Operating manual

RÜMEX

RXF600 T05 rev02

Mounted sprayer for individual plant control

This operating manual is an integral part of the device. The device must not be operated without the operating manual. The operating manual must be made available to users at all times for information purposes. The operating manual must be supplied with the device when it is sold. Before starting up the device for the first time, read and follow this operating manual! Keep them for future use!

D A CH

CE

Identification data

Enter the identification data of the machine here.

The identification data can be found on the rating plate.

Machine identification no:	_____
Type:	RUMEX RXF600 T05
Year of construction:	_____
Basic weight kg:	750 kg
Permissible gross weight kg:	985 kg
Maximum payload kg:	235 kg

Manufacturer's address

RUMEX GmbH

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Ordering spare parts

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Formalities of the operating manual

Document number: RXF 600 T05 rev02

Creation date: 2024

Important! Before starting up the device, read this operating manual and observe all notes and instructions! Failure to follow these instructions may result in injury or death, damage to the device and damage to the environment.

This operating manual is part of the RXF600. The RXF600 must not be operated without the operating manual

Keep this operating manual together with the RXF600 in a safe place. Always pass the user manual on to new users of the device.

This document is valid only in its entirety.

Foreword

Dear customer

You have decided on the mounted sprayer for individual dock control from RUMEX GmbH. We thank you for the trust you have placed in us.

On receipt of the machine, please check for any transport damage or missing parts. Using the delivery note, check that the supplied machine is complete, including the special equipment ordered. Only by making a complaint immediately will you be able to claim compensation!

Before starting up the machine for the first time, read and observe this operating manual, in particular the safety instructions. After carefully reading this manual, you will be able to take full advantage of your newly acquired machine.

Please ensure that all machine operators read this operating manual before starting up the machine.

If you have any questions or problems, please refer to this operating manual or contact RUMEX GmbH.

Regular maintenance and timely replacement of worn or damaged parts will increase the life expectancy of your machine.

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1. User instructions

The User instructions chapter provides information on how to use the operating manual.

1.1. Purpose of the document

This operating manual

- describes the operation and maintenance of the machine,
- provides important information for safe and efficient use of the machine,
- is an integral part of the machine and must always be kept on the machine or in the towing vehicle,
- must be kept for future reference.

1.2. Location information in the operating manual

All directions in this operating manual are always in the direction of travel of the tractor with which the machine is operated.

1.3. Representations used

Instructions and responses

Activities to be carried out by the operator are shown as numbered instructions. Follow the sequence of the instructions given. The response to the respective instruction is indicated by an arrow where applicable.

Example:

1. Instruction 1

   → Response of the machine to instruction 1

2. Instruction 2

   → Response of the machine to instruction 2

Enumerations

Enumerations without a mandatory order are shown as a list with bullet points.

Example:

- Point 1
- Point 2

Item numbers in figures

Numbers in round brackets refer to item numbers in figures. The first digit refers to the figure, the second digit to the item number in the figure.

Example (Fig. 3/6)

- Figure 3
- Item 6

2. General safety instructions

This chapter contains important information on how to operate the machine safely.

2.1. Obligations and liability

Observe the notes in the operating manual

Knowledge of the basic safety instructions and safety regulations is a basic prerequisite for safe handling and trouble-free operation of the machine.

Obligation of the operating company

The operating company undertakes to allow only those persons to work with and on the machine who

- are familiar with the basic regulations on occupational safety and accident prevention,
- have been instructed in working with/on the machine,
- have read and understood this operating manual.

The operating company undertakes to

- keep all warning symbols on the machine in a legible condition,
- replace damaged warning symbols.
- Proper storage
- All RUMEX machines must be stored in such a way that they are not exposed to weather conditions.
- The machine must not be stored outdoors or in sub-zero temperatures. This may cause serious damage to the machine and impair its functionality. The machine must be stored frost-free in a protected location, such as a closed room or machine hall, to ensure optimum performance and a long service life.

Obligation of the operator

Before starting work, all persons authorised to work with/on the machine undertake to

- observe the basic regulations on occupational safety and accident prevention,
- read and observe the "General safety instructions" chapter in this operating manual,
- read the chapter "Warning symbols and other markings on the machine" in this operating manual and to follow the safety instructions in the warning symbols when operating the machine,
- familiarise themselves with the machine,
- read the chapters in this operating manual which are important for carrying out the tasks assigned to them.

If the operator realises that a device is not in perfect working order in terms of safety, they must rectify this defect immediately. If this is not part of the operator's job or if they do not have the necessary expertise, they must report the defect to their supervisor (operating company).

Dangers when handling the machine

The machine is built according to the state of the art and the recognised safety regulations. Nevertheless, the use of the machine may result in hazards and impairments

- to the life and limb of the operator or third parties,
- to the machine itself,
- to other property.

Use the machine only

- for the intended use,
- in a technically safe condition.

Immediately eliminate any malfunctions which may impair safety.

Warranty and liability

In principle, our "General terms and conditions of sale and delivery" apply. These will be available to the operating company at the latest when the contract is concluded.

Our products are subject to strict quality control. If the RXF600 still does not work properly, we very much regret this and ask you to contact our customer service partner. We are also available by email if you would like to contact us.

Claims under the statutory warranty must be asserted as soon as you become aware of the defect within the warranty period. The warranty begins when the machine is handed over to the customer and ends after the statutory warranty period of 12 months.

During the warranty period, devices which are defective due to material and processing faults will be repaired or replaced at our discretion. Replaced devices or parts thereof will become our property. The assertion of a claim will not result in an extension to the warranty period.

Asserting warranty claims

- Keep the following documents and information to hand, as they form the basis for asserting claims under your warranty:
    - Delivery note / handover protocol (date of the start of the warranty).
    - Invoice (proof of purchase).
    - Serial number of the device.
    - Area coverage
    - Operating hours
    - Spraying agents used

- Please contact our customer service partner. The terms and conditions of our customer service partner for handling the warranty apply.
- Please do not send your device to our warehouse or to our head office.

Exclusion from the warranty

Warranty claims will lapse in the following cases:

- Improper use of the machine
- Improper maintenance of the machine
- Modification or conversion of the machine without the prior consent of the manufacturer.
- Use of non-recommended spare parts or accessories
- Disregarding the operating manual
- Wearing parts (filters, nozzles, spray valves, tyres)
- Work required due to soiling and blockages is not covered by the warranty.
- All warranty claims are void if the machine is damaged by the operator.

The warranty does not cover

- Any kind of conventional and usual wear and tear of the machine, wearing parts, such as nozzles, filters, valves; fragile parts, such as glass and lenses; pixel error tolerance up to 3 pixels; consumables, such as filters, batteries or rechargeable batteries.
- Minor deviations of the device from the target condition which have no influence on the utility value of the product;
- Operating and handling errors, damage caused by aggressive environmental influences, chemicals, cleaning agents; defects in the product caused by installation and transport.
- Achieved spraying and field results which are affected by factors such as growing conditions, soil conditions, cutting times, machine settings and agricultural practices. These factors are beyond our control and therefore cannot be the subject of warranty claims.
- Further details on the warranty are regulated in the purchase contract.

Repairs

We are happy to repair defects or damage to the device which are not (or no longer) covered by the warranty for a fee. Please contact our customer service partner for an individual offer.

Other applicable documents

- Safety data sheets for the media and substances handled;
- Operating instructions of the operating company;

- Regulations of the accident insurer of the company in which the machine is operated;
- Statutory regulations for handling herbicides in the country in which the RUMEX RXF600 is used.

2.2. Representation of safety symbols

Safety instructions are labelled with the triangular safety symbol and the above signal word. The signal word (DANGER, WARNING, CAUTION) describes the severity of the imminent danger and has the following meaning:

DANGER

indicates an immediate high-risk hazard which, if not avoided, will result in death or serious injury (loss of body parts or long-term injuries).

Failure to observe these notes may result in immediate death or serious injury.

WARNING

indicates a potential medium-risk hazard which, if not avoided, may result in death or (serious) injury.

Failure to observe these notes may result in death or serious injury.

CAUTION

indicates a low-risk hazard which, if not avoided, could result in minor or moderate injuries or damage to property.

IMPORTANT

indicates an obligation to behave or act in a particular way to ensure that the machine is handled correctly.

Failure to observe these notes may cause the machine or the surrounding area to malfunction.

NOTE

indicates application tips and particularly useful information.

These notes will help you make optimum use of all the functions on your machine.

2.3. Organisational measures

The operating company must have the plant protection certificate of competence required under the Plant Protection Act.

The certificate of competence is required by persons who

- apply herbicides or
- advise on plant protection (including biological plant protection),
- instruct or supervise others who use herbicides as part of a training programme or as an auxiliary activity,
- place herbicides on the market on a commercial basis

The operating company must provide the required personal protective equipment, e.g.:

- Safety glasses
- Protective gloves
- Safety shoes
- Overalls
- Skin protection products, etc.

The operating manual must always be kept

- at the machine's place of use!
- must be freely accessible to operators and maintenance personnel at all times!

Regularly check all existing safety devices!

2.4. Safety and protective devices

Before starting up the machine, ensure that all safety and protective devices are properly fitted and functional. Regularly check all safety and protective devices.

2.4.1. Defective safety devices

Defective or removed safety and protective devices may result in hazardous situations.

2.5. Informal safety measures

In addition to all safety instructions in this operating manual, observe the generally applicable national regulations on accident prevention and environmental protection. When travelling on public streets and roads, observe the statutory road traffic regulations.

2.6. Qualification of personnel

The machine and the associated operating manual are authorised exclusively for commercial use. The machine may be used only by employees who have been trained in its operation and instructed in the existing hazards and who have been explicitly authorised to use the machine.

This operating manual is intended for technically qualified users who are or will be specially trained to operate the machine.

By personnel we mean all persons who work on the machine. Apprentices are not personnel in this sense.

We assume that

- the operating personnel have been trained to work with this machine,
- the operating personnel have received instruction on how to work with this machine,
- the operating personnel know and follow the work instructions for working with this machine,
- the operating personnel have been instructed in the use of the required tractor,
- the operating and maintenance personnel
    - set,
    - operate,
    - check,
    - maintain

  the machine in such a way that the machine poses no danger to people, the environment or property.

This expertise is an essential prerequisite for any work with the machine. The required operating information can be found in this operating manual.

Minimum age	The minimum age for operating the machine is 16 years.
Transport	The machine, assemblies and components may be transported only by experienced specialists. The qualification required to drive a tractor (agricultural towing vehicle, etc.) must be fulfilled.
Assembly	Initial assembly may be carried out by the manufacturer only.
Disassembly	Disassembly work may be carried out by trained specialists only.
Starting up the machine for the first time	The machine may be started up for the first time only under the supervision of the manufacturer / by authorised specialist personnel.

Starting up the machine again	The machine may be started up again only under the supervision of instructed and trained or authorised specialist personnel. Authorisation is issued by the operating company.
Qualified person	Only qualified personnel may inspect, maintain and repair the machine. A qualified person is someone who is able to assess and carry out the tasks assigned to them and recognise potential hazards based on several years of specialist training, their practical knowledge and experience and their knowledge of the relevant laws, directives, standards and other regulations.
Electrical work Qualified electrician	Work on the electrical equipment may be carried out by qualified electricians only. Based on their specialist training, knowledge and experience as well as knowledge of the relevant standards and regulations, a qualified electrician is able to carry out work on electrical systems and independently recognise and avoid potential hazards. The qualified electrician is trained for the specific location in which they are working and is familiar with the relevant standards and regulations.
Alcohol, drugs, medicines	Personnel must not be under the influence of alcohol, drugs or other intoxicants. Likewise, personnel must not be under the influence of drugs which affect their ability to react.
Work instructions	Observe the local accident prevention regulations and work instructions.
Worker / operator	Person who works with or on the machine. To improve readability, only the generic masculine is used here. The term "worker" / "operator" is used here in a gender-abstract manner and does not imply any gender-specific predetermination or limitation.

Only trained and instructed persons may work with / on the machine. The operating company must clearly define the responsibilities of persons for operation, maintenance and servicing. A person undergoing training may work with / on the machine only under the supervision of an experienced person.

Persons / Activity	Person specially trained for the activity [1]	Instructed person [2]	Persons with specialised training (service centre) [3]
Loading/transport	X	X	X
Starting up the machine	--	X	--
Equipping, setting up	--	--	X
Operation	--	X	--
Maintenance	--	--	X
Troubleshooting and fault rectification	--	X	X
Disposal	X	--	--

Legend: X = allowed **--** = not allowed

1) A person who can take on a specific task and is authorised to carry it out for a suitably qualified company.
2) An instructed person is a person who has been informed about the tasks assigned to them and the potential dangers of improper behaviour and, if necessary, trained and instructed about the required protective devices and protective measures.
3) Persons with specialised training are considered specialists.
Based on their technical training and knowledge of the relevant regulations, they can assess the work assigned to them and recognise potential hazards.

Remark:

A qualification equivalent to specialised training may also have been acquired through several years of work in the relevant field.

Only a service centre may carry out maintenance and servicing work on the machine if this work is identified as "Service centre work". The personnel in a service centre have the required knowledge and suitable equipment (tools, lifting and support devices) to maintain and service the machine properly and safely.

2.7. Responsibility of the operating company

The machine is used in the commercial sector. The operating company is therefore subject to the statutory occupational safety obligations.

In addition to the safety instructions in this operating manual, observe the safety, accident prevention and environmental protection regulations applicable to the area of use of the machine.

Personnel are obliged to wear the personal protective equipment required for their work.

To guarantee safe operation, the operating company must ensure

- that the personnel have the required qualifications and receive the required training,
- that the personnel have read and understood the operating manual,
- that the personnel have read and understood the operating instructions for working with the machine,
- that the personnel have read and understood the operating instructions for handling the media and substances,
- that personnel have access to the operating manual at all times. The operating manual must be kept in the vicinity of the machine.
- that the local accident prevention regulations are implemented and observed,
- that the local environmental protection regulations are observed,
- that the operating personnel are instructed by the responsible supervisor,
- that the inspection, maintenance and servicing intervals are observed,
- that unauthorised persons are kept away from the machine,
- that the machine is operated only in a safe and functional condition,
- that damage to the machine is repaired immediately or that the damaged machine is shut down immediately.

2.8. Safety measures during normal operation

Do not operate the machine unless all safety and protective devices are fully functional. Check the machine at least once a day for externally visible damage and functionality of the safety and protective devices.

2.9. Dangers due to residual energy

Be aware of the occurrence of mechanical, hydraulic, pneumatic and electrical/electronic residual energy on the machine. Take appropriate measures when instructing the operating personnel. Detailed instructions are given again in the respective chapters of this operating manual.

2.10. Maintenance and servicing, troubleshooting

Carry out the prescribed setting, maintenance and inspection work on time. Secure all operating media such as compressed air and hydraulics to prevent the machine from starting up unintentionally. When replacing larger assemblies, attach and secure them carefully to lifting gear. Check that loosened screw connections have been tightened. Check the function of safety and protective devices after completing maintenance work.

2.11. Structural changes

You must not make any modifications, attachments or conversions to the machine without the authorisation of RUMEX GmbH. This also applies to welding on load-bearing parts. All extension or conversion measures require written authorisation from RUMEX GmbH. Only use the conversion and accessory parts approved by RUMEX GmbH so that, for example, the operating licence remains valid in accordance with national and international regulations. Vehicles with an official operating licence or devices and equipment connected to a vehicle with a valid operating licence or approval for road traffic in accordance with road traffic regulations must be in the condition specified by the licence or approval.

WARNING

Risk of crushing, cuts, becoming caught, being pulled in and struck due to breakage of load-bearing parts.

The following is strictly prohibited

- drilling on the frame or chassis,
- drilling open existing holes in the frame or chassis,
- welding on load-bearing parts.

2.12. Spare parts, wearing parts and auxiliary materials

Immediately replace any machine parts which are not in perfect condition. Use only original RUMEX spare parts and wearing parts or parts approved by RUMEX GmbH to ensure that the operating licence remains valid in accordance with national and international regulations. When using spare parts and wearing parts from third-party manufacturers, there is no guarantee that they have been designed and manufactured to withstand the stresses and strains and are safe. RUMEX GmbH accepts no liability for damage resulting from the use of non-approved spare parts, wearing parts or auxiliary materials.

2.13. Cleaning and disposal

Properly handle and dispose of substances and materials used, in particular

- when working on lubrication systems and equipment and
- when cleaning with solvents,
- when disposing of herbicides.

2.14. Operator's workstation

Only one person may operate the machine from the driver's seat of the tractor. The working area of this person changes only for folding and unfolding the spray bars and cameras and is in front of the machine in these cases.

2.15. Warning symbols and other labels on the machine

Always keep all warning symbols on the machine clean and clearly legible! Replace illegible warning symbols.

Request the warning symbols from the manufacturer using the order number.

Warning symbol - design

Warning symbols identify danger areas on the machine and warn of residual dangers. These danger areas are permanently exposed to current or unexpected hazards.

A warning symbol consists of 2 fields:

Field 1

Field 2

Field 1

shows the pictorial description of the hazard, possibly surrounded by a triangular warning symbol.

Field 2

shows the pictorial instruction to avoid danger. Prohibition or command

Warning symbols - Explanation

The **Explanation** column provides a description of the adjacent warning symbol. The description of the warning symbols is always the same and is given in the following order:

1. Description of the hazard.

   For example: Hazard due to cutting or severing!

2. The consequences of disregarding the instruction(s) on hazard avoidance. For example: Causes serious injuries to fingers or hand.

3. The instruction(s) for hazard avoidance.

   For example: Do not touch machine parts until they have come to a complete standstill.

Safety labels have the following colour coding:

- Warning signs (triangular or square and yellow) warn people of a risk or danger.
- Prohibition signs (circular or square and red border with crossbar) prohibit behaviour which creates a hazard.
- Mandatory signs (circular or square and blue) require certain behaviour.
- First aid signs (rectangular, green with white symbol) indicate first aid facilities.
- Hazardous substance signs (diamond-shaped white with a red border) warn of dangers from hazardous substances.

Explanation **Warning symbol**

Risk of fingers or hands being crushed by moving, accessible machine parts!

This hazard causes extremely serious injuries with loss of fingers or hand.

Never reach into the danger area while the tractor engine is running and the universal shaft / hydraulic system connected.

Risk of torso being crushed in the articulated area of the drawbar due to sudden steering movements!

This hazard will cause severe injuries to the torso and even death.

It is prohibited for persons to remain in the danger zone between the tractor and the machine as long as the tractor engine is running and the tractor is not secured against unintentional rolling.

Risk of persons falling off steps and platforms when riding on the machine!

This hazard will cause severe injuries to the entire body and even death.

It is prohibited for persons to ride on the machine and/or climb onto running machines. This prohibition also applies to machines with steps or platforms. Ensure that nobody is riding on the machine.

Risk of entire body being crushed due to machine parts swivelling down from above!

This hazard will cause severe injuries to the entire body and even death.

It is prohibited for persons to remain in the swivelling range of moving machine parts.

Before swivelling machine parts down, instruct persons to leave the swivelling range of moving machine parts.

Risk of poisoning from toxic vapours in the spray liquid tank!

This hazard will cause severe injuries and even death.

Never climb into the spray liquid tank.

Danger!
Risk of entire body being crushed in the danger zone under suspended loads / machine parts!

This hazard will cause severe injuries to the entire body and even death.

It is prohibited for persons to stand under suspended loads / machine parts.

Keep a sufficient safety distance from suspended loads / machine parts.

Ensure that persons maintain a sufficient safety distance from suspended loads / machine parts.

Instruct persons to leave the danger zone of suspended loads / machine parts

Risk of crushing due to unintentional rolling of the uncoupled, unsecured machine!

This hazard will cause severe injuries to the entire body and even death.

Before uncoupling the machine from the tractor, secure the machine against unintentional rolling. To do this, use the parking brake and/or the wheel chock(s).

Before starting up the machine, read and observe the operating instructions and safety instructions!

Risk of infection for the entire body due to fluid escaping under high pressure (hydraulic oil)!

This hazard will cause extremely serious injuries to the entire body if hydraulic fluid, escaping under high pressure, penetrates the skin and enters the body.

Never attempt to seal leaking hydraulic hose lines with your hand or fingers.

Before carrying out maintenance and servicing work, read and observe the information in the operating manual.

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

Risk of the machine starting and rolling unintentionally when carrying out work on the machine, e.g. assembly, setting, elimination of malfunctions, cleaning, maintenance and servicing.

This hazard will cause severe injuries to the entire body and even death.

Before carrying out any work on the machine, secure the tractor and machine against unintentional starting and unintentional rolling.

Depending on the work, read and observe the notes in the corresponding chapters of the operating manual.

Risk of poisoning from toxic fluids!

This hazard will cause severe injuries and even death!

Never use the contents of the tank as drinking water.

Danger due to rotating parts, e.g. PTO shaft

This hazard will cause severe injuries to the entire body and even death.

Do not touch the PTO shaft during operation. The universal shaft must not be connected or disconnected unless the PTO shaft has been switched off. Items of clothing may become caught in the running universal shaft.

Depending on the work, read and observe the notes in the corresponding chapters of the operating manual.

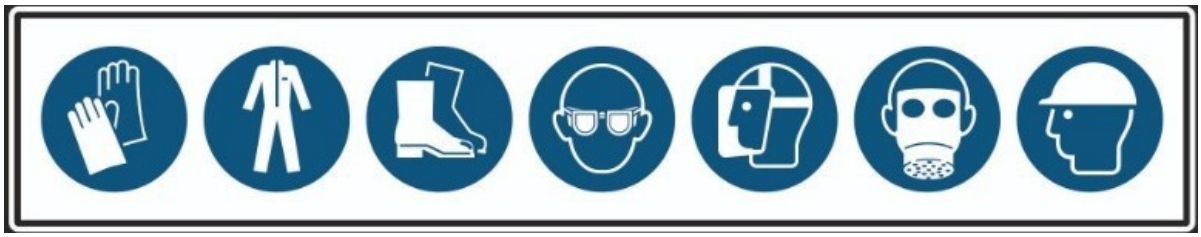
Nominal speed (**maximum 550 rpm**) and direction of rotation of the machine-side drive shaft

The CE marking on the machine indicates compliance with the provisions of the applicable EU directives.

CE

Protective clothing

When handling herbicides, always wear personal protective clothing!



2.15.1. Positioning of warning symbols and other labels

Warning symbols

The following figures show the arrangement of the warning symbols on the machine (see arrow).

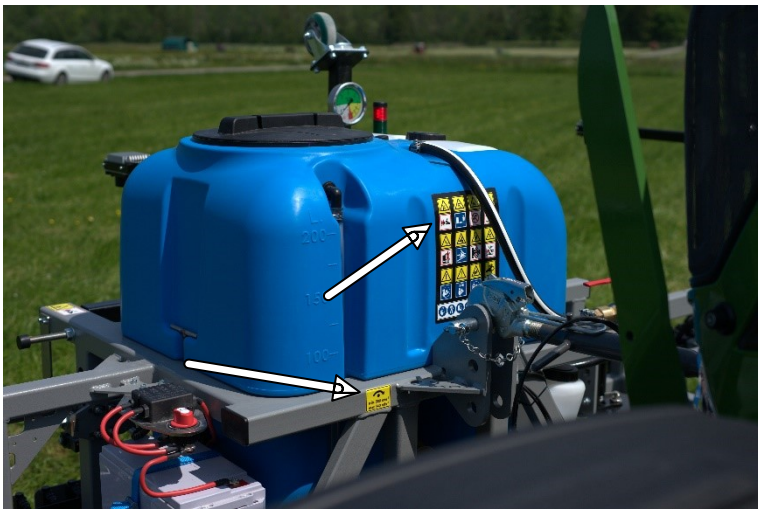


Fig 1

Fig 2

2.16. Dangers if the safety instructions are not observed

Non-observance of the safety instructions

- may endanger persons, the environment and the machine,
- may result in the loss of any claims for damages.

In particular, failure to observe the safety instructions may result, for example, in the following hazards:

- Danger to persons due to unsecured work areas.
- Failure of important machine functions.
- Failure of prescribed methods for maintenance and servicing.
- Danger to persons due to mechanical and chemical effects.
- Danger to the environment due to leakage of herbicides or hydraulic fluid.

2.17. Safety-conscious working

In addition to the safety instructions in this operating manual, the national, generally applicable health and safety and accident prevention regulations are binding.

To avoid danger, follow the instructions on the warning symbols.

When travelling on public streets and roads, observe the relevant statutory road traffic regulations.

Observe the safety instructions listed in this operating manual, the existing national regulations for accident prevention and any internal work, operating and safety regulations of the operating company. Both for the European Community and for other countries, the operating company must determine the current status of the applicable laws and regulations and ensure compliance with them.

- When handling the machine, always be attentive and careful. If you are tired or have consumed alcohol or drugs or taken certain medication, you must not operate the machine. Even a momentary loss of concentration during operation may result in hazardous situations or environmental hazards.
- Do not work on this machine unless you have the appropriate qualifications and have been instructed in the use of the machine and the tractor required to operate it.
- Safety and protective devices must not be bypassed, removed without authorisation or rendered ineffective.
- If faults occur, never switch any machine functions by actuating existing end switches, limit switches and actuators (e.g. valves).
- Observe not only the general safety instructions listed under this main point Safety information, but also the special safety instructions included under the other main points. The machine must not be operated without precise knowledge of the instructions in this operating manual and full compliance with all safety instructions.

2.18. Safety instructions for the operator

WARNING

Risk of crushing, cuts, becoming caught, being pulled in and struck due to lack of roadworthiness and operational safety!

Before starting up the machine, always check the machine and the tractor for roadworthiness and operational safety!

2.18.1. General safety and accident prevention instructions

- In addition to these instructions, please also observe the generally applicable national safety and accident prevention regulations!
- The warning symbols and other labels attached to the machine provide important instructions for the safe operation of the machine. Follow these instructions for your safety!
- Before starting up and putting the machine into operation, check the vicinity of the machine (children)! Ensure adequate visibility!
- Riding on the machine and using it for transport is prohibited!
- Adjust your driving style so that you can control the tractor safely at all times with the machine attached or detached. Take into account your personal abilities, the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the effects of the attached or hitched machine.

Coupling and uncoupling the machine

- Couple and transport the machine only with tractors which are suitable for this purpose.
- When coupling machines to the tractor three-point hydraulic system, the attachment categories of the tractor and machine must always match!
- Couple the machine to the prescribed devices according to the instructions!
- When coupling machines to the front and/or rear of a tractor, do not exceed
    - the permissible gross tractor weight
    - the permissible tractor axle loads
    - the permissible load capacities of the tractor tyres
- Before coupling or uncoupling the machine, secure the tractor and the machine against unintentional rolling!
- It is prohibited for persons to stand between the machine to be coupled and the tractor while the tractor is approaching the machine! Helpers present may act only as guides next to the vehicles and step between the vehicles only when they are stationary.

- Before attaching the machine to the tractor three-point hydraulic system or removing it from the tractor three-point hydraulic system, secure the operating lever of the tractor hydraulics in the position in which unintentional lifting or lowering is impossible.
- When coupling and uncoupling machines, bring the support devices (if provided) into the respective position (stability)!
- When operating support devices, there is a risk of injury from crushing and shearing points!
- Be particularly careful when coupling and uncoupling machines to and from the tractor! There are crushing and shearing points between the tractor and the machine in the area of the coupling point!
- It is prohibited for persons to stand between the tractor and the machine when operating the three-point hydraulic system!
- Coupled supply lines
    - must yield easily to all movements when cornering without tension, kinking or friction,
    - must not rub against foreign objects.
- Release cables for quick connectors must hang loosely and must not become detached in the low position!
- Always park uncoupled machines in a stable position!

Using the machine

- Before starting work, familiarise yourself with all the equipment and operating elements of the machine and their functions. It is too late to do this while the machine is in operation!
- Wear tight-fitting clothing! Loosely worn clothing increases the risk of being caught or entangled on drive shafts or moving machine components!
- Do not operate the machine until all protective devices have been fitted and are in the protective position!
- Observe the maximum payload of the mounted / hitched machine and the permissible axle and drawbar loads of the tractor! If required, drive only with a partially filled hopper.
- It is prohibited for persons to remain in the working area of the machine!
- It is prohibited for persons to remain in the turning and swivelling range of the machine!
- There are crushing and shearing points on power-operated machine parts (e.g. hydraulic)!
- You must not operate power-operated machine parts until persons have maintained a sufficient safety distance from the machine!
- Before leaving the tractor, secure it against unintentional starting and unintentional rolling. To do this

- lower the machine to the ground
- apply the parking brake
- switch off the tractor engine
- remove the ignition key

Transporting the machine

- When using public roads, observe the relevant national road traffic regulations!
- Before transporting the machine, check
  - that the supply lines are properly connected
  - the lighting system for damage, function and cleanliness
  - the brake and hydraulic system for visible defects
  - whether the parking brake has been fully released
  - the function of the brake system
- Ensure that the tractor always has sufficient steering and braking capacity! Machines and front or rear weights attached or hitched to a tractor influence the driving behaviour as well as the steering and braking capacity of the tractor.
- The tractor front axle must always be loaded with at least 20% of the net weight of the tractor to ensure sufficient steering capacity.
- Ensure that the tractor always has sufficient steering and braking capacity! Observe the maximum payload of the mounted / hitched machine and the permissible axle and drawbar loads of the tractor!
- The tractor must ensure the prescribed braking deceleration for the loaded train (tractor plus attached / hitched machine)!
- Check the braking effect before setting off!
- When cornering with a mounted or hitched machine, take into account the wide overhang and the centrifugal mass of the machine!
- Before transporting the machine, ensure that the tractor lower links are sufficiently locked laterally when the machine is attached to the tractor's three-point hydraulic system or lower links!
- Before transporting the machine, bring all swivelling machine parts into the transport position!
- Before transporting the machine, secure swivelling machine parts in the transport position against dangerous changes in position. Use the transport safety devices provided for this purpose!
- Before transporting the machine, lock the operating lever of the three-point hydraulic system to prevent the attached or hitched machine from being raised or lowered unintentionally!
- Before transporting the machine, check that the required transport equipment has been correctly mounted on the machine, e.g. lighting, warning devices and protective devices!

- Before transporting the machine, carry out a visual check to ensure that the upper and lower link pins are secured with the lynch pin to prevent them from working loose.
- Adjust your driving speed to the prevailing conditions!
- Before driving downhill, change down to a lower gear!
- Before transporting the machine, always switch off the single wheel braking system (lock pedals)!

2.18.2. Hydraulic system

- The hydraulic system is under high pressure!
- Ensure that the hydraulic hose lines are connected correctly!
- When connecting the hydraulic hose lines, ensure that the hydraulic system has been depressurised on both the tractor and the machine side!
- It is prohibited to block controls on the tractor which are used to directly execute hydraulic or electrical movements of components, e.g. folding, swivelling and sliding operations. When you release the corresponding control, the respective movement must stop automatically. This does not apply to movements of equipment which
    - is continuously or
    - automatically controlled or
    - requires a floating or pressurised position for functional reasons
- Before working on the hydraulic system
    - set down the machine
    - depressurise the hydraulic system
    - switch off the tractor engine
    - apply the parking brake
    - remove the ignition key
- Have hydraulic hose lines checked at least once a year by an expert to ensure that they are in a safe working condition!
- Replace hydraulic hose lines if they are damaged or ageing! Use only original RUMEX hydraulic hose lines!
- The period of use of the hydraulic hose lines should not exceed six years, including a possible storage period of a maximum of two years. Even with proper storage and permissible stress and strain, hoses and hose connections are subject to natural ageing which limits their storage time and period of use. Notwithstanding this, the period of use may be determined in accordance with experience, in particular taking into account the hazard potential. Other guide values may apply to hoses and hose lines made of thermoplastics.

- Never attempt to seal leaking hydraulic hose lines with your hand or fingers. Fluid (hydraulic fluid) escaping under high pressure may penetrate the skin and cause serious injuries!
- If you are injured by hydraulic fluid, consult a doctor immediately! Risk of infection.
- When searching for leaks, use suitable tools to prevent the risk of serious infection

2.18.3. Electrical system

- When working on the electrical system, always disconnect the battery (negative terminal)!
- Only use the specified fuses. The electrical system will be destroyed if higher rating fuses are used – fire hazard.
- Ensure that the battery is connected correctly - connect the positive terminal first and then the negative terminal! When disconnecting the battery, first disconnect the negative terminal and then the positive terminal!
- Always put the cap provided on the positive terminal of the battery. There is a risk of explosion in the event of an earth fault!
- Risk of explosion Avoid sparks and naked flames in the vicinity of the battery!
- The machine can be equipped with electronic components and parts whose function can be influenced by electromagnetic emissions from other devices. These influences may endanger persons if the following safety instructions are not followed.
    - If electrical devices and/or components are retrofitted to the machine and connected to the vehicle electrical system, it is the user's responsibility to check whether the installation will cause interference with the vehicle electronics or other components.
    - Ensure that the retrofitted electrical and electronic components comply with the current version of the EMC Directive 89/336/EEC and bear the CE mark.

2.18.4. PTO shaft operation

- Use only the universal shafts specified by RUMEX GmbH and equipped with the prescribed protective devices!
- Please also observe the operating manual of the universal shaft manufacturer!
- The protective tube and protective funnel of the universal shaft must be undamaged and the protective shield of the tractor and machine PTO shaft must be fitted and in proper working order!
- It is prohibited to work with damaged protective devices!
- You may only connect and disconnect the universal shaft when
    - the PTO shaft is switched off
    - the tractor engine is switched off
    - the parking brake is applied
    - the ignition key has been removed
- Always ensure that the universal shaft has been correctly installed and secured!
- When using wide-angle universal shafts, attach the wide-angle joint always to the pivot point between the tractor and the machine!
- Prevent the universal shaft guard from moving by securing it with the chain(s)!
- Pay attention to the prescribed tube overlaps in the transport and working position for universal shafts! (Observe the operating manual of the universal shaft manufacturer!)
- Before switching on the PTO shaft, check whether the selected PTO shaft speed of the tractor matches the permissible drive speed of the machine.
- Before switching on the PTO shaft, instruct persons to leave the danger zone of the machine.
- When working with the PTO shaft, there must be nobody in the area of the rotating PTO shaft or universal shaft.

- Never switch on the PTO shaft when the tractor engine is switched off!
- Always switch off the PTO shaft if the angles are too large or if the PTO shaft is not required!
- WARNING! When the PTO shaft is switched off, there is a risk of injury from the overrunning flywheel mass of rotating machine parts! Do not get too close to the machine during this time! Do not work on the machine until all machine parts have come to a complete standstill!
- Before cleaning, lubricating or adjusting PTO-driven machines or universal shafts, secure the tractor and machine against unintentional starting and rolling.
- Place the uncoupled universal shaft on the holder provided!
- After removing the universal shaft, place the protective cover on the PTO shaft stub!

- When using the forward/reverse PTO shaft, please note that the PTO shaft speed depends on the driving speed and that the direction of rotation is reversed when reversing!

2.18.5. Hitched machines

- Observe the permissible combination options for the hitch on the tractor and the towing device on the machine! Couple only permissible combinations of vehicles (tractor and hitched machine).
- For single-axle machines, observe the maximum permissible drawbar load of the tractor on the hitch!
- Ensure that the tractor always has sufficient steering and braking capacity! Machines attached or hitched to a tractor influence the driving behaviour as well as the steering and braking capacity of the tractor, especially single-axle machines with drawbar load on the tractor!

2.18.6. Tyres

- Repair work on the tyres and wheels may be carried out only by qualified personnel using suitable assembly tools!
- Regularly check the air pressure! 4.8 bar working pressure.
- Observe the prescribed air pressure! There is a risk of explosion if the tyre pressure is too high!
- Before carrying out any work on tyres, park the machine safely and secure it against unintentional lowering and rolling (parking brake, wheel chocks)!
- You must tighten or retighten all fastening screws and nuts in accordance with the RUMEX GmbH specifications!

2.18.7. Field sprayer operation

- Follow the recommendations of the herbicide manufacturers with regard to
    - Protective clothing
    - Warnings on handling herbicides
    - Dosing, application and cleaning instructions
- Follow the instructions in the Plant Protection Act!
- Never open pressurised lines!
- You may use only original RUMEX replacement hoses which can withstand the chemical, mechanical and thermal stresses. Always use V2A hose clamps when installing hoses!
- Repair work in the spray liquid tank may be carried out only after it has been thoroughly cleaned and a respirator mask must be worn. For safety reasons, a second person must monitor the work from outside the spray liquid tank!

- When filling the spray liquid tank, do not exceed the nominal volume!
- Do not mix different spraying agents
- Never use spraying agents or additives which tend to stick or harden. (Wetting agent, etc.)

WARNING

- When handling herbicides, wear the correct protective clothing, e.g. chemical-resistant gloves, overalls, safety glasses, etc.!
- When handling herbicides, wear a breathing mask with activated carbon filters
- If cab tractors feature ventilation fans, replace filters for fresh air supply with activated carbon filters!
- Observe the information on the compatibility between herbicides and materials of the field sprayer!
- Do not spray any herbicides which tend to stick or solidify!
- To protect people, animals and the environment, do not fill field sprayers with water from open bodies of water!
- Fill field sprayers
    - only in free fall via the water line!
    - only via original RUMEX filling devices!

2.18.8. Cleaning, maintenance and servicing

- Before cleaning, maintaining or repairing the machine,
    - switch off the drive
    - stop the tractor engine
    - the ignition key has been removed
    - disconnect the machine plug from the on-board computer
- Regularly check that the nuts and bolts are tight and retighten them if required!
- Before cleaning, maintaining or servicing the machine, secure the raised machine or raised machine parts against unintentional lowering!
- When replacing working tools with cutting edges, use suitable tools and gloves!
- Properly dispose of oil, grease, filters and herbicides!
- Before carrying out electrical welding work on the tractor and attached machines, disconnect the cable from the tractor's generator and battery!
- Spare parts must fulfil at least the specified technical requirements of RUMEX GmbH! This is the case when using original RUMEX spare parts!

3. Loading and unloading

Loading and unloading with tractor

WARNING

There is a risk of accident if the tractor is not suitable and the machine is full!

Before loading the machine onto a transport vehicle or unloading it from a transport vehicle, couple the machine to the tractor in accordance with the regulations!

You may couple and transport the machine for unloading and loading only with a tractor which fulfils the power requirements!

4. Product description

This chapter

- provides a comprehensive overview of the design of the machine.
- provides the names of the individual assemblies and controls.

If possible, read this chapter directly on the machine. This is the best way to familiarise yourself with the machine.

The machine consists of the main assemblies:

- Main frame
- Left and right side frames
- Tyres (four)
- Running gear (four)
- Pressure armature
- Power unit
- Spray bar
- Operating terminal (tablet/smartphone)
- Cameras (three)
- Switching valves
- Spray liquid tank
- Fresh water tank
- Manual cleaning tank
- Radio remote control

4.1. Overview – Assemblies

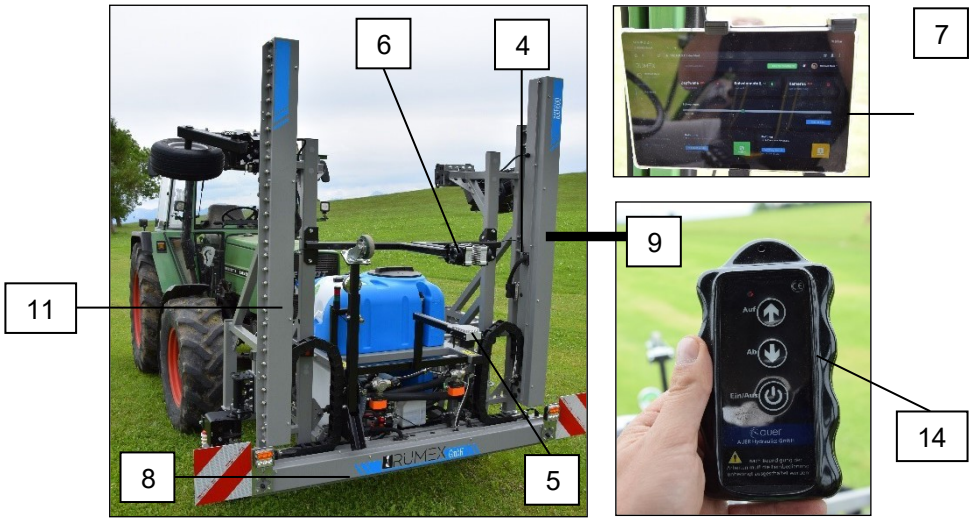


Fig 3

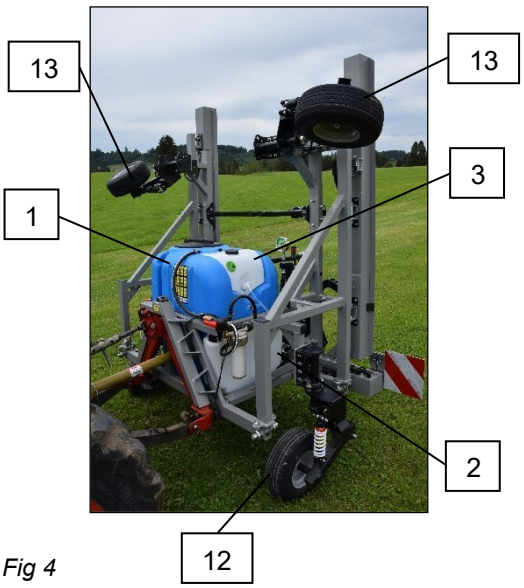


Fig 4

(1) Spray liquid tank
(2) Fresh water tank
(3) Hand wash tank
(4) Camera 1 (left)
(5) Camera 2 (centre)
(6) Camera 3 (right)
(7) Operating terminal
(8) Support wheel
(9) Side arm/spray bar (left)
(10) Spray bar centre
(11) Side arm/spray bar (right)
(12) Main frame wheels
(13) Side arm wheels
(14) Radio remote control

4.2. Liquid flow

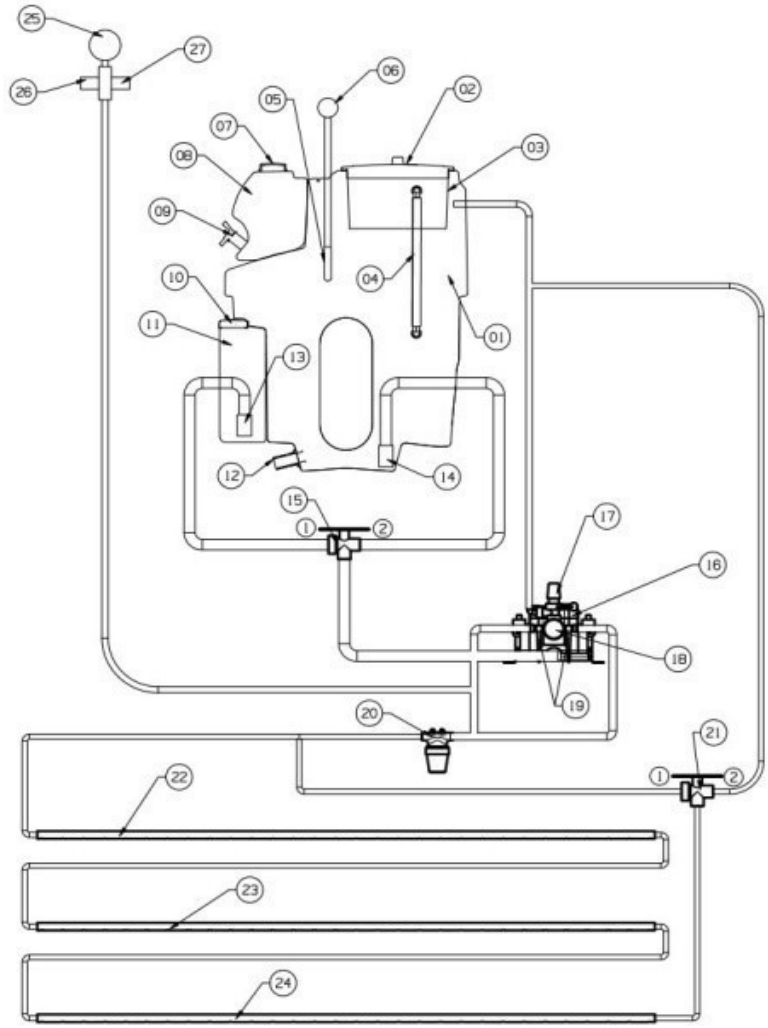


Fig 5

(1) Spray liquid tank

(2) Spray liquid tank cover

(3) Spray liquid tank filling sieve

(4) Spray liquid tank level indicator

(5) Spray liquid tank nozzle internal cleaning

(6) Spray liquid tank nozzle water connection internal cleaning

(7) Hand wash tank cover

(8) Hand wash tank

(9) Hand wash tank outlet

(10) Fresh water tank cover

(11) Fresh water tank

(12) Spray liquid tank outlet

(13) Fresh water tank suction filter

(14) Spray liquid tank suction filter

(15) Spray liquid/fresh water changeover valve

(16) Diaphragm pump

(17) Pressure regulator

(18) Pressure display

(19) 2x outlet taps

(20) Pressure filter

(21) Changeover valve

(22) Spray bar 1

(23) Spray bar 2

(24) Spray bar 3

(25) Pressure display

4.3. Overview – Supply line between tractor and machine

- Electric cable for lighting

Fig 6

4.4. Safety and protective devices

- Universal shaft guard

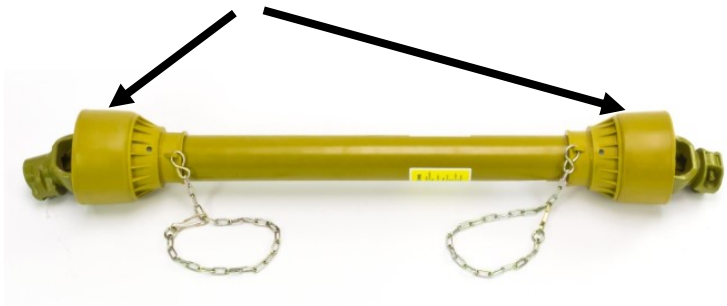


Fig 7

4.5. Transport equipment

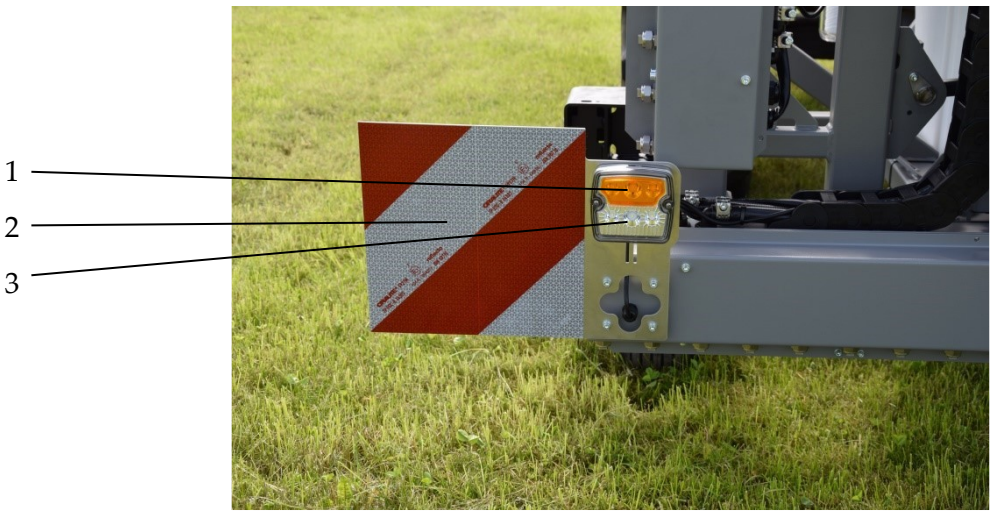


Fig 8

1. 2 direction indicators (required if the tractor direction indicator is covered)
2. 2 warning signs (square)
3. 2 front lights

4.6. Intended use

The field sprayer

- corresponds to the state of the art and ensures biological success when the device is correctly set and the correct dosage is used, while achieving an economical use of spraying agents and a low environmental impact,
- is intended exclusively for agricultural use for the treatment of individual dock plants

Intended use also includes:

- observing all instructions in this operating manual,
- compliance with the inspection and maintenance work,
- the exclusive use of original RUMEX spare parts.

Uses other than those listed above are prohibited and are considered improper. For damage resulting from improper use

- the operating company bears sole responsibility,
- RUMEX GmbH accepts no liability whatsoever

4.7. Effects of the use of certain herbicides

At the time the field sprayer was manufactured, the manufacturer had only collected empirical values for the following herbicides.

- "RANGER" from Dow AgroSciences GmbH
- SIMPLEXTM Herbicide from Dow AgroSciences GmbH
- HARMONY ® SX ® from Cheminova Deutschland GmbH & Co. KG

Other comparable herbicides can also be used if required. However, the manufacturer only has experience with the herbicides mentioned.

The effects of other herbicides cannot be assessed.

If herbicides other than those mentioned above are used, no guarantee can be given for their applicability, compatibility with the machine and the availability of the machine.

Immediate cleaning after each use is always required.

In particular, warnings are issued against unauthorised mixtures of 2 or more different herbicides.

Do not spread substances which tend to stick or solidify.

Do not store any mixed spray liquid in the machine. The herbicide may flocculate and clog the nozzles or damage the sealing elements.

4.8. Danger zone and danger areas

The danger zone is the area around the machine in which people can be reached

- by work-related movements of the machine and its working tools
- by materials or foreign objects ejected from the machine
- by unintentionally lowering or raised working tools
- by the tractor and machine rolling unintentionally

The danger zone of the machine contains danger areas in which hazards are permanently present or may occur unexpectedly. Warning symbols identify these danger areas and warn of residual dangers which cannot be eliminated by design. The special safety regulations in the relevant chapters apply here.

There must be no persons in the danger zone of the machine,

- as long as the tractor engine is running with the universal shaft connected,
- as long as the tractor and machine are not secured against unintentional starting and unintentional rolling.

The operator may only move the machine or transfer or drive working tools from the transport position to the working position and from the working position to the transport position if there are no persons in the danger zone of the machine.

Danger areas exist:

- between the tractor and the field sprayer, especially when coupling and uncoupling.
- in the area of moving components,
- on the moving machine,
- in the swivelling range of the spray boom,
- in the spray liquid tank due to toxic vapours,
- under raised, unsecured machines or machine parts.
- when unfolding and folding the spray bar in the area of overhead lines due to contact with overhead lines

4.9. Rating plate and CE marking

The following figure shows the arrangement of the rating plate and the CE marking.

The rating plate and CE marking are located on the right side of the main frame.

The rating plate indicates:

- Machine identification no:
- Type
- Permissible system pressure bar
- Year of construction
- Manufacturer
- Net weight kg

Fig 9

4.10. Conformity

EG-Konformitätserklärung

nach

Anhang II der EG-Maschinenrichtlinie 2006/42/EG

Die

RUMEX GmbH
Gewerbepark 25
D-87675 Rettenbach a.A.

erklärt, dass die Maschine

Kennzeichnung:	**RUMEX RXF 600**
Typ:	**Anbauspritze zur Einzelbekämpfung von Ampfer**
Grenzen der Maschine:	**Aufnahmepunkte für Frontkraftheber, Zapfwelle für Gelenkwelle**
Typ:	**T05**

in ihrer Konzeption und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den grundlegenden Sicherheits- und Gesundheitsanforderungen der genannten EG-Richtlinie entspricht. Bei einer mit uns nicht abgestimmten Änderung der Maschine verliert diese Erklärung ihre Gültigkeit.

Folgende im Sinne der EG- Maschinenrichtlinie harmonisierte Normen wurden angewandt:

- DIN EN ISO 16122-1:2018-09
  Land- und Forstmaschinen - Kontrolle von in Gebrauch befindlichen Pflanzenschutzgeräten - Teil 1: Allgemeines (ISO 16122-1:2015)
- DIN EN ISO 12100: 2011-03
  Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze - Risikobeurteilung und Risikominderung (ISO 12100:2010);

Weiterhin wurden folgende Richtlinien und nationale Normen und technischen Spezifikationen angewandt:

- Richtlinie zur Änderung der Richtlinie 2006/42/EG betreffend Maschinen zur Ausbringung von Pestiziden 2009/127/EG
- DIN EN 50082-2, (VDE 0839-82-2): Elektromagnetische Verträglichkeit (EMV) Störfestigkeit

Dokumentationsverantwortlicher: RUMEX GmbH, Böhmerwaldstraße 6, D-87616 Marktoberdorf

Rettenbach, den 01.01.2023
Ort, Datum

Thomas Ullrich Michael Thier CEO RUMEX

4.11. Technical data

Basic weight	kg	750
Total depth	cm	155
Total width when folded up	cm	270
Total height	cm	266
Working width	cm	600
Tank • Main tank • Rinsing water tank • Hand wash tank	l	 200 30 5
Tyres load-bearing capacity per tyre at 4.8 bar	kg	450

4.11.1. Control unit

Maximum pressure	bar	7
Working pressure	bar	5
Pressure adjustment		manual
Pressure setting range	bar	0 - 25
Pressure gauge 0-8 / 25 bar ø 100 mm, spread		X
Pressure filter mesh size	µm	10
Residual quantity	l	1

4.11.2. Spraying performance

Working width	cm	600
Number of boom sections		3
Number of nozzles per boom section		30
Residual quantity including fitting and hose assembly	l	1

4.11.3. Pump equipment

Pump type		Comet BP60K
Delivery rate at 540 rpm	l/min	Max. 60
Power requirement	kW	see operating manual for the pump
Weight	kg	see operating manual for the pump
Residual quantity: Pump equipment including suction and pressure hoses	l	1.5

4.12. Required tractor equipment

To operate the machine as intended, the tractor must fulfil the following requirements:

- Tractor engine power: min. 44 kW
- Electrics: Battery voltage 12 V (volts)
- Device holder: Front power lift with min. 10,000 N lifting force
- Device drive: Front PTO shaft

5. Structure and function

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

5.1. Universal shaft

The universal shaft transmits the power between the tractor and the machine.

WARNING

Risk of crushing due to unintentional starting and unintentional rolling of the tractor and machine!

Do not couple or uncouple the universal shaft from the tractor unless the tractor and machine have been secured against unintentional starting and rolling.

WARNING

Danger of being caught and entangled by an unsecured universal shaft or damaged protective devices!

- Never use the universal shaft without a protective device or with a damaged protective device or without using the retaining chain correctly.
- Before each use, check that all protective devices on the universal shaft have been mounted and are functional.
- Attach the retaining chains (not required for universal shafts with full protection) in such a way that a sufficient swivelling range is guaranteed in all operating positions. Retaining chains must not get caught on components of the tractor or the machine
- Have damaged or missing parts of the universal shaft replaced immediately with original parts from the universal shaft manufacturer.
- Please note that only a service centre may repair a universal shaft.

WARNING

Parts of the universal shaft in the power transmission area between the tractor and the driven machine!

These hazards will cause severe injuries and even death.

Work only with a fully protected drive between the tractor and the driven machine.

- The unprotected parts of the universal shaft must always be protected by a protective shield on the tractor and a protective funnel on the machine.
- Check that the protective shield on the tractor or the protective funnel on the machine and the safety and protective devices on the extended universal shaft overlap by at least 50 mm. If not, do not drive the machine via the universal shaft.

- Use only the supplied universal shaft or the supplied type of universal shaft.
- Read and observe the operating manual for the universal shaft. Proper use and maintenance of the universal shaft will prevent serious accidents.
- When coupling the universal shaft, observe the operating manual of the universal shaft manufacturer.
- Ensure that there is sufficient clearance in the swivelling range of the universal shaft. A lack of clearance will damage the universal shaft.
- Observe the permissible drive speed of the machine.
- If the universal shaft has an overload or overrunning clutch, always install the overload or overrunning clutch on the machine side.
- Observe the correct installation position of the universal shaft. The tractor symbol on the protective tube of the universal shaft indicates the tractor-side connection of the universal shaft.
- Before switching on the PTO shaft, observe the safety instructions for PTO shaft operation in the chapter "Safety instructions for the operator".

5.1.1. Coupling the universal shaft

- Clean and grease the PTO shaft on the tractor and the input shaft on the machine.
- Couple the tractor to the machine.
- Secure the tractor against unintentional starting and unintentional rolling.
- Check that the PTO shaft is switched off.
- Couple the universal shaft to the tractor's PTO shaft. When coupling the universal shaft, follow the instructions of the universal shaft manufacturer and observe the permissible drive speed of the machine.
- The tractor symbol on the protective tube of the universal shaft indicates the tractor-side connection of the universal shaft.
- Prevent the universal shaft guard from rotating by securing it with the retaining chain(s).
- Attach the retaining chain(s) as perpendicular as possible to the universal shaft.
- Attach the retaining chain(s) in such a way that a sufficient swivelling range of the universal shaft is guaranteed in all operating conditions. Retaining chains must not get caught on components of the tractor or the machine.

5.1.2. Uncoupling the universal shaft

CAUTION

Danger of burns from hot universal shaft components!

This hazard causes minor to serious injuries to the hands.

Do not touch any universal shaft components which have become very hot (especially couplings).

Place the uncoupled universal shaft in the holder provided. This protects the universal shaft from damage and soiling.

Never use the retaining chain of the universal shaft to suspend the uncoupled universal shaft.

Clean and lubricate the universal shaft before prolonged downtime.

- Switch off the PTO shaft.
- Place the machine on the ground.
- Secure the tractor and machine against unintentional starting and unintentional rolling.
- Pull the universal shaft off the tractor's PTO shaft

5.2. Controls

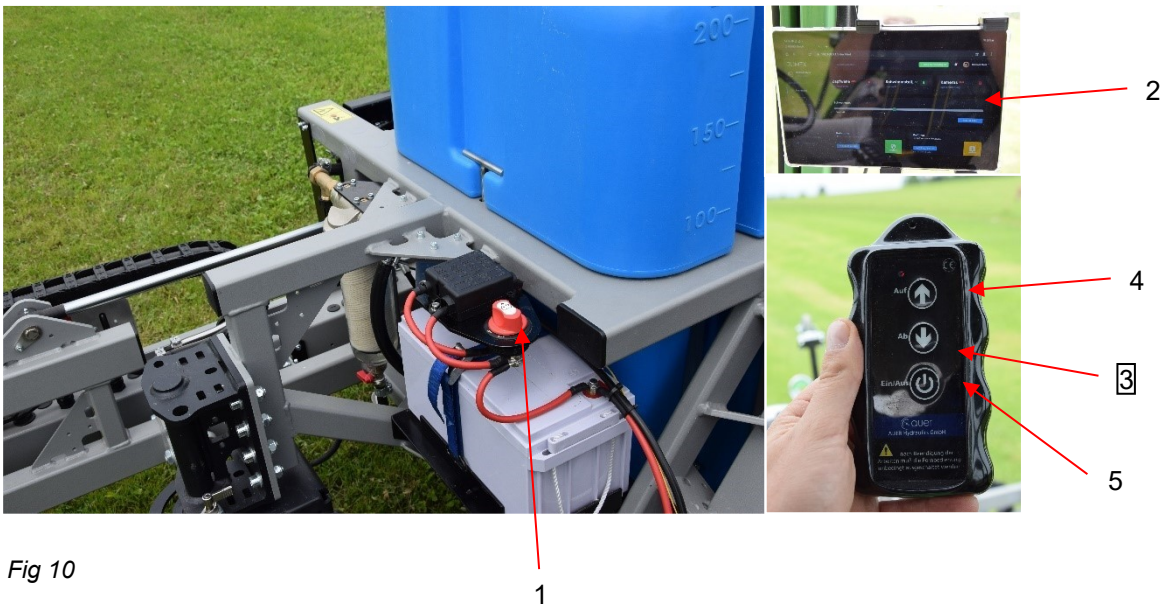


Fig 10

Main switch

(1) Operating terminal

(2) Radio remote control unfold machine

(3) Radio remote control fold up machine

(4) Radio remote control switch on/off

5.3. Pump equipment

The piston diaphragm pump has a flow rate of 58 l/min at 20 bar.

According to current knowledge, these pumps are suitable for applying commercially available herbicides.

For more detailed information and technical data, please refer to the supplied operating manual for the pump.

5.4. Three-point linkage

The machine is mounted on the front power lift.

Fig 11

5.5. Support foot

- Support foot raised during operation (Fig. 12)
- Support foot lowered (Fig. 13)

Raising the support foot:

1. Release the safety cotter pin on the locking bolt and pull the locking bolt.
2. Fold the support foot upwards into the holder provided.
3. Insert the locking bolt into the upper hole to secure the support foot in the folded-up position.
4. Secure the locking bolt with a safety cotter pin.

Fig 12

Lowering the support foot:

1. Release lynch pin and pull the bolt.
2. Fold down the support foot, then insert the locking bolt into the lower hole and secure with a safety cotter pin.

Fig 13

5.6. Filter equipment

Only perfect filtration of the spray liquid and continuous cleaning of the spraying system will guarantee trouble-free operation of the herbicide sprayer - especially the nozzles - and will therefore have a significant influence on the success of the treatment. Therefore, use all filters provided and ensure that they function properly by carrying out regular maintenance.

The mesh sizes of pressure and nozzle filters must always be smaller than the flow cross-section of the nozzles used.

Observe the permissible combinations of the filters and their mesh size and any other specifications provided by the herbicide manufacturers.

5.6.1. Filling sieve

The filling sieve in the filling opening of the main tank prevents contamination of the spray liquid when filling the spray liquid tank with herbicide.

Fig 14

5.6.2. Filling filter

Filling the main and fresh water tanks via the filling connection on the main frame.

Changeover valve for both tanks (left lever position main tank, right lever position fresh water tank) (Fig. 15).

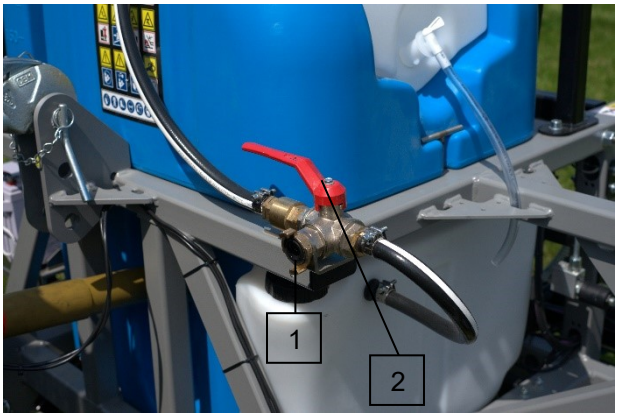


Fig 15

(1) Changeover valve

(2) Hose connection

5.6.3. Pressure filter of the control unit

The pressure filter (Fig. 16) prevents the nozzle filters in front of the spray nozzles from becoming blocked.

Fig 16

5.6.4. Nozzle filter

The nozzle filter prevents the spray nozzles from becoming blocked. For the structure of the nozzle and the nozzle filter, see no. 5.12.

5.7. Rinsing water tank

The rinsing water tank contains clear water. This water is used to

- dilute the residual quantity in the spray liquid tank at the end of spraying operation,
- clean (rinse) the entire field sprayer in the field.

Fill the rinsing water tanks with clear water only

- Tank contents: 30 litres

Fig 17

(1) Rinsing water tank

(2) Hand wash tank

5.8. Hand wash tank

Hand wash tank (Fig. 15, No. 3) contains clear water for cleaning your hands using drain tap. The tank holds 5 litres.

Fill the hand wash tank with clear water only.

WARNING

Never use the water in the hand wash tank as drinking water! The materials of the hand wash tank are not food-safe.

5.9. Spray bar

DANGER

When folding the spray bars out and in, always keep sufficient distance from overhead lines! Contact with overhead lines may result in fatal injuries.

CAUTION

- When folding the spray bars out and in, direct people away from the swivelling range of the spray bars!
- All hydraulically operated folding parts have shearing and crushing points!
- It is prohibited to fold the spray bars in and out while driving!
- The spray bars must not be folded out and in unless the machine is coupled to the tractor!

The definition "right and left" spray bars are always to be seen in the direction of travel.

5.10. Folding out the spray bars

- Level ground must be selected for the folding out area.
- The front power lift of the tractor must be positioned in the hydraulic floating position.
- Ensure that there are no people in the working area.
- Position the machine horizontally using the upper link.
- Unlock the two wheels on the main frame.
- Switch on the main switch on the machine.
- Unlock the mechanical safety catch on the left and right spray bars. (Fig. 18)

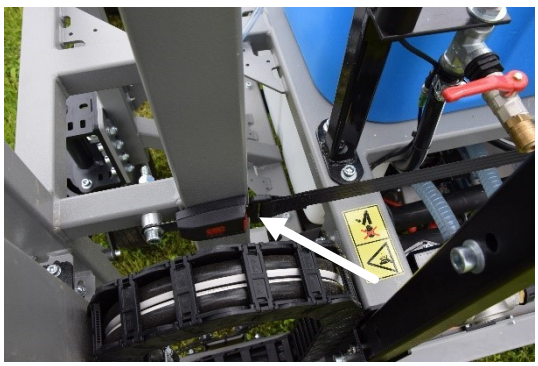


Fig 18

5.11. Folding in the spray bars

1. Switch off the PTO shaft.
2. Level ground must be selected for the folding up area.
3. Ensure that there are no people in the working area.
4. Lock the two wheels on the main frame.
5. To avoid hazards, always keep an eye on moving parts.
6. Switch on the radio remote control and press the "OPEN" button until the machine has been folded in.
7. Lock the mechanical safety catch on the left and right spray bars. (Fig. 16)
8. Switch off the machine on the main switch.
9. Whenever driving on the road, the machine must be locked with the mechanical safety catch, the wheels on the main frame must be secured against turning and the electric lighting must be connected to the tractor.

5.12. Nozzles

- Whenever the nozzle is changed, adjust the equal pressure fitting.

Union nut

(1) Bayonet cap
(2) Nozzle holder
(3) Flat jet nozzle
(4) Solenoid valve
(5) Flat gasket
(6) Orifice plate
(7) Filter sieve

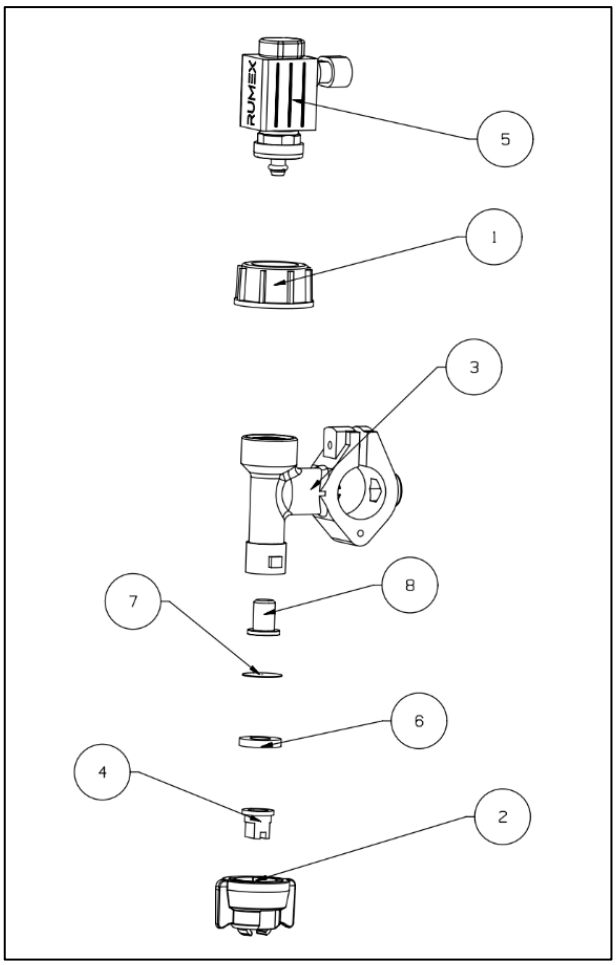


Fig 19

5.13. Filling connection

5.13.1. Filling from the water mains

The filling connection (Fig. 20, No. 1) can be used to fill the spray liquid tank or the rinsing water tank with water from the public mains.

Fig 20

Operating procedure for filling the tank:

1. Establish the connection to the water mains (Fig. 20).
2. To fill the fresh water tank, set the three-way valve to the right position.
3. To fill the main tank, set the three-way valve to the left position.
4. Control the filling process via the corresponding taps of the water mains.

Do not leave the device unattended during the filling process!

6. Starting up the machine

This chapter contains information

- on starting up your machine.
- how you can check whether you are allowed to attach / hitch the machine to your tractor.

- Before starting up the machine, the operator must have read and understood the operating manual.
- Observe the chapter "Safety instructions for the operator" when
  - Coupling and uncoupling the machine
  - Transporting the machine
  - Using the machine
- Couple and transport the machine only with a tractor which is suitable for this purpose!
- The tractor and machine must comply with the national road traffic regulations.
- Vehicle owner (operating company) and driver (operator) are responsible for complying with the legal provisions of the national road traffic regulations.

WARNING

Risk of crushing, shearing, cuts, being pulled in and becoming entrapped in the area of hydraulically or electrically actuated components.

Do not block any controls on the tractor which are used to directly execute hydraulic or electrical movements of components, e.g. folding, swivelling and sliding operations. When you release the corresponding control, the respective movement must stop automatically. This does not apply to movements of equipment which

- is continuously or
- automatically controlled or
- requires a floating or pressurised position for functional reasons.

6.1. Check the suitability of the tractor

WARNING

Risk of breakage during operation, insufficient stability and insufficient steering and braking capacity of the tractor if the tractor is not used as intended!

- Before attaching or hitching the machine to the tractor, check the suitability of your tractor.
- You may attach or hitch the machine only to tractors which are suitable for this purpose.
- Carry out a brake test to check whether the tractor achieves the required braking deceleration even with the machine attached / hitched.

Requirements for the suitability of the tractor are in particular:

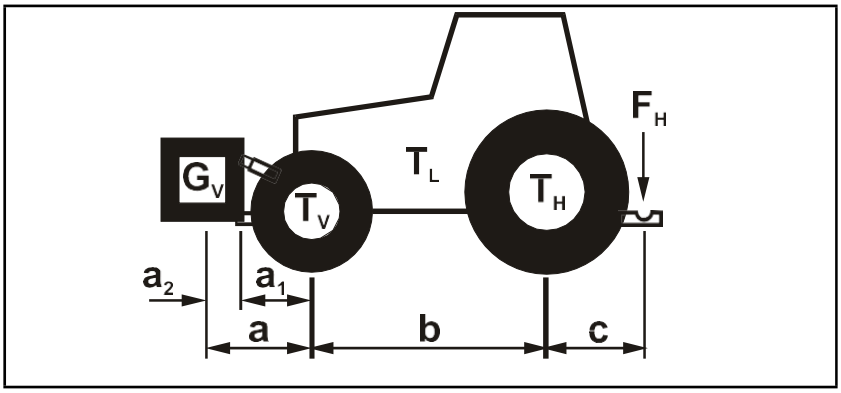
- the permissible gross weight
- the permissible axle loads
- the permissible drawbar load on the coupling point of the tractor
- the tyre load capacities of the fitted tyres
- the permissible trailer load must be sufficient
  - This information can be found on the rating plate or in the vehicle registration document and in the tractor operating manual.
- The tractor must achieve the braking deceleration specified by the tractor manufacturer even with the machine attached or hitched.

6.1.1. Calculate the actual values for the gross tractor weight, tractor axle loads and tyre load capacities, as well as the required minimum ballasting

The permissible gross tractor weight, which is specified in the vehicle registration document, must be greater than the sum of the

- net tractor weight,
- ballasting mass,
- gross weight of the attached machine or drawbar load of the hitched machine

Data required for the calculation



TL	[kg]	Net tractor weight	See tractor operating manual or vehicle registration document
TV	[kg]	Front axle load of the empty tractor	
TH	[kg]	Rear axle load of the empty tractor	
GV	[kg]	Mounted sprayer	See technical data of the machine
FH	[kg]	Maximum drawbar load	See technical data of the machine
a	[m]	Distance between centre of gravity of front-mounted machine or front weight and centre of front axle (sum a1 + a2)	See technical data for tractor and front-mounted machine or front weight or measurement
a1	[m]	Distance from centre of front axle to centre of lower link connection	See tractor operating manual or measurement
a2	[m]	Distance from centre of lower link connection point to centre of gravity of front-mounted machine or front weight (centre of gravity distance)	See technical data for front-mounted machine or front weight or measurement
b	[m]	Tractor wheelbase	See tractor operating manual or vehicle registration document or measurement
c	[m]	Distance between centre of rear axle and centre of lower link connection	See tractor operating manual or vehicle registration document or measurement

Calculation of the required minimum front ballasting $G_{V\,min}$ of the tractor to ensure manoeuvrability

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

Enter the numerical value for the calculated minimum ballasting $G_{V\,min}$, required at the front of the tractor, in the table.

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

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

Enter the numerical value for the calculated actual front axle load and the permissible tractor front axle load, specified in the tractor operating manual, in the table.

Calculation of the actual gross weight of the tractor and machine combination

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

Enter the numerical value for the calculated actual gross weight and the permissible gross tractor weight, specified in the tractor operating manual, in the table.

Calculation of the actual rear axle load of the tractor TH tat

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

Enter the numerical value for the calculated actual rear axle load and the permissible tractor rear axle load, specified in the tractor operating manual, in the table.

Tyre load capacity

Enter double the value (two tyres) of the permissible tyre load capacity (see e.g. documentation of the tyre manufacturers) in the table.

Table

	Actual value according to calculation		Permissible value according to tractor operating manual		Double permissible tyre load capacity (two tyres)
Minimum ballasting Front/rear	/ kg		---		---
Gross weight	kg	≤	kg		---
Front axle load	kg	≤	kg	≤	kg
Rear axle load	kg	≤	kg	≤	kg

Refer to the vehicle registration document of your tractor for the permissible values for gross tractor weight, axle loads and tyre load capacities.

The actual, calculated values must be less than or equal (≤) to the permissible values!

WARNING

Risk of crushing, cuts, becoming caught, being pulled in and struck due to insufficient stability and insufficient steering and braking capacity of the tractor!

It is prohibited to couple the machine to the tractor on which the calculation is based if

even one of the actual, calculated values is greater than the permissible value,

a front weight (if required) for the required minimum ballasting at the front (G_{Vmin}) is not attached to the tractor.

You must use a front weight which corresponds to at least the required minimum ballasting at the front ($G_{V\,min}$)!

Special cases:

- If the weight of the front-mounted machine (G_V) does not reach the required minimum ballasting at the front ($G_{V\,min}$), use additional weights in addition to the front-mounted machine!
- If the weight of the rear-mounted machine (G_H) does not reach the required minimum ballasting at the rear ($G_{H\,min}$), use additional weights in addition to the rear-mounted machine!

6.1.2. Requirements for the operation of tractors with hitched machines

WARNING

Risk of breakage during operation of components due to unauthorised combinations of connecting devices!

Ensure that

- that the connecting device on the tractor has a sufficient permissible drawbar load for the actual drawbar load,
- that the axle loads and weights of the tractor changed by the drawbar load are within the permissible limits. If in doubt, reweigh.
- that the static, actual front axle load of the tractor does not exceed the permissible front axle load,
- that the permissible gross weight of the tractor is observed,
- that the permissible load capacities of the tractor tyres are not exceeded.

6.1.3. Machines without their own braking system

WARNING

Risk of crushing, cuts, becoming caught, being pulled in and struck due to insufficient braking capacity of the tractor!

The tractor must also achieve the braking deceleration specified by the tractor manufacturer even with the machine hitched.

If the machine does not have its own braking system,

- the actual tractor weight must be greater than or equal (≥) to the actual weight of the hitched machine,
- the maximum authorised driving speed is 25 km/h.

6.2. Adjusting the length of the universal shaft to the tractor

WARNING

Danger due to damaged and/or destroyed components flying off if the universal shaft compresses or pulls apart when the machine coupled to the tractor is raised/lowered because the length of the universal shaft has been incorrectly adjusted!

Have the length of the universal shaft checked in all operating conditions by a service centre and adjusted if required before you couple the universal shaft to your tractor for the first time.

This will prevent the universal shaft from being compressed or having insufficient profile overlap.

This adjustment of the universal shaft applies only to the current tractor type. If you couple the machine to a different tractor, you may have to repeat the adjustment of the universal shaft. When adjusting the universal shaft, always observe the operating manual of the universal shaft manufacturer.

WARNING

Danger of drawing in and entrapment due to incorrect assembly or unauthorised structural modifications to the universal shaft!

Only a service centre may make structural modifications to the universal shaft. In doing so, observe the operating manual of the universal shaft manufacturer.

It is permissible to adjust the length of the universal shaft, taking into account the minimum profile overlap.

Structural modifications to the universal shaft are not permitted if they are not described in the operating manual of the universal shaft manufacturer.

WARNING

Risk of crushing between the front of the tractor and the machine when raising and lowering the machine to determine the shortest and longest operating position of the universal shaft!

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

- only from the designated workstation.
- Never do this when you are in the danger zone between the tractor and the machine.

WARNING

Risk of crushing due to unintentional

- **rolling of the tractor and the coupled machine!**
- **lowering the raised machine!**

Before entering the danger zone between the tractor and the raised machine to adjust the universal shaft, secure the tractor and machine against unintentional starting, unintentional rolling and the raised machine against unintentional lowering.

The shortest length of the universal shaft is when it is arranged horizontally. The longest length of the universal shaft is when the machine is fully raised.

1. Couple the tractor to the machine (do not connect the universal shaft).
2. Apply the parking brake on the tractor.
3. Determine the lifting height of the machine with the shortest and longest operating position for the universal shaft.

   3.1 To do this, raise and lower the machine using the tractor's three-point hydraulic system.

   Actuate the controls for the tractor's three-point hydraulic system from the designated workstation.
4. Secure the raised machine at the determined lifting height against unintentional lowering (e.g. by supporting it or suspending it from a crane).
5. Before entering the danger zone between the tractor and the machine, secure the tractor against unintentional starting.
6. When determining the length and shortening the universal shaft, observe the operating manual of the universal shaft manufacturer.
7. Push the shortened halves of the universal shaft back together.
8. Before connecting the universal shaft, grease the tractor’s PTO shaft and the input shaft of the gearbox. The tractor symbol on the protective tube indicates the tractor-side connection of the universal shaft.

6.3. Securing the tractor / machine against unintentional starting and unintentional rolling

WARNING

Risk of crushing, shearing, cuts, amputation, becoming caught, entangled, being pulled in, becoming entrapped and being struck when working on the machine due to

- **unintentional lowering of the unsecured machine raised by the tractor's three-point hydraulic system,**
- **unintentional lowering of raised, unsecured machine parts,**
- **unintentional starting and unintentional rolling of the tractor/machine combination.**
- Before carrying out any work on the machine, secure the tractor and machine against unintentional starting and unintentional rolling.
- All work on the machine, such as assembly, adjustment, fault rectification, cleaning, maintenance and servicing, is prohibited
  - when the machine is being driven,
  - as long as the tractor engine is running with the universal shaft / hydraulic system connected,
  - if the ignition key is in the tractor and the tractor engine can be started unintentionally when the universal shaft / hydraulic system is connected,
  - if the tractor and machine are not secured against unintentional rolling with their respective parking brakes and/or wheel chocks,
  - if moving parts are not blocked against unintentional movement.

Particularly when carrying out this work, there is a risk of contact with unsecured components.

1. Lower the raised, unsecured machine / raised, unsecured machine parts. This will prevent unintentional lowering.
2. Switch off the tractor engine.
3. Remove the ignition key.
4. Apply the parking brake on the tractor.
5. Secure the machine against unintentional rolling (only when the machine is hitched)

- on level terrain using the parking brake (if available) or wheel chocks,
- on very uneven terrain or on slopes using the parking brake and wheel chocks.

7. Coupling and uncoupling the machine, switching on the machine

When coupling and uncoupling machines, observe the chapter "Safety instructions for the operator".

WARNING

Risk of crushing due to unintentional starting and unintentional rolling of the tractor and the machine when coupling or uncoupling the machine!

Before entering the danger zone between the tractor and machine to couple or uncouple, secure the tractor and machine against unintentional starting and unintentional rolling.

WARNING

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

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

- only from the designated workstation.
- Never do this when you are in the danger zone between the tractor and the machine.

7.1. Preparing the machine

- The machine may be moved from the parking position to the tractor only under the following conditions:
  - Wheels on the main frame locked against turning
  - Support wheel folded down and locked
  - Move on level ground only
  - Move on firm ground only
  - At least 2 persons required

7.2. Coupling the machine

WARNING

Risk of breakage during operation, insufficient stability and insufficient steering and braking capacity of the tractor if the tractor is not used as intended

You may attach or hitch the machine only to tractors which are suitable for this purpose. See chapter "Checking the suitability of the tractor".

WARNING

Risk of crushing between the tractor and machine when coupling the machine!

Before approaching the machine, instruct persons to leave the danger zone between the tractor and the machine.

Helpers present may act only as guides next to the tractor and machine and step between the vehicles only when they are stationary.

WARNING

Risk of crushing, cuts, becoming caught, being pulled in and struck if the machine is unintentionally detached from the tractor!

- Use the equipment provided for connecting the tractor and machine as intended.
- When coupling the machine to the tractor three-point hydraulic system, ensure that the attachment categories of the tractor and machine match.
- Whenever you couple the machine, check the upper and lower link pins for any visible defects. Replace the upper and lower link pins if there are clear signs of wear.
- Secure the upper and lower link pins in the pivot points of the three-point mounting frame with a lynch pin to prevent them from working loose.

WARNING

Machines with single-sided or welded-in lower link pins: It is essential to use ball sleeves with a catch pocket and integrated lynch pin.

Risk of accident due to loosening of the connection between the machine and tractor!

Coupling the machine:

The following work may be carried out only on level and solid surfaces.

1. Secure the tractor and machine against unintentional rolling.
2. The two centre wheels of the machine must be secured against turning by engaging the detent pins.
3. Before approaching the machine, instruct persons to leave the danger zone between the tractor and the machine.
4. Guide the upper and lower links of the tractor on the machine.
5. Check that the quick-release clamps or, if required, the bolts in the control arms are correctly locked
6. Secure the locking mechanism with the safety cotter pin provided.
7. Raise the machine approx. 10 cm.
8. Lift the support foot into the transport position. To do this, see "Structure and function – support foot".
9. Set the machine down in the floating position and adjust the horizontal alignment of the machine using the upper link length.
10. Establish a connection between the lighting system and the tractor.
11. Before starting up:
    - Remove the wheel chocks.
    - Visually check that all bolts, safety devices and locking mechanisms on the tractor and the machine are correct.

7.3. Uncoupling the machine

WARNING

Risk of crushing, cuts, becoming caught, being pulled in and struck due to the uncoupled machine not being stable enough and overturning!

Place the empty machine on a level and firm surface.

When the machine is moving, the detent pins on the wheels of the main frame must be engaged.

The machine may be moved and pushed only by two people at any one time.

When uncoupling the machine, there must always be enough free space in front of the machine so that you can re-align the tractor with the machine when coupling them again.

Uncoupling the machine:

1. The two centre wheels of the machine must be secured against turning by engaging the detent pins.
2. Before approaching the machine, instruct persons to leave the danger zone between the tractor and the machine.
3. Lower the support foot and lock it.
4. Place the empty machine on a level and firm surface with the front power lift in the hydraulic floating position.
5. Ensure that the support foot is in contact with the ground before lowering the machine. By lengthening the upper link, the machine load is shifted to the support wheel.
6. Disconnect the PTO shaft and the electrical connection from the tractor.
7. Secure the machine against unintentional rolling.
8. Loosen the upper and lower link connections to the machine
9. Lower the front power lift.

7.4. Switching on the machine

To switch on the machine, proceed as follows:

1. When the machine is switched on by the main switch (Fig. 9, No. 1), the system starts up automatically.
2. The system start-up is indicated by the flashing red indicator lamp (Fig. 21, No. 2).
3. When the machine is switched on, a W-LAN network is generated which is used as an interface for operation and monitoring via the tablet/smartphone used. To do this, the tablet/smartphone must be connected to the generated W-LAN. A user profile can then be created in the web browser so that the machine's system can be controlled and monitored. To avoid interface problems, we recommend using the available operating terminal from RUMEX GmbH.
4. In order to activate image recognition, all four wheels must be in contact with the ground.
5. Additionally switching on the PTO shaft activates image processing. This is indicated in the indicator lamp by a continuous green light (Fig. 23, No. 1).
6. The system pressure, which can be read on the pressure indicator (Fig. 23, No. 3), is also generated by switching on the PTO shaft.

Fig 21

- If the system malfunctions, switch off the PTO shaft immediately.
- For reversing, the machine must be fully raised using the front power lift, as the guide wheels do not allow 360 degree rotation.
- Lifting the machine when unfolded will cause the side arms to lock hydraulically. This allows the machine to be moved backwards. Pay attention to any unevenness in the terrain.
- Lowering the machine to the floating position switches the side arms back to the floating position.

8. Settings

WARNING

Risk of crushing, shearing, cuts, amputation, becoming caught, entangled, being pulled in, becoming entrapped and being struck due to

- **unintentional lowering of the machine raised by the tractor's three-point hydraulic system,**
- **unintentional lowering of raised, unsecured machine parts,**
- **unintentional starting and unintentional rolling of the tractor/machine combination.**

Before making any adjustments to the machine, secure the tractor and machine against unintentional starting and unintentional rolling.

8.1. Overview – Positions of the multi-directional changeover taps

The position of the taps always corresponds to the operator's line of sight when standing directly in front of the tap!

Changeover tap jetting filter

- Position on left: Filling the main tank (Fig. 24)
- Position on right: Filling the fresh water tank (Fig. 25)

Fig 22

Fig 23

Changeover valve suction and pressure side

1. Changeover valve inlet pump
   - The changeover valve (Fig. 26, No. 1) is used to switch between suction from the main tank and suction from the fresh water tank.
   - The home position of the changeover valve is "Suction from the main tank".
2. Changeover valve working circuit
   - The changeover valve (Fig. 26, No. 2) is used to switch between working pressure and flushing the line system in the spray bar
   - The home position of the changeover valve is "pressure / working position".

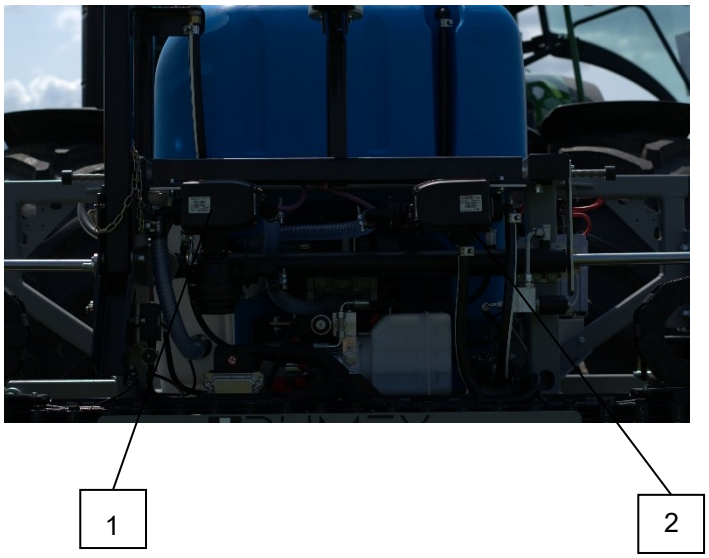


Fig 24

Suction filter

- Is used to filter contamination in the line system.
- Must be checked regularly for contamination and cleaned if required.

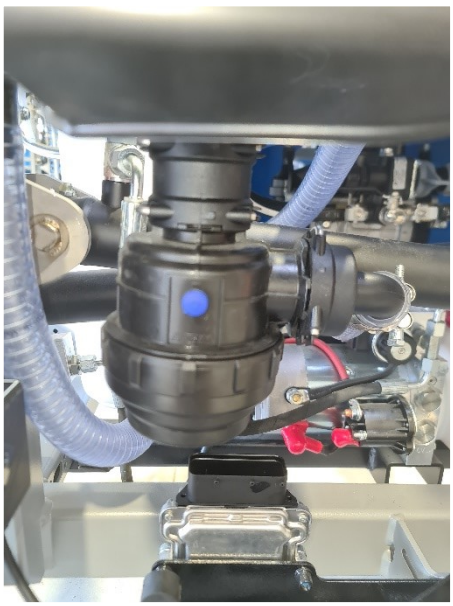


Fig 25

Pressure filter

- Is used to filter contamination in the line system.
- Must be checked regularly for contamination and cleaned if required.

Fig 26

Drain tap main tank

- Is used to remove residual quantities from the system. These must be collected in suitable tanks. Position of tap see Fig. 29.
- Must remain closed during the entire operation.

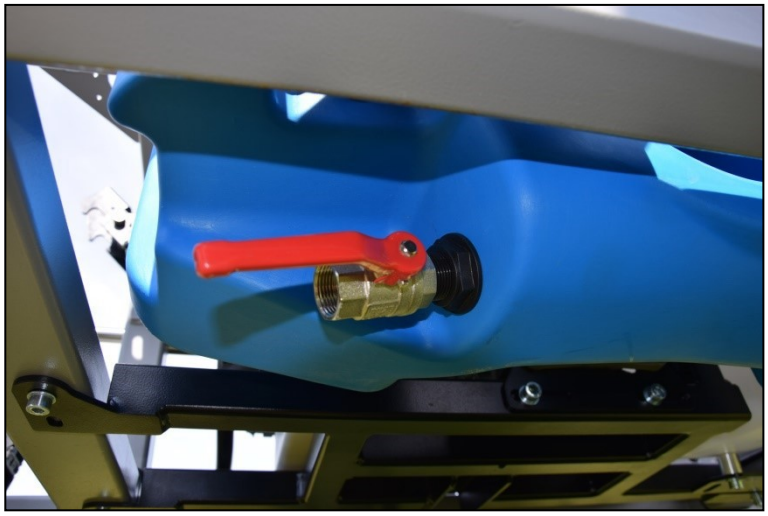


Fig 27

WARNING

Danger to the environment, soil and groundwater!

Herbicides are hazardous to the environment.

Depending on the product used, the following hazard statements may apply:

H400: Very toxic to aquatic organisms.

H 410: Very toxic to aquatic organisms with long lasting effects.

These pollute the soil and groundwater.

Never allow residue to run out. Do not allow herbicide residue to reach the ground.

Collect residue safely and dispose of it properly.

9. Transporting the machine

- When transporting the machine, observe the chapter "Safety instructions for the operator".
- Before transporting the machine, check
  - that the supply lines are properly connected,
  - the lighting system for damage, function and cleanliness,
  - the brake and hydraulic system for visible defects,
  - whether the parking brake has been fully released,
  - the function of the brake system.

WARNING

Risk of crushing, cuts, becoming caught, being pulled in and struck due to the attached / hitched machine being unintentionally released!

Before transporting the machine, carry out a visual check to ensure that the upper and lower link pins are secured with the lynch pin to prevent them from working loose.

WARNING

Risk of crushing, shearing, cuts, amputation, becoming caught, entangled, being pulled in, becoming entrapped and being struck due to unintentional movements of the machine.

- For folding machines, check that the transport locking mechanisms are locked correctly.
- Before transporting the machine, secure the machine against unintentional movements.

WARNING

Risk of crushing, cuts, becoming caught, being pulled in or struck due to the machine not being stable enough and overturning.

- Adjust your driving style so that you can control the tractor safely at all times with the machine attached or detached.

  Take into account your personal abilities, the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the effects of the attached or hitched machine.
- Before transporting the machine, tighten the lateral locks of the tractor lower links so that the attached or hitched machine cannot swing back and forth.

WARNING

Risk of breakage during operation, insufficient stability and insufficient steering and braking capacity of the tractor if the tractor is not used as intended

These hazards will cause severe injuries and even death.

Observe the maximum payload of the mounted machine and the permissible axle and drawbar loads of the tractor. If required, drive only with a partially filled hopper.

WARNING

Danger of falling from the machine if you are riding on it without authorisation!

It is prohibited for persons to ride on the machine and/or climb onto running machines.

Before starting up the machine, instruct people to leave the loading area.

WARNING

Danger of stab injuries to other road users due to protruding parts projecting into the traffic!

Cover protruding parts on machines.

You must mark protruding parts if it is not possible to cover them with reasonable effort.

When transporting the machine, observe the following:

- The system must be depressurised.
- The support foot must be folded up.
- The side arms must be folded up and mechanically locked.
- The two wheels of the main frame must be locked and must not be in contact with the ground.
- The electrical lighting must be functional and connected.
- If the maximum permitted front attachment (distance to the centre of the steering wheel) is exceeded, approved safety precautions must be taken.
- Due to the restricted field of vision, adjust the driving speed to the road conditions.
- To prevent the front power lift from lowering, it must have a fully functional hydraulic system.
- Check the functionality of the safety devices and the safety cotter pins.

10. Using the machine

When using the machine, follow the instructions in chapters

- "Warning symbols and other labels on the machine",
- "Safety instructions for the operator".

Follow these instructions for your safety.

WARNING

Risk of breakage during operation, insufficient stability and insufficient steering and braking capacity of the tractor if the tractor is not used as intended!

Observe the maximum payload of the mounted / hitched machine and the permissible axle and drawbar loads of the tractor.

If required, drive only with a partially filled hopper.

WARNING

Risk of crushing, cuts, amputation, being pulled in, becoming entrapped and being struck due to the tractor / hitched machine not being stable enough and overturning!

Adjust your driving style so that you can control the tractor safely at all times with the machine attached or detached.

Take into account your personal abilities, the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the effects of the attached or hitched machine.

WARNING

Risk of crushing, cuts, becoming caught, being pulled in and struck due to the attached / hitched machine being unintentionally released!

Before using the machine, always carry out a visual check to ensure that the upper and lower link pins are secured with the lynch pin to prevent them from working loose.

WARNING

Risk of crushing, becoming caught or being struck due to damaged components or foreign objects ejected from the machine!

Before switching on the tractor's PTO shaft, observe the permissible drive speed of the machine.

WARNING

Risk of becoming caught and entangled and risk of caught foreign objects being ejected in the danger zone of the driven universal shaft!

- Before using the machine, always check that the safety and protective devices on the universal shaft are functioning correctly and are complete.

  Have damaged safety and protective devices on the universal shaft replaced immediately by a service centre.
- Check whether the universal shaft guard is secured against turning with the retaining chain.
- Keep a sufficient safety distance from the driven universal shaft.
- Instruct people to leave the danger zone of the driven universal shaft.

Immediately switch off the tractor engine in the event of danger.

CAUTION

Risk of the universal shaft breaking if the driven universal shaft is not angled correctly!

When lifting the machine, observe the permissible angles of the driven universal shaft. Impermissible angles of the driven universal shaft will result in increased, premature wear or direct destruction of the universal shaft.

If the raised machine is not running smoothly, immediately switch off the tractor's PTO shaft.

WARNING

Risk of crushing, becoming caught and being struck due to objects being ejected from the driven machine!

Before switching on the PTO shaft, instruct persons to leave the danger zone of the machine.

WARNING

Risk of crushing, being pulled in and becoming entrapped when operating the machine without the protective devices provided!

Do not operate the machine unless the protective devices are fully fitted.

Description of the workflow

In order to optimise the work process, we have listed a complete workflow here. To avoid duplicate explanations in the operating manual, please refer to the relevant section in the operating manual:

Activity	Number/designation in the operating manual		Page
1. Coupling the machine	7.2	Coupling the machine	66
2. Driving to the field	9	Transporting the machine	74
3. Preparing the spray liquid	10.2	Preparing the spray liquid	81
4. Folding out	5.10	Folding out the spray bars	51
5. Switching on the machine and connecting the operating terminal to the machine W-LAN	7.4	Switching on the machine and connecting the operating terminal to the machine W-LAN	69
6. Treating the area	10.3	Applying the spray liquid	84
7. Cleaning the lines	12.1.2	Cleaning the sprayer when the tank is full after the spraying process	92
8. Folding in	5.11	Folding in the spray bars	52
9. Driving from the field	9	Transporting the machine	74
10. Cleaning	12.1	Cleaning	90
11. Uncoupling the machine	7.3	Uncoupling the machine	68

10.1. Preparing the spraying operation

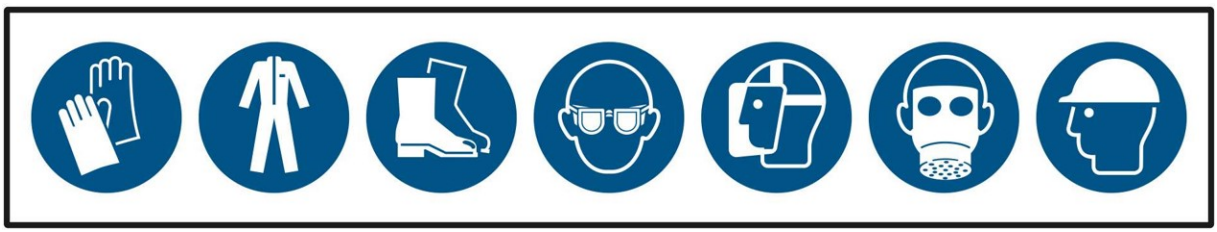
- The basic prerequisite for the proper application of herbicides is that the field sprayer functions properly. Have the field sprayer tested regularly on the test bench. Correct any faults immediately.
- Use all filters provided. Clean the filters regularly. The field sprayer can only be operated without problems if the spray liquid is filtered properly. Proper filtration has a significant influence on the treatment success of the herbicide measure.
- Observe the permitted combinations of filters and mesh sizes. The mesh sizes of the self-cleaning pressure filter and the nozzle filters must always be smaller than the nozzle opening of the nozzles used.
- Completely flush the nozzle line after each use

  → To do this, see chapter "Cleaning"

10.2. Preparing the spray liquid

WARNING

Always wear protective gloves and appropriate protective clothing! The greatest risk of coming into contact with the herbicide is when preparing the spray liquid.



- Before each filling process, check the field sprayer for damage, e.g. leaking tanks and hoses and that all controls are correctly positioned.
- Never leave the field sprayer unattended during the filling process.
- To prevent spray liquid from being drawn back into the line network, never establish a direct connection between the filling hose and the contents of the spray liquid tank.
- Avoid foaming. Foam must not escape from the spray liquid tank during the filling process. A funnel with a large cross-section, which extends to the bottom of the spray liquid tank, effectively prevents foaming.
- Fill the spray liquid tank with herbicide only when the filling sieve is inserted.

- In addition to the generally applicable instructions listed here, please also observe the product-specific procedures described in the instructions for use of the herbicides.
- Refer to the instructions for use of the herbicides concerning the prescribed water and preparation application rates.
- Read the instructions for use of the preparation and observe the listed precautionary measures!
- Carefully determine the required filling or refilling quantity to avoid residual quantities at the end of spraying operation, as it is difficult to dispose of residual quantities in an environmentally friendly manner.
- Carefully rinse out drained preparation tanks and add the rinsing water to the spray liquid!

Observe the permissible payload of your field sprayer during the filling process! When filling your field sprayer, be sure to take into account the different specific weights [kg/l] of the individual liquids.

DANGER

Wear appropriate protective clothing when pouring in the preparations, as prescribed by the herbicide manufacturer!

Implementation

1. Define the quantity of spray liquid to be prepared.
2. Determine the required quantity of herbicide for the spray liquid to be prepared.
3. Fill the main tank with the required amount of water via the jetting connection (Fig. 30) – this can be read off the level indicator (Fig. 31).
4. Add the calculated amount of preparation via the tank opening into the filling sieve (Fig. 32) of the main tank. Wear the prescribed protective clothing.
5. To mix the spray liquid, the PTO shaft can be driven when the machine is stationary in order to use the generated volume flow as an agitator.
6. To ensure that herbicide is present in all nozzles, the residual quantity of water must then be flushed out with herbicide by pressing the "Start filling" button on the operating terminal. The procedure is displayed in the user interface.
7. Follow the instructions of the spraying agent manufacturer.

Fig 28

Fig 29

Fig 30

10.3. Applying the spray liquid

- Do not treat at average wind speeds above 5 m/s
- Avoid overdosing (caused by overlapping when not moving precisely from one spraying lane to the next and/or when cornering on the headland with the spray boom switched on)!
- Wear personal protective equipment.
- During application, constantly check the spray liquid consumption in relation to the treated area.
- The tank is empty if there is a significant drop in spray pressure. If the spray pressure drops under otherwise unchanged conditions, either the suction or pressure filter is clogged.

The front power lift of the tractor must be positioned in the hydraulic floating position. When folding out, all four wheels must be in contact with the ground.

1. Ensure that there are no people in the working area.
2. Position the machine horizontally using the upper link.
3. When the machine is switched on at the main switch, a W-LAN network is generated which is used as an interface for operation and monitoring via the tablet/smartphone used. To do this, the tablet/smartphone must be connected to the generated W-LAN. A user profile can then be created in the web browser so that the machine's system can be controlled and monitored. To avoid interface problems, we recommend using the available operating terminal from RUMEX GmbH.
4. Switch on the tractor's PTO shaft. When the machine is switched on and unfolded, the PTO shaft speed is used to make the entire system ready for operation. This is indicated by the green indicator lamp switching on.
5. The spray pressure can be read off the pressure indicator. This must be set to 5 bar on the pressure control device of the pump (see 10.5).
6. Switching off the PTO shaft reduces the pressure in the system and switches off the image recognition.
7. The driving speed must be adjusted to the ground conditions and must not exceed 10 km/h.
8. The line system must be flushed after each use.

10.4. Setting the threshold value

If an unsatisfactory application of the spray liquid is detected when using the system, adjust the threshold value in the user interface to the plant population.

- **Increasing the threshold value:** Smaller dock plants can be sprayed.
    - Risk: Other plants (e.g. dandelions) are also sprayed in some cases.
- Reducing the threshold value: Dock plants are sprayed which clearly stand out from the plant population:
    - Risk: smaller dock plants are sprayed less.

This threshold value must be adjusted individually to each plant population and treatment time. To optimise the work result, the user interface allows additional adjustments to be made. These settings are explained on the operating terminal

10.5. Setting the spray pressure

- If the spray pressure drops under otherwise unchanged conditions, clean the suction or pressure filter!

The spray pressure of the system must be set to 5 bar. This pressure is set and readjusted by turning the pressure control unit (Fig. 33) on the piston diaphragm pump.

- Direction of rotation left: Reduce pressure
- Direction of rotation right: Increase pressure

As this is done while the machine is running, ensure that the tractor is secured against unintentional movement.

Do not carry out any other work/settings at the same time.

When setting the system pressure, do not exceed 6 bar.

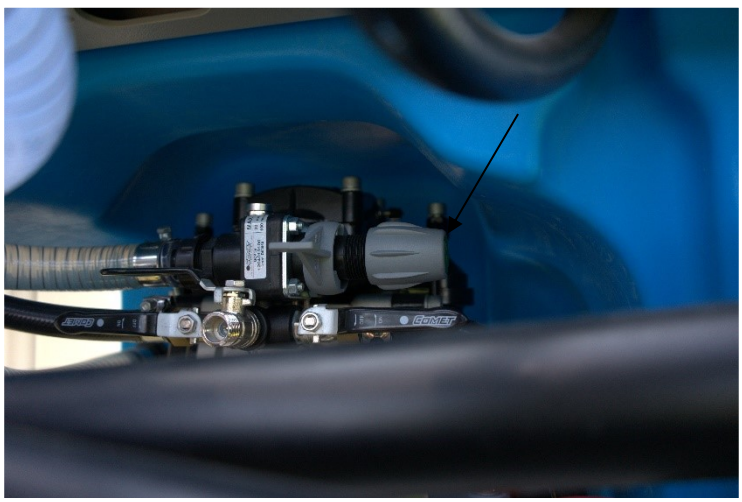


Fig 31

10.6. Residual quantities

A distinction is made between two types of residual quantities:

1. Excess quantity remaining in the tank at the end of the spraying process.
2. Technical residual quantity which remains in the tank, filter tap, pump, suction and pressure hoses, operating fitting and nozzle lines after a significant drop in spray pressure. The residual quantities of the individual components can be found in the chapter "Technical data" and must be added together.

10.6.1. Disposal of residual quantities

The residual quantity in the spray bars depends on the working width and is still discharged in undiluted concentration. It is essential to spray this residual quantity onto an untreated surface.

CAUTION

When discharging residual quantities, user protection measures apply. Follow the instructions of the spraying agent manufacturer and wear suitable protective clothing. Dispose of the collected spray liquid residue in accordance with the relevant legal regulations. E.g. collect in suitable tanks, allow to dry out and dispose of in accordance with the prescribed waste disposal regulations.

To do this, proceed as follows:

1. To drain residual quantities from the main tank, open the drain tap in the main tank. (Fig. 34)
2. These residual quantities may be collected and stored only in tanks provided for this purpose.
3. Residual quantities must be handled in accordance with the manufacturer's instructions for the herbicide.

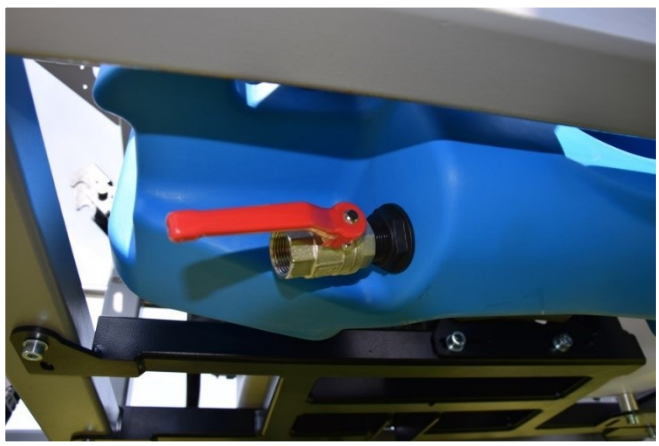


Fig 32

11. Malfunctions

WARNING

Risk of crushing, shearing, cuts, amputation, becoming caught, entangled, being pulled in, becoming entrapped and being struck due to

- **unintentional lowering of the machine raised by the tractor's three-point hydraulic system,**
- **unintentional lowering of raised, unsecured machine parts,**
- **unintentional starting and unintentional rolling of the tractor/machine combination.**

Before rectifying faults on the machine, secure the tractor and machine against unintentional starting and unintentional rolling.

Before entering the danger zone of the machine, wait until the machine has come to a standstill.

Malfunction	Cause	Remedy
Pump has no suction	Blockage on the suction side (suction filter, filter insert, suction hose).	Remove the blockage.
	Pump is drawing in air.	Check the hose connection for the suction hose at the suction connection for leaks.
Pump has no power	Suction filter, filter insert soiled.	Clean suction filter, filter insert.
	Jammed or damaged valves.	Replace the valves.
	Pump draws in air, recognisable by air bubbles in the spray liquid tank.	Check the hose connections on the suction hose for leaks.
Fluttering of the spray cone or strong oscillation of the pressure display	Irregular flow rate of the pump.	Check or replace suction and pressure-side valves
Oil/spray liquid mixture in the oil filler neck or clearly recognisable oil consumption	Pump diaphragm defective.	Repair the pump – See operating manual for the pump

12. Cleaning, maintenance and servicing

WARNING

Risk of crushing, shearing, cuts, amputation, becoming caught, entangled, being pulled in, becoming entrapped and being struck due to

- **unintentional lowering of the machine raised by the tractor's three-point hydraulic system,**
- **unintentional lowering of raised, unsecured machine parts,**
- **unintentional starting and unintentional rolling of the tractor/machine combination.**

Before cleaning, maintaining or servicing the machine, secure the tractor and machine against unintentional starting and unintentional rolling.

WARNING

Risk of crushing, shearing, cuts, amputation, becoming caught, entangled, being pulled in and becoming entrapped due to unprotected danger areas!

- Install protective devices which you have removed for cleaning, maintaining and servicing the machine.
- Replace defective protective devices with new ones.

DANGER

When carrying out maintenance, repair and care work, observe the safety instructions!

- Regular and proper maintenance keeps your machine ready for use for a long time and prevents premature wear. Regular and proper maintenance is a prerequisite for our warranty provision.
- Specialised knowledge is a prerequisite for carrying out inspection and maintenance work. This specialised knowledge is not covered by this operating manual.
- When carrying out cleaning and maintenance work, observe environmental protection measures.
- When disposing of operating materials, e.g. oil and grease, observe statutory regulations. Parts which come into contact with these operating materials are also affected by these statutory regulations.
- When lubricating with high-pressure grease guns, do not exceed a lubrication pressure of 400 bar.
- Before carrying out any repairs, clean the machine thoroughly with water.
- When the pump is not driven, it is essential to repair the field sprayer.
- Use only original replacement hoses from RUMEX GmbH.
- Before carrying out any repair work inside the spray liquid tank, clean it thoroughly! Do not climb into the spray liquid tank!
- The following is strictly prohibited:
    - drilling on the chassis,
    - drilling out existing holes on the chassis,
    - welding on load-bearing components.
- Protective measures, such as covering the lines or removing the lines at particularly critical points, are required:
    - during welding, drilling and grinding work,
    - when working with cutting discs near plastic pipes and electrical cables.

12.1. Cleaning

- Monitor the hydraulic hose lines particularly carefully!
- Never treat brake, air and hydraulic hose lines with petrol, benzene, petroleum or mineral oils.
- Lubricate the machine after cleaning, especially after cleaning with a high-pressure cleaner / steam jet or grease-soluble agents.
- Observe the statutory regulations for the handling and disposal of cleaning agents.
- The machine must always be completely cleaned after each use.
- Do not store any spray liquid in the machine, as this may result in the formation of system-critical deposits.
- Only clear tap water and no cleaning agents may be used for cleaning.

Cleaning with a high-pressure cleaner / steam jet

- When using a high-pressure cleaner / steam jet for cleaning, always observe the following points:
  - Do not clean any electrical components.
  - Do not clean any chrome-plated components.
  - Never point the cleaning jet from the cleaning nozzle of the high-pressure cleaner / steam jet directly at lubrication and bearing points.
  - Always maintain a minimum nozzle distance of 300 mm between the high-pressure cleaner or steam jet cleaning nozzle and the machine.
- When handling high-pressure cleaners, observe the safety regulations.

Cleaning the field sprayer

- Regular cleaning of the machine is a prerequisite for proper maintenance and facilitates operation of the machine.
- Keep the exposure time as short as possible, e.g. by cleaning daily after spraying. Do not leave the spray liquid in the spray liquid tank for an unnecessarily long time, for example overnight.
- The service life and reliability of the field sprayer essentially depend on the exposure time of the herbicides on the materials of the field sprayer.
- Always clean the field sprayer before applying another herbicide.

- Before you clean the field sprayer properly, give it a preliminary clean in the field.
- Whenever you clean the field sprayer, dispose of the cleaning residue in an environmentally friendly manner.
- Remove the spray nozzles at least once a season. Check the removed spray nozzles for soiling; if required, clean the spray nozzles with a soft brush (see chapter "Maintenance"). Flush the spray lines without the spray nozzles installed.

- Whenever nozzles are changed and before installing different nozzles, flush the spray lines.
- Wear protective clothing for all cleaning work.

12.1.1. Cleaning the sprayer when the tank is empty

Clean the main tank as follows:

1. Spray out the empty main tank using a strong jet of water.
2. Collect the cleaning water in suitable tanks via the drain tap in the main tank and dispose of it properly.
3. Clean the hose line system.
4. Run the PTO shaft at idle speed.
5. Click on "Clean system" on the operating terminal.
6. Follow the instructions on the cleaning display.

12.1.2. Cleaning the sprayer with a full tank after the spraying process

- After each spraying process, flush the entire line system with fresh water!
- In doing so, wear protective clothing.

Clean in the field using water from the rinsing water tank as follows:

1. Run the PTO shaft at idle speed.
2. Click on "Clean system" on the operating terminal.
3. Follow the instructions on the cleaning display.

12.1.3. Overwintering the machine or shutting it down for a prolonged period

- The sprayer may be stored in dry conditions only.
- Do not put any antifreeze in the machine.

Overwinter the machine or shut it down for a prolonged period as follows: Clean the field sprayer accordingly before shutting it down.

1. The fresh water tank is emptied by activating the cleaning program in the user interface.
2. When the fresh water tank is completely empty, switch off the PTO shaft to prevent the pump from running dry for a long time and to prevent mechanical damage.
3. Drain residual quantities from the pressure filter (Fig. 32).
4. Drain off all the liquid via the drain tap in the main tank, collect it in suitable tanks and dispose of it properly.
5. Fill the machine's line system with special plant protection antifreeze
6. Cycle the nozzles to fill them with antifreeze
7. Before overwintering the machine, change the oil in the pump. To do this, remove the main tank. When changing the oil, observe the operating manual for the pump.

- The complete machine must be stored frost-free, as low temperatures have a negative effect on all electronic components

12.1.4. Cleaning the pressure filter

Regularly check the pressure filter for blockages

12.2. Lubrication instructions

Lubricate all grease nipples (keep seals clean).

Lubricate / grease the machine at the specified intervals.

Before lubrication, carefully clean the lubrication points and grease gun to prevent dirt from being pressed into the bearings. Press out all the soiled grease in the bearings and replace with fresh grease!

12.2.1. Lubricants

Use a lithium-saponified multi-purpose grease containing EP additives for lubrication work:

Company	Product
Meguin	Langzeitfett C2LP

12.2.2. Overview of lubrication points

	Lubrication point	Interval [h]	Number of lubrication points	Type of lubrication
1	Cylinder bolts	50	4	Grease nipples
2	Chassis brass and Teflon bushings	50	16	Grease
3	Support foot	100	1	Grease
4	Bearings side frame	30	8	Grease nipples
Fig. 41				
	Universal shaft	see below		

Lubricating universal shaft

During winter operation, grease the protective tubes to prevent them from freezing.

Please also observe the installation and maintenance instructions of the universal shaft manufacturer affixed to the universal shaft

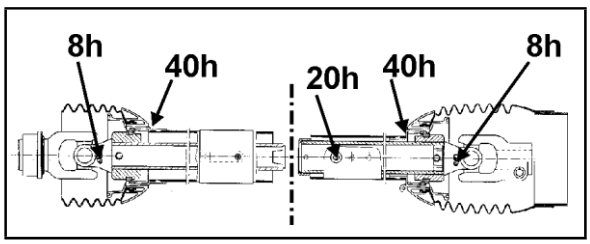


Fig 33

12.3. Maintenance schedule – overview

- Carry out the maintenance intervals after the first deadline has been reached.
- The time intervals, mileage or maintenance intervals of any supplied third-party documentation have precedence.

Daily

Component	Maintenance work	Service centre
Pump	Check oil level Clean or flush	
Spray liquid tank	Clean or flush	
Suction filter		
Pressure filter		
Spray nozzles		
Wheels	Check that the wheel nuts are tight Check air pressure	
Hydraulic hose lines	Check for defects Check for leaks	X
Electrical lighting	Replace defective light bulbs	

Quarterly / 200 operating hours

Component	Maintenance work	Service centre
Wheels	Check wheel hub bearing play	X

Annually / every 1000 operating hours

Component	Maintenance work	Service centre
Pump	Change oil Check valves, replace if required Check piston diaphragm, replace if required	X
Nozzles	Check spray cone and flow rate, replace worn nozzles if required	

If required

Component	Maintenance work	Service centre
Spray bar	Correct settings Transport position Alignment	
Throttle valves	Set	
Level indicator	Adjust	

12.4. Tyres / wheels

Tightening torque of the wheel bolts: **86 Nm**

Tyre pressure: **4.8 bar**

- Regularly check that the
  - wheel bolts are tight.
  - Tyre pressure
- Use only the tyres and rims which we have specified.
- Tyres may be repaired only by qualified personnel using suitable assembly tools!
- The fitting of tyres requires sufficient knowledge and the correct assembly tools!
- Use the jack only at the marked attachment points!

12.4.1. Tyre pressure

- The required tyre pressure depends on the
  - tyre size,
  - tyre load capacity,
  - driving speed.
- The mileage of the tyres is reduced by
  - overloading,
  - excessively low tyre pressure,
  - excessively high tyre pressure.

- Regularly check the tyre pressure when the tyres are cold, i.e. before setting off.
- The air pressure difference in the tyres must not be greater than 0.1 bar.
- The tyre pressure can increase by up to 1 bar after driving fast or when driving in warm weather. Never reduce the tyre pressure, otherwise the tyre pressure will be too low when the tyres cool down.

12.4.2. Fitting tyres

- Before fitting a new / different tyre, remove any signs of corrosion from the tyre seating surfaces of the rims. Corrosion may cause rim damage while driving.
- When fitting new tyres, always use new tubeless valves or tubes.
- Always screw valve caps onto the valves with the seal in place.

12.5. Pump

- Observe the enclosed pump operating manual.
- Carry out all maintenance and care work in accordance with the pump operating manual.

12.6. Nozzles

12.6.1. Installing the nozzles

1. Mount the nozzle holder with O-ring on the injection rail.
2. Mount the solenoid valve including union nut on the nozzle holder. To prevent leaks, ensure that the O-ring is properly seated. To prevent abrasion in the nozzle holder, counter the stainless steel solenoid valve when tightening the union nut. Then secure the solenoid coil with the retaining nut.
3. Insert filter sieve, flat gaskets and, if required, orifice plate into the nozzle holder and lock with the bayonet cap including nozzle.

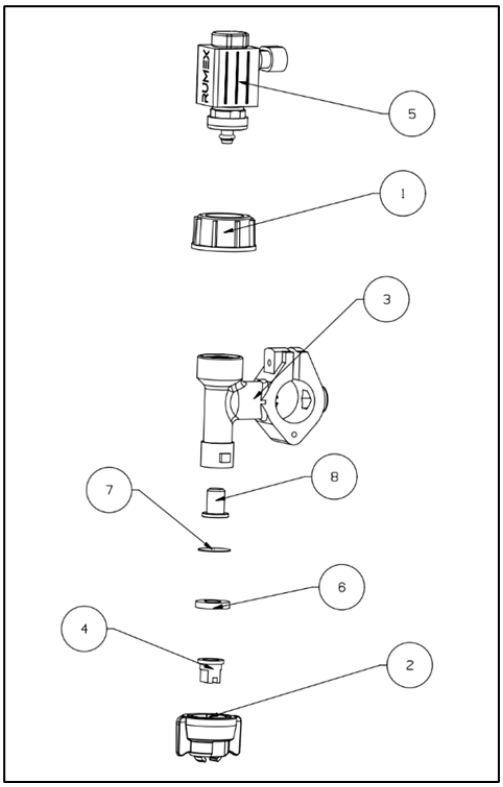


Fig 34

12.7. Determining actual consumption

To determine the actual consumption of the applied spray liquid, use the filling level scale (Fig. 38) as follows:

1. Before treating an area, make a note of the contents of the spray liquid tank.
2. Treat the area.
3. After completing the work on an area, determine the contents of the tank.
4. Subtract the final quantity from the initial quantity. This is the quantity of spray liquid actually used on an area.
5. If enabled, a consumption calculation can also be displayed on the operating terminal.

Fig 35

12.8. Hydraulic system

WARNING

Risk of infection due to highly pressurised hydraulic fluid from the hydraulic system penetrating the body!

- Only a service centre may carry out work on the hydraulic system!
- Before starting work on the hydraulic system, depressurise the hydraulic system!
- Always use suitable tools when searching for leaks!
- Never attempt to seal leaking hydraulic hose lines with your hand or fingers.

  Fluid (hydraulic fluid) escaping under high pressure may penetrate the skin and cause serious injuries!

  If you are injured by hydraulic fluid, consult a doctor immediately! Risk of infection!

- Ensure that the hydraulic hose lines are connected correctly.
- Regularly check all hydraulic hose lines and couplings for damage and soiling.
- Have hydraulic hose lines checked at least once a year by an expert to ensure that they are in a safe working condition!
- Replace hydraulic hose lines if they are damaged or ageing! Use only original **RUMEX** hydraulic hose lines!
- The period of use of the hydraulic hose lines should not exceed six years, including a possible storage period of a maximum of two years. Even with proper storage and permissible stress and strain, hoses and hose connections are subject to natural ageing which limits their storage time and period of use. Notwithstanding this, the period of use may be determined in accordance with experience, in particular taking into account the hazard potential. Other guide values may apply to hoses and hose lines made of thermoplastics.
- Dispose of waste oil in accordance with regulations. If you have disposal problems, talk to your oil supplier!
- Keep hydraulic fluid away from children!
- Ensure that hydraulic fluid does not get into the ground or water!

12.8.1. Maintenance intervals

After the first 10 operating hours and subsequently every 50 operating hours

1. Check all components of the hydraulic system for leaks.
2. Retighten screw connections if required.

Before starting up the machine

1. Check the hydraulic hose lines for visible defects.
2. Eliminate chafe marks on hydraulic hose lines and tubes.
3. Immediately replace worn or damaged hydraulic hose lines.

12.8.2. Inspection criteria for hydraulic hose lines

Observe the following inspection criteria for your own safety!

The maximum operating pressure is 200 bar.

Replace the hydraulic hose lines if you notice the following inspection criteria during the inspection:

- Damage to the outer layer down to the inlay (e.g. chafe marks, cuts, tears).
- Embrittlement of the outer layer (cracking of the hose material).
- Deformations which do not correspond to the natural shape of the hose or hose line. Both in unpressurised and pressurised condition or when bent (e.g. layer separation, blistering, pinch points, kinks).
- Leaks.
- Damage or deformation of the hose fitting (sealing function impaired); minor surface damage is not a reason for replacement.
- Hose migrating out of the fitting.
- Corrosion of the fitting which reduces its function and strength.
- Installation requirements not observed.

12.8.3. Installing and removing hydraulic hose lines

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

- Use only original **RUMEX** hydraulic hose lines!
- Always pay attention to cleanliness.
- You must always install hydraulic hose lines in such a way that in all operating conditions
  - there is no tensile stress, except due to dead weight,
  - there is no compression load for short lengths,
  - external mechanical influences on the hydraulic hose lines are prevented.
  - Prevent the hoses from rubbing against components or each other by arranging and fastening them appropriately. If required, secure hydraulic hose lines with protective covers. Cover sharp-edged components.
  - Do not undercut the permissible bending radii.
- When connecting a hydraulic hose line to moving parts, the hose length must be dimensioned in such a way that the smallest permissible bending radius is not undercut in the entire movement range and/or the hydraulic hose line is not additionally subjected to tensile stress
- Attach the hydraulic hose lines to the specified attachment points. Avoid hose holders which hinder the natural movement and change in length of the hose.
- It is prohibited to paint over the hydraulic hose lines!

12.9. Upper and lower link pins

WARNING

Risk of crushing, becoming caught, entrapped and being struck if the machine is unintentionally detached from the tractor!

Whenever you couple the machine, check the upper and lower link pins for any visible defects. Replace the upper and lower link pins if there are clear signs of wear.

12.10. Screw tightening torques

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

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