RAUCH

POWER FOR PRECISION

OPERATOR MANUAL

Please read carefully before using the machine.

Keep for future reference.

This operator manual is to be considered as part of the machine. Suppliers of new and second-hand machines are required to document in writing that the operator manual.

UKS 80/100/120/150/190/230/300

Original operating manual

5901337-g-en-1012

Preface

Dear customer,

By purchasing the **universal box spreader** of the UKS series, you have shown trust in our product. Thank you very much! We want to justify your trust. You have purchased a powerful and reliable **universal box spreader**. If against expectations any problems occur: Our customer service is always there for you.

Please read this operating manual carefully before commissioning the universal box spreader and follow the instructions given. This **operating manual** explains in detail how to operate the spreader and contains important information on operation, care and maintenance.

The manual could also describe equipment that is not included in your **universal box spreader**.

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

Note: Please enter the type and serial number as well as the year of construction of your **universal box spreader** here. You can find this information on the nameplate and/or the frame. Please always state this information when ordering spare parts or accessories, and in case of complaints.

Type	Serial number	Year of construction

Technical improvements

We are continuously improving our products. Therefore, we reserve the right to make any improvements and changes to our machine that we consider necessary without notice. This constitutes no 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

1 Intended use and EC conformity

1.1 Intended use

The universal box spreaders of the UKS series are constructed in accordance with their intended use and may be exclusively used for the following:

- in winter road maintenance for spreading material that can be delivered by chute, such as grit with a size up to 3/8, sand and salt,
- in agriculture for spreading dry, granular and crystalline fertilisers,
- in agriculture for spreading seeds,
- in road construction for spreading material that can be delivered by chute, such as grit with a size up to 3/8.

Any use outside these definitions is considered misuse. The manufacturer is not liable for any damage which results from misuse. The operator bears the entire risk.

Intended use also includes observing the operating, maintenance and service conditions specified by the manufacturer. Only genuine spare parts from the manufacturer may be used as replacements.

The universal box spreaders of the UKS series 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 notes on the operation, service and secure handling of the machine as described in this operating manual and in the form of warning notes and pictorial warnings at the machine issued by the manufacturer are to be adhered to when using the machine.

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

Unauthorised modifications to the universal box spreader UKS are not permitted. They will exempt the manufacturer from liability for any damage resulting therefrom.

Foreseeable misuse

The manufacturer provides warning notes and signs on the universal box spreader UKS relating to foreseeable misuse. These warning notes and signs must be observed under all circumstances in order to prevent the universal box spreader UKS being used for any other purpose than that specified in the operating manual.

1.2 EC conformity declaration

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

Rauch - Landmaschinenfabrik GmbH,
Landstrasse 14, 76547 Sinzheim, Deutschland

We hereby declare that the product:

universal box spreader of the UKS series
Model: UKS 80, UKS 100, UKS 120,
Model: UKS 150 GB, UKS 190 GB, UKS 230 GB, UKS 300 GB

complies with all relevant regulations of the EC Machinery Directive 2006/42/EC.
Technical documents compiled by:
Rauch - Design Management
Landstrasse 14, 76547 Sinzheim, Deutschland

(Norbert Rauch - CEO)

2 User instructions

2.1 About this operating manual

This operating manual is an **integral part** of the universal box spreaders **of the UKS series**.

The manual contains important instructions for a **safe**, **proper** and economic **use** and **maintenance** of the universal box spreader. Adherence to the manual helps to **avoid** risks, reduce repair costs and downtime, and increase the machine's reliability and service life.

The complete documentation, comprising this operating manual and any supplier documentation provided, must be kept in an easily accessible location close to where the universal box spreader is used (e. g. on the tractor).

If the machine is sold, the operating manual must also be passed to the new owner.

The operating manual is intended for the operator of the universal box spreader UKS and its operating and maintenance staff. It must be read, understood, and applied by all persons entrusted with the following work on the machine:

- Operation,
- Maintenance and cleaning,
- Repairing faults.

The following are particularly important:

- the chapter on safety,
- the warning instructions in the text of the individual chapters.

This operating manual does not exempt you from **your own responsibility** as operator and operating staff of the universal box spreaderUKS.

2.2 Structure of the manual

The manual is divided into 5 key areas in terms of content:

- General information
- Safety instructions
- Machine data
- Instructions for operating the universal box spreader
- Maintenance and repair instructions.

2.3 Notes on text descriptions

2.3.1 Instructions and procedures

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

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

Instructions involving only one step are not numbered. The same applies for action steps that do not have a specific sequence.

A bullet is placed in front of these instructions:

- Handling instruction

2.3.2 Listings

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

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

2.3.3 References

References to other text passages in the document are indicated with section number, headline text and page number:

- See also Chapter 3: Safety, page 5.

References to other documents are indicated as note or instruction without exact chapter or page number:

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

3 Safety

3.1 General Information

The chapter on safety contains general safety instructions as well as occupational and traffic safety regulations regarding the handling and operation of the UKS universal box spreader.

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

There are additional warnings in the other chapters of this 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 notes are to be adhered to, as well.

3.2 Meaning of warnings

The warning instructions in this manual have been structured according to the degree of danger and the probability of their occurrence.

Danger signs and symbols inform the user about other construction-related and unavoidable remaining dangers that may be encountered when operating the machine. The safety warnings are structured as follows:

	Signal word
Symbol	Explanation

Example

⚠ DANGER	
	**Description of the sources of danger** Description of the danger and possible consequences. Ignoring these warnings will result in very serious or even fatal injury. ▶ Measures to prevent the danger.

Warning severity level

The degree of danger is indicated by the signal word. The levels are classified as follows:

⚠ DANGER

Type and source of danger

This advice warns of a danger posing an immediate threat to the health and life of persons.

Ignoring these warnings will result in very serious or even fatal injury.

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

⚠ WARNING

Type of hazard and source of danger

This advice warns of a possible dangerous situation for the health of persons.

Ignoring these warnings will result in very serious or even fatal injury.

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

⚠ CAUTION

Type of hazard and source of danger

This note warns of a potentially dangerous situation for personal health or of material and environmental damage.

Ignoring these warnings can result in damage to the product or the general area.

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

NOTICE

General information contain application tips and particularly useful information but neither warnings nor hazards.

3.3 General information on the safety of the machine

The UKS universal box spreader 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 of the operating staff or third parties and/or the impairment of the machine and other material assets.

For this reason, operate the UKS universal box spreader:

- only when it is in a proper and roadworthy condition,
- being aware of safety and dangers.

For this purpose, it is essential that you know and apply the content of the operating manual, the applicable accident prevention regulations as well as the general safety-related, occupational-medical, road-traffic-related regulations.

3.4 Instructions for the operator

It is the operator's responsibility that the UKS universal box spreader is used as intended.

3.4.1 Personnel qualifications

Members of staff who are commissioned with the operation, maintenance or the repair of the universal box spreader must have read and understood this operating manual in advance, in particular the chapter on safety and the warning notes regarding the respective activities.

- The machine may only be operated by trained personnel authorised by the operator.
- Members of staff who are still in training or subject to coaching/instructions may only work on the machine when an experienced person is present.
- Maintenance and repair work may only be carried out by qualified staff.

3.4.2 Instruction

Distribution partners, works representatives or employees of the company RAUCH will instruct the operator regarding the operation and maintenance of the universal box spreader.

It is the operator's responsibility to ensure that new operating and maintenance staff members are instructed in the operation and repair of the machine with the same diligence, adhering to the stipulations of the present operating manual.

3.4.3 Accident prevention

The safety and accident prevention regulations are subject to applicable laws in each country. The operator of the machine shall be responsible for the compliance with these regulations applicable in the country of use.

The following instructions must also be observed:

- Never let the universal box spreader run without supervision.
- Do not ride on the universal box spreader while it is working or being transported (no passengers).
- Machine parts of the universal box spreader must not be used as boarding aid.
- Always wear tight fitting clothes. Do not wear work clothes with belts, loose threads or other items that could snag.
- Follow the manufacturer's directions when working with chemicals. It may be necessary to wear personal protective equipment.

3.5 Information on operating safety

To avoid dangerous situations only use the universal box spreader in a reliable condition.

3.5.1 Parking the universal box spreader

- Only park the universal box spreader with the hopper empty and on horizontal, solid ground.
- If you park the universal box spreader alone (without the tractor), fully open the metering slide (any water that may enter the hopper can drain).

3.5.2 Filling the universal box spreader

- Only fill the universal box spreader when the motor of the tractor is stopped. Prevent an unauthorised start of the tractor's engine by removing the ignition key.
- Use suitable auxiliary equipment for filling the spreader (e. g. front-end loader, feed screw conveyor).
- Fill the universal box spreader no higher than the top-edge. Check the filling level.
- Only fill the universal box spreader when the protective grid is closed. This way, faults during spreading caused by lumps in the spreading material or foreign bodies are prevented.

3.5.3 Checks before start-up

Check the operating safety of the universal box spreader before the first and every subsequent commissioning.

- Is all safety equipment on the universal box spreader present and functioning?
- Are all fasteners and load-bearing connections tight and in good condition?
- Is the protective grid closed and screwed on?
- Are any people in the danger area of the universal box spreader?
- Is the drive shaft cover in good condition?
- Is the chain guard box of the hopper closed and screwed on?

3.5.4 Operation

- If the universal box spreader malfunctions, stop the machine immediately and secure it. Have the fault repaired immediately by qualified technicians.
- Never climb onto the universal box spreader while the spreader unit is running.
- Only operate the universal box spreader with the protective grid in the hopper closed. The protective grid must not be **opened or removed** during operation.
- Rotating machine components can cause serious injury. For this reason, ensure that you avoid any contact between body parts or clothes and rotating components.
- Do not deposit any parts (such as screws, nuts) in the spreader hopper.
- Never climb onto the universal box spreader or the tractor when it is situated beneath high-voltage electrical power lines.
- Only operate the universal box spreader when the chain guard box is closed.

3.6 Use of the spreading material

Incorrect selection or use of spreading material may cause serious injury or environmental damage.

- When selecting the spreading material, inform yourself about its effects on persons, the environment, and the machine.
- Follow the directions of the spreading material manufacturer exactly.

3.7 Hydraulic system

The hydraulic system is under high pressure.

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

- Always operate the machine below the permissible maximum operating pressure.
- Depressurize the hydraulic system **before** starting any maintenance work. Stop the motor of the tractor and secure it against being switched on again.
- When looking for leaks, wear **protective glasses** and **protective gloves at all times**.
- In the case of injury in connection with hydraulic oil, **consult a physician immediately** as severe infections may occur otherwise.
- When connecting the hydraulic hoses to the tractor, ensure that the hydraulic system is **depressurised,** both on the tractor and the spreader side.
- Connect the hydraulic hoses of the tractor and the spreader using only the specified connections.
- Prevent any contamination of the hydraulic circuit. Only attach the couplings to the brackets provided (see figure 6.11, page 44). Use the dust caps. Clean the connections before joining 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 under approved loads, hoses and hose couplings are subject to a natural ageing process. This limits their storage and service life.

The service life of the hose lines may not exceed 6 years, including a possible storage time of maximally 2 years.

The date of manufacture of the hoses is indicated on the hose coupling in month and year

- Replace hydraulic hoses if damaged or aged.
- Replacement hydraulic hoses must meet the technical requirements of the equipment manufacturer. In particular, observe the different maximum pressure ratings of the hydraulic hoses to be replaced.

3.8 Service and maintenance

During the maintenance and repair work, additional risks which do not occur while operating the machine are to be expected.

- Any maintenance and repair work is to be conducted with increased alertness at all times. You should work particularly carefully and be aware of any dangers.

3.8.1 Qualifications of maintenance personnel

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

3.8.2 Wear parts

- The maintenance and repair intervals described in the present operating manual are to be strictly adhered to at all times.
- Furthermore, the maintenance and repair intervals of the supplier components must also be complied with. See the respective supplier documentation on this topic.
- We recommend that you have the condition of the universal box spreader checked after each season by your specialist dealer, paying particular attention to its fastening components, safety-relevant plastic components, hydraulic system and metering parts.
- Spare parts must at least comply with the technical standards specified by the manufacturer. For instance, this is ensured by 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. for the lower link connection and/or the coupling triangle).

3.8.3 Maintenance and repair work

- Always switch off the tractor engine before all cleaning, maintenance and repair work and when troubleshooting. Wait until all moving parts of the machine have stopped moving.
- Make sure that no unauthorised person can start the universal box spreader. Remove the ignition key of the tractor. Cut the power supply of the control unit.
- Check that the tractor with the universal box spreader is correctly parked. Park the spreader with an empty hopper on level, solid ground and secure it to prevent it from moving.
- Depressurise the hydraulic system before all maintenance and repair work.
- Disconnect the power supply before working on the electrical system.
- If you have to work while the PTO shaft is rotating, make sure that nobody is near the PTO or the drive shaft.
- Never remove any clogging in the spreader hopper with your hand or foot, but use suitable tools for this purpose. In order to avoid clogging, only fill the hopper when the protective grid is mounted.
- Before cleaning the spreader with water, steam or other cleaning agents, cover all components that must not get wet (e. g. bearings, electrical connections, electrical actuators).
- Regularly check that all nuts and screws are tight. Retighten loose connections.

3.9 Safety in traffic

When driving on public streets and roads, the tractor with the attached universal box spreader must comply with the road traffic regulations of the respective country. The owner and driver are responsible for compliance with these regulations.

3.9.1 Pre-departure checks

The pre-departure check 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 permissible total weight complied with? Observe the permitted axle load, the permitted braking load, and the permitted tyre load capacity; 13: Axle load calculation, page 101.
- Is the universal box spreader mounted correctly?
- Could spreading material be lost while travelling?
  Check the level of the spreading material in the hopper.
  The metering slider must be closed.
- Check the tyre pressures and the function of the tractor brake system.
- Does the illumination and marking of the universal box spreader comply with the regulations of your country with respect to driving on public roads? Make sure that warning signs, reflectors, and auxiliary lights are correctly placed.

3.9.2 Transporting the universal boy spreader

Handling, steering, and braking performance of the tractor are affected by the attached universal box spreader. For example, the high load will reduce the weight on the tractor's front axle and affect its steering.

- Adapt your way of driving to the changed driving behaviour.
- 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 permissible maximum speed.
- Avoid sudden turns when driving uphill or downhill or across a slope. By repositioning the gravity centre, there is a risk of toppling over. Special care is to be applied when driving on uneven, soft ground (e. g. when entering fields, kerbs) as well.
- Arrest sideways movement of the lower link of the three-point linkage to prevent the machine from swinging.
- Passengers are prohibited on the universal box spreader during transport and operation.

3.10 Safety equipment on the machine

3.10.1 Position of safety equipment

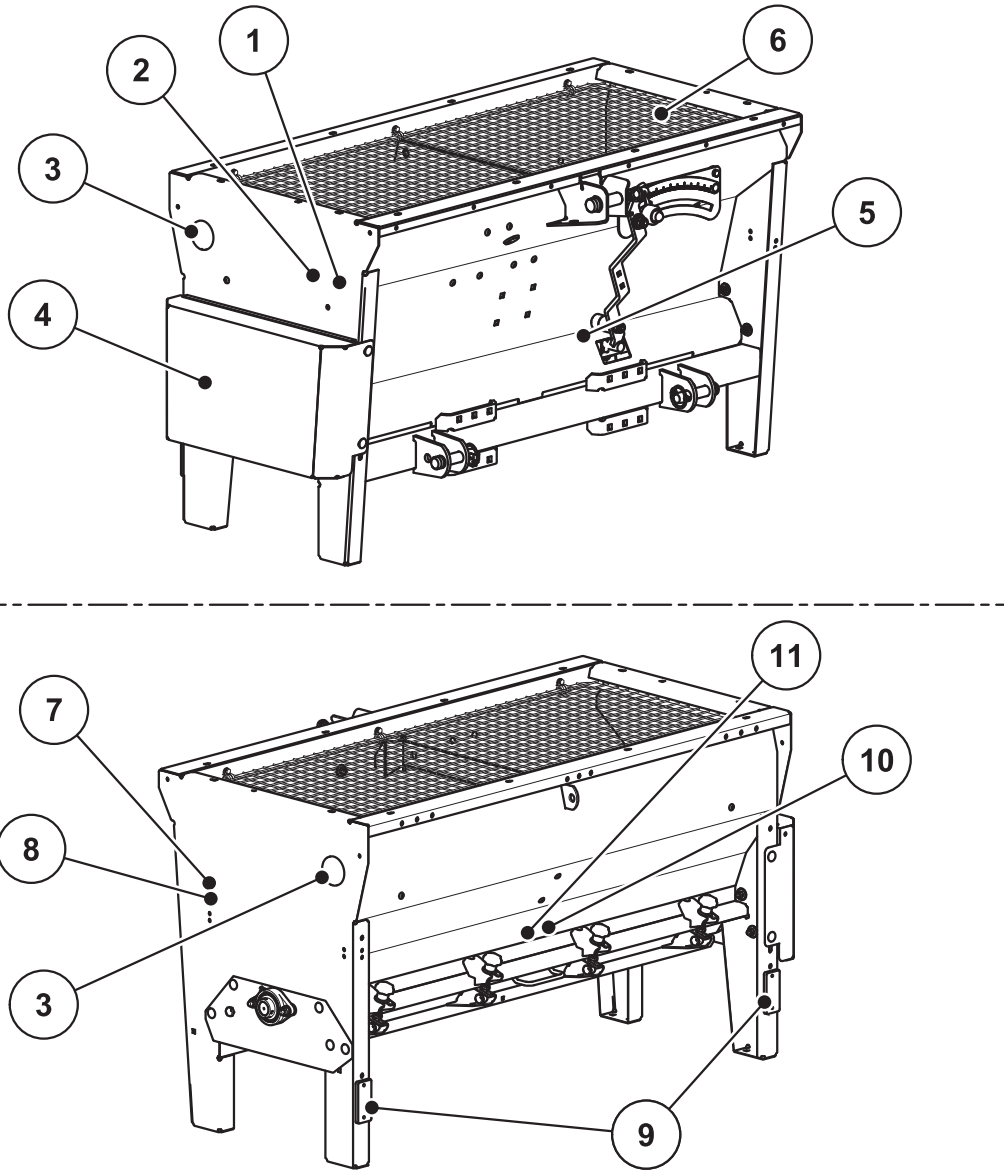
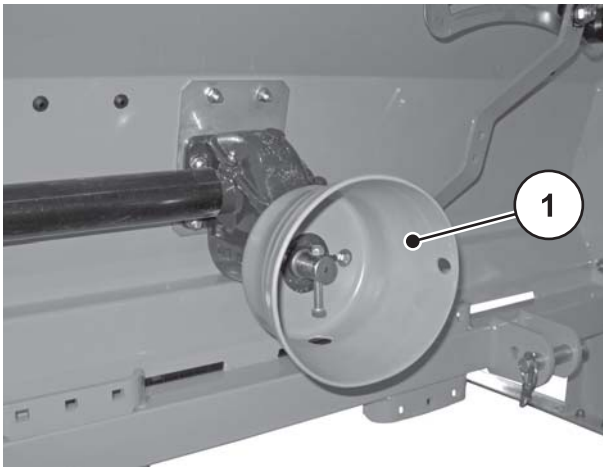


figure 3.1: Position of safety equipment, warning and instruction notices

[1] Serial number on the hopper
[2] Nameplate
[3] Yellow side reflectors
[4] Chain guard box
[5] Instructions: PTO speed
[6] Protective grid in hopper
[7] Instructions: maximum payload
[8] Warning: read operating manual
[9] Red reflectors
[10] Warning: remove ignition key
[11] Warning: moving parts



[1] Drive shaft guard

figure 3.2: Drive shaft guard

3.10.2 Function of safety equipment

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

- Only operate the universal box spreader when the safety equipment is functional.
- Do **not** use safety equipment as a climbing aid. It is not designed for this purpose. There is a risk of falling.

Description	Function
Protective grid in hopper	Prevents body parts from being caught by the rotating agitator. Prevents body parts from being cut off by the metering sliders. Prevents faults during spreading caused by lumps in the spreading material, large stones or other large objects (screening effect).
Drive shaft guard	Prevents body parts from being pulled into the rotating drive shaft.
Retainer	For securing the hoses and cables to the frame. Prevents crushing or kinking the hoses and cables. See figure 3.3.
Chain guard box	Prevents body parts from being pulled into the chain.

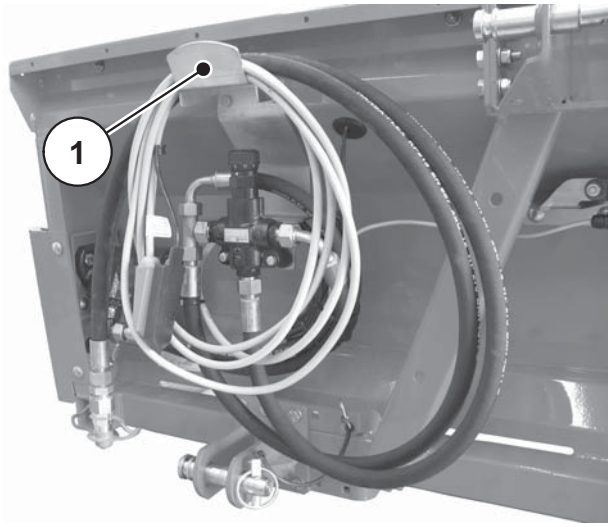


figure 3.3: Retainer for cables and hoses

[1] Retainer for cables and hoses

3.11 Warning and instruction stickers

There are several warning and instruction notices attached to the universal box spreader of the UKS series (regarding attachment on the machine, see figure 3.1).

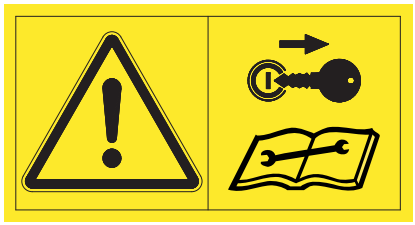
The warning and instruction notices are an integral part of the machine. They must not be removed or modified. Missing or illegible warning and instruction notices must be replaced immediately.

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.

NOTICE

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

3.11.1 Warning stickers

	**Read the operating manual and safety instructions.** Read and observe the operating manual and warning notices before putting the machine into operation. The operating manual explains in detail how to operate the spreader and contains valuable information on operation, care and maintenance.
	**Danger due to moving parts** Risk of body parts being cut off. It is prohibited to reach into the danger area of the rotating spreading discs, the agitator or the drive shaft. Switch off the tractor's engine and remove the key before carrying out repair and adjustment work.
	**Remove ignition key** Before starting maintenance, repair or adjustment work, switch off the engine, and remove the ignition key to prevent the engine being started inadvertently.

3.11.2 Instruction stickers and nameplate

	**PTO speed** The rated speed of the PTO shaft is 540 rpm.
	**PTO speed** The rated speed of the PTO shaft is 1000 rpm.
	**The maximum load capacity is 500 kg** for UKS 80, UKS 100, UKS 120.
	**The maximum load capacity is 700 kg** for UKS 150 GB, UKS 190 GB, UKS 230 GB.
	**The maximum load capacity is 1000 kg** for UKS 300 GB
	**Nameplate**
	**Serial number**

3.12 Reflector

The components of the lighting system must be installed in accordance with the stipulations and be ready to operate at all times. Lights must not be covered or obscured by dirt.

The universal box spreader of the UKS series is fitted with passive front, back and side indicators by the manufacturer (for an illustration of the positioning on the machine, see figure 3.1).

4 Information on the machine

4.1 Manufacturer

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4.2 Versions

4.2.1 Municipal spreaders UKS

Type **Function**	**UKS 80**		**UKS 100**		**UKS 100 Q**	**UKS 120**		**UKS 120 Q**
Drive with drive shaft	●		●			●		
Drive with hydraulic motor		●		●	●		●	●
Electronic control of the spreading volume					●			●

4.2.2 Fertiliser spreaders UKS GB

Type Function	UKS 150	UKS 150 Q	UKS 190	UKS 190 Q	UKS 230	UKS 230 Q	UKS 300	UKS 300 Q
Drive with hydraulic motor	●	●	●	●	●	●	●	●
Electronic control of the spreading volume		●		●		●		●

4.3 Technical data of basic equipment

4.3.1 Municipal spreaders UKS

Dimensions:

Data		UKS 80	UKS 100	UKS 120
Overall width		98 cm	118 cm	138
Overall length		70 cm	70 cm	70 cm
Filling level (basic machine)		75 cm	75 cm	75 cm
Distance between centre of gravity and lower link coupling point	Cat. 1N	31 cm	30,5 cm	30,5 cm
	Machine triangle	27 cm	27 cm	27 cm
Spreading width		80 cm	100 cm	120 cm
Hopper size (L x W)		87 x 62 cm	106 x 62 cm	125 x 62 cm
PTO speed	minimum	450 rpm 1000 rpm	450 rpm 1000 rpm	450 rpm 1000 rpm
	maximum	600 rpm 1100 rpm	600 rpm 1100 rpm	600 rpm 1100 rpm
Rated speed		540 rpm 1000 rpm	540 rpm 1000 rpm	540 rpm 1000 rpm
Mass flow[a]	maximum	250 kg/min	250 kg/min	250 kg/min
Hydraulic pressure	maximum	200 bar	200 bar	200 bar
Sound pressure level[b] (in the closed driver's cab of the tractor)		75 dB(A)	75 dB(A)	75 dB(A)

a. Maximum mass flow according to the type of spreading material.

b. Since the sound pressure level of the universal box spreader can only be determined when the tractor is running, the actual measured value is greatly dependent on the tractor type being used.

Weights and loads:

HINWEIS

The empty weight (mass) of the universal box spreader varies depending on the feature package and attachment combination. The empty weight indicated on the nameplate refers to the standard version.

Data	UKS 80	UKS 100	UKS 120
Empty weight	105 kg	120 kg	130 kg
Payload maximum	500 kg	500 kg	500 kg
Capacity	165 l	200 l	240 l
Upper link	Cat. I + II	Cat. I + II	Cat. I + II
Lower link	Cat. I N	Cat. I / Cat. I N	Cat. I / Cat. I N
Machine triangle	Cat. I	Cat. I	Cat. I

4.3.2 Fertiliser spreaders UKS GB

Dimensions:

Data		UKS 150 GB	UKS 190 GB	UKS 230 GB	UKS 300 GB
Overall width		168 cm	208 cm	248	318
Overall length		70 cm	70 cm	70 cm	70 cm
Filling level (basic machine)		60 cm	60 cm	60 cm	60 cm
Distance between centre of gravity and lower link coupling point	Cat. II	35 cm	35 cm	35 cm	35 cm
	Cat. I	31 cm	31 cm	-	-
	Machine triangle	43 cm	43 cm	43 cm	43 cm
Spreading width		150 cm	190 cm	230 cm	300 cm
Hopper size (W x L)		157 x 62 cm	196 x 62 cm	235 x 62 cm	310 x 62 cm
Mass flow [a]	maximum	250 kg/min	250 kg/min	250 kg/min	
Sound pressure level [b] (in the closed driver's cab of the tractor)		75 dB(A)	75 dB(A)	75 dB(A)	

a. Maximum mass flow according to the type of spreading material.

b. Since the sound pressure level of the universal box spreader can only be determined when the tractor is running, the actual measured value is greatly dependent on the tractor type being used.

Weights and loads:

HINWEIS

The empty weight (mass) of the universal box spreader varies depending on the feature package and attachment combination. The empty weight indicated on the nameplate refers to the standard version.

Data		UKS 150 GB	UKS 190 GB	UKS 230 GB	UKS 300 GB
Empty weight		160 kg	180 kg	210 kg	260 kg
Payload	maximum	700 kg	700 kg	700 kg	1000 kg
Capacity		300 l	370 l	440 l	580 l
Upper link		Cat. I + II	Cat. I + II	Cat. I + II	Cat. II
Lower link		Cat. I / Cat. II	Cat. I / Cat. II	Cat. II	Cat. II
Machine triangle		Cat. II	Cat. II	Cat. II	Cat. II

4.4 Technical data of the extensions

Universal box spreaders of the UKS series can be used with various extensions. The capacity, dimensions and weights may change depending on the selected feature package.

4.4.1 Municipal spreaders UKS

Data incl. extension	UKS 80	UKS 100	UKS 120
Hopper capacity	230 l	280 l	340 l
Filling height	90 cm	90 cm	90 cm
Overall width	98 cm	118 cm	138 cm

4.4.2 Fertiliser spreaders UKS GB

Data incl. extension	UKS 150 GB	UKS 190 GB	UKS 230 GB	UKS 300 GB
Hopper capacity	420 l	510 l	610 l	830 l
Filling height	75 cm	75 cm	75 cm	75 cm
Overall width	168 cm	208 cm	248 cm	318 cm

5 Transport without tractor

5.1 General safety instructions

Observe the following instructions before transporting the universal box spreader:

- If no tractor is used, the universal box spreader may only be transported with the hopper empty.
- The tasks may only be carried out by suitable, trained and expressly authorised personnel.
- Suitable means of transportation and lifting equipment (e. g. crane, forklift, truck, cable devices...) are to be used for transport purposes.
- Determine the transport route in good time and remove possible obstacles.
- Check that all safety and transport devices are fully operational.
- All danger areas are to be appropriately secured, even if they only exist briefly.
- The person responsible for transport must ensure that the universal box spreader is transported correctly.
- Unauthorised persons are to be kept away from the transport route. The areas concerned must be cordoned off.
- The universal box spreader must be handled and transported carefully.
- Make sure that the centre of gravity can be compensated. If necessary, adjust the lifting tackles so that the machine is correctly suspended.
- Transport the universal box spreader to the final destination as close to the ground as possible.
- Make sure that there is enough room between the spreader floor and the loading platform.

5.2 Loading and unloading, parking

1. Calculate the weight of the universal box spreader.

   Check the details provided on the nameplate.

   If applicable, also take the weight of mounted special equipment into account.
2. Carefully lift the machine with suitable lifting equipment.
3. Carefully set the machine down on the loading platform of the transport vehicle or on solid ground.

6 Start-up

6.1 Acceptance of the universal box spreader

When the universal box spreader is delivered, please check that it is complete.

The standard equipment includes

- 1 universal box spreader of the UKS series
- 1 operating manual UKS with spreading table
- Lower and upper link bolts and/or coupling triangle
- Agitator shaft
- Protective grid in hopper
- 1 drive shaft (including operating manual); not included in case of hydraulic motor drive

Please also check any additionally ordered special equipment for completeness.

Check for any shipping damage or missing parts. Any shipping damage must be confirmed by the shipping agent.

NOTICE

When receiving the machine, check that all attached components are correctly and securely tightened.

If in doubt, contact your salesperson or the manufacturer directly.

6.2 Requirements for the tractor

To ensure safe and correct use of the universal box spreader of the UKS series, the tractor must meet the necessary mechanical, hydraulic, and electrical requirements.

- Drive shaft connection: 1 3/8 inches, 6 splines, 540 rpm and/or 1000 rpm
- Category I and/or II three-point linkage (type dependant).
- Category I N three-point linkage is additionally available as special equipment.
- Operating voltage: 12 V
- **Oil supply** (hydraulic drive):
  - 1 single-acting control valve
  - 1 free return,
  - Oil supply: max. 200 bar

6.3 Adjusting the chain idler

6.3.1 Clockwise PTO drive

The UKS universal box spreader is equipped with the Z17/Z40 sprocket set as a standard. The chain idler [1] has been mounted for a clockwise PTO drive below the chain by the manufacturer.

With this design, the agitator shaft of the universal box spreader is driven with a PTO speed of 540 rpm or 1000 rpm.

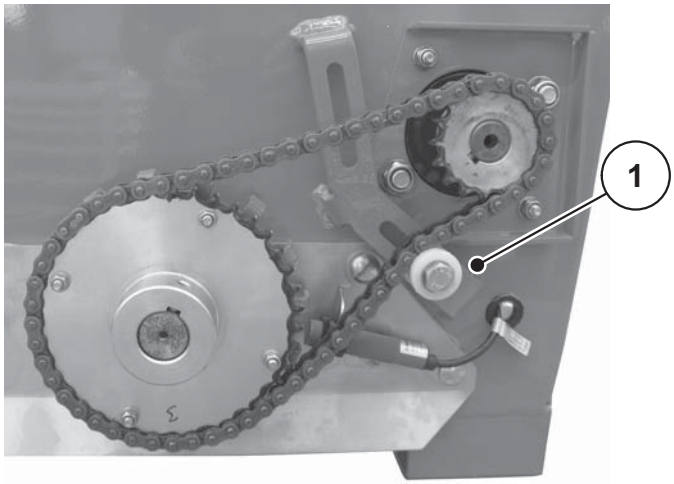


Figure 6.1: Chain idler assembly (clockwise PTO drive)

6.3.2 Anti-clockwise PTO drive

If an anti-clockwise PTO drive is used, the chain idler has to be mounted above the chain.

With this design, the agitator shaft of the universal box spreader is driven with a PTO speed of 540 rpm or 1000 rpm.

Assembling the chain idler above the chain

1. Remove the chain guard box.
2. Unscrew the chain idler screw [1].
3. Remove the chain idler [1] from the opening of the lower flap.
4. Insert the chain idler [1] into the opening of the upper flap.

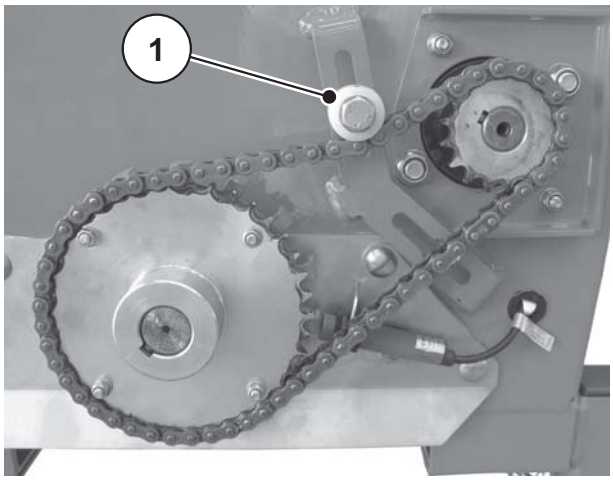


Figure 6.2: Chain idler assembly (anti-clockwise PTO drive)

5. Adjust the chain idler [1] in such a way that it sufficiently tightens the chain downwards.
6. Tighten screw.
7. Reassemble the chain guard box.

6.4 Mounting the drive shaft to the universal box spreader

⚠ CAUTION

Danger from unsuitable drive shaft.

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

The usage of incorrectly dimensioned or inadmissible drive shafts, for instance without guard or suspension chain, may lead to damages to the tractor and the universal box spreader.

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

6.4.1 Checking the length of the drive shaft

- Check the length of the drive shaft during its first assembly to the tractor.

  Drive shaft tubes that are too long can result in damages to the drive shaft and the universal box spreader.

NOTICE

For checking and adjusting the drive shaft, please refer to the installation instructions and the brief instructions in the operating manual of the manufacturer of the drive shaft. The manual is attached to the drive shaft on delivery.

6.4.2 Fitting and removing the drive shaft

⚠ DANGER

Entanglement hazard at the rotating drive shaft

Attaching and removing the drive shaft with the engine running may cause severe injuries (crushing, entanglement in the rotating shaft).

- ▶ Turn the tractor motor off.
- ▶ Remove the ignition key.

Assembly:

1. Check the installation position.

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

2. Remove the hexagonal screw and nut from the transmission spigot.

Figure 6.3: Drive shaft

3. Grease the spigot.
4. Push the drive shaft onto the spigot.

Figure 6.4: Transmission spigot

5. Insert the hexagonal screw into the hole of the drive shaft guard from below.

Figure 6.5: Insert the hexagonal screw.

6. Tighten the hexagonal screw and nut using a size 13 wrench (**max. 18 Nm**).

Figure 6.6: Tighten the hexagonal screw.

Instructions for removal:

- Remove the drive shaft in reverse order of assembly.
- After uncoupling the drive shaft, suspend it with the suspension chain.

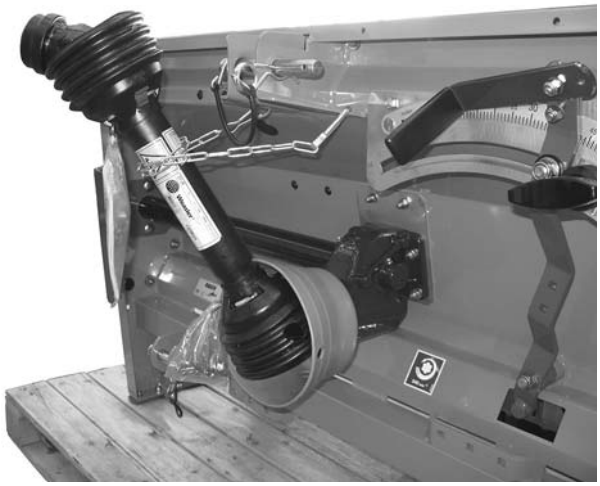


Figure 6.7: Suspend the drive shaft

6.5 Installing the universal box spreader on the tractor

6.5.1 Preconditions

⚠ DANGER

Danger due to unsuitable tractor

Using an unsuitable tractor for the UKS universal box spreader may result in serious accidents during operation or road travel.

- ▶ Only use tractors that comply with the technical requirements of the universal box spreader.
- ▶ Use the vehicle's documentation to check if your tractor is suitable for the UKS universal box spreader.

In particular, check the following requirements:

- Are both the tractor and the universal box spreader in a reliable condition?
- Does the tractor comply with the mechanical, hydraulic, and electrical requirements (see 6.2: Requirements for the tractor, page 29)?
- Do the attachment categories of the tractor and the universal box spreader match (if necessary, consult your dealer)?
- Is the universal box spreader securely positioned on level and solid ground?
- Do the axle loads conform to the stipulated calculations (see chapter 13: Axle load calculation, page 101)?

6.5.2 Rear assembly

⚠ DANGER

Danger to life due to inattention or faulty operation.

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

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

▶ Make sure that there is no one between the tractor and the universal box spreader.

⚠ DANGER

Risk of tipping or falling

There are no fixing or lifting points provided on the attachments or the frame of the universal box spreader.

If the universal box spreader is lifted or moved on the attachments or the frame, it may tip over or fall. This can endanger persons and cause material damage.

▶ Fasten the universal box spreader to a pallet.

Mount the universal box spreader to the three-point linkage (rear hydraulic lift).

Installation instructions:

- Installing the UKS 100, UKS 120 on a tractor with cat. II is only possible with cat. I clearance and the use of reducing sleeves.
- Installing the UKS 150, UKS 190, UKS 230, UKS 300 on a tractor with cat. III is only possible with cat. II clearance and the use of reducing sleeves.
- Installing the UKS 80, UKS 100 and UKS 120 on a tractor with cat. 1N is only possible with an adapter.
- Secure the lower and upper linkage pins with the provided linch pins or spring clips.
- Always install the universal box spreader horizontally.
- To prevent the machine from swinging during spreading operations install the universal box spreader horizontally and transversely to the direction of travel and arrest any sideways movements.
- Check if the machine triangle is correctly locked.

NOTICE

We recommend using lower link hooks together with a hydraulic upper link for safety and comfort.

Precondition

- The PTO shaft is switched off.

1. Start the tractor.
2. Move the tractor to the universal box spreader.
   - Do not latch the lower link hooks into place yet.
   - Make sure there is enough space between the tractor and the universal box spreader in order to be able to connect the drives and control elements.

NOTICE

If more space between the tractor and the universal box spreader is needed, use the elongated version of the lower link coupling point. See chapter „Special equipment“ on page 97

3. Turn the tractor motor off. Remove the ignition key.
4. Mount the drive shaft to the tractor.
5. Connect the electric slide actuation, hydraulic drive and the lightning (see chapter 6.7: Connecting the hydraulic drive, page 40).
6. From the tractor cab, connect the lower link hooks and the upper link to the designated coupling points.

   Observe the operating manual of your tractor.

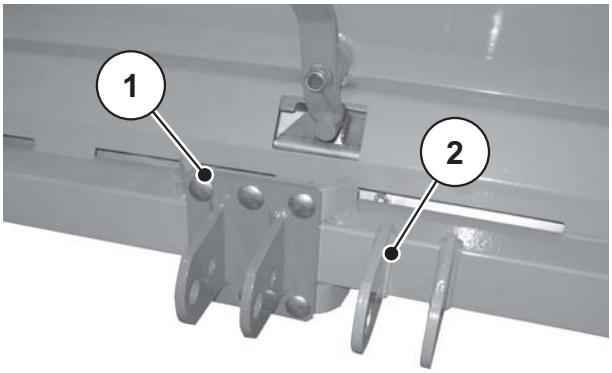


Figure 6.8: Lower link coupling points of UKS 80/100/120

[1] Coupling point, category 1N (special equipment of UKS 80/100/200)
[2] Coupling point, category 1N (standard equipment of UKS 100/120)

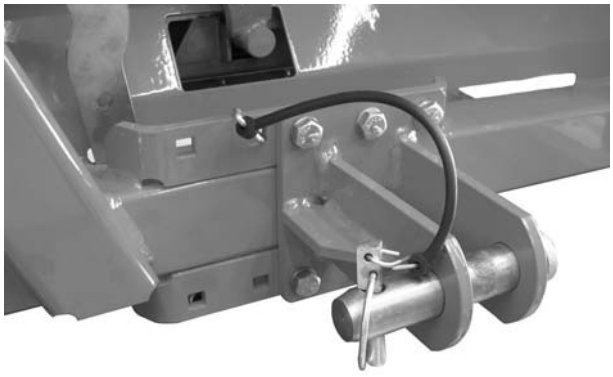


Figure 6.9: Lower link coupling point from UKS 150 GB, category II

NOTICE

We recommend using lower link hooks together with a hydraulic upper link for safety and comfort.

7. Check that the universal box spreader is securely tightened.

⚠ CAUTION

Material damages due to excessively long drive shaft

When the fertiliser spreader is lifted up, the drive shaft halves can come into contact inside each other. This can cause damage to the drive shaft, the gearbox or the universal box spreader.

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

8. Shorten the drive shaft, if required.

NOTICE

Have the drive shaft shortened **only** by your dealer or your specialist workshop.

NOTICE

Observe the installation and shortening instructions provided in the **operating manual of the drive shaft manufacturer** when checking and adjusting the drive shaft. The manual is attached to the drive shaft on delivery.

6.5.3 Frontal assembly (only for UKS GB)

⚠ DANGER

Danger to life due to inattention or faulty operation.

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

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

▶ Make sure that there is no one between the tractor and the universal box spreader.

Mount the universal box spreader to the three-point linkage.

Mounting instructions

- The machine can be connected to a tractor with category III linkage only with category II clearance and the use of reducing sleeves.
- Secure the lower and upper linkage pins with the provided linch pins or spring clips.
- Check if the machine triangle is correctly locked.

1. Start the tractor.
2. Move the tractor to the universal box spreader.
   - Do not latch the lower link hooks into place yet.
   - Make sure there is enough space between the tractor and the universal box spreader in order to be able to connect the drives and control elements.

NOTICE

If more space between the tractor and the universal box spreader is needed, use the elongated version of the lower link coupling point. See chapter „Special equipment“ on page 97

3. Turn the tractor motor off. Remove the ignition key.
4. Connect the hydraulic and electric slide actuators and the lightning (see chapter 6.7: Connecting the hydraulic drive, page 40).
5. From the tractor cab, connect the lower link hooks and the upper link to the designated coupling points.

   Observe the operating manual of your tractor.

NOTICE

We recommend using lower link hooks together with a hydraulic upper link for safety and comfort.

6. Check that the universal box spreader is securely tightened.

6.6 Connecting the actuator

Depending on the model, the UKS universal box spreader may be equipped with an actuator for the electronic control of the spreading volume (see chapter 4.2: Versions, page 21).

The actuator is connected to a special control unit inside the tractor.

Connections

- See the operating manual of the QUANTRON-A control unit for UKS.

6.7 Connecting the hydraulic drive

Depending on the model, the UKS universal box spreader may be equipped with a hydraulic motor for the agitator shaft.

A single-acting control valve and a free return is needed on the tractor. In addition, a non-return valve is fitted in the return line.

The hydraulic drive is connected to the tractor via two hydraulic hoses.

NOTICE

- Connect the connector with the red protection cap to the pressure line.
- Connect the connector with the blue protection cap to the return line.
- Do not permit uncoupled hydraulic hoses to touch the ground.
- Always put dust caps on the uncoupled hydraulic hoses.
- Always secure the uncoupled hydraulic hoses by means of the retainer provided for hoses and cables. See figure 3.3.

Adjusting the hydraulic drive

The universal box spreader is driven by a hydraulic motor with a displacement of 315 cm³. With a tractor output of 20 l/min, this yields a spreader shaft speed of 25-30 rpm.

- Set the agitator shaft speed to 10 to 40 rpm.

The agitator shafts of the UKS 100 Q, UKS 120 Q and all UKS GB universal box spreaders are **always** hydraulically driven.

- Set the agitator shaft speed using the hand wheel of the flow control valve.

For the UKS 100 and UKS 120 series the flow control valve is available as additional equipment.

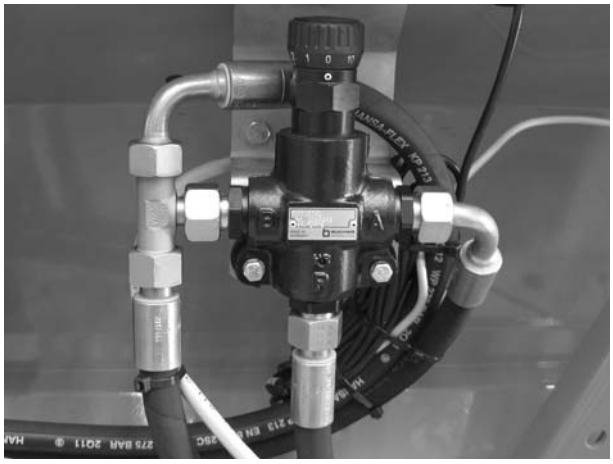


Figure 6.10: Flow control valve

Adjusting the agitator shaft speed

Position of the hand wheel	Speed of the agitator shaft (rpm)
1	-
2	3
3	15
4	24
5	32
6	40

If the slider opening is small and the fertiliser flows well, reduce the speed of the agitator shaft (using the hand wheel of the flow control valve) to protect the fertiliser.

If the fertiliser does not flow well and is mealy, increase the speed of the agitator shaft (using the hand wheel of the flow control valve).

NOTICE

Always carry out a calibration after changing the spreader shaft speed.

6.8 Filling the universal box spreader

⚠ DANGER

Danger from running engine

Working on the universal box spreader while the engine is running may cause injuries from the mechanical components and escaping spreading material.

- ▶ Turn the tractor motor off.
- ▶ Remove the ignition key.

⚠ CAUTION

Inadmissible overall weight

If the permissible total weight is exceeded, this will affect the operating and road safety of the vehicle (universal box spreader and tractor) and may cause serious damage to the machine and the environment.

- ▶ Before you start filling, calculate the amount you can load.
- ▶ Comply with the permissible overall weight.

Instructions on filling the universal box spreader:

- Close the metering slider.
- Fill the universal box spreader **only** when it is installed on the tractor. Make sure that the tractor is standing on level and solid ground.
- Secure the tractor to prevent it moving. Apply the handbrake.
- Turn the tractor motor off. Remove the ignition key.
- For filling levels above 1.25 m use auxiliary equipment (e. g. front loader or screw conveyor) to fill the universal box spreader.
- Make sure that there is enough space between the hopper bottom and the ground.
- Fill the universal box spreader no higher than the top-edge.

6.9 Parking and unhitching the universal box spreader

The universal box spreader can be parked safely on the frame.

⚠ DANGER

Crushing hazard between the tractor and the universal box spreader

Persons standing between the tractor and the universal box spreader while they are being parked or unhitched are in lethal danger.

- ▶ Make sure that there is **nobody** standing between the tractor and the universal box spreader when activating the external control for the three-point linkage.

⚠ CAUTION

Material damage due to unsuitable parking place

An unsuitable parking place may cause material damage to the machine. Objects on the ground may deform the metering system.

- ▶ Make sure that there is enough space between the hopper bottom and the ground.
- ▶ If necessary park and store the universal box spreader on its transport pallet.

Requirements for parking the universal box spreader:

- The universal box spreader may only be parked on level, solid ground.
- Only park the universal box spreader with an empty hopper.
- Relieve the load on the coupling points (lower / upper link) before removing the universal box spreader.

- After unhitching, place the hydraulic hoses and electric cables in the retainers on the frame provided for the purpose (see figure 6.11).
- Suspend the drive shaft with the suspension chain (see figure 6.7).

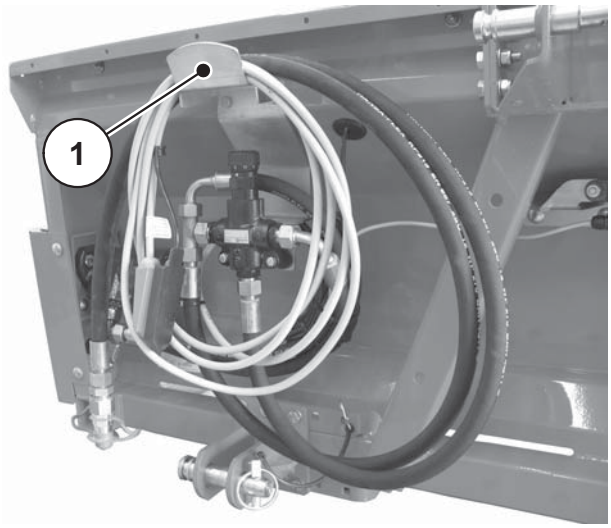


Figure 6.11: Retainer for cables and hoses

[1] Retainer for cables and hoses

7 Machine adjustments

⚠ DANGER

Danger from running engine

Working on the machine while the engine is running may result in serious injuries caused by mechanical components and escaping fertiliser.

- ▶ Turn the tractor motor off.
- ▶ Remove the ignition key.
- ▶ Send third persons out of the danger area.

Before carrying out machine adjustments, observe the following:

- Volume setting is always carried out with the slide closed.

7.1 Adjusting the spreading volume

NOTICE

The UKS universal box spreader model with **QUANTRON-A** is equipped with an electric slide actuation for setting the spreading volume.

The electronic metering slide actuator is described in a separate operating manual for the QUANTRON-A control unit. This operating manual is an integral part of the QUANTRON-A control unit.

7.1.1 UKS with mechanical spreading volume adjustment

The spreading volume is set via a stop on the graduated arc.

⚠ CAUTION

Material damage caused by an insufficient metering slider opening

Insufficient opening of the metering slider can cause blockages and can damage the spreading material. Agitator wear increases.

- ▶ Always select an adequate opening for the metering slider, at which the spreading material flows out unhindered.

Procedure for adjusting the spreading volume

1. Close the metering slider.

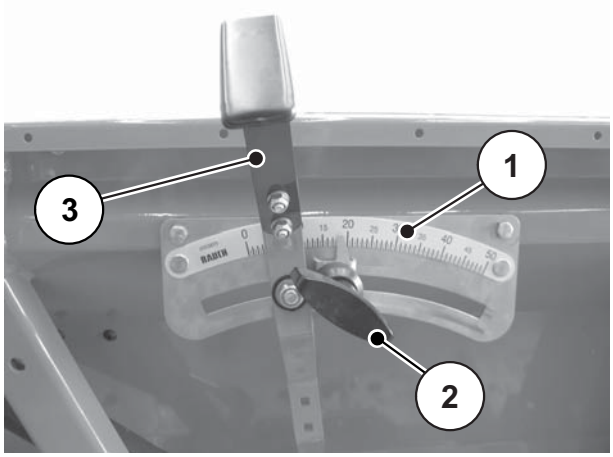


Figure 7.1: Metering slider adjustment

[1] Scale for the spreading volume
[2] Stop
[3] Volume control lever

2. Set stop [2] to the position (indicator) you calculated beforehand using the spreading table or a calibration.

3. Push the volume control lever [3] to the stop before starting spreading.

- Adjusting in the direction of higher values opens the metering slider.
- Adjusting in the direction of lower values closes the metering slider.

7.2 Using the spreading table

7.2.1 Information on the spreading table

The values in the spreading table were determined by the universal box spreader testing system.

The spreading materials used have been purchased from the manufacturers or from dealers. Experience shows that due to storage, transport and other reasons, your spreading material – even with identical specifications – might exhibit a different spreading behaviour.

This means that the settings specified in the spreading tables may result in a different spreading volume and a poorer material distribution.

Therefore, observe the following instructions:

- **For grit, sand and salt**: the spreading tests were carried out using 2 possible **PTO speeds**.
  - 540 rpm; agitator shaft speed of 15 rpm
  - 1000 rpm; agitator shaft speed of 28 rpm
- Always check the actual spreading amount with a calibration (see chapter 8: Calibration, page 79).
- Adjustments for spreading materials not listed in the spreading table can be determined by a calibration.
- Observe the setting values exactly. Even a slightly incorrect setting may significantly affect the spreading pattern.

When using urea, please note the following in particular:

- Due to a great number of fertiliser imports, urea is available in a wide variety of different qualities and grain sizes. It may therefore be required to adjust the settings of the spreader.
- Urea is more sensitive to wind and absorbs more moisture than other spreading materials.

NOTICE

The operating staff is responsible for making the correct spreader adjustments according to the spreading material used.

We point out specifically that we do not accept any liability for damage resulting from spreading errors.

NOTICE

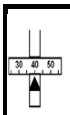
Please find additional spreading tables for your universal box spreader on our website www.rauch.de.

We point out specifically that we do not accept any liability for damage resulting from spreading errors.

7.2.2 List of spreading tables

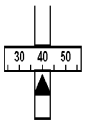
7.2.3 Spreading table for grit, sand and salt

- Spreading volume in g/m²

	Grit					Sand (wet)					Salt				
	km / h					km / h					km / h				
	4	**6**	**8**	**12**	**16**	**4**	**6**	**8**	**12**	**16**	**4**	**6**	**8**	**12**	**16**
7											11	8	6	4	3
8											16	10	8	5	4
9											21	14	11	7	5
10	11	7	5	4	3	12	8	6	4	3	28	18	14	9	7
11	14	10	7	5	4	15	10	8	5	4	37	25	18	12	9
12	18	12	9	6	5	19	13	9	6	5	44	30	22	15	11
13	23	16	12	8	6	23	15	11	8	6	49	33	24	16	12
14	29	19	14	10	7	26	18	13	9	7	59	39	29	20	15
15	36	24	18	12	9	36	24	18	12	9	68	45	34	23	17
16	44	29	22	15	11	45	30	23	15	11	91	60	45	30	23
17	51	34	26	17	13	49	33	24	16	12	109	73	55	36	27
18	59	39	29	20	15	53	35	26	18	13	126	84	63	42	32
19	69	46	34	23	17	55	37	28	18	14	150	100	75	50	38
20	79	53	39	26	20	58	39	29	19	15	173	115	86	58	43
21	94	63	47	31	24	61	41	30	20	15	204	136	102	68	51
22	110	73	55	37	28	64	43	32	21	16	229	153	114	76	57
23	126	84	63	42	32	70	47	35	23	18					
24	143	95	71	48	36	77	51	38	26	19					
25	166	111	83	55	42	88	59	44	29	22					
26	190	127	95	63	48	99	66	49	33	25					
27	218	145	109	73	54	111	74	55	37	28					
28	245	163	123	82	61	123	82	61	41	31					
29	291	194	145	97	73	136	91	68	45	34					
30	336	224	158	112	84	149	100	75	50	37					
31	374	250	187	125	94	160	107	80	53	40					
32	413	275	206	138	103	171	114	86	57	43					
33						188	125	94	63	47					
34						205	137	103	68	51					
35						224	150	112	75	56					
36						244	163	122	81	61					
37						265	177	133	88	66					
38						287	191	143	96	72					
39						300	200	150	100	75					
40						313	209	157	104	78					
41						337	225	169	112	84					
42						361	241	181	120	90					
43						385	257	193	128	96					
44						409	273	204	136	102					

7.2.4 Spreading table for yellow mustard

- Spreading volume in kg/ha

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
5	10	7	5	4	3	25	17	13	10	8
5,5	15	10	8	6	5	38	25	19	15	13
6	20	13	10	8	7	50	33	25	20	17
6,5	48	32	24	19	16	70	47	35	28	23
7	75	50	38	30	25	90	60	45	36	30
7,5	93	62	46	37	31					

7.2.5 Spreading table for lupins, yellow, white

- Spreading volume in kg/ha

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
17	165	110	83	66	56	178	118	89	71	59
18	220	147	110	88	73	245	136	123	98	82
19	250	167	125	100	83	298	198	149	119	99
20	280	187	140	112	93	350	233	175	140	117
21	338	225	169	135	113	420	280	210	168	140
22	395	263	198	158	132	490	327	245	196	163
23	443	295	221	177	148	580	387	290	232	193
24	490	327	245	196	163	670	447	335	268	223
25	573	382	286	229	191					
26	655	437	328	262	218					

7.2.6 Spreading table for oil radish

- Spreading volume in kg/ha

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
5	12	8	6	5	4	15	10	8	6	5
5,5	20	13	10	8	7	25	17	13	10	8
6	30	20	15	12	10	35	23	18	14	12
6,5	41	27	21	16	14	56	37	28	22	19
7	53	35	26	21	18	78	52	39	31	26
7,5	63	42	32	25	21	98	65	49	39	33
8	75	50	38	30	25					
8,5	93	62	47	37	31					

7.2.7 Spreading table for phacelia

- Spreading volume in kg/ha

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
4						10	7	5	4	3
4,5	10	7	5	4	3	13	8	6	5	4
5	15	10	8	6	5	15	10	8	6	5
5,5	23	15	11	9	8	28	18	14	11	9
6	30	20	15	12	10	40	27	20	16	13
6,5	43	28	21	17	14					

7.2.8 Spreading table for rape

- Spreading volume in kg/ha

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
3,5	15	10	8	6	5	15	10	8	6	5
4	20	13	10	8	7	45	30	23	18	15
4,5	38	25	19	15	13	68	45	34	27	23
5	59	39	29	23	20	93	62	46	37	31
5,5	79	53	40	32	26	116	78	58	47	39
6	100	67	50	40	33	140	93	70	56	47
6,5	131	87	56	52	44					

7.2.9 Spreading table for red clover

- Spreading volume in kg/ha

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
3,5	15	10	8	6	5	15	10	8	6	5
4	20	13	10	8	7	45	30	23	18	15
4,5	38	25	19	15	13	68	45	34	27	23
5	59	39	29	23	20	93	62	46	37	31
5,5	79	53	40	32	26	116	78	58	47	39
6	100	67	50	40	33	140	93	70	56	47
6,5	131	87	56	52	44					

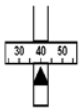
7.2.10 Spreading table for ryegrass

- Spreading volume in kg/ha

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
10						40	27	20	16	13
11	48	32	24	19	16	55	37	28	22	18
12	55	37	28	22	18	70	47	35	28	23
13	60	40	30	24	20	93	62	46	37	31
14	65	43	33	26	22	115	77	58	46	38
15	88	58	44	35	29	130	87	65	52	43
16	110	73	55	44	37	145	97	73	58	48
17	133	88	66	53	44	185	123	93	74	62
18	155	103	78	62	52					
19	165	110	83	66	55					
20	175	117	88	70	58					

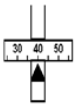
7.2.11 Spreading table for vicia

- Spreading volume in kg/ha

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
8	25	17	13	10	8	45	30	23	18	15
9	63	42	31	25	21	88	58	44	35	29
10	100	57	50	40	33	130	87	65	52	43
11	133	88	66	53	44	185	123	93	74	62
12	165	110	83	66	55	240	160	120	96	80
13	218	145	109	87	73	338	225	169	135	113
14	270	180	135	108	90	435	290	218	174	145
15	345	230	173	138	115					
16	420	280	210	168	140					

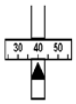
7.2.12 Spreading table for winter beet

- Spreading volume in kg/ha

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
5	25	17	13	10	8	25	17	13	10	8
5,5	38	25	19	15	13	38	25	19	15	13
6	50	33	25	20	17	75	50	38	30	25
6,5	70	47	35	28	23	98	65	49	39	33
7	90	60	45	36	30					

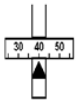
7.2.13 Spreading table for Agricorn Günther Corufera GmbH

- Spreading volume in kg/ha
- NPK

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
25						980	653	490	392	327
26						1090	727	545	436	363
27						1215	810	608	486	405
28						1340	893	670	536	447
29						1495	997	748	598	498
30	970	647	485	388	323	1650	1100	825	660	550
31	1118	745	559	447	373	1878	1252	939	751	626
32	1265	843	633	506	422	2105	1403	1053	842	702
33	1413	942	706	565	471	2333	1555	1166	933	778
34	1560	1040	780	524	520	2560	1707	1280	1024	853
35	1730	1153	865	692	577	2820	1880	1410	1128	940
36	1900	1267	950	760	633	3080	2053	1540	1232	1027
37	2135	1423	1068	854	712	3340	2227	1670	1336	1113
38	2370	1580	1185	948	790	3600	2400	1800	1440	1200
39	2560	1707	1280	1024	853	3825	2550	1913	1530	1275
40	2750	1833	1375	1100	917	4050	2700	2025	1620	1350
41	3018	2012	1509	1207	1006	4305	2870	2153	1722	1435
42	3285	2190	1643	1314	1095	4560	3040	2280	1824	1520
43	3593	2395	1796	1437	1198	4905	3270	2453	1962	1635
44	3900	2600	1950	1560	1300	5250	3500	2625	2100	1750
45	4253	2835	2126	1701	1418	5665	3777	2833	2266	1888
46	4605	3070	2303	1842	1535	6080	4053	3040	2432	2027
47	4903	3268	2451	1961	1634	6390	4260	3195	2556	2130
48	5200	3467	2600	2080	1733	6700	4467	3350	2680	2233
49	5520	3680	2760	2208	1840	7085	4723	3543	2834	2362
50	5840	3893	2920	2336	1947	7470	4980	3735	2988	2490

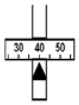
7.2.14 Spreading table for prilled urea SKW Piesteritz

- Spreading volume in kg/ha
- 46 % N

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
6	60	40	30	24	20	75	50	38	30	25
7	100	67	50	40	33	125	83	63	50	42
8	140	93	70	56	47	175	117	88	70	58
9	210	140	105	84	70	275	183	138	110	92
10	280	187	140	112	93	375	250	188	150	125
11	370	247	185	148	123	473	315	236	189	158
12	460	307	230	184	153	570	380	285	228	190
13	603	402	301	241	201	723	482	361	289	241
14	745	497	373	298	248	875	583	438	350	292
15	878	585	439	351	293	1068	712	534	427	356
16	1010	673	505	404	337	1260	840	630	504	420
17	1205	803	603	482	402	1455	970	728	582	485
18	1400	933	700	560	467	1650	1100	825	660	550
19	1580	1053	790	632	527	1898	1265	949	759	633
20	1760	1173	880	704	587	2145	1430	1073	858	715
21	1990	1327	995	796	663					
22	2220	1480	1110	888	740					

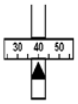
7.2.15 Spreading table for calcium ammonium nitrate Raiffeisen

- Spreading volume in kg/ha
- 27 % N

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
10	145	97	73	58	48	220	147	110	88	73
11	195	130	98	78	65	305	203	153	122	102
12	245	163	123	98	82	390	260	195	156	130
13	340	227	170	136	113	493	328	246	197	164
14	435	290	218	174	145	595	397	298	238	198
15	543	362	271	217	181	730	487	365	292	243
16	650	433	325	260	217	865	577	433	346	288
17	805	537	403	322	268	1030	687	515	412	343
18	960	640	480	384	320	1195	797	598	478	398
19	1103	735	551	441	368	1380	920	690	552	460
20	1245	830	623	498	415	1565	1043	783	626	522
21	1463	975	731	585	488	1743	1162	871	697	581
22	1680	1120	840	672	560	1920	1280	960	768	640
23	1885	1257	943	754	628	2205	1470	1103	882	735
24	2090	1393	1045	836	697	2490	1660	1245	996	830
25	2375	1583	1188	950	792					
26	2660	1773	1330	1064	887					

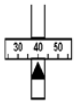
7.2.16 Spreading table for calcium cyanide SKW Trostberg

- Spreading volume in kg/ha
- 19,8 % N

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
10	300	200	150	120	100	420	280	210	168	140
11	388	258	194	155	129	565	377	283	226	188
12	475	317	238	190	158	710	473	355	284	237
13	600	400	300	240	200	865	577	433	346	288
14	725	483	363	290	242	1020	680	510	408	340
15	925	617	463	370	308	1230	820	615	492	410
16	1125	750	563	450	375	1440	960	720	576	480
17	1328	885	664	531	443	1700	1133	850	680	567
18	1530	1020	765	612	510	1960	1307	980	784	653
19	1795	1197	898	718	598	2225	1483	1113	890	742
20	2060	1373	1030	824	687	2490	1660	1245	996	830
21	2430	1620	1215	972	810	2835	1890	1418	1134	945
22	2800	1867	1400	1120	933	3180	2120	1590	1272	1060
23	3180	2120	1590	1272	1060	3600	2400	1800	1440	1200
24	3560	2373	1780	1424	1187	4020	2680	2010	1608	1340

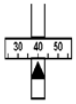
7.2.17 Spreading table for converter lime

- Spreading volume in kg/ha
- 45 % CaO

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					Km/h				
	4	6	8	10	12	4	6	8	10	12
15						1345	897	673	538	448
16						1608	1072	804	643	536
17						1871	1247	936	748	624
18						2134	1423	1067	854	711
19						2397	1598	1199	959	799
20	1670	1113	835	668	557	2660	1773	1330	1064	887
21	1936	1291	968	774	645	3046	2031	1523	1218	1015
22	2202	1468	1101	881	734	3432	2288	1716	1373	1144
23	2468	1645	1234	987	823	3818	2545	1909	1527	1273
24	2734	1823	1367	1094	911	4204	2803	2102	1682	1401
25	3090	2060	1545	1236	1030	4700	3133	2350	1880	1567
26	3446	2297	1723	1378	1149	5196	3464	2598	2078	1732
27	3892	2595	1946	1557	1297	5802	3868	2901	2321	1934
28	4338	2892	2169	1735	1446	6408	4272	3204	2563	2136
29	4784	3189	2392	1914	1595	7014	4676	3507	2806	2338
30	5230	3487	2615	2092	1743	7620	5080	3810	3048	2540
31	5780	3853	2890	2312	1927	8454	5636	4227	3382	2818
32	6330	4220	3165	2532	2110	9288	6192	4644	3715	3096
33	6880	4587	3440	2752	2293	10122	6748	5061	4049	3374
34	7430	4953	3715	2972	2477	10956	7304	5478	4382	3652
35	8067	5378	4034	3227	2689	11955	7970	5978	4782	3985
36	8703	5802	4352	3481	2901					
37	9426	6284	4713	3770	3142					
38	10149	6766	5075	4060	3383					
39	10872	7248	5436	4349	3624					
40	11595	7730	5798	4638	3865					
41	12450	8300	6225	4980	4150					

7.2.18 Spreading table for Maltaflor NPK MALTAFLOR

- Spreading volume in kg/ha
- 45 % CaO

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					Km/h				
	4	6	8	10	12	4	6	8	10	12
22	395	263	198	158	132	575	383	288	230	192
23	470	313	235	188	157	730	487	365	292	243
24	545	363	273	218	182	880	587	440	352	293
25	620	413	310	248	207	1040	693	520	416	347
26	695	463	348	278	232	1200	800	600	480	400
27	790	527	395	316	263	1350	900	675	540	450
28	890	593	445	356	297	1500	1000	750	600	500
29	995	663	498	398	332	1660	1107	830	664	553
30	1100	733	550	440	367	1820	1213	910	728	607
31	1250	833	625	500	417	2010	1340	1005	804	670
32	1400	933	700	560	467	2200	1467	1100	880	733
33	1585	1057	793	634	528	2405	1603	1203	962	802
34	1770	1180	885	708	590	2610	1740	1305	1044	870
35	1935	1290	968	774	645	2880	1920	1440	1152	960
36	2100	1400	1050	840	700	3150	2100	1575	1260	1050
37	2320	1547	1160	928	773	3443	2295	1721	1377	1148
38	2535	1690	1268	1014	845	3735	2490	1868	1494	1245
39	2767	1845	1384	1107	922	4043	2695	2022	1617	1348
40	3000	2000	1500	1200	1000	4350	2900	2175	1740	1450
41	3330	2220	1665	1332	1110	4675	3117	2338	1870	1558
42	3675	2450	1838	1470	1225	5000	3333	2500	2000	1667
43	3880	2587	1940	1552	1293	5375	3583	2688	2150	1792
44	4100	2733	2050	1640	1367	5750	3833	2875	2300	1917
45	4435	2957	2218	1774	1478	6125	4083	3063	2450	2042
46	4770	3180	2385	1908	1590	6500	4333	3250	2600	2167
47	5135	3423	2568	2054	1712	6875	4583	3438	2750	2292
48	5500	3667	2750	2200	1833	7250	4833	3625	2900	2417
49	5930	3953	2965	2372	1977	7645	5097	3823	3058	2548
50	6360	4240	3180	2544	2120	8040	5360	4020	3216	2680

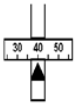
7.2.19 Spreading table for Maxiflor 92, finely ground, Maxit Kalkwerke

- Spreading volume in kg/ha
- 54 % CaO

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					Km/h				
	4	6	8	10	12	4	6	8	10	12
35	1770	1180	885	708	590	2269	1513	1135	908	756
36	1866	1244	933	746	622	2451	1634	1226	980	817
37	1962	1308	981	785	654	2633	1755	1317	1053	878
38	2058	1372	1029	823	686	2815	1877	1408	1126	938
39	2154	1436	1077	862	718	2998	1998	1499	1199	999
40	2250	1500	1125	900	750	3180	2120	1590	1272	1060
41	2360	1573	1180	944	787	3471	2314	1736	1388	1157
42	2470	1647	1235	988	823	3762	2508	1881	1505	1254
43	2582	1721	1291	1033	861	4053	2702	2027	1621	1351
44	2694	1796	1347	1078	898	4344	2896	2172	1738	1448
45	2855	1903	1427	1142	952	4610	3073	2305	1844	1537
46	3015	2010	1508	1206	1005	4875	3250	2438	1950	1625
47	3225	2150	1613	1290	1075	5115	3410	2558	2046	1705
48	3435	2290	1718	1374	1145	5355	3570	2678	2142	1785
49	3645	2430	1823	1458	1215	5595	3730	2798	2238	1865
50	3855	2570	1928	1542	1285	5835	3890	2918	2334	1945

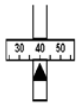
7.2.20 Spreading table for Nitrophoska perfekt COMP BASF

- Spreading volume in kg/ha
- NPK 15- 5 - 20

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					Km/h				
	4	6	8	10	12	4	6	8	10	12
10	175	117	88	70	58	250	167	125	100	83
11	233	155	116	93	78	335	223	168	134	112
12	290	193	145	116	97	420	280	210	168	140
13	355	237	178	142	118	535	357	268	214	178
14	420	280	210	168	140	650	433	325	260	217
15	535	357	268	214	178	805	537	403	322	268
16	650	433	325	260	217	960	640	480	384	320
17	788	525	394	315	263	1133	755	566	453	378
18	925	617	463	370	308	1305	870	653	522	435
19	1083	722	541	433	361	1553	1035	776	621	518
20	1240	827	620	496	413	1800	1200	900	720	600
21	1468	978	734	587	489	2050	1367	1025	820	683
22	1695	1130	848	678	565	2300	1533	1150	920	767
23	1973	1315	986	789	658	2660	1773	1330	1064	887
24	2250	1500	1125	900	750	3020	2013	1510	1208	1007
25	2625	1750	1313	1050	875	3360	2240	1680	1344	1120
26	3000	2000	1500	1200	1000					
27	3390	2260	1695	1356	1130					

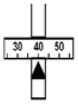
7.2.21 Spreading table for Nitrozol Top Spiess Urania

- Spreading volume in kg/ha
- 38 % N

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
13	320	213	160	128	107	385	257	193	154	128
14	385	257	193	154	128	445	297	223	178	148
15	478	318	239	191	159	568	378	284	227	189
16	570	380	285	228	190	690	460	345	276	230
17	680	453	340	272	227	828	552	414	331	276
18	790	527	395	316	263	965	643	483	386	322
19	935	623	468	374	312	1113	742	556	445	371
20	1080	720	540	432	360	1260	840	630	504	420
21	1220	813	610	488	407	1475	983	738	590	492
22	1360	907	680	544	453	1690	1127	845	676	563
23	1555	1037	778	622	518	1865	1243	933	746	622
24	1750	1167	875	700	583	2040	1360	1020	816	680
25	1995	1330	998	798	665	2285	1523	1143	914	762
26	2240	1493	1120	896	747	2530	1687	1265	1012	843
27	2595	1730	1298	1038	865					

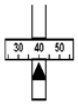
7.2.22 Spreading table for NPK Raiffeisen

- Spreading volume in kg/ha
- NPK 12- 12 - 17

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					Km/h				
	4	6	8	10	12	4	6	8	10	12
10	200	133	100	80	67	320	213	160	128	107
11	255	170	128	102	85	380	253	190	152	127
12	310	207	155	124	103	440	293	220	176	147
13	380	253	190	152	127	558	372	279	223	186
14	450	300	225	180	150	675	450	338	270	225
15	590	393	295	236	197	818	545	409	327	273
16	730	487	365	292	243	960	640	480	384	320
17	870	580	435	348	290	1133	755	566	453	378
18	1010	673	505	404	337	1305	870	653	522	435
19	1218	812	609	487	406	1555	1037	778	622	518
20	1425	950	713	570	475	1805	1203	903	722	602
21	1593	1062	796	637	531	2068	1378	1034	827	689
22	1760	1173	880	704	587	2330	1553	1165	932	777
23	2090	1393	1045	836	697	2690	1793	1345	1076	897
24	2420	1613	1210	968	807	3050	2033	1525	1220	1017
25	2735	1823	1368	1094	912	3500	2333	1750	1400	1167
26	3050	2033	1525	1220	1017	3950	2633	1975	1580	1317
27	3445	2297	1723	1378	1148	4375	2917	2188	1750	1458
28	3840	2560	1920	1536	1280					
29	4380	2920	2190	1752	1460					

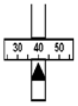
7.2.23 Spreading table for Patentkali Kalimagnesia, Kali + Salz GmbH

- Spreading volume in kg/ha
- 30 % K

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					Km/h				
	4	6	8	10	12	4	6	8	10	12
10	145	97	73	58	48	195	130	98	78	65
11	205	137	103	82	68	273	182	136	109	91
12	265	177	133	106	88	350	233	175	140	117
13	325	217	163	130	108	443	295	221	177	148
14	385	257	193	154	128	535	357	268	214	178
15	475	317	238	190	158	648	432	324	259	216
16	565	377	283	226	188	760	507	380	304	253
17	673	448	336	269	224	910	607	455	364	303
18	780	520	390	312	260	1060	707	530	424	353
19	913	608	456	365	304	1240	827	620	496	413
20	1045	697	523	418	348	1420	947	710	568	473
21	1203	802	601	481	401	1635	1090	818	654	545
22	1360	907	680	544	453	1850	1233	925	740	617
23	1550	1033	775	620	517	2095	1397	1048	838	698
24	1740	1160	870	696	580	2340	1560	1170	936	780
25	2025	1350	1013	810	675	2685	1790	1343	1074	895
26	2310	1540	1155	924	770	3030	2020	1515	1212	1010
27	2625	1750	1313	1050	875	3495	2330	1748	1398	1165
28	2940	1960	1470	1176	980	3960	2640	1980	1584	1320
29	3360	2240	1680	1344	1120					
30	3780	2520	1890	1512	1260					

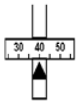
7.2.24 Spreading table for Rasenstolz NPK Spiess Urania

- Spreading volume in kg/ha
- NPK 20 - 6 - 18 + 2

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
10	165	110	83	66	55	330	220	165	132	110
11	248	165	124	99	83	438	292	219	175	146
12	330	220	165	132	110	545	363	273	218	182
13	418	278	209	167	139	648	432	324	259	216
14	505	337	253	202	168	750	500	375	300	250
15	620	413	310	248	207	880	587	440	352	293
16	735	490	368	294	245	1010	673	505	404	337
17	883	588	441	353	294	1180	787	590	472	393
18	1030	687	515	412	343	1350	900	675	540	450
19	1213	808	606	485	404	1588	1058	794	635	529
20	1395	930	698	558	465	1825	1217	913	730	608
21	1603	1068	801	641	534	2038	1358	1019	815	679
22	1810	1207	905	724	603	2250	1500	1125	900	750
23	2010	1340	1005	804	670	2550	1700	1275	1020	850
24	2210	1473	1105	884	737					

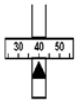
7.2.25 Spreading table for Agricolan castor meal shellcoarse (pellets) Günther

- Spreading volume in kg/ha
- 5 % N

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					Km/h				
	4	6	8	10	12	4	6	8	10	12
32						1200	800	600	480	400
33						1360	907	680	544	453
34						1520	1013	760	608	507
35						1690	1127	845	676	563
36	1163	775	582	465	388	1860	1240	930	744	620
37	1274	849	637	510	425	2055	1370	1028	822	685
38	1385	923	693	554	462	2250	1500	1125	900	750
39	1493	995	746	597	498	2470	1647	1235	988	823
40	1600	1067	800	640	533	2690	1793	1345	1076	897
41	1715	1143	858	686	572	2915	1943	1458	1166	972
42	1830	1220	915	732	610	3140	2093	1570	1256	1047
43	2033	1355	1016	813	678	3325	2217	1663	1330	1108
44	2235	1490	1118	894	745	3510	2340	1755	1404	1170
45	2438	1625	1219	975	813	3740	2493	1870	1496	1247
46	2640	1760	1320	1056	880	3970	2647	1985	1588	1323
47	2845	1897	1423	1138	948	4115	2743	2058	1646	1372
48	3050	2033	1525	1220	1017	4260	2840	2130	1704	1420
49	3255	2170	1628	1302	1085	4470	2980	2235	1788	1490
50	3460	2307	1730	1384	1153	4680	3120	2340	1872	1560

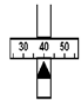
7.2.26 Spreading table for Agricolan castor oil shellcoarse (meal) Günther

- Spreading volume in kg/ha
- 5 % N

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					Km/h				
	4	6	8	10	12	4	6	8	10	12
26	1620	1080	810	648	540	965	643	483	386	322
27	1835	1223	918	734	612	1188	792	594	475	396
28	2050	1367	1025	820	683	1410	940	705	564	470
29	2265	1510	1133	906	755	1855	1237	928	742	618
30	2480	1653	1240	992	827	2300	1533	1150	920	767
31	2850	1900	1425	1140	950	2698	1798	1349	1079	899
32	3220	2147	1610	1288	1073	3095	2063	1548	1238	1032
33	3590	2393	1795	1436	1197	3628	2418	1814	1451	1209
34	3960	2640	1980	1584	1320	4160	2773	2080	1664	1387
35	4300	2867	2150	1720	1433	4650	3100	2325	1860	1550
36	4640	3093	2320	1856	1547	5140	3427	2570	2056	1713
37	4980	3320	2490	1992	1660	5540	3693	2770	2216	1847
38	5320	3547	2660	2128	1773	5940	3960	2970	2376	1980
39	5903	3935	2951	2361	1968	6480	4320	3240	2592	2160
40	6485	4323	3243	2594	2162	7020	4680	3510	2808	2340
41	7068	4712	3534	2827	2356	7560	5040	3780	3024	2520
42	7650	5100	3825	3060	2550	8100	5400	4050	3240	2700
43	8498	5665	4249	3399	2833	8790	5860	4395	3516	2930

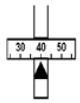
7.2.27 Spreading table for superphosphate Donau Chemie

- Spreading volume in kg/ha
- 18 % P

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
10	160	107	80	64	53	260	173	130	104	87
11	240	160	120	96	80	333	222	166	133	111
12	320	213	160	128	107	405	270	203	162	135
13	400	267	200	160	133	503	335	251	201	168
14	480	320	240	192	160	600	400	300	240	200
15	565	377	283	226	188	715	477	358	286	238
16	650	433	325	260	217	830	553	415	332	277
17	798	532	399	319	266	980	653	490	392	327
18	945	630	473	378	315	1130	753	565	452	377
19	1073	715	536	429	358	1288	858	644	515	429
20	1200	800	600	480	400	1445	963	723	578	482
21	1445	963	723	578	482	1698	1132	849	679	566
22	1690	1127	845	676	563	1950	1300	975	780	650
23	1910	1273	955	764	637					

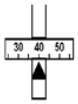
7.2.28 Spreading table for Basamid Compo

- Spreading volume in kg/ha

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
6	205	137	103	82	68	235	157	118	94	78
7	285	190	143	114	95	290	193	145	116	97
8	365	243	183	146	122	350	233	175	140	117
9	460	307	230	184	153	475	317	238	190	158
10	560	373	280	224	187	600	400	300	240	200
11	710	473	355	284	237	735	490	368	294	245
12	850	567	425	340	283	870	580	435	348	290
13	1050	700	525	420	350	1090	727	545	436	363
14	1250	833	625	500	417	1310	873	655	524	437
15	1610	1073	805	644	537	1670	1113	835	668	557

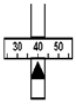
7.2.29 Spreading table for Basatop Sport COMPO BASF

- NPK 20 - 5 - 10 + 3 % MgO,
- Spreading volume in kg/ha

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
10	90	60	45	36	30	150	100	75	60	50
11	145	97	73	58	48	241	160	120	96	80
12	200	133	100	80	67	331	221	166	133	110
13	258	172	129	103	86	421	280	210	168	140
14	315	210	158	126	105	510	340	255	204	170
15	395	263	198	158	132	641	427	320	256	214
16	475	317	238	190	158	771	514	386	309	257
17	600	400	300	240	200	917	611	458	367	306
18	725	483	363	290	242	1063	708	531	425	354
19	850	567	425	340	283	1244	829	622	498	415
20	975	650	488	390	325	1425	950	713	570	475
21	1175	783	588	470	392	1656	1104	828	663	552
22	1375	917	688	550	458	1888	1258	944	755	629
23	1600	1067	800	640	533	2156	1438	1078	863	719
24	1825	1217	913	730	608	2425	1617	1213	970	808
25	2100	1400	1050	840	700	2781	1854	1391	1113	927

7.2.30 Spreading table for Basatop Starter COMPO BASF

- NPK 19 - 25 - 5 + 2 % MgO,
- Spreading volume in kg/ha

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
10	70	47	35	28	23	105	70	53	42	35
11	105	70	53	42	35	178	118	89	71	59
12	141	94	70	56	47	250	167	125	100	83
13	177	118	89	71	59	326	218	163	131	109
14	214	143	107	86	71	403	269	201	161	134
15	316	211	158	127	105	504	336	252	202	168
16	419	279	209	168	140	605	403	303	242	202
17	525	350	263	210	175	753	502	376	301	251
18	631	421	316	253	210	900	600	450	360	300
19	791	527	395	316	264	1050	700	525	420	350
20	950	633	475	380	317	1200	800	600	480	400
21	1138	758	569	455	379	1400	933	700	560	467
22	1325	883	663	530	442	1600	1067	800	640	533
23	1538	1025	769	615	513	1838	1225	919	735	613
24	1750	1167	875	700	583	2075	1383	1038	830	692
25	2025	1350	1013	810	675	2381	1588	1191	953	794

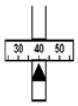
7.2.31 Spreading table for Floranid N32 COMPO BASF

- Spreading volume in kg/ha

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					**Km/h**				
	4	6	8	10	12	4	6	8	10	12
10	83	55	41	33	28	105	70	53	42	35
11	128	85	64	51	43	158	105	79	63	53
12	173	115	86	69	58	210	140	105	84	70
13	236	158	118	95	79	293	195	146	117	98
14	300	200	150	120	100	375	250	188	150	125
15	375	250	188	150	125	463	308	231	185	154
16	450	300	225	180	150	550	367	275	220	183
17	563	375	281	225	188	669	446	334	268	223
18	675	450	338	270	225	788	525	394	315	263
19	788	525	394	315	263	909	606	455	364	303
20	900	600	450	360	300	1031	688	516	413	344
21	1050	700	525	420	350	1222	815	611	489	407
22	1200	800	600	480	400	1413	942	706	565	471
23	1350	900	675	540	450	1606	1071	803	643	535
24	1500	1000	750	600	500	1800	1200	900	720	600
25	1738	1158	869	695	579	2044	1363	1022	818	681

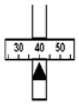
7.2.32 Spreading table for Floranid NK COMPO BASF

- NK 14 - 19 + 3 % MgO,
- Spreading volume in kg/ha

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					Km/h				
	4	6	8	10	12	4	6	8	10	12
10	138	92	69	55	46	183	122	92	73	61
11	218	145	109	87	73	285	190	143	114	95
12	303	202	151	121	101	388	258	194	155	129
13	388	258	194	155	129	488	325	244	195	163
14	473	315	236	189	158	589	393	294	236	196
15	618	412	309	247	206	764	509	382	306	255
16	764	509	382	306	255	939	626	470	376	313
17	939	626	470	376	313	1148	765	574	459	383
18	1115	743	558	446	372	1356	904	678	543	452
19	1290	860	645	516	430	1569	1046	785	628	523
20	1465	977	733	586	488	1783	1188	891	713	594
21	1706	1138	853	683	569	2048	1365	1024	819	683
22	1948	1298	974	779	649	2313	1542	1156	925	771
23	2189	1459	1094	876	730	2578	1718	1289	1031	859
24	2430	1620	1215	972	810	2843	1895	1421	1137	948
25	2771	1848	1386	1109	924	3296	2198	1648	1319	1099

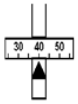
7.2.33 Spreading table for Floranid Permanent COMPO BASF

- NPK 16 - 7 - 15 + 2 % MgO,
- Spreading volume in kg/ha

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					Km/h				
	4	6	8	10	12	4	6	8	10	12
10	83	56	42	33	28	113	75	56	45	38
11	104	69	52	42	35	189	126	95	76	63
12	125	83	63	50	42	266	178	133	107	89
13	164	109	82	66	55	343	229	172	137	114
14	203	135	101	81	68	420	280	210	168	140
15	326	218	163	131	109	541	361	271	217	180
16	450	300	225	180	150	663	442	331	265	221
17	569	379	284	228	190	806	538	403	323	269
18	688	458	344	275	229	950	633	475	380	317
19	850	567	425	340	283	1119	746	559	448	373
20	1013	675	506	405	338	1288	858	644	515	429
21	1206	804	603	483	402	1506	1004	753	603	502
22	1400	933	700	560	467	1725	1150	863	690	575
23	1588	1058	794	635	529	1938	1292	969	775	646
24	1775	1183	888	710	592	2150	1433	1075	860	717
25	2044	1363	1022	818	681	2456	1638	1228	983	819

7.2.34 Spreading table for Sportica K COMPO BASF

- NK 30 - 10 + 3 % MgO,
- Spreading volume in kg/ha

	PTO shaft 540 rpm = Agitator shaft 15 rpm					PTO shaft 1000 rpm = Agitator shaft 28 rpm				
	Hand wheel pos. 3 = Agitator shaft 15 rpm					Hand wheel pos. 4,5 = Agitator shaft 28 rpm				
	Km/h					Km/h				
	4	6	8	10	12	4	6	8	10	12
10	45	30	23	18	15	68	45	34	27	23
11	83	55	41	33	28	115	77	58	46	38
12	120	80	60	48	40	163	108	81	65	54
13	158	105	79	63	53	209	139	104	84	70
14	195	130	98	78	65	255	170	128	102	85
15	254	169	127	102	85	328	218	164	131	109
16	313	208	156	125	104	400	267	200	160	133
17	394	263	197	158	131	488	325	244	195	163
18	475	317	238	190	158	575	383	288	230	192
19	569	379	284	228	190	663	442	331	265	221
20	663	442	331	265	221	750	500	375	300	250
21	794	529	397	318	265	888	592	444	355	296
22	925	617	463	370	308	1025	683	513	410	342
23	1063	708	531	425	354	1163	775	581	465	388
24	1200	800	600	480	400	1300	867	650	520	433
25	1381	921	691	553	460	1488	992	744	595	496

8 Calibration

For precise control of the application rate we recommend running a new calibration every time you change spreading material types.

Carry out a calibration:

- Before spreading for the first time.
- If the spreading material quality has changed significantly (moisture, high dust content, granulate damage).
- If new types of spreading material are used.

The calibration must be conducted with engaged PTO at a standstill or during travel over a test track.

NOTICE

With the UKS **universal box spreaders with QUANTRON-A** the calibration is carried out at the QUANTRON-A control unit.

The calibration is described in a separate operating manual for the QUANTRON-A control unit. This operating manual is an integral part of the QUANTRON-A control unit.

8.1 Calculating the maximum spreading distance

The maximum spreading distance depends on the following:

- Amount of the spreading material carried (g)
- Spreading density (g/m²)
- Spreading width (m)

- Formula:

$$\frac{\text{Hopper volume}}{\text{Spreading density}} = \text{Spreading distance at 1 m spreading width}$$

- Example

$$\frac{300000}{30} = 10000\ \text{m}^2 = 10\ \text{km Spreadistance}$$

- Spreading distance with 1.20 m spreading width

$$\frac{10000\ \text{m}}{1,\ 20} = 8333\ \text{m}$$

▷ With a hopper filling of 300 kg, a spreading density of 30 g/m2 and a spreading width of 1.20 m, you can spread a distance of 8333 m.

8.2 Calculating the target output volume per minute

To calculate the target output volume per minute you will require the following information:

- The forward speed,
- the working width,
- the desired application rate.

Example 1: Sand, salt and grit (g/min)

Forward speed	3 km/h
Working width	1,20 m
Desired application rate	50 g/m²
Target output volume	? kg/min

- Formula:

$$\text{Target output volume} = \frac{\text{Forward speed} \times \text{Working width} \times \text{Appl. rate}}{60}$$

- Example

$$\frac{3\ \text{km/h} \times 1,\ 20\ \text{m} \times 50\ \text{g/m}^2}{60} = 3\ \text{kg/min}$$

▷ 3 kg spreading material per minute must be discharged.

Example 2: Fertiliser (kg/min)

Forward speed	8 km/h
Working width	1,50 m
Desired application rate	300kg/ha
Target output volume	? kg/min

- Formula

$$\frac{\text{Forward speed} \times \text{Working width} \times \text{Appl. rate}}{600} = \text{kg/min}$$

- Example

$$\frac{8 \times 1,5 \times 300}{600} = 6\ \text{kg/min}$$

▷ 6 kg fertiliser per minute must be discharged.

8.3 Running the calibration

⚠ WARNING

Risk of injury due to chemicals

Discharged fertiliser may cause injuries to eyes and nasal mucous membranes.

- ▶ Wear protective goggles during the calibration.
- ▶ Send all persons out of the danger area of the universal box spreader before beginning the calibration.

Requirements:

- The metering slider is closed.
- PTO and tractor engine are switched off and locked to prevent unauthorised starting.
- An adequately sized container is ready for collecting the discharged material (minimum capacity **25 kg**). The container's empty weight is known.
- Using the spreading table, the pre-set values for the metering slider stop are determined and known.

NOTICE

Select the calibration time to obtain the maximum possible discharge amount. The greater the quantity, the greater the precision of the measurement (e. g.: Target output volume: 10 kg/min, calibration time: 3 min, used spreading material quantity: 30 kg).

Implementation:

1. Fill the universal box spreader.
2. Put a recipient or a sheet beneath the universal box spreader to collect the spreading material.
3. Set the metering slider stop to the value specified in the spreading table.

⚠ DANGER

Risk of injury due to rotating machine parts

Contact with rotating machine components (drive shaft, agitator shaft) may cause bruises, abrasions and crushing injuries. Body parts or objects may be caught and pulled in.

- ▶ Always stay outside the area of rotating components while the machine is running.
- ▶ **Always** operate the metering slider from the driver's seat of the tractor when the drive shaft is rotating.
- ▶ Send all persons out of the danger area of the universal box spreader before beginning the calibration.

4. Start the tractor.
5. Start the agitator shaft.
6. Set the agitator shaft speed according to the values in the spreading table.
7. From the driver's seat of the tractor, open the metering slider for the pre-set calibration time.

   Usually, this is approx. **1 min**.
8. Close the metering slider when this time has elapsed.
9. Turn the drive and the tractor off, remove the ignition key.
10. Calculate the weight of the spreading material (include the empty weight of the recipient).
11. Compare the actual volume with the target volume.

▷ **Actual output volume = target output volume: output rate stop is set correctly. End calibration.**

▷ **Actual output volume < nominal output volume: set output rate stop to a higher position and repeat calibration.**

▷ **Actual output volume > nominal output volume: Set output volume stop to a lower position and repeat calibration.**

9 Important instructions on spreading

9.1 General Information

The modern technology and design of our universal box spreaders, and exhaustive, continuous testing in the factory's fertiliser spreader test facilities are the prerequisites for a perfect spreading pattern.

In spite of the care taken during manufacture of the machines, deviations in application or some type of fault cannot be excluded even when the machine is used as intended.

The reasons for this may be:

- Changes in the physical characteristics of the spreading material or fertiliser (e. g. varying density, grain form and surface, treatment, sealing, humidity).
- Clumping and moist fertiliser.
- Drifting caused by wind (in the case of excessive wind speed, cancel the spreading work).
- Bridging and clogging can occur, (e. g. due to foreign bodies, bag residue or moist spreading material etc.).
- Uneven ground.
- Wearing down of wear parts (e. g. agitator blade).
- Damage from external causes.
- Inadequate cleaning and care to prevent corrosion.
- Incorrect drive speeds and forward speeds.
- Calibration test has not been carried out.
- Incorrect machine adjustments.

Make sure that the machine is correctly set. Even a minor deviation from the correct setting may lead to a significant impairment of the spread pattern. Therefore, before each operation and during operation, check the correct functioning of your machine and ensure that the application accuracy is sufficient (run calibration).

Always use the protective grid included in the scope of delivery in order to avoid clogging e. g. due to foreign particles or clumping fertiliser.

Claims for damages other than to the universal box spreader itself will not be accepted.

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

9.2 Procedure for spreading

The intended use of the universal box spreader includes compliance with the operating, maintenance, and service conditions according to manufacturer specifications. **Spreading** therefore always includes **preparation** and **cleaning/maintenance**.

- Execute the spreading work in accordance with the following process.

Preparation	• Install the universal box spreader on the tractor • Close the metering slider • Fill in spreading material or fertiliser • Run the calibration • Adjust the spreading volume
Spreading	• Travel to the spreading location • Engage the drive • Open the slider and start spreading • Finish spreading operations and close the slider • Disengage the drive • Discharge residual material
Cleaning/maintenance	• Open metering slider • Remove the universal box spreader from the tractor • Cleaning and maintenance

NOTICE

If mealy spreading materials are used, we recommend installing a wind blocker to avoid drifting.

- See 12: Special equipment, page 97.

9.3 Discharging residual material

9.3.1 Emptying the hoppers of UKS 80 to UKS 120

⚠ DANGER

Risk of injury due to rotating machine parts

Contact with rotating machine components (drive shaft, agitator shaft) may cause bruises, abrasions and crushing injuries. Body parts or objects may be caught and pulled in.

- ▶ Always stay outside the area of rotating components while the machine is running.
- ▶ **Always** operate the metering slider from the driver's seat of the tractor when the drive shaft is rotating.
- ▶ Send all persons out of the danger area of the universal box spreader before discharging residual material.

We recommend immediately discharging the universal box spreader after each use, in order to conserve its value.

Instructions for completely discharging the residual material:

The universal box spreader is equipped with a folding hopper bottom.

1. Unfasten star knobs.
2. Fold hopper bottom downwards.
3. Remove remaining spreading material with a soft water spray during cleaning.

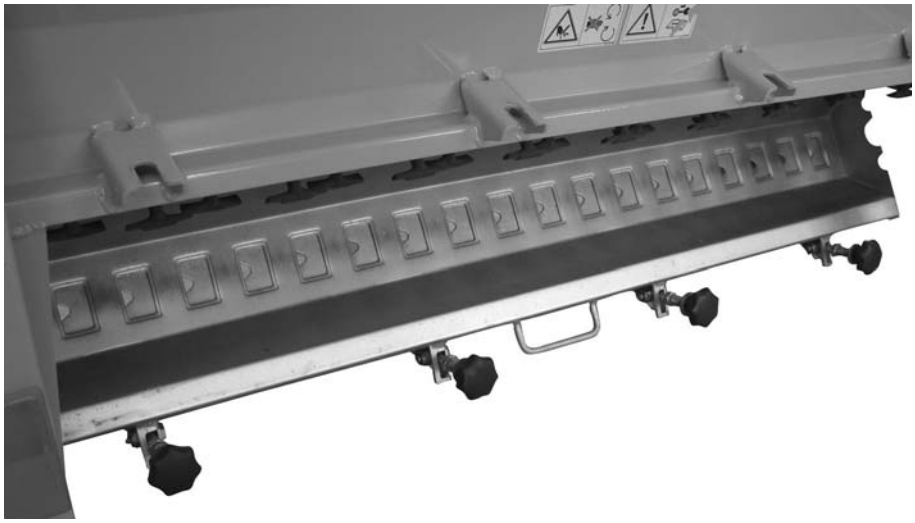


Figure 9.1: Fast emptying of the UKS municipal spreaders

9.3.2 Emptying the hoppers of UKS 150 GB to UKS 300 GB

⚠ DANGER

Risk of injury due to rotating machine parts

Contact with rotating machine components (agitator shaft) may cause bruises, abrasions and crushing injuries. Body parts or objects may be caught and pulled in.

- ▶ Always stay outside the area of rotating components while the machine is running.
- ▶ **Always** operate the metering slider from the driver's seat of the tractor when the agitator shaft is rotating.
- ▶ Send all persons out of the danger area of the universal box spreader before discharging residual material.

We recommend immediately discharging the universal box spreader after each use, in order to conserve its value.

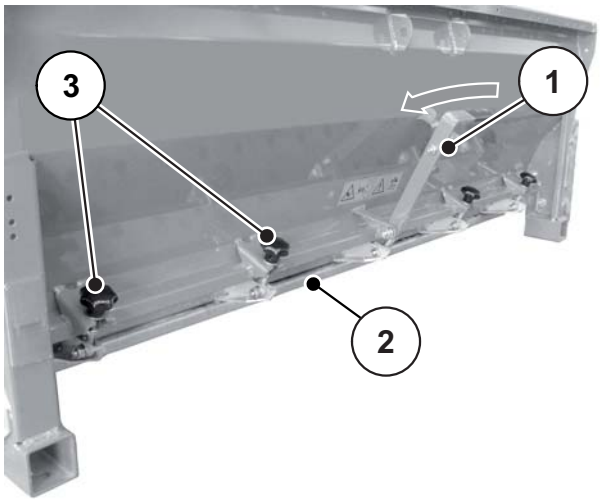


Figure 9.2: Fast emptying of the UKS GB fertiliser spreaders, unfasten star knobs

Instructions for completely discharging the residual material:

The universal box spreader is equipped with a folding hopper bottom.

1. Unfasten star knobs [3].
2. Fold the hopper bottom [2] downwards using the lever [1].
3. Remove remaining spreading material with a soft water spray during cleaning.

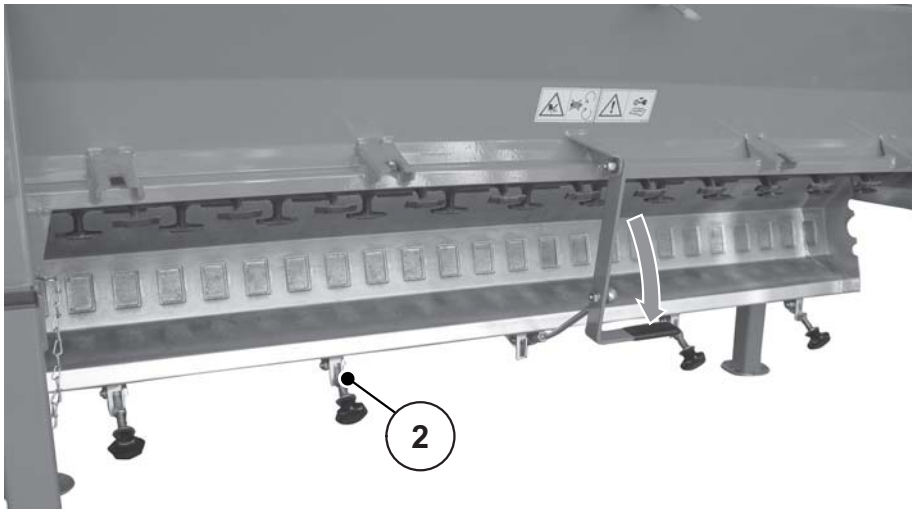


Figure 9.3: Fast emptying of the UKS GB fertiliser spreaders, fold the spreader floor downwards

10 Maintenance and repair

10.1 Safety

During the maintenance and repair work, additional risks which do not occur while operating the machine are to be expected.

Any maintenance and repair work is to be conducted with increased alertness at all times. Work very carefully and with awareness of danger.

NOTICE

Arrange for your dealer to carry out major servicing work.

Observe the following instructions in particular:

- Welding and work on the electrical and hydraulic systems must be carried out by qualified technicians only.
- When working on the lifted universal box spreader, there is a **risk of the machine tipping over**. Always secure the universal box spreader using suitable supports.
- To lift the universal box spreader with lifting equipment, always use a **suitable belt**.
- There is a **risk of crushing and shearing** at power-operated components (adjustment lever, metering slide). During maintenance, nobody must stay close to moving and rotating components.
- Spare parts must at least comply with the technical standards specified by the manufacturer. This is guaranteed with genuine spare parts, for example.
- Before starting with any cleaning, maintenance, or repair work and when troubleshooting, switch off the tractor engine and wait until all rotating parts of the machine have come to a stop.
- Always have repairs carried out by a **qualified** and **authorised specialist workshop** only.

NOTICE

Please also refer to the warning notes in chapter 3: Safety, page 5. Take particular note of the instructions in section 3.8: Service and maintenance, page 11.

10.2 Wear parts and screw connections

10.2.1 Checking wear parts

Wear parts are: **agitator shaft, agitator fingers, hopper bottom**, **outlet**, **hydraulic hoses**.

- Check the wear parts.
- Check the ball bearings of the agitator shaft.

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

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

10.2.2 Checking the screw connections

The screw connections are tightened with the required tightening torque and secured at the factory. Vibrations and shocks, in particular during the initial operating hours, can loosen screw connections.

- With a new universal box spreader, check all screw connections for tightness after approx. 30 operating hours.
- Check all the screw connections regularly for tightness, and definitely before the start of the spreading season.

Some components (e. g. coupling triangle) are mounted with self-locking nuts. When mounting these components **always use new self-locking** nuts.

10.3 Cleaning

We recommend immediately cleaning the universal box spreader after each use, in order to conserve its value.

Observe the following instructions for cleaning:

- Only clean the area around the slide guide from below.
- Only clean oiled machines at washing points equipped with an oil separator.
- When cleaning with high-pressure water, never aim the jet directly at warning signs, electrical equipment, hydraulic components, and sliding bearings.

After cleaning, we recommend treating the **dry** universal box spreader, **and in particular the stainless steel parts**, with an environmentally friendly anti-corrosion agent.

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

10.4 Checking the agitator shaft for wear and tear

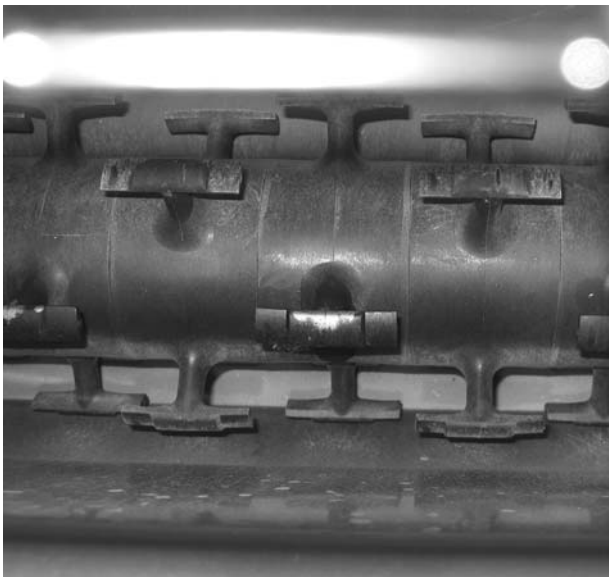


Figure 10.1: Checking the agitator fingers for wear and tear

You can continue using the agitator shaft if the following requirements are met:

- The T shape of the agitator fingers is clearly visible.
- The agitator fingers reach the spreader floor.

  ▷ If any of this is no longer the case, the agitator fingers need to be replaced.

NOTICE

ONLY have your dealer or your specialist workshop replace the agitator shaft.

10.4.1 Checking wear and tear and tension of the chain

- Regularly check the chain for wear and tear and check if it is sufficiently tensioned.

  ▷ Replace the chain, if necessary.

  ▷ Re-tension the chain using the chain idler.

10.5 Gear oil

10.5.1 Quantity and types

The gearbox is filled with approx. **0.4 l** gear oil C-LP 460.

NOTICE

Use only one type of oil, **never mix different types**.

10.5.2 Checking the oil level, changing the oil

The gearbox does not need to be lubricated under normal operating conditions. However, we recommend changing the oil after **10 years**.

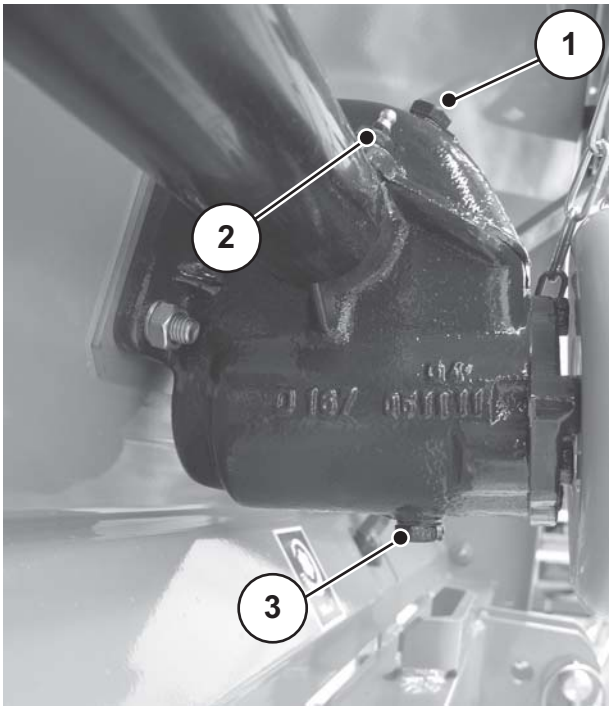
A shorter oil change interval is recommended if spreading materials with a high dust content are used and the spreader is frequently cleaned.

⚠ CAUTION

Environmentally sound disposal of used oil

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

▶ Dispose of used oil in accordance with the applicable local provisions.



[1] Filling screw
[2] Lubrication points in the gear box (left and right)
[3] Drain screw

Figure 10.2: Gear oil filling and draining points

Checking the oil level

- Open the oil filling screw [1].
  ▷ The oil level is satisfactory if the screw enters the oil.

10.6 Lubrication chart

Lubrication points	Lubricant	Notes
Drive shaft	Grease	See manufacturer's manual.
Metering slider, stop lever	Grease, oil	Ensure smooth movement and grease regularly.
Agitator shaft ball bearing, left/right	Grease	Grease before and after each spreading season.
Upper and lower link balls	Grease	Grease regularly.
Drive chain	Grease, oil	Grease before and after each spreading season.
Lubrication points in the gearbox	Grease	Grease before and after each spreading season.
Drive shaft bearing (inside chain guard box)	Grease	Grease before and after each spreading season.

11 Faults and possible causes

⚠ DANGER

Risk of injury and accident from omitted or inadequate troubleshooting

Delayed or incorrect repairs by unqualified persons may result in incalculable risks with negative consequences for persons, the machine, and the environment.

- ▶ Any faults occurring must be repaired **immediately**.
- ▶ Only carry out repairs yourself if you have the appropriate qualifications.

Fault	Possible cause/action
Uneven distribution of spreading material	● Metering opening partly blocked. ● Agitator blades partly worn and/or damaged,
Metering slider does not open.	● Metering slider does not move easily. Check the slider and the lever for smooth movement and improve if necessary. ● Push-pull cable defective. Check. ● Power supply to actuator interrupted.
Agitator not working.	● Check for wear. ● Chain torn. Replace chain. ● Check oil supply of the hydraulic motor.
Blockage of the metering openings due to: lumps of spreading material, damp spreading material, other impurities (leaves, straw, sack residues)	● Clear blockages. Proceed as follows: 1. Park tractor, remove ignition key. 2. Open metering slide. 3. Place collecting vessel underneath. 4. Clean the outlet **from below** with a wooden pole or screwdriver and push through the metering opening. 5. Remove any foreign objects in the hopper. 6. Close the metering slide.

12 Special equipment

12.1 Municipal spreaders UKS

12.1.1 Electric remote control EF 25

Using the electric remote control, you can operate the metering slider from the tractor.

For the electric remote control you will need a 12 V connection (2--pin socket) on the tractor.

12.1.2 Mechanical remote control MFB 6/MFB 7

Using the mechanical remote control, you can operate the metering slider from the tractor.

12.1.3 Hopper extensions

You can increase the capacity of the universal box spreader by fitting a hopper extension.

The extensions are bolted to the standard hopper.

HINWEIS

For an overview of extensions and extension combinations, see chapter 4.4: Technical data of the extensions, page 25.

12.1.4 Hopper covers

The hopper covers protects the spreading material from wetness and moisture.

You can attach the covers to the extensions.

Cover	Application
AP 18	● Standard hopper and extension UKS 80
AP 15	● Standard hopper and extension UKS 100
AP 17	● Standard hopper and extension UKS 120

12.1.5 Lighting with warning sign (UKS 80/100/120)

The universal box spreader can be fitted with lighting.

Lighting	Application
BLW 7	• Rear lighting • With warning sign

HINWEIS

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

12.1.6 Lower link connection cat. I long

The long version of the lower link connection is used if more space between the tractor and the attached spreader is needed. It is screwed to the shorter standard lower link connection.

12.1.7 Lower link connection cat. I N

For assembly to tractors with cat. I N.

12.1.8 Device triangle cat. I

The device triangle is available for quick and easy coupling of the spreader to the tractor.

HINWEIS

The device triangle may only be used for universal box spreaders with hydraulic drive.

12.1.9 Hydraulic current regulation valve (special design, UKS 100/120)

The hydraulic current regulation valve is installed if the performance of the hydraulic system of the tractor can not be set below 25l/min.

12.2 Fertiliser spreaders UKS GB

12.2.1 Electric remote control EF 25

Using the electric remote control, you can operate the metering slider from the tractor.

For the electric remote control you will need a 12 V connection (2--pin socket) on the tractor.

12.2.2 Mechanical remote control MFB 6/MFB 7

Using the mechanical remote control, you can operate the metering slider from the tractor.

12.2.3 Hopper extensions

You can increase the capacity of the universal box spreader by fitting a hopper extension.

The extensions are bolted to the standard hopper.

HINWEIS

For an overview of extensions and extension combinations, see chapter 4.4: Technical data of the extensions, page 25.

12.2.4 Parking rests

Set of 4 parking rests, 450 mm.

12.2.5 Wind blocker

Wind blocker	Application
WS 190	• UKS 190
WS 230	• UKS 230
WS 300	• UKS 300

12.2.6 Hopper cover

The hopper cover protects the spreading material from wetness and moisture.

You can attach the covers to the extensions.

Cover	Application
AP 16	● Standard hopper and extension UKS 150
AP 20	● Standard hopper and extension UKS 190
AP 21	● Standard hopper and extension UKS 230
AP 23	● Standard hopper and extension UKS 300

12.2.7 Lighting without warning sign

The universal box spreader can be fitted with lighting.

Lighting	Application
BLO 9	● Rear lighting
BLO 10	● Lighting for front

HINWEIS

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

12.2.8 Row spreading device

This row spreading device can be used to place dry, granular fertiliser in a row next to sprouting plants.

12.2.9 Spreading device

This spreading device is used for the application of micro-granular materials and seeds over a wide area.

12.2.10 Parts set category I (UKS 150, UKS 190)

For tractors with a coupling point of category I the cat. I parts set is available.

12.2.11 Parts set category II

For tractors with a coupling point of category II the cat. II parts set is available.

12.2.12 Device triangle cat. II

The device triangle is available for quick and easy coupling of the spreader to the tractor.

13 Axle load calculation

13.1 Calculating the axle loads

⚠ CAUTION

Risk of overload.

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

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

Calculating the total weight, axle loads, tyre load capacity and the necessary minimum ballast.

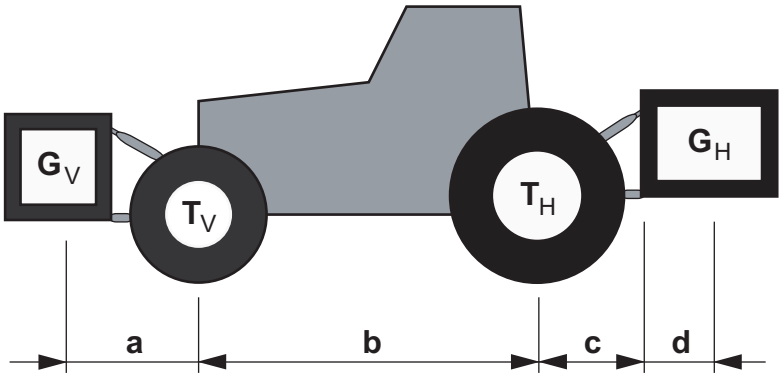


Figure 13.1: Loads and weights

You will need the following data for the calculation:

Character [unit]	Meaning	Determined by
T_L [kg]	Empty weight of the tractor	[1]
T_V [kg]	Front axle load of the empty tractor	[1]
T_H [kg]	Rear axle load of the empty tractor	[1]
G_V [kg]	Total weight of front-mounted unit / front ballast	[2]
G_H [kg]	Total weight of rear-mounted unit / rear ballast	[2]
a [m]	Distance between centre of gravity of front-mounted unit / front ballast and centre of front axle	[2], [3]
b [m]	Wheel base of the tractor	[1], [3]
c [m]	Distance between centre of rear axle and centre of lower link ball	[1], [3]
d [m]	Distance between centre of lower link ball and centre of gravity of rear-mounted unit / rear ballast	[2]

[1] See operating manual of the tractor

[2] See price list and/or operating manual of the unit

[3] Measuring

Rear-mounted unit and/or front-rear combinations

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

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

Enter the calculated minimum ballast requirement in the table.

Front-mounted unit

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

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

Enter the calculated minimum ballast requirement in the table.

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

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

$$T_{Vtat} = \frac{(G_V \bullet (a + b) + T_V \bullet b - G_H \bullet (c + d))}{b}$$

Enter the calculated actual front axle load as well as the admissible front axle load specified in the tractor's operating manual in the table.

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

Calculation of the actual total weight G_{tat}

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

Enter the calculated actual total weight as well as the admissible total weight specified in the tractor's operating manual in the table.

Calculation of the actual rear-axle load $T_{H\,tat}$

$$T_{Htat} = (G_{tat} - G_{Vtat})$$

Enter the calculated actual rear axle load as well as the admissible rear axle load specified in the tractor's operating manual in the table.

Tyre load capacity

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

13.2 Axle loads table

	Actual value according to calculation		Admissible value according to operating manual		Twice the admissible tyre load capacity (two tyres)
Minimum ballast front / rear	kg		—		—
Total weight	kg	≤	kg		—
Front axle load	kg	≤	kg	≤	kg
Rear axle load	kg	≤	kg	≤	kg

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

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

14 Disposal

14.1 Safety

⚠ WARNING

Environmental pollution caused by an inappropriate disposal of hydraulic and gearbox oil

The hydraulic and gearbox oils are not entirely biodegradable. For this reason, any uncontrolled exposure of the environment to the oil is to be prevented.

- ▶ The professional removal of escaped oil may only be conducted by authorised maintenance staff.
- ▶ Collect/dam escaped oil with sand, earth or other absorptive material.
- ▶ Collect hydraulic and gear oil in a suitable container provided for the purpose, and dispose of it in accordance with the local statutory requirements.
- ▶ Oil must be prevented from spilling and draining into the sewers.
- ▶ The ingress of oil into the sewage system must be prevented by building dams made of sand and/or earth or by other suitable damming means.

⚠ WARNING

Environmental pollution caused by inappropriate disposal of packaging materials

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

- ▶ An appropriate disposal of packaging materials is to be implemented with an authorised waste management company respecting the national regulations.
- ▶ Packaging material may **not** be burned or disposed of with the domestic waste processing.

⚠ WARNING

Environmental pollution caused by inappropriate disposal of components

In the case of an inappropriate disposal, the environment may be endangered.

- ▶ Only authorised companies may be commissioned with the disposal.

14.2 Disposal

The following points are applicable without any restriction. The precautions laid down as a result of national regulations must be observed implicitly.

1. All components, auxiliary and operating materials from the universal box spreader must be removed by specialist staff. Hereby, these components and substances must be cleanly separated into categories.
2. All waste products are then to be disposed of in accordance with local regulations and directives for recycling or special refuse categories by authorised companies.

Terms/conditions of warranty

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

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

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

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