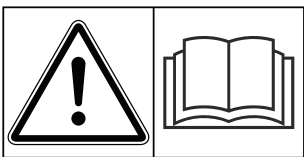




## Operator's manual



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

### Keep for future use

This operator's and assembly manual is an integral part of the machine. Suppliers of new and second-hand machines are required to document in writing that the operator's and assembly manual was delivered with the machine and handed over to the customer.

**AXENT 90.1**

5903360-**b**-en-1122

Original instructions

## Foreword

Dear customer,

By purchasing the large area spreader of the series AXENT, you have shown confidence in our product. Thank you very much! We want to justify this confidence. You have purchased a powerful and reliable machine.

However, in case unexpected problems arise, our customer service department is always there for you.



**Please read this operator's manual carefully before commissioning the large area spreader and follow the advice given.**

This operator's manual gives detailed instructions on the operation of the machine, as well as valuable information on assembly, maintenance, and care.

This manual may also describe equipment that is not included in your machine.

Please note that damage caused by incorrect operation or improper use cannot be covered by warranty claims.



Please enter your model type and serial number, together with the year of manufacture of your machine here.

These data are provided on the machine nameplate or on the frame.

Please state this information when ordering spare parts or optional equipment, and in case of complaints.

Type:

Serial number:

Year of manufacture:

## Technical improvements

We continuously strive to improve our products. For this reason, we reserve the right to make any improvements and changes to our machine that we consider necessary without notice. We do not accept any obligation to make such improvements or changes on machines that have already been sold.

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

Yours sincerely

RAUCH Landmaschinenfabrik GmbH

# Table of contents

<b>1</b>	<b>Intended use</b>	<b>7</b>
<b>2</b>	<b>User instructions</b>	<b>8</b>
2.1	About this operator's manual	8
2.2	Structure of the operator's manual	8
2.3	Notes on text descriptions	9
2.3.1	Instructions and procedures	9
2.3.2	Lists	9
2.3.3	References	9
<b>3</b>	<b>Safety</b>	<b>10</b>
3.1	General information	10
3.2	Meaning of warnings	10
3.3	General information on the safety of the machine	11
3.4	Instructions for the operator	11
3.4.1	Qualifications of personnel	11
3.4.2	Instruction	12
3.4.3	Accident prevention	12
3.5	Information on operational safety	12
3.5.1	Parking the machine	12
3.5.2	Filling the machine	13
3.5.3	Checks before commissioning the machine	13
3.5.4	Hazard zone	13
3.5.5	Running operation	14
3.5.6	Wheels and brakes	15
3.6	Use of fertilizer and slug pellets	16
3.7	Hydraulics system	16
3.8	Maintenance and service	17
3.8.1	Qualifications of maintenance personnel	17
3.8.2	Wear parts	17
3.8.3	Maintenance and service tasks	18
3.9	Safety in traffic	18
3.9.1	Checks before driving	18
3.9.2	Road travel with the machine	19
3.10	Safety equipment, warnings and instructions	19
3.10.1	Position of safety equipment as well as warning and instruction stickers	19
3.10.2	Function of safety equipment	23
3.11	Warning and instruction stickers	23
3.11.1	Warning stickers	24
3.11.2	Instruction stickers	25
3.12	Name plate and machine marking	27
3.13	Lighting system, front, side, and rear reflectors	29
<b>4</b>	<b>Machine data</b>	<b>30</b>
4.1	Manufacturer	30
4.2	Description of the machine	30

4.2.1	<b>Assembly overview</b> .....	31
4.3	Technical data .....	35
4.3.1	Technical data for the basic equipment .....	35
4.3.2	Technical data of fertilizer spreading unit .....	37
4.3.3	Wheels and tires .....	38
4.4	Special equipment .....	40
4.4.1	Optional equipment for the large area spreader .....	41
4.4.2	Optional equipment for the fertilizer spreading unit .....	41
<b>5</b>	<b>Transport without tractor</b> .....	<b>43</b>
5.1	General safety instructions .....	43
5.2	Loading and unloading, parking .....	43
<b>6</b>	<b>Commissioning</b> .....	<b>44</b>
6.1	Accepting the machine .....	44
6.2	Type approval .....	44
6.3	Tractor requirements .....	45
6.4	Mounting the universal drive shaft on the machine .....	45
6.5	Installing the machine at the tractor .....	48
6.5.1	Preconditions .....	48
6.5.2	Ball coupling .....	52
6.5.3	Hitch coupling .....	52
6.5.4	Folding away the support stand .....	53
6.5.5	Fitting the universal drive shaft at the tractor .....	53
6.5.6	Braking .....	54
6.5.7	Disengaging the parking brake .....	56
6.5.8	Establishing other connections .....	57
6.6	Filling the machine .....	57
6.7	Checking the filling level .....	59
<b>7</b>	<b>Spreading operation</b> .....	<b>61</b>
7.1	General information .....	61
7.2	Conveyor belt speed adjustment .....	62
7.3	Adjusting the opening of the pre-metering slide .....	62
7.4	Fertilizer spreading .....	63
7.4.1	Spreading operation sequence .....	63
7.4.2	Information on the fertilizer chart .....	63
7.4.3	Setting the machine via ISOBUS terminal .....	64
7.4.4	Setting the working width .....	66
7.4.5	Adjusting the drop point .....	69
7.4.6	Setting the application rate .....	71
7.4.7	Spreading at the headlands .....	71
7.5	Discharging residual material .....	74
7.5.1	Safety instructions .....	74
7.5.2	Emptying the machine .....	74
7.6	Parking and unhitching the machine .....	75
<b>8</b>	<b>Faults and possible causes</b> .....	<b>79</b>
<b>9</b>	<b>Maintenance and service</b> .....	<b>81</b>

9.1	Safety .....	81
9.2	Cleaning the machine .....	84
9.2.1	Cleaning the bearings of the guide rollers .....	84
9.2.2	Draining of cleaning water .....	85
9.2.3	Clean mud guards and wheels .....	86
9.3	Wear parts and screw connections .....	86
9.3.1	Checking wear parts .....	86
9.3.2	Checking the screw connections .....	87
9.4	Covers .....	87
9.4.1	Front cover .....	88
9.4.2	Spreading unit cover .....	88
9.5	Electrics, electronic system .....	89
9.6	Hydraulics system .....	90
9.6.1	Checking the hydraulic hoses .....	91
9.6.2	Replacing hydraulic hoses .....	91
9.6.3	Hydraulic cylinders for adjustment functions .....	92
9.6.4	Checking the conveyor belt drive .....	93
9.7	Setting of the towing bar suspension .....	93
9.8	Hitch .....	95
9.9	Setting the conveyor belt .....	95
9.9.1	Adjusting the conveyor belt position .....	95
9.9.2	Setting the conveyor belt tension .....	97
9.10	Adjusting the belt cleaner .....	98
9.11	Chassis and brakes .....	100
9.11.1	Checking the condition and function of the braking system .....	100
9.11.2	Checking the free travel of the slack adjuster .....	101
9.11.3	Draining the air tank .....	102
9.11.4	Checking the brake pad .....	102
9.12	Wheels and tires .....	102
9.12.1	Checking the tires .....	103
9.12.2	Checking the condition of the wheels .....	103
9.12.3	Checking the bearing clearance of the wheel hub .....	103
9.12.4	Changing wheels .....	103
9.12.5	Checking the brake lever length .....	105
9.13	Recovery of the machine .....	106
9.14	Lubrication plan .....	106
9.14.1	Basic machine lubrication points .....	107
9.14.2	Drive shaft lubrication .....	109
9.15	Maintenance of the fertilizer spreading unit .....	109
9.15.1	Checking the position of the spreading disc hub .....	109
9.15.2	Checking the agitator drive .....	110
9.15.3	Metering slide adjustment .....	113
<b>10</b>	<b>Winterization and preservation .....</b>	<b>116</b>
10.1	Safety .....	116
10.2	Washing the machine .....	116
10.3	Preserving the machine .....	117

<b>11 Disposal</b> .....	<b>118</b>
11.1 Safety.....	118
11.2 Disposal of the machine.....	118
<b>12 Appendix</b> .....	<b>119</b>
12.1 Tire table.....	120
12.2 Torque value.....	121
<b>13 Guarantee and warranty</b> .....	<b>125</b>

# 1 Intended use

The large area spreaders of the series AXENT may only be used in accordance with the stipulations of the present operator's manual.

The large area spreaders of the series AXENT are constructed in accordance with their intended use and may be **exclusively** used for the application of dry, granular and crystalline fertilizers, seeds and slug pellets.

The machine is intended to be used by one person and be attached to a tractor that meets the requirements of this operator's manual.

In the following chapters, the large area spreader is referred to as "machine."

Any use beyond these specifications is considered as contrary to the intended use. The manufacturer shall not assume any liability for any damages resulting from this. The risk is solely carried by the operator.

The intended use also comprises the compliance with the operating, maintenance, and repair conditions prescribed by the manufacturer. Only genuine spare parts from RAUCH may be used as replacements.

The machine may only be used, maintained and repaired by people who are familiar with the characteristics of the machine and who are aware of the risks.

The instructions regarding the operation, service, and safe handling of the machine as described in this operator's 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 other generally recognized safety-related, occupational health and road traffic regulations must be observed when using the machine.

Unauthorized modifications to the machine are not permitted. Such modifications exclude any liability of the manufacturer for any resulting damages.

## ■ **Foreseeable misuse**

The manufacturer provides warning notes and signs on the mineral fertilizer spreader relating to foreseeable misuse. These warnings and warning symbols must always be observed. This way, application of the machine against the intentions of the operator's manual is prevented.

## 2 User instructions

### 2.1 About this operator's manual

This operator's manual is an **integral part** of the machine.

The operator's manual contains important instructions for **safe, proper, and economic use and maintenance** of the machine. Compliance with its stipulations helps to **avoid risks**, reduce repair costs and downtime, and to increase the reliability and service life of the machine controlled with it.

The complete documentation, comprising this operator's manual and any other documents provided, must be kept in an easily accessible location close to where the machine is used (e.g., in the tractor).

If the machine is sold, the operator's manual must also be passed to the new owner.

The operator's manual is intended for the operator of the machine 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,
- Troubleshooting.

In particular, the following is to be observed:

- The chapter on safety,
- The warnings in the text of the individual chapters.

The operator's manual does not replace your **own responsibility** as operator and operational staff of the machine control unit.

### 2.2 Structure of the operator's manual

The operator's manual is divided into six key areas in terms of content

- User instructions
- Safety instructions
- Machine data
- Instructions on operating the machine
- Instructions for finding and correcting faults
- Maintenance and service instructions



## 2.3 Notes on text descriptions

### 2.3.1 Instructions and procedures

Steps that the operator must carry out are shown as follows.

- ▶ Instruction for action step 1
- ▶ Instruction for action step 2

### 2.3.2 Lists

Lists without a specific sequence are shown as lists with bullet points:

- Property A
- Property B

### 2.3.3 References

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

- **Example:** Please also note 3 *Safety*

References to other documents are shown as information or instructions without the exact chapter or page number:

- **Example:** Follow the instructions in the operator's manual of the universal drive shaft manufacturer.

## 3 Safety

### 3.1 General information

The chapter **Safety** contains basic warning notes as well as working and traffic safety instructions for the usage of the installed machine.

The adherence to the instructions in this chapter is a prerequisite for the safe handling and trouble-free operation of the machine.

There are additional warnings in the other chapters of this operator's manual, which must also be observed. The warning instructions are given before the text for the relevant actions.

Warning notes on the supplier components can be found in the respective supplier documentation. These warning instructions must also be observed.

### 3.2 Meaning of warnings

The warnings in the operator's manual are classified according to the severeness of the risk and the probability of its occurrence.

The warning symbols draw attention to the unavoidable residual risks inherent in the design to which users of the machine are exposed. The warnings used are structured as follows:

---

Symbol + **signal word**

Explanation

---

#### Level of danger of warnings

The level of danger is indicated in the signal word. The levels of danger are classified as follows:

#### **DANGER!**

##### **Type and source of danger**

This warning warns of a danger posing an immediate threat to the health and life of people.

Ignoring these warnings will result in severe injury or death.

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

#### **WARNING!**

##### **Type and source of danger**

This warning warns of a potentially dangerous situation for personal health.

Ignoring these warnings leads to severe injury.

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

**⚠ CAUTION!****Type and source of danger**

This warning warns of a potentially dangerous situation for personal health.

Ignoring these warnings leads to injury.

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

**NOTICE!****Type and source of danger**

This warning warns of material and environmental damage.

Ignoring these warnings will result in damage to the machine and to the environment.

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



This is a note:

General information containing application tips and particularly useful information, but which constitutes neither warnings nor hazards.

### 3.3 General information on the safety of the machine

The machine is constructed in accordance with the state of the art and the recognized technical regulations. However, its usage and maintenance may cause danger to the health and life of the operator or third parties and/or the impairment of the machine and other material assets.

For this reason, the machine may only be operated

- when it is in a proper and roadworthy condition,
- in awareness of safety and dangers.

Therefore, it is imperative that you have read and understood the contents of the operator's manual. You must be familiar with the applicable accident protection regulations and the generally accepted regulations for safety, occupational health, and road traffic, and apply these rules as required.

### 3.4 Instructions for the operator

The owner is responsible for the intended use of the machine.

#### 3.4.1 Qualifications of personnel

Before starting any work on or with the machine, all persons who are involved in operation, maintenance or service must have read and understood this operator's manual.

- The machine may only be operated by instructed personnel authorized by the owner.
- Persons who are apprentices, in training or under instruction may only work on the machine under the supervision of an experienced person.
- Maintenance and service may only be carried out by qualified maintenance personnel.

### 3.4.2 Instruction

Distribution partners, works representatives or employees of the manufacturer will instruct the operator regarding the operation and maintenance of the machine.

The owner must ensure that newly recruited operating and maintenance personnel are instructed to the same extent and with the same care with regard to the operation and repair of the machine in compliance with this operator's manual.

### 3.4.3 Accident prevention

Safety and accident prevention regulations are legally specified in every 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 let the machine run without supervision.
- Do not ride on the machine while it is working or being transported (**no passengers**).
- **Do not use** machine parts as steps.
- Always wear tight fitting clothes. Do not wear work clothes with belts, loose threads or other items that could get caught.
- Follow the manufacturer's warnings when handling chemicals. You may have to wear personal protective equipment (PPE).

## 3.5 Information on operational safety

Only use the machine in safe operating condition. Avoid hazardous situations.

### 3.5.1 Parking the machine

Only park the machine with an empty hopper on level, firm ground.

Prior to decoupling, check that the machine is secured against tilting and rolling.

- Is the parking brake engaged?
- Is the support stand folded down?
- Are the wheels secured with wheel chocks?

For further information, refer to chapter 7.6 *Parking and unhitching the machine*

### 3.5.2 Filling the machine

- Only fill the machine when the machine is mounted or attached to the tractor (depending on the machine)
- Only fill the machine when the engine of the tractor is shut off. Remove the ignition key in order to prevent the engine from being started.
- Make sure that there is adequate space on the filling side.
- Use suitable auxiliary equipment for filling the machine (e.g., front-end loader, screw conveyor).
- Fill the machine no higher than the top-edge. Check the filling level.
- Only fill the machine with the protective grid closed. This way, faults during spreading caused by lumps in the spreading material or other foreign bodies are prevented.

### 3.5.3 Checks before commissioning the machine

Check the operating safety of the machine before the first and every subsequent commissioning.

- Is all safety equipment at the machine installed and functioning?
- Are all fasteners and load-bearing connections tightly installed and in good condition?
- Are all locking mechanisms securely engaged?
- Are there **no** persons in the danger zone of the machine?
- Is the universal drive shaft cover in good condition?

### 3.5.4 Hazard zone

Ejected spreading material may cause serious injury (e.g., to the eyes).

When persons are present between the tractor and the machine, there is a great hazard by the tractor rolling away of machine movements. When persons are present between the tractor and the machine which may have fatal consequences.

The following figure displays the hazard zones of the machine.

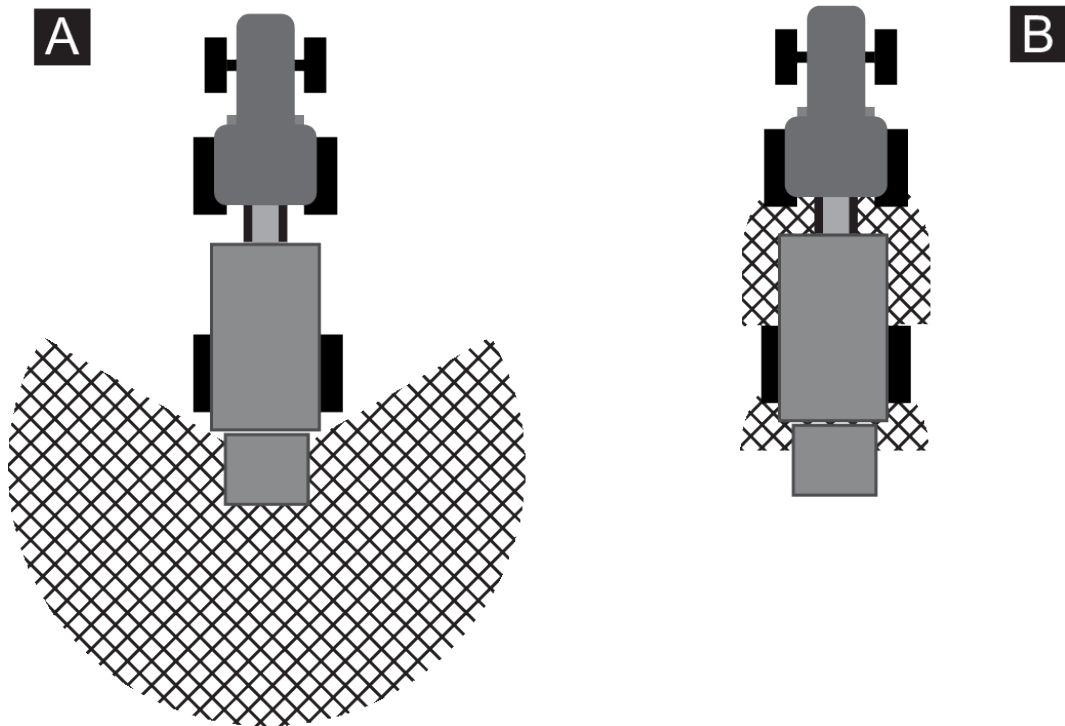


Fig. 1: Hazard zone when devices are pulled

A Hazard zone in spreading operation

B Hazard zone when coupling/decoupling the machine

- Ensure that no persons are present in the spreading range [A] of the machine.
- Immediately stop the machine and the tractor if persons are present in the hazard zone of the machine.
- When coupling/decoupling the machine at the tractor, make sure that no one is present in the hazard zones [B].

### 3.5.5 Running operation

- In the event of malfunctions, the machine is to be shut down and secured immediately against reactivation. Have the fault repaired immediately by qualified technicians.
- Do not climb on the machine while the spreader unit is running.
- Only operate the machine with the protective grids in the hopper closed. During operation, the protective grid must **neither be opened nor removed**.
- Rotating machine components can cause serious injury. Make sure that body parts or clothing never come close to rotating components.
- Do not deposit any parts (such as screws, nuts) in the hopper.
- Ejected spreading material may cause serious injury (e.g., to the eyes). For this reason, ensure that nobody is present in the spreading range of the machine.
- If the wind speed becomes too high, spreading has to be stopped as the specified spreading range cannot be guaranteed under such conditions.
- Do not climb on the machine or the tractor when it is situated beneath high-voltage electrical power lines.
- Do not open or close the hopper cover when the machine is situated under high-voltage electrical power lines.

#### ■ **Measures in case of contact with overhead lines**

- Operations such as opening and closing the hopper cover can change the dimensions of the machine. Check the area to make sure that the machine can be operated safely.
- Do not leave the vehicle if it is standing under hazardous voltage (discharge voltage pattern).
- In case of contact with power lines, remain in the vehicle if possible.
- Keep all persons away from the machine (at least 10 m) and contact emergency services to ask them to switch off power.
- Drive away from the power line if the machine is operational.  
If you have to leave the cabin, park the machine, turn off the engine, and jump away from the machine as far as possible. Do not touch the ground and the machine at the same time as this may result in electric shock.
- Maintain a safe distance from the machine as the ground near the machine can be live.
- Do not return to the machine until the operator of the power line has confirmed that it is safe to do so.

### 3.5.6 **Wheels and brakes**

Due to the high overall weight and the terrain, the chassis of the towed machine is subject to extreme loads. To ensure operational safety, the following points are to be considered:

- All wheels and tires must comply with the technical requirements specified by the manufacturer.
- Wheels must not be bent or have inadmissible bumps.
- Check the wheels at their sides on the inside and outside. In case of damage (bumps, scratches), replace them immediately.
- Prior to every use, check the tire pressure and the function of the brakes.
- Have the brake pads replaced in time. All brake pads must comply with the technical requirements specified by the manufacturer.
- To prevent contamination of the wheel bearings, they must always be covered by dust covers.
- Only use wheels approved in the certificate of conformity. Always observe the specification of the approved wheels (load bearing capacity, tire pressure).
- Check the brake pads when changing the tires and when using tires other than those approved by the manufacturer. See *9.12.4 Changing wheels*
- **Do not use the tractor joystick for braking** This way, trailers with pneumatic brakes cannot be stopped.

### 3.6 Use of fertilizer and slug pellets

Improper selection or use of fertilizer and slug pellets may cause serious injury or environmental damage.

- When selecting the fertilizer, inform yourself of its effects on humans, the environment and the machine. When using slug pellets, observe the specific national plant protection directives.
- When selecting the fertilizer, inform yourself of its effects on humans, the environment and the machine.
- Always follow the instructions of the fertilizer manufacturer.

### 3.7 Hydraulics system

The hydraulic system is under high pressure.

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

- Always operate the machine below the permissible maximum operating pressure.
- **Release the pressure** from the hydraulic system **before** carrying out any maintenance. Switch off the engine of the tractor. Secure it against reactivation.
- When searching for leaks, always wear safety **glasses** and safety **gloves**.
- In case of injury in connection with hydraulic oil, consult **a physician immediately** as severe infections may occur.
- When connecting the hydraulic hoses to the tractor, ensure that the hydraulic system is **depressurized**, both on the tractor and the machine side.
- Attach the hydraulic hoses of the tractor and the spreader hydraulic systems only with the prescribed connections.
- Prevent any contamination of the hydraulic circuit. Always suspend the couplings in the brackets provided. Use the dust caps. Clean the connections before coupling them.
- Regularly check the hydraulic components and hydraulic hose lines for mechanical defects, e.g., cuts and abrasions, contusions, bends, tears, porosity, etc.
- Even when stored correctly and used within approved load limits, hoses and hose couplings are subject to a natural aging process. This limits their storage and service life.

The hydraulic hoses are designed for a maximum service life of 6 years, including storage for a maximum of 2 years.

The month and year of manufacture of the hydraulic hoses is stamped on the hose fitting.

- Have the hydraulic hoses replaced if they are damaged and after the specified service life has been reached.
- Replacement hydraulic hoses must meet the technical requirements of the equipment manufacturer. Make sure the replacement hydraulic hoses meet the maximum pressure specifications.



## **3.8 Maintenance and service**

Maintenance and service involve additional hazards that do not occur during operation of the machine.

For this reason, take particular care when carrying out maintenance and service work. Work particularly thoroughly and cautiously.

### **3.8.1 Qualifications of maintenance personnel**

- Only specialist workshops or approved brake repair service providers may perform adjustment or repair work on the brake system.
- Only qualified personnel may perform repair work on wheels and tires. They must use appropriate mounting tools for this.
- Welding and work on the electrical and hydraulic systems is to be carried out by qualified technicians only.

### **3.8.2 Wear parts**

- The maintenance and service intervals described in the present operator's manual are to be strictly adhered to at all times.
- Also observe the maintenance and service intervals for the supplied components. See the supplier documentation for the relevant intervals.
- We recommend having your dealer check the condition of the machine, particularly fastening components, safety-relevant plastic components, the hydraulic system, metering components and spreader vanes, after every working season.
- Spare parts must at least comply with the technical standards specified by the manufacturer. Compliance with technical requirements is ensured using original spare parts.
- 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 Maintenance and service tasks

- **Always switch off the tractor engine** before any cleaning, maintenance, service, and troubleshooting. **Wait until all rotating parts of the machine have come to a standstill.**
- Make sure that no unauthorized person can start the machine. Remove the ignition key of the tractor.
- Disconnect the power supply between the tractor and the machine before performing any maintenance and service tasks or before working on the electrical system.
- Check that the tractor with the machine is correctly parked. Park the spreader with an empty hopper on level, solid ground and secure it to prevent it from moving.
- Release the pressure from the hydraulic system before any maintenance and repair work.
- If work is to be carried out while the PTO shaft is rotating, make sure that nobody is near the PTO or the universal drive shaft.
- Never clear blockages in the spreader hopper by hand or with the foot: always use a suitable tool.
- Before cleaning the machine with water, steam jet, or other cleaning agents, cover all components that must not get wet (e.g., bearings, electrical connections).
- Regularly check nuts and screws for tightness. Retighten loose connections.
- After driving the first 5 km, check the tightening torque of each individual wheel nut. See *9.12.4 Changing wheels*

## 3.9 Safety in traffic

Driving on public roads with the towed machine without attached spreading unit is prohibited (override protection).

When traveling on public roads and tracks, the tractor with the towed machine and attached spreading unit 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

The check before departure is an important contribution to road safety. Before every trip, check compliance with the operating conditions, traffic safety, and the regulations of the country of operation.

- Is the admissible overall weight complied with? Observe the admissible towing load and static load of the trailer unit as well as the admissible axle load.
- Note the permitted brake load, the permitted tire load capacity load, and the permitted tire pressure.
- Is the machine coupled correctly?
- Can fertilizer be lost while traveling?
  - Observe the filling level of the fertilizer in the hopper.
  - The metering slides must be closed.
  - Switch off the electronic control unit.
- Check the tire pressures and the function of the machine brake system. Observe the admissible brake load and tire payload.
- Does the brake system setting correspond to the machine's load? See *6.5.6.1 Setting the manual brake force regulator*.
- Is the hopper cover closed and secured against accidental opening?
- Do the lighting and labeling on the machine comply with the national regulations for operation on public roads? Make sure that warning signs, rear reflectors, and auxiliary lights are correctly placed.

### 3.9.2 Road travel with the machine

Handling, steering, and braking performance of the tractor are affected by the towed machine. For example, an excessive support load of the machine will reduce the weight on the front axle of the tractor and affect the steering.

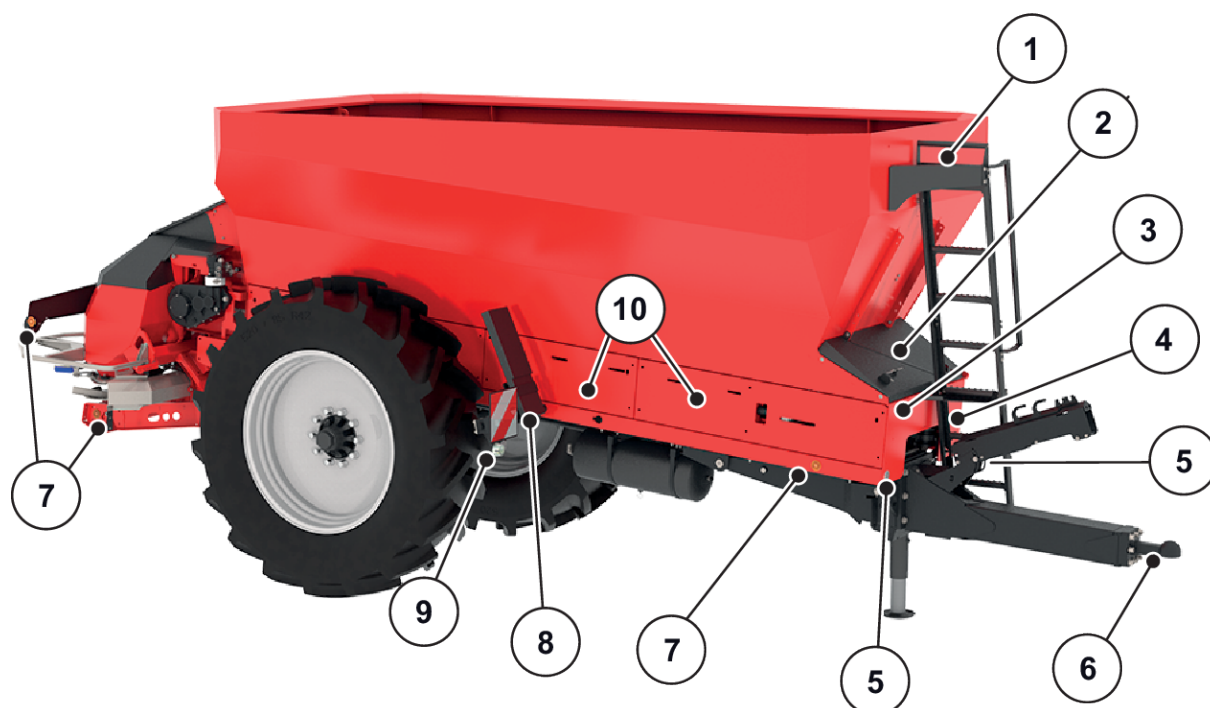
- Adapt your driving to the modified driving characteristics.
- When driving, always ensure that there is sufficient visibility. If vision is restricted (e.g., when reversing), another person is required to direct the driver.
- Observe the admissible maximum speed.
- Avoid sudden turns when driving uphill or downhill or across a slope. The change in the center of gravity may increase the danger of tipping. Special care is to be particularly applied when driving on uneven, soft ground (e.g., when entering fields, curbs).
- Passengers are prohibited on the machine during transport and operation.
- If necessary, attach a front weight at the tractor. For further information, please refer to the operator's manual of the tractor.

## 3.10 Safety equipment, warnings and instructions

### 3.10.1 Position of safety equipment as well as warning and instruction stickers

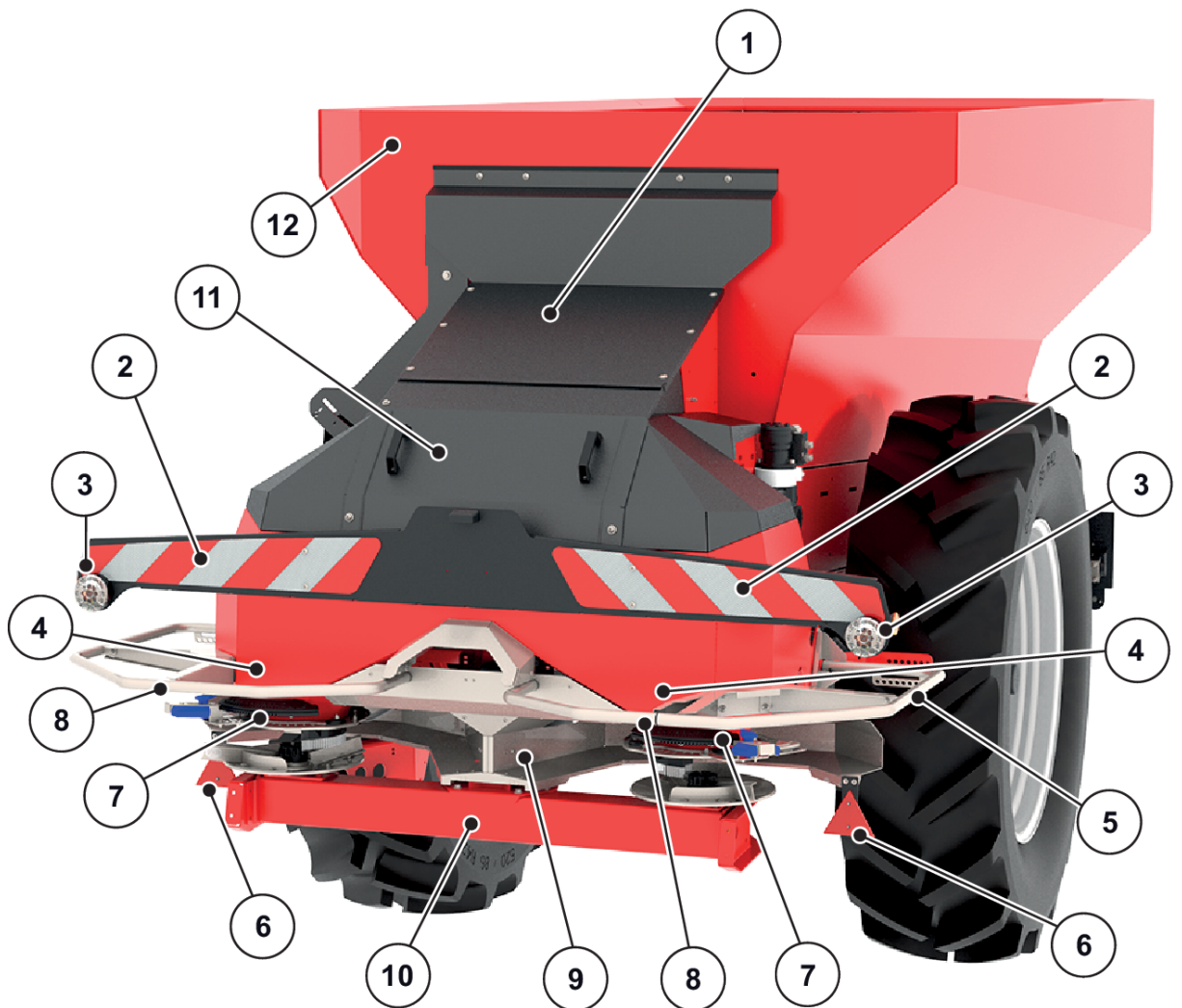


The safety equipment is not available in all countries and depends on the regulations that apply where the machine is used.



*Fig. 2: Safety equipment, warning and instruction stickers, front*

- |  |  |
|--|--|
| [1] Warning: passenger transport prohibited  | [6] Trailer unit nameplate                               |
| Warning: high-voltage electrical power lines | [7] Yellow side reflectors                               |
| [2] Cleaning flap cover                      | [8] Wheel chock  |
| Warning: moving parts                        | Warning: wheel chocks                                    |
| [3] Homologation sign                        | [9] Front lighting with warning sign and white reflector |
| Serial number                                | [10] Side cover for guide rollers and conveyor belt      |
| [4] Warning: read operator's manual          |  |
| Warning: remove ignition key                 |  |
| [5] White reflectors                         |  |



*Fig. 3: Safety equipment, warning and instruction stickers, rear*

- |  |  |
|--|--|
| [1] Pre-metering slide cover           | [7] Warning: crushing hazard               |
| [2] Warning sign                       | [8] Warning: do not climb onto the machine |
| [3] Tail light, brake light, indicator | [9] Spreading disc cover                   |
| [4] Warning: moving parts              | [10] Warning: ejection of material         |
| [5] Deflector bracket                  | [11] Spreading unit cover                  |
| [6] Red reflectors                     | [12] Admissible maximum speed              |

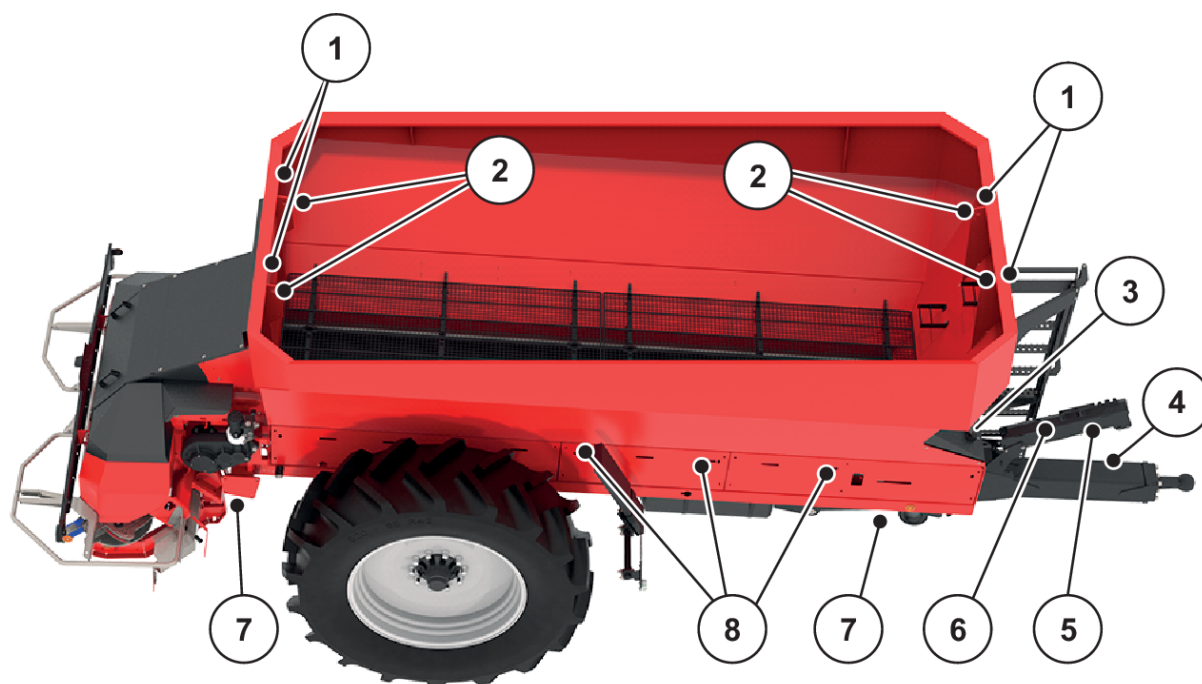


Fig. 4: Safety equipment, warning and instruction stickers, top

- |   |  |
|---|--|
| [1] Instructions: eyelet in hopper                    | [7] Universal drive shaft cover (underneath the machine) |
| [2] Eyelets   | [8] Warning: moving parts (behind folding side cover)    |
| [3] Instructions: cleaning flap                       |  |
| [4] Instructions: PTO speed                           |  |
| [5] Warning: danger from hydraulic system             |  |
| [6] Instructions: color assignment of hydraulic hoses |  |

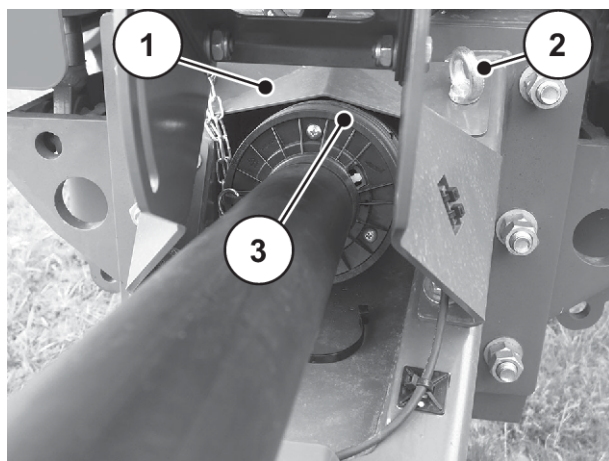


Fig. 5: Universal drive shaft

- |                      |                                 |
|----------------------|---------------------------------|
| [1] Protective sheet | [3] Universal drive shaft cover |
| [2] Eyelet           |                                 |

### 3.10.2 Function of safety equipment

The safety equipment is designed to protect your health and life.

- Before working with the machine, ensure that the safety equipment is functioning and not damaged.
- Only operate the machine when the safety equipment is functional.

Designation	Function
Universal drive shaft guard	Prevents body parts and clothing from being pulled into the rotating universal drive shaft.
Wheel chock	Prevents rolling of the machine
Spreading unit cover	Prevents body parts from being caught by the agitator
Side cover	Prevents body parts from being cut off by the conveyor belt and caught by the guide rollers.
Cleaning flap cover	Prevents body parts from being pulled into the conveyor belt and guide rollers.
Spreading disc cover	Prevents the ejection of fertilizer to the front (direction of tractor/workplace).
Deflector bracket	Protection against getting caught by the rotating spreading discs from behind and from the side.

### 3.11 Warning and instruction stickers

Various warning and instruction stickers are attached to the machine (for the position at the machine, please refer to *3.10.1 Position of safety equipment as well as warning and instruction stickers*).

The warning and instruction stickers are components of the machine. They must not be removed or modified.

- ▶ Replace missing or illegible warning and instruction stickers immediately.

If new components are installed during repairs, the same warning and instruction stickers that were on the original parts must be placed on the new parts.



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

### 3.11.1 Warning stickers












Illustration	Description
	<p>Read the operator's manual and warnings. Read and observe the operator's manual and warnings before commissioning the machine. The operator's manual explains in detail how to operate the spreader and contains valuable information on operation, care and maintenance.</p>
	<p>Remove the ignition key. Switch off the engine and remove the key before carrying out maintenance and repair work. Disconnect the power supply</p>
	<p>Passenger transport prohibited Risk of slipping and injury. Do not climb on the machine during spreading and transport.</p>
	<p>Climbing prohibited Climbing on the deflector bracket is prohibited.</p>
	<p>Danger due to ejection of material Danger of injury to the whole body caused by ejected spreading material Before commissioning, instruct all people to leave the hazard zone (spreading range) of the machine.</p>
	<p>Danger due to moving parts Danger of cutting off body parts It is prohibited to reach into the hazard zone of rotating parts. Switch off the engine and remove the key before carrying out maintenance, repair and adjustment work.</p>
	<p>Crushing hazard Risk of crushing a hand. It is prohibited to reach into the hazard zone.</p>



Illustration	Description
	<p>Danger from hydraulic system                      Hot fluid escaping under high pressure may cause serious injury. It may also penetrate the skin and cause infection.                      De-pressurize the hydraulic system before maintenance work.                      When checking for leakage, wear protective goggles and protective gloves at all times.                      In the event of injury caused by hydraulic oil, seek medical attention immediately!                      Observe the manufacturer documentation.</p>
	<p>Risk of death due to live overhead lines                      Never park the machine under live overhead lines.                      Keep safety distance.</p>
	<p>Wheel chock                      When parking the machine, secure it with wheel chocks against rolling.</p>
	<p>Ban on splash water                      It is prohibited to splash water into the housing of the job computer and other electronic components.</p>

### 3.11.2 Instruction stickers


Illustration	Description
	<p>Rated speed of the PTO shaft                      The rated speed of the PTO shaft is 750 rpm.</p>




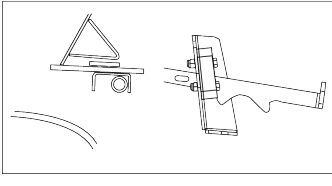
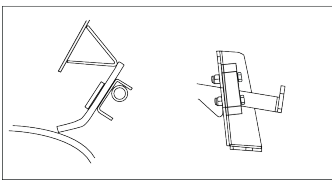


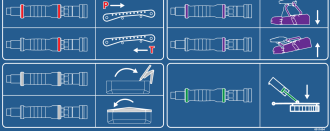
Illustration	Description
	<p>Eyelet in the hopper Labeling of the bracket for fixing the hoisting gear</p>
	<p>Lubrication point</p>
	<p>Application point for the lifting jack</p>
	<p>The cleaning flap is open.</p>
	<p>The cleaning flap is closed.</p>

Illustration	Description
	Admissible maximum speed
	Trailer unit nameplate
	<p>Color assignment at the handles of the hydraulic hoses</p> <p>Left: Hydraulic hoses of the machine, conveyor belt drive, and hopper cover drive</p> <p>Right: further hydraulic hoses if optional equipment is mounted on the machine: GSE or TELIMAT.</p>

### 3.12 Name plate and machine marking



When delivering your machine, ensure that all necessary signs are present.

Depending on the country of destination, additional signs can be attached to the machine.

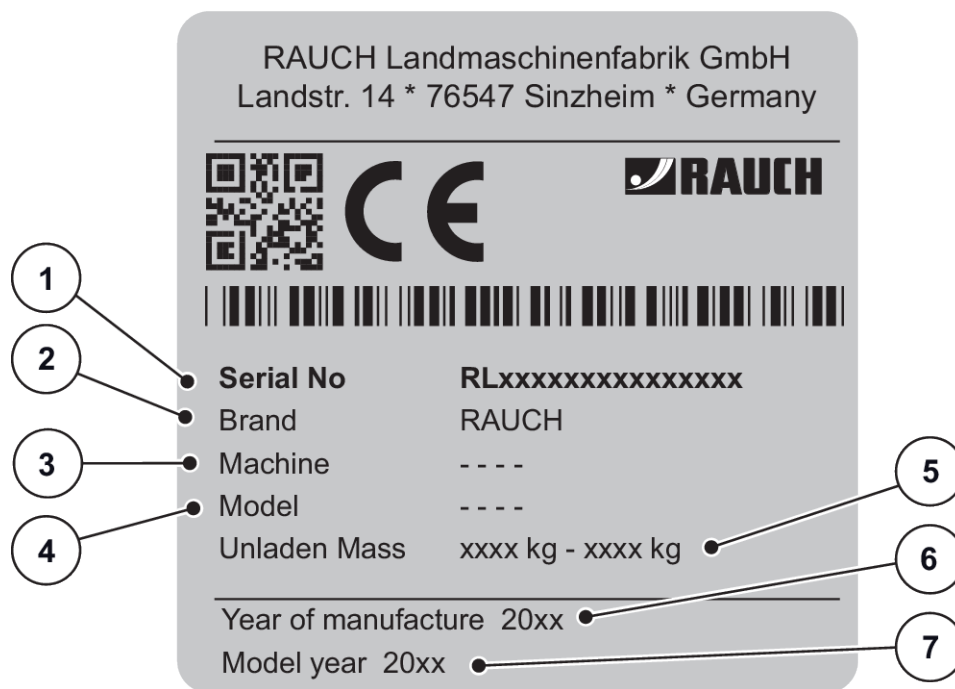


Fig. 6: Nameplate

- |                   |                               |
|-------------------|-------------------------------|
| [1] Manufacturer  | [6] Admissible axle load      |
| [2] Serial number | [7] Admissible overall weight |
| [3] Machine       | [8] Year of construction      |
| [4] Type          | [9] Model year                |
| [5] Empty weight  |                               |

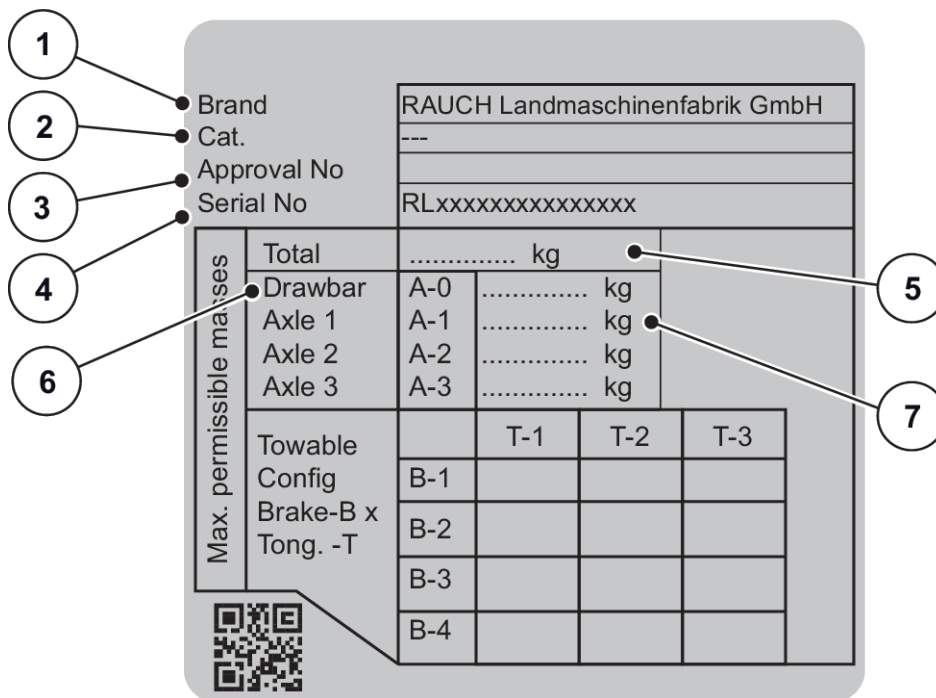


Fig. 7: Homologation sign

- |                             |                               |
|-----------------------------|-------------------------------|
| [1] Manufacturer            | [5] Admissible overall weight |
| [2] Category                | [6] Admissible static load    |
| [3] EU type approval number | [7] Axle load                 |
| [4] Serial number           |                               |

### 3.13 Lighting system, front, side, and rear reflectors

- ▶ Correctly attach the lighting equipment to the machine as specified.

*The lighting equipment must always be in operating condition.*

*Lights must not be covered or obscured by dirt.*

The machine is factory-equipped with a lighting system and front, rear, and side lighting (for the attachment to the machine, please refer to *Fig. 3 Safety equipment, warning and instruction stickers, rear*).

## 4 Machine data

### 4.1 Manufacturer

RAUCH Landmaschinenfabrik GmbH  
Landstrasse 14  
76547 Sinzheim  
Germany

Phone: +49 (0) 7221 985-0

Fax: +49 (0) 7221 985-206

#### **Service Center, Technical Customer Service**

RAUCH Landmaschinenfabrik GmbH  
PO box 1162  
email: [service@rauch.de](mailto:service@rauch.de)  
Fax: +49 (0) 7221 985-203

### 4.2 Description of the machine

Use the machines in accordance with chapter 1 *Intended use*.

The machine consists of the following assemblies.

- Hopper with frame
- Conveyor belt and outlet elements
- Ball coupling/trailer coupling
- Universal drive shaft with overload protection
- Wheels and brake system
- Fertilizer spreading unit
- Safety equipment - See 3.10.1 *Position of safety equipment as well as warning and instruction stickers*



Some models are not available in all countries.

### 4.2.1 Assembly overview

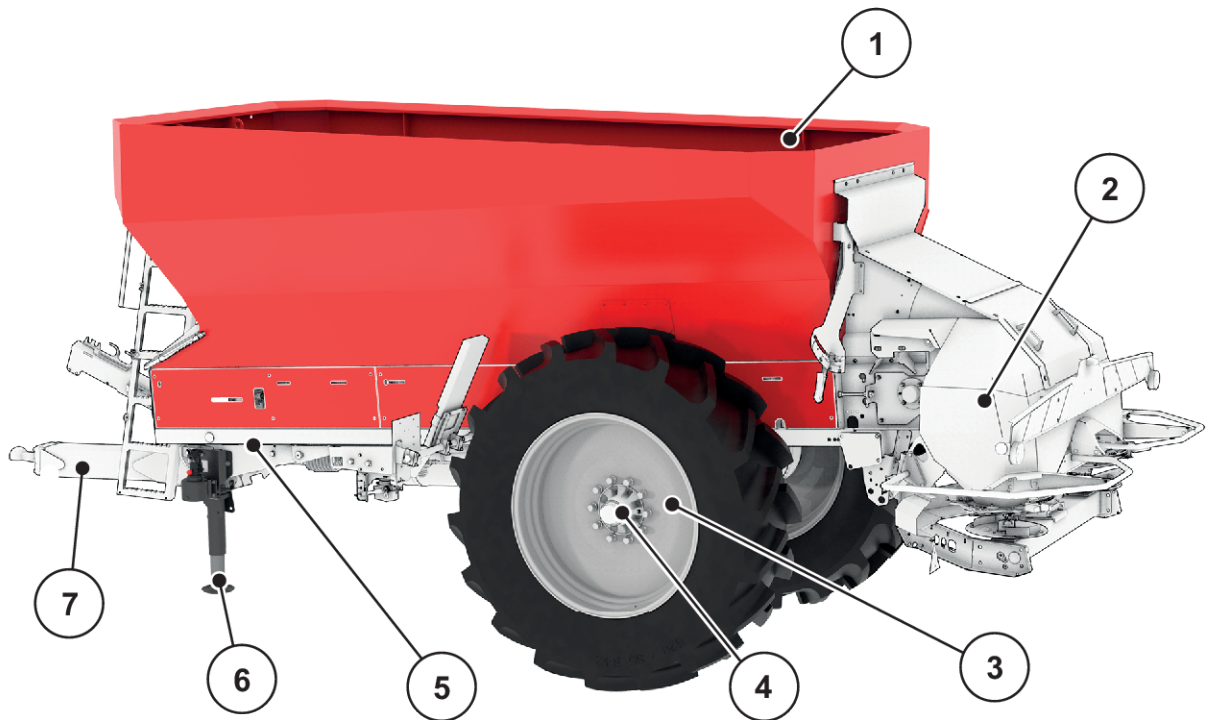
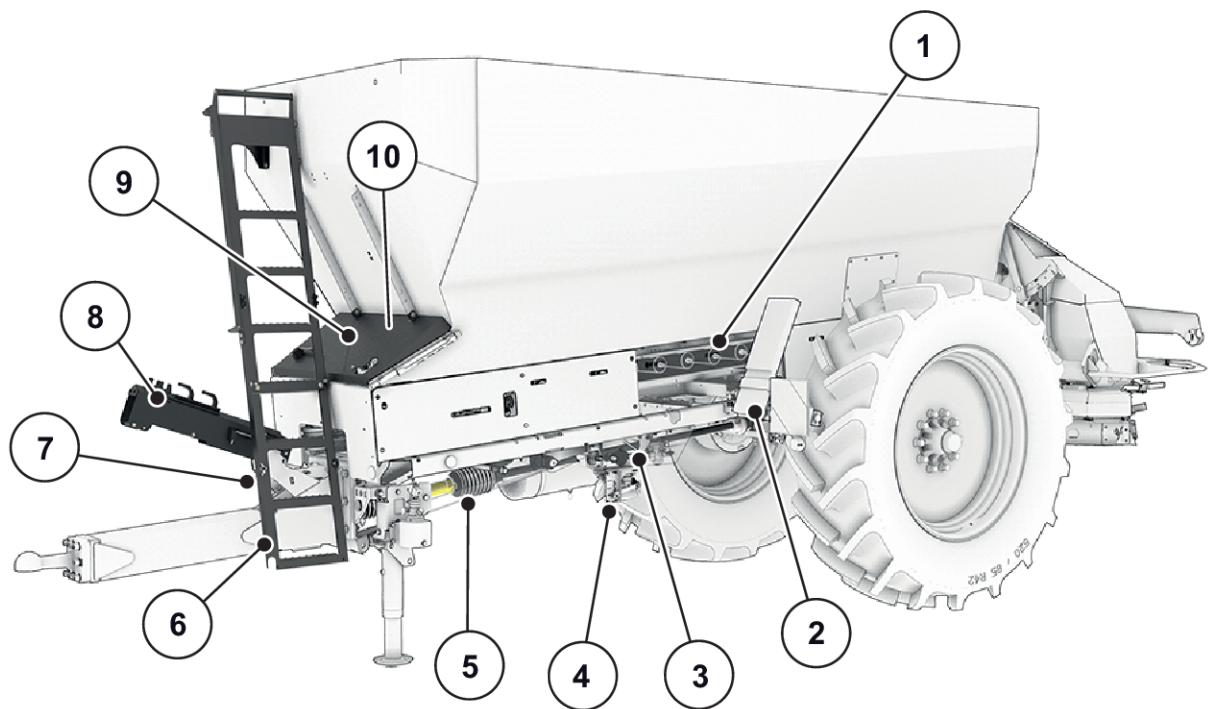


Fig. 8: Assembly overview: left side

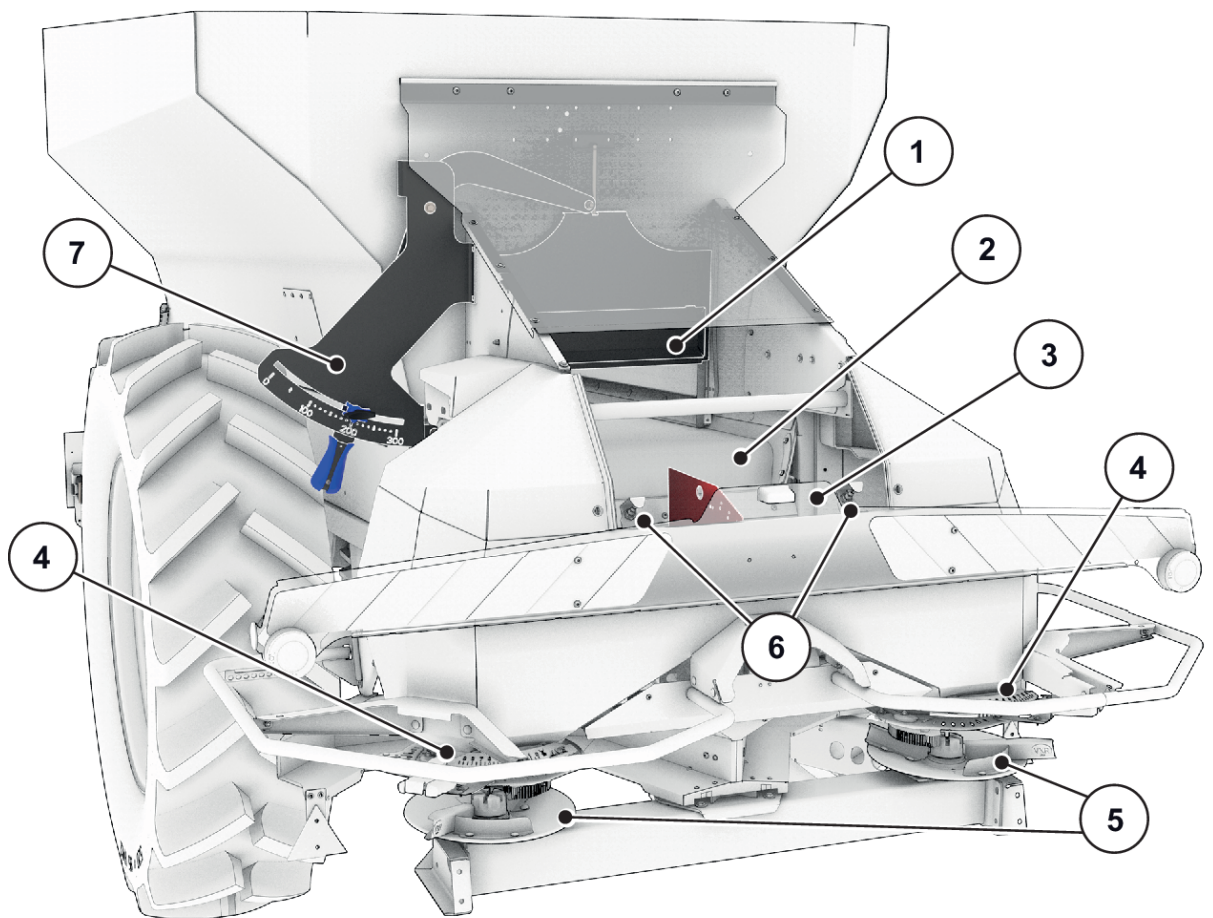
- |                           |                      |
|---------------------------|----------------------|
| [1] AXENT hopper          | [5] Frame            |
| [2] Spreading unit hopper | [6] Support stand    |
| [3] Wheel                 | [7] Trailer coupling |
| [4] Braking axle          |                      |



*Fig. 9: Assembly overview: Front*

- |                                     |   |
|-------------------------------------|---|
| [1] Conveyor belt and guide rollers | [6] Folding ladder                      |
| [2] Wheel chock transport bracket   | [7] Universal shaft drive               |
| [3] Parking brake                   | [8] Hose and cable tray                 |
| [4] Brake force regulator           | [9] Maintenance flap                    |
| [5] Universal through drive shaft   | [10] Filling level sensor in the hopper |



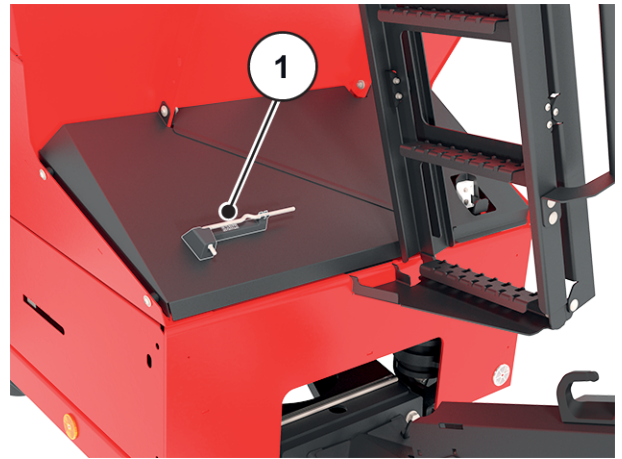


*Fig. 10: Assembly overview: Rear*

- |                                  |   |
|----------------------------------|---|
| [1] Pre-metering slide           | [6] Ultrasonic sensors for the spreading unit hopper    |
| [2] Conveyor belt                | [7] Adjustment center of the pre-metering slide opening |
| [3] Hopper of the spreading unit |   |
| [4] Drop point adjustment center |   |
| [5] Spreading disc               |   |

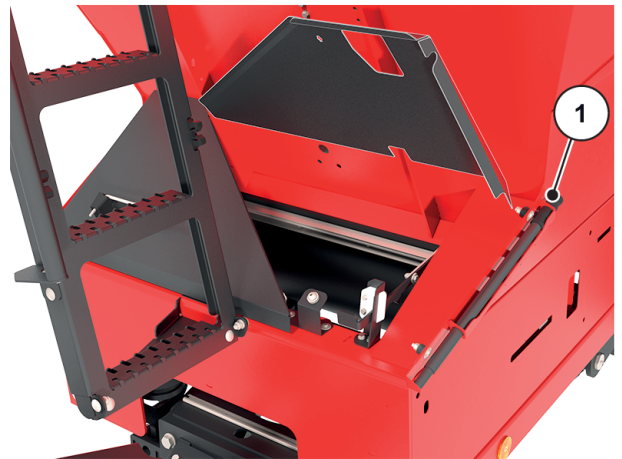
For disassembly and assembly of specific components at the machine, the adjustment lever is required as a tool. It is located at the front of the machine.

[1] Adjustment lever (direction of travel on the left)



*Fig. 11: Adjustment lever position*

The lever [1] for the support stand is located on the hopper on the left side (direction of travel)



*Fig. 12: Location of the lever*

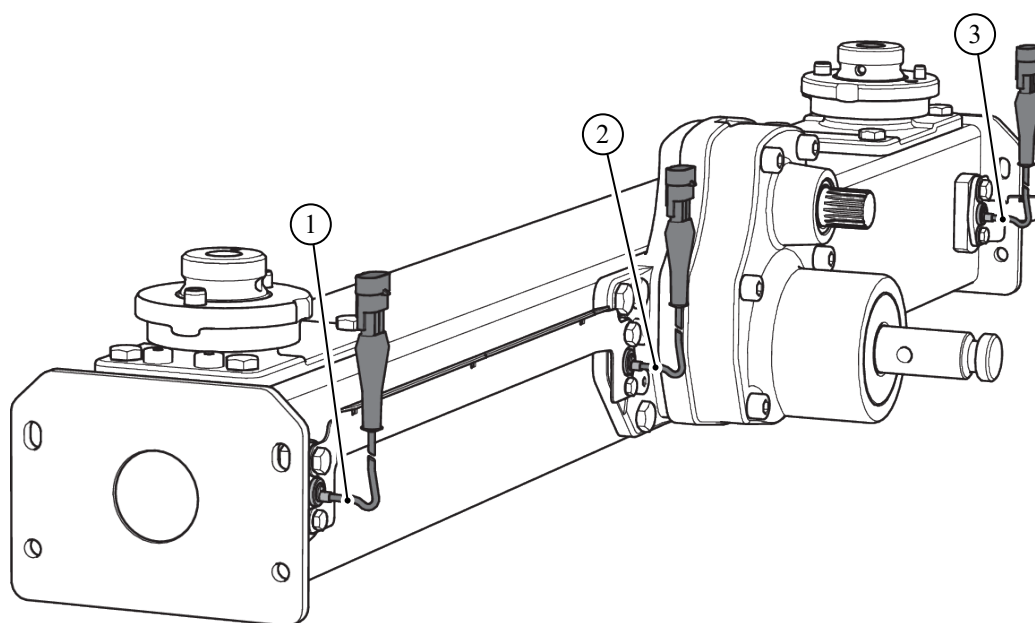


Fig. 13: Mass flow control by measuring the torque of the spreading discs

- [1] Right speed sensor (direction of travel)      [3] Left speed sensor (direction of travel)  
 [2] Reference speed sensor

### 4.3 Technical data



Some models are not available in all countries.

#### 4.3.1 Technical data for the basic equipment

Data	AXENT 90.1
Total width	2.55 m Depending on the tires, up to 3.0 m at the wheels
Height	3.10 Up to 3.20 m depending on the tires
Clearance (to frame bottom edge)	0.75 m
Hopper capacity	9 400 l
Filling level	2.95 cm
Length of trailer unit to vehicle end (with attached fertilizer spreader)	Approx. 7.70 m depending on attached options

Data	AXENT 90.1
Length of trailer unit to axle With towing bar for bottom hitching	5.00 m
PTO speed	750 rpm
Conveying rate for conveyor belt <sup>1</sup>	max. 1 600 kg/min
Track width <sup>2</sup>	2.00 m to 2.40 m depending on equipment variant
Standard tires <sup>3</sup>	520/85 R42
Sound pressure level <sup>4</sup> (measured in the closed driver's cab of the tractor)	75dB(A)

### ■ Weights and loads



The empty weight (mass) of the machine varies depending on the feature package and extension combination. The empty weight (mass) shown on the nameplate refers to the standard version.

Data	AXENT 90.1
<b>Admissible axle load</b>	10 000 kg
<b>Empty weight AXENT 90.1</b>	4,000 - 4,600 kg (depending on the equipment)
<b>Fertilizer payload<sup>5</sup></b>	9 000
Observe the <b>admissible static load</b> of the trailer equipment	3 000 kg

<sup>1)</sup> Max. conveying rate depending on fertilizer type

<sup>2)</sup> Different track width on request

<sup>3)</sup> Other tires are available as an option

<sup>4)</sup> Since the sound pressure level of the machine can only be determined when the tractor is running, the actual measured value is greatly dependent on the tractor type being used.

<sup>5)</sup> The exact payload depends on the machine's equipment (wheels, rigid axle, brake system, etc.).

### ■ Center of gravity



The position of the center of gravity depends on the coupling type, the axle position as well as the filling level in the hopper.

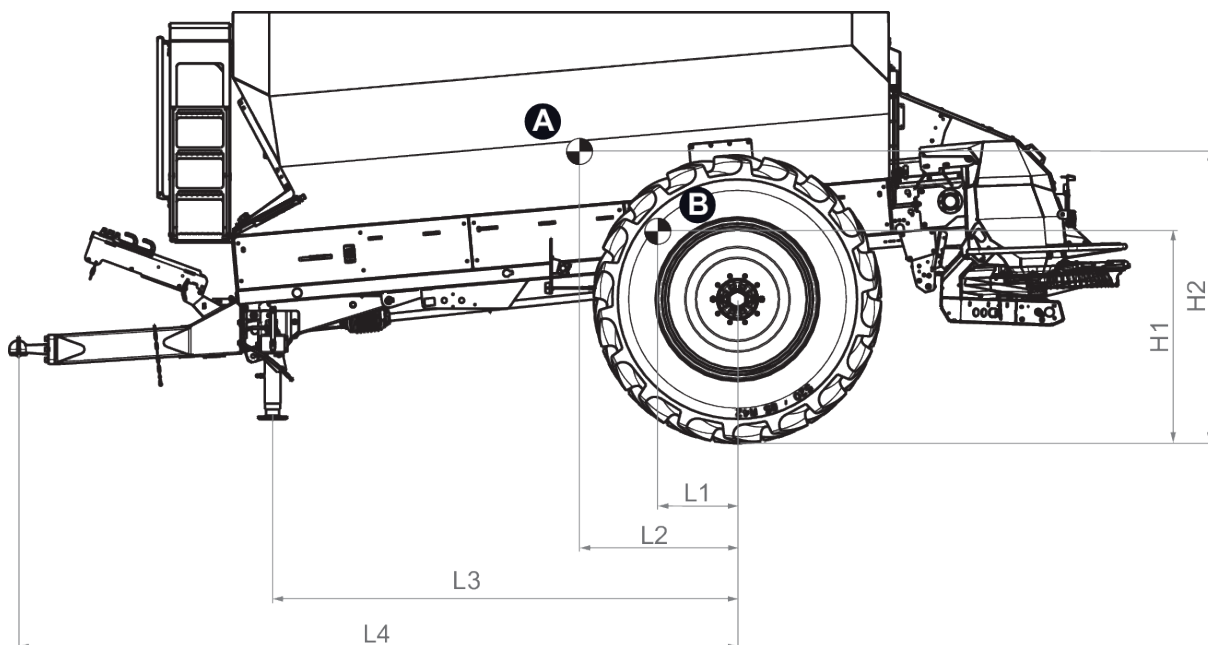


Fig. 14: Center of gravity at bottom hitching

A Center of gravity with full hopper

B Center of gravity with empty hopper

Length	Bottom hitching (mm)
L1	550
L2	1090
L3	3200
L4	4980
H1	1460
H2	2020

### 4.3.2 Technical data of fertilizer spreading unit

Data	AXIS-PowerPack
Overall width with deflector bracket	2.55 m
Working width <sup>6</sup>	18 - 50 m

<sup>6</sup>) Working width depending on fertilizer type

Data	AXIS-PowerPack
Hopper capacity	Approx. 200 l
Mass flow <sup>7</sup>	500 kg/min
Transmission for the universal shaft drive	750 rpm
Spreading disc speed	900 rpm

### 4.3.3 Wheels and tires



Some models are not available in all countries.

Observe the labeling on the tire:

- Speed category
  - A8 for 40 km/h
- Load index (LI)
  - LI = 164 for a load bearing capacity of 5,000 kg



The air pressure can vary widely by manufacturer.

- Observe the air pressure depending on the tire manufacturer's load bearing capacity.

<sup>7)</sup> Max. mass flow depending on fertilizer type

Tire size	Track width in m	Rigid axle 2 m	Rigid axle 2.40 m	Tire pressure in bar Load bearing capacity: 500 kg at 40 km/h
480/80 R46	2.15	x	-	See tire manufacturer's data sheet
	2.25	x	-	
	2.40	-	x	
520/85 R42	2.00	x	-	
	2.10	x	-	
	2.15	x	-	
	2.25	x	-	
	2.40	-	x	
520/85 R46	2.00	x	-	
	2.10	x	-	
	2.15	x	-	
	2.25	x	-	
	2.40	-	x	
650/65 R42	2.00	x	-	
	2.10	x	-	
	2.25	x	-	
	2.40	-	-	

## Table key

- x: available for this machine variant
- -: not available

Tire size	Track width in m	Rigid axle 2 m	Rigid axle 2.40 m	Tire pressure in bar Load bearing capacity: 500 kg at 40 km/h
VF 380/90 R46	2.25	x	-	See tire manufacturer's data sheet
	2.40	-	x	
VF 380/105 R50	2.25	x	-	
	2.40	-	x	
VF 520/85 R42	2.00	x	-	
	2.15	x	-	
	2.25	x	-	
	2.40	-	x	
VF 520/85 R46	2.00	x	-	
	2.15	x	-	
	2.25	x	-	
	2.40	-	x	

## Table key

- x: available for this machine variant
- -: not available

## 4.4 Special equipment



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



Some models are not available in all countries.



The available special equipment depends on the country of use of the machine and is not listed fully here.

- Contact your dealer/importer if you need specific special equipment.



#### 4.4.1 Optional equipment for the large area spreader

- Universal drive shaft 1 3/8", 6-part
- Weighing unit
- Kingpin steering
- Mud guard
- Hopper cover

#### 4.4.2 Optional equipment for the fertilizer spreading unit

##### ■ Practice test kit

##### ■ PPS 5

For checking the cross-distribution in the field.

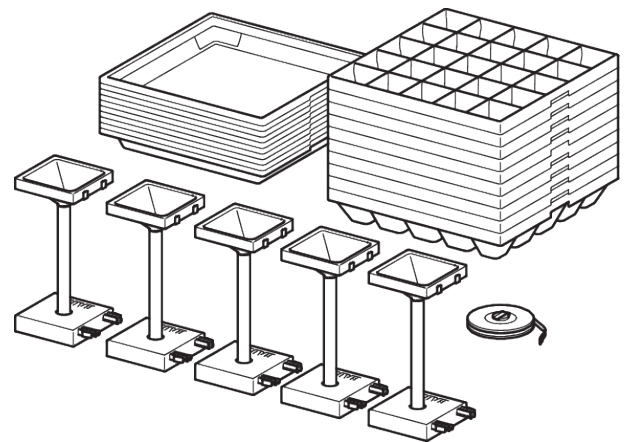


Fig. 15: PPS5 optional equipment

##### ■ Operating lights

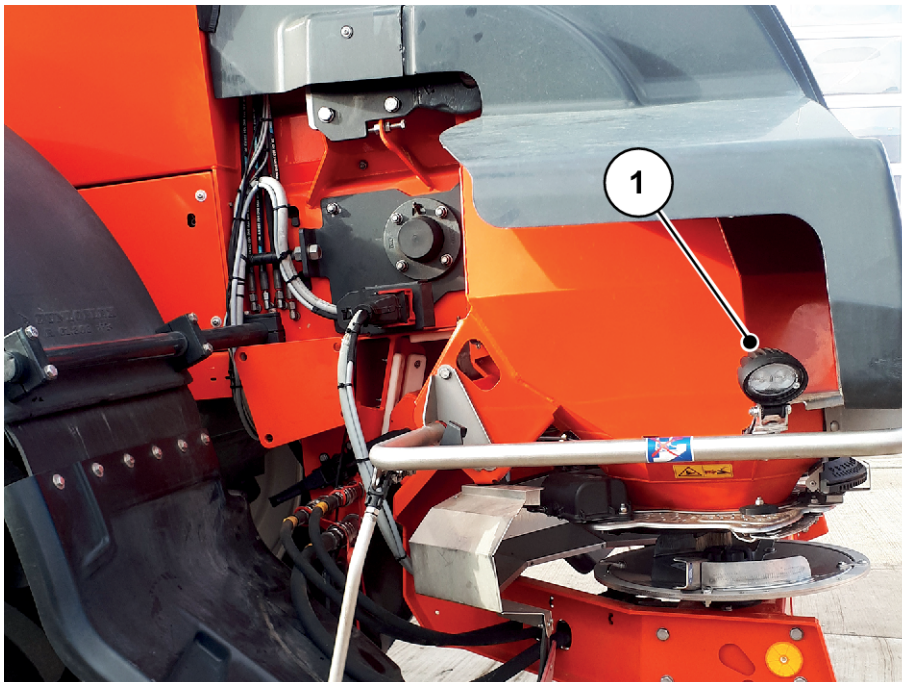


Fig. 16: Optional equipment SpreadLight

The SpreadLight [1] optional equipment supports the user in visually checking the individual spreading functions during the spreading operation in the dark.

The SpreadLight optional equipment consists of an intensive LED light and is targeted onto the spreading compartments. Potential incorrect settings or blocks in the metering slides are immediately recognized.

Additionally, they allow the user to more quickly react to objects or danger zones in the external spreading area which are hard to detect, especially in the event of large working widths, when it is dark.

### ■ Spreading width limiter

#### ■ *GSE 60*

Limits the spreading width (either towards the left or right) to a range between approx. 0 m and 3 m from the center of the tractor to the outer edge of the field. The metering slide that points to the field border is closed.

- Fold the spreading width limiter downwards for border spreading.
- The spreading width limiter must be folded up again before starting the two-sided spreading.

### ■ Limited/full border spreading system

#### ■ *TELIMAT T50*

The TELIMAT system is used for remote-controlled full and limited border spreading from the track (right).

A single-acting valve is required for the operation of the full and limited border spreading system TELIMAT.

## 5 Transport without tractor

### 5.1 General safety instructions

#### **NOTICE!**

##### **Property damages caused by incorrect transport**

The eyelets in the hopper are **not** suitable for lifting the overall machine. They are only intended for transport of the hopper during production and assembly.

Non-compliance leads to damage at the machine.

- ▶ Make sure to observe the manufacturer's transport instructions.

##### **Read the following instructions before transporting the machine:**

- Without tractor, the machine may only be transported with an empty hopper.
- Only suitable, instructed and expressly authorized persons may execute the work.
- Only use suitable means of transport and lifting gear (e.g., low-loading truck with wheel recess, ropes, etc.)
- Establish the transportation route in good time and remove possible obstacles.
- Check that all safety and transportation devices are fully operational.
- Secure all danger areas appropriately, even if they only exist briefly.
- The person responsible for transportation ensures that the machine is transported appropriately.
- Unauthorized persons are to be kept away from the transport route. Cordon off the affected areas!
- Transport the machine cautiously and handle it with care.
- Ensure that allowances are made for the center of gravity. If necessary, adjust the cables to ensure that the machine is correctly aligned on the means of transport.
- Transport the machine to the set-up location as close to the ground as possible.

### 5.2 Loading and unloading, parking

- ▶ Determine the weight of the machine.
  - ▷ Check the information on the nameplate and in chapter 4.3 *Technical data*.
  - ▷ If applicable, also take the weight of mounted optional equipment into account.
- ▶ Carefully move the machine on or off the loading platform with a suitable tractor.
- ▶ Carefully place the machine on the loading platform of the transportation vehicle or on solid ground.

## 6 Commissioning

### 6.1 Accepting the machine

When accepting the machine, please check the completeness of the delivery.

The standard equipment includes:

- 1 large area spreader AXENT 90.1
- 1 operator's manual AXENT 90.1
- 1 ISOBUS cable
- 1 feeder mesh in hopper
- 2 wheel chocks
- 1 fertilizer spreading unit AXIS-PowerPack
- 1 wide-angle universal drive shaft (including operator's manual) with friction coupling
- 1 AXENT ISOBUS electronic machine control unit (including operator's manual)

Please also check any additionally ordered optional equipment.

Check for any transport damage or missing parts. Have any shipping damage confirmed by the forwarding agent.



When receiving the machine, check that attached components are correctly and tightly positioned. The right-hand and left-hand spreading discs must be mounted facing the direction of travel.

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

#### **DANGER!**

##### **Risk of accident without spreading unit**

If the machine is driven on public roads without spreading unit, there is a risk of an accident.

Severe personal or fatal injury may occur.

- ▶ The spreading unit serves as rear underride protection.
- ▶ Drive the machine on public roads **only** with the spreading unit attached.

### 6.2 Type approval

Please observe the applicable road traffic regulations of the respective country or the location of use of the machine. If required, the importing body registers the machine at the respective registration office for traveling on public roads.

- For additional identification (warning sign, lighting) please contact your dealer or importer.

## 6.3 Tractor requirements

To ensure a safe and correct use of the machine, the tractor must meet the necessary mechanical, hydraulic, and electrical requirements.

- Tractor engine power: at least 180 HP
- Hydraulic pressure: 180 bar
- Oil volume: 35 l/min for conveyor belt drive
- Coupling types:
  - Ball-type coupling device 80 ISO 24347
  - Hitch towing eye ISO 20019
- Admissible static load: 3,000 kg, bottom hitching
- 1 double-acting control unit for the conveyor belt drive
- 1 double-acting control unit for the hopper cover (optional equipment)
- 1 single-acting control unit for the limited and full border spreading system TELIMAT (optional equipment)
- 1 double-acting control unit for the spreading width limiter GSE 60 (optional equipment)
- Universal drive shaft connection:
  - 1 3/8 inches, 6-part, 750 rpm or
  - 1 3/4 inches, 20-part, 750 rpm
- Hydraulic connectors as per ISO 15657
- Operating voltage: 12 V, must also be ensured for multiple actuators
- ISOBUS connection according to ISO 11 783
- 7-pin socket for the lighting system
- Connections for the pneumatic brake system DIN ISO 1728 (control line and supply line)

## 6.4 Mounting the universal drive shaft on the machine

### DANGER!

#### **Danger of pulling in on the rotating universal drive shaft**

Installing and removing the universal drive shaft while the motor is running may cause serious injuries (crushing, pulling into the rotating shaft).

- ▶ Turn the tractor engine off and remove the ignition key.
- ▶ Make sure that the universal drive shaft cover is in good condition.

### NOTICE!

#### **Material damage due to an unsuitable universal drive shaft**

The machine is equipped with a universal drive shaft that is designed according to the device and performance.

The use of incorrectly dimensioned or inadmissible drive shafts, for instance without guard or suspension chain, may cause personal injury or lead to damage to the tractor and/or the machine.

- ▶ Use only universal drive shafts approved by the manufacturer.
- ▶ Follow the directions in the operator's manual of the universal drive shaft manufacturer.

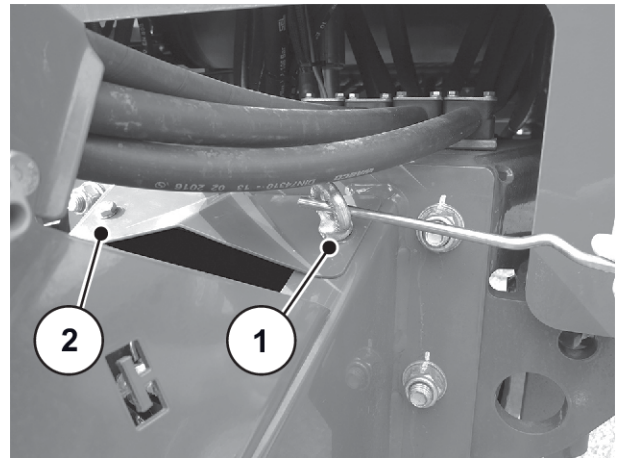
- ▶ Check the mounting position.

The drive shaft end that is marked with a tractor symbol must point to the tractor.

- ▶ Untighten the eyelet [1] and bolt [2] of the protective sheet at the universal drive shaft panel with the adjustment lever.

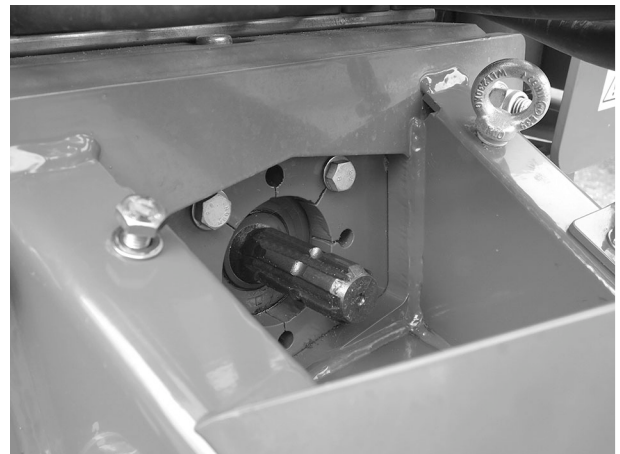
- ▷ Adjustment lever position, see *Fig. 37 Adjustment lever position*

- ▶ Disassemble the protective sheet.



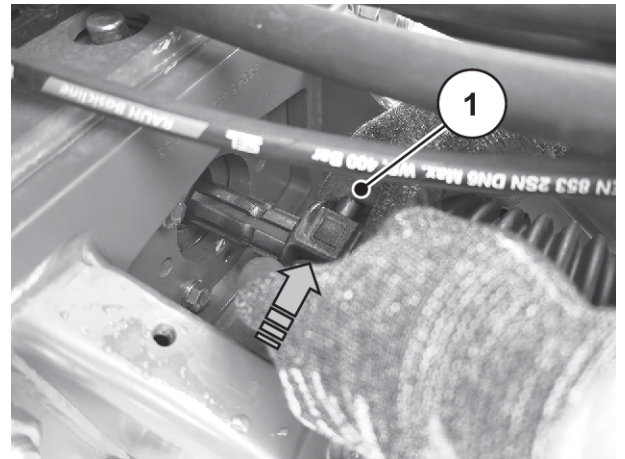
*Fig. 17: Removing the protective sheet*

- ▶ Remove the spigot protection and grease the transmission spigot.



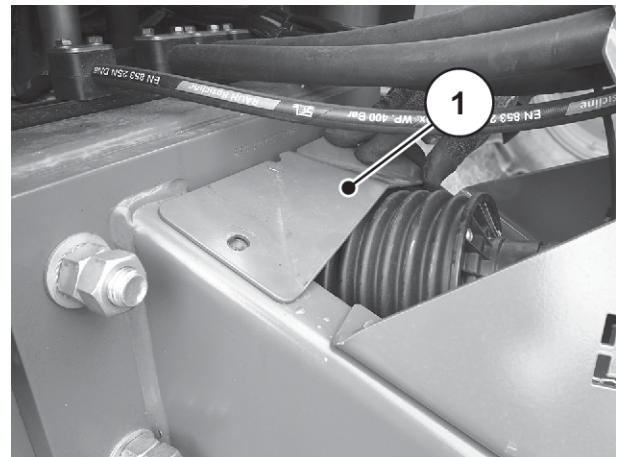
*Fig. 18: Greasing the transmission spigot*

- ▶ Press the sliding pin [1].
- ▶ Slide the universal drive shaft on the transmission spigot until the sliding pin engages in the annular groove.
- ▶ Release the sliding pin.



*Fig. 19: Pushing the universal drive shaft onto the transmission spigot*

- ▶ Apply the protective sheet [1].
- ▶ Apply 2 washers.
- ▶ Tighten the eyelet, screw with the adjustment lever at the protective sheet.



*Fig. 20: Assemble the protective sheet*

- ▶ Secure the safety chain through the bore of the eyelet.



*Fig. 21: Securing the safety chain*

**Instructions for dismounting:**

- Dismount the universal drive shaft in reverse order of mounting.

## 6.5 Installing the machine at the tractor

### 6.5.1 Preconditions

 **DANGER!**

**Danger to life due to unsuitable tractor**

Using an unsuitable tractor for the machine may result in severe accidents during operation or road travel.

- ▶ Only use tractors that comply with the technical requirements of the machine.
- ▶ Refer to the vehicle documents in order to check whether the tractor is suitable for the machine.

 **DANGER!**

**Danger to life due to carelessness or incorrect operation**

There is a crushing hazard that may result in fatal injury for persons standing between the tractor and the machine when the tractor approaches or the hydraulic system is actuated.

The tractor may brake too late or not at all because of carelessness or incorrect operation.

- ▶ Ensure that nobody is present in the hazard zone between the tractor and the machine.

 **WARNING!**

**Risk of injury and property damage due to excessive static load**

Exceeding the maximum admissible static load of the drawbar compromises the steering and braking function of the machine and the tractor.

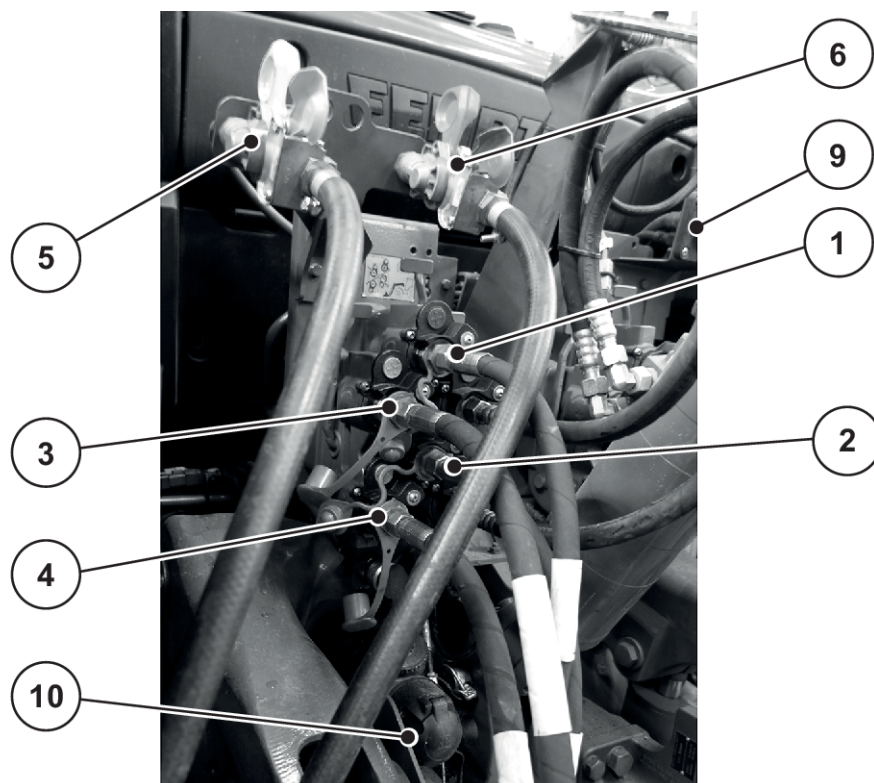
Persons may be injured. This may lead to severe damage at the machine, the tractor or to the environment.

- ▶ Observe the admissible static load of the tractor.
- ▶ Observe the admissible static load of the trailer equipment.



**Check the following specific preconditions:**

- Are both the tractor and the machine safe to operate?
- Does the tractor comply with the mechanical, hydraulic, and electrical requirements?
- Does the tractor comply with the requirements defined by the technical data of the towed machine (towed load, static load, etc.)?
- Is the machine securely positioned on level and solid ground?
- Is the machine properly secured against rolling?
- Is the ISOBUS terminal installed in the tractor and functional?
- Is the combination of the connection equipment (towing eye - pin coupling or coupling bracket - ball coupling) admissible?



*Fig. 22: Order of connecting the machine lines to the tractor*

- |  |   |
|--|---|
| [1] Conveyor belt hydraulic line             | [6] Pneumatic line of the compressed air tank (pneumatic brake) |
| [2] Conveyor belt hydraulic line             | [9] ISOBUS connector  |
| [3] Hopper cover hydraulic line              | [10] Lighting connector   |
| [4] Hopper cover hydraulic line              |   |
| [5] Pneumatic control line (pneumatic brake) |   |

- ▶ Position the tractor at the machine.
- ▶ Switch off the tractor engine. Remove the ignition key.

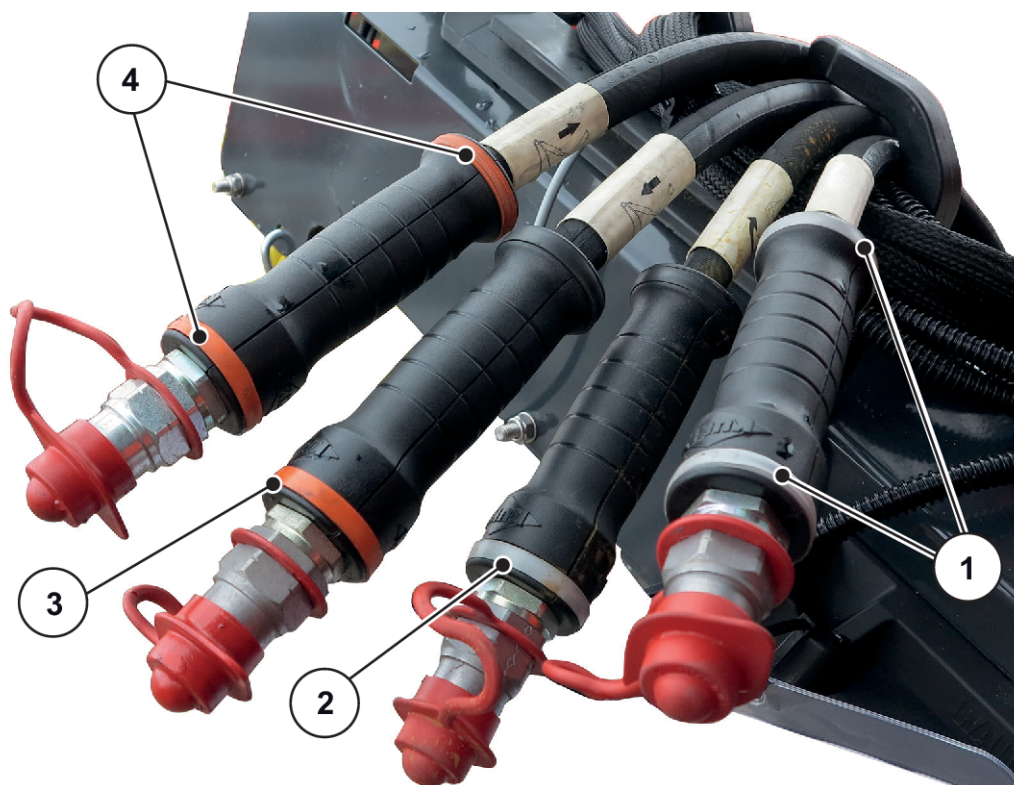


Fig. 23: Marking of the hydraulic hoses

- |  |   |
|--|---|
| [1] Hose with 2 gray rubber bands on the handle: Open hopper cover | [3] Hose with 1 red rubber band on the handle: Conveyor belt drive return         |
| [2] Hose with 1 gray rubber band on the handle: Close hopper cover | [4] Hose with 2 red rubber bands on the handle: Conveyor belt drive pressure line |

- ▶ Connect hydraulic lines [3] and [4] of the conveyor belt to the hydraulic control unit of the tractor.  
See Fig. 22
- ▶ Connect hydraulic lines [1] and [2] of the hopper cover to the hydraulic control unit of the tractor.

Depending on the optional equipment that has been installed, additional hydraulic hoses are marked in color.

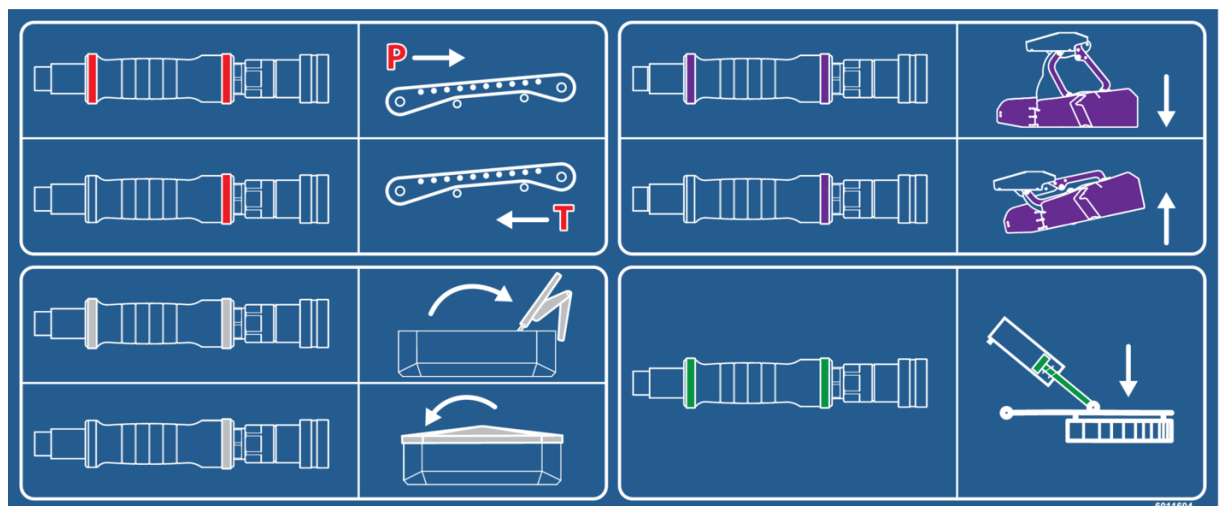


Fig. 24: Marking of the hydraulic hoses of the basic machine/optional equipment

Red: Conveyor belt drive  
 Gray: Hopper cover

Purple: Optional equipment GSE  
 Green: Optional equipment TELIMAT

## 6.5.2 Ball coupling

### Variant A

- ✓ The PTO shaft is switched off.
- ✓ The holding-down clamp of the ball coupling is open.
- ▶ Start the tractor.
- ▶ Position the tractor at the machine.
- ▶ Precisely position the ball coupling of the tractor under the coupling bracket of the machine.
- ▶ Pull the hand brake of the tractor.
- ▶ Open the valve on the support stand until the ball coupler is resting on the ball head.  
*The support stand is retracted automatically. See 6.5.4 Folding away the support stand*
- ▶ Close the valve on the support stand.
- ▶ Switch off the tractor engine. Remove the ignition key.
- ▶ Close the holding down clamp.
  - ▷ Please refer to the instructions of the tractor manufacturer.

*The connection is secured.*

## 6.5.3 Hitch coupling

### Variant B

- ✓ The PTO shaft is switched off.
- ✓ The hydraulic system is switched off.
- ✓ The holding-down clamp of the ball coupling is open.
- ▶ Start the tractor.
- ▶ Position the tractor at the machine.
- ▶ Set the height of the hydraulic support stand to ensure that the hitch ring is precisely engaged into the hitch hook of the tractor.
- ▶ Pull the hand brake of the tractor.
- ▶ Switch off the tractor engine. Remove the ignition key.
- ▶ Close the holding down clamp.
  - ▷ Please refer to the instructions of the tractor manufacturer.

*The connection is secured.*

### 6.5.4 Folding away the support stand

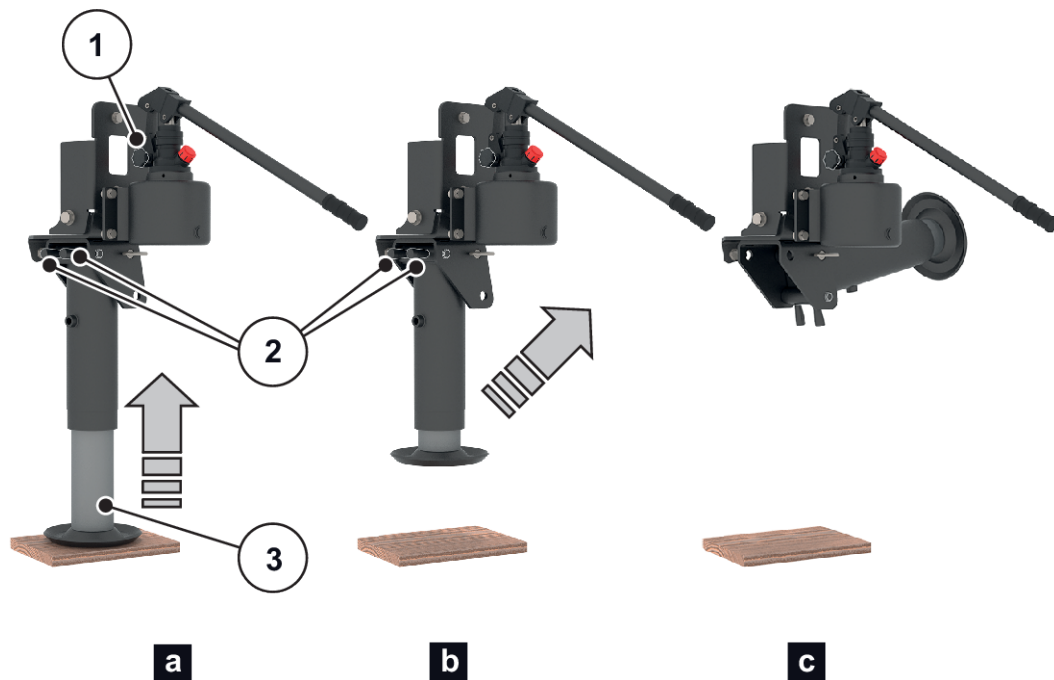


Fig. 25: Folding away the support stand

- ▶ Open the valve [1]:
  - ▷ Turn the valve counterclockwise.
  - The support stand is retracted automatically.*
- ▶ Close the valve [1]:
  - ▷ Turn the valve clockwise.
- ▶ Release both locking bolts [2].
- ▶ Fold away the support stand.
- The locking bolt engages into the top position.*

*The support stand is in the operating position.*

### 6.5.5 Fitting the universal drive shaft at the tractor

#### **NOTICE!**

##### **Material damage caused by a universal drive shaft that is too long**

When the machine is lifted up, the halves of the universal drive shaft can come into contact with each other. This may cause damage to the universal drive shaft, to the gearbox or the machine.

- ▶ Check the clearance between the machine and the tractor.
- ▶ Make sure that there is enough space (at least 20 to 30 mm) between the outer pipe of the universal drive shaft and the protective cone on the spreading side.



Observe the installation and shortening instructions provided in the operator's manual of the universal drive shaft manufacturer when checking and adjusting the universal drive shaft. The operator's manual is attached to the drive shaft on delivery.

- ▶ Mount the universal drive shaft on the tractor.
  - ▷ At initial commissioning, adjust the universal drive shaft to the tractor.
- ▶ Shorten the universal drive shaft, if required.



**Only** your dealer or your specialist workshop may shorten the universal drive shaft.

### 6.5.6 Braking

The machine is equipped with a pneumatic braking system as a standard.

In connection with the braking system, also observe the applicable national regulations of the country, in which the machine is used.

As a standard, the machine is equipped with a manually operated, pneumatic parking brake.

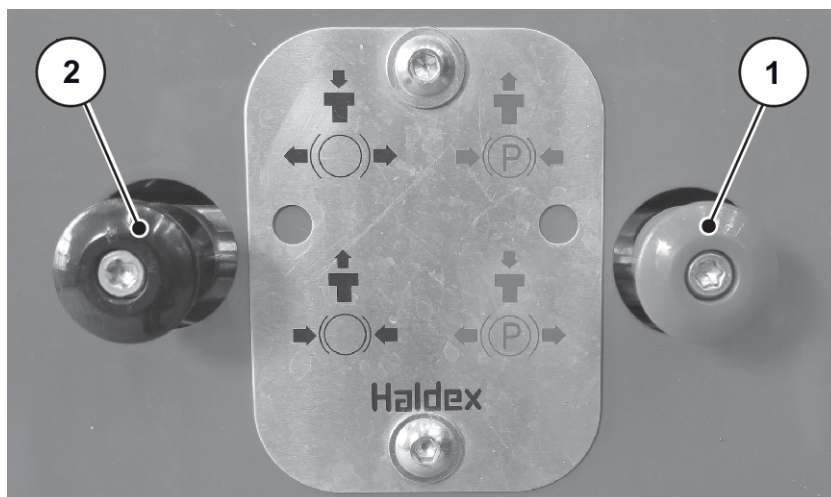


Fig. 26: Pneumatic brake

[1] Parking brake

[2] Operating brake

**! WARNING!****Risk of injury due to the unsecured machine**

Until the machine is fully coupled, it may still roll and cause personal injury.

When coupling the machine, always observe the following sequence for the pneumatic lines:

- ▶ Ensure that nobody is present in the hazard zone.
- ▶ First, couple the yellow coupling head (brake line).
- ▶ Afterwards, couple the red coupling head (supply).

For commissioning, please observe the following instructions:

- ▶ Prior to coupling, clean the seal rings and coupling heads of the pneumatic lines.
- ▶ Observe the connection order: See *Fig. 22 Order of connecting the machine lines to the tractor*
- ▶ After coupling and prior to travel, check the braking system for tightness and proper function. To do so, engage the operating brake of the tractor.
- ▶ Do not drive with the coupled machine before the pressure gage in the tractor cabin indicates the correct operating pressure of the tractor.



For further information, please refer to the operator's manual of the tractor.

### ■ Setting the manual brake force regulator

**! DANGER!****Risk of death due to defective braking system**

There is a risk of death if the braking system is improperly operated or defective.

The machine may accidentally roll or tilt and cause severe injury.

- ▶ Prior to use, make sure that the pressure gage in the driver cabin indicates the minimum pressure of 6.6 bar specified by the tractor manufacturer.
- ▶ Check routing of the hose lines. The hose lines must not be in contact with other components.

The brake force regulator is located on the frame under the manual parking brake, to the left on the side in the direction of travel.

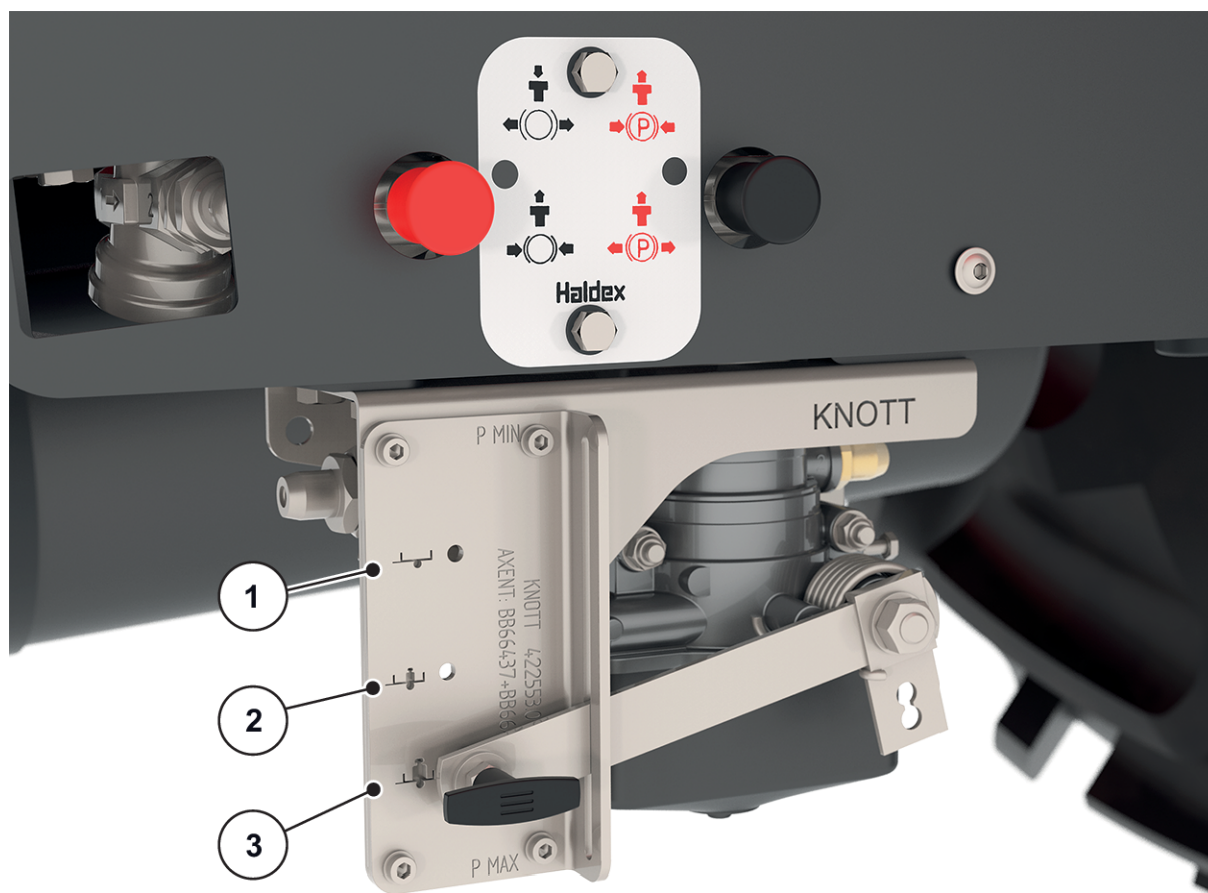


Fig. 27: Brake force regulator setting

- [1] Empty  
[2] Half load

- [3] Full load

### **⚠ DANGER!**

#### **Risk of death due to incorrectly adjusted brake system**

If the brake force regulator setting does not correspond to the machine load, the braking effect during an emergency stop can be too low or too high.

The machine may tilt and cause severe injury.

- ▶ Adjust the brake force regulator in accordance with the actual load of the machine to FULL - HALF FULL - EMPTY.
- ▶ Adjust the brake force regulator settings to the filling level of the machine.

## 6.5.7 Disengaging the parking brake

Only disengage the parking brake [1] after the machine is coupled to the tractor and the pneumatic lines are connected.



- ▶ Remove the wheel chocks and insert them into the transport bracket on the mud guard.
- ▶ Press the button [1].
  - ▷ The parking brake is disengaged.

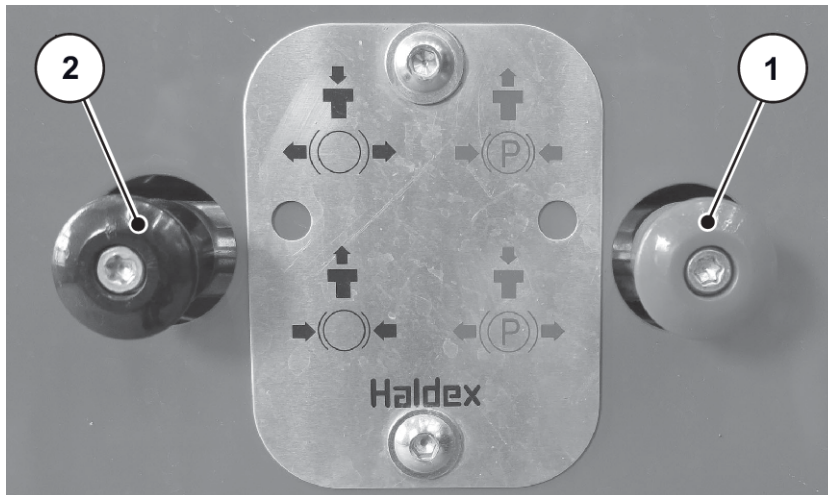


Fig. 28: Disengaging the parking brake

[1] Parking brake

[2] Operating brake

### 6.5.8 Establishing other connections

- ▶ Connect the lighting.
  - ▷ See Fig. 22 Order of connecting the machine lines to the tractor.
- ▶ Always check the lighting system prior to travel.
- ▶ Connect the ISOBUS cable to the ISOBUS connector of the tractor.



Observe the operator's manual for the electronic machine control unit.

## 6.6 Filling the machine

### **⚠ DANGER!**

#### **Risk of tilting and rolling**

During filling, the unsecured machine may tilt or roll and cause severe personal injury and property damage.

- ▶ Only fill the machine on even and firm ground.
- ▶ Make sure that the machine is coupled to the tractor prior to filling.
- ▶ Ensure that the parking brake is engaged.

**⚠ DANGER!**

**Danger due to inadmissible overall weight**

Exceeding the overall weight can lead to breakage during operation and negatively affects the operational and road safety of the vehicle (machine and tractor).

Serious personal injury is possible as well as material and environmental damage.

- ▶ Always observe the information in chapter 4.3 *Technical data*.
- ▶ Prior to filling, determine the maximum quantity to be loaded.
- ▶ Observe the admissible overall weight.



Prior to filling, make sure that the pre-metering slides and cleaning flap are closed.



*Fig. 29: Pre-metering slide in closed position*

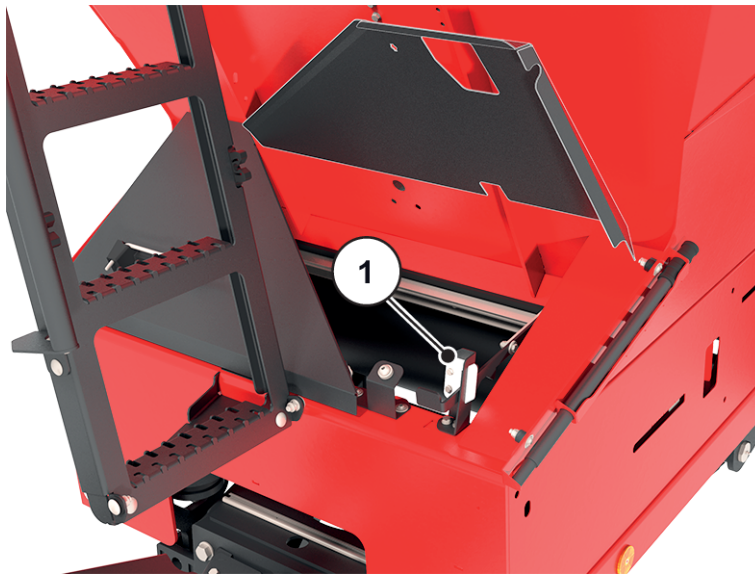


Fig. 30: Cleaning flap in closed position, front in direction of travel

- ▶ Evenly fill the machine. For this purpose, use a front-end loader or a screw conveyor.
- ▶ Visually check the filling level in the hopper.

*The machine is filled.*

## 6.7 Checking the filling level

### ■ **Operating the ladder**

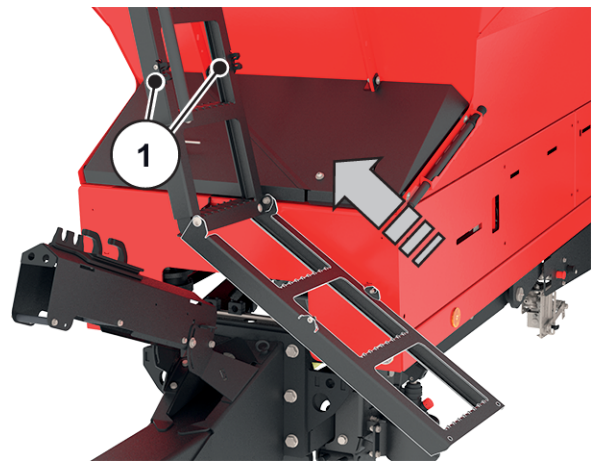
- ▶ Pull the folding ladder until the snap pins [1] are free.
- ▶ Fold down the ladder.



Fig. 31: Folding out the lower part of the ladder

### ■ **Folding in the ladder in transport position**

- ▶ Fold up the lower part of the ladder.
- ▶ Press the snap pin [1] in the groove of the snap locking mechanisms.



*Fig. 32: Folding in the ladder*

## 7 Spreading operation

### 7.1 General information



Please note that the service life of the machine mainly depends on your driving behavior.

- ▶ Pay close attention to the machine settings. Even a slightly incorrect setting may adversely affect the scatter pattern.
- ▶ Check that your machine is working properly and that the application is sufficiently precise before every use of the spreader and during work (carry out a calibration test).
- ▶ Reduce the speed on uneven ground.
- ▶ Special care is to be particularly taken when driving on uneven, soft ground (e.g., when entering fields, curbs).
- ▶ Drive with care through the headlands.
- ▶ Avoid sudden and rapid turns when driving uphill or downhill or across a slope.
  - ▷ The change in the center of gravity may increase the danger of tipping.

The modern technology and design of our machines and exhaustive, continuous testing in the factory's fertilizer spreader test system ensure that you will have a perfect spreading pattern.

In spite of the care taken during machine manufacture, deviations in fertilizer application or other faults are possible even with designated usage.

Reasons for this may be:

- Changes in the physical properties of the fertilizer (such as variable grain size distribution, variable density, grain size and surface, treatment, coating, moisture)
- Particularly hard fertilizer types (such as Thomas fertilizer and kieserite) increase the wear.
- Clumping and damp fertilizer
- Wind drift: stop spreading at high wind speeds.
- Blockages or bridge formation (e.g., due to foreign objects, bag residue, wet fertilizer, etc.).
- Uneven ground
- Deterioration of wear parts
- Damage from external causes
- Poor cleaning and care for preventing corrosion
- Incorrect drive speeds and forward speeds
- Neglecting to carry out the calibration test.
- Incorrect machine settings

#### Spreading unit

- ▶ **ALWAYS use the feeder mesh** in combination with the AXIS-PowerPack fertilizer spreading unit to prevent clogging, e.g., due to foreign objects or lumps in the fertilizer.

Claims for damage other than to the machine will not be accepted.

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

## 7.2 Conveyor belt speed adjustment

The conveyor belt is started up and stopped automatically. Via the machine control unit, the status of the conveyor belt can be checked at the screen.



The electronic conveyor belt control is described in a separate operator's manual for the electronic machine control unit. This separate operator's manual is an integral part of the AXENT ISOBUS machine control unit.

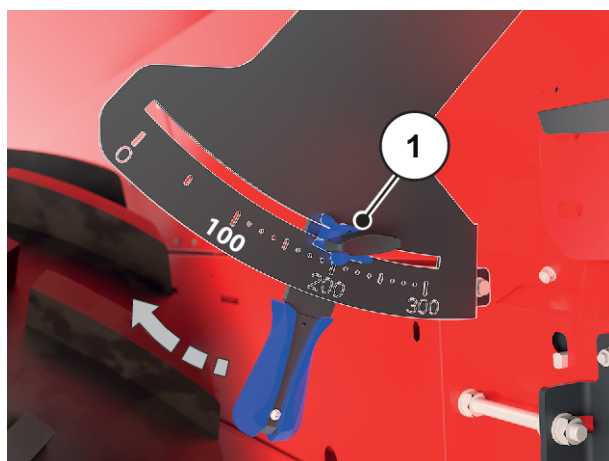


If the speed of the conveyor belt is too low in comparison with the application rate set at the spreading unit, there is no notification that the spreading unit hopper is full. This may lead to spreading errors or underfertilization in the spread fields as the hopper may be emptied.

- Increase the speed of the conveyor belt.

## 7.3 Adjusting the opening of the pre-metering slide

You can adjust the opening of the pre-metering slide on the scale plate. The scale plate is located at the left rear (viewed in the direction of travel).



*Fig. 33: Scale plate of pre-metering slide opening*

- ▶ Release the scale mounting screw [1].
- ▶ Use the lever to move the pointer to scale value 100.
  - ▷ This will result in optimum fertilizer flow into the spreading unit hopper.
- ▶ Tighten the mounting screws again.

## 7.4 Fertilizer spreading

### 7.4.1 Spreading operation sequence

The intended use of the machine includes compliance with the operating, maintenance, and service conditions in accordance with the manufacturer specifications. **Spreading** therefore always includes **preparation** and **cleaning/maintenance**.

- Carry out spreading operations in accordance with the sequence described below.

#### Preparation

- ▶ Couple the machine to the tractor, *Chapter 6.5 - Installing the machine at the tractor - Page 48*.
- ▶ Close the pre-metering slide.
- ▶ Pour in fertilizer, *Chapter 6.6 - Filling the machine - Page 57*.
- ▶ Adjust machine settings (working width, application rate, etc.).
  - ▷ See operator's manual of the machine control unit

#### Spreading

- ▶ Travel to the spreading location
- ▶ Adjust the opening of the pre-metering slide on the adjustment center.
- ▶ Activate the PTO.
- ▶ Start spreading.
- ▶ Finish spreading operations and close the pre-metering slide.
- ▶ Disengage the PTO shaft.

#### Cleaning/maintenance

- ▶ Empty the remaining quantity.
- ▶ Park the machine, *Chapter 7.6 - Parking and unhitching the machine - Page 75*.
- ▶ Clean and maintain the machine, *Chapter 9 - Maintenance and service - Page 81*.

### 7.4.2 Information on the fertilizer chart

The values in the fertilizer chart have been determined using the manufacturer's test system.

The fertilizer used has been obtained from fertilizer manufacturers or dealers. Experience shows that your fertilizer - even with identical specifications - may have different spreading properties due to storage, transport, and many other reasons.

Together with the machine settings indicated in the fertilizer charts, this may lead to a different application rate and a less optimal fertilizer distribution.

### The following instructions should therefore be observed:

- Always check the actual application rate discharged by performing a calibration test.
- Check the working width of the fertilizer distribution with a practice test kit (4.4.2.1 Practice test kit optional equipment).
- Use only fertilizers listed in the fertilizer chart.
- Contact us if you do not find a particular fertilizer type in the fertilizer chart.
- Observe the adjustment values exactly. Even a slightly incorrect setting may adversely affect the spreading pattern.

### When using urea, particular attention is to be paid to the following:

- Because of fertilizer imports, urea is available in widely varying qualities and particle sizes. It may therefore be required to adjust the spreader.
- Urea is more sensitive to wind and absorbs more moisture than other fertilizers.



The operator is responsible the correct adjustments for the fertilizer in use.

The machine manufacturer shall not assume any liability for any damage due to incorrect spreader settings.

### 7.4.3 Setting the machine via ISOBUS terminal

The necessary settings for fertilizer spreading are made at the ISOBUS terminal.

#### ■ Example of field spreading during normal fertilizing:

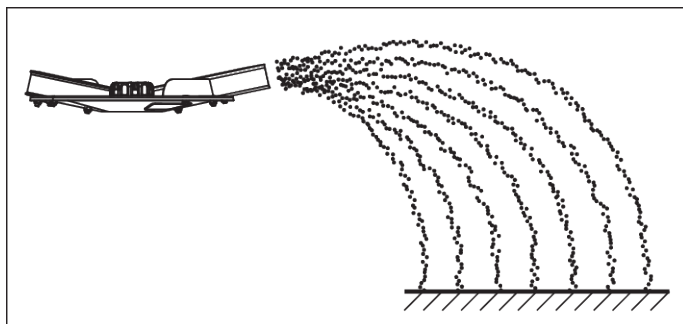


Fig. 34: Field spreading during normal fertilizing

During field spreading in normal fertilizing mode, a symmetrical spreading pattern is produced. If the spreader is correctly set (see information in the fertilizer chart), the fertilizer is evenly spread over the field.

- ▶ Enter the values from the fertilizer chart in the Fertiliser settings menu:
  - ▷ Application rate
  - ▷ Working width
  - ▷ Drop point
  - ▷ Normal disc speed
- ▶ Follow the instructions of the separate AXENT ISOBUS operator's manual.



### ■ Example of limited border spreading during normal fertilizing

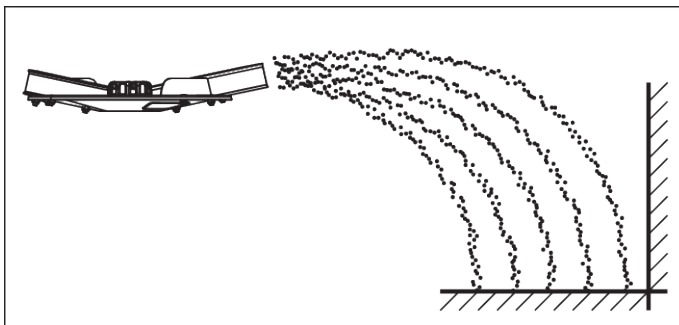


Fig. 35: Limited border spreading during normal fertilizing

During limited border spreading in normal fertilizing mode, almost no fertilizer crosses the field border. Underfertilization at the field boundary must be accepted in this case.

- ▶ Enter the values from the fertilizer chart in the Fertiliser settings menu: .
  - ▷ Application rate
  - ▷ Working width
  - ▷ Drop point
  - ▷ Bound. sprd.type: select Limited bd
  - ▷ Applic. rate (%)



The display at the screen may vary depending on the configured software version.

- Observe the separate operator's manual of the AXENT ISOBUS machine control unit.



- ▶ In the main menu, activate the limited border spreading function.

*The settings in the Fertiliser settings menu are applied.*

*The currently selected mode is displayed in the top of the operating screen.*

- ▶ Follow the instructions of the separate AXENT ISOBUS operator's manual.

### ■ Example of full border spreading during normal fertilizing

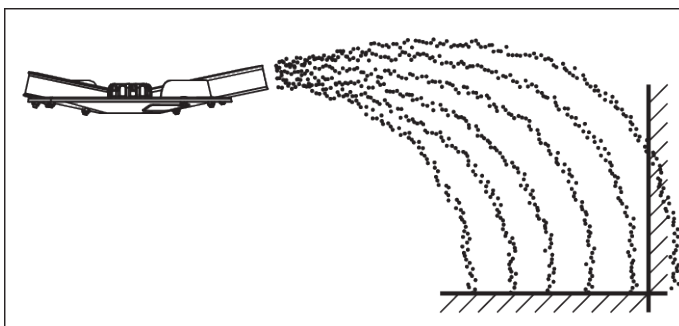


Fig. 36: Full border spreading during normal fertilizing

Full border spreading in normal fertilizing mode refers to a spreading technique in which a bit more fertilizer lands beyond the border of the field. Therefore, there is just a slight underfertilization at the field boundary.

- ▶ Enter the values from the fertilizer chart in the Fertiliser settings menu:
  - ▷ Application rate
  - ▷ Working width
  - ▷ Drop point
  - ▷ Bound. sprd.type: select Full bord..
  - ▷ Applic. rate (%)



The display at the screen may vary depending on the configured software version.

- Observe the separate operator's manual of the AXENT ISOBUS machine control unit.



- ▶ In the main menu, activate the full border spreading function.

*The settings in the Fertiliser settings menu are applied.*

*The currently selected mode is displayed in the top of the operating screen.*

- ▶ Follow the instructions of the separate AXENT ISOBUS operator's manual.

#### 7.4.4 Setting the working width

##### ■ Selecting the correct spreading disc

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

Disc type	Working width
S4	18 m - 28 m
S6	24 m - 36 m
S8	30 m - 42 m
S10	32 m - 48 m
S12	42 m - 50 m

There are two different, permanently installed spreader vanes on every spreading disc. The spreader vanes are labeled in accordance with their type.

**! WARNING!****Risk of injury from rotating spreading discs**

The distribution unit (spreading discs, spreading vanes) may catch and pull in body parts or objects. Contact with the distribution unit may injure, crush or cut off body parts.

- ▶ Maximum admissible mounting heights at front (V) and rear (H) are to be complied with at all times.
- ▶ Ensure that nobody is present in the hazard zone of the machine.
- ▶ Do not remove deflectors mounted on the hopper.

Spreading disc type	Left-hand spreading disc	Right-hand spreading disc
S4	S4-L-200 S4-L-270	S4-R-200 S4-R-270
S4 VxR	S4-L-200 VxR S4-L-270 VxR	S4-R-200 VxR S4-R-270 VxR
S6 VxR plus (coated)	S6-L-255 VxR S6-L-360 VxR	S6-R-255 VxR S6-R-360 VxR
S8 VxR plus (coated)	S8-L-390 VxR S8-L-380 VxR	S8-R-390 VxR S8-R-380 VxR
S10 VxR plus (coated)	S10-L-340 VxR S10/S12-L-480 VxR	S10-R-340 VxR S10/S12-R-480 VxR
S12 VxR plus (coated)	S12-L-360 VxR S10/S12-L-480 VxR	S12-R-360 VxR S10/S12-R-480 VxR

**■ Dismounting and mounting spreading discs**

For disassembly and assembly of specific components at the machine, the adjustment lever is required as a tool. It is located at the front of the machine.

- [1] Adjustment lever (direction of travel on the left)

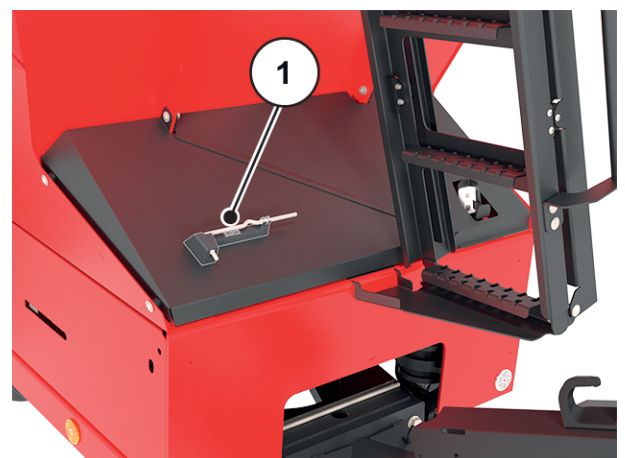


Fig. 37: Adjustment lever position

**⚠ DANGER!**

**Danger of injury due to running engine**

Working on the machine with the engine running may result in serious injury caused by mechanical components and escaping fertilizer.

- ▶ **Never** mount or dismount spreading discs while the engine is running or the PTO shaft of the tractor is rotating.
- ▶ Switch off the tractor engine.
- ▶ Remove the ignition key.

**Dismounting the spreading discs**

- ▶ Use the adjustment lever to loosen the cap nut of the spreading disc.



*Fig. 38: Loosen the cap nut*

- ▶ Unscrew the cap nut.
- ▶ Remove the spreading disc from the hub.
- ▶ Put the adjustment lever back into the designated bracket. See *Fig. 37 Adjustment lever position*



*Fig. 39: Unscrew the cap nut*

### Mounting the spreading discs

- ✓ The tractor engine is switched off and locked to prevent unauthorized starting.
- ✓ Mount the left spreading disc on the left side in the direction of travel and the right spreading disc on the right side in the direction of travel.
  - Make sure that the left and right spreading discs are not confused.
  - The following procedure is for mounting the left-hand spreading disc.
  - Mount the right-hand spreading disc according to these instructions as well.
- ▶ Put the left spreading disc on the left spreading disc hub.
 

The spreading disc must be placed level on the hub (if required, remove dirt).



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

- ▶ Carefully position the cap nut (do not tilt).
- ▶ Tighten the cap nut with approx. 38 Nm.



The cap nuts have an internal locking mechanism that prevents them from coming loose. The locking mechanism must be noticeable while tightening, otherwise, the cap nut is worn and must be replaced.

- ▶ Check that there is clearance between the spreader vanes and the outlet by turning the spreading discs by hand.

### 7.4.5 Adjusting the drop point

With the selection of the spreading disc type, a particular range for the working width is defined. By altering the drop point, the working width can be accurately set and adjustments to different fertilizer types can be made.

#### ■ *Spreading unit with manual drop point adjustment (VariSpread V8)*

The drop point is set using the top scale arc [1] on the fertilizer spreading unit.

- **Adjustment towards smaller numbers:** The fertilizer is dropped earlier. This results in spreading patterns for smaller working widths.
- **Adjustment towards larger numbers:** The fertilizer is dropped later and is spread more towards the outside in the overlap zones. This results in spreading patterns for larger working widths.

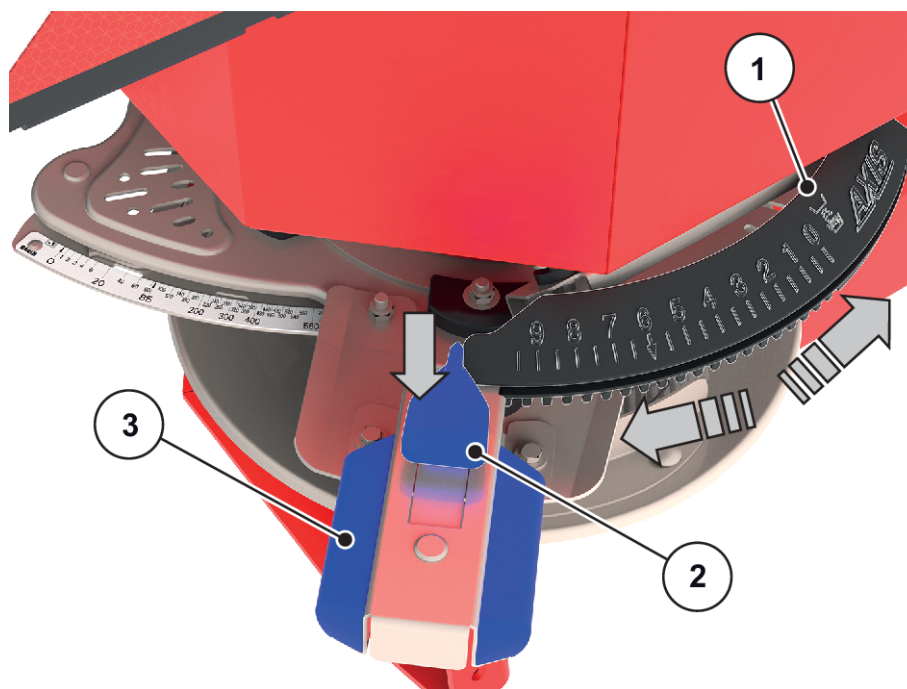


Fig. 40: Drop point adjustment center

- ▶ Determine the position for the drop point in the fertilizer chart or by means of a test with the practice test kit (optional equipment).
- ▶ Grip the left and right handle [3].
- ▶ Press the pointer unit [2].  
*The lock is released. The adjustment center can be moved.*
- ▶ Slide the adjustment center with the pointer unit to the determined position.
- ▶ Release the pointer unit.  
*The adjustment center is locked.*
- ▶ Thoroughly check that the adjustment center is locked.
- ▶ Adjust the drop point on both sides.

*The drop point is set.*

#### ■ Spreading unit with electronic drop point adjustment (VariSpread VS pro)



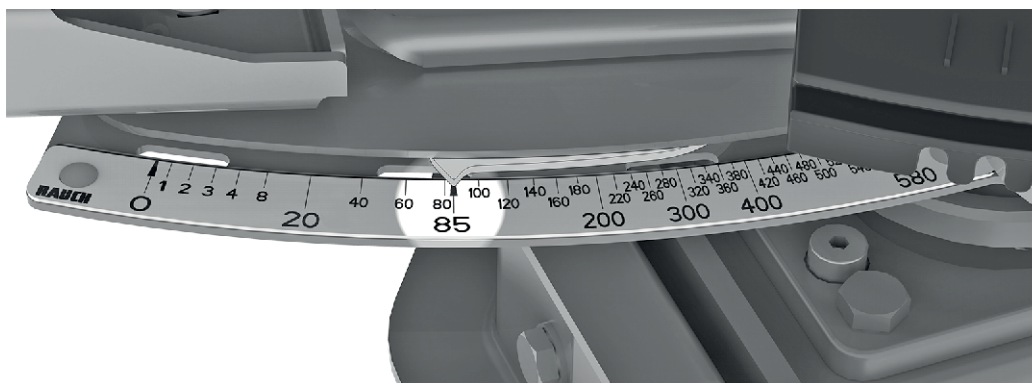
The spreading unit has an electronic drop point adjustment. The electronic drop point adjustment is described in a separate operator's manual for the machine control unit. This separate operator's manual is supplied with the machine control unit.

### 7.4.6 Setting the application rate



The machine has an electronic slide actuator for setting the application rate on the fertilizer spreading unit.

The electronic metering slide actuator is described in a separate operator's manual for the electronic machine control unit.



*Fig. 41: Scale for displaying the application rate*

### 7.4.7 Spreading at the headlands

In order to achieve good fertilizer distribution in headlands, a precise arrangement of the tramlines is essential.

#### **Limited border spreading**

Spreading at the headlands in limited border spreading mode (reduced speed, drop point adjustment, and reduced quantity).

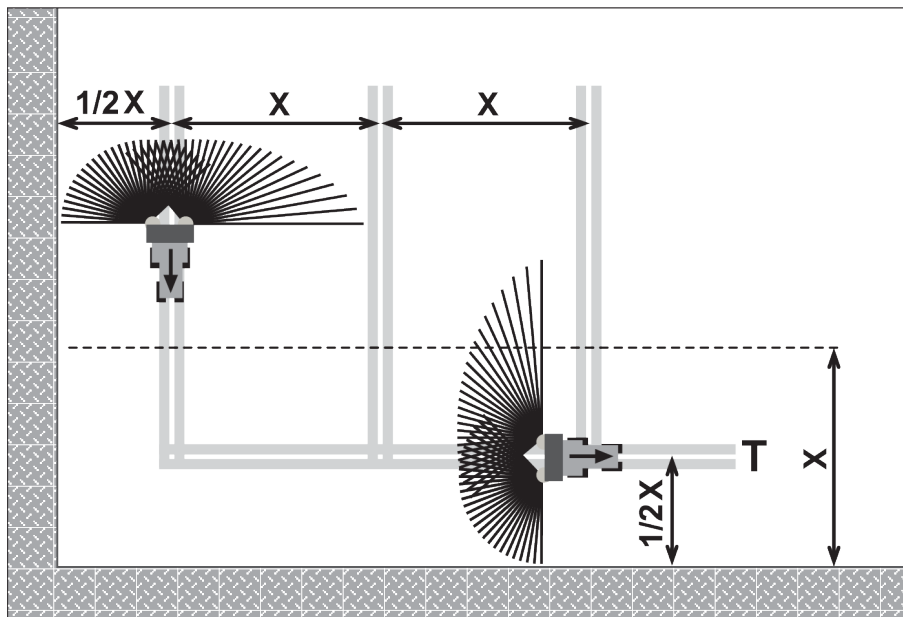


Fig. 42: Limited border spreading

[T] Headland track

[X] Working width

- Place the headland track [T] half the working width [X] away from the border of the field.

When continuing spreading in the field after headland track spreading note the following:

- Switch off the limited border spreading system.



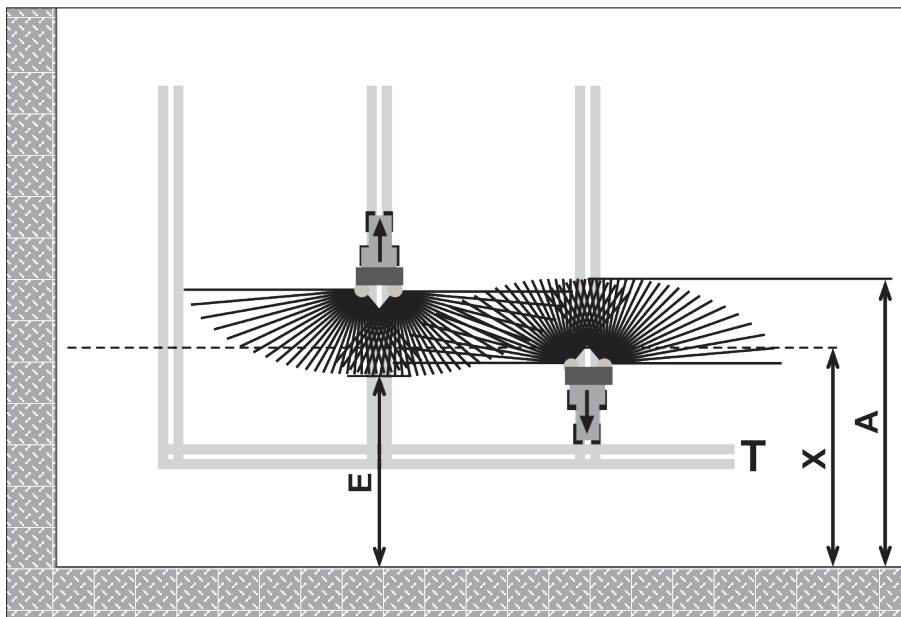


Fig. 43: Normal spreading

- |     |   |     |                |
|-----|---|-----|----------------|
| [A] | End of spreading fan when spreading in the headland track | [T] | Headland track |
| [E] | End of spreading fan when spreading in the field          | [X] | Working width  |

The metering slides open or close at different distances to the field border of the headlands when traveling backwards and forwards.

#### Driving out of the headland track

- ▶ **Open** the metering slides if the following condition is met:
  - ▷ The end of the spreading fan on the field [E] is at approx. half of the working width + 4 to 8 m from the field boundary of the headland.

The tractor is then located at different distances in the field, depending on the spreading width of the fertilizer.

#### Driving into the headland track

- ▶ Close the metering slides **as late as possible**.
  - ▷ The end of the spreading fan should ideally lie on the field [A] at a distance of approx. 4 to 8 m wider than the working width [X] of the headlands.
  - ▷ This cannot always be achieved depending on the spreading distance of the fertilizer and the working width.
- ▶ Alternatively, the headland track can be passed or a 2nd headland track can be prepared.

Follow these instructions in order to ensure an environmentally friendly and economical working method.

## 7.5 Discharging residual material

Empty the machine daily after use. This prevents corrosion and clogging and the properties of the fertilizer are maintained.

### 7.5.1 Safety instructions

#### DANGER!

##### Risk of injury due to rotating spreading discs

Working on the machine with the engine running and rotating spreading discs may result in serious injury caused by mechanical components and escaping fertilizer.

- ▶ Prior to discharge of residual material, disassemble the spreading discs.
- ▶ Ensure that nobody is present in the hazard zone.

##### Also ensure the following specific preconditions:

- The machine is parked on even and solid ground and secured against tilting and rolling.
- During discharge of residual material, the machine is coupled to the tractor.
- Nobody is present in the hazard zone.
- AXIS-PowerPack:
  - The spreading discs are disassembled. See 7.4.4.2 *Dismounting and mounting spreading discs*
- ▶ Manually move the drop point above the adjustment center or electronically to position 0.



The drop point adjustment of the fertilizer spreading unit with the VarisSpread VS pro function is actuated electronically. A message indicates that the drop point is temporarily set to drop point position 0 during discharge of residual material.

Observe the separate AXENT ISOBUS operator's manual. and the "Fast emptying" section.

### 7.5.2 Emptying the machine

Residual material is discharged by opening the pre-metering slides and activating the conveyor belt.

- ▶ Position a collection vessel under the fertilizer spreading unit.
- ▶ The discharge of residual material is started via the AXENT ISOBUS machine control unit.
- ▶ Simultaneously, start discharging residual material at the spreading unit via the AXENT ISOBUS machine control unit.
- ▶ Follow the instructions on the screen.
- ▶ After completely emptying the spreading material hopper, clean the machine. See 9.2 *Cleaning the machine*.

## 7.6 Parking and unhitching the machine

### ⚠ WARNING!

#### Risk of tilting

The machine is a single-axle vehicle. One-sided loading in the rear may lead to tilting of the machine.

This may cause personal injury and property damage.

- ▶ Park the machine on even and solid ground.
- ▶ In case of uneven loading of the machine in the rear, never decouple it from the tractor.

- Only park the **machine when it is empty**.
- ▶ Park the vehicle train on even and solid ground.
- ▶ Turn the tractor engine off and remove the ignition key.
- ▶ Pull the button [1] of the parking brake.  
*The parking brake is engaged.*

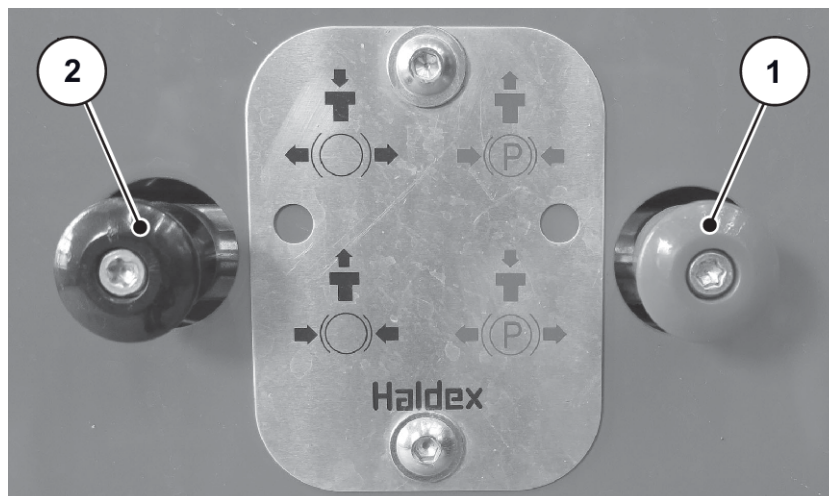
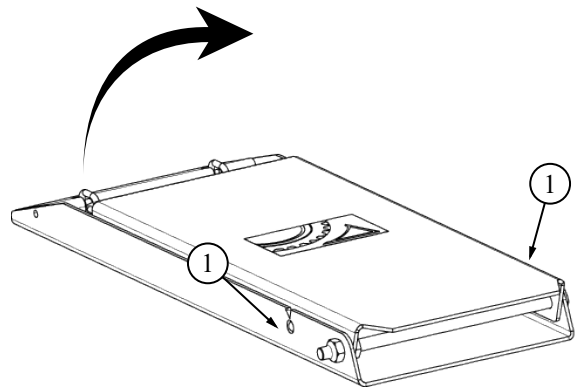


Fig. 44: Engaging the manual parking brake

[1] Parking brake

[2] Operating brake

- ▶ Take out the wheel chocks from the transport bracket at the mud guard.
- ▶ Press the sliding pin [1] and fold open the wheel chocks.



*Fig. 45: Folding out the wheel chock*

- ▶ Apply wheel chocks at both wheels.



*Fig. 46: Positioning the wheel chock*

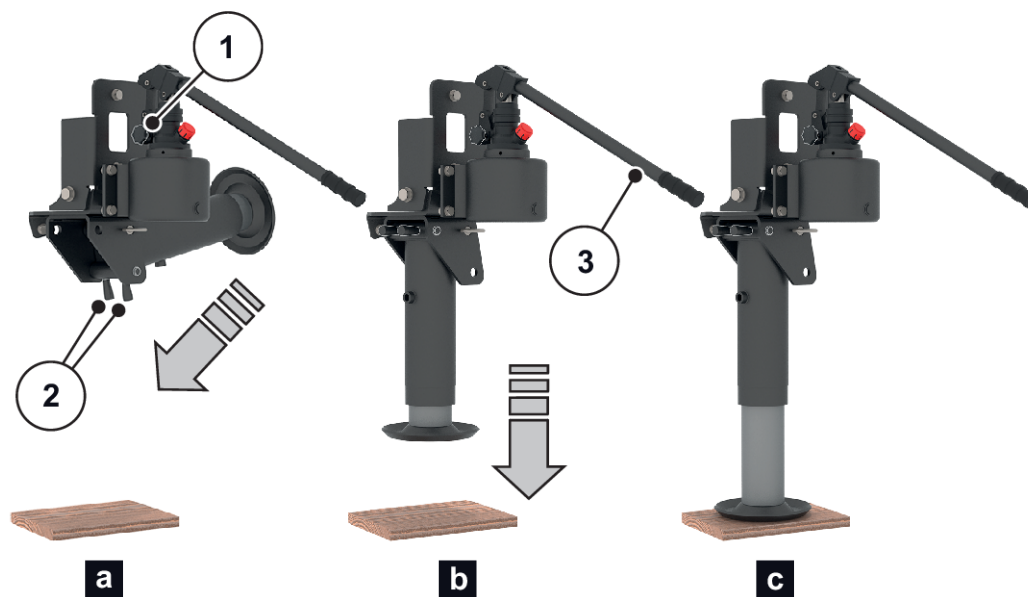


Fig. 47: Folding out the support stand

### ⚠ CAUTION!

#### Risk of injury due to support stand

When the support stand is released, it can fall down accidentally and cause hand and foot injuries.

- ▶ Make sure to hold the support stand with one hand when releasing the locking bolts.

#### Folding out the support stand

- ▶ Unlock the support stand by pushing together the locking bolts [2] and fold it down until the locking bolts have engaged in the bottom position.
- ▶ Insert the operating lever [3] into the bracket of the pump.

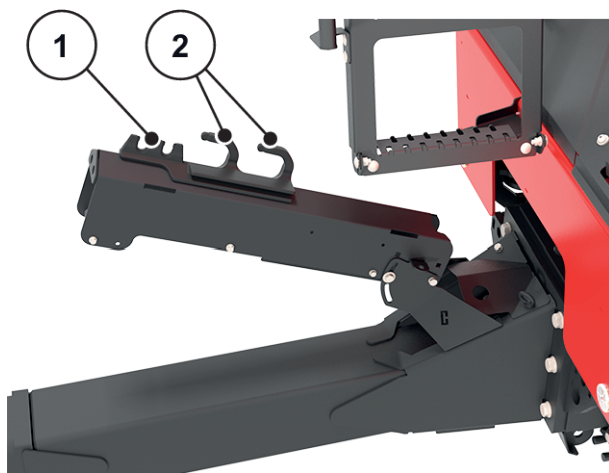


The operating lever is located on the frame at the left front (viewed in the direction of travel).

- See Fig. 12 Location of the lever

- ▶ Securely close the valve [1] at the top.
- ▶ Extend the support stand through pump movements until the machine has released the coupling point of the tractor.
- ▶ Reinsert the operating lever [3] into the designated bracket.

- ▶ When decoupling the machine, **always decouple the red coupling head first** (supply) and then the **yellow** coupling head of the pneumatic braking system.
- ▶ Disconnect the electrical connections from the tractor.
- ▶ Protect all connectors with dust caps.
- ▶ Decouple the universal drive shaft from the tractor.
- ▶ Depressurize the hydraulic system of the tractor (**floating position**).
- ▶ Disconnect the hydraulic connections from the tractor.
- ▶ Decouple the machine from the tractor.
- ▶ Place all cables and hoses at the panel over the towing bar in the designated bracket.



*Fig. 48: Transport bracket for cables, hydraulic hoses and pneumatic lines*

- [1] Holder for hydraulic hoses and electric cables      [2] Holder for pneumatic lines of the brake system

*The machine is decoupled and parked.*

## 8 Faults and possible causes

### ! WARNING!

#### Risk of injury due to incorrect troubleshooting

Delayed or incorrect repairs by unqualified personnel may result in severe personal injury as well as in damages to the machine and the environment.

- ▶ Any faults occurring must be repaired **immediately**.
- ▶ Repairs may only be carried out by **qualified** personnel.

#### Troubleshooting requirements

- Switch off the tractor engine and lock it to prevent unauthorized starting.



Please take particular note of the warnings in chapter 3 *Safety* and 9 *Maintenance and service*.

Fault	Possible cause	Measure
The conveyor belt does not convey any fertilizer into the hopper of the fertilizer spreading unit.	<ul style="list-style-type: none"> <li>• The hydraulic couplings for the conveyor belt are not connected to the tractor.</li> <li>• The machine control unit is not switched on.</li> <li>• The AXENT hopper is empty.</li> <li>• The fertilizer spreading unit is filled completely.</li> <li>• The level sensors in the AXIS-PowerPack are dirty or defective.</li> <li>• The pre-metering slide is closed.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check connections and connectors.</li> <li>▶ Check the function of the sensors or clean them.</li> <li>▶ Open the pre-metering slide and adjust to the desired scale value.</li> </ul>
The conveyor belt conveys insufficient fertilizer.	<ul style="list-style-type: none"> <li>• The pre-metering slide is not open wide enough.</li> <li>• The consistency of the spreading material is not suitable for spreading with the machine.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Adjust the pre-metering slide to scale position 100.</li> <li>▶ Check the oil supply of the tractor valve.</li> </ul>

Fault	Possible cause	Measure
Slippage at the conveyor belt.	<ul style="list-style-type: none"><li>• The tension of the conveyor belt is incorrectly set.</li></ul>	▶ Retension the conveyor belt.
The spreading discs do not turn or stop suddenly after being turned on.	When using a universal drive shaft with shear pin protection: <ul style="list-style-type: none"><li>• The shear pin is defective</li></ul>	<ul style="list-style-type: none"><li>• Check the shear pin protection, and replace if necessary (see the universal drive shaft manufacturer's manual).</li></ul>



## 9 Maintenance and service

### 9.1 Safety



Please note the warnings in the chapter 3 *Safety*

Take **particular note of the instructions** in the section. 9 *Maintenance and service*

Observe the following instructions in particular:

- Welding and work on the electrical and hydraulic systems is to be carried out by qualified technicians only.
- There is a **risk of tipping** when working at the lifted machine. Always secure the machine using suitable supports.
- Always use **both** eyelets in the hopper for lifting the machine by means of hoisting gear.
- There is a risk of **crushing and shearing** at power-operated components. Make sure that there is no one in close proximity to the moving parts during maintenance.
- Spare parts must at least comply with the technical standards specified by the manufacturer. This is assured with original spare parts.
- Before starting any cleaning, maintenance, or repair work, and when troubleshooting, switch off the tractor's engine and wait until all moving parts of the machine have come to a stop.
- By controlling the machine with an operating unit, additional risks and hazards due to externally operated components may arise.
  - Disconnect the power supply between the tractor and the machine.
  - Disconnect the power supply cable from the battery.
- Repairs may **ONLY be carried out by instructed and authorized workshops**.
  
- There are two nitrogen tanks in the hydraulic circuit. These also remain under pressure after system shutdown. Slowly and carefully open the screw connections of the hydraulic circuit.

#### ■ **Maintenance plan**

This maintenance plan applies for vehicles subject to normal stress and wear. In case of increased stress and wear, reduce the maintenance intervals accordingly. This helps you prevent damage to the tractor, the machine, or the spreading unit.



For further information, please refer to the operator's manual of the tractor.

Task	Before operation	After operation	After the first X hours	After the first X hours	After the first X hours	After the first X hours	Every X hours	Every X hours	Every X hours	Every X hours	Every X hours	Every X hours	Every X hours	Every X hours	Daily	Weekly	Every X weeks	Quarterly	Yearly	Every X years	At the beginning of the season	At the end of the season
	Value (X)		10	30	50	100	20	30	50	100	150	200	500	1000			2			6		
<b>Cleaning</b>																						
Cleaning		X																				
Bearings of the guide rollers		X																				X
Draining of cleaning water		X																				X
Dirt deflector and wheels	X	X																				X
Air tank															X							
<b>Lubrication</b>																						
Machine components									X													X
Universal drive shaft																						X
Spreading disc hub										X												X
<b>Check</b>																						
Wear parts									X													
Screw connections	X	X						X														X
Trailer coupling												X						X				
Towing bar											X							X				
Wheel nut												X							X			
Electric lines	X			X							X											X
Lighting system						X									X							
Electronic control unit	X			X							X											X
Hydraulic hoses	X							X														X
Hydraulic cylinders	X														X							

Task	Before operation	After operation	After the first X hours	After the first X hours	After the first X hours	After the first X hours	Every X hours	Every X hours	Every X hours	Every X hours	Every X hours	Every X hours	Every X hours	Every X hours	Daily	Weekly	Every X weeks	Quarterly	Yearly	Every X years	At the beginning of the season	At the end of the season
			10	30	50	100	20	30	50	100	150	200	500	1000			2			6		
<i>Motor and block of conveyor belt drive</i>	X															X						
<i>Towing bar suspension</i>										X												X
<i>Trailer unit</i>	X							X														X
<i>Conveyor belt position</i>	X														X							
<i>Conveyor belt tension</i>			X																			
<i>Belt cleaner</i>	X																		X			
<i>Braking system</i>	X																		X			
<i>Slack adjuster</i>																			X			
<i>Brake pad</i>													X				X				X	
<i>Tires</i>	X																X				X	
<i>Wheels</i>	X																				X	
<i>Bearing clearance of the wheel hub</i>				X					X													
<i>Brake lever length</i>											X											X
<i>Position of the spreading disc hub</i>						X																X
<i>Agitator drive</i>	X																					
<i>Metering slide adjustment</i>					X																	X
<b>Replacement</b>																						
<i>Hydraulic hoses</i>																					X	

## 9.2 Cleaning the machine

### ■ *Cleaning*



Spreading material and dirt promote corrosion. Although the machine components are made from corrosion-free material, we recommend that you clean the machine immediately after each use to maintain its value.

- ▶ Only clean oiled machines at washing points fitted with an oil separator.
- ▶ When cleaning with high-pressure, never aim the water jet directly at warning signs, electrical equipment, hydraulic components, and sliding bearings.
- ▶ After cleaning, treat the **dry** machine, **especially the stainless steel parts**, with an environmentally friendly anti-corrosion agent.
  - ▷ A suitable polishing kit can be ordered from authorized dealers for treating rust spots.

### 9.2.1 Cleaning the bearings of the guide rollers

#### ■ *Bearings of the guide rollers*

During spreading, dust and dirt accumulate at the guide rollers of the conveyor belt.

- ▶ Clean the guide rollers. For this purpose, open the side covers.

Below, opening the side cover is described. Proceed respectively for all side covers. On every side of the machine, the guide rollers are covered by 3 side covers.

- ▶ Insert the adjustment lever through the side cover into the sheet metal guide.
- ▶ Lift the adjustment lever.

*The locking mechanism is disengaged.*

*The side cover is unlocked.*

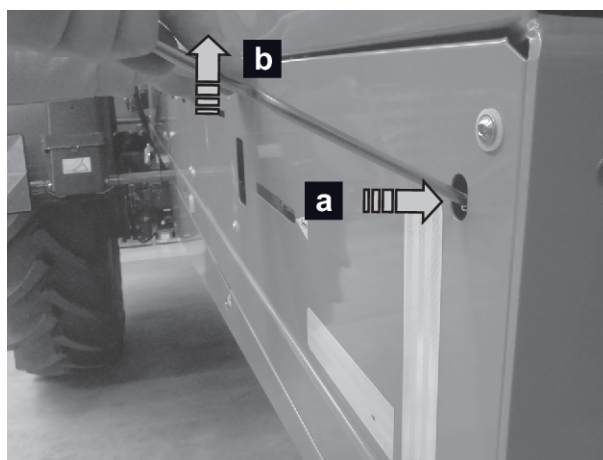


Fig. 49: Using the adjustment lever

- ▶ Fold open the side cover and remove it.

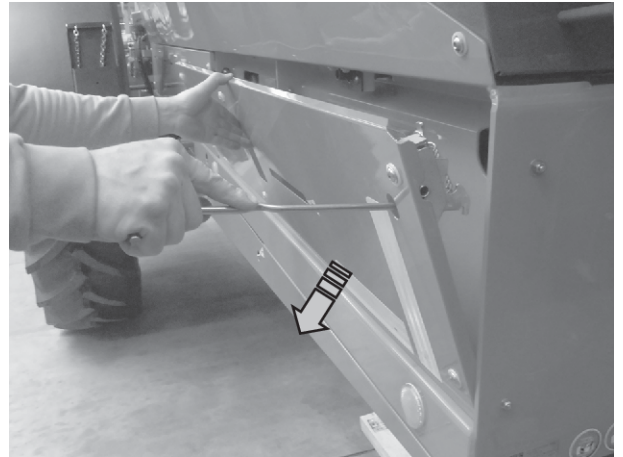


Fig. 50: Folding open the side cover

- ▶ **Clean the guide rollers with a soft jet of water.**
- ▶ Insert the side cover with the lower metal hook [1] into the brackets [2] on the frame.
- ▶ Close the side cover upwards by hand.

*The side cover is closed and secured.*

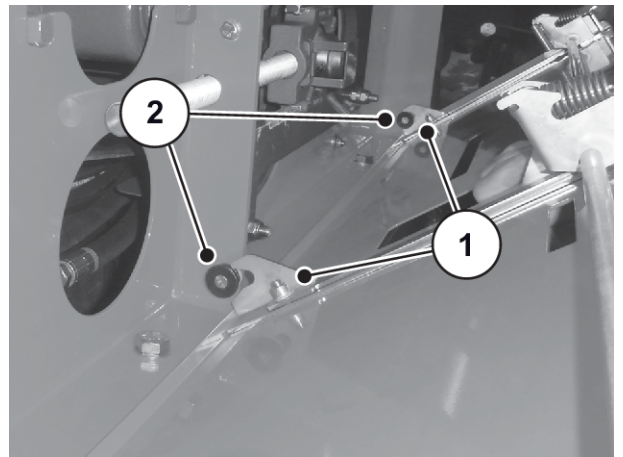


Fig. 51: Assembling the side cover

## 9.2.2 Draining of cleaning water

### ■ *Draining of cleaning water*

**After cleaning**, there may still be water in the hopper of the machine.

- Cleaning flap position and lever adjustment: See 3.11.2 *Instruction stickers*

- ▶ Open the front maintenance flap in direction of travel.
- ▶ Pull the cleaning flap lever [1].  
*The cleaning flap is opened.*  
*Water is drained.*

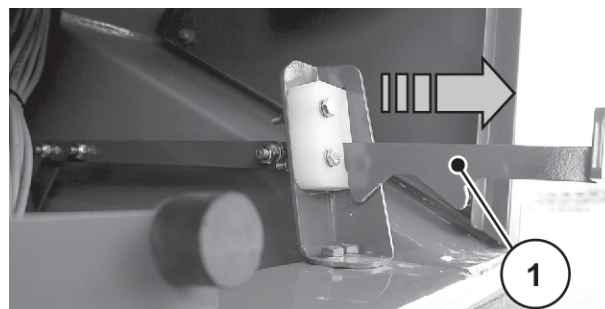


Fig. 52: Cleaning flap lever

- ▶ Slide in the cleaning flap lever.  
*The cleaning flap is closed.*

### 9.2.3 Clean mud guards and wheels

#### ■ *Dirt deflector and wheels*

- ▶ Clean the dirt deflector and the wheels on a regular basis, however, at least every each time before driving on public roads.

## 9.3 Wear parts and screw connections

### 9.3.1 Checking wear parts

#### ■ *Wear parts*

Wear parts include: the cleaner at the AXENT outlet, the belt sealing in the AXENT hopper, the sealing profile at the maintenance flap, and all plastic components.

- ▶ Inspect wear parts on a regular basis.
- ▶ Replace these parts if they show signs of wear, deformation, holes, or aging. Otherwise, the spreading pattern will not be correct.
  - ▷ The durability of wear parts depends, among other things, on the material being spread.
- ▶ Have the condition of the machine and particularly the attached components, hydraulic system, metering elements, and conveyor belt checked by your specialist dealer after each season.
- ▶ Replace worn parts in time to prevent consequences resulting from damage.
- All connection elements between the towed machine and the tractor are also subject to wear. This particularly applies for the coupling bracket of the ball coupling or the towing eye of the pin coupling.
- Spare parts must at least comply with the technical standards specified by the manufacturer. This is assured for example with genuine spare parts.

### 9.3.2 Checking the screw connections

#### ■ *Screw connections*

Screw connections have been tightened to the specified torque and locked at the factory. Vibrations and shocks, in particular during the initial operating hours, can loosen screw connections.

- ▶ Check all screw connections for tightness.  
Some components are mounted with self-locking nuts.
- ▶ When mounting these components, always use new self-locking nuts.



Observe the tightening torques of the standard screw connections.

- See 12.2 Torque value

#### ■ *Trailer coupling*

- ▶ Check all screw connections for tightness.
- ▶ If necessary, retighten the screw connection of the trailer coupling with 560 Nm.

#### ■ *Towing bar*

- ▶ Check all screw connections for tightness.
- ▶ If necessary, retighten the screw connection of the towing bar with 440 Nm.

#### ■ *Wheel nut*

- ▶ Check the wheel nuts for tightness.
  - ▷ Every 500 operating hours **or after 8,500 km**
- ▶ If necessary, retighten the screw connection with 510 Nm.

## 9.4 Covers

There are several covers attached to the machine. During certain maintenance steps, they must be opened or removed.



After maintaining your machine, **reattach or close and secure all covers.**

### 9.4.1 Front cover

The belt cleaner is readjusted at the front of the hopper. To do this, you have to open the front cover [1].

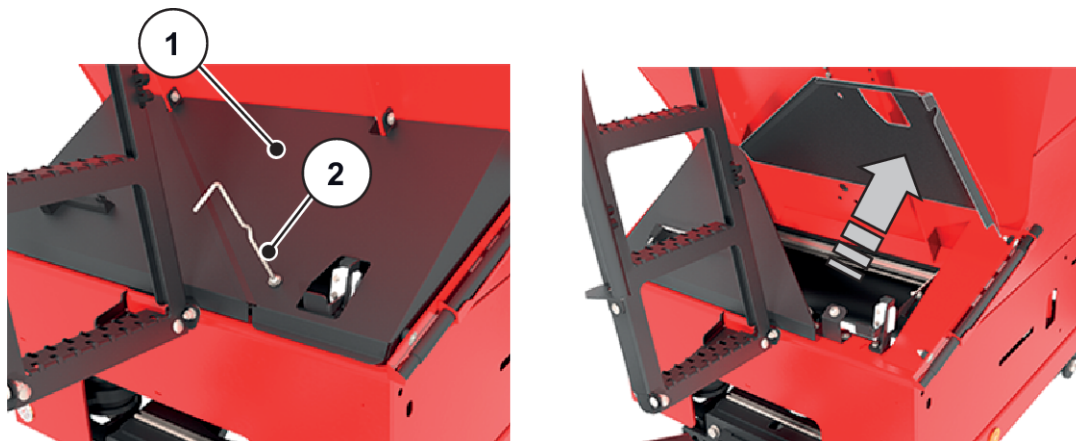


Fig. 53: Opening the front cover

- ▶ Remove the adjustment lever from the bracket.
  - ▷ Fig. 37 Adjustment lever position
- ▶ Open the quick release closure [2] with the adjustment lever.
- ▶ Fold up the cover [1].



The cover will not stay open by itself.

- If necessary, use the lever for the support stand and block the cover in the open position. See Fig. Location of the lever 34

- ▶ Put the adjustment lever back into the designated bracket.

### 9.4.2 Spreading unit cover

The cover [1] of the spreading unit can be removed to clean the machines.



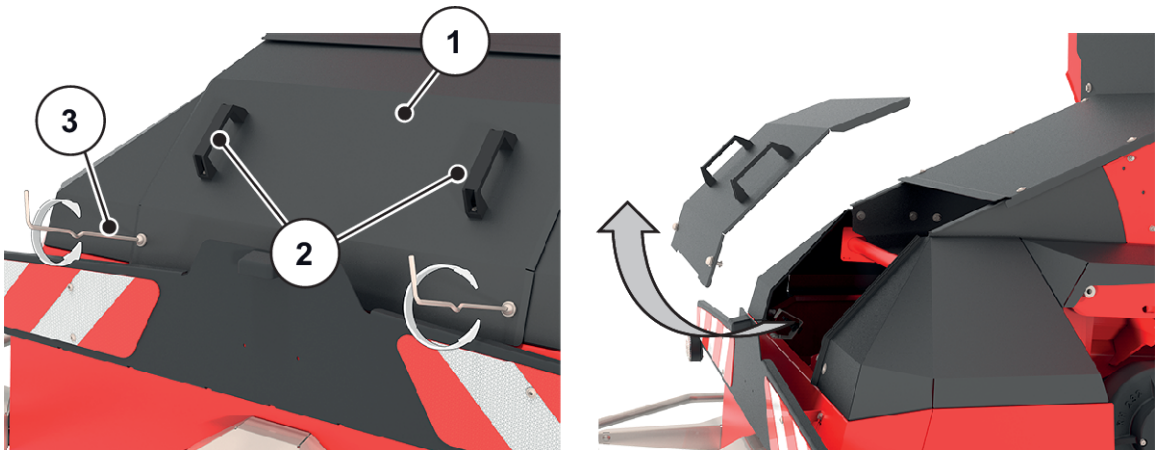


Fig. 54: Spreading unit cover

- ▶ Remove the adjustment lever from the bracket.
  - ▷ Fig. 37 Adjustment lever position
- ▶ Open the quick release closure with the adjustment lever [3].
- ▶ Take the cover by the handles [1].
- ▶ Tilt the lower side of the cover upwards.
- ▶ Remove the cover.
- ▶ Put the adjustment lever back into the designated bracket.

## 9.5 Electrics, electronic system

### ■ *Electric lines*

- ▶ Visually inspect all electric lines for wear.
  - ▷ Check particularly for outside damage or breaks.

### ■ *Lighting system*

- ▶ Check the lighting system daily for proper condition.



Replace any parts that are damaged immediately.

Clean any parts that are dirty immediately.

### ■ *Electronic control unit*

**! WARNING!**

**Risk of injury**

The electronic control unit is checked in real time. This means, the selected function is directly executed by the machine components.

- ▶ Ensure that nobody is present in the hazard zone.

Check the following functions of the electronic control unit:

- Conveyor belt start-up
- Checking the forward speed sensor
- Checking the filling level sensors



Check the function of the sensors and actuators with the AXENT ISOBUS electronic machine control unit.

- Observe the operator's manual of the AXENT ISOBUS electronic machine control unit.

## 9.6 Hydraulics system

The hydraulically driven components such as the conveyor belt and the hopper cover or TELIMAT and GSE are supplied by the tractor's hydraulic system.

**! WARNING!**

**Danger due to high pressure and high temperature in the hydraulic system**

Hot fluid escaping under high pressure may cause serious injury.

- ▶ Depressurize the hydraulic system before carrying out any work.
- ▶ Switch off the tractor engine and secure it against restarting.
- ▶ Let the hydraulic system cool down.
- ▶ When checking for leakage, wear protective goggles and protective gloves at all times.

**! WARNING!**

**Danger of infection due to hydraulic oil**

Hydraulic oil escaping under high pressure may penetrate the skin and cause infection.

- ▶ In the event of injury caused by hydraulic oil, seek medical attention immediately!

**! WARNING!****Environmental pollution due to unsuitable disposal of hydraulic and transmission oil**

The hydraulic and transmission oils are not entirely biodegradable. Therefore, oil must be prevented from entering the environment in an uncontrolled manner.

- ▶ Collect/dam escaped oil with sand, soil, or other absorptive material.
- ▶ Collect hydraulic and transmission oil in a suitable container provided for the purpose, and dispose of it in accordance with the local statutory requirements.
- ▶ Draining and penetration of oil into the sewerage system is to be prevented.
- ▶ Prevent the penetration of oil into the water drain by setting up sand or earth barriers, or by using other appropriate barrier methods.

### 9.6.1 Checking the hydraulic hoses

#### ■ *Hydraulic hoses*

Hydraulic hoses are subject to high loads. They have to be checked regularly and are to be replaced immediately when damaged.

- ▶ Check the hydraulic hoses for damage on a regular basis or at least before the start of the spreading season, by means of a visual inspection.
- ▶ Before the start of the spreading season, check the age of the hydraulic hoses. Replace the hydraulic hoses when the prescribed period for storage and usage has been exceeded.
- ▶ Replace the hydraulic hoses if they show one or several of the following types of damage:
  - ▷ Damages to the external layer up to the insert
  - ▷ Embrittlement of the external layer (crack formation)
  - ▷ Deformation of the hose
  - ▷ Hose moving out of the hose fitting
  - ▷ Damages to the hose fitting
  - ▷ Resistance and function of the hose fitting reduced due to corrosion

### 9.6.2 Replacing hydraulic hoses

#### ■ *Hydraulic hoses*

Hydraulic hoses are subject to aging. They may only be used for a maximum of 6 years, including a storage period of a maximum of 2 years.



The manufacturing date of a hose line is indicated in one of the hose fittings as year/month (e.g., 2012/04).

### Preparation

- ▶ Ensure that the hydraulic system is depressurized and has cooled down.
- ▶ Provide collection trays for leaking hydraulic oil below the separation points.
- ▶ Have suitable plugs ready in order to prevent a leaking of the hydraulic oil out of the lines which cannot be replaced.
- ▶ Provide suitable tools.
- ▶ Put on your protective gloves and glasses.
- ▶ Ensure that the new hydraulic hose corresponds to the type of hydraulic hose to be replaced. In particular, observe the correct pressure range and hose length.

There are two nitrogen tanks in the hydraulic circuit. These also remain under pressure after system shutdown.

- ▶ Slowly and carefully open the screw connections of the hydraulic circuit.



Observe the different maximum pressure specifications on the hydraulic lines to be replaced.

### Implementation:

- ▶ Loosen the hose fitting at the end of the hydraulic hose to be replaced.
- ▶ Discharge the oil from the hydraulic hose.
- ▶ Loosen the other end of the hydraulic hose.
- ▶ Put the loose hose end into the oil collection tray immediately and plug the connection.
- ▶ Loosen the hose fixtures and remove the hydraulic hose.
- ▶ Connect the new hydraulic hose. Tighten the hose fittings.
- ▶ Fix the hydraulic hose by means of the hose fixtures.
- ▶ Check the position of the new hydraulic hose.
  - ▷ The hose routing must correspond to the one of the old hydraulic hose.
  - ▷ Friction points are to be excluded.
  - ▷ The hose may not be twisted or tensioned.

*The hydraulic hoses have been replaced successfully.*

## 9.6.3 Hydraulic cylinders for adjustment functions

### ■ Hydraulic cylinders

- ▶ Regularly check the adjustment functions of all hydraulic cylinders and at least prior to every spreading operation.
- ▶ Check the components for external damages and leaks.

Adjustment functions: Hydraulic cylinders [1] for hopper cover (front and rear) - optional equipment

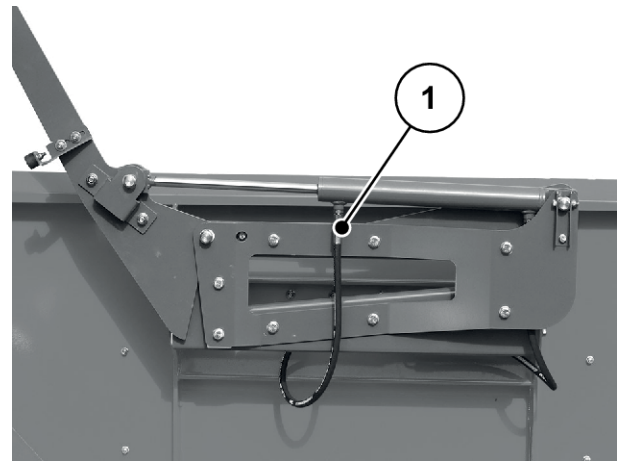


Fig. 55: Hopper cover hydraulic cylinder

## 9.6.4 Checking the conveyor belt drive

### ■ Motor and block of conveyor belt drive

- ▶ Check the **motor** of the conveyor belt on a regular basis, however, at least prior to every spreading operation.
- ▶ Check the components such as the hydraulic block for external damage and leaks.

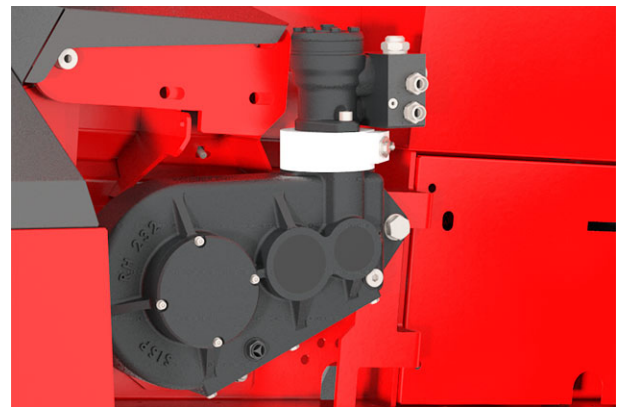


Fig. 56: Checking the motor and the hydraulic block of the conveyor belt drive

## 9.7 Setting of the towing bar suspension

### ■ Towing bar suspension

To ensure correct function of the attached spreading unit, the AXENT hopper has to be in a **horizontal** position independent from the operating conditions.

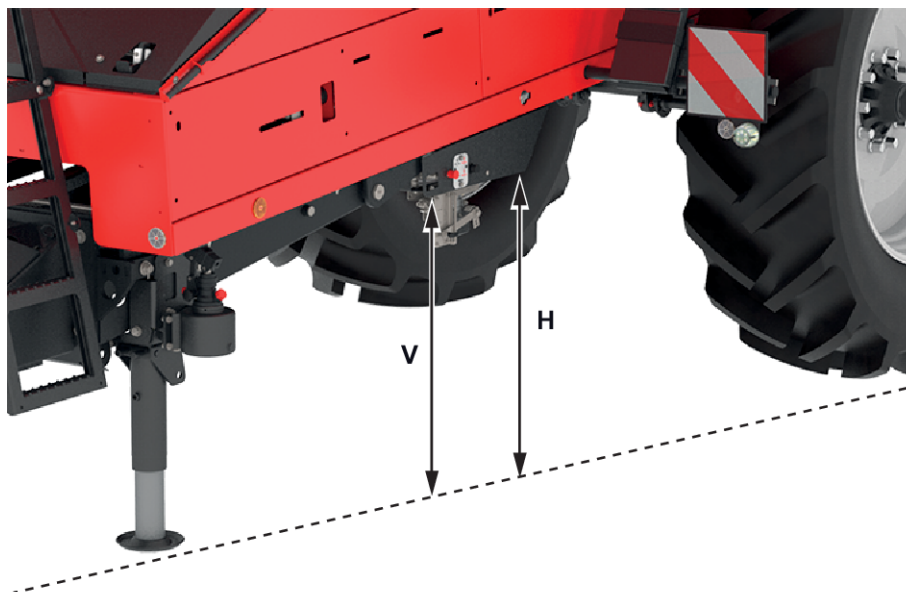
The towing bar suspension is preset at the company and suitable for most application conditions.

**Requirements:**

- The machine is parked on even and solid ground and secured against tilting and rolling.
- The machine is attached to the tractor.
- Nobody is present in the hazard zone.

**Checking the machine inclination**

- ▶ Measure the clearance to the ground at the front [V] and rear [H] bottom edge of the brake panel. If the deviation between both dimensions exceeds 10 mm, adjust the towing bar height.

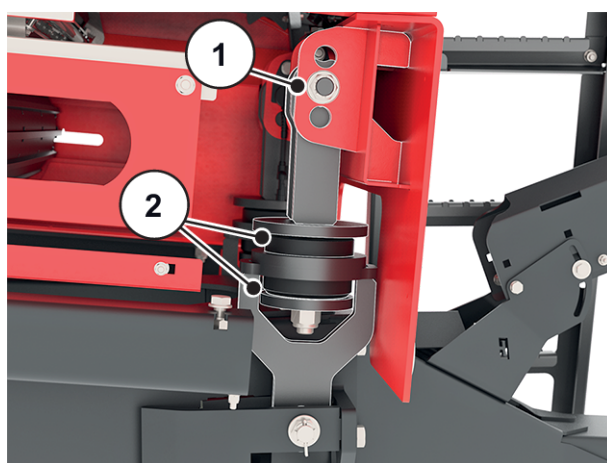


*Fig. 57: Checking the machine inclination*

[H] Clearance between hopper frame bottom edge/floor, rear

[V] Clearance between hopper frame bottom edge/floor, front

**Checking the towing bar damping system for damage**



*Fig. 58: Checking the towing bar suspension*



The towing bar suspension is factory-installed in the central bore hole [1].

- ▶ Check the rubber buffers [2] for damage.



Only authorized workshops are permitted to convert the towing bar suspension and replace the rubber buffers.

## 9.8 Hitch

### ■ *Trailer unit*

- ▶ Check the towing eye/ball coupling for wear on a regular basis.

## 9.9 Setting the conveyor belt

### 9.9.1 Adjusting the conveyor belt position

#### ■ *Conveyor belt position*

For correct distribution of the spreading material in the spreading unit hopper, the conveyor belt has to be centered on its drive rollers.

- ▶ Measure the clearance between the conveyor belt and the hopper walls on both sides.

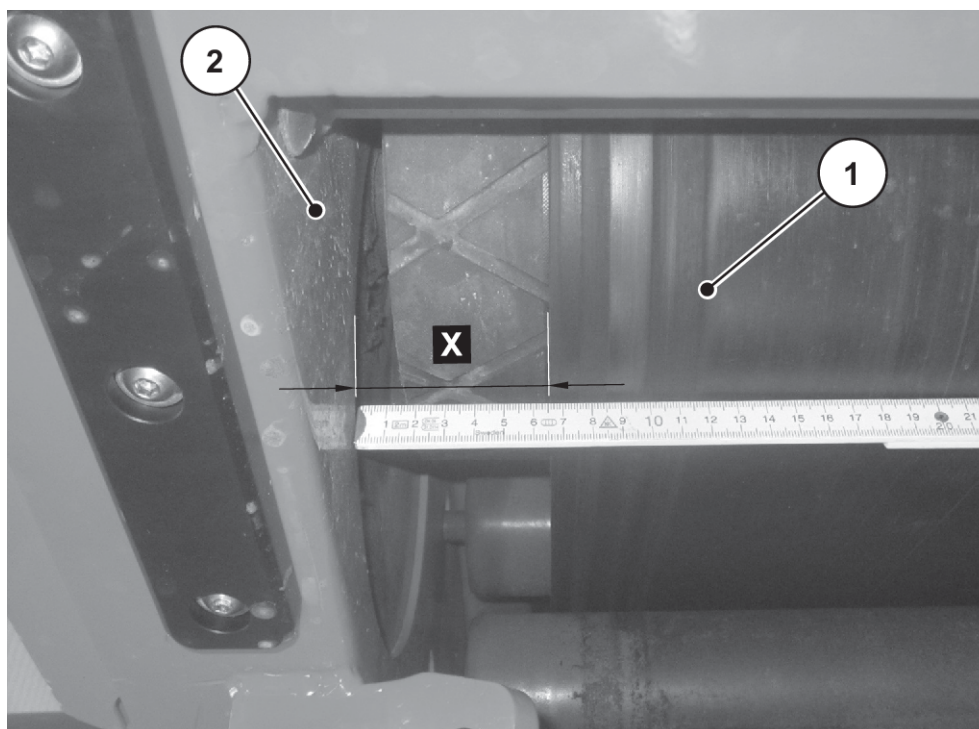


Fig. 59: Checking the position of the conveyor belt

- [1] Conveyor belt
- [2] Hopper walls

- [X] Measure the clearance between the conveyor belt and the left/right hopper walls

- ▶ If the deviation between both sides **exceeds 20 mm**, adjust the drive roller.

The bearings of the drive rollers are located in the rear in the direction of travel on each side of the spreading unit coupling points.

- ▶ At the side with the larger clearance, unscrew the nuts [1] of the drive roller by approx. 2 turns.
- ▶ Unscrew the adjustment screw [2] with nuts [3] until the clearance is identical on both sides.
- ▶ Retighten the nuts [1] and [3].

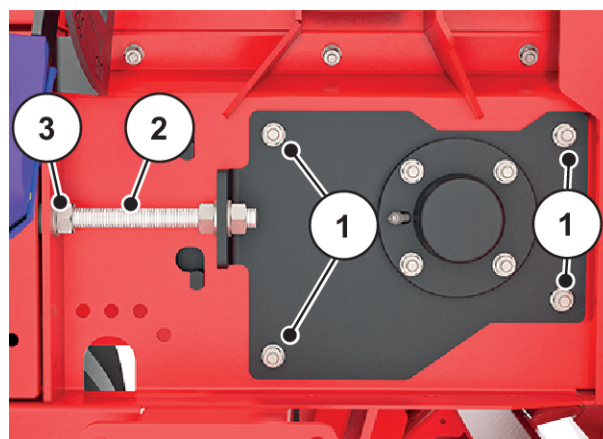


Fig. 60: Drive roller position



- ▶ Adjust the position of the belt cleaner at the conveyor belt.  
See 9.10 *Adjusting the belt cleaner*
- ▶ Start the conveyor belt via the AXENT ISOBUS machine control unit.
- ▶ Stop the conveyor belt after one minute.
- ▶ Check the position of the conveyor belt at the tension roller and adjust, if necessary.

## 9.9.2 Setting the conveyor belt tension

### ■ *Conveyor belt tension*

- ▶ Check the tension of the conveyor belt after the initial operating hours or if you detect a slipping conveyor belt.

The tension rollers of the conveyor belt are located in front in the direction of travel between the hopper and the frame.

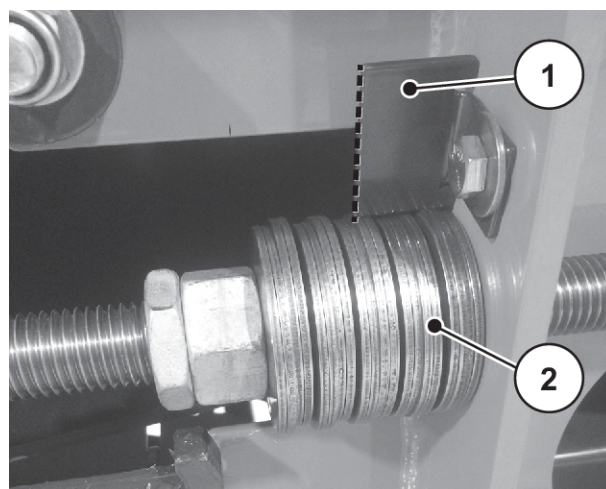
- ▶ Check the position of the disc spring assemblies [2].

Nominal dimension in the pre-tensioned installation position of all disc springs = 56 mm

Half of the disc spring assemblies are flush to the positioning plate [1] on both sides.

28 mm +/- 1 mm,  
10 disc springs

- ▶ If necessary, retighten the disc springs.



*Fig. 61: Retightening the disc spring assemblies*

### Checking the deflection roller position

The deflection roller has to be positioned in a right angle over the entire length.

- ▶ Check the position of the marking plate [2] on each side.

*The marking plate should be in the range of the same marking notch [A] on both sides.*

*The scale [1] of the deflection roller should also be identical on each side.*

- ▶ If the position of the markings deviate, adjust the disc spring assemblies accordingly.

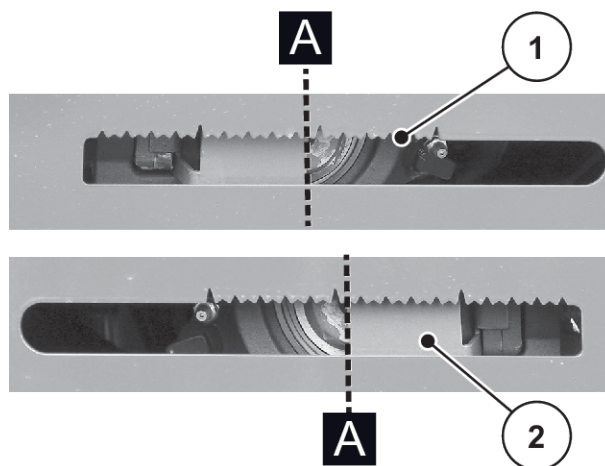


Fig. 62: Setting the disc spring assemblies

- ▶ Adjust the disc spring assemblies [1] by +/- 2 mm.

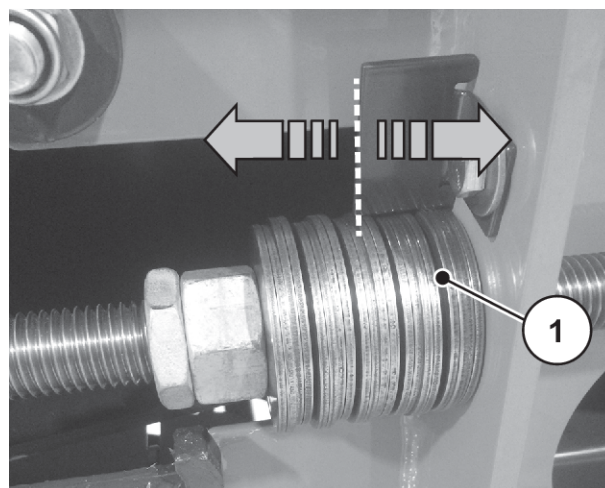


Fig. 63: Adjusting the disc spring assemblies

## 9.10 Adjusting the belt cleaner



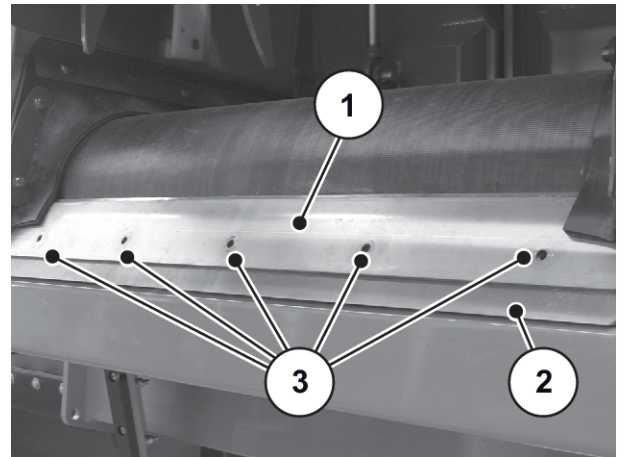
Remove the cover.

- See 9.4 Covers

### ■ Belt cleaner

**Disassembling the belt cleaner**

- ▶ Loosen the 5 screws [3] of the clamping plate [1].
- ▶ Remove the belt cleaner [2].



*Fig. 64: Disassembling the clamping plate*

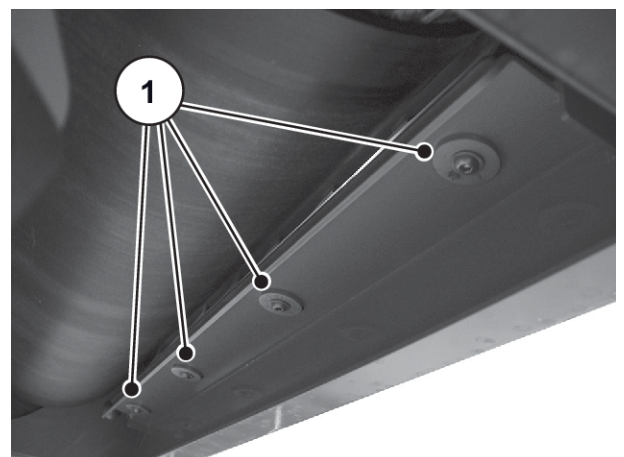
**Readjusting the belt cleaner bracket**

- ▶ Use a 4 mm gage.
- ▶ Check for an even clearance to the conveyor belt.



*Fig. 65: Checking the clearance*

- ▶ Loosen the 4 screws [1] under the conveyor belt.
- ▶ Readjust the position of the bracket at the slots.
- ▶ Retighten the screws [1].



*Fig. 66: Adjusting the position of the bracket*

**Tightening the belt cleaner**

- ▶ Reattach the belt cleaner [1].  
Observe the position of the cleaner.
- ▶ Tighten the clamping plate with the screws at the cleaner.

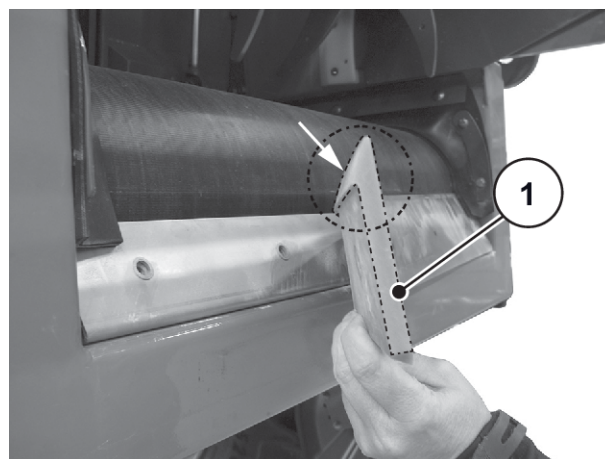


Fig. 67: Attaching the clamping plate

## 9.11 Chassis and brakes

The machine is equipped with a two-circuit pneumatic braking system. Chassis and brakes are decisive for the operational safety of the machine.

### ! WARNING!

#### Risk of accident due to improperly carried out work

Work improperly carried out at the chassis and the braking system compromises the operational safety of the machine and may lead to severe accidents with personal injury and property damage.

- ▶ Settings and repairs at the braking system may only be carried out by specialist workshops or approved brake repair services.

### 9.11.1 Checking the condition and function of the braking system

#### ■ *Braking system*



The operator is responsible for proper condition of the system.

Proper function of the braking system is essential for the safety of your machine.

Have the braking system regularly, at least once a year, checked by a specialist workshop.

- ▶ Regularly check the braking system for damage and leakage and at least prior to every travel.
- ▶ Check the braking system in a dry condition, **not when the vehicle is wet or during rain.**
- ▶ Check the brake lever and linkage for smooth operation.
- ▶ Replace the brake pad in time.
  - ▷ Only use the brake pads designated for the axles.

## 9.11.2 Checking the free travel of the slack adjuster

### ■ Slack adjuster

#### Checking the free travel

- ▶ Secure the machines against moving.
- ▶ Release the parking brake and the operating brake.  
Push in both buttons [1] and [2].

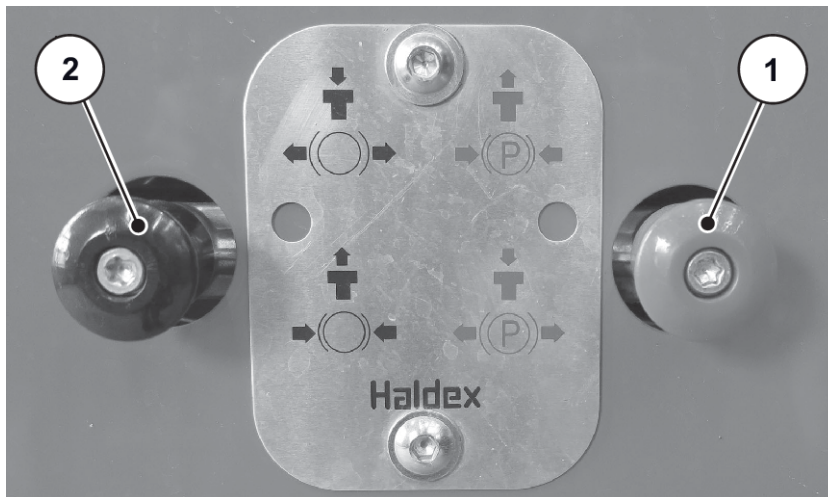


Fig. 68: Pneumatic brake

[1] Parking brake

[2] Operating brake

- ▶ Operate the slack adjuster by hand.

If the braking effect is reduced and the free travel exceeds 10 - 15% of the brake lever length [d], the specialist workshop must readjust the slack adjuster.

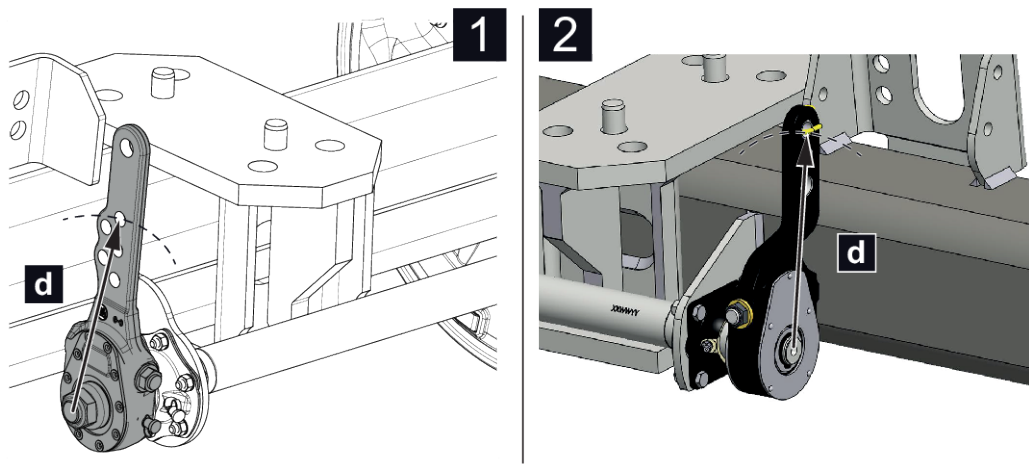


Fig. 69: Checking the free travel

[1] BPW Rigid axle

[2] ADR Rigid axle

[d] Brake lever length

Axle type	Brake lever length	Max. permissible free travel
BPW Rigid axle [1]	180 mm	27 mm
BPW Rigid axle [1]	165 mm	24 mm
ADR Rigid axle [2]	152 mm	23 mm



Only the specialist workshop is permitted to perform retrofitting work on the brakes.

### 9.11.3 Draining the air tank

#### ■ Air tank

Condensation may occur in the pneumatic braking system of the brake circuit and accumulate in the air tank. To prevent corrosion-related damage at the pneumatic braking system, drain the air tank every day.

- ▶ Pull the operation pin [1] with a finger.  
*The tilt valve is opened.*
- ▶ Fully drain the condensation water.
- ▶ Release the operation pin [1].

*The air tank is drained.*

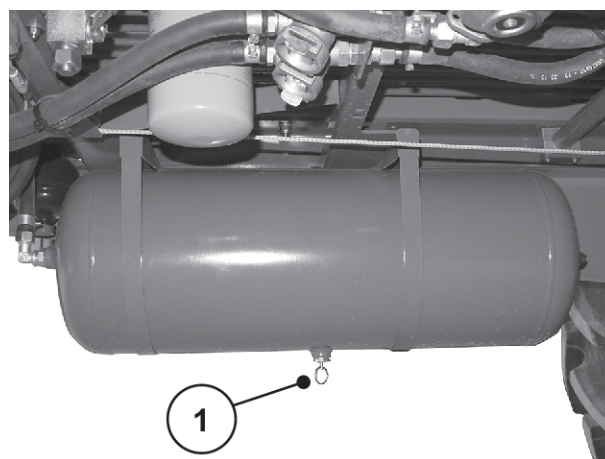


Fig. 70: Draining the air tank

### 9.11.4 Checking the brake pad

#### ■ Brake pad

- ▶ Check the brake pad for wear.
- ▶ If necessary, renew the brake pads.

## 9.12 Wheels and tires

The condition of the wheels and tires is crucial for the operational safety of the machine.

**! WARNING!****Risk of accident due to improperly carried out work**

Work improperly carried out at the wheels and tires compromises the operational safety of the machine and may lead to severe accidents with personal injury and property damage.

- ▶ Repairs at wheels and tires may only be carried out by **qualified personnel** with appropriate assembly tools.
- ▶ **Never** weld cracked rims or wheel disks. Due to the dynamic load during travel, the weld spots would break quickly.

### 9.12.1 Checking the tires

#### ■ *Tires*

- ▶ Regularly check the tires for wear, damage, and foreign objects.
- ▶ Check the pressure of the cold tires in intervals of two weeks. Observe the manufacturer instructions.

### 9.12.2 Checking the condition of the wheels

#### ■ *Wheels*

- ▶ Regularly check the wheels for deformation, corrosion, cracks and breaks.

Corrosions may lead to tension cracks at wheels and damage at tires.

- ▶ Keep the contact surface to the tire and the wheel hub free from corrosion.
- ▶ Immediately replace torn or deformed wheels or wheels that are damaged otherwise.
- ▶ Replace wheels with cracked or deformed bolt openings.

### 9.12.3 Checking the bearing clearance of the wheel hub

#### ■ *Bearing clearance of the wheel hub*

- ▶ Check the bearing clearance of the wheel hub.

### 9.12.4 Changing wheels

The condition of the wheels and tires is crucial for the operational safety of the machine.

**! WARNING!****Risk of accident due to improperly carried out change of wheels**

Improper change of wheels at the machine may lead to severe accidents and personal injury.

- ▶ Change wheels only if the machine is empty and coupled to the tractor.
- ▶ For wheel change, the machine has to be parked on even and solid ground.

**Requirements:**

- Use a jack with a minimum load rating of **5 tons**.
- For tightening the wheel nuts, use a torque wrench.

**Lifting jack positioning:**

- The correct lifting jack application points are marked with an illustration.
- Position the lifting jack in such a way that the support surface cannot slip (e.g., using a fitting piece of wood or rubber block).



- ▶ Additionally secure the lifting chuck against slipping.
- ▶ For a wheel change on the right side in direction of travel, position the lifting jack on the right [2] under the sticker.
- ▶ For a wheel change on the left side in direction of travel, position the lifting jack on the left [1] under the sticker.

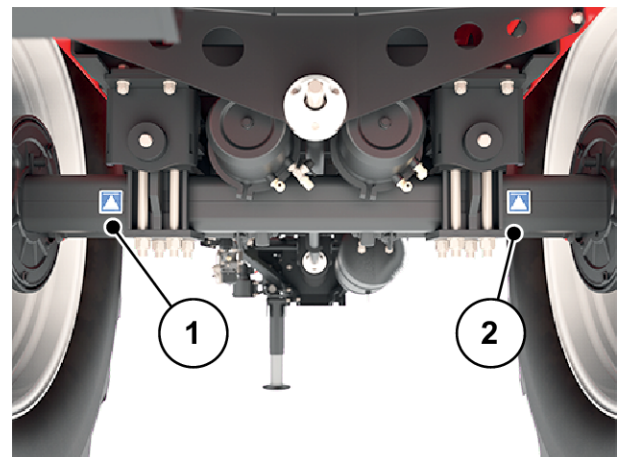


Fig. 71: Lifting jack application points

**Wheel assembly**

- ▶ Prior to assembly, clean the contact surface of the wheel at the hub.
- ▶ Prior to assembly, check the wheel nuts and bolts. Replace damaged, stuck or corroded wheel nuts or bolts.
- ▶ Tighten all wheel nuts in steps and diagonally with a torque wrench.
  - ▷ Tighten the wheel nuts with a tightening torque of **510 Nm**.
  - ▷ Screw on all **10** wheel nuts per wheel and tighten them.



Due to setting, the wheel nuts become loose during the first kilometers of travel of the new machine or after a wheel change.

- ▶ Retighten all wheel nuts after 50 km with the specified tightening torque.



Observe the instructions and required tasks specified by the axle manufacturer for wheel assembly.

### 9.12.5 Checking the brake lever length

#### ■ *Brake lever length*



#### **Only required when changing the wheel sizes**

The correct brake lever length is adjusted in the factory on your machine corresponding to the factory-installed wheels.

#### **! WARNING!**

#### **Risk of an accident due to an incorrect brake lever length**

The brake lever length used depends on the wheel type. During braking, an incorrect brake lever length can lead to blocking of the wheels or to insufficient braking action.

- ▶ Check the brake lever length in accordance with the specification in the **supplied tire table** and adjust it, if necessary.

- You can find the tire table in the appendix of this operator's manual, refer to *Chapter 12.1 - Tire table - Page 120*.

If you are using new wheels or a new wheel type or if the track width of your machine has changed, you have to check the brake lever length and adjust it, if necessary.



**Only the specialist workshop** is authorized to perform retrofitting and conversion work on the brakes.

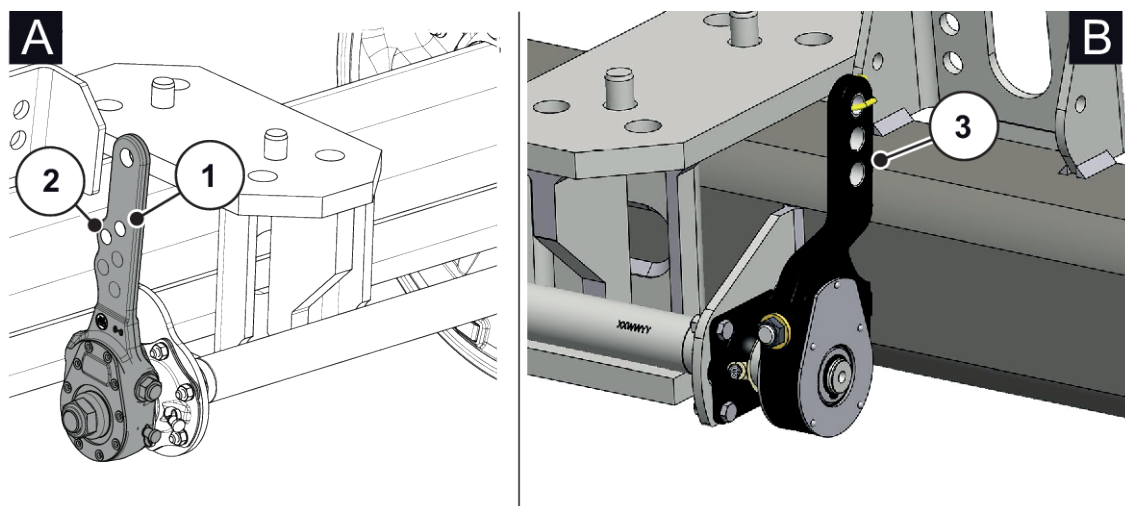


Fig. 72: Position of the brake lever/brake cylinder connection

[A] BPW Rigid axle

[B] ADR Rigid axle

[1] Position 1 of the brake lever - BPW rigid axle: 180 mm

[2] Position 2 of the brake lever - BPW rigid axle: 165 mm

[3] Position of the brake lever - ADR rigid axle: 152 mm

## 9.13 Recovery of the machine

If the machine cannot be towed by the tractor, proceed as follows to recover the machine from the field.

- ▶ Attach a rope around the axle body.

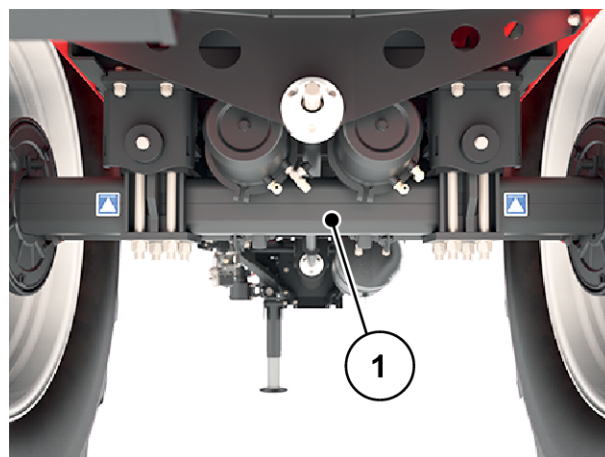


Fig. 73: Recover the machine with the rope

## 9.14 Lubrication plan

### ■ Machine components

Lubrication intervals: every 50 operating hours or in shorter intervals under extreme spreading conditions.

### 9.14.1 Basic machine lubrication points

The lubrication points are distributed over the entire machine and marked correspondingly.

You can identify the lubrication points by means of the following notice plate:



Fig. 74: Lubrication points notice plate

- ▶ Always keep the notice plates clean and in a legible state.



Fig. 75: Ball coupling

[1] Ball coupling lubrication point

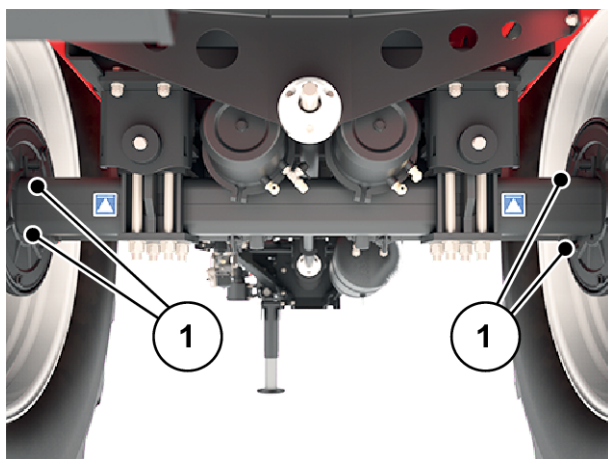


Fig. 76: Brake linkage and axle

- [1] Lubrication point of brake linkage and axle

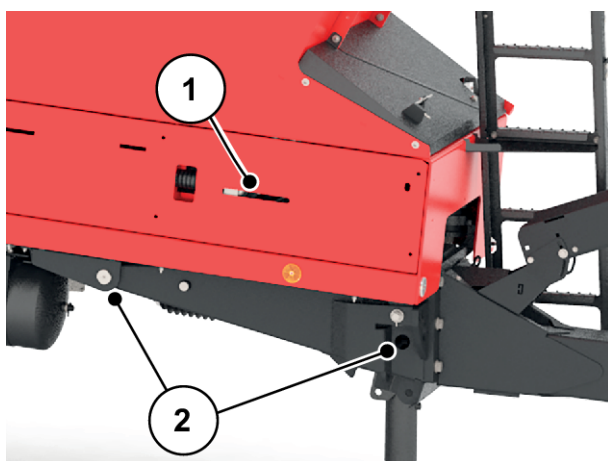


Fig. 77: Lubrication point of belt drive and towing bar

- [1] Deflection roller lubrication point
- [2] Towing bar lubrication point

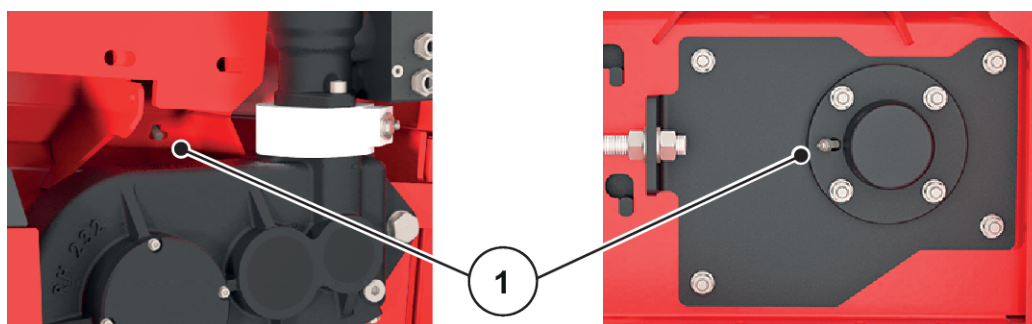


Fig. 78: Lubrication point of conveyor belt drive

- [1] Lubrication point of universal through drive shaft

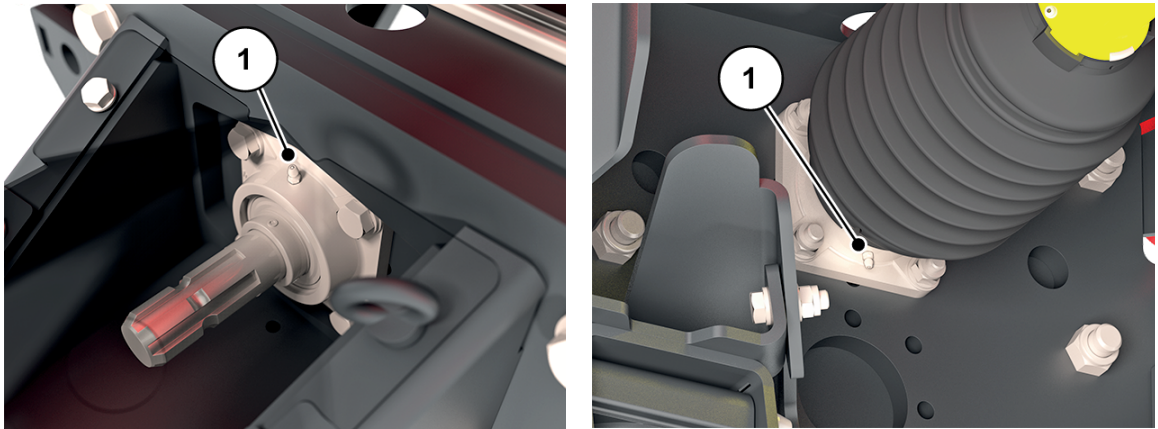


Fig. 79: Lubrication point of universal through drive shaft

[1] Lubrication point of universal through drive shaft

## 9.14.2 Drive shaft lubrication

### ■ *Universal drive shaft*

- Lubricant: Grease
- See operator's manual of the manufacturer.

## 9.15 Maintenance of the fertilizer spreading unit

### 9.15.1 Checking the position of the spreading disc hub

#### ■ *Position of the spreading disc hub*

- Lubricant: Graphite grease

The spreading disc hub must be centered under the agitator.

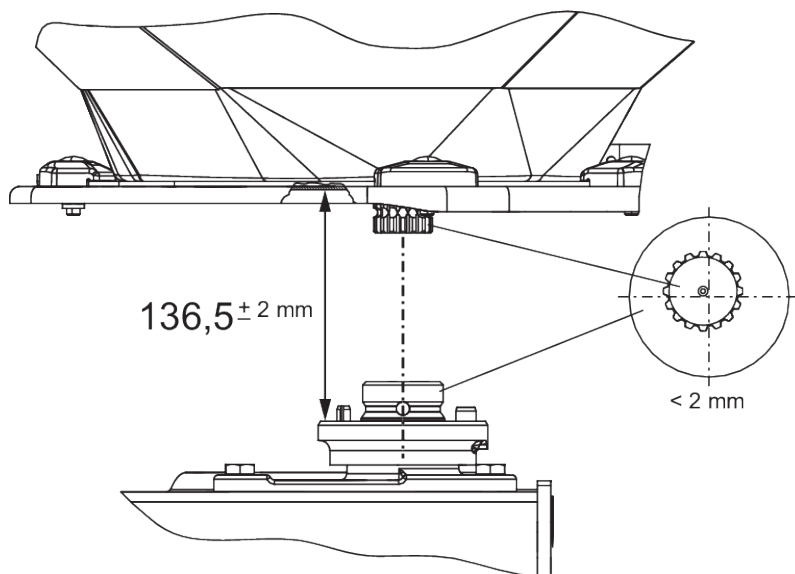


Fig. 80: Checking the position of the spreading disc hub

**Requirements:**

- The spreading discs are removed (see *Position of the spreading disc hub*).

*Checking the centering:*

- ▶ Check the centering of the spreading disc hub and the agitator by means of suitable aids (e.g., straightedge, angled blade)

*The axes of the spreading disc hub and of the agitator must be aligned. They may deviate from each other by a maximum of 2 mm.*

*Checking the clearance:*

- ▶ Measure the clearance between the upper edge of the spreader disc hub and the lower edge of the agitator.
  - ▷ The clearance must be **136.5 mm** (permissible tolerance  $\pm 2$  mm).



If these tolerances are exceeded, please refer to your dealer and/or your specialist workshop.

■ **Spreading disc hub**

- Lubricant: Graphite grease

**9.15.2 Checking the agitator drive**

■ **Agitator drive**

- Lubricant: Grease/oil



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

In order to guarantee an even fertilizer flow, the agitator must work at a constant speed.

- Speed of the agitator: 15 - 20 rpm

In order to reach the correct agitator speed, the agitator requires the resistance of the spreading material inside it. This is the reason why it is entirely possible that even with a fully functional agitator, the correct speed cannot be reached or that the hopper swings back and forth when the hopper is empty.

If the speed is outside of this range **when the hopper is full**, the agitator must be checked for damage and wear.

### Checking the function of the agitator

Requirements:

- ✓ The tractor is parked
- ✓ The ignition key has been removed
- ✓ The machine is placed on the ground

► Checking the connecting rods

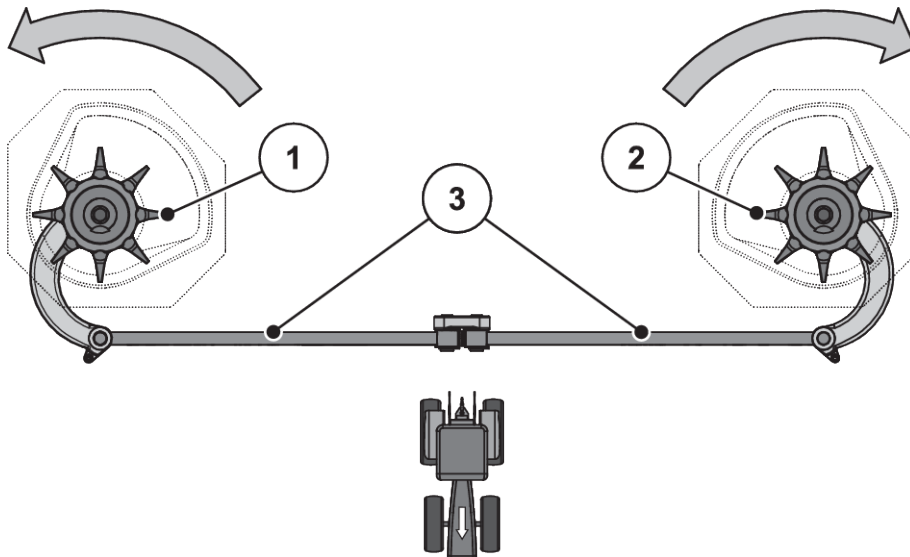


Fig. 81: Checking the agitator drive

- |  |   |
|--|---|
| <p>[1] Right-hand agitator head (in the direction of travel)</p> <p>[2] Left-hand agitator head (in the direction of travel)</p> | <p>[3] Connecting rods</p> <p>Arrows: Rotational direction of spreading discs</p> |
|--|---|

- ▷ Connecting rods must not show any cracks or other signs of damage.
- ▷ Checking the joint bearing for wear
- ▷ Checking safety element functions at all joints

► Manually turn the agitator head **into the rotational direction of the spreading disc**. See Fig. 81 Checking the agitator drive.

- ▷ It must be possible to turn the agitator head
- If it does not turn, replace the agitator head.*

► Turn the agitator head manually or with the help of an oil filter belt forcefully **against the rotational direction of the spreading disc**. See Fig. 81 Checking the agitator drive

- ▷ The agitator head must lock
- If the agitator head can be turned, replace it.*

*If the checkup does not identify any cause, please contact your authorized specialist workshop for further inspections.*



### Checking the agitator head for wear or damage

- ▶ Checking the fingers of the agitator head for wear

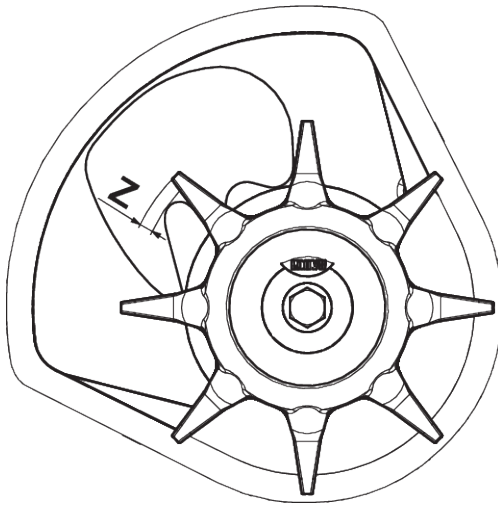


Fig. 82: Agitator head wear range

The length of the fingers must not be less than the wear range ( $Z = 9 \text{ mm}$ ).

The fingers must not be bent.

### 9.15.3 Metering slide adjustment

#### ■ Metering slide adjustment

Check the setting of the two metering slides for even opening before each spreading season and also during the season, if necessary.

#### **! WARNING!**

##### **Danger of crushing and shearing due to externally-actuated components**

When working on power-operated components (adjusting lever, metering slides), there is a crushing and shearing risk.

Pay attention to the shear point of the metering slide opening and the metering slide during adjustment.

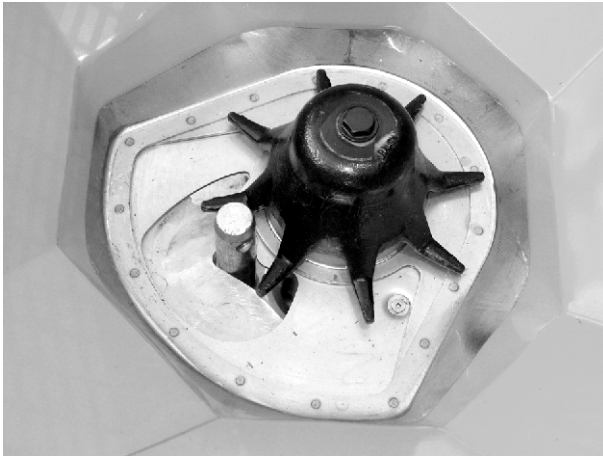
- ▶ Switching off the tractor engine
- ▶ Removing the ignition key
- ▶ Disconnecting the power supply between the tractor and the machine
- ▶ Never operating the hydraulic metering slide during adjustment

Requirements:

- The mechanical system must move freely
- Version K: The return spring is unhooked
- The hydraulic cylinder is unhooked

**Checking (e.g., left side of machine)**

- ▶ Insert a lower link pin with a diameter of **28 mm** centrally into the metering opening.



*Fig. 83: Lower link pin in metering opening*

- ▶ Push the metering slide against the pin and lock it in this position by tightening the setscrew.  
*The stop at the lower scale arc (metering scale) is at scale value 85.*
- ▶ If the position is not correct, readjust the scale.

### Adjustment

- ✓ The metering slide is pushed lightly against the pin. See *Fig. 83 Lower link pin in metering opening*.
- ▶ Loosen the mounting screws on the scale of the lower scale arc.

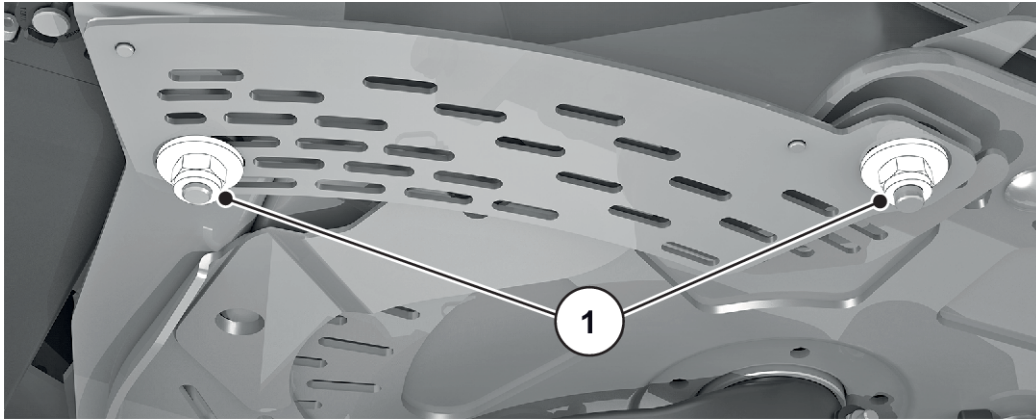


Fig. 84: Scale mounting screws

- ▶ Adjust the scale in such a way that **scale value 85** lies exactly under the pointer element.

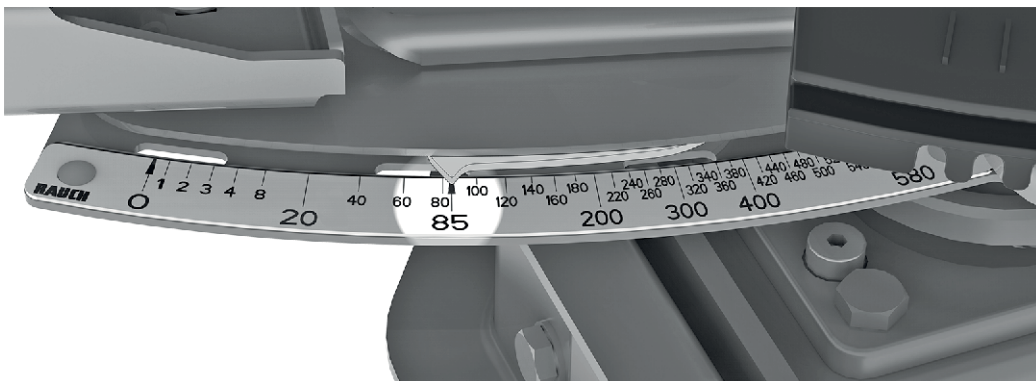


Fig. 85: Metering slide pointer on scale value 85

- ▶ Tighten the scale again.  
*Repeat the steps for the right-hand metering slide.*



Both metering slides must open **evenly** and to the same extent. Therefore, always check both metering slides.



After scale correction with electronic metering slide actuators, correcting the slide testing points in the ISOBUS machine control unit is also necessary.

- Please observe the operator's manual for the machine control unit.
- In the event of discrepancies, please contact your dealer or an authorized specialist workshop for recalibration.

## 10 Winterization and preservation

### 10.1 Safety

In combination with moisture, fertilizer can form aggressive acids that attack paints, plastics, and especially metal parts. This is why **regular washing and caring after use** is very important.



Prior to winterizing, thoroughly **wash** the machine (refer to *10.2 Washing the machine*) and let it dry well.

Next, **preserve** the machine (refer to *10.3 Preserving the machine*).

- ▶ Hang up hoses and cables (refer to *Fig. 48 Transport bracket for cables, hydraulic hoses and pneumatic lines*).
- ▶ Park the machine (refer to *7.6 Parking and unhitching the machine*).
- ▶ Close the hopper cover. Leave a gap open to prevent moisture in the hopper.
- ▶ If present, disconnect the control unit or the ISOBUS terminal from power and dust off.



Do not store the control unit or the ISOBUS terminal outdoors. Store in a suitable warm location.

- ▶ Place dust caps on hoses and cable.
- ▶ Open the fertilizer outlets:
  - ▷ Metering slide, pre-metering slide, drain door, etc (depends on the machine)

### 10.2 Washing the machine

A machine that is placed into storage **must** first be cleaned.



Spreading material and dirt can collect in hidden corners!

- Thoroughly clean hidden corners and nooks (under the machine, between frame and hopper, etc.).

- ▶ Fold up the protective grid in the hopper (if present).
- ▶ When cleaning with high-pressure, never aim the water jet directly at warning signs, electrical equipment, hydraulic components, and sliding bearings.
- ▶ Letting the machine dry after cleaning
  
- ▶ Fold out the boom after washing and let the blower run for approx. 15 minutes to dry out the fertilizer ducts.

## 10.3 Preserving the machine



- Only spray on **approved and environmentally friendly** preserving agents.
- Prevent mineral oil-based agents (diesel, etc.). They are rinsed off when the machine is first washed and can get into the sewage system.
- Only use preservation agents that will not attack the paint, plastics, and rubber seals.

- ▶ Only spray the machine once certain that it is completely **clean** and **dry**.
- ▶ Treat the machine with environmentally friendly anti-corrosion agents.
  - ▷ We recommend using protective wax or preservation wax.



Please contact your specialist dealer or your specialist workshop if you want to obtain preservation agents.

Preserve the following assemblies or parts:

- All hydraulic components that are susceptible to rust, e.g., hydraulic couplers, pipes, press-fit rings, and valves
- Galvanized bolts
- If present on your machine:
  - Parts of the braking system
  - Pneumatic lines
  - Spray galvanized **bolts on the axles and the drawbar** with a special protective wax after washing.



You can find further useful information on washing and preserving in the video "Getting ready - winterization essentials".

- Please visit the RAUCH YouTube channel.
- Here is the link to the video: "*Winterization video*".

# 11 Disposal

## 11.1 Safety

### **WARNING!**

#### **Environmental pollution due to unsuitable disposal of hydraulic and transmission oil**

The hydraulic and transmission oils are not entirely biodegradable. Therefore, oil must be prevented from entering the environment in an uncontrolled manner.

- ▶ Collect/dam escaped oil with sand, earth or other absorptive material.
- ▶ Collect hydraulic and transmission oil in a suitable container provided for the purpose, and dispose of it in accordance with the local statutory requirements.
- ▶ Draining and penetration of oil into the sewerage system is to be prevented.
- ▶ Prevent the penetration of oil into the water drain by setting up sand or earth barriers, or by using other appropriate barrier methods.

### **WARNING!**

#### **Environmental pollution caused by inappropriate disposal of packaging materials**

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

- ▶ Packaging material is to be disposed of at an authorized waste management company.
- ▶ Observe the national regulations.
- ▶ Packaging material may not be burned nor disposed of with the domestic waste processing.

### **WARNING!**

#### **Environmental pollution caused by inappropriate disposal of components**

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

- ▶ Only authorized companies may be commissioned with disposal.

## 11.2 Disposal of the machine

The following points apply without restriction. Stipulate suitable precautionary measures based on the national legislation and implement them.

- ▶ All components, auxiliary and operating materials from the machine must be removed by specialist staff.
  - ▷ In so doing, these parts are to be sorted into specific categories.
- ▶ All waste products are then to be disposed of in accordance with local regulations and directives for recycling or special refuse categories by authorized companies.

## 12 Appendix

# 12.1 Tire table

Mass(es) and tyre(s) AXENT		RAUCH wir nehmen's genau KUHN									
Mass(es) and tyre(s) AXENT											
Tyre combination	Axle no.	Brake calculation	Tyre dimensions, including load capacity index and speed category symbol	Rolling radius [mm]	Tyre load - load capacity per tyre [kg]	Maximum permissible axle load [kg] (*)	Maximum permissible mass of the vehicle [kg] (*)	Maximum permissible vertical load on the coupling point [kg] (*) (**)(***)	Track width [mm]		
									Minimum	Maximum	
1	1	2/3	IF 380/90 R46 164 A8	875	5000	10000	10000	-	2250	2400	
2	1	2/3	VF 380/90 R 46 164 A8	875	5000	10000	10000	-	2250	2400	
3	1	1/3	IF 380/105 R50 164 A8	1025	5000	10000	10000	-	2250	2400	
4	1	1/3	VF 380/105 R 50 164 A8	975	5000	10000	10000	-	2250	2400	
5	1	1/3	VF 420/95 R 50 164 A8	1000	5000	10000	10000	-	2250	2400	
6	1	1/3	480/80 R 46 164 A8	925	5000	10000	10000	-	2250	2400	
7	1	2/3	VF 480/80 R 46 164 A8	925	5000	10000	10000	-	2250	2400	
8	1	1/3	480/80 R 50 164 A8	975	5000	10000	10000	-	2250	2400	
9	1	1/3	IF 480/80 R50 164 A8	975	5000	10000	10000	-	2250	2400	
10	1	1/3	VF 480/80 R 50 164 A8	975	5000	10000	10000	-	2250	2400	
11	1	1/3	520/85 R 42 164 A8	925	5000	10000	10000	-	2000	2400	
12	1	2/3	IF 520/85 R42 164 A8	925	5000	10000	10000	-	2000	2400	
13	1	1/3	VF 520/85 R 42 164 A8	925	5000	10000	10000	-	2000	2400	
14	1	1/3	520/85 R 46 164 A8	975	5000	10000	10000	-	2000	2400	
15	1	1/3	VF 520/85 R 46 164 A8	975	5000	10000	10000	-	2000	2400	
16	1	1/3	580/85 R 42 164 A8	975	5000	10000	10000	-	2000	2250	
17	1	1/3	IF 580/85 R 42 164 A8	975	5000	10000	10000	-	2000	2250	
18	1	1/3	VF 580/85 R 42 164 A8	975	5000	10000	10000	-	2000	2250	
19	1	2/3	650/65 R 42 164 A8	925	5000	10000	10000	-	2000	2250	
20	1	2/3	VF 650/65 R 42 164 A8	925	5000	10000	10000	-	2000	2250	

1. Brake calculation for wheels Rstat = 885 to 949 mm. Brake lever position 182 mm steering axle / 180 mm rigid axle
2. Brake calculation for wheels Rstat = 835 to 885 mm. Brake lever position 165 mm steering axle and rigid axle
3. Brake calculation for wheels Rstat = 885 to 949 mm, Brake lever position 152 mm rigid axle



## 12.2 Torque value

Tightening torque and assembly pre-load for bolts with metric thread and standard or fine pitch



The values listed apply to dry or slightly lubricated connections.  
Do not use galvanized (plated) bolts and nuts without grease.  
When using a stiff grease, reduce the value in the table with 10%.  
When using (self-)locking bolts and nuts increase the value in the table with 10%.

Tightening torque and assembly pre-load with  $v=0,9$  for shank bolts with metric thread and standard or fine pitch according to ISO 262 and ISO 965-2

Steel class quality fasteners according to ISO 898-1

Head dimensions of hexagonal bolts according to ISO 4014 to ISO 4018

Head dimensions of cylindrical bolts according to ISO 4762

Hole "medium" according to EN 20273

Friction coefficient:  $0,12 \leq \mu \leq 0,18$

Metric thread with standard pitch				
Thread	Class	Tightening torque		Max. assembly pre-load ( $\mu_{\min}=0.12$ ) N
		Nm	lbf-ft (lbf-in)	
M4 (X0.7)	8.8	3	(26.5)	4400
	10.9	4.9	(40.7)	6500
	12.9	5.1	(45.1)	7600
M5 (X0.8)	8.8	5.9	(52.2)	7200
	10.9	8.6	(76.1)	10600
	12.9	10	(88.5)	12400
M6 (X1)	8.8	10.1	7.4	10200
	10.9	14.9	11	14900
	12.9	17.4	12.8	17500
M8 (X1.25)	8.8	24.6	18.1	18600
	10.9	36.1	26.6	27300
	12.9	42.2	31.1	32000

Metric thread with standard pitch				
Thread	Class	Tightening torque		Max. assembly pre-load ( $\mu_{\min}=0.12$ ) N
		Nm	lbf-ft (lbf-in)	
M10 (X1.5)	8.8	48	35.4	29600
	10.9	71	52.4	43400
	12.9	83	61.2	50800
M12 (X1.75)	8.8	84	62	43000
	10.9	123	90.7	63200
	12.9	144	106.2	74000
M14 (X2)	8.8	133	98	59100
	10.9	195	143.8	86700
	12.9	229	168.9	101500
M16 (X2)	8.8	206	151.9	80900
	10.9	302	222.7	118800
	12.9	354	261	139000
M18 (X2.5)	8.8	295	217.6	102000
	10.9	421	310.5	145000
	12.9	492	363	170000
M20 (X2.5)	8.8	415	306	130000
	10.9	592	436.6	186000
	12.9	692	510.4	217000
M22 (X2.5)	8.8	567	418.2	162000
	10.9	807	595	231000
	12.9	945	697	271000
M24 (X3)	8.8	714	526.6	188000
	10.9	1017	750.1	267000
	12.9	1190	877.1	313000
M27 (X3)	8.8	1050	774.4	246000
	10.9	1496	1013.3	351000
	12.9	1750	1290.7	410000

Metric thread with standard pitch				
Thread	Class	Tightening torque		Max. assembly pre-load ( $\mu_{\min}=0.12$ ) N
		Nm	lbf-ft (lbf-in)	
M30 (X3.5)	8.8	1428	1053.2	300000
	10.9	2033	1499.4	427000
	12.9	2380	1755.4	499000
M36 (X4)	8.8	2482	1830.6	438000
	10.9	3535	2607.3	623000
	12.9	4136	3050.5	729000

Metric thread with fine pitch				
Thread	Class	Tightening torque		Max. assembly pre-load ( $\mu_{\min}=0.12$ ) N
		Nm	lbf-ft (lbf-in)	
M8X1	8.8	26.1	19.2	20200
	10.9	38.3	28.2	29700
	12.9	44.9	33.1	34700
M10X1.25	8.8	51	37.6	31600
	10.9	75	55.3	46400
	12.9	87	64.2	54300
M12X1.25	8.8	90	66.4	48000
	10.9	133	98	70500
	12.9	155	114.3	82500
M12X1.5	8.8	87	64.2	45500
	10.9	128	94.4	66800
	12.9	150	110.6	78200
M14X1.5	8.8	142	104.7	64800
	10.9	209	154.1	95200
	12.9	244	180	111400

Metric thread with fine pitch				
Thread	Class	Tightening torque		Max. assembly pre-load ( $\mu_{\min}=0.12$ ) N
		Nm	lbf-ft (lbf-in)	
M16X1.5	8.8	218	160.8	87600
	10.9	320	236	128700
	12.9	374	275.8	150600
M18X1.5	8.8	327	241.2	117000
	10.9	465	343	167000
	12.9	544	401	196000
M20X1.5	8.8	454	335	148000
	10.9	646	476.5	211000
	12.9	756	557.6	246000
M22X1.5	8.8	613	452	182000
	10.9	873	644	259000
	12.9	1022	754	303000
M24X2	8.8	769	567	209000
	10.9	1095	807.6	297000
	12.9	1282	945.5	348000

## 13 Guarantee and warranty

RAUCH devices are manufactured using modern production methods and with the greatest of professional care, and are subjected to numerous inspections.

This is why RAUCH is offering a 12 month warranty if the following conditions are met:

- The warranty starts on the date of purchase.
- The warranty covers material or manufacturing defects. We are liable for third-party products (hydraulics, electronics) only to the extent of the relevant manufacturer. During the warranty period, manufacturing and material defects will be rectified free of charge with the replacement or repair of the affected parts. Other rights extending beyond the above, such as claims for conversion, reduction, or replacement for reasons of damage not suffered by the supplied product are explicitly excluded. Warranty services are provided by authorized workshops, by RAUCH factory representatives or the factory itself.
- Consequences of natural wear, dirt, corrosion, and all defects caused by improper use as well as external influences shall be excluded from the warranty. Any unauthorized repairs or changes to the original condition will void the warranty. The warranty is voided if any spare parts other than genuine RAUCH spare parts were used. Therefore, the directions in the operating manual must be observed. Please contact our company representatives of the parent company if you have any questions or doubts. Warranty claims must be submitted to the company within 30 days at the latest after the damage has occurred. The date of purchase and the machine number must be indicated. If repairs under the warranty are required, they must be carried out by the authorized workshop only after consultation with RAUCH or the company's appointed representatives. The warranty period will not be extended by warranty work. Transport damage is not a factory defect and is therefore not covered by the manufacturer's warranty manufacturer.
- Claims for damage other than to the RAUCH devices will not be accepted. This also means that no liability will be accepted for damage resulting from spreading errors. Unauthorized modifications of the RAUCH devices may result in consequential damage, for which the manufacturer will not accept any liability. The manufacturer's exclusion from liability will not apply in the case of willful 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. The exclusion from liability will also not apply if characteristics are missing that are explicitly guaranteed, if the purpose of their guarantee was to protect the purchaser against damage not suffered by the supplied product itself.


**RAUCH Streutabellen**  
**RAUCH Fertilizer Chart**  
**Tableaux d'épandage RAUCH**  
**Tabele wysiewu RAUCH**  
**RAUCH Strooitabellen**  
**RAUCH Tabella di spargimento**  
**RAUCH Spredetabellen**  
**RAUCH Levitystaulukot**  
**RAUCH Spridningstabellen**  
**RAUCH Tablas de abonado**



<http://www.rauch-community.de/streutabelle/>



**RAUCH Landmaschinenfabrik GmbH**

 Landstraße 14 · D-76547 Sinzheim

 Victoria-Boulevard E200 · D-77836 Rheinmünster



info@rauch.de · www.rauch.de

Phone +49 (0) 7221/985-0

Fax +49 (0) 7221/985-200