

OPERATOR MANUAL



**Please read carefully
before using the machine!**

Store carefully for future
use!

This Operator Manual should be considered as part of the machine. Suppliers of new and second-hand machines are obliged to indicate in writing that the Operator Manual has been delivered with the machine.

30.1 EMC
30.1 EMC + W
50.1 EMC + W

AXIS-H

Preface

Dear customer,

you have shown your trust in our product by the purchase of a Series AXIS H + EMC solid fertilizer broadcaster. Thank you! We want to justify your trust. You have purchased a powerful and reliable solid fertiliser broadcaster.

However, if any problems occur: Our Customer Service is always ready to help.



Please read this operator's manual carefully before using the solid fertiliser broadcaster and observe the instructions.

The operating instructions offer a comprehensive operational overview and give you valuable information regarding assembly, maintenance and care of the product.

The manual could also describe equipment that is not included in your mineral fertiliser spreader.

You should be aware that damage caused by incorrect operation or improper use cannot be covered by warranty claims.

▲ CAUTION



Please enter your model type and serial number together with the year of manufacture of your solid fertiliser broadcaster here.

You can find this information either on the manufacturer's nameplate or on the frame of the product.

Please state this information whenever you wish to order spare parts, accessories or in case of complaints.

Technical improvements

Model:

Serial number:

Year of manufacture:

We are continuously improving our products. For this reason, we reserve the right to make any improvements and necessary changes to our product line without prior notice. However, we are not obligated to apply such improvements or changes to machines that have already been sold.

We will be pleased to answer any other questions that you might have.

Yours sincerely

RAUCH

Landmaschinenfabrik GmbH

Preface

1	Intended use and manufacturers declaration of conformity	1
1.1	Intended use	1
1.2	Declaration of conformity	2
2	User instructions	3
2.1	About this operator's manual	3
2.2	Structure of the operator's manual	3
2.3	Depictions in the text	4
2.3.1	Directions and instructions	4
2.3.2	Lists	4
2.3.3	References	4
3	Safety	5
3.1	General Information	5
3.2	Significance of warnings	5
3.3	General safety information	7
3.4	Operator instructions	7
3.4.1	Personnel qualification	7
3.4.2	Orientation	7
3.4.3	Accident prevention	8
3.5	Operating safety instructions	8
3.5.1	Parking the solid fertiliser broadcaster	8
3.5.2	Filling the solid fertiliser broadcaster	8
3.5.3	Inspection before startup	9
3.5.4	During operation	9
3.6	Fertiliser	9
3.7	Hydraulics	10
3.8	Service and maintenance	11
3.8.1	Maintenance personnel qualification	11
3.8.2	Parts subject to wear and tear	11
3.8.3	Service and repair tasks	11
3.9	Traffic safety	12
3.9.1	Checks before driving	12
3.9.2	Road travel with the solid fertiliser broadcaster	13
3.10	Protective equipment built into the machine	14
3.10.1	Positioning of the protective equipment	14
3.10.2	Protective device functions	16
3.11	Warning and instruction message stickers	17
3.11.1	Warning stickers	18
3.11.2	Instruction stickers and factory plate	19
3.12	Reflectors	20

4	Technical data	21
4.1	Machine information	21
4.1.1	Manufacturer	21
4.1.2	Versions	21
4.1.3	Specifications of base equipment	22
4.1.4	Specifications of attachments and attachment combinations	23
4.2	List of available optional equipment	24
4.2.1	Extensions	24
4.2.2	Hopper covers	24
4.2.3	Hopper tarpaulin supplement	24
4.2.4	Auxiliary lighting	25
4.2.5	ASR 25 parking rollers with bracket	25
4.2.6	Border spreading device GSE 25	25
4.2.7	Hydraulic remote control FHZ for GSE 25	26
4.2.8	Hydraulic remote control FHZ 26 for GSE 25	26
4.2.9	Dirt deflector extension SFG-E 30	26
4.2.10	Spreading vane set Z14, Z16, Z18	26
4.2.11	Inspection kit PPS5	26
4.2.12	Fertiliser Identification System DiS	27
4.2.13	Hydraulic pressure filter	27
5	Axle load calculation	29
6	Transport without tractor	33
6.1	General safety instructions	33
6.2	Loading and unloading, parking	33
7	Before operation	35
7.1	Handing over the solid fertiliser broadcaster	35
7.2	Tractor requirements	35
7.3	Mounting the solid fertiliser broadcaster to the tractor	36
7.3.1	Requirements	36
7.3.2	Attachment	37
7.4	Preset the mounting height	40
7.4.1	Safety	40
7.4.2	Maximum approved hopper mounting height at front (V) and rear (H)	41
7.4.3	Hopper mounting heights A and B as per the spreading calibration chart	42
7.5	Using the step	46
7.6	Filling the solid fertiliser broadcaster	49
7.7	Using the calibration charts	51
7.7.1	Information on the calibration chart	51
7.7.2	Settings as per calibration chart	51
7.8	Spreading at the headland	58

7.9	Adjusting the option boundary spreading attachment GSE	60
7.9.1	Calibration of the border spreading unit	60
7.9.2	Adjusting border spreading unit	61
7.10	Adjustments for unlisted fertiliser types	62
7.11	Requirements and conditions	62
7.12	Definition of the terms "triangular spreading pattern" and "trapezoid spreading pattern"	63
7.13	Carrying out a spreading test with a single pass	65
7.14	Carrying out a spreading test with three passes	67
7.15	Carrying out a spreading test above a working width of 24 m	69
7.16	Carrying out a spreading test above a working width of 36 m	70
7.17	Evaluate the results and correct if necessary:	71
8	Spreading operation	73
8.1	General information about the spreading operation	73
8.2	Spreading sequence	74
8.3	Using the calibration charts	75
8.4	Spreading on slopes	75
8.5	Setting the application rate	75
8.6	Setting the working width.	76
8.6.1	Choosing the correct spreading disc	76
8.6.2	Removing and mounting spreading discs	77
8.6.3	Setting the fertiliser drop point	80
8.7	Check mounting height	81
8.8	Setting the spreading disc speed	81
8.9	Spreading sequence	81
8.9.1	Requirements.	81
8.10	Faults and possible causes	82
8.11	Discharging residue	85
8.12	Switching off and uncoupling the solid fertiliser broadcaster	86
9	Service and maintenance	87
9.1	Safety	87
9.2	Wear parts and bolted connections	88
9.2.1	Check the screw connections in the weighing cell	89
9.3	Cleaning the solid fertiliser broadcaster	91
9.3.1	Cleaning	91
9.3.2	Care	91
9.4	Opening the protective grid in the hopper	92
9.5	Checking the position of the spreading disc hub	94
9.6	Checking agitator drive	95
9.7	Changing spreader vanes	97
9.8	Maintenance Schedule	99
9.8.1	Maintenance.	99
9.9	Metering slide adjustment	101
9.10	Fertiliser drop point	103

Table of Contents

9.11	Manual adjustment of the drop point	111
9.12	Maintenance of the Hydraulics	114
9.12.1	Checking Hydraulic Hoses	115
9.12.2	Replacing Hydraulic Hoses.	115
9.12.3	Checking the Hydromotors	116
9.12.4	Checking the hydraulic pressure filter.	117
9.13	Gear oil.	119
9.13.1	Quantity and types	119
9.13.2	Checking oil level, changing oil.	119
9.14	Lubrication chart.	121
9.14.1	Location of the Lubrication Points.	121
9.14.2	Lubrication chart	122
10	Disposal	123
10.1	Safety	123
10.2	Disposal	124
11	Terms/conditions of warranty	125

1 Intended use and manufacturers declaration of conformity

1.1 Intended use

The solid fertiliser broadcasters of the AXIS H EMC series may only be used in accordance with the details given in this operator's manual.

The solid fertiliser broadcasters of AXIS H EMC series are built according to their specified use, therefore they should be used only for the following purposes:

- for conventional agricultural use
- for the spreading of dry, granular and crystalline fertilisers, seeds and pest control agents

Any use beyond these specifications is considered contrary to the intended use. The manufacturer is not liable for any damage resulting from misuse. The operator bears all risk.

The intended use also includes compliance with the operating, maintenance and service conditions according to manufacturer specifications. Only genuine spare parts from the manufacturer may be used as replacements.

The solid fertiliser broadcasters of the AXIS H EMC series may only be used, serviced and repaired by persons who are acquainted with the characteristics of the machine and who have been advised of the dangers involved.

The instructions regarding the operation, service and safe handling of the machine as described in this manual and declared by the manufacturer in the form of warning signs and symbols on the machine must be strictly followed during operation.

The relevant accident prevention regulations and all other generally recognised safety, occupational health and road traffic regulations must be strictly observed when using the machine.

Unauthorised modifications to the solid fertiliser broadcasters of the AXIS H EMC series are not permitted. The manufacturer is not liable for any resulting damage.

Foreseeable misuse

The manufacturer indicates anticipated incorrect use by means of the warning signs and warning symbols on the solid fertiliser broadcasters of the AXIS H EMC series. These warning signs and symbols must be observed at all times in order to avoid use other than the intended use of the solid fertiliser broadcaster of the AXIS H EMC series as specified in the operating manual.

1 Intended use and manufacturers declaration of conformity

1.2 Declaration of conformity

In accordance with 2006/42/EG, Appendix II, No. 1 A

**Rauch - Landmaschinenfabrik GmbH,
Landstr. 14, D-76547 Sinzheim, Germany**

We hereby declare that the product:

Solid fertiliser broadcaster of series AXIS H
Model: AXIS H 30.1 EMC, AXIS H 30.1 EMC + W, AXIS H 50.1 EMC + W

complies with all relevant regulations of the EU Machine Directive 2006/42/EU.

Compilation of the technical documents by:

**Rauch - Design Management
Landstr. 14, D-76547 Sinzheim, Germany**

Norbert Rauch

(Norbert Rauch – Managing Director)

2 User instructions

2.1 About this operator's manual

This operator's manual is an **element** of the solid fertiliser broadcaster of **series** AXIS H EMC.

The operator's manual contains important information for **safe, proper** and economical **use** and **maintenance** of the solid fertiliser broadcaster. Adherence to the operating instruction helps **to avoid dangers**, repair costs and down time and to increase the reliability and life of the machine.

The entire documentation, which consists of this operator's manual and all documentation provided by the supplier, must be kept close at hand in the place where the solid fertiliser broadcaster is used (for example in the tractor).

When the machine is sold, the operator's manual must be transferred with it.

The operator's manual is intended for the operator of this MDS solid fertiliser broadcaster of the AXIS H EMC series and anyone involved in operating and maintaining it. It must be read, understood and applied by every person who is entrusted with the following work on the machine:

- Operation
- Maintenance and cleaning
- Repairing faults

At the same time, particular attention must be paid to the following:

- The chapter on Safety
- The warnings in the text of the various individual chapters

The operator's manual does not replace your **personal responsibility** as the owner and operator of the MDS solid fertiliser broadcaster of the AXIS H EMC series.

2.2 Structure of the operator's manual

The content in the operator's manual is arranged according to six focal points:

- User instructions
- Safety instructions
- Machine details
- Instructions for operating the solid fertiliser broadcaster
- Instructions for finding and correcting faults and
- Maintenance and repair instructions.

2.3 Depictions in the text

2.3.1 Directions and instructions

Steps that the operator must carry out are shown as a numbered list.

1. Instruction for action step 1
2. Instruction for action step 2

Directions involving a single step are not numbered. The same applies to actions which do not have to be carried out in a particular sequence.

The following directions are preceded by a bullet point:

- Handling instruction

2.3.2 Lists

Lists without a specific sequence are shown as lists with bullet points (level 1) and dashes (level 2):

- Property A
 - Point A
 - Point B
- Property B

2.3.3 References

References to other sections in the document are shown as paragraph number, header text and page number:

- Please note also chapter [3: Safety, page 5](#).

References to other documents are made without mentioning the exact chapter or page number:

- Please also observe the instructions contained in the universal drive shaft manual.

3 Safety

3.1 General Information

The chapter on **safety** contains basic safety instructions and safety regulations for working and operation in traffic when using the attached AXIS H EMC solid fertiliser broadcaster.

All instructions in this chapter must be observed to ensure safe handling and trouble-free operation of the AXIS H EMC solid fertiliser broadcaster.

There are also additional warnings in the other chapters of this Operator's Manual, which must also be observed. The warnings are always given before the description of the respective action.

Warnings regarding third party supplier components are given in the respective supplier documents. Please observe these warnings as well.

3.2 Significance of warnings

The warnings in the operator's manual are classified according to how serious the danger is and the probability of its occurrence.

The warning symbols draw attention to the unavoidable residual risks inherent in the operation of the solid fertiliser broadcaster. The warning messages are structured in the following way:

Signal word	
Symbol	Explanation
Example	
▲ DANGER	
	<p>Risk to life if warning is disregarded</p> <p>Description of the danger and possible consequences.</p> <p>Disregard of this warning can lead to the most extreme injury, resulting in possible death.</p> <p>► Always take the specified measures to avoid this risk.</p>

Warning severity level

The risk level is determined through the signal word. The risk levels are classified as follows:

⚠ DANGER



Type and source of danger

This is a warning against an immediate threat to the health and life of persons.

Disregard of this warning can lead to the most extreme injury, resulting in possible death.

- ▶ Always observe the measures described to prevent this danger.
-

⚠ WARNING



Type of danger

This is a warning against possible danger to the health of persons.

Disregard of this warning can lead to severe injury.

- ▶ Always take the specified measures to avoid this risk.
-

⚠ CAUTION



Type of danger

This is a warning against possible danger for the health of persons or damage to the environment and property.

Disregard of this warning can lead to injury as well as damage to the product or the surrounding area.

- ▶ Always take the specified measures to avoid this risk.
-

NOTICE

General instructions contain usage tips and particularly useful information but no warnings.

3.3 General safety information

This solid fertiliser broadcaster of AXIS H EMC series is designed and manufactured to the state of the art in technology and the generally accepted rules of engineering. Nevertheless, operation and maintenance of the machine may pose a risk to the life and limb of the operator or other persons, as well as cause damage to the machine or other assets in the surrounding area.

Therefore operate the solid fertiliser broadcaster of AXIS H EMC series

- Only when it is in a proper and roadworthy condition
- In a safety-conscious and risk-aware manner.

This makes it imperative that you read and understand the contents of these operating instructions thoroughly. You must know the relevant accident prevention measures as well as the generally recognised safety-related, occupational health and road traffic laws and you must be in a position to practically apply this knowledge as well.

3.4 Operator instructions

The owner is responsible for the designated use of the AXIS H EMC solid fertiliser broadcaster.

3.4.1 Personnel qualification

The personnel to be assigned the task of operating, maintaining and servicing the solid fertiliser broadcaster must have read and understood the contents of the operating manual before using the product.

- The machine should only be operated by trained and authorised personnel.
- Personnel under training may work on the machine only if an experienced colleague is present.
- Maintenance and repair work must be carried out by appropriately qualified persons.

3.4.2 Orientation

Sales representatives, factory representatives or employees of our company RAUCH will instruct the operator in the operation and maintenance of the solid fertiliser broadcaster.

It is the responsibility of the operating company to ensure that new or inexperienced operating or maintenance personnel thoroughly understand the contents of this operator's manual before starting work on the machine.

3.4.3 Accident prevention

Safety and accident prevention regulations are regulated by law according to each country. The owner of the machine is responsible for observing the regulations applicable in the country of operation.

The following instructions must also be observed:

- Never leave the AXIS H EMC solid fertiliser broadcaster running without supervision.
- Do not ride on the AXIS H EMC solid fertiliser broadcaster while it is working or being transported. (**No passengers**).
- Do not use components of the AXIS H EMC solid fertiliser broadcaster as steps to climb up onto the machine.
- Do not wear loose clothing. Avoid workwear with belts, fringes or other parts which can get caught in the machinery.
- Follow the manufacturer's directions when working with chemicals. It may be necessary to wear personal protective equipment.

3.5 Operating safety instructions

The solid fertiliser broadcaster should only be operated in a reliable condition to avoid dangerous situations.

3.5.1 Parking the solid fertiliser broadcaster

- Park the AXIS H EMC solid fertiliser broadcaster with an empty hopper on level, firm ground.
- If the AXIS H EMC solid fertiliser broadcaster is parked alone (without a tractor), the metering valve should be left completely open.

3.5.2 Filling the solid fertiliser broadcaster

- Never fill the solid fertiliser broadcaster while the tractor engine is running. Take the ignition key out to make sure the motor cannot be started.
- Use suitable equipment for filling (e.g. front-end loader, auger).
- Fill the solid fertiliser broadcaster no higher than the top. Check the filling level, e.g. through the viewing window in the container (depending on model).
- Only fill the solid material broadcaster while in an attached state.
- Only fill the solid fertiliser broadcaster with the protective screen closed. This way you will avoid operating problems caused by clumping of the grit or other foreign bodies.

3.5.3 Inspection before startup

Before the first start and every subsequent operation, check the solid fertiliser broadcaster to make sure that it is safe to operate.

- Is all safety equipment on the solid fertiliser broadcaster installed and functional?
- Are all attachments and load bearing assemblies tight and in a proper condition?
- Are the spreading discs and their fasteners in good condition?
- Are the protective screens on the container closed and bolted?
- Is the check gauge on the protective screen bolting device in the correct zone? See [figure 9.6](#) on [page 92](#).
- Are any persons in the danger zone of the solid fertiliser broadcaster?

3.5.4 During operation

- If the solid fertiliser broadcaster malfunctions, stop the machine immediately and lock it. Have the fault repaired immediately by qualified technicians.
- Never climb up on to the solid fertiliser broadcaster when it is running.
- Operate the solid fertiliser broadcaster only with the safety guard in the hopper closed. The safety guard must not be opened or removed during operation.
- Rotating parts of the machine can cause severe injury. Therefore, always make sure that body parts or items of clothing never come close to the rotating parts of the machine.
- Do not place any objects (such as screws, nuts) in to the spreader hopper.
- Grit is flung from the machine at a high speed and can cause serious injury, e.g. to the eyes. Make sure that there are no persons within the spreading range of the solid fertiliser broadcaster.
- If the wind speed is too high, you should stop the spreading operation, as the spreading accuracy cannot be ensured.
- Never climb up on the solid fertiliser broadcaster or the tractor under power lines.

3.6 Fertiliser

Improper selection or use of fertiliser may cause serious injury or environmental damage.

- When you choose a fertiliser, make sure you are properly informed about its effects on humans, the environment and the machine.
- Please note the fertiliser manufacturers instructions.

3.7 Hydraulics

The hydraulic system **is under high pressure**.

Fluid escaping under high pressure can cause serious injuries and environmental damage. The following instructions must be observed to prevent danger:

- The maximum allowed operating pressure should never be exceeded.
- Release the pressure from the hydraulic system **before** all maintenance work. Turn the tractor motor off and make sure it cannot be started during maintenance work.
- When searching for leaks always wear **safety glasses** and **safety gloves**.
- If injuries are caused by hydraulic oil **consult a physician immediately**, because serious infections may result.
- When connecting the hydraulic hoses to the tractor hydraulics, make sure that the hydraulic system is **depressurised**.
- The hydraulic hoses from the tractor and spreader should be connected with the specified couplings only.
- Keep the hydraulic circuitry clean. Only hang the couplings in the brackets provided. Clean the connections before coupling.
- Check the hydraulic components and hydraulic lines regularly for mechanic defects, such as cuts and worn positions, crushing, cracking, porous sections etc.
- Pipes and pipe couplings undergo a natural aging process even if they are stored and used properly. This is the reason their shelf and service life is limited.

The service life of the hose line should not exceed **6 years**, including a storage period of a maximum of **2 years**.

The date of manufacture of the hose line is stamped on the hose coupling in month and year

- Replace the hydraulic pipes if they are damaged or old.
- Replacement hydraulic lines must meet the technical requirements of the equipment manufacturer. Pay particular attention to the maximum pressure specifications of the pipes to be replaced.

3.8 Service and maintenance

During service and maintenance tasks, you have to take additional dangers into account which cannot occur during normal operation.

- Carry out the service and maintenance tasks carefully and with full concentration. Always work with full awareness of the risks involved.

3.8.1 Maintenance personnel qualification

- Welding and work on the electrical and hydraulic systems must be carried out by qualified technicians only.

3.8.2 Parts subject to wear and tear

- Observe the maintenance and repair intervals specified in this operator's manual exactly.
- Also observe the maintenance and repair intervals for the supplied components. See the supplier documentation for the relevant intervals
- We recommend having your dealer check the condition of the AXIS H EMC solid fertiliser broadcaster, particularly fastening components, safety-relevant plastic components, hydraulic system, metering components and spreader vanes, after every working season.
- Replacement parts should meet the minimum technical standards specified by the manufacturer. The technical standards can be guaranteed by using genuine replacement parts, for example.
- Self-locking nuts are designed to be used only once. Always use new self-locking nuts to fasten components (e.g. when replacing spreading vanes).

3.8.3 Service and repair tasks

- Turn the tractor motor off before starting any cleaning, maintenance, repair or service tasks. Wait for all rotating parts to come to a stop.
- Make sure that no unauthorised person can switch on the solid fertiliser broadcaster. Take out the tractor ignition key.
- Check that the tractor is correctly parked with the solid fertiliser broadcaster. Park the fertiliser spreader with an empty hopper on level, solid ground and secure it to prevent it from moving.
- Depressurise the hydraulic system before starting service or maintenance work.
- Disconnect the electrical system from the main power supply before starting work on it.
- Never clear blockages in the spreader hopper by hand or with the foot but always use a suitable tool. To prevent blockages always use the safety guard when filling the hopper.
- Before cleaning the fertiliser spreader with water, steam or other cleaning agents cover all components that must be prevented from getting wet (e.g. bearings, electrical connections).
- Check the nuts and bolts regularly for tightness and tighten loose contacts.

3.9 Traffic safety

When travelling on public roads and tracks, the tractor with the attached solid fertiliser broadcaster must comply with the traffic regulations of the country in which it is operating. The owner and driver are responsible for compliance with these regulations.

3.9.1 Checks before driving

A pre-operational check is an important contribution to traffic safety. Before every trip check compliance with the operating conditions, traffic safety and the regulations of the country of operation.

- Make sure that the approved total weight is not exceeded. Note the permissible axle load, the approved braking load and the permissible tyre load capacity. [See also "Axle load calculation" on page 29.](#)
- Is the solid fertiliser broadcaster mounted correctly?
- Could spreading material be lost while travelling?
 - Check the fill level of the fertiliser in the hopper.
 - The metering slides must be closed.
 - The locks must also be closed on single-action hydraulic cylinders.
 - Turn off electronic controls.
- Check the tyre pressure and the function of the tractor brake system.
- Do the lights and identification on the solid fertiliser broadcaster comply with the national regulations for operation on public roads? Make sure to make the fittings according to the regulations .

3.9.2 Road travel with the solid fertiliser broadcaster

The road handling and the tilting, steering and braking performance of the tractor are all altered by the attached solid fertiliser broadcaster. For example, the high permissible load capacity will reduce the weight on the front axle of the tractor and may affect the steering.

- Adjust your driving behaviour according to the load on the vehicle.
- Always make sure you have unencumbered sight. If this is not possible (e.g. while reversing), another person is required to direct the driver.
- Do not exceed the legal speed limit.
- Avoid sudden turns when driving uphill or downhill or across a slope. Due to the change in the centre of gravity there is a risk of tipping over. Travel over uneven, soft ground (e.g. entering a field, over road edges) with great care.
- Set the lower link on the three-point linkage so it is rigid to prevent the machine from rocking.
- Passengers are prohibited on the solid fertiliser broadcaster during transport and operation.

3.10 Protective equipment built into the machine

3.10.1 Positioning of the protective equipment

AXIS H 30.1 EMC, AXIS H 30.1 EMC + W

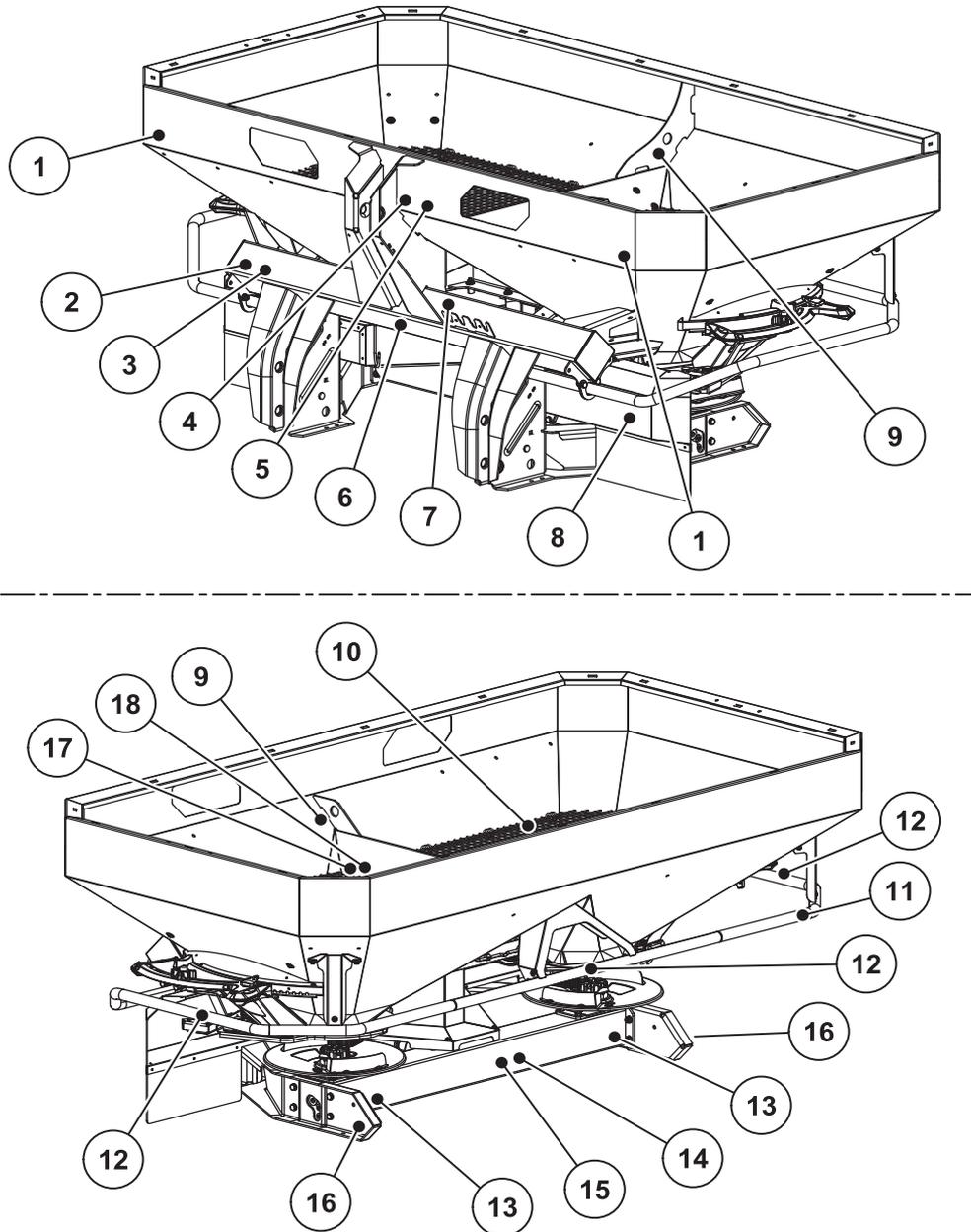


Figure 3.1: Position of protection devices, warning and instruction notices and reflectors

- | | |
|-------------------------------------|--|
| [1] White reflector in front | [10] Protective screen in hopper |
| [2] Nameplate | [11] Deflector bracket |
| [3] Serial number | [12] No-climbing notice |
| [4] Warning: read operator's manual | [13] Red reflector |
| [5] Material ejection warning | [14] Warning: remove ignition key |
| [6] KS/LS conversion | [15] Moving parts warning |
| [7] Maximum payload warning | [16] Yellow side reflector |
| [8] Spreading disc cover | [17] Protective screen lock |
| [9] Eyelet in hopper notice | [18] Instructions for protective screen lock |

AXIS H 50.1 EMC + W

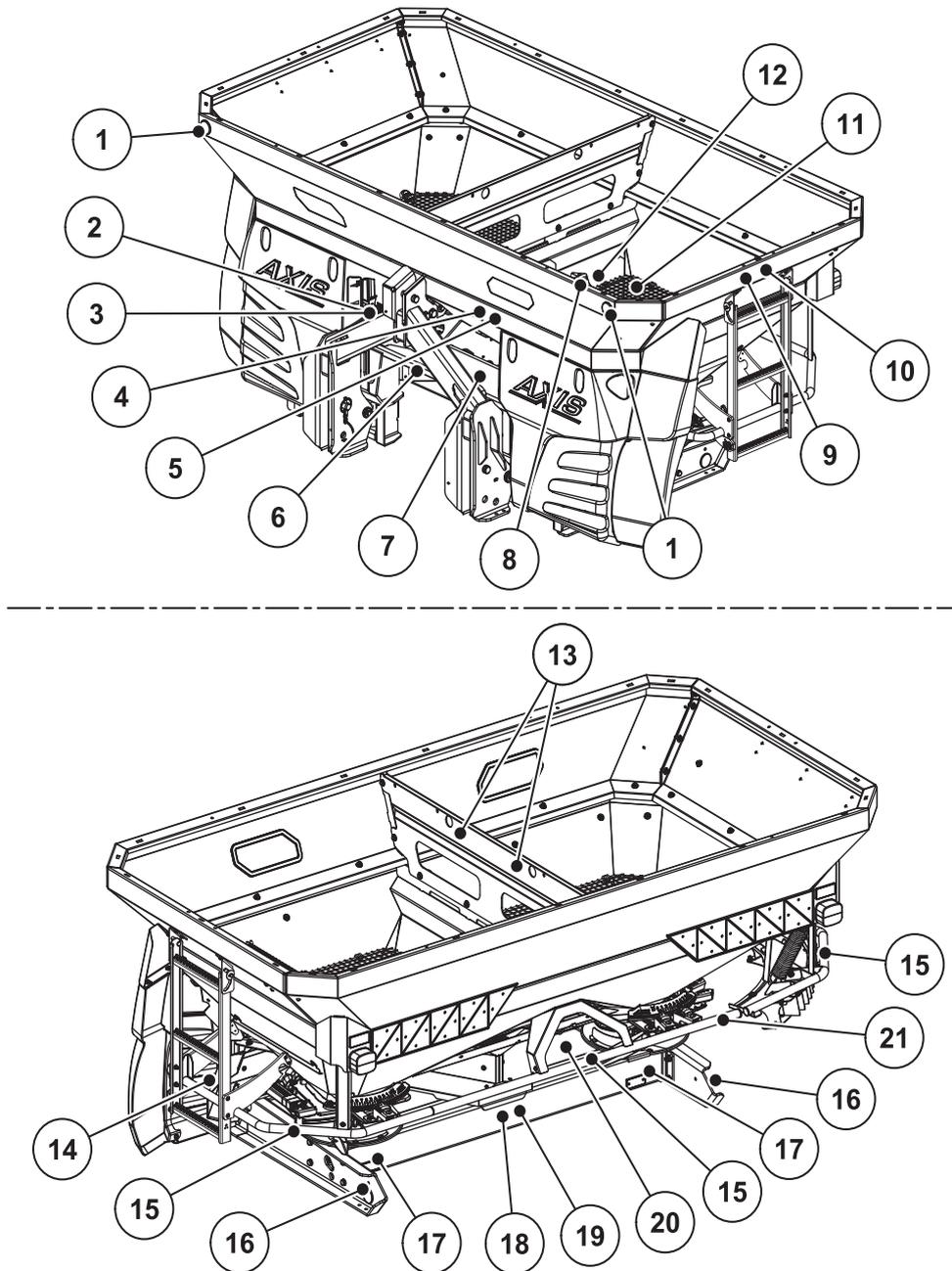


Figure 3.2: Position of protection devices, warning and instruction notices and reflectors

- | | |
|---|--|
| [1] White reflector in front | [12] Instructions for protective grid lock |
| [2] Nameplate | [13] Eyelet in hopper notice |
| [3] Serial number | [14] Spreading disc cover |
| [4] Warning: read operator's manual | [15] No-climbing notice |
| [5] Material ejection warning | [16] Yellow side reflector |
| [6] KS/LS conversion | [17] Red reflector |
| [7] Maximum payload warning | [18] Moving parts warning |
| [8] Protective grid lock | [19] Warning: remove ignition key |
| [9] Instructions on going uphill | [20] Gear protective cover |
| [10] Passenger transport prohibited warning | [21] Deflector bracket |
| [11] Protective grid in hopper | |

3.10.2 Protective device functions

The protective devices protect your life and limb.

- Only operate the solid fertiliser broadcaster with effective protection devices.
- Do not use the deflector bracket to climb up on the machine. It is not designed for this. You may be in danger of falling.

Designation	Function
Protective grid in the hopper	Prevents the intake of body parts by the rotating agitator. Prevents body parts from being cut off by the metering slide. Prevents faults caused by lumps in the spreading material, large stones or other large-scale objects (screening effect) during the spreading process.
Protective grid lock	Prevents the inadvertent opening of the protective grid on the container. Engages mechanically if protective grid is closed properly. Can be opened by using a tool.
Deflector bracket	Protection against getting caught by the rotating spreading discs from behind and from the side.
Spreading disc cover	Protection against getting caught by the rotating discs from the front. Prevents the casting of fertiliser towards the front side (in the direction of the tractor and driver).

3.11 Warning and instruction message stickers

The solid fertiliser broadcaster of the AXIS H EMC series has various warning and instruction messages affixed to it. (For an illustration, please see [figure 3.1](#) and [figure 3.2](#).)

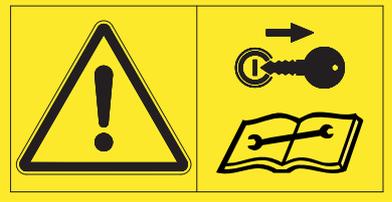
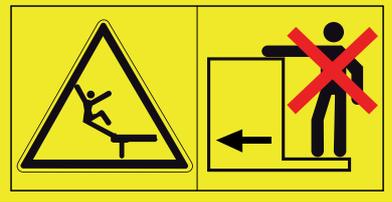
These warning and instruction messages are a part of the machine. They must not be removed or modified. Missing or unreadable warning and instruction stickers must be replaced immediately.

If parts have been replaced with new ones, it should be made sure that the new parts have the same warning and instruction stickers as the previous ones.

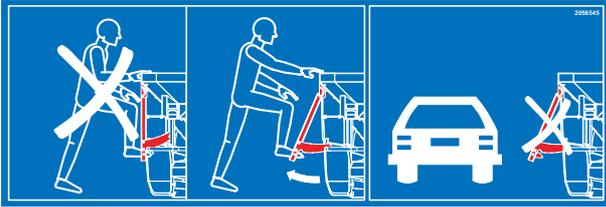
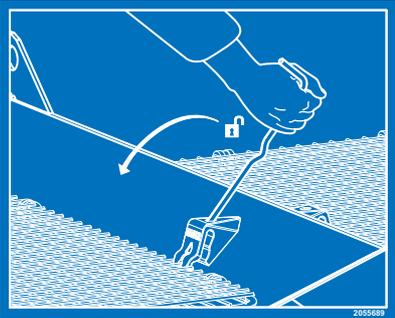
NOTICE

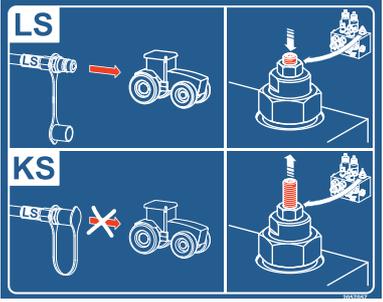
The correct warning and instruction notices can be obtained from the spare parts service.

3.11.1 Warning stickers

	<p>Read instruction manual and warning messages.</p> <p>Read and understand the instruction manual before operating the machine.</p> <p>The operator's manual explains in detail how to operate the spreader and contains valuable information on operation, care and maintenance.</p>
	<p>Danger through ejection of material</p> <p>Risk of injury to the entire body through rapidly ejected spreading material</p> <p>Direct all persons out of the danger zone (spreading area) of the solid fertiliser broadcaster before commissioning.</p>
	<p>Danger from moving parts</p> <p>Danger of amputation of body parts</p> <p>Reaching into the danger areas of the rotating spreading discs, the agitator or the drive shaft is prohibited.</p> <p>Before carrying out repair and adjustment work, shut off engine and remove the key.</p>
	<p>Remove the ignition key.</p> <p>Before carrying out repair and maintenance work, shut off engine and remove the key.</p>
	<p>No carrying of people</p> <p>Risk of slipping and injury. Do not climb on the steps of the solid fertiliser broadcaster during spreading and transport.</p>

3.11.2 Instruction stickers and factory plate

	<p>Step</p> <p>Climbing on the retracted steps is prohibited. Only climb on the ladder when it is extended. Only travel on the road with the ladder retracted.</p>
	<p>Ring eyelets on the container</p> <p>The brackets used for the fastening of the lifting gear</p>
	<p>Climbing prohibited</p> <p>Climbing on the deflector bracket is prohibited.</p>
	<p>Protective screen lock</p> <p>The screen lock is automatically locked when the protective screen on the container is closed properly. It can only be unlocked by using a tool.</p>
	<p>Maximum loading capacity (depending on model)</p>
	

	<p>KS/LS conversion</p> <p>Tighten the setscrew as far as it will go, LS operation</p> <p>Unscrew the setscrew as far as it will go, KS operation</p>
	<p>Nameplate</p>
	<p>Serial number</p>

3.12 Reflectors

The solid fertiliser broadcaster of the AXIS H EMC series is factory fitted with front, back and side identification (For an illustration of the positioning on the machine, see [figure 3.1](#) and [figure 3.2](#)).

4 Technical data

4.1 Machine information

4.1.1 Manufacturer

RAUCH Landmaschinenfabrik GmbH

Landstrasse 14

76547 Sinzheim

Germany

Telephone: +49 (0) 7221 / 985-0

Fax: +49 (0) 7221 / 985-200

Service centre, technical service

RAUCH Landmaschinenfabrik GmbH

Postfach 1162

76545 Sinzheim

Germany

Telephone: +49 (0) 7221 / 985-250

Fax: +49 (0) 7221 / 985-203

4.1.2 Versions

Model	AXIS H 30.1 EMC	AXIS H 30.1 EMC + W	AXIS H 50.1 EMC + W
Spreading speed, depending on travelling-speed	•	•	•
Weighing cells		•	•
Electrical application point adjustment	•	•	•
Speed regulation	•	•	•
EMC mass flow control	•	•	•

4.1.3 Specifications of base equipment

Dimensions:

Data	AXIS H 30.1 EMC	AXIS H 30.1 EMC + W	AXIS H 50.1 EMC + W
Overall width	240 cm	240 cm	290 cm
Overall length	141.5 cm	145.0 cm	161,0 cm
Fill height (basic machine)	101 cm	101 cm	125 cm
Distance of centre of gravity from lower link point	65.5 cm	72.5 cm	74.5 cm
Fill width	230 cm	230 cm	270 cm
Working width ¹	12 - 42 m	12 - 42 m	18 - 50 m
Capacity of basic container	1,200 l	1,200 l	2,000 l
Mass flow ² max.	500 kg/min	500 kg/min	500 kg/min
Hydraulic pressure max.	210 bar	210 bar	210 bar
Hydraulic output	50l/min	50l/min	65l/min
Noise level ³ (measured in the closed tractor driver's cab)	75 dB (A)	75 dB (A)	75 dB (A)

1. Working width dependent on fertiliser and casting disc type
2. Max. mass flow dependent on fertiliser type
3. Since the noise level of the solid fertiliser broadcaster can only be determined when the tractor is running, the actual measured value is greatly dependent on the tractor type being used.

Weights and loads:

NOTICE

The unladen weight (mass) of the solid fertiliser broadcaster varies depending on how it is equipped and the combination of attachments. The unladen weight (mass) shown on the factory plate refers to the standard version.

Data	AXIS H 30.1 EMC	AXIS H 30.1 EMC + W	AXIS H 50.1 EMC + W
Unladen weight	340 kg	400 kg	700 kg
Payload max.	3,000 kg		4,000 kg

4.1.4 Specifications of attachments and attachment combinations

Solid fertiliser broadcasters of AXIS H EMC series can be operated with different attachments and combinations of attachments. Depending on the feature package the capacity, dimensions and weights may change.

NOTICE

The combination of attachments must be chosen so that the max. loading capacity is not exceeded.

Attachment combination	AXIS H 30.1 EMC, AXIS H 30.1 EMC + W					
	L603	L800	L1500	XL1103	XL1300	XL1800
Change in capacity	+ 600 l	+ 800 l	+ 1500 l	+ 1100 l	+ 1300 l	+ 1800 l
Change in fill height	0	+ 26 cm	+ 50 cm	+ 24 cm	+ 38 cm	+ 52 cm
Attachment size max.	240 x 130 cm			280 x 130 cm		
Attachment weight	30 kg	45 kg	75 kg	60 kg	65 kg	85 kg
Notes	3-side	4-side	4-side	3-side	4-side	4-side

Attachment combination	AXIS H 50.1 EMC + W	
	GLW1000	GLW2000
Change in capacity	+ 1000 l	+ 2000 l
Change in fill height	+ 22 cm	+ 44 cm
Attachment size max.	290 x 150 cm	
Attachment weight	52 kg	86 kg
Notes	4-side	4-side

4.2 List of available optional equipment

NOTICE

We recommend that you have the extra equipment fitted and mounted on the basic machine by your supplier or an authorised service centre .

4.2.1 Extensions

The holding capacity of the spreader can be increased by extending the main container by an attachment hopper.

The extensions are bolted to the standard unit.

NOTICE

For an overview of extensions and extension combinations see Chapter [4.1.4: Specifications of attachments and attachment combinations, page 23](#).

4.2.2 Hopper covers

A hopper cover can be installed to protect the spreader material from rain and moisture.

The hopper covers are screwed both to the main hopper and to the hopper extension.

Hopper covers	Application
AP-L 25, foldable	<ul style="list-style-type: none">● Standard unit● Extensions: L603¹, L800, L1500
AP-XL 25, foldable	<ul style="list-style-type: none">● Extensions: XL1103¹, XL1300, XL1800
AP-L 50, foldable	<ul style="list-style-type: none">● Extensions: GLW1000, GLW2000

1. A supplementary hopper tarpaulin is necessary for this attachment.

4.2.3 Hopper tarpaulin supplement

For the attachments L603 and XL1103, a supplementary tarpaulin is necessary in addition to the container tarpaulin.

Tarpaulin supplements	Application
APE-L 25, foldable	<ul style="list-style-type: none">● Extension: L603
APE-XL 25, foldable	<ul style="list-style-type: none">● Extension: XL1103

4.2.4 Auxiliary lighting

The solid fertiliser broadcaster can be fitted with additional lighting.

Lighting	Application
BLO 25/50	<ul style="list-style-type: none"> ● Lighting for rear ● without warning sign
BLW 20/25/50	<ul style="list-style-type: none"> ● Lighting for rear ● with warning sign
BLF 25/50	<ul style="list-style-type: none"> ● Lighting for front ● with warning sign ● for wide attachments
BLF	<ul style="list-style-type: none"> ● Lighting for front ● without warning sign ● for wide attachments

NOTICE

Attachments are subject to the lighting regulations specified in the traffic regulations. Observe the traffic regulations of your country.

4.2.5 ASR 25 parking rollers with bracket

For parking and manually moving the empty fertiliser broadcaster.

The parking rollers consist of two turning wheels in front and two non turning wheels at the rear without wheel lock

4.2.6 Border spreading device GSE 25

NOTICE

This option is only available for the AXIS H 30.1 EMC and AXIS H 30.1 EMC + W.

Limits the spreading width (either towards the left or right) to the range between approx. 0.5 m and 2 m from the centre of the tractor track to the outer edge of the field. The metering slide that points to the field edge is closed.

- Fold the border spreading unit downwards for border spreading.
- The border spreading unit must be hinged up again before two-sided spreading.

4.2.7 Hydraulic remote control FHZ for GSE 25

NOTICE

This option is only available for the AXIS H 30.1 EMC.

This remote controller is used, from the tractor cab, to hydraulically swing the GSE 25 border spreading unit into position or to swing it from border spreading position to the both side spreading position.

For operating the hydraulic remote controller FHZ 25, a single action valve is required

4.2.8 Hydraulic remote control FHZ 26 for GSE 25

NOTICE

This option is only available for the AXIS H 30.1 EMC + W.

This remote controller is used, from the tractor cab, to hydraulically swing the GSE 25 border spreading unit into position or to swing it from border spreading position to the both side spreading position.

For operating the hydraulic remote controller FHZ 26, a single action valve is required.

4.2.9 Dirt deflector extension SFG-E 30

NOTICE

This option is only available for the AXIS H 30.1 EMC and AXIS H 30.1 EMC + Wr.

If the deflector SFG 30 does not perform satisfactorily, the SFG-E 30 extension can be mounted additionally.

4.2.10 Spreading vane set Z14, Z16, Z18

This set of spreading vanes is used for spreading snail bait. The snail bait spreading vane replaces the short spreading vane on the right and left spreading discs.

Set	Application
Z14	● Spreading disc S4
Z16	● Spreading disc S6
Z18	● Spreading disc S8

4.2.11 Inspection kit PPS5

For checking cross-distribution in the field.

4.2.12 Fertiliser Identification System DiS

Rapid, uncomplicated determination of spreader settings with unfamiliar fertilisers.

4.2.13 Hydraulic pressure filter

For long, error-free operation of hydraulic components.

5 Axle load calculation

⚠ CAUTION



Danger of overloading

Mounted units on the front or rear three-point linkage must not cause the approved total weight to be exceeded. The front axle of the tractor must always be loaded with at least 20 % of the unladen weight of the tractor.

- ▶ Before using the unit make sure that it meets these requirements by performing the following calculations or weighing the tractor-unit combination

Calculation of the total weight, the axle loads and the tyre capacity and the required ballast weights.

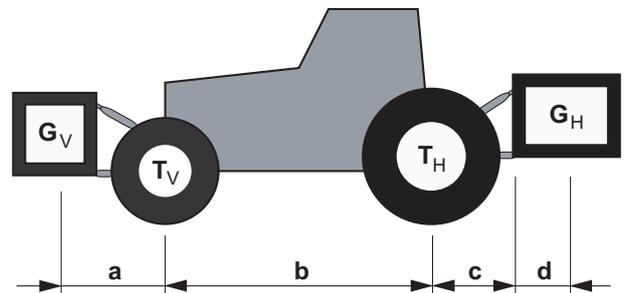


Figure 5.1: Loads and weights

You will need the following data for the calculation:

Character [unit]	Meaning	Calculation by (table footer)
T_L [kg]	Empty weight of tractor	[1]
T_V [kg]	Front axle load on the empty tractor	[1]
T_H [kg]	Rear axle load on the empty tractor	[1]
G_V [kg]	Total weight of front-mounted unit or front ballast	[2]
G_H [kg]	Total weight of rear-mounted unit or rear ballast	[2]
a [m]	Distance between centre of gravity of front-mounted unit or front ballast and centre of front axle	[2], [3]
b [m]	Tractor wheelbase	[1], [3]
c [m]	Distance between centre of rear axle and centre of lower link ball	[1], [3]
d [m]	Distance between centre of lower link ball and centre of gravity of rear-mounted unit or rear ballast	[2]

[1] See tractor operator's manual
 [2] See equipment price list and/or operator's manual
 [3] Measuring

Rear-mounted unit or front-rear combinations

Calculation of minimum ballast at front $G_{V \min}$

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

Enter the calculated minimum ballast requirement in the table.

Front-mounted unit

Calculation of the minimum ballast at rear $G_{H \min}$

$$G_{H \min} = \frac{(G_V \cdot a - T_H \cdot b + 0,45 \cdot T_L \cdot b)}{b + c + d}$$

Enter the calculated minimum ballast requirement in the table.

(If the front-mounted unit (G_V) is lighter than the minimum ballast at the front ($G_{V \min}$), the weight of the front-mounted unit must be increased to at least the weight of the minimum front ballast.)

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

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

Enter the calculated actual and approved front-axle load as specified in the tractor operator's manual in the table.

If the rear-mounted unit (G_H) is lighter than the minimum ballast at the rear ($G_{H \min}$), the weight of the rear-mounted unit must be increased to at least the weight of the minimum rear ballast.

Calculation of the actual total weight G_{tat}

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

Enter the calculated actual and approved total weight as specified in the tractor operator's manual in the table.

Calculation of the actual rear-axle load $T_{H\text{tat}}$	$T_{H\text{tat}} = (G_{\text{tat}} - G_{V\text{tat}})$
Enter in the table the actual calculated rear axle load and the permissible rear axle load specified in the tractor operating instruction.	

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

Axle load table:

	Actual value from calculation	Reliable value according to operator's manual	Twice approved tyre load capacity (two tyres)
Minimum ballast front/rear	<input style="width: 100%; height: 20px;" type="text"/> kg	—	—
Total weight	<input style="width: 100%; height: 20px;" type="text"/> kg	≤	<input style="width: 100%; height: 20px;" type="text"/> kg
Front-axle load	<input style="width: 100%; height: 20px;" type="text"/> kg	≤	<input style="width: 100%; height: 20px;" type="text"/> kg
Rear-axle load	<input style="width: 100%; height: 20px;" type="text"/> kg	≤	<input style="width: 100%; height: 20px;" type="text"/> kg

The minimum ballast weight must be mounted on the tractor as an attachment or as ballast!

The calculated values must be less than or equal to the permitted values.

6 Transport without tractor

6.1 General safety instructions

Before transporting the solid fertiliser broadcaster observe the following instructions:

- The solid fertiliser broadcaster is not allowed to be transported with an empty hopper without a tractor.
- The operation must only be carried out by suitable, trained and expressly authorised personnel.
- Suitable means of transportation and lifting equipment (e.g. crane, fork lift truck, cable devices ...) are to be used for transport purposes.
- Establish the transportation route in good time and remove possible obstacles.
- A check must be made to ascertain that all safety and transport devices are fit for operation.
- Secure all danger zones even if the risk is short lived.
- The person responsible for the transport must ensure that the solid fertiliser broadcaster will be transported correctly.
- Unauthorised persons are to be kept away from the transport route. The areas concerned must be cordoned off.
- The solid fertiliser broadcaster must be handled and transported carefully.
- Make sure that allowance is made for the centre of gravity. If necessary, adjust the cables such that the machine is correctly aligned on the means of transport.
- Transport the solid fertiliser broadcaster to the final destination as close to the ground as possible.

6.2 Loading and unloading, parking

1. Determine the weight of the solid fertiliser broadcaster.
Details are provided on the nameplate.
If applicable, also note the weight of possible accessories and attachments.
2. Hang suitable lifting cables in both ring eyelets.
3. Carefully raise the machines with suitable hoisting gear.
4. Carefully set the machine down on the loading pallet of the transport vehicle on a stable ground surface.

7 Before operation

7.1 Handing over the solid fertiliser broadcaster

When taking delivery of the solid fertiliser broadcaster, check to make certain the scope of delivery is complete.

The standard equipment includes

- 1 solid fertiliser broadcaster of AXIS H EMC series
- 1 AXIS H EMC operator's manual
- 1 calibration chart (paper or CD)
- 1 calibration kit comprising chute and calculator
- Lower link and upper link pins
- 1 spreading disc set (according to order)

Please check any special equipment that you ordered.

Check and make sure that no damage occurred to the machine during transport and that no parts are missing. Have the transport damages confirmed by the transport company.

In case of doubt, please contact your dealer or our factory.

7.2 Tractor requirements

To ensure safe, proper use of the MDS solid fertiliser broadcaster of the AXIS H EMC series, the tractor must meet the necessary mechanical, hydraulic and electrical requirements.

- Oil supply: **max. 210 bar**, single or double-acting valve (depending on equipment)
- Hydraulic output, depending on machine type: **50 - 65 l/min**, constant flow or load sensing system
- Free backflow **min. NW 18 mm**
- Electrical system: **12 V**
- Three point linkage category II.

7.3 Mounting the solid fertiliser broadcaster to the tractor

7.3.1 Requirements

⚠ DANGER



Danger from unsuitable tractor

Use of an unsuitable tractor for the solid fertiliser broadcaster of the AXIS H EMC series can lead to the severest possible accidents during operation and transport.

Only tractors that meet the technical requirements for the solid fertiliser broadcaster may be used.

- ▶ Check the vehicle documentation to make sure that your tractor is suitable for the solid fertiliser broadcaster of the AXIS H EMC series.

Check the following points in particular:

- Are both the tractor and solid fertiliser broadcaster safe to operate?
- Does the tractor comply with the mechanical, hydraulic and electrical requirements? (See [„Tractor requirements“ on page 35](#)).
- Do the attachment categories of the tractor and solid fertiliser broadcaster match? (If necessary, consult with your dealer)
- Is the solid fertiliser broadcaster standing securely on flat, firm ground?
- Do the axle loadings conform to the stipulated calculations (see [„Axle load calculation“ on page 29](#))?

7.3.2 Attachment

⚠ DANGER**Danger of crushing between the tractor and the solid fertiliser broadcaster**

Persons present between the tractor and the solid fertiliser broadcaster and the when the tractor is approaching or when the hydraulics are actuated are risking their lives.

The tractor may brake too late or not at all because of inattention or faulty operation.

- ▶ Make sure that no one stands between the tractor and the solid fertiliser broadcaster.

The solid fertiliser broadcaster is attached to the three-point linkage (rear power lift) of the tractor.

NOTICE

For normal fertilisation and late fertilisation **always** use the **upper couplings** of the solid fertiliser spreader. See [figure 7.1](#).

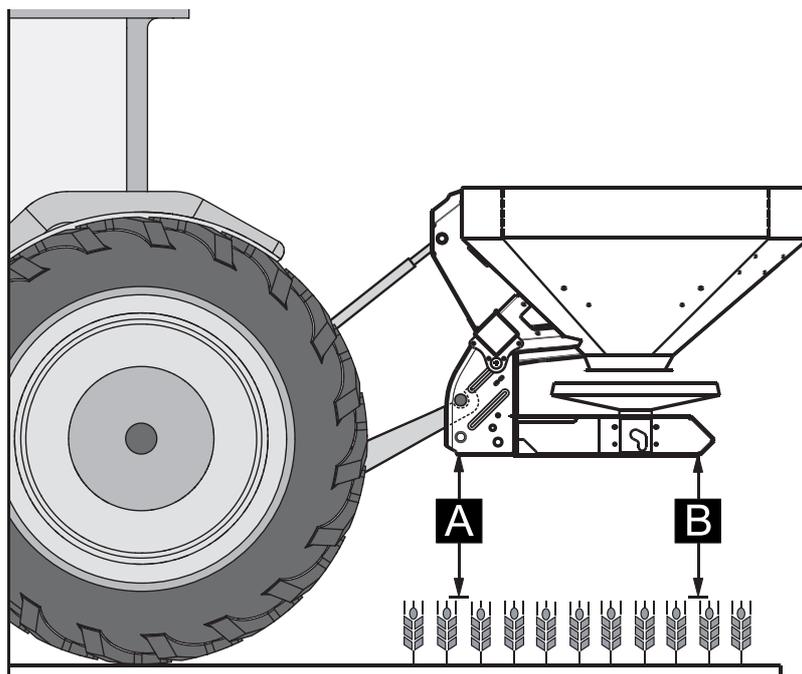


Figure 7.1: Mounting position

Mounting instructions:

- The machine can be connected to the tractor with class III linkage only with class II clearance and the use of reducing sleeves.
 - The bottom and top linkage pins must be locked with the locking pins or spring clips.
 - The solid fertiliser broadcaster must be mounted as specified in the calibration charts for correct cross distribution of the fertiliser.
 - To avoid a seesawing motion during operation, make sure that the solid fertiliser broadcaster does not have too much sideways play:
 - Lower steering arms of the tractor should be braced by stabilising struts or chains.
1. Start the tractor.
 2. Approach the solid fertiliser broadcaster with the tractor.
 - Do not latch the lower steering arm hooks into place yet.
 - Make sure there is enough space between the tractor and the solid fertiliser broadcaster to be able to connect the drive shaft and control elements.
 3. Turn off the tractor. Remove the ignition key.

NOTICE

The solid fertiliser broadcaster can be connected to different hydraulic systems.

- Hydraulic system with constant flow pump
- Hydraulic system with regulating pump without external load sensing connection
- Hydraulic system with regulating pump with external load sensing connection

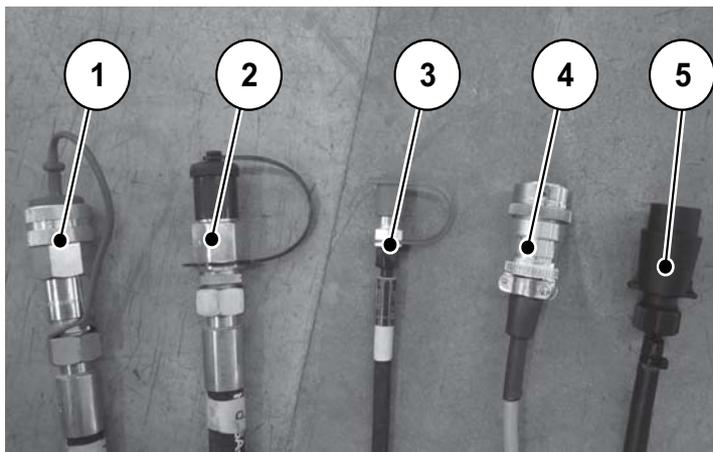


Figure 7.2: Connection lines, solid fertiliser broadcaster

- [1] Free backflow
- [2] Pressure line
- [3] LS pipe
- [4] ISOBUS device connector
- [5] Light cable

NOTICE

The couplings of the hydraulic hoses are colour coded and positive. Always connect the hoses according to colour and suitability.

The connections and coupling heads of the cables must be clean.

4. Connect the free return hose ([figure 7.2](#) position 1), the pressure line ([figure 7.2](#) position 2) and the LS line ([figure 7.2](#) position 3) with the relevant couplings on the tractor.
5. Connect the ISOBUS device connector ([figure 7.2](#) position 4) to the ISOBUS connector socket on the rear of the tractor.
6. Connect the lighting cable ([figure 7.2](#) position 5).

NOTICE

An electronic slide control is connected to the AXIS H EMC solid fertiliser broadcaster.

The electric slide actuator is described in a separate operator's manual for the electronic control system. This operator's manual is part of the electronic control system.

7. From the tractor cab, couple the lower steering arm hook and the upper steering arm to the retainers provided for them, as described in the operator's manual for your tractor.

NOTICE

We recommend using lower arm hooks with a hydraulic upper arm for safety and comfort. See [figure 7.1](#).

8. Check that the solid fertiliser broadcaster is securely fixed in position.
9. Raise the solid fertiliser broadcaster carefully to the maximum lifting height.
10. Preset mounting height according to the spreader settings chart. See [7.7.2: Settings as per calibration chart, page 51](#).

7.4 Preset the mounting height

7.4.1 Safety

DANGER



Danger of being crushed under falling spreader

If the two halves of the upper steering arm are brought fully apart from each other by mistake, the steering arm may not be able to compensate for the weight of the full load of the fertiliser resulting in the solid fertiliser broadcaster from abruptly falling over or falling over backwards.

Persons can be seriously hurt and the machine damaged.

- ▶ If you want to extend the upper steering arm, please always take the maximum allowed extension length given by the tractor or steering arm manufacturer into account.
- ▶ Clear the area of any persons who might be present in the danger zone of the solid fertiliser broadcasters.

WARNING



Risk of injury from rotating machine components

Contact with the spreading equipment (spreading discs, spreading vanes) may injure, crush or cut off body parts. Body parts or objects may be caught and pulled in.

- ▶ **Never** exceed the maximum approved hopper heights at the front (V) and rear (H).

General instructions before setting the mounting height

- We recommend that you choose the highest coupling point on the tractor to connect the upper steering arm to, particularly for high lifting heights.

NOTICE

For normal fertilisation and late fertilisation **always** use the **upper couplings** of the solid fertiliser spreader.

- The lower coupling points on the solid fertiliser broadcaster which are meant for the lower steering arms of the tractor should **only be used** **be used in exceptional circumstances** during late fertilisation.

7.4.2 Maximum approved hopper mounting height at front (V) and rear (H)

The **maximum** approved hopper height (**V + H**) is measured from the ground to the bottom edge of the frame.

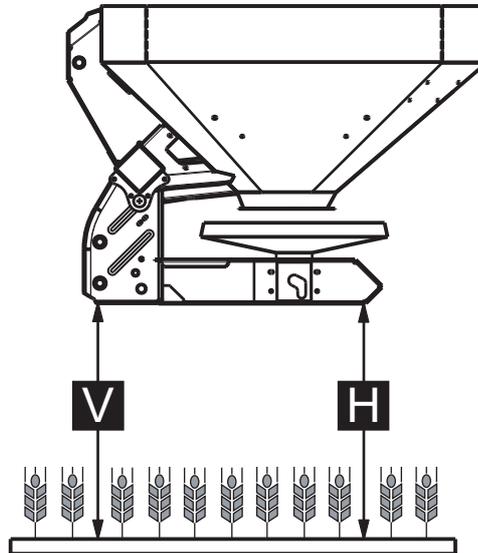


Figure 7.3: Maximum approved hopper mounting height V and H during normal and late fertilisation

The maximum approved hopper height depends on the following factors:

- Normal or late fertilisation.

Spreader equipment	Maximum approved hopper mounting height			
	during normal fertilisation		during late fertilisation	
	V [mm]	H [mm]	V [mm]	H [mm]
AXIS H 30.1 EMC	1040	1040	950	1010
AXIS H 30.1 EMC + W				
AXIS H 50.1 EMC + W	990	990	900	960

7.4.3 Hopper mounting heights A and B as per the spreading calibration chart

The hopper heights in the calibration chart (**A and B**) are always measured in the field from the top of the **crop height** to the bottom edge of the frame.

NOTICE

The values of A and B are taken from the **calibration charts**.

Setting the mounting height during normal fertilisation

Requirements:

- The solid fertiliser spreader should be connected to the tractor at the highest pivoting point of the steering arm.
- The lower arm of the tractor should be connected to the **upper coupling point** of the solid fertiliser broadcaster.

Proceed as follows when determining the hopper height (in normal dressing):

1. Determine the hopper heights **A and B** (above crop) from the calibration chart.
2. Compare the hopper heights **A and B** (plus the crop height) with the maximum approved hopper mounting heights at the front (V) and rear (H).

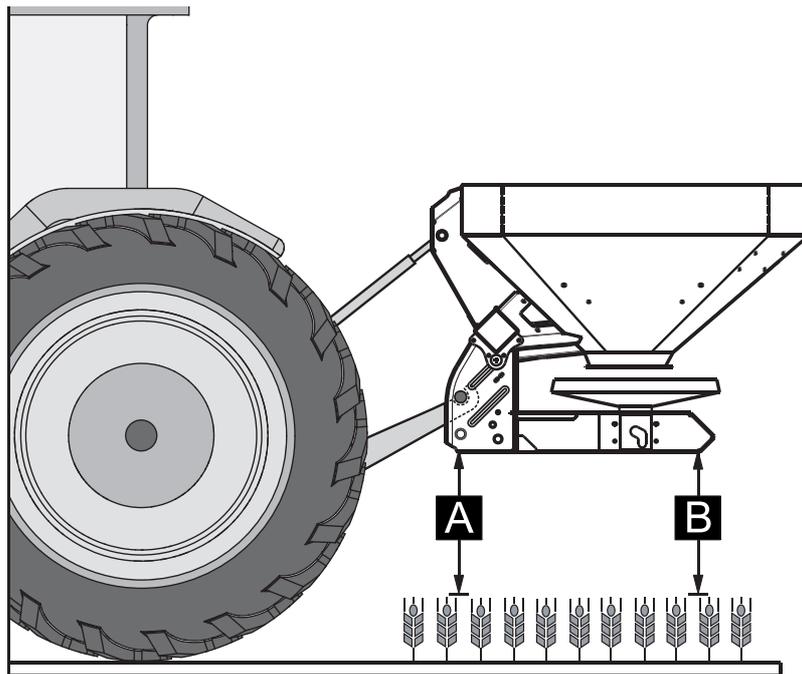


Figure 7.4: Mounting position and height during normal fertilisation

The following applies:

	AXIS H 30.1 EMC, AXIS H 30.1 EMC + W	AXIS H 50.1 EMC + W
A + crop height ≤ V	Max. 1040 mm	Max. 990 mm
B + crop height ≤ H	Max. 1040 mm	Max. 990 mm

3. If the maximum approved mounting height of the solid fertiliser broadcaster is exceeded or the mounting heights A and B cannot be reached, then the solid fertiliser broadcaster should be mounted according to **late fertilisation** calibration values.

Setting the mounting height during late fertilisation

Requirements:

- The solid fertiliser spreader should be connected to the tractor at the highest pivoting point of the tractor.
- The lower arm of the tractor should be connected to the **upper lower coupling point** of the solid fertiliser broadcaster.

Proceed as follows when determining the hopper mounting height (during late fertilisation):

1. Determine the hopper mounting heights **A** and **B** (above crop) from the calibration chart.
2. Compare the hopper heights **A** and **B** (plus the crop height) with the maximum approved hopper mounting heights at the front (V) and rear (H).

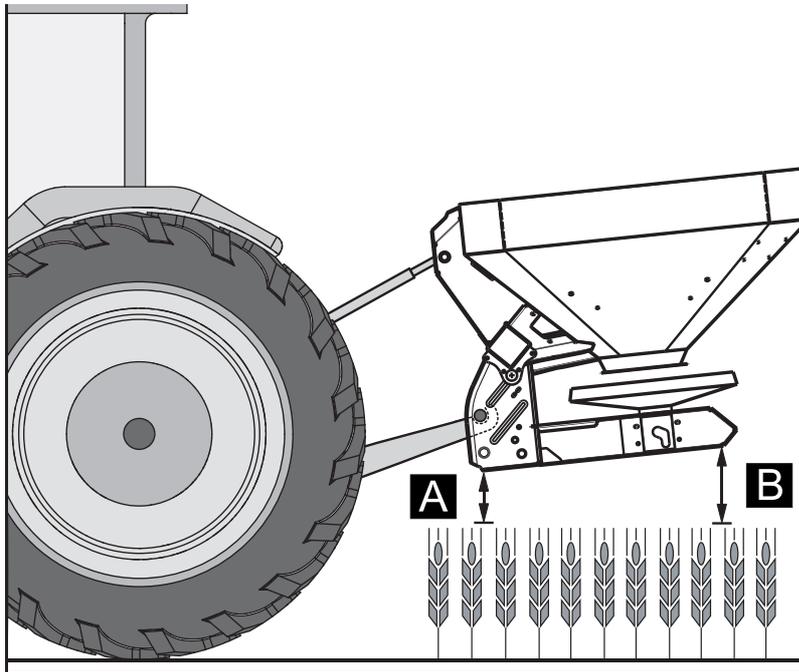


Figure 7.5: Mounting position and height during late fertilisation

The following applies:

	AXIS H 30.1 EMC, AXIS H 30.1 EMC + W	AXIS H 50.1 EMC + W
A + crop height ≤ V	Max. 950 mm	Max. 900 mm
B + crop height ≤ H	Max. 1010 mm	Max. 960 mm

- If the lifting height of the tractor is not enough to be able to set the required mounting height, you can use the lower coupling point on the lower arm of the solid fertiliser spreader.

NOTICE

Make sure that the **maximum allowed length** of the upper arm is not exceeded.

- Please note the instructions in the operating manuals of the tractor and steering arm.

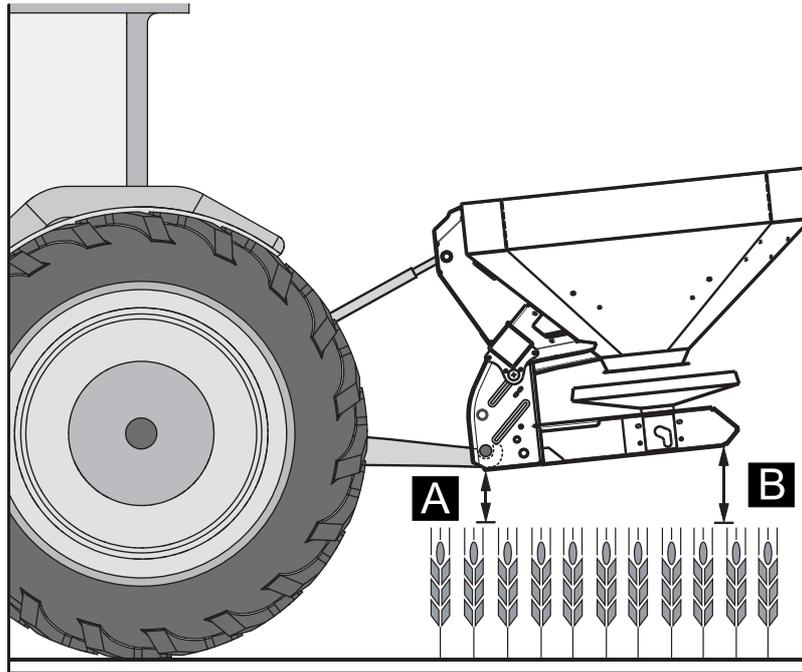


Figure 7.6: Solid fertiliser broadcaster mounted to the lower coupling point of the lower steering arm

The following applies:

	AXIS H 30.1 EMC, AXIS H 30.1 EMC + W	AXIS H 50.1 EMC + W
A + crop height ≤ V	Max. 950 mm	Max. 900 mm
B + crop height ≤ H	Max. 1010 mm	Max. 960 mm

7.5 Using the step

Always keep in mind that troubleshooting involves additional hazards in case you are climbing into the hopper container.

Use the step with extra care. Work very carefully and with awareness of danger.

Observe the following instructions in particular:

- Turn tractor motor off and wait till all moving parts have stopped moving. Take the ignition key out.
- Use the step only when the solid fertiliser broadcaster is lowered.
- Use the step only if it is folded out.
- Do not climb over the container tarpaulin into the container.
- Use the handle on the container tarpaulin.
- Do not climb into a filled up container.

DANGER



Danger of injury from moving parts in the hopper

There are moving parts in the hopper.

The rotating agitator can cause injury to hands and feet.

- ▶ Turn off agitator.
 - ▶ Climb into the container **only** for troubleshooting purposes.
 - ▶ Safety screen should be opened **only** for maintenance or repair work.
-

Folding out step

Before folding out step:

- Turn off tractor motor.
- Lowering the solid fertiliser spreader.

1. Lift the step at the bottom and fold it inwards.
2. Lower the step to the stop while it is in the folded position.

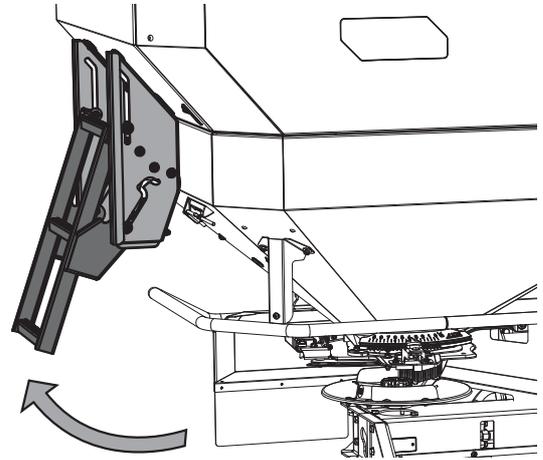


Figure 7.7: Step AXIS 30.1 EMC

1. Lift the step at the bottom and fold it out.
2. Lock it into an open position.

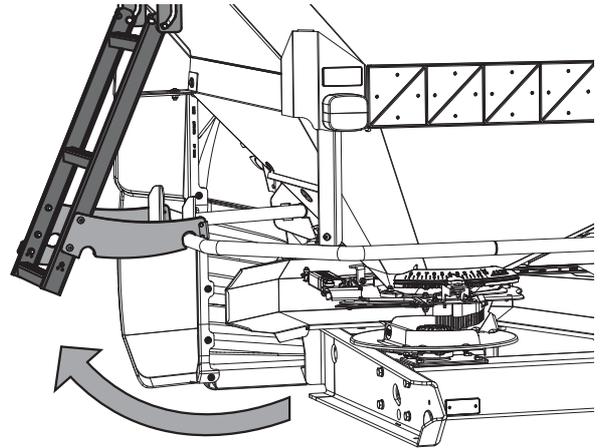


Figure 7.8: Step AXIS 50.1 EMC

Folding in the step

NOTICE

The step must be folded up before each ride and during spreading operation.

1. Lift the step at the bottom and fold it upwards.
2. Lock it into a closed position.

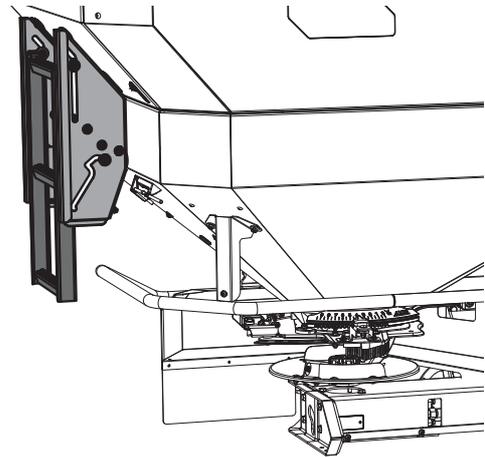


Figure 7.9: Step AXIS 30.1 EMC

1. Lift the step at the bottom and fold it inwards.
2. Lock it into a closed position.

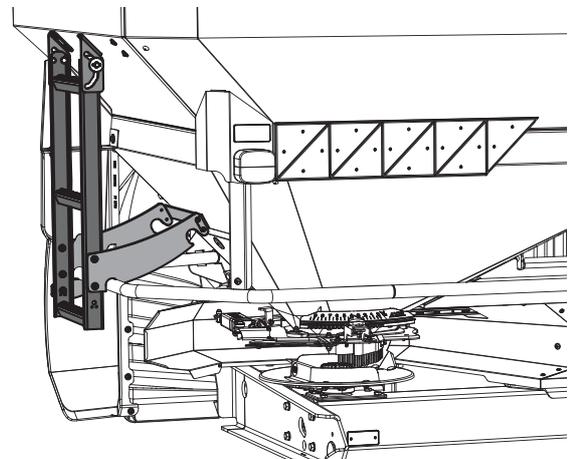


Figure 7.10: Step AXIS 50.1 EMC

7.6 Filling the solid fertiliser broadcaster

DANGER



Danger from running engine

Working on the solid fertiliser broadcaster with the engine running may cause serious injuries from the mechanical components and escaping fertiliser.

Never fill the solid fertiliser with the tractor engine running.

- ▶ Turn off tractor. Remove the ignition key.

CAUTION



Excessive total weight.

If the approved total weight is exceeded, it will affect the operating and traffic safety of the vehicle (and tractor) and may cause serious damage to the machine and environment.

- ▶ Before filling up, please determine the possible volume that can be filled.
- ▶ Do not exceed the approved maximum total weight.

Notes on filling the solid fertiliser broadcaster:

- Park the solid fertiliser broadcaster on even, solid ground only.
- Fill the solid fertiliser broadcaster **only** when attached to the tractor. Make sure that the tractor is standing on flat, firm ground.
- Secure the tractor to prevent movement. Set handbrake.
- Shut off the engine of the tractor. Remove the ignition key.
- For filling levels above 1.25 m, use special equipment (e.g. front loader, screw conveyor).
- Fill the solid fertiliser broadcaster no higher than the top.
- Check the fill level either by climbing up on the folded-down step or by looking through the inspection window in the hopper container.
 - Please refer to the climbing instructions given in the chapter [„Using the step“ on page 46](#).

Fill level scale

A fill level scale is installed in the hopper to monitor the starting weight.

The scale can be used to estimate how long spreading can continue before the hopper must be refilled.

The fill level can be checked through two inspection windows in the side of the hopper.

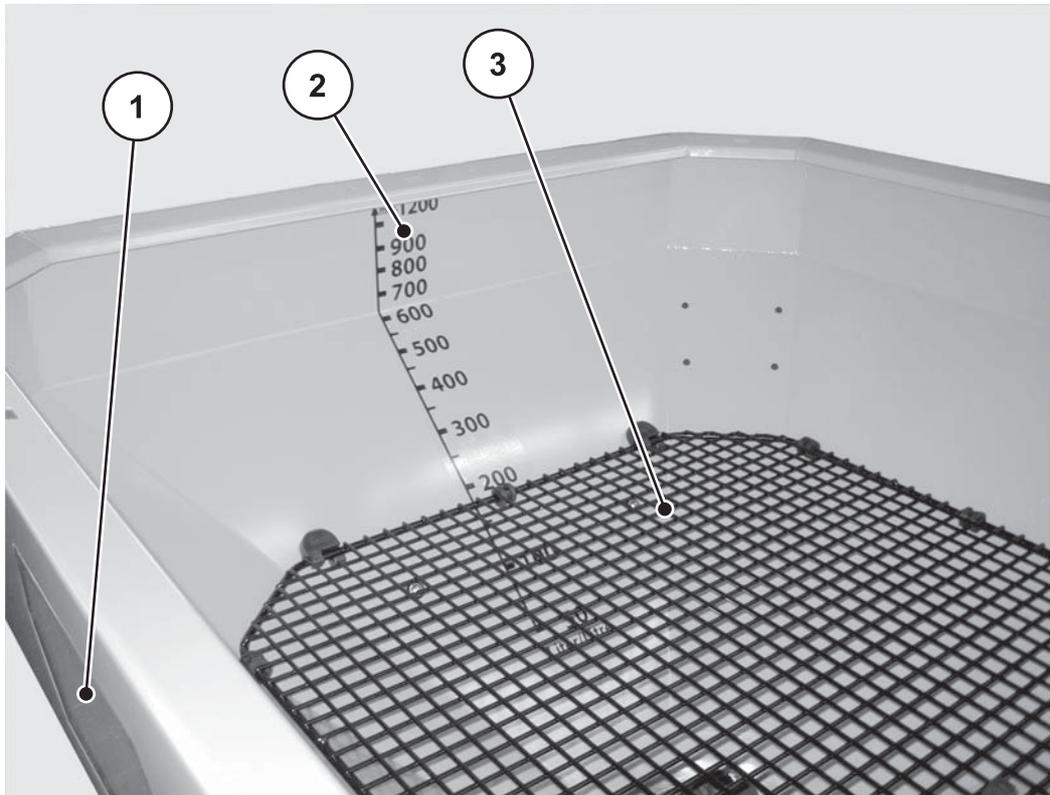


Figure 7.11: Fill level scale

- [1] Inspection window
- [2] Fill level scale (graduated in litres)
- [3] Protective grid in hopper

7.7 Using the calibration charts

7.7.1 Information on the calibration chart

The values in the spreading charts have been determined on the solid fertiliser broadcaster test installation.

The fertilisers used have been procured from fertiliser manufacturers or from storage depots. Experience shows that your spreading materials - even with identical specifications - may have different spreading properties because of storage, transport and many other reasons.

This means that the solid fertiliser spreading settings specified in the fertiliser charts may result in a different spreading amount and a poorer fertiliser distribution.

Therefore observe the following instructions:

- Check the working width of the fertiliser distribution with a practice test kit (option).
- Use only fertilisers listed in the spreading calibration charts.
- Please contact us if you do not find a particular fertiliser type mentioned in the calibration charts.
- Follow the settings exactly. Even a slightly incorrect setting may adversely affect the spreading pattern.

When using urea note particularly the following:

- Because of fertiliser imports, urea is available in widely varying qualities and particle sizes. This may make different spreader settings necessary.
- Urea is more sensitive to wind and absorbs more moisture than other fertilisers.

NOTICE

The operator is responsible for making the correct settings according to the fertiliser in use.

We point out specifically that we do not accept any liability for damage resulting from incorrect spreader settings.

7.7.2 Settings as per calibration chart

Depending on fertiliser type, working width, application rate, ground speed and fertilisation method, the operator determines the hopper mounting height, fertiliser drop point, metering slide adjustment, and PTO speed for optimum spreading from the **calibration chart**.

Example of spreading during normal fertilisation

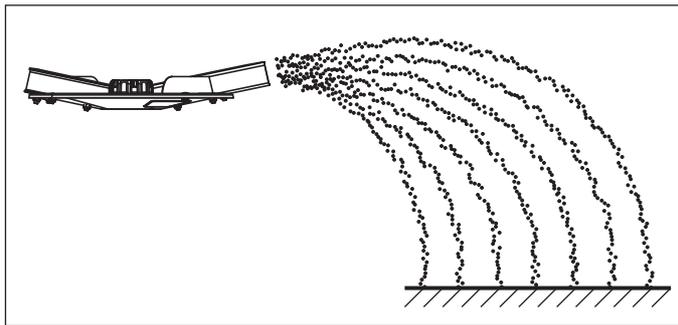


Figure 7.12: Spreading during normal fertilisation

Field spreading in normal fertilisation yields a symmetrical scatter pattern. If the spreader is correctly set (see information in the calibration charts), the fertiliser is spread evenly over the field.

Specified parameters:

Types of fertiliser:	KAS BASF
Application rate:	300 kg/ha
Working width:	24 m
Ground speed:	12 km/h

The following settings on the solid fertiliser broadcaster are required according to the fertiliser charts:

- Hopper height: 50/50 (A = 50 cm, B = 50 cm)
- Fertiliser drop point: 6
- Metering slide adjustment: 180
- Spreading disc type: S4
- Spreading disc speed: 900 rpm

Example of boundary spreading in normal fertilisation

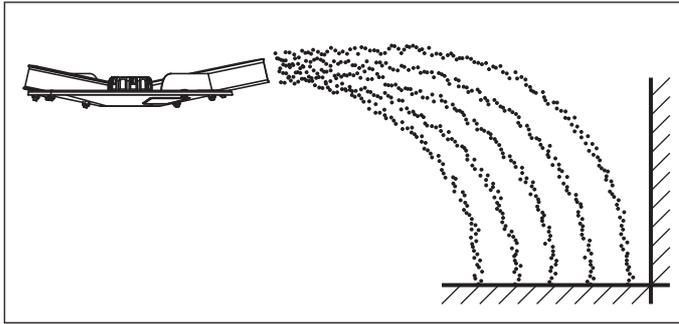


Figure 7.13: Environmentally optimised boundary spreading in normal fertilisation

During boundary spreading in normal fertilisation, almost no fertiliser goes beyond the field boundary. Underfertilisation at the field boundary must be accepted in this case.

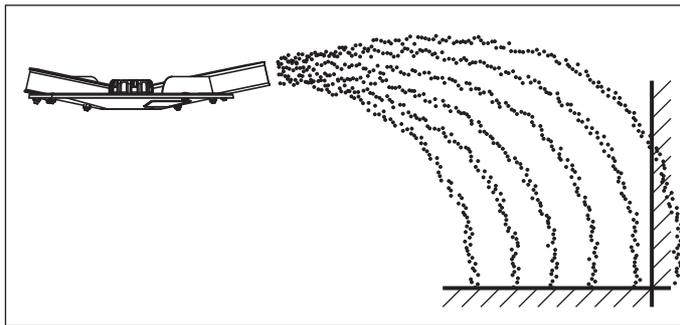
Specified parameters:

Types of fertiliser:	KAS BASF
Application rate:	300 kg/ha
Working width:	24 m
Ground speed:	12 km/h

The following settings on the solid fertiliser broadcaster are required according to the fertiliser charts:

- Hopper height: 50/50 (A = 50 cm, B = 50 cm)
- fertiliser drop point: 6
- Metering slide adjustment: 180 left, 150 right¹
- Spreading disc type: S4
- Spreading disc speed: 900 rpm
- Border spreading speed: 600 rpm

1. Recommended volume reduction of 20% on boundary spreading side

Example of yield-optimised boundary spreading in normal fertilisation:**Figure 7.14:** Yield-optimised boundary spreading in normal fertilisation

Yield-optimised boundary spreading in normal fertilisation refers to a spreading technique in which a bit more fertiliser lands beyond the boundary of the field. Therefore, there is just a slight underfertilisation at the field boundary.

Specified parameters:

Types of fertiliser:	KAS BASF
Application rate:	300 kg/ha
Working width:	24 m
Ground speed:	12 km/h

The following settings on the solid fertiliser broadcaster are required according to the fertiliser charts:

- Hopper height: 50/50 (A = 50 cm, B = 50 cm)
- fertiliser drop point: 6
- Metering slide adjustment: 180
- Spreading disc type: S4
- Spreading disc speed: 900 rpm
- Border spreading speed: 600 rpm

Example of field spreading in late top fertilisation

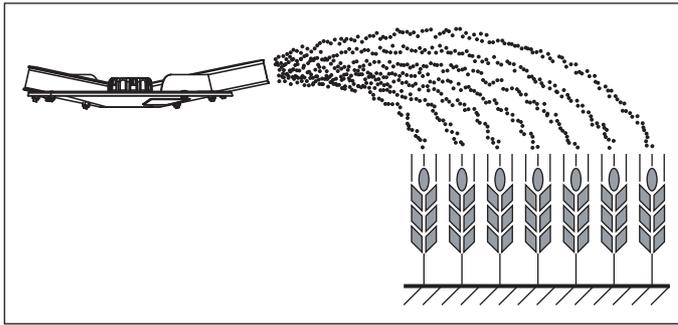


Figure 7.15: Field spreading in late top fertilisation

Field spreading in late fertilisation yields a symmetrical spreading pattern. If the spreader is correctly set (see information in the calibration charts), the fertiliser is spread evenly over the field.

Specified parameters:

Types of fertiliser:	KAS BASF
Application rate:	150 kg/ha
Working width:	24 m
Ground speed:	12 km/h

The following settings on the solid fertiliser broadcaster are required according to the fertiliser charts:

- Hopper height: 0/6 (A = 0 cm, B = 6 cm)
- Fertiliser drop point: 6.5
- Metering slide adjustment: 90
- Spreading disc type: S4
- Spreading disc speed: 900 rpm

Example of environmentally optimized boundary spreading in late top fertilisation:

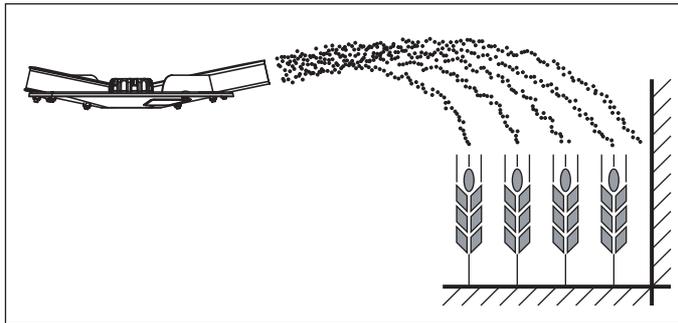


Figure 7.16: Environmentally optimised boundary spreading in delayed top fertilisation

During boundary spreading in normal fertilisation, almost no fertiliser goes beyond the field boundary. Underfertilisation at the field boundary must be accepted in this case.

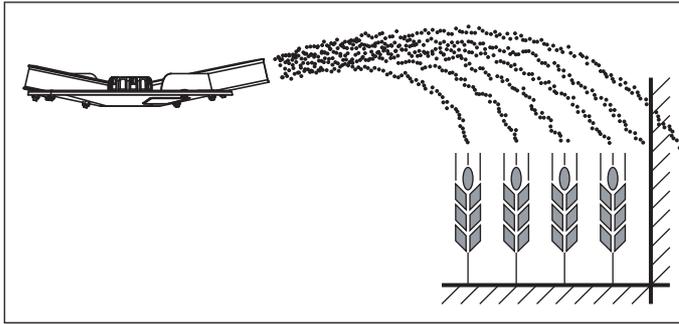
Specified parameters:

Types of fertiliser:	KAS BASF
Application rate:	150 kg/ha
Working width:	24 m
Ground speed:	12 km/h

The following settings on the solid fertiliser broadcaster are required according to the calibration charts:

- Hopper height: 0/6 (A = 0 cm, B = 6 cm)
- Fertiliser drop point: 6.5
- Metering slide adjustment: 90 left, 72 right¹
- Spreading disc type: S4
- Spreading disc speed: 900 rpm
- Border spreading speed: 600 rpm

1. Recommended volume reduction of 20% on boundary spreading side

Example of the yield-optimised boundary spreading in late top fertilisation:**Figure 7.17:** Yield-optimised boundary spreading in late top fertilisation

Yield-optimised boundary spreading in normal fertilisation refers to a spreading technique in which a bit more fertiliser lands beyond the boundary of the field. Therefore, there is just a slight underfertilisation at the field boundary.

Specified parameters:

Types of fertiliser:	KAS BASF
Application rate:	150 kg/ha
Working width:	24 m
Ground speed:	12 km/h

The following settings on the solid fertiliser broadcaster are required according to the calibration charts:

- Hopper height: 0/6 (A = 0 cm, B = 6 cm)
- Fertiliser drop point: 6.5
- Metering slide adjustment: 90
- Spreading disc type: S4
- Spreading disc speed: 900 rpm
- Border spreading speed: 600 rpm

7.8 Spreading at the headland

For proper spreading at headlands, it is very important to have precisely laid driving tracks.

Environmentally optimised boundary spreading

For spreading at headlands through boundary spreading operation (speed reduction, drop point adjustment and volume reduction).

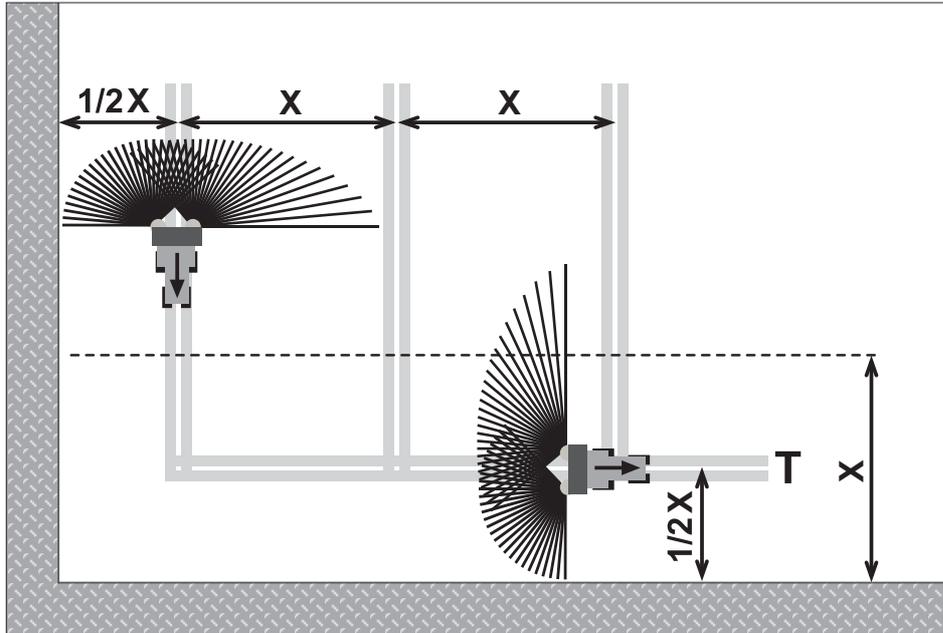


Figure 7.18: Environmentally optimised boundary spreading

- [T] Headland driving track
- [X] Working width

- The headland driving track [T] should be laid at a distance of half of the working width [X] from field boundary.

Normal spreading in/out of the headland driving track

When continuing spreading in the field after spreading from the headland driving track, please note the following:

- Switching off boundary spreading operation.

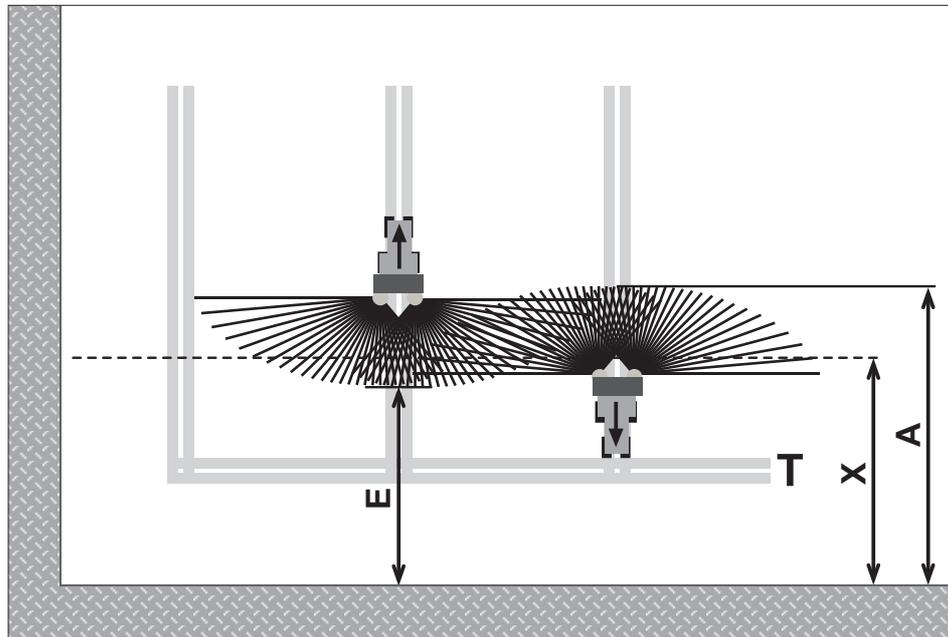


Figure 7.19: Normal spreading

- [A] End of spreading fan during spreading in the headland driving track
- [E] End of spreading fan during spreading on the field
- [T] Headland driving track
- [X] Working width

The metering slides should be closed or open according to the various distances travelled to and back from the headland field boundary.

Driving out of the headland drive track

- Metering slides should be **open**, if following condition is fulfilled:
 - The end of the spreading fan on the field [E] is app. at a distance of half the working width + 4 to 8 m from the headland field boundary.

The tractor is, depending on broadcast range of the material, at different distances on the field.

Driving into the headland drive track

- Metering slides should be closed **as late as possible**.
 - The end of the spreading fan should ideally come to lie on the field [A] at a distance of app. 4 to 8 m further than the working width [X] of the headland.
 - This is not always possible, depending on the broadcast range of the material and the working width.
- Alternatively, you can either drive out of the headland track or a second track can be laid down.

Follow these directions for an environmentally friendly and economical method of working.

7.9 Adjusting the option boundary spreading attachment GSE

NOTICE

This option is only available for the AXIS H 30.1 EMC and AXIS H 30.1 EMC + W.

The boundary spreading attachment is used for limiting the spreading width (either towards the right or left) in the range between approx. 0.5 m and 2 m from the middle of the tractor track towards the outer field boundary.

- The metering slide that points to the field edge is closed.
- Fold the boundary spreading attachment downwards for boundary spreading.
- The boundary spreading device must be hinged up again before two-sided spreading.

7.9.1 Calibration of the border spreading unit

NOTICE

The settings for the border spreading unit refer to the **spreading disc working towards the inside of the field**.

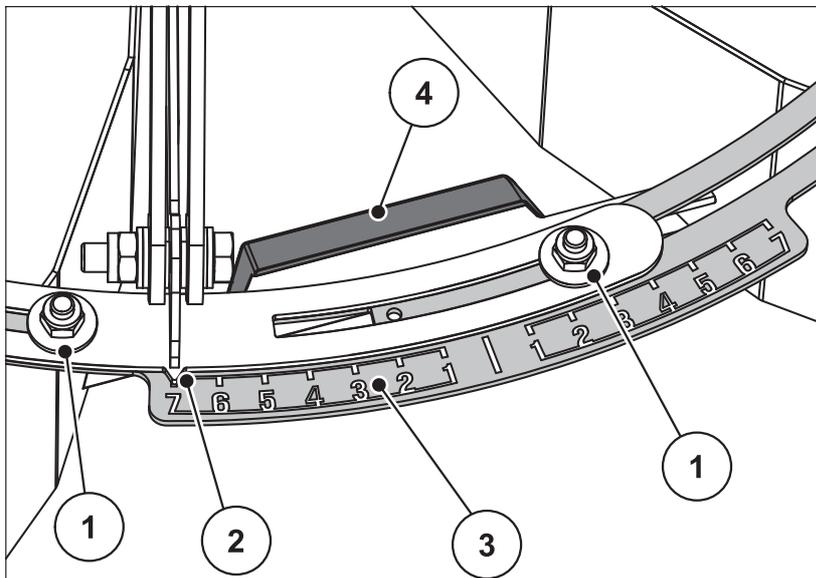


Figure 7.20: Calibration of the border spreading unit

- [1] Screw nut
- [2] Indicator
- [3] Number scale
- [4] Plastic handle

1. Refer to the assembly instruction manual for the correct position of the indicator [2].
2. Release the 2 screw nuts [1].

3. Move the number scale [3] till the indicator shows the intended value. Use the plastic hand grip [4].
4. Put on and tighten the screw nuts [1].

Correcting the broadcast range

The specifications in the provided assembly manual are standard values. If there are deviations in fertiliser quality it may be necessary to correct the setting.

- To **decrease** the broadcast range, move towards the spreading disc.
- To **increase** the broadcast range, move away from the spreading disc.

The boundary spreading operation is prepared according to the **fertiliser types**, the **working width** and the required **type of spreading** (border or edge spreading) for the spreading work.

7.9.2 Adjusting border spreading unit

The boundary spreading operation is prepared according to the **fertiliser types** and the **working width** for the spreading work.

NOTICE

The settings for the boundary spreading operation can be found in the calibration table.

Correcting the broadcast range

The values in the calibration chart are standard values. If there are deviations in fertiliser quality it may be necessary to correct the setting.

- To **reduce** the broadcast range as compared to the setting in the calibration chart: Reduce the **boundary spreading speed** .
- To **increase** the broadcast range from the standard setting in the calibration chart: Increase the **boundary spreading speed**.
- To **reduce** the broadcast range as compared to the setting in the calibration chart: Choose **drop point earlier**.
- To **increase** the broadcast range from the standard setting in the setting chart: Choose **drop point later**.

NOTICE

Boundary spreading at working widths of 12 - 50 m:

For an optimal scatter pattern it is recommended that the material output be reduced **by 20 %** on the boundary side.

7.10 Adjustments for unlisted fertiliser types

The settings for fertiliser types not listed in the calibration charts can be calculated with the practice test kit (optional).

To check the spreader settings **quickly** we recommend layout for **one pass**.

For **more precise** calculation of the spreader settings we recommend the layout for **three passes**.

7.11 Requirements and conditions

NOTICE

The requirements and conditions apply for both one pass and three passes. Observe these conditions to ensure that the results are as accurate as possible.

- Conduct the test on a **dry day with no wind so the weather will not influence the result**.
- We recommend an area that is horizontal in both directions as the test area. (width 3 x track width, length approx. 60 - 70 m)
- Run the test on a freshly cut field or one with low growth (max. 10 cm) and make sure that the three tracks are parallel. If you are running the test without drilled tracks the paths must be measured or marked with rods, for example.
- The 3 tracks must **not have any significant cavities or inclines** which may distort the spreading pattern.

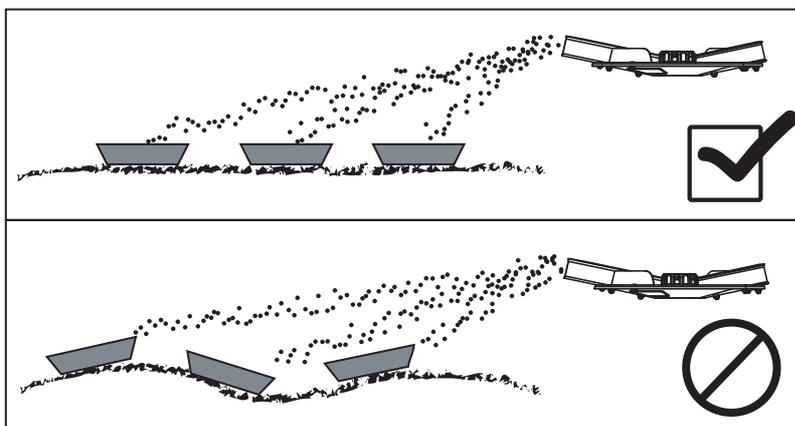


Figure 7.21: Layout of the catch trays

- Set the trays horizontally. Slanted trays may cause measurement errors ([figure 7.21](#)).

7.12 Definition of the terms "triangular spreading pattern" and "trapezoid spreading pattern"

What is a triangular spreading pattern?

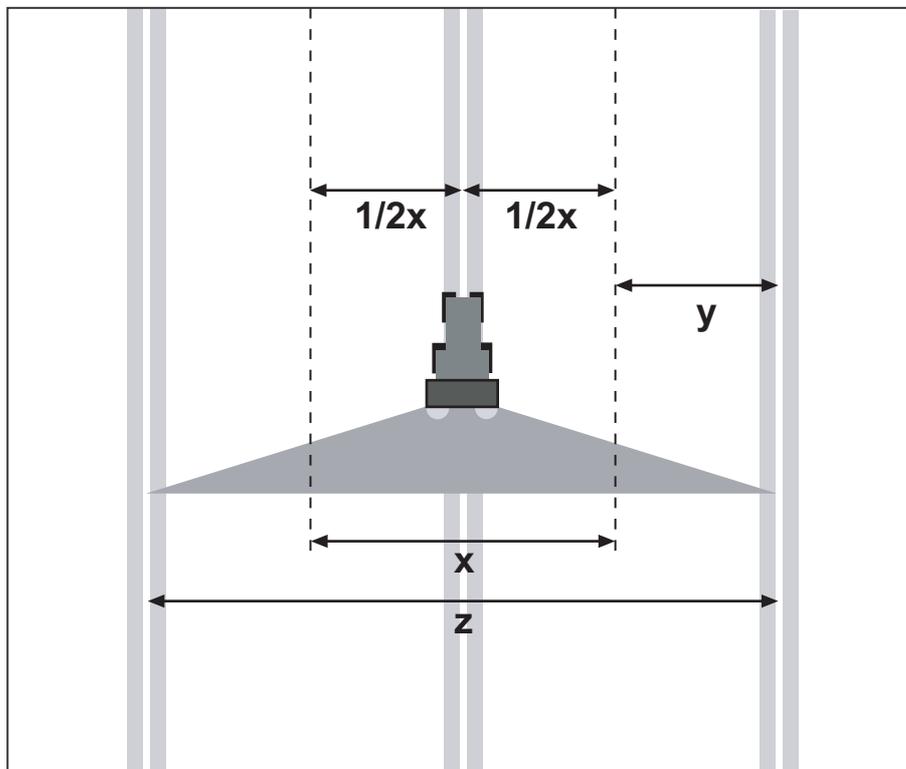


Figure 7.22: Triangular spreading pattern

- [X] Working width
- [Y] Overlapping zone
- [Z] Total spreading width

The features of what is referred to as a triangular spreading pattern are the wide spreading edges and the resulting large overlap zones. The fertiliser is spread significantly wider than the actual working width, well into the next track depending on the working width and type of fertiliser.

As a result of these features this spreading pattern is less prone to influences such as

- Side wind
- Humidity
- Changes in fertiliser type and quality.

The triangular spreading patterns are generally achieved with fertilisers that have very good flight properties and very even grain sizes (such as ammonium nitrate lime), even with larger working widths (up to 28m).

What is a trapezoid spreading pattern?

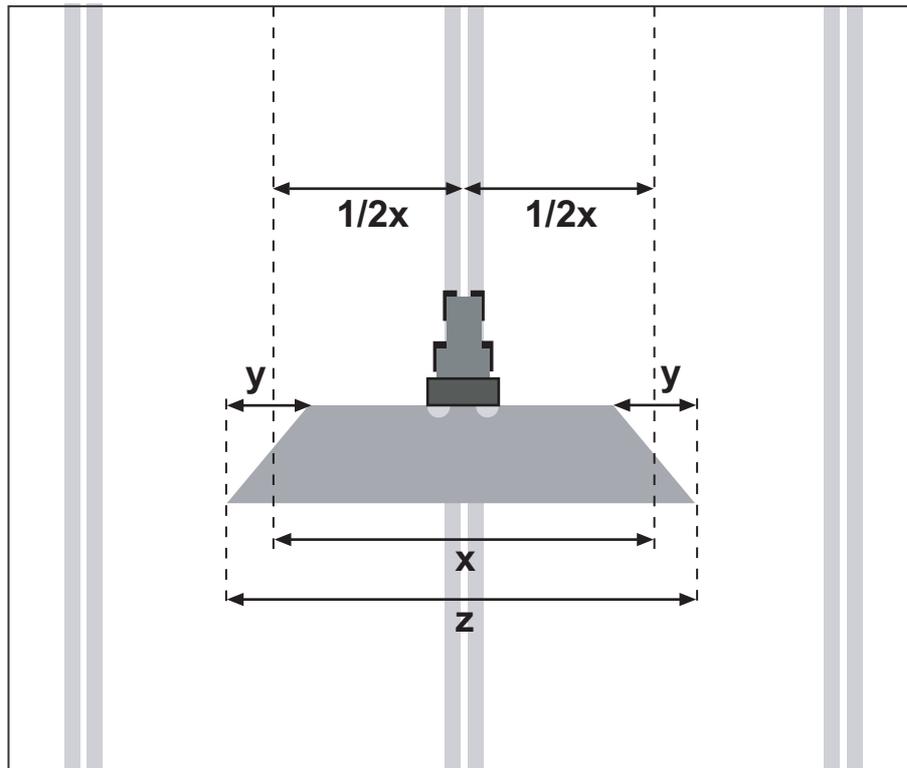


Figure 7.23: Trapezoid spreading pattern

- [X] Working width
- [Y] Overlapping zone
- [Z] Total spreading width

The features of what is referred to as a trapezoid spreading pattern are the steeply falling spreading edges and the resulting, in some cases very small, overlap zones. The fertiliser is spread only a little wider than the actual working width.

As a result of this feature this spreading pattern is more subject to influences such as

- Side wind
- Humidity
- Changes in fertiliser type and quality.

The trapezoid spreading patterns occur with fertilisers that flow very easily (e.g. ammonium nitrate lime) and large working widths (e.g. 42 m), with fertiliser types with less good flow properties (e.g. prilled urea) and fertilisers with very poor flow properties (e.g. potash fertilisers) from around 24 m working width and more.

7.13 Carrying out a spreading test with a single pass

NOTICE

We recommend the layout plan for a spreading width of **24 m**. Layout plans for larger working widths can be found in the chapters [\[7.15\]](#) and [\[7.16\]](#).

- Length of testing area: 60 - 70 m

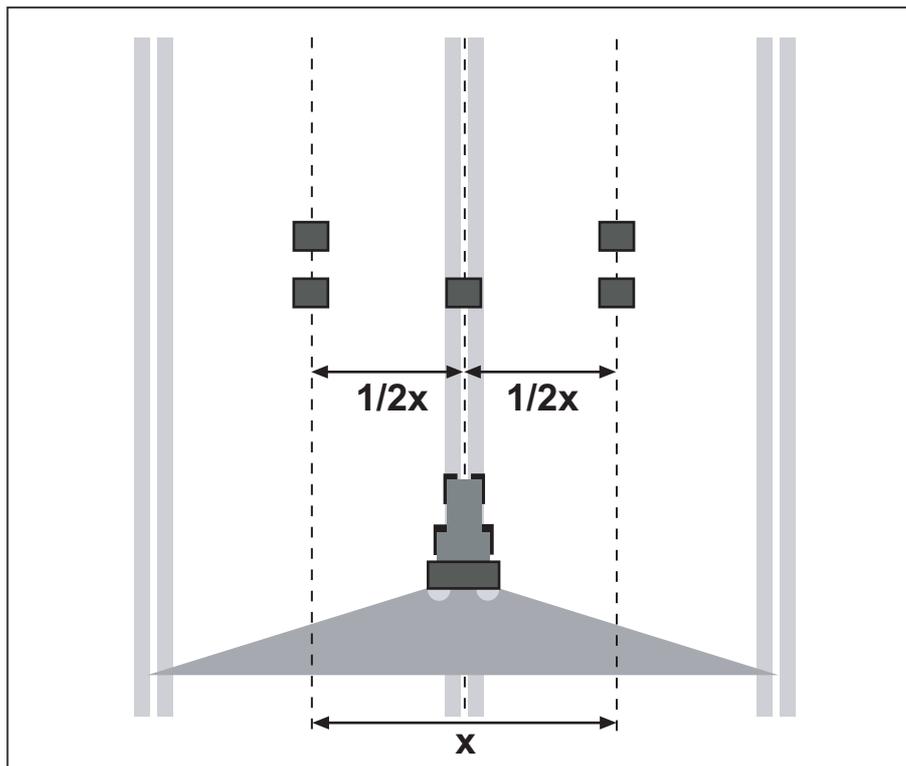


Figure 7.24: Layout for one pass

Preparing one pass:

- Select a similar fertiliser from the calibration charts and set the spreader accordingly.
- Set the hopper height of the solid fertiliser broadcaster according to the information from the calibration chart. Make sure that the mounting height includes the top edge of the trays.
- Check the completeness and status of the spreading components (spreading discs, spreader vanes, discharge).
- Place two trays in line as shown in the diagram (distance 1 m) in the overlap zones (between the tracks) and one tray in the track (corresponding to [figure 7.24](#)).

Run casting test with the openings set as calculated for the job.

- Ground speed: select **3 - 4 km/h**.
- Open metering slide **10 m before** the catch trays.
- Close metering slides approx. **30 m after** the catch trays.

NOTICE

If the quantity in the trays is too low, repeat the run.

Do not change the adjustment of the metering slide.

7.14 Carrying out a spreading test with three passes

NOTICE

We recommend the layout plan for a spreading width of **24 m**. Layout plans for larger working widths can be found in the chapters [\[7.15\]](#) and [\[7.16\]](#)

- Length of testing area: 60 - 70 m

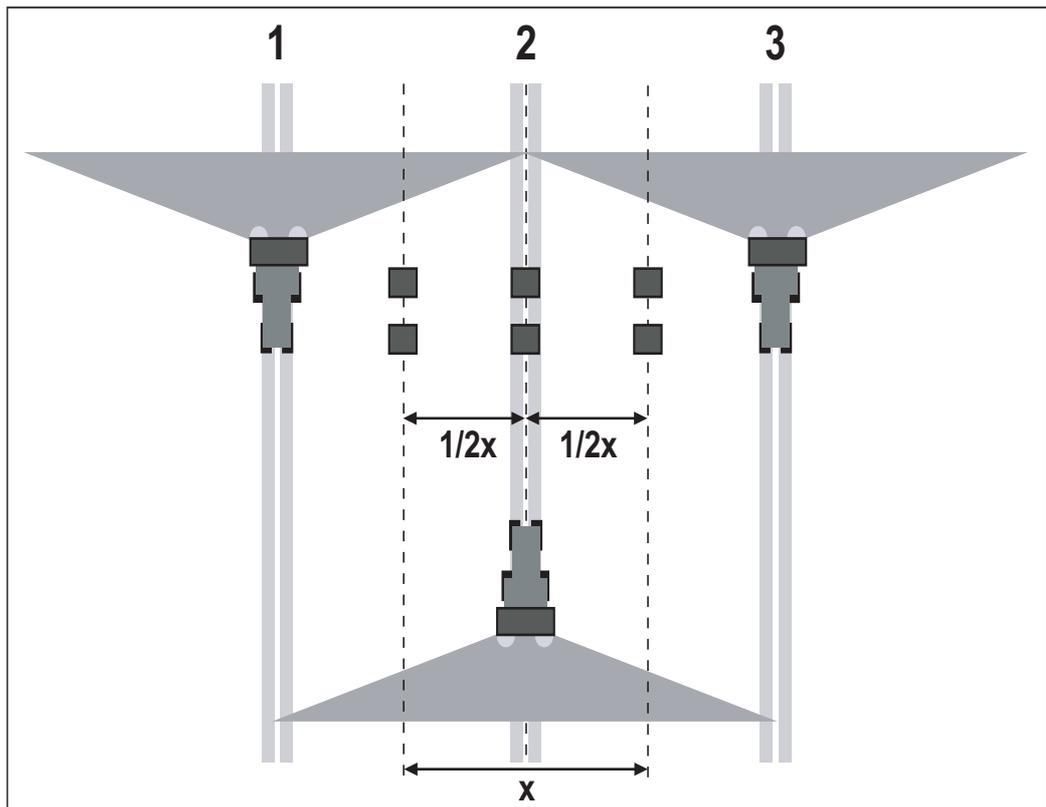


Figure 7.25: Layout for three passes

Preparing for three passes:

- Select a similar fertiliser from the calibration charts and set the spreader accordingly.
- Set the hopper height of the solid fertiliser broadcaster according to the information from the calibration chart. Make sure that the mounting height includes the top edge of the trays.
- Check the completeness and status of the spreading components (spreading discs, spreader vanes, discharge).
- Place two catch trays at a distance of **1 m** behind each other in the overlap zones and in the centre track (corresponding to [figure 7.25](#)).

Run casting test with the openings set as calculated for the job.

- Ground speed: select **3 - 4 km/h**.
- Open metering slide **10 m before** the catch trays.
- Close metering slides approx. **30 m after** the catch trays.

NOTICE

If the quantity in the trays is too low, repeat the run.

Do not change the adjustment of the metering slide.

7.15 Carrying out a spreading test above a working width of 24 m

- As shown in the diagram position all ten collection bowls at even distances apart. Place two collection bowls in the centre of the track, one in the overlap zone and one exactly between.

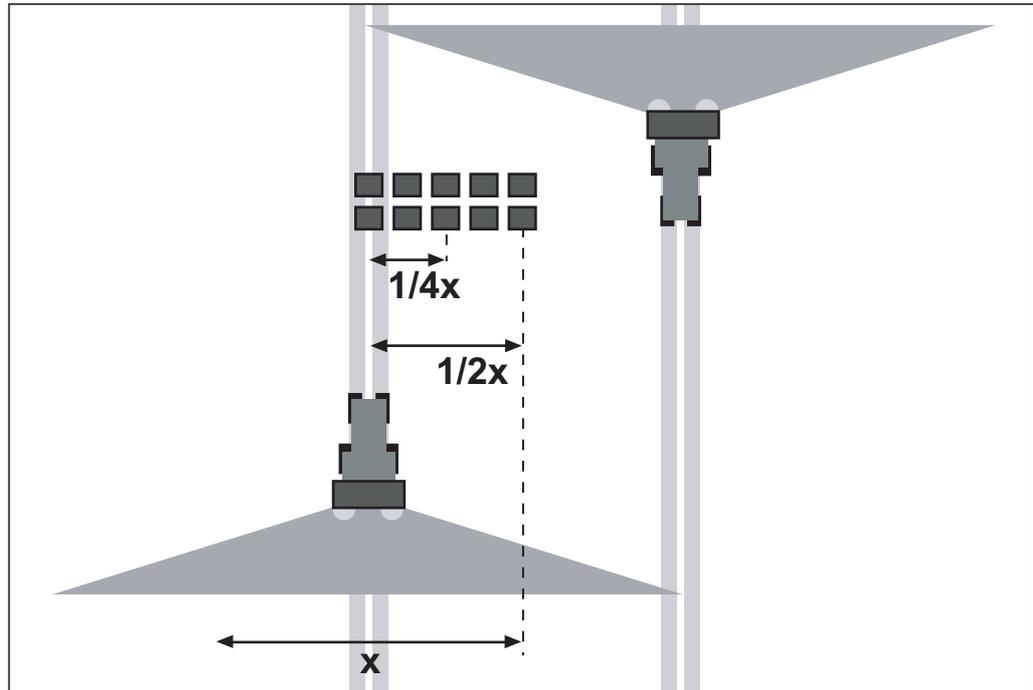


Figure 7.26: Lateral distribution

NOTICE

Set the trays horizontally. Slanted trays may cause measurement errors .

- Set the attachment height of the spreader at an equal height on the left and right spreader sides as specified in the spreader table. Make sure that the mounting height includes the top edge of the trays.
- Check the completeness and status of the spreading components (broadcast discs, vanes, discharge).
- Run broadcast test and adjust and lock left and right metering slide. Run spread test with the openings set as calculated for the job. If the amount in the collection bowls needs to be increased, the run is repeated and the opening adjustment is not changed. Select a speed between 3 and 4 km/h so the tractor and spreader run smoothly.
- Travel over tracks in succession. Open the metering slides approx. 10 m before the collection bowls and close them approx. 40 m after. If the quantity in the trays is too low, repeat the run.
- Pour the contents of the trays into the measuring tube from the left. The quality of the cross-spreading can be easily read in the 5 sight glasses.

7.16 Carrying out a spreading test above a working width of 36 m

- As shown in the diagram position all 9 collection bowls at even distances apart. Place 1 collection bowl in the centre of the track, one in the overlap zone and one exactly between.

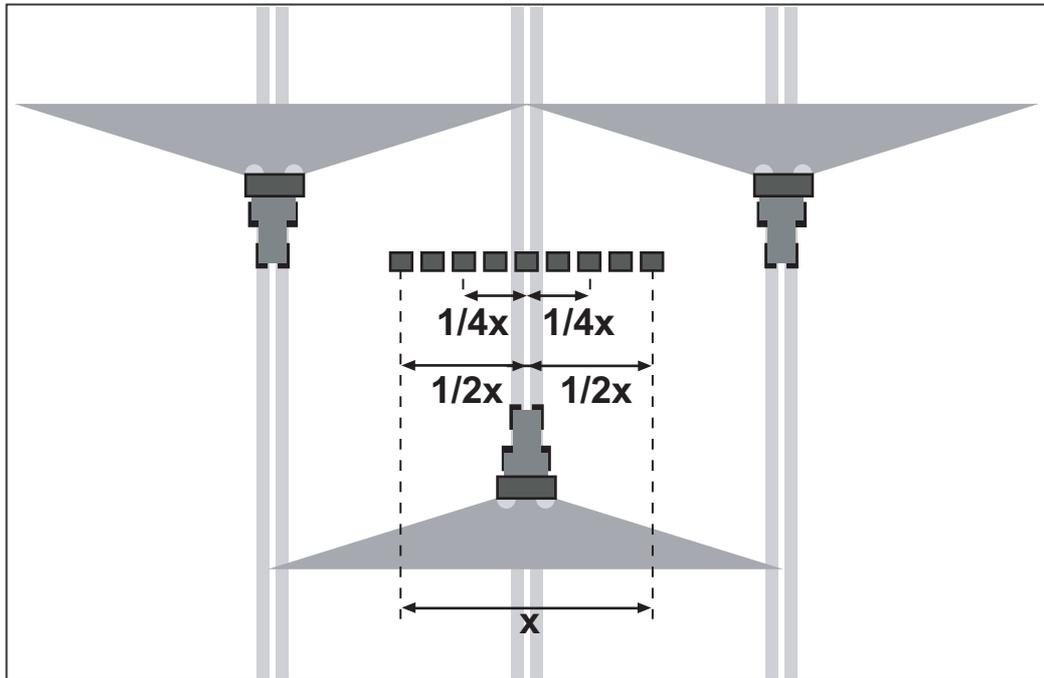


Figure 7.27: Lateral distribution

NOTICE

Set the trays horizontally. Slanted trays may cause measurement errors .

- Set the attachment height of the spreader at an equal height on the left and right spreader sides as specified in the spreader table. Make sure that the mounting height includes the top edge of the trays.
- Check the completeness and status of the spreading components (broadcast discs, vanes, discharge).
- Run broadcast test and adjust and lock left and right metering slide. Run spread test with the openings set as calculated for the job. If the amount in the collection bowls needs to be increased, the run is repeated and the opening adjustment is not changed. Select a speed between 3 and 4 km/h so the tractor and spreader run smoothly.
- Travel over tracks in succession. Open the metering slides approx. 10 m before the collection bowls and close them approx. 40 m after. If the quantity in the trays is too low, repeat the run.
- Pour the contents of the trays into the measuring tube from the left. The quality of the cross-spreading can be easily read in the 9 sight glasses. When using 9 measuring points please note the first two scale values in the measuring tubes.

7.17 Evaluate the results and correct if necessary:

Results:

- Collect the contents of the trays and pour them into the measuring pipe from the left.
- The quality of the cross-distribution can be easily read from the fill level of the three sight glasses.

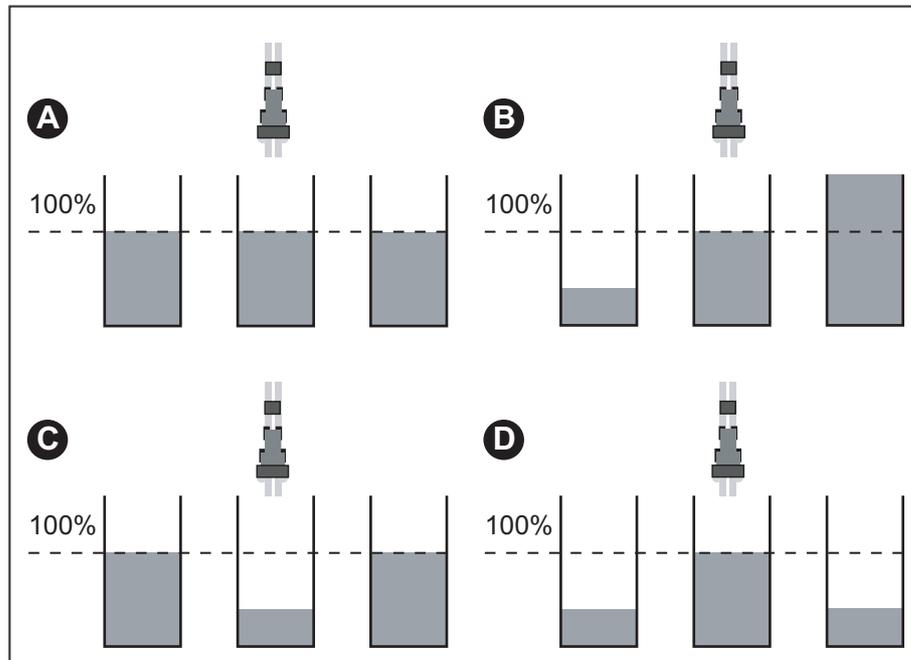
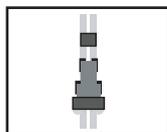


Figure 7.28: Possible results of pass

- [A] All measuring pipes contain the same amount.
- [B] Fertiliser distribution asymmetric.
- [C] Too much fertiliser in the overlap zone
- [D] Too little fertiliser in the overlap zone.

Pictogram representation, tracks



The measurement results B, C, D can be changed by adjustment to achieve the optimum measurement results as per A.

Examples of spreader setting corrections:

Fertiliser distribution	Action, test
With spreading result [A], even distribution (permissible deviation ± 1 graduation mark)	Adjustments are correct.
With spreading result [B], fertiliser reduces from right to left (or vice versa).	Is the same drop point set on the right and left?
	Is the metering slide setting on the left and right the same?
	Track distances the same?
	Tracks parallel?
With spreading result [C], too little fertiliser in the middle.	Select drop point setting earlier (e.g. change drop point from 5 to 4).
With spreading result [D], too little fertiliser in the overlap zones.	Select drop point setting later (e.g. change drop point from 8 to 9).

8 Spreading operation

8.1 General information about the spreading operation

The modern technology and design of our solid fertiliser broadcasters of the AXIS H EMC series and comprehensive, continuous testing at our factory fertiliser spreader test area ensures that you will have a perfect scatter pattern.

In spite of the care taken during manufacture of the machines deviations in fertiliser application or some type of fault is always possible even when used as designated.

The reasons for this may be:

- Changes in the physical properties of the fertiliser (e.g. different grain size distribution, varying densities, grain shape and surface, dampness).
- Clumping and damp spreading material.
- Bridging and clogging can occur, e.g. due to foreign bodies, bag residue or wet spreading material
- Wind drift (stop spreading at high wind speeds).
- Uneven ground.
- Wearing of wear parts
- Damage from external causes.
- Poor cleaning and care to prevent corrosion.
- Incorrect drive speeds and ground speeds.
- Incorrect machine settings.

Pay close attention to the machine settings. Even a slightly incorrect setting may adversely affect the scatter pattern. Therefore, before every use of the spreader and during work check that your machine operates properly and that the application is sufficiently precise.

Particularly hard fertiliser types (e.g. aluminium nitrate lime, kieserite) augment wear.

Always use the supplied sieve to prevent blockages caused by foreign objects or fertiliser clumping.

No claims for compensation for damages that did not arise on the AXIS H EMC solid fertiliser broadcaster itself will be accepted..

This also means that no liability will be accepted for damages resulting from spreading errors.

8.2 Spreading sequence

Intended use of the solid fertiliser spreader includes compliance with the sequence specified by the manufacturer. **Spreading** therefore always includes the work of **preparation** and **cleaning/maintenance**.

- Conduct spreading as described below.
-

- | | |
|--------------------|--|
| Preparation | ● Mounting the solid fertiliser broadcaster to the tractor |
| | ● Close metering slide |
| | ● Preset the mounting height |
| | ● Fill fertiliser |
| | ● Set application rate |
| | ● Setting the working width |
-

- | | |
|------------------|--|
| Spreading | ● Travel to the spreading location |
| | ● Check mounting height |
| | ● Switching on the hydraulic system ¹ |
| | ● Switching on the spreading discs |
| | ● Open slide and start spreading |
| | ● Finish spreading run and close the outlets |
| | ● Discharge residue |
-

- | | |
|-----------------------------|--|
| Cleaning/maintenance | ● Open metering slide |
| | ● Unhitch the solid fertiliser material from the tractor |
| | ● Maintenance and lubrication |
-

1. In the load sensing system, the hydraulic circuit of the mounted unit is always under pressure

8.3 Using the calibration charts

NOTICE

Please note chapter [7.7: Using the calibration charts, page 51](#).

8.4 Spreading on slopes

NOTICE

Please note chapter [7.8: Spreading at the headland, page 58](#).

8.5 Setting the application rate

NOTICE

The solid fertiliser broadcaster AXIS H EMC is fitted with an electric slide actuator for the setting the spreading volume.

The electric slide actuator is described in a separate operator's manual for the electronic control system. This operator's manual is part of the electronic control system.

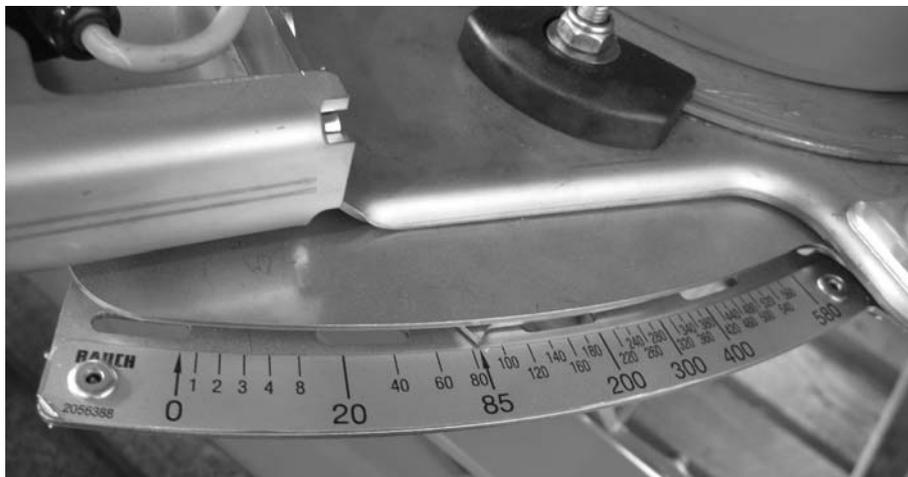


Figure 8.1: Scale for setting the spreading quantity

NOTICE

The spreading volume is electrically actuated and configured in the solid fertiliser broadcaster AXIS H EMC by means of the electronic control system.

- See also the operating manual for the electronic control system.

8.6 Setting the working width

8.6.1 Choosing the correct spreading disc

Various spreading discs are available for implementation of the working width depending on the fertiliser type.

NOTICE

A working width of 12- 50m can be realised using 6 different spreader discs:

	S2	S4	S6	S8	S10	S12
	12-18 m	18 - 28 m	24 - 36 m	30 - 42 m	36 - 48 m	42 - 50 m
AXIS 30.1 EMC	•	•	•			
AXIS 30.1 EMC + W	•	•	•	•		
AXIS 50.1 EMC + W		•	•	•	•	•

There are two different, permanently installed vanes on every spreading disc. The vanes are marked according to their model.

⚠ WARNING



Risk of injury from rotating machine components

Contact with the spreading equipment (spreading discs, spreading vanes) may injure, crush or cut off body parts. Body parts or objects may be caught and pulled in.

- ▶ Do not remove deflectors which are mounted on the spreader container.

Spreading disc type:	Spreading disc left	Spreading disc right
S2 uncoated	S2-L-170 S2-L-240	S2-R-170 S2-R-240
S2 coated (optional)	S2-L-170 VxR S2-L-240 VxR	S2-R-170 VxR S2-R-240 VxR
S4 uncoated	S4-L-200 S4-L-270	S4-R-200 S4-R-270
S4 coated (optional)	S4-L-200 VxR S4-L-270 VxR	S4-R-200 VxR S4-R-270 VxR
S6 coated	S6-L-255 VxR S6-L-360 VxR	S6-R-255 VxR S6-R-360 VxR
S8 coated	S8-L-390 VxR S8-L-380 VxR	S8-R-390 VxR S8-R-380 VxR

Spreading disc type:	Spreading disc left	Spreading disc right
S10 coated	S10-L-340 VxR S10/S12-L-480 VxR	S10-R-340 VxR S10/S12-R-480 VxR
S12 coated	S12-L-360 VxR S10/S12-L-480 VxR	S12-R-360 VxR S10/S12-R-480 VxR

NOTICE

You can achieve extended service lives for the spreader vanes by using a VxR coating.

8.6.2 Removing and mounting spreading discs

⚠ DANGER



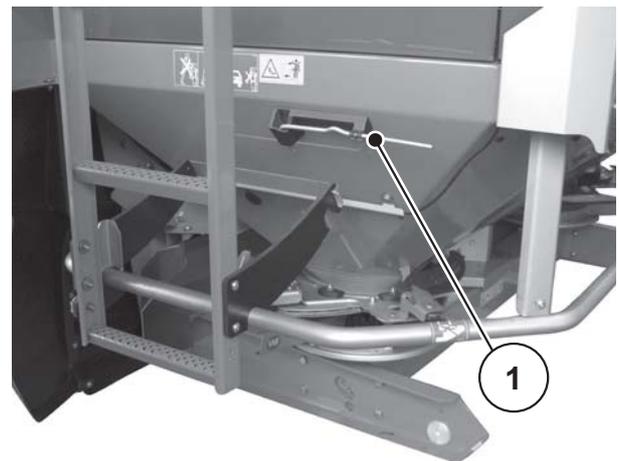
Danger from running engine

Working on the solid fertiliser broadcaster with the engine running may cause serious injuries from the mechanical components and escaping fertiliser.

Never remove or mount the spreading discs with the tractor engine running.

- ▶ Turn off tractor. Remove the ignition key.

Removing spreading discs



- [1] Setting lever
(left according to travel direction)

Figure 8.2: Setting lever

Proceed for both sides (left and right) as follows.

1. Take the setting lever out of the bracket.
2. Use the setting lever to release the cap nuts on the spreading discs. Remove the spreading disc from its hub.



Figure 8.3: Release cap nuts

3. Unscrew the cap nuts and remove the spreading discs.
4. Put the setting lever back into the retainer provided for the purpose.



Figure 8.4: Unscrewing cap nuts

Fitting the spreading discs

Requirements:

- The engine and control unit of the tractor are switched off and locked to prevent accidental starting.

Mount the left spreading disc on the left side of direction of travel and the right spreading disc on the right side of direction of travel. Make sure that the left and right spreading discs are not reversed.

The following procedure is for mounting the left hand spreading disc. The right hand spreading disc should be mounted in the same way.

1. Place the left hand disc on the left hand hub. Make sure that the disc is correctly placed on the hub (remove dirt if necessary).

NOTICE

The pins on the spreading disc holders have different positions on the left and right. The correct spreading disc is the one that fits precisely into the spreading disc holder.

2. Carefully position cap nut (do not tilt).
3. Tighten the cap nut hand-tight to 25 Nm. **Do not** use the setting lever.

NOTICE

The cap nuts have an internal catching mechanism that prevents them from coming loose. It should be possible to hear it clicking while tightening. If not, then the cap nut is worn and must be replaced.

4. Check that there is clearance between the vanes and the outlet by turning the discs by hand.

8.6.3 Setting the fertiliser drop point

NOTICE

The solid fertiliser broadcaster AXIS H EMC has an electronic setting of the drop point.

The electronic slide feed actuator adjustment is described in a separate operator's manual for the electronic control system. This operator's manual is part of the electronic control system.

Setting the spreading disc type selects a particular range for the working width. Changing the drop point sets the working width and adjusts it for various types of fertilisers.

The fertiliser drop point is adjusted and set using the electronic control system.

- Adjustment of the upper scale plate towards smaller numbers: The fertiliser is dropped earlier. This gives scatter patterns for smaller working widths.
- Adjustment of the upper scale plate towards larger numbers: The fertiliser is dropped later and more is spread outwards in the overlap zones. This gives spreading patterns for larger working widths.

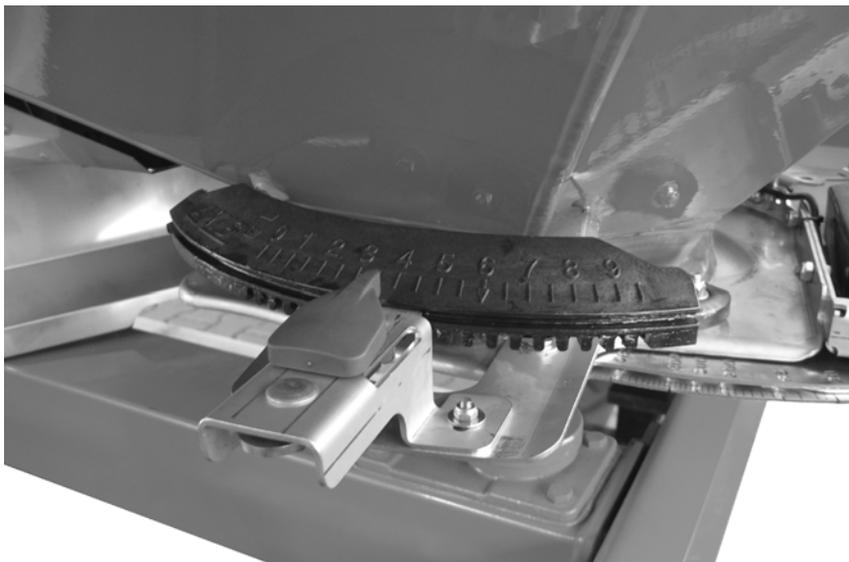


Figure 8.5: Fertiliser drop point gauge

⚠ CAUTION



Risk of material damage through stuck or blocked indicator

The fertiliser drop point is adjusted and set using the electric controls. If the indicator sticks, the electrical adjusting cylinders can be damaged.

- ▶ Never push the indicator forwards or block it.

8.7 Check mounting height

NOTICE

Check with full container whether the preset mounting height is correct.

- Take the mounting height setting values from the calibration chart.
- The preset mounting height should not exceed the maximum allowed mounting height.
- See also [„Preset the mounting height“ on page 40](#).

8.8 Setting the spreading disc speed

NOTICE

Get the correct spreading disc speed from the calibration charts and enter this figure into the operating terminal of the solid fertiliser broadcaster.

8.9 Spreading sequence

8.9.1 Requirements

Before starting work, check whether all the conditions for safe and economical spreading are satisfied.

Pay particular attention to the following points:

- Are both the tractor and the solid fertiliser broadcaster AXIS H EMC safe to operate?
- Is there anyone on the solid fertiliser broadcaster or in the spreading area? Remove such people from the danger areas.
- Do environmental conditions allow spreading to be performed safely? Pay particular attention to high wind speeds.
- Are you familiar with the terrain and aware of potentially dangerous areas?
- Are you using the correct fertiliser?
- Have you entered the required output volume in the Control Unit in the **fertiliser setting** menu?
- Has the hydraulic system on the tractor been switched on?
 - ▷ You can start the spreading work.

8.10 Faults and possible causes

⚠ WARNING



Risk of injury and accident from missing or inadequate troubleshooting.

Delayed or unprofessional troubleshooting can lead to uncalculable risks with negative effects to man, machine and the environment.

- ▶ Have any faults corrected **immediately**.
- ▶ Correct faults yourself only if you have the appropriate **qualifications**.

Requirements for elimination of faults

Please make sure the following conditions are met before eliminating faults.

- The engine of the tractor and the control unit are switched off and locked to prevent accidental starting.
- The solid fertiliser broadcaster has been placed evenly on firm ground.

NOTICE

Please take particular note of the warnings in chapter [3: Safety, page 5](#) and in chapter [9: Service and maintenance, page 87](#), before rectifying faults.

Fault	Possible cause/action
Uneven fertiliser distribution	<ul style="list-style-type: none"> ● Drop point incorrectly set. Correct setting.
Too much fertiliser on the tractor driving track	<ul style="list-style-type: none"> ● Check vanes and outlets and replace faulty parts immediately. ● The fertiliser has a smoother surface compared to the calibration tested fertiliser. Select drop point setting later (e.g. from 4 to 5). ● PTO speed too low. Adjust speed.
Too much fertiliser in the overlap zone	<ul style="list-style-type: none"> ● The fertiliser has a rougher surface compared to the calibration tested fertiliser. Select drop point setting earlier (e.g. from 5 to 4). ● PTO speed too high. Adjust speed.

Fault	Possible cause/action
<p>Spreader feeds more on one side</p> <p>Container empties unevenly during normal spreading.</p>	<p>fertiliser bridging above the agitator</p> <ul style="list-style-type: none"> ● Remove fertiliser to the height of the safety screen on the affected side. ● Break up accumulated fertiliser with a wooden stick through the bars of the safety screen. <p>Outlet blocked</p> <ul style="list-style-type: none"> ● See metering outlet blockages. <p>Defective agitator</p> <ul style="list-style-type: none"> ● Remove fertiliser to the height of the safety screen on the affected side. ● Open the metering outlet and break up accumulated fertiliser with a wooden stick through the bars of the safety screen so that the remaining fertiliser can run out of the outlet opening. ● Check functionality of agitator drive. see chapter 9.6: Checking agitator drive, page 95. <p>Metering slide set incorrectly</p> <ul style="list-style-type: none"> ● Empty the container of remaining fertiliser. see chapter 8.11: Discharging residue, page 85. ● Check metering slide setting. see chapter 9.9: Metering slide adjustment, page 101.
<p>Irregular fertiliser feed to spreading disc</p>	<p>Fertiliser bridging above the agitator</p> <ul style="list-style-type: none"> ● Remove fertiliser to the height of the safety screen on the affected side. ● Break up accumulated fertiliser with a wooden stick through the bars of the safety screen. <p>Outlet blocked</p> <ul style="list-style-type: none"> ● See metering outlet blockages. <p>Defective agitator</p> <ul style="list-style-type: none"> ● Remove fertiliser till the height of the safety screen on the affected side. ● Open the metering outlet and break up accumulated fertiliser with a wooden stick through the bars of the safety screen so that the remaining fertiliser can run out of the outlet opening. ● Check functionality of agitator drive. see chapter 9.6: Checking agitator drive, page 95.
<p>Spreading discs flutter</p>	<ul style="list-style-type: none"> ● Check that cap nuts are tight and the thread sits properly.
<p>Metering slide opens with difficulty or not at all.</p>	<ul style="list-style-type: none"> ● Metering slides do not move easily. Regularly check slides, nuts and screws for tight fit and tighten them, if necessary.

Fault	Possible cause/action
Agitator does not operate	<ul style="list-style-type: none"> ● Check agitator drive. See 9.6: Checking agitator drive, page 95.
Blockages at outlets because of: lumps in the spreading material, wet spreading material, other contaminants (leaves, straw, bag residues)	<ul style="list-style-type: none"> ● Clear blockages. Proceed as follows: <ol style="list-style-type: none"> 1. Park tractor, remove ignition key 2. Open metering slides 3. Place collection vessel underneath 4. Remove spreading discs 5. Clean the outlet from below with a wooden pole or clean the setting lever and push through the metering opening, 6. Remove foreign objects in hopper container 7. Install spreading discs, close metering slides

8.11 Discharging residue

⚠ WARNING



Risk of injury from rotating machine components

Contact with rotating machine components may cause bruises, abrasions and crush injuries. Body parts or objects may be caught and pulled in.

- ▶ When the machine is running keep clear of the rotating hubs.
- ▶ Clear the area of any persons who might be present in the danger zone of the solid fertiliser broadcaster.

We recommend emptying the solid fertiliser broadcaster immediately after every use to maintain its value .

NOTICE

If the solid fertiliser broadcaster AXIS H EMC AXIS W is connected to the electronic control system, a warning message appears that the drop point will temporarily be set to position 0 during emptying of residue.

Please refer to the electronic control system manual

Instructions for completely discharging the residue:

Small amounts of fertiliser may remain in the solid fertiliser broadcaster when discharging residue normally. If you wish to discharge the residue completely (e.g. at the end of the season, when changing spreading material), please proceed as follows:

1. Empty hopper container until no more material comes out (normal residue discharge).
2. Switch off tractor engine and control unit and lock to prevent unauthorised starting. Remove the tractor ignition key.
3. Remaining fertiliser can be removed with a soft water spray whilst cleaning the machine; . [see also „Cleaning the solid fertiliser broadcaster“ on page 91.](#)

8.12 Switching off and uncoupling the solid fertiliser broadcaster

The solid fertiliser broadcaster can be securely parked on the frame or the prop wheels (optional accessory).

DANGER



Danger of crushing between the tractor and the solid fertiliser broadcaster

Persons standing between the tractor and solid fertiliser broadcaster while they are being parked or disconnected are exposed to lethal hazard.

- ▶ Make certain when activating the external control for the three-point linkage that there is no one between the tractor and the solid fertiliser broadcaster.

Prerequisites for parking the solid fertiliser broadcaster:

- The solid fertiliser broadcaster must only be parked on a firm, level surface.
- Park the solid fertiliser broadcaster with an empty hopper only.
- Relieve the load on the coupling points (lower / upper link) before removing the solid fertiliser broadcaster.
- After decoupling, place the hydraulic lines and electric cables in the brackets provided.

9 Service and maintenance

9.1 Safety

NOTICE

Note the warning in chapter [3: Safety, page 5](#).

Take particular **note of the instructions** in section [3.8: Service and maintenance, page 11](#).

Maintenance and repair work involves additional hazards that do not occur during operation of the machine.

Take particular care when carrying out maintenance and repair work. Work very carefully and with awareness of danger.

Observe the following instructions in particular:

- Welding and work on the electrical and hydraulic systems must be carried out by qualified technicians only.
- When working on the raised solid fertiliser broadcaster, it may be in **danger of tipping**. Always secure the solid fertiliser broadcaster with suitable supports.
- To lift the solidfertiliser broadcaster with hoisting gear, always use **both** eyelets in the hopper.
- Power-operated components (adjusting lever, metering slide) may **crush and shear**. Make sure that there is no one in close proximity to the movable parts during maintenance.
- Spare parts must at least comply with the technical standards specified by the manufacturer. This is assured with genuine spare parts.
- Before all cleaning, maintenance and repair jobs, and when repairing faults, turn off the tractor engine and wait until all rotating parts of the machine have come to a stop.
- Always have repairs carried out **by an authorised service centre**.

9.2 Wear parts and bolted connections

Checking wear parts

Wearing parts are: **Spreader blades, agitator, outlet, hydraulic hoses.**

- Check the wear parts.

If these parts show visible signs of wear, deformation or holes, they must be replaced, otherwise the spreading pattern will not be correct.

The durability of the wear parts depends in part on the material spread.

Checking bolted connections

Bolted joints have been tightened to the specified torque and locked at the factory. Vibrations and jerks, in particular during the initial operating hours, can loosen screwed connections.

- Check the solid fertiliser broadcaster when it is new about every 30 operating hours to make certain all screw connections are tight.
- Check all the bolted connections regularly for tightness, and at least before the start of the spreading season.

Some components (e.g. spreader vanes) are mounted with self-locking nuts. **Always use new self-locking nuts** when mounting these components.

9.2.1 Check the screw connections in the weighing cell

NOTICE

This maintenance work is only required for AXIS H 30.1 EMC + W and AXIS H 50.1 EMC + W.

The solid fertiliser broadcaster comes with 2 weighing cells, which are mounted with 2 bolted connections per cell. The tie rod has one bolted connection.

On both sides of the solid fertiliser broadcaster, check the bolted connections of the weighing cells and tie rod before each spreading season, and if necessary during the season, to make certain all connections are tight.

Checking:

1. Tighten the bolted connection with a torque wrench (torque = **300 Nm**).



Figure 9.1: Fasten the weighing cell (on the left of the travelling direction)

- Tighten the bolted connection [1] with a torque wrench (torque = **300 Nm**).

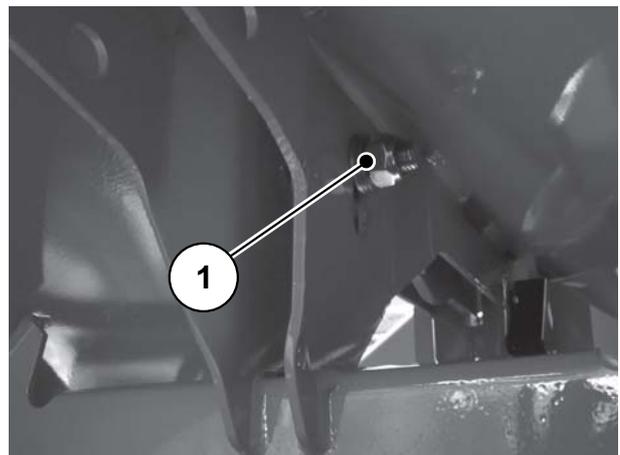


Figure 9.2: Securing the tie rod
AXIS H 30.1 EMC + W

- Tighten the bolted connection [2] with a torque wrench (torque = **300 Nm**).

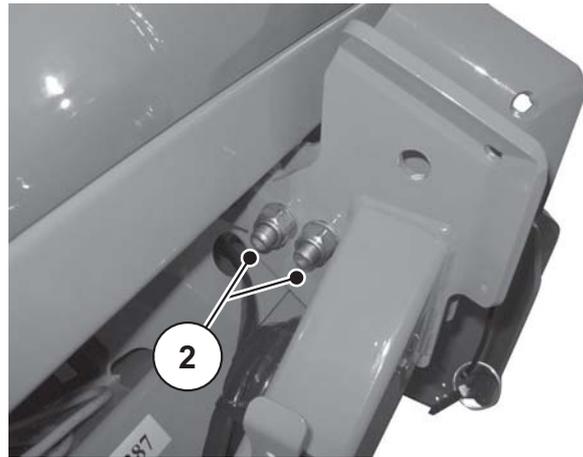


Figure 9.3: Securing the tie rod
AXIS H 50.1 EMC + W

NOTICE

After tightening the bolted connections with the torque wrench, the weighing cells must be tared anew. Please follow the instructions in the chapter "Taring the scales" of the electronic control system operating manual.

9.3 Cleaning the solid fertiliser broadcaster

We recommend cleaning the solid fertiliser broadcaster immediately after every use with a soft water spray to maintain its value.

To facilitate cleaning, the screens in the hopper can be folded up (see chapter [9.4: Opening the protective grid in the hopper, page 92](#)).

The following instructions must be observed for cleaning:

- Clean the discharge ducts and the area of the slide guides from below only.
- Clean oiled machines only at washing points with an oil separator.
- When cleaning with high pressure never direct the water jet directly at warning signs, electrical equipment, hydraulic components and sliding bearings.

9.3.1 Cleaning

- Clean the solid fertiliser broadcaster AXIS H EMC with a **soft water jet**.
- In particular, clean the hydraulic components, such as the control block, hose screw fittings, gear unit.

9.3.2 Care

- After cleaning, treat the solid fertiliser broadcaster AXIS H EMC with a biodegradable corrosion protection agent.
- In particular, **treat the coated vanes and stainless steel parts, the hydraulic components such as the control block, hose connections and gear unit**, with a biodegradable anti-corrosion unit after cleaning.

NOTICE

A suitable polishing kit can be ordered from authorised dealers for use in treating rust spots.

9.4 Opening the protective grid in the hopper

⚠ WARNING



Danger of injury from moving parts in the hopper

There are moving parts in the hopper.

Injuries to hands and feet can be caused during commissioning and operation of the solid fertiliser broadcaster.

- ▶ Always fit the safety mesh guard before commissioning and operation of the solid fertiliser broadcaster and lock it in position.
- ▶ Protective grid should be opened **only** for maintenance or repair work.

The protective grid in the hopper container is locked automatically by a protective grid interlock.

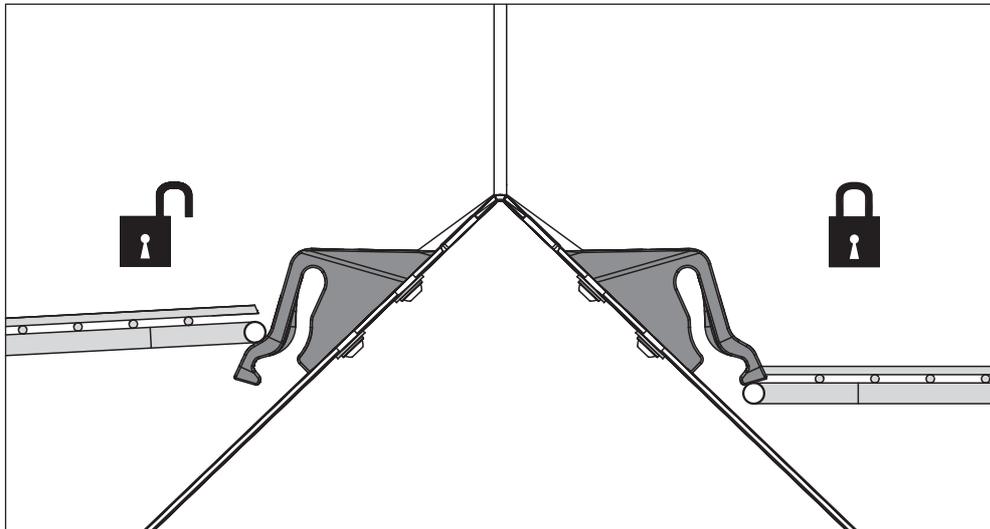


Figure 9.4: Protective grid interlock open/closed

To prevent the protective grid from being opened unintentionally, the protective grid interlock can only be opened with a special tool (setting lever - see 6.10).

Before opening the protective grid:

- Lowering the solid fertiliser broadcaster.
- Turn tractor motor off.

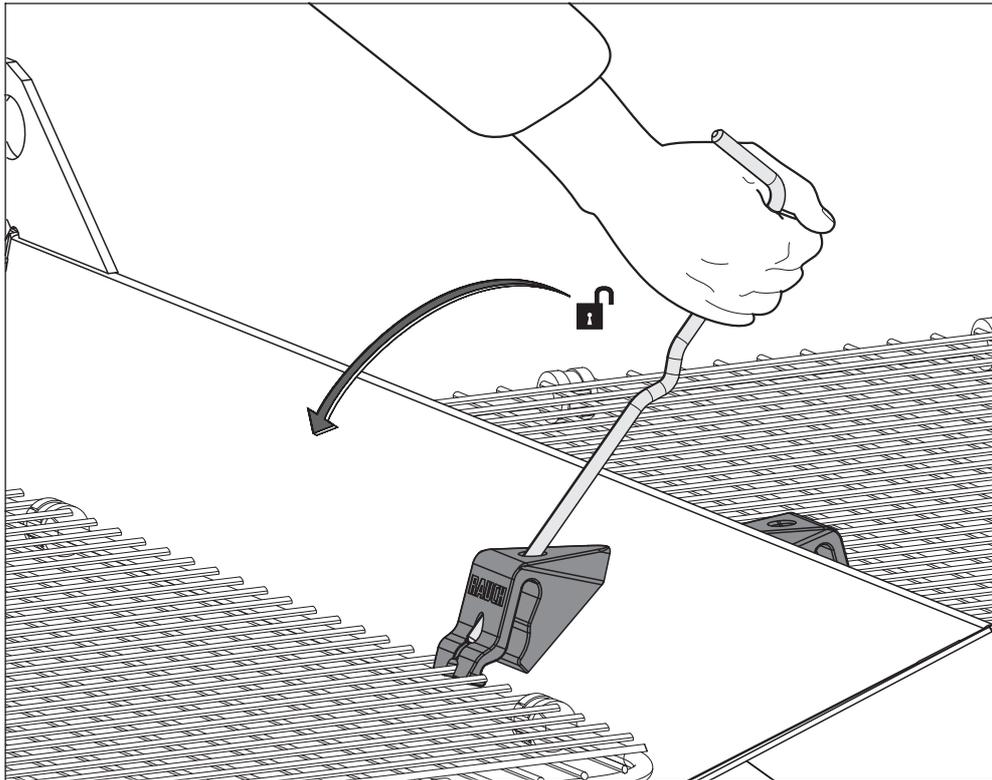


Figure 9.5: Open the protective grid interlock

- Carry out regular functional checks of the protective grid interlock. See illustration below.
- Replace defective protective grid interlocks immediately.
- [1] If necessary, correct the setting by moving the protective grid interlock downwards/upwards (see illustration at the bottom).

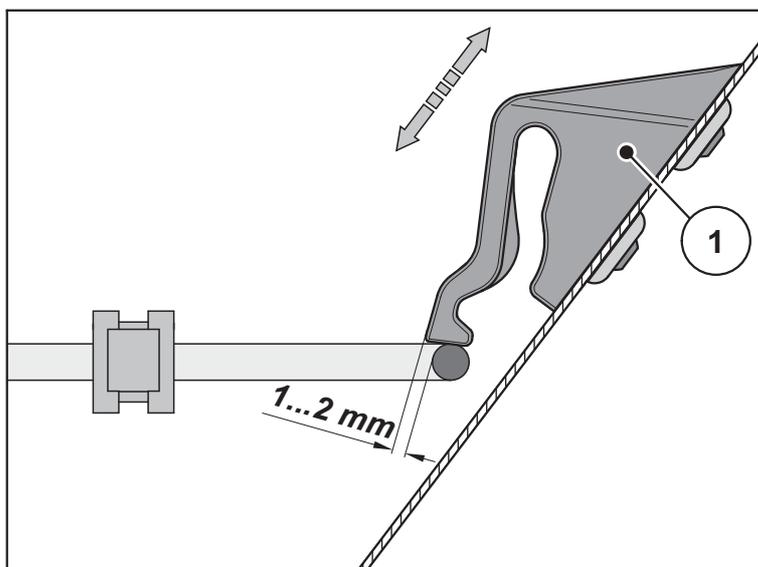


Figure 9.6: : Test measurement for functional check of the safety screen interlock

9.5 Checking the position of the spreading disc hub

The spreading disc hub must be centred exactly under the agitator.

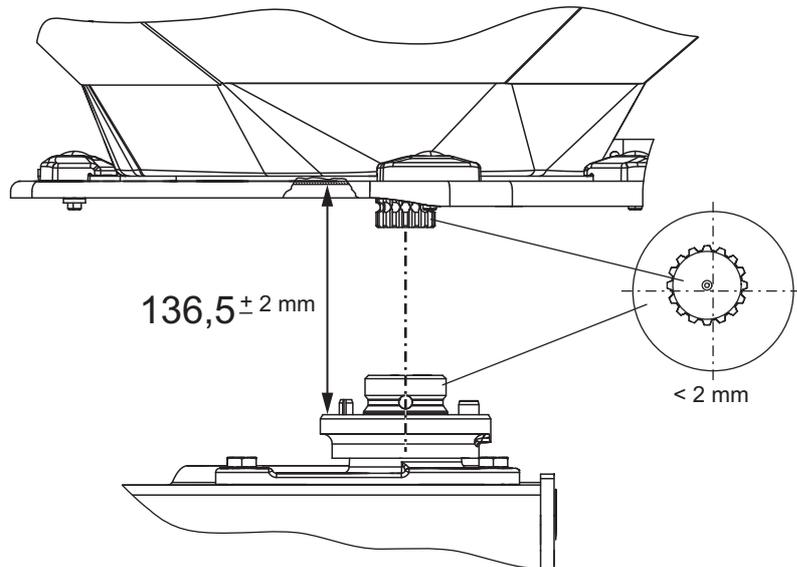


Figure 9.7: Checking the position of the spreading disc hub

Requirements:

- The spreading discs have been removed.

Testing the centring:

1. Use suitable equipment to check that the spreading disc hub and agitator are centred (e.g. straight edge ruler, protractor)
 - ▷ The axes of the spreading disc hub and the agitator must be aligned. The maximum allowable deviation is **2 mm**.

If this margin is exceeded, please contact your dealer or authorised service centre.

Checking distance:

2. Measure the gap between upper edge of spreading disc hub and the lower edge of the agitator.
 - ▷ The distance must be **136.5 mm** (permissible tolerance $\pm 2 \text{ mm}$).

If this margin is exceeded, please contact your dealer or authorised service centre.

9.6 Checking agitator drive

NOTICE

There is a left and a right hand agitator. Both agitators rotate left and right in the same direction as the spreading discs.

The agitator must operate at a revolve at a constant speed to ensure an even flow of fertiliser.

- Agitator speed: **15 - 20 rpm**.

To attain the correct agitator speed of **15 - 20 rpm**, the agitator needs the resistance of the spreading material inside it. This is the reason it is entirely possible with an empty hopper container that even with a fully functional agitator, the correct speed cannot be attained or that the hopper seesaws.

If the speed **with full container** lies outside the specified range, the agitator needs to be checked for wear and tear.

Checking agitator functions

Requirements

- Tractor should be turned off.
- The ignition key should be removed.
- The solid fertiliser broadcaster should be set on the ground.

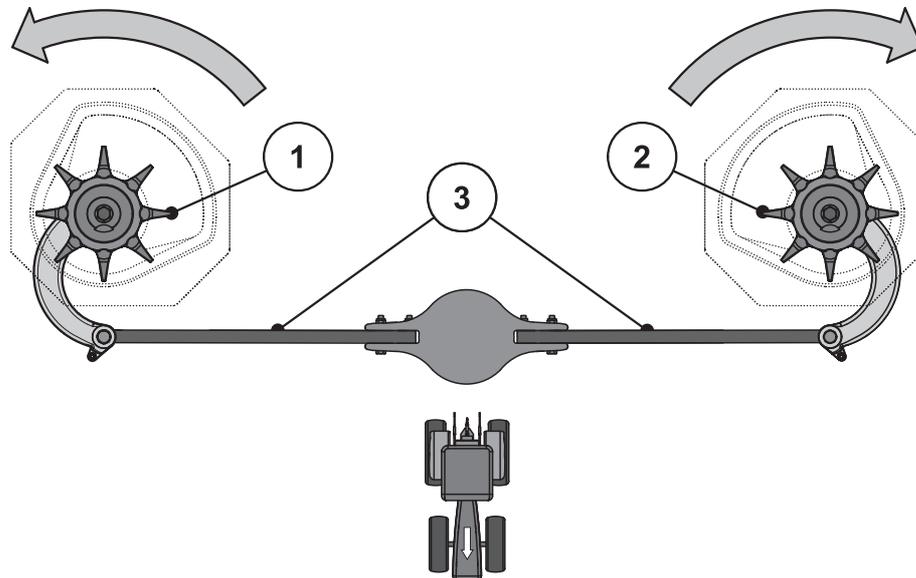


Figure 9.8: Check agitator drive

- [1] Right side agitator head (in direction of travel)
- [2] Left side agitator head (in direction of travel)
- [3] Connecting rods
- [4] Arrows: Rotational direction of the spreading discs

1. Check the connecting rods.
 - Connecting rods should not show any cracks or other signs of damage.
 - Check pivots for wear and tear.
 - Check safety element functions at all joints.
 2. Turn the agitator head manually **in the rotational direction of the spreading discs**. See [Figure 9.8](#).
 - The agitator head must be able to turn.
 - ▷ If the head does not turn, replace head.
 3. Turn the head manually or with the help of an oil filter belt forcefully **against the rotational direction of the spreading discs**. See [Figure 9.8](#).
 - The head should not turn.
 - ▷ If the head allows itself to be turned, replace head.
- ▷ **If the checkup does not identify a cause, please contact your authorised service centre for further inspection.**

Checking agitator head for wear and tear:

- Check the fingers of the agitator head for wear.
 - ▷ The length of the fingers must not be less than the **wear range (Z)**.
 - ▷ The fingers must not be bent.

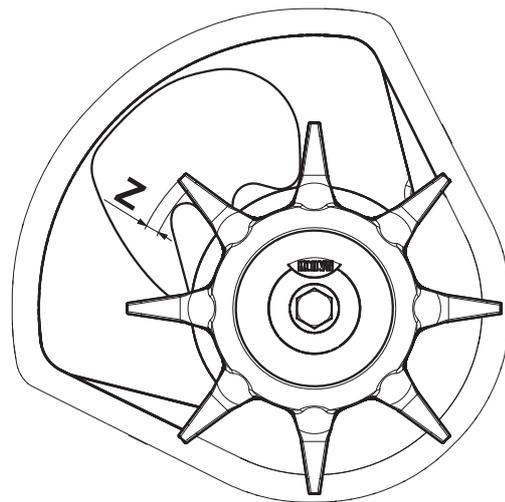


Figure 9.9: Agitator head wearing zone

9.7 Changing spreader vanes

Worn spreader vanes must be replaced.

NOTICE

Worn spreader vanes must be replaced **only** by your dealer or authorised service centre.

Requirement:

- The spreading discs have been removed.

Determining the vane type:

CAUTION



Matching the vane types

The model and size of the vanes are matched to the spreading disc. Unsuitable vanes can cause damage to the machine and its surroundings.

- ▶ Only use vanes which are approved for the relevant disc.
- ▶ Examine what is written on the vanes. The model and size of the new and old spreader vane must be identical.

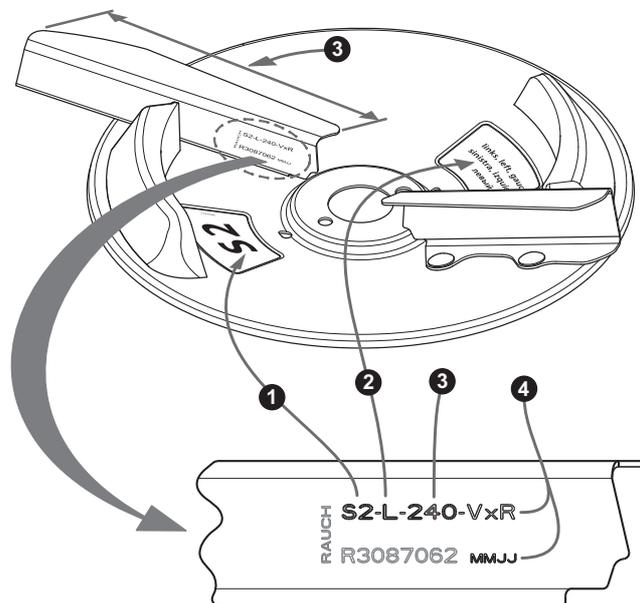


Figure 9.10: Spreading disc label

- [1] Spreading disc type
- [2] Spreader side
- [3] Vane length
- [4] Coating

Replacing the spreader vane:

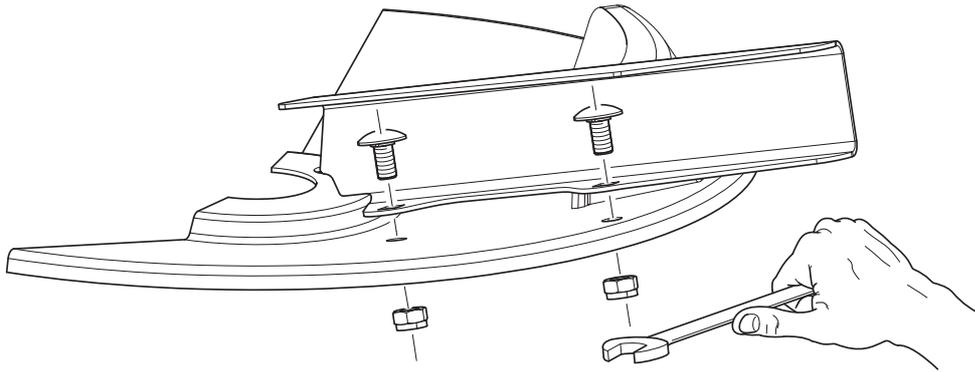


Figure 9.11: Loosen the vane screws

1. Release the self-locking nuts on the vane and remove the vane.
2. Position the new vane on the spreading disc. Make sure you have the correct vane model.

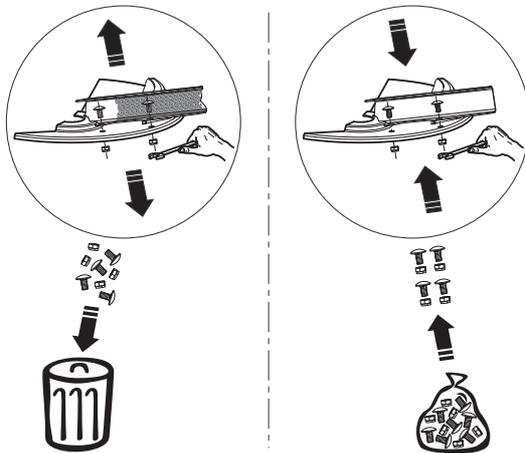


Figure 9.12: Use new self-locking nuts.

3. Screw on the vane (tightening torque: **20 Nm**). Always use new self-locking nuts.

9.8 Maintenance Schedule

The chapter lists the maintenance activities.

NOTICE

For notes of lubrication and lubrication intervals, please refer to chapter [9.14: Lubrication chart, page 121](#).

9.8.1 Maintenance

Component	Activity	NOTE
Safety devices	Functional check before departure	Page 92
Hydraulics	Check for damage/ leaks	Page 114
Screwed connections	Regularly check for tightness, tighten where necessary, check their condition	Page 88
Wear-prone parts	Regularly check their condition, where necessary replace	Page 88
Entire fertiliser spreader	Cleaning	Page 91
Protective grid interlock in the hopper	Is the safety mesh guard present? Functional check, adjust the safety screen interlock	Page 92
Spreading disc	Check the condition. Replace the spreading disc as required, treat with an anti-corrosion agent where necessary	Page 94
Spreader vane	Check the condition. Replace the spreading disc as required, treat with an anti-corrosion agent where necessary	Page 97
Casting disc hub	Check the position and distance from the agitator - correct where necessary	Page 94

Component	Activity	NOTE
Agitator	Check function of eccentric drive, check that the Pleulstäbe are tight and are not damaged, test the free running and locking direction of the heads, check agitator fingers for signs of wear	Page 95
Metering slide	Check the opening of the metering slider and adjust where necessary, recalibrate the slide testing points of the electronic control	Page 101
Adjustment of the drop point	Check the correct adjustment of the drop point and adjust where necessary, recalibrate the slide testing points of the electronic control	Page 103
Gears drive	Check the fill levels, replace the oil, check the speed sensor	Page 119
Pressure filter	Check the contamination in the pressure filter, check the hydraulic hoses and screw fittings, replace where necessary	Page 117
Hydraulic hoses	Check the hydraulic hoses and screw fittings, replace where necessary	Page 115

9.9 Metering slide adjustment

Check that the metering slides open evenly before every working season and also during the season, if necessary.

▲ WARNING



Danger of crushing and shearing!

Power-operated components (adjusting lever, metering slide) may crush and shear when working on them.

Pay attention to the shear points of the metering outlet and slides during all adjustment work.

- ▶ Turn off tractor. Remove the ignition key.
- ▶ Do not operate hydraulic slide actuators during adjustment work.

Requirements:

The mechanics must be freely movable to check the metering slide setting.

- Actuator is disengaged.

Running the test (example on left side of spreader):

1. Take a lower link pin **d = 28 mm** and insert it centrally into the outlet.



Figure 9.13: Lower link pin in metering outlet

2. Push the metering slide against the pin.
 - ▷ **The pointer must point to 85 on the metering slide scale. If position is not correct, the scale must be adjusted.**

To adjust:

The metering slide is in the position from work step 2.

3. Unfasten the fixing screws for the scale.

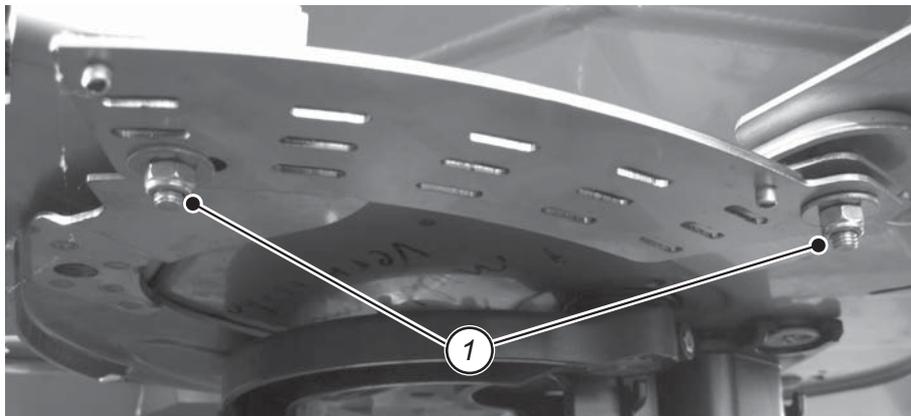


Figure 9.14: Scale fixing screws

4. Move the entire scale so **scale value 85** is exactly at the display pointer. Tighten the scale again.

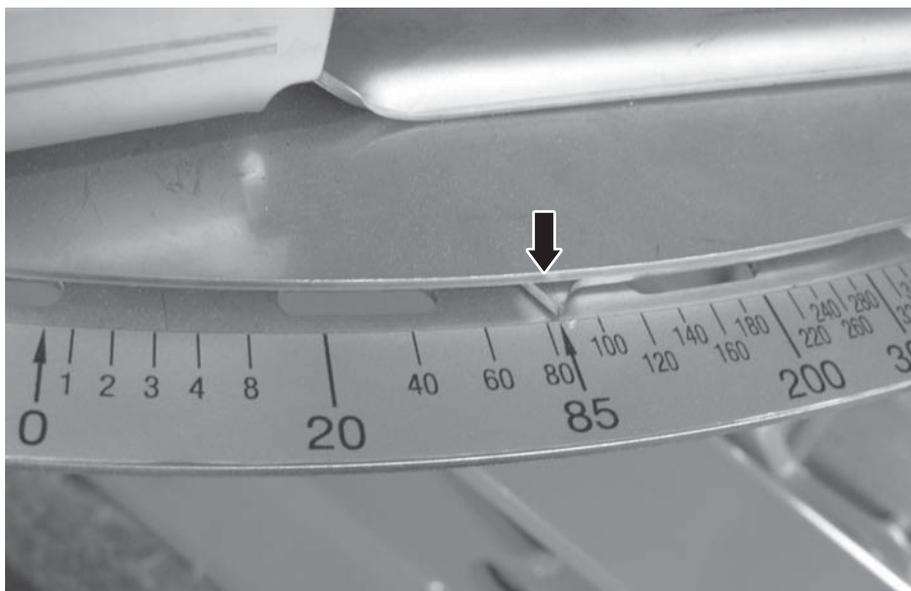


Figure 9.15: Metering slide pointer at position 85

5. Repeat steps 1-4 for the right metering slide.
6. Connect the actuator back to the metering slide

NOTICE

Both metering slides must open **evenly**. Always test both metering slides.
After scale correction with electronic slide controls, a correction of the slide testing points in the electronic control system is also necessary.
Please observe the operating instructions for the electronic control system.

9.10 Fertiliser drop point

Changing the drop point sets the working width and adjusts it for various types of fertilisers.

Check the setting of the drop point at the start of every season and also during the season if uneven spreading is noticed.

▲ WARNING



Danger of crushing and shearing!

There is a risk of crushing and shearing when working on power-operated components (actuators, linkages).

► Turn off tractor. Remove the ignition key.

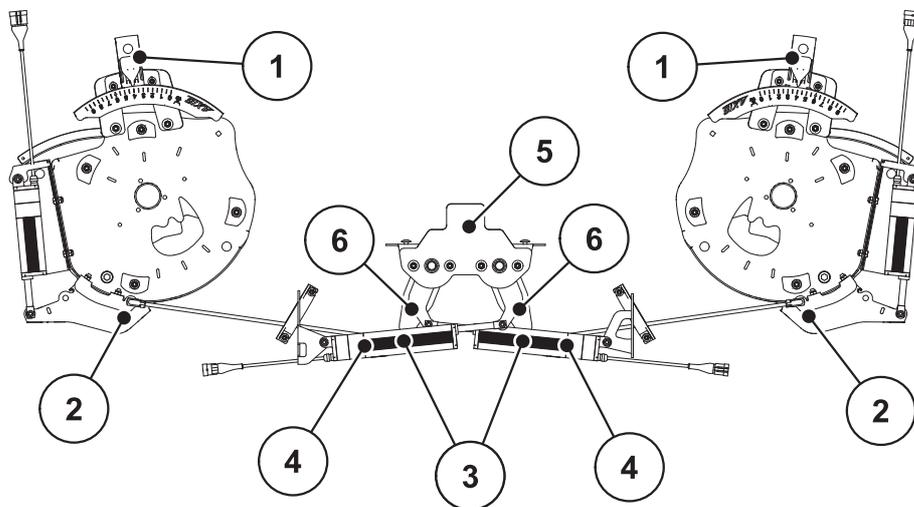


Figure 9.16: Checking the fertiliser drop point

- [1] Left/right adjustment centre
- [2] Left/right outer yoke
- [3] Left/right inner yoke
- [4] Actuator
- [5] Setting unit
- [6] Actuating arm

NOTICE

The fertiliser drop point must be set to the **same** position on both sides of the machine. When performing yield optimised boundary spreading, the working range can be adjusted on one or both sides via the drop point and speed. Always check both sides.

Disengaging the actuator for the drop point adjustment

- Remove the pin.

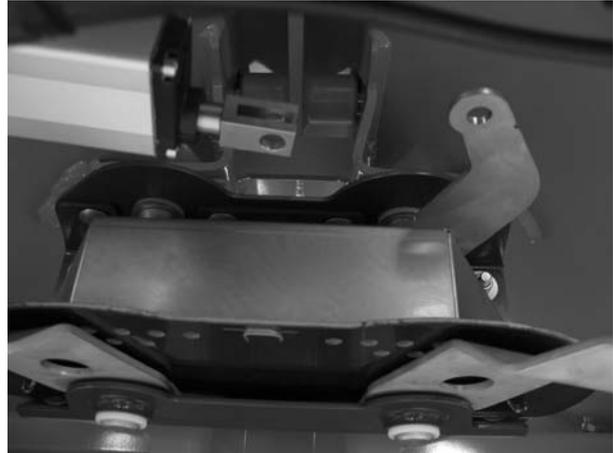


Figure 9.17: Disengage actuator

Standard setting of the inner yoke

NOTICE

The inner and outer yokes must have the **same** setting on both sides. Proceed as described below for both sides.

1. Screw the yoke (1) in until the threaded rod rests flush on the inner edge of the yoke.
2. Screw the yoke out again by 2 turns.
3. Tighten the lock nut (2).

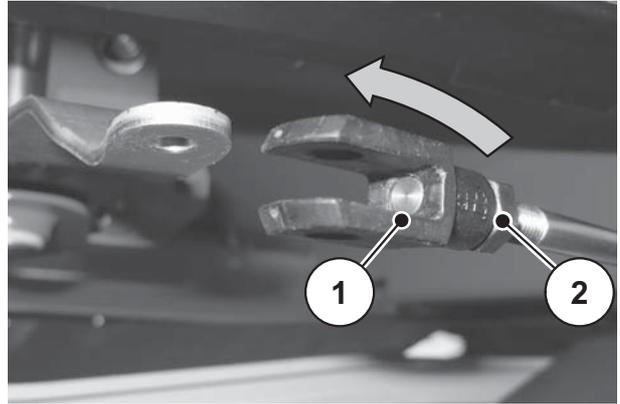


Figure 9.18: Disengaging the inner yoke

4. Hook the yoke in position and secure by tightening the locknut.



Figure 9.19: Engaging the inner yoke

Standard setting of the outer yoke

1. Disengage the outer yoke at the left and right adjustment centres.
2. Screw the yoke (1) in until the threaded rod rests on the inner edge of the yoke.
3. Screw the yoke out again by 2 turns.

Do **not** tighten the lock nut [2] yet.

Do **not** engage the yoke.

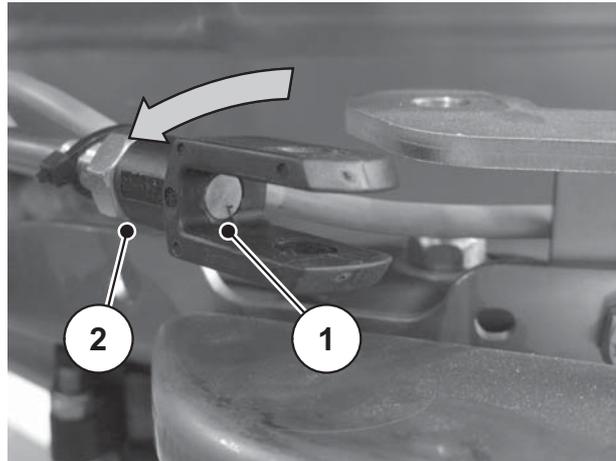


Figure 9.20: Disengaging the outer yoke

4. Set the fertiliser drop point on both sides by screwing in the adjustment centre to **position 6**.

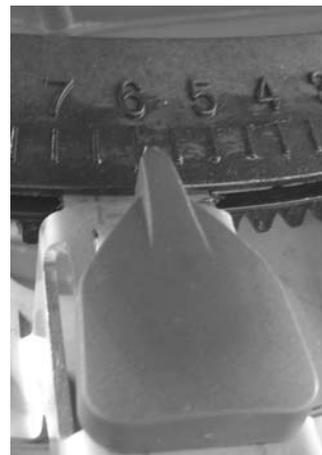


Figure 9.21: Set drop point

5. Release the screw under the display element using a SW13 spanner.
6. Push the pointer forwards to lock it.

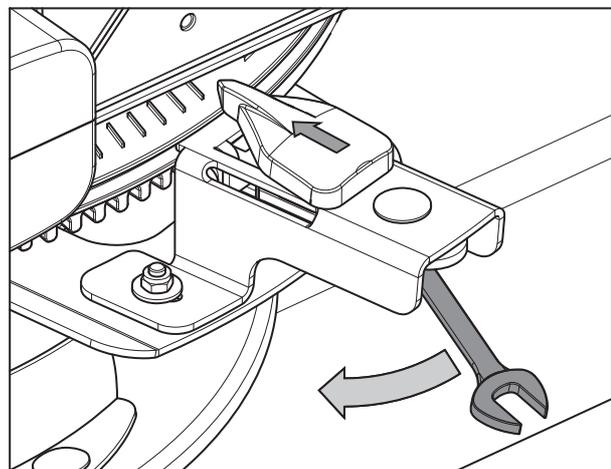


Figure 9.22: Adjust the display element

7. Attach a suitably thin string at the **rear** in the direction of travel to the lower sides of the left and right adjustment centres as shown, and tauten it.

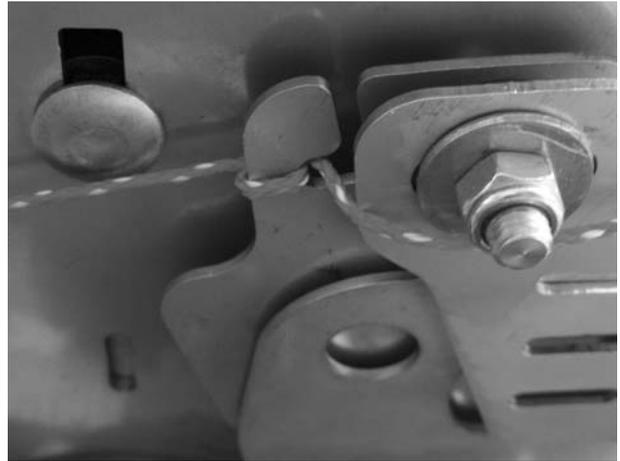


Figure 9.23: Attaching the string to the adjustment centre

8. Check:

- The triangular marking on the adjustment centre must coincide with the tensioned string.



Figure 9.24: Markings on the adjustment centre

- If this is not the case then the drop point must be readjusted.

9. Adjustment:

- Release both of the display element fixing screws.
- Turn the adjustment centre until the triangular mark lines up with the taut string.
- Retighten the two display element fixing screws.
 - When tightening make sure that the pointer is parallel to and flush with the baseplate.
- Remove the string.

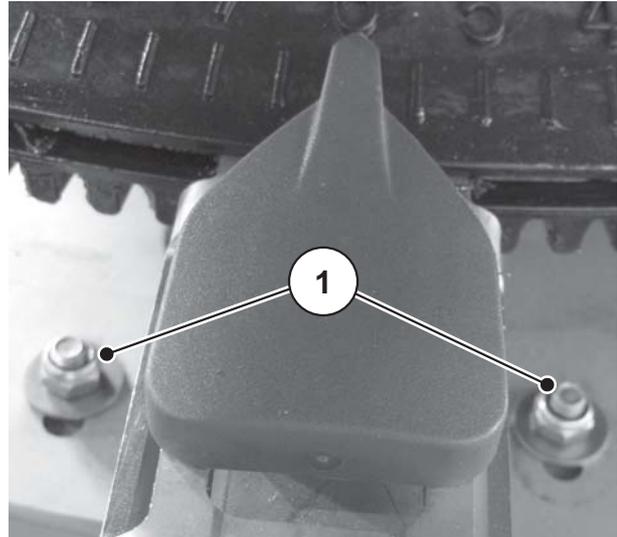


Figure 9.25: Release/tighten the fixing screws

10. Push the display element back again.

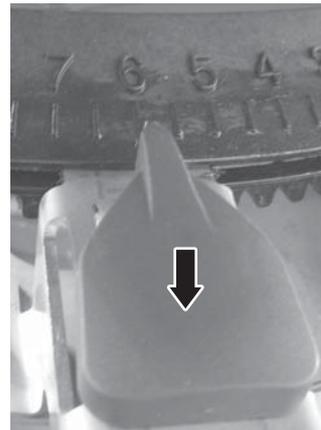


Figure 9.26: Push the display element back

11. Set the drop point to 0 on both sides.
12. Push the display element forward to lock it.

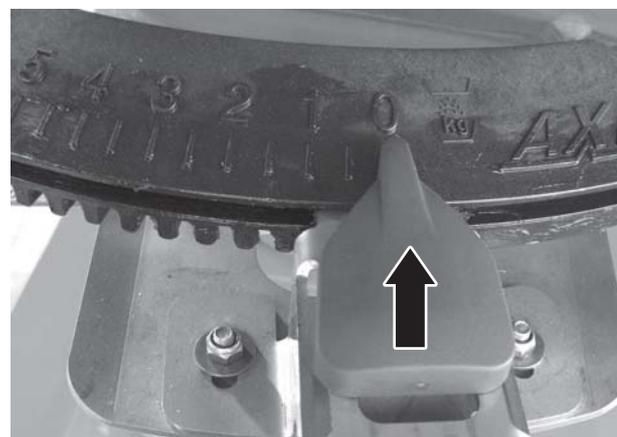


Figure 9.27: Set the drop point to position 0

- 13. Adjust the outer yokes so that the adjustment centre and the adjusting rod can be coupled by the pin (1).
- 14. Tighten the locknut.

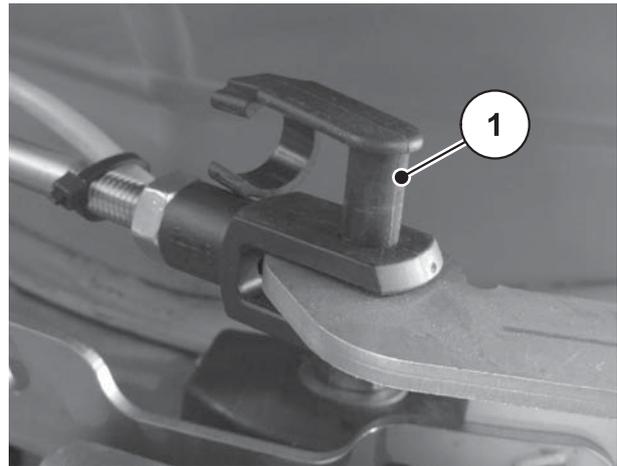


Figure 9.28: Engage the outer yoke.

- 15. Push the display element back
- 16. Tighten the screw.

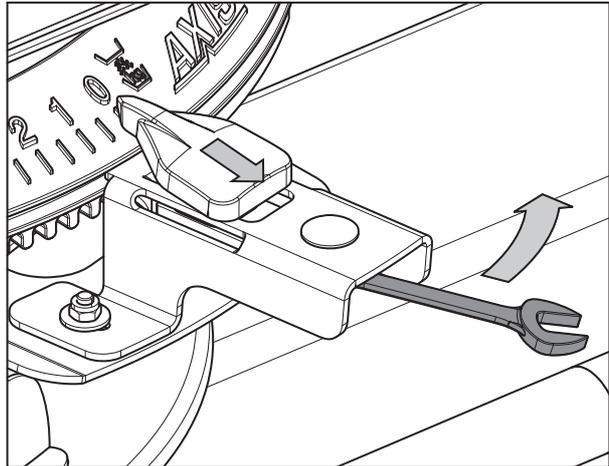


Figure 9.29: Pushing the display element back

- 17. Adjust the drop point in the control system to check that the settings on the left and right sides coincide (e.g. check that drop point positions 1, 6 and 9 coincide).



Figure 9.30: Checking the adjustment of the drop point

18. Hook the actuator back in position and secure.

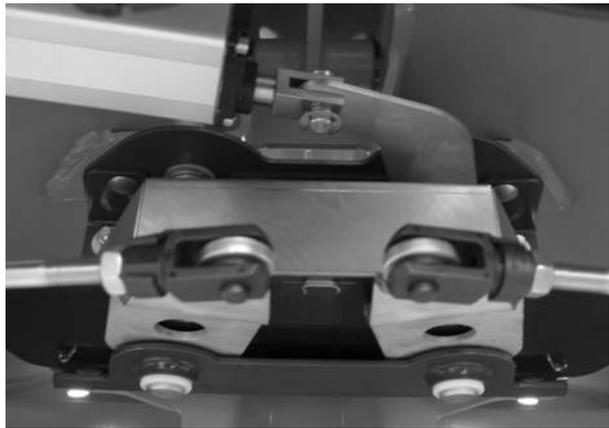


Figure 9.31: Engaging the actuator

NOTICE

Adjust the drop points **evenly** on both sides.

After scale correction with electronic slide controls, a correction of the slide testing points in the electronic control system is also necessary.

Please observe the operating instructions for the electronic control system.

9.11 Manual adjustment of the drop point

NOTICE

If the drop point can no longer be electrically actuated it is adjusted manually.

Deactivating the actuator control

The actuators which are electrically operated for the drop point adjustment must be disconnected prior to manual adjustment of the drop point.

1. Disconnect the adjusting rod from the adjustment centre **on both sides**. Remove the pins to do this.

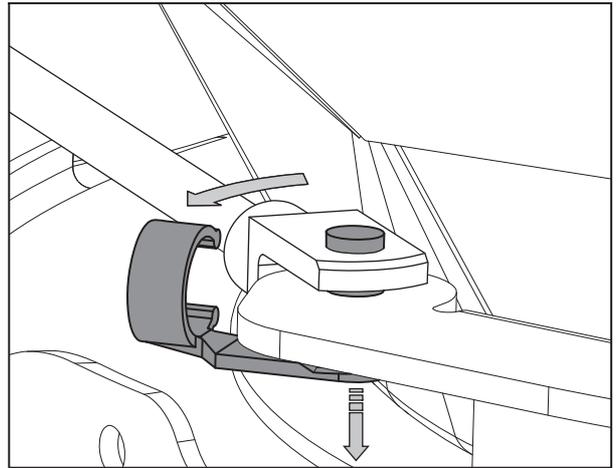


Figure 9.32: Removing a pin

2. Push rod to the side.
3. Put pins back into the yoke and lock.

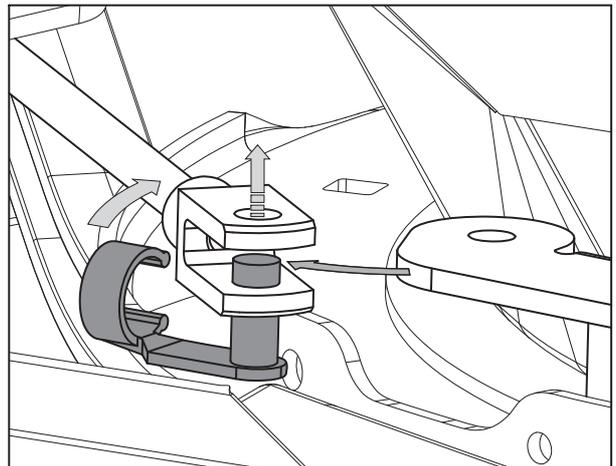


Figure 9.33: Remove rod

Set Drop Point

The drop point is manually adjusted using the scale plate **on both sides**.

NOTICE

Ensure that the drop point **on both sides** is set the same.

1. Release the screw under the display element using a SW13 spanner.
 - ▷ The lock is released and the display element can be moved freely (see [Figure 9.34](#)).

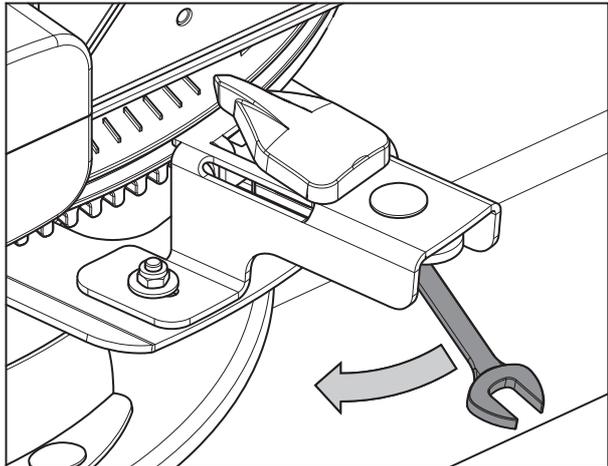


Figure 9.34: Release lock

2. Set display element to the desired value.

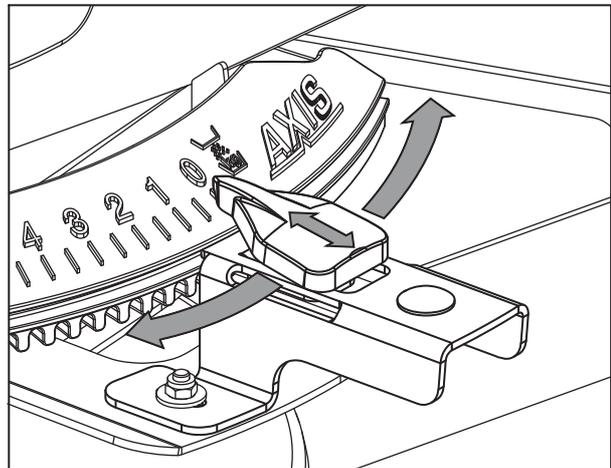


Figure 9.35: Manually adjust drop point

3. Push display element forward at the desired value.
- ▷ **The display element engages.**
4. Tighten lock.

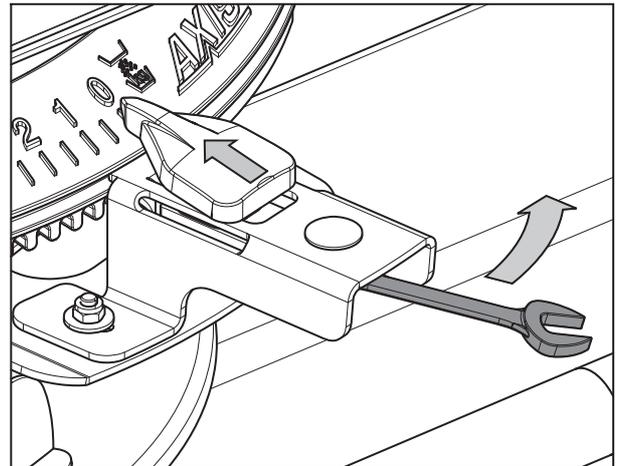


Figure 9.36: Tighten lock

9.12 Maintenance of the Hydraulics

The hydraulic unit in the AXIS H EMC solid fertiliser broadcaster comprises

- Hydraulic block with oil supply from the tractor
- Hydraulic motors
- Connecting hoses.

Within the hydraulic circuits, the drive components and actuators are connected to each other via hydraulic hoses.

In operating conditions, the hydraulic system of the solid fertiliser broadcaster is under high pressure. The temperature of the oils in the system is approx. 90°C during operation.

▲ WARNING



Danger from high pressure and high temperature in the hydraulic system

Fluids which are hot and discharged under high pressure can cause serious injuries.

- ▶ Before starting any work, depressurise the hydraulic system.
- ▶ Switch off the tractor engine and secure it from being switched back on.
- ▶ Allow the hydraulic system to cool.
- ▶ Always wear safety goggles and safety gloves when looking for leaks.

▲ WARNING



Risk of infection from hydraulic oils

Fluids which are discharged under high pressure can penetrate the skin and cause infections.

- ▶ Immediately contact a doctor in the event of suffering an injury from hydraulic oil.

▲ CAUTION



Environmental danger from hydraulic or gear oils

Hydraulic or gear oil which ends up in the sewerage system or the ground can contaminate large volumes of ground and drinking water.

- ▶ Always dispose of used oil in accordance with the manufacturer's instructions and in compliance with environmental requirements at the stipulated collection points.

9.12.1 Checking Hydraulic Hoses

Hydraulic hoses are subjected to high stress. They must be checked regularly and be immediately replaced if damaged.

Hydraulic hoses are subject to an ageing process. They may be used for a maximum of 6 years, including storage time of maximum 2 years.

NOTICE

The manufacturing date of the hose is given on one of the hose fittings as the month and year (e.g. 09/4).

- Regularly check the hydraulic hoses, at the latest before the start of the spreading season, with a visual inspection for wear.
- Replace the hydraulic hoses when detecting the following damage:
 - Damage to the outer layer through to the inlay,
 - Embrittlement of the outer layer (formation of cracks),
 - Deformation of the hose
 - Sliding of the hose out of the hose fitting,
 - Damage to the hose fitting,
 - Reduced strength and function of the hose fitting as a result of corrosion.
- Before the start of the spreading season, check the age of all the hydraulic hoses. Replace the hydraulic hoses once the storage and use duration has elapsed.

9.12.2 Replacing Hydraulic Hoses

Preparation:

- Ensure that the hydraulic system is **depressurized** and **has cooled down**.
- Provide a collection container for escaping hydraulic oil under the separation points.
- Provide suitable caps, to prevent the hydraulic oil from escaping from hoses which do not have to be replaced.
- Prepare suitable tools.
- Wear protective gloves and goggles.
- Ensure that the new hydraulic hose corresponds to the model of the hose to be replaced. Pay particular attention to the correct pressure range and the hose length.

NOTICE

In particular, note the different maximum pressure ratings of replacement hoses.

Implementation:

1. Loosen the hose fitting at one end of the hydraulic hose to be replaced.
 2. Bleed the oil contained in the hydraulic hose.
 3. Loosen the other end of the hydraulic hose.
 4. Immediately hold the loosened hose end over the oil collection container and close the connection.
 5. Loosen the hose fixtures and remove the hydraulic hose.
 6. Connect the new hydraulic hose to the connections. Tighten the hose fittings.
 7. Fix the hydraulic hose with the hose fastenings.
 8. Check the position of the new hydraulic hose. The hose guide must be identical to that of the previous hydraulic hose. No fretting points should appear, the hose must not be twisted or be laid under tension.
- ▷ **The hydraulic hoses were successfully replaced.**

9.12.3 Checking the Hydromotors

Check all hydromotors regularly, at least before each spreading procedure.

The spreading discs are driven by hydromotors, which are located underneath the protective cover of the gear unit.

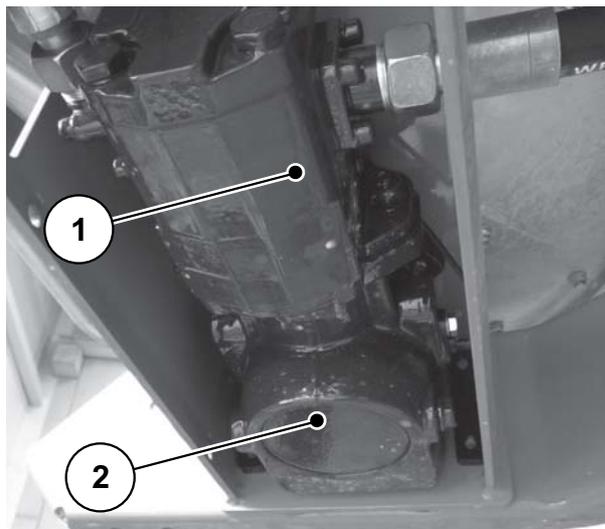


Figure 9.37: Hydromotor

- [1] Hydromotor
- [2] Gearbox

- Check the components for external damage and leaking.

9.12.4 Checking the hydraulic pressure filter

In order to ensure long, error-free operation, we recommend you use a hydraulic pressure filter ([Figure 9.38](#)). If the hydraulic pressure filter becomes contaminated, you will need to replace the filter cartridge with a new filter cartridge.

To detect contamination, the pressure filter ([Figure 9.38](#)) has a contamination indicator ([Figure 9.38](#) position 1).

NOTICE

With cold oil and pressure peaks, the contamination display/display pin may trigger even though the filter is not contaminated.

We therefore recommend you reset the contamination indicator manually when the operating temperature of the hydraulic oil is reached.

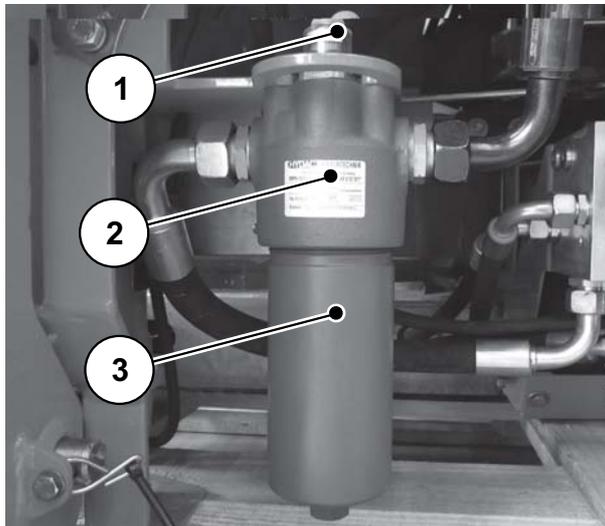


Figure 9.38: Hydraulic Pressure Filter

- [1] Contamination Indicator
- [2] Filter Head
- [3] Filter Top

Replacing filter cartridges

- Ensure that the hydraulic system is **depressurised** and **has cooled down**.
 - Place catch pan underneath the pressure filter to collect escaping hydraulic oil.
 - Wear protective gloves and goggles.
1. Undo the filter top ([Figure 9.38](#) position 3) with a SW24 spanner
 2. Unscrew the filter top from the hydraulic pressure filter.
 3. Replace the contaminated filter cartridge with a new filter cartridge.
 4. Clean the filter top and filter head ([Figure 9.38](#) position 2) in the region of the thread and the sealing surface and examine for mechanical damage.
 5. Check the O-rings and replace where necessary.
 6. Screw the filter top ([Figure 9.38](#) position 3) with the SW24 spanner as far as the stop and undo the filter top one quarter of a revolution.

7. Bleed the hydraulic pressure filter.
 - ▷ **The filter cartridge was successfully replaced.**
 - Check the components for external damage and leaking.

9.13 Gear oil

9.13.1 Quantity and types

The two gears of the solid fertiliser broadcaster are filled with around **0.6 l** gear oil in total.

Any oil that meets the requirements of CLP 460 DIN 51517 (SAE 85W 90) is suitable for gearbox lubrication. Some of these oils are listed in the table below.

NOTICE

Always use clean oil.

- **Never** mix different oil types.

9.13.2 Checking oil level, changing oil

The gearbox is lubricated for life under normal operating conditions. However, we recommend changing the oil after 10 years.

A shorter oil change interval is recommended if fertilisers with a high dust content are used and the spreader is frequently cleaned.

Requirements:

- The solid fertiliser broadcaster must be in a horizontal position for an oil level check or oil top-up. To discharge the oil, the solid fertiliser broadcasters must be slightly tilted toward the front.
- The engine and control unit have been switched off; the ignition key of the tractor has been removed.
- When draining the oil have a sufficiently large collection vessel (approx. 1 l) ready.

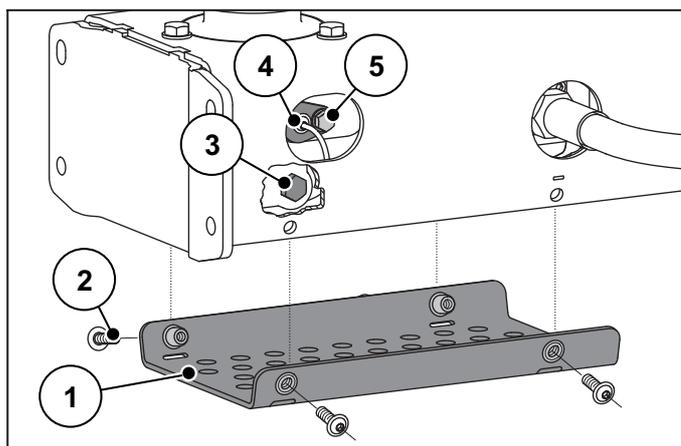


Figure 9.39: Fill and drain points for gear oil

- [1] Protective cover
- [2] Fixing screws, protective cover
- [3] Drain screw
- [4] Speed sensor
- [5] Fixing screw, speed sensor

Checking oil level:

- Remove the fixing screw [5] on the speed sensor [4].
- Remove the speed sensor [4].
 - ▷ The oil level is satisfactory if the oil reaches the lower edge of the sensor hole.

Draining oil:

- Tip the solid fertiliser broadcaster slightly towards the front.
- Detach the protective cover.
- Place the collection vessel under the oil drain plug.
- Unscrew the drain plug and allow the oil to drain out completely.
- Replace the drain plug.

⚠ CAUTION



Environmentally correct used oil disposal

Used oil that enters the ground water is a hazard for people and the environment.

- ▶ Dispose of used oil according to the local regulations.
- ▶ Please note chapter [10: Disposal, page 123](#).

Filling with oil:

- Only use SAE 85W 90 gear oil.
- Remove the speed sensor.
- Fill gear oil into the sensor hole until the oil level reaches the bottom edge of the sensor hole.
- Attach the speed sensor and protective cover again.

9.14 Lubrication chart

9.14.1 Location of the Lubrication Points

The lubrication points are distributed and identified throughout the machine. This information sign identifies the lubrication points:



Figure 9.40: Information sign, lubrication point

- Ensure the information signs are always **clean** and **legible**.

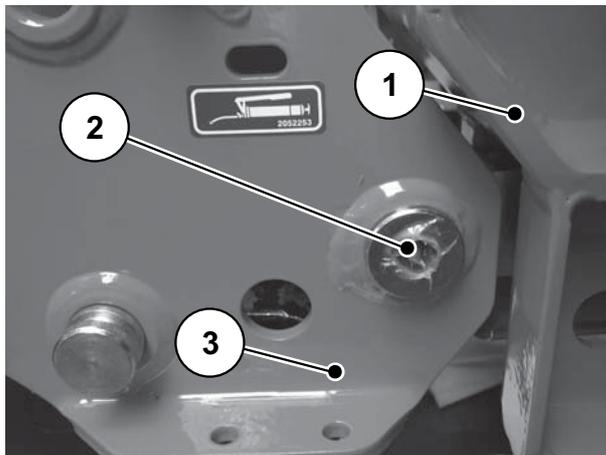


Figure 9.41: Lubrication point, weighing cell AXIS H 30.1 EMC + W

- [1] Solid fertiliser broadcaster AXIS H 30.1 EMC + W
- [2] Lubrication point
- [3] Weighing cell

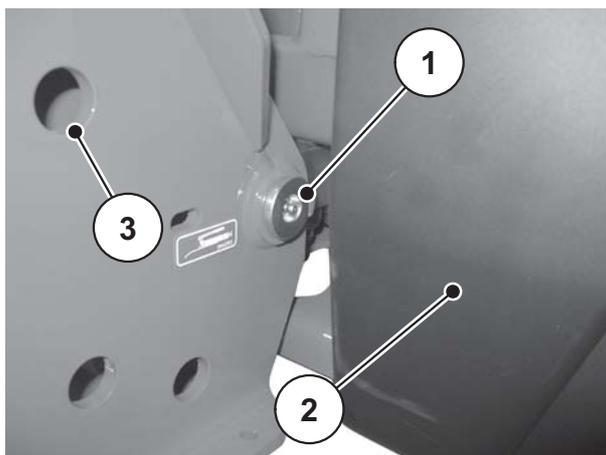


Figure 9.42: Lubrication point, weighing cell AXIS H 50.1 EMC + W

- [1] Lubrication point
- [2] Solid fertiliser broadcaster AXIS H 50.1 EMC + W
- [3] Weighing cell

9.14.2 Lubrication chart

Lubrication points	Lubricant	Notes
Metering slide	Grease/oil	Must move smoothly and be greased regularly.
Casting disc hub	Grease	Pivot and sliding surfaces must move smoothly and be greased regularly.
Upper and lower link balls	Grease	Grease regularly.
Joints, bushes, agitator drive	Grease/oil	Designed for dry operation but can be lightly greased.
Drop point adjustment for adjustable bases	Oil	Keep mechanical action smooth and oil regularly from the outer edge inward and from the base outward.
Lubrication point, weighing cell 30.1	Grease	
Lubrication point, weighing cell 50.1	Grease	

10 Disposal

10.1 Safety

▲ WARNING



Pollution of the environment due to unsuitable disposal of hydraulic and gear oil

Hydraulic oil and gear oil are not fully biodegradable. Therefore, oil must be prevented from entering the environment in an uncontrolled manner.

- ▶ The proper disposal of used oil must only be undertaken by the authorised maintenance personnel.
- ▶ Soak up or dam up oil that has run out of equipment with sand, soil or absorbent material.
- ▶ Collect hydraulic and gear oil in a suitable container provided for the purpose and dispose of it in accordance with the local statutory requirements.
- ▶ Prevent oil from running out and seeping into the public sewage system. Erect sand/soil barriers or other barrier measures to prevent oil from escaping into the reservoirs .

▲ WARNING



Environmental pollution due to the unsuitable disposal of packaging material

Packaging material contains chemical compounds, which must be dealt with appropriately.

- ▶ The specialised disposal of packaging material takes place via an appropriately authorised disposal company with adherence to the national regulations.
- ▶ Do not burn packaging material or dispose of it as household refuse.

▲ WARNING



Environmental pollution due to the unsuitable disposal of packaging material

The inappropriate disposal of materials is a threat to the environment.

- ▶ Disposal must be carried out by authorised companies only.

10.2 Disposal

The following points apply without restriction. The precautions laid down as a result of national regulations are to be carried out implicitly.

1. All components, auxiliary and operating substances must be removed from the solid fertiliser broadcaster by specialist personnel.

In so doing these parts are to be sorted into specific categories.

2. The materials are then to be disposed of in accordance with local regulations and directives for recycling or special refuse categories by authorised companies.

11 Terms/conditions of warranty

Rauch units are manufactured with modern production methods and with the greatest care and are subject to numerous inspections.

Therefore RAUCH offers a 12-month warranty subject to the following conditions:

- The warranty begins on the date of purchase.
- The warranty covers material and manufacturing faults. Our liability for third-party products (hydraulic system, electronics) is limited to the warranty of the manufacturer of the equipment. During the warranty period, manufacturing and material faults are corrected free of charge by replacement or repair of the affected parts. Other rights extending beyond the above, such as claims for conversion, reduction or replacement for damages that did not occur in the object of supply are explicitly excluded. Warranty services are provided by authorised workshops, by RAUCH factory representatives or the factory.
- The following are excluded from coverage by the warranty: natural wear, dirt, corrosion and all faults caused by improper handling and external causes. The warranty is rendered void if the owner carries out repairs or modifications to the original state of the supplied product. Warranty claims are rendered void if RAUCH original spare parts were not used. Therefore, the directions in the operating manual must be observed. In all cases of doubt contact our sales representatives or the factory directly. Warranty claims must be submitted to the factory by 30 days at the latest after occurrence of the problem. The date of purchase and the serial number must be indicated. If repairs under the warranty are required, they must be carried out by the authorised workshop only after consultation with RAUCH or the company's appointed representatives. The warranty period is not extended by work carried out under warranty. Shipping faults are not factory faults and therefore are not part of the warranty obligation of the manufacturer.
- No claims for compensation for damages that are not part of RAUCH machines themselves will be accepted. This also means that no liability will be accepted for damage resulting from spreading errors. Unauthorised modifications of RAUCH machines may result in consequential damage, for which the manufacturer will not accept any liability. The manufacturer's liability exclusion will not apply in case of wilful intent or gross negligence by the owner or a senior employee, and in cases where – according to the product liability law – there is liability for personal injury or material damage to privately used objects in the event of defects in the supplied product. It will also not apply in the event that assured properties are absent, if the purpose of the assured properties was to protect the purchaser against damage that does not involve the supplied product itself.



RAUCH
POWER FOR PRECISION

RAUCH Landmaschinenfabrik GmbH

 Landstraße 14 · D-76545 Sinzheim

 Victoria-Boulevard E200 · D-77836 Rheinmünster

Phone +49 (0) 7221/985-0 · Fax +49 (0) 7221/985-200
info@rauch.de · www.rauch.de · wap.rauch.de

