

Operating Manual

AMAZONE

Precision airplanter

EDX 4500-2C

EDX 6000-2C



MG3980
BAH0046-3 09.14

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

en



Reading the instruction

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

Leipzig-Plagwitz 1872. Rud. Stark.

Identification data

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

Machine ident. no.:
(10-digit)

Type:

EDX 45/6000-2C

Maximum permissible system
pressure:

210 bar

Year of manufacture:

Basic weight (kg):

Permissible total weight (kg):

Maximum load (kg):

Manufacturer's address

AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

Postfach 51

D-49202 Hasbergen

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

Fax: + 49 (0)5405 501-234

E-mail: amazone@amazone.de

Spare part orders

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

Please send orders to your AMAZONE specialist retailer.

Formalities of the operating manual

Document number: MG3980

Compilation date: 09.14

© Copyright AMAZONEN-WERKE H. DREYER GmbH & Co. KG, 2014

All rights reserved.

Reprinting, even of sections, only possible with the approval of
AMAZONEN-WERKE H. DREYER GmbH & Co. KG.

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 any special optional equipment ordered. 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 any questions or problems, please consult this operating manual or contact your local service partner.

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

User evaluation

Dear Reader,

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

AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

Postfach 51

D-49202 Hasbergen

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

Fax: + 49 (0)5405 501-234

E-mail: amazone@amazone.de

1	User Information	9
1.1	Purpose of the document.....	9
1.2	Locations in the operating manual	9
1.3	Diagrams used	9
2	General Safety Instructions	10
2.1	Obligations and liability	10
2.2	Representation of safety symbols.....	12
2.3	Organisational measures	12
2.4	Safety and protection equipment	13
2.5	Informal safety measures.....	13
2.6	User training.....	14
2.7	Safety measures during normal operation	15
2.8	Danger from residual energy	15
2.9	Maintenance and repair work, fault elimination	15
2.10	Structural changes	16
2.10.1	Spare and wear parts and auxiliary materials.....	17
2.11	Cleaning and disposal.....	17
2.12	Operator workstation.....	17
2.13	Warning symbols and other labels on the machine	18
2.13.1	Positioning of warning symbols and other labels.....	24
2.14	Risks if the safety information is not observed	25
2.15	Safety-conscious working	25
2.16	Safety information for the operator	26
2.16.1	General safety and accident prevention information	26
2.16.2	Attached tools	30
2.16.3	Hydraulic system.....	31
2.16.4	Electrical system	32
2.16.5	Operation of the seed drill.....	33
2.16.6	Cleaning, maintenance and repairs	33
3	Loading and unloading	34
4	Product description	35
4.1	Overview of subassemblies	35
4.2	Safety and protection equipment	41
4.3	Overview – Supply lines between the tractor and the machine.....	42
4.4	Transportation equipment.....	44
4.5	Intended use	45
4.6	Danger area and danger points	46
4.7	Rating plate and CE mark.....	47
4.8	Technical data.....	48
4.8.1	Technical data for the calculation of tractor weights and tractor axle load.....	48
4.9	Necessary tractor equipment.....	49
4.10	Noise production data	49
5	Design and function	50
5.1	Radar	52
5.2	AMATRON 3 control terminal	53
5.3	Frame and machine extension arms	54
5.4	Stands	54
5.5	Seed singling and application	55
5.5.1	Seed hopper.....	55
5.5.2	Singling drum	56
5.5.3	Seed shutter.....	57

Table of Contents

5.5.4	Air guide	59
5.5.5	Seed scraper	60
5.5.5.1	Seed scraper, mech. adjustable.....	61
5.5.5.2	Seed scraper, electr. adjustable.....	61
5.5.6	Baffle plates (optional) for working on a slope	62
5.5.7	Digital seed fill level monitoring.....	62
5.5.8	Blower fan for seed singling and fertiliser delivery	63
5.5.9	Double disc type coulters	64
5.5.9.1	Seed placement depth	64
5.5.9.2	Coulter pressure (double disc type coulter)	65
5.5.9.3	Ground contact pressure and intensity of press rollers.....	66
5.5.9.4	Star clearer (optional).....	67
5.5.9.5	Clod clearers (optional)	67
5.5.9.6	Carrier roller scraper (optional)	67
5.6	Fertiliser dosing and application.....	68
5.6.1	Fertiliser tank.....	68
5.6.2	Digital fill level monitoring (optional).....	68
5.6.3	Fertiliser dosing unit and injector sluice	69
5.6.4	Fertiliser quantity adjustment	70
5.6.5	Calibration test	71
5.6.6	Distributor head	71
5.6.7	Single disc-type fertiliser coulter	72
5.7	Track markers	74
5.8	Tractor wheel mark eradicators (optional)	75
5.9	Lighting for the tools (optional).....	75
6	Commissioning	76
6.1	Checking the suitability of the tractor	77
6.1.1	Calculating the actual values for the total tractor weight, tractor axle loads and load capacities, as well as the minimum ballast	78
6.1.1.1	Data required for the calculation (attached machine)	79
6.1.1.2	Calculation of the required minimum ballasting at the front $G_{V \min}$ of the tractor to ensure steering capability	80
6.1.1.3	Calculation of the actual front axle load of the tractor $T_{V \text{ tat}}$	80
6.1.1.4	Calculation of the actual total weight of the combined tractor and machine.....	80
6.1.1.5	Calculation of the actual rear axle load of the tractor $T_{H \text{ tat}}$	80
6.1.1.6	Tractor tyre load-bearing capacity.....	80
6.1.1.7	Table	81
6.2	Securing the tractor / machine against unintentional start-up and rolling	82
6.3	Fitting instructions for connecting the blower fan to the tractor hydraulics	83
7	Coupling and uncoupling the machine	84
7.1	Hydraulic hose lines	85
7.1.1	Coupling the hydraulic hose lines	85
7.1.2	Uncoupling the hydraulic hose lines.....	86
7.2	Coupling the machine to the tractor	86
7.2.1	Aligning the machine after attachment.....	91
7.3	Uncoupling the machine.....	92
7.3.1	Uncoupling the folded-out machine from the tractor	93
7.3.2	Decoupling the folded-in machine from the tractor	93
7.3.3	Position of the stands	94
8	Settings	95
8.1	Seed dosing and application	96
8.1.1	Adjusting the sowing rate	96
8.1.2	Setting the seed shutter	96
8.1.3	Adjusting the air guide.....	97
8.1.4	Setting the seed scraper	98
8.1.5	Adjusting the seed placement depth	99
8.1.5.1	Setting the coulter pressure	100
8.1.6	Closing the seed furrow by adjusting the press roller	101



8.1.7	Adjusting the star clearer	101
8.1.8	Adjusting the clod clearer	102
8.1.9	Checking the placement depth and grain spacing	102
8.2	Fertiliser dosing and application	103
8.2.1	Repositioning the level sensor	103
8.2.2	Installing/removing the dosing roller	104
8.2.3	Setting the fertilising rate using a calibration test	107
8.2.4	Adjusting the fertiliser placement depth	109
8.3	Adjusting the track marker length and working intensity	110
8.3.1	Calculating the track marker length	111
8.4	Adjusting the machine and tractor wheel mark eradicator	111
8.5	Adjusting blower fan speed	112
8.5.1	Setting the blower fan speed (tractor hydraulics connection)	113
8.5.1.1	Setting the fan speed via the flow control valve of the tractor	113
8.5.1.2	Adjust the blower speed on the machine pressure limiting valve	114
9	Transportation	115
9.1	Putting the machine into the transport position	117
10	Use of the machine	119
10.1	Folding the machine extension arms and track markers out/in	120
10.1.1	Folding out the machine extension arms (from transport position to working position)	121
10.1.2	Working without track markers	122
10.1.3	Folding in the machine extension arms (from working position to transport position)	123
10.2	Filling the seed / fertiliser hopper	125
10.2.1	Filling the seed hopper	125
10.2.2	Filling the fertiliser tank	127
10.3	Starting work	129
10.3.1	During the work	131
10.3.2	Turning at end of the field	131
10.4	End of work in the field	132
10.4.1	Emptying the seed hopper and/or seed singling unit	132
10.4.2	Emptying the fertiliser tank and/or dosing unit	136
10.4.3	Emptying the fertiliser hopper	137
10.4.4	Emptying the dosing unit	137
11	Faults	139
11.1	Display of amount remaining	139
11.2	Cleaning the seed tube	140
11.3	Fault table	143
12	Cleaning, maintenance and repairs	144
12.1	Cleaning the machine	145
12.1.1	Daily quick cleaning of the singling unit and the spur gears	146
12.1.2	Thorough cleaning of the machine	148
12.1.2.1	Cleaning the fertiliser distributor head	149
12.2	Assembly work on the machine	150
12.2.1	Removing/installing the singling drum	150
12.2.2	Securing the seed tubes	152
12.2.3	Adjusting the carrier roller scrapers	153
12.2.4	Adjusting the furrow former on the fertiliser coulter	153
12.3	Lubrication specifications	154
12.3.1	Overview of lubrication points	155
12.4	Maintenance schedule – overview	156
12.4.1	Checking the tyre pressure of the support wheels	158
12.4.2	Visual inspection of the lower and upper link pins	158
12.5	Specialist workshop – Adjustment and repair work	159
12.5.1	Hydraulic system (specialist workshop)	159
12.5.1.1	Labelling hydraulic hose lines	160

Table of Contents

12.5.2	Maintenance intervals	160
12.5.3	Inspection criteria for hydraulic hose lines	161
12.5.4	Installation and removal of hydraulic hose lines (specialist workshop).....	162
12.5.5	Repairs to the pressure tank (specialist workshop)	163
12.6	Bolt tightening torques	164
13	Hydraulic diagram	165
13.1	Hydraulic diagram EDX 4500/6000-2C	165

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 operator 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
→ Machine response to 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 familiar with 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 symbols on the machine in a legible state.
- To replace damaged warning symbols.

Obligations 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 "General safety information" section of this operating manual.
- To read the "Warning pictograms and other labelling on the machine" section of this operating manual and to follow the safety instructions of the warning pictograms when operating the machine.
- To get to know the machine.
- To read the sections of this operating manual, important for carrying out your work.

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

Risks in handling the machine

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

- For the health and safety of the operator or third parties,
- 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 delivery" are always applicable. These shall be available to the operator, at the latest on the completion of the contract. Guarantee and liability claims for damage to people or 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 or protective equipment.
- Non-compliance with the instructions in the operating manual regarding commissioning, operation and maintenance.
- Unauthorised structural changes to the machine.
- Insufficient monitoring of machine parts which are subject to wear.
- Improperly executed repairs.
- Disasters through the impact of foreign objects 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:

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



The operating manual

- Must always be kept at the place at which the machine is operated.
- Must always be easily accessible for the operator 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..permitted —..not permitted

- ¹⁾ A person who can assume a specific task and who can carry out this task for an appropriately qualified company.
- ²⁾ 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 risks.

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 "Specialist workshop". The personnel of a specialist workshop shall possess the appropriate knowledge and suitable aids (tools, lifting and support equipment) for carrying out the maintenance and repair work on the machine in a way which is both appropriate and safe.

2.7 Safety measures during 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 Danger 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 Structural changes

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

Any expansion or modification work shall require the written approval of AMAZONEN-WERKE. Only use the modification and accessory parts released by AMAZONEN-WERKE so that the operating permit, for example, remains valid in accordance with national and international regulations.

Vehicles with an official type approval or with equipment connected to a vehicle with a valid type approval or approval for road transport according to the German road traffic regulations must be in the state specified by the approval.



WARNING

Risk of being crushed, cut, caught, drawn in or struck if supporting parts break.

It is forbidden to:

- Drill holes in the frame or on the running gear.
- Increase the size of existing holes on the frame or the running gear.
- Welding support parts.

2.10.1 Spare and wear parts and auxiliary materials

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

Use only genuine AMAZONE spare and wear parts or parts approved 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 Operator workstation

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

2.13 Warning symbols and other labels on the machine



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

Warning symbols - structure

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

A warning symbol consists of two fields:



Field 1

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

Field 2

is a symbol showing how to avoid the danger.

Warning symbols - explanation

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

1. A description of the danger.
For example: Risk of cutting or severing!
2. The consequence of non-observance of the risk-avoidance instructions.
For example: Causes serious injuries to fingers or hands.
3. Risk-avoidance instructions.
For example: Do not touch machine parts until they have come to a complete stop.

Order number and explanation

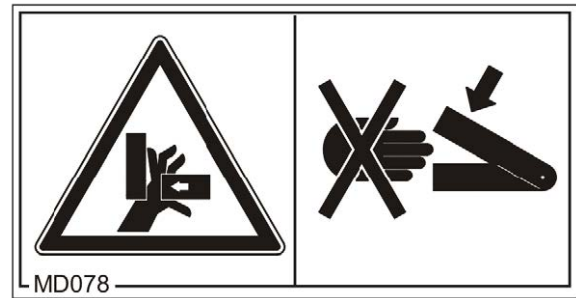
Warning symbols

MD078

Risk of fingers or hands being crushed by accessible moving parts of the machine.

This danger can result in extremely serious injuries resulting in the loss of limbs.

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



MD082

Risk of falling when riding the machine on treads or platforms.

This danger can result in extremely serious and potentially fatal injuries.

It is prohibited to ride on the machine as a passenger or to climb onto machines while they are running. This ban also applies to machines with treads or platforms.

Ensure that no-one rides with the machine.



MD084

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

This danger can result in extremely serious and potentially fatal injuries.

- It is forbidden to stand in the swivel area of the machine when machine parts are being lowered.
- Direct persons away from the swivel area of any machine parts which can be lowered before you lower the parts.

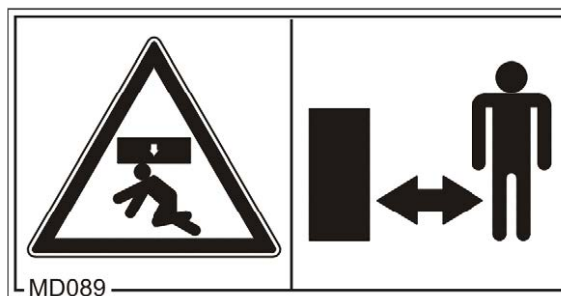


MD089

Risk of crushing the entire body due to standing under suspended loads or raised machine parts.

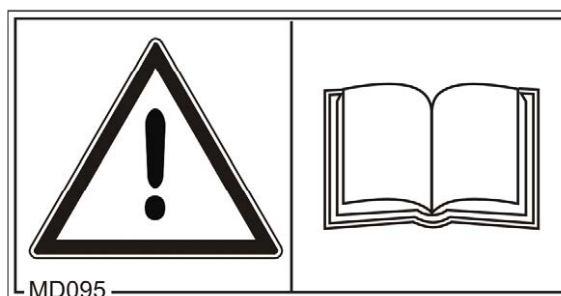
This danger can result in extremely serious and potentially fatal injuries.

- It is forbidden to stand under suspended loads or raised machine parts.
- Maintain an adequate safety distance from any suspended loads or raised machine parts.
- Ensure that all personnel maintain an adequate safety distance from suspended loads or raised machine parts.



MD095

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

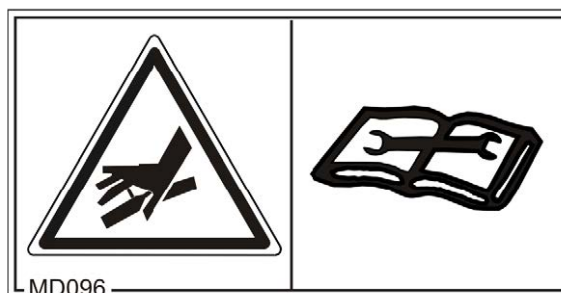


MD096

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

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

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

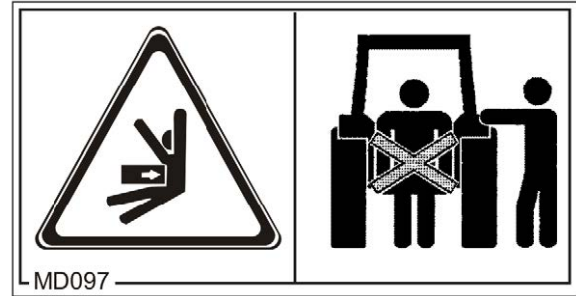


MD097

Risk of crushing the entire body due to standing in the stroke area of the three-point suspension when the three-point hydraulic system is actuated.

This danger can result in extremely serious and potentially fatal injuries.

- Personnel are prohibited from entering the stroke area of the three-point suspension when the three-point hydraulic system is actuated.
- Actuate the operating controls for the tractor's three-point hydraulic system
 - only from the intended workstation.
 - under no circumstances if you are in the stroke area between the tractor and machine.

**MD102**

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

These dangers can cause extremely serious and potentially fatal injuries.

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



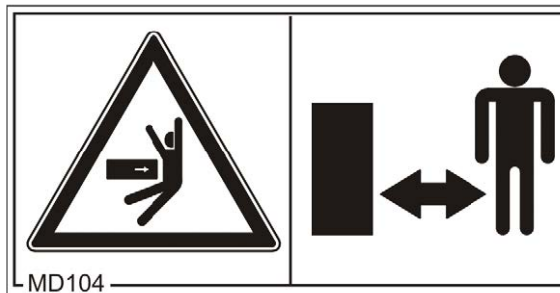
General Safety Instructions

MD104

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

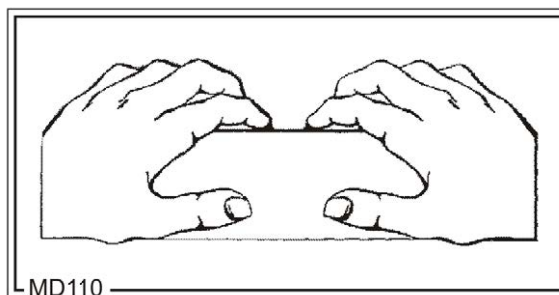
These dangers can cause extremely serious and potentially fatal injuries.

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



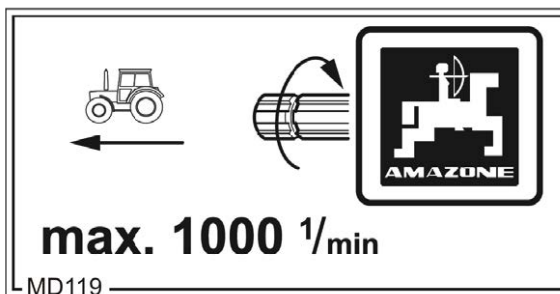
MD110

This symbol identifies parts of the machine that serve as a handle.



MD119

Nominal speed (maximum 1000 rpm) and direction of rotation of the machine-side drive shaft.



MD187

Risk of injury to unprotected body parts!

Seed grains may emerge uncontrollably at high speeds and cause injuries particularly to the eyes.

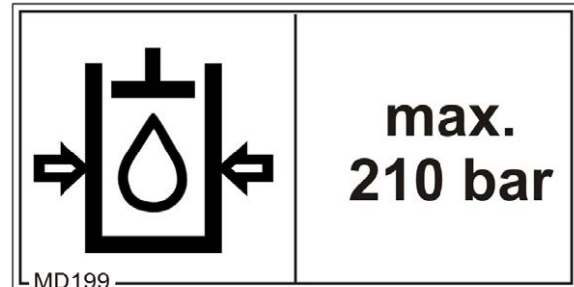
Never pull the seed lines out of the housing or raise the press rollers with the blower fan switched on (singling).



MD187

MD199

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



MD199

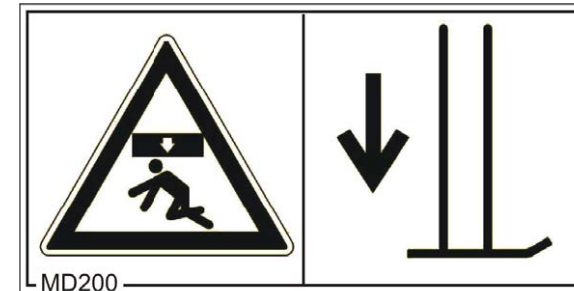
MD200

Risk of crushing the entire body due to necessary periods spent under raised, unsecured machine parts.

This danger can result in extremely serious and potentially fatal injuries.

Secure the entire machine against inadvertent lowering before entering the danger zone beneath the machine.

For this purpose, use the mechanical support devices on the machine.



MD200

2.13.1 Positioning of warning symbols and other labels

Warning symbols

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

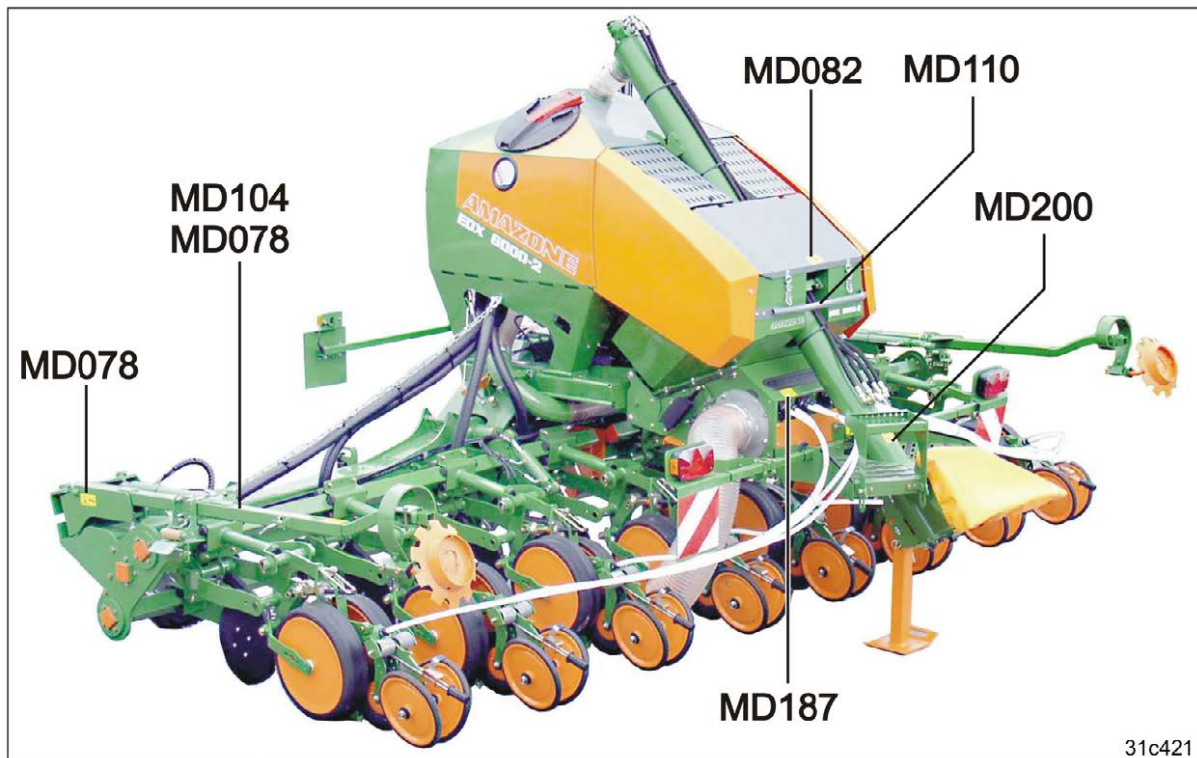


Fig. 1



Fig. 2



Fig. 3

2.14 Risks if the safety information is not observed

Non-observance of the safety information

- Can pose both a risk 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:

- Risk to people from working in an unsafe working environment.
- Failure of important machine functions.
- Failure of prescribed methods of maintenance and repair.
- Risk to people through mechanical and chemical influences.
- 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 symbols.

When driving on public roads and routes, comply with the appropriate statutory road traffic regulations.

2.16 Safety information for the operator



WARNING

Risk of crushing, cutting, being trapped or drawn in, or impact through inadequate roadworthiness and operational safety.

Before starting up the machine and the tractor, always check their traffic and operational safety.



CAUTION

Switch off the on-board computer

- before transport
- before adjustment, maintenance and repair work.

Risk of accident due to unintentional movement of the dosing unit or other machine components caused by radar impulse.

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 symbols 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 attached or hitched machine.

Connecting and disconnecting the machine

- Only connect and transport the machine with tractors suitable for the task.
- When connecting machines to the tractor three-point hydraulic system, the linkage 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 while the tractor is moving towards the machine!

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

- Secure the operating lever of the tractor hydraulic system so that unintentional raising or lowering is impossible, before connecting the machine to or disconnecting the machine from the tractor three-point hydraulic system.
- When coupling and uncoupling machines, move the support equipment (if available) to the appropriate position (stability).
- When actuating the support equipment, there is a risk of injury from nip and shear points.
- Be particularly careful when coupling the machine to the tractor or uncoupling it from the tractor. There are nip and shear points in the area of the coupling point between the tractor and the machine.
- It is forbidden to stand between the tractor and the machine when actuating the three-point hydraulic system.
- Coupled supply lines:
 - Must easily give way to all movements in bends without tensioning, kinking or rubbing
 - Must not scour other parts.
- The release ropes for quick couplings must hang loosely and may not release themselves when lowered.
- Also ensure that uncoupled machines are stable.

Use of the machine

- Before starting work, ensure that you understand all the equipment and actuation elements of the machine and their function. There is no time for this when the machine is already in operation.
- Do not wear loose-fitting clothing. Loose clothing increases the risk of being caught by drive shafts.
- Only start-up the machine, when all the safety equipment has been attached and is in the safety position.
- Comply with the maximum load of the connected machine and the approved axle and drawbar loads of the tractor. If necessary, drive only with a partially filled hopper.
- It is forbidden to stand in the working area of the machine.
- It is forbidden to stand in the turning and swivel area of the machine.
- There are nip and shear points on externally-actuated (e.g. hydraulic) machine parts.
- 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.

Transporting the machine

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

the approved axle and drawbar loads of the tractor.

- The tractor must guarantee the prescribed brake delay for the loaded vehicle combination (tractor plus connected machine).
- Check the brake power before moving off.
- When turning corners with the machine connected, take the broad load and balance weight of the machine into account.
- Before moving off, ensure sufficient side locking of the tractor lower links, when the machine is fixed to the three-point hydraulic system or lower links of the tractor.
- Before moving off, move all the swivel machine parts to the transport position.
- Before moving off, secure all the swivel machine parts in the transport position against risky position changes. Use the transport safety catches intended for this.
- Before moving off, secure the operating lever of the three-point hydraulic system to prevent 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 pins are firmly fixed with the lynch pin against unintentional release.
- Adjust your driving speed to the prevailing conditions.
- Before driving downhill, switch to a low gear.
- Before moving off, always switch off the independent wheel braking (lock the pedals).
- Observe the maximum permissible total weight. Only transport the machine with empty seed and fertiliser hoppers.

2.16.2 Attached tools

- When tools are attached, the attachment categories of the tractor and the machine must always coincide or be matched to one another.
- Take note of the manufacturer's instructions.
- Before attaching machines to or removing them from the three-point suspension, shift the operating equipment to a position in which unintended raising or lowering is impossible.
- There is a risk of crushing or shearing injury around the three-point linkage.
- The machine may only be transported and towed by the tractors intended for this purpose.
- There is a risk of injury when machines are coupled to and uncoupled from the tractor.
- Do not step between tractor and machine when operating the external control for the three-point attachment!
- There is a risk of crushing and shearing injury when operating the support devices.
- When devices are attached 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.
- Observe the maximum payload of the attached devices and the permissible axle loads of the tractor.
- Always ensure that the tractor lower links are adequately locked against sideways movement before transporting the machine.
- When travelling on public roads,
 - the operating lever for the tractor lower links must be secured against lowering
 - the on-board computer must be switched off.
- Shift all equipment into the transport position before travelling on the road.
- Any devices and ballast weights attached to a tractor influence the driving behaviour and the steering and braking power of the tractor.
- The front tractor axle must always be loaded with at least 20% of the empty tractor weight, in order to ensure sufficient steering power. If necessary, use front weights.
- Repair, maintenance and cleaning work or rectifying malfunctions must always only be carried out with
 - the ignition key removed
 - the on-board computer switched off
- Leave safety devices attached and always position them in the protective position.

2.16.3 Hydraulic system

- The hydraulic system is under high pressure.
- Ensure that the hydraulic hose lines are connected correctly.
- When connecting the hydraulic hose lines, ensure that the hydraulic system is depressurised on both the 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
 - due to their function require a float position or pressure position.
- Before working on the hydraulic system
 - Lower the machine
 - Depressurise the hydraulic system
 - Switch off the tractor engine
 - Apply the tractor parking brake
 - Take out the ignition key.
- Have the hydraulic hose lines checked at least once a year by a specialist for proper functioning.
- Replace the hydraulic hose lines if 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 hose lines using your hand or fingers.

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

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

2.16.4 Electrical system

- When working on the electrical system, always disconnect the battery (negative terminal).
- Only use the prescribed fuses. If fuses are used that are too highly rated, the electrical system will be destroyed – risk of fire.
- Ensure that the battery is connected correctly - first 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 risk of explosion.
- Risk 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 2004/108/EEC in the appropriate version and carry the CE mark.

2.16.5 Operation of the seed drill


- Observe the permissible fill levels for seed/fertiliser hoppers.
It is forbidden to ride on the machine during operation.
- During the calibration test, note the danger points from rotating and oscillating machine parts.
- Do not place any parts in the hopper.

2.16.6 Cleaning, maintenance and repairs

- Only carry out cleaning, maintenance and repair work on the machine when:
 - The on-board computer is switched off
 - The drive is switched off
 - The tractor engine is at a standstill
 - The ignition key has been removed.
- 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

The pictogram identifies the location at which the lifting gear is to be secured to the machine.



DANGER

Only attach the lifting gear at the location indicated.

Do not walk under suspended loads.

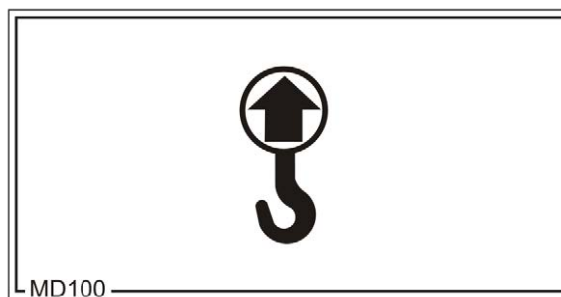


Fig. 4

Loading the machine onto a transport vehicle



Fig. 5



Fig. 6

1. Fold in the machine to the transport position and set it down on the stands.
2. Secure three belts at the points marked:
 - o one belt (Fig. 5/1) at the filling auger
 - o one belt (Fig. 6/1) at each machine extension arm.
3. To load on a transport vehicle, attach the belts to a crossbar on a crane.
4. Place the machine on the transport vehicle and lash it down as instructed.

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.

4.1 Overview of subassemblies

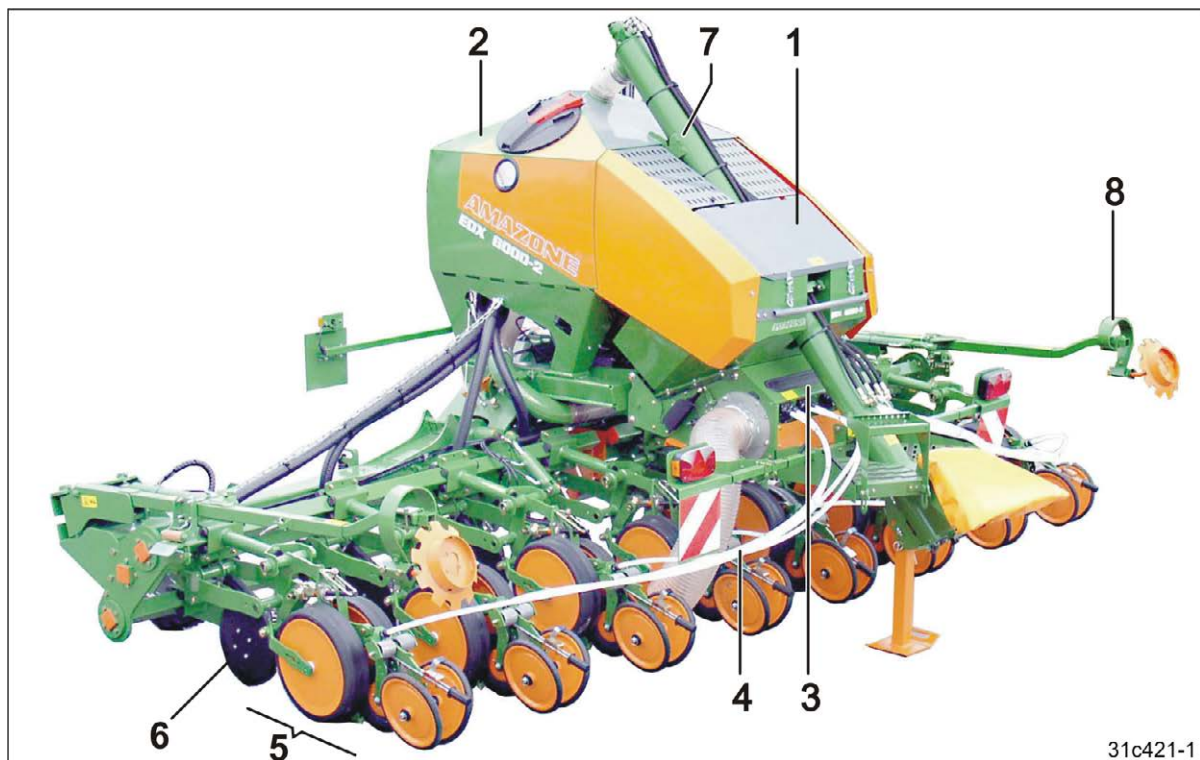


Fig. 7

- | | |
|-------------------------------------------------------------------------|---------------------------------------------------------------------|
| (1) Seed hopper | (6) Fertiliser coulter with hydraulic fertiliser coulter adjustment |
| (2) Fertiliser tank | (7) Fertiliser filling auger |
| (3) Singling | (8) Track marker |
| (4) Seed line hoses | |
| (5) Double disc type coulter with hydraulic coulter pressure adjustment | |



31c420-1

Fig. 8

- (1) Upper link coupling point
- (2) Lower link coupling points

- (3) Fertiliser distributor head

Fig. 9/...

- (1) Cartridge for stowing
 - o the operating manual
 - o the fertiliser dosing roller
 - o the digital scales



Fig. 9

Fig. 10/...

AMATRON 3 control terminal



Fig. 10

Fig. 11/...

- (1) Radar



Fig. 11

Fig. 12/...

- (1) Upper link coupling point
- (2) Lower link coupling points
- (3) Hose cabinet

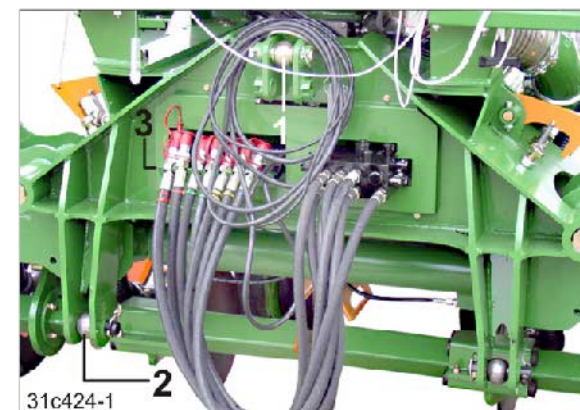


Fig. 12

Product description

Fig. 13/...

- (1) Step
for loading the seed hopper



Fig. 13

Fig. 14/...

- Blower fan
(not visible behind the machine panelling)
for singling and fertiliser transportation



Fig. 14

Fig. 15/...

- (1) Level sensor (seed)



Fig. 15

Fig. 16/...

- (1) Setting lever for seed shutter

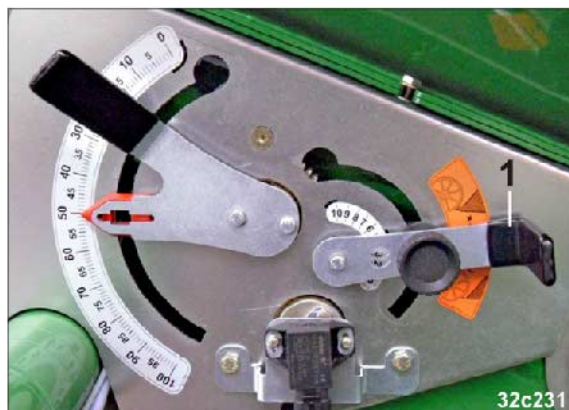


Fig. 16

Fig. 17/...

- (1) Setting lever for air guide



Fig. 17

Fig. 18/...

- (1) Setting lever for sealing lip



Fig. 18

Fig. 19/...

- (1) Setting lever of the mech. adjustable seed scraper



Fig. 19

Fig. 20/...

- (1) Pointer of the electr. adjustable seed scraper



Fig. 20

Product description

Fig. 21/...

Double disc type coulters



Fig. 21

Fig. 22/...

(1) Level sensor (fertiliser)



Fig. 22

Fig. 23/...

- 1 Fertiliser dosing unit
- (2) Injector sluice
- (3) Electric motor (dosing roller drive)



Fig. 23

Fig. 24/...

(1) Calibration trough (fertiliser)
in mounting for calibration test



Fig. 24

4.2 Safety and protection equipment

Fig. 25/...

- (1) Mechanical transport locking mechanism



Fig. 25

Fig. 25/...

Stands
required for setting down the machine
and for adjustment work.



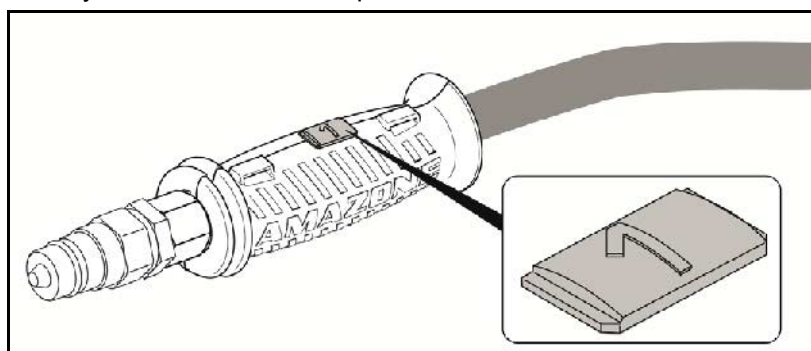
Fig. 26

4.3 Overview – Supply lines between the tractor and the machine






Fig. 27















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



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

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

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

Marking		Function			Tractor control unit	
Yellow			Track marker	Put in working position	Double acting	
				Put in headlands position.		
Green			Machine	Fold out	Double acting	
				Fold in		
Blue			Filling auger	Drive	Single acting	
Red		Hydraulic fan motor Coulter pressure (Sowing and fertiliser coulter) Pressure hose with priority (approx. 38 l/min.)			Single acting	
Red		Pressure-free return flow (see section "Fitting instructions for connecting the blower fan to the tractor hydraulics", Seite 83)				

Designation	Function
Machine connector	AMATRON 3 on-board computer
Connector (7-pin)	Road-use lighting system

4.4 Transportation equipment

Fig. 28/...

- (1) 2 rear-facing indicators
- (2) 2 reflectors, yellow
- (3) 2 brake and tail lights
- (4) 2 red reflectors
- (5) 2 rear-facing warning boards

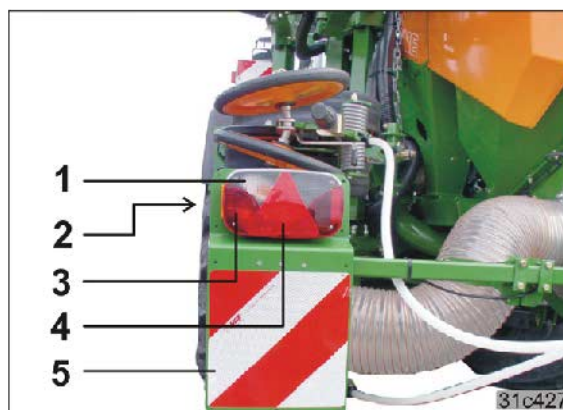


Fig. 28

Fig. 29/...

- (1) 2 forward-facing warning boards
- (2) 2 forward-facing limiting lights
- (3) 2 forward-facing turn indicators

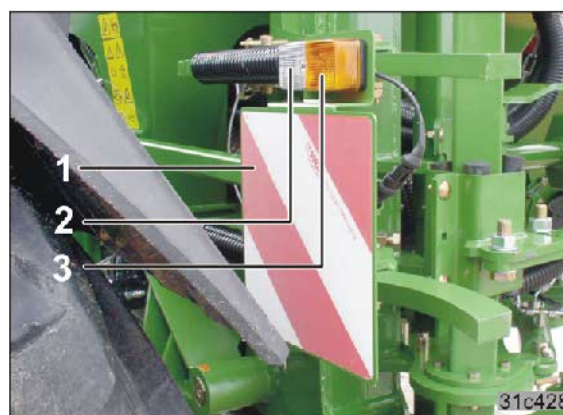


Fig. 29

4.5 Intended use

The machine

- is designed
 - for the singling and sowing of commercially available seed
 - for dosing and spreading commercially available kinds of fertiliser
- is coupled to the tractor using the three-point attachment 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 prescribed inspection and maintenance work.
- Exclusive use of original AMAZONE spare parts.

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

For any damage resulting from improper use:

- The operator bears sole responsibility
- AMAZONEN-WERKE assumes no liability whatsoever.

4.6 Danger area and danger points

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

- By work movements made by the machine and its tools
- By materials or foreign objects thrown out of the machine
- By tools rising or lowering 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 symbols indicate these danger points and warn against residual risks, which cannot be eliminated for structural reasons. Here, the special safety regulations of the appropriate section shall be valid.

Personnel must stay clear of the machine danger area under the following circumstances:

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

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

Danger points exist:


- Between the tractor and the machine, particularly during coupling and uncoupling operations.
- When loading the hoppers
- In the vicinity of moving parts
- In the area of the swivelling machine extension arms
- In the area of the swivelling track marker
- Under raised, unsecured machines and machine parts
- When folding the machine extension arms in/out near overhead power lines
- When climbing onto the machine
- Behind the machine in the area of the seed hopper. If the seed tube is torn off, seed shoots out of the optical sensor.



4.7 Rating plate and CE mark

The figure shows the arrangement of the rating plate and the CE mark. The CE mark on the machine indicates compliance with the stipulations of the valid EU directives.

The rating plate shows:

- Mach. ident. no.
- Type
- Basic weight (kg)
- Perm. total weight, kg
- Factory
- Model year
- Year of construction (beside the CE mark).

AMAZONEN-WERKE			
D-49205 Hasbergen / BBG D-04249 Leipzig			
Masch.-Ident.Nr.	EDX0000000		
Typ	EDX 6000-2C		
Grundgewicht kg		Werk	
zul. Gesamtgewicht kg		Modelljahr	

	Baujahr	
	Annee de fabrication year of construction Дата изготовления	

32c684

Fig. 30

4.8 Technical data

Precision airplanter		EDX 4500-2C	EDX 6000-2C
Number of sowing units		See table (Fig. 31)	See table (Fig. 31)
Row spacing			
Working width			
Transport width	[m]	3.0	3.0
Empty weight (basic weight)	[kg]	2950	3250
Seed hopper capacity	[l]	360	360
Fertiliser tank capacity	[l]	1100	1100
Working speed	[km/h]	15	max. 15
Oil flow rate (minimum)	[l/min]	80	80
Electrical system	[V]	12 (7-pin)	12 (7-pin)
Coupling point category		Cat. III	Cat. III
Continuous acoustic pressure level	[dB(A)]	72	72

	Number of sowing units	Row spacing [cm]	Working width
EDX 4500-2C	6	70	4,2
	6	75	4.5
	6	80	4,8
EDX 6000-2C	8	70	5.6
	8	75	6.0
	8	80	6.4

Fig. 31

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

	Total weight G_H (see Seite 79)	Distance d (see Seite 79)
EDX 4500-2C		
• with 8 sowing units, row spacing 75 cm	4200 kg	800 mm
• with full seed and fertiliser hopper		
EDX 6000-2C		
• with 8 sowing units, row spacing 75 cm	4500 kg	800 mm
• with full seed and fertiliser hopper		

4.9 Necessary tractor equipment

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

Tractor engine power

EDX 4500-2C: from 100 kW

EDX 6000-2C: from 130 kW

Electrical system

Required output of tractor generator: 12.5 V at 30 A (>110 Ah)

Lighting socket: 7-pin

Hydraulic system

Maximum operating pressure: 200 bar

Tractor pump capacity: At least 80 l/min at 190 bar

Machine hydraulic fluid: Gearbox/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 *yellow*: Double-acting control unit

Control unit *green*: Double-acting control unit

Control unit *red*: 1 single-acting or double-acting control unit with priority control for the feed line

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

4.10 Noise production data

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

Measuring unit: OPTAC SLM 5.

The sound power level is primarily dependent on the vehicle used.

5 Design and function

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

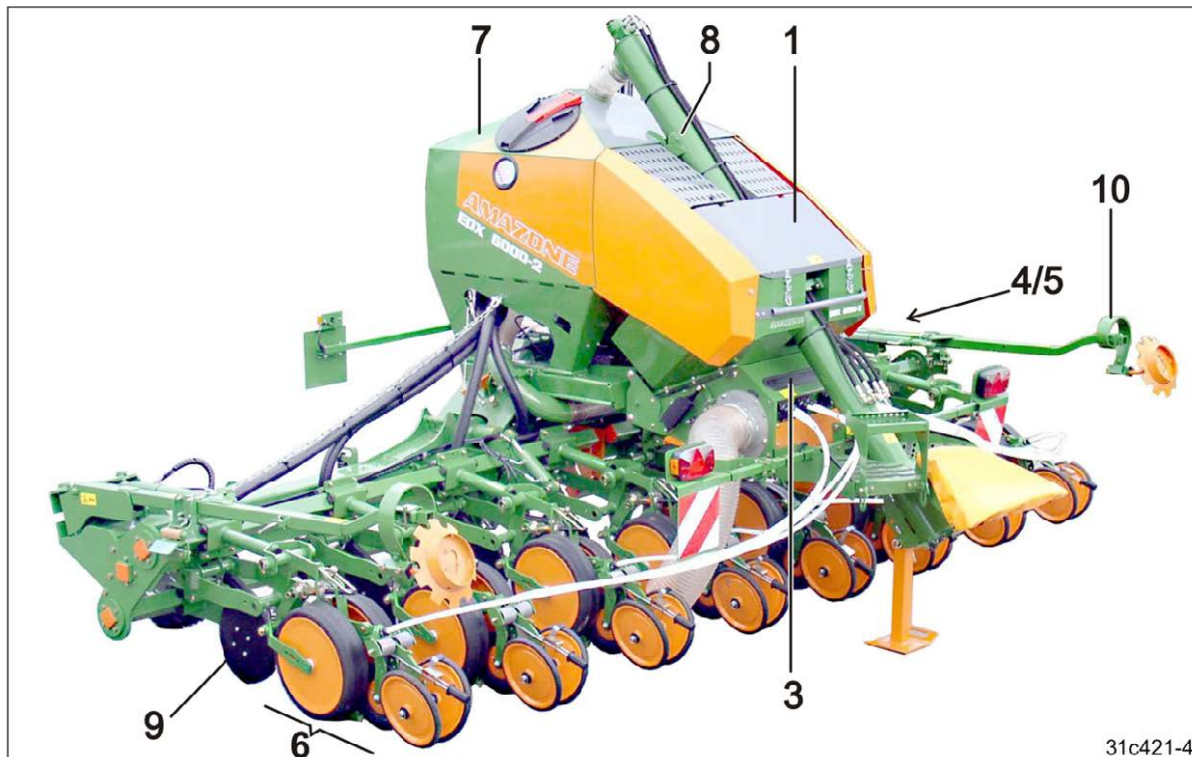


Fig. 32

The machine is equipped with a centrally positioned seed hopper (Fig. 32/1).

The spread rate is adjusted by keying the desired value into the AMATRON 3 on-board computer. The AMATRON 3 determines the working speed and the distance from the signals received from the radar.

An electric motor below the seed hopper drives the singling drum [shown in window (Fig. 32/3)] with reference to the specified spread rate and working speed.

The central adjustment (Fig. 32/4) for the scrapers that prevent multiple occupancy of seed grains on the drum and the central adjustment (Fig. 32/5) for the air guides are conveniently accessible.

The figure (Fig. 33) shows the progression of the seed grains from singling through to placement by the double disk type coulter (Fig. 32/6) in the seed furrow.

The fertiliser is carried on-board in the fertiliser tank (Fig. 32/7). The desired fertiliser quantity is metered by a dosing roller in the dosing unit.

The fertiliser hopper is conveniently filled with the filling auger (Fig. 32/8).

The dosing roller is driven by an electric motor. The drive speed of the dosing roller is determined by the working speed and fertiliser quantity set.

The air current generated by the blower fan is divided for conveying

the fertiliser and for singling the seed.

The fertiliser is conveyed from the injector sluice to the distributor head and then evenly distributed over all the fertiliser coulters (Fig. 32/9).

The fertiliser is placed in the soil beside the seed. The depth of the fertiliser coulters is adjusted centrally by actuating a tractor control unit.

Track markers mark the field connection run (Fig. 32/10) in the centre of the tractor.

The various parts of the machine can be retracted to achieve a transport width of 3 m.

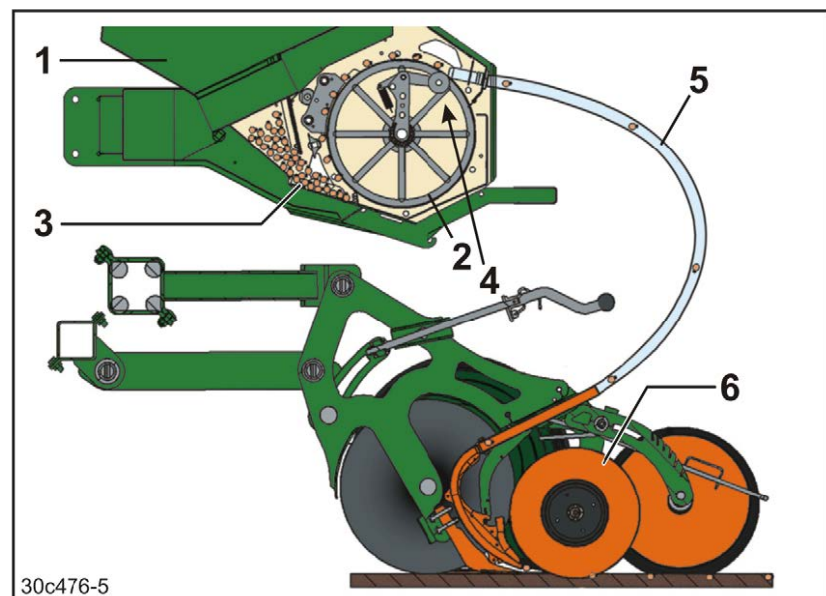


Fig. 33

The seed hopper (Fig. 33/1) has a singling drum (Fig. 33/2) on which the precise pneumatic singling of seed grains takes place.

The centrally adjustable air flow sets the gains in the fluid bed (Fig. 33/3) in motion. Every hole in the drum is closed by a seed grain. Surplus seed grains are removed by centrally adjustable scrapers in the event of multiple occupancy.

The suction force that acts on the grain is interrupted by a roller (Fig. 33/4) attached to the inside of the drum. The roller closes the hole directly in front of the outlet nozzle to which the seed tube (Fig. 33/5) will subsequently be attached. The overpressure escapes via the seed tube. The grain is released from the drum, is accelerated rapidly by the flow and emerges with high velocity at the coulter. A catcher roller (Fig. 33/6) softly intercepts the seed grain and pushes it firmly into the furrow.

The modular separation of the singling and sowing operations makes reliable seed placement possible, even at high working speeds up to 15 km/h.

The cross-section of the furrow generated is rectangular. A positive closure is formed between the catcher roller and the edge of the furrow which ensures optimum placement, even with varying ground conditions and at high working speeds.

Design and function

As an option, each seed tube (Fig. 34/1) can be sealed by a swivelable module (Fig. 34/2).

The modules are controlled by the on-board computer (see AMATRON 3 operating manual).

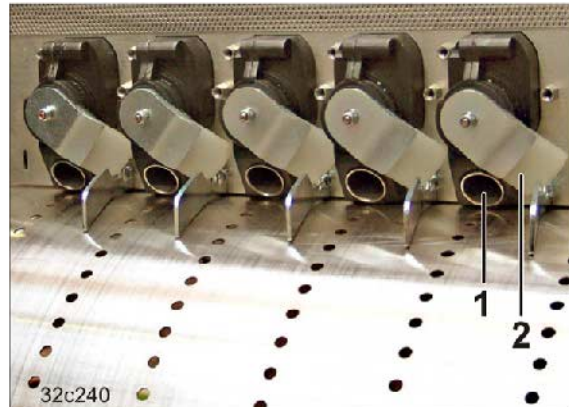


Fig. 34

By sealing the seed tubes with the modules (Fig. 35/1):

- any number of rows can be cut out
- tramlines can be created.

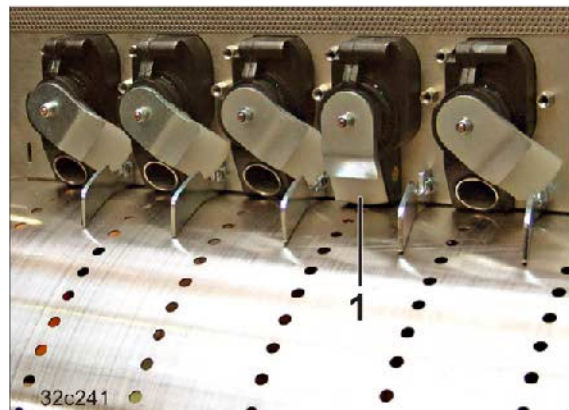


Fig. 35

5.1 Radar

The radar (Fig. 36/1) measures the distance covered.

The on-board computer requires this data to calculate the drive speed and area cultivated (hectare counter).



Fig. 36

5.2 AMATRON 3 control terminal

The AMATRON 3 consists of the operator control terminal (Fig. 37), the basic equipment (cable and fastening material) and the job computer on the machine.

Fasten the operator control terminal in the tractor cab in accordance with the AMATRON 3 operating manual.



Fig. 37

The following are performed via the operator control terminal (Fig. 37)

- input of the machine-specific data
- input of the job-related data
- activation of the machine that modifies the sowing rate during the sowing operation
- monitoring of the seed drill during sowing operation.
- monitoring of the fill level in the seed and fertiliser tank.

The AMATRON 3 determines

- the current forward speed [km/h]
- the current sowing rate [grains/ha]
- the actual seed/fertiliser hopper content [kg]
- the remaining distance [m], until the seed hopper/fertiliser tank is empty
- the blower fan speed
- the speed of the singling drum
- the pressure in the singling unit.

For a commenced order, the AMATRON 3 stores

- the daily and total volume of seed/fertiliser applied [kg]
- the daily and total area cultivated [ha]
- the daily and total sowing time [h]
- the average work performance [ha/h]

5.3 Frame and machine extension arms

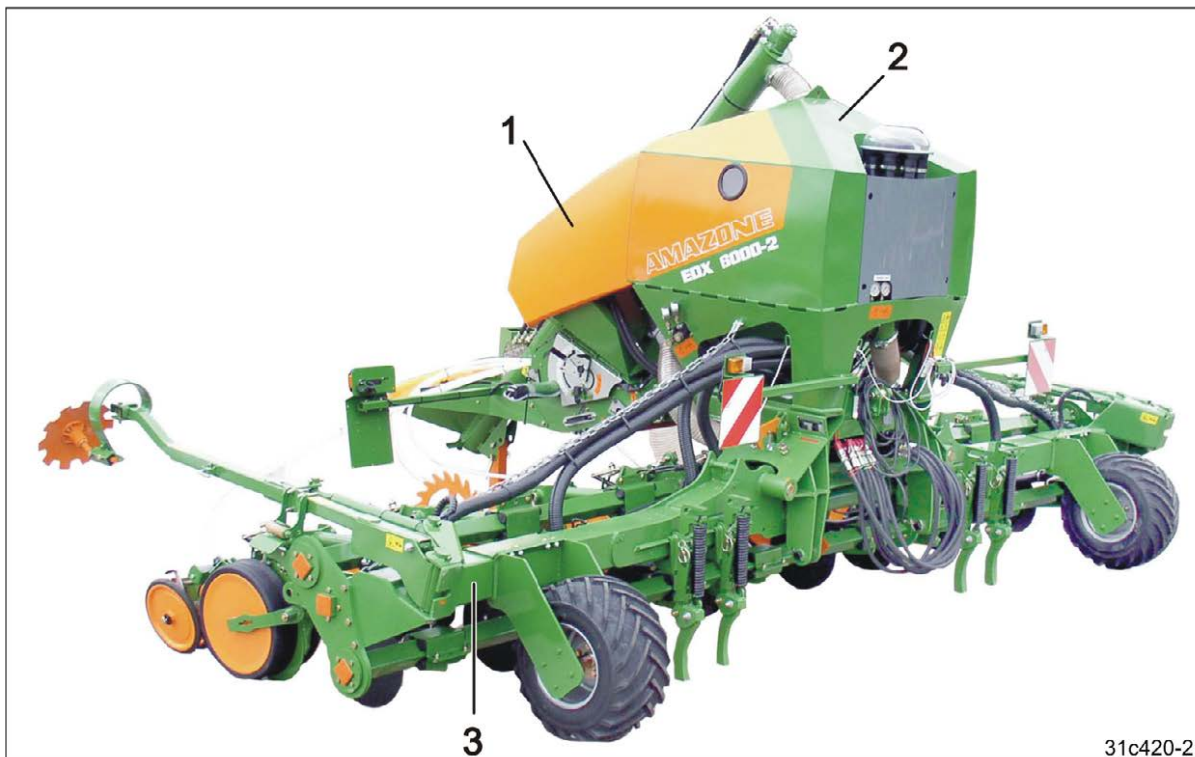


Fig. 38

The machine has:

- a seed hopper (Fig. 38/1)
- a fertiliser hopper (Fig. 38/2)
- two machine extension arms which can be folded in for transportation (Fig. 38/3).

5.4 Stands

The machine has:

- two front stands (Fig. 39/1)
- one rear stand (Fig. 39/2).

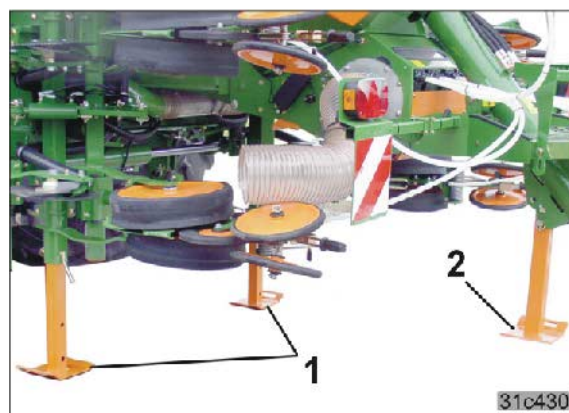


Fig. 39

5.5 Seed singling and application

5.5.1 Seed hopper

The seed hopper has an air-tight cover (Fig. 40/1) that can be sealed with two clips (Fig. 40/2).

A pneumatic spring assists cover opening.



Fig. 40

The seed hopper (Fig. 41/1) is located above the singling drum housing (Fig. 41/2).

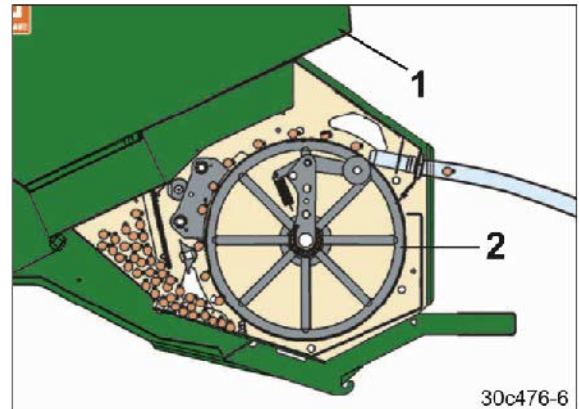


Fig. 41

5.5.2 Singling drum

Different seeds require adaptation of the singling drum to the seed. Select and fit the required singling drum as per the table (Fig. 43) (see section "Removing/installing the singling drum", Seite 150).

The singling drums differ according to the number of rows (Fig. 42/1) and the hole diameters.

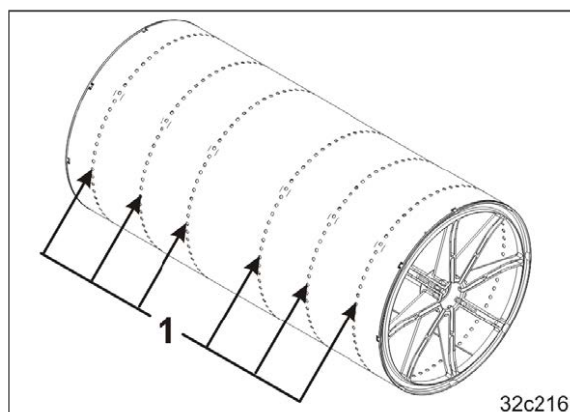


Fig. 42

Seed	Singling drum						Note
	Number of rows per singling drum					Hole [mm]	
Maize	6	8	9	10	12	Ø 5,5	Singling drum standard for maize
	6	8	9	10	12	Ø 4,5	Singling drum for small maize grains
Sunflowers	6	8	9	10	12	Ø 3.0	

Fig. 43

Recommendation for selecting correct maize singling drum

For planting maize, two singling drums, with hole diameters 4.5 mm and 5.5 mm, are available.

Selection of the right drum depends on the grain shape, which varies greatly in size and shape. Large grains are mostly held securely on the 5.5 mm diameter drum. Only use the 4.5 mm diameter drum if large grains are shaped so that with the drum with hole diameter of 5.5 mm they are too far in and thus become damaged.

As a guide, depending on the thousand-grain weight of the seed, use the drum

with hole diameter 4.5 mm for maize up to 250 thousand-grain weight

with hole diameter 5.5 mm for maize up to 230 thousand-grain weight

Select the overlap range (230 to 250 thousand-grain weight) depending on the grain shape, e.g.:

- the drum with hole diameter 4.5 mm for a long grain, so that it does not fall through the larger hole
- the drum with hole diameter 5.5 mm for a round grain, so that it is held in the drum.

5.5.3 Seed shutter

The seed flows from the seed hopper to the fluid bed (Fig. 44/1) directly before the singling drum.

The fluid bed must not be completely filled with seed. Otherwise, with the subsequent air supply, no swirl bed can be created.

If too much seed gets into the fluid bed, reduce the supply quantity by adjusting the seed shutter (Fig. 44/2).

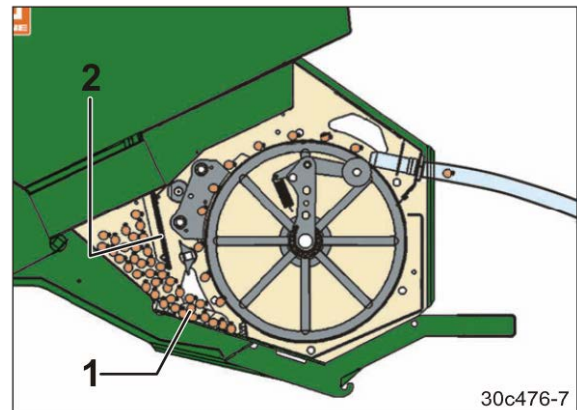


Fig. 44

The sight glass should be half full with seed when the machine is at rest.

The setting of the seed shutter depends on the working speed and the seed.

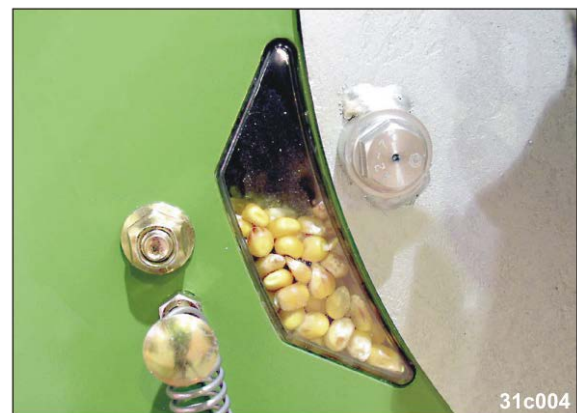


Fig. 45

Design and function

Actuate the seed shutter with the lever (Fig. 46/1).

The numbers on the scale to which the pointer (Fig. 46/2) of the lever points serve for orientation.

Take the settings from the table (Fig. 47).

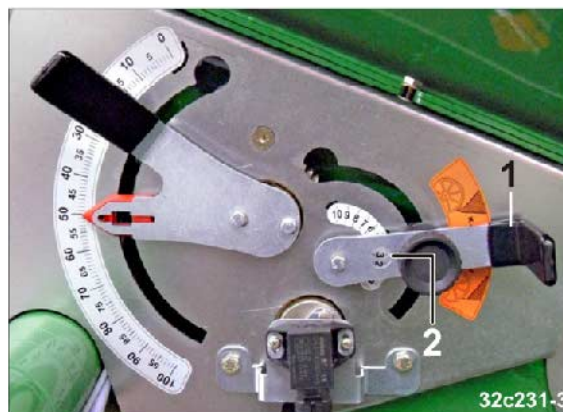


Fig. 46

Seed	Scale value on seed shutter
Maize	2 – 3
Sunflowers	2

Fig. 47

The table values (Fig. 47) are guide values. Check the result of the setting in the sight glass (Fig. 32/3) and adjust the lever accordingly.

The fluid bed contains too much seed: Move the lever (Fig. 46/1) clockwise (-).

The fluid bed contains too little seed: Move the lever (Fig. 46/1) anti-clockwise (+).

If the lever points to the Scale value "0", the supply from the seed hopper is closed.

5.5.4 Air guide

Air flowing through the fluid bed sets the seed grains in front of the singling drum in motion.

The air quantity is correctly dosed if the seed grains

- move loosely at the sight glass (without jumping)
- are not thrown across the singling drum.



Fig. 48

Set the air quantity required for the swirl bed by adjusting the air guide by means of the lever (Fig. 49/1).

The numbers on the scale to which the pointer (Fig. 49/2) of the lever points serve for orientation.

Take the settings from the table (Fig. 50).

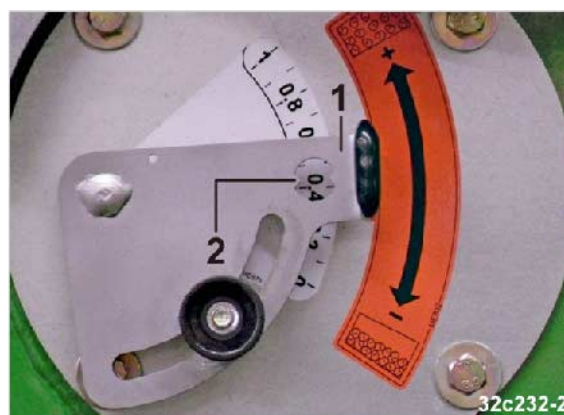


Fig. 49

Seed	Scale value on air guide
Maize	0,6
Sunflowers	0,5

Fig. 50

The table values (Fig. 50) are guide values. For example, small free-flowing corn grains require less air than large corn grains with a sticky dressing. Check the results of the adjustment in the sight glass (Fig. 32/3).

Reduce the air volume in the fluid bed:

Move the lever (Fig. 49/1) clockwise (-).

Increase the air volume in the fluid bed:

Move the lever (Fig. 49/1) anti-clockwise (+).

5.5.5 Seed scraper

Multiple occupancy and gaps in the holes of the singling drum are detected by the optosensors after working speed has been reached. The AMATRON 3 issues an alarm.

Mechanically or electrically adjustable seed scrapers remove excess seed grains.

The table values (Fig. 51) are guide values.

Seed	Scale value on seed scraper
Maize	60
Sunflowers	60

Fig. 51

If at working speed the AMATRON 3 indicates gaps or double occupancy, rectify the scraper position.

In event of double occupancy Adjust the pointer anti-clockwise to a higher scale value.

In event of gaps Adjust the pointer clockwise to a lower scale value.

5.5.5.1 Seed scraper, mech. adjustable

Adjustment of the lever (Fig. 52/1) changes the scraper position.

The numbers on the scale to which the pointer (Fig. 52/2) of the lever points serve for orientation.

Take the settings from the table (Fig. 51).



Fig. 52

5.5.5.2 Seed scraper, electr. adjustable

The set scraper position is indicated

- by the pointer (Fig. 53/1)
- by the AMATRON 3.

If at working speed the AMATRON 3 indicates gaps or double occupancy, rectify the scraper position as described in the AMATRON 3 operating manual.

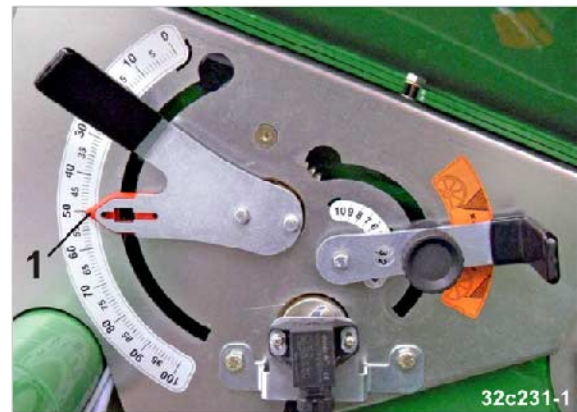


Fig. 53

An electric setting motor (Fig. 54/1), controlled by the AMATRON 3, adjusts the seed scrapers.



Fig. 54

5.5.6 Baffle plates (optional) for working on a slope

When working on sloping terrain, the seed may slip in the singling unit. Individual holes in the drum or whole rows may then no longer be supplied with seed.

This problem is solved by baffle plates (Fig. 55/1), which prevent the slipping in the fluid bed.

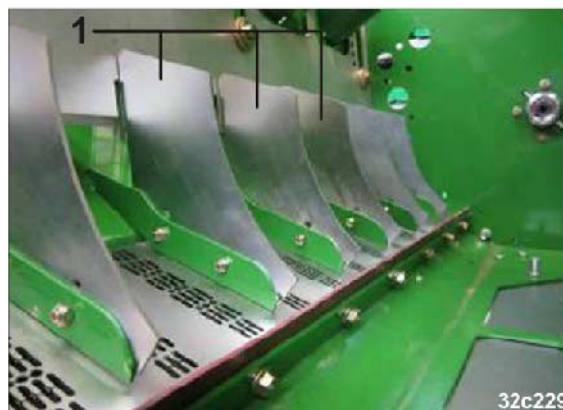


Fig. 55

5.5.7 Digital seed fill level monitoring

The level sensor (Fig. 56/1) monitors the seed level in the hopper.

If the seed level reaches the level sensor, the AMATRON 3 displays a warning message. An alarm signal sounds simultaneously.

This alarm signal is intended to remind the tractor driver to promptly replenish the hopper.



Fig. 56

5.5.8 Blower fan for seed singling and fertiliser delivery

The blower fan (Fig. 57/1) produces the air current

- for seed singling
- for fertiliser delivery

The blower fan hydraulic motor (Fig. 57/2) is driven by

- the tractor hydraulics

The maximum blower fan speed is 4000 rpm.

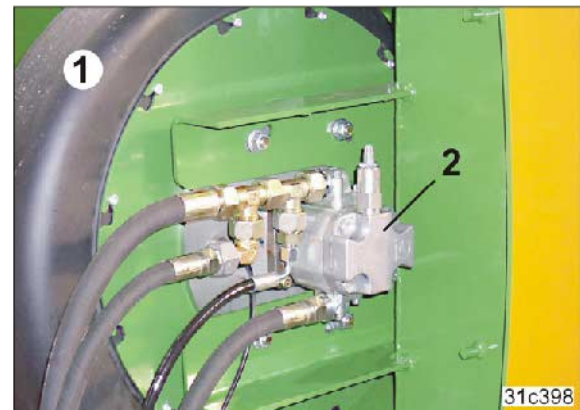


Fig. 57

The blower fan speed is correctly set when the AMATRON 3 indicates an air pressure of 55 mbar in the singling unit.

The air pressure in the singling housing is measured by a pressure sensor (Fig. 58/1).



Fig. 58

To prevent the seed grains from falling from the singling drum, constant air pressure must be ensured in the singling housing.

The required air pressure is established

- if all the singling drum holes are sealed with seed grains
- if the blower fan speed is constant
- if the system is air-tight (pressure tank).

The AMATRON 3 initiates an alarm if singling drum holes are not sealed with seed grains. The alarm is triggered if no seed is detected by the optosensors.

5.5.9 Double disc type coulters

The double disc type coulters (Fig. 59/1) is supported by the two carrier rollers (Fig. 59/2) and maintains a constant working depth. The diameters of the double disc type coulters and carrier rollers are especially large.

Remaining vegetation in front of the furrow former (Fig. 59/3) is moved to one side by the double disc type coulters.

The adjustable press rollers (Fig. 59/4) close and press on the seed furrow.

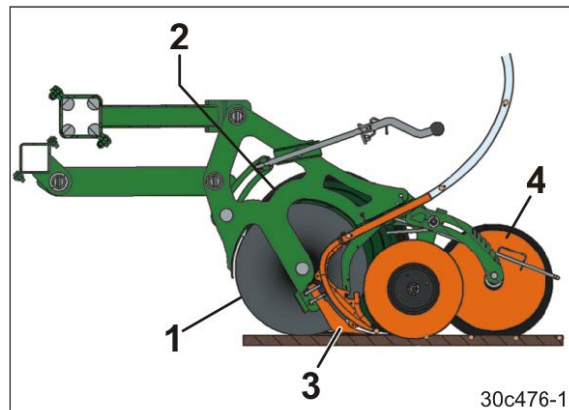


Fig. 59

5.5.9.1 Seed placement depth

The seed placement depth is adjusted via a spindle (Fig. 60/1). The scale (Fig. 60/2) is provided as an adjustment aid.

Adjust all sowing units so that the same value appears on the scale.

The maximum placement depth is 10 cm.

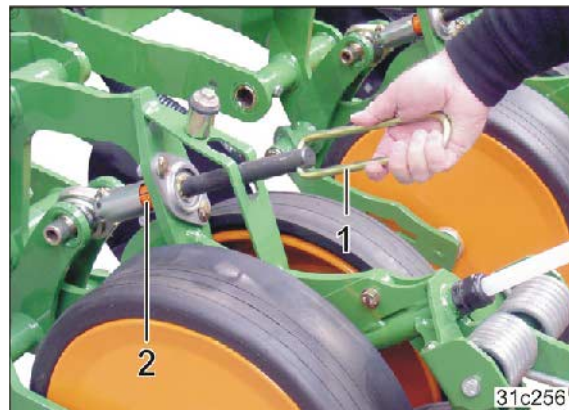


Fig. 60



Check the placement depth and grain spacing

- Following every adjustment to the seed placement depth
- When changing from light to heavy soil and vice-versa. The carrier rollers penetrate the ground more deeply with light soil than with heavy soil.

5.5.9.2 Coulter pressure (double disc type coulter)

The adjustable coulter pressure applies a load of up to 250 kg on the double disc type coulter.

The desired seed placement depth is only achieved if the coulter pressure is correctly set.

If the coulter pressure is too low, the necessary placement depth will not be achieved. The coulters do not run smoothly.

If the coulter pressure is too high, the furrows formed by the carrier rollers will be too deep. The machine lifts out.

Adjust the coulter pressure by actuating

- the valve (Fig. 61/1) or
- a setting motor (optional), which is operated via the AMATRON 3 in the tractor cab.

Read off the coulter pressure

- on the pressure gauge (Fig. 61/2) or
- in the AMATRON 3 display (with the option "setting motor").

Adjustment of the electr. coulter pressure is described in the AMATRON 3 operating manual.

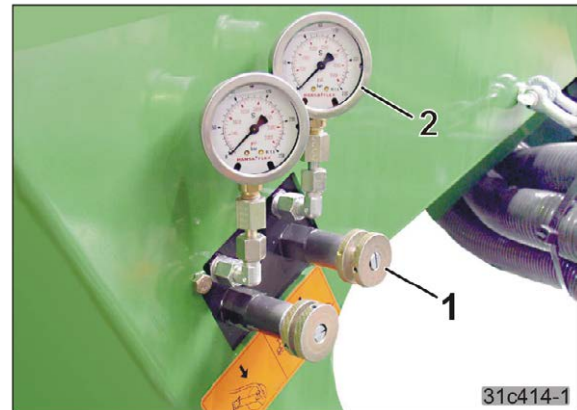


Fig. 61



The pressure indicated on the pressure gauge (Fig. 61/2) changes until the fan blower driven by the tractor hydraulics is running at constant speed.

5.5.9.3 Ground contact pressure and intensity of press rollers

The adjustable press rollers (Fig. 62/1) close the seed furrow and push soil over the seed.

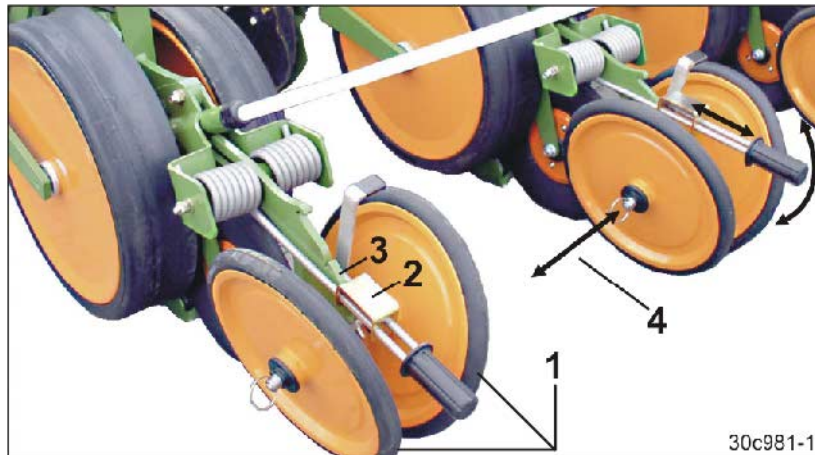


Fig. 62

Ground contact pressure of the press rollers

The ground contact pressure of the press rollers increases with the height at which the tab (Fig. 62/2) engages in the toothed segment (Fig. 62/3).

Intensity of the press rollers

The intensity of the press rollers changes according to the axial adjustment of the press rollers (Fig. 62/4). Adjust the position of the press rollers to the ground or the seed furrow.



If the desired work result is not achieved, adjust the press rollers by rotating the axle.

The lever (Fig. 63/1) serves for adjustment.

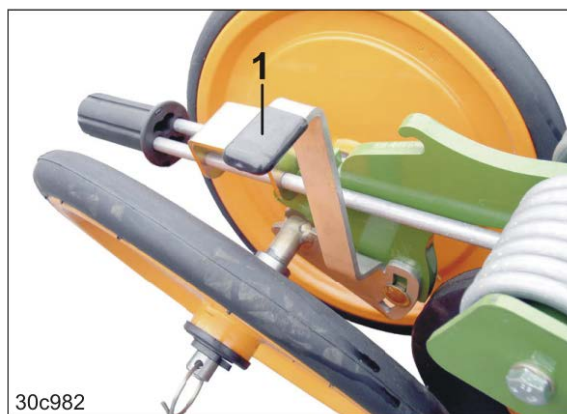


Fig. 63

5.5.9.4 Star clearer (optional)

The star clearers (Fig. 64/1) level the seed groove.

The star clearers are suitable for mulch sowing.

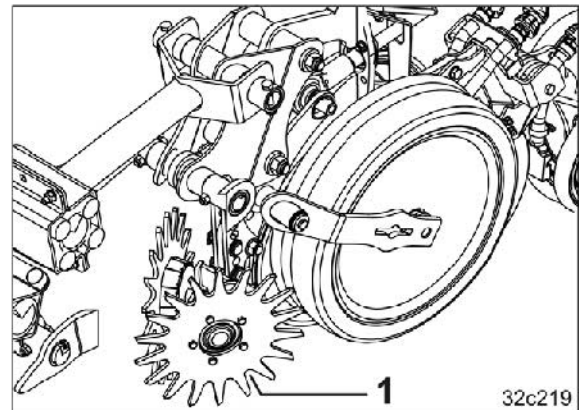


Fig. 64

5.5.9.5 Clod clearers (optional)

The clod clearers (Fig. 65/1) level the seed groove.

The clod clearers are suitable for mulch sowing.

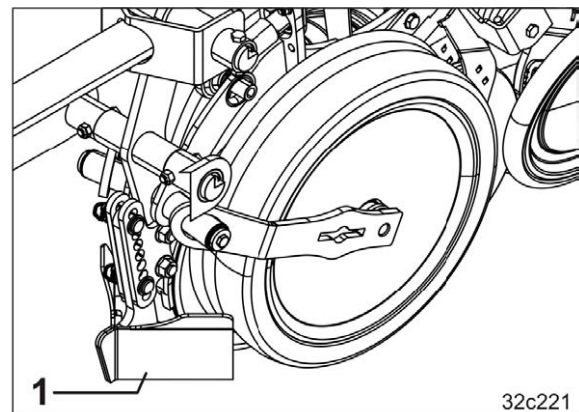


Fig. 65

5.5.9.6 Carrier roller scraper (optional)

Each carrier roller can be equipped with a scraper arm (Fig. 66/1). With a scraper arm, the machine row spacing must not be less than 45 cm.

The scrapers (Fig. 66/2) are adjustable.



Fig. 66

5.6 Fertiliser dosing and application

5.6.1 Fertiliser tank

The fertiliser hopper is filled by means of the filling augur (Fig. 67/1).

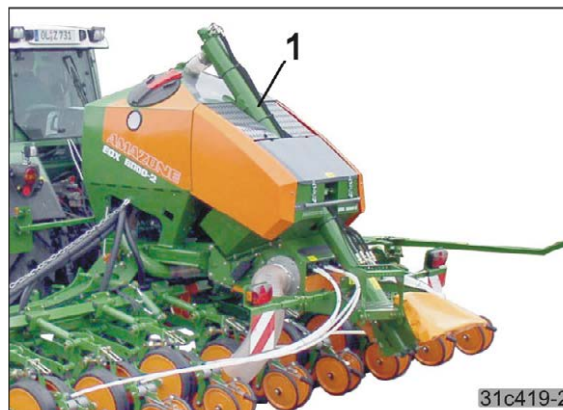


Fig. 67

5.6.2 Digital fill level monitoring (optional)

A fill level sensor monitors the fertiliser level in the fertiliser tank.

If the fertiliser level reaches the level sensor, the AMATRON 3 displays a warning message. An alarm signal sounds simultaneously. This alarm signal is intended to remind the tractor driver to promptly replenish the fertiliser.

The height of the level sensor (Fig. 68/1) can be adjusted from the outside by fastening it in one of the mounts.

Fit the level sensor according to the spread rate.

Attaching the sensor

- to the upper mount if the spread rate is large;
- to the lower mount if the spread rate is small;

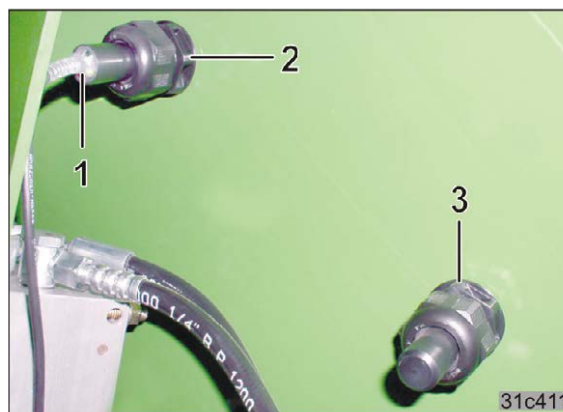


Fig. 68

5.6.3 Fertiliser dosing unit and injector sluice

The fertiliser is metered by a dosing roller (Fig. 69/1) in the dosing unit.

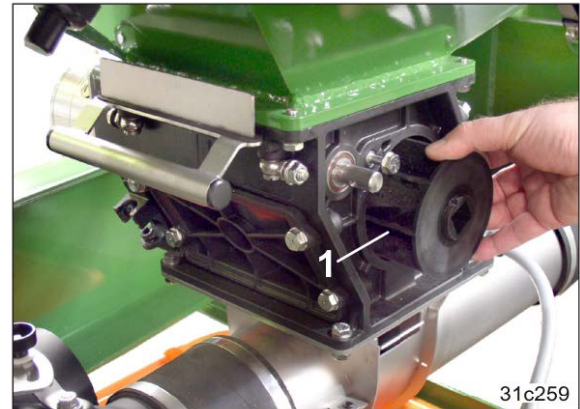


Fig. 69

The dosing roller is driven by an electric motor (Fig. 70/1).

The metered fertiliser drops into the injector sluice (Fig. 70/2) and is carried by the air current to the distributor head and on to the coulters.



Fig. 70

For calibration testing and emptying purposes, the fertiliser falls through an opening in the floor of the injector sluice. A rotary slide closes the opening. The rotary slide is actuated by means of a lever (Fig. 711). Ensure that the lever engages when opening and closing.

Always make the lever (1) engage in one of the two positions

- Rotary slide closed
- Rotary slide open



Always keep the rotary slide closed.
Open the rotary slide only for calibration tests and for emptying.

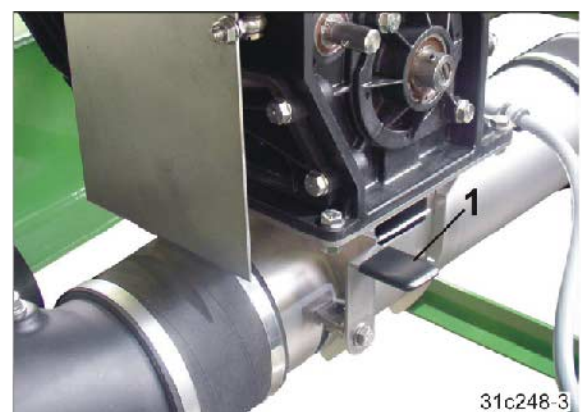


Fig. 71

5.6.4 Fertiliser quantity adjustment

The dosing roller is driven by an electric motor (Fig. 72/1).

The speed of the dosing roller is determined by the spread rate set in the AMATRON 3 and the working speed.



Fig. 72

The AMATRON 3 calculates the working speed from the radar impulses (Fig. 73/1).

Each setting must be checked with a calibration test.



Fig. 73

The speed of the dosing roller

- determines the spread rate. The higher the speed of the electric motor, the greater the spread rate.
- automatically adjusts to changing working speeds.

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

5.6.5 Calibration test

The calibration test checks whether the reset and actual spread rates correspond.

Always carry out a calibration test:

- when changing the type of fertiliser
- if the same type of fertiliser is used, but with a different grain size and specific weight
- if there are differences between the spread rate calculated by the AMATRON 3 and the actual spread rate.

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

The calibration trough is located in the transport box above the seed hopper.



Fig. 74



When changing from normal soil to heavy soil, the spread rate can be increased in the AMATRON 3 at the press of a button.

5.6.6 Distributor head

The fertiliser is distributed evenly amongst all fertiliser coulters in the distributor head (Fig. 75/1).



Fig. 75

5.6.7 Single disc-type fertiliser coulters

The single disc-type fertiliser coulters (Fig. 76/1) is suitable for spreading fertiliser on ploughed and mulched soil.

The fertiliser placement depth is adjustable.

The maximum fertiliser placement depth is 15 cm.

In the tractor tramline, the placement depth of individual fertiliser coulters can be adjusted, in addition to the hydr. adjustment, by means of the adjusting screws.

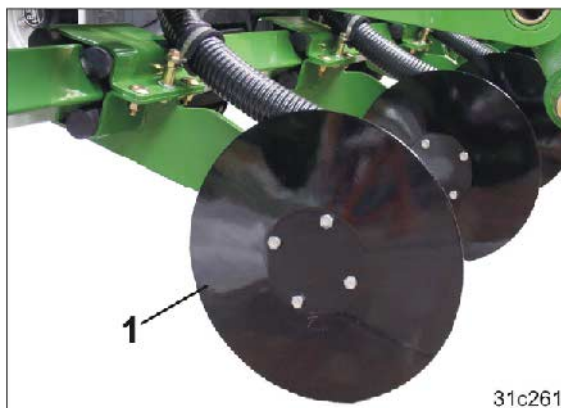


Fig. 76

Adjust the working depth of the single disc type fertiliser coulters by actuating

- the valve (Fig. 77/1) or
- a setting motor (optional), which is operated via the AMATRON 3 in the tractor cab.

Read off the pressure acting on the central adjustment

- on the pressure gauge (Fig. 77/2)
- in the AMATRON 3 display (with the option "setting motor").

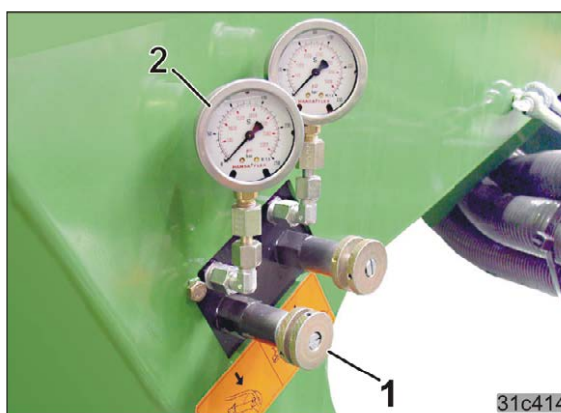


Fig. 77



The pressure displayed on the pressure gauge (Fig. 77/2) changes until the blower fan is running at constant speed.



The fertiliser placement depth depends on the following factors

- the condition of the soil
- the pressure acting on the central adjustment unit;
- working speed.

Check the placement depth at regular intervals.



5 cm is the distance set at the factory between fertiliser and seed placement.

The distance between fertiliser and seed placement is adjustable. (Specialist workshop).

On very light soil, the single-disc fertiliser coulter can be guided at depth by the sowing coulter via a length-adjustable chain (option, Fig. 78/1).

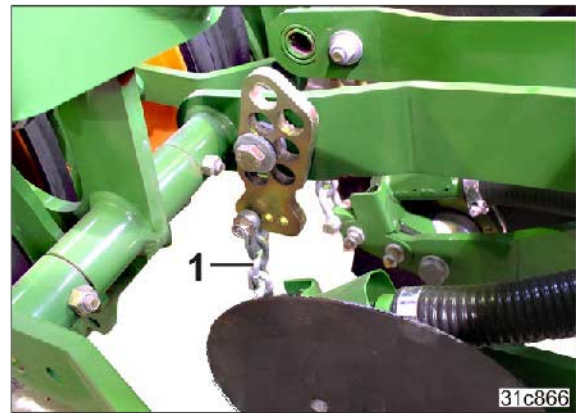


Fig. 78

5.7 Track 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.

During the work, the inactive track marker lies closely against the machine.

On the next run, the tractor driver drives over the centre of the mark.



Fig. 79

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. 80

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

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.

5.8 Tractor wheel mark eradicators (optional)

The tractor wheel mark eradicators (Fig. 81/1) loosen the track marks compacted by the tractor tyres and create fine earth to cover the seed furrows.

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



Fig. 81

5.9 Lighting for the tools (optional)

The working area of the tools can be lit up during night working.



Fig. 82

The switch for the lighting can be fitted on the machine or in the tractor cab.

Connect the lighting to the 12-volt socket in the tractor cab.



Fig. 83

6 Commissioning

This section contains information

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



- Before commissioning the machine, the operator must have read and understood the operating manual.
- Follow the instructions given in the section "Safety information for the operator" when
 - connecting and disconnecting the machine
 - transporting the machine
 - using the machine
- Only couple and transport the machine to/with a tractor which is suitable for the task.
- The tractor and machine must meet the national road traffic regulations.
- The operator and the user shall be responsible for compliance with the statutory road traffic regulations.



WARNING

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

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

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

6.1 Checking the suitability of the tractor



WARNING

Risk 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 hydr. pump output of the tractor must be at least 80 l/min.
- 12V at 110 A output of the tractor generator
- The permissible total weight
- The approved axle loads
- The approved drawbar load at the tractor coupling point
- The load capacity of the installed tyres
- The approved trailer load must be sufficient

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

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

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

6.1.1 Calculating the actual values for the total tractor weight, tractor axle loads and load capacities, as well as the minimum ballast



The permissible total tractor weight, specified in the vehicle documentation, must be greater than the sum of the

- tractor's empty weight
- ballast weight and
- total weight of the attached machine or drawbar load of the hitched machine.



This notice applies only to Germany.

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

6.1.1.1 Data required for the calculation (attached machine)

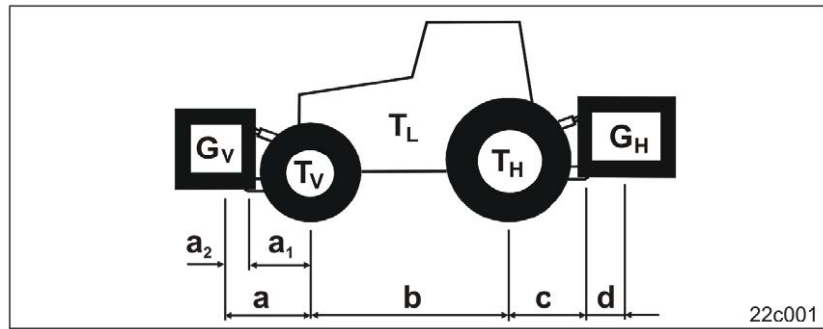


Fig. 84

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_H	[kg]	Total weight of rear-mounted machine or rear ballast	See section "Technical data for the calculation of tractor weights and tractor axle load", Seite 48, or rear ballast
G_V	[kg]	Total weight of front-mounted machine or front ballast	See technical data for front-mounted machine or front ballast
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
d	[m]	Distance between the centre of the lower link connection point and the centre of gravity of the rear-mounted machine or rear ballast (centre of gravity distance)	See section "Technical data for the calculation of tractor weights and tractor axle load", Seite 48

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

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

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 $T_{V \text{ tat}}$

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

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

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

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

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

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

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

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 Tractor tyre load-bearing 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 the tractor operating 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 (\leq) the permissible values.



WARNING

Risk of crushing, cutting, being trapped or drawn in, or impact through insufficient stability of the tractor and insufficient tractor steering capability and braking 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 ($G_{V \min}$).



- Ballast your tractor with weights at the front or rear if the tractor axle load is exceeded on only one axle.
- Special cases:
 - If you do not achieve the minimum ballast at the front ($G_{V \min}$) from the weight of the front-mounted machine (G_V), you must use ballast weights in addition to the front-mounted machine.
 - If you do not achieve the minimum ballast at the rear ($G_{H \min}$) from the weight of the rear-mounted machine (G_H), you must use ballast weights in addition to the rear-mounted machine.

6.2 Securing the tractor / machine against unintentional start-up and rolling



WARNING

Risk of crushing, shearing, cutting, being caught and/or drawn in, or impact when making interventions in the 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 starting and rolling before any intervention in the machine.

Any interventions in the machine, such as installation, adjustment, troubleshooting, cleaning, maintenance and repairs are prohibited under the following circumstances

- while the machine is being driven
- when the tractor's engine is running and the tractor's universal joint shaft/hydraulic system is connected
- if the ignition key is inserted in the tractor when the tractor's universal joint shaft/hydraulic system is connected and the tractor engine could be started unintentionally
- if the tractor and machine have not both been secured against unintentional rolling by applying their parking brakes and/or securing them with wheel chocks
- if moving parts are not locked to prevent unintentional movement
- contact with unsecured components poses a particularly high risk when carrying out such work

1. Only park the tractor with the machine on firm flat ground.
 2. Lower the raised, unsecured machine / raised, unsecured parts of the machine.
- This is how to prevent unintentional lowering:
3. Shut down the tractor engine.
 4. Remove the ignition key.
 5. Apply the tractor parking brake.

6.3 Fitting instructions for connecting the blower fan to the tractor hydraulics

The banking-up pressure of 10 bar must not be exceeded. The fitting instructions therefore have to be followed when connecting the hydraulic fan coupling.

- Connect the hydraulic coupling of the pressure line (Fig. 85/5) to a single-acting or double-acting tractor control unit with priority.
- Connect the large hydraulic coupling of the return line (Fig. 85/6) only to an unpressurised tractor connection with direct access to the hydraulic fluid tank (Fig. 85/4).
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.

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

Fig. 85/...

- | | |
|-----|----------------------------------------------------------------------------------|
| (A) | On the machine face |
| (B) | On the tractor face |
| (1) | Hydraulic fan motor
$N_{max.} = 4000 \text{ rpm.}$ |
| (2) | Filter |
| (3) | Single-acting or double-acting control unit
<u>with priority</u> |
| (4) | Hydraulic fluid tank |
| (5) | Supply line:
Pressure line with priority
(marking: 1 red) |
| (6) | Return line:
Pressureless line with plug coupling "large"
(marking: 2 red) |

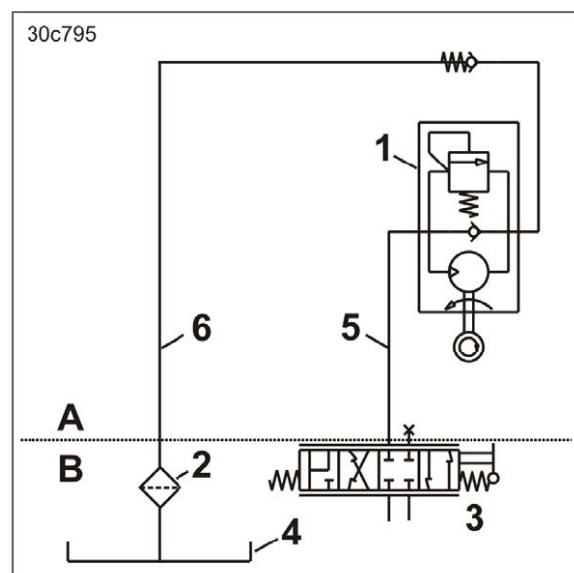


Fig. 85



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. 85/4) should be at least twice the oil flow rate. If the hydraulic fluid heats up excessively, the installation of an oil radiator is required at a specialist workshop.

7 Coupling and uncoupling the machine



When coupling and uncoupling machines, follow the instructions given in the section "Safety instructions for the operator".



CAUTION

Switch off the on-board computer

- before transport
- before adjustment, maintenance and repair work.

Risk of accident due to unintentional movement of the dosing unit or other machine components caused by radar impulse.



WARNING

Risk of crushing 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.



WARNING

Risk of crushing between the rear of the tractor and the machine when coupling and uncoupling the machine.

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

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

7.1 Hydraulic hose lines



WARNING

Risk 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.

7.1.1 Coupling the hydraulic hose lines



WARNING

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

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



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

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



Fig. 86

7.1.2 Uncoupling the hydraulic hose lines

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



29c847

Fig. 87

7.2 Coupling the machine to the tractor



WARNING

Risk 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", Seite 77.



WARNING

Risk of crushing 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 crushing, being cut, caught or pulled in, or impact when the machine is unexpectedly released from the tractor.

- Use the intended equipment to connect the tractor and the machine in the proper way.
- When coupling the machine to the tractor's three-point hydraulic system, ensure that the linkage of the tractor and the machine are the same.
- Only use the upper and lower link pins provided for coupling the machine.
- Check the upper and lower link pins for visible damage each time you couple the machine. Replace the upper and lower link pins in the event of clearly visible wear.
- Secure the upper and lower link pins with clip pins against unintentional release.

**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 during all movements of the coupled or attached machine.
- must not scour other parts.

**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.

Coupling and uncoupling the machine

1. Check whether the mount categories of the machine and the tractor are identical (see section "Technical data", Seite 48).
2. Secure the upper and lower link pins with clip pins.
3. Direct people out of the danger area between tractor and machine.
4. Drive the tractor up to a distance of approx. 25 cm from the machine.
The tractor lower links must be aligned with the hinging points of the machine.
5. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.



Fig. 88

6. Clean the hydraulic couplings.
7. Connect the supply lines to the tractor (see section "Overview – Supply lines between the tractor and the machine", Seite 42).
Plug the machine connector into the terminal as described in the AMATRON 3 operating manual.



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



During work the tractor control unit *yellow* is actuated more frequently than all other control units. Assign the connections of control unit 1 to an easily reachable control unit in the tractor cab.

8. Direct people away from the danger area between the tractor and machine before you approach the machine with the tractor.
9. Couple the tractor lower links (Fig. 89/1) with the lower hinging points of the machine. The lower link hooks lock automatically.
10. Couple the tractor upper link (Fig. 89/2) with the upper hinging point of the machine. The upper link hook locks automatically.
The power required to raise the machine is the least if the tractor upper link (Fig. 89/2) is horizontal.



Fig. 89

11. Align the machine so that it is straight by adjusting the upper link.
12. Secure the upper link against rotating.
13. Check that the upper and lower link hooks are correctly secured.



Check the route of the supply lines.

The supply lines must not chafe against other parts.

14. Insert the connector (Fig. 90/1) of the counter frame lighting into the socket in the tractor cab.

Lay the cable in the tractor cab.

The switch (Fig. 90/2) serves to switch the lighting on and off (Fig. 90/3).

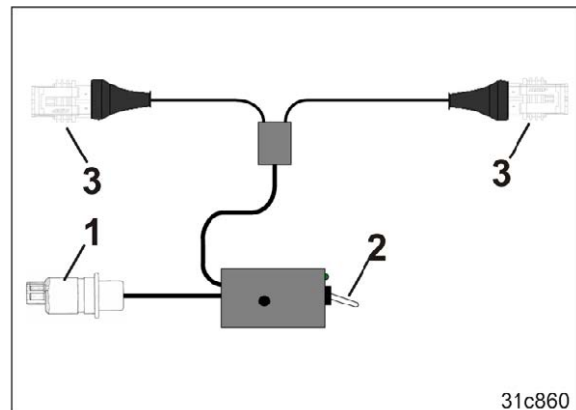


Fig. 90



Fig. 91

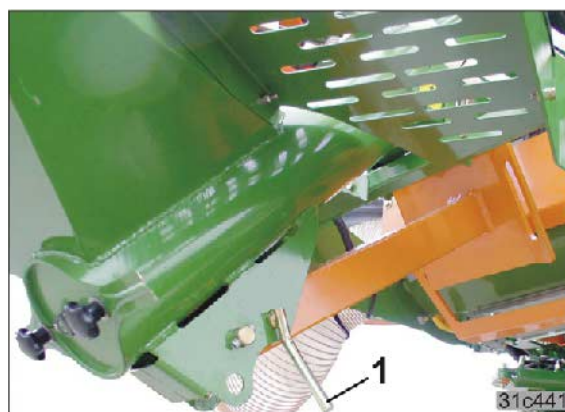



Fig. 92

15. Place the stands (Fig. 91/1 and Fig. 92/1) in transport position (see section "Position of the stands", Seite 94).

The sticker (Fig. 93) is intended to remind you to slide the front stands fully in before you fold out the machine extension arms.



Extended stands collide when the machine extension arms are folded out.

Push in the front stands before folding out the machine extension arms.



Fig. 93

7.2.1 Aligning the machine after attachment

Once the machine has been coupled, align it horizontally on the tractor so that the catcher rollers (Fig. 94/1) always have ground contact in the grooves formed.

If the machine is not aligned, the catcher rollers may rise from the ground and the seed grains shoot under the catcher rollers after leaving the shoot pipe (Fig. 94/2).

To align the machine, the coulter frame has a horizontal vial on the left on the outside.

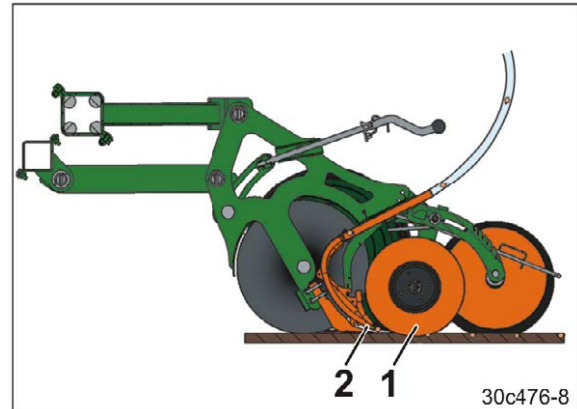


Fig. 94

1. Sow approximately 100 m on the field at working speed.
2. Adjust the tractor's upper link so that the horizontal vial (Fig. 95/1) on the coulter frame indicates horizontal positioning.



Fig. 95

7.3 Uncoupling the machine



WARNING

Risk of crushing, cutting, being caught or drawn in, or impact through inadequate stability and tipping over of the uncoupled machine.

Set the machine down on a horizontal parking area with a firm base.
Fully fold the booms of the machine in or out before decoupling the machine from the tractor.



Remember that the tractor wheel mark eradicators (optional) may penetrate loose soil, or secure the tractor wheel mark eradicators right at the top beforehand.



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

1. Preparing the machine for decoupling
 - o See section "Uncoupling the folded-out machine from the tractor", Seite 93.
 - o see section "Decoupling the folded-in machine from the tractor", Seite 93.
2. Lower the machine so that the rear stand touches the ground.
3. Relieve the load on the upper link. Adjust the upper top link length accordingly.
4. Uncouple the upper link hook from inside the tractor cab.
5. Lower the machine fully.
6. Uncouple the lower link hook from inside the tractor cab.
7. Pull the tractor forward approx. 25 cm.
The free space between tractor and machine allows convenient access for disconnecting the supply lines.



DANGER

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

8. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
9. Hang up and suspend the supply lines from the hose cabinet (Fig. 96).



Fig. 96

7.3.1 Uncoupling the folded-out machine from the tractor

1. Switch off the AMATRON 3.
2. Switch off the blower fan.
3. Retract the machine extension arms (see section "Folding the machine extension arms and track markers out/in", Seite 120).
4. Fold out the rear stand (Fig. 97/1) (see section "Position of the stands", Seite 94).
Do not pull out the front stands.
5. Fold out the machine fully.

Decouple the machine from the tractor (see section "Uncoupling the machine", Seite 92).



Fig. 97

7.3.2 Decoupling the folded-in machine from the tractor

1. Switch off the blower fan.
2. Switch off the AMATRON 3.
3. Retract the machine extension arms (see section "Folding the machine extension arms and track markers out/in", Seite 120).
4. Pull the front stands (Fig. 98/1) to central position (see section "Position of the stands", Seite 94).
5. Fold out the rear stand (Fig. 98/2) (see section "Position of the stands", Seite 94).

Decouple the machine from the tractor (see section "Uncoupling the machine", Seite 92).

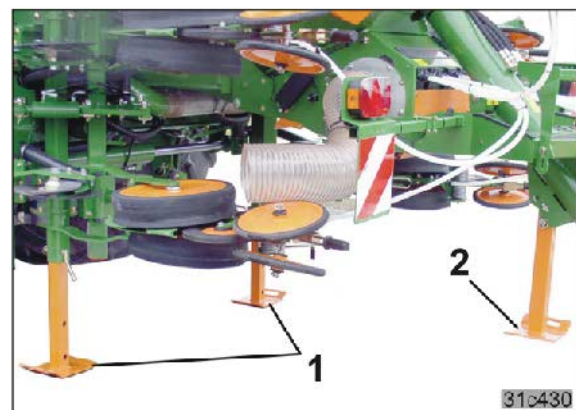


Fig. 98

7.3.3 Position of the stands



DANGER

Each time the pins for pegging the stands are repositioned, secure the pins with a lynch pin.

The machine has:

- two front stands (Fig. 99/1)
- one rear stand (Fig. 99/2).



DANGER

Never locate the stands under the raised machine.

Always stand to the side of the machine when locating the stands.

To locate the stands, fold the machine in and raise by means of the tractor's three-point hydraulic system.

The front stands (Fig. 100/1) can be located in 3 positions with a bolt:

- **Inserted** (see Fig. 100)
Position of stands during work on the field and road transport
- **Central position**
Position of stands when machine is lowered
- **Extended**
Position of the stands for calibrating the amount of fertiliser.

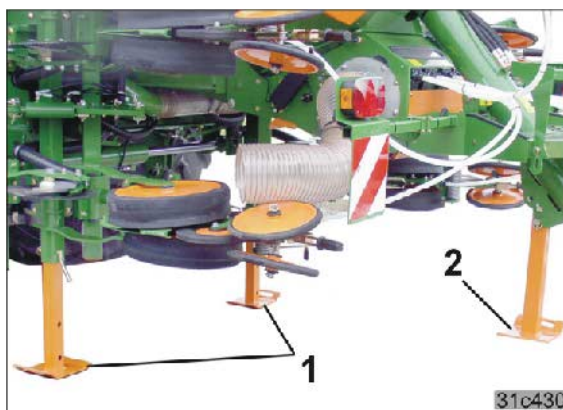


Fig. 99



Fig. 100

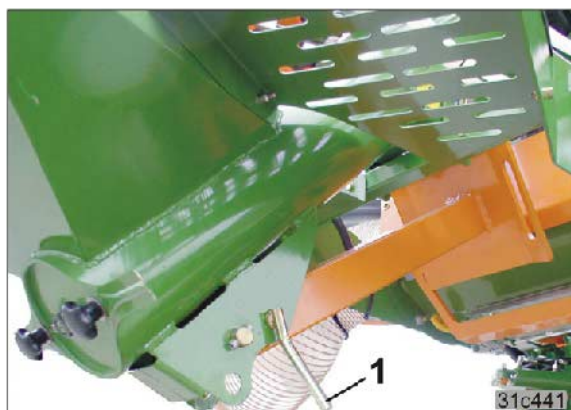


Fig. 101



Fig. 102

The rear stand is foldable (see Fig. 101 / Fig. 102) and must be located in both positions with a bolt (Fig. 101/1) and secured with a clip pin.

8 Settings



DANGER

Before making adjustments (if no other description is provided)

- Fold out and lower the machine extension arms
- Switch off the tractor's universal joint shaft
- Apply the tractor's parking brake
- Switch off the tractor's engine
- Remove the ignition key.



CAUTION

Switch off the on-board computer

- before transport
- before adjustment, maintenance and repair work.

Risk of accident due to unintentional movement of the dosing unit or other machine components caused by radar impulse.



WARNING

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

- unintentional lowering of the machine raised using the tractor's three-point hydraulic system.
- unintentional lowering of raised, unsecured machine parts.
- Unintentional start-up and rolling of the tractor-machine combination.

Secure the tractor and the machine against unintentional start-up and rolling before making any adjustments to the machine.

8.1 Seed dosing and application

8.1.1 Adjusting the sowing rate

Set the following in the AMATRON 3 once:

- the machine type
- the number of sowing units
- the machine equipment
- the row spacing
 - o grain quantity
 - o fertiliser calibration test

For a more detailed description, refer to the AMATRON 3 operating manual .



Fig. 103

8.1.2 Setting the seed shutter

1. Set the seed shutter with the lever (Fig. 104/1). Take the provisional setting from the table (Fig. 47).
2. Secure the lever position with the knurled-head screw (Fig. 104/2).

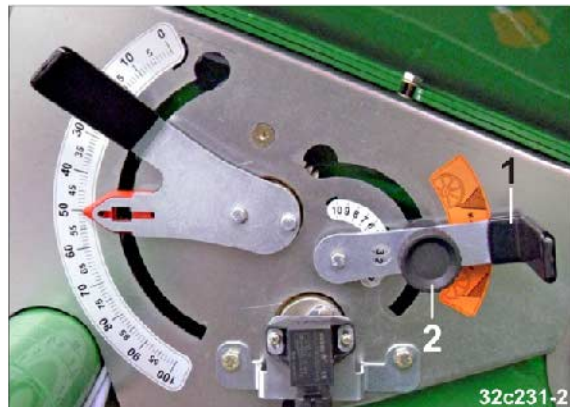


Fig. 104



This setting influences the occupancy of the seed grains in the holes of the singling drum.

Multiple occupancy and gaps in the holes of the singling drum are detected by the optosensors after working speed has been reached. The AMATRON 3 issues an alarm.

8.1.3 Adjusting the air guide

1. Adjust the air guide using the lever (Fig. 105/1). Take the provisional setting from the table (Fig. 50).
2. Secure the lever position with the knurled-head screw (Fig. 105/2).



Fig. 105



This setting influences the occupancy of the seed grains in the holes of the singling drum.

Multiple occupancy and gaps in the holes of the singling drum are detected by the optosensors after working speed has been reached. The AMATRON 3 issues an alarm.

8.1.4 Setting the seed scraper



This setting influences the occupancy of the seed grains in the holes of the singling drum.

Multiple occupancy and gaps in the holes of the singling drum are detected by the optosensors after working speed has been reached. The AMATRON 3 issues an alarm.

Seed scraper (mechanical setting)

1. Set the seed scrapers with the lever (Fig. 106/1). Take the provisional setting from the table (Fig. 51).
2. Secure the lever position with the knurled-head screw (Fig. 106/2).



Fig. 106

Seed scraper (electronic setting)

Set the pointer (Fig. 107/1) of the seed scraper in the AMATRON 3. Take the provisional setting from the table (Fig. 51).

For a more detailed description, refer to the AMATRON 3 operating manual .

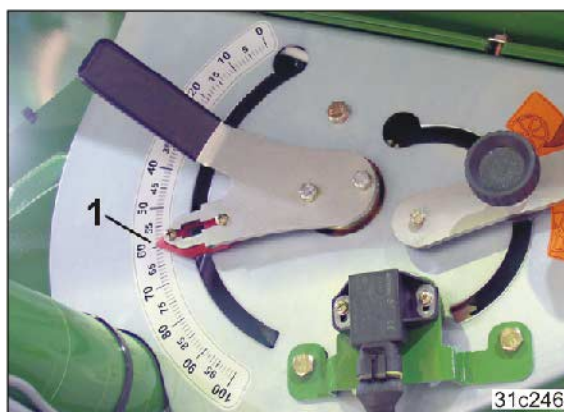


Fig. 107

8.1.5 Adjusting the seed placement depth

1. Move the machine on the field to the working position.
2. Set the desired placement depth by turning the spindle (Fig. 108/2) with the clamp (Fig. 108/1).

Spindle adjustment

Turn to the right: Reduce working depth

Turn to the left: Increase working depth

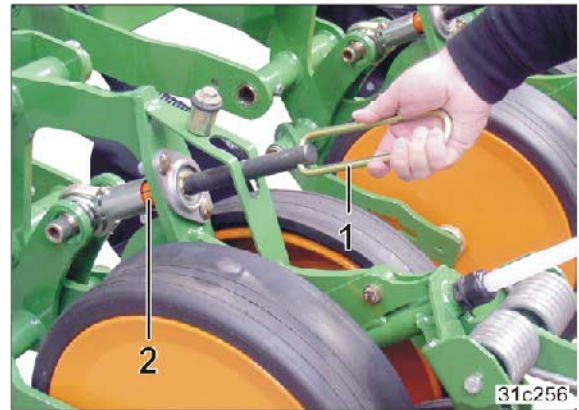


Fig. 108

3. Secure the clamp (Fig. 109/1) against rotation.



Fig. 109

4. Check the placement depth of the first sowing unit and adjust if required (see section "Checking the placement depth and grain spacing", Seite 102).



Check the placement depth after each adjustment.

5. If the spindle adjustment does not produce the required seed placement depth,
 - o adjust the coulter pressure (see section "Setting the coulter pressure", Seite 100).
6. Adjust all sowing units to match the value of the first sowing unit and check the placement depth of each sowing unit.

Settings

8.1.5.1 Setting the coulter pressure



Make the following adjustment only on the field with the blower fan (singling) running.



The pressure is set to 20 bar at the factory.

1. Release the lock nut (Fig. 110/1).
 2. Adjust the coulter pressure by turning the valve screw (Fig. 110/2).
- Read of the pressure at the pressure gauge (Fig. 110/3).
3. Tighten the lock nut.

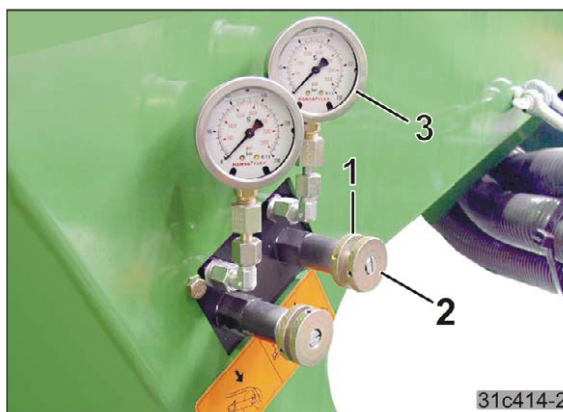


Fig. 110



This setting influences the placement depth of the seed.
Check the setting (see section „Checking the placement depth and grain spacing“, Seite 102).

8.1.6 Closing the seed furrow by adjusting the press roller

1. Lift up the lever (Fig. 111/1) briefly and locate the tab (Fig. 111/2) in the toothed segment (Fig. 111/3).
2. Make the same axial adjustment at each of the press rollers (Fig. 111/4) and secure (circlip, Fig. 111/5).
3. Adjust the position of the tab and axial adjustment of the press rollers until the required working result is achieved.

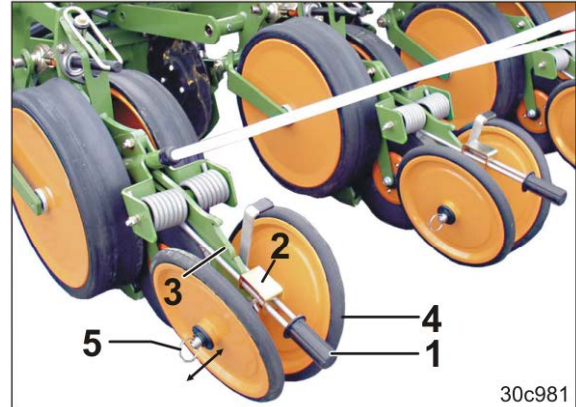


Fig. 111



If the desired work result is not achieved, adjust the press rollers by rotating the axle.

4. Rotate the axle by moving the lever (Fig. 112/1).
5. Secure the lever position with the screw (Fig. 112/2).
6. Make the same settings on all sowing units.

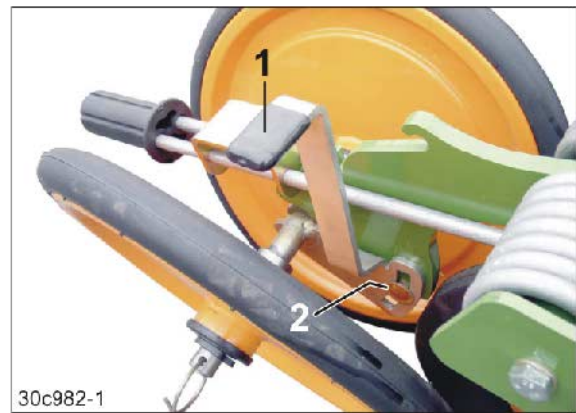


Fig. 112

8.1.7 Adjusting the star clearer

Secure the star clearer (Fig. 113/1) with two bolts (Fig. 113/2) and 4 washers (Fig. 113/3) on the coulter. Secure the bolts with lynch pins (Fig. 113/4).

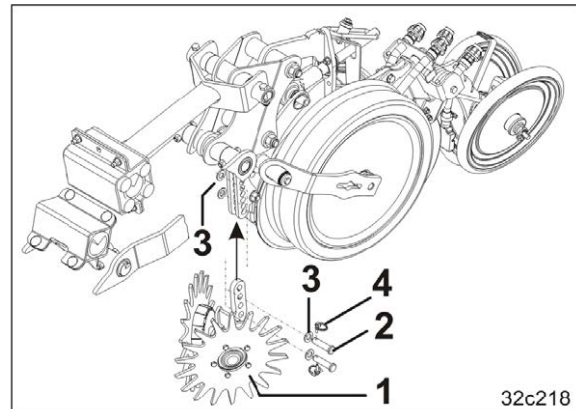


Fig. 113

8.1.8 Adjusting the clod clearer

Secure the clod clearer (Fig. 114/1) with two bolts (Fig. 114/2) and 4 washers (Fig. 114/3) on the coulter. Secure the bolts with lynch pins (Fig. 114/4).

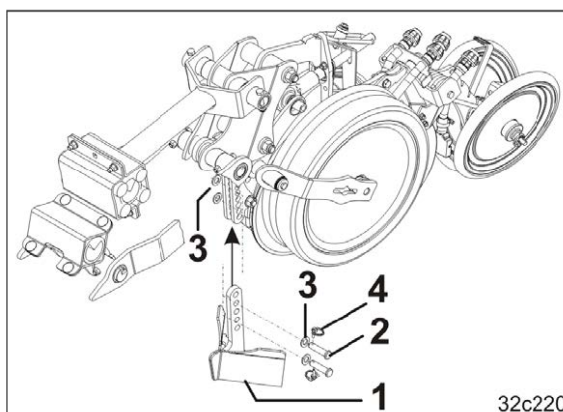


Fig. 114

8.1.9 Checking the placement depth and grain spacing

1. Sow approximately 100 m at working speed.
2. Expose the grains at several points using the multi-placement tester (optional). Use the read-off edge to remove the earth in layers.
3. Place the multi-placement tester (Fig. 115) horizontally on the ground
4. Place the pointer (Fig. 115/1) on the seed grain and read off the placement depth from the scale (Fig. 115/2).
5. Measure the grain spacing with the ruler.



Fig. 115



The desired grain spacing is achieved by adjusting the speed of the singling drum with reference to the travel speed.

The speed of the electric motor that drives the singling drum is a result of the calibration value (pul./100 m).

If the required grain spacing is not achieved (see AMATRON 3 operating manual), determine the calibration value (pul./100 m) by completing a new calibration distance.

8.2 Fertiliser dosing and application



CAUTION

Switch off the on-board computer

- before transport
- before adjustment, maintenance and repair work.

Risk of accident due to unintentional movement of the dosing unit or other machine components caused by radar impulse.

8.2.1 Repositioning the level sensor

1. Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
2. Release the nut (Fig. 116/1).
3. Detach the level sensor (Fig. 116/2) and insert and secure in the intended connection.
4. Fit the dummy (Fig. 116/3), which has no function, into the vacated opening and secure.

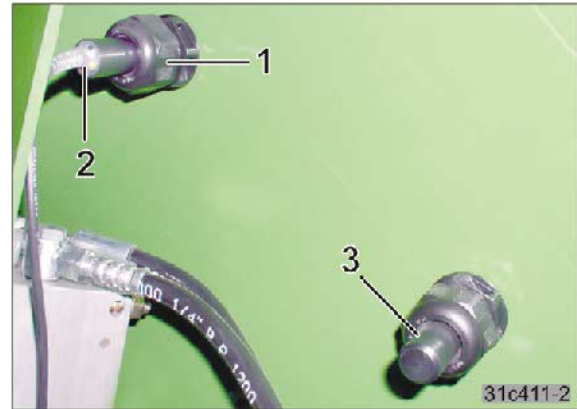


Fig. 116

8.2.2 Installing/removing the dosing roller



DANGER

Switch off the on-board computer, turn off the tractor universal joint shaft, apply the tractor parking brake, switch off the tractor engine and remove the ignition key.



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

1. Switch off the AMATRON 3.
2. Switch off the blower fan.
3. Retract the machine extension arms (see section "Folding the machine extension arms and track markers out/in", Seite 120).
4. Fully pull out the front stands (see section "Position of the stands", Seite 94).

Do not fold out the rear stand.

5. Place the machine on the front stands (Fig. 39/1).
6. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
7. Close the hopper opening to the dosing unit (only necessary when the hopper is full).
 - 7.1 Remove the key (Fig. 118/1) from the holder.

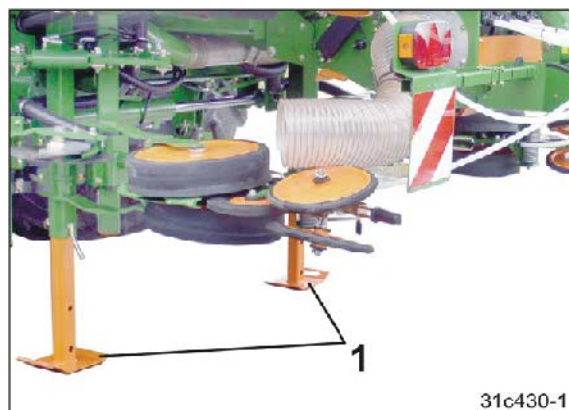


Fig. 117



Fig. 118

- 7.2 Release two nuts (Fig. 119/1) but do not remove.

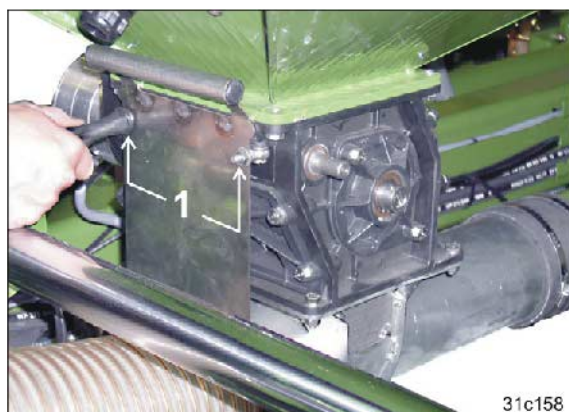
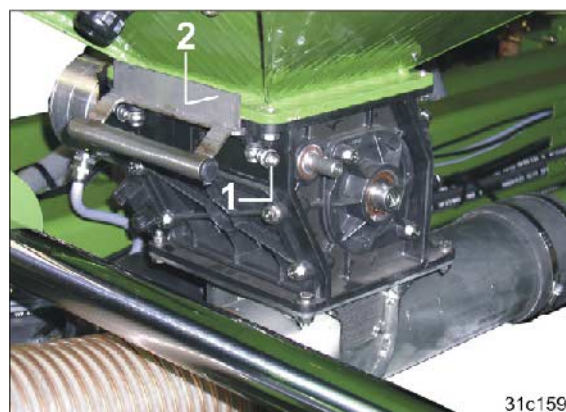


Fig. 119

- 7.2 Swivel the screws (Fig. 120/1).
- 7.3 Insert the shutter (Fig. 120/2) into the dosing unit as far as it will go.

**Fig. 120**

8. Release two screws (Fig. 121/1).

**Fig. 121**

9. Twist and remove the bearing cover.

**Fig. 122**



Check whether the O-ring (Fig. 123/1) in the bearing cover is damaged.

Replace the O-ring if it is damaged. Otherwise, the required system pressure will fall.

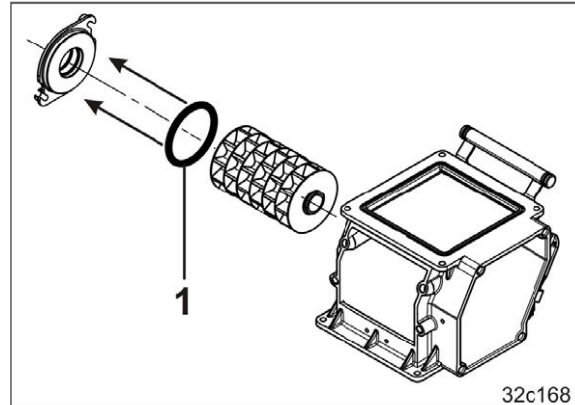


Fig. 123

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



The dosing roller is installed in the reverse order.



Fig. 124



Secure the shutter in the parking position.



Fig. 125

8.2.3 Setting the fertilising rate using a calibration test



CAUTION

Switch off the AMATRON 3 on-board computer before working on the dosing system.

There is a risk of accident when the dosing roller is started by radar impulse and the on-board computer is switched on.

1. Fill the hopper with at least 200 kg of fertiliser.
2. Switch off the AMATRON 3.
3. Switch off the fan.
4. Fold in the machine extension arms.
5. Fully extend the front stands
Do not fold out the rear stand.
6. Place the machine on the front stands (Fig. 39/1).
7. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

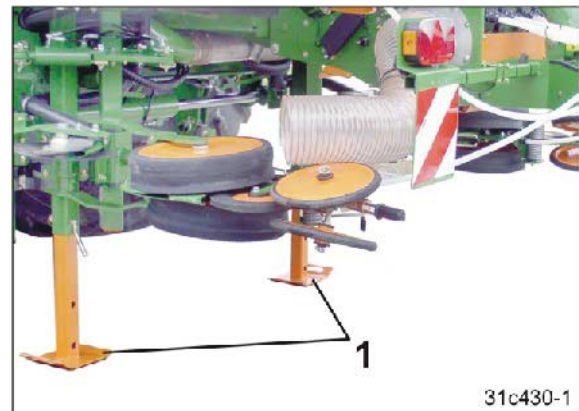


Fig. 126



DANGER

Secure the tractor and the machine against unintentional start-up and unintentional movement.

8. Open the rotary slide of the injector sluice [see figure (Fig. 71), Seite 69].



Fig. 127

Settings

9. Fold the holder (Fig. 128/1) for the calibration trough down and secure with a clip pin (Fig. 128/2).

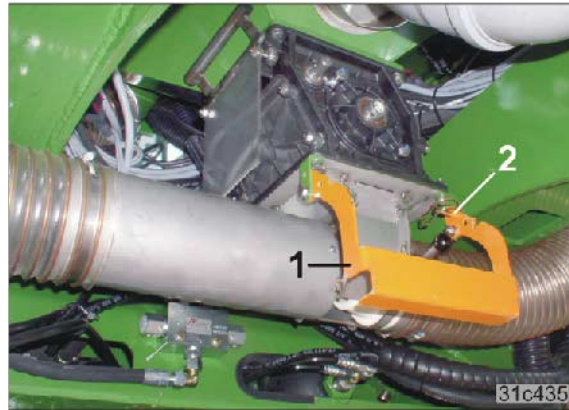


Fig. 128

10. Slide the calibration trough (Fig. 129/1) into the holder beneath the dosing unit.



Fig. 129

11. Set the desired spread rate in the AMATRON 3.
 - 11.1 Set the spread rate with calibration test in accordance using the AMATRON 3 operating manual (see section "Calibrate machines with electric full dosing").



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

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

12. Slide the calibration trough into the transport box.
13. Close the injector sluice flap [see Figure (Fig. 71), Seite 69].

8.2.4 Adjusting the fertiliser placement depth

1. Release the lock nut (Fig. 130/1).
 2. Turn the valve screw (Fig. 130/2) to adjust the fertiliser coulter pressure.
- Read off the fertiliser coulter pressure at the pressure gauge (Fig. 130/3).
3. Tighten the lock nut.
 4. Drive the machine across the field for a distance of roughly 100 m at the intended working speed and check the placement depth, adjust if necessary.

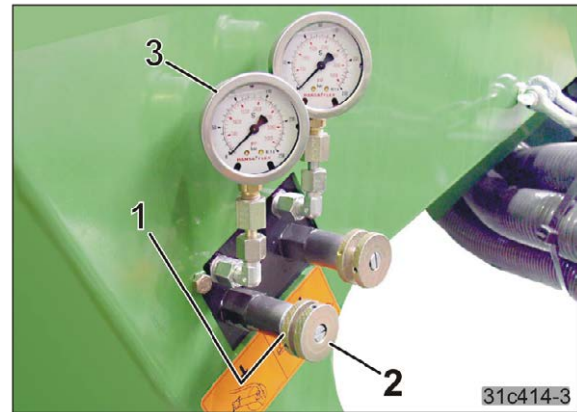


Fig. 130



Always check the placement depth of the fertiliser:

- before starting work
- following every adjustment of the fertiliser coulter pressure
- if the travel speed changes when work is in progress
- if the ground conditions change.

Drive the machine across the field for a distance of roughly 100 m at the intended working speed and check the placement depth, adjust if necessary.

8.3 Adjusting the track marker length and working intensity



DANGER

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

1. Direct people away from the danger area.
2. Fold out both track markers simultaneously on the field (see AMATRON 3 operating manual) and drive several metres.
3. Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
4. Undo the screw (Fig. 131/1).
5. Set the track marker length to distance "A" (see section 8.3.1, Seite 111).

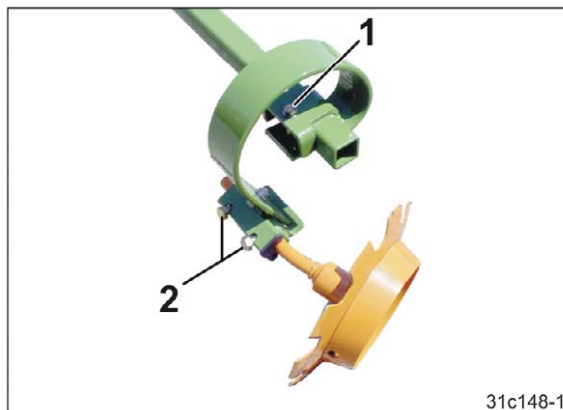


Fig. 131

6. Release both screws (Fig. 131/2).
7. 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.
8. Fully tighten all screws.
9. The machine is equipped with two track markers. Repeat the procedure as described.

8.3.1 Calculating the track marker length

The working width is the track marker length A (Fig. 132), measured from the centre of the machine to the contact surface of the track marker wheel on the ground.

$$\text{Track marker length A} = \text{Row spacing R [cm]} \times \text{number of sowing units}$$

Example:

Row spacing R: 75 cm

Number of sowing units: 8

Track marker length A = 75 cm x 8

Track marker length A = 600 cm

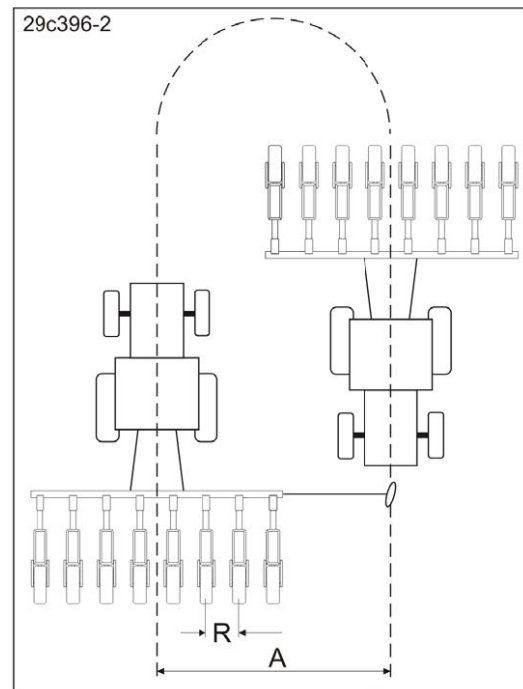


Fig. 132

8.4 Adjusting the machine and tractor wheel mark eradicator

Horizontal adjustment

- 1 Tighten and lock the screw (Fig. 133/1) after adjusting the tractor wheel mark eradicator.

Vertical adjustment

1. Hold the tractor wheel mark eradicator by the handle (Fig. 133/2).
2. Remove the bolt (Fig. 133/3).
3. Adjust the tractor wheel mark eradicator
 - o vertically
 - o peg it in place with the pin
 - o secure the pin with the lynch pin supplied.

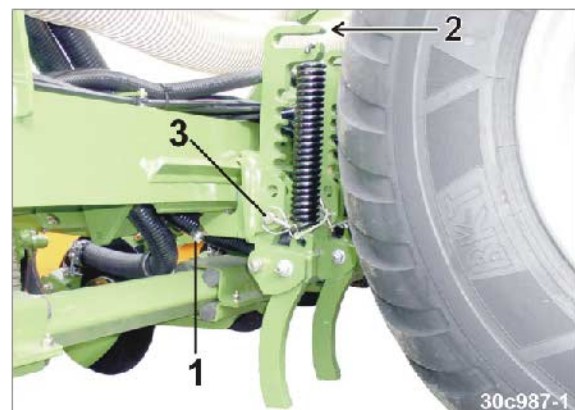


Fig. 133

8.5 Adjusting blower fan speed



Seed hopper lid (Fig. 134)

- close and seal the lid before switching on the blower fan
- always keep the lid closed when the blower fan is running.



Fig. 134



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



DANGER

Do not exceed the maximum fan speed of 4000 rpm.

8.5.1 Setting the blower fan speed (tractor hydraulics connection)

Set the blower fan speed on the flow control valve of the tractor. If the tractor has no flow control valve, set the blower fan speed using the machine's pressure relief valve.



Fig. 135

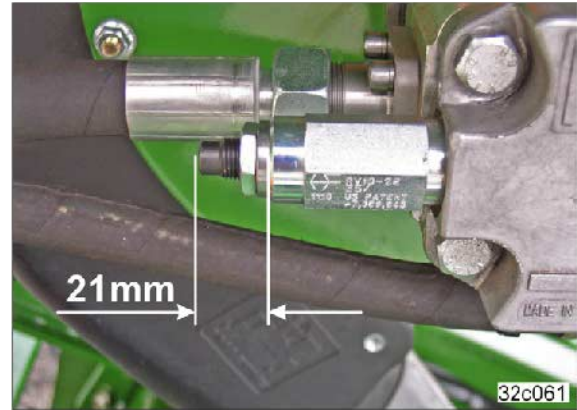


Fig. 136

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

1. Using the flow control valve, set the blower fan speed so that the pressure in the singling unit displayed by the AMATRON 3 is 55 mbar.
- For an 8-row machine (maize setting), the blower fan speed is approx. 3900 rpm.

The pressure relief valve (Fig. 136) is correctly set at the factory.

If the pressure relief valve has been moved out of position, make the following adjustments

1. Set the pressure relief valve with the hexagon socket wrench to the factory setting "21 mm" (Fig. 136).
2. Tighten the lock nut (Fig. 135).

8.5.1.2 Adjust the blower speed on the machine pressure limiting valve



Only make this setting if the tractor has no flow control valve.

1. Using the hexagon socket wrench, set the blower fan speed at the pressure relief valve (Fig. 135) so that the AMATRON 3 displays a pressure of 55 mbar in the singling unit.

→ For an 8-row machine (maize setting), the blower fan speed is approx. 3900 rpm.

Do not allow the dimension to fall below 21 mm (Fig. 136)!

Fan speed

Turn to the right: Increase the target blower fan speed

Turn to the left: Reduce the target blower fan speed.

2. Tighten the lock nut (Fig. 135).

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.

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

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

The max. permissible speed¹⁾ is 40 km/h for tractors with mounted work equipment.

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

¹⁾The permissible maximum speed for mounted work 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.



- Before transport, follow the instructions given in the section "Safety information for the operator"
- Before moving off, check:
 - That the permissible weight is not exceeded
 - The correct connection of the supply lines
 - The lighting system for damage, function and cleanliness
 - The hydraulic system for visible defects
 - That the tractor parking brake is released completely.

○



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



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



WARNING

Risk of crushing, cutting, being caught and/or drawn in, or impact from tipping and insufficient stability.

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

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

These risks may cause serious injuries or death.

Comply with the maximum load of the connected machine and the approved axle and drawbar loads of the tractor.



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 crushing, shearing, cutting, being caught and/or drawn in, or impact when making interventions in the machine, through unintentional machine movements.

- On folding machines, check that the transport locking mechanisms are locked correctly.
- Secure the machine against unintentional movements before starting transportation.



WARNING

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

Carry out a visual check that the upper and lower link pins are firmly secured with original clip pins against unintentional release.

9.1 Putting the machine into the transport position



WARNING

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

- Unintentional lowering of the machine raised using the tractor's three-point hydraulic system.
- Unintentional lowering of raised, unsecured machine parts.
- Unintentional start-up and rolling of the tractor-machine combination.

Secure tractor and machine against unintentional starting and rolling away (see section "6.2", Seite 82).



DANGER

Disable the tractor control units during transport.
Incorrect use leads to the risk of accidents!



CAUTION

Switch off the on-board computer

- before transport
- before adjustment, maintenance and repair work.

Risk of accident due to unintentional movement of the dosing unit or other machine components caused by radar impulse.

1. Switch off the on-board computer.
2. Switch off the fan.
3. Retract the machine extension arms (see section "Folding the machine extension arms and track markers out/in", Seite 120).
4. Check the function of the lighting system.
5. Disable the tractor control units during transport.



Fig. 137

10 Use of the machine



When using the machine, observe the information in the sections

- "Warning symbols and other labels on the machine", as of Seite 18 and
- "Safety information for the operator", Seite 26.

Observing this information is important for your safety.



WARNING

Risk 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 drawbar loads of the tractor. If necessary, drive only with an empty or partially filled seed hopper.



WARNING

Risk of crushing, cutting, being caught and/or drawn in, or impact through insufficient stability and tipping of the tractor and/or the attached machine.

Drive in such a way that you always have full control over the tractor with the attached or hitched 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 attached or hitched machine.



WARNING

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

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



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



WARNING

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

Before each use of the machine, carry out a visual check that the upper and lower link pins are firmly secured with clip pins against unintentional release.

10.1 Folding the machine extension arms and track markers out/in



DANGER

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



Park the tractor on an even surface before folding the machine extension arms out or in.

Raise the machine so that the machine extension arms have sufficient ground clearance when folding in order to prevent damage.

The bars (Fig. 138/1) form the mechanical transport locking mechanism of the machine extension arm. The cables (Fig. 138/2) serve to release the bars.

Operate the cables only from inside the tractor cab.



Fig. 138

10.1.1 Folding out the machine extension arms (from transport position to working position)



Extended stands collide when the machine extension arms are folded out.

Push in the stands before folding out the machine extension arms.

1. Raise the tractor lower link.
 - 1.1 Raise the machine so that the machine extension arms have sufficient ground clearance when folding in order to prevent damage.
2. Open the bars (Fig. 139/1) by actuating the two cables (Fig. 139/2) from the tractor seat.
3. Fold out the machine extension arms fully.
 - 3.1 Actuate control unit *green* (see section "Overview – Supply lines between the tractor and the machine", Seite 42) until the machine extension arms are fully unfolded.
 - 3.2 Actuate control unit *green* for a further 3 secs. so that the hydraulic accumulator (Functional description of the standard pressure tank, Seite 163) is filled with hydraulic fluid.

Leave the tractor control unit *green* in float position during work on the field.



Fig. 139



Fig. 140

Use of the machine

4. Pull out the two track markers.
 - 4.1 Actuate the lever (Fig. 141/1) and withdraw the track marker. Ensure that the lever engages after each adjustment as shown.

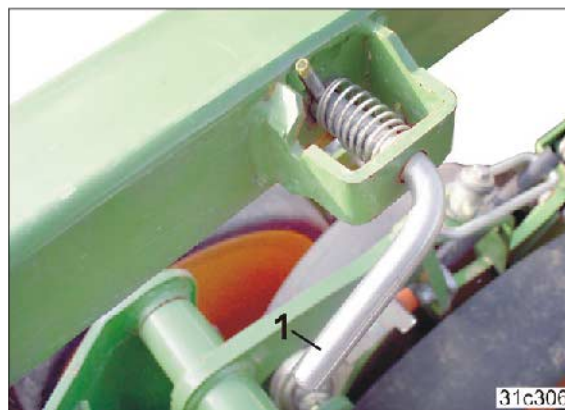


Fig. 141



Pull the machine forward when lowering the coulters into the ground.

Blockages may occur

- when the coulters are lowered on the field and the machine is not pulled forward or
- when driving backwards.

10.1.2 Working without track markers



DANGER

Direct people away from the danger area of the track markers.

1. Press the "Park" button (see AMATRON 3 operating manual).
2. Actuate control unit *yellow* until both track markers butt against the machine extension arms (see Fig. 142).



Fig. 142

10.1.3 Folding in the machine extension arms (from working position to transport position)

1. Switch on the tractor engine.
2. Actuate control unit *yellow* (see section "Overview – Supply lines between the tractor and the machine", Seite 42) until both track markers (Fig. 143) are folded in (parking position)



Fig. 143

3. Push in the two track markers.
 - 3.1 Actuate the lever (Fig. 144/1) and push in the track marker. Ensure that the lever engages after each adjustment as shown.

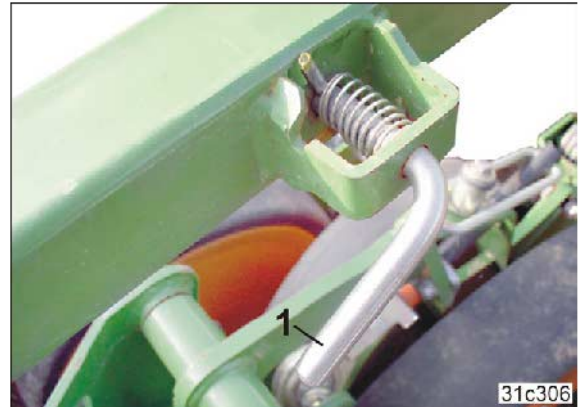


Fig. 144

1. Raise the tractor lower link.
 - 1.1 Raise the machine so that the machine extension arms have sufficient ground clearance when folding in order to prevent damage (see Fig. 145).
2. Fold in the machine extension arms fully.
 - 2.1 Actuate control unit *green* (see section "Overview – Supply lines between the tractor and the machine", Seite 42) until the machine extension arms are fully folded in.



Fig. 145



DANGER

Check whether the bars are engaged properly and the cables are detensioned after folding in the extension arms.

The bars (Fig. 146/1) form the mechanical transport locking mechanism.



Fig. 146

3. Lower the tractor lower link to a central position.



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



Fig. 147

10.2 Filling the seed / fertiliser hopper



DANGER

- Before filling:
 - Couple the machine to the tractor
 - Unfold the machine and place it on the coulter.
- Observe the approved filling levels and total weights.



- Remove other parts from the seed hopper before filling it.
- Do not fill the seed hopper with moist or sticky seed.

10.2.1 Filling the seed hopper

1. Proceed as follows:
 - Couple the machine to the tractor
 - Fold the machine out
 - Place the machine on the coulter.
 2. Switch off the fan.
 3. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
 4. Operate the lever (Fig. 149/1) and fold down the step treads.
- The step tread locks on the second lever.



Fig. 148

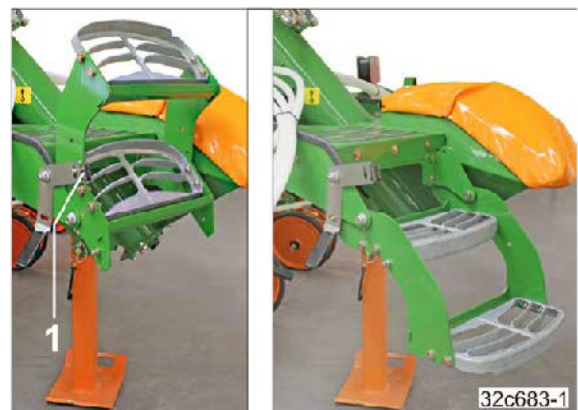


Fig. 149



CAUTION

Never open the seed hopper cover with the blower fan running.

The seed hopper is pressurised when the blower fan is running.

Switch off the blower fan before opening the seed hopper cover and only switch back on when the cover is closed.

5. Open the cover (Fig. 150/1) of the hopper.

5.1 Secure the cover.

A pneumatic spring assists cover opening.

5.2 Release two clips (Fig. 150/2).



Fig. 150

5.2 Slowly open the cover.

6. Fill the seed hopper.



Fig. 151

7. Close and lock the cover.

8. Fold up the step (Fig. 149).

10.2.2 Filling the fertiliser tank

1. Proceed as follows:
 - o Couple the machine to the tractor
 - o Fold the machine out
 - o Place the machine on the coulters.
2. Switch off the fan.
3. Apply the tractor parking brake.
4. Remove the cover (Fig. 152/1) from the filling auger.

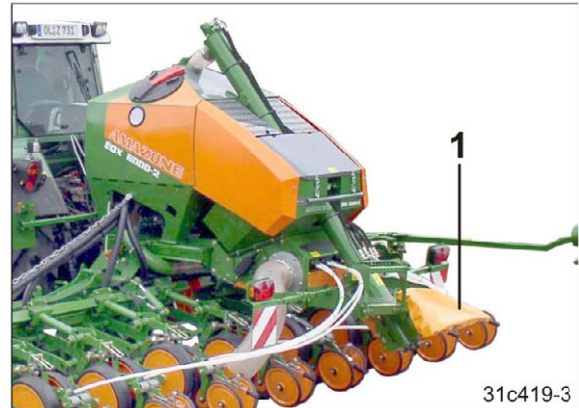


Fig. 152

5. Switch off the hydr. drive of the filling auger (see ball valve lever position A).

Switch off the hydr. drive of the filling auger:

Ball valve lever position A (Fig. 153)

Switch on the hydr. drive of the filling auger:

Ball valve lever position B (Fig. 153).

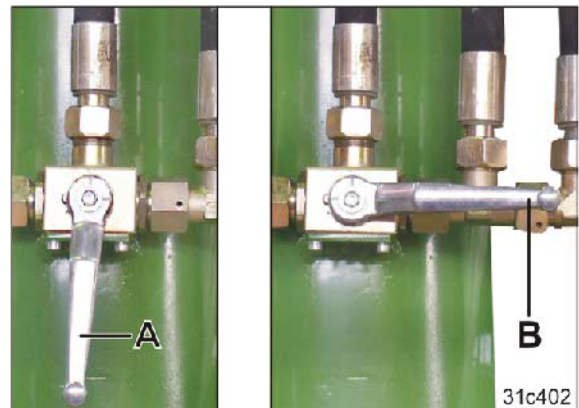


Fig. 153

6. Apply pressure to the hydraulic motor of the filling auger by actuating control unit *red* (see section "Overview – Supply lines between the tractor and the machine", Seite 42).
7. Regulate the delivery speed of the filling auger at the ball valve (Fig. 154/1).

Slowly increase the delivery speed.



Fig. 154

Use of the machine

8. Fill the filling funnel of the filling auger, e.g. from a supply vehicle (Fig. 155).



Fig. 155

9. Switch off the hydr. drive of the filling auger as soon as the fertiliser hopper is full. The fill level in the fertiliser hopper is visible in the sight glass (Fig. 156/1).
10. Switch off the tractor control unit *red*.
11. Seal the filling funnel with the cover (Fig. 152/1).



Fig. 156



Danger

Make sure nobody is standing between the supply vehicle and filling funnel during manoeuvring.



Important!

Switch off the hydr. drive of the filling auger and the tractor control valve *blue* after use.

10.3 Starting work



Fig. 157



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.



When lowering the coulters, pull the machine forward slightly.

Never drive backwards once the coulters are in the ground, as this could block them.

Raise the coulters before stopping on the field.

1. Fold out the machine extension arms.
2. Switch on the blower fan and, depending on the connection of the hydraulic fan motor, adjust the speed
 - o at the tractor flow control valve
 - o at the pressure relief valve of the hydraulic motor (if the tractor has no flow control valve)



The blower fan speed is correctly set when the AMATRON 3 indicates an air pressure of 55 mbar in the singling unit.

The max. blower fan speed of 4000 rpm must not be exceeded.



When the "Pre-calibration" function is activated (see AMATRON 3 operating manual), the holes of the singling drum are sealed with seed grains.

The required air pressure can be built up and measured.

If the required air pressure is not reached, check that all holes are filled with seed grains.

In event of gaps, correct the machine settings.

3. Start.
4. Check the required air pressure in the singling unit in the AMATRON 3.
5. Check the placement depth and grain spacing of the seed as well as the placement depth of the fertiliser at all coulters, and adjust if necessary (see section "Checking the placement depth and grain spacing", Seite 102)
 - o after the first 100 m travelled at working speed
 - o after switching from light to heavy soil or vice-versa
 - o at regular intervals, at the latest when filling the seed hopper.

Dirty seed delivery channels may result in deficient sowing.

10.3.1 During the work



During the work, the optosensors detect gaps on the singling drum. The AMATRON 3 indicates gaps.

In event of gaps, correct the machine settings.



From time to time, check the fertiliser distributor heads for soiling.

Impurities may block the fertiliser distributor heads and must be removed immediately (see section "Cleaning the fertiliser distributor head").

10.3.2 Turning at end of the field

Before turning at the end of the field

1. Slow down your travel speed.
2. Actuate tractor control unit *yellow* until the active track marker is lifted completely.
3. Raise the machine.
4. Turn the tractor at the end of the field.



Fig. 158



Avoid abrupt braking and accelerate to prevent placement areas in distribution along the row.

The speed of the singling drum is regulated according to the tractor speed and adjusts only to normal speed changes.

After turning at the end of the field

1. When starting, lower the machine.
2. Actuate tractor control unit *yellow* until the active track marker is lowered completely.
3. Then put tractor control unit *yellow* into the neutral position and operate it in the neutral position during the work.



DANGER

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

10.4 End of work in the field

After working on the field, set the machine to road transport position (see section "Transportation", Seite 115).

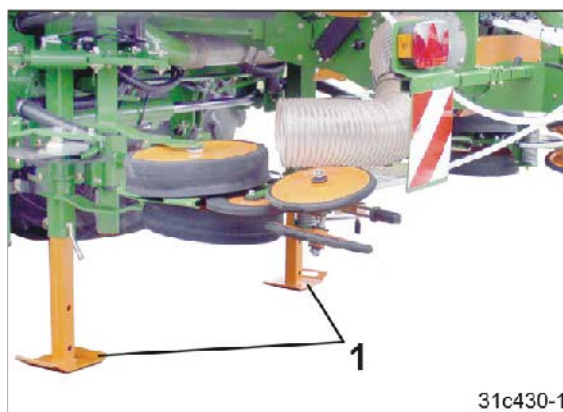
10.4.1 Emptying the seed hopper and/or seed singling unit



WARNING

The seed hopper is pressurised when the blower fan is running.

1. Switch off the blower fan.
 2. Fold in the machine extension arms.
 3. Fully extend the front stands
- Do not fold out the rear stand.
4. Place the machine on the front stands (Fig. 39/1).
 5. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.



31c430-1

Fig. 159



DANGER

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

Only necessary when the seed hopper is full and is not to be emptied:

6. Close the feed from the seed hopper to the singling unit (Fig. 44/2).
- 6.1 Set the lever (Fig. 46/1) to the scale value "0".

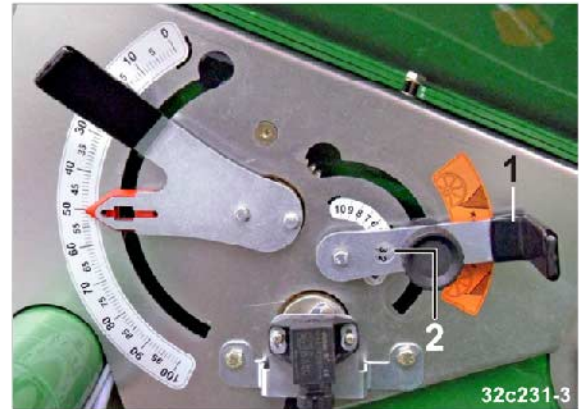


Fig. 160

7. Open the bottom flap (Fig. 161/1).

The bottom flap is secured with quick-release clamps (Fig. 161/2).

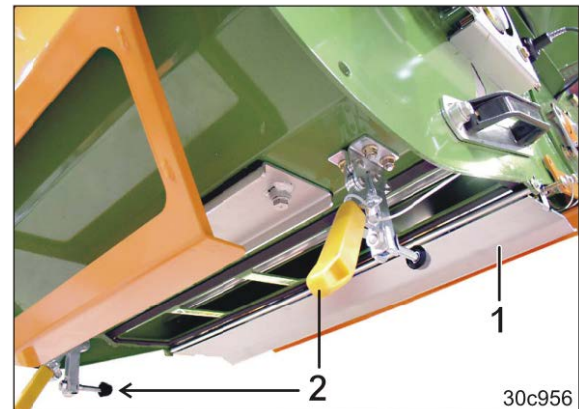


Fig. 161

8. Fold the mount down and secure [lynch pin (Fig. 162/1)].

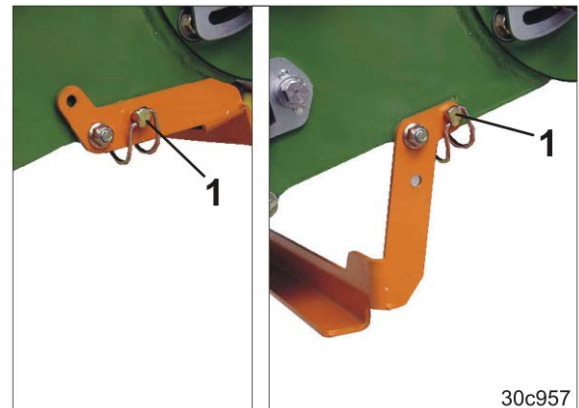


Fig. 162

Use of the machine

9. Place the collecting trough in the mount.



Fig. 163

10. Release the screen slider.



Fig. 164



Use the hexagon wrench provided.



Fig. 165

11. Pull the screen slider (Fig. 166/1) slowly out of the housing.
→ The seed drops into the collecting trough (Fig. 166/2).



Fig. 166

12. Empty the collecting hopper.
 - 122 Open the closing device (Fig. 167/1) with the hexagon wrench provided (Fig. 167/2).
 - 123 Pour the collected seed into the seed hopper for re-use.
13. Close and seal the singling housing or clean it when it is open (see section "Daily quick cleaning of the singling unit and the spur gears", Seite 146).

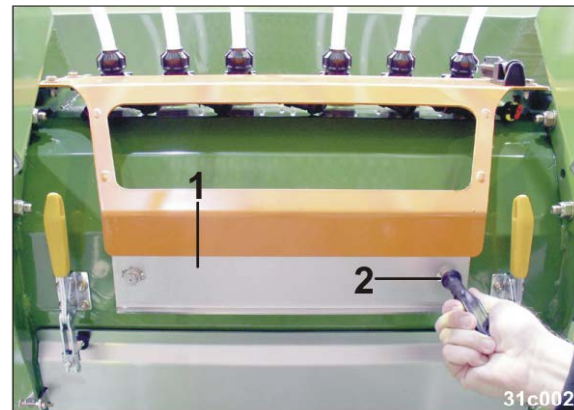


Fig. 167

10.4.2 Emptying the fertiliser tank and/or dosing unit



DANGER

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



CAUTION

Switch off the on-board computer

- before transport
- before adjustment, maintenance and repair work.

Risk of accident due to unintentional movement of the dosing unit or other machine components caused by radar impulse.

1. Switch off the AMATRON 3 on-board computer
2. Switch off the blower fan.
3. Fold in the machine extension arms.
4. Fully extend the front stands

Do not fold out the rear stand.

5. Place the machine on the front stands (Fig. 168/1).
6. Apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

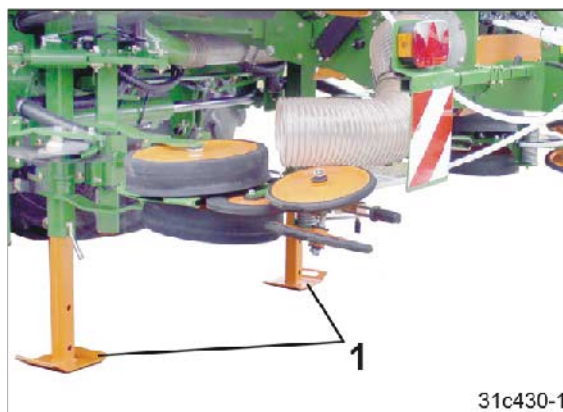


Fig. 168

7. Empty the fertiliser tank (see section "Emptying the fertiliser hopper", Seite 137)
8. Empty the dosing unit (see section "Emptying the dosing unit", Seite 137)

10.4.3 Emptying the fertiliser hopper

1. Prepare the machine for emptying as described (see section "Emptying the fertiliser tank and/or dosing unit", Seite 136).

1. Open the shutter (Fig. 169) and empty the hopper content into the calibration trough or a suitable container.



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

2. Empty the remaining hopper content (see section Emptying the dosing unit, unterhalb).



Fig. 169

10.4.4 Emptying the dosing unit

1. Prepare the machine for emptying as described (see section "Emptying the fertiliser tank and/or dosing unit", Seite 136).

2. Fold the mount for the calibration trough down (see section "Setting the fertilising rate using a calibration test", Seite 107).
3. Insert the calibration trough (Fig. 170/1) into the holder beneath the dosing unit.



Fig. 170

4. Close the opening of the fertiliser hopper above the dosing unit with the shutter (Fig. 171/1) (see section "Installing/removing the dosing roller", Seite 104).



Fig. 171

Use of the machine

5. Open the rotary slide of the injector sluice.
- The fertiliser drops into the calibration trough.



Fig. 172

6. Remove the dosing roller (see section "Installing/removing the dosing roller", Seite 104).

7. Close the housing cover (Fig. 173/1).
 8. Pull the shutter (Fig. 173/2) slowly out of the dosing unit.
- The fertiliser drops into the calibration trough.

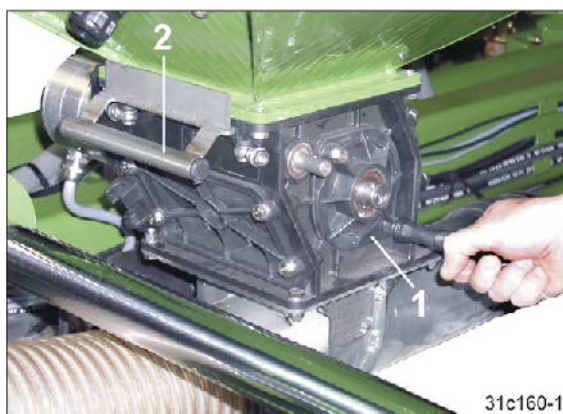


Fig. 173

9. Reassembly occurs in the reverse sequence.

11 Faults



WARNING

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

- **Unintentional lowering of the machine raised using the tractor's three-point hydraulic system.**
- **Unintentional lowering of raised, unsecured machine parts.**
- **Unintentional start-up and rolling of the tractor-machine combination.**

Secure the tractor and the machine against unintentional start-up and rolling, before you eliminate any faults on the machine. On this subject see section 6.2, Seite 82.

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



CAUTION

Switch off the on-board computer

- before transport
- before adjustment, maintenance and repair work.

Risk of accident due to unintentional movement of the dosing unit or other machine components caused by radar impulse.

11.1 Display of amount remaining

If the residual supply in the tank is undercut (and if the level sensor is set correctly), a warning message appears in the on-board computer, accompanied by an acoustic signal (see on-board computer operating manual).

The residual supply should be large enough to prevent fluctuations in the spread rate.

11.2 Cleaning the seed tube



DANGER

Never switch the blower fan (singling) on under the following circumstances

- **if a seed line has detached from the housing**
- **if the press rollers are raised.**

Seed grains may emerge uncontrollably at high speeds and cause injuries to unprotected parts of the body, particularly the eyes.

The AMATRON 3 indicates when one or more coulters are blocked and the seed is no longer placed in the soil.

The air flow in the seed tube then ceases and the supply of seed in the seed tube is interrupted. The grains do not enter the delivery hose, but accumulate at the sealing lip below the seed tube.

In event of blockage in the seed placement area (Fig. 174/1), proceed as follows:

- Clean the seed tube
- Eliminate seed accumulation at the sealing lip

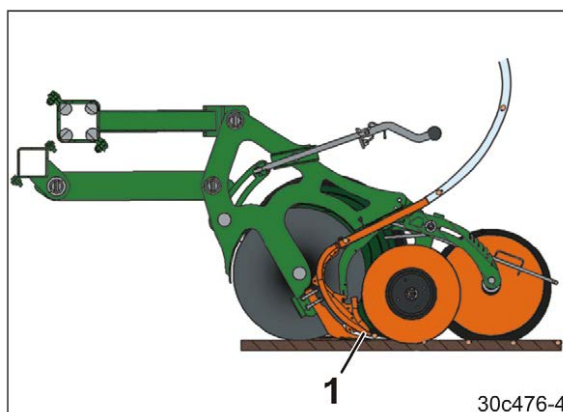


Fig. 174

Cleaning the seed tube

1. Switch off the fan.
2. Raise the coulter to the point where they have just come clear of the ground.
3. Release, but do not remove, the two screws (Fig. 175/1).
4. Fold up the press rollers and hook onto the clamp (Fig. 176/1).
5. Clear the blockage in the shoot pipe (Fig. 176/2), remove the shoot pipe to clean it if necessary.
6. Put the coulter in the working position.



Fig. 175

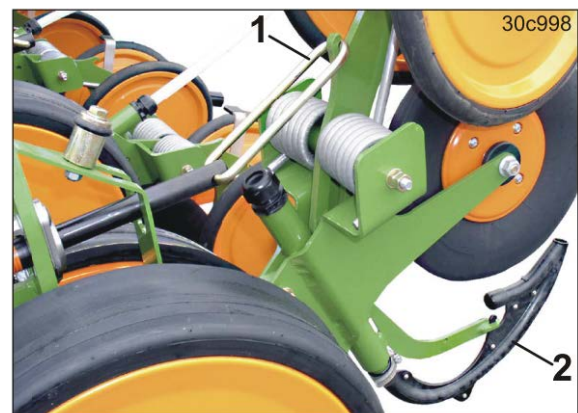


Fig. 176

Eliminating seed accumulation at the sealing lip

7. Move the lever several times clockwise to the stop.
- This causes the seed to fall from the sealing lip into the collecting hopper.

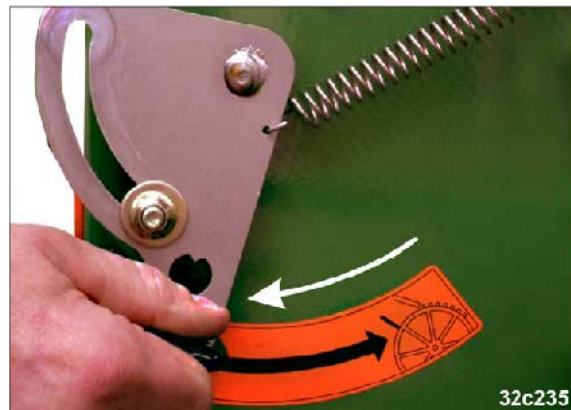


Fig. 177

8. Then return the spring-loaded lever (Fig. 178/1) to its initial position until it stops.



Fig. 178

The collecting hopper (Fig. 179/1) is usually emptied after completion of the field work (see section "Emptying the seed hopper and/or seed singling unit", Seite 132).

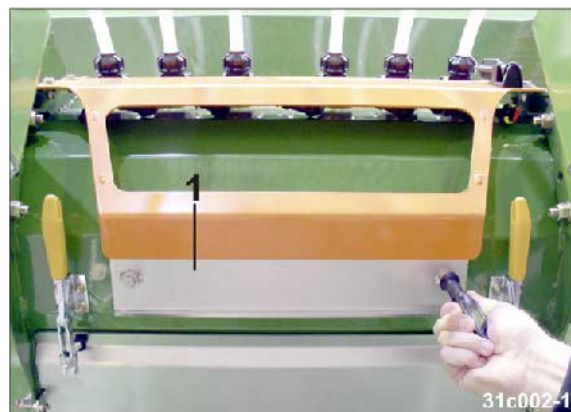


Fig. 179

11.3 Fault table

Fault	Possible cause	Remedy
False alarm from fan sensor, indicated on AMATRON 3 display	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
Grains are not placed with the target spacing	The incorrect calibration value (pul./100) is being used for sowing	Determine the calibration value (pul./100) and recalibrate the AMATRON 3.
Warning message: "Singling pressure"	Compressed air for singling seed grains is escaping.	Check the seed hoppers for leak-tightness. Check the air-ducting hoses.
Gaps in entire rows	The accumulation of grains is preventing singling.	Cleaning the seed tube(see Seite 140.)
	Foreign objects in front of the hole rows or scraper	Remove foreign objects.
The outer rows are not occupied.	The screen slider is blocked.	Remove deposits on the screen slider.
The electric motor of the singling drum does not start	The "working position" sensor requires adjustment or is defective	Adjust/replace sensor
Incorrect message from the optosensor	Seed dressing deposits impair the optics of the optosensor	Clean the optosensor with a damp cloth. Important! Do not use any strong cleaning agents. Eliminate severe contamination with technical alcohol.

12 Cleaning, maintenance and repairs



WARNING

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

- **Unintentional lowering of the machine raised using the tractor's three-point hydraulic system.**
- **Unintentional lowering 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 before you perform any cleaning, servicing or maintenance work on the machine. On this subject see Seite 82.



CAUTION

Switch off the on-board computer

- before transport
- before adjustment, maintenance and repair work.

Risk of accident due to unintentional movement of the dosing unit or other machine components caused by radar impulse.



WARNING

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

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



Danger

Only carry out cleaning, maintenance and repair work (unless otherwise instructed) if

- the machine extension arms are extended (see section 10.1, Seite 120)
- the tractor parking brake is engaged
- the tractor's universal joint shaft is switched off
- the tractor engine switched off
- the ignition key removed

12.1 Cleaning the machine



DANGER

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

When emptying the seed hopper and singling unit, or when removing toxic dressing dust, e.g. with compressed air: Wear a protective suit, protective mask, safety glasses and gloves.



DANGER

Fully extend or retract the machine before cleaning it.

Never clean the machine if the machine extension arms are not fully extended/retracted.



- Inspect the hydraulic hose lines with particular care!
- Never treat hydraulic hose lines with petrol, benzole, kerosene or mineral oils.
- After cleaning, grease the machine, in particular after cleaning with a pressure washer/steam jet or liposoluble agents.
- Observe the statutory requirement for the handling and removal of cleaning agents.



Observe the following when cleaning with a pressure washer/steam jet:

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

12.1.1 Daily quick cleaning of the singling unit and the spur gears

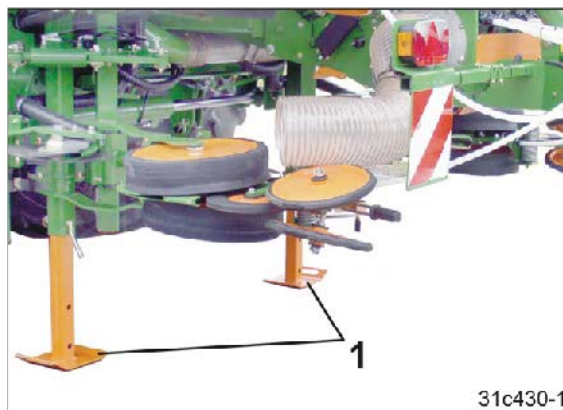


DANGER

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

When emptying the seed hopper and singling unit, or when removing toxic dressing dust, e.g. with compressed air: Wear a protective suit, protective mask, safety glasses and gloves.

1. Fold in the machine and set it down on the front stands (Fig. 180/1).
Do not fold out the rear stand.
2. Secure the tractor against unintentional starting and unintentional movement.

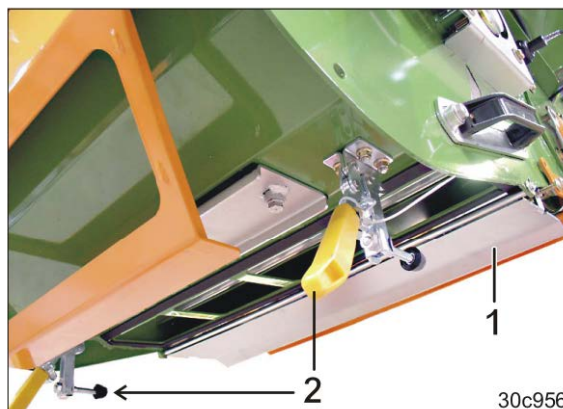


31c430-1

Fig. 180

3. Open the bottom flap (Fig. 181/1).

The bottom flap is secured with quick-release clamps (Fig. 181/2).



30c956

Fig. 181

4. Direct people away from the danger area.
5. Switch on the blower fan.
- Blow out seed residues and seed dressing deposits from the singling housing.
6. With the blower fan active, move the air guide lever (Fig. 182/1) to and fro several times.
7. Switch off the fan.



Fig. 182

8. Clean the spur gears (Fig. 183/1) behind the scale plate (Fig. 183/2) from dust and dirt with compressed air.
- Removal of the scale plate, as shown, is not necessary.

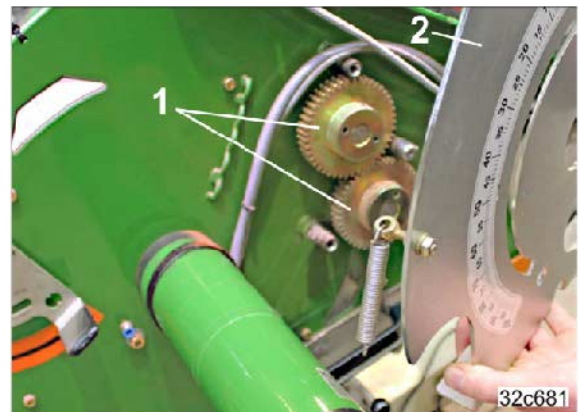


Fig. 183

9. After cleaning, close the singling housing.



Thorough cleaning should be carried out after emptying the seed hopper and the singling unit (see section "Thorough cleaning of the machine", Seite 148).

12.1.2 Thorough cleaning of the machine

1. Fully extend or retract the machine before cleaning it (see section 10.1, Seite 120).
Never clean the machine if the machine extension arms are not fully extended/retracted.
2. Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.
3. Empty the seed hopper and the singling unit.
4. Empty the fertiliser tank and dosing unit (see section Emptying the fertiliser tank and/or dosing unit, Seite 136).
5. Clean the fertiliser distributor head (see section Cleaning the fertiliser distributor head, Seite 149).
6. Clean the machine with water or with a high-pressure cleaner. Important! Only blow out the singling unit with compressed air.
7. Clean the optosensors with ISOPRORANOL (alcohol).
Seed dressing deposits may adversely affect the correct operation of the optosensor. Do not use any strong cleaning agents.



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

If the required air quantity is not achieved, there may be problems with the seed distribution.



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

12.1.2.1 Cleaning the fertiliser distributor head

1. Fold out the machine's extension arm (see section 10.1, Seite 120).
2. Switch off the tractor's universal joint shaft and apply the tractor parking brake, switch off the tractor engine and remove the ignition key.

**DANGER**

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

**WARNING**

There is a risk of slipping on the route to the distributor head and also in the area around the distributor head.

3. Slacken the wing nuts (Fig. 184/2) and remove the clear plastic cap (Fig. 184/1) 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. Refit the plastic cap.



Fig. 184

12.2 Assembly work on the machine

12.2.1 Removing/installing the singling drum

1. When the seed hopper is full, close the seed shutter so that no seed can get into the fluid bed from the seed hopper.
2. Disconnect the exhaust air hose (Fig. 185/1) from the housing cover (Fig. 185/2).



Fig. 185

3. Release the screws (Fig. 186/2) with the hexagon wrench provided.
4. Remove the bolt (Fig. 186/3).
5. Remove the housing cover (Fig. 186/1).



Fig. 186

6. Pull the singling drum out of the housing.
While doing so, slowly rotate it clockwise.
7. Installation is in the reverse sequence.

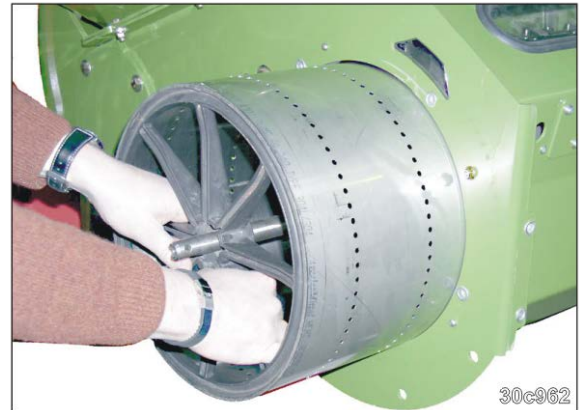


Fig. 187



When installing and removing the drum

slowly rotate the drum clockwise in order to avoid damaging the sealing lips.

When installing the drum

carefully press the drum spoke into the support of the electric motor by slightly raising the drum. If excessive force is used, the spoke may be damaged.



When installing the housing cover, pay attention to the recesses (Fig. 188/1).

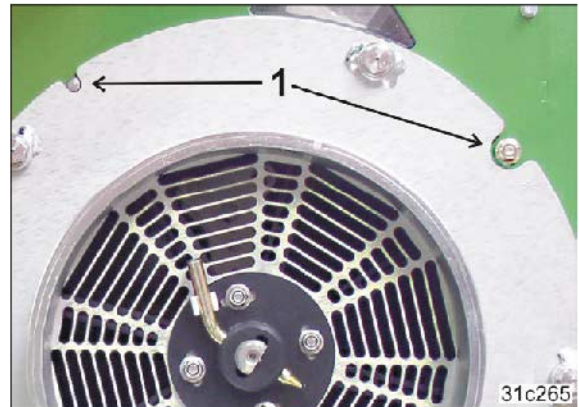


Fig. 188



Secure the bearing seat with the bolt (Fig. 188/1).



Fig. 189

12.2.2 Securing the seed tubes



Fig. 190



Fig. 191



- Always insert the seed tube as far as it will go to prevent seed accumulating in front of the seed tube. Insulating tape on the seed tubes marks the installation position of the tubes. Unintended loosening of a seed tube is immediately evident.
- Lubricate the thread with multi-purpose grease, e.g. Duplex 9 (from Fuchs) before securing the collar nut.
- Only tighten the collar nut by hand to prevent damage.

The optosensor wrench (Fig. 192) serves to release and secure the collar nuts, in particular for narrow seed drills.



Fig. 192

12.2.3 Adjusting the carrier roller scrapers

Scrapers coated in hard metal (Fig. 193/1) clean the carrier rollers.

The distance between scraper and carrier roller is 10 mm.

To adjust the scrapers, release the screws (Fig. 193/2).

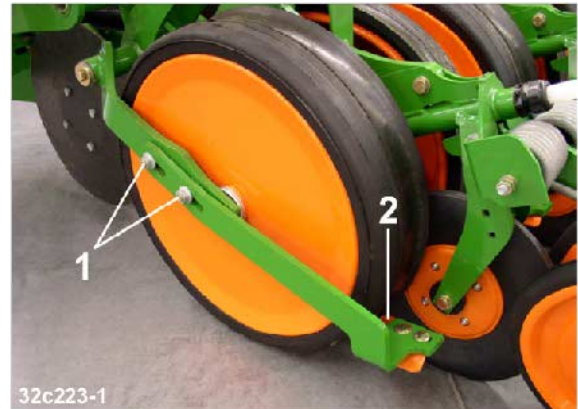


Fig. 193

12.2.4 Adjusting the furrow former on the fertiliser coulters

The gap (arrow) between the furrow former (Fig. 194/1) and coulters disc (Fig. 194/2) is adjustable.

The furrow former (Fig. 194/1) should be close to the coulters disc (Fig. 194/2), but not touch it.

The gap (arrow) can be adjusted, like a toggle, by variously tightening the two screws (Fig. 194/3). Do not tighten the screws too hard. It should be possible to move the furrow former with average force.

Lock the screws after each adjustment.

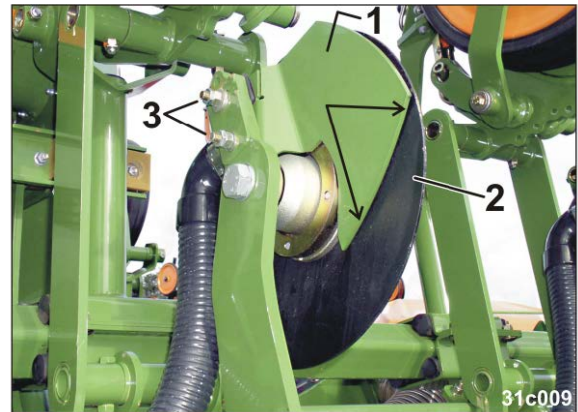


Fig. 194

12.3 Lubrication specifications



WARNING

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

The lubrication points on the machine are marked with a foil sticker (Fig. 195).

Carefully clean the lubrication nipple and grease gun before lubrication so that no dirt is pressed into the bearings. Press the dirty grease out of the bearings completely and replace it with new grease.

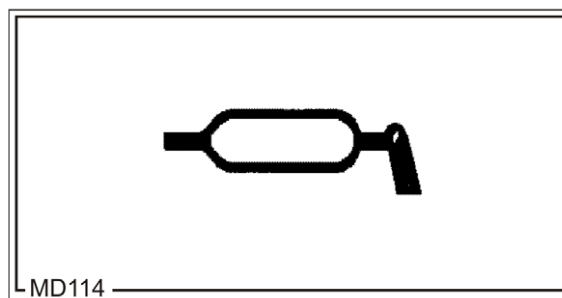


Fig. 195

Lubricants

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

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

12.3.1 Overview of lubrication points

EDX 4500-2C 6000-2C	Number of lubrication nipples	Lubrication interval	Note
Fig. 197/1	2	50 h	Track markers
Fig. 197/2	2	50 h	
Fig. 198/1	2	50 h	Hydr. cylinder for machine extension arm
Fig. 199/1	4	50 h	Machine extension arm
Fig. 200/1	2	50 h	Coulter pressure (Sowing and fertiliser coulter)
Fig. 200/2	2	50 h	
Fig. 200/3	2	50 h	
Fig. 200/4	2	50 h	

Fig. 196



Fig. 197

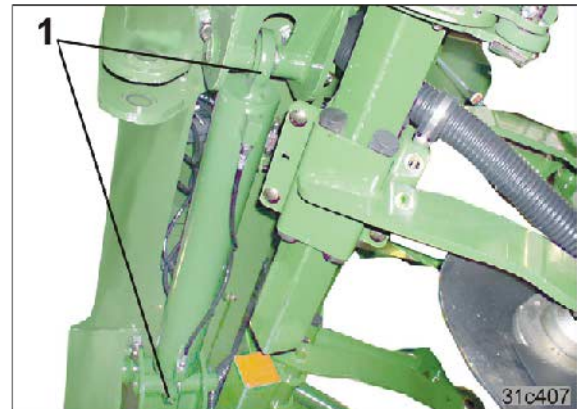


Fig. 198



Fig. 199

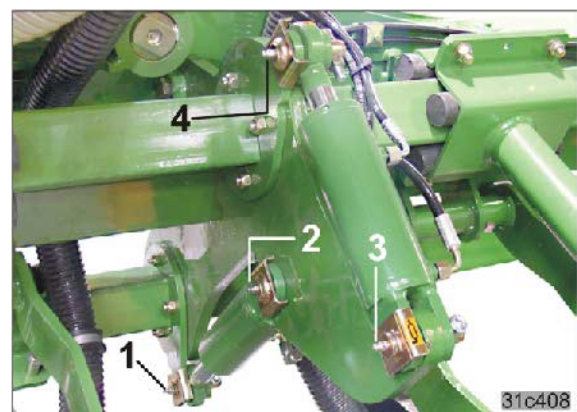


Fig. 200

12.4 Maintenance schedule – overview



Carry out maintenance work when the first interval is reached.

The times, continuous services or maintenance intervals of any third party documentation have priority.

Initial operation	Before initial operation	Specialist workshop	Check and service the hydraulic hose lines. This inspection has to be recorded by the operator.	Section 12.5.1
			Checking the tyre pressure of the support wheels	Section 12.4.1
	After the first 10 operating hours	Specialist workshop	Check and service the hydraulic hose lines. This inspection has to be recorded by the operator.	Section 12.5.1
		Specialist workshop	Check that all screw connections are tight.	Section 12.6

<u>Before starting work</u> (daily)		Visual inspection of the lower and upper link pins	Section 12.4.2
<u>Hourly</u> (e.g. for replenishing a tank)		Checking the placement depth and grain spacing	Section 8.1.9
		Inspection and elimination of contaminants <ul style="list-style-type: none"> • Fertiliser dosing unit • Fertiliser hoses • Fertiliser distributor head • Blower fan intake guard screen 	
		Remove surplus grains from sealing lips	Section 11.2
<u>During the work</u>		Check fertiliser distributor head for contamination and clean if necessary (see section "Cleaning the fertiliser distributor head")	Section 12.1.2.1
		Check fertiliser dosing units for contamination and clean if necessary (see section "Emptying the fertiliser tank and/or dosing unit")	Section 10.4.2

<u>After completion of work</u> (daily)		Daily quick cleaning of the singling unit and the spur gears	Section 12.1.1
		Thorough cleaning of the machine (as required)	Section 12.1.2
<u>Each week</u> (at least every 50 operating hours)	Specialist work-shop	Check and service the hydraulic hose lines. The inspection must be documented by the operator.	Section 12.5.1
		Seed dressing deposits may adversely affect the correct operation of the opto-sensor. Clean the optosensors e.g. with ISOPRORANOL (alcohol). Do not use any strong cleaning agents.	
<u>Every 2 weeks</u>		Checking the tyre pressure of the support wheels	Section 12.4.1
<u>Every 6 months</u> <u>(before the start of the season)</u>	Specialist work-shop	Check and service the hydraulic hose lines. This inspection has to be recorded by the operator.	Section 12.5.1
		Checking the tyre pressure of the support wheels	Section 12.4.1

12.4.1 Checking the tyre pressure of the support wheels

Check compliance with specified tyre pressure (see table Fig. 201).



Observe the inspection intervals
(see section Maintenance schedule – overview, Seite 156).

Tyres	Nominal tyre pressure
400/60-15.5	1.8 bar



Fig. 201

12.4.2 Visual inspection of the lower and upper link pins



WARNING

Risk of crushing, catching, trapping or impact when the machine unexpectedly releases from the tractor.

Check the upper and lower link pins for visible defects whenever the machine is coupled. Replace the drawbar if there are any clear signs of wear to the lower link pin.

12.5 Specialist workshop – Adjustment and repair work

12.5.1 Hydraulic system (specialist workshop)



WARNING

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

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

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

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



- When connecting the hydraulic hose lines to the hydraulic system of connected machines, ensure that the hydraulic system is depressurised on both the drawing vehicle and the trailer.
- Ensure that the hydraulic hose lines are connected correctly.
- Regularly check all the hydraulic hose lines and couplings for damage and impurities.
- Have the hydraulic hose lines checked at least once a year by a specialist for proper functioning.
- Replace the hydraulic hose lines if 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.

12.5.1.1 Labelling hydraulic hose lines

The labelling of the assembly provides the following information:

Fig. 202/...

- (1) Manufacturer's marking on the hydraulic hose line (A1HF)
- (2) Date of manufacture of the hydraulic hose line (12/02 = Year / Month = February 2012)
- (3) Maximum approved operating pressure (210 BAR).

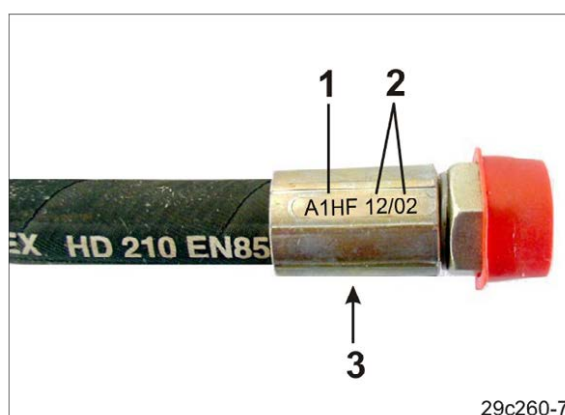


Fig. 202

12.5.2 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 worn or damaged hydraulic hose lines immediately (specialist workshop).

12.5.3 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 impaired); 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 "2012", then the hose should not be used after February 2018. For more information, see "Labelling of hydraulic hose lines".

12.5.4 Installation and removal of hydraulic hose lines (specialist workshop)



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

- Only use original AMAZONE hydraulic hose lines.
- Ensure cleanliness.
- The hydraulic lines must always be installed so that, under all operating conditions:
 - There is no tension, apart from the hose's own weight.
 - There is no possibility of jolting on short lengths.
 - Outer mechanical influences on the hydraulic hose lines are avoided.

Use appropriate arrangements and fixing to prevent any scouring of the hoses on components or on each other. If necessary, secure hydraulic hose lines using protective covers. Cover sharp-edged components.

 - The approved bending radii may not be exceeded.
- When connecting a hydraulic hose line to moving parts, the hose length must be appropriate so that the smallest approved bending radius is not undershot over the whole area of movement and/or the hydraulic hose line is not overtensioned.
- Fix the hydraulic hose lines to the intended fixing points. Avoid using hose clips at points where the natural movement and changes in length of the hose will be restricted.
- It is forbidden to paint over hydraulic hose lines.

12.5.5 Repairs to the pressure tank (specialist workshop)

The machine has a pressure tank (Fig. 203/1).

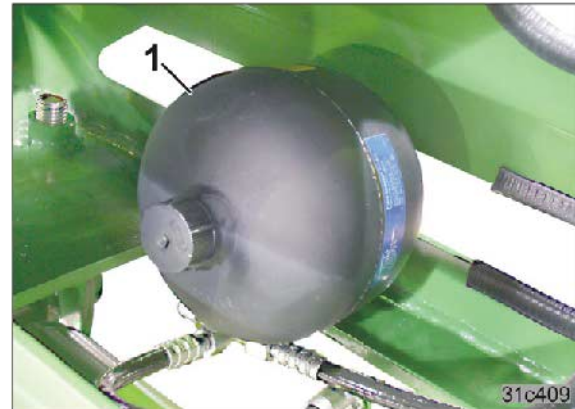


Fig. 203

Functional description of the standard pressure tank (Fig. 203/1)

To ensure that the machine's weight is evenly distributed on all coulters and press rollers, part of the machine's weight is transmitted to the coulters via the hydraulic cylinder, which actuates the booms.

As the hydraulic fluid is almost non-compressible, the pressure does not remain constant even when the hydraulic cylinder is shut off, i.e. when the oil is cooling down. The hydraulic cylinder is retracted by a few 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. 203/1).

In the event of a repair observe the following

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

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

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



DANGER

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

12.6 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

13 Hydraulic diagram

13.1 Hydraulic diagram EDX 4500/6000-2C

Fig. 204/...	Designation	Note
0010	Tractor hydraulics	
0020	2 yellow	
0030	1 yellow	
0040	2 green	
0050	1 green	
0060	1 blue	
0070	1 red	
0080	2 red	
0090	Control block EDX	
0100	Track marker shuttle valve	
0110	Track marker changeover valve	
0120	Coulter pressure changeover valve	
0125	Non-return valve.	
0130	Control block, coulter pressure	
0140	Fertiliser coulter pressure	
0150	ED coulter pressure	
0160	Folding mechanism pressure accumulator	
0170	Worm gear motor	
0180	Ball valve, worm gear switching	
0190	Track marker, right	
0210	Fertiliser coulter pressure, right	
0220	ED coulter pressure, right	
0230	Extension arm folding system	
0240	Pipe breakage safety device	
0250	Folding mechanism check valve	
0260	Folding mechanism check valve	
0270	ED coulter pressure, left	
0280	Fertiliser coulter pressure, left	
0290	Track marker, left	
0310	Blower fan drive, tractor hydraulics	
0320	Blower fan drive	

All position specifications in direction of travel

Hydraulic diagram

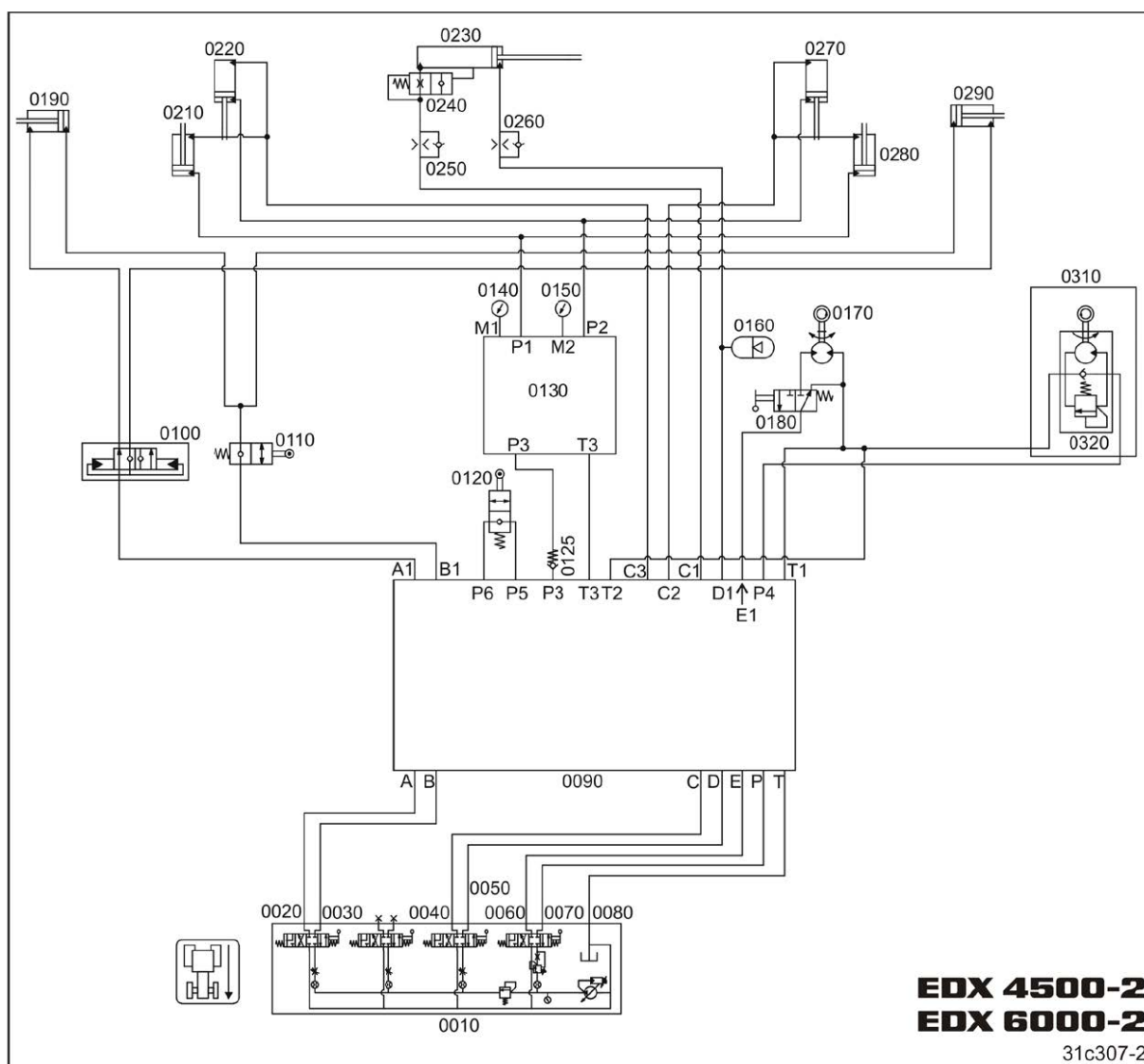


Fig. 204



AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

Postfach 51
D-49202 Hasbergen-Gaste
Germany

Tel.: + 49 (0) 5405 501-0
Telefax: + 49 (0) 5405 501-234
e-mail: amazone@amazone.de
[http:// www.amazone.de](http://www.amazone.de)

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

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