continue without interruption at the headland.
3. Actuate control unit 1.
4. Turn the combination as soon as the machine or coulter frame is raised.



Fig. 188

After turning at the end of the field

1. Operate the control unit 1 for at least 5 seconds so that all hydraulic functions are fully executed after turning.
2. Start the field run as soon as the disc array touches the ground.



DANGER

After turning, if control unit 1 is actuated the opposite track marker is moved to the operational position.

10.8.1 Turning on the axle

Actuating control unit 1 before turning results in

- Raising of the star wheel
- Raising of the machine via the integrated running gear
- Folding in of the active track marker
- Shifting on of the tramline counter
- Raising of the track disc of the pre-emergence marker.

10.8.2 Turning on the roller (except Cirrus 3001)

1. Press the Shift-key of the **AMATRON⁺** operator terminal and activate the symbol (Fig. 189).

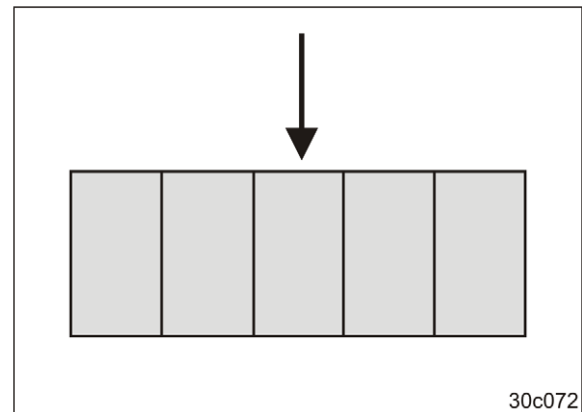


Fig. 189


Actuating control unit 1 before turning results in

- Raising of the star wheel
- Raising of the coulter frame
- Raising of the disc array
- Folding in of the active track marker
- Shifting on of the tramline counter
- Raising of the track disc of the pre-emergence marker.

10.9 End of work on the field



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

1. Deactivate the symbol "Turning on the roller" appearing in the (**AMATRON⁺**) display (Fig. 189) so that the machine can be raised above the integrated running gear.
 - 1.1 Press the Shift-key (**AMATRON⁺**)
 - The symbol (Fig. 189) is deleted.
2. Switch off the fan.
3. Actuate control unit 1 until the following hydraulic functions are carried out:
 - o Raising the star wheel
When the machine is lowered, if the tramline counter is prevented from indexing, press the STOP key  as soon as the star wheel is raised (see **AMATRON⁺** operating manual).
 - o Folding in of the active track marker
 - o Raising of the track disc of the tramline marker.
 - o Raising of the machine via the integrated running gear
4. Empty the seed hopper (see section 10.10, on page 169).



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!

5. Put the Cirrus in the transport position (see section "10.1", on page 152).

only Cirrus 3001:

6. Swivel the disc array to the transport position.
 - 6.1 Operate control unit 2.

All types:

7. Switch off the **AMATRON⁺**.

10.10 Emptying the hopper and/or dosing unit



DANGER

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

10.10.1 Emptying the seed hopper

1. Open the slider (Fig. 190) and empty the seed into the calibration trough or a suitable hopper.



A commercially available hose (DN 140) can be fitted.

2. Empty the residual seed (see section Emptying the dosing unit, below).



Fig. 190

10.10.2 Emptying the dosing unit

1. Push a calibration trough into the mounting under the dosing unit.

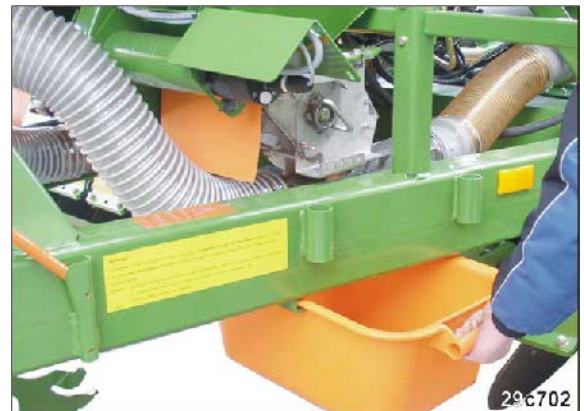


Fig. 191

Use of the machine

The hopper should not be emptied:

2. Close the slider (Fig. 192/1)
(see section "Installing/removing the dosing roller", on page 113).

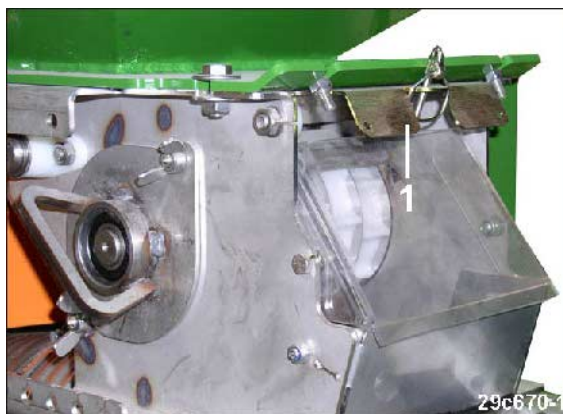


Fig. 192

2. Empty the hopper and dosing unit.
 - 2.1 Turn the handle (Fig. 193/1).
→ The residue emptying flap opens to allow emptying of the hopper and dosing unit.
3. Repeat the procedure on the second dosing unit (if fitted).



Fig. 193

3. Empty the injector sluice (Fig. 194/1).
 - 4.1 Open the injector sluice flap (Fig. 194/1).
→ Emptying the injector.
5. Repeat this procedure on the second injector sluice (if fitted).

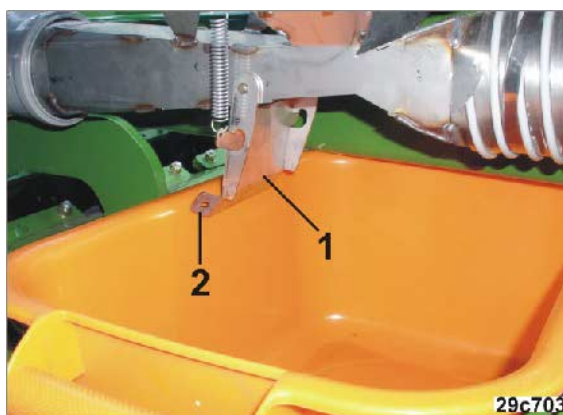


Fig. 194



CAUTION

Risk of contusions on opening and closing the injector sluice flap (Fig. 194/1)!

Hold the injector sluice flap only by the lug (Fig. 194/2), otherwise there is a danger of injury when the spring-loaded injector sluice flap snaps closed.

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

6. Empty the dosing units and the dosing rollers completely.
 - 6.1 Turn the star wheel (Fig. 195) anti-clockwise with the calibration crank. (Only machines with star wheel drive)
 - 6.2 Run the electric motor briefly. (Only machines with full dosing).
7. To completely clean the dosing unit, remove and reinstall the dosing roller (see section "Installing/removing the dosing roller", on page 113).

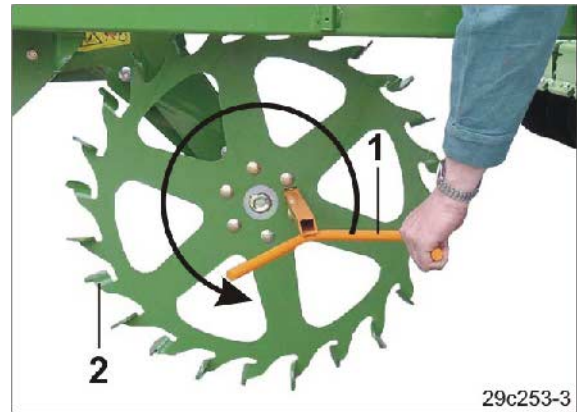


Fig. 195

8. Open the slider(s) (Fig. 192/1) and secure (clip pin).
9. Close the residue emptying flap(s) (Fig. 193/1).
10. Close the injector sluice flap(s) (Fig. 194/1).
11. Secure the calibration trough(s) on the transport bracket (Fig. 70).

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 97.

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

11.1 Residual seed volume indicator

When volume drops below the residual seed volume, if the level sensor is correctly set, on the **AMATRON⁺** display a warning message (Fig. 196) appears with an acoustic signal.

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

machine type:	Cirrus	Order
order No.:	6	drill calibr.
tramline rhythm No.:	15	machine
working width:	6.0m	Setup
level too low		29c214_GB

Fig. 196

11.2 Failure of the **AMATRON⁺** during work

If during work on the field a failure of the **AMATRON⁺** occurs, seeding can continue in emergency mode or the machine can be transported to the nearest workshop.

In emergency mode the track marker and the tramlining control system cannot be actuated.

Setting the machine for operation in emergency mode

- 1 Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
- 2 Release the screw in the control block with the hexagon socket wrench (Fig. 197/1) up to the stop.
Undoing the Allen screw causes raising/lowering of the star wheel with the machine.
- 3 Start working in emergency mode.

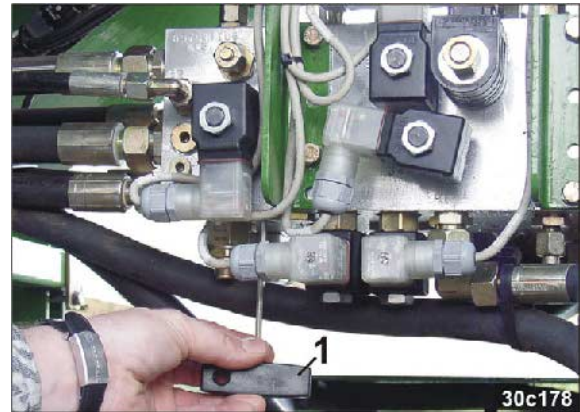


Fig. 197

Transporting the machine to the nearest workshop after failure of the **AMATRON⁺**



DANGER

- Actuate the tractor's control units only in the tractor cab.
- Before actuating the tractor's control units, direct any people out of the danger area.

1. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Take the two valve pins (Fig. 198/1) out of the valves and turn them through 45 degrees to lock.

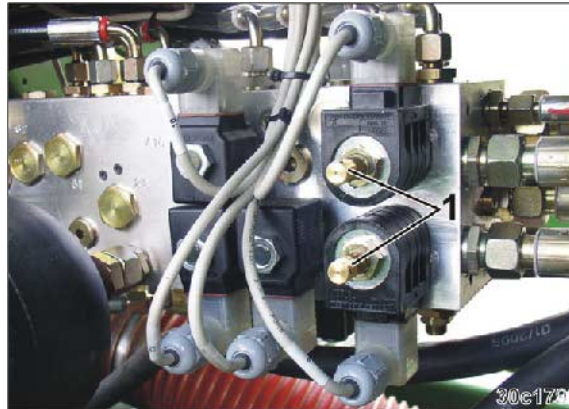


Fig. 198



DANGER

- Only if the **AMATRON⁺** fails, fold the machine in emergency mode.
- After folding in the booms, check whether the locking hooks (Fig. 174/1, on page 155) lock the booms.

3. Direct people out of the danger area.
4. Operate control unit 1.
 - 4.1 Raise the machine fully by moving the integrated running gear out completely.
5. Press the manually operated valve 41
→ The coulter frame is lowered.
6. Operate control unit 2.
 - 6.1 Fold in the machine.
7. Check whether the locking hooks (Fig. 174/1) lock the extension arm.
8. Put the machine in road transport position (see section 9, on page 142).
9. Go to the nearest repair workshop.



Fig. 199

**DANGER**

Go to the nearest repair workshop without delay.

**After repair**

- Insert the screw (Fig. 197/1)
- Move the two valve pins (Fig. 198/1) to their normal position.

11.3 Deviations between the preset and actual sowing rates

Possible causes that can lead to a deviation between the preset and actual sowing rates:

- For acquisition of the cultivated area and of the requisite seed output rate the **AMATRON⁺** requires the impulses of the drive wheel over a measuring distance of 100 m.

The slippage of the star wheel can alter during operation, e.g. when changing from light to heavy soils. This also alters the calibration value "Imp./100 m".

If there are differences between the preset and actual sowing rates the calibration value "Imp./100 m" has to be redetermined by travelling a measured distance (see **AMATRON⁺** operating manual).

- When seeding with moist dressed seeds, differences between the preset and actual sowing rates can come about, if there is a period of less than 1 week (2 weeks recommended) between the dressing and seeding.

- A defective or wrongly set dosing lip (Fig. 200/1) will cause dosing errors.

Set the dosing lip so that it is lying lightly up against the dosing roller (Fig. 200/2).

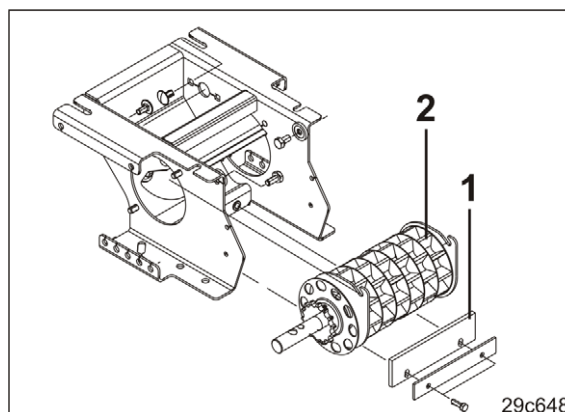


Fig. 200

11.4 Fault table

Fault	Possible cause	Remedy
Track marker not changing	Working position sensor defective	Replace the work position sensor
	Hydraulic valve jamming	Replace the hydraulic valve
Track marker switching too early or too late	Work position sensor wrongly set	Set the sensor
	Working position sensor defective	Replace the work position sensor
Tramline counter not working	Stop key actuated	Switch off the stop key
	Work position sensor wrongly set	Set the sensor
	Tramline rhythm wrong	Adjust tramline rhythm
	Working position sensor defective	Replace the work position sensor
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
Path sensor (star wheel/Vario gearbox) not functioning	Path sensor defective	Replace the path sensor
Slide in the distributor head (tramlining control system) not functioning		Clean the distributor head
		Clean the control disc

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 97.



WARNING

Risk of contusions, cutting, catching, drawing in and knocks through unprotected danger points!

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

12.1 Securing the connected machine

Before working on the machine, place the machine connected to the tractor on the sustainer (Fig. 201/1) to prevent unintentional lowering of the tractor's lower link.



Fig. 201

12.2 Securing the raised machine (workshop)



DANGER

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

1. Direct people out of the danger area.
 2. Fold in the machine's extension arms (see section "Folding the machine extension arm in/out", on page 152).
 3. Remove the two spacers (Fig. 202/1) from the transport brackets.
- Each spacer is fixed with two bolts (Fig. 202/2), which are secured with linch pins.
4. Raise the machine fully by moving the integrated running gear out completely.



Fig. 202

5. Position the spacer (Fig. 203/1) on the extended piston rod of the hydraulic cylinder and secure the spacer with the previously released bolts (Fig. 203/2).
6. Secure the bolts with the previously released linch pins.
7. Repeat the procedure with the second spacer on the opposite side of the machine.
8. Fold out the machine extension arms (see section "Folding the machine extension arm in/out" on page 152) and lower the machine completely.

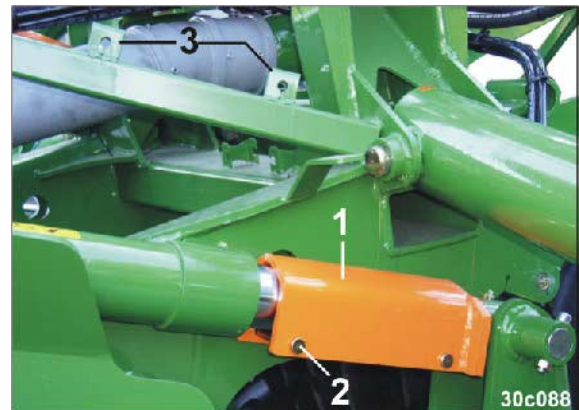


Fig. 203

After completion of the cleaning, maintenance and repair work

1. Remove both spacers (Fig. 203/1).
2. Lower the machine completely.
3. Fasten the spacers (see Fig. 202) to the transport mountings (Fig. 203/3).
4. Secure the bolts with the original linch pins.

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 benzene, benzole, 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.

Cleaning with a pressure cleaner / steam cleaner



Always observe the following points when using a high pressure cleaner / steam jet for cleaning:

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

Cleaning the machine:

1. To clean, always place the machine connected to the tractor on the sustainer (Fig. 112/1).
2. Fold out the machine (see section 10.1, on page 152) and lower the machine by moving in the integrated running gear completely.
3. Empty the seed hopper and seed dosing unit (see section 10.10, on page 169).
4. Clean the distributor head [see section "Cleaning the distributor head (workshop)", on page 182].
5. Clean the machine with water or with a high pressure cleaner.
6. If you raise the machine, secure the raised machine as described in section 12.2, on page 179, before you start with the cleaning.

12.3.1 Cleaning the distributor head (workshop)

1. Fold out the machine's extension arm (see section 10.1, on page 152).
2. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.



WARNING

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

Before climbing on it, clean the path to the distributor head and the area of the distributor head (danger of slipping).

There is the risk of an accident on the path to the distributor head and in the area of the distributor head.

3. Slacken the winged nuts (Fig. 204/1) and remove the clean plastic flap (Fig. 204/2) from the distributor head.
4. Remove any impurities with a brush, and wipe out the distributor head and plastic cap with a dry cloth.
5. Clean impurities between the base plate (Fig. 204/A) with compressed air.
6. Install the plastic cap (Fig. 204/2).
7. Fix the plastic cap with winged nuts (Fig. 204/1).

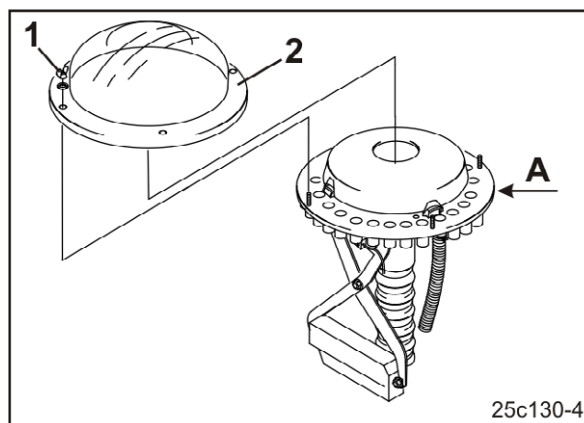


Fig. 204



Intensive cleaning requires the slides to be removed in accordance with section 12.6.1.2 on page 203.

12.3.2 Shutdown of the machine over a long period of time

1. Do not raise the coulters, but set them down on a firm base.
2. Thoroughly clean and dry the coulter.
3. To prevent rust, conserve the sowing discs (Fig. 205) with an environmentally friendly anti-corrosion agent.



Fig. 205

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. 206).

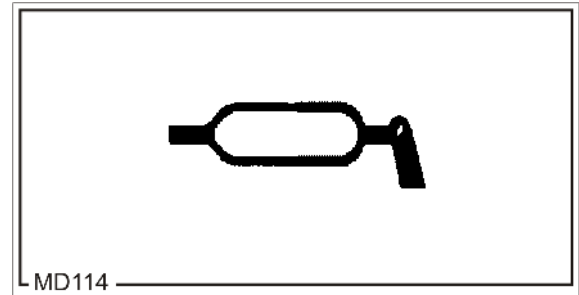


Fig. 206

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

	Number of lubrication nipples			Lubrication interval
	Cirrus 3001	Cirrus 4001	Cirrus 6001	
Fig. 208/1	1	1	1	25 h
Fig. 208/2	1	1	1	25 h
Fig. 209/1	2	2	2	25 h
Fig. 209/2	2	2	2	25 h
Fig. 210/1	—	2	2	25 h
Fig. 211/1	—	2 ¹⁾	4 ¹⁾	25 h
Fig. 211/2	—	2 ¹⁾	4 ¹⁾	25 h
Fig. 211/3	—	4 ¹⁾	4 ¹⁾	25 h
Fig. 212/1	2	2 ¹⁾	2 ¹⁾	25 h
Fig. 212/2	2	2 ¹⁾	2 ¹⁾	25 h
Fig. 212/3	2	2 ¹⁾	2 ¹⁾	25 h
Fig. 212/4	2	2 ¹⁾	2 ¹⁾	— ²⁾
Fig. 212/5	2	2 ¹⁾	2 ¹⁾	— ²⁾
Fig. 212/6	—	2 ¹⁾	2 ¹⁾	25 h
¹⁾ Lubricate only with folded in, raised and secured machine (see section 0). ²⁾ regular lubrication not necessary.				

Fig. 207

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

1. Fold the machine extension arms out (see section 10.1, on page 152).
2. Lower the machine by moving in the integrated running gear completely.
3. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
4. For lubrication intervals, refer to the table (Fig. 207).

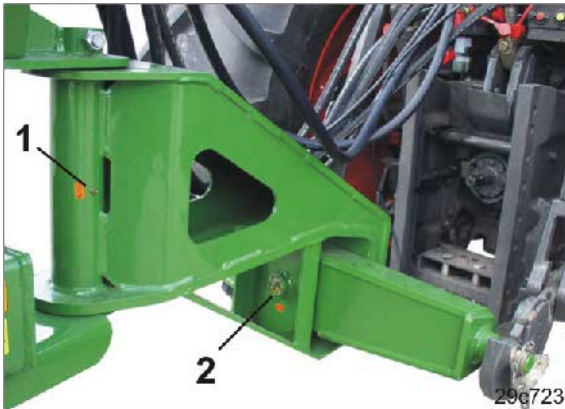


Fig. 208

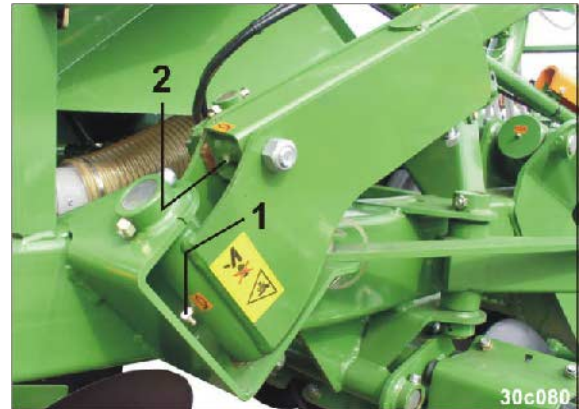


Fig. 209



Fig. 210

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

1. Fold the machine extension arm in (see section 10.1, on page 152).
2. Raise the machine by moving the integrated running gear out completely.
3. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
4. Secure the raised machine (see section 12.2, on page 179).
5. For lubrication intervals, refer to the table (Fig. 207).



Fig. 211

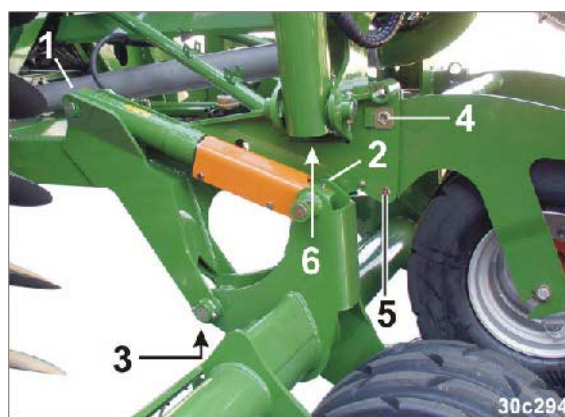


Fig. 212

12.5 Service plan – 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.

Before initial operation	Specialist workshop	Checking and service the hydraulic hose lines. Recording of the inspection by the operator.	Section 12.5.6
		Checking the oil level in the Vario gearbox	Section 12.5.5
After the first 10 operating hours	Specialist workshop	Retighten wheel and hub screws (workshop)	Section 12.5.1
	Specialist workshop	Checking and service the hydraulic hose lines. Recording of the inspection by the operator.	Section 12.5.6
Daily before starting work		Draining the compressed air tank of the dual-circuit magnetic braking system	Section 12.5.8.1
When the seed hopper is filled or hourly		Checking the seed planting depth	Section 10.6.1
		Checking the seed hoses for contamination	
		Checking the seed dosing unit for impurities, clean if necessary. (See section 10.10)	
During work		Checking distributor heads for impurities, clean if necessary (See section 12.3.1)	
Daily at the end of work		Emptying seed dosing unit	Section 10.10
		Cleaning the machine (as required)	Section 12.3
Every week, at the latest every 50 operating hours	Specialist workshop	Checking and servicing the hydraulic hose lines. This inspection has to be recorded by the operator.	Section 12.5.6
		Checking the brake fluid level	Section 12.5.9.1

Cleaning, maintenance and repairs

Before the season, then every 2 weeks	Specialist workshop	Checking tyre pressure (workshop)	Section 12.5.3
		Checking the oil level in the Vario gearbox	Section 12.5.5
Every 3 months, at the latest every 500 operating hours	Specialist workshop	Checking the brake lining thickness (specialist workshop)	Section 12.5.9.4
		External testing of the compressed air tank of the dual-circuit pneumatic braking system	Section 12.5.8.2
	Specialist workshop	Checking the pressure in the compressed air tank of the dual-circuit pneumatic braking system (workshop)	Section 12.5.8.3
	Specialist workshop	Leak test of the dual-circuit pneumatic braking system (workshop)	Section 12.5.8.4
	Specialist workshop	Cleaning the line filter of the dual-circuit pneumatic braking system (workshop)	Section 12.5.8.5
Every 6 months before the season	Specialist workshop	Check and service the hydraulic hose lines. This inspection has to be recorded by the operator.	Section 12.5.6
	Specialist workshop	Checking the brake lining thickness (specialist workshop)	Section 12.5.9.4
Every 6 months after the season		Servicing roller chains and chain wheels	Section 12.5.4
		Servicing sowing shaft bearing	Section 12.5.2
Every 12 months	Specialist workshop	Checking the service brake system for safe operating condition (specialist workshop)	Section 12.5.7.1
	Specialist workshop	Brake check on the hydraulic part of the braking system (specialist workshop)	Section 12.5.9.3
Every 2 years	Specialist workshop	Changing the brake fluid (workshop)	Section 12.5.9.2

12.5.1 Retighten wheel and hub screws (workshop)

Tighten the wheel and hub screws and check tightening torques (see table Fig. 213).

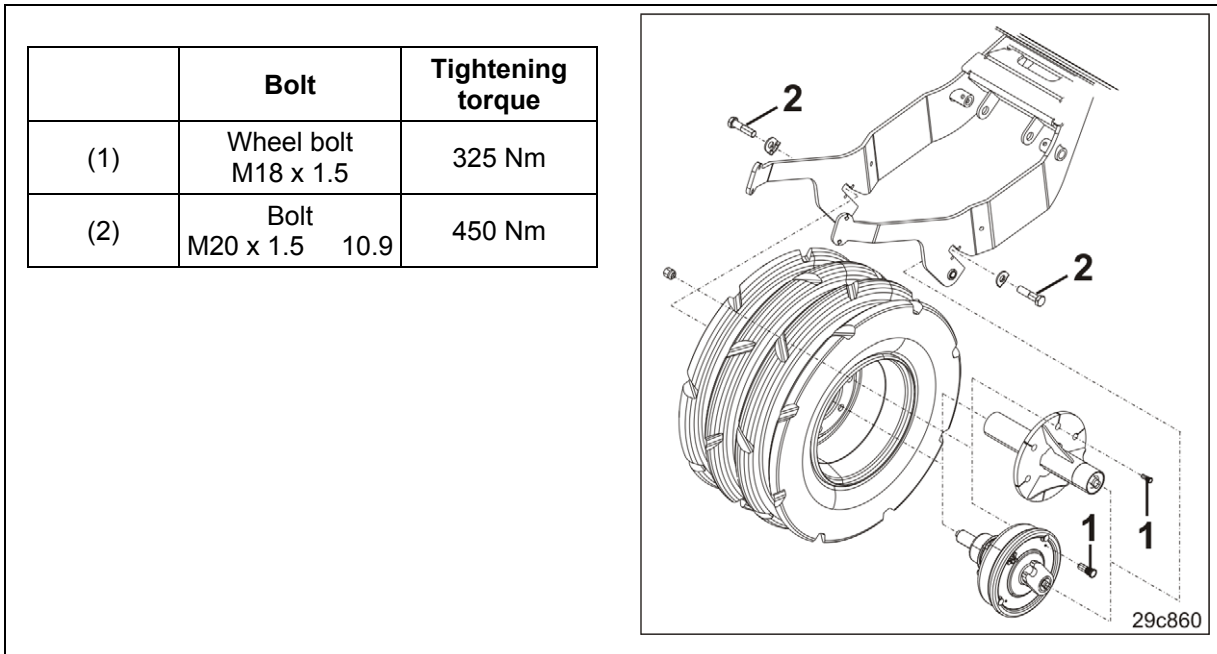


Fig. 213

12.5.2 Servicing sowing shaft bearing

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

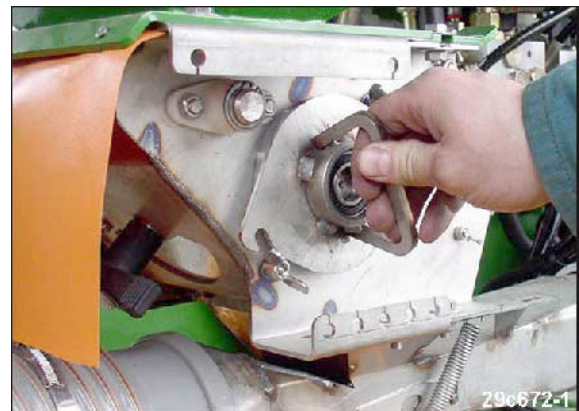


Fig. 214

12.5.3 Checking tyre pressure (workshop)

Check compliance with specified tyre pressure (see table Fig. 215).



Adhere to the inspection intervals (see section “Service plan – overview”, on page 187).
Insufficient pressure overloads the tyres and leads to failure.

Tyres	Tyre rated pressure
400/55-15.5 10 PR	3.5 bar
400/55-15.5 139A8	4.3 bar



For new tyres, the initial filling pressure is 0.3 bar above the tyre rated pressure.



Fig. 215



The running gear (Fig. 216/1) can be equipped with tyres filled with polyurethane (option) and need not be checked with regard to pressure. On account of their heavy weight, tyres filled with polyurethane must only be used on the running gear (Fig. 216/1).

The roller wheels (Fig. 216/2) can be subsequently fitted with a hose (see online spare parts list). Follow the manufacturer's installation instructions!

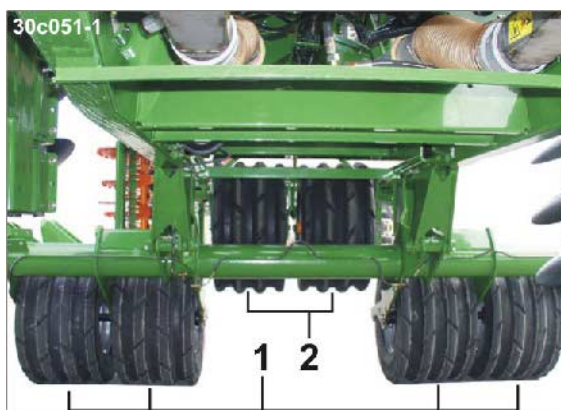


Fig. 216

12.5.4 Servicing roller chains and chain wheels

After the season make sure all roller chains are:

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

12.5.5 Checking the oil level in the Vario gearbox

There is no need to change the oil.

Checking the oil level in the Vario gearbox:

1. Position the machine on a horizontal surface.
2. The oil level must be visible in the oil sight glass (Fig. 217/1).
3. Check the gearbox for leak points.
4. If there are any leak points, have the Vario gearbox repaired in a specialist workshop.
5. Refer to the table (Fig. 218) for the requisite type of transmission oil.
6. Fill the Vario gearbox through the oil filler neck (Fig. 217/2) up to the oil sight glass (Fig. 217/1) with transmission oil.
7. After filling close the oil filler neck with the cap (Fig. 217/2).

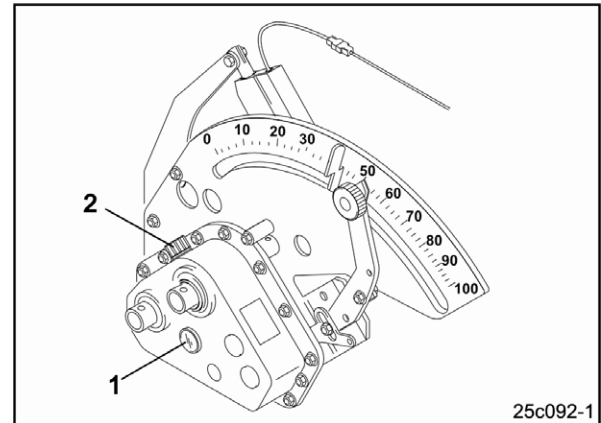


Fig. 217

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. 218

12.5.6 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 line 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.

12.5.6.1 Labelling hydraulic hose lines

The assembly labelling provides the following information:

Fig. 219/...

- (1) Manufacturer's marking on the hydraulic hose line (A1HF)
- (2) Date of manufacture of the hydraulic hose line (04/02 = Year / Month = February 2004)
- (3) Maximum approved operating pressure (210 BAR).

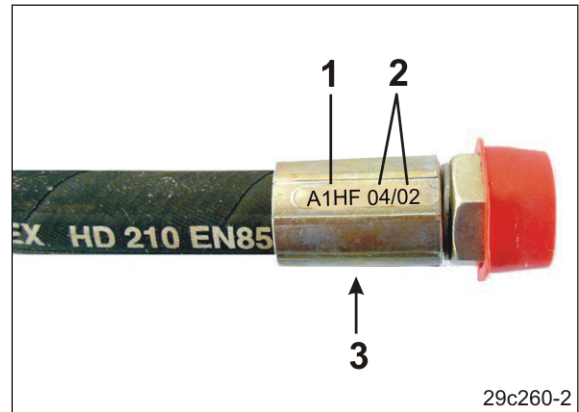


Fig. 219

12.5.6.2 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.

12.5.6.3 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 "2004", then the hose should not be used beyond February 2010. See also "Labelling of hydraulic hose lines".

12.5.6.4 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. There, avoid hose clips, which impair the natural movement and length changes of the hose.
- It is forbidden to paint over hydraulic hose lines!

12.5.7 Service brake system: dual-circuit pneumatic braking system - hydraulic braking system

The Cirrus is equipped with a dual-circuit pneumatic braking system with a hydraulically actuated brake cylinder.

The dual-circuit pneumatic braking system does not actuate as normally a rod or brake cable connected to the brake shoe.

The dual-circuit pneumatic braking system acts on a hydraulic cylinder, which actuates the hydraulic brake cylinder of the brake shoes in the brake drum.



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.

The brake valve settings laid down by the manufacturer must not be altered.



DANGER

- Only specialist workshops or recognised brake services may perform adjustment and repair work on the brake system.
- Have the brake system checked regularly.
- 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 30.

General visual check

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

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

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

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

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



In Germany Section 57 of the regulation BGV D 29 of the industrial injuries mutual insurance organisation requires as follows: the keeper has to have vehicles tested as required, however at least once annually, by an expert as to their safe operating condition.

12.5.8 Dual-circuit pneumatic braking system

12.5.8.1 Draining the compressed air tank of the dual-circuit magnetic braking system

1. Run the tractor engine (approx. 3 mins.), until the compressed air reservoir (Fig. 220/1) has filled.
2. Switch off the tractor engine, apply the tractor parking brake and remove the ignition key.
3. Pull the drain valve (Fig. 220/2) in a sideways direction by the ring until no more water escapes from the compressed air reservoir.
4. If the escaping water is dirty, let off air, unscrew the drainage valve from the compressed air reservoir and clean the compressed air reservoir.
5. Fit the drainage valve and check the compressed air reservoir for seal tightness (see section 12.5.8.4, on page 198).

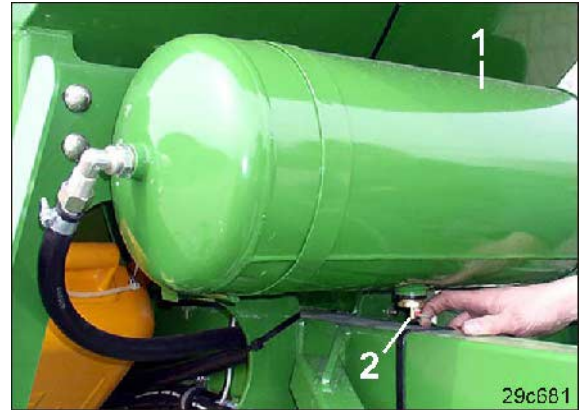


Fig. 220

12.5.8.2 External testing of the compressed air tank of the dual-circuit pneumatic braking system

External testing of the compressed air reservoir (Fig. 221/1).

If the compressed air reservoir moves in the tensioning bands (Fig. 221/2)

→ tension or replace the compressed air reservoir

If the compressed air reservoir has any external corrosion damage or is damaged

→ replace the compressed air reservoir.

If the type plate (Fig. 221/3) is rusty, loose or the type plate is missing from the compressed air reservoir

→ replace the compressed air reservoir.

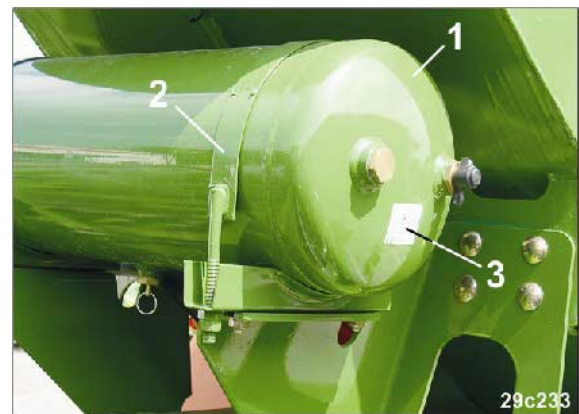


Fig. 221



The compressed air reservoir may be replaced in a specialist workshop only.

12.5.8.3 Checking the pressure in the compressed air tank of the dual-circuit pneumatic braking system (workshop)

1. Connect a pressure gauge to the test connection on the compressed air reservoir.
2. Run the tractor engine (approx. 3 mins.) until the compressed air reservoir has filled.
3. Check whether the pressure gauge displays the setpoint range 6.0 to 8.1 bar.
4. If the reading drops below or exceeds the setpoint range, have the defective parts of the braking system replaced in a specialist workshop.

12.5.8.4 Leak test of the dual-circuit pneumatic braking system (workshop)

- Test all connections, pipe, hose and screw unions for seal-tightness
- Eliminate any abrasion points on pipes and hoses
- Replace any porous and damaged hoses (specialist workshop)
- The dual-circuit pneumatic braking system applies as being seal-tight, if the pressure drop within 10 minutes with the engine shut down is no greater than 0.10 bar, i.e. about 0.6 bar per hour.
- If the values are not maintained, have the leakage sealed or the defective components of the
- braking system replaced at a specialist workshop.

12.5.8.5 Cleaning the line filter of the dual-circuit pneumatic braking system (workshop)

The dual-circuit pneumatic braking system is equipped with two line filters (Fig. 222/1). Clean both line filters as described above.

To clean the line filters

1. Press the two lugs (Fig. 222/2) together and take out the closure piece complete with O-ring, pressure spring and filter insert.
2. Clean the filter insert with petrol or thinner (wash it) and dry with compressed air.
3. When re-assembling in the reverse order, ensure that the O-ring does not jam in the guide slot.

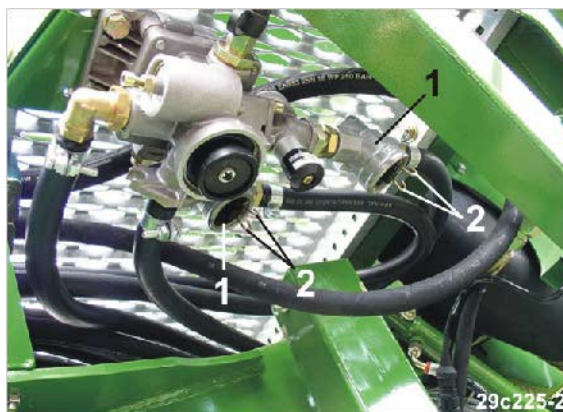


Fig. 222

12.5.9 Hydraulic braking system

12.5.9.1 Checking the brake fluid level

The equalising tank (Fig. 223) is filled in accordance with DOT 4 up to the "max." marking with brake fluid.

The brake fluid must be between the marks "max." and "min.".



If any brake fluid is lost, visit a specialist workshop!



Fig. 223

12.5.9.2 Changing the brake fluid (workshop)

If possible, change the brake fluid after the winter.



WARNING

Under no circumstances may drained brake fluid be reused.

Under no circumstances may drained brake fluid be poured away or put in the household waste, but must be collected separately from used oil and disposed of via authorised waste disposal companies.

When handling brake fluid observe the following:

- Brake fluid is corrosive and must therefore not come into contact with the paint on the machine. If necessary, wipe it off immediately and wash it off with plenty of water.
- Brake fluid is hygroscopic, i.e. it absorbs moisture from the air. Therefore store the brake fluid only in closed containers.
- Brake fluid that has already been used in the braking system must not be reused. Even when venting the braking system, use only new brake fluid.
- The requirements made of brake fluid are subject to the standard SAE J 1703 or the American safety statutes DOT 3 and DOT 4. Use only brake fluids in compliance with DOT 4.
- Brake fluid must never come into contact with mineral oil. Even small traces of mineral oil will render brake fluid unusable or cause a failure of the braking system. Plugs and collars on the braking system will be damaged, if they come into contact with agents that contain mineral oil. For cleaning purposes do not use any wiping cloths that contain mineral oils.

12.5.9.3 Brake check on the hydraulic part of the braking system (specialist workshop)

Brake check on the hydraulic part of the braking system:

- check all flexible brake hoses for wear
- check all brake lines for damage
- check all screw unions for seal tightness
- renew any worn or damaged parts.

12.5.9.4 Checking the brake lining thickness (specialist workshop)

The brake lining wear must be checked every 500 operating hours, at the latest before the start of the season.

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

Renew the brake shoes at a residual lining thickness of less than 1.5 mm (use only genuine brake shoes with type-tested brake linings). When doing so the shoe return springs may have to be renewed.

12.5.9.5 Venting the hydraulic braking system (workshop)

After each brake repair, for which the system has been opened, vent the brake system, because air may have entered the pressure lines.

At specialist workshops the brake is vented with a brake filling and venting device:

1. Remove the equalising tank screw union.
2. Fill the equalising tank up to the top edge.
3. Fit the venting muff to the equalising tank.
4. Connect the filling hose.
5. Open the stop valve of the filling union piece.
6. Vent the main cylinder.
7. Via the system's venting screws remove brake fluid until it flows out clear and bubble-free. To do so, the transparent venting hose, which leads to a collecting cylinder one-third filled with brake fluid, is pushed onto the venting valve to be vented.
8. After venting the complete brake system close the stop valve on the filling union piece.
9. Relieve the residual pressure coming from the filling device.
10. Close the last venting valve when the residual pressure coming from the filling device has dropped and the brake fluid level in the equalising tank has reached the "MAX" mark.
11. Remove the filling union piece.
12. Close the equalising tank.



Carefully open the venting valves so that they are not turned off. It is recommended that the valves be sprayed with a rust releasing agent for approx. 2 hours before venting.



Perform a safety check:

- Are the venting screws tightened?
- Has sufficient brake fluid been filled?
- Check all connections for seal-tightness.



After each brake repair apply the brakes on a road with little traffic. When doing this at least one emergency braking application must be performed.

Caution: when you do this pay attention to any traffic behind you!

12.6 Workshop settings and repair work

12.6.1 Adjusting the wheelmark spacing / track width (specialist workshop)



WARNING

The distributor head is located at the centre of the machine.

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

Before approaching, clean the path to the distributor head and the area of the distributor head (danger of slippage).

There is the risk of an accident on the path to the distributor head and in the area of the distributor head.

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

When the machine is delivered or when buying a new tractor, check that the tramline is set to the wheel mark spacing (Fig. 224/a) of the tractor.

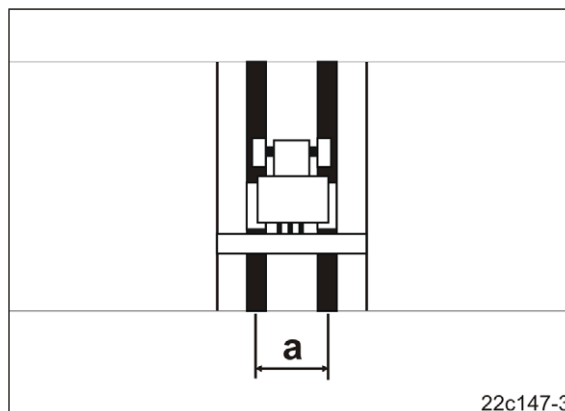


Fig. 224

The seed line tubes (Fig. 225/1) of the tramline coulters must be fixed to the distributor head openings, which can be closed by the sliders (Fig. 225/2).

If necessary, interchange the seed line tubes.

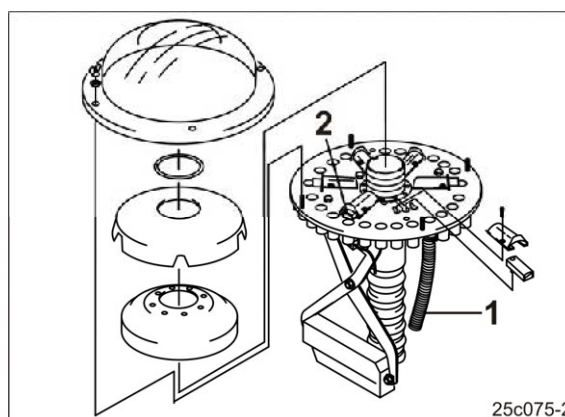


Fig. 225



Set the track discs of the tramline marker (if present) to the new track (see section "Moving the track disc carrier of the tramline marker to the operational/transport position", on page 140).

12.6.1.2 Adjusting the track width of the cultivating tractor (specialist workshop)

When the machine is delivered or when buying a new tractor, check that the tramline is set to the track width (Fig. 226/a) of the tractor.

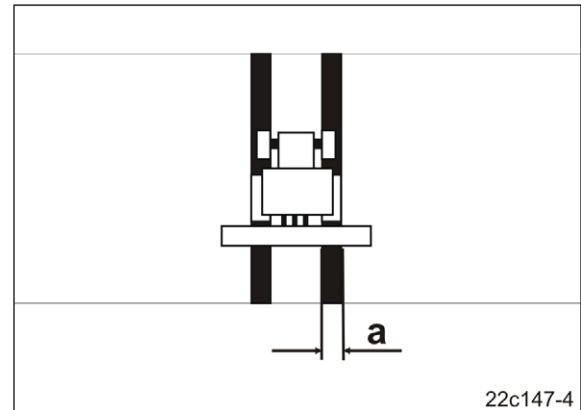


Fig. 226

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

To create two tracks, in the distributor head it is possible to close the sliders (Fig. 225/2):

- for machines, Cirrus 3001/4000 up to 3 openings
- for machines, Cirrus 6001 up to 6 openings

Deactivate any non-required sliders (Fig. 225/2) (see section on page 204). Deactivated sliders do not close the feed lines to the tramline coulter.

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

Activating or deactivating sliders

1. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Set the tramline counter in the **AMATRON⁺** to "0" as for creating tramlines.
3. Switch off the **AMATRON⁺**.
4. Remove the outer distributor cover (Fig. 227/1).
5. Remove the ring (Fig. 227/2).
6. Remove the inner distributor cover (Fig. 227/3).
7. Remove the foam insert (Fig. 227/4).
8. Slacken the screws (Fig. 228/1).
9. Remove the slider tunnel (Fig. 228/2).

Activating the sliders:

10. The slider (Fig. 228/3) is in the guide, as shown in the diagram.

Deactivating the sliders:

11. Turn the sliders around (Fig. 228/3) and push them into the drill hole (Fig. 228/4).
12. Screw the slider tunnel (Fig. 228/2) onto the base plate.
13. Install the foam insert (Fig. 229/1).
14. Install the inner distributor cover (Fig. 229/2).
15. Install the ring (Fig. 229/3).
16. Install the outer distributor cover (Fig. 229/4).
17. Check the function of the tramline circuit.

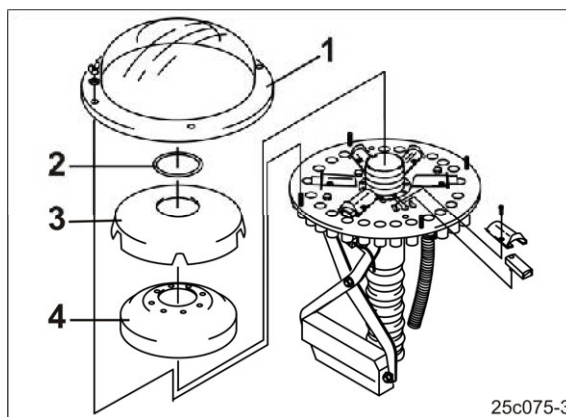


Fig. 227

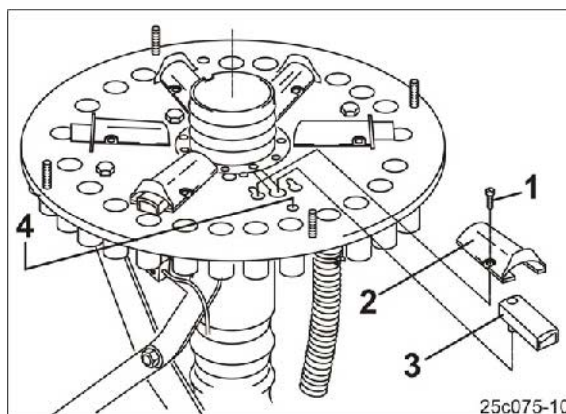


Fig. 228

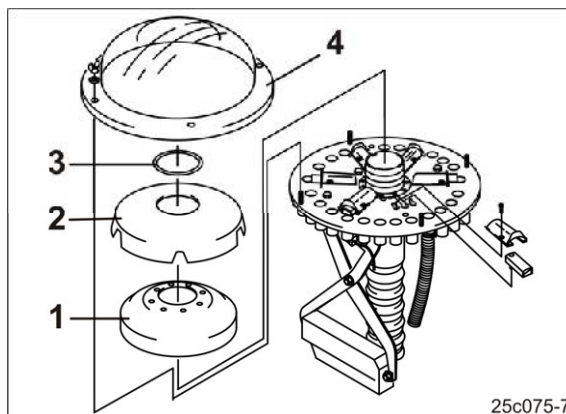


Fig. 229

12.6.2 10 operational hours after a wheel change (workshop)

Retighten wheel and hub screws (workshop), see section 12.5.1.

12.6.3 After brake repairs (workshop)

Venting the hydraulic braking system (workshop), see section 12.5.9.5.

12.6.4 Setting the track marker for correct fitting in the transport bracket (workshop)

When the track marker is folded in, the roller (Fig. 230/1) runs on the raceway (Fig. 230/2) into the mounting.

To set the track marker:

1. 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. 230/3) until the roller (Fig. 230/1) of the track marker is running properly over the raceway (Fig. 230/2) into the mounting.
4. Tighten the lock nut.



Fig. 230



DANGER

Apply the tractor parking brake, switch off the tractor engine and remove the ignition key before working on the track marker.

12.6.5 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 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. 231/1).

In the event of a repair observe the following:

The hydraulic system and the pressure tank connected to it (Fig. 231/1) 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. 231



DANGER

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

12.6.6 Checking lock nut tightening torque after repairs to the machine extension arm (workshop)

Retighten the lock nuts (Fig. 232/1) and check tightening torques (see table Fig. 232).

	Lock nut (1)	Tightening torque
Cirrus 4001 Cirrus 6001	M 27 x 2	150 Nm



Fig. 232

12.6.7 Replacing the RoTeC coulter wear tip (workshop)

1. Remove the plastic disc (Fig. 233/1) (see section "Setting the RoTeC plastic discs", on page 127)
2. Release the cylinder screw (Fig. 233/2) (screw tightening torque 30-35 Nm).
3. Replace the wear tip (Fig. 233/3) and install in reverse sequence.



The wear tip (Fig. 233/3) must not project beyond the edge of the sowing disc (Fig. 233/4). If necessary, replace the sowing disc.

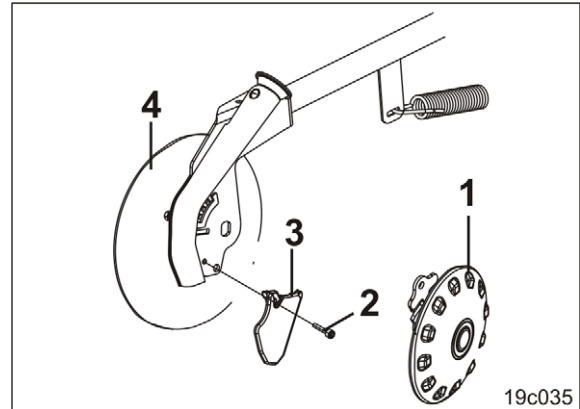


Fig. 233

12.7 Lower link pin



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 draw bar, if there are any clear signs of wear to the lower link pin.

12.8 Bolt tightening torques

Thread	Width across flats [mm]	Tightening torques [Nm] as a function of the bolt/nut grade		
		8.8	10.9	12.9
M 8	13	25	35	41
M 8x1		27	38	41
M 10	16 (17)	49	69	83
M 10x1		52	73	88
M 12	18 (19)	86	120	145
M 12x1.5		90	125	150
M 14	22	135	190	230
M 14x1.5		150	210	250
M 16	24	210	300	355
M 16x1.5		225	315	380
M 18	27	290	405	485
M 18x1.5		325	460	550
M 20	30	410	580	690
M 20x1.5		460	640	770
M 22	32	550	780	930
M 22x1.5		610	860	1050
M 24	36	710	1000	1200
M 24x2		780	1100	1300
M 27	41	1050	1500	1800
M 27x2		1150	1600	1950
M 30	46	1450	2000	2400
M 30x2		1600	2250	2700



For the tightening torques of the wheel and hub bolts, see section 12.5.1, on page 189.

13 Hydraulic system diagrams

13.1 Hydraulic system diagram of the Cirrus 3001 Special

Fig. 234/...	Designation
T2	Pre-emergence marker
T5	Harrow pressure
T6	Coulter pressure
T9a	Running gear, left
T9b	Running gear, right
T10	Star wheel
T11a	Track marker left
T11b	Track marker right
T12	Disc array adjustment
T14	Blower
T15	1 x cable tie, yellow
T16	2 x cable ties, yellow
T17	1 x cable tie, red
T18	2 x cable ties, red
T19	1 x cable tie, green
T20	2 x cable ties, green
T30	Tractor

All position specifications in direction of travel

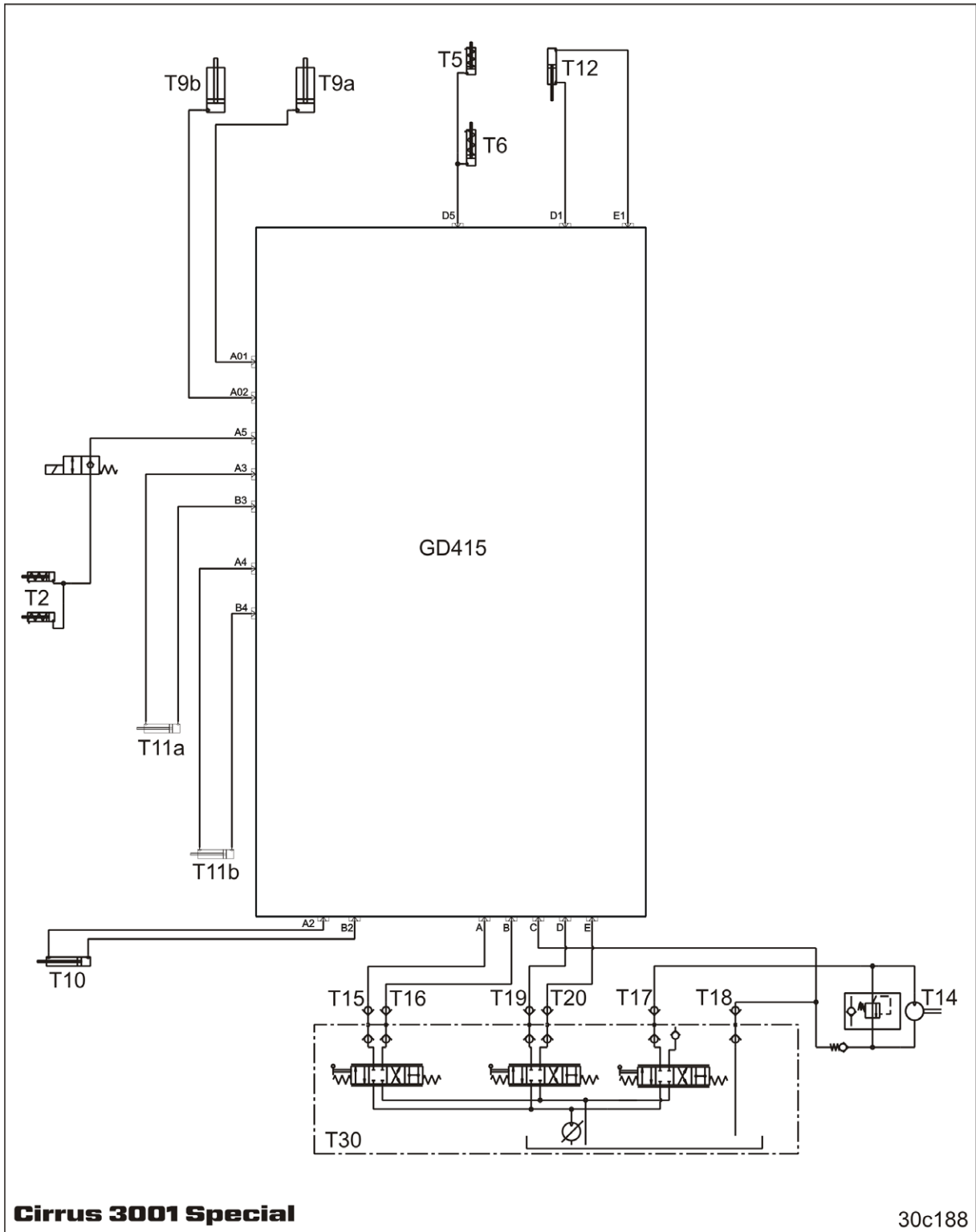


Fig. 234

13.2 Hydraulic system diagram of the Cirrus 4001 Special / 6001 Special

Fig. 235/...	Designation
T1a	Coulter lift-out left
T1b	Coulter lift-out right
T2	Pre-emergence marker
T4a	Harrow pressure adjustment, left
T4b	Harrow pressure adjustment, right
T5a	Coulter pressure adjustment, left
T5b	Coulter pressure adjustment, right
T6a	Folding cylinder, rear left
T6b	Folding cylinder, rear right
T7	Folding frame securing device
T8a	Folding cylinder, front left
T8b	Folding cylinder, front right
T9a	Running gear, left
T9b	Running gear, right
T10	Star wheel
T11a	Track marker left
T11b	Track marker right
T12	Disc array adjustment
T14	Blower
T15	1 x cable tie, yellow
T16	2 x cable ties, yellow
T17	1 x cable tie, red
T18	2 x cable ties, red
T19	1 x cable tie, green
T20	2 x cable ties, green
T22a	Coulter frame safety catch, left
T22b	Coulter frame safety catch, right
T30	Tractor

All position specifications in direction of travel

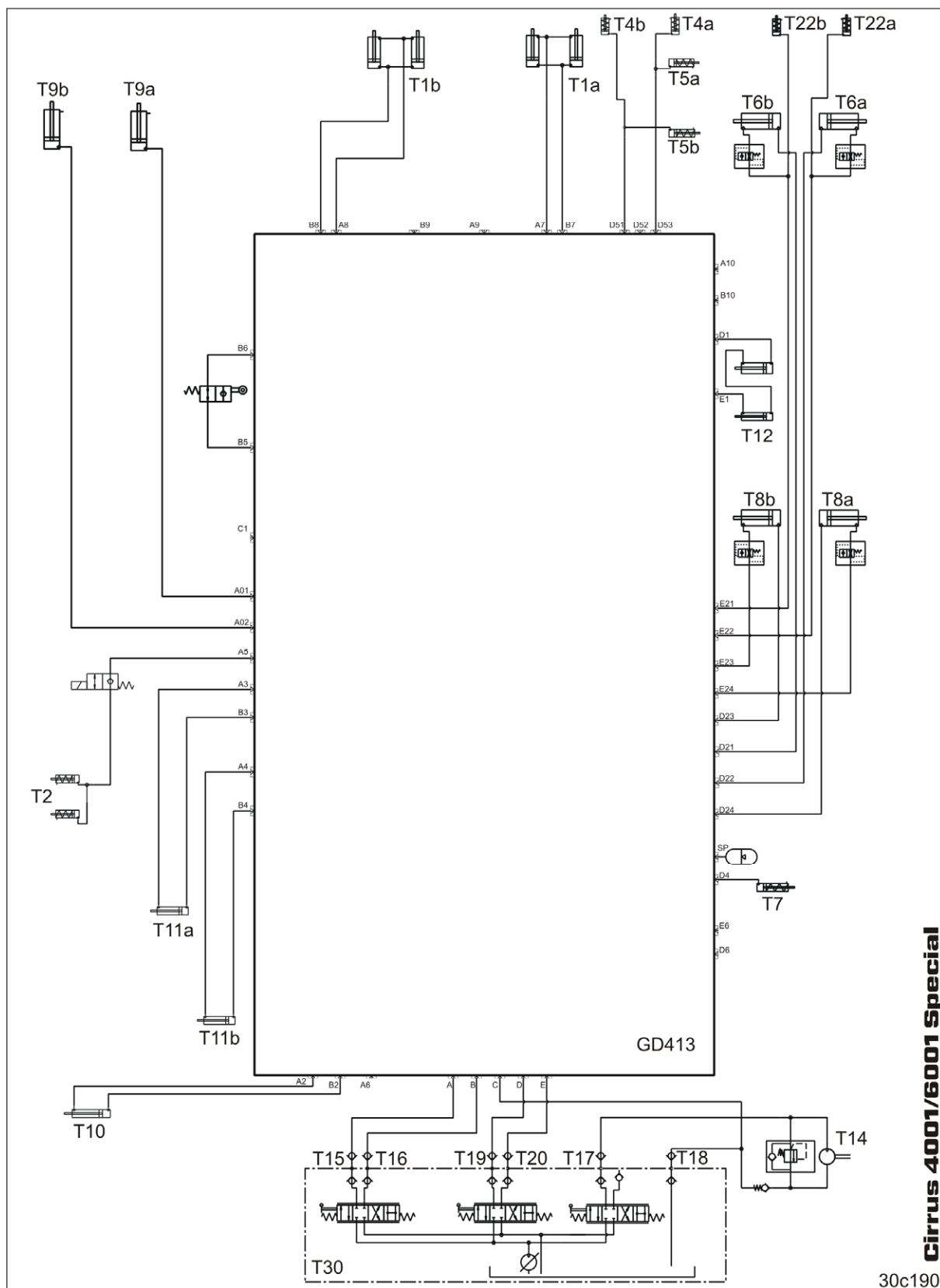


Fig. 235



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