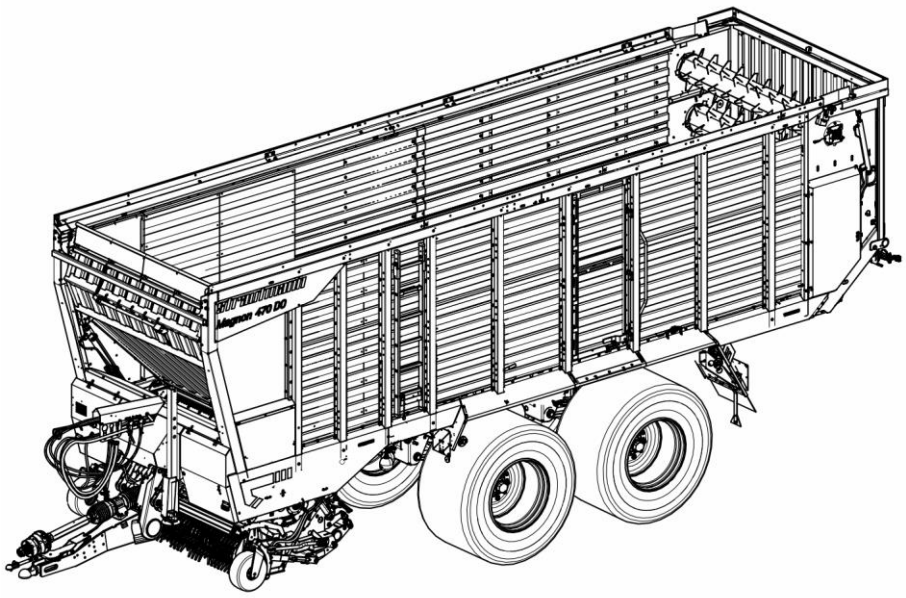
STRAUTMANN

Operating instructions

Forage wagon

Magnon 8-370, 8-370 DO,
Magnon 8-410, 8-410 DO,
Magnon 8-450, 8-450 DO,
Magnon 10-430, 10-430 DO,
Magnon 10-470, 10-470 DO,
Magnon 10-530, 10-530 DO
Continuous-Flow-System

W09763000_0S38001 - W09766999_0S38999



Original instructions
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EU Declaration of Conformity

Manufacturer:

B. Strautmann & Söhne GmbH u. Co. KG

Bielefelder Str. 53 | D-49196 Bad Laer

Legal person established within the Union and authorised to compile the technical documentation:

B. Strautmann & Söhne GmbH u. Co. KG

Bielefelder Str. 53 | D-49196 Bad Laer

Description and identification of machine:

Designation:	Forage wagon
Function:	Cutting, charging, transport and distribution of green, chopped and dried-out forage Magnon CFS / Magnon
Model:	Magnon
Type:	Magnon 8-370 - 8-450 (DO), 10-430 - 10-530 (DO) Continuous-Flow-System
Vehicle/Machine ID number:	W09763000_0S38001 - W09766999_0S38999
Trade name:	Forage wagon Magnon

We hereby explicitly declare that the machine complies with all relevant provisions of the following directives:

2006/42/EC:2006-05-17	EC machinery directive 2006/42/EC
2014/30/EU:2014-02-26	Electromagnetic compatibility directive 2014/30/EU

Sources of the applied harmonised standards according to article 7 paragraph 2:

DIN EN ISO 12100-1:2013-08	Safety of machinery - General principles for design - Risk assessment and risk reduction
DIN EN 690:2014-03	Agricultural machinery – Manure spreaders - Safety
DIN EN 703:2004+A1:2009	Agricultural machinery - Machines for loading, mixing and/or chopping and distributing silage
EN 1853:2019-09	Agricultural machinery - Trailers - Safety German version EN 1853:2017+AC:2019
DIN EN ISO 4254-1:2016-09	Agricultural machinery - Safety - Part 1: General requirements German version EN ISO 4254-1:2015

DIN EN ISO 4254-11:2011-08	Agricultural machinery - Safety - Part 11 - Pick-up balers German version EN ISO 4254-11:2010
DIN EN ISO 4413:2011-04	Fluid power - General rules and safety requirements for hydraulic systems and their components German version EN ISO 4413:2010
DIN EN 12965:2020-10	Tractors and machinery for agriculture and forestry - Propeller shafts and their guards - Safety
DIN EN ISO 13854:2020-01	Safety of machinery - Minimum distances to prevent limbs from being crushed
DIN EN ISO 13857:2020-04	Safety of machinery - Safety distances to prevent hazard areas from being reached by upper and lower limbs German version EN ISO 13857:2019
DIN EN ISO 14120:2016-05	Safety of machinery - Guards - General requirements German version EN ISO 14120:2015
DIN EN 60204-1:2019-06	Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2016)

Bad Laer, 24.10.2023

Dipl. Wirt.-Ing. P. Strautmann
Managing Director

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Identification data
They are registered on the type plate. Please enter the data of your machine here:
ID no.
Model
Year of manufacture

Contact details of dealer / of authorised workshop
Address
Phone

Table of contents

1 About these instructions

Dear customer,

You have decided in favour of a quality product from the large B. Strautmann & Söhne GmbH u. Co. KG product range. We thank you for the confidence you have shown in us.

Upon receipt of the machine, please check for transport damage or missing parts. Inspect the delivered machine for completeness, including the ordered optional extras, by means of the delivery note.

Only immediate complaints will give reason to compensation.

Read and observe these operating instructions and any other enclosed operating instructions for individual machine components before the first start-up; in case of doubt, the details and information in such sub-supplier documentation shall prevail.

These instructions contain descriptions and important information for the safe and efficient use of the machine. They are part of the machine. Therefore, always keep these operating instructions in the machine. Hand these operating instructions over to the buyer when the machine is sold.

The staff shall have carefully read and understood these instructions before starting work.

The machines are available with various optional extras. Due to the individual equipment of your machine, not all descriptions included in these operating instructions apply to your machine. Optional extras are marked in these operating instructions and are available at extra cost.

In case of any inquiries or problems, please refer to these operating instructions or call us.

Regular service and maintenance of the machine and timely replacement of worn-out or damaged parts will result in a longer service life of your machine.

Due to constant further development and improvement of our machines, deviations between the status of the technical equipment of the machine and the status of these operating instructions may occur.

Deviating specifications, illustrations and descriptions, designations, possible faults or errors do not constitute a reason for asserting any claims.

In this case or if this document

- is required in another language,
- has become illegible / unusable,
- is needed as a PDF file,

the required documents can be downloaded from the Strautmann website at www.Strautmann.com, requested from a Strautmann dealer or from the Strautmann customer service.

Declaration of delivery

Only the completely filled in and signed declaration of delivery will secure the warranty claim according to our sales terms and delivery conditions.

Please send the declaration of delivery completely filled in and signed to the manufacturer.

Other relevant documents

In addition, further documents shall apply, such as e.g. documentation of sub-suppliers, workshop manual and circuit diagrams. Observe and always adhere to the specifications and instructions contained therein.

► see section 12 Other relevant documents, page 290

1.1 Target group

These operating instructions are primarily intended for the operator of the machine.

Operator

The operator has been instructed in working with the machine and informed about possible risks in case of improper behaviour.

Qualified staff

The members of staff have completed the respective professional training qualifying them to carry out maintenance and troubleshooting work.

Minimum qualification and staff requirements

► see section 2.6.1 Staff requirements, page 24

1.2 Representational conventions

To facilitate easy and fast comprehension, different information in these instructions is represented or highlighted as follows:

1.2.1 Activities and lists

Activities which have to be carried out in a predetermined order are specified as numbered instructions. In some cases, an arrow marks the response of the machine to the respective instruction.

Instructions

1. First step
2. Second step
3. …

→ Response of machine

Adhere to the order of the steps.

Lists without predetermined order

Introductory phrase

- Information
- Information
- …

Subordinate lists

- Subitem
- Subitem
- …

Position numbers in figures, legends, continuous text

1 Machine part
2 Machine part
3 …

Position numbers in a continuous text are indicated in parentheses (1).

Lines of position in figures

Starting from the position numbers, the lines of position refer to the respective components.

A line without an arrow means that the machine part can be seen in the figure.

A line with an arrow means that the machine part is hidden in the figure and is therefore not visible.

1.2.2 References and further information

References

A preceding arrow head ► indicates a reference to further information elsewhere in the operating instructions.

Example:

► Please refer to paragraph 9.10, page 21.

Notes and additional information

NOTE

Notes are highlighted as shown here.

- Notes contain additional information, recommendations and tips.
- Notes do not contain any warnings of risks.

Environmental protection

This symbol marks information about environmental protection.

1.2.3 Location details

Any directional data in these operating instructions refer to the direction of motion.

1.2.4 Warning signs

Signal words

Warning information is highlighted by a signal word. The signal word explains the extent of a risk. The signal words DANGER, WARNING and CAUTION mark risks to people.

Risks to people are additionally marked by the general hazard symbol ⚠. It is imperative to observe these warning signs to avoid injuries or death.

The signal word *ATTENTION* marks risks of material damage. The information regarding material damage is not preceded by a symbol.

Risk levels

⚠ DANGER

Marks a dangerous situation which will cause serious injuries or even death if it is not prevented.

⚠ WARNING

Marks a dangerous situation which may cause serious injuries or even death if it is not prevented.

⚠ CAUTION

Marks a dangerous situation which may cause injuries if it is not prevented.

ATTENTION

Marks measures to avoid material damage.

Paragraph-related warning information

Paragraph-related warning information refers to entire chapters, a paragraph or several paragraphs in these instructions.

Paragraph-related warning information is structured according to the following layout:

SIGNAL WORD

Kind and source of risk

Possible consequences in case of non-observance of risk

- Measures to avoid a dangerous situation.

Embedded warning information

Embedded warning information is situation-related and refers to a certain activity or to a part within a paragraph.

Embedded warning information is structured according to the following layout:

⚠ **SIGNAL WORD** – Kind of risk. Measures to avoid a dangerous situation.

1.3 Applied terms

Term	Description
Third person/party	All other persons apart from the operator.
Risk	The source of a possible injury or damage to health.
Manufacturer	B. Strautmann & Söhne GmbH u. Co. KG
Machine	Forage wagon Magnon 8-370 - 8-450 (DO), 10-430 - 10-530 (DO) Continuous-Flow-System
Trailer	Forage wagon Magnon 8-370 - 8-450 (DO), 10-430 - 10-530 (DO) Continuous-Flow-System
Towing vehicle	Tractor which powers and tows the machine.
Tractor	Towing vehicle which powers and tows the machine.
Operating element	Part of an operating device, which is directly actuated by the operator, e.g. by pressing. An operating element may be an adjusting lever, a key button, rotary switch, key etc.
Shop work	Fundamental expert knowledge, especially qualified staff and adequate means (tools, lifting and supporting equipment) are required to carry out shop work in a professional and safety-conscious way.
Authorised workshop	Only authorised workshops having special expert knowledge, especially trained and qualified staff and adequate means (tools, lifting and supporting equipment) at their disposal are allowed to carry out work marked by this term on the machine.

Tab. 1: Terms

1.4 Abbreviations

Abbreviation	Description
StVZO	Road Traffic Licensing Code
SES	Strautmann Electronic Steering
ALB	Automatic load-sensitive brake pressure regulator
DO	Machine equipped with beaters
LS	Load-sensing hydraulic system

Tab. 2: Abbreviations

2 Safety

This chapter contains basic safety instructions and information and provides an overview of all important safety aspects. Further individual safety instructions are included in the descriptions of the machine components as well as in the task-related paragraphs and operating instructions about the individual phases during the life cycle. Their observance serves the safety of all persons as well as the prevention of damage and accidents.

2.1 Correct use

The "Magnon / Magnon DO" forage wagon models are exclusively intended for normal use in the course of agricultural work:

- For charging, cutting, transport and distribution of green, leaf and dried-out forage.
- For transport and distribution of chopped forage.

Depending on the model, the maximum admissible speed is usually 40 km/h.

The machine is only allowed to be operated by **one** person.

Slopes / Load-bearing grounds with maximum gradient can be travelled on as follows:

- Traversing hills

  Direction of travel to the left 11.3 ° (20 % uphill/downhill gradient)

  Direction of travel to the right 11.3 ° (20 % uphill/downhill gradient)
- Slope line

  Uphill 11.3 ° (20 % uphill gradient)

  Downhill 11.3 ° (20 % downhill gradient)

The following is also part of the correct use:

- The observance of all instructions contained herein,
- the adherence to the inspection and maintenance work,
- the exclusive use of original Strautmann spare parts.

Any use beyond the above is prohibited and will be regarded as incorrect.

For any damage resulting from incorrect use

- the user will be solely responsible,
- B. Strautmann & Söhne GmbH u. Co. KG will not assume any liability.

2.2 Reasonably foreseeable misuse

The following points describe a reasonably foreseeable misuse of the machine:

- Non-observance of the safety labels attached to the machine and of the safety instructions included in the operating instructions
- Use of the machine beyond the limits specified under Correct Use
- Transport and processing of other materials with the machine that are not specified under Correct Use
- Overloading the machine
- Participation in road traffic with overloaded machine
- Travelling with the brake system not ready for operation
- Transport journeys with lifted lift axle
- Accidental actuation of hydraulic functions during transport journeys
- Travelling as passengers on the machine
- Entry into the cargo space through the access hatch or the tailgate with the machine running
- Performance of troubleshooting, setting, cleaning, maintenance, service and repair work contrary to the instructions contained in the operating instructions
- Unauthorised alterations of the machine
- Installation of non-released/non-approved additional equipment
- Operation of the machine with overload clutches not functioning properly
- Replacement of shear bolts by bolts of greater shear force
- Non-observance of applicable road traffic regulations, safety regulations and accident prevention regulations
- Operating the machine without valid vehicle registration documents (registration / operating license) and insurance cover
- Use of non-original Strautmann spare parts

2.3 Safety-conscious working

Observe as the basic prerequisite for safe working:

- All specified safety and warning information as well as the instructions in these operating instructions
- Instructions regarding correct use
- Warning signs on the machine
- General national occupational safety, accident prevention and environmental protection rules
- National road traffic regulations for transport journeys
- Operation of the machine only in a sound safety-related condition
- Wearing of personal protective equipment
- Make sure that third parties and animals leave the hazardous area before operating the machine. Particularly be aware of children.
- Never carry passengers, animals or objects on the machine.

2.4 Technical alterations

You are only allowed to carry out technical alterations, extensions or modifications on the machine with the prior written consent of the manufacturer.

The manufacturer will not assume any liability for damage resulting from:

- Unauthorised alterations of the machine
- Use of non-approved parts
- Welding, cutting and drilling work on load-bearing parts of the machine

In case of non-observance, the declaration of conformity and the CE symbol of the machine will become invalid. Furthermore, the operating license / type approval according to national and international regulations will become invalid.

2.5 User’s obligation

The user himself is responsible for observance of the binding laws, rules, applicable local provisions and national regulations.

The user is obliged

- to exclusively have staff working with and on the machine who have been instructed how to operate the machine and possess the minimum qualification.
- to provide the necessary personal protective equipment.
- to keep all warning signs attached to the machine in legible condition. Immediately replace missing or damaged warning signs.

2.6 Operator’s obligation

Any people charged to work with and on the machine are obliged

- to acquaint themselves with the machine before starting work.
- to observe the general national occupational safety, accident prevention and environmental protection rules.
- to adhere to the instructions in these operating instructions.

2.6.1 Staff requirements

The different works described in these operating instructions place different requirements on the qualification of the people entrusted with such works.

Inexperienced and insufficiently qualified members of staff are not able to evaluate the risks associated with the handling of the machine, thus endangering themselves and other people.

- Only trained and instructed members of staff, who have been informed about the risks, are allowed to carry out the work.
- Members of staff to be trained must be supervised by experienced qualified staff members when working on the machine.
- Only people are allowed to perform this work who are physically and mentally capable and who are expected to carry out such tasks reliably and in professional and safety-conscious manner.
- Only authorised workshops are allowed to carry out work requiring special expert knowledge, tools or auxiliary materials.

Unless otherwise provided by law, the admissible members of staff, their minimum qualification and their deployment are defined according to the machine's life cycle. See the following table:

NOTE

We recommend to attend a Strautmann service training.

Staff	Activity	Qualification	Life cycle
Qualified staff for load transport	Transport and loading/unloading	Proven experience in handling suspended loads and securing loads*	Transport, loading
Qualified staff (mechanics, hydraulics, pneumatics)	Work on mechanical, hydraulic and pneumatic components	Vocational training as an agricultural mechatronic technician or an equal professional qualification (internal training course and/or external training)*	Commissioning, troubleshooting, maintenance
Qualified electricians	Electro-technical work	Professional training in electrical engineering or an equal professional qualification (internal training course and/or external training)*	Commissioning, troubleshooting, maintenance
Operator	Operation and use of machine	Person instructed by the user, based on the operating instructions, about the functioning of the machine and the risks that may occur during work	Commissioning, operation, handling, troubleshooting, maintenance
Qualified staff (disposer)	Professional disposal	Knowledge of the disposal regulations applicable at the place of operation	Disassembly, disposal

Tab. 3: Qualifications of staff

*minimum professional experience of three years

2.6.2 Personal protective equipment (PSA)

Various work activities on the machine require personal protective equipment. Wearing the personal protective equipment protects your safety.

- Wear the required personal protective equipment when carrying out work on the machine.

	**Wear safety footwear** Safety footwear provides a good anti-slip effect and protects the feet against falling objects.
	**Wear protective gloves** Protective gloves protect the hands against slight crushing, cuts, infections and hot surfaces.
	**Wear protective clothing** Close-fitting protective clothing protects people against becoming entangled by moving machine parts. Furthermore, the protective clothing protects the skin against slight mechanical effects.
	**Wear protective goggles** Protective goggles protect the eyes against flying particles and operating media squirting out.

2.7 Risk potential and residual risks

Basic risks of the machine are indicated here.

The residual risks are determined by means of a risk evaluation. Any people working on the machine, must

- be aware of such residual risks.
- have been internally instructed, taking into account the professional qualification.
- adhere to instructions to minimise residual risks and avoid accidents or damage.

2.7.1 Hazardous area and dangerous spots

The hazardous area is the area within and/or in the vicinity of a machine, in which the safety or health of people might be impaired.

People are not allowed in the hazardous area

- if the tractor engine is running with the propeller shaft coupled/the hydraulic/electronic system connected.
- if tractor and machine are not secured against accidental starting and rolling.

Only when there are no people within the hazardous area of the machine, is the operator allowed to

- move the machine.
- set movable machine parts from transport to working position and from working to transport position.
- power working tools.

The machine is only allowed to be operated from the driver seat of the tractor when there are no people within the machine’s hazardous area.

Risks may arise due to the following situations:

- Work-related movements of the machine and its working tools
- Substances or foreign objects being flung out of the machine
- Accidental lowering of the lifted machine/of lifted machine parts
- Accidental starting and rolling of the machine/of tractor and machine
- Overturning of machine due to inappropriate driving, traversing hills, driving on soft ground or due to incorrect operation of the passive steering
- Due to accidental touching of electrical overhead lines or inadmissible approach to high-voltage overhead lines.
- Lightning strike to the machine during thunderstorm

Dangerous spots

- within the drawbar area between tractor and machine
- within the area of the powered propeller shaft
- beneath the machine
- beneath the lifted, unsecured tailgate
- within the area of powered beaters (if available)
- within the area of the powered transport floor
- in the cargo space with the machine powered
- within the area of the powered pick-up
- within the area of the pick-up, when lifting and lowering the pick-up
- within the area of the cutting unit, when extending and retracting

2.7.2 Risks due to moving parts

Easily accessible moving parts may cause serious injuries or even death. Risk of being trapped, drawn in or caught by moving parts.

- Keep a safety distance from the moving parts.
- Never open covers during operation.
- Wait for the machine to stop completely before carrying out maintenance and repair work.
- Observe the follow-up time. Make sure that machine parts are no longer moving before opening covers.
- Wear close-fitting clothing.
- Do not wear any rings, necklaces or other jewellery.
- If you have long hair, wear a hairnet.
- Secure tractor and machine against starting and rolling, in order to prevent unintentional machine movements.

Pay particular attention during propeller shaft operation to the following:

- The operating instructions for the propeller shaft. Specifications in the sub-supplier documentation shall prevail.
- A protective device in proper condition must each be mounted at the p.t.o. shaft of the tractor and of the machine.
- Mounting and dismounting of the propeller shaft is only allowed
  - with the p.t.o. shaft switched off.
  - with the tractor engine turned off.
  - with the ignition key pulled out.
  - with the parking brake applied.
- Never switch the propeller shaft on with the tractor engine turned off.
- Slip the protective element onto the p.t.o. shaft stub after removal of the propeller shaft.

2.7.3 Risks due to hydraulic and pneumatic energy

Hydraulic and pneumatic components under pressure may perform uncontrolled movements in case of improper handling. Furthermore, medium may squirt out under high pressure from pressurised components in case of a malfunction. Risk of serious injuries or even death.

- Only an authorised workshop is allowed to carry out work on hydraulic and pneumatic components.
- Before carrying out any work,
  - depressurise; discharge residual energies.
  - make sure to prevent accidental outflow of the medium.
  - secure lifted movable machine parts against accidental lowering.
  - turn the engine off. Pull the ignition key out.
  - apply the parking brake.
- Have all hose pipes checked for their operational safety by an expert at least once a year.
- Regularly check all pipes, hoses and screwed connections for leakage and visible damage. Eliminate damage immediately.
- Never try to plug hose pipe leaks with your hands or fingers. Media squirting out under high pressure may penetrate the skin and enter the body, potentially causing serious injuries.
- Never detect leakages with your bare hands. Immediately contact an authorised workshop if a leak is suspected.
- Immediately contact the medical services if injuries caused by hydraulic oil occur. Risk of serious infection.
- Risk of explosion due to improper work on hydraulic accumulators.
  - Welding, soldering, drilling or other work which might affect the mechanical properties is not allowed.

2.7.4 Risks due to electrical energy

Danger to life due to electric current when coming into contact with conductive parts. Risk of serious injuries or even death. Furthermore, switched-on electrical machine parts may perform uncontrolled movements.

- Do not reach into conductive areas.
- Have work on electrical systems and operating media carried out by qualified electricians only and in accordance with electro-technical regulations.
- Before carrying out any work on the electrical system, de-energise the system, e.g. disconnect the machine's power supply from the tractor or disconnect the battery's minus pole.

- Ensure correct order when connecting and disconnecting the battery:
  - Connection: First connect the plus pole, then the minus pole.
  - Disconnection: First disconnect the minus pole, then the plus pole.
- Always cover the plus pole of the battery as required. Risk of explosion in case of accidental ground.
- Avoid sparking and open fire in the vicinity of the battery. Risk of explosion.
- Only use the specified fuses. If the rating of the fuses used is too big, the electrical system may be destroyed. Risk of fire.
- Regularly check the electrical equipment for damage. Risk due to loose cable connections and scorched cables. Remedy defects immediately.
- Keep humidity away from conductive parts. Risk of a short circuit.
- The machine can be equipped with electronic components, the functioning of which may be affected by electromagnetic emissions of other devices. Such interferences may be a risk to people if the following safety instructions are not observed:
  - In case of a retrofitting of electronic components into the machine and their connection to the on-board electrical system, the staff authorised by the user must check on their own responsibility whether the retrofitted parts interfere with the vehicle electronics or other components.
  - Retrofitted electronic components must comply with the EMC directive as amended from time to time and bear the CE symbol.
- Never connect electrical consumers such as additional work lights to the electrical system of the machine without authorisation.

2.7.5 Risks due to hot spots and fire hazards

Risk of burns due to high surface temperatures at components and/or the drives of the machine.

- Keep a safety distance from hot components.

When carrying out work on or in the vicinity of hot spots of the machine,

- wear appropriate protective clothing.
- switch all machine parts off and allow them to cool down.

People can be seriously injured or killed by fire. Fire hazards arise from:

- Accumulation of combustible materials at hot spots.
- Damage, chafing points and leaks at electrical lines / hydraulic pipes.
- Foreign objects at movable machine parts.
- Defective machine parts.

To prevent fire hazards:

- Keep the machine in a clean condition. Immediately remove easily inflammable material such as dust and dry fodder, dirt accumulation, hay, straw, etc.
- Avoid material accumulation on rotating parts.
- Observe the maintenance intervals and adhere to the lubricant regulations.
- Check all lines (hydraulic and electrical) for proper condition. Have damage, leakage and chafing points promptly eliminated.
- Check and clean the machine several times a day if necessary.

2.7.6 Risks when handling chemical substances

Contact with oils, greases and other auxiliary materials may provoke chemical reactions. Risk of scalding when handling hot operating media and auxiliary materials.

- Observe and adhere to the applicable regulations and safety data sheets of the manufacturers when handling chemical substances.
- In case of contact with the eyes or skin, rinse the affected spot immediately with plenty of water.

2.8 Safely park tractor and machine

Risk due to accidental contact with powered, unsecured working tools and lifted, unsecured machine parts when working on the machine.

Therefore, safely park the tractor and the hitched machine before carrying out any work on the machine such as e.g. setting work or trouble-shooting.

1. Park tractor and machine on firm, even ground.
2. Lower lifted, unsecured machine parts to a secure stop position.
3. Apply the tractor's parking brake.
4. Secure tractor and machine against rolling by means of chocks.
5. Turn the tractor engine off.
6. Pull the ignition key out.
7. Keep third parties, particularly children, away from tractor and machine.
8. Secure the machine against unauthorised use.

2.9 Road safety

Hitched and attached machines change the driving characteristics of the tractor. The driving characteristics depend on the operating state and on the ground. Inappropriate driving may cause serious accidents involving high material damage and serious personal injury.

- Prior to road travel, ensure not to exceed the maximum admissible dimensions, weights, axle, tongue and towed loads.
- Prior to road travel, secure working tools and hydraulic functions against accidental actuation.
- Observe the loading condition, ensure sufficient tongue load if the machine is partly empty.
- Lower the lift axle.
- Adapt driving to the conditions. Consider your personal abilities as well as the road, cornering, traffic, visibility and weather conditions and the driving characteristics of the machine.

Avoid danger to other road users.

- Check the lighting system for proper functioning prior to road travel.
- Ensure proper installation of the traffic-related equipment prior to road travel.
- Avoid road contamination.

Brake system:

- The brake system of the tractor must be compatible with the brake system of the machine.
- In case of a manual brake pressure regulator, adapt the braking force to the respective loading condition.
- Always carry out a visual inspection and a functional check of the brake system (brake test) prior to the start of a journey.
- Have malfunctions, leakages and defects promptly remedied by an authorised workshop.
- Have the brake system regularly (according to the maintenance plan) checked by an authorised workshop.
- Only authorised workshops are allowed to carry out adjustment and repair work on the brake system.

Additionally observe the following for compressed-air brake systems:

- Ensure cleanliness during coupling and uncoupling of coupling heads to prevent malfunctions of the brake system due to contamination.
- The brake system of the hitched machine is only ready for operation when the pressure gauge on the tractor indicates 5 bar.
- Drain the air reservoir every day.

Axles:

Overloading axles reduces the service life of the axle bearings and causes damage to the axles. Damage or improper work on axles and chassis may cause sudden failure, endanger operational safety or cause accidents.

- Do not overload the machine.
- Do not bump into curbs.
- Do not exceed the speed limit.
- Exclusively use tyres approved by the manufacturer.

With the passive steering axle unlocked, unintentional machine movements may occur.

- Lock the passive steering axle at higher speeds, in order to achieve improved driving stability.
- Lock the passive steering axle when travelling on uneven roads.
- Lock the passive steering axle when traversing hills.
- Lock the passive steering axle when travelling on soft ground (e.g. when travelling over clamp silos).

Wheels and tyres:

Damage or improper work on wheels and tyres may cause sudden failure, endanger operational safety or cause accidents.

- Have damaged, worn or too old tyres replaced by an authorised workshop.
- Remove stones, pebbles, nails and other foreign objects stuck in the tyre, as otherwise they further penetrate the tyre.
- Never overload tyres.
- Ensure that the tyre pressure is properly adapted to the load and the kind of work performed by the machine.
- Check the tyre pressure at least every 2 weeks. If the machine has not been used for a longer time, check the tyre pressure before putting the machine into operation again.
- Check the tyres during operation for "folds" or other abnormal deformation.
- Ensure that the caps are seated on the valves and have been tightened.
- Only authorised workshops equipped with appropriate fitting tools are allowed to carry out repair work on tyres and wheels.
- Only mount tyres approved by the manufacturer.

- When changing the tyre size, check the traffic-related equipment such as splash guard system, warning plates, lighting, underride guard and the brake system for proper setting and adapt it if necessary.
- Only place the lifting device at the marked fixing points when changing tyres.
- Tighten or retighten the fastening screws and nuts according to the specifications of B. Strautmann & Söhne GmbH u. Co. KG.
- Relieve the tyres if they are not intended to be used for a longer period, in order to avoid deformation. Store "loose" tyres in a dark place, free of oil and other chemicals. Do not place tyres near electric motors, as the ozone produced by the motors slowly desiccates the rubber.

2.10 Service life of machine

- The service life depends on the proper use, maintenance and service as well as on the operating conditions and conditions of use of the machine.
- By observing the instructions and notes included in these operating instructions, constant readiness for operation and a long service life of the machine can be achieved.
- The replacement of worn or damaged parts can extend the machine's service life.

2.11 Repair / Disassembly / Disposal

Improper disassembly may cause significant damage to health, property and the environment due to machine parts tipping over or falling and leaking operating media.

Only qualified staff is allowed to repair, disassemble and dispose of the machine.

Machine parts and operating media must be disposed of properly.

2.12 Environmental protection

Improper or careless use of hazardous substances may cause serious environmental pollution.

- Dispose of oils, greases and other auxiliary materials and consumables in accordance with the environmental regulations.
- Observe applicable local regulations regarding the disposal.
- Observe the manufacturers' specification and safety data sheets for the individual substances.
- Additionally observe the specifications in the sub-suppliers' documentation.
- Have any leaks repaired immediately.
- After proper disassembly, take worn or damaged machine parts to an appropriate recycling centre or dispose of them properly.

2.13 Hygiene measures

Health hazard and transmission of infections due to contact with operating media, cleaning agents, fodder residues and contamination

- Avoid contact with forage, fodder additives, operating media and cleaning agents.
- Avoid contamination of forage by operating media, spoiled fodder residues, dirt and cleaning agents.
- Use environmentally friendly, food-safe, biodegradable greases.
- Wear appropriate personal protective equipment.
- In case of skin contact, thoroughly clean the affected areas without delay.
- Change contaminated personal protective equipment.
- Clean used tools.
- Keep the machine clean, promptly remove fodder residues.
- Adhere to general hygiene measures.

2.14 Warranty and liability

As a basic principle, our "General Sales Terms and Delivery Conditions" shall apply. They have been handed over to the user upon conclusion of contract at the latest.

Any warranty and liability claims in case of personal injury and material damage will be excluded if they are due to one or several of the following reasons:

- Non-observance of these instructions
- Incorrect use
- Improper assembly, commissioning, operation and maintenance of the machine
- Operation of the machine with defective, improperly installed or inoperable safety and protective devices
- Unauthorised modifications and technical alterations
- Deployment of non-trained staff
- Neglected maintenance
- Insufficient inspection of machine parts subject to wear
- Failure to carry out in due time, omit or neglect inspection, cleaning, service, maintenance and repair work.
- Improperly effected repairs
- Use of non-authorised spare parts
- Disasters due to foreign objects and force majeure

Technical modifications within the framework of an improvement and further development of the machine are reserved.

2.15 Safety and protective devices

Observe the following points, in order to ensure a sound condition and proper functioning of the safety and protective devices:

- Do not damage, modify, remove or disable protective devices. Increased risk of injury.
- It is not allowed to open protective devices
  - when the machine is powered.
  - as long as the tractor engine is running with the propeller shaft coupled/the hydraulic system connected.
  - if the ignition key is in the tractor and the tractor engine can be accidentally started with the propeller shaft coupled/the hydraulic system connected.
  - if tractor and machine have not been secured against accidental rolling by means of their respective parking brake and/or the chocks.
- Immediately replace missing or defective safety and protective devices.

The machine is equipped with the following safety and protective devices:

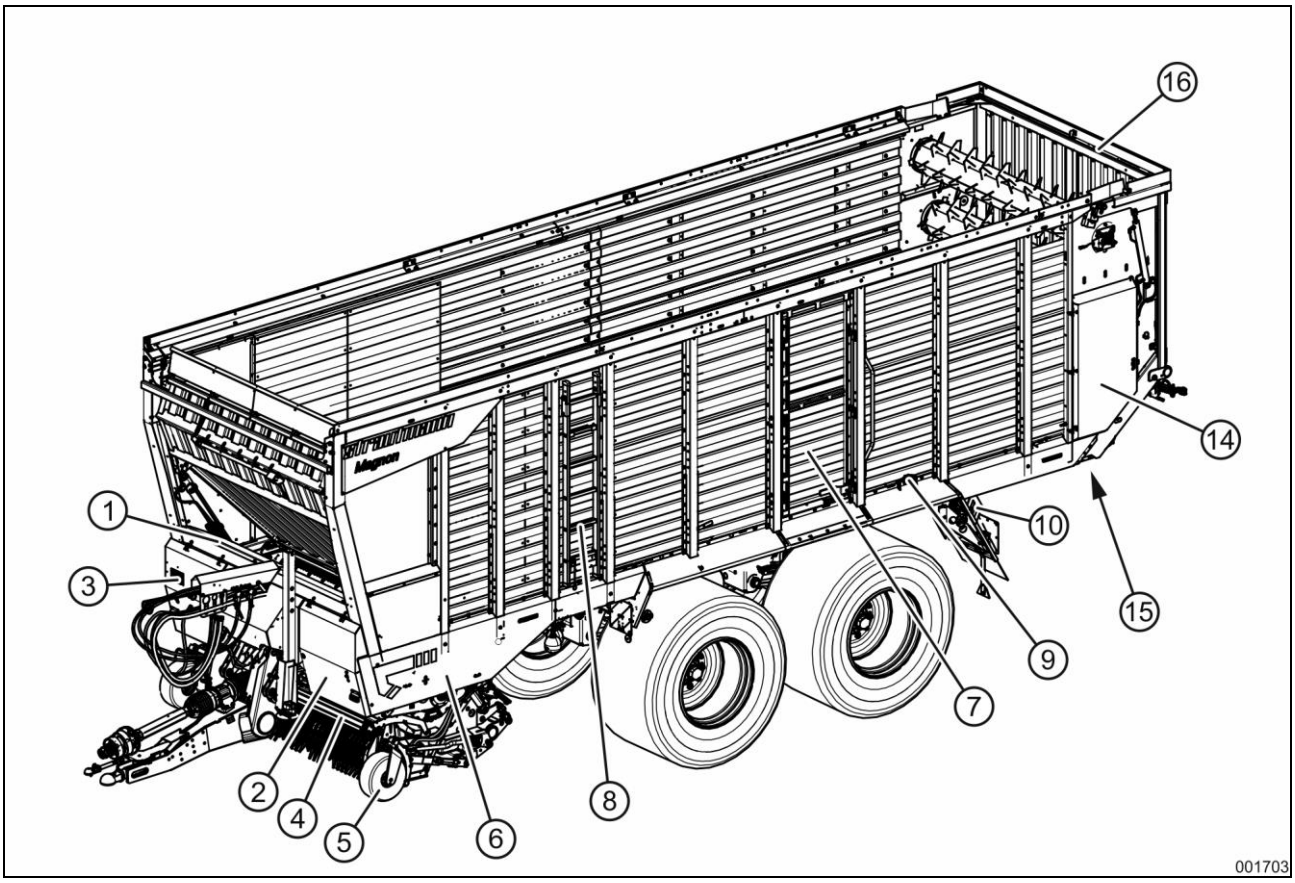


Fig. 1

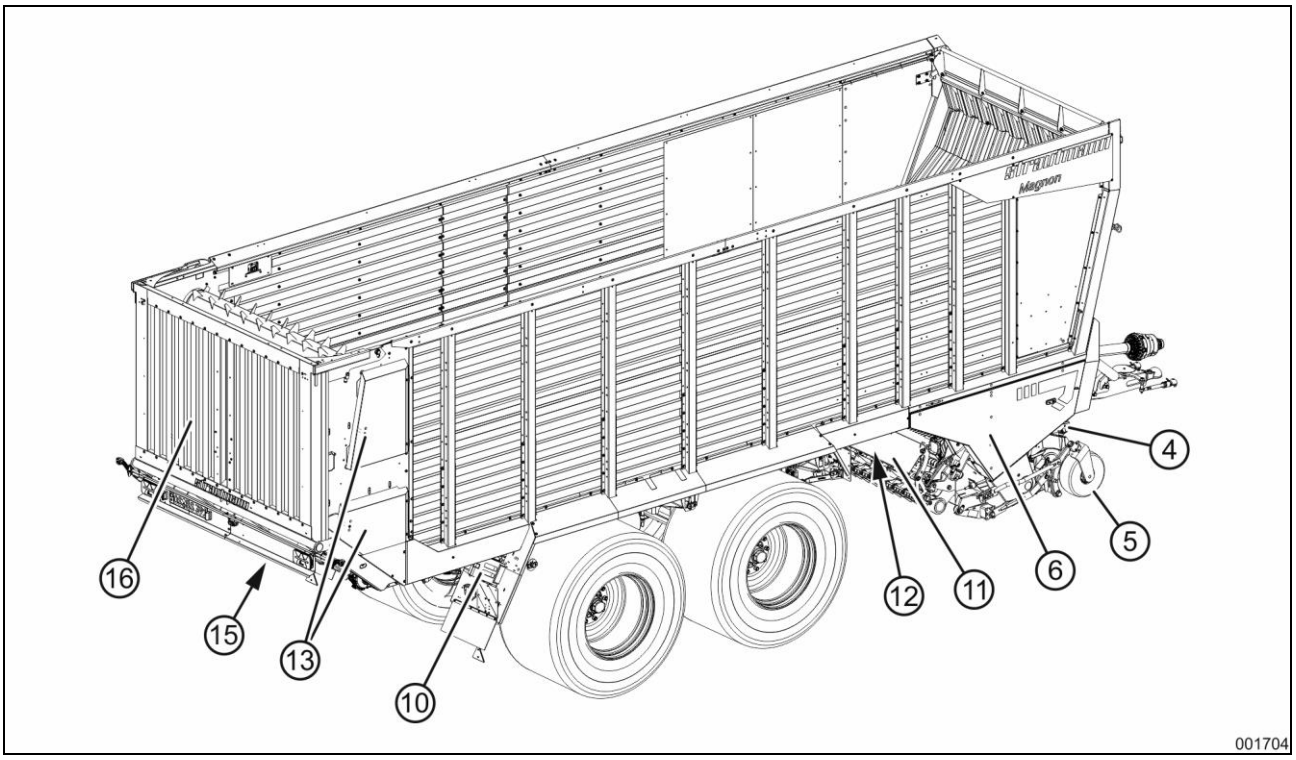


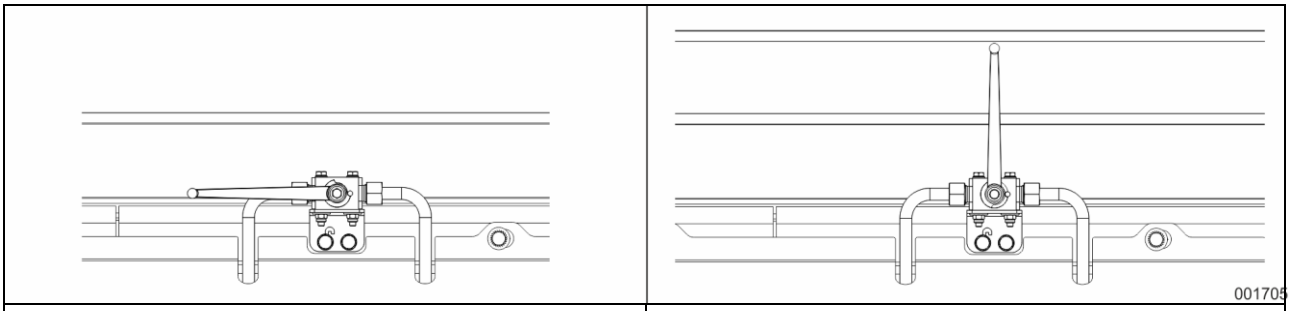
Fig. 2

1 Cover plate, feeder rotor and hydraulic system
2 Bonnet, feeder rotor drive
3 Bonnet, beater drive coupling
4 Holding-down device with pulley
5 Guide wheel
6 Side guard
7 Access door to cargo space
8 Ladder for access door
9 Stop-cock
10 Chocks
11 Cover plate, cutting unit
12 Safety guard, transport floor deflector
13 Side guard, beater drive, right-hand
14 Side guard, beater drive, left-hand
15 Bottom cover plates for feed shaft
16 Tailgate

2.15.1 Lock tailgate

The tailgate can be locked via the stop-cock to secure it against accidental lifting and lowering. The stop-cock is positioned on the left-hand side next to the access door.

The table shows the meaning of the stop-cock positions.



I – Stop-cock open	0 – Stop-cock closed

Fig. 3

Stop-cock	Tailgate	Activity
0 - Closed	Lifted and locked	Trouble-shooting, cleaning, service and maintenance work
I - Open	Not locked Lifting and lowering possible	Charging and discharging

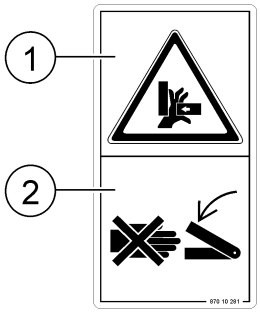
Tab. 4: Tailgate

2.16 Signs at the machine

Labels and signs may become soiled or otherwise unrecognisable. Thus, risks and important information may not be recognised and observed.

- Keep signs and labels in a clearly legible condition at all times.
- Do not remove or cover signs.

2.16.1 Warning signs



Warning signs mark dangerous spots on the machine and warn about residual risks.

A warning sign consists of two pictographs:

1 Pictograph for description of risk, surrounded by a triangular hazard symbol

2 Pictograph for avoidance of risk with illustrative instruction

All warning signs attached to the machine include:

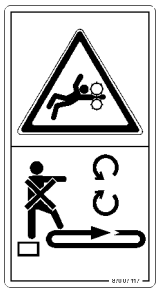
- Order number
- Description of risk
- Consequences in case of non-observance
- Instruction how to avoid the risk

87007104

Risks if people stand within the swivelling range of the tailgate

If people stand within the swivelling range of the tailgate, there is a risk of most serious injuries or even death due to any part of the body being crushed.

- People are not allowed within the swivelling range of the tailgate as long as the tractor engine is running with the propeller shaft coupled/the hydraulic system connected.
- Make sure that people leave the swivelling range of the tailgate before opening or closing the tailgate.

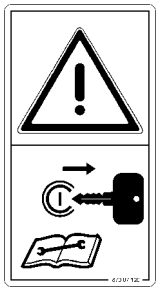


87007117

Risk to the body of being drawn in or becoming entangled due to powered working tools

Powered working tools may cause serious injuries or even death.

- Never enter the cargo space as long as the tractor engine is running with the propeller shaft coupled / the hydraulic/electronic system connected.

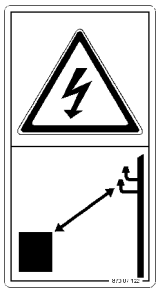


87007120

Accidental starting or rolling of tractor and machine

Risk of serious injuries or even death if accidental movements are triggered during mounting, setting, troubleshooting or maintenance work.

- Secure tractor and machine against accidental starting and rolling before carrying out any work on the machine.
- Observe the instructions in the respective chapters of the operating instructions depending on the work to be carried out.



87007122

Electric shock or burns due to accidental touching of electrical overhead lines

Accidental touching or inadmissible approaching of high-voltage overhead lines may cause serious injuries or even death.

- Keep an adequate safety distance from high-voltage overhead lines.

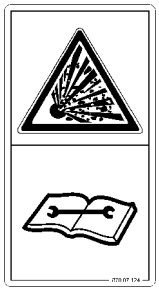
Nominal voltage	Safety distance
up to 1 kV	1 m
over 1 up to 110 kV	3 m
over 110 up to 220 kV	4 m
over 220 up to 380 kV	5 m
unknown	5 m

87007123

Hydraulic oil squirting out under high pressure caused by leaking hydraulic hose pipes

Hydraulic oil squirting out under high pressure may penetrate the skin and enter the body, potentially causing serious injuries or even death.

- Never use your hand or fingers to seal leaks.
- Read and observe the operating instructions before carrying out service and maintenance work on hydraulic hose pipes.



87007124

Risk of explosion of pressure accumulator

The pressure accumulator being under gas and oil pressure may explode or hydraulic oil may squirt out under high pressure. This risk may cause most serious injuries or even death.

- Read and observe the information in the operating instructions before carrying out any work on the hydraulic system.
- Immediately contact the medical services if injuries caused by hydraulic oil occur.

87007126

Running-over of people due to accidental rolling of the machine parked in unsecured condition

Rolling machines may cause serious injuries or even death.

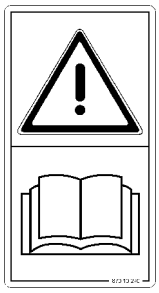
- Secure the machine against accidental rolling before unhitching the machine from the tractor or before parking the machine.
- Use the parking brake and/or chocks.

87007130

Risk of crushing to people standing between tractor and machine

Risk of serious injuries or even death within the swivelling range of the drawbar between tractor and hitched machine.

- Stop and secure tractor and machine against accidental rolling before carrying out any work on the machine
- Keep people away from the hazardous area.



87010270

Please read and observe the operating and safety instructions before commissioning.

87010276

Risk to the body of being drawn in or becoming entangled due to powered working tools

Powered working tools may cause serious injuries or even death.

- Keep an adequate safety distance from powered working tools.
- Keep people away from the hazardous area.

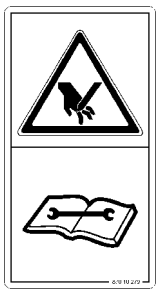
87010278

Risk of becoming entangled and wound up by powered propeller shaft

Rotating parts may entangle people and cause serious injuries or even death.

- Keep an adequate safety distance from the powered propeller shaft.

  The risk exists as long as the tractor engine is running with the propeller shaft coupled.
- Keep people away from the hazardous area.



87010279

Risk of cuts for fingers and hands due to sharp working tools.

Sharp working tools may cause serious injuries including loss of limbs.

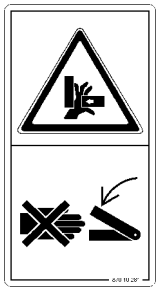
- Read and observe the operating instructions before carrying out work on working tools.
- Wear the prescribed protective equipment.

87010280

Risk to hands or arms of being drawn in or becoming entangled by moving power transmission parts

Powered parts may cause serious injuries including loss of limbs.

- Keep protective devices closed as long as the tractor engine is running with the propeller shaft coupled / the hydraulic/electronic system connected.



87010281

Risk of crushing fingers and hands due to moving parts

Accessible moving parts may cause serious injuries including loss of limbs.

- Never reach into the hazardous area.

  The risk exists as long as the tractor engine is running with the propeller shaft coupled / the hydraulic/electronic system connected.
- Keep an adequate safety distance from the hazardous area.

87010283

Substances flung out of the machine

Risk of serious injuries to people in the hazardous area due to substances or foreign objects being flung out of the machine.

- Keep an adequate safety distance from the hazardous area.
- Keep people away from the hazardous area.

87010284

Risks if people stand beneath the open tailgate

If people stand beneath the open tailgate, there is a risk of most serious injuries or even death due to any part of the body being crushed.

- Never stand beneath the open tailgate without securing it against accidental lowering.
- Ensure that there are no people beneath the open tailgate.

87010287

Breaking of load-bearing parts due to work on frame elements

Load-bearing parts may break due to mechanical work on frame elements. Risk of material damage and serious injuries or even death.

As a basic principle, the following is not allowed:

- Mechanical processing of the chassis
- Drilling at the frame or chassis
- Boring-up of existing holes
- Welding on load-bearing parts.

87010289

Risk due to powered working tools (pick-up and feeder rotor)

Risk to any part of the body of being drawn in and becoming entangled due to powered working tools. Risk of most serious injuries or even death.

- Keep an adequate safety distance from powered working tools.
- Never reach into the hazardous area of powered working tools as long as the tractor engine is running with the propeller shaft coupled/the hydraulic system connected.
- Ensure that people keep an adequate safety distance from powered working tools.

877795002 DE/EN (877795003 FR/ES)

Incorrect operation of the hydraulic brake system may cause dangerous situations!

Action guidelines:

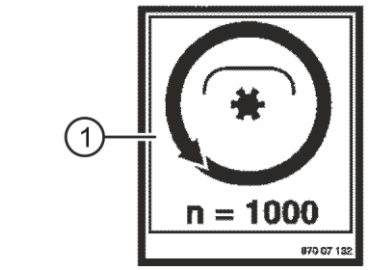
Before each journey:

1. Set the brake pressure regulator (if manually operated) according to load.
2. Carry out a brake test (10 seconds) (to fill the pressure accumulator)

Before uncoupling:

1. Actuate the mechanical parking brake
2. Depressurise the hydraulic brake system (empty pressure accumulator).

2.16.2 Instruction signs



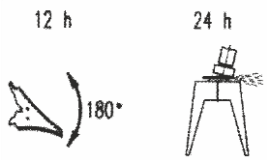
Instruction signs provide information referring to proper use of the machine.

An instruction sign consists of a pictograph.

1 Pictograph with visual or descriptive information or information summarised in a table

All instructions signs attached to the machine include:

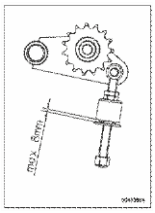
- Order number
- Instruction or explanation how to use the machine properly



50406501

Cutting knives

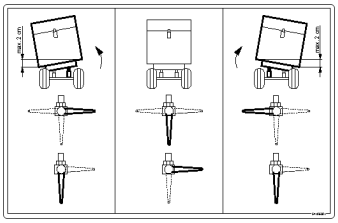
Turn cutting knives over every 12 service hours, grind them every 24 service hours.



50433504

Tension of roller chain

Check the tension of the roller chain at the chain tensioner.

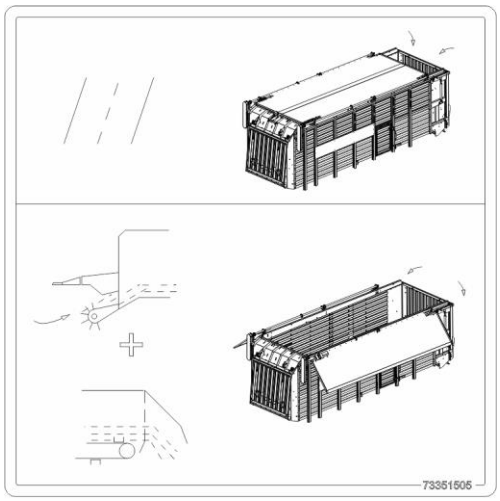


1 2 3

54106501

Adjust travelling height of hydraulic chassis via three-way cock:

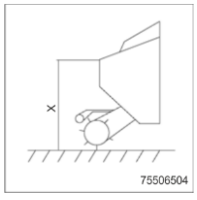
1 Upper stop-cock to the right (open) = right-hand vehicle side preselected
   – Lower stop-cock down (open) = right-hand vehicle side can be lifted (max. 2 cm)
2 Upper stop-cock down (closed) and lower stop-cock to the right (closed) = travelling height cannot be changed
3 Upper stop-cock to the left (open) = left-hand vehicle side preselected
   – Lower stop-cock down (open) = left-hand vehicle side can be lifted (max. 2 cm)



73351505

Covering system

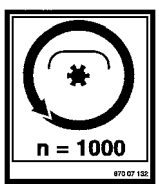
Keep the covering system closed during transport journey, only open it for charging and discharging.



763005000

Folding drawbar

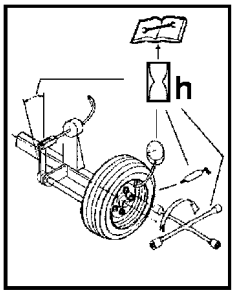
Adjust mounting height of folding drawbar.



87007132

The required driving speed of the machine is 1,000 min^{-1}.

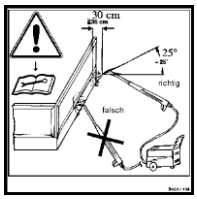
Before switching the propeller shaft on, check whether the selected speed and sense of rotation of the tractor's p.t.o. shaft have been adjusted to coincide with the admissible speed and sense of rotation of the machine.



87007133

Tyre maintenance information

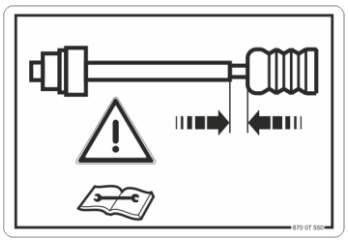
Observe the information for braking axle maintenance in the operating instructions.



87007134

Improper cleaning of machine

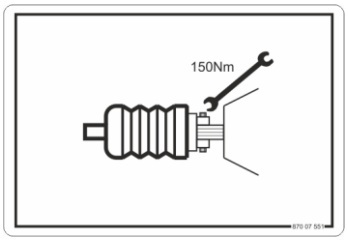
It is imperative to observe the cleaning instructions when using a pressure washer/steam blaster for cleaning the machine.



87007550

Adjust length of propeller shaft

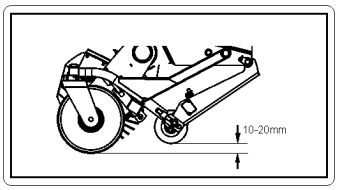
Before putting the machine into operation, shorten the propeller shaft, in order to avoid damage to the tractor and the machine. It is imperative to observe the information in the respective chapter as well as the operating instructions provided by the propeller shaft manufacturer along with the propeller shaft.



87007551

Propeller shaft

Tighten the screws of the propeller shaft on the machine at 150 Nm.



87007556

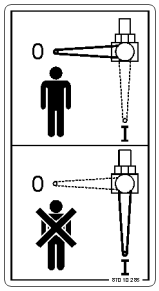
Additional guide wheels

Set additional guide wheels by 10-20 mm higher than the guide wheels

87706091

Note "Lashing point"

Marks lashing points for fixing lashing equipment when transporting the machine

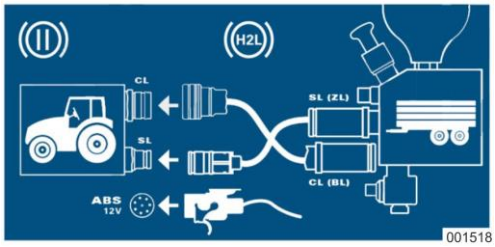


87010285

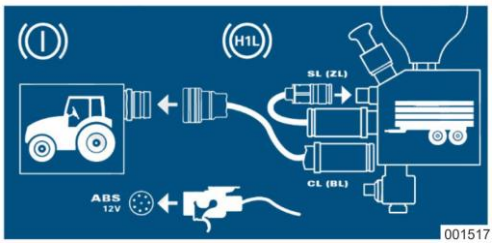
Stop-cock

Close the stop-cock (position 0) to secure the tailgate before carrying out work beneath the lifted tailgate.

87010288
Note "Lifting point"
Marks fixing points of lifting equipment (jack)



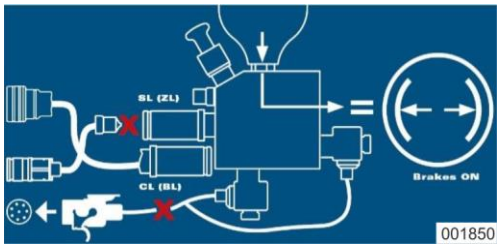
877795000
Connection specification, hydraulic
dual-line brake system
Tractor with hydraulic dual-line brake system



877795000
Connection specification, hydraulic
dual-line brake system
Tractor with hydraulic single-line brake system

NOTE

Observe the national road traffic regulations for operation with single-line brake system.



877795001
Functional note,
hydraulic dual-line brake system
Braking is automatically initiated by means of the accumulated pressure in the pressure accumulator

- if the additional line is torn off or disconnected,
- if the pressure of the additional line falls below 12 bar, e.g. due to actuation of the handbrake, a leakage in the additional line or if the tractor engine stalls.
- if the power supply is interrupted.

The electrical power supply must be applied and a pressure of 15 - 30 bar must be available in the additional line to release a braking operation.

2.16.3 Placing of warning and instruction signs

The following figure illustrates the position of the warning and instruction signs on the machine.

Depending on the machine's equipment, more or less warning and instructions signs than shown here may be available.

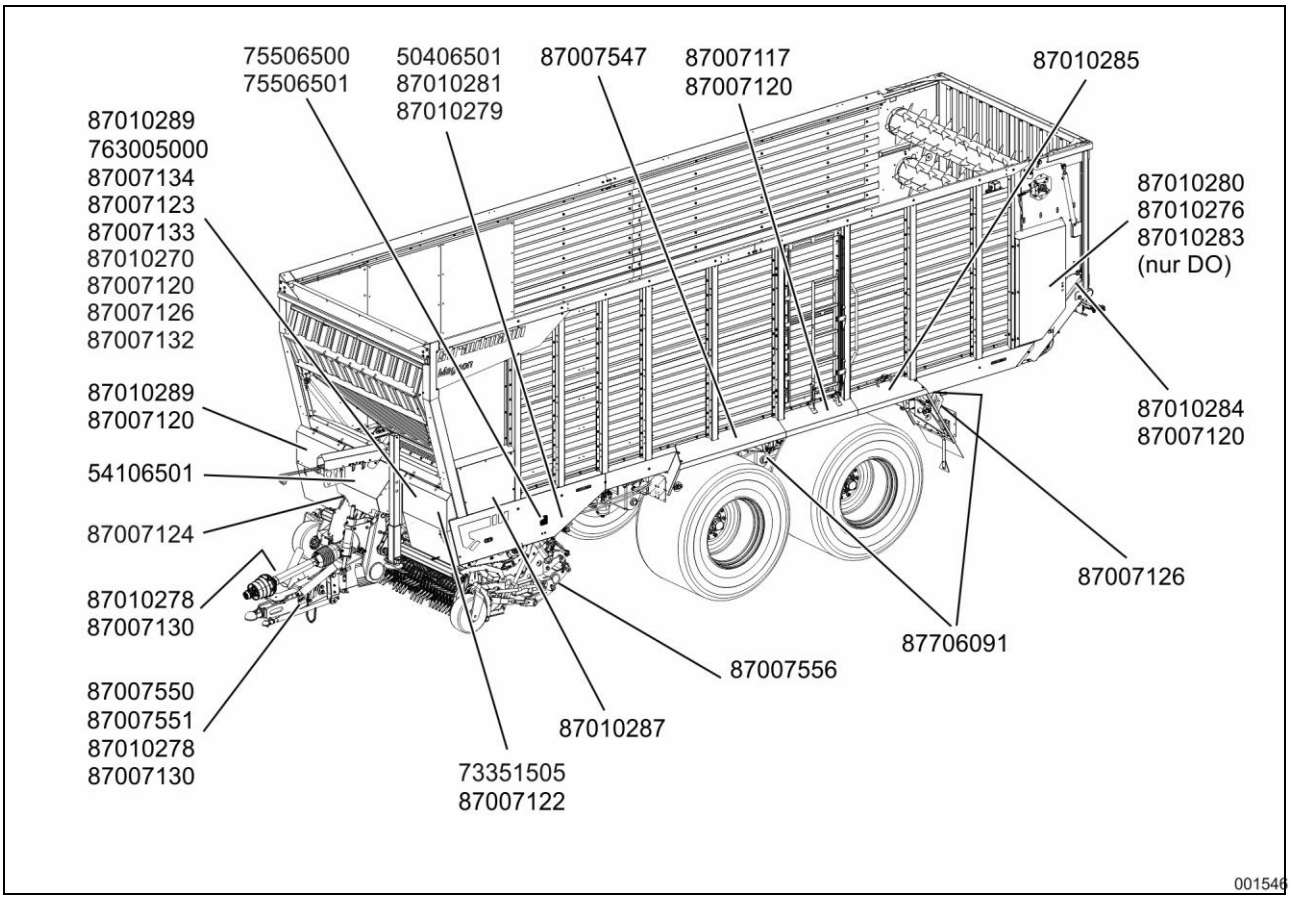

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Fig. 4

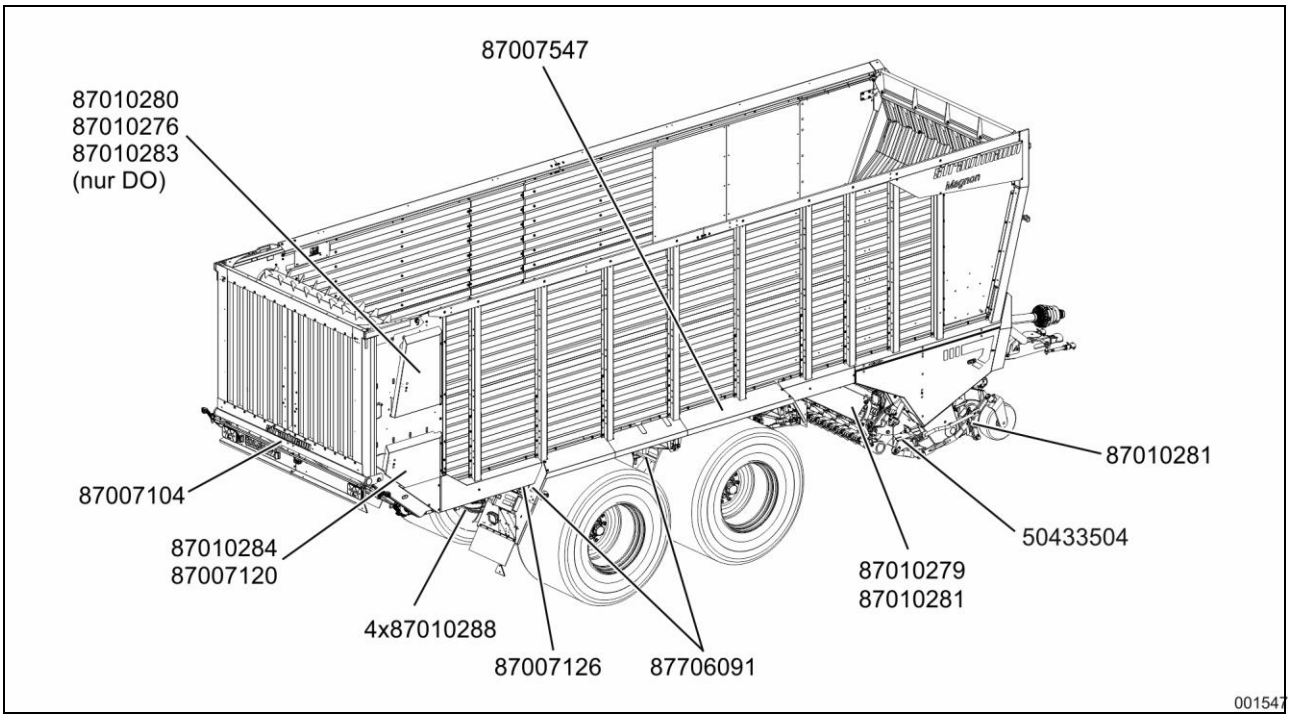
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Fig. 5

3 Technical data

This chapter contains the basic technical data of the machine.

The machines are available with various optional extras and variants. Due to the individual equipment and continuous further development of the machines, not all details described herein might be applicable.

3.1 General data

Designation	Unit	Magnon					
		10-430	10-430 DO	10-470	10-470 DO	10-530	10-530 DO
Gross vehicle weight rating (total weight)							
• Hydraulic tandem chassis • Bottom linkage with shell K80	kg	24,000		24,000		-	
• Hydraulic tandem chassis • Bottom linkage with drawbar lug	kg	23,000		23,000			
• Hydraulic tridem chassis • Bottom linkage with shell K80	kg	-		31,000		34,000	
• Hydraulic tridem chassis • Bottom linkage with drawbar lug	kg	-		30,000		33,000	
Admissible tongue load with bottom linkage							
• with shell K80	kg	4,000		4,000		4,000	
• with drawbar lug	kg	3,000		3,000		3,000	
Admissible axle load, front							
• Hydraulic tandem chassis	kg	10,000		10,000		-	
• Hydraulic tridem chassis	kg	-		9,000		10,000	
Admissible axle load, central							
• Hydraulic tridem chassis	kg	-		9,000		10,000	
Admissible axle load, rear							
• Hydraulic tandem chassis	kg	10,000		10,000		-	
• Hydraulic tridem chassis	kg	-		9,000		10,000	

Designation	Unit	Magnon					
		10-430	10-430 DO	10-470	10-470 DO	10-530	10-530 DO
Other							
Empty weight with tandem chassis	kg	11,100	11,600	11,700	12,200	-	-
Empty weight with tridem chassis	kg	-	-	12,700	13,200	13,600	14,100
Loading capacity according to DIN 11741	m^3	42	40	46	44	52	50
Loading capacity at medium pressing power	m^3	78	74	86	82	97	93
Maximum travel speed	km/h	40		40		40	
Uptake width, pick-up	m	2.25		2.25		2.25	
Number of tine rows, pick-up	pcs.	6		6		6	
Tine spacing, pick-up	mm	55		55		55	
Ground clearance, pick-up	m	with lifted folding drawbar approx. 0.60					
Number of knives	pcs.	48		48		48	
Theoretical cutting length	mm	35		35		35	
Maximum hydraulic pressure	bar	210		210		210	
Oil flow rate	l/min	40-100		40-100		40-100	
Minimum power required	kW/HP	140/190		155/210		176/240	
P.t.o. speed	min^{-1}	1,000		1,000		1,000	
Power supply	volt	12		12		12	
Sound pressure level	dB(A)	74		74		74	

Tab. 5: General data

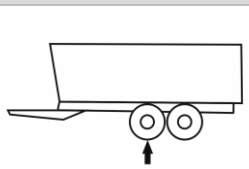
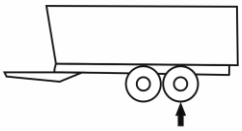
Designation	Unit	Magnon					
		8- 370	8- 370 DO	8- 410	8- 410 DO	8- 450	8- 450 DO
Gross vehicle weight rating (total weight)							
• Boogie chassis • Bottom linkage with shell K80	kg	22,000		22,000		-	
• Boogie chassis • Bottom linkage with drawbar lug	kg	21,000		21,000		-	
• Hydraulic tandem chassis • Bottom linkage with shell K80	kg	24,000		24,000		24,000	
• Hydraulic tandem chassis • Bottom linkage with drawbar lug	kg	23,000		23,000		-	
• Hydraulic tridem chassis • Bottom linkage with shell K80	kg	-		-		31,000	
• Hydraulic tridem chassis • Bottom linkage with drawbar lug	kg	-		-		30,000	
Admissible tongue load with bottom linkage							
• with shell K80	kg	4,000		4,000		4,000	
• with drawbar lug	kg	3,000		3,000		3,000	
Admissible axle load, front							
• Boogie chassis	kg	8,640		8,640		-	
• Hydraulic tandem chassis	kg	10,000		10,000		10,000	
• Hydraulic tridem chassis	kg	-		-		9,000	
Admissible axle load, central							
• Hydraulic tridem chassis	kg	-		-		9,000	
Admissible axle load, rear							
• Boogie chassis	kg	9,360		9,360		-	
• Hydraulic tandem chassis	kg	10,000		10,000		10,000	
• Hydraulic tridem chassis	kg	-		-		9,000	
Other							
Empty weight with boogie chassis	kg	10,400	10,900	10,880	11,380	-	-
Empty weight with tandem chassis	kg	10,400	10,900	10,880	11,380	11,400	11,900
Empty weight with tridem chassis	kg	-		-		12,300	12,800

Designation	Unit	Magnon					
		8- 370	8- 370 DO	8- 410	8- 410 DO	8- 450	8- 450 DO
Loading capacity according to DIN 11741	m^3	36	34	40	38	44	42
Loading capacity at medium pressing power	m^3	67	63	74	70	82	78
Maximum travel speed	km/h	40		40		40	
Uptake width, pick-up	m	2.25		2.25		2.25	
Number of tine rows, pick-up	pcs.	6		6		6	
Tine spacing, pick-up	mm	55		55		55	
Ground clearance, pick-up	m	with lifted folding drawbar approx. 0.60					
Number of knives	pcs.	44		44		44	
Theoretical cutting length	mm	35		35		35	
Maximum hydraulic pressure	bar	210		210		210	
Oil flow rate	l/min	40-100		40-100		40-100	
Minimum power required	kW/HP	110/150		125/170		140/190	
P.t.o. speed	min^{-1}	1,000		1,000		1,000	
Power supply	volt	12		12		12	
Sound pressure level	dB(A)	74		74		74	

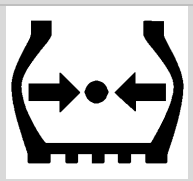
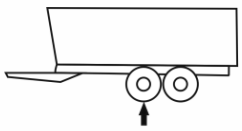
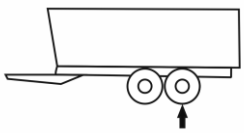
Tab. 6: General data

3.1.1 Tyre pressure

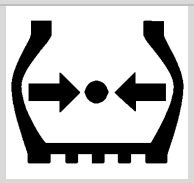
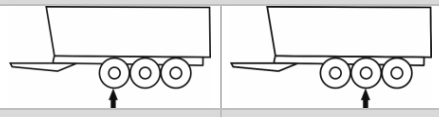
According to the StVZO, the maximum entire width of farming or forestry trailers may be 3.00 m if the maximum width is the sole result of such vehicles being equipped with wide-base tyres, which at a reference speed of 10 km/h and at a maximum internal pressure of 1.5 bar possess the load capacity required for reaching the respective admissible axle load.

Wheels for 18-t chassis						
						
		8640 kg		9360 kg		
Tyre manufacturer: BKT		**25**	**40**	**25**	**40**	**km/h**
Number	**Designation**	**bar / psi**				**max.**
87020582	RAD_710/50 R26.5_170D_BKT_FL630Ultra	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	4.0 / 58
87020044	RAD_710/50 R26.5_170D_Vred_FL_Pro	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	4.0 / 58
87020904	RAD_710/50 R26.5_170D_Vred_FL_Trac	1.2 / 17.4	1.6 / 23.2	1.2 / 17.4	1.6 / 23.2	4.0 / 58
87020164	Rad 750/45 R26.5 Vred Flotat. Trac ET-50	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	4.0 / 58
87020587	Rad 750/45 R26.5 BKT FL 630 Super ET-50	1.6 / 23.2	2.4 / 34.8	1.6 / 23.2	2.4 / 34.8	4.0 / 58
87020069	Rad 800/45 R26.5 Vred FlotationPro ET-50	1.2 / 17.4	1.6 / 23.2	1.6 / 23.2	2.0 / 29.0	4.0 / 58
87020183	Rad 800/45 R26.5 Vred Flotat. Trac ET-50	1.2 / 17.4	1.6 / 23.2	1.2 / 17.4	1.6 / 23.2	4.0 / 58
87020585	Rad 800/45 R26.5 BKT FL 630 Ultra ET-50	1.2 / 17.4	1.6 / 23.2	1.6 / 23.2	2.0 / 29.0	4.0 / 58
1 bar = 14.5 psi = 100 kPa (data without guarantee. observe the data of the tyre manufacturer.)						

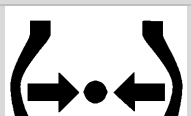
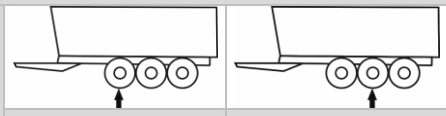
Tab. 7: Tyre pressure 18-t chassis

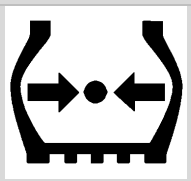
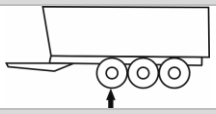
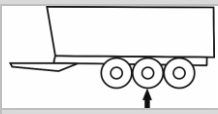
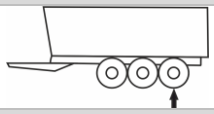
Wheels for 20-t chassis						
						
		10,000 kg		10,000 kg		
Tyre manufacturer: BKT		**25**	**40**	**25**	**40**	**km/h**
Number	**Designation**	**bar / psi**				**max.**
87020044	RAD_710/50 R26.5_170D_Vred_FL_Pro	2.0 / 29.0	2.4 / 34.8	2.0 / 29.0	2.4 / 34.8	4.0 / 58
87020582	RAD_710/50 R26.5_170D_BKT_FL630Ultra	2.0 / 29.0	2.4 / 34.8	2.0 / 29.0	2.4 / 34.8	4.0 / 58
87020904	RAD_710/50 R26.5_170D_Vred_FL_Trac	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	4.0 / 58
87020587	RAD_750/45R26.5_170D_BKT _FL630Sup.SB_ET-50	2.0 / 29.0	2.4 / 34.8	2.0 / 29.0	2.4 / 34.8	4.0 / 58
87020164	RAD_750/45- R26.5_170D_Vred_FL_Trac	2.0 / 29.0	2.4 / 34.8	2.0 / 29.0	2.4 / 34.8	4.0 / 58
87020069	RAD_800/45 R26.5_174D_Vred_FL_Pro	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	4.0 / 58
87020585	RAD_800/45 R26.5_174D_BKT_FL630Ultra_ ET-50	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	4.0 / 58
87020183	RAD_800/45 R26.5_174D_Vred_FL_Trac	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	4.0 / 58
87020159	RAD_710/50 R30.5_173D_Vred_FL_Trac	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	4.0 / 58
87020562	RAD_800/45 R30.5_176D_Vred_FL_Trac_ ET-50	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	4.0 / 58
1 bar = 14.5 psi = 100 kPa (data without guarantee. observe the data of the tyre manufacturer.)						

Tab. 8: Tyre pressure 20-t chassis

Wheels for 27-t chassis								
								
		9,000 kg		9,000 kg		9,000 kg		
Tyre manufacturer: BKT		25	40	25	40	25	40	km/h
Number	Designation	bar / psi						max.
87020599	RAD_710/50 R26.5_170D_BKT_ FL630Ultra_ET-50	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	4.0 / 58
87020164	RAD_750/45- R26.5_170D_Vred_ FL_Trac	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	4.0 / 58
87020587	RAD_750/45R26.5_170D _BKT_FL630Sup.SB_ ET-50	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	4.0 / 58
87020903	RAD_710/50 R26.5_170D_Vred_ FL_Trac	1.2 / 17.4	1.6 / 23.2	1.2 / 17.4	1.6 / 23.2	1.2 / 17.4	1.6 / 23.2	4.0 / 58
1 bar = 14.5 psi = 100 kPa (data without guarantee. observe the data of the tyre manufacturer.)								

Tab. 9: Tyre pressure 27-t chassis

Wheels for 30-t chassis								
								
		10,000 kg		10,000 kg		10,000 kg		
Tyre manufacturer: BKT		25	40	25	40	25	40	km/h
Number	Designation	bar / psi						max.
87020044	RAD_710/50 R26.5_170D_Vred_ FL_Pro	2.0 / 29.0	2.4 / 34.8	2.0 / 29.0	2.4 / 34.8	2.0 / 29.0	2.4 / 34.8	4.0 / 58
87020582	RAD_710/50 R26.5_170D_BKT_ FL630Ultra	2.0 / 29.0	2.4 / 34.8	2.0 / 29.0	2.4 / 34.8	2.0 / 29.0	2.4 / 34.8	4.0 / 58
87020904	RAD_710/50 R26.5_170D_Vred_ FL_Trac	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	1.6/ 23.2	2.0 / 29.0	4.0 / 58
87020164	RAD_750/45- R26.5_170D_Vred_ FL_Trac	2.0 / 29.0	2.4 / 34.8	2.0 / 29.0	2.4 / 34.8	2.0 / 29.0	2.4 / 34.8	4.0 / 58
87020587	RAD_750/45R26.5_170D _BKT_FL630Sup.SB_ ET-50	2.0 / 29.0	2.4 / 34.8	2.0 / 29.0	2.4 / 34.8	2.0 / 29.0	2.4 / 34.8	4.0 / 58
87020069	RAD_800/45 R26.5_174D_Vred_ FL_Pro	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	4.0 / 58

Wheels for 30-t chassis								
								
		10,000 kg		10,000 kg		10,000 kg		
Tyre manufacturer: BKT		25	40	25	40	25	40	km/h
Number	Designation	bar / psi						max.
87020183	RAD_800/45 R26.5_174D_Vred_ FL_Trac	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	4.0 / 58
87020585	RAD_800/45 R26.5_174D_BKT_ FL630Ultra_ET-50	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	4.0 / 58
87020159	RAD_710/50 R30.5_173D_Vred_ FL_Trac	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	1.6 / 23.2	2.0 / 29.0	4.0 / 58
87020562	RAD_800/45 R30.5_176D_Vred_ FL_Trac_ET-50	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	4.0 / 58
1 bar = 14.5 psi = 100 kPa (data without guarantee. observe the data of the tyre manufacturer.)								

Tab. 10: Tyre pressure 30-t chassis

3.2 Dimensions of wagon

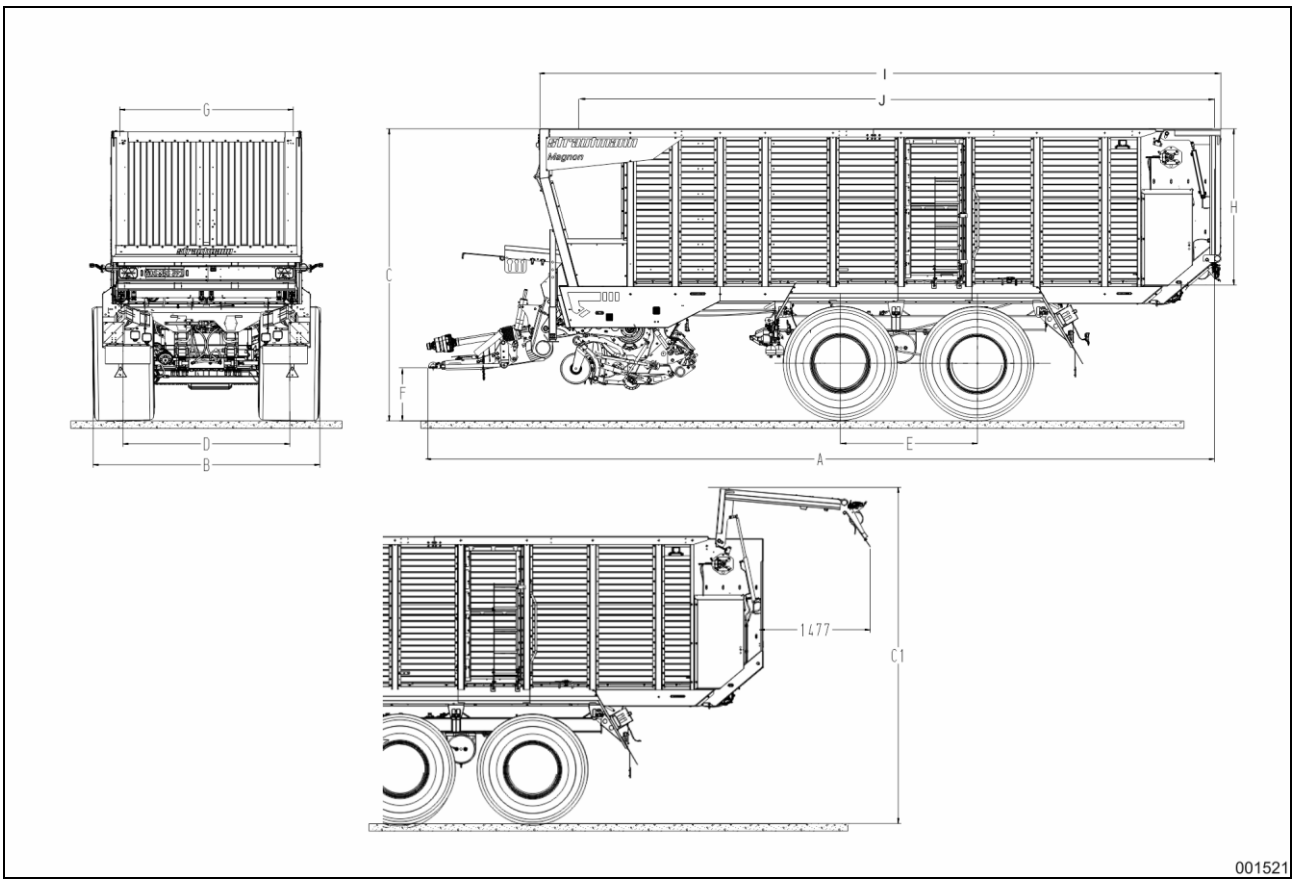


Fig. 6

Designation	Unit	Magnon					
		10-430	10-430 DO	10-470	10-470 DO	10-530	10-530 DO
Dimensions							
• A = Total length	m	9.908		10.528		11.768	
• B = Total width	m	max. 3.00		max. 3.00		max. 3.00	
• C = Total height	m	max. 4.00		max. 4.00		max. 4.00	
• C1 = Total height with open tailgate	m	max. 4.60		max. 4.60		max. 4.60	
• D = Track width, tandem axle	m	2.10		2.10		2.10	
• E = Wheelbase	m	1.82		1.82		1.82	
• F = Drawbar height, bottom linkage	m	0.61-0.75		0.61-0.75		0.61-0.75	
• G = Cargo space width	m	2.40		2.40		2.40	
• H = Cargo space height	m	2.08		2.08		2.08	
• I = Length, superstructure, outside	m	8.407		9.027		10.267	
• J = Length, superstructure, inside	m	7.855		8.475		9.715	
• Platform length	m	7.184		7.804		9.044	
• Height, extension	mm	90		90		90	
• Height, covering system	mm	53		53		53	

Designation	Unit	Magnon					
		10-430	10-430 DO	10-470	10-470 DO	10-530	10-530 DO
Height with tyres (without covering system and extension)							
RAD_710/50 R26.5_170D_Vred_FL_Pro	mm	3793		3793		3793	
RAD_710/50 R26.5_170D_BKT_FL630Ultra	mm	3799.5		3799.5		-	
RAD_710/50 R26.5_170D_Vred_FL_Trac	mm	3798		3798		3798	
RAD_710/50 R26.5_170D_BKT_FL630Ultra_ ET-50	mm	-		-		3799.5	
RAD_750/45 R26.5_170D_BKT_FL630Sup. SB_ET-50	mm	3782.5		3782.5		3782.5	
RAD_750/45 R26.5_170D_Vred_FL_Trac	mm	3788		3788		3788	
RAD_800/45 R26.5_174D_Vred_FL_Pro	mm	3793		3793		3793	
RAD_800/45 R26.5_174D_BKT_FL630Ultra_ ET_50	mm	3804.5		3804.5		3804.5	
RAD_800/45 R26.5_174D_Vred_FL_Trac	mm	3798		3798		3798	
RAD_710/50 R30.5_173D_Vred_FL_Trac	mm	3898		3898		3898	
RAD_800/45 R30.5_176D_Vred_FL_Trac_ ET_50	mm	3913		3913		3913	

Tab. 11: Vehicle dimensions

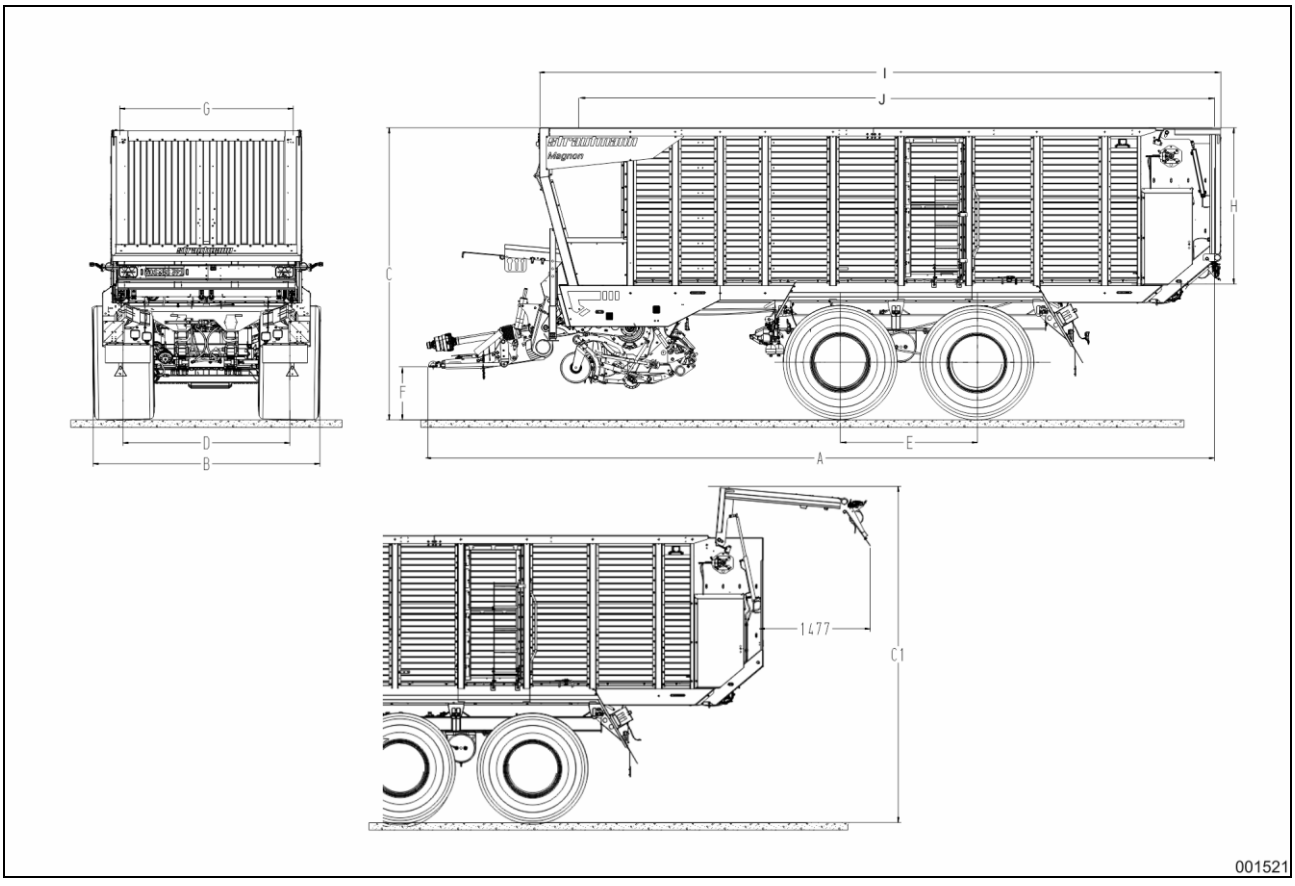


Fig. 7

Designation	Unit	Magnon					
		8- 370	8- 370 DO	8- 410	8- 410 DO	8- 450	8- 450 DO
Dimensions							
• A = Total length	m	9.258		9,908		10,528	
• B = Total width	m	max. 3.00		max. 3.00		max. 3.00	
• C = Total height	m	max. 4.00		max. 4.00		max. 4.00	
• C1 = Total height with open tailgate	m	max. 4.60		max. 4.60		max. 4.60	
• D = Track width, tandem axle	m	2.10		2.10		2.10	
• E = Wheelbase:							
• Boogie	m	1.55		1.55		-	
• Tandem	m	1.81		1.81		1.81	
• Tridem	m	-		-		1.55	
• F = Drawbar height, bottom linkage	m	0.61-0.75		0.61-0.75		0.61-0.75	
• G = Cargo space width	m	2.25		2.25		2.25	
• H = Cargo space height	m	2.08		2.08		2.08	
• I = Length, superstructure, outside	m	7757		8.407		9.027	
• J = Length, superstructure, inside	m	7205		7.855		8.475	
• Platform length	m	6.534		7.184		7.804	
• Height, extension	mm	90		90		90	
• Height, covering system	mm	53		53		53	
Height with tyres (without covering system and extension)							
RAD_710/50 R26.5_170D_Vred_FL_Pro							
• Boogie	mm	3780		3780		-	
• Tandem	mm	3868		3868		3868	
RAD_710/50 R26.5_170D_BKT_FL630Ultra							
• Boogie	mm	3786.5		3786.5		-	
• Tandem	mm	3874.5		3874.5		3874.5	
• Tridem	mm	-		-		3842.5	
RAD_710/50 R26.5_170D_Vred_FL_Trac							
• Boogie	mm	3785		3785		-	
• Tandem	mm	3873		3873		3873	
• Tridem	mm	-		-		3841	
RAD_750/45 R26.5_170D_BKT_FL630Sup. SB							
• Boogie	mm	3769.5		3769.5		-	
• Tandem	mm	3857.5		3857.5		3857.5	
• Tridem	mm	-		-		3825.5	

Designation	Unit	Magnon					
		8- 370	8- 370 DO	8- 410	8- 410 DO	8- 450	8- 450 DO
RAD_750/45 R26.5_170D_Vred_FL_Trac							
• Boogie	mm	3775		3775		-	
• Tandem	mm	3863		3863		3863	
• Tridem	mm	-		-		3831	
RAD_710/50 R30.5_173D_Vred_FL_Trac							
• Tandem	mm	3923		3923		3923	
RAD_800/45 R30.5_176D_Vred_FL_Trac_ ET_50							
• Tandem	mm	3938		3938		3938	
Rad 800/45 R26.5 Vred FlotationPro							
• Boogie	mm	3780		3780		-	
• Tandem	mm	3868		3868		3868	
Rad 800/45 R26.5 Vred Flotat. Trac							
• Boogie	mm	3785		3785		-	
• Tandem	mm	3873		3873		3873	
Rad 800/45 R26.5 BKT FL 630 Ultra							
• Boogie	mm	3791.5		3791.5		-	
• Tandem	mm	3879.5		3879.5		3879.5	

Tab. 12: Vehicle dimensions

4 Description of machine

This chapter provides comprehensive information about the design and function of the machine.

The machine is a **Forage wagon**. It is used for **Cutting, charging, transport and distribution of green, chopped and dried-out forage Magnon CFS / Magnon**.

The machines are available with various optional extras and variants. Due to the individual equipment and continuous further development of the machines, not all details and descriptions contained in these operating instructions might be applicable. Optional extras are marked in these operating instructions and are available at extra cost.

4.1 General overview

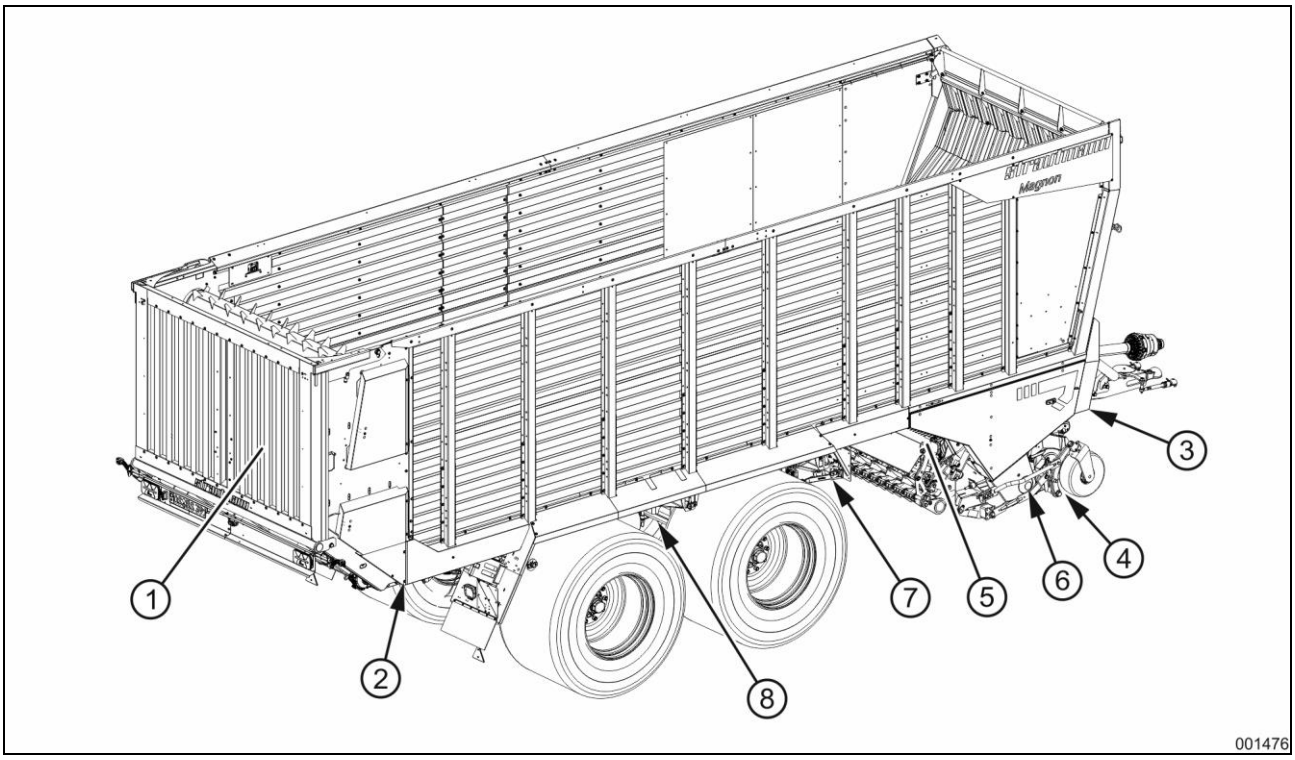


Fig. 8

1 Tailgate
2 Angular gear, rear, beater drive
3 Angular gear, front, beater drive
4 Pick-up guide wheels
5 Cutting unit
6 Guide roller with chain drive
7 Parking brake
8 Compressed-air reservoir

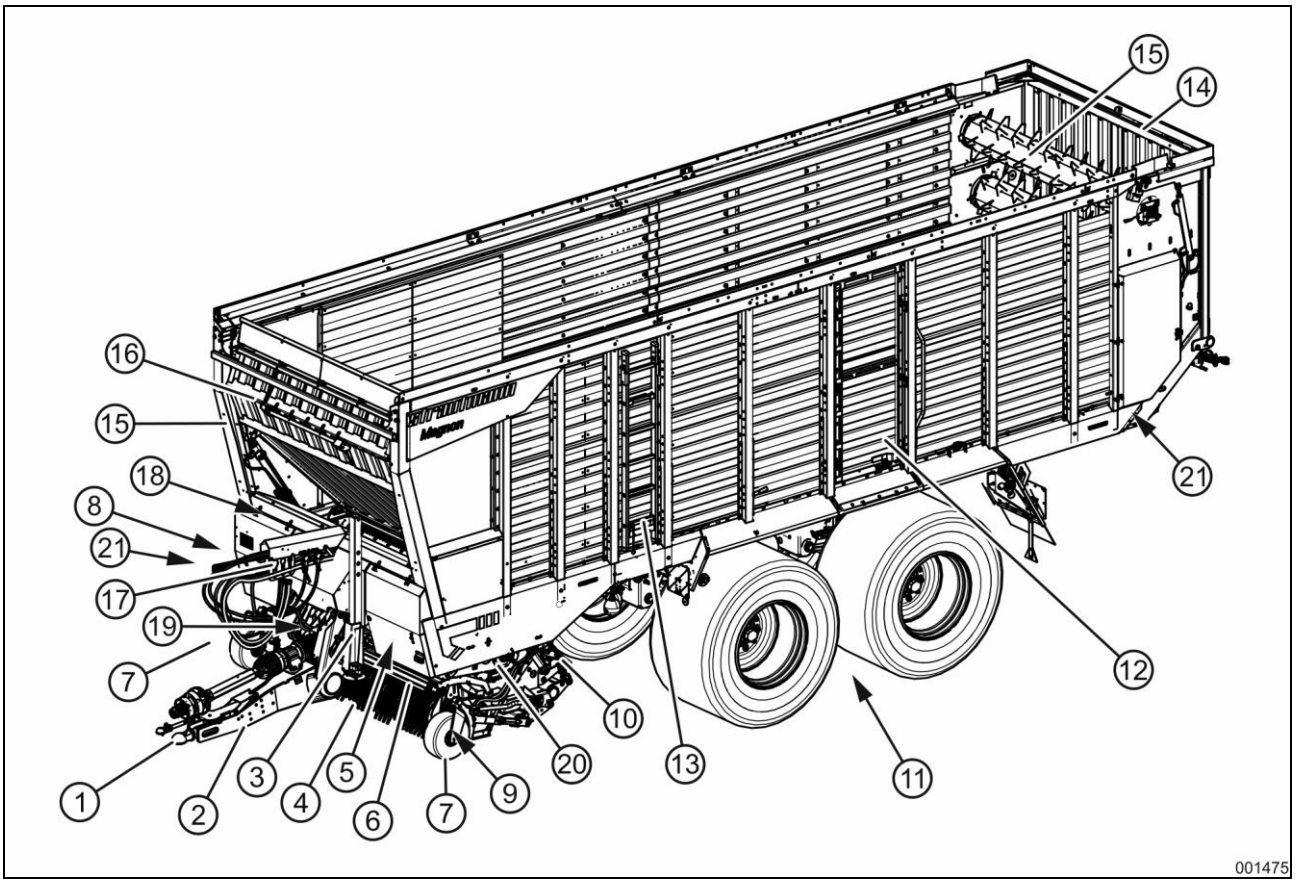


Fig. 9

1 Drawgear
2 Folding drawbar
3 Supporting leg
4 Pick-up
5 Conveying unit
6 Holding-down device with pulley
7 Guide wheels
8 Pick-up drive
9 Chassis
10 Access door
11 Ladder
12 Beaters
13 Swivelling front panel
14 Plug holder
15 Electro-hydraulic control block
16 Main gearbox
17 Rotor gear
18 Coupling / Circuit, beaters
19 Feed gearing for transport floor

4.2 Equipment

Magnon 8-370 / 8-370 DO / 8-410 / 8-410 DO / 8-450 / 8-450 DO	
Standard equipment	**Optional extra**
Chassis	
Boogie chassis with an axle load of 18 t (not on 8-450 / 8-450 DO) Hydraulic tandem chassis with an axle load of 20 t (on 8-450 / 8-450 DO) 26.5" tyres Unsprung balancing system in the chassis Passive steering	Hydraulic tandem chassis with an axle load of 20 t (standard equipment on 8-450 / 8-450 DO) Hydraulic tridem chassis with an axle load of 27 t (only for 8-450 / 8-450 DO) Mechanical forced steering axle system Electronic forced steering axle system 30.5" tyres Suspension for hydraulic chassis
Brake system	
Compressed-air brake system Manual parking brake	Hydraulic brake Combination brake
Folding drawbar	
Bottom linkage, tongue load of 4 t Shell K80 Drawbar suspension	Drawbar lug Bumper buffer
Supporting leg	
Mechanical	
Pick-up	
Camless Flex-Load pick-up PUR plastic tines 6 tine rows 2 movable, adjustable guide wheels Mechanical pick-up drive	Additional sensing roller
Conveying unit	
Guide roller Rotor with 8 tine rows and integral augers Switchable drive with clutch on DO machines	
Cutting unit	
Exact-Cut cutting unit 44 knives / theoretical cutting length of 35 mm	
Operation	
ISOBUS control	Control terminal Smart 570

Magnon 8-370 / 8-370 DO / 8-410 / 8-410 DO / 8-450 / 8-450 DO	
Standard equipment	**Optional extra**
Equipment	
LED lighting Transport floor, 4 round steel chains Tailgate with integrated automatic discharging system Hydraulic system Automatic charging system Swivelling front panel External operation of folding drawbar/cutting unit 3-beater dosing unit only on DO models LED cargo space lighting LED work lights, rear	Maize cover Extension Covering system with nets hydraulically folding to the side Clearance lighting Side-marker lights Camera system for cargo space and reverse travel Preparation, silage additive pump Load-sensing amplifier LED work lights, front

Tab. 13: Equipment, Magnon 8

Magnon 10-430 / 10-430 DO / 10-470 / 10-470 DO with tandem chassis	
Standard equipment	**Optional extra**
Chassis	
Hydraulic tandem chassis with an axle load of 20 t Passive steering 26.5" tyres	Tandem chassis with hydraulic suspension and an axle load of 20 t Mechanical forced steering axle system Electro-hydraulic forced steering axle system SES 30.5" tyres
Brake system	
Compressed-air brake system with hydraulic ALB regulator Manual parking brake	
Folding drawbar	
Bottom linkage, tongue load of 4 t Shell K80 Drawbar suspension	Drawbar lug
Supporting leg	
Mechanical	

Magnon 10-430 / 10-430 DO / 10-470 / 10-470 DO with tandem chassis	
Standard equipment	**Optional extra**
Pick-up	
Camless Flex-Load pick-up PUR plastic tines 6 tine rows 2 movable, adjustable guide wheels Hydraulic pick-up drive	Additional sensing roller
Conveying unit	
Guide roller Rotor with 8 tine rows and integral augers Permanent drive (without clutch even with DO)	
Cutting unit	
Exact-Cut cutting unit 48 knives / theoretical cutting length of 35 mm	
Operation	
ISOBUS control	Control terminal Smart 570
Equipment	
LED lighting Transport floor, 4 plate-link chains Tailgate with integrated automatic discharging system Hydraulic system Automatic charging system Swivelling front panel External operation of folding drawbar/cutting unit 3-beater dosing unit only on DO models LED cargo space lighting LED work lights, rear	Maize cover Extension Covering system with nets hydraulically folding to the side Clearance lighting Side-marker lights Camera system for cargo space and reverse travel Preparation, silage additive pump Load-sensing amplifier LED work lights, front

Tab. 14: Equipment, Magnon 10, tandem

Magnon 10-470 / 10-470 DO / 10-530 / 10-530 DO with tridem chassis	
Standard equipment	**Optional extra**
Chassis	
Hydraulic tridem chassis with an axle load of 27 t or 30 t Electro-hydraulic forced steering axle system SES 26.5" tyres Lift axle	Mechanical forced steering axle system 30.5" tyres
Brake system	
Compressed-air brake system with hydraulic ALB regulator and parking brake via spring-loaded brake cylinder (Tristopp brake cylinder)	Hydraulic brake Combination brake
Folding drawbar	
Bottom linkage, tongue load of 4 t Shell K80 Drawbar suspension	 Drawbar lug Bumper buffers
Supporting leg	
Mechanical	
Pick-up	
Camless Flex-Load pick-up PUR plastic tines 6 tine rows 2 movable, adjustable guide wheels Hydraulic pick-up drive	Additional sensing roller
Conveying unit	
Guide roller Rotor with 8 tine rows and integral augers Permanent drive (without clutch even with DO)	
Cutting unit	
Exact-Cut cutting unit 48 knives / theoretical cutting length of 35 mm	
Operation	
ISOBUS control	Control terminal Smart 570

Magnon 10-470 / 10-470 DO / 10-530 / 10-530 DO with tridem chassis	
Standard equipment	**Optional extra**
Equipment	
LED lighting	Maize cover
Transport floor, 4 plate-link chains	Extension
Tailgate with integrated automatic discharging system	Covering system with nets hydraulically folding to the side
Hydraulic system	Clearance lighting
Automatic charging system	Side-marker lights
Swivelling front panel	Camera system for cargo space and reverse travel
External operation of folding drawbar/cutting unit	Preparation, silage additive pump
3-beater dosing unit only on DO models	Load-sensing amplifier
LED cargo space lighting	LED work lights, front
LED work lights, rear	

Tab. 15: Equipment, Magnon 10, tridem

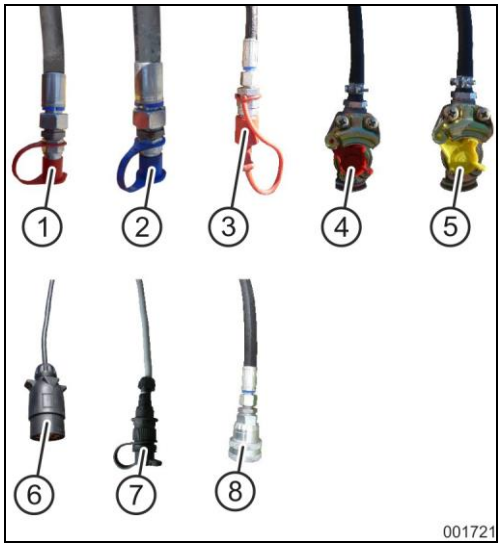


Fig. 10

4.3 Connections

The following figure illustrates the connections or supply lines between tractor and machine.

1 Hydraulic connection "Flow line" SN 16 (red)
2 Hydraulic connection "Return line" SN 20 (blue)
3 Load-sensing connection SN 6 (only with available load-sensing connection)
4 Compressed-air brake system, feed line (red)
5 Compressed-air brake system, brake line (yellow)
6 Lighting connection, 7-pole
7 Power supply, 3-pole
8 ISOBUS connection for ISOBUS control set (only with available ISOBUS control set)

4.3.1 Marking of hydraulic supply lines

The labels marking the hydraulic supply lines are attached to the front of the machine.

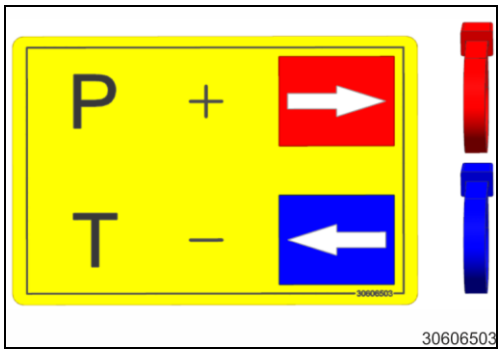


Fig. 11

Explanation of hydraulic connection symbols

Hydraulic connection "Flow line"

- P: Pressure line
  - one red cable tie

Hydraulic connection "Return line"

- T: Tank line
  - one blue cable tie

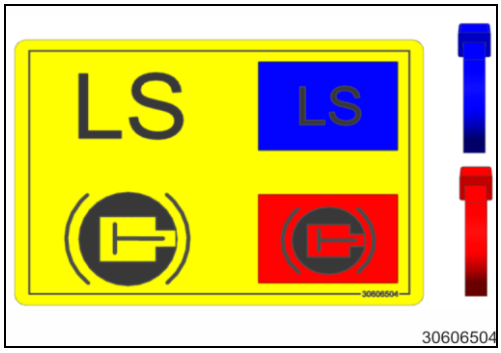


Fig. 12

Load-sensing connection

- LS: Load-sensing control line
  - one blue cable tie

Hydraulic brake system

- hydraulic brake line
  - one red cable tie

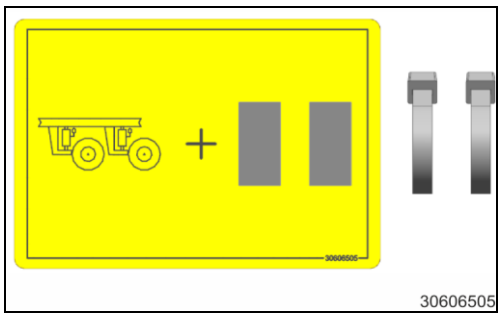


Fig. 13

Hydraulic connection, chassis (single-acting)

- Pressure line / Return line
  - two grey cable ties
  - → lift chassis
  - → lower chassis

4.4 Hydraulic system

The hydraulic system consists of the following basic components:

- Hydraulic motors
- Hydraulic valves with pressure limiters
- Hydraulic cylinders
- Hydraulic pipes and connecting parts

The hydraulic system is powered by the tractor's hydraulic pump. The hydraulic pump conveys the hydraulic oil through the high-pressure filter to the control block. The oil is passed through it to the hydraulic cylinders and hydraulic motors if required. The hydraulic oil flows through a return-flow filter back into the hydraulic oil tank of the tractor.

The hydraulic components are controlled via the ISOBUS control set.

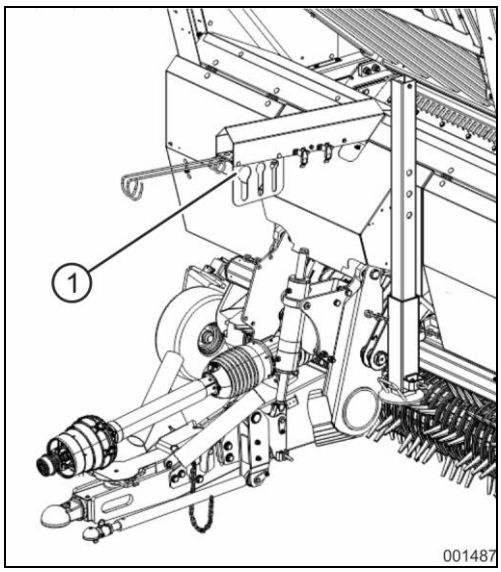


Fig. 14

1 Plug holder for proper deposition of supply lines

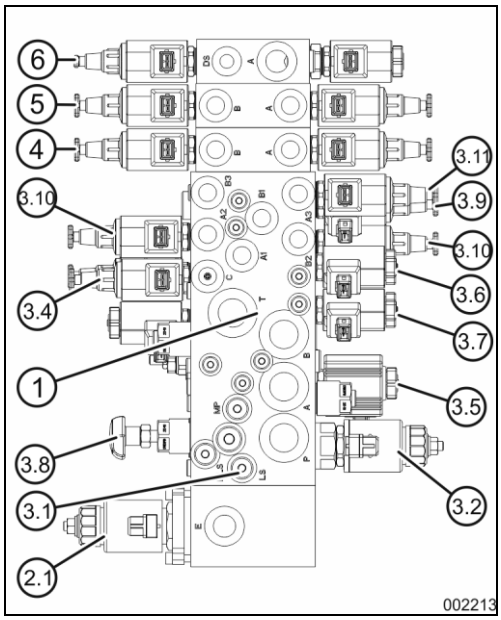


Fig. 15

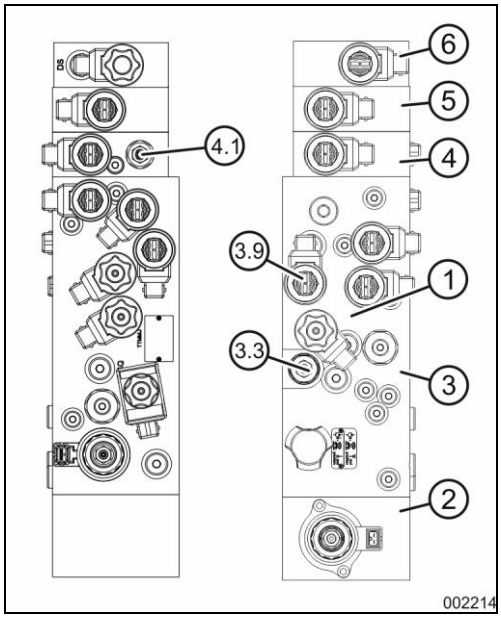


Fig. 16

4.4.1 Electro-hydraulic control block

Permanent oil circulation between tractor and electro-hydraulic control block with a fixed displacement pump or a standby pressure with an LS pump is required for initiating the individual hydraulic functions.

1 Electro-hydraulic control block

2 End plate for pick-up

2.1 Proportional directional control valve, pick-up drive (only with hydr. pick-up drive)

3 Basic block with:

3.1 Connecting aperture for load-sensing control line

3.2 Proportional directional control valve for transport floor

3.3 Pressure limiting valve for priority function (190 bar)

3.4 Lift / Lower pick-up

3.5 Reverse transport floor

3.6 Pre-selection solenoid B

3.7 Pre-selection solenoid A

3.8 Load-sensing screw:

- Screw unscrewed = Fixed displacement pump (free oil circulation)
- Screw screwed in = Load-sensing mode

3.9 Folding drawbar

3.10 Tailgate and clutch, beater drive

3.11 Cutting unit

Alternatively

4 Control element with directional seat valves for covering system

4.1 Pressure limiting valve for front panel (100 bar)

5 Control element with directional seat valves for front panel

6 Control element with directional seat valves for passive steering axle or lift axle, tridem (optional extra)

4.4.2 Load-sensing hydraulic system

The electro-hydraulic control block of the machine is directly connected to the hydraulic pump of the tractor via the load-sensing control line. The current hydraulic oil requirement of the machine determines the pressure and the delivery rate of the tractor's hydraulic pump.

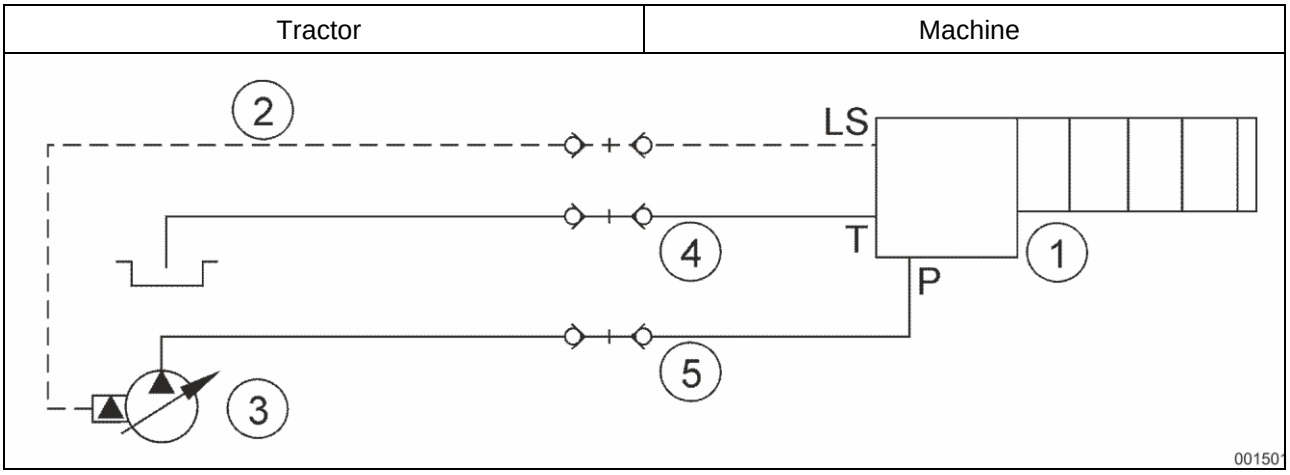


Fig. 17

1 Electro-hydraulic control block at the machine
2 Load-sensing control line
3 Adjustable hydraulic pump of tractor
4 Hydraulic connection "Return line", connected to the free return port of the tractor provided for this purpose, **not** via control device
5 Hydraulic connection "Flow line", connected to the pressure line provided for this purpose leading to the tractor's hydraulic pump, oil extraction **not** via control device

NOTE

If the standby pressure in the load-sensing system is too low (below 20 bar) and cannot be increased at the tractor, it is possible to retrofit a load-sensing amplifier.

Please contact your dealer.

4.5 Sensors

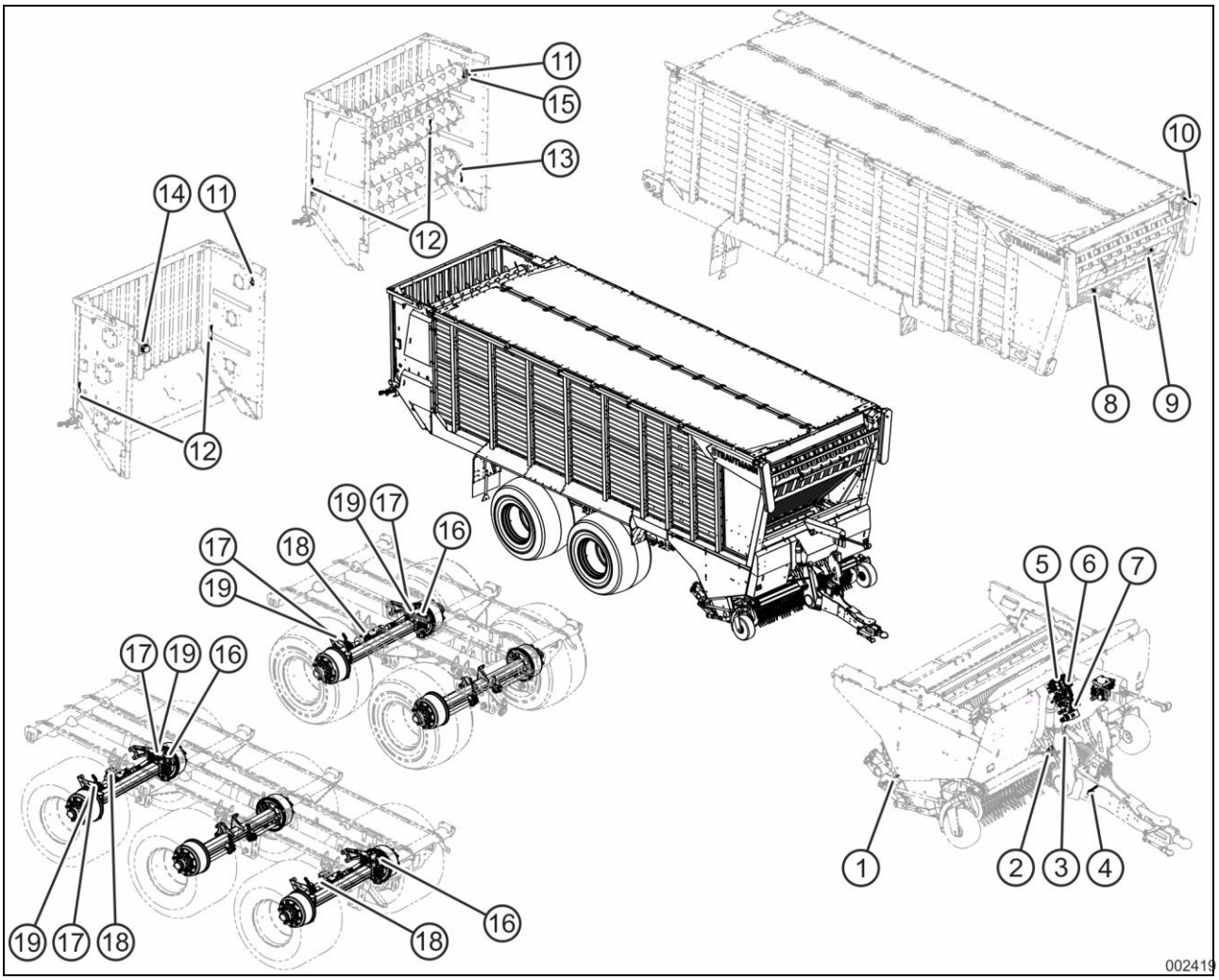


Fig. 18:

Item	Designation	Function	Place of installation	Machine
1	Proximity sensor	Check, cutting unit position	Cutting unit, right-hand	Magnon 8/ Magnon 10
2	Angle sensor 120°	Check, folding drawbar position	Folding drawbar, connection, press	Magnon 8/ Magnon 10
3	Angle sensor 120°	Check, drawbar angle	Drawbar, right-hand	Magnon 8/ Magnon 10
4	Proximity sensor	Speed check, p.t.o. shaft	Connection, p.t.o shaft at main gearbox	Magnon 8/ Magnon 10
5	Pressure sensor, NO contact	170bar pressure check, tandem, steering axle locked, tridem, lift axle up	Control block	Magnon 8/ Magnon 10
6	Pressure sensor, NO contact	25bar pressure check, tridem, lift axle down for steering computer	Control block	Magnon 8/ Magnon 10

Item	Designation	Function	Place of installation	Machine
7	Pressure sensor, NO contact	15bar pressure check (only with forced steering axle)	Control block	Magnon 8/ Magnon 10
8	Angle sensor 120°	Check, front panel position	Front panel front bottom	Magnon 8/ Magnon 10
9	Angle sensor 29°	Check, automatic charging system	Front panel front	Magnon 8/ Magnon 10
10	Proximity sensor	Check, cover position	Front panel, left-hand front	Magnon 8/ Magnon 10
11	Angle sensor 120°	Check, tailgate position	Tailgate, outside, left-hand	Magnon 8/ Magnon 10
12	Proximity sensor	Check, tailgate closed	Tailgate, rear, left and right	Magnon 8/ Magnon 10
13	Proximity sensor	Signal, Wagon Full (only with DO)	Bottom beater	Magnon 8/ Magnon 10
14	Switch, palm button	Signal, Wagon Full (only on machines without beaters)	Tailgate, inside	Magnon 8/ Magnon 10
15	Proximity sensor	Speed, beaters (only on DO machines)	Top beater, tailgate, left-hand	Magnon 8/ Magnon 10
16	Angle sensor SES	Check, angle position, steering	Tandem, rear axle Tridem, front and rear axle	Magnon 8 Tandem/ Magnon 10-430/470 Tandem/ 10-530 Tridem
17	Rpm sensor SES	Check, speed / direction of travel	Rear axle	Magnon 8 Tandem/ Magnon 10-430/470 Tandem/ 10-530 Tridem
18	Angle sensor 120°	Check, angle position, steering	Tandem, rear axle Tridem, front and rear axle	Magnon 8-370/410 Boogie and 8-450 Tridem/ Magnon 10-470 Tridem
19	Rpm sensor	Check, speed / direction of travel	Rear axle	Magnon 8-370/410 Boogie and 8-450 Tridem/ Magnon 10-470 Tridem

Tab. 16:

4.6 Drawbar

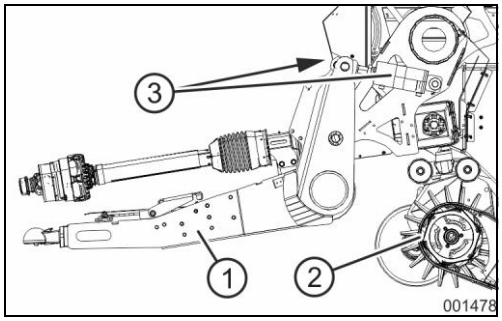


Fig. 19

The hydraulically adjustable drawbar (1) helps to increase the ground clearance of the pick-up (2) when travelling over the silo.

Lifting and lowering of drawbar

- is carried out by means of two double-acting hydraulic cylinders (3).
- is carried out via the ISOBUS control set.

4.6.1 Drawgear for bottom linkage

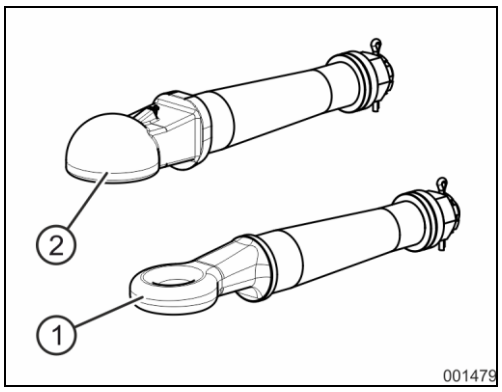


Fig. 20

Depending on the design of the tractor's coupling device, the drawgear may be:

- a drawbar lug (hitch ring) (1) for a tow-hook (hitch hook) or a draw pin (Piton-Fix) according to ISO 5692-1,
- a shell K80 (2) for a ball-type coupling K80.

4.6.2 Drawbar suspension

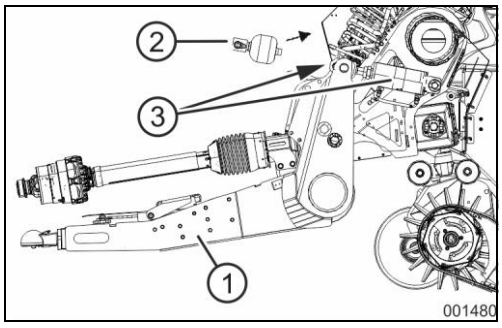


Fig. 21

The drawbar suspension of the hydraulic folding drawbar (1) ensures an even smoother ride during transport journeys and consists of a hydraulic accumulator and a control block (2). Hydraulic accumulator and control block interact with the hydraulic cylinders (3) of the folding drawbar.

With the drawbar suspension switched on, the machine fully filled and the hydraulic cylinders extended by approx. 20 mm, the deflection is approx. 10 mm. For the empty machine, the deflection is accordingly less.

The drawbar suspension:

- is only allowed to be switched on during transport journeys,
- must be always switched off when charging and discharging the machine.

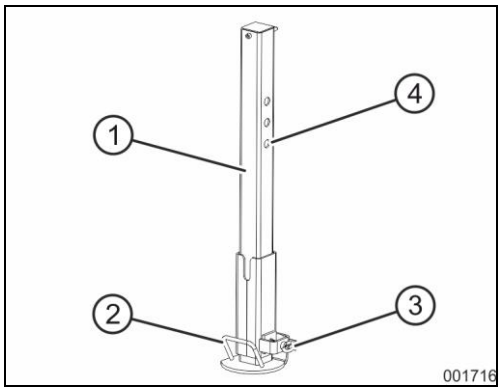


Fig. 22

4.7 Supporting leg

The machine is equipped with a mechanical supporting leg, which supports the unhitched machine.

Use the handle (2) to pull the mechanical supporting leg (1) up and down and use the locking bolt (3) to engage the mechanical supporting leg in the boreholes (4).

⚠ WARNING

Risk of failure of support device due to excessive tongue load or risk of tipping over if the machine is unevenly charged due to insufficient tongue load.

- Do not unhitch the machine when charged or partly charged.
- Do not charge the unhitched machine.

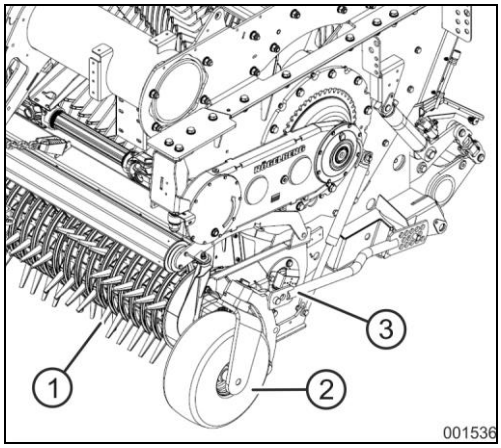


Fig. 23

4.8 Pick-up

The pick-up is flexibly hinged to the guide roller and picks up the material to be loaded from the swathe by means of its six helically arranged tine rows.

The tines (1) are made of flexible plastic and can therefore bend in any direction, thus achieving ideal adaptation to the ground. Penetration into the ground is prevented to the greatest possible extent, thus minimising contamination of fodder.

Lifting and lowering of the pick-up to transport and working position is effected via the control system from the tractor seat by means of two single-acting hydraulic cylinders.

The steerable, rubber-tyred guide wheels (2) move the pick-up into its working position. The guide wheels serve to:

- adapt the pick-up in working position to uneven terrain.
- set different operating heights for the pick-up lowered to working position. The operating height is set via the respective perforated strut (3) on both sides of the pick-up.

Depending on the model version, the pick-up is powered hydraulically (Magnon 10) or mechanically (Magnon 8).

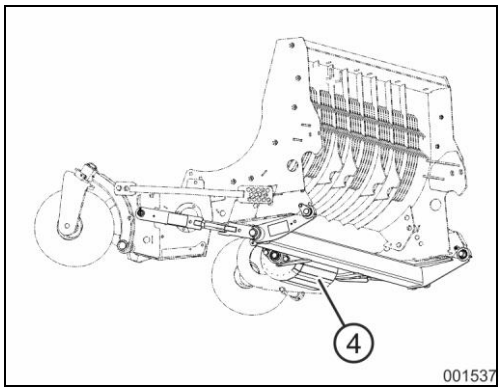


Fig. 24

The pick-up can be equipped with an additional sensing roller (4) (optional extra). The additional sensing roller runs beyond the tractor tracks and is set 10-20 mm higher than the guide wheels (2). It assists the guide wheels in guiding the pick-up in working position on particularly soft ground.

4.8.1 Holding-down device

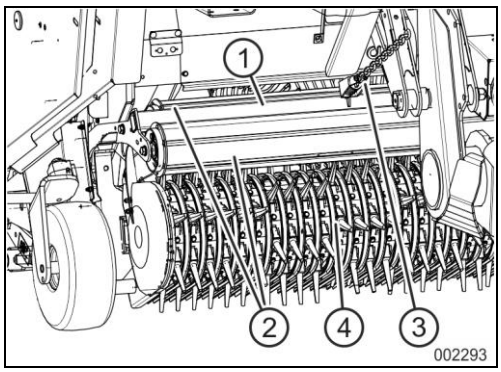


Fig. 25

The pick-up is equipped with a holding-down device. When picking up the material to be loaded, the holding-down device (1) and the pulley (2) press the material against the tines of the pick-up (4).

The distance set between the holding-down device/pulley and the pick-up by means of the chains (3) is vital for proper picking-up of the material from the swathe.

For setting the holding-down device, please refer to ► see section 6.16.3 Set holding-down device, page 157

4.9 Power train

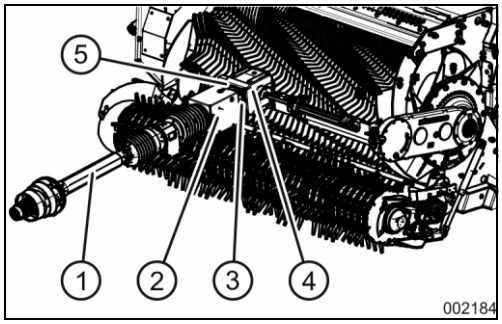


Fig. 26

The forage wagon (feeder rotor and guide roller) is powered by means of the tractor's p.t.o. shaft. The power train consists of:

1 Propeller shaft
2 Bearing block/Intermediate shaft, drawbar
3 Double universal joint with cam-type cut-out clutch
4 Main gearbox
5 Rpm sensor at main gearbox

4.9.1 Feeder rotor drive

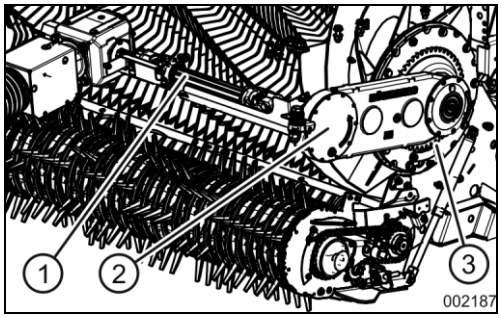


Fig. 27

The power train of the feeder rotor consists of:

1 Intermediate propeller shaft*

2 Spur gear on the left-hand side in the direction of travel

3 Planetary gear set integrated in the feeder rotor

* On the Magnon 8 machines equipped with beaters, a claw clutch is mounted between the main gearbox and the spur gear, which disengages the feeder rotor drive when the tailgate is opened, see ► page 76

On all other Magnon machines, the feeder rotor is permanently powered (directly without clutch) by the propeller shaft of the tractor.

4.9.2 Guide roller drive

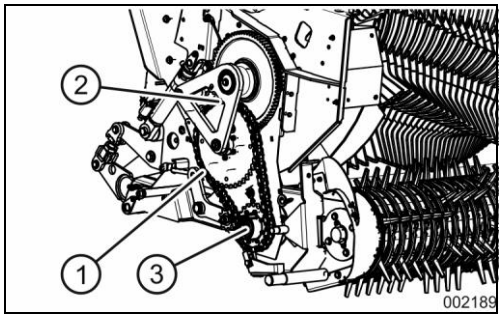


Fig. 28

The guide roller is powered by means of the roller chain (1) positioned on the right-hand side in the direction of travel and the toothed wheels (2) mounted at the feeder rotor. A star ratchet clutch (3) for protection against overload is mounted on the guide roller.

4.9.3 Hydraulic pick-up drive

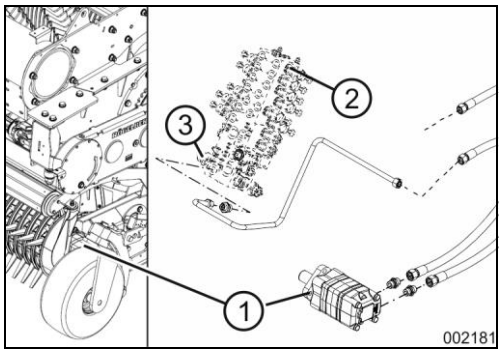


Fig. 29

On the Magnon 10 machines, the pick-up is powered hydraulically.

The hydraulic motor (1) mounted at the pick-up is supplied by the hydraulic system of the tractor via a proportional directional control valve (3) at the control block (2).

The hydraulic motor of the pick-up is switched on or off via the ISOBUS control set. Speed and velocity of the pick-up can be adjusted via the ISOBUS control set in manual mode or are controlled in automatic mode proportionally to the travelling speed.

4.9.4 Mechanical pick-up drive

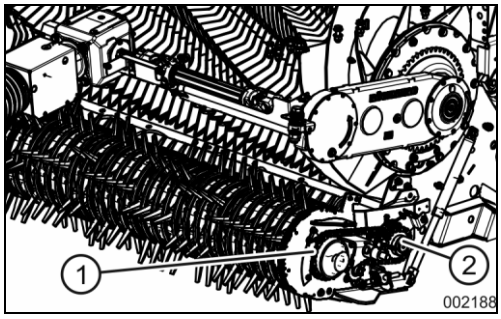


Fig. 30

On the Magnon 8 machines, the pick-up (1) is powered mechanically by the guide roller (2) via a chain.

4.9.5 Drive / Clutch, beaters

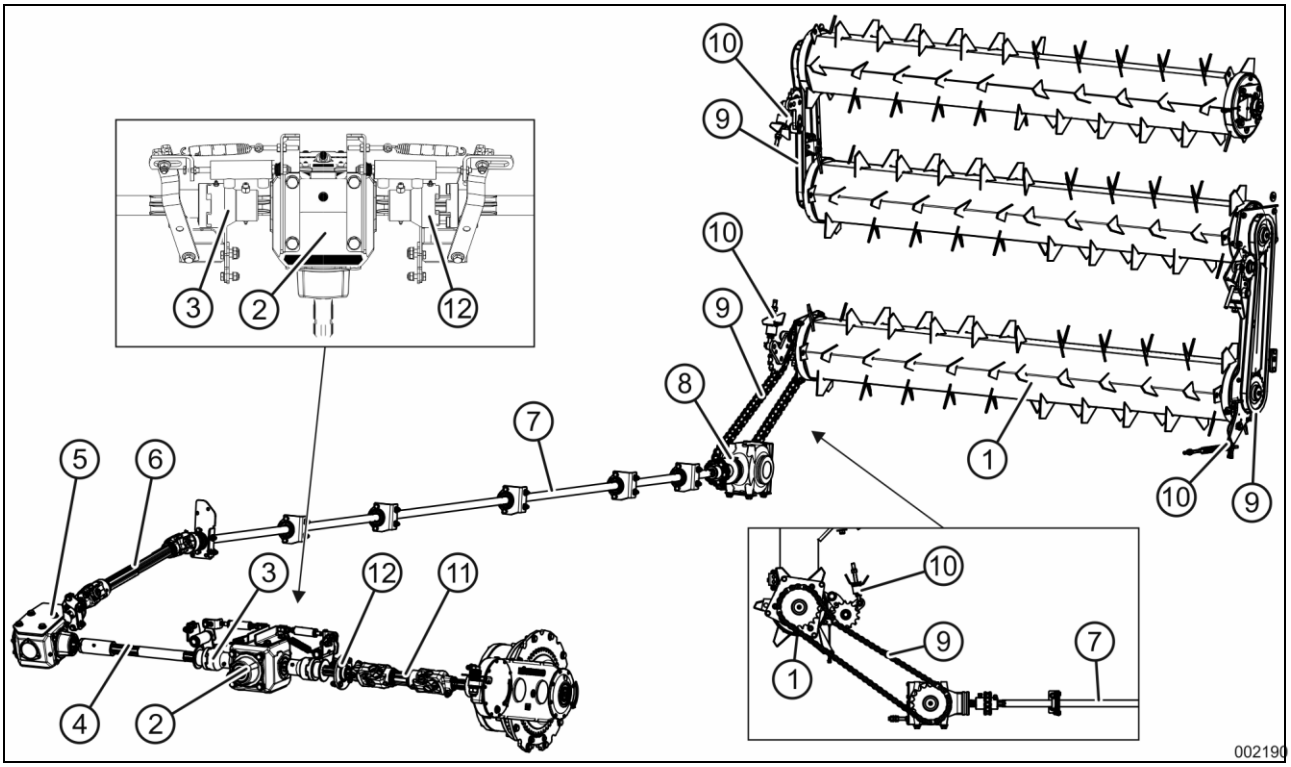


Fig. 31:

The beaters (1) are powered by the tractor's p.t.o. shaft connected to the main gearbox (2).

The claw clutch (3) mounted on the right-hand side next to the main gearbox is engaged when the hydraulic tailgate is opened. The drive shaft (4) and the angular gear (5) transmit the movement to the propeller shaft (6).

The drive shaft (7) running along the side of the platform ends with another gearbox (8) connected to the beaters by toothed wheel and chain (9).

The individual beaters are connected to identical toothed wheels and chain (9), such that speed and velocity are equal to each other.

Each chain is equipped with a chain tensioner (10) to ensure good power transmission and to minimise wear. An rpm sensor is mounted at the upper beater on the left in the direction of travel.

On all Magnon 10 models with beaters:

- Only one claw clutch (3) for powering the beaters is mounted on the right-hand side in the direction of travel.

The feeder rotor and the guide roller rotate at any time with the p.t.o. shaft switched on (even with open tailgate).

On all Magnon 8 models with beaters:

- Another claw clutch (12) is interposed between the rotor drive shaft (11) and the main gearbox (2).

When opening the hydraulic tailgate:

→ the clutch (3) to the beater drive is engaged.

→ the clutch (12) to the rotor drive is disengaged.

→ the beaters rotate.

→ rotor, guide roller and pick-up do not rotate.

4.10 Guide roller and feeder rotor

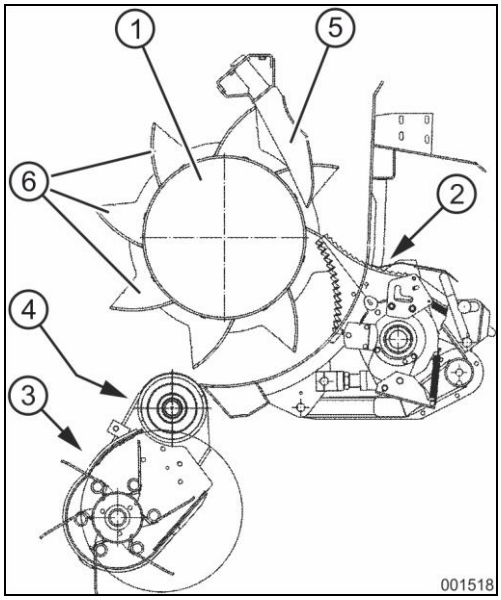


Fig. 32 Old illustration

The feeder rotor (1) transports the material picked up by the pick-up (3) through the cutting unit (2) in the conveyor duct and compacts it into the cargo space.

The guide roller (4) improves the material flow. The arrangement of the guide roller creates more space between pick-up (3) and feeder rotor (1). With massive swathes, the feeder rotor (1) does not press the material onto the pick-up (3), thus improving adaptation to the ground and extending the service life of the pick-up.

The strippers (5) protrude into the gaps between the conveying tines (6) of the feeder rotor (1) and strip off the material such that it is conveyed into the cargo space.

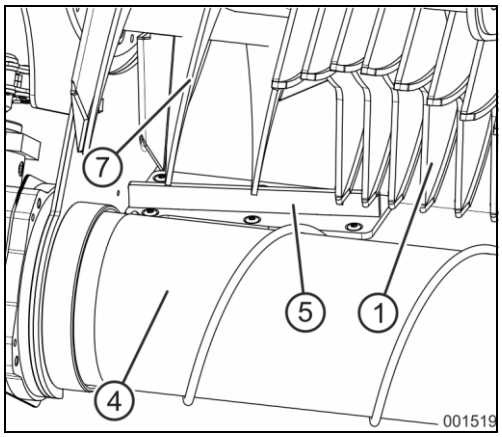


Fig. 33

Narrow swathes are widened by means of the guide roller (4). The loaded material is homogeneously conveyed to the rotor, the cutting unit and the cargo space over the entire width

Material with a poor structure is homogeneously taken up by the rotor without any stagnation and fodder jams.

The auger windings (7) (integral range) of the feeder rotor (1) and the strippers (5) ensure a merging of the material from the outer sides in case of wide swathes or cornering.

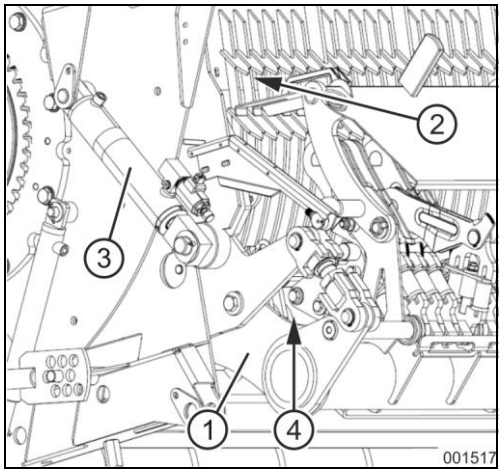


Fig. 34

4.11 Cutting unit

The knives of the Exact-Cut cutting unit (1) engage in the conveyor duct (2). The cutting unit can be extended into and retracted from the conveyor duct by means of two double-acting hydraulic cylinders (3) actuated via the control set

- for the elimination of blockages.
- for the removal and installation of cutting knives.

Cutting knives (4) are mounted as standard:

- 48 cutting knives (Magnon 10)
- 44 cutting knives (Magnon 8)

The theoretical cutting length of the loaded material is 35 mm.

NOTE

If the knife protection system is triggered due to contact with a foreign object, the knives are completely retracted from the conveyor duct,

The knives automatically swivel back into the conveyor duct in the event of a brief reduction in material flow (e.g. by reducing the travelling speed or by a brief stop).

4.11.1 External operation

⚠ WARNING

Cutting unit

Risk of cuts, crushing or shearing when moving the cutting unit.

Make sure that people leave the vicinity of the cutting unit.

⚠ WARNING

Drawbar

Risk of cuts, crushing or shearing when moving the drawbar.

Make sure that people leave the vicinity of the drawbar.

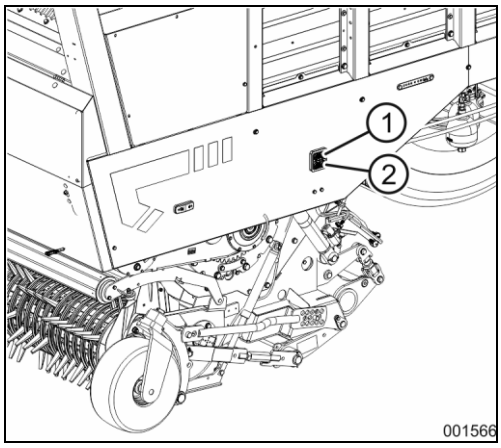


Fig. 35

On machines equipped with ISOBUS control, a keypad with two button functions is mounted on the left-hand vehicle side on a level with the pick-up; use these buttons with the hydraulic system connected

- to extend and retract the cutting unit for cleaning or knife change.
- to lift or lower the drawbar for maintenance work

For operation, please refer to ► page 200

4.12 Auxiliary tools, pick-up and cutting unit

Auxiliary tools for setting work on the pick-up are included in the machine's scope of delivery. They are located above the cutting unit behind the press.

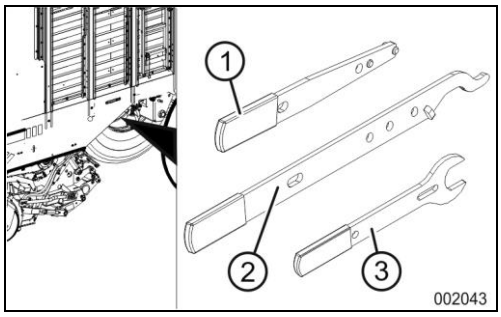


Fig. 36

1 Knife lever
   – for unlocking and locking the cutting unit
   – for replacing the knives
2 Locking lever
   – for counter-holding during knife removal
3 Open-end wrench
   – for setting the additional sensing rollers

4.13 Connection for silage additive pump

The electrical connection for the silage additive pump is connected with the floating position of the pick-up via the control system.

A maximum of 8 amperes of current may be drawn off.

ATTENTION

Damage to the electrical system due to overload.

Install a fuse and a relay for the silage additive pump.

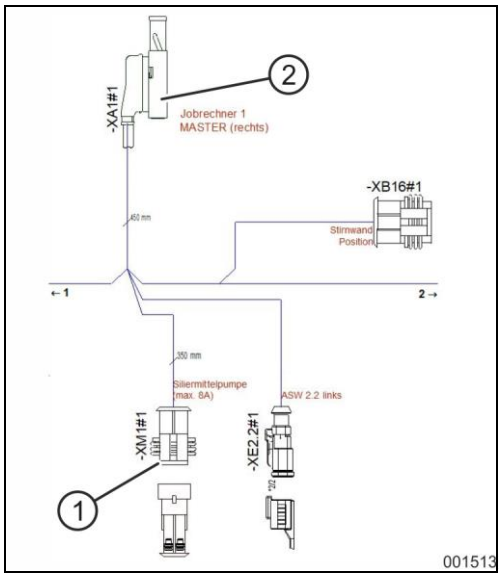


Fig. 37

The plug (1) for the connecting cable is mounted at the cable harness near the control unit (2).

The control unit is mounted at the left-hand front on the side panel of the cargo space behind a sheet metal cladding.

4.14 Swivelling front panel with integrated automatic charging system

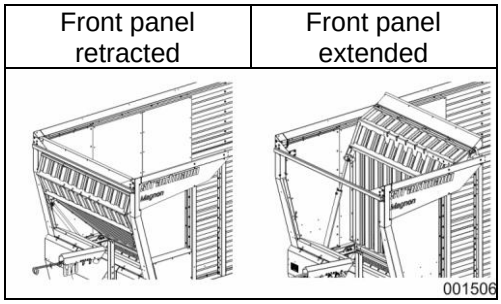


Fig. 38

All machine models are equipped with a standard swivelling front panel with integrated automatic charging system.

The front panel position can be manually or automatically set via the control set on the tractor.

With the automatic charging system enabled, the front panel is extended to position B1 for charging, in order to achieve optimum compaction of the material.

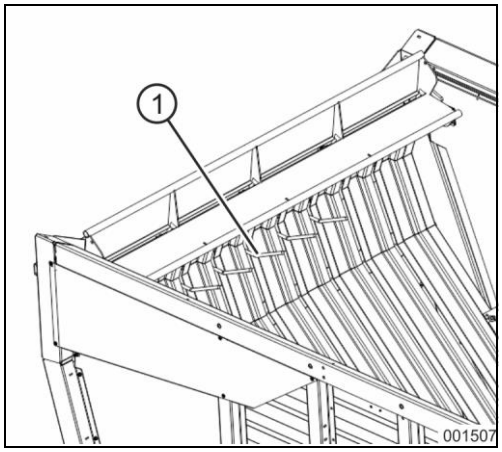


Fig. 39

During charging, the front panel is in start position B1. The loaded material piles up at the front panel during charging. When the loaded material reaches the feelers (1), the latter are deflected upwards and the angle sensor is actuated.

1. The transport floor is actuated.
2. The feelers are released again.

The cargo space can continue to be filled with material until it is full and the feelers (1) are actuated again.

→ The front panel is automatically retracted to position B2.

Retracting the front panel increases the loading capacity by 5 m³.

The integrated automatic charging system is enabled and disabled via the ISOBUS control set and switches the transport floor automatically on and off for uniform and complete filling of the cargo space,

The lowest and highest position can be set via calibration of the feelers, ► see section 7.1.45.1 Calibrate feeler for automatic charging system, page 194

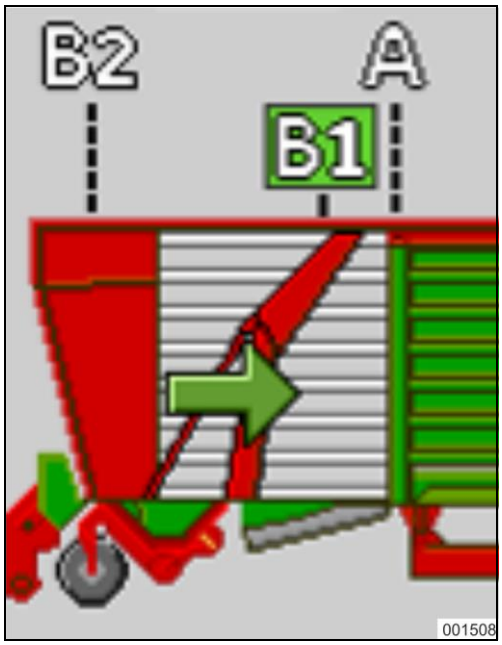


Fig. 40

During discharge, the front panel is swivelled from position B2 to position A, then swivelled back and forth between A and B1 up to three times to prevent material residues during discharge.

4.14.1 Disable / Stop automatic charging system / transport floor

4.14.1.1 Automatic charging system on machine without beaters

An electrical pressure switch as signal generator for the automatic charging system is mounted on the inside of the tailgate.

If the machine is fully charged,

- the control set generates an acoustic signal (horn sound),
- a visual signal "Forage wagon full" is displayed on the control set,
- the automatic charging system is disabled and the automatic feed function for the transport floor is switched off.

NOTE

The transport floor drive can be manually switched on again for a short time (3 seconds), until the acoustic signal (horn sound) sounds for the third time.

4.14.1.2 Machines equipped with beaters

The bottom beater will evade to the rear if the loaded material applies a particular pressure to this beater, thus actuating an electrical pressure switch. Then

- the control set generates an acoustic signal (horn sound),
- a visual signal "Forage wagon full" is displayed on the control set.
- the automatic charging system is disabled and the automatic feed function for the transport floor is switched off.

These measures are intended to prevent the loaded material from being too strongly pressed against the beaters and the beaters from becoming clogged during discharge.

During discharge, the hydraulic drive of the transport floor automatically restarts as soon as the loaded material is no longer applying any pressure to the bottom beater.

4.15 Transport floor

Depending on the model, plate-link chains (1) are mounted on the Magnon 10, while round steel chains (3) are used on the Magnon 8.

The chains of the transport floor are equipped with U-sections (2) and ensure consistent feeding of the loaded material when charging and discharging.

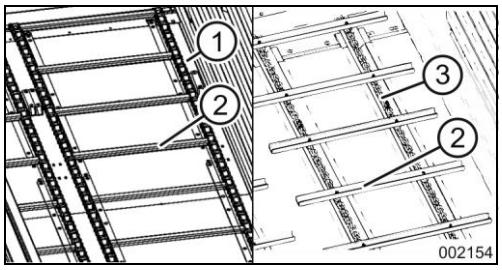


Fig. 41

Four chain tensioners tighten the chains.

The transport floor is powered hydraulically via two feed gearings.

The control set serves

- to switch the transport floor on and off.
- to variably adjust the feed rate of the transport floor.
- to switch from parallel drive to drive in series of both hydraulic motors for faster complete emptying
- to reverse the feed direction of the transport floor for a short time (max. three seconds), e.g. to eliminate blockages occurred at the beaters during discharge.

The chain tensioners must be retightened manually, see ► see section 10.12.1 Check / Tighten transport floor chains, page 271

⚠ DANGER

Most serious injuries due to crushing, becoming entangled, wound up, being drawn in or trapped might occur if people enter the cargo space or step under the charging area with the transport floor running!

Make sure that people leave the hazardous area.

Secure tractor and machine against accidental starting and rolling.

ATTENTION

Failure / Breakage of the chain tensioners when reversing the transport floor

- Reverse the transport floor drive only for a short time (max. three seconds).
- Do not press any material against the front panel during reversing.

4.16 Maize cover

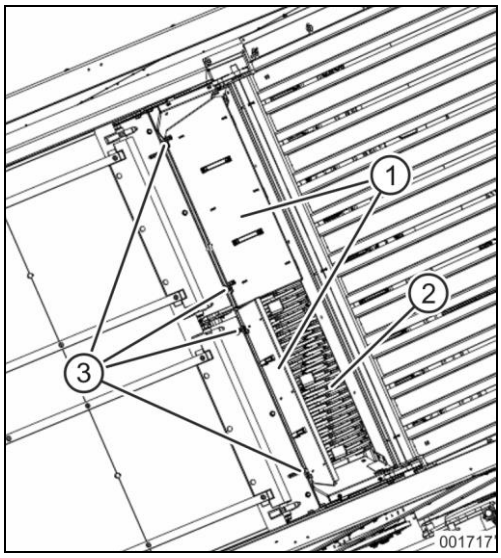


Fig. 42

The maize cover consists of two sheet metal plates (1) that can be mounted in the cargo space above the conveyor duct (2), thus preventing material to be loaded from falling into the conveyor duct when charging e.g. maize from the top.

For mounting, insert the sheet metal plates into the four holders (3) and fold them down.

4.17 Access door and ladder

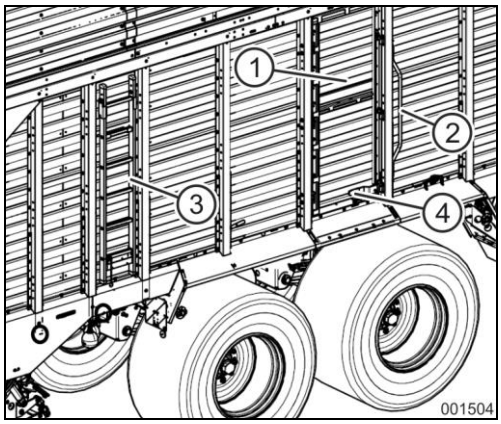


Fig. 43

The access door (1), the handle (2) and the detachable ladder (3) enable access to the cargo space.

The access door is locked and unlocked by means of the locking lug (4).

DANGER

Risk of crushing, becoming entangled, wound up, being drawn in and trapped if people enter the cargo space with the drive running!

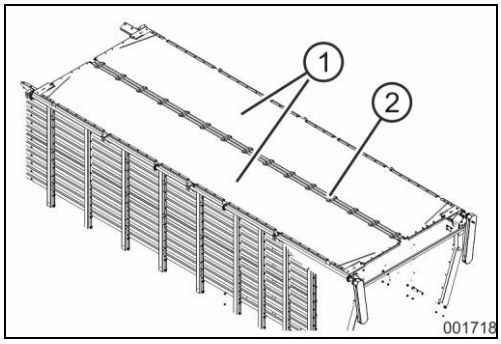
Secure tractor and machine against accidental starting and rolling before entering the charging area / the cargo space.

CAUTION

Risk of crushing fingers and hands due to unintentional slamming of the access door

Secure the access door against unintentional slamming.

4.18 Covering system



>Fig. 44

The folding mesh cover (1) ensures silage transport without any losses. The central overlapping (2) guarantees complete covering.

The hydraulic actuation is carried out via the ISOBUS control set.

The covering system must be closed during road travel. It must be open during charging and discharging, as otherwise other functions will be disabled (e.g. front panel, transport floor).

4.19 Extension

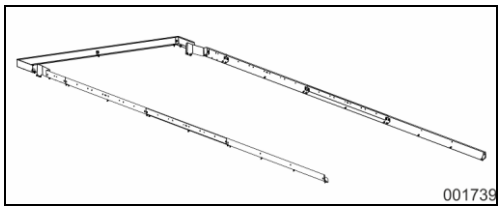


Fig. 45

The extension is 90 mm high and can be mounted onto the superstructure of the machine to increase the loading capacity.

4.20 Beaters

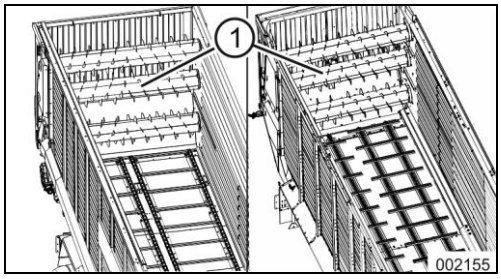


Fig. 46

Machines with the type designation "DO" are equipped with three beaters (1) for even discharge of fodder on the silo.

The beaters are powered by the tractor's p.t.o. shaft. When the tailgate is closed, the power train is separated by a clutch.

The individual beaters are connected with each other by means of roller chains. Each roller chain is equipped with an automatic chain tensioner.

The speed is queried at the top beater for the purpose of speed monitoring.

4.21 Tailgate

NOTE

The tailgate can only be moved with the covering system open.

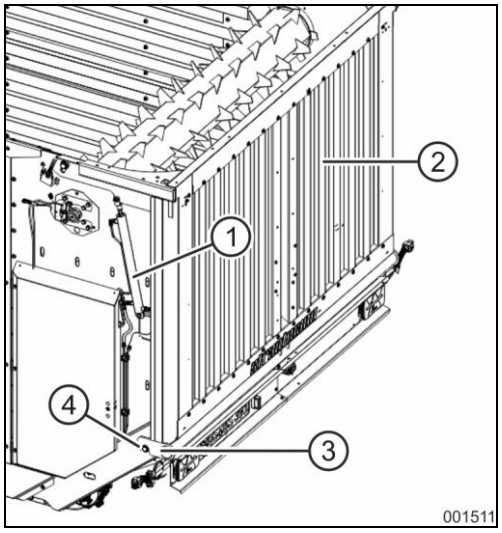


Abb. 47

The tailgate can be swivelled hydraulically and closes the cargo space on the rear side. The tailgate is lifted and lowered by means of two hydraulic cylinders via the control set.

When lifting the tailgate, the hydraulic cylinders (1) first vertically lift the tailgate (2) out of its locking mechanism (3). Then, the tailgate swivels upwards to the rear and lifts up to the desired position, with the automatic charging system activated up to the saved position.

When lowering the tailgate, it initially comes down due to its dead weight. The hydraulic cylinders only come into operation at the last moment to close the tailgate and lower it vertically onto the locking pin (4) for being locked.

On machines without beaters, an electrical pressure switch is mounted on the inside of the tailgate as signal generator for the "Wagon full" message.

4.22 Chassis

Depending on the machine’s equipment, it is fitted with:

- a mechanically suspended tandem chassis,
- a hydraulic tandem or tridem chassis with adjustable travelling height,
- a hydraulic tandem or tridem chassis with adjustable travelling height and suspension via hydraulic accumulator,
- a passive steering,
- a forced steering axle system,
- a compressed-air or hydraulic brake system.

4.22.1 Hydraulic tandem or tridem chassis

The hydraulic axle load compensation:

- ensures a dynamic axle load compensation between the axles due to the large compensating paths of the hydraulic cylinders, thus constantly ensuring an even load on the axles.
- ensures anti-roll stability on uneven ground and during fast cornering.
- controls the hydraulic brake pressure regulator (ALB regulator) of the compressed-air brake system.

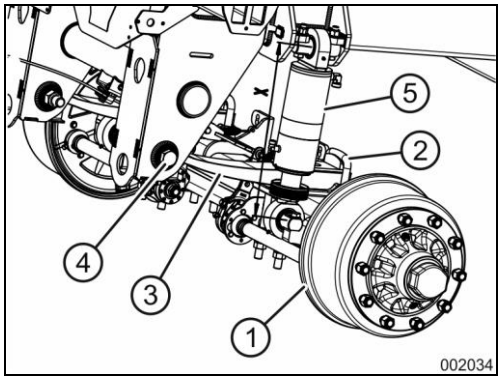


Fig. 48

With hydraulic chassis, the axles (1) are connected to the trailing arms (3) by means of the spring clamps / axle connection (2). The trailing arms (3) are connected to the axle support/chassis by means of the spring bearing bolts (4). The hydraulic cylinders (5) ensure the balancing between the wheels on each side.

The travelling height X is manually adjusted by means of stop-cocks separately for the right-hand and left-hand machine side.

⚠ WARNING

Insufficient braking ability

Risk due to insufficient braking ability of the machine if the travelling height of the hydraulic chassis has not been properly set.

The hydraulic ALB regulator controls the required braking force depending on the loading condition of the hitched machine only with the travelling height properly set.

4.22.2 Hydraulic tandem or tridem chassis with suspension

The hydro-pneumatic suspension:

- ensures a dynamic axle load compensation between the axles due to the large compensating paths of the hydraulic cylinders, thus constantly ensuring an even load on the axles.
- ensures higher driving comfort due to active suspension.
- protects material and tyres.
- controls the hydraulic brake pressure regulator (ALB regulator) of the compressed-air brake system.

In the hydraulic chassis with suspension, the balancing between the wheels is carried out by four or six hydraulic cylinders. One nitrogen accumulator on each side ensures the axle suspension and the shock absorption of the machine on the individual wheels.

The suspension is manually switched on and off via stop-cocks.

The travelling height is manually adjusted by means of stop-cocks separately for the right-hand and left-hand machine side.

⚠ WARNING

Risk due to insufficient braking ability of the machine if the travelling height of the hydraulic chassis has not been properly set.

The ALB regulator controls the required braking force depending on the loading condition of the hitched machine only with the travelling height properly set.

4.22.3 Lift axle

The machine can be equipped with a lift axle as an optional extra.

The first axle of the chassis can be hydraulically lifted with the machine empty or partly empty, in order to improve the traction of the tractor.

⚠ WARNING

Risks due to insufficient braking ability

Always completely lower the lift axle when carrying out transport journeys.

The ALB regulator is only able to control the required braking force properly when the lift axle is completely lowered.

⚠ WARNING

Uncontrolled machine movements

Only lift the lift axle with the steering axle locked. (Tandem chassis)

ATTENTION

Overload of axles, chassis, drawgear etc.

Lift the lift axle only with the machine empty or partly empty.

4.22.4 Boogie chassis with suspension

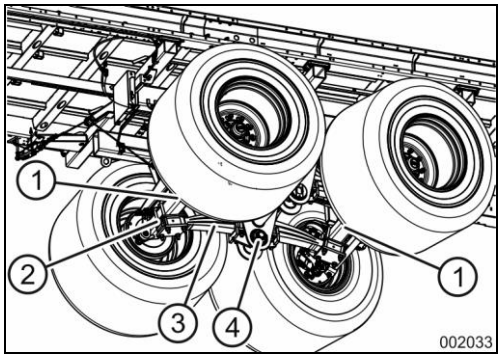


Fig. 49

On the boogie tandem chassis, the axles (1) are connected to the parabolic springs (3) by means of the spring clamps of the rubberised axle connection (2). The parabolic springs serve as a compensating rocker arm and are connected to the axle support/chassis by means of the spring fixing and the spring bearing/spring bearing bolt (4).

The large pendulum radii and the arrangement of the asymmetrical springs beneath the axles ensure optimum driving characteristics.

4.23 Steering axle

4.23.1 Passive steering axle

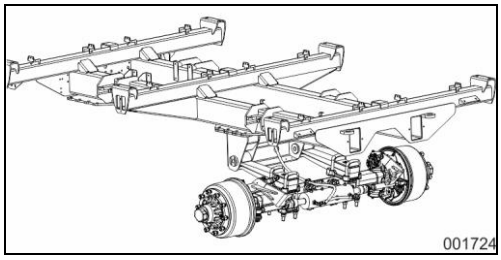


Fig. 50

In unlocked condition, the passive steering axle can move freely and follows the turning radius of the corner during cornering, thus improving the manoeuvrability and protecting the sward during cornering or reducing tyre wear on paved areas.

As the passive steering axle is passively steered when cornering the tractor, the axle must be locked during reverse travel. Otherwise, the machine cannot be steered in a controlled way. Furthermore, the passive steering axle can be locked,

- in order to achieve improved driving stability at higher speeds.
- in order to reduce drifting of the wagon when traversing hills.
- always when travelling over clamp silos.

The passive steering axle is unlocked and locked from the tractor via remote control. Unlocking and locking is carried out via the ISOBUS control set.

4.23.2 Forced steering axle system

Depending on the machine's equipment, it is fitted with a mechanical or an electro-hydraulic forced steering axle system.

The steering movements of the tractor are transmitted to the steering axle(s) via the coupling rod (1) / (4).

The bumper buffers (2) / (5) prevent the tractor from coming into contact with the steering rod of the forced steering axle system during tight cornering. Depending on the tractor tyres, the position of the bumper buffers can be adapted by means of the hole patterns.

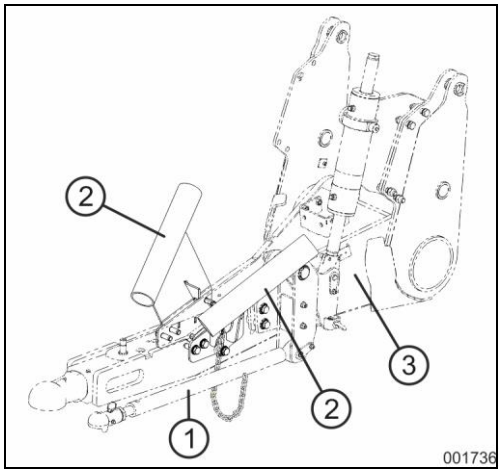


Fig. 51

1 Coupling rod for mechanical forced steering axle system
2 Bumper buffer
3 Folding drawbar

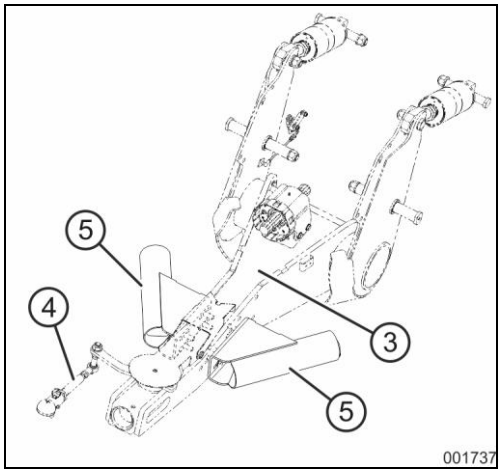


Fig. 52

3 Folding drawbar
4 Coupling rod for electro-hydraulic forced steering axle system SES
5 Bumper buffer (optional)

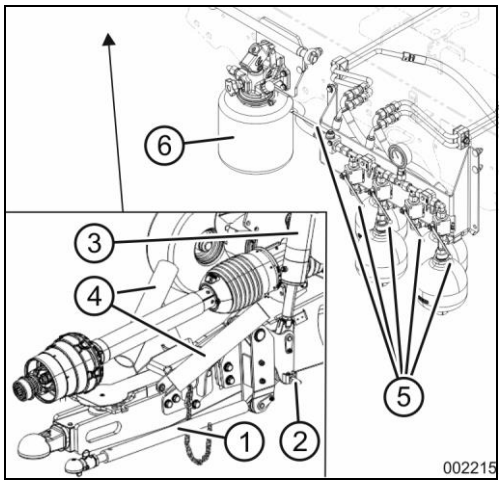


Fig. 53

4.23.3 Steering axle with mechanical-hydraulic forced steering axle system

The mechanical-hydraulic forced steering axle system mainly consists of

- coupling rod (1), locking bolt (2) and master cylinder (3) on the left-hand, right-hand or on both sides at the drawbar,
- bumper buffer (4) on both sides at the drawbar,
- the hydraulic system with stop-cocks (5) and pump (6) at the chassis,
- steering cylinder at the steering axle(s)

The following axles can be steering axles:

- The rear axle on the tandem chassis,
- the front and rear axle on the tridem chassis.

The steering angles between tractor and machine are mechanically and hydraulically transmitted to the steering axle.

The pump (6) and the stop-cocks (5) at the chassis serve to align the mechanical-hydraulic forced steering axle.

The bumper buffers (4) at the drawbar avoid damage due to excessive steering angles during tight cornering. They must be set such that the rear wheels of the tractor touch them during tight cornering before the max. steering angle / cylinder stroke (3) is reached.

4.23.4 Steering axle for electro-hydraulic forced steering axle system SES

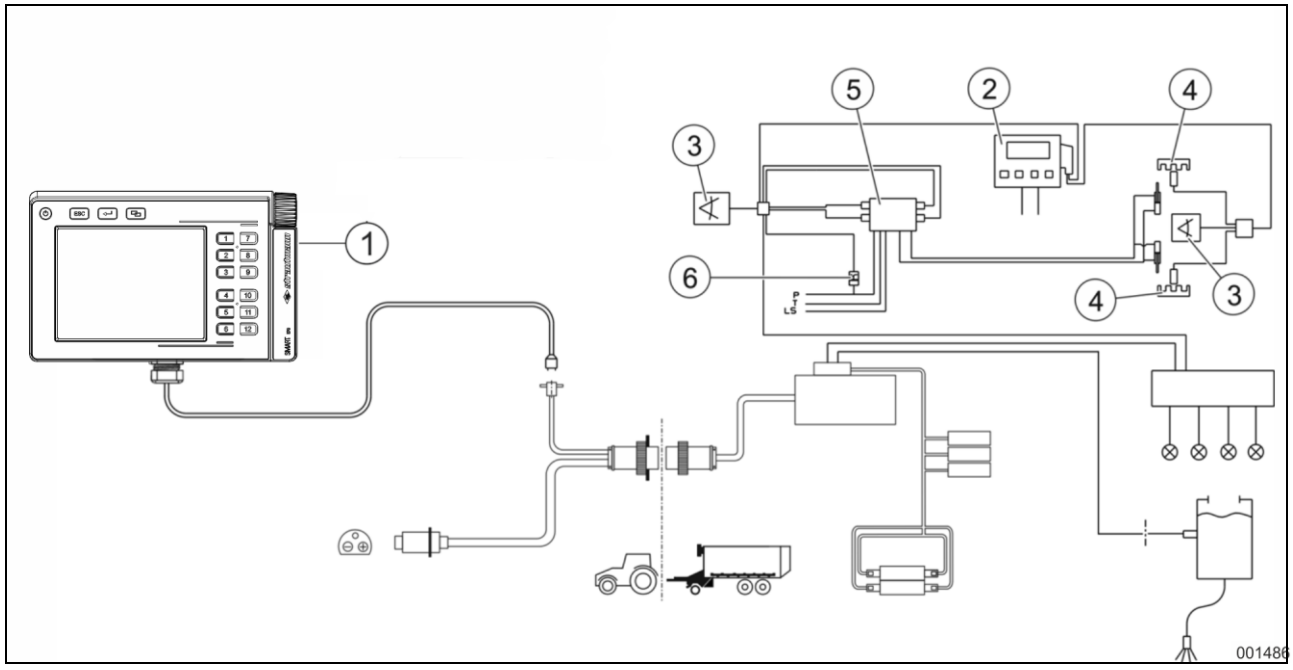


Fig. 54

The SES system (SES = Strautmann Electronic Steering) mainly consists of

- the control set (1) (exemplary diagram)
- the steering computer (2)
- the angle sensors (3) at the drawbar and the axle to determine the required steering angle
- the speed sensors (4)
- the hydraulic components (5)
- the pressure switch (6).

The following axles can be steering axles:

- The rear axle on the tandem chassis,
- the front and rear axle on the tridem chassis.

Via the drawbar angle sensor and two speed sensors, the SES system electronically registers the required steering angle and transforms the required steering angle into an electrical signal.

For reasons of driving safety, the SES system is equipped with a **speed-dependent steering angle reduction function**; the higher the travelling speed, the smaller the steering angle of the wheels:

- 0-30 km/h full steering angle of wheels,
- 30-50 km/h steering angle is reduced in proportion to the travelling speed
- from 50 km/h steering axle(s) locked in central position

The reduction of the steering angle is not displayed on the control set.

The maximum steering angle at the drawbar is 42-51°, depending on the machine's equipment. The value is perfectly adapted to each vehicle in the factory.

The steering computer transmits the information to an electrically actuated hydraulic valve and thus controls the steering cylinders of the steering axle(s). The pressure switch registers the circulation pressure in the hydraulic system.

The pressure switch reacts and activates the passive steering as soon as the hydraulic pressure falls below 15 bar.

For safety reasons, the SES system automatically switches over from forced steering to passive steering in other cases of trouble as well, e.g.:

- when the power supply falls below 11 V
- when the sensors do not work
- when the angle sensor or the steering rod is damaged.

The forced steering function can be disabled via the control set up to a travelling speed of 12 km/h.

4.24 Brake system

The brake system of the machine consists of

- a compressed-air brake system,
- a hydraulic dual-line brake system,
- a hydraulic single-line brake system,
- or a combination of compressed-air brake system and hydraulic brake system
- and a parking brake.

The applied parking brake acts independently of the service brake system and secures the unhitched machine against accidental rolling.

4.24.1 Compressed-air brake system

The compressed-air brake system

- pneumatically actuates the wheel brakes of the braking axle / braking axles.
- is connected to the tractor connections provided for that purpose.
  - The supply line marked in red serves to permanently provide the hitched machine with air, while the brake line marked in yellow is responsible for the control of the braking process.
- is, depending on its version, designed for the admissible axle load and a speed limit of up to 40 km/h.
- is equipped with an automatic brake pressure regulator.
  - The required braking force is automatically set depending on the loading condition of the hitched machine.
- is equipped with one or several compressed air reservoir(s) for air supply with a device for draining condensate.
- is equipped with a release valve for manoeuvring the machine with the brake and feed line disconnected.
- is, depending on the equipment (with tridem), fitted with spring-accumulator brake cylinders (Tristopp brake cylinders).
  - In this case, the parking brake is applied and released automatically via a double release valve, depending on the operating state of the compressed-air brake system, or manually applied and released.

⚠ WARNING

Insufficient braking ability

Risks due to insufficient braking ability of the machine may occur if

- the manual brake pressure regulator is not set properly.

– Adjust the setting of the manual brake pressure regulator before each journey and every time the loading condition changes.

- the admissible axle load or the gross vehicle weight rating of the machine is exceeded.

– Do not overload the machine.

- the compressed-air brake system is not ready for operation.

– Carry out a brake test at slow speed to check the brake for proper functioning.

ATTENTION

Observance of the maintenance intervals is indispensable for proper functioning of the compressed-air brake system.

4.24.1.1 Compressed-air brake system with mechanical ALB regulator

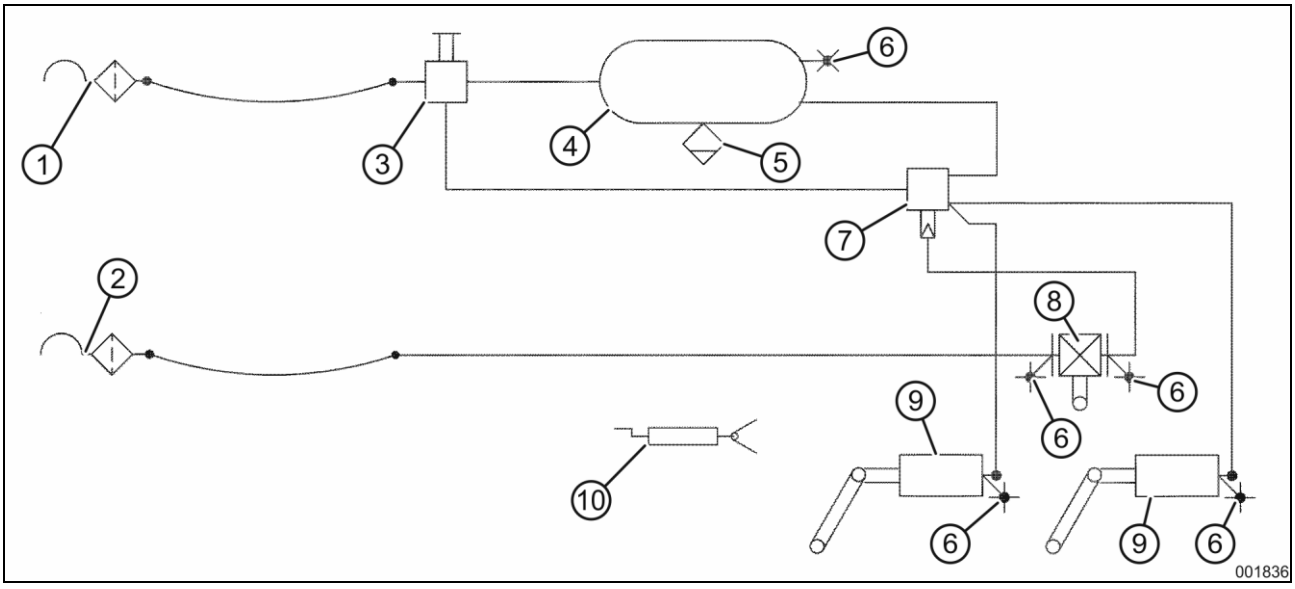


Fig. 55

1	Feed line with hose coupling (red) with filter	6	Test connection
2	Brake line with hose coupling (yellow) with filter	7	Trailer brake valve
3	Release valve	8	Automatic brake pressure regulator (ALB)
4	Compressed-air reservoir	9	Brake cylinder
5	Drain valve	10	Parking brake

4.24.1.2 Compressed-air brake system with hydraulic ALB regulator

⚠ WARNING

Insufficient braking ability

Risk due to insufficient braking ability of the machine if the travelling height of the hydraulic chassis has not been properly set.

The hydraulic ALB regulator controls the required braking force depending on the loading condition of the hitched machine only with the travelling height properly set.

Tandem chassis

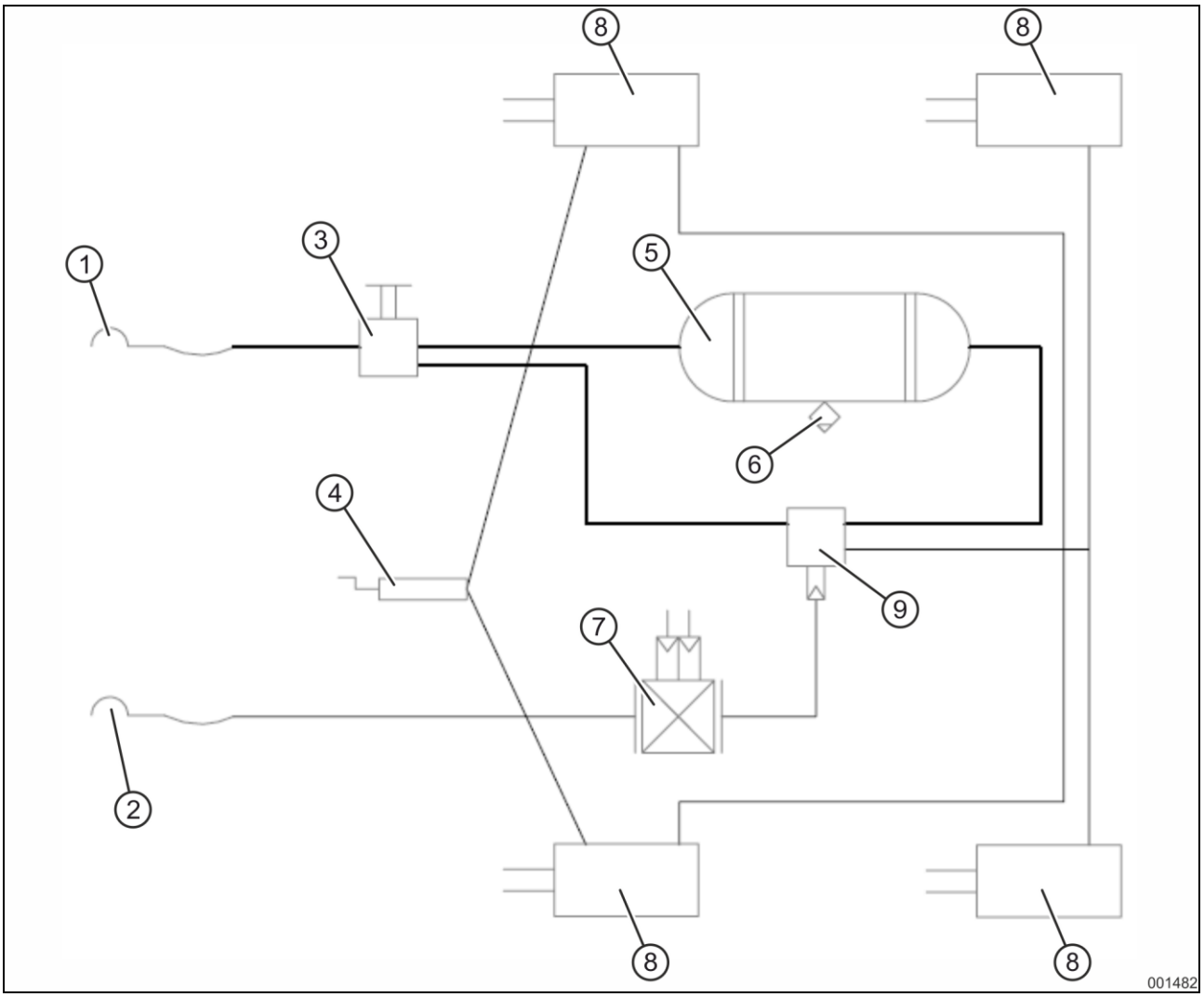


Fig. 56

1 Feed line with hose coupling (red)
2 Brake line with hose coupling (yellow)
3 Release valve
4 Mechanical parking brake
5 Compressed-air reservoir
6 Drain valve
7 ALB regulator, hydraulic
8 Membrane brake cylinder
9 Trailer brake valve

Tridem chassis

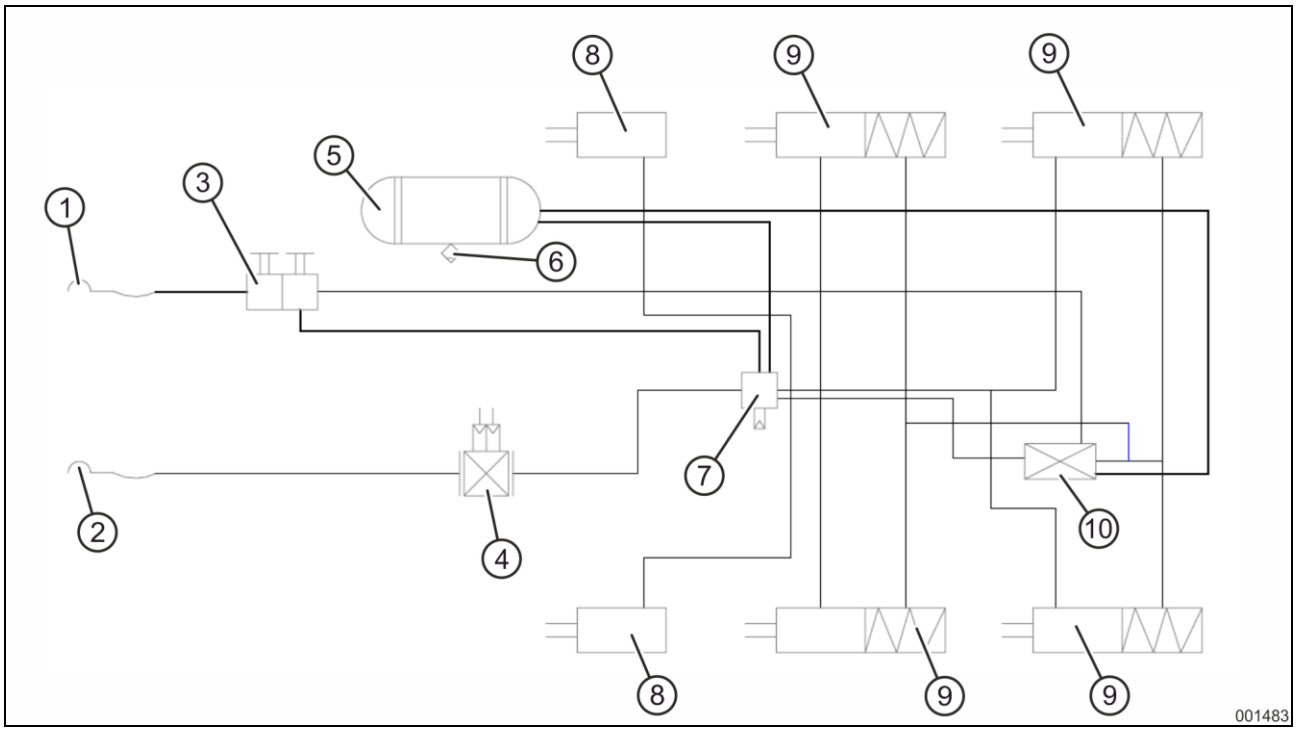


Fig. 57

1 Feed line with hose coupling (red)
2 Brake line with hose coupling (yellow)
3 Release valve (double release valve)
4 ALB regulator, hydraulic
5 Compressed-air reservoir
6 Drain valve
7 Trailer brake valve
8 Membrane brake cylinder
9 Spring-loaded brake cylinder
10 Overload protection relay valve

The brake system consists of

- one or several braking axle(s)
- emergency brake valve and hydr. pressure accumulator
- brake cylinder, hydr. line and hydraulic clutch according to ISO 5676

The hydraulic brake system

- is connected to the connection of the tractor brake valve provided for this purpose.
- is controlled by actuation of the tractor brake pedal.
- acts on the wheels of the braking axle(s).
- is, depending on its version, designed for the admissible axle load and a speed limit of up to 25/40 km/h.

ATTENTION

Observance of road traffic regulations

Observe the national road traffic regulations concerning the operation of the hydraulic single-line brake system.

DANGER

Travelling with the brake system not ready for operation

Before starting the journey, carry out a brake test for 10 seconds to fill the pressure accumulator of the hydraulic brake system.

ATTENTION

With hydraulic brake system,

- it is necessary to apply the parking brake to securely park the trailer!
- it is necessary to depressurise the brake system before uncoupling!

ATTENTION

Observance of the maintenance intervals is indispensable for proper functioning of the hydraulic brake system.

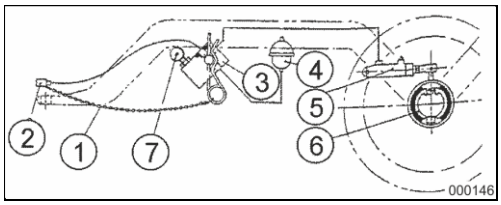


Fig. 58

1 Ripcord
2 Coupling sleeve
3 Emergency brake valve
4 Pressure accumulator
5 Brake cylinder
6 Brake drum
7 Drain valve

4.24.2 Hydraulic dual-line brake system

The brake system consists of

- one or 2 braking axle(s)
- a hydraulic dual-line brake valve with pressure accumulator for breakaway and emergency brake function
- an automatic or a manual brake pressure regulator.
- a mechanical parking brake

The hydraulic brake system

- is connected to the connections of the tractor brake valve provided for this purpose.
- is controlled by actuation of the tractor brake pedal.
- acts on the wheels of the braking axle.
- is, depending on its version, designed for the admissible axle load and a speed limit of up to 40 km/h.

In case of an automatic brake pressure regulator, the required braking force is automatically set depending on the loading condition of the hitched machine.

The mechanical ALB regulator mounted at the chassis frame is connected to the axles by means of a linkage.

– When charging the machine, the distance between frame and axles decreases due to the chassis suspension.
  → The braking force is increased.
– When discharging the machine, the distance between frame and axles increases due to the chassis suspension.
  → The braking force is reduced.

In case of a manual brake pressure regulator, the required braking force is set depending on the manual presetting.

DANGER

Travelling with the brake system not ready for operation

Before starting the journey, carry out a brake test for 10 seconds to fill the pressure accumulator of the hydraulic brake system.

WARNING

Insufficient braking ability

Risks due to insufficient braking ability of the machine may occur if

• the manual brake pressure regulator is not set properly.
– Adjust the setting of the manual brake pressure regulator before each journey and every time the loading condition changes.
• the admissible axle load or the gross vehicle weight rating of the machine is exceeded.
– Do not overload the machine.

ATTENTION

With hydraulic brake system,

• it is necessary to apply the parking brake to securely park the trailer!
• it is necessary to depressurise the brake system before uncoupling!

ATTENTION

Observance of the maintenance intervals is indispensable for proper functioning of the hydraulic brake system.

4.24.2.1 Connection diagram, hydraulic brake system

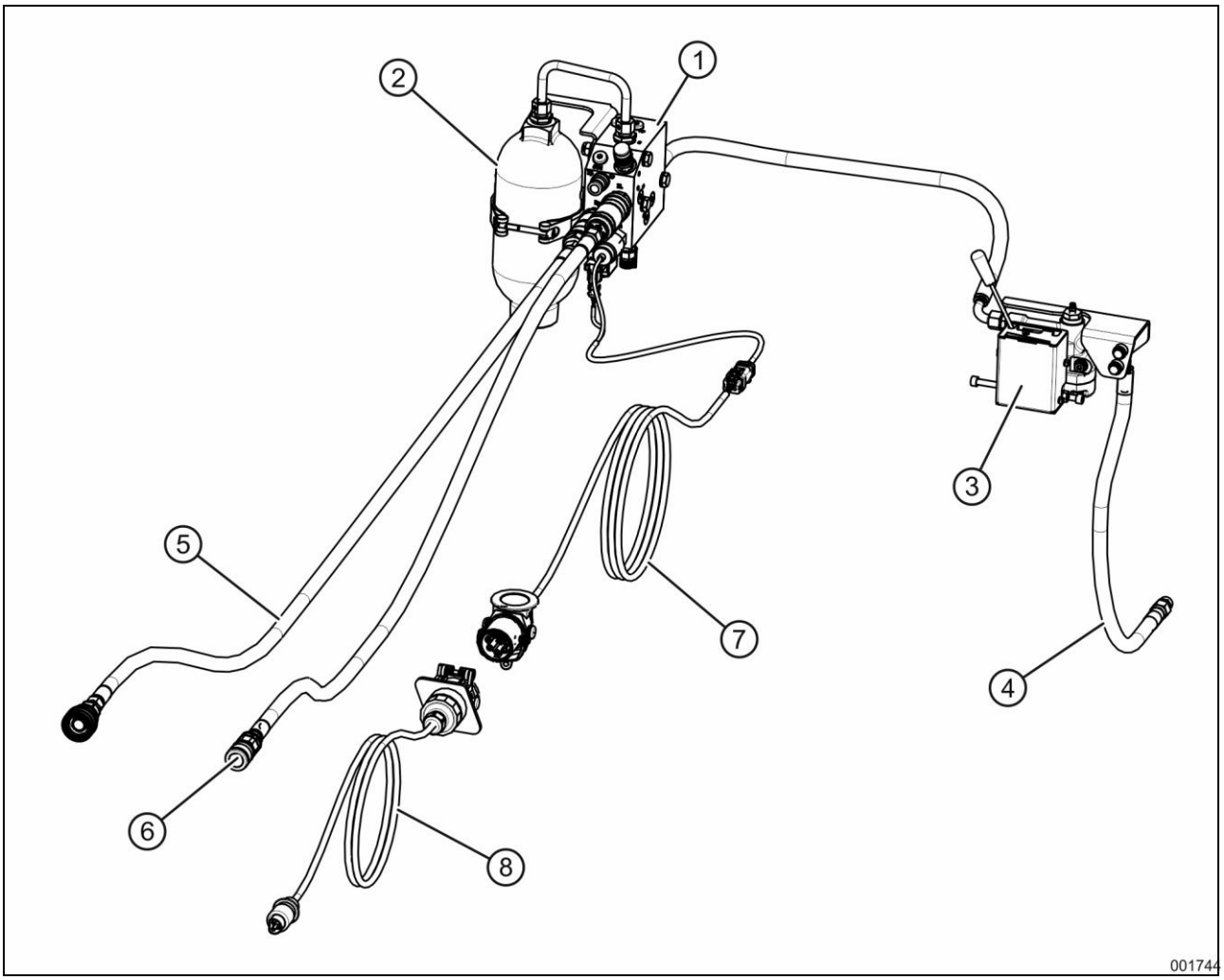


Fig. 59:

1 Brake valve
2 Pressure accumulator
3 Brake pressure regulator (manual brake pressure regulator illustrated / alternatively automatic brake pressure regulator)
4 Supply line, brake cylinder (axle)
5 Brake line
6 Additional line (for dual-line operation)
7 Electrical connection with ABS plug
8 Adapter cable, ABS plug / 3-pole plug (not included in the scope of delivery, article no. 881175000)

NOTE

Operation of the hydraulic brake system without additional line (single-line operation)

- Couple the additional line to the "parking plug" of the brake valve.

– The emergency brake function remains intact when the brake line is torn off.

- The electrical power supply for the "Immobiliser" function can alternatively be provided via 3-pole socket and adapter cable.
- Observe the national road traffic regulations concerning single-line operation of the hydraulic brake system.

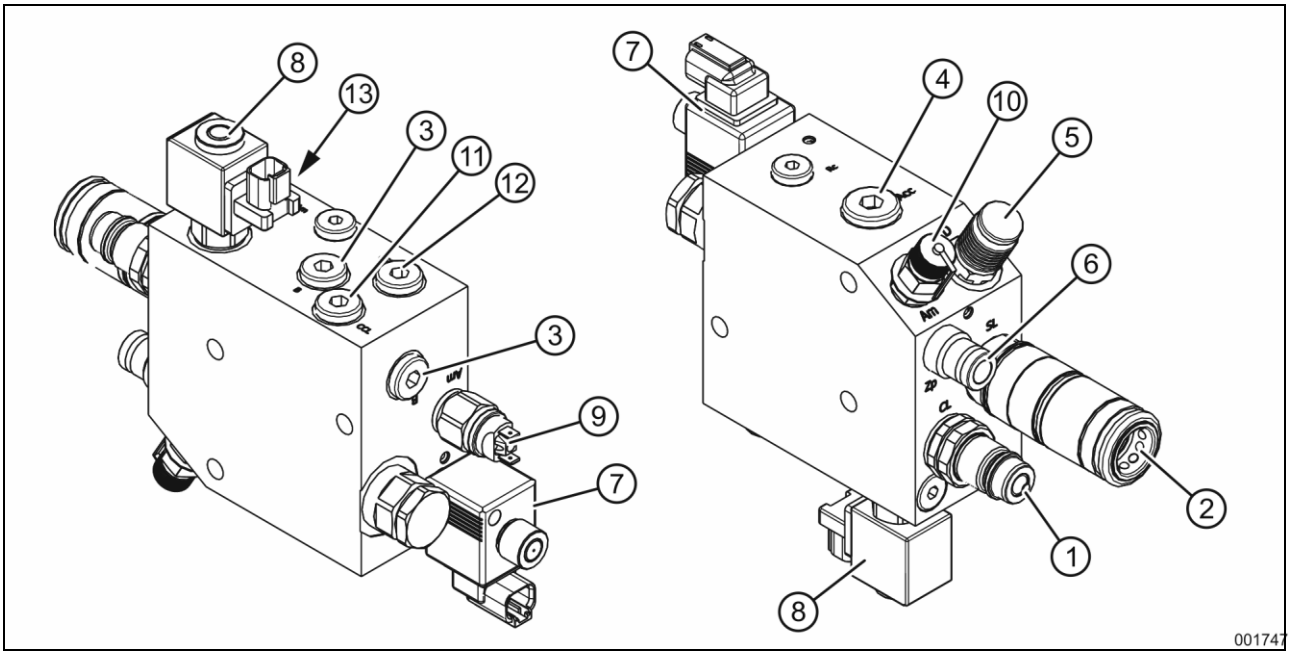


Fig. 60:

1 Connection, brake line
2 Connection, additional line (for dual-line operation)
3 Supply line, brake pressure regulator / brake cylinder
4 Connection, pressure accumulator
5 Drain valve
6 Parking coupler for additional line (with single-line operation)
7 Solenoid valve, emergency braking activation
8 Solenoid valve, immobiliser
9 Pressure switch
10 Test port, accumulator pressure
11 Transfer line, brake line
12 Transfer line, additional line
13 Test port, additional line

When the tractor is turned off, the machine goes into braking mode.

An automatic emergency braking takes place:

- if the brake line is torn off or disconnected,
- if the additional line is torn off or disconnected,
- if the pressure of the additional line falls below 12 bar, e.g. due to actuation of the handbrake, a leakage in the additional line or if the tractor engine stalls.
- if the power supply is interrupted.

For release of the hydraulic brake system, please refer to ► see section 9.9 Release hydraulic dual-line brake system, page 231

4.24.3 Parking brake with crank handle

The applied parking brake secures the unhitched machine against rolling. The parking brake is actuated by turning the crank handle via spindle and cable.

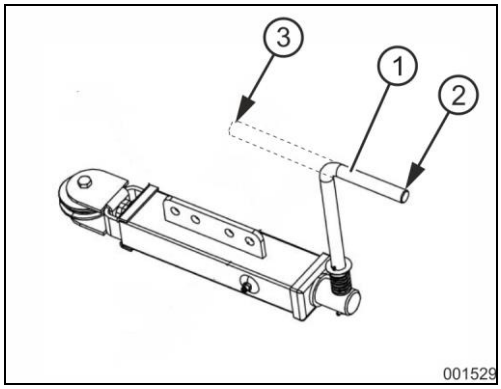


Fig. 61

1 Crank handle; in adjustment position (2)
2 Adjustment position
3 Rest position, swivelled by 180° compared to the adjustment position

4.24.4 Braking axle

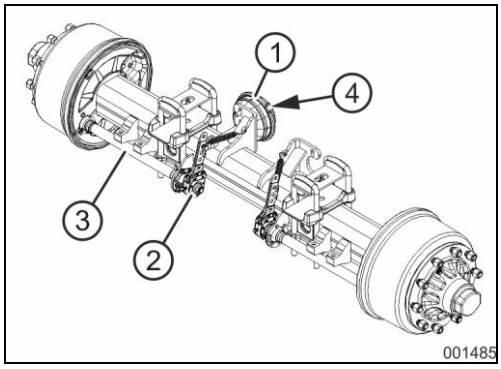


Fig. 62

1 Brake cylinder
2 Slack adjuster for brake camshaft
3 Brake camshaft
4 Test connection for pressure gauge (optional, depending on equipment)

4.25 Traffic-related equipment

Properly fix and check the traffic-related equipment for proper functioning before travelling on public roads and paths.

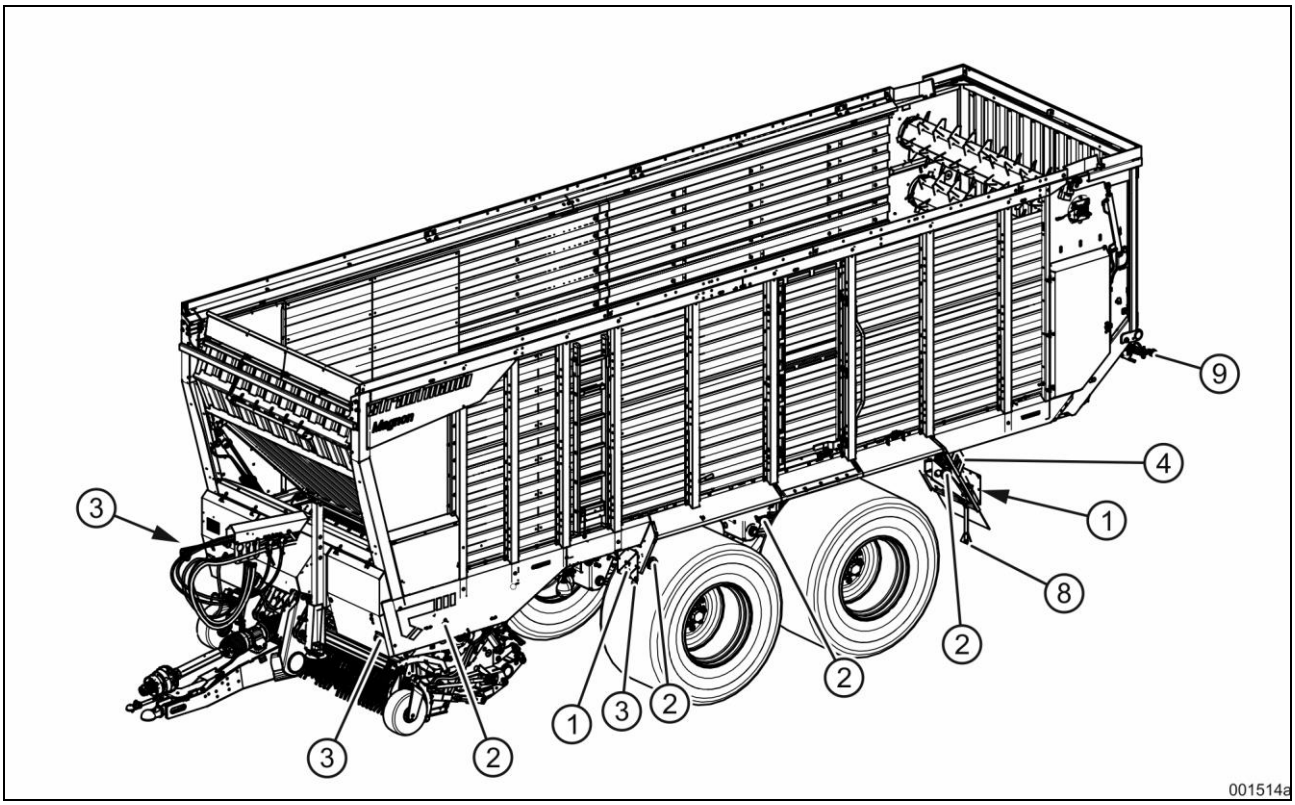


Fig. 63

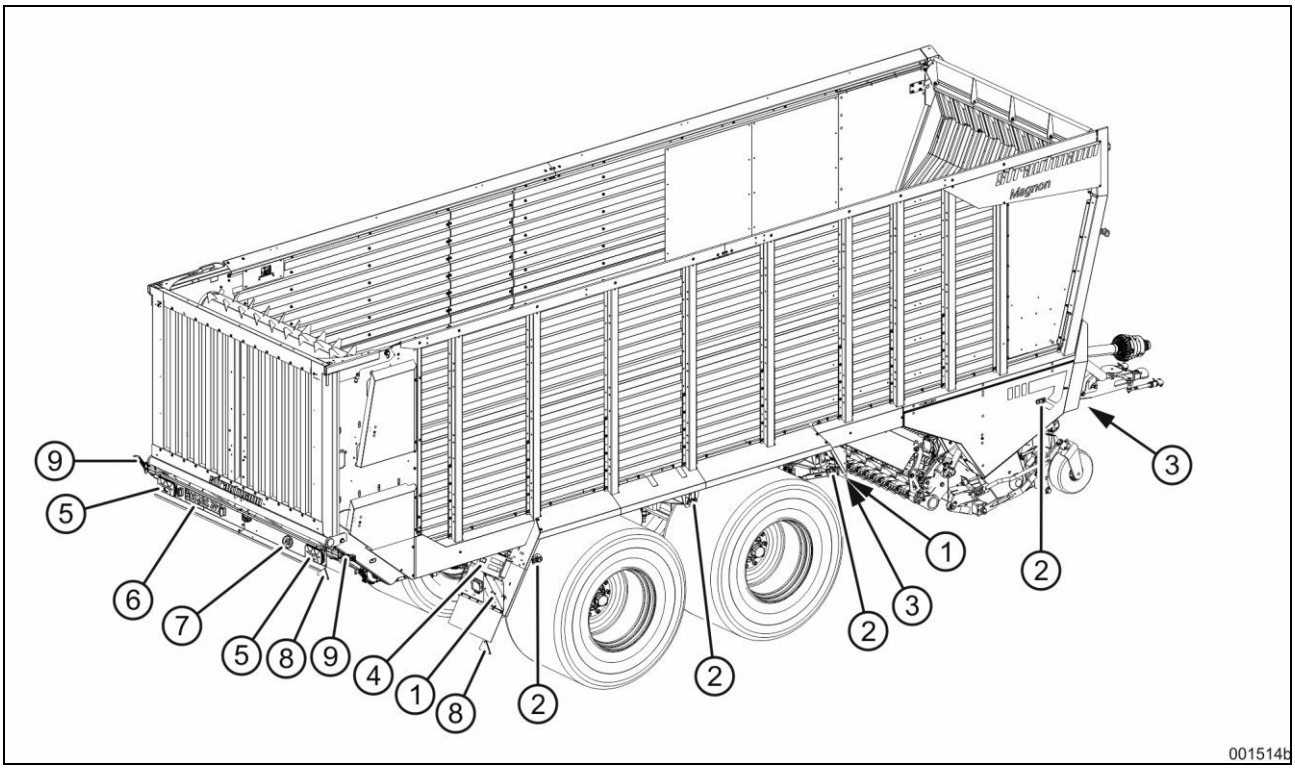


Fig. 64

1 Warning plates
2 Side-marker lights / Side reflectors
3 Front position lights / Front white reflectors
4 Chocks
5 Multi-function lights
6 License plate
7 Speed sign
8 Triangle reflectors
9 Clearance lights

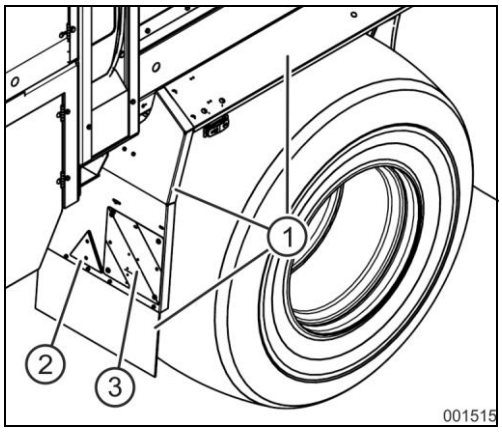


Fig. 65

4.25.1 Splash guard system

The splash guard system (1) protects other road users against whirled-up stones, dirt, water, snow or ice. Reflectors (2), warning plates (3) and side-marker lamps can be mounted at the splash guard system as traffic-related equipment.

When changing a tyre, check the splash guard system and the traffic-related equipment for compliance with the current national road traffic regulations. Adapt the splash guard system, the brake system and traffic-related equipment if necessary due to other wheel sizes.

In countries where EU law applies the width of the splash guard system must not exceed the wheel width.

ATTENTION

When changing a tyre, only mount tyres approved by the manufacturer. Please contact the dealer for this purpose.

► see section 10.15.3 Change wheel / tyres Tighten wheel nuts, page 279

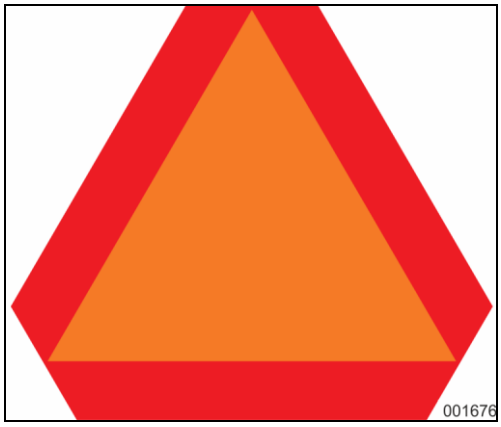


Fig. 66

4.25.2 SMV identification board

The Slow Moving Vehicle identification board can be attached to the rear centre or the left-hand side of the vehicle as an optional extra. Please observe the country-specific road traffic regulations.

NOTE

Remove or cover the speed signs and the SMV identification board when transporting the machine on transport vehicles.

Fig. 67

4.25.3 Yellow warning beacon

The yellow warning beacon can be attached to the vehicle as an optional extra. Please observe the country-specific road traffic regulations during operation.

4.26 Type plate

The marking of the machine is treated as a document and must not be altered or made unrecognisable.

The type plates are mounted beneath the side bar on the right-hand vehicle side (in the direction of motion).

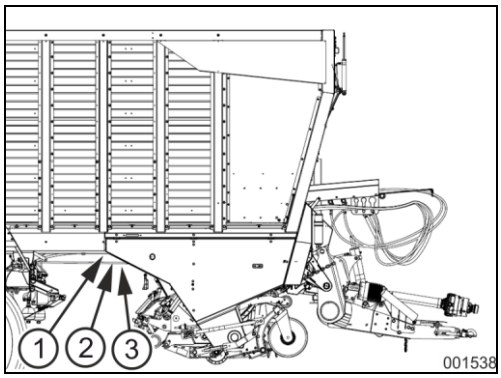


Fig. 68

1 Type plate with CE symbol
2 Type plate for EU-type approved machines
3 Vehicle identification number (machine ID number) embossed into the frame

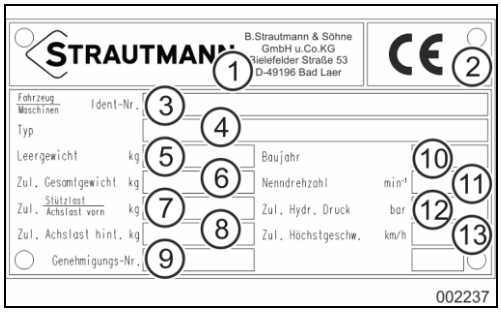


Fig. 69

Information on the type plate:

1 Manufacturer
2 CE symbol
3 Vehicle/Machine ID number
4 Model
5 Empty weight [kg]
6 Gross vehicle weight rating [kg]
7 Admissible tongue load/front axle load [kg]
8 Admissible rear axle load [kg]
9 Approval number
10 Year of manufacture
11 Rated speed [min^{-1}]
12 Admissible hydraulic pressure [bar]
13 Maximum admissible speed [km/h]

NOTE

Depending on the machine's equipment, not all fields on the type plate are filled.

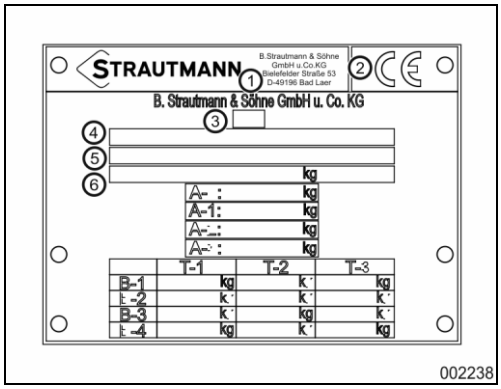


Fig. 70

Information on the EU type plate:

1 Manufacturer

2 CE symbol

3 Vehicle class

R3a Farming or forestry trailer Total axle load 3.5 – 21 t up to 40 km/h

R3b Farming or forestry trailer Total axle load 3.5 – 21 t more than 40 km/h

R4a Farming or forestry trailer Total axle load more than 21 t up to 40 km/h

R4b Farming or forestry trailer Total axle load more than 21 t more than 40 km/h

S2a Towed, interchangeable farming or forestry equipment Total axle load more than 3.5 t up to 40 km/h

S2b Towed, interchangeable farming or forestry equipment Total axle load more than 3.5 t more than 40 km/h

4 EU type approval number

5 Vehicle/Machine ID number type

6 Total axle load [kg]

A-0 Tongue load [kg]

A-1 Axle load, first axle

A-2 Axle load, second axle

A-3 Axle load, third axle

Information for rear coupling device (if available)

T-1 Drawbar trailer vehicle

T-2 Rigid drawbar trailer vehicle

T-3 Central axle trailer vehicle

B-1 Unbraked

B-2 Overrun brake

B-3 Continuous or semi-continuous brake

B-4 Hydraulic or pneumatic brake

5 Transport

This chapter provides basic information and instructions regarding loading and transport of the machine.

5.1 Safety

This work requires special know-how and/or specific technical equipment.

Operative staff:

- Qualified staff for load transport (haulage contractor, crane operator)

Loading/Unloading by means of lifting devices

- Only authorise duly qualified staff to lift loads and instruct crane operators.
- Only use lifting, transport and load-handling equipment and slings with sufficient lifting capacity and in technically sound condition for transport.
- Check all anchorage points and slings before each use for possible damage and replace them if necessary.
- Exclusively use the marked anchorage points when fixing slings.
- Attach slings vertically, use spacers / crossbars if necessary.
- Secure loading areas against unauthorised access.
- Move loads only under supervision.

⚠ DANGER

Suspended loads

Tilting or falling loads may cause serious or even fatal injuries.

- Never stand beneath suspended loads.
- Observe the total weight, anchorage points and the centre of gravity of the load.
- Observe the transport instructions and symbols on the load to be transported.

Fig. 71

Lashing and anchorage points for fixing slings and lashing loads are identified by the adjacent pictograph.

Application points for lifting device (e.g. jack) are marked by the adjacent symbol.

Loading/Unloading by means of tractor

- The tractor must be able to safely decelerate the machine.
- If the machine is equipped with a compressed-air brake system, start moving the machine only when the pressure gauge on the tractor indicates 5 bar.

⚠ WARNING

Uncontrolled movements due to tractor

Insufficient stability and insufficient steerability and braking ability of the tractor may cause dangerous tractor and machine movements.

- Properly hitch the machine only to an appropriate tractor.

Transporting the machine on transport vehicles

- Observe the national road traffic regulations.
- All movable machine parts / machine parts that are dangerous to traffic must be secured in transport position or removed.
- The speed signs and the SMV identification board are to be removed or covered.

5.2 Lashing and anchorage points

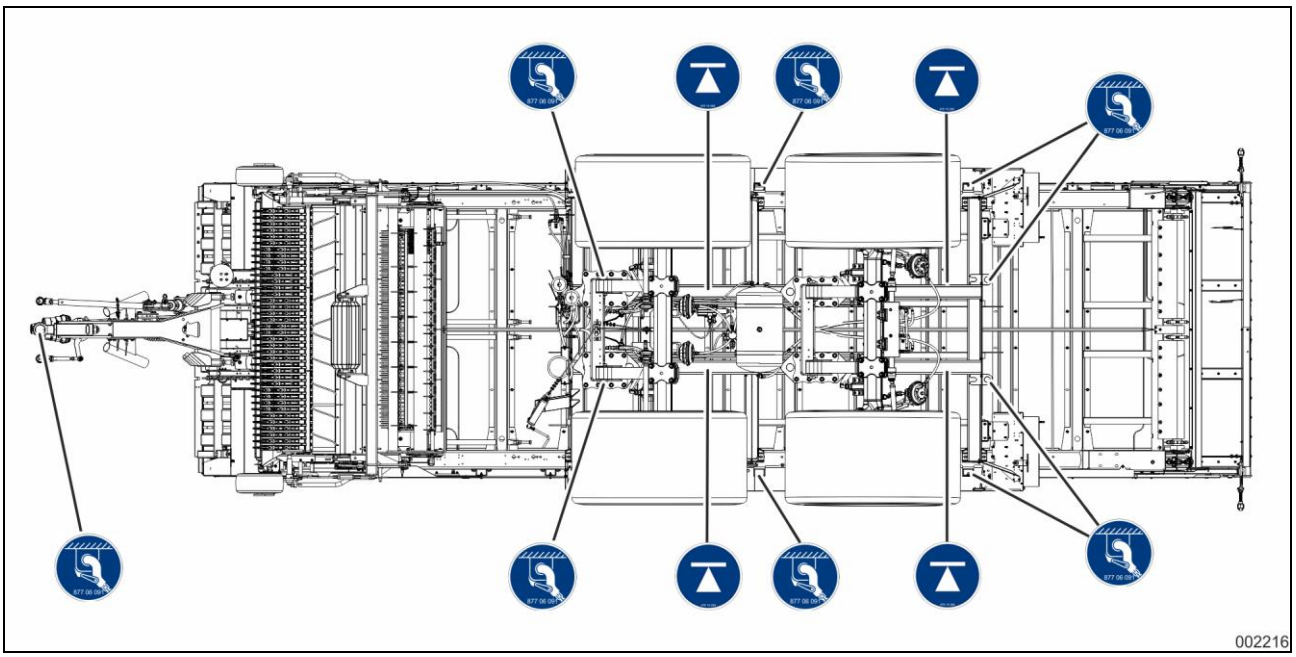


Fig. 72

Lashing and anchorage points

Application points for lifting device (jack)

5.3 Transport locks, steering axle(s)

ATTENTION

For manoeuvring during machine transport, the steering axle(s) is(are) mechanically locked by means of transport locks or stop-cocks.

Open the stop-cocks at the steering axle(s) or remove the blockage of the steering axle(s) before putting the machine into operation.

6 Commissioning

This chapter provides basic information and instructions about the preparations and activities to be carried out before working with the machine.

6.1 Safety

As a basic principle, the following is applicable:

- Do not put the machine into operation until the operating instructions have been fully read and understood by all persons involved.
- Commissioning may only take place if the machine is guaranteed to be in an operational and roadworthy condition.
- Only put the machine into operation when there is a good view of the working area. Adjust the outside mirrors and camera properly to view the hazardous areas.
- People are not allowed
  - within the operating/hazardous area of the machine.
  - within the turning and swivelling range of movable machine parts.
  - within the discharge area of the machine.
  - beneath lifted and unsecured movable machine parts.
- Wear close-fitting clothing. Loose-fitting clothing may be more easily caught by moving machine parts.
- Only actuate powered machine parts if there are no people within the machine’s hazardous area.
- Observe the applicable road traffic regulations.
- Observe the applicable accident prevention and safety regulations.

6.2 Road traffic regulations

NOTE

The following points include information for the registration and the operation of the machine in Germany. When using the machine in other countries, observe the respective applicable national regulations and laws. Regulations and laws are subject to constant further development and modifications, therefore, we cannot assume any guarantee for the following points.

The machine is a trailer / towed equipment for farming and forestry purposes within the meaning of the StVZO (note of transl.: German Road Traffic Licensing Code).

The machine is usually delivered with an EU type approval (Certificate of Conformity CoC), a data confirmation of the general operating license or an expert report for obtaining an individual operating license according to § 21 StVZO.

The machine is equipped with speed signs according to §58 subs. 4 StVZO for the speed limit (usually 25 or 40 km/h).

Compulsory operating license (§20, 21 StVZO)

- Farming or forestry trailers and equipment with a maximum speed of more than 6 km/h require an operating license on public roads.
- For farming or forestry equipment (irrespective of the operating speed) and trailers up to 25 km/h, the EU Certificate of Conformity (CoC) is sufficient as an operating license for travelling on public roads.

  For farming or forestry trailers, it is important that the EU type approval and the Certificate of Conformity (CoC) have been issued for 25 km/h.
- Machines and trailers with individual approval (expert report for obtaining an individual operating license) or data confirmation of the general operating license.
  - The enclosed expert report or the data confirmation alone must not be considered as a permit to travel on public roads.
  - Use the enclosed expert report or the data confirmation to apply for the operating license (or the registration).

Compulsory registration (§ 18 StVZO)	Registration not required
• Farming or forestry trailers* with a maximum speed of more than 25 km/h – are, as a basic principle, subject to registration, – require a separate license plate, – are subject to general inspection (up to and including 40 km/h every two years, from 40 km/h every year), – and are additionally subject to a safety check from a gross vehicle weight rating of 10 t and a speed limit of more than 40 km/h every six months. For entirely new trailers, the first safety check shall only be necessary after 24 months. * Vehicle class (paragraph 5 in the expert report / vehicle registration certificate) "open box“ or R3a, R3b, R4a or R4b / LOFANH…with EU type approval. ** Vehicle class (paragraph 5 in the expert report / vehicle registration certificate) "Farming equipment" or S2a or S2b / LOFGAG…with EU type approval.	• Towed farming or forestry equipment is not subject to registration but only to operating license (irrespective of their operating speed) • Farming or forestry trailers* are not subject to registration but only to operating license if they fulfil the following criteria: – Exclusive use in farming and forestry establishments. As a basic principle, contractors are obliged to register farming or forestry trailers from a maximum speed of 6 km/h. – Exclusive use for farming or forestry purposes. – Use only up to a maximum operating speed of 25 km/h (marking by "25 km/h" sign). • Farming or forestry trailers and equipment that do not require registration – have to be equipped with the license plate of a tractor registered for the farming or forestry establishment. – require a liability insurance unless they are co-insured by the towing tractor. – are not subject to general inspection,

Apply for operating license or registration

- Machines and trailers with individual approval (expert report for obtaining an individual operating license) or data confirmation of the general operating license.
  - Use the enclosed expert report or the data confirmation to promptly apply for the operating license at your local registration office.
  - Use the enclosed expert report or the data confirmation to apply for the registration at your local registration office.

- Machines and trailers with EU type approval, i.e. EU Certificate of Conformity (CoC)
  - Use the EU Certificate of Conformity (CoC) to apply for the registration at your local registration office.

NOTE

The enclosed "Merkblatt für die Zulassungsstelle" ("Leaflet for the Registration Office") facilitates the work of the local registration office.

- For farming or forestry trailers up to 25 km/h and equipment (irrespective of their operating speed), the EU Certificate of Conformity (CoC) is sufficient as an operating license for travelling on public roads. (Applies to farming or forestry trailers only if the EU type approval and the Certificate of Conformity (CoC) have been issued for 25 km/h and not for 40 km/h).

NOTE

In order to avoid the obligation for registration, the speed limit may be reduced:

- by replacing the speed sign,
- by means of an acceptance of modifications by an expert on site (TÜV or DEKRA inspector),
- and subsequent correction of the vehicle registration documents by the competent local registration office.

6.3 Tractor's compatibility

Incorrect use of the tractor may cause risks due to failure of components.

- Do not exceed the following admissible limit values:
  - Total weight of the tractor
  - Axle loads of the tractor
  - Tongue load at the tractor's coupling point
  - Towing capacity of the coupling device
  - Load-bearing capacity of the tractor tyres
- The gross vehicle weight rating of the tractor, which is specified in the vehicle registration certificate, must exceed the sum of:
  - the tractor's empty weight
  - the ballasting mass
  - the tongue load of the hitched machine
- The tractor's front axle load must never fall below 20 % of the tractor's empty weight.
- The tractor must reach the deceleration specified by the tractor's manufacturer even with the machine attached/hitched up. Perform a braking test.
- Equip the tractor with mirrors if necessary, such that the hazardous areas on both sides of the machine are clearly visible from the tractor.

6.4 Required tractor equipment

The tractor used must meet the following requirements, in order to ensure correct use of the machine:

Engine output of tractor
For power requirement ► page 47

Tab. 17: Engine output

Electrical system	
Battery voltage	12 V
Socket for lighting	7-pole
Socket for control set	ISOBUS plug, 9-pole

Tab. 18: Electrical system

Hydraulic system	
Maximum operating pressure	200 bar
Delivery rate of hydraulic pump	Min. 40 l/min at 180 bar, max. 100 l/min at 200 bar
Delivery rate with electro-hydraulic forced steering axle system	Min. 60 l/min, max. 100 l/min
Hydraulic oil of machine	HLP 46 ***ATTENTION*** – Damage due to mixing of hydraulic oils. Check the compatibility of the hydraulic oils before connecting the machine to the hydraulic system of the tractor. Contact the agricultural machinery dealer to check if necessary. Never mix different types of hydraulic oil.

Tab. 19: Hydraulic system

Hydraulic connection	
Hydraulic component	**Required control devices on the tractor**
Electro-hydraulic control block	Alternatively: • Load-sensing connections or • single-acting control device with return line or • double-acting control device
Electro-hydraulic forced steering axle system (SES system)	• Load-sensing connections (combined on the machine side with the electro-hydraulic control block connection)
Hydraulic chassis	• Single-acting control device

Tab. 20: Hydraulic connection

NOTE

Depending on their function, the hydraulic components can be connected to

- a double-acting control device
- a single-acting control device and a depressurised return line leading directly into the hydraulic oil tank of the tractor

Given a free choice, we recommend a single-acting control device and a depressurised return line. The hydraulic oil flows back into the hydraulic oil tank of the tractor through the free return line with a low backpressure. Thus, a free return line reduces heating-up of the hydraulic oil.

Brake system	
Compressed-air brake system	• Hose coupling (red) for feed line • Hose coupling (yellow) for brake line
Hydraulic single-line brake system	• Brake line connection with hydraulic clutch according to ISO 5676 (100 bar)
Hydraulic dual-line brake system	• Brake line connection with hydraulic clutch according to ISO 5676 (100 bar) • Additional line connection with hydraulic clutch according to ISO 16028 (with dual-line operation) • ABS socket, 7-pole, according to ISO 7638-2 12 V (alternatively 3-pole socket and adapter cable, article no. 881175000) with dual-line brake system

Tab. 21: Brake system

Mirrors
The tractor used must be equipped with mirrors, such that the hazardous areas on both sides of the machine are clearly visible from the tractor's seat.

Tab. 22: Mirrors

6.5 Combination options of coupling devices and drawgears

The following table shows admissible combination options of the tractor's coupling device and the machine's drawgear depending on the maximum admissible tongue load.

- Only couple admissible combinations of tractor and hitched machine.

NOTE

The maximum admissible tongue load is indicated on the type plate of the coupling device, in the operating instructions and in the vehicle registration certificate of the tractor.

Tractor's coupling device	Machine's drawgear
Tow hook (hitch hook) ISO 6489-1	• Drawbar lug 50 (hitch ring) ISO 20019 / DIN9678
Draw pin (Piton-Fix) ISO 6489-4	• Drawbar lug 50 (hitch ring) ISO 20019 / DIN9678
Ball-type coupling K80 ISO 24347	• Shell K80 ISO 24347

Tab. 23: Coupling devices and drawgears

6.6 D_C value and towing capacity

The D_C value is the theoretical thrust between tractor and rigid-drawbar trailer; it is a calculated reference value of forces between moving masses.

- Calculate the actual D_C value to check whether the coupling device of your tractor has the required D_C value.
- The calculated D_C value must be **equal or less than** (≤) the specified D_C value of the tractor's coupling device and the drawgear of the rigid-drawbar trailer. In each case, the lowest D_C value shall be relevant.

  If the calculated D_C value is higher, calculate the admissible towing capacity for the tractor.
- Do not exceed the calculated towing capacity when filling the trailer.

⚠ WARNING

Risk of accident due to breaking components

An inadmissibly high load exerted on the coupling device and drawgear may cause failure of components and provoke dangerous situations to people.

- Only combine compatible coupling devices and drawgears.

6.6.1 Calculate Dc value

The actual Dc value can only be calculated from the gross vehicle weight rating of both quantities (tractor and trailer) as follows:

$$D_C\,(kN) = g \times \frac{T \times C}{T + C}$$

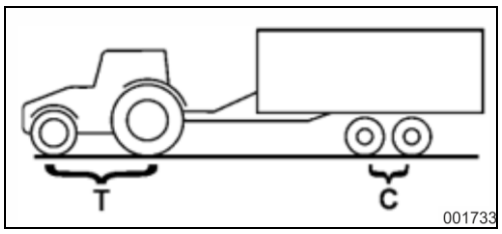


Fig. 73

T Gross vehicle weight rating of tractor in [t]
(see operating instructions and vehicle registration certificate of tractor)

C Axle load/Sum of axle loads of the machine charged with the admissible mass (payload) in [t] without tongue load

g Gravitational acceleration (9.81 m/s²)

Calculation example:

T = 14 t Gross vehicle weight rating of tractor in [t]

C = 18 t Admissible axle load(s) of rigid-drawbar trailer in [t]

$$D_C = 9.81\ m/s^2 \times \frac{14\ t \times 18\ t}{14\ t + 18\ t} = 77.2\ kN$$

NOTE

The Dc value for the coupling device is directly indicated on the type plate of the coupling device, in the operating instructions and in the vehicle registration certificate of the tractor.

In case of differing values on the type plates of the trailer bracket and the coupling device, the lower value shall be relevant.

The Dc value for the drawgear is directly indicated on the type plate of the drawgear.

6.6.2 Calculate towing capacity

The lowest D_C value of the tractor's coupling device or of the drawgear of the rigid-drawbar trailer determines the admissible towing capacity C of the tractor.

In case of rigid-drawbar trailers, the tractor's towing capacity is equal to the axle load(s) of the rigid-drawbar trailer.

The admissible towing capacity of the tractor determines the admissible load capacity of the trailer.

The towing capacity is calculated as follows:

$$C = \frac{T \times D_C}{g \times T - D_C}$$

T	Gross vehicle weight rating of tractor in [t] (see operating instructions and vehicle registration certificate of tractor)
D_C	Lowest D_C value of the tractor's coupling device, of the drawgear of the rigid-drawbar trailer or of the combination in [kN]
g	Gravitational acceleration (9.81 m/s²)
C	Maximum towing capacity in [t]

Calculation example:

T = 14 t	Gross vehicle weight rating of tractor in [t]
D_C = 70 kN	D_C value of tractor's coupling device in [kN]
D_C = 77.5 kN	D_C value of drawgear at rigid-drawbar trailer in [kN]
D_C = 77.2 kN	D_C value for the combination to be coupled in [kN]

$$C = \frac{14\ t \times 70\ kN}{9.81\ m/s^2 \times 14\ t - 70\ kN} = 14.5\ t$$

In this example, the admissible axle load is 14.5 t due to the D_C value of the tractor's coupling device.

Do not exceed the calculated towing capacity when charging the trailer.

6.6.3 Calculate ballast of the tractor and machine combination

⚠ CAUTION

Risk of accident due to insufficient stability, steering and braking ability of the tractor.

Check the tractor for compatibility and the distribution of weight in the tractor and machine combination before hitching or attaching the machine.

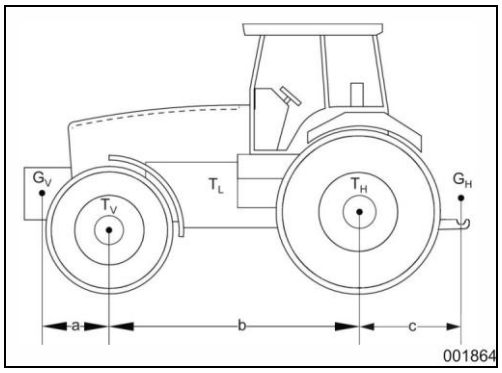


Fig. 74

T_L	Empty weight of tractor [t]*
T_V	Front axle load of empty tractor [t]*
T_H	Rear axle load of empty tractor [t]*
G_H	Tongue load or weight of rear-mounted equipment [t]**
G_V	Weight of front ballast [t]
a	Distance between centre of gravity of front ballast and centre of front axle [m]
b	Wheelbase of tractor [m]*
c	Distance between centre of rear axle and coupling point [m]

* see operating instructions / vehicle registration documents of tractor

** Due to different loading and operating conditions, the tongue load / the weight of the rear-mounted equipment may vary significantly.

Calculation of required front ballast

In order to ensure sufficient steerability of the tractor, it must have the following minimum ballast at the front:

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

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

Calculation example:

G_H = 3 t	Tongue load or weight of rear-mounted equipment (maximum value) [t]
c = 1.5 m	Distance between centre of rear axle and coupling point [m]
T_V = 2 t	Front axle load of empty tractor [t]
b = 2.4 m	Wheelbase of tractor [m]
T_L = 6 t	Empty weight of tractor [t]
a = 1.2 m	Distance between centre of gravity of front ballast and centre of front axle [m]

$$G_{V\,min} = \frac{3\ t \times 1.5\ m - 2\ t \times 2.4\ m + 0.2 \times 6\ t \times 2.4\ m}{1.2\ m + 2.4\ m} = 0.7\ t$$

Calculation of the actual front axle load of the tractor

The admissible axle load of the tractor's front axle and the load capacity of the front wheels must not be exceeded.

For the calculation of the maximum actual front axle load, apply the minimum tongue load or the minimum weight of the rear-mounted equipment.

The tractor's front axle load must never fall below 20 % of the tractor's empty weight.

For the calculation of the minimum actual front axle load, apply the maximum tongue load or the maximum weight of the rear-mounted equipment.

$$T_{V\,act} = \frac{G_V \times (a + b) + T_V \times b - G_H \times c}{b}$$

Calculation example:

$G_V = 0.8$ t	Weight of front ballast [t]
a = 1.2 m	Distance between centre of gravity of front ballast and centre of front axle [m]
b = 2.4 m	Wheelbase of tractor [m]
$T_V = 2$ t	Front axle load of empty tractor [t]
$G_H = 3$ t	Tongue load or weight of rear-mounted equipment [t]
c = 1.5 m	Distance [m] between centre of rear axle and coupling point

$$T_{V\,act} = \frac{0.8\text{ t} \times (1.2\text{ m} + 2.4\text{m}) + 2\text{ t} \times 2.4\text{ m} - 3\text{ t} \times 1.5\text{m}}{2.4\text{ m}} = 1.3\text{ t}$$

Calculation of the actual total weight of the tractor

The gross vehicle weight rating of the tractor must not be exceeded.

$$T_{Total} = T_L + G_V + G_H$$

Calculation example:

$T_L = 6$ t	Empty weight of tractor [t]
$G_V = 0.8$ t	Weight of front ballast [t]
$G_H = 3$ t	Tongue load or weight of rear-mounted equipment [t]

$$T_{Total} = 6\text{ t} + 0.8\text{ t} + 3\text{ t} = 9.8\text{ t}$$

Calculation of the actual rear axle load of the tractor

The admissible rear axle load of the tractor and the load capacity of the rear wheels must not be exceeded.

$T_{H\ act} = T_{Total} - T_{V\ act}$

Calculation example:

T_{Total} = 9.8 t actual total weight of tractor [t]

$T_{V\ act}$ = 1.3 t actual front axle load of tractor [t]

$T_{H\ act} = 9.8\ t - 1.3\ t = 8.5\ t$

6.7 Hitch and unhitch machine

6.7.1 Safety

As a basic principle, the following is applicable:

- Properly hitch the machine only to an appropriate tractor.
- Always check the machine for visible defects before hitching and unhitching.
- Do not exceed admissible limit values,
  ► see section 3 Technical data, page 47
- Secure tractor and machine against rolling before hitching or unhitching the machine.
- People are not allowed between tractor and machine, while the tractor is approaching the machine. Any helpers are only allowed to act as a guide next to the vehicles and to enter the space between the vehicles after the vehicles have stopped.
- Put the support device into support position when hitching and unhitching the machine. Keep limbs away from the area between support device and ground. Risk of crushing and shearing.
- Properly use the provided coupling devices of the tractor and the machine.
- Take particular care when hitching and unhitching the machine. Crushing and shearing zones exist within the area of the coupling points between tractor and machine.
- Coupled supply lines must easily give way to any movements during cornering without any stress, buckling or chafing and must not chafe against external components.
- Always park the unhitched machine in a stable position. Observe the ground condition; beware of soft surfaces.
- All automatic functions of the ISOBUS control must be disabled before hitching and unhitching.

⚠ WARNING

Hitch the machine to the tractor

Improper hitching of the machine to the tractor may cause serious accidents.

- During hitching, observe all operating instructions:
  - of the tractor
  - of the machine
  - of the propeller shaft

6.7.2 Hitch machine

In the following, the procedure for hitching the machine is listed. The individual steps are described in detail in the respective subchapters and must be observed, see cross-references. Depending on the type of coupling devices on the wagon and on the tractor, the order of the following steps may vary.

ATTENTION

Only with load-sensing hydraulic system:

Check hydraulic system for correct setting ► page 125

- Lock the load-sensing screw in the electro-hydraulic control block if the hydraulic connection "Flow line" is connected to the pressure line provided for this purpose leading to the tractor's hydraulic pump.
- Open the load-sensing screw in the electro-hydraulic control block, when the hydraulic connection "Flow line" is connected to the control device of the tractor.

1. Make sure that people leave the hazardous area between tractor and machine.
2. Reverse the tractor to a distance of approx. 15 - 20 cm between the coupling device of the tractor and the machine's drawgear.
3. Secure tractor and machine against rolling.
   ► see page 30
4. Connect the hydraulic hose pipes.
   ► see page 124
5. Mount the control set on the tractor.
   ► see page 125
6. Connect electrical supply lines and lighting system.
7. Couple the drawbar.
   ► see page 128

8. Connect the brake system.
   – Connect compressed-air brake system.
     ► see page 132
   – Connect single-line brake system.
     ► see page 136
   – Connect dual-line brake system.
     ► see page 137
9. Couple the forced steering axle (if available).
   – ► see page 140
   – Electronic forced steering axle SES
     ► see page 143
10. Couple the propeller shaft.
    ► see page 150.
11. Lift the supporting leg to transport position.
    ► see page 153.
12. Release the parking brake.
    ► see page 139

6.7.3 Unhitch machine

In the following, the procedure for unhitching the machine is listed. The individual steps are described in detail in the respective subchapters and must be observed, see cross-references. Depending on the type of coupling devices on the wagon and on the tractor, the order of the following steps may vary.

⚠ WARNING

Insufficient stability

Insufficient stability of the unhitched machine may cause the machine to move. Risk of tipping over.

- Park the empty machine in horizontal position on firm ground.
- Secure the machine against rolling.

NOTE

Ensure that there is always still enough free space in front of the machine when unhitching, such that the tractor can reapproach the machine in true alignment for hitching the machine again.

1. Secure the machine against rolling.
   ► see page 30
2. Lower the mechanical supporting leg to support position.
   ► see page 154
3. Uncouple the propeller shaft.
   ► see page 151

4. Uncouple the forced steering axle (if available).
   ► see page 142
   ► see page 147
5. Disconnect the brake system.
   – Disconnect compressed-air brake system.
     ► see page 133
   – Disconnect single-line brake system.
     ► see page 136
   – Disconnect dual-line brake system.
     ► see page 138
6. Uncouple the drawbar.
   ► see page 131
7. Disconnect the hydraulic hose pipes.
   ► see page 124
8. Disconnect the electrical supply lines and the lighting system and place them in the plug holder provided for this purpose at the machine.
9. Insert the control set into the holder on the machine.
10. Protect the control set and the electrical supply lines against moisture and humidity if necessary.
11. Secure the unhitched machine against unauthorised use.
    ► see page 155

6.8 Hydraulic hose pipes

6.8.1 Safety

As a basic principle, the following is applicable:

- Improperly connected hydraulic hose pipes may cause malfunctions of the hydraulic system. Check the assignment of the hydraulic hose pipes at the control block of the machine if the coloured markings (dust caps) are missing ► see section 4.3.1 Marking of hydraulic supply lines, page 66:
  – P = Pressure line
  – T (R;S) = Return line
  – LS = Load-sensing control line
- Check the compatibility of the hydraulic oils before connecting the machine to the hydraulic system of the tractor.
- Never mix different types of hydraulic oil.
- Observe the maximum admissible operating pressure of the hydraulic oil.
- Only connect clean hydraulic plugs and sleeves.

- Insert the hydraulic plug into the hydraulic sleeve until the hydraulic plug noticeably locks.
- Check the coupling spots of the hydraulic hose pipes for correct and tight seat.
- Connected hydraulic hose pipes must easily give way to any movements during cornering without any stress, buckling or chafing and must not chafe against external components.

⚠ WARNING

Risk of infection due to hydraulic oil squirting out

Hydraulic oil squirting out under high pressure may penetrate the skin and enter the body, potentially causing serious injuries. Risk of serious infection.

- Depressurise the hydraulic system of the tractor and the machine before connecting and disconnecting the hydraulic hose pipes.
- Always set the operating element at the control device on the tractor to neutral position.

6.8.2 Connect hydraulic hose pipes

1. Depressurise the control device and set the operating elements on the tractor to neutral position
2. Connect the hydraulic hose pipes to the tractor's control devices:
   - Pressure line to a single-acting or double-acting control device.
   - Return line to a depressurised return port.

6.8.3 Disconnect hydraulic hose pipes

⚠ CAUTION

Burns due to hot components

Risk of burns due to hot components of the hydraulic hose pipes

- Do not touch considerably warmed-up components of the hydraulic hose pipes, particularly do not touch any hydraulic plugs and sleeves.

1. Set the operating elements to neutral position and depressurise the control device
2. Switch the tractor engine off.
3. Disconnect the hydraulic hose pipes.
4. Use the dust caps to protect the hydraulic plugs against soiling.
5. Place the hydraulic hose pipes into the plug holder.

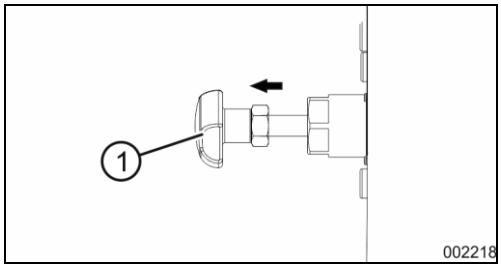


Fig. 75

6.8.4 Open hydraulic system

1. Swivel the respective operating element at the control device on the tractor to floating position.
2. Switch the tractor engine off.
3. Screw the load-sensing screw (1) at the electro-hydraulic control block out as far as it will go.
4. Connect the pressure line (flow line) to a single-acting or double-acting control device of the tractor.
5. Connect the tank line (return line) to a depressurised return line of the tractor.

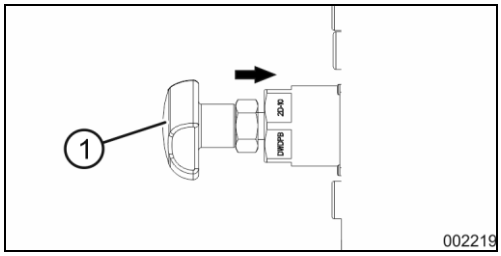


Fig. 76

6.8.5 Load-sensing mode

1. Switch the tractor engine off.
2. Screw the load-sensing screw (1) at the electro-hydraulic control block in as far as it will go.
3. If not available, provide the load-sensing connection of the electro-hydraulic control block with a control line. (Authorised workshop)
4. Connect the load-sensing control line to the load-sensing control system of the tractor.
5. Connect the tank line (return line) to the free return port of the tractor provided for this purpose.
6. Connect the pressure line (flow line) with the pressure line to the hydraulic pump of the tractor provided for this purpose.

6.9 Mount control set on the tractor

6.9.1 Mount ISOBUS control terminal

NOTE

- A constant power supply of 12 V DC (direct current) is required.
- Do not draw the current from the light socket.
- Use a 3-pole socket and an adapter cable only in exceptional cases for power supply.
- For powerful optional extras (in particular electronic forced steering, work lights, silage additive pump, central lubrication, etc.) only the 9-pole ISOBUS plug is allowed, in order to ensure stable power supply and thus reliable operation.
- If no 9-pole ISOBUS socket is available, it can be retrofitted (art no. 87008925).

Fig. 77

1. Fix the control set (1) in the cabin within view and reach to the driver's right.
2. Connect the signal plug (2) of the control set with the signal socket (3) of the mobile cable harness or with the signal socket of the tractor (if available).
3. Depending on the equipment
   - insert the ISOBUS plug of the control unit into the ISOBUS socket of the mobile cable harness on the machine.
   - insert the ISOBUS plug of the control unit into the ISOBUS socket of the tractor.

6.10 Drawbar

6.10.1 Adjust mounting height of folding drawbar

The mounting height of the folding drawbar must be adjusted to the respective tractor model, in order to ensure that the lowered pick-up can properly adapt to uneven terrain. Only a properly adjusted mounting height of the folding drawbar guarantees best possible picking-up of the material to be loaded.

⚠ WARNING

Sinking chassis

Risk of crushing due to accidental sinking of chassis during work on the drawbar.

- Ensure sufficient ground stability.
- Use additional solid, load-distributing supports if necessary.

⚠ WARNING

Unintentional loosening from the tractor

Risk of being crushed and risk of impact to people if the hitched machine accidentally disengages from the tractor. Failure/Breakage, increased wear of components of the coupling device due to overload.

- Check whether there is enough free space in the coupling device in any situation.

This work requires expert knowledge and appropriate tools.

Operative staff:

- Authorised workshop

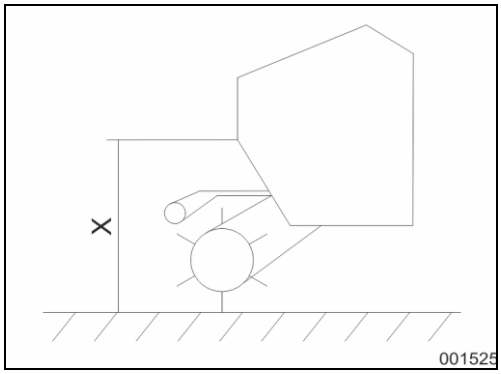


Fig. 78

The distance X must be 1400 mm between the ground and the machine frame with the forage wagon with lowered folding drawbar hitched up to the tractor.

Align the mounting height of the folding drawbar in relation to the machine frame by means of the threaded spindles of the hydraulic cylinders if the actual distance X is not 1400 mm.

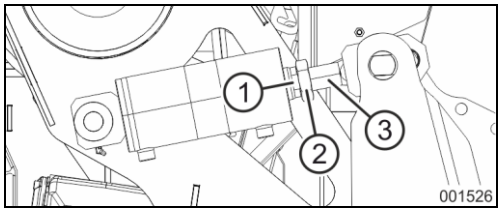


Fig. 79

1. Park the tractor with the hitched machine on even ground.
2. Lower the folding drawbar by completely retracting the hydraulic cylinders of the folding drawbar.
3. Secure tractor and machine against accidental starting and rolling.
4. Loosen the counter nut (2) of the threaded spindle (3).
5. Turn the piston rod (1) of the two hydraulic cylinders alternately in the required direction.

   ATTENTION – Adjust the two threaded spindles evenly.

   - Increase distance X = Turn piston rod clockwise
   - Reduce distance X = Turn piston rod counterclockwise

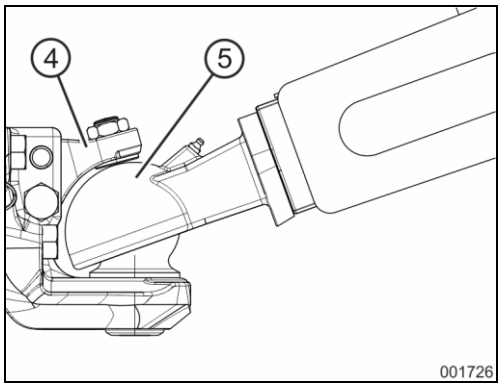


Fig. 80

6. Retighten the counter nuts of the threaded spindles.
7. Start the tractor engine.
8. Completely lift the folding drawbar.
9. Check whether there is enough free space between the holding-down device (4) and the ball-type shell (5),
   ► see section 6.10.2.3 Ball-type coupling and shell, page 130

NOTE

After mechanical adjustment, it is obligatory to recalibrate the minimum and maximum sensor position to ensure proper functioning of the automatic drawbar mechanism.

► see section 7.1.45.4 Calibrate folding drawbar, page 197

6.10.2 Couple drawbar

As a basic principle, the following is applicable:

- Properly hitch the machine only to an appropriate tractor.
- Do not exceed the admissible towing capacity,
  ► see section 6.6 DC value and towing capacity, page 115
- Check whether the coupling device of the tractor is licensed for taking up the machine's drawgear.
  ► see section 6.5 Combination options of coupling devices and drawgears, page 114
- Properly hitch the machine to the tractor.
- Never use damaged, worn or deformed trailer systems.
- People are not allowed between tractor and machine, while the tractor is approaching the machine. Any helpers are only allowed to act as a guide next to the vehicles and to enter the space between the vehicles after the vehicles have stopped.

6.10.2.1 Tow hook (hitch hook) and drawbar lug (hitch ring)

1. Secure the machine against rolling.
2. Lower the tow hook.
3. Reverse the tractor and approach the machine, such that the lowered tow hook can take up the drawbar lug.

⚠ WARNING

Risk of accident when approaching the machine. Keep people away from the hazardous area between tractor and machine.

4. Lift the tow hook to catch the drawbar lug.
   → The drawbar lug automatically engages and is fixed between the tow hook and the locking mechanism (holding-down device).
5. Secure the tractor against accidental starting and rolling.
6. Ensure that the tow hook is properly locked.
7. Connect the supply lines.
8. Lift the supporting leg to transport position.
9. Release the parking brake of the machine.

6.10.2.2 Draw pin (Piton-Fix) and drawbar lug (hitch ring)

1. Secure the machine against rolling.
2. Reverse the tractor and approach the machine.

⚠ WARNING

Risk of accident when approaching the machine. Keep people away from the hazardous area between tractor and machine.

3. Secure the tractor against accidental starting and rolling.
4. Unlock the holding-down device (cross bolt) above the draw pin.
5. Connect the supply lines.
6. Drive as close as possible towards the machine, such that the draw pin can take up the drawbar lug.
7. Lower the drawbar via the hydraulic system of the folding drawbar until the draw pin engages in the drawbar lug.
8. Secure the tractor against accidental starting and rolling.
9. Fix and secure the cross bolt above the draw pin.
10. Lift the supporting leg to transport position.
11. Release the parking brake of the machine.

6.10.2.3 Ball-type coupling and shell

⚠ WARNING

Unhitch the machine from the tractor

When travelling on particularly uneven ground or over clamp silos, the shell might loosen from the ball-type coupling. Risk of dangerous situations to people due to unintentional unhitching of the machine.

- Check the free space between holding-down device and shell.
- Have a shorter holding-down device mounted if necessary.

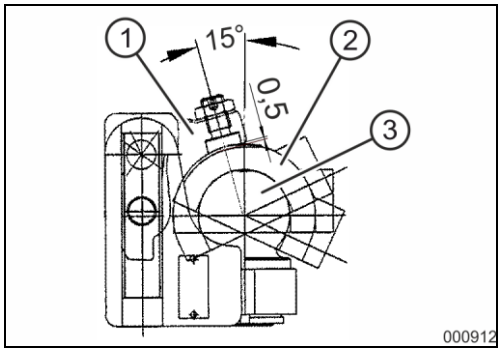


Fig. 81

If the free space between holding-down device (1) and shell (2) is not sufficient, mount a shorter holding-down device on the tractor's ball-type coupling (3).

NOTE

Lubricate the coupling device every day to minimise wear on the ball head and the shell. Lubricate the area between the holding-down device and the surface of the shell as well.

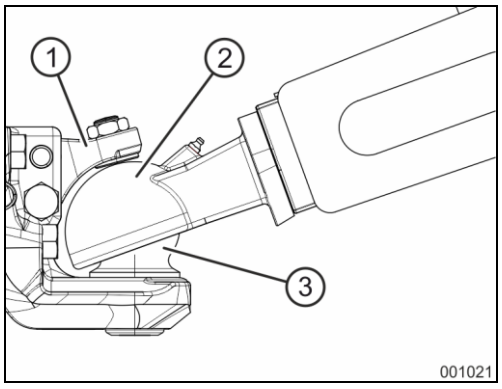


Fig. 82

1. Secure the machine against rolling.
2. Prepare for hitching up:
   - Remove grease and dirt from the holding-down device (1), the shell (2) and the ball head (3).
   - Lubricate the ball head and the surface of the shell with new grease.
   - Unlock the holding-down device (1) at the bearing block.
   - Swivel the holding-down device to coupling position.
3. Reverse the tractor and approach the machine, such that the ball head can take up the shell.

⚠ WARNING

Risk of accident when approaching the machine. Keep people away from the hazardous area between tractor and machine.

4. Secure the tractor against accidental starting and rolling.
5. Lower the drawbar by means of the supporting leg until the ball head (3) engages in the shell (2).
6. Lock and secure the holding-down device at the bearing block.
7. Connect the supply lines.
8. Lift the supporting leg to transport position.
9. Release the parking brake of the machine.

6.10.3 Uncouple drawbar

⚠ WARNING

Insufficient stability

Insufficient stability of the unhitched machine may cause the machine to move. Risk of tipping over.

- Park the empty machine in horizontal position on firm ground.
- Secure the machine against rolling.

6.10.3.1 Tow hook (hitch hook) and drawbar lug (hitch ring)

1. Secure tractor against accidental starting and rolling.
2. Secure machine against rolling.
3. Lower the supporting leg to support position.
4. Lower the tow hook.
5. Move the tractor forward (approx. 25 cm).
6. Lift the tow hook.
7. Secure tractor against accidental starting and rolling.
8. Disconnect the supply lines and place them into the plug holder.
9. Move the tractor forward.

6.10.3.2 Draw pin (Piton-Fix) and drawbar lug (hitch ring)

1. Secure tractor against accidental starting and rolling.
2. Secure machine against rolling.
3. Unlock the holding-down device (cross bolt) above the draw pin.
4. Lower the supporting leg to support position.
5. Move the tractor forward (approx. 25 cm).
6. Secure tractor against accidental starting and rolling.
7. Fix and secure the holding-down device (cross bolt) above the draw pin.
8. Disconnect the supply lines and place them into the plug holder.
9. Move the tractor forward.

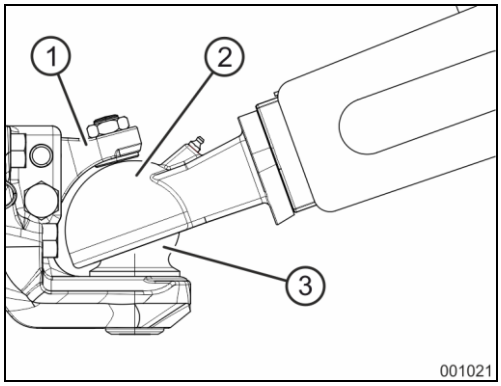


Fig. 83

6.10.3.3 Ball-type coupling and shell

1. Secure tractor against accidental starting and rolling.
2. Secure machine against rolling.
3. Unlock the holding-down device (1) at the bearing block.
4. Swivel the holding-down device to coupling position.
5. Lower the supporting leg to support position.
6. Move the tractor forward (approx. 25 cm).
7. Secure tractor against accidental starting and rolling.
8. Lock and secure the holding-down device at the bearing block.
9. Disconnect the supply lines and place them into the plug holder.
10. Move the tractor forward.

6.11 Brake system

NOTE

The braking axle needs to run in during the first service hours, such that the brake lining adjusts to the brake drum. Full braking power is only reached after this running-in period.

- Check the brake system for proper functioning before carrying out a transport journey.

6.11.1 Compressed-air brake system

6.11.1.1 Connect brake and feed line

As a basic principle, the following is applicable:

- When connecting the brake and feed line, ensure that
  - the sealing rings of the hose couplings are clean.
  - the sealing rings of the hose couplings seal tightly.
- Immediately have damaged sealing rings replaced.
- Drain the air reservoir every day before the first trip.
- Only start the tractor with the hitched machine moving when the pressure gauge of the brake system on the tractor indicates 5.0 bar.
- Check the course of the connected brake lines. The brake lines must not chafe against external components.

⚠ WARNING

Rolling of machine

Risk of dangerous situations to people caused by the machine rolling due to released brake system

- Always connect the hose coupling of the brake line (yellow) first and then the hose coupling of the feed line (red).

  The machine's brake system immediately leaves the brake position if the red hose coupling is connected.

Fig. 84

1. Open the caps of the hose couplings on the tractor.
2. Remove the hose coupling of the brake line (yellow) (2) from the hose and plug holder.
3. Clean soiled sealing rings or have damaged sealing rings replaced.
4. Properly fix the hose coupling of the brake line (yellow) (2) to the yellow marked coupling device at the tractor.
5. Remove the hose coupling of the feed line (red) (1) from the hose and plug holder.
6. Clean soiled sealing rings or have damaged sealing rings replaced.
7. Properly fix the hose coupling of the feed line (red) (1) to the red marked coupling device at the tractor.
8. Release the parking brake of the machine and/or remove the chocks.
9. Test the brakes before starting a journey to check the efficiency of the service brake system.

⚠ WARNING

Risk due to insufficient braking ability of the machine if the travelling height of the hydraulic chassis has not been properly set!

The hydraulic ALB regulator can control the braking force by means of the machine's filling degree only with the travelling height properly set.

6.11.1.2 Disconnect brake and feed line

⚠ WARNING

Rolling of machine

Risk of dangerous situations to people caused by the machine rolling due to released brake system

- Always disconnect the hose coupling of the feed line (red) first and then the hose coupling of the brake line (yellow).

  The machine's brake system only moves to brake position if the red hose coupling is disconnected.

  It is imperative to observe this order, as otherwise the brake system will be released and the non-braked machine may start to move.

NOTE

When the machine is unhitched or torn off, the feed line connected to the trailer brake valve bleeds. The trailer brake valve automatically switches over, thus actuating the brake.

Fig. 85

1. Secure the machine against rolling.
2. Disconnect the hose coupling of the feed line (red) (1).
3. Disconnect the hose coupling of the brake line (yellow) (2).
4. Close the hose couplings and fasten them in the hose and plug holder provided for this purpose.
5. Close the caps of the hose couplings at the tractor.

6.11.2 Manoeuvre unhitched machine by means of a manoeuvring vehicle

⚠ WARNING

Rolling of machine

Risk of dangerous situations to people caused by the machine rolling due to released brake system.

- Tightly connect the machine with the braked manoeuvring vehicle before releasing the brake by means of the release valve at the brake pressure regulator.

  The machine is now exclusively decelerated by the manoeuvring vehicle.

1. Hitch the machine to the braked manoeuvring vehicle.
2. Release the parking brake of the machine.
3. Push the release valve (1) in as far as it will go.
   ► see section 6.11.2.1 Tandem chassis, page 135
   ► see section 6.11.2.2 Tridem chassis, page 135

→ The service brake is released and the machine can be manoeuvred.

4. Move the machine by the manoeuvring vehicle.
5. Apply the parking brake of the manoeuvring vehicle after completion of manoeuvring.
6. Pull the release valve (1) out as far as it will go.
   ► see section 6.11.2.1 Tandem chassis, page 135
   ► see section 6.11.2.2 Tridem chassis, page 135

→ The system pressure from the air reservoir slows the machine down.

7. Apply the parking brake of the machine.
8. Unhitch the machine from the manoeuvring vehicle.

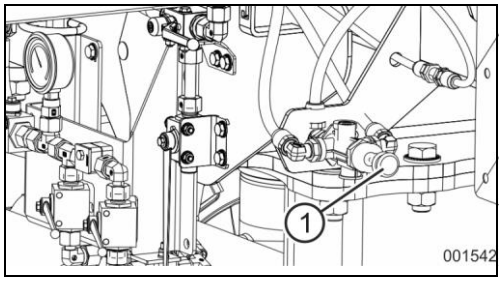


Fig. 86

6.11.2.1 Tandem chassis

The release valve (1) is used for actuating and releasing the service brake system.

The release valve (1) can only be actuated in uncoupled condition. The following switch positions are possible:

- Push in as far as it will go
  → The service brake system releases, e. g. for manoeuvring the unhitched machine.
- Pull out as far as it will go
  → The machine is braked again by means of the system pressure coming from the compressed-air reservoir.

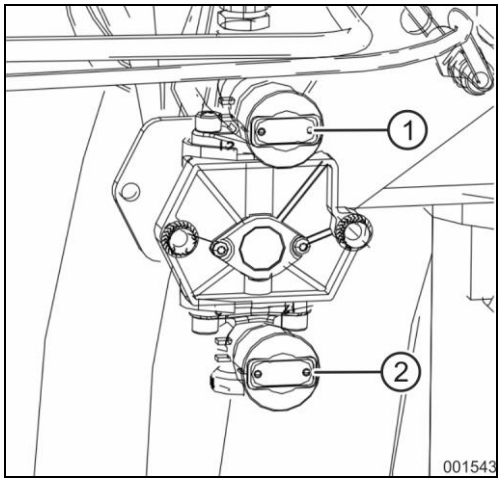


Fig. 87

6.11.2.2 Tridem chassis

The double release valve (1) is used for actuating and releasing the service brake system and for actuating the spring-loaded brake system with the machine hitched.

Actuating mechanism for release valve (1):

- Push in as far as it will go
  → The service brake system releases, e. g. for manoeuvring the unhitched machine.
- Pull out as far as it will go
  → The machine is braked again by means of the system pressure coming from the compressed-air reservoir.

Actuating mechanism for park valve (2) of spring-loaded brake system:

- Push in as far as it will go
  → The spring-loaded brake system releases.
- Pull out as far as it will go
  → The spring-loaded brake system is actuated; the spring accumulator is, however, only bled (braked) when the two-way valve in the system switches over.

6.11.3 Hydraulic brake system

6.11.3.1 Connect hydraulic single-line brake system

1. Properly fix the hydraulic clutch of the brake line to the coupling device at the tractor provided for this purpose.
2. Connect the ripcord of the parking brake or the emergency brake valve to the tractor. The ripcord must be in horizontal position between the vehicles if the machine is torn off.
3. If equipped with emergency brake valve:

   Start the engine and press the brake pedal of the tractor for 10 seconds to fill the pressure accumulator of the brake system with oil.
4. Carry out a visual inspection to check couplings and lines for tightness.
5. Release the parking brake.
6. Carry out a control braking at low speed.

6.11.3.2 Disconnect hydraulic single-line brake system

⚠ WARNING

Rolling of machine

Risk of dangerous situations to people caused by the machine rolling due to released brake system

Secure the machine against accidental rolling by means of the parking brake and additional chocks if necessary.

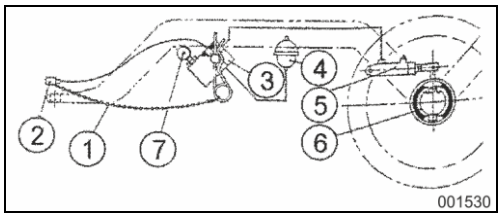


Fig. 88

1. Secure the machine against rolling by means of the parking brake and additional chocks if necessary.
2. Depressurise the brake system of tractor and machine.
3. If equipped with emergency brake valve:

   Press the drain valve (7) at the brake valve (3) to empty the pressure accumulator (4).

   → The hydraulic oil flows back to the tractor and the pressure accumulator is depressurised.
4. Remove the ripcord (1) from the tractor.
5. Uncouple plugs and plug-in couplings from the tractor and securely fasten them in the plug holder of the machine.

6.11.3.3 Connect hydraulic dual-line brake system

1. Properly fix the hydraulic clutch of the brake line to the coupling device at the tractor provided for this purpose.
2. Fix the hydraulic clutch of the additional line to the coupling device at the tractor provided for this purpose. If the tractor is equipped with a hydraulic single-line brake system, fix the additional line in parking position at the brake valve of the machine.
3. Connect the ABS plug with the tractor to establish the power supply of the hydraulic brake system. Use an adapter cable for the 3-pole plug if a connection for an ABS plug is not available at the tractor.
4. Start the engine and press the brake pedal of the tractor for 10 seconds.
   – The pressure accumulator of the brake system fills with oil.
5. Carry out a visual inspection to check couplings and lines for tightness.
6. Release the parking brake.
7. Carry out a control braking at low speed.

Tractor equipped with connection for hydraulic dual-line brake system

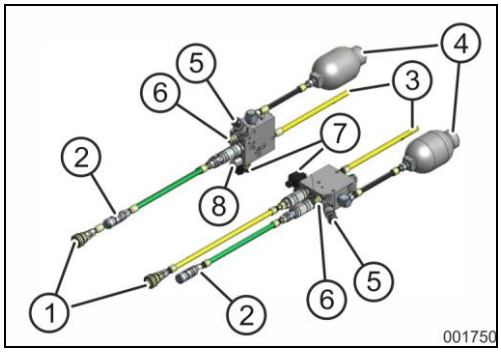


Fig. 89

1) Brake line to tractor CL 1.
2) Additional line to tractor SL
3) Brake line to brake pressure regulator / brake cylinder B
4) Pressure accumulator
5) Drain valve
6) Park connection Zp (for single-line operation)
7) Electric immobiliser
8) Pressure switch for monitoring

Tractor equipped with connection for hydraulic single-line brake system

In order to use the machine with a tractor only equipped with a hydraulic single-line brake system,

- connect the additional line SL (2) to the "parking plug" at the brake valve,
- and supply the valve (6) (immobiliser) with power.

The emergency brake function by tearing off the brake line (1) and the immobiliser function (7) remain available.

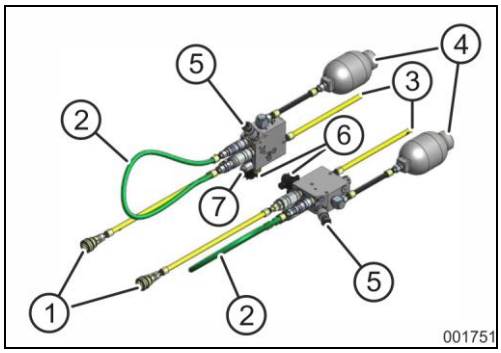


Fig. 90

1) Brake line to tractor CL
2) Additional line to tractor SL
3) Brake line to brake pressure regulator / brake cylinder B
4) Pressure accumulator
5) Drain valve
6) Electric immobiliser
7) Pressure switch for monitoring

6.11.3.4 Disconnect hydraulic dual-line brake system

⚠ WARNING

Rolling of machine

Risk of dangerous situations to people caused by the machine rolling due to released brake system

Secure the machine against accidental rolling by means of the parking brake and additional chocks if necessary.

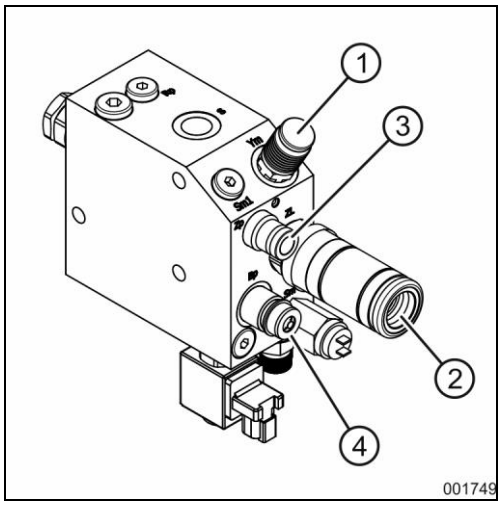


Fig. 91

1. Secure the machine against rolling by means of the parking brake and additional chocks if necessary.
2. Depressurise the brake system of tractor and machine.
3. Press the drain valve (1) at the brake valve to empty the pressure accumulator.

→ The hydraulic oil flows back to the tractor and the pressure accumulator is depressurised.

4. Disconnect the plug of the electric line from the tractor.
5. Disconnect the plug-in coupling of the additional line, connection (3), from the tractor. In single-line operation, the additional line may remain in park position (3).
6. Disconnect the plug-in coupling of the brake line, connection (4), from the tractor.
7. Close plugs and plug-in couplings and securely fasten them in the plug holder of the machine.
8. Close plugs and plug-in couplings at the tractor.

6.11.4 Connection of combination brake

The combination brake is a combination of a compressed-air brake system and a hydraulic brake system. Depending on the tractor connection, one of the two functions can be used and connected. The other connection must be depressurised and must not be used.

For connecting and disconnecting, please refer to:

- Compressed-air brake system ► see section 6.11.1 Compressed-air brake system, page 132
- Hydraulic brake system ► see section 6.11.3 Hydraulic brake system, page 136

6.11.5 Parking brake

Release parking brake with crank handle

ATTENTION

Unintentional braking due to chassis movements

- The cable must sag slightly when the parking brake is released.
- Ensure that the cable does not rest on or chafe against other vehicle components.

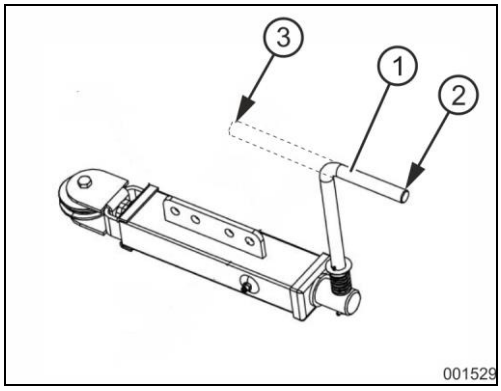


Fig. 92

1. Swivel the crank handle (1) from its rest position (3) by 180° to its adjustment position (2).
2. Turn the crank handle counterclockwise until the cable is relieved.

→ The parking brake is released.

3. Swivel the crank handle to its rest position (3).

Apply parking brake with crank handle

NOTE

Have the setting of the brake linkage / the parking brake readjusted if the tension path of the spindle is no longer sufficient.

1. Swivel the crank handle (1) from its rest position (3) by 180° to its adjustment position (2).
2. Turn the crank handle clockwise and tighten it (at 400 N / 40 kg).

→ The parking brake is applied via the cable.

6.12 Forced steering axle system

6.12.1 Safety

As a basic principle, the following is applicable:

- Observe the operating instructions of the axles.
- Only couple and uncouple the forced steering axle:
  - with the p.t.o. shaft switched off
  - with the tractor engine turned off
  - with the ignition key pulled out
  - with the parking brake applied.

Preconditions for safe operation of the forced steering axle system:

- Correct hydraulic oil level to ensure a sufficient supply of the steering axle(s) with hydraulic oil.
- Ball-type coupling K80 (according to ISO 24347) to couple the drawgear free of clearance and in a fail-safe manner.
- Ball-type coupling K50 (according to DIN 74058 / ISO 1103) at the same level and at a distance of 245-250 mm next to the K80 ball-type coupling to couple the forced steering axle free of clearance and in a fail-safe manner.

6.12.2 Couple mechanical forced steering axle system

As a basic principle, the following is applicable:

- Properly hitch the machine only to an appropriate tractor.
- Do not exceed admissible limit values,
  ► see section 3 Technical data, page 47
- Check whether the coupling device of the tractor is licensed for taking up the machine's drawgear.
- Properly hitch the machine to the tractor.
- Never use damaged or deformed hitch systems.
- People are not allowed between tractor and machine, while the tractor is approaching the machine. Any helpers are only allowed to act as a guide next to the vehicles and to enter the space between the vehicles after the vehicles have stopped.

⚠ WARNING

Uncontrolled machine movements

Risk of uncontrolled machine movements if the forced steering axle is not coupled to the tractor and the steering axles can move freely.

- Never move the machine with the forced steering axle uncoupled.
- Exclusively couple the forced steering axle to a ball-type coupling K50 (according to DIN 74058 / ISO 1103).

  When using couplings of other sizes, the ball socket may come loose during travelling.

1. Secure the machine against rolling.
2. Reverse the tractor and approach the machine, such that the ball head can take up the shell.

⚠ WARNING

Risk of accident when approaching the machine.

Keep people away from the hazardous area between tractor and machine.

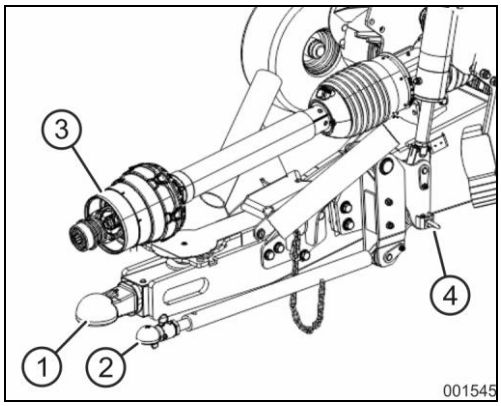


Fig. 93

3. Couple the shell (1) of the drawgear and align tractor and machine in a straight line.
4. Pull the locking bolt (4).
5. Couple the ball socket (2) of the forced steering axle.
6. Lock and secure the holding-down device.
7. Couple the propeller shaft (3).

   ► see section 6.13.3 Couple propeller shaft to tractor, page 150
8. Connect the hydraulic hose pipes.

   ► see section 6.8.2 Connect hydraulic hose pipes, page 124
9. Connect the brake system.

   ► see section 6.11.1.1 Connect brake and feed line, page 132

   ► see section 6.11.3.1 Connect hydraulic single-line brake system, page 136

   ► see section 6.11.3.3 Connect hydraulic dual-line brake system, page 137
10. Move the tractor slightly forward and steer it such that the locking bolt (4) engages again.

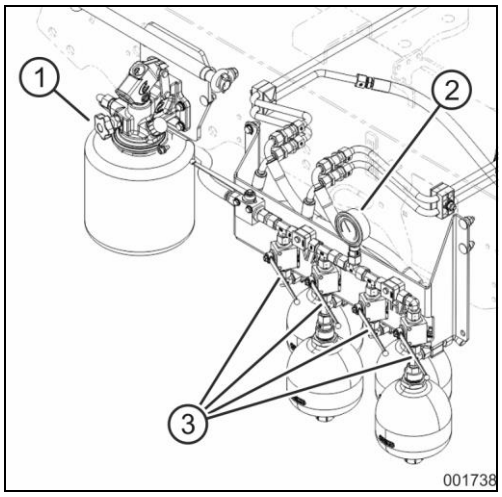


Fig. 94

11. Align the machine.
    - Open all stop-cocks (3) of the pump.
    - Open the rotary wheel (1).
    - Make sure that tractor and machine are in a straight line.
    - Close the rotary wheel (1).
    - Preload the hydraulic system evenly to 60 bar, see pressure gauge (2).
      Preload each axle separately if necessary, close or open the respective stop-cocks (3) for this purpose.
    - Close all stop-cocks (3).

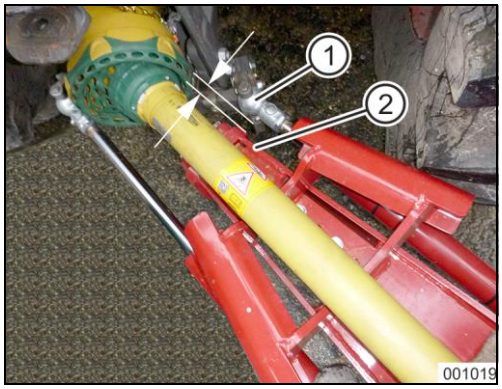


Fig. 95

During initial commissioning:

- Acquaint yourself with the maximum steering angle of the combination of tractor and machine before the first journey.
- Check any free space and possible steering angles for collision.

The ball socket (1) of the steering rod must not contact the drawbar (2), not even during maximum cornering to the left or right. Adapt the bumper buffers to the tractor tyres if necessary. The bumper buffers can be adjusted by means of hole patterns.

6.12.3 Uncouple mechanical forced steering axle system

⚠ WARNING

Insufficient stability

Insufficient stability of the unhitched machine may cause the machine to move. Risk of tipping over.

- Park the empty machine in horizontal position on firm ground.
- Secure the machine against rolling.

1. Align tractor and machine in a straight line.
2. Secure the tractor against accidental starting and rolling.
3. Disconnect the brake system.

   ► see section 6.11.1.2 Disconnect brake and feed line, page 133

   ► see section 6.11.3.2 Disconnect hydraulic single-line brake system, page 136

   ► see section 6.11.3.4 Disconnect hydraulic dual-line brake system, page 138

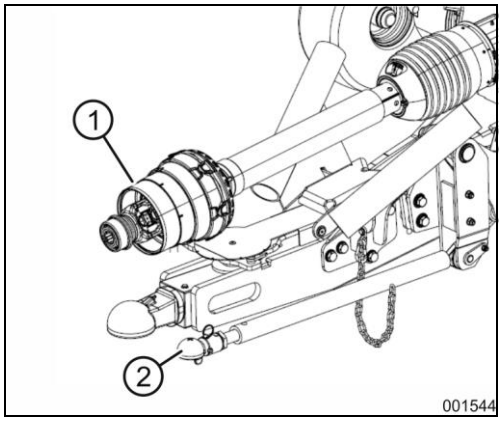


Fig. 96

4. Disconnect the hydraulic hose pipes.
   ► see section 6.8.3 Disconnect hydraulic hose pipes, page 124
5. Uncouple the propeller shaft (1).
   ► see section 6.13.4 Uncouple propeller shaft from tractor, page 151
6. Unlock the holding-down device for the forced steering axle system.

NOTE

If the master cylinders are warped and the ball sockets cannot be loosened, open the rotary wheel and the stop-cock to depressurise the system.

7. Swivel the holding-down device to coupling position.
8. Uncouple the ball socket (2) of the forced steering axle.

6.12.4 Couple forced steering axle SES

As a basic principle, the following is applicable:

- Properly hitch the machine only to an appropriate tractor.
- Do not exceed admissible limit values,
  ► see section 3 Technical data, page 47
- Check whether the coupling device of the tractor is licensed for taking up the machine's drawgear.
- Properly hitch the machine to the tractor.
- Never use damaged or deformed hitch systems.
- People are not allowed between tractor and machine, while the tractor is approaching the machine. Any helpers are only allowed to act as a guide next to the vehicles and to enter the space between the vehicles after the vehicles have stopped.

⚠ WARNING

Uncontrolled machine movements

Risk of uncontrolled machine movements if the forced steering axle is not coupled to the tractor and the steering axles can move freely.

- Never move the machine with the forced steering axle uncoupled.
- Exclusively couple the forced steering axle to a ball-type coupling K50 (according to DIN 74058 / ISO 1103).
  When using couplings of other sizes, the ball socket may come loose during travelling.

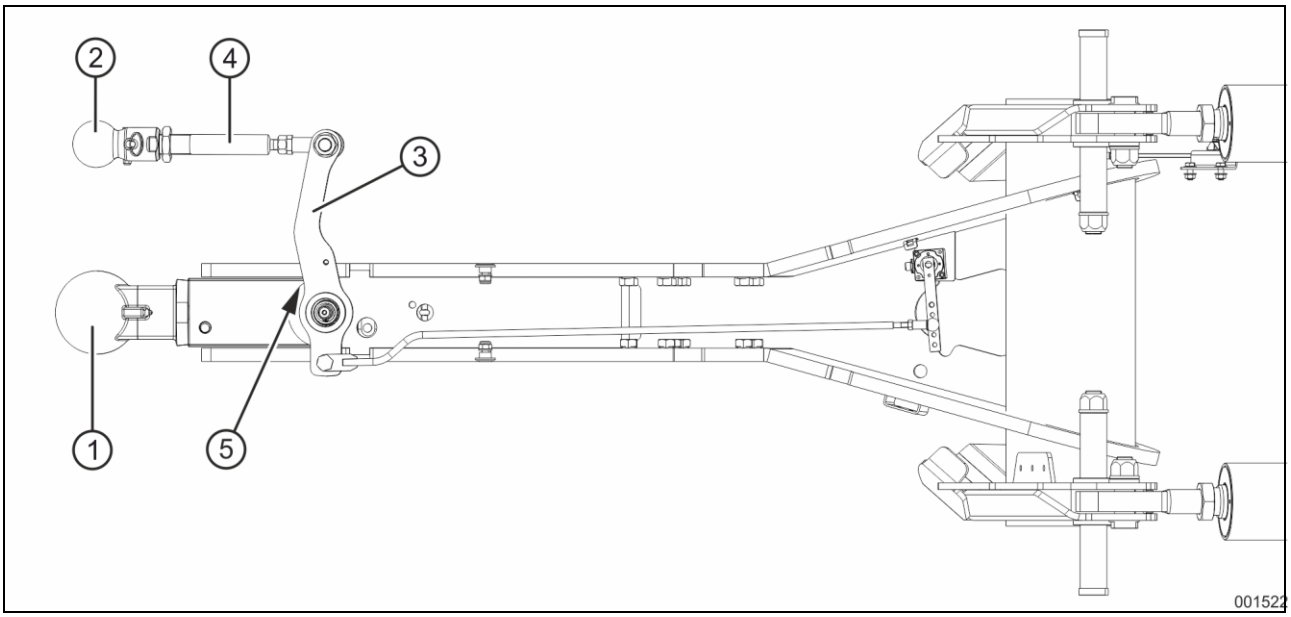


Fig. 97

1. Secure the machine against rolling.
2. Reverse the tractor and approach the machine, such that the ball head can take up the shell.

⚠ WARNING

Risk of accident when approaching the machine.

Keep people away from the hazardous area between tractor and machine.

3. Couple the shell (1) of the drawgear and align tractor and machine in a straight line.
4. Couple the ball socket (2) of the forced steering axle.

During initial commissioning:

Set the steering rod such that the left-hand edge of the lever (3) is positioned in one line with the right-hand edge of the orientation notch (5) if tractor and machine are in one line. Turn the coupling rod (4) to adjust the steering rod.

5. Couple the propeller shaft.
   ► see section 6.13.3 Couple propeller shaft to tractor, page 150
6. Connect the hydraulic system.
   ► see section 6.8.2 Connect hydraulic hose pipes, page 124
7. Connect the brake system.
   ► see section 6.11.1.1 Connect brake and feed line, page 132
   ► see section 6.11.3.1 Connect hydraulic single-line brake system, page 136
   ► see section 6.11.3.3 Connect hydraulic dual-line brake system, page 137
8. Connect the control set to the power supply of the tractor.
9. Switch the ignition on.

→ The steering computer boots and carries out a power-up test, checking the SES system for proper functioning.

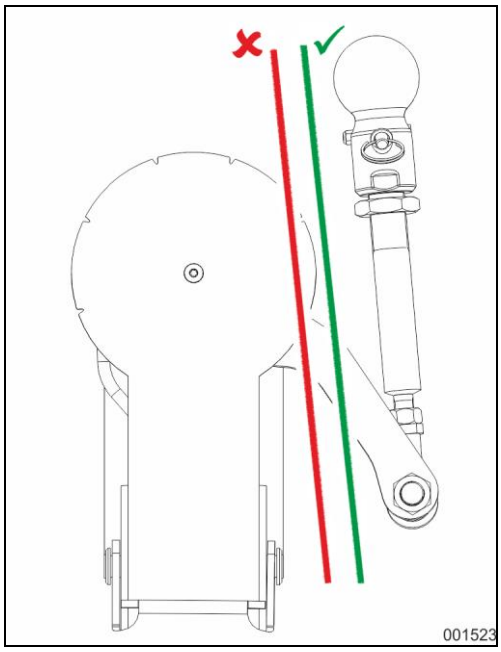


Fig. 98

During initial commissioning:

- Acquaint yourself with the maximum steering angle of the combination of tractor and machine before the first journey.
- Check any free space and possible steering angles for collision.

The ball socket of the steering rod must not contact the drawbar, not even during maximum cornering to the left or right. Have bumper buffers retrofitted by Strautmann if necessary.

NOTE

Preconditions for proper execution of the power-up test:

- Forced steering axle coupled
- Hydraulic system connected and sufficient hydraulic pressure (minimum 15 bar) available
- Power supply of control set
- Ignition of tractor switched on
- With tridem chassis: Lift axle (if available) lowered
- Stop of tractor and machine; if the combination of tractor and machine moves, the power-up test will be stopped and restarted when the movement stops.

The control set displays the execution of the power-up test by acoustic and visual signals:

- A beep is emitted twice for max. three seconds each.
- The green control lamp "Steering axle locked" on the control set is flashing.

After the second beep and upon disappearance of the visual signal, the power-up test has been successfully completed. The SES system is now ready for operation.

If the power-up test could not be successfully completed, check the display of the steering computer.

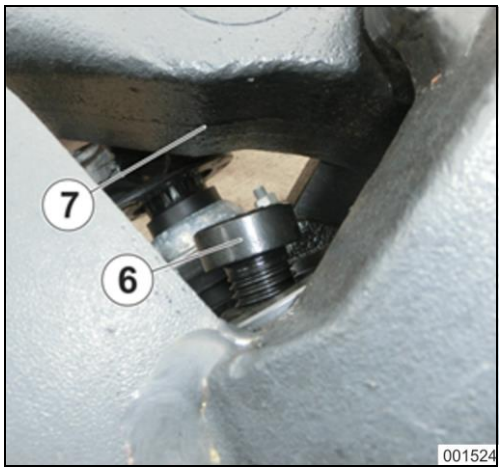


Fig. 99

ATTENTION

The forced steering axle system has been perfectly calibrated for your vehicle in the factory.

Only set the length of the coupling rod.

The forced steering axle system works properly if the distance between the stops (6) and (7) is approx. 3 mm with turned wheels.

Any modifications will invalidate the guarantee.

6.12.5 Uncouple forced steering axle SES

⚠ WARNING

Insufficient stability

Insufficient stability of the unhitched machine may cause the machine to move. Risk of tipping over.

- Park the empty machine in horizontal position on firm ground.
- Secure the machine against rolling.

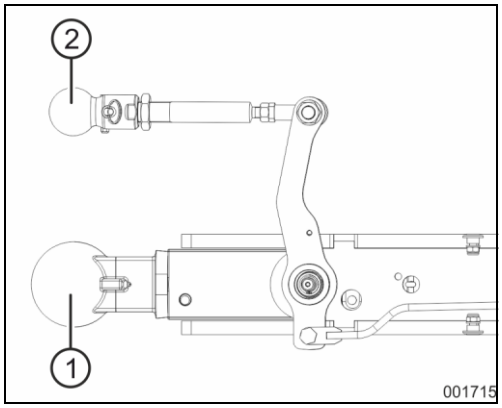


Fig. 100

1. Align tractor and machine in a straight line.
2. Secure the tractor against accidental starting and rolling.
3. Disconnect the brake system.

   ► see section 6.11.1.2 Disconnect brake and feed line, page 133

   ► see section 6.11.3.2 Disconnect hydraulic single-line brake system, page 136

   ► see section 6.11.3.4 Disconnect hydraulic dual-line brake system, page 138
4. Disconnect the hydraulic system

   ► see section 6.8.3 Disconnect hydraulic hose pipes, page 124
5. Uncouple the propeller shaft.

   ► see section 6.13.4 Uncouple propeller shaft from tractor, page 151
6. Uncouple the ball socket (2) of the forced steering axle.
7. Uncouple the shell (1) of the drawgear.

6.13 Propeller shaft

The power transmission between tractor and machine is effected by means of the propeller shaft.

6.13.1 Safety

As a basic principle, the following is applicable:

- Observe the operating instructions for the propeller shaft.
- A protective device in proper condition must each be mounted at the p.t.o. shaft of the tractor and of the machine.
- The protective devices on the tractor and on the machine and the protective devices of the extended propeller shaft must overlap by at least 50 mm. If not, the machine must not be powered via the propeller shaft.
- Never use the propeller shaft without protective device or with a damaged protective device or without proper handling of the clip chain.
- There must be sufficient free space around the propeller shaft in any operating state to avoid damage to the propeller shaft.
- Mounting and dismounting of the propeller shaft is only allowed:
  - with the p.t.o. shaft switched off
  - with the tractor engine turned off
  - with the ignition key pulled out
  - with the parking brake applied.
- Never switch the propeller shaft on with the tractor engine turned off.
- Slip the protective element onto the p.t.o. shaft stub after removal of the propeller shaft.

6.13.2 Adjust length of propeller shaft

Only an authorised workshop is allowed to carry out structural alterations on the propeller shaft. Observe the enclosed operating instructions for the propeller shaft.

- Structural alterations on the propeller shaft which are not specified in the enclosed operating instructions for the propeller shaft are not allowed.
- Take a sufficient transverse contact ratio into account when adapting the propeller shaft length.
- Have the length of the propeller shaft checked in all operating states by an authorised workshop before coupling the propeller shaft to the tractor for the first time.
- Adapt the length if necessary to prevent a compression or insufficient transverse contact ratio.
- The adjustment of the propeller shaft only applies to the current tractor model. Readaptation of the propeller shaft may be necessary if hitching the machine to another tractor.

NOTE

The propeller shaft reaches its shortest operating position during extreme cornering. The propeller shaft reaches its longest operating position during straight travelling.

- Observe possible changes in inclination between tractor and machine, e.g. in case of ramp travel.
- Observe specific differences between top and bottom linkage.

⚠ WARNING

Rolling of tractor and machine

Risk of crushing if tractor and machine accidentally roll.

- Secure tractor and machine against accidental starting and rolling before entering the hazardous area between the tractor and the hitched machine.

This work requires expert knowledge and appropriate tools.

Operative staff:

- Authorised workshop

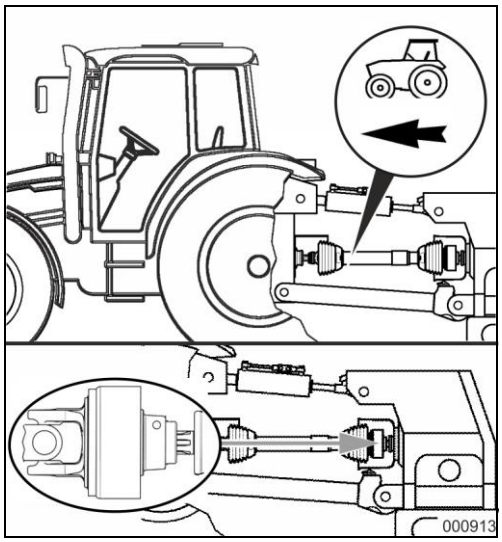


Fig. 101

1. Park the machine in horizontal position on firm ground.
2. Use the chocks to secure the machine against accidental rolling.
3. Hitch the machine to the tractor.
   – Do not couple the propeller shaft.
4. Take the shortest operating position of the propeller shaft.
5. Secure tractor and machine against accidental starting and rolling before entering the hazardous area between tractor and machine.
6. Pull the propeller shaft apart.
7. Slip the fork of the propeller shaft half with the tractor symbol onto the p.t.o. shaft of the tractor until the locking mechanism noticeably engages.
8. Slip the fork of the other propeller shaft half onto the p.t.o. shaft of the machine until the locking mechanism noticeably engages.
9. Determine the length and shorten the propeller shaft.
   – See enclosed operating instructions for the propeller shaft.
10. Reinsert the shortened propeller shaft halves into each other.
11. Lubricate the p.t.o shaft of the tractor and the machine's p.t.o. shaft before coupling the propeller shaft.

6.13.3 Couple propeller shaft to tractor

When coupling the propeller shaft, observe:

- Admissible driving speed of the machine
- Correct driving direction of the propeller shaft
- Proper fitting length of the propeller shaft
- Proper mounting position of the propeller shaft. The tractor symbol on the protective tube of the propeller shaft indicates the propeller shaft connection at the tractor.

⚠ WARNING

Risk of becoming entangled by powered propeller shaft

The powered propeller shaft may catch clothing and draw it in and fling away foreign objects.

- Check the safety and protective devices of the propeller shaft for proper functioning before each start-up of the machine.
- Immediately turn the tractor engine off in case of emergency.

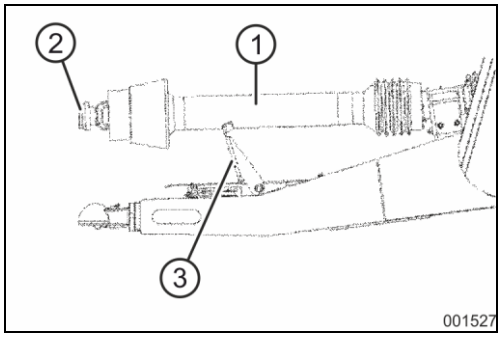


Fig. 102

1. Clean and lubricate the p.t.o. shaft stub on the tractor.
2. Hitch the machine to the tractor.
3. Secure tractor against accidental starting and rolling.
4. Make sure that the p.t.o. shaft has been switched off.
5. Release the p.t.o. shaft brake at the tractor if necessary.
6. Slip the propeller shaft (1) onto the p.t.o. shaft stub until the locking mechanism (2) noticeably engages.
7. Check the free space around the propeller shaft.
   – There must be sufficient free space in any operating state to avoid damage to the propeller shaft.

6.13.4 Uncouple propeller shaft from tractor

⚠ CAUTION

Burns due to hot components

Risk of burns due to hot components of the propeller shaft.

- Do not touch considerably warmed-up propeller shaft components, particularly do not touch any couplings.

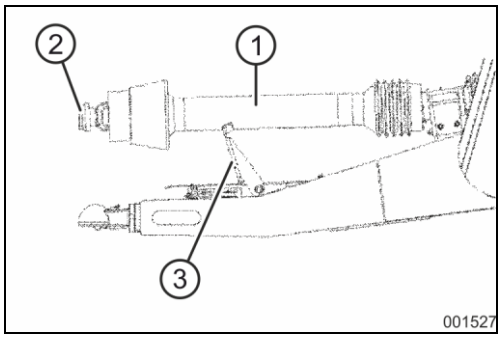


Fig. 103

1. Secure tractor and machine against accidental starting and rolling
2. Unlock the locking mechanism (2).
3. Strip the locking mechanism (2) of the propeller shaft (1) off the p.t.o. shaft of the tractor.
4. Place the propeller shaft onto the respective holder (3).

NOTE

Clean and lubricate the propeller shaft before longer downtimes.

6.14 Check and adjust travelling height of hydraulic chassis

Operative staff:

- Operator

⚠ WARNING

Risk due to insufficient braking ability of the machine if the travelling height of the hydraulic chassis has not been properly set!

- The hydraulic ALB regulator can control the braking force by means of the machine's filling degree only with the travelling height properly set.

ATTENTION

Depending on the tyres and extensions used, the vehicle height may vary.

- Make sure not to exceed the admissible vehicle height (in Germany 4 m) when setting the travelling height.

- The vehicle height is readjusted with the machine empty and standing on firm, even ground by means of three-way cock, stop-cock and single-acting hydraulic control device of the tractor.
- The travelling heights of the right-hand and left-hand machine side are separately set. The procedure for setting the travelling height is the same on both machine sides.
- For safety reasons, the machine lowers only slowly.
- A second person is helpful for monitoring the setting of the travelling height next to the vehicle and assisting the operator on the tractor with the setting of the hydraulic cylinders.

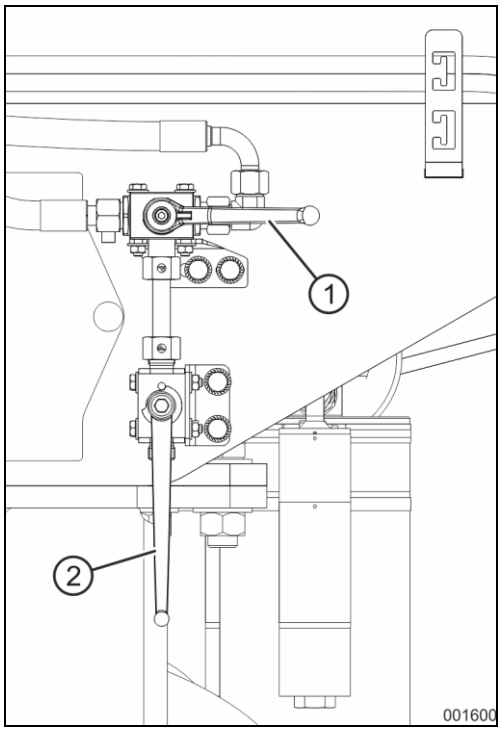


Fig. 104

Set the correct distance X between the locating points of the hydraulic cylinders (3) one after another on the right-hand and left-hand machine side.

1. Hitch the machine to the tractor
2. Park the tractor and the empty machine on even ground.
3. Secure tractor and machine against accidental starting and rolling. ***ATTENTION*** – Ensure that the brakes of the machine are not applied.
4. Connect the hydraulic hose pipe of the chassis with a single-acting control device of the tractor.
5. Use the upper three-way cock (1) to preselect the vehicle side. In middle position, the lines are blocked.
6. Slowly turn the lower stop-cock (2) to vertical position.

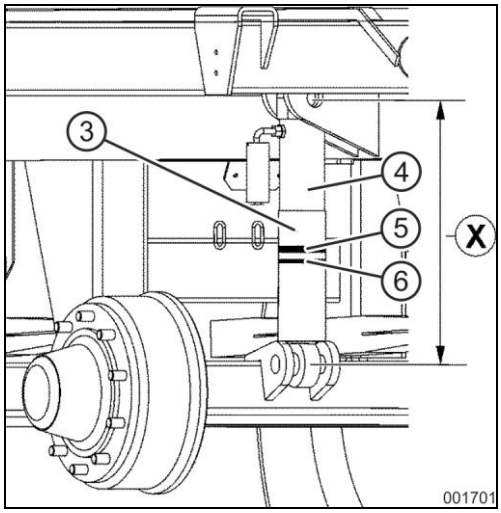


Fig. 105

7. Hold the operating element at the tractor's control device in "Lift" or "Lower" position
   - until the distance X = 600±10 mm or
   - until the lower edge of the protective tube (4) is within the upper, wide marking (5).

   The lower, narrow marking (6) should be reached with the machine being fully charged.
8. Turn the lower stop-cock (2) back to horizontal position.
9. Set the operating element at the tractor's control device to floating position.
10. Repeat steps 5 to 9 for the other vehicle side.

6.15 Supporting leg

6.15.1 Mechanical supporting leg

⚠ WARNING

Risk of crushing due to mechanical supporting leg

Risk of crushing feet due to unintentional downward movement of the supporting leg

- Check whether the locking bolt has completely engaged into the borehole and properly locks the supporting leg in its transport position.

ATTENTION

Only adjust the supporting leg manually with the tractor switched off and the brake applied.

6.15.1.1 Lift to transport position

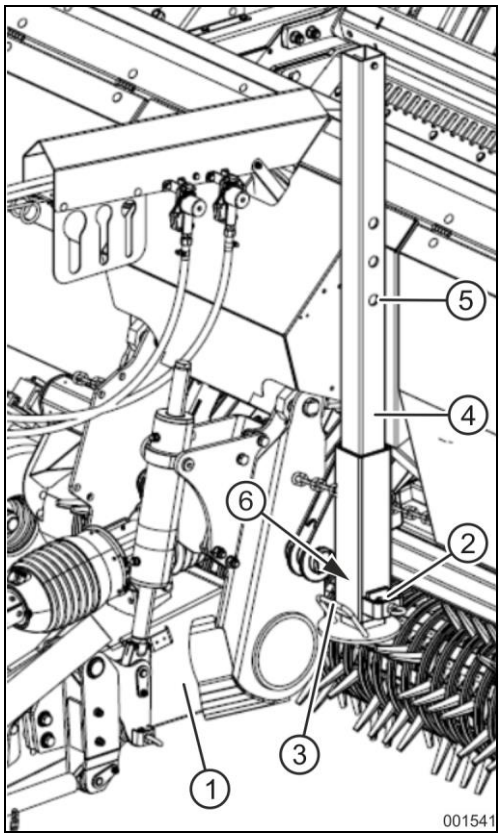


Fig. 106

1. Lift the machine hitched to the tractor via the hydraulic folding drawbar (1).

→ The supporting leg is relieved.

2. Secure tractor and machine against accidental starting and rolling
3. Pull the locking bolt (2) out of the borehole.
4. Use one hand to grip the handle (3) and the other hand to lift the supporting leg (4) until the locking bolt engages into the borehole (6).
5. Check whether the locking bolt has completely engaged into the borehole and properly locks the supporting leg in its transport position.

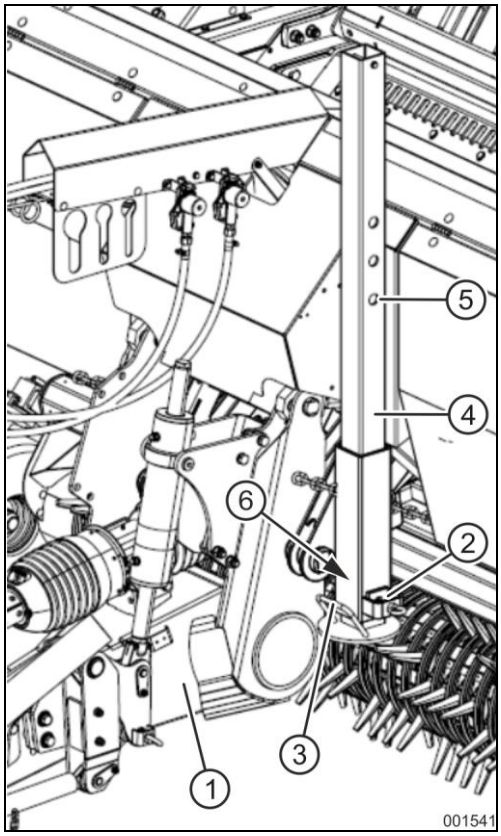


Fig. 107

6.15.1.2 Lower to support position

1. Lift the machine hitched to the tractor via the hydraulic folding drawbar (1).
2. Secure tractor and machine against accidental starting and rolling
3. Use one hand to grip the handle (3) of the supporting leg (4).
4. Use the other hand to pull the locking bolt (2) out of the borehole.
5. Lower the supporting leg until the locking bolt (2) engages into the bottom borehole (5).
6. Check whether the locking bolt has properly engaged into the borehole and properly locks the supporting leg in its support position.
7. Lower the machine via the hydraulic folding drawbar until the machine rests on the supporting leg.

→ The folding drawbar no longer transmits any tongue load to the tractor.

6.15.2 Secure the machine against unauthorised use

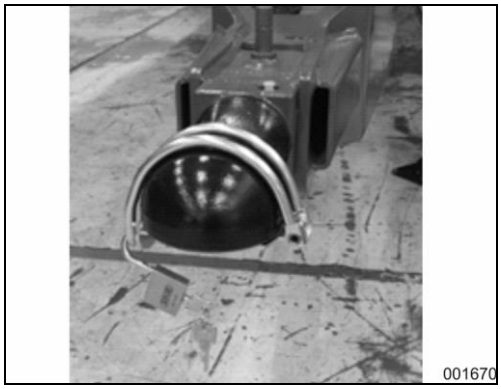


Fig. 108

A machine hitched to a tractor can be secured against unauthorised use by

- locking the tractor cabin,
- parking the machine in a closed area which is not accessible to unauthorised persons.

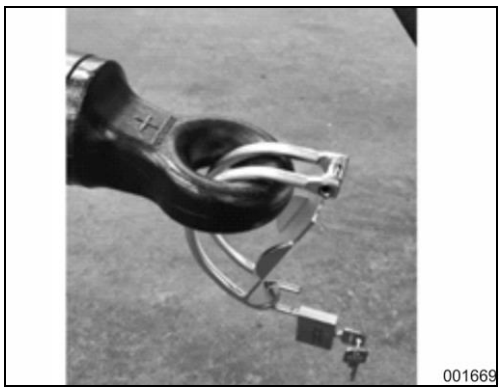


Fig. 109

A parked machine can be secured against unauthorised use by

- parking the machine in a closed area which is not accessible to unauthorised persons,
- installing the immobiliser (see adjacent illustrations).

6.16 Pick-up

6.16.1 Set operating height

The material to be loaded and the ground condition determine the operating height of the pick-up.

ATTENTION

Set the operating height of the pick-up at the same level by means of the two guide wheels. The tines must not scratch the ground. The distance between the tines and the ground should be approx. 10-20 mm.

NOTE

The operating height of the pick-up is set by means of the perforated strut (1):

- Small distance of boreholes = Small operating height of pick-up
- Large distance of boreholes = Larger operating height of pick-up

The perforated struts are identical on both machine sides, therefore the mounting positions may be different.

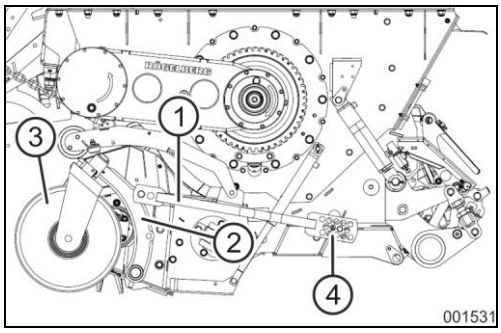


Fig. 110

1. Lift pick-up.
2. Secure tractor and machine against accidental starting and rolling
3. Remove the rear linch pin of the perforated strut (1).
4. Use one hand to hold up the supporting tube (2) of the guide wheel (3), while using your other hand to hang the perforated strut (1) of the pick-up into the desired borehole (4).

ATTENTION

Check the setting of the additional sensing roller in any case.

6.16.2 Set additional sensing roller

ATTENTION

Only adjust the additional sensing roller with the tractor switched off and the brake applied.

NOTE

The height and the load-bearing capacity of the additional sensing roller are set by means of the spindle:

- Spindle unscrewed = Additional sensing roller carries more weight
- Spindle screwed in = Additional sensing roller carries less weight

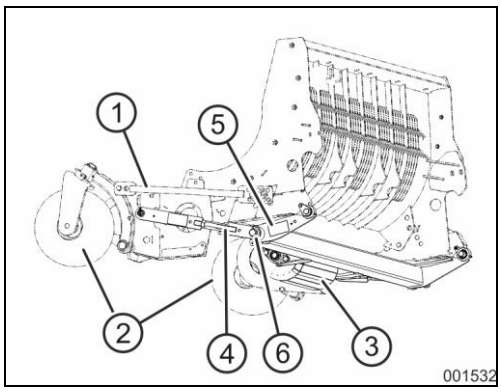


Fig. 111

1. Set the operating height of the pick-up via the left-hand and right-hand perforated strut (1).
2. Lower the guide wheels (2) of the pick-up onto a solid, even surface.
3. Secure tractor and machine against accidental starting and rolling
4. Set the height of the additional sensing roller (3) via the left-hand and right-hand spindle (4) such that the guide wheels (2) bear the largest load. For this purpose, align the frame (5) of the additional sensing roller (3) via the two spindles (4) such that the additional sensing roller (3) is set by 10-20 mm higher than the guide wheels (2).
   – Unscrew the counter nut by means of the enclosed open-end wrench.
   – Turn the upper link nut into the desired direction (set both sides evenly)
   – Tighten the counter nut

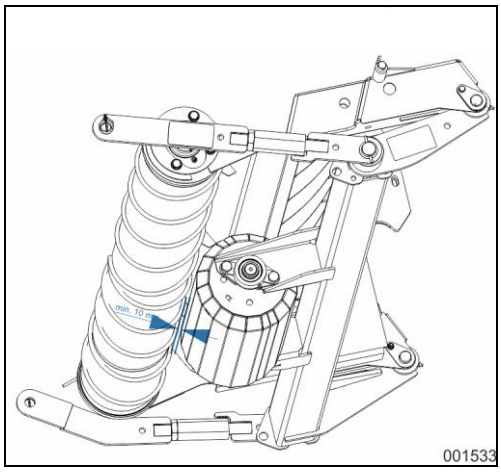


Fig. 112

5. Completely lift pick-up.
   – In lifted position, the additional sensing roller must have a clearance of at least 10 mm to adjacent components.

6.16.3 Set holding-down device

⚠ CAUTION

Risk of injury due to movements of tractor and machine or machine parts

Secure tractor and machine against accidental starting and rolling before carrying out any work on the machine.

Make sure that people leave the hazardous area of the tractor and the machine or of movable machine parts.

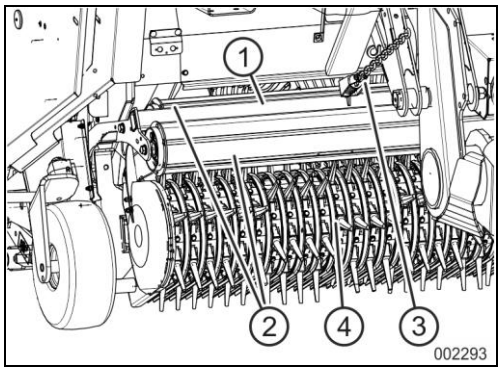


Fig. 113

1. Lower the pick-up.
2. Set the desired distance between the holding-down device (1) with pulley (2) and the pick-up tines (5) by means of the two clip chains (3) on the left-hand and right-hand side.

- Large swathe = Large distance,
- Small swathe = Small distance.

In any case, the pulley must easily turn to guide the holding-down device properly.

NOTE

Set the chain and the pulley equally on both sides to achieve even drawing-in and minimise wear.

6.17 Set cutting length

The number of cutting knives mounted in the cutting unit determines the cutting length of the loaded material. The more cutting knives are mounted, the shorter the cutting length.

For the removal and installation of cutting knives

► see section 10.11.3 Remove and install cutting knives, page 262

6.18 Check machine for proper functioning

Carry out a visual inspection and check the machine for proper functioning before the first start-up and each time before starting work.

1. Hitch the machine to the tractor.
2. Completely lubricate the machine and the propeller shaft.
3. Check the oil level of the individual gearboxes (before the first start-up).
4. Carry out a visual inspection to check the entire machine for damage, wear, foreign objects, coarse contamination, leaks, loosened fastening or connecting screws and other defects.
5. Check all functions of the machine before charging the machine for the first time.
   - Lower and lift pick-up.
   - Extend and retract cutting unit.
   - Switch conveying unit/pick-up on and off.
   - Lift and lower tailgate.
   - Switch on and reverse transport floor (max. three seconds).
   - Check travelling height of hydraulic chassis.
   - Lock and unlock steering axle.
   - Retract and extend front panel
   - Carry out a brake test to check the brake system for proper functioning.
   - Check the lighting system for proper functioning.

   If available:
   - Switch beaters on and off.
   - Check the weighing device for proper functioning.

Should abnormalities

- in the operating behaviour of the machine (e.g. unexpected operating noise, vibrations, imbalance, excessive temperatures) be noticed,
- foreign objects, coarse contamination, oil leaks, loosened fastening or connecting screws be identified during the visual inspection of the machine,

the causes / defects must be eliminated before the first start-up or further operation of the machine.

If the abnormalities cannot be exactly localised, consultation with an authorised workshop or with the Strautmann customer service is required.

7 Control system

This chapter summarises information and instructions on how to operate the machine.

The machine’s hydraulic and electrical function(s) is (are) actuated via remote control from the tractor by means of the ISOBUS control. The Smart 570 terminal supplied (as an optional extra) or another ISOBUS terminal can be used for this purpose.

NOTE

The actuating speed of the hydraulic components depends on the tractor’s hydraulic system.

Depending on the tractor model, a correction of the set actuating speeds at the tractor's control device or the machine's control block may be necessary.

For information about the required control devices, please refer to

► see section 6.4 Required tractor equipment, page 112

7.1 ISOBUS control

7.1.1 Design of ISOBUS control

NOTE

The ISOBUS control complies with the latest ISO standard.

If the tractor software and hardware comply with the current ISO standard, our control set is not required. The machine can be directly operated via the tractor control set and an existing joystick can also be used.

NOTE

The ISOBUS control set is automatically switched on and off when the tractor ignition is turned on and off. In case of longer downtimes of the machine, additionally disconnect the mobile tractor connecting cable.

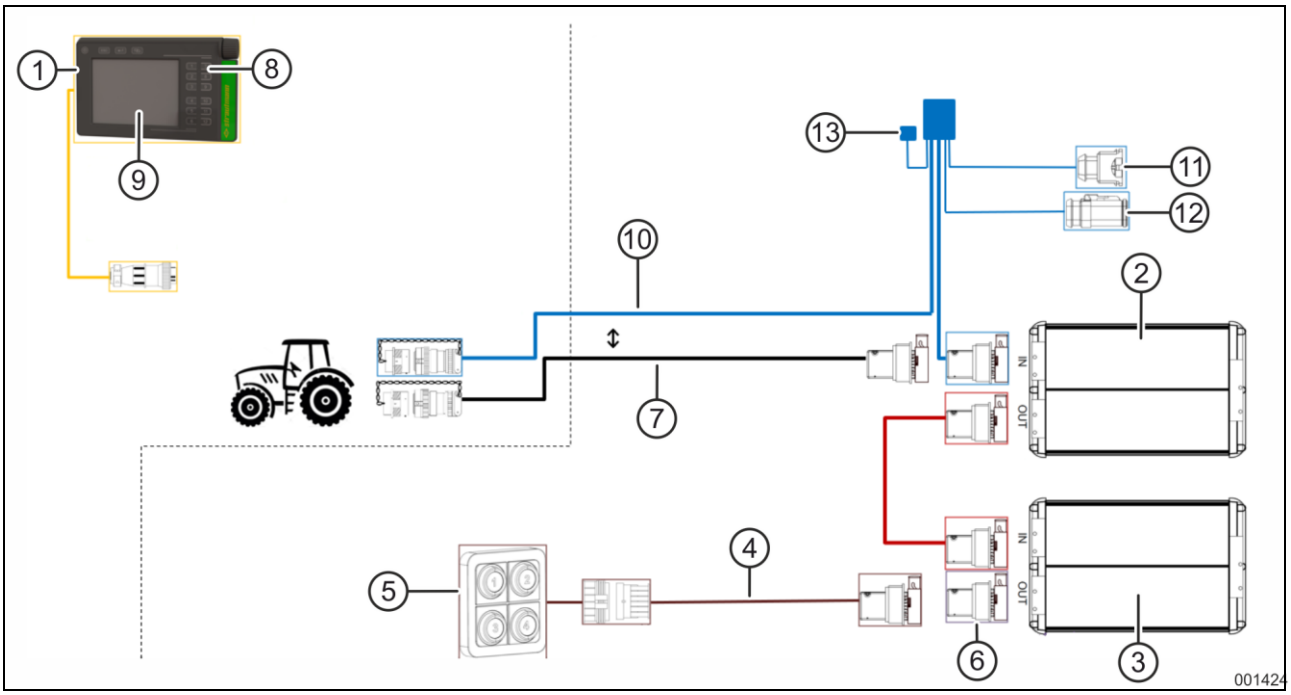


Fig. 114

The ISOBUS control system mainly consists of:

- a control terminal (1), with connecting cable (9-pole "InCab" connecting plug) (optional, not included in the machine's scope of delivery),
- the ISOBUS connecting cable (7) (without SES forced steering axle system), or (10) (with SES forced steering axle system),
- the MASTER control unit (2) with 2x 16-pole connecting plug IN/OUT and 42-pole connecting plug for connection to the cable harness,
- the 2nd control unit (3) (only if the machine is equipped with lift axle, covering system, crossover conveyor, central lubrication etc.), with corresponding connecting cable,
- the connecting cable for keypad (4) (external operation) and keypad (5),
- the connecting plug (6), with a resistance of 120 ohm (connection to the last component to interrupt bus) (only required if no keypad is installed),
- the power supply of the SES forced steering axle system (11) (with SES forced steering axle system) / the reserve connecting plug (12) (optional),
- the 25 A fuse and the relay (13) (ignition-switched) for the supply of the SES forced steering axle system.

The control terminal (1) is mounted in the driver's cabin of the tractor and connected to the control unit (2) of the machine via the connecting cable (7) or (10) (with SES forced steering axle system).

All functions required for operating the machine as well as for transport journeys are actuated via the touch function of the screen (9) or the keys (8). The executable functions are displayed next to the function keys.

After a key has been pressed, the control unit triggers the corresponding solenoid valve at the electro-hydraulic control block to carry out the selected function. Individual sensors determine the respective operating state of the selected assembly, e.g. Steering Axle Locked or Folding Drawbar Position. The operating states are graphically displayed on the screen (9).

7.1.2 Control terminal Smart 570

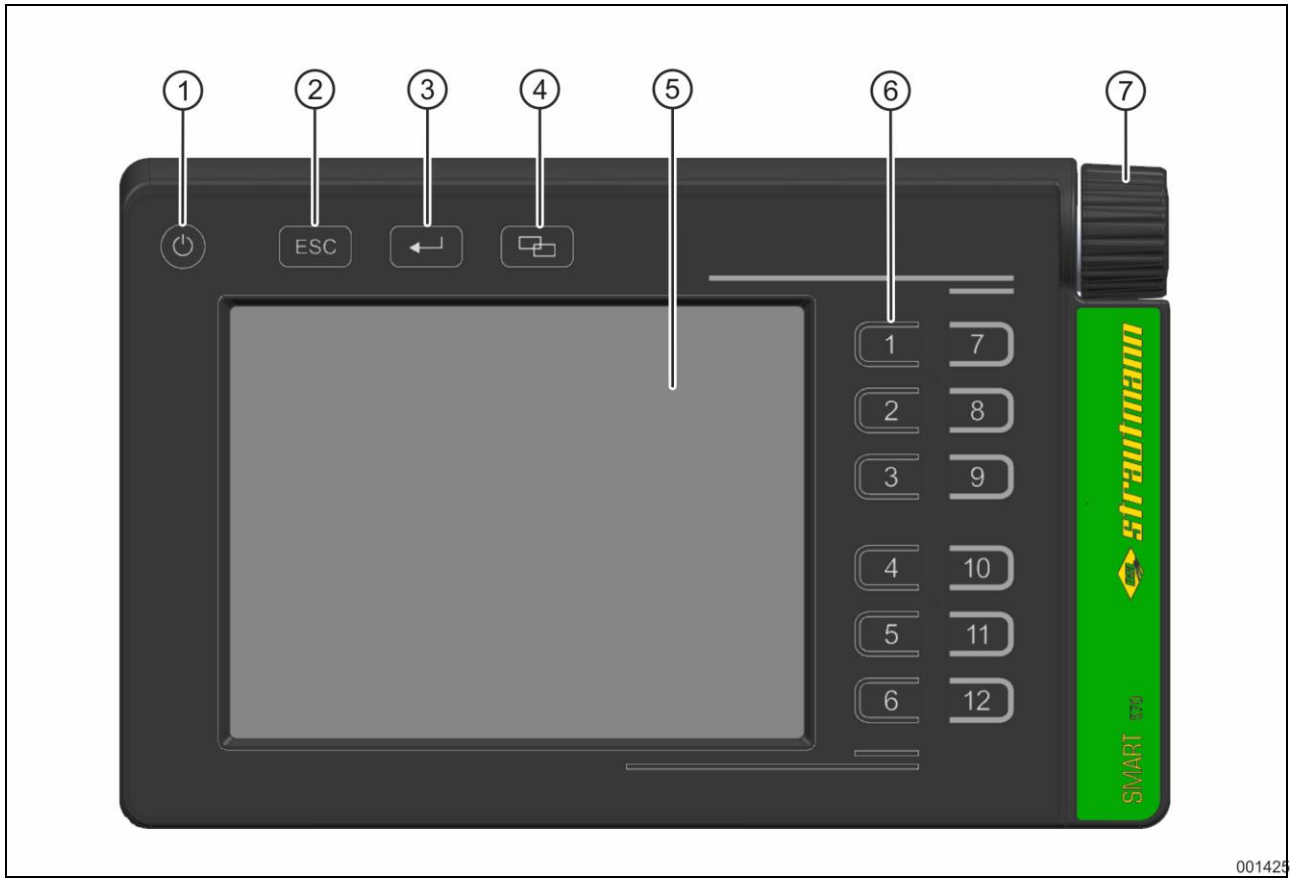


Fig. 115

1 Switch terminal on and off
2 "Escape" key: Exit mask/Cancel entry
3 Enter key: Confirm entry
4 "Change" key: Change to another app
5 Touch screen for performing functions/selecting parameters/changing parameter values
6 Soft keys for performing the adjoining functions displayed on the screen
7 Rotary knob/Push button for entry of values in the setup menu

The Smart 570 control terminal provides all functions for operating the machine via capacitive touch screen, a membrane keyboard and a rotary knob.

7.1.3 Soft keys

⚠ WARNING

Risk of injury or material damage due to unintentional actuation of machine functions caused by careless operation of the soft keys or touching the screen.

When pressing the soft keys or touching the keys on the screen, parts of the connected machine might be moved or activated.

Before activating a function:

- make sure that people leave the hazardous area.
- make sure that the operating routes are clear.

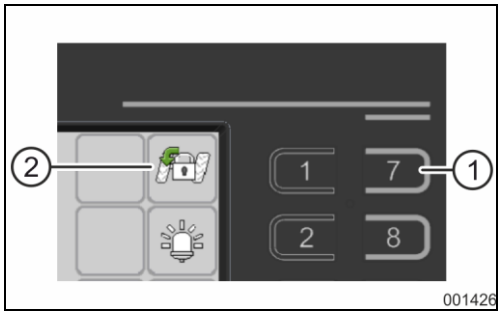


Fig. 116

The soft keys (1) serve to activate functions displayed on the respective function symbol (2). As an alternative, the respective function symbol (2) can be directly touched on the screen.

If there is no function symbol next to a soft key, this key has no function at the moment.

7.1.4 Rotary knob

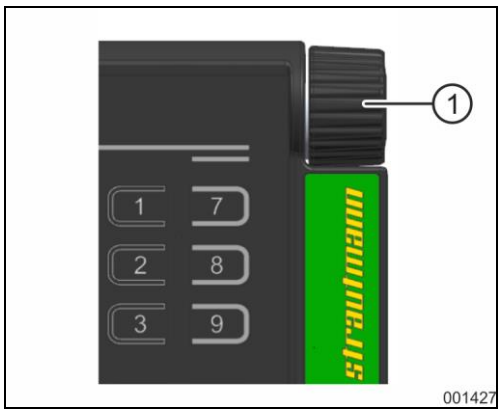


Fig. 117

The rotary knob (1) is mounted at the upper right-hand corner of the control terminal.

The rotary knob serves to perform the following activities in the setup menu:

Turn the rotary knob:

- Move cursor up and down.
- Change value of a parameter.

Press the rotary knob:

- Click on the marked line.
- Activate parameter.
- Confirm entry.

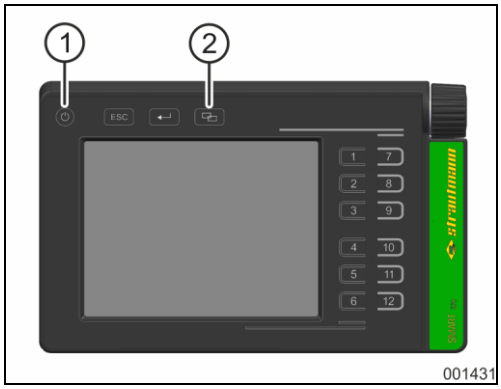


Fig. 118

7.1.5 Switch control terminal Smart 570 on and off

1. Press key (1) on the screen.

→ The control terminal is switched on, the start screen appears on the display.

2. Press key (2) to select the machine type in the machine selection.

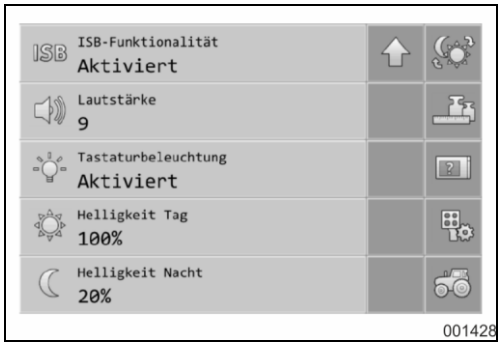


Fig. 119

7.1.6 Basic setting of terminal Smart 570

Actuate the "Change" key on the control terminal to access the terminal settings.

Here, brightness, date, time, language etc. can be set and changed.

Further functions and submenus

- Weighing device
- Joystick settings
- …

can be called up.

Use the rotary knob on the terminal or the touch function on the screen to make the settings.

7.1.7 Menu navigation

The ISOBUS control system is divided into the three main menus "Road travel", "Charging" and "Discharging".

Use the arrow keys (4) to switch between the main menus.

- Press briefly: One menu forward
- Press and hold: One menu backward

Each menu has submenus with further functions. Press the Submenu key (5) to display the submenus one after the other. Press the arrow key (6) to return to the main menu.

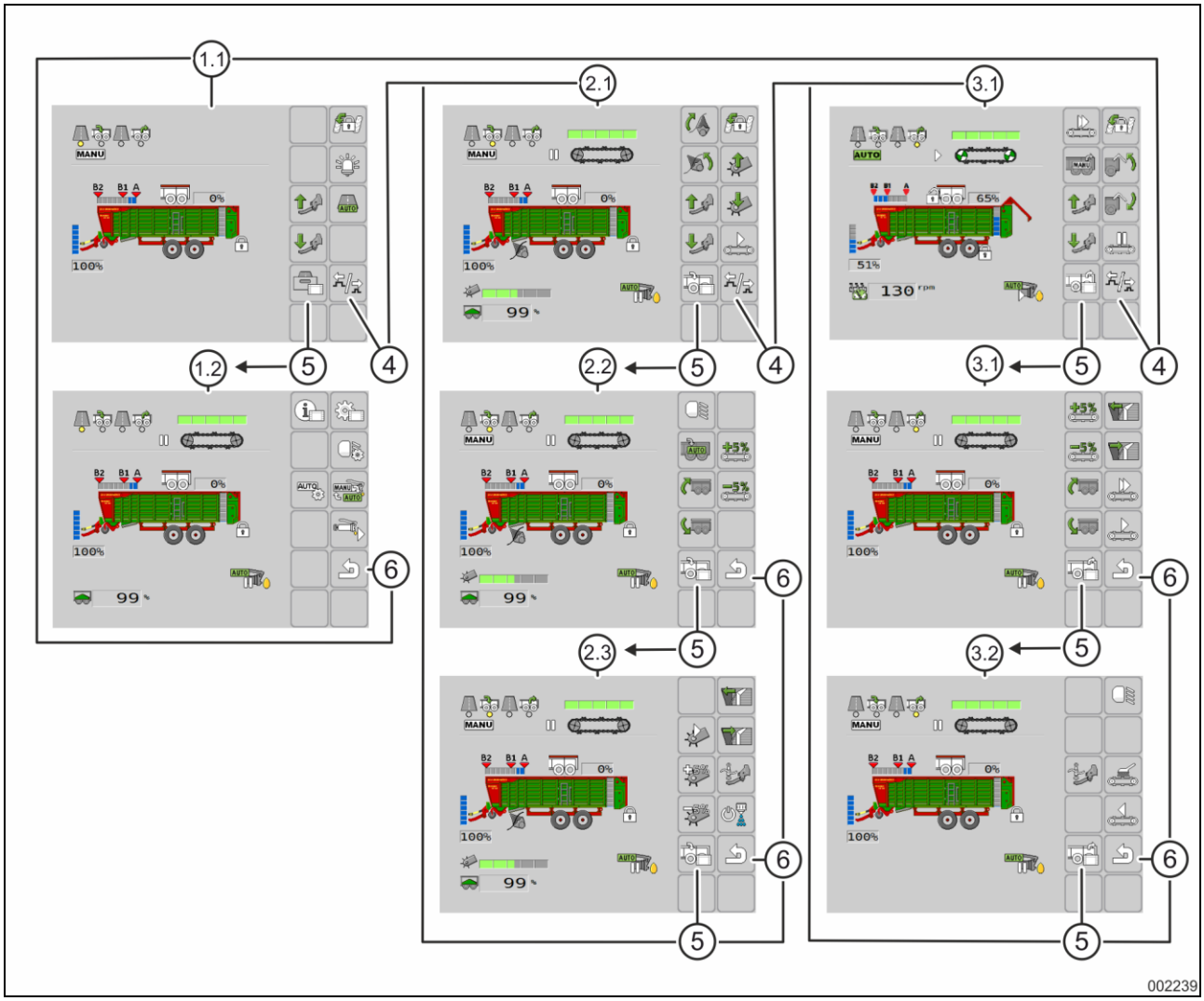


Fig. 120

1 "Road travel" main menu	2 "Charging" main menu	3 "Discharging" main menu
1.1 „Road travel" submenu	2.1 First "Charging" submenu	3.1 First "Discharging" submenu
	2.2 Second "Charging" submenu	3.2 Second "Discharging" submenu

7.1.8 Change menu

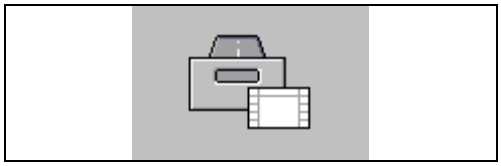


Fig. 121

Change to first "Road travel" submenu.

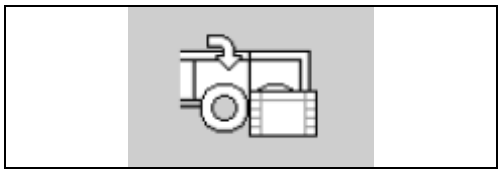


Fig. 122

Change to first and second "Charging" submenu (optionally available, depending on the equipment).

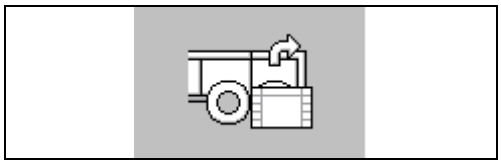


Fig. 123

Change to first and second "Discharging" submenu.

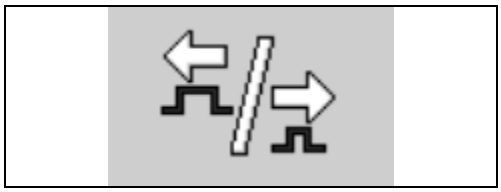


Fig. 124

1. Press the key briefly to move on to the next main menu.
2. Press and hold the key to return to previous main menu.

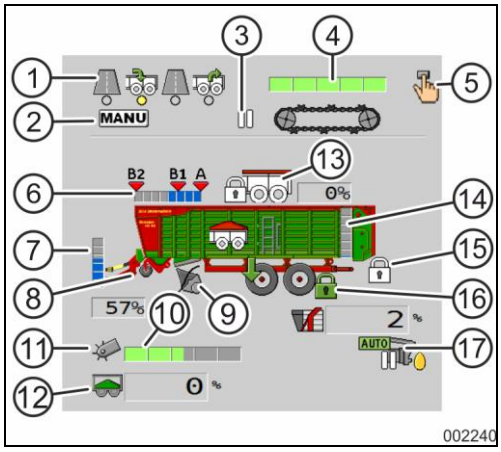


Fig. 125

7.1.9 Status indicator in display

1 Current working mode (marked by a yellow dot)
2 Current operating mode
- auto = Automatic functions enabled
- manu = Manual mode

3 Transport floor on or off
4 Transport floor speed in %
5 Operation via external CAN keypad (enabled here)
6 Front panel position (blue bar)
7 Folding drawbar position in %
8 Pick-up position
- lifted (displayed here)
- locked position
- floating position

9 Status of knives
- extended (displayed here)
- retracted

10 Pick-up speed in %*
11 Pick-up*
- enabled (coloured symbol)
- disabled (grey symbol) (displayed here)

12 Feeler deflection in %
13 Covering system open/closed
14 Tailgate position
15 Tailgate locked
16 Steering axle
- open (grey)
- locked (green)

17 Central lubrication status
- auto
- manu

*only with Magnon 10 (hydr. pick-up drive)

7.1.10 Road travel

NOTE

The road travel mode can only be switched on:

- with the pick-up lifted

  ATTENTION – The pick-up is not checked for having been completely lifted.
- with the tailgate closed.
- with the transport floor stationary.
- with the p.t.o. shaft stationary.

If these requirements are not fulfilled, a beep is emitted, a warning message and the non-fulfilled requirement appear on the screen.

Press the "Escape" key to hide warning messages and alarms.

NOTE

With the road travel mode switched on:

- the "Road travel" menu appears.
- the folding drawbar moves to the position saved for road travel,
- the work lights are switched off.

In "AUTO" operating mode, the preselected automatic functions are enabled.

NOTE

If the folding drawbar is equipped with a drawbar suspension, the hydraulic cylinders of the folding drawbar must be extended by at least 20 mm, before switching on manual road travel mode (in automatic mode, the drawbar moves to the preset value).

The drawbar suspension does not work if the folding drawbar is lowered to its end position.

NOTE

With the road travel mode switched off:

- the preselected AUTO functions are disabled.
- the work lights are switched on if they were switched on while performing the function "Switch road travel mode on".

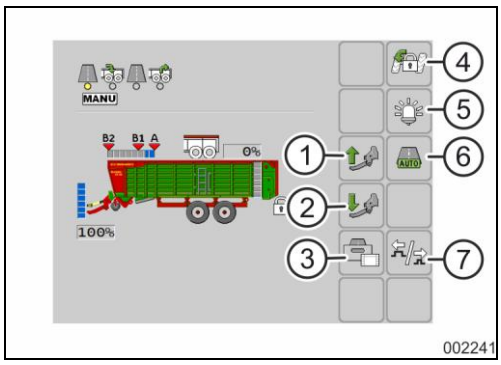


Fig. 126

"Road travel" main menu

1 Lift folding drawbar
2 Lower folding drawbar
3 "Road travel" submenu
4 Lock and unlock steering axle / forced steering axle (depending on the equipment)
5 Switch warning beacon on and off
6 Change operating mode (auto/manu)
7 Change of menu

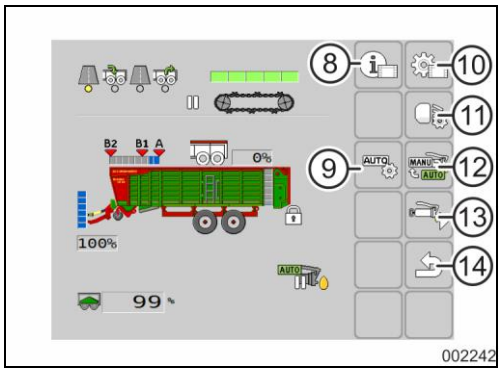


Fig. 127

"Road travel" submenu

8 Information menu, transported loads and hours counter
9 "Automatic settings" menu
10 "Setting" menu
11 Work lights settings
12 Change of operating mode
- auto
- manu

13 Central lubrication
14 Return to main menu

7.1.11 Transported loads counter

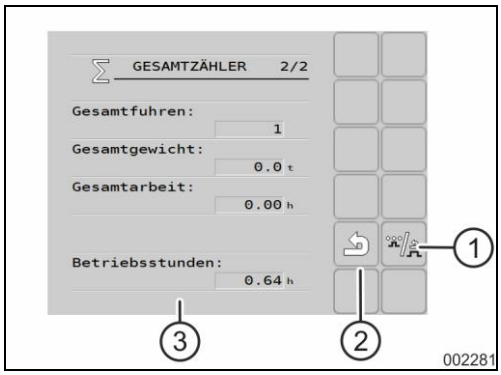


Fig. 128

The counter readings of the machine can be found in the information menu Transported Loads and Hours Counter in the second Road Travel submenu.

1 Change between menus
2 Return to main menu
3 Display with counter readings

7.1.12 Charging

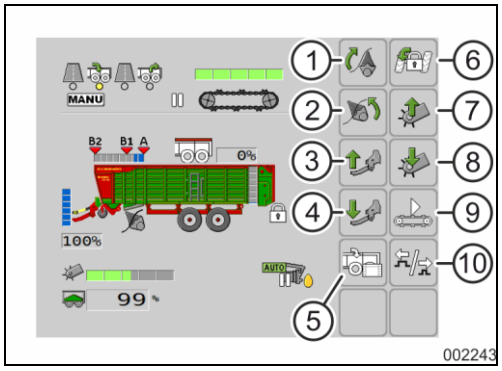


Fig. 129

"Charging" main menu

1 Retract cutting unit
2 Extend cutting unit
3 Lift folding drawbar
4 Lower folding drawbar
5 Change to first "Charging" submenu
6 Lock and unlock steering axle / forced steering axle (depending on the equipment)
7 Lift pick-up
8 Lower pick-up
9 Start transport floor (with enabled automatic charging system: via touch control, with disabled automatic charging system: via latch-in)
10 Change of menu

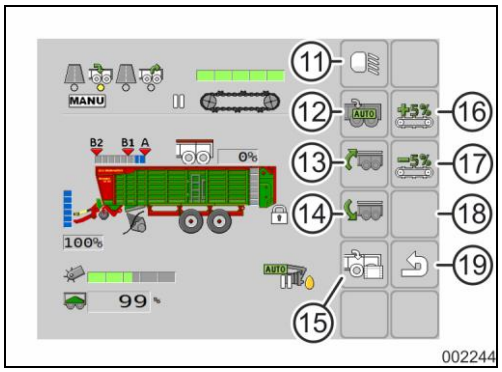


Fig. 130

First "Charging" submenu

11 Switch work lights on and off (according to presetting)
12 Change of operating mode
- auto
- manu

13 Open covering system
14 Close covering system
15 Change to second "Charging" submenu
16 Increase of transport floor speed by 5 % in manual mode. With the automatic charging system enabled, the filling degree changes.
17 Reduce transport floor speed by 5 % in manual mode. With the automatic charging system enabled, the filling degree changes.
18 Lift axle
19 Return to "Charging" main menu

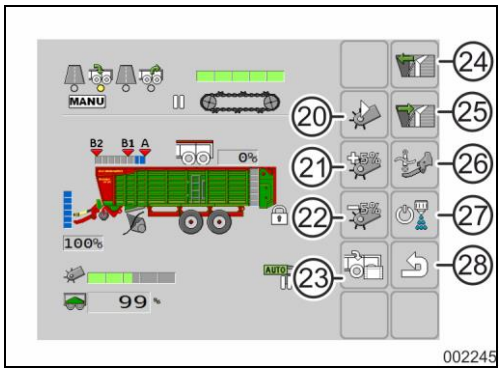


Fig. 131

Second "Charging" submenu

20 Start pick-up
21 Increase pick-up speed by 5 %*
22 Reduce pick-up speed by 5 %*
23 Change to first "Charging" submenu
24 Retract front panel
25 Extend front panel
26 Switch drawbar suspension on and off
27 Switch silage additive pump permanently on and off
28 Return to "Charging" main menu

* only with Magnon 10 (hydr. pick-up drive)

7.1.13 Switch automatic charging system on and off

NOTE

The higher the set filling degree, the **lower** the transport floor feed rate and the **higher** the filling quantity.

NOTE

All functions selected in the "Automatic settings" menu, see ► page 189, are enabled when switching the automatic charging system on.

Switch the automatic charging system on for uniform and complete filling of the cargo space.

The automatic charging system:

- automatically and infinitely variably switches the transport floor on and off during charging,
- is automatically disabled when the control terminal generates the acoustic signal (horn sound) and the visual signal "Forage wagon full",
- remains switched on until the automatic charging system is manually switched off,
- permits to preselect the filling degree of the loaded material in the cargo space.

The automatic charging system can be switched on and off in the "Charging" submenu via "auto/man" only if it is preselected.

After a mask change, the automatic charging system starts with a time delay of three seconds, which is indicated by the hourglass symbol (1) in the display.

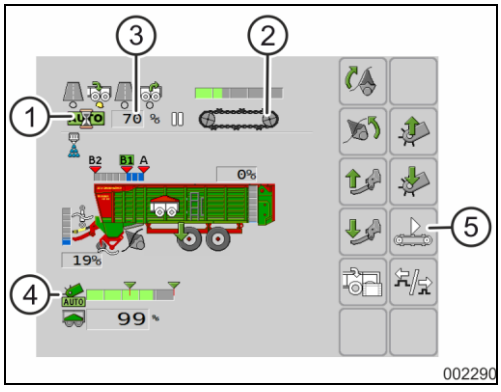


Fig. 132

2 Transport floor enabled/disabled
3 Desired filling degree in %
4 Pick-up enabled*
5 Transport floor start (overrides automatic charging system)

*only with Magnon 10 (hydr. pick-up drive)

7.1.14 Switch transport floor on with automatic charging system enabled

NOTE

Manual actuation of the transport floor overrides the automatic charging system.

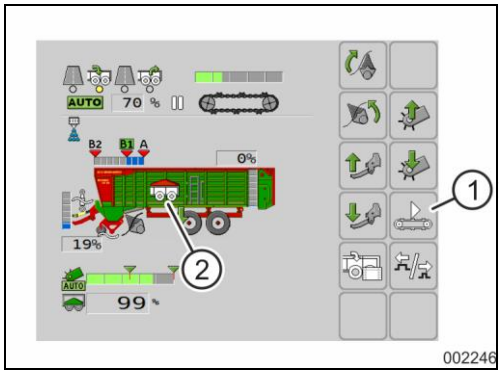


Fig. 133

1. Press key (1) during charging to switch the transport floor feed on.
   → The transport floor will move at the set feed rate as long as the key is pressed.
2. When the machine is fully charged, the control terminal generates an acoustic signal (horn sound) and the "Forage wagon full" message appears on the display (2).
   → The automatic charging system is disabled and the automatic feed function for the transport floor is switched off.

On machines without beaters, the transport floor can be still started for a total of three seconds despite the "Forage wagon full" message.

7.1.15 Change filling degree of loaded material

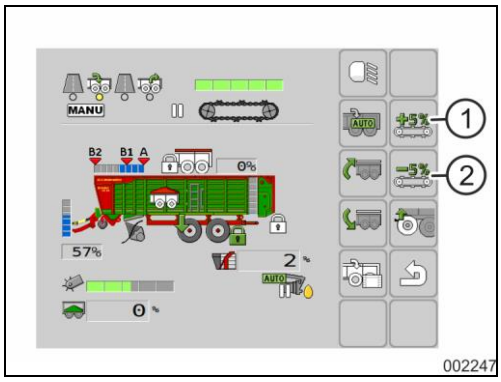


Fig. 134

The filling degree can be changed in the first "Charging" submenu.

1. Press key (1) to increase the filling degree by 5 % at each keystroke.
   → The higher the desired filling degree, the slower the transport floor.
   - To achieve higher compaction with dry crops.
2. Press key (2) to reduce the filling degree by 5 % at each keystroke.
   → The lower the desired filling degree, the faster the transport floor.
   - To avoid overloading of the machine.
   - To reduce compaction / protect the structure of moist crops.

7.1.16 Discharging

ATTENTION

Align the wheels in a straight line before switching to discharging mode.

Align the wheels in a straight line by means of a short forward travel of the tractor and the hitched machine.

NOTE

The automatic functions (automatic discharging mode, locking of steering axle, drawbar suspension, positioning of folding drawbar and front panel) are preselected in the "Automatic settings" menu, see ► page 189.

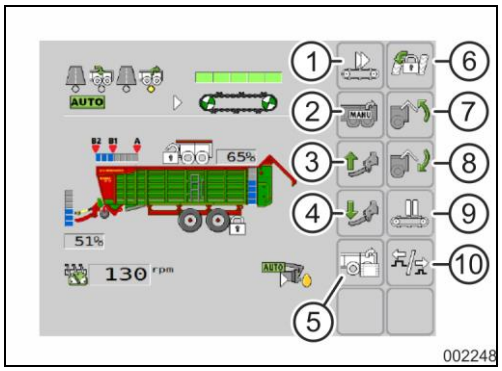


Fig. 135

"Discharging" main menu

1 Transport floor rapid motion mode
2 Change of operating mode
   - auto
   - manu
3 Lift folding drawbar
4 Lower folding drawbar
5 Change to first "Discharging" submenu
6 Lock and unlock steering axle / forced steering axle (depending on the equipment)
7 Open tailgate
8 Close tailgate
9 Transport floor start
10 Change of menu

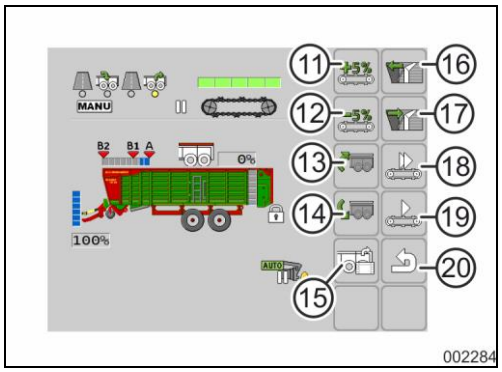


Fig. 136

First "Discharging" submenu

11 Increase transport floor speed by 5 %
12 Reduce transport floor speed by 5 %
13 Open covering system
14 Close covering system
15 Change to second "Discharging" submenu
16 Retract front panel
17 Extend front panel
18 Transport floor rapid motion mode
19 Transport floor start (latch-in)
20 Return to "Discharging" main menu

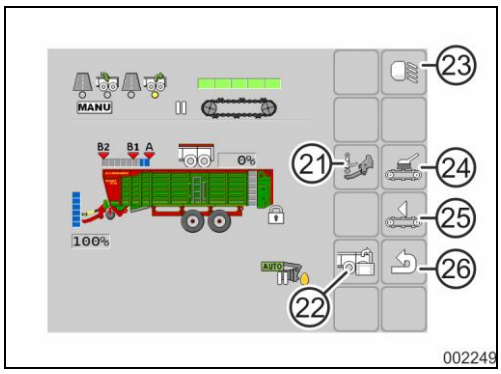


Fig. 137

Second "Discharging" submenu

21 Switch drawbar suspension on and off
22 Change to second "Discharging" submenu
23 Switch work lights on and off (according to presetting)
24 Clean transport floor
25 Reverse transport floor
26 Return to "Discharging" main menu

7.1.17 Automatic discharging system

NOTE

The automatic discharging system is automatically switched off if the tailgate is lowered (only possible with the p.t.o. shaft switched off).

When discharging step by step, press the "Transport floor start/stop" key to manually stop the transport floor and switch the p.t.o. shaft off.

→ The beaters and the transport floor stop. The transport floor switches automatically to standby mode.

NOTE

All functions selected in the "Automatic settings" menu, see ► page 189, are enabled when switching on the automatic discharging system.

The automatic discharging system can be switched on and off in the "Discharging" main menu.

For machines without beaters:

Keep key (1) pressed for three seconds to actuate the discharging function.

The following functions will automatically be carried out one after the other:

- Tailgate opens up to the saved position,
- Transport floor starts when the tailgate position has been reached.
  → Discharging starts.

For machines equipped with beaters:

1. Keep key (1) pressed for three seconds to actuate the discharging function.

The following functions will automatically be carried out one after the other:

- Tailgate opens up to the saved position,
- Gearbox and DO clutch switch.
- Transport floor is briefly reversed to relieve the DO beaters and switched to standby mode when the tailgate position has been reached.

2. Switch the p.t.o. shaft on and wait for the rpm signal of the beaters. ***ATTENTION*** – As soon as the p.t.o. shaft is switched on, the beaters start to run and after a short delay, the transport floor automatically starts.

   → Discharging starts.

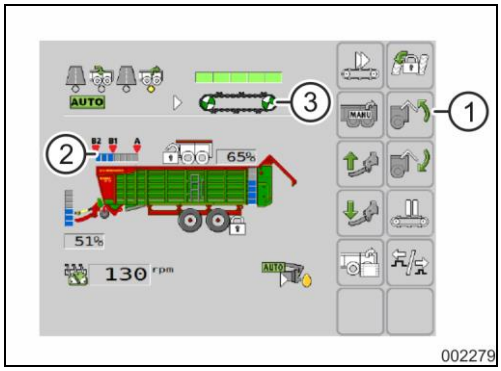


Fig. 138

1 Discharging Function key
2 Front panel position
3 Transport floor enabled

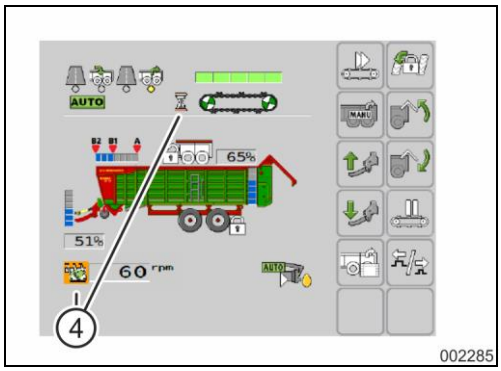


Fig. 139

If the beater speed is too low or the tailgate opening is insufficient, the automatic discharging system pauses.

→ The symbols (4) on the display change.

- The rpm symbol is highlighted in yellow.
- An hourglass appears next to the transport floor symbol.

7.1.18 Stop and restart transport floor during discharge

NOTE

The transport floor can only be switched on and off with the tailgate open, or, when the machine is equipped with beaters, only with the beater speed applied.

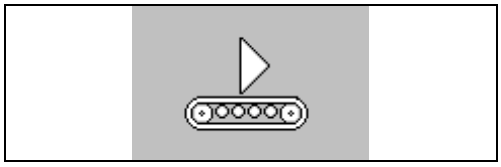


Fig. 140

1. Press adjacent key to stop the transport floor.
2. Press this key again to restart the transport floor.

7.1.19 Complete emptying of transport floor (rapid motion mode)

NOTE

The "Transport floor rapid motion mode" function can only be started with the transport floor enabled.

When the machine is equipped with beaters, the p.t.o. shaft can already be switched off when there is no more loaded material in contact with the beaters.

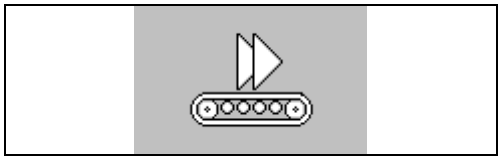


Fig. 141

1. Press adjacent key to empty the transport floor.

→ The transport floor speed is increased to its maximum.

2. Press this key again to stop the function.

7.1.20 Change transport floor speed during discharging

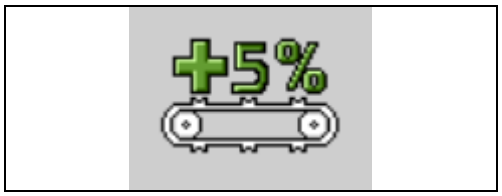


Fig. 142

1. Press the adjacent key to increase the transport floor speed.

→ The transport floor speed is increased by 5% at each keystroke.

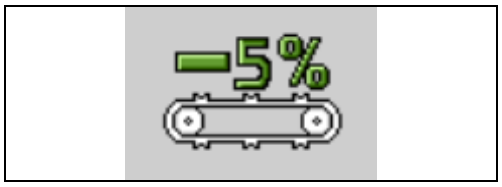


Fig. 143

2. Press the adjacent key to reduce the transport floor speed.

→ The transport floor speed is reduced by 5% at each keystroke.

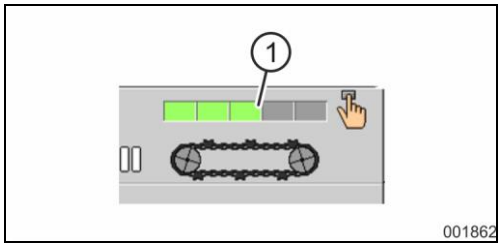


Fig. 144

→ The preselected transport floor speed is indicated by a green bar (1) on the display.

7.1.21 Reverse transport floor

ATTENTION

Risk due to failure of components caused by frequent or long reverse of transport floor.

The feed direction of the transport floor may be reversed only for a short time (max. three seconds).

Check the transport floor for proper tension every day, in order to prevent material damage.

Reverse only:

- for a short time,
- in case of emergency,
- if the slip clutch responds during discharge,
- in order to reduce the pressing power which the loaded material applies to the beaters (only on forage wagons with dosing unit).

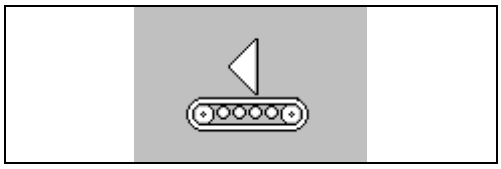


Fig. 145

1. Press adjacent key.

→ The transport floor starts to run and conveys the loaded material in the opposite direction for a maximum time of three seconds.

7.1.22 Clean transport floor

NOTE

This function starts the transport floor irrespective of the tailgate position, when there is no p.t.o. shaft / beater speed.

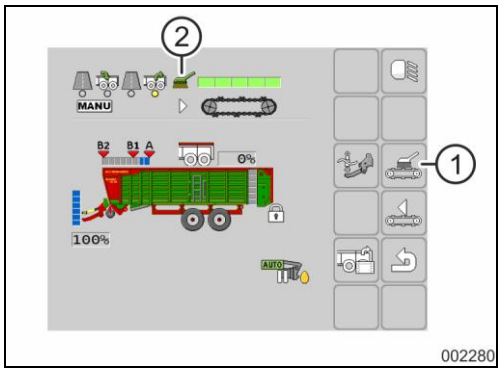


Fig. 146

Press key (1) in the "Road travel" submenu to enable the cleaning function. The symbol (2) appears in the display.

Press key (1) for ten seconds to permanently enable the transport floor.

→ The transport floor remains switched on and can be cleaned until another function is actuated.

→ The transport floor is stopped as soon as a p.t.o. shaft / beater speed is available.

7.1.23 Lift tailgate

NOTE

In manual discharging mode, this function is touch-operated.

NOTE

The tailgate can only be moved with the covering system open.

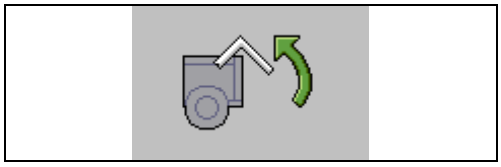


Fig. 147

1. Press adjacent key until the tailgate has reached the desired position.

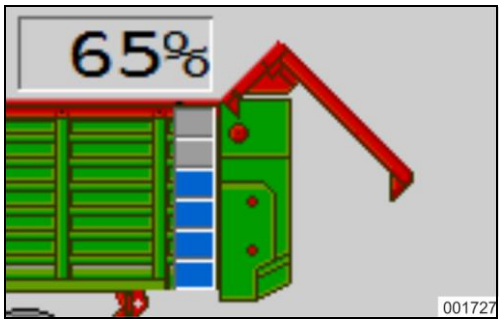


Fig. 148

→ The tailgate position is displayed on the screen by a blue bar.

7.1.24 Lower tailgate

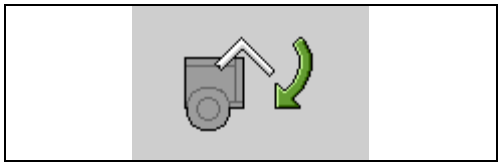


Fig. 149

1. Press the adjacent key until the tailgate has reached the desired position.

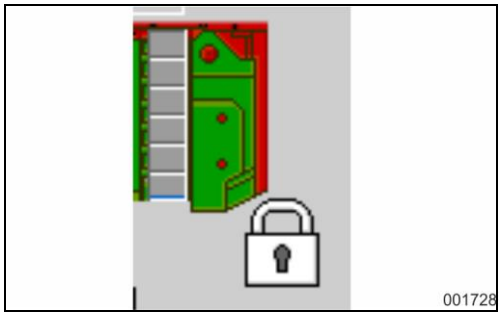


Fig. 150

→ As soon as the tailgate is completely closed and fits tightly, the tailgate is locked. The screen shows the adjacent symbol.

7.1.25 Lift folding drawbar

NOTE

With the automatic system enabled, the folding drawbar moves to the saved position when switching between the different operating modes.

NOTE

The ground clearance of the pick-up is increased when lifting the folding drawbar.

Fig. 151

1. Press the adjacent key until the folding drawbar has been lifted to the desired position or has reached its end position.

→ The display shows the drawbar position.

7.1.26 Lower folding drawbar

NOTE

The ground clearance of the pick-up is reduced when lowering the folding drawbar.

Fig. 152

1. Press the adjacent key until the folding drawbar has been lowered to the desired position or has reached its end position.

→ The display shows the drawbar position.

7.1.27 Folding drawbar suspension

Fig. 153

Switch drawbar suspension on:

1. Extend the hydraulic cylinders of the folding drawbar by approx. 20 mm.
2. Press the key.

→ The road travel mode is switched on. At the same time, the drawbar suspension is automatically switched on. The Road Travel menu appears.

Fig. 154

Switch drawbar suspension off:

3. Press the key again.

→The road travel mode is switched off. At the same time, the drawbar suspension is automatically switched off. The Working menu appears.

7.1.28 Open covering system

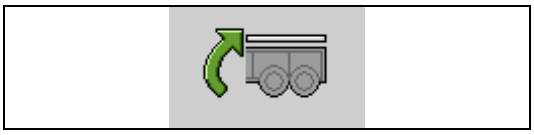


Fig. 155

1. Press the adjacent key to open the covering system.

7.1.29 Close covering system

NOTE

If the covering system is closed, all functions and automatic functions moving the front panel or tailgate are disabled to prevent collisions between the covering system and the front panel or tailgate.

Fig. 156

1. Press the adjacent key to close the covering system.

Fig. 157

If the covering system is closed and an automatic function involving the front panel/tailgate is selected or the operating mode is changed, the display shows the adjacent illustration.

→ Press the "Yes" key to completely open the covering system. During the opening procedure, the automatic functions concerned pause. If the covering system cannot be opened completely, the display will show an error message.

→ Press the "No" key to stop all automatic functions concerned until the covering system has been opened manually. During that time, the "Covering system closed" symbol is flashing in orange.

7.1.30 Lift pick-up

Fig. 158

1. Press the adjacent key to lift the pick-up.

7.1.31 Lower pick-up

⚠ WARNING

Risk of material damage when travelling on uneven ground with the pick-up lowered or locked.

Only move the machine on uneven ground with the pick-up held in floating position.

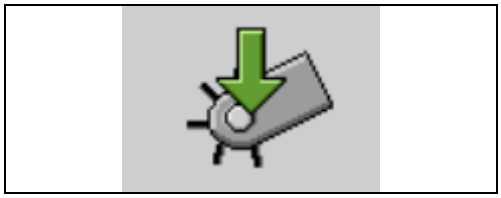


Fig. 159

1. Press the adjacent key to lower the pick-up.

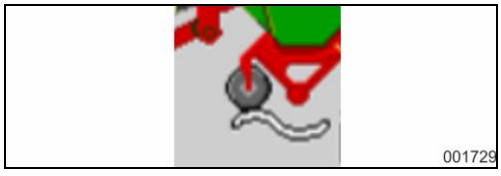


Fig. 160

→ The pick-up lowers and works in floating position.

→ The display shows the adjacent symbol.

Fig. 161

2. Briefly lift the pick-up.

→ The pick-up is locked in its position and is fixed.

→ The display shows the adjacent symbol.

7.1.32 Change pick-up speed

On machines with hydraulic pick-up drive (Magnon 10):

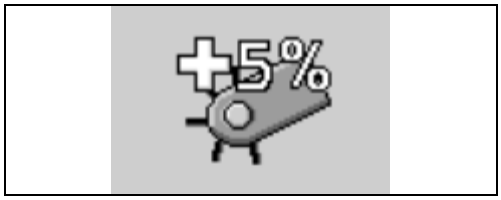


Fig. 162

1. Press the adjacent key to increase the pick-up speed.

→ The pick-up speed is increased by 5% at each keystroke.

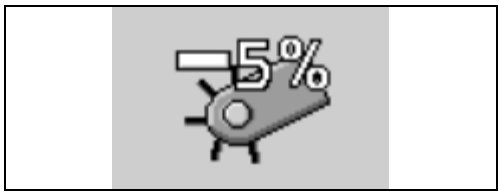


Fig. 163

2. Press the adjacent key to reduce the pick-up speed.

→ The pick-up speed is reduced by 5% at each keystroke.

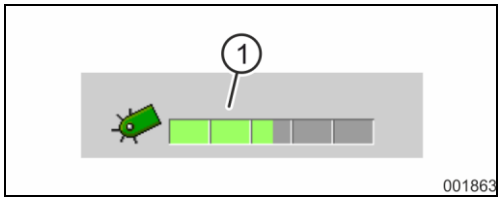


Fig. 164

→ The preselected pick-up speed is indicated by a green bar (1) on the display.

7.1.33 Pick-up speed control

This function can be enabled and disabled for charging mode on machines with hydraulic pick-up drive (Magnon 10) in the "Automatic settings" menu. When being enabled, the "Pick-up start" function is automatically also enabled.

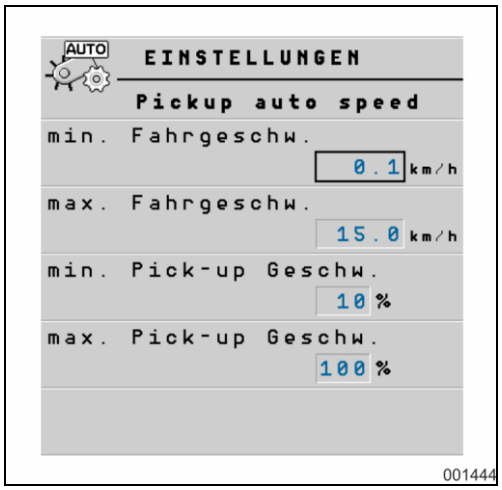


Fig. 165

Select the setup menu to adjust the pick-up speed control. The pick-up speed can be set there proportionally to the travelling speed.

→ The higher the travelling speed, the higher the pick-up speed.

→ The lower the travelling speed, the lower the pick-up speed.

NOTE

Depending on the machine's equipment, the travelling speed can be selected via the ISOBUS control set or the rpm and rotational direction sensor, which is mounted in the rear steering axle.

When using the rpm and rotational direction sensor, slight deviations may occur in left and right-hand turns due to the fact that the sensor is mounted on one side and measures the wheel speed either on the inside or on the outside of the turn. Thus, there is a slight difference in the travelling speed, which is (only slightly) noticeable in the pick-up speed control.

7.1.34 Extend cutting unit

Fig. 166

1. Press the adjacent key until the cutting unit has been completely extended.

→ The display shows the cutting unit position.

7.1.35 Retract cutting unit

Fig. 167

1. Press the adjacent key until the cutting unit has been completely retracted.

→ The display shows the cutting unit position.

If the cutting unit is not in extended position when changing to charging mode, an information message will appear.

7.1.36 Switch silage additive pump on and off

NOTE

With the automatic system enabled, the silage additive pump starts as soon as the p.t.o. shaft has been switched on and the pick-up has been lowered.

Fig. 168

The silage additive pump can be permanently switched on and off in the second "Charging" submenu.

1. Press the adjacent key to switch the silage additive pump on.

→ The display shows the "Silage additive pump" symbol.

2. Press the key again to switch the silage additive pump off.

7.1.37 Lock steering axle

WARNING

Insufficient stability

Risk to people due to insufficient stability and tipping over of the machine if the steering axle/s is/are not properly used.

It is imperative to lock the steering axle:

- at high travelling speeds
- on rough road tracks
- before travelling over clamp silos
- when traversing hills
- before carrying out reverse travels.

ATTENTION

Align the wheels in a straight line before locking the steering axle.

Align the wheels in a straight line by means of a short forward travel of the tractor and the hitched machine.

Fig. 169

1. Press the adjacent key.

→ The steering axle is locked in "Straight" position. The display shows the "Steering axle locked" symbol (lock at the rear axle).

→ If the symbol (rear wheel in the display) is flashing, the steering axle could not be completely locked. Check the steering system.

7.1.38 Unlock steering axle

Fig. 170

1. Press the adjacent key.

→ The steering axle can move freely (is unlocked) and follows the turning radius of the corner during cornering. The display shows the "Steering axle unlocked" symbol.

7.1.39 Forced steering axle system

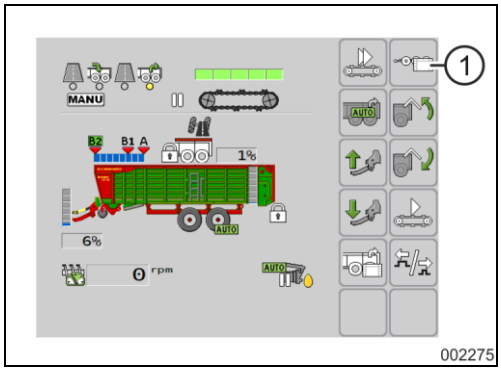


Fig. 171

If a forced steering axle system is available, the Steering Axle soft key is replaced by the Forced Steering Axle soft key (1) and can be selected in "Charging" and "Discharging" mode.

→ The Forced Steering Axle menu is opened such that the different steering functions can be operated.

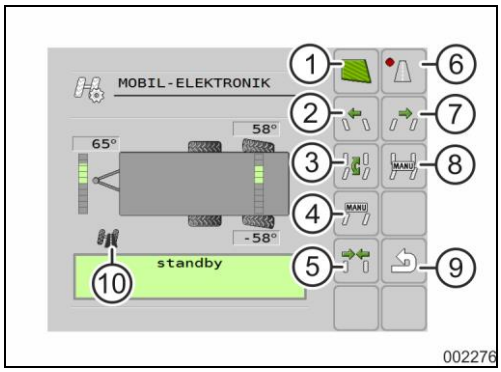


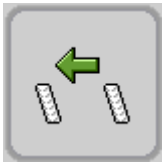
Fig. 172

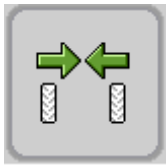
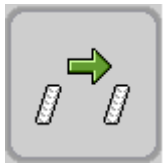
The Steering menu of the forced steering axle system

The steering programme is distinguished between field mode and road travel mode. The selected mode is displayed by a symbol (10).

1 Field mode
2 Steer to the left*
3 Four-wheel*
4 Offset*
5 Centre axle*
6 Road travel mode
7 Steer to the right*
8 Manual*
9 Return to main menu

* can only be selected in field mode

Function symbol	Meaning
	Enables field mode
	Steers to the left
	Enables the "Four-wheel" steering programme in field mode, the steering programme corresponds to road travel mode.
	Enables the "Offset" steering programme. The steering programme corresponds to road travel mode with the exception that the driver sets the steering. The bend angle is added with a manual offset and used as start value. The steering programme can e.g. be used when working on slopes.

Function symbol	Meaning
	Enables the "Centre axle" steering programme. The axle is centred in touch-operated manner. This function can e.g. be used when manoeuvring.
	Enables road travel mode
	Steers to the right
	Enables the "Manual" steering programme in field mode. The steering programme corresponds to road travel mode with the exception that the driver sets the steering. The bend angle is used as start value. The driver can directly steer all axles. The steering programme can e.g. be used when manoeuvring.

Tab. 24:

7.1.40 Lock steering axle with electro-hydraulic forced steering axle system SES

⚠ WARNING

Insufficient stability

Risk to people due to insufficient stability and tipping over of the machine if the steering axle(s) is(are) not properly used.

ATTENTION

Align the wheels in a straight line before locking the steering axle.

Align the wheels in a straight line by means of a short forward travel of the tractor and the hitched machine.

NOTE

With the electro-hydraulic forced steering axle system, the "Lock steering axle" function is touch-operated.

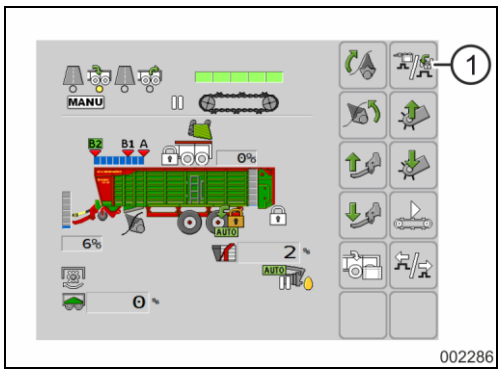


Fig. 173

1. Keep the adjacent key (1) pressed for more than 1 second.
   – If pressed too briefly, the Forced Steering Axle menu is opened.

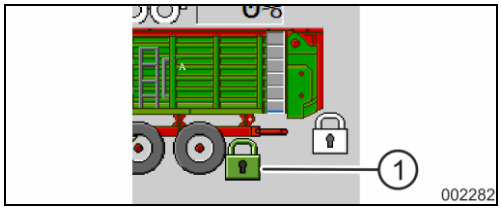


Fig. 174

→ The steering axle is locked in "Straight" position. A green lock as "Steering axle locked" symbol (1) appears on the display and an acoustic signal is emitted.

→ If the symbol is flashing,
- the steering axle could not be completely locked.
- check the steering system.

NOTE

If the soft key is pressed only briefly, the Forced Steering Axle menu is opened.

7.1.41 Switch warning beacon on and off

NOTE

In some countries, the warning beacon is mandatory.

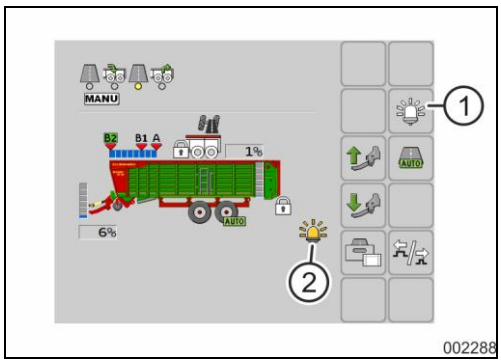


Fig. 175

Use the soft key (1) in the "Road travel" main menu to switch the warning beacon on and off.

→ With the warning beacon switched on, the display shows a symbol (2).

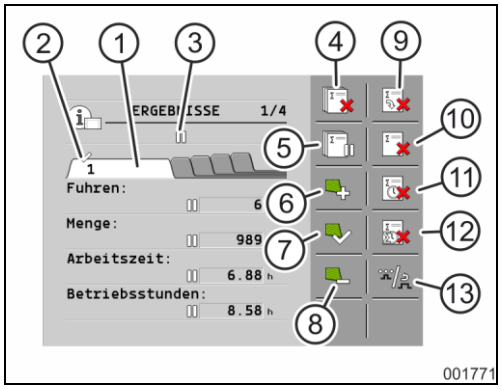


Fig. 176

7.1.42 Operating hours, service hours, transported loads and traversed area counters

Call up the "Transported loads and hours counter" menu in the "Road travel" submenu.

Press keys (6) and (8) to switch between index cards (1) to 20 for partial results.

Press key (7) to specify which index card is to be counted on.

→ The tick (2) shows which index card is counted on.

Press key (5) to switch counting on or off.

→ The symbol (3) indicates when counting is paused.

Press keys (4), (9), (10), (11) and (12) to reset the counter readings.

Briefly press key (13) to display further counter readings as well as total transported loads and hours counters.

Press and hold key (13) to display the "Road travel" menu.

7.1.43 Automatic settings

NOTE

Automatic functions for all three operating modes can be individually compiled. When selecting an operating mode, the preselected automatic functions for this mode are centrally enabled.

NOTE

When manually operating an actually automatic function, the respective automatic mechanism remains disabled until the mask is changed.

In this event, a warning message appears for some functions.

NOTE

If the folding drawbar is equipped with a drawbar suspension, the hydraulic cylinders of the folding drawbar must be extended by at least 20 mm.

The drawbar suspension does not work if the folding drawbar is lowered to its end position.

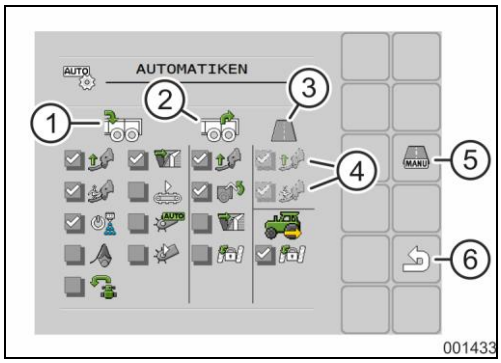


Fig. 177

1. Automatic functions for all three operating modes can be individually compiled according to the needs.
   - Charging (1)
   - Discharging (2)
   - Road travel/Reverse travel (3)
2. Use the respective soft key (5) to set the corresponding operating mode to "Manual", in order to adjust an automatic function.
   → The functions have a light grey background (4).
3. Use the rotary knob at the upper right-hand side of the control terminal or the direct selection function on the touch display to select the respective function.
   → A white tick appears in front of the symbol.
4. Press key (6) to return to the main mask.

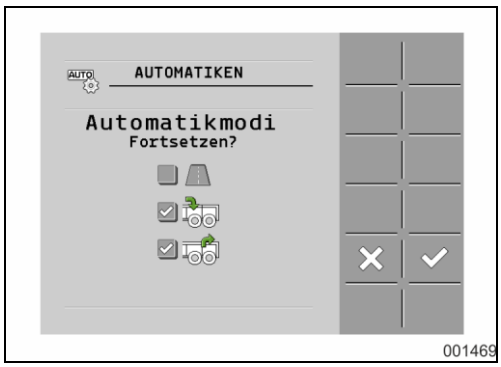


Fig. 178

If the machine is switched off with automatic functions enabled, the adjacent message appears in the display during a restart. The previous settings are adopted when confirmed (by pressing the key with the tick). When rejecting (by pressing the key with the cross), all modes are in "manual". The preselection of the automatic functions (see above) remains unaffected.

Explanations of automatic functions

Item	Automatic function	Symbol				Functions
1	Folding drawbar position		X	X	X	Move folding drawbar to defined position (see settings)
2	Front panel position			X		At start of charging: Move front panel to rear position; after "Forage wagon full" & "Feelers completely deflected": Move to front position
3	Front panel position				X	Swivel front panel from front to back, then swivel it back and forth three times
4	Drawbar suspension		X	X		Drawbar suspension in respective mode enabled/disabled

Explanations of automatic functions

Item	Automatic function	Symbol				Functions
5	Automatic charging system			X		Control of transport floor depends on the desired filling degree and on the feeler deflection (high filling degree = transport floor slow; low filling degree = transport floor fast); can be manually overridden at any time
6	Wayback			X		After detection of retracted individual knives: Extend and retract knife bar as soon as pick-up has been lifted (e.g. at the headland) (not required when equipped with Exact-Cut cutting units)
7	Silage additive pump			X		Start silage additive pump as soon as p.t.o. shaft is on and pick-up has been lowered
8	Automatic headland function			X		Lift folding drawbar to defined headland position when pick-up is lifted
9	Pick-up start*			X		Start pick-up when it is lowered and the p.t.o. shaft is on; stop pick-up during lifting (only on Magnon (hydraulic pick-up))
10	Tailgate				X	Keep pressed for three seconds: Open tailgate to defined position and start transport floor; on DO wagons it reverses one second before transport floor start and only starts when DO speed is reached
11	Pick-up Speed control (optional)*			X		Depending on the travelling speed, the pick-up speed is controlled (can be adjusted in the setup menu). When being enabled, the "Pick-up start" function is automatically also enabled (only on Magnon (hydraulic pick-up))
12	Lock steering axle				X	Lock steering axle in discharging mode
13 Lock steering axle						Lock/Unlock steering axle during reverse travel

Tab. 25: Explanations of automatic functions

*only with Magnon 10 (hydr. pick-up drive)

7.1.44 Automatic setting of work lights

Positions of work lights

- Work light 1: At the front top, near the front panel; illuminates the cargo space
- Work lights 2: At the cutting unit; facing to the rear; can, however, be turned to the cutting unit to assist knife change or the like
- Work light 3: At the rear machine; illuminates the path when reversing

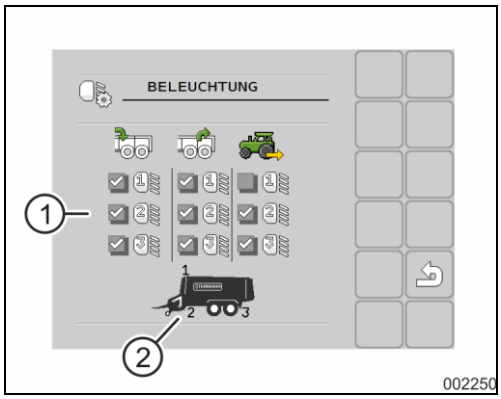


Fig. 179

The setup menu of the work lights (1) can be selected in the "Road travel" submenu. Use the rotary knob on the terminal or the touch function on the screen to set the work lights for the operating modes "Charging", "Discharging" and for Reverse Travel.

→ With work lighting enabled and in accordance with this preselection, the work lights are switched on in the operating modes.

A model shows the different positions (2) beneath the work light selection.

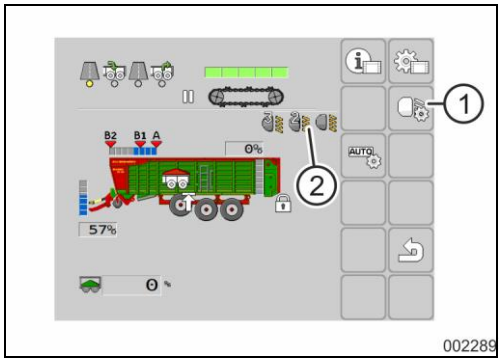


Fig. 180

With the work lights (1) switched on, the display shows a symbol (2).

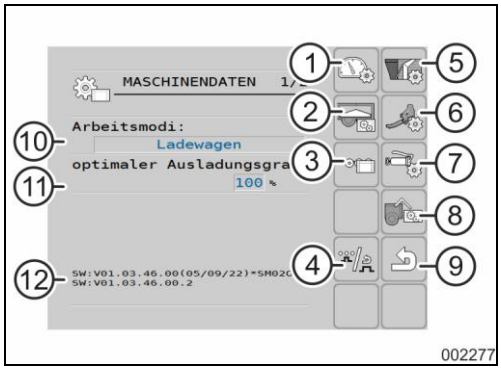


Fig. 181

7.1.45 "Setting" menu

The settings can be accessed in the submenu of road travel mode, see ► see section 7.1.10 Road travel, page 167.

Machine data 1/2

1 Settings, speed

2 Settings, feelers – Automatic charging system

► see section 7.1.45.1 Calibrate feeler for automatic charging system, page 194

3 Service menu, forced steering axle

► see section 7.1.45.2 Forced Steering Axle service menu, page 195

4 Submenu, machine data 2/2

5 Settings, front panel

► see section 7.1.45.3 Calibrate front panel, page 195

6 Settings, folding drawbar

► see section 7.1.45.4 Calibrate folding drawbar, page 197

7 Settings, central lubrication

8 Settings, tailgate

► see section 7.1.45.5 Calibrate tailgate, page 198

9 Return to main menu

10 Change between functional area for forage wagon and forage transport wagon

11 Settings, optimum filling degree

12 Software version control unit 1 and control unit 2 (if available)

Explanation for 10:

Here, the operating mode can be selected between forage wagon and forage transport wagon. When selecting the forage transport wagon, some functions such as e.g. operation of automatic charging system and the "Forage wagon full" display (is not triggered by the sensor when it is actuated by the chopped forage) are not available. After discharging, the front panel moves to position B2.

Machine data 2/2

Go to the second page in the "Setting" menu to access the Diagnostics menu.

► see section 7.1.45.6 Diagnostics menu, page 199

NOTE

The desired positions of the individual components can be saved for the corresponding operating modes.

As far as the respective automatic functions in the "Automatic settings" menu are enabled, the machine moves to the saved positions in the respective operating modes.

1. Use the soft keys to set the desired component.

→ The display shows the values to be changed.

2. Use the rotary knob on the terminal to select the value to be changed.
3. For changing or setting, turn the rotary knob until the desired value appears; then press the rotary knob to save the value.

7.1.45.1 Calibrate feeler for automatic charging system

Fig. 182

1. Select the automatic charging system in the setup menu and then open the calibration menu.
2. Press key (1) to start the calibration procedure.
3. Enter the cargo space (only with the machine switched off) and lift the feeler once up to approx. 90% of the possible path.

   → The maximum and the minimum value, which the sensor registers while pushing the feeler up, is saved.

   ⚠ **WARNING** – Unintentional movements of the machine may cause serious injuries. Secure the machine against accidental starting and rolling.
4. Leave the cargo space and press key (2) to save the registered value.

Fig. 183

If a function (e.g. pick-up in floating position or drive, transport floor, etc.) is still enabled when starting the calibration procedure, the adjacent error message will appear in the display.

Select the respective operating mode and switch still enabled functions off to be able to start the calibration procedure.

7.1.45.2 Forced Steering Axle service menu

Select the forced steering axle in the setup menu to access the service menu of the forced steering axle.

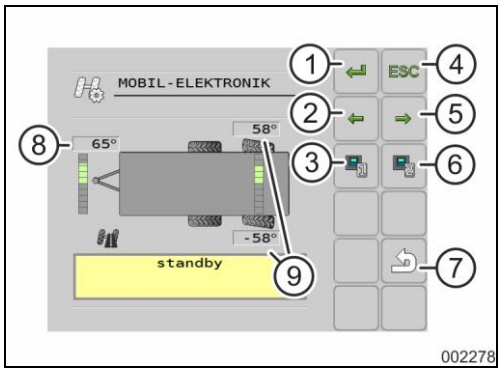


Fig. 184

1 Confirm parameters or error messages
2 Scroll back to previous parameters or error messages
3 Mask 1 for settings of main control unit
4 Clear display
5 Scroll forward to the next parameters or error messages
6 Mask 2 for settings of main control unit
7 Return to main menu
8 Reading of steering angle sensor at the drawbar
9 Reading of steering angle sensor at the axle

7.1.45.3 Calibrate front panel

NOTE

Calibration of the front panel is usually only necessary after working on the sensor.

NOTE

Open the covering system (if available) before starting the calibration procedure.

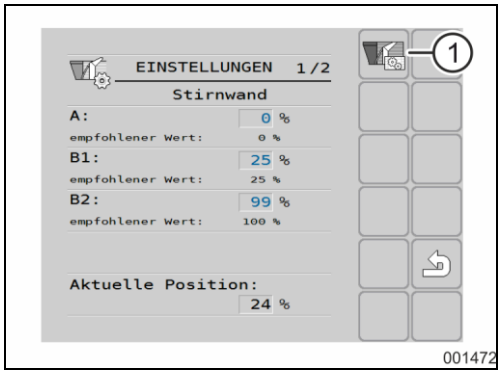


Fig. 185

1. Select the front panel in the setup menu. The adjacent page opens.
2. Here, values for the respective front panel positions can be entered first (via touch function or via rotary knob).
3. Press key (1) to access the extended Calibration menu if necessary.

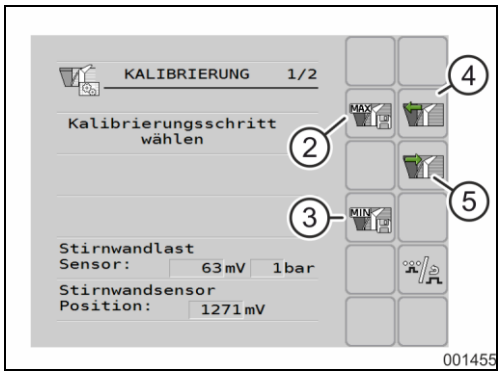


Fig. 186

4. First, define the maximum and minimum position by pressing keys (4) and (5), thus moving the front panel in both directions as far as it will go. Then use keys (2) and (3) to save both positions.

   Item 4 is only required after working on the sensor.

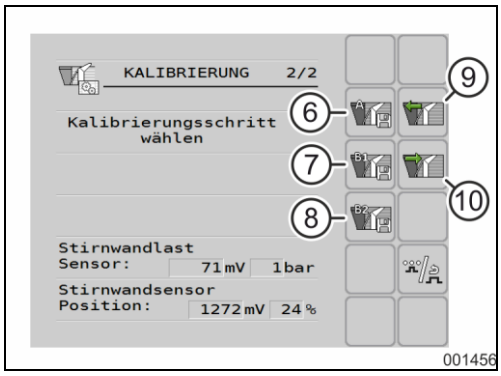


Fig. 187

5. Then save the front panel positions A, B1 and B2 on the second page of the menu. Press keys (9) and (10) to move the front panel to the desired position and save the respective position by pressing keys (6), (7) and (8).

   Explanation of positions:

   A: Discharging (completely retracted)

   B1: Charging (swivelled into the cargo space at approx. 6°)

   B2: Charging (front panel right at the front, in the direction of the tractor)

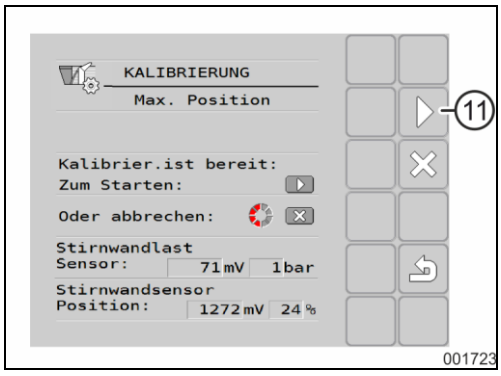


Fig. 188

6. The adjacent page opens for saving. Press key (11) to start the calibration procedure. As soon as the red circle has been completely run through, the calibration is completed.

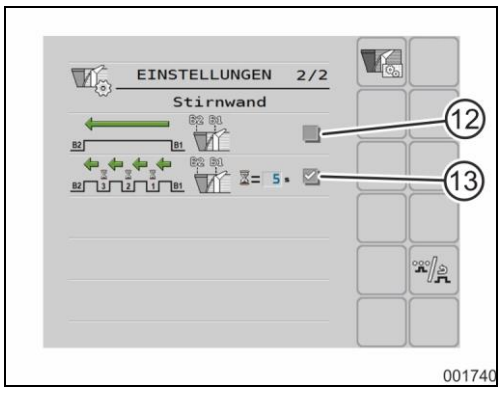


Fig. 189

7. Set control response of front panel during charging

   (12) The front panel moves forward in one go with the wagon full and feeler at 100%.

   (13) The front panel moves forward in three steps with adjustable dwell time with the wagon full and feeler at 100%.

(Available from software version V01.00.33)

7.1.45.4 Calibrate folding drawbar

NOTE

Calibration of the folding drawbar is usually only necessary after working on the sensor and after changing the cylinder length.

NOTE

The folding drawbar position must be at least 3% to ensure proper functioning of the drawbar suspension. (Except for charging 0%)

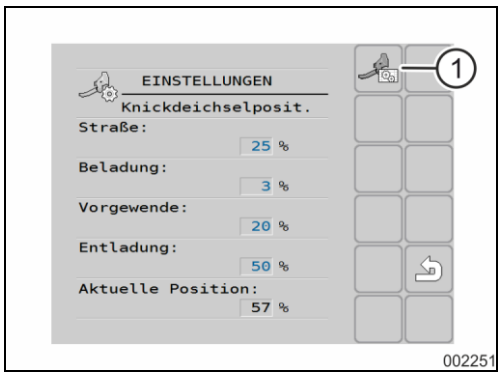


Fig. 190

1. Select the folding drawbar in the setup menu. The adjacent page opens.
2. Here, values for the respective folding drawbar positions can be entered first (via touch function or via rotary knob).
3. Press key (1) to access the extended calibration menu if necessary.

Fig. 191

4. First, define the maximum and minimum position by pressing keys (4) and (5), thus moving the folding drawbar in both directions as far as it will go. Then use keys (2) and (3) to save both positions.

   Item 4 is only necessary after working on the folding drawbar (change of cylinder length, sensor dismounted).

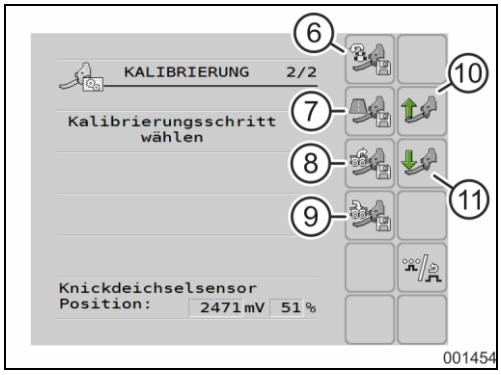


Fig. 192

5. Alternatively to the setup menu (setting in percentages), the folding drawbar position for headland (6), road travel (7), discharging (8) and charging (9) can be additionally saved on the second page. Press keys (10) and (11) to move the folding drawbar to the desired position and save the respective position by pressing the corresponding soft key.

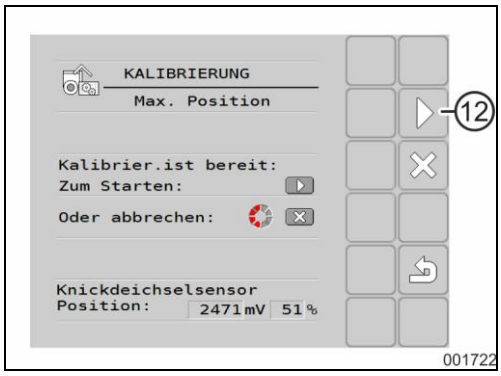


Fig. 193

6. The adjacent page opens for saving. Press key (12) to start the calibration procedure. As soon as the red circle has been completely run through, the calibration is completed.

7.1.45.5 Calibrate tailgate

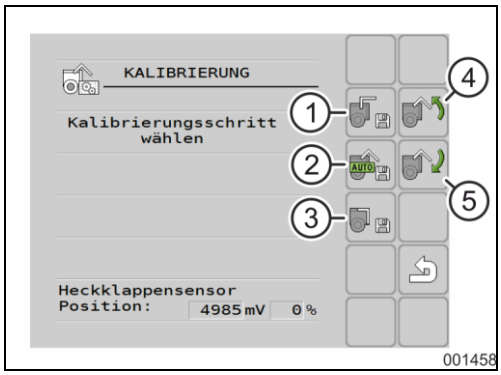


Fig. 194

1. Select the tailgate in the setup menu and open the calibration menu.
2. First define the "Tailgate open" and "Tailgate closed" position by pressing keys (4) and (5) to completely open and close the tailgate. Then use keys (1) and (3) to save both positions.

   (Item 2 is only required after working on the sensor.)

   ⚠ **WARNING** – Risk of injuries when opening and closing the hydraulic tailgate. Make sure that people leave the swivelling range of the tailgate before carrying out work on the tailgate.
3. Move the tailgate to the desired position to define the position for the automatic tailgate function. Then use key (2) to save. Calibrate this position at 95% on wagons without beaters.

Fig. 195

4. The adjacent page opens for saving. Press key (1) to start the calibration procedure. As soon as the red circle has been completely run through, the calibration is completed.

7.1.45.6 Diagnostics menu

The "Diagnostics menu" can be selected in setup menu 2.

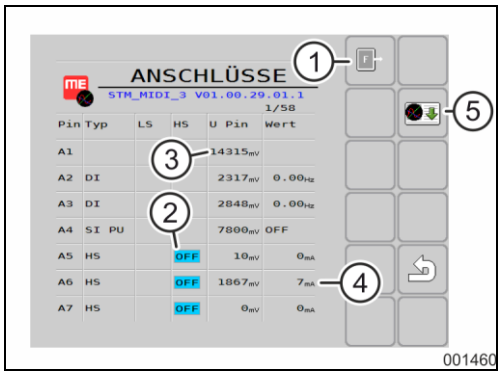


Fig. 196

(1) Change to menu: Overview, pin assignment
see next figure
(2) Status, pin triggering (on/off)
(3) Current voltage in mV
(4) Current input current in mA
(5) Scroll on

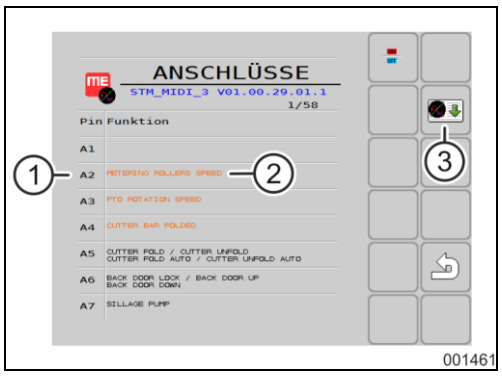


Fig. 197

Overview, pin assignment - Connection diagram

(1) Connection
(2) Function (orange=sensor, black=actuator)
(3) Scroll on

In the "Diagnostics menu", the status of each individual control unit pin can be checked, such that the cause can be quickly localised in the event of an error.

Example:

1. The beater speed is not recognised although the beaters are rotating.
   – Seek "Beater speed" function → Check pin A2 to see whether the voltage changes when switching the sensor, whether a frequency is displayed and changes as well
2. The drawbar suspension does not work.
   – Seek "Drawbar suspension" function → Check pin A12. If this pin does not take up any current with enabled drawbar suspension, the connection to the solenoid is interrupted. If the pin takes up only half the current value, one of the two solenoids at the drawbar suspension does not work.

7.2 External operation for folding drawbar / cutting unit

⚠ WARNING

Risk of injury

Risk of crushing, shearing and impact when moving the cutting unit and the folding drawbar.

- Make sure that people leave the vicinity of the cutting unit and the folding drawbar.

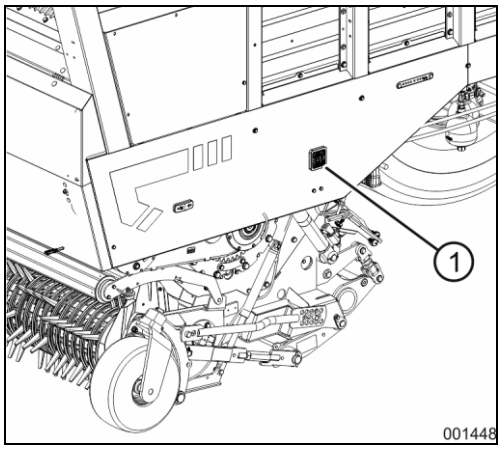


Fig. 198

An additional switch group (1) ("keypad") is mounted on the left-hand vehicle side on a level with the cutting unit to operate the folding drawbar and the cutting unit.

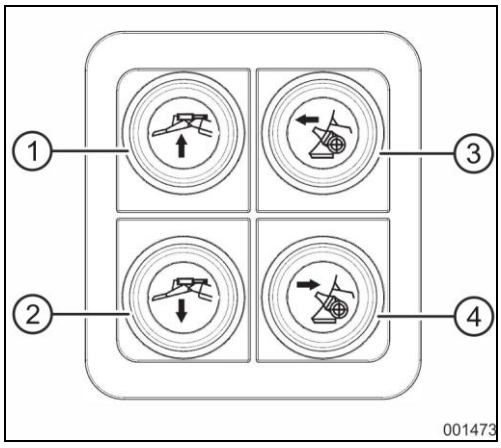


Fig. 199

(1) Lift folding drawbar
(2) Lower folding drawbar
(3) Extend cutting unit
(4) Retract cutting unit

1. Simultaneously press any two keys to enable the control set.
2. The control set locks automatically if:
   - no key is pressed during 30 seconds,
   - a function is actuated on the terminal or
   - the machine moves (from a speed of 1 km/h).

7.3 Electronic forced steering axle system SES

7.3.1 Operation of steering computer

Operation of the steering computer is required:

- for error diagnosis during operation.
- for read-out of the fault memory.

ATTENTION

The steering computer is permanently supplied with power, even after the control set has been switched off.

- Always pull the plug for the power supply out after completion of work.

7.3.2 Access to steering computer

⚠ WARNING

Risk of injury

Unexpected movements of the machine or its working tools during operation of the steering computer may cause serious injuries.

- Before accessing the steering computer, secure tractor and machine against accidental starting and rolling.
- Lock the driver's cabin of the tractor, as the ignition must remain switched on when operating the steering computer.

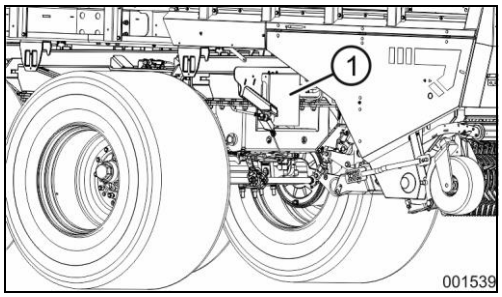


Fig. 200

The steering computer is mounted behind a protective cover (1) beneath the machine.

7.3.3 Operating and display elements of steering computer

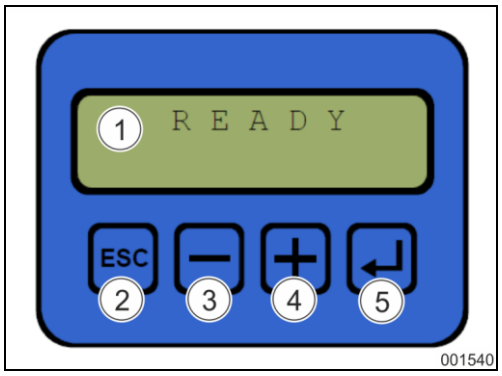


Fig. 201

1 Display
2 ESC key: Exit current menu / Exit without saving / One input position back
3 MINUS key: Reduce value by 1 / One selection item back
4 PLUS key: Increase value by 1 / One selection item forward
5 ENTER key: Confirm value / Save value / Enable selected menu / One input position forward

As standard, the display shows the main menu.

Main menu

Display in case of trouble-free operation

When no malfunction has occurred, the main menu of the steering computer displays one of the following status messages:

Display	Meaning
R E A D Y >	The axle control of the steering computer is switched on. Regular status during travel and steering.
Standby >	The axle control of the steering computer is switched off. Regular status during vehicle standstill without steering.
no hydr. supply >	There is no hydraulic supply of the forced steering axle system. This display is only active during vehicle standstill.
actuator test >	The steering computer is just carrying out a power-up test. This test is only carried out during vehicle standstill and existing hydraulic supply.

Tab. 26: Steering computer

The scroll arrow in the second line indicates that the steering computer is working and that the display functions properly.

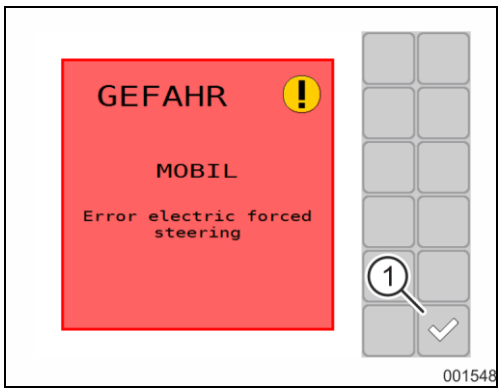


Fig. 202

Display in case of malfunction

A malfunction of the steering system (active error) is displayed at the control set by the adjacent error message. Press key (1) to acknowledge this message.

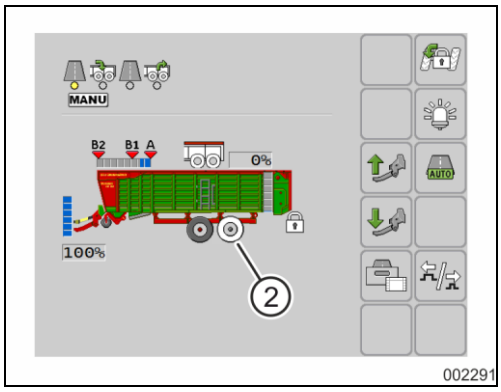


Fig. 203

Then, the display shows the adjacent message. The rear wheel is flashing white (2) until the malfunction at the steering computer has been remedied.

In this case

- check the steering computer.
  - The main menu of the steering computer displays the error in encoded form.

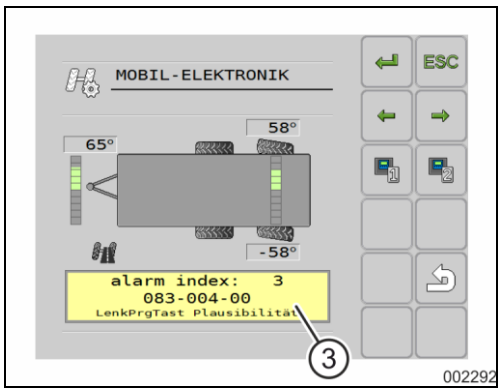


Fig. 204

- Read the error message on the display (3).
  - The respective plug and the function of the cable harness are specified.

Display	Meaning
	Error message (example). The steering computer reports an active error, i.e. a currently existing malfunction. This display has priority over all other displays of the main menu. In most cases, the display remains active until the error has been remedied and the steering system has been restarted. In case of several active errors, the 3-part error codes are alternately displayed in the second line. The error codes are permanently saved in the fault memory.

Tab. 27: Malfunction, steering computer

ATTENTION

If the control set reports an error, immediately stop and park the machine and contact the Strautmann customer service at +49 (0) 5424 802-220.

The following information must be provided to the Strautmann customer service:

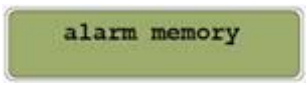
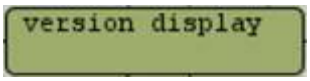
- The 3-part error code
- the vehicle/machine ID number (17-digit, see type plate)

Press the ENTER key in the main menu (for at least 2 seconds) to switch over to the selection of the service menus.

Usually, the service menus only have to be called up to read out the fault memory or to display the service hours.

Selection of service menus

Press the PLUS or MINUS key to display the following service menus one after the other:

Display	Meaning
	Display of operating data, e.g. steering angle, service hours, vehicle speed.
	Display of input and output signals of the steering computer.
	Display of saved active (current) and passive (past) errors.
	Display and change of parameters/settings. Access is protected by a password. Only the customer service staff is allowed to change parameters.
	Display of software versions.
	Entry of an access code to change basic settings. Only the customer service staff is allowed to change these settings.

Tab. 28: Service menu, steering computer

Press the ENTER key to enable the displayed service menu.

Usually, only the following service menus are required:

- "alarm memory" to read out the fault memory
  ► page 207
- "operating data" to display the service hours
  ► page 189

Read out fault memory (service menu "alarm memory")

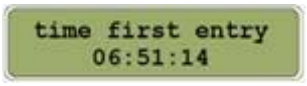
1. Press the ENTER key with the service menu "alarm memory" selected.

→ The first saved error message is displayed.

2. Press the PLUS or MINUS key repeatedly until the desired error message is displayed.

– A maximum of 32 error messages is displayed (after the last one the first is displayed again).

Each error message consists of the following data (example):

Display	Meaning
	Error message with consecutive number and 3-part error code. The error code 255 255 255 means: No further errors have been entered in the fault memory or the fault memory has been completely cleared.
	Time of first occurrence of error.
	Time of last occurrence of error.
	Frequency of occurrence of error.

Tab. 29: Error message, steering computer

3. Enter the data of the error messages into the table of the error log on the following pages.
4. Press the ESC key to return to the selection of the service menus.

Display of service hours

(service menu "operating data")

1. Press the ENTER key with the service menu "operating data" selected.
2. Press the PLUS or MINUS key repeatedly until the following display of the service hours appears:

Display	Meaning
	Service hours (hours / minutes / seconds)

Tab. 30: Service hours, steering computer

3. Enter the service hours into the head of the error log on the following pages.
4. Press the ESC key to return to the selection of the service menus.

7.3.4 Error log, forced steering axle system

Vehicle/Machine ID number:	
Model:	
Year of manufacture:	
Customer:	
Technician:	
Date:	
Service hours of SES system:	
Miscellaneous:	

Tab. 31: Error log, forced steering axle system

Enter saved error codes in the list.

No.	Error code *alarm index*	First entry *Time first entry*	Last entry *Time last entry*	Frequency *frequency*
Example:	180 006 00	06:51:14	08:02:36	4
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				

Tab. 32: Error codes, forced steering axle system

Send the completed error log to your dealer, the authorised workshop or the Strautmann customer service:

E-mail: service@strautmann.com

Have the malfunctions remedied and the fault memory cleared.

8 Operation

This chapter provides basic information and instructions about the procedure and activities regarding the use of the machine.

8.1 Safety

As a basic principle, the following is applicable:

- Acquaint yourself with all mechanisms and operating elements of the machine and their functions before starting work. During operation will be too late.
- Wear close-fitting clothing. Loose-fitting clothing may be more easily caught by moving machine parts.
- Start the machine only if all protective devices have been installed and are in protective position.
- It is not allowed to open protective devices
  - when the machine is powered.
  - as long as the tractor engine is running with the propeller shaft coupled/the hydraulic system connected.
  - if the ignition key is in the tractor and the tractor engine can be accidentally started with the propeller shaft coupled/the hydraulic system connected.
  - if tractor and machine have not been secured against accidental rolling by means of their respective parking brake and/or the chocks.
- Safely support folded-up covers before working beneath them.
- Immediately replace missing or defective protective devices.
- Observe the maximum payload of the attached/hitched machine and the admissible axle and tongue loads of the tractor. Run the machine in only partly filled condition if necessary.
- People are not allowed
  - within the operating/hazardous area of the machine.
  - within the discharge area of the machine.
  - within the turning and swivelling range of movable machine parts.
  - beneath lifted and unsecured movable machine parts.
- Immediately switch the tractor's p.t.o. shaft off in case of a response of the overload clutch.
- Only actuate powered machine parts if there are no people within the machine’s hazardous area.
- Check the hazardous area behind the machine before starting reverse travel. If a rear-view camera (optional extra) is available, set it such that you have a complete view of the rear hazardous area.

- Avoid critical driving situations to prevent the machine from slipping off / tipping over when traversing hills and driving on unpaved surfaces.
  - Reduce the speed.
  - Lock the passive steering axle.
  - Avoid driving on slopes with the machine fully or partly filled.
  - Reverse instead of taking risky turns
  - Only travel over clamp silos in sections that have been sufficiently compacted and are level enough.
- Moving the charged machine with lifted lift axle (only with tridem chassis) is not allowed. Always lower the lift axle completely before charging the machine.
- Secure the tractor against accidental starting and rolling before leaving the tractor.

  ► see section 2.8 Safely park tractor and machine, page 30

Operative staff:
- Operator

8.2 Transport journeys

A transport journey is a journey of the charged or empty machine to or from the place of operation.

As a basic principle, the following is applicable:
- Observe the national road traffic regulations.
- Change to road travel mode for road journeys to avoid unintentional actuation of hydraulic functions.
- Adapt driving to the conditions. Consider personal abilities as well as the road, cornering, traffic, visibility and weather conditions, the driving characteristics of the tractor and the influences exerted by the attached/hitched machine.
- Avoid sudden changes of direction, particularly when travelling uphill and downhill and when traversing hills. Risk of tipping over.
- Shift down to a lower gear before travelling downhill and observe the instructions in the operating instructions of the tractor.
- Observe the broad overhang and the flywheel mass of the machine when cornering with attached/hitched machine.
- Observe the maximum payload of the attached/hitched machine and the admissible axle and tongue loads of the tractor.
- Ensure sufficient steerability and braking ability of the tractor. Machines attached or hitched to a tractor and front or tail weights influence the driving behaviour as well as the steerability and the braking ability of the tractor.

The following is applicable with partly charged or partly empty machine:

- Avoid transport journeys with the machine partly charged or half empty.
- The driving characteristics of the tractor are influenced by the load,
  - with the machine partly charged, the admissible tongue load may be exceeded.
  - with the machine partly empty even negative tongue loads may occur.
- Ensure sufficient tongue load when the machine is partly empty. Transport the loaded material from the rear to the front if the machine has been discharged to an extent of approx. 50%. The transport floor may be reversed for a short time (max. three seconds) for this purpose.
- With the machine partly charged, avoid exceeding the admissible tongue load. Distribute the loaded material evenly in the cargo space (in the middle) by means of the transport floor.

Before carrying out transport journeys, check:

- the supply lines for proper connection.
- the lighting system for damage, proper functioning and cleanliness.
- the brake and hydraulic system for visible defects.
- Lock the steering axle if necessary, e.g. on uneven tracks, at high transport speed.
- whether the parking brake has been completely released.
- whether the travelling height of hydraulic chassis is set properly.
- Lower the lift axle. The ALB regulator is only able to control the required braking force properly when the lift axle is completely lowered.
- the brake system for proper functioning and the braking effect. The tractor must ensure the specified deceleration for the combination of tractor and machine.
- Ensure that parts of the loaded material do not risk to fall off the machine onto the road.
- whether all movable machine parts are in transport position secured by the provided transport locks.
- whether the work lights are switched off.
- the brake system of the tractor. Observe the instructions in the operating instructions of the tractor.
- the transport equipment for proper installation, e.g. lighting, warning and protective devices.
- whether the covering system is closed.

⚠ WARNING

Machine movements

Risk of dangerous situations to people due to machine movements caused by unintentional actuation of the hydraulic system.

Switch to road travel mode at the control set prior to transport journeys:

- The display shows the "Road travel" menu.
- Apart from the functions "Lock steering axle" and "Unlock steering axle", all other functions on the control set are disabled.
- The hydraulic drawbar suspension (optional extra) and the warning beacon (optional extra) are switched on,
- The work lights (optional extra) are switched off.

NOTE

If the folding drawbar is equipped with a drawbar suspension, the hydraulic cylinders of the folding drawbar must be extended by approx. 20 mm before switching the road travel mode on.

The drawbar suspension does not work if the folding drawbar is lowered to its end position.

1. Completely lower the lift axle (if available).
   – The ALB regulator is only able to control the required braking force properly when the lift axle is completely lowered.
2. Disable the automatic charging system.
3. Switch the road travel mode on.
4. Lock the passive steering axle,
   - at high transport speed,
   - on uneven terrain.

8.3 Charge machine

As a basic principle, the following is applicable:

- Observe the different specific weights of the various materials to be loaded. Heavy loaded materials lead to a reduced admissible loading capacity.
- Observe the total weight and the tongue load of the machine.
- Only lift the pick-up with the conveyor duct being empty.
- Reduce the travelling speed during cornering and keep the p.t.o. speed constant.
- Switch the p.t.o. shaft off and lift the pick-up when taking tight curves.
- Always adapt the travelling speed of the tractor during charging to the swathe size, cutting length and filling degree of the loaded material.
- Avoid uneven charging of the machine which might cause overloading of the drawbar.
- The maximum filling height is the top edge of the superstructure. Otherwise, individual components might be deformed.
- Switch the automatic charging system on for uniform and complete filling of the cargo space. The automatic charging system:
  - only has to be switched on once.
  - automatically and infinitely variably switches the transport floor on and off during charging,
  - is automatically disabled if the control set generates the acoustic signal (horn sound) and the visual signal "Forage wagon full",
  - is automatically enabled if the machine has been emptied and the pick-up is lowered the next time,
  - remains switched on until the automatic charging system is manually switched off.
- Preselect the filling degree of the loaded material in the cargo space.
- Observe the visual and acoustic signals of the control set during charging.
- Check the set operating height of the pick-up and readjust if necessary.
- Check whether the desired cutting length of the loaded material can be achieved by means of the number of mounted cutting knives.

⚠ DANGER

Risk of becoming entangled, wound up, drawn in and trapped within the area of the movable pick-up components and conveying unit!

Make sure that people leave the hazardous area before switching the drive on.

Switch the drive off if people approach the hazardous area.

⚠ WARNING

Failure of components due to overload

Overload may cause insufficient stability, steering and braking ability of the machine. Risk of accident.

- Observe the maximum load capacity of the hitched machine.
- Observe the admissible axle and tongue loads of the tractor; run the machine in only partly filled condition if necessary.

⚠ WARNING

Risk of injuries when actuating hydraulic functions

Risk of crushing fingers, hands and feet when actuating hydraulic functions.

Risk to parts of the body of being drawn in or becoming entangled within the area of hydraulically actuated components.

Make sure that people leave the hazardous area before actuating hydraulic functions.

Switch hydraulic functions off if people approach the hazardous area.

8.3.1 Determine admissible loading capacity

As a basic principle, the following have to be observed:

- The different specific weights of the various materials to be loaded. Heavy loaded materials lead to a reduced admissible loading capacity.
- the gross vehicle weight rating,
- the admissible axle loads,
- the admissible tongue load at the coupling point,
- the load-bearing capacities of the mounted tyres,
- the admissible towing capacity

of tractor and machine.

NOTE

These details are registered on the type plate, in the vehicle registration certificate and in the operating instructions of tractor and machine. ► see section 3.1 General data, page 47

The tractor's front axle load must never fall below 20 % of the tractor's empty weight.

$$\text{Max. admissible load (payload)} = \text{Gross vehicle weight rating} - \text{empty weight}$$

$$\text{Max. admissible loading capacity} = \frac{\text{Max. load [kg]}}{\text{Specific weight of loaded material [kg/m}^3\text{]}}$$

8.3.2 Bulk densities of different loaded materials

Loaded material	Weight [kg/m³]	TS content
Grass silage "dry"	approx. 250*	approx. 40 %
Grass silage "humid"	approx. 400*	approx. 30 %
Hay	approx. 150*	approx. 70 %
Straw	approx. 100*	approx. 80 %
Lucerne	approx. 200*	approx. 50 %
Maize silage	approx. 400	approx. 30 %

Tab. 33: Bulk densities of loaded materials

TS content = Dry matter of loaded material

* Weight may vary depending on the compressed density.

8.3.3 Charge with ISOBUS control / Smart570

1. Press the  key on the control set until the charging mode is switched on.
2. Press the  key to go to the submenu.
3. Use the  key to switch the automatic charging system on.

→ All preset automatic functions are enabled.

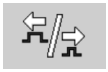
- After a change of menu, the automatic charging system remains enabled, such that it has to be switched on only once.

4. Press the  key to lower the folding drawbar if necessary.
5. Switch the tractor's p.t.o. shaft on (1,000 min^{-1}).
6. Lower the pick-up to start charging.

   When the machine is fully charged, the ISOBUS control set generates an acoustic signal (horn sound) and a visual signal "Forage wagon full".

→ The automatic charging system is deactivated and the automatic feed function for the transport floor is switched off. If the feeler deflection reaches 100%, the front panel moves to the front position.

8.3.3.1 Machines without beaters

1. After the "Forage wagon full" message, charging of the machine can still be continued. Press the  key in the "Charging" main menu to leave the transport floor switched on for three seconds.
2. Let the p.t.o. shaft continue to run until the conveyor duct is free from any loaded material.
3. Switch the tractor's p.t.o. shaft off.
4. Press the  key in the "Charging" main menu to lift the pick-up.
5. Press the  key to switch the charging mode off and to go to the next menu.

8.3.3.2 Machines equipped with beaters

1. After the "Forage wagon full" message, let the p.t.o. shaft continue to run until the conveyor duct is free from any loaded material.
2. Switch the tractor's p.t.o. shaft off.
3. Press the  key in the "Charging" main menu to lift the pick-up.
4. Press the  key to switch the charging mode off and to go to the next menu.

8.4 Discharge machine

As a basic principle, the following is applicable:

- Completely lift pick-up.
- Lock steering axle.
- Lift the folding drawbar such that there is always enough ground clearance for the pick-up when moving onto the clamp silo und distributing the loaded material.

⚠ WARNING

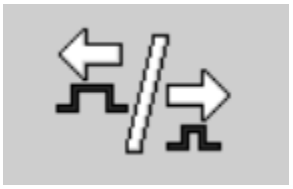
Injuries caused by hydraulic tailgate

Risk of crushing and impact when opening and closing the tailgate.

- Make sure that people leave the swivelling range of the tailgate before starting discharge.

8.4.1 Discharge with ISOBUS control / Smart 570

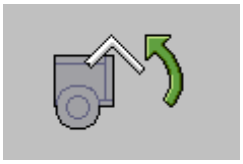
8.4.1.1 Machines without beaters

1. Press the  key on the control set until the discharging mode is switched on.
2. Use the 

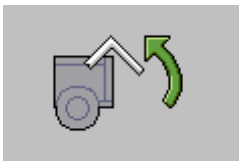
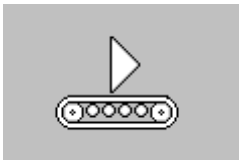
key to switch the automatic discharging system on.

→ All preset automatic functions are enabled.

- After a change of menu, the automatic discharging system remains enabled, such that it has to be switched on only once.

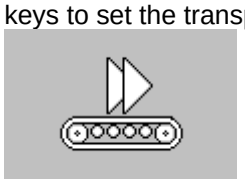
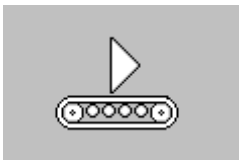
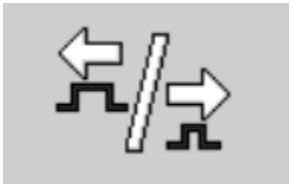
3. With the automatic discharging system switched on, keep the  key in the "Discharging" main menu pressed for three seconds to actuate the discharging function.
   - Tailgate opens up to the saved position,
   - Transport floor starts when the tailgate position has been reached.

→ Discharging starts.

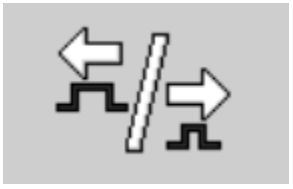
4. In manual mode, press the  key in the "Discharging" main menu until the tailgate has reached the desired position.
5. Press the  key to start the transport floor.
6. Start to move and select the travelling speed according to the height of the desired discharged material stack.

7. Use the 

and 

keys to set the transport floor speed. Use the  key to switch on the rapid motion mode for complete emptying.
8. For discharging step by step, use the  key to switch the transport floor on and off.
9. Press the  key in the "Discharging" main menu to lower the tailgate and to stop discharging. If the automatic discharging system is enabled, it will be stopped.
10. Exit the clamp silo.
11. Press the  key in the "Discharging" main menu until the folding drawbar has been lowered to the desired position. ***ATTENTION*** – If the folding drawbar is equipped with a drawbar suspension, lower the folding drawbar just far enough to ensure that the hydraulic cylinders of the folding drawbar are still extended by approx. 20 mm.
12. Press the  key to switch the discharging mode off and to go to the next menu.

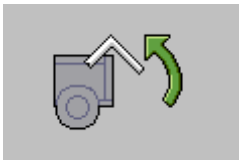
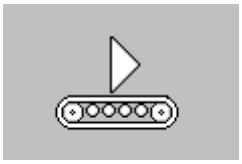
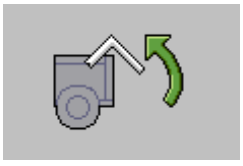
8.4.1.2 Machines equipped with beaters

1. Press the  key on the control set until the discharging mode is switched on.
2. Use the 

key to switch the automatic discharging system on.

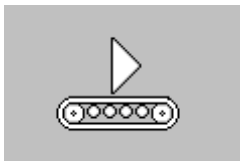
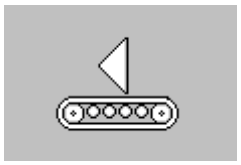
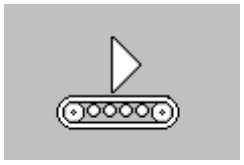
→ All preset automatic functions are enabled.

- After a change of menu, the automatic discharging system remains enabled, such that it has to be switched on only once.

3. In manual mode, press the  key in the "Discharging" main menu until the tailgate has reached the desired position.
4. Switch the p.t.o. shaft on and wait for the rpm signal of the beaters.
5. Press the  key to start the transport floor.
6. With the automatic discharging system switched on, keep the  key in the "Discharging" main menu pressed for three seconds to actuate the discharging function.
   - Tailgate opens up to the saved position,
   - Gearbox and beater clutch switch.
   - Transport floor switches to standby mode when the tailgate position has been reached.

7. Switch the p.t.o. shaft on and wait for the rpm signal of the beaters.

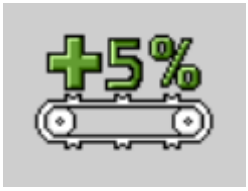
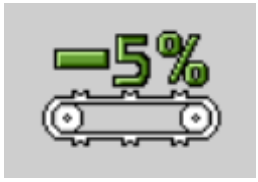
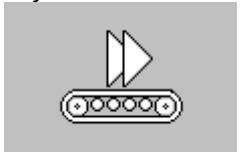
→ Discharging starts.

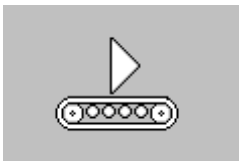
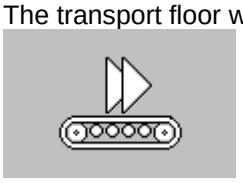
- Switch the tractor's p.t.o. shaft immediately off if the slip clutch responds.
- Press the  key to switch the transport floor feed off.
- Press the  key to reverse the transport floor for three seconds. Thus, the pressing power which the loaded material applies to the beaters, and the starting torque for loosening the beaters are reduced.
- Press the  key again. The transport floor switches to standby mode.
- Switch the tractor's p.t.o. shaft on again.
- Let the tractor's p.t.o. shaft smoothly start to run such that the beaters are able to loosen themselves.

→ The beaters start to run and after a short delay, the transport floor automatically starts.

8. Start to move and select the travelling speed according to the height of the desired discharged material stack.
   - Switch the p.t.o. shaft off when changing the lane.

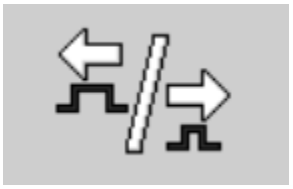
   → The beaters and the transport floor stop. The transport floor switches to standby mode.
   - Change the lane.
   - Switch the tractor's p.t.o. shaft on again.
   - Let the tractor's p.t.o. shaft smoothly start to run such that the beaters are able to loosen themselves.

   → The beaters start to run and after a short delay, the transport floor automatically starts.
9. Use the  and  keys to set the transport floor speed. Use the  key to switch on the rapid motion mode for complete emptying.

10. For discharging step by step, use the  key to switch the transport floor on and off.
11. Switch the p.t.o. shaft off when the cargo space has been emptied up to the beaters.
    – The transport floor will not switch off if the  key has been pressed for complete emptying.
12. Press the  key in the "Discharging" main menu to lower the tailgate and to stop discharging. If the automatic discharging system is enabled, it will be stopped.
13. Exit the clamp silo.
14. Press the  key in the "Discharging" main menu until the folding drawbar has been lowered to the desired position.

NOTE

If the folding drawbar is equipped with a drawbar suspension, lower the folding drawbar just far enough to ensure that the hydraulic cylinders of the folding drawbar are still extended by approx. 20 mm.

15. Press the  key to switch the discharging mode off and to go to the next menu.

9 Malfunctions

This chapter provides basic information and instructions on how to avoid, localise and remedy problems and malfunctions that might occur while using the machine.

9.1 Safety

Malfunctions specified in this chapter must be eliminated by qualified staff authorised and trained by the user or by an authorised workshop.

In order to locate and eliminate malfunctions, special know-how is required in some cases, which is not provided within the scope of these operating instructions.

Observe the general occupational safety, accident prevention rules and the applicable documents such as the sub-suppliers' documentation.

Contact an authorised workshop, a Strautmann dealer or the Strautmann customer service in case of malfunctions not specified below.

As a basic principle, the following is applicable:

- Park the machine on firm, even ground.
- Safely park the machine and secure it against accidental rolling.
- Secure lifted machine parts against accidental lowering.
- Keep people away from the hazardous area.
- Only carry out work with the machine stopped.
- If safety and/or protective devices must be removed, reinstall them immediately after completion of work and check them for proper functioning.
- Wear personal protective equipment required for the respective work to be carried out.
- Have work on the electrical system only carried out by qualified electricians.
- Risk of accident due to damaged safety-related parts; immediately replace damaged parts.
- Malfunctions affect the safe operation of the machine. Immediately eliminate detected malfunctions.
- Ensure tidiness and cleanliness in the operating area.
- Observe all safety and warning instructions in the operating instructions.
- Work that is too demanding for the technical qualifications of the staff involved or requires special tools / aids should be carried out by an authorised workshop, a Strautmann dealer or the Strautmann customer service.

9.2 List of malfunctions, machine

Malfunction	Cause	Remedy
Blockages in the taking-in area	Unequal or too large swathes	Pick up smaller, more equal swathes
	Excessive travelling speed	Reduce travelling speed
	Too little flow in the taking-in area	Keep to hitching height
Response of overload clutch during charging	Excessive travelling speed	Reduce travelling speed
	Blunt cutting knives	Sharpen/Replace cutting knives
	Loaded material too heavily compressed	Switch transport floor feed function on in good time
Poor cutting quality	Blunt cutting knives	Sharpen/Replace cutting knives
	Cutting unit extended not far enough	Clean and completely extend cutting unit
	Swathe size too small	Increase swathe or travelling speed
	Cutting knives evade too early	Check cutting unit setting
Cutting knives break frequently	Defective knife protection system	Check knife protection system
	Cutting unit extended not far enough	Clean and completely extend cutting unit
Cutting unit cannot be extended	Cutting unit soiled between cutting knives and conveying trough	Clean cutting unit
	Conveyor duct clogged	Clean conveyor duct
	Bent cutting knives	Align or replace cutting knives
Slip clutch of guide roller responds frequently	Pick-up set too low	Correct setting
	Pick-up / Guide roller heavily soiled inside	Clean guide roller / pick-up
	Foreign object in guide roller / pick-up	Remove foreign objects
Folding drawbar does not move up	Machine overload	Adapt charging degree
	Hydraulic pressure at tractor too low	Set hydraulic pressure at the tractor to at least 180 bar

Malfunction	Cause	Remedy
Pick-up, folding drawbar and tailgate sink during work	Leaking hydraulic cylinder	Seal hydraulic cylinder
Cutting unit slowly retracting during work	Leaking piston in hydraulic cylinder	Seal piston
	Leaking hydraulic cylinder	Seal hydraulic cylinder
	Hydraulic oil pressure too low	Press "Retract cutting unit" key longer
Braking power too low	Machine overload	Adapt charging degree
	Brake linings worn	Readjust brake linkage
		Replace brake linings
	Travelling height of hydraulic chassis not set properly	Set travelling height properly
	Improper settings of brake system	Check and correct settings of brake system
	Insufficient contact between brake lining and brake drum during braking	Retract braking axle
Machine wobbles heavily during road travel	Tyre pressure too low	Correct tyre pressure according to table
	Machine overload	Adapt charging degree
	Pressure in hydraulic accumulator too low on hydraulic chassis with suspension	Increase filling pressure / Lock suspension
	Air in hydraulic system	Bleed chassis cylinders
On the hydraulic chassis, one machine side significantly lowers	Machine overload	Adapt charging degree
	Filling pressure in hydraulic accumulator too low on one side of hydraulic chassis with suspension	Increase filling pressure / Lock suspension
	Air in hydraulic system	Bleed chassis cylinders
Transport floor often switches off during discharge	"Forage wagon full" sensor or tension spring of beater switch-off device not set properly	Correct settings
Rotor conveys the material forward in the integral range	Strippers worn or defective.	Check strippers, replace them if necessary.
Rotor does not rotate although the p.t.o. shaft is switched on	DO clutch Magnon 8 disengaged	Close tailgate, check clutch

Tab. 34: List of malfunctions, machine

9.3 List of malfunctions, hydraulic system

Malfunction	Cause	Remedy
No hydraulic function available	Interrupted hydraulic oil flow	Switch oil circulation between tractor and machine on
		Check hydraulic plugs for wear
	Hydraulic hose pipes not connected properly (return line to pressure connection)	Connect hydraulic hose pipes properly
	Hydraulic plugs not properly locked in the hydraulic sleeves	Insert the hydraulic plugs into the hydraulic sleeves until the hydraulic plugs noticeably lock
	System screw at electro-hydraulic control block not properly set	Check setting and readjust if necessary
Transport floor feed does not start	Machine overload	Partly discharge machine manually
	Transport floor blocked by foreign objects	Remove foreign objects
Transport floor feed only works temporarily	Jamming control piston of transport floor valve	Clean control piston and check for smoothness during installation
Tailgate does not open	Closed stop-cock	Open stop-cock
Control block leaking	Defective O-rings	Replace O-rings
	Loose tie rod	Tighten tie rod at 22 Nm
	Leaking screw plugs	Seal screw plugs by means of liquid threadlocker or sealing tape
In the flow line, the pressure rises to 180 bar although no valve is being actuated (open system)	Screwed-in load-sensing screw for locking of pressure regulator	Unscrew load-sensing screw
Hydraulic system excessively heating up	Volume flow from tractor too large	Adjust volume flow to tractor valve
	Hydraulic plugs too small	Provide appropriately large hydraulic plugs
	Worn hydraulic plugs	Replace hydraulic plugs
Too little hydraulic power in load-sensing mode	Hydraulic plugs too small	Provide appropriately large hydraulic plugs
	Load-sensing control pressure too low	Possibly use pressure intensifier; consult the manufacturer

Tab. 35: List of malfunctions, hydraulic system

9.4 List of malfunctions, electrical system

Malfunction	Cause	Remedy
No function working	No power at control set	Provide a voltage of 12 V at the tractor
	Defective fuse	Replace fuse
	Loose contact in socket	Remedy loose contact
	Control system switched off	Switch control system on
Functions work irregularly	Cable cross section of feed line too small	Select larger cable cross section
Fuse at tractor often defective	Fuse protection too weak	Install a fuse of at least 25 A, check cable cross sections (rated cable cross section = min. 4 mm^2)
	Damaged cable	Replace cable
Feed function cannot be controlled	No power, 12 V at control set	Provide a voltage of 12 V at the tractor
	Cable cross section of feed line too small	Select larger cable cross section
	Defective control set	Have control set checked
	Defective solenoid of a hydraulic valve	Replace solenoid
Feed function can only temporarily be controlled	Loose contact at solenoid	Remedy loose contact
	Cable cross section of feed line too small	Select larger cable cross section
Feed function does not work	Defective solenoid of feed	Replace solenoid
Two or more functions work simultaneously	Damaged cable	Replace cable
	Several simultaneously energised solenoids	Check cable
	Emergency manual operation function actuated	Check whether knurled screws of control block are unscrewed, unscrew if necessary
Function does not work although a voltage of 12 V is available at the solenoid	Defective solenoid	Replace solenoid
Display of control set does not work	No 12 V voltage	Provide a voltage of 12 V at the control set
	Defective fuse at the tractor	Replace fuse
The display of a function does not show a status message on the control set	Defective wiring (short-circuit)	Check wires, replace them if necessary
	Sensor not properly set	Adjust sensor
	Defective sensor	Replace sensor
The displays of all functions do not show a status message on the control set	Defective wiring (short-circuit)	Check wires, replace them if necessary
	Sensors not properly set	Adjust sensors
	Defective sensor/s	Replace sensor/s

Malfunction	Cause	Remedy
Automatic charging system switches too late	Range not set	Recalibrate automatic charging system
	Interrupted hydraulic oil circulation	Switch oil circulation between tractor and machine on
System does not work	Malfunction in the system	Restart system
Discharge procedure does not start	Steering axle not completely locked due to blocked wheels	Move machine slightly forward
Speed signal breaks off (with higher speed) Tailgate can be operated despite applied speed	Switching gap of rpm sensor too large	Check switching gap of rpm sensor and reduce it if necessary

Tab. 36: List of malfunctions, electrical system

9.5 Eliminate clogging at the pick-up and the feeder rotor

- Clogging and blockages must be manually eliminated if they cannot be eliminated from the tractor seat.
- Extend the cutting unit only with the feeder rotor running.

9.5.1 Elimination from the tractor seat

1. Retract the cutting unit from the conveyor duct.
2. Carefully couple the p.t.o. shaft at low tractor engine speed.

→ The feeder rotor transports the loaded material together with any foreign objects into the cargo space without resistance from the cutting unit.

3. Extend the cutting unit back into the conveyor duct when the clogging and blockages have been eliminated.

9.5.2 Elimination not from the tractor seat

⚠ WARNING

Unintentional starting of pick-up

Risk to the operator of being drawn in or becoming entangled if the pick-up accidentally starts to run during manual elimination of clogging and blockages.

- Secure tractor and machine against accidental starting and rolling before eliminating clogging and blockages.
- Make sure that unauthorised people leave the hazardous area.

1. Switch the p.t.o. shaft off.
2. Secure tractor and machine against accidental starting and rolling
3. Eliminate clogging and blockages manually.

9.6 Eliminate clogging at beaters

- Clogging and blockages must be manually eliminated if they cannot be eliminated from the tractor seat.

9.6.1 Elimination from the tractor seat

NOTE

Loosen minor blockages at the beaters by reversing before starting work

Short reversing (max. three seconds) of the transport floor helps to eliminate minor blockages at the beaters from the driver seat.

1. Switch the p.t.o. shaft off.
2. Reverse the transport floor for max. three seconds.
3. Switch the p.t.o. shaft on.

9.6.2 Elimination not from the tractor seat

⚠ WARNING

Unintentional starting of pick-up

Risk to the operator of being drawn in or becoming entangled if the beaters or the transport floor accidentally start to run during manual elimination of clogging and blockages.

- Secure tractor and machine against accidental starting and rolling before eliminating clogging and blockages.
- Make sure that unauthorised people leave the hazardous area.

⚠ WARNING

Risk of crushing, shearing and impact

Risk of crushing, shearing and of impact to third parties due to moving tailgate

- Make sure that third persons leave the hazardous area of the machine before lifting or lowering the tailgate.
- Use the stop-cock to secure the tailgate against accidental lifting and lowering.

⚠ WARNING

Risk of cuts for fingers and hands due to sharp working tools.

Sharp working tools may cause serious injuries including loss of limbs.

- Wear the prescribed protective equipment.
- Use appropriate cleaning equipment.

1. Switch the p.t.o. shaft off.
2. Secure tractor and machine against accidental starting and rolling.

   ► see section 2.8 Safely park tractor and machine, page 30.
3. Lift the tailgate.
4. Actuate the stop-cock to lock the tailgate against accidental lowering.

   ► see section 2.15.1 Lock tailgate, page 37.
5. Use a mobile service platform to reach elevated machine components without any risk, see ► see section 10.1 Safety, page 232.
6. Eliminate clogging/blockages/foreign objects.
7. Open the stop-cock of the tailgate.
8. Close the tailgate.

9.7 Emergency manual operation

In case of a failure of the electrical system, the hydraulic functions can be actuated via the emergency manual operation function.

Operative staff:

- Qualified staff

⚠ WARNING

Movements of working tools

Risk of dangerous situations to people caused by unintentional movements of working tools due to the actuation of the emergency manual operation function.

- Keep people away from the hazardous area.

The solenoids (2) to (6) for switching the directional control valves and directional seat valves are manually actuated directly at the electro-hydraulic control block via the emergency manual operation function.

ATTENTION

Risk of damage to the proportional solenoids due to the use of a sharp-edged object.

Use a blunt object to push in the armature of the solenoid at the respective switch-over valve to actuate the desired hydraulic function.

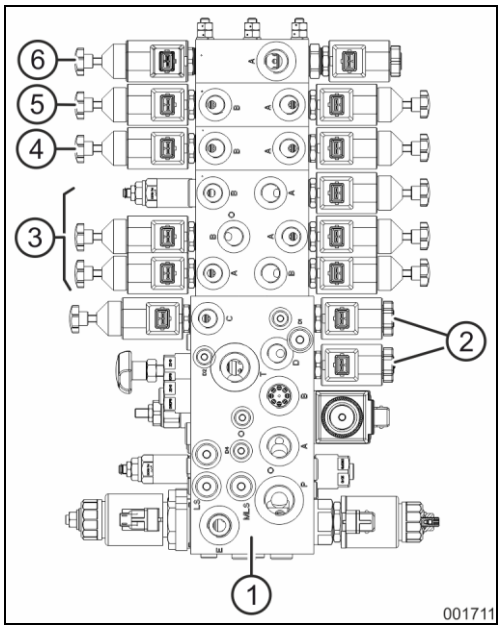


Fig. 205

Control block

1 Basic block
2 Pre-selection valves
3 Directional control valves for e.g. hydraulic cylinders of cutting knives, tailgate, folding drawbar etc.
4 End plate with directional seat valves for steering axle
5 End plate with directional seat valves for front panel and covering system
6 End plate with directional seat valves for tridem lift axle (optional extra)

1. Secure the machine against accidental starting and rolling.
2. Screw in the knurled screws at the directional control / directional seat valve (3) to (6) required for the function.
3. Use a blunt object to push in the armature of the solenoid at the respective pre-selection valve (2) to actuate the desired hydraulic functions.
   → The respective hydraulic function is actuated.
4. Unscrew the knurled screws completely again after having carried out the emergency manual operation function.

9.8 Emergency manual operation of electro-hydraulic forced steering axle system SES

ATTENTION

Only lock steering axles via the emergency manual operation function in case of a malfunction, e.g. for short reverse travel!

Long drives with two locked steering axles cause increased wear on tyres and chassis, in particular on the tridem chassis.

- Unlock the steering axle(s) again as soon as the malfunction has been remedied.

Operative staff:

- Operator

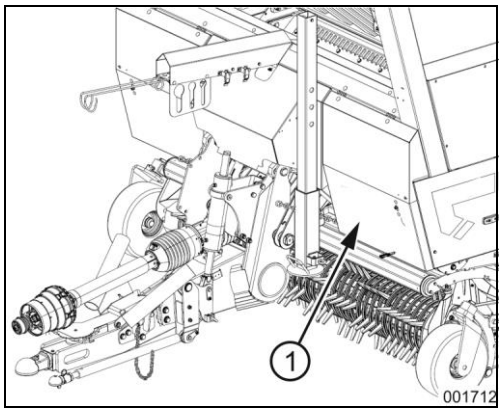


Fig. 206

In case of a malfunction, the forced steering axle system automatically switches over to passive steering, thus making targeted reversing impossible.

Lock the steering axle(s) by means of the emergency manual operation function, in order to be nevertheless able to move the vehicle backwards (over short distances). The wheels should be in a straight line then.

Emergency manual operation is actuated at the electro-hydraulic control block (1).

Lock steering axle(s)

1. Secure tractor and machine against accidental starting and rolling.
2. Use a hexagon key SW 3 to screw in the grub screws (2). Screw in the grub screws only finger-tight (max. 2 Nm). Otherwise, the valves may interlock and the emergency manual operation function can no longer be released.

→ Steering axle(s) locked.

Unlock steering axle(s)

1. Secure tractor and machine against accidental starting and rolling.
2. Unscrew the grub screws (2) again.

→ Steering axle(s) unlocked

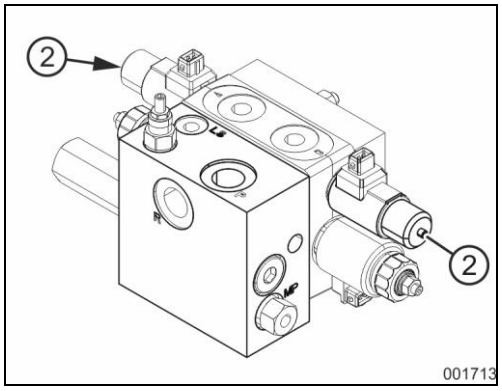


Fig. 207

Control block with tandem chassis

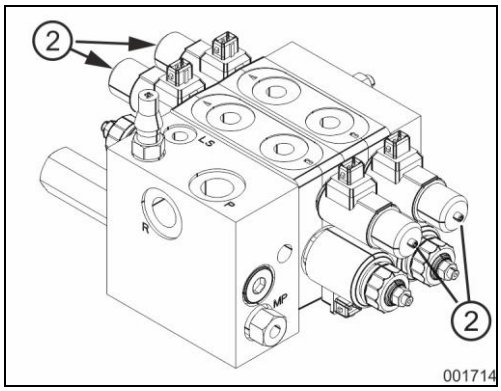


Fig. 208

Control block with tridem chassis

9.9 Release hydraulic dual-line brake system

For function and description of hydraulic brake system, please refer to ► see section 4.24.2 Hydraulic dual-line brake system, page 96

Release emergency braking:

1. Reconnect the torn-off brake line (this is also possible under pressure).
2. Start the tractor and press the brake pedal.

→ The clutch is unlocked and the hose pipe is filled with oil.

3. Press the drain valve (5) to empty the pressure accumulator.
4. Connect the feed line and the electric line.

Release emergency braking without appropriate tractor:

1. Provide a suitable container with a capacity of approx. five litres.
2. Have a suitable hose with an inner diameter of 6 mm available.
3. Apply the parking brake.
4. Put one end of the hose onto the emergency drain nozzle (6) and insert the other end into the container.
5. Loosen the emergency drain nozzle (6) and press the drain valve (5).

→ The oil from the brake system flows into the container and the brake releases.

10 Service and maintenance

This chapter provides basic information and instructions about the maintenance, servicing and repair of the machine.

- Special know-how is required for carrying out testing and maintenance work, which is not communicated by these operating instructions.
- The maintenance intervals depend on the frequency of use of the machine. The maintenance plan has been tailored to medium stress exerted on the machine.

  In case of higher loads and amount of stress, maintenance work must be carried out at respectively shorter intervals.
- In case of doubt, the maintenance intervals, time intervals and service hours specified in the sub-supplier documentation shall prevail.
- Warranty claims can only be asserted if maintenance, cleaning and repair work as well as inspections have been carried out verifiably, on time, regularly and properly.

10.1 Safety

As a basic principle, the following is applicable:

- Carry out the specified service and maintenance work on the machine in due time.
- Observe the maintenance intervals for wearing parts.
- Replace damaged or worn parts immediately.
- Secure the tractor against accidental starting and rolling before carrying out service or maintenance work on the machine and climbing onto the machine.
- Wait for the machine to stop completely before entering the hazardous area.
- Existing mechanical, hydraulic, pneumatic and electrical or electronic residual energies may cause accidental machine movements.

  Beware of possible residual energies. Warning signs mark the components with residual energies.

Fig. 209

- Wear / Use appropriate personal protective equipment.
- Use safe and appropriate equipment.
- Use a mobile service platform to reach elevated machine components and to carry out cleaning, maintenance and repair work without any risk.
- Fix larger assemblies carefully to lifting equipment before replacing them.
- Secure the lifted machine or lifted machine parts against accidental lowering before carrying out service and maintenance work.
- Risk of crushing, shearing, cuts, becoming entangled and being drawn in to parts of the body due to powered machine parts if protective devices are open or removed.

  Always close open protective devices or mount previously removed protective devices before powering the machine.

It is not allowed to open protective devices

– when the machine is powered.
– as long as the tractor engine is running with the propeller shaft coupled/the hydraulic system connected.
- if the ignition key is in the tractor and the tractor engine can be accidentally started with the propeller shaft coupled/the hydraulic system connected.
– if tractor and machine have not been secured against accidental rolling by means of their respective parking brake and chocks.

- Check screws and nuts for firm seating at regular intervals (approx. every 50 service hours). Retighten loosened screws and nuts.
- Check loosened screwed connections for firm seating.
- Use appropriate equipment and gloves when replacing working tools with blades.
- Disconnect the generator and battery cable on the tractor and all electrical/electronic plug-in connections before carrying out electrical welding work on the tractor and/or on the attached/hitched machine.
- Protect adjacent parts when carrying out welding, drilling and grinding work and when working with cut-off wheels. This applies in particular to power, hydraulic, brake and supply lines.
  – Cover lines or remove them at especially critical spots.
- Dispose of oils, greases and filters properly.
- Check all hose pipes with special care for visible defects.
- Observe environmental protection measures when carrying out service and maintenance work on the machine.
- Immediately eliminate any leaks.
- Observe applicable local regulations regarding the disposal. This applies also to parts having come into contact with operating media.
- Properly handle and dispose of substances and materials used for cleaning the machine. This applies in particular when working on lubrication systems and devices and when carrying out cleaning work using solvents.
- Load-bearing parts may break due to mechanical work on frame elements. Risk of material damage and serious injuries or even death.

  As a basic principle, the following is not allowed:

  – Drilling at the frame or chassis.
  – Boring-up of existing holes.
  – Welding on load-bearing parts.
- Exclusively use original spare parts or parts approved by the manufacturer.
- After finishing maintenance work, check the safety and protective devices for proper functioning.
  – Immediately replace missing or defective protective devices.

10.2 Lubricants and operating media

Lubricant and operating medium	Specification	Manufacturer	Designation
Hydraulic oil	HLP 46	AVIA	RSL 46
Gear lubricant oil	ISO VG 100		EP80W-90SAE*
	ISO VG 320	Mobilgear	600 XP 320*
	ISO VG 460	Mobilgear	SHC 460*
Grease	KP2N-20 DIN 51 825 Agraset 116		Lithium soap-based multi-purpose grease
		Walterscheid	Special grease

Tab. 37: Lubricants and operating media

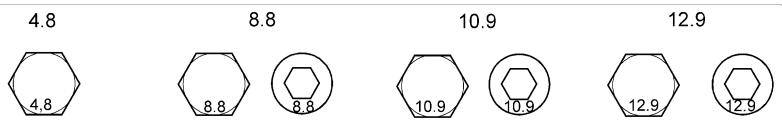
* Initially filled by the manufacturer

10.3 Tightening torques

The tightening torques listed here are reference values. Differing data specified elsewhere in the operating instructions or the enclosed sub-supplier documentation shall always prevail.

- Check screwed connections for firm seating at regular intervals (approx. every 50 service hours).
- Always replace screws and nuts by parts of the same quality.
- Tighten gear or crown nuts to full torque.
- Shear bolts are designed such that they shear off (break) at a certain stress. Only use bolts of equal quality when replacing shear bolts.

10.3.1 Metric standard threads

Grade and marking of screw heads	
Grade and marking of nuts	

	Grade 4.8				Grade 8.8				Grade 10.9				Grade 12.9			
	lubricated*		dry **		lubricated*		dry **		lubricated*		dry **		lubricated*		dry **	
Size	Nm	lb·ft	Nm	lb·ft	Nm	lb·ft	Nm	lb·ft	Nm	lb·ft	Nm	lb·ft	Nm	lb·ft	Nm	lb·ft
M6	4.8	3.5	6	4.5	9	6.5	11	8.5	13	9.5	17	12	15	11.5	19	14.5
M8	12	8.5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70
M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	47	80	60	120	88	150	110	175	130	225	165	205	150	260	190
M16	100	73	125	92	190	140	240	175	275	200	350	255	320	240	400	300
M18	135	100	175	125	260	195	330	250	375	275	475	350	440	325	560	410
M20	190	140	240	180	375	275	475	350	530	400	675	500	625	460	800	580
M22	260	190	330	250	510	375	650	475	725	540	925	675	850	625	1075	800
M24	330	250	425	310	650	475	825	600	925	675	1150	850	1075	800	1350	1000
M27	490	360	625	450	950	700	1200	875	1350	1000	1700	1250	1600	1150	2000	1500
M30	675	490	850	625	1300	950	1650	1200	1850	1350	2300	1700	2150	1600	2700	2000
M33	900	675	1150	850	1750	1300	2200	1650	2500	1850	3150	2350	2900	2150	3700	2750
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2750	4750	3500

Tab. 38: Tightening torques for standard threads

* "Lubricated“ means that the screws are treated with a lubricant such as e.g. engine oil, or that phosphatised or oiled screws are used.

** "Dry" means that normal or galvanised screws without any lubrication are used.

10.3.2 Wheel nuts

		M14x1.5		M16x1.5		M18x1.5		M20x1.5		M22x1.5	
		[Nm]									
ADR											
DIN		130+10		–		270+20		–		–	
Ecrous+ Rondelles		–		–		270+20		350+30		450+60	
"jumelés"		–		–		270+20		350+30		450+60	
"M"		–		–		–		415+35		575+75	
"Bec"		–		–		270+20		350+30		450+60	
BPW											
		–		–		270±20		380±20		510±25	
FAD											
Property class		8.8	10.9	8.8	10.9	8.8	10.9	8.8	10.9	8.8	10.9
Spherical collar nut, conical nut, spherical collar screw		160	220	230	330	330	460	490	630	630	740
Flat collar nut with spherical washer		120	170	190	260	270	360	360	450	460	550
Flat nut with pivotable flat washer		–		–		260	360	350	500	450	650

Tab. 39: Tightening torques for wheel nuts

10.4 Maintenance and lubrication plan

Scheduled service and maintenance of the machine is an important prerequisite for reliable functioning. Insufficient maintenance may provoke malfunctions or damage causing downtimes and repair costs.

Due maintenance work is specified in the maintenance plan and lubrication plan and listed according to the intervals.

The minimum qualification required for the staff to carry out the respective work is specified in the column "Performer" and in front of the description of the maintenance activity.

If increased wear is detected during regular checks, reduce the required maintenance intervals according to wear.

10.4.1 Maintenance plan – Machine

Before each start-up		
Maintenance work	**Performer**	**See**
Brake system – Visual inspection and functional check by means of brake test	Operator	► page 280
Travelling height – Check, correct if necessary	Operator	► page 151
Traffic-related equipment and lighting – Check for proper functioning	Operator	► page 101
Hydraulic hose pipes – Visual inspection for defects and damage	Operator	► page 67
Wheel nuts – Check for firm seating, retighten if necessary (after each wheel change)	Qualified staff	► page 279

After first journey with loaded material		
Maintenance work	**Performer**	**See**
Wheel nuts – Check for firm seating, retighten if necessary (after each wheel change)	Qualified staff	► page 279
Spring bolt, spring clamp, axle connection and spring fixing – Check for firm seating	Authorised workshop	► page 85

After the first 10 service hours		
Maintenance work	**Performer**	**See**
Hydraulic system – Check all components for tightness	Qualified staff	► page 67
Main gearbox – Check oil level*	Operator	► page 246
Spur gear, rotor – Check oil level*	Operator	► page 247
Planetary gear set, rotor – Check oil level*	Operator	► page 248
Feed gearing, transport floor – Check oil level*	Operator	► page 250
Angular gear, front beaters – Check oil level*	Operator	► page 251
Angular gear, rear beaters – Check oil level*	Operator	► page 251

* after commissioning / after a change of the gear lubricant oil

Daily		
Maintenance work	**Performer**	**See**
Roller chain for pick-up drive – Check tension and carry out visual inspection for defects	Operator	► page 253
Roller chain for guide roller drive – Check tension and carry out visual inspection for defects	Operator	► page 252
Roller chain for beater drive – Check tension and carry out visual inspection for defects	Operator	► page 257
Cutting unit – Clean	Operator	► page 261
Cutting unit – Check cutting knives for sharpness	Operator	► page 265
Cutting unit – Turn over / Grind blunt cutting knives	Operator	► page 265
Transport floor – Check chain tension	Operator	► page 271
Power train / Gearbox – Carry out visual inspection for defects and damage, remove dirt accumulation / wrapping twine.	Operator	► page 74
Tyres – Check tyre pressure and carry out visual inspection for defects.	Operator	► page 279
Compressed-air brake system – Drain compressed-air reservoir.	Operator	► page 281
Lubricate machine according to lubrication plan	Operator	► page 241

Every 250 service hours		
Maintenance work	**Performer**	**See**
Hydraulic system – Check all components for tightness	Qualified staff	► page 273
Hydraulic system – Replace hydraulic filter	Authorised workshop	► page 277
All chassis components – Check for damage and wear	Qualified staff / Authorised workshop	► page 287
Spring bolt, spring clamp, axle connection and spring fixing – Check for firm seating	Authorised workshop	► page 85
Brake system – Check for proper functioning.	Qualified staff	► page 280
Compressed-air brake system – Check in-line filters	Qualified staff	► page 281
Bearing play of wheel hubs – Check, have it readjusted if necessary	Qualified staff / Authorised workshop	► page 286
Brake linings – Check for damage and wear, have them replaced if necessary.	Qualified staff / Authorised workshop	► page 282
Brake lever / Slack adjuster – Check brake setting, have it readjusted if necessary	Qualified staff / Authorised workshop	► page 284

After 50 service hours for the first time, then every 500 service hours or once a year		
Maintenance work	**Performer**	**See**
Main gearbox – Change oil	Authorised workshop	► page 246
Spur gear, rotor – Change oil	Authorised workshop	► page 247
Planetary gear set, rotor – Change oil	Authorised workshop	► page 248
Feed gearing, transport floor – Change oil	Authorised workshop	► page 245
Angular gear, front beaters – Change oil	Authorised workshop	► page 250
Angular gear, rear beaters – Change oil	Authorised workshop	► page 251

Once a year		
Maintenance work	**Performer**	**See**
Hydraulic hose pipes – Check for operational safety	Qualified staff	► page 276
Carry out maintenance work on cam-type cut-out clutch	Authorised workshop	► page 254
Oil storage tank at chassis cylinder – Change oil	Authorised workshop	► page 287
Wheel hub bearing – Change grease	Authorised workshop	► page 287

Before longer downtimes		
Maintenance work	**Performer**	**see**
Thoroughly clean the machine.	Operator	► page 242
Completely lubricate the machine	Operator	► page 243
Protect all movable and blank parts of the machine against corrosion	Operator	
Touch up paintwork	Qualified staff	

ATTENTION

Do not expose the machine to the weather if it is not in use for a long period of time.

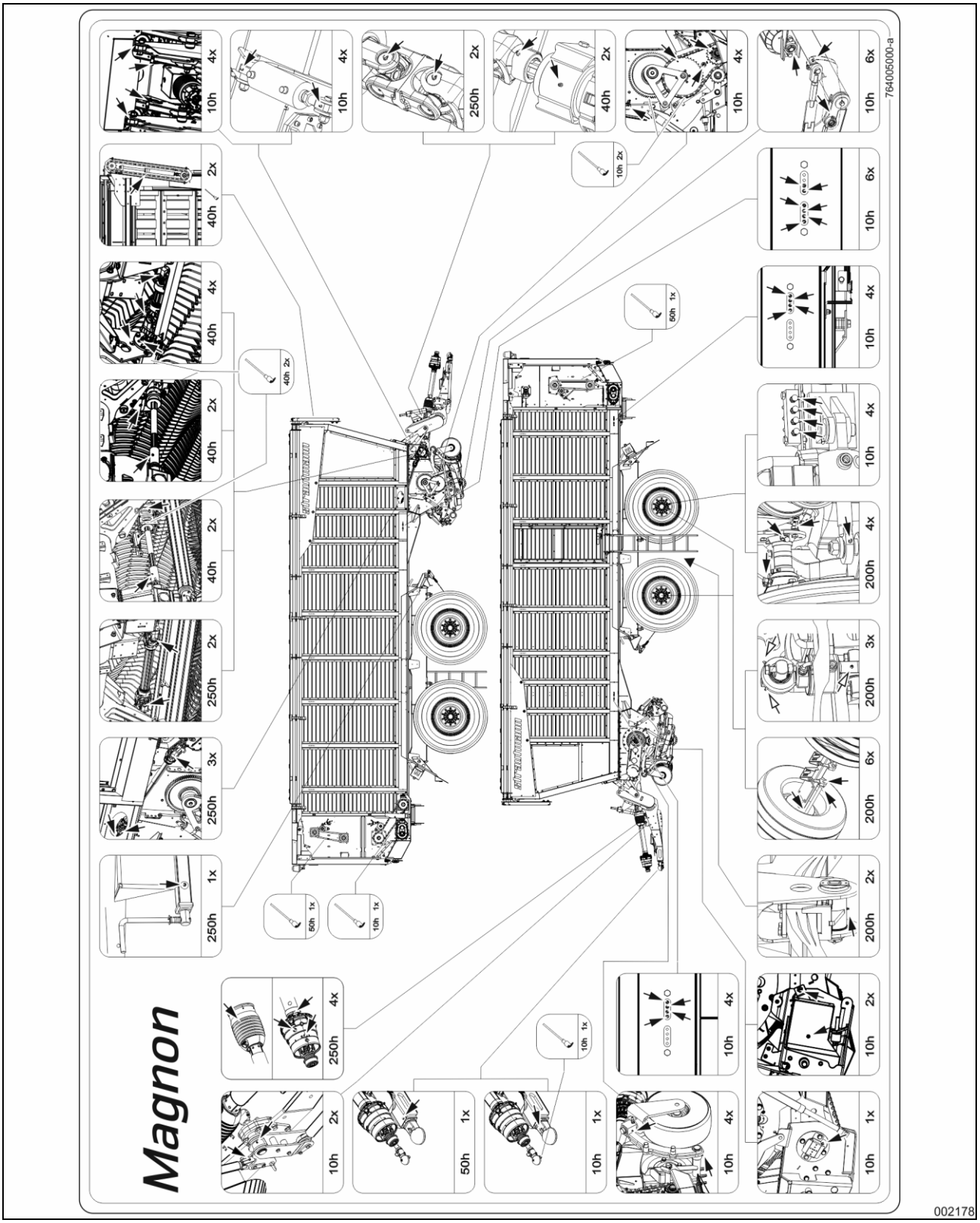
If required/worn		
Maintenance work	**Performer**	**see**
Beater circuit – Set	Qualified staff	► page 258
Cutting unit – Replace cutting knives	Qualified staff	► page 262
Pick-up – Change tines	Qualified staff	► page 252
Cutting knives – Set distance to rotor	Qualified staff	► page 268

If required/worn		
Maintenance work	**Performer**	**see**
Strippers – Check distance to rotor	Qualified staff	► page 266
Strippers – Replace deformed strippers	Authorised workshop	► page 266
"Cutting unit extended" sensor – Set	Qualified staff	► page 269
"Beater circuit" rpm sensor – Set	Qualified staff	► page 260
"Drive shaft" rpm sensor – Set	Qualified staff	► page 257
"Tailgate closed" sensor – Set	Qualified staff	► page 272
Transport floor – Shorten and tighten chains	Qualified staff	► page 271
Hydraulic hose pipes – Replace	Authorised workshop	► page 276
Tyres – Change	Qualified staff	► page 279
Brake linkage, slack adjuster – Readjust	Authorised workshop	► page 284

10.4.2 Lubrication plan – Machine

NOTE

Observe the enclosed sub-supplier documentation for lubrication of the propeller shaft(s).



10.5 Clean machine

- Regularly and thoroughly clean the machine. Dirt binds humidity thus causing rust formation.
- Remove wrapping twine from the drive shafts and the beaters. Wrapping twine causes damage to bearings and shaft seals and leads to imbalance.
- Immediately eliminate dirt accumulation in the area of drive shafts, bearings and gearboxes (shaft seals and ventilators). Dirt binds humidity thus causing leakages, contamination of lubricants, unnecessary wear and premature failure of drive components.
- Lubricate the machine after cleaning and protect it against corrosion, especially after cleaning by means of a pressure washer / steam blaster or fat-dissolving agents.
- Replace detached, damaged and illegible labels, warning and instruction signs.

⚠ WARNING

Toxic and flammable detergents

Risk of poisoning and risk of fire due to the use of inadmissible detergents.

- Never use fuels, benzene, paraffin or mineral oils as detergents.
- Observe the data sheets.

ATTENTION

Damage to the machine caused by cleaning work improperly carried out

When using a pressure washer/steam blaster for cleaning the machine, observe:

- The operating instructions of the pressure washer/steam blaster manufacturer.
- Do not exceed the maximum admissible spray pressure of 80 bar.
- Do not exceed the water temperature of 60°C.
- Do not aim the jet at the following components:
  - Electrical / Electronic components
  - Lubrication points and bearings
  - Seals
  - Gearboxes
  - Hydraulic components
  - Labels, warning and instruction signs
- Keep a minimum distance of 30 cm between the cleaning nozzle and the machine.
- Never aim the cleaning nozzle jet at the components at right angles or in a too flat position. The spray angle should be 20-30°.
- Do not use any chemical additives that may affect the paintwork and the machine components.

- Carry out cleaning work at a washing area provided for this purpose.
- Observe the environmental protection rules.
- Dispose of used detergents and empty containers in accordance with the environmental regulations.

10.6 Lubricate machine

- Observe the specified intervals and lubricants according to the lubrication plan.
  ► see page 241
  Observe the enclosed sub-supplier documentation where applicable.
- Remove the dirt from the lubricating nipples before carrying out lubrication work.
- Exclusively use appropriate lubricants approved by the manufacturer, ► see page 234

ATTENTION

Damage to components

Damage to bearings, seals etc. may occur if the lubricating pressure is excessive and the grease gun used is not equipped with a protective device.

- Do not exceed the maximum lubricating pressure of 250 bar.

- Use environmentally friendly, biodegradable oils and greases where lubricants may penetrate the fodder or the ground.
- Remove excess grease at the lubricating nipple immediately.
- Observe the environmental protection rules.

10.7 Gear lubricant oil

Change the oil

- when the oil change interval has been reached,
- at least once a year
- or the gear lubricant oil has been contaminated e.g. due to humidity, condensate or metal abrasion.

Let the machine warm up before changing oil.

The flowability of the gear lubricant oil is at its optimum at operating temperature (30-40°C).

The optimum oil level / filling quantity

- must be regularly checked (according to maintenance plan / abnormalities detected during visual inspection of the machine),
- can be determined at an oil temperature of 0-20°C at the inspection glass / inspection plug,
- must be checked several times a day in case of an oil change after a test run / operation of the machine.

ATTENTION

Damage to the machine due to lack of oil or poor oil quality

- Always ensure a sufficient oil level.
- Change oil contaminated due to humidity, condensate or metal abrasion.
- Do not mix different types of oil.
- Immediately eliminate dirt accumulation, wrapping twine and humidity in the area of shaft seals, bearings and ventilators.
- Have any leaks, defective shaft seals and ventilators repaired immediately.
- Do not clean the gearboxes by means of a pressure washer/steam blaster or fat-dissolving agents.

⚠ CAUTION

Risk of slipping due to leaking oil

Risk of slipping and falling to people due to leaking oil during topping-up of oil or oil change.

- Immediately remove oil spills by means of binding agents.
- Have any leaks repaired immediately.

Dispose of used oil properly.

- Have any leaks repaired immediately.

10.7.1 Feed gearing, transport floor

Check oil level

Operative staff:
- Operator

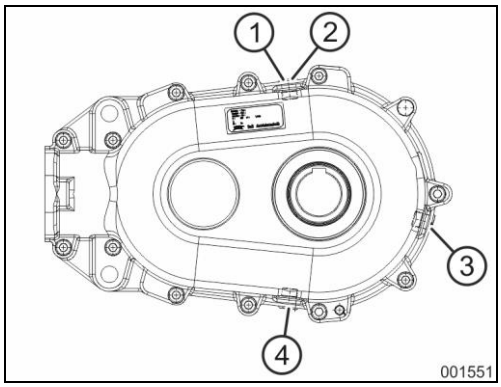


Fig. 210

1. Unscrew the inspection plug (3).
   The oil level must be visible at the inspection plug.
2. Top up gear lubricant oil if necessary.
   – Loosen the vent screw (1).
   – Top up gear lubricant oil ISO VG 100 through the filler neck (2).
   – Screw the vent screw (1) in.
3. Screw the inspection plug (3) in.

Change oil

Operative staff:
- Authorised workshop

1. Park the machine on even ground.
2. Switch the machine off and secure it against rolling.
3. Place a drip tray beneath the gearbox.
   – Capacity approx. 2 litres
4. Unscrew the oil drain plug (4).
5. Loosen the vent screw (1).

→ The gear lubricant oil drains off into the drip tray.

6. Wait until no more oil comes out of the oil drain opening.
7. Screw the oil drain plug (4) in.
8. Unscrew the inspection plug (3).
9. Fill in 1.5 litres of gear lubricant oil ISO VG 100 through the filler neck (2) until the oil is visible at the level of the threaded hole.
10. Screw the inspection plug (3) in.
11. Clean and screw in the vent screw (1).
12. Check the oil level after five service hours.

Dispose of used oil properly.

10.7.2 Main gearbox

Check oil level

Operative staff:
- Operator

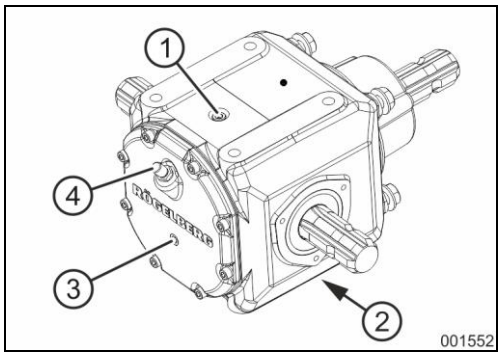


Fig. 211

1. Unscrew the inspection plug (3).
   The oil level must be visible at the inspection plug.
2. Top up gear lubricant oil if necessary.
   – Loosen the vent screw (4).
   – Unscrew the oil filling screw (1).
   – Top up gear lubricant oil ISO VG 320 through the filler neck.
   – Screw the oil filling screw (1) in.
   – Screw the vent screw (4) in.
3. Screw the inspection plug (3) in.

Change oil

Operative staff:
- Authorised workshop

1. Park the machine on even ground.
2. Switch the machine off and secure it against rolling.
3. Place a drip tray beneath the gearbox.
   – Capacity approx. 3 litres
4. Unscrew the oil drain plug (2).
5. Loosen the vent screw (4).

→ The gear lubricant oil drains off into the drip tray.

6. Wait until no more oil comes out of the oil drain opening.
7. Screw the oil drain plug (2) in.
8. Unscrew the inspection plug (3).
9. Unscrew the oil filling screw (1).
10. Fill in 2.3 litres of gear lubricant oil ISO VG 320 through the filler neck until the oil is visible at the level of the threaded hole.
11. Screw the inspection plug (3) in.
12. Screw the vent screw (4) in.
13. Clean and screw in the oil filling screw (1).
14. Check the oil level after five service hours.

Dispose of used oil properly.

10.7.3 Spur gear, rotor

Check oil level

Operative staff:
- Operator

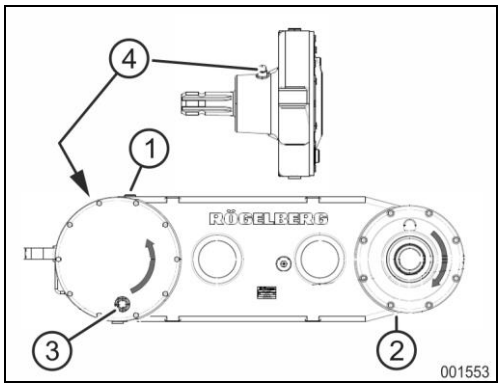


Fig. 212

1. Unscrew the inspection plug (3).
   The oil level must be visible at the inspection plug.
2. Top up gear lubricant oil if necessary.
   – Loosen the vent screw (4).
   – Unscrew the oil filling screw (1).
   – Top up gear lubricant oil ISO VG 320 through the filler neck.
   – Screw the oil filling screw (1) in.
   – Screw the vent screw (4) in.
3. Screw the inspection plug (3) in.

Change oil

Operative staff:
- Authorised workshop

1. Park the machine on even ground.
2. Switch the machine off and secure it against rolling.
3. Place a drip tray beneath the gearbox.
   – Capacity approx. 2 litres
4. Unscrew the oil drain plug (2).
5. Loosen the vent screw (4).

→ The gear lubricant oil drains off into the drip tray.

6. Wait until no more oil comes out of the oil drain opening.
7. Screw the oil drain plug (2) in.
8. Unscrew the inspection plug (3).
9. Unscrew the oil filling screw (1).
10. Fill in 1.4 litres of gear lubricant oil ISO VG 320 through the filler neck until the oil is visible at the level of the threaded hole.
11. Screw the inspection plug (3) in.
12. Clean and screw in the vent screw (4).
13. Clean and screw in the oil filling screw (1).
14. Check the oil level after five service hours.

Dispose of used oil properly.

10.7.4 Planetary gear set, rotor

Check oil level

Operative staff:
- Operator

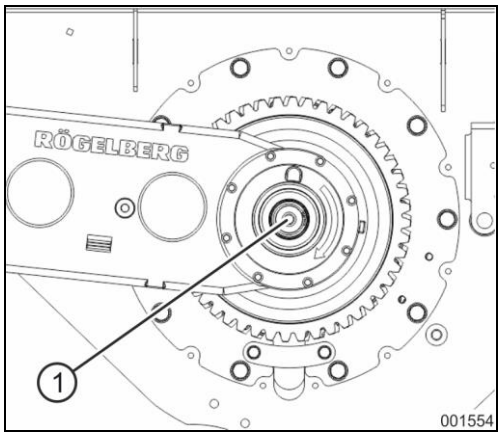


Fig. 213

1. Unscrew the filling screw (1).
   The oil must be visible up to the level of the threaded hole.
2. Top up gear lubricant oil if necessary.
   – Top up gear lubricant oil ISO VG 460 through the filler neck.
   – Tilt the vehicle slightly to the right-hand side.
3. Glue the filling screw (1) in again with a low-strength threadlocker.

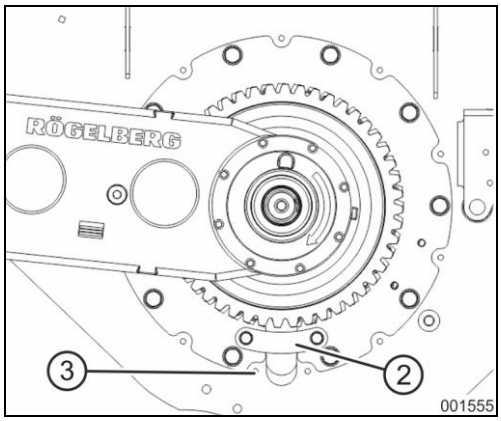


Fig. 214

Change oil

Operative staff:
- Authorised workshop

1. Park the machine on even ground.
2. Switch the machine off and secure it against rolling.
3. Place a drip tray beneath the gearbox.
   – Capacity approx. 4 litres.
4. Remove the component (2).
5. Turn the rotor until the drain plug is visible at the bottom recess (3).
6. Screw the drain pipe (4) onto the thread.
   ATTENTION – the oil pours immediately after tightening the thread.

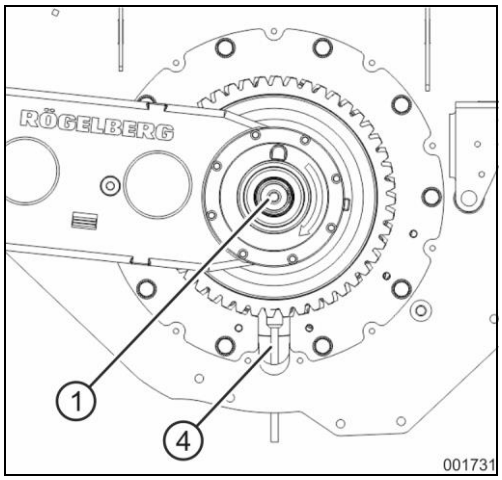


Fig. 215

7. For complete emptying, tilt the vehicle slightly to the left-hand side and unscrew the filling screw (1).
8. Wait until no more oil comes out of the oil drain opening.
9. Unscrew the drain pipe (4).
10. Fill in 3.2 litres of gear lubricant oil ISO VG 460 through the filler neck.
    – Tilt the vehicle slightly to the right-hand side.
11. Glue the filling screw (1) in again with a low-strength threadlocker.
12. Reinstall the component (2).
13. Check the oil level after five service hours.

Dispose of used oil properly.

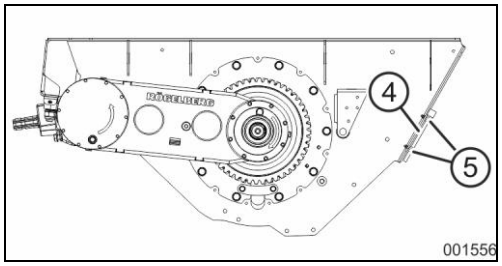


Fig. 216

Drain pipe parking position

The drain pipe (4) is fastened to the left-hand press side element by means of two clamps (5).

Retrofit kit 763946000

10.7.5 Angular gear, front, beaters

Check oil level

Operative staff:
- Operator

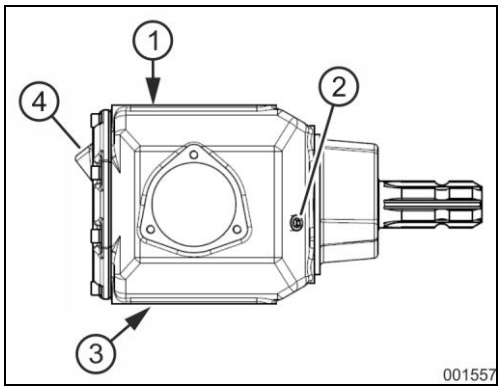


Fig. 217

1. Unscrew the inspection plug (2).
   The oil level must be visible at the inspection plug.
2. Top up gear lubricant oil if necessary.
   – Loosen the vent screw (4).
   – Unscrew the oil filling screw (1).
   – Top up gear lubricant oil ISO VG 320 through the filler neck.
   – Screw the oil filling screw (1) in.
   – Screw the vent screw (4) in.
3. Screw the inspection plug (2) in.

Change oil

Operative staff:
- Authorised workshop

1. Park the machine on even ground.
2. Switch the machine off and secure it against rolling.
3. Place a drip tray beneath the gearbox.
   – Capacity approx. 3 litres
4. Unscrew the oil drain plug (3).
5. Loosen the vent screw (4).

→ The gear lubricant oil drains off into the drip tray.

6. Wait until no more oil comes out of the oil drain opening.
7. Screw the oil drain plug (3) in.
8. Unscrew the inspection plug (2).
9. Unscrew the oil filling screw (1).
10. Fill in 2.5 litres of gear lubricant oil ISO VG 320 through the filler neck until the oil is visible at the level of the threaded hole.
11. Screw the inspection plug (2) in.
12. Clean and screw in the vent screw (4).
13. Clean and screw in the oil filling screw (1).
14. Check the oil level after five service hours.

Dispose of used oil properly.

10.7.6 Angular gear, rear, beaters

Check oil level

Operative staff:
- Operator

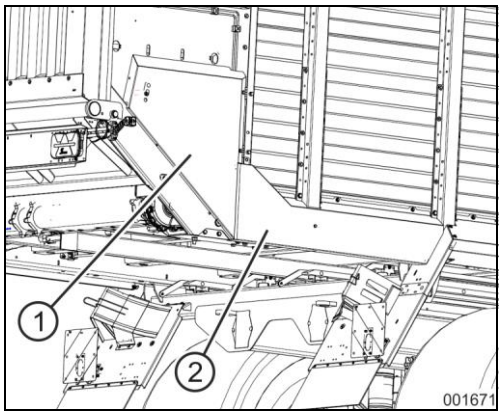


Fig. 218

1. Unscrew the oil filling and oil drain plug (3).
   The oil must be visible up to the level of the threaded hole.
2. Top up gear lubricant oil ISO VG 100 if necessary.
3. Screw the oil filling and oil drain plug (3) in.

Change oil

Operative staff:
- Authorised workshop

1. Park the machine on even ground.
2. Secure tractor and machine against accidental starting and rolling

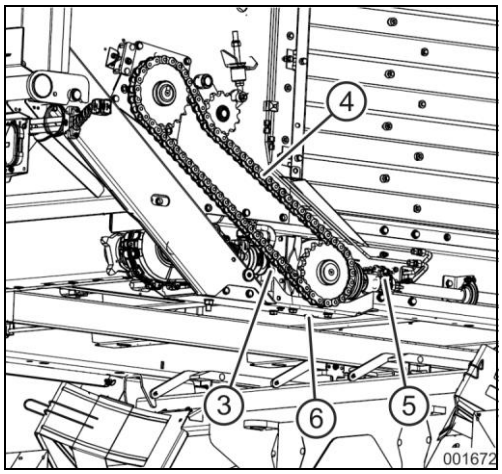


Fig. 219

3. Remove the bottom protective casings (1) and (2) of the beater drive on the right-hand side in the direction of motion.
4. Relieve and remove the drive chain (4) of the bottom beater to the angular gear
5. Remove the chain of the chain coupling (5).
6. Loosen and remove the fastening screws (6) of the gearbox beneath the side bar of the platform.
7. Take the gearbox out of the side bar.
8. Drain the gear lubricant oil through the oil filling and oil drain plug (3) above a drip tray.

– Capacity approx. 3 litres.

9. Wait until no more oil comes out of the oil filling and oil drain opening (3).
10. Fill in 2 litres of gear lubricant oil ISO VG 100 through the oil filling and oil drain opening (3).
    In mounting position, the oil must be at the level of the oil filling and oil drain opening (3).
11. Clean the oil filling and oil drain plug (3) and screw in together with the sealing ring.
12. Reinstall all components in reverse order.
13. Check the oil level after five service hours.

Dispose of used oil properly.

10.8 Pick-up

10.8.1 Change Flex-Load pick-up tines

Operative staff:

- Qualified staff

⚠ WARNING

Unprotected driving elements / rotating working tools

Risk of serious injuries when powering the machine during maintenance or cleaning work and/or with protective devices open/removed.

- Secure the machine against accidental starting and rolling.

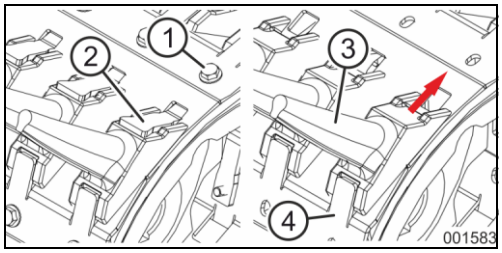


Fig. 220

1. Turn the tractor off and secure the machine against accidental starting and rolling.
2. Unscrew screw (1).
3. Remove clamp (2) from tine (3).
4. Pull tine (3) out in the direction of the arrow.
5. Push the new tine into the holder (4) in the opposite direction of the arrow.
6. Reinsert clamp (2).
7. Tighten screw (1).

10.9 Power train

10.9.1 Lubricate guide roller drive

Operative staff:

- Operator

1. Lift the folding drawbar to elevate the working position.
2. Secure tractor and machine against accidental starting and rolling.
3. Use an appropriate tool to open the protective devices at the right-hand front of the machine.
4. Lubricate the toothed wheels and the roller chain of the guide roller drive.
5. Close protective devices and lock them in protective position.

10.9.2 Check / Retighten roller chain of guide roller

- Check the tension of the roller chain at the chain tensioner every day.
- Retighten the roller chain if the distance between washer and sleeve is more than 8 mm.

Operative staff:
- Operator

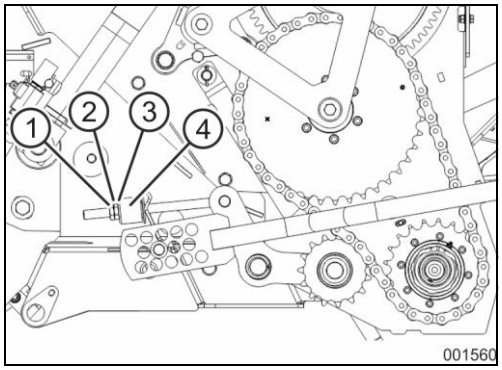


Fig. 221

1. Lift the folding drawbar to elevate the working position.
2. Secure tractor and machine against accidental starting and rolling.
3. Use an appropriate tool to open the protective devices at the right-hand front of the machine.
4. Unscrew the counter nut (1) by means of an open-end wrench (wrench size SW 24), supplied auxiliary tools see ► page 79
5. Turn the hexagon nut (2) until the distance between washer (3) and sleeve (4) is less than 8 mm.
6. Tighten the counter nut (1).
7. Close protective devices and lock them in protective position.

10.9.3 Lubricate drive chain of pick-up

Operative staff:
- Operator

1. Lift the folding drawbar to ensure a convenient working position.
2. Secure tractor and machine against accidental starting and rolling.
3. Use the lubricating nipple provided for this purpose to lubricate the roller chain of the pick-up drive.

⚠ WARNING

Unprotected driving elements / rotating working tools

Risk of serious injuries when powering the machine during maintenance or cleaning work and/or with protective devices open/removed.

- Secure the machine against accidental starting and rolling.
- Properly fix and close all protective devices before starting the machine.
- Do not stay in hazardous areas

10.9.4 Check and retighten drive chain of pick-up

Operative staff:
- Operator

It is not mandatory to remove the chain case at the pick-up in order to check the chain tension or retighten the drive chain of the pick-up.

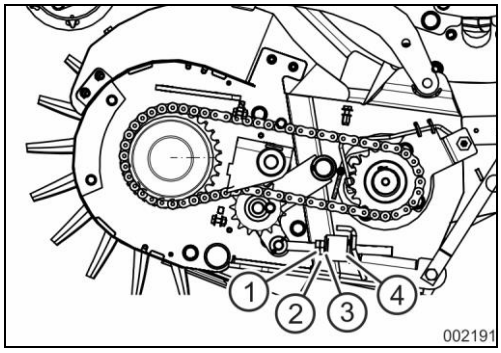


Fig. 222

1. Lift the folding drawbar to ensure a convenient working position.
2. Lower the pick-up to working position.
3. Secure tractor and machine against accidental starting and rolling.
4. Unhook the struts of the guide wheel.
5. Use an appropriate tool to remove the protective devices of the pick-up.
6. Unscrew the counter nut (1) by means of an open-end wrench (wrench size SW 24), supplied auxiliary tools see ► page 79
7. Turn the hexagon nut (2) until the distance between washer (3) and sleeve (4) is less than 8 mm.
8. Tighten the counter nut (1).
9. Reinstall the protective devices and hang in the struts of the guide wheel.

10.9.5 Carry out maintenance work on cam-type cut-out clutch

NOTE

Cam-type cut-out clutches must transmit high power. In order to ensure perfect functioning and a long service life, regular maintenance (basic lubrication) with special Walterscheid grease every 500h / once a year is imperative.

ATTENTION

Never clean cam-type cut-out clutches by means of a pressure washer! Water would penetrate the clutch interior and cause corrosion at the clutch components.

ATTENTION

Insufficient or incorrect maintenance / cleaning of the cam-type cut-out clutch may cause serious damage to the machine.

ATTENTION

Only an authorised workshop is allowed to carry out the work specified below!

The manufacturer will not assume any warranty and liability for material damage and personal injuries if the work is carried out by insufficiently qualified staff.

Preparation:

- Secure tractor and machine against accidental starting and rolling.
- Remove the cam-type cut-out clutch from the machine.

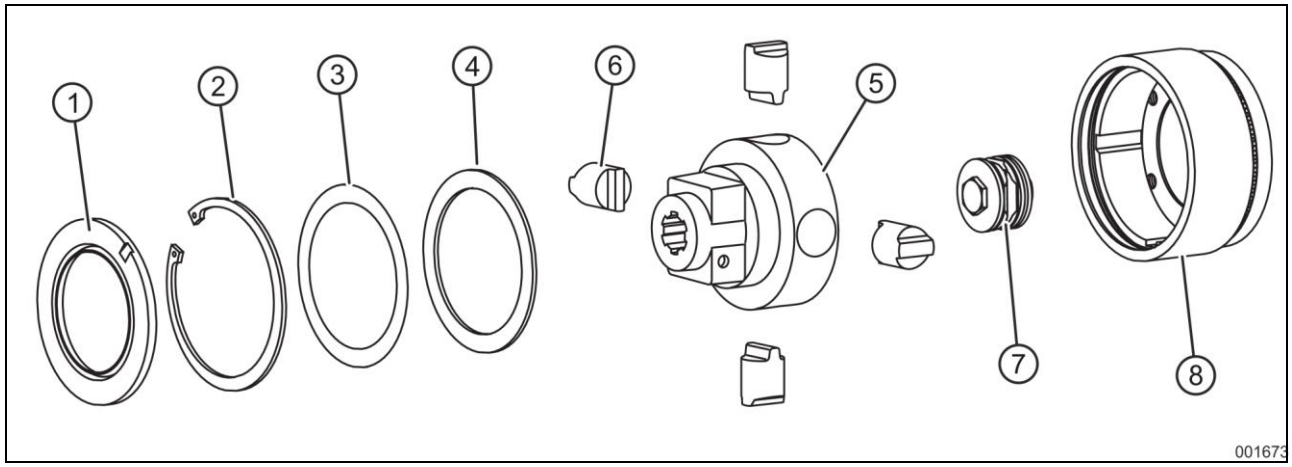


Fig. 223:

Disassembly of cam-type cut-out clutch

1. Use a screwdriver to remove the sealing ring (1) from the clutch housing (8).
2. Use an appropriate tool to remove the circlip (2).
3. Remove the adjusting washers (3) and the supporting ring (4).
4. Pull the hub (5) out of the clutch housing (8).

   It is imperative to pay attention to the position of the chamfer of the locking cams (6) when pulling out!
5. Take the locking cams (6) and the spring assembly (7) out of the hub.
6. Clean all parts and check them for wear / damage.
7. Grease all parts with special Walterscheid grease "Agraset 116".
8. Fill the grooves in the clutch housing with grease.

Installation of cam-type cut-out clutch

1. Insert the locking cams (6) and the spring assembly (7) into the hub (5).
2. Push the pre-assembled hub (5) into the clutch housing (8).
3. Insert the supporting ring (4) and the adjusting washers (3) and secure them by means of the circlip (2).
4. Again, apply grease onto the adjusting washers, supporting ring and circlip.
5. Insert the sealing ring.

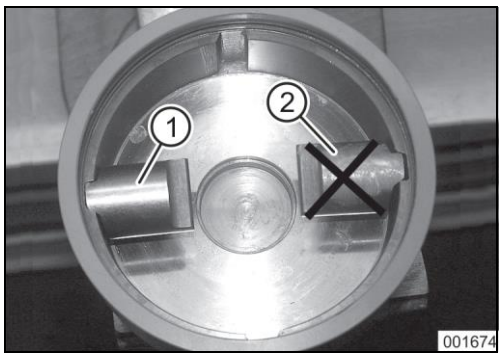


Fig. 224

NOTE

It is imperative to pay attention to the position of the chamfer at the locking cams when inserting the hub.

(1) Correct position of locking cams in the clutch housing.
(2) Incorrect position of locking cams in the clutch housing.

ATTENTION

The guarantee for the machine will become null and void if the set torque of the cam-type cut-out clutch is manipulated.

In case of doubt, have the torque of the cam-type cut-out clutch checked or set, if necessary, by an authorised workshop.

10.9.6 Set rpm sensor "Drive shaft"

⚠ WARNING

Accidental starting

Risk of crushing and shearing during setting of rpm sensor if the machine is unintentionally powered or hydraulic functions are accidentally carried out.

- Before setting the sensor, secure tractor and machine against accidental starting and rolling.

Operative staff:

- Qualified staff

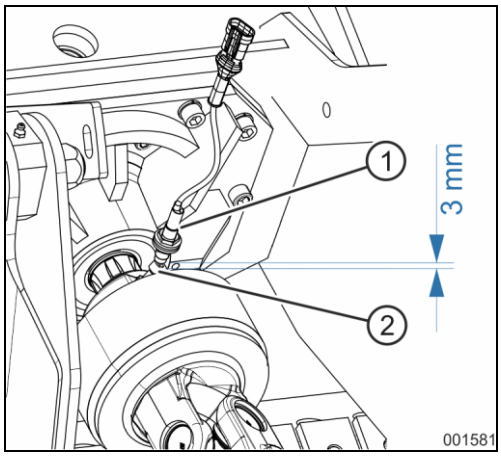


Fig. 225

1. Fasten the sensor (1) such that the distance between the sensor and the bolt head (2) is approx. 3 mm.

→ The light emitting diode lights up.

2. Screw the sensor in this position.
3. Access the diagnostic menu to check the speed detection over the entire speed range (especially at high speed).

10.10 Beaters

10.10.1 Lubricate roller chains of beaters

Operative staff:

- Operator

1. Secure tractor and machine against accidental starting and rolling.
2. Use a service platform with ladder:
   – to open and close protective devices.
   - to ensure safe access to the roller chains.
3. Use an appropriate tool to open protective devices.
4. Lubricate the roller chains.
5. Close protective devices and lock them in protective position.

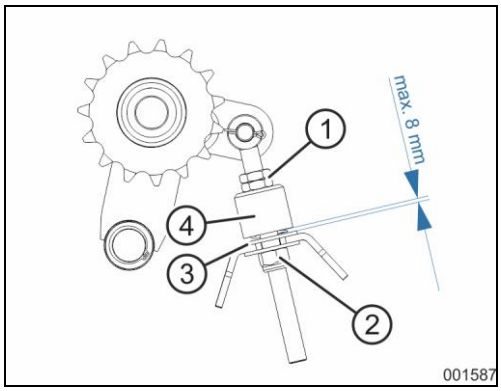


Fig. 226

10.10.2 Check/Retighten roller chain tension

Operative staff:

- Operator

The 3 roller chains of the beaters are equipped with spring-loaded chain tensioners.

Retighten the roller chains if the distance between washer (3) and sleeve (4) is more than 8 mm.

1. Secure tractor and machine against accidental starting and rolling.
2. Use a service platform with ladder:
   - to open the protective devices for the roller chains.
   - to ensure safe access to the roller chains.
3. Open the protective covers of the beater drive by means of an appropriate tool.
4. Unscrew the counter nuts (1) by means of an open-end wrench.
5. Turn the hexagon nuts (1) until the distance between washer (3) and sleeve (4) is less than 8 mm.
6. Tighten the counter nuts (1).
7. Close and lock the protective cover of the beater drive.

The hexagon nut (2) serves as a loss prevention and limits the max. spring travel / tension path.

10.10.3 Clutch for switching beaters on / off

Operative staff:

- Qualified staff

The clutch for switching the beaters on / off is mounted next to the main gearbox on the right-hand side in the direction of travel.

* On the Magnon 8 DO, a second clutch for switching the feeder rotor and pick-up on / off is mounted next to the main gearbox on the left-hand side in the direction of travel.

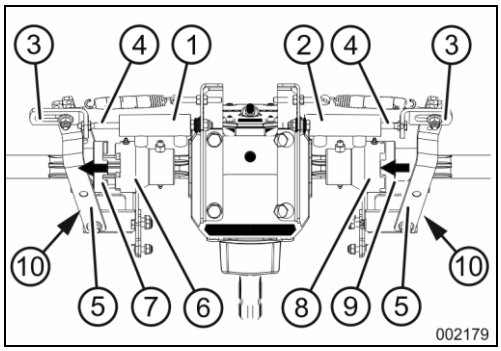


Fig. 227

1. Secure tractor and machine against accidental starting and rolling.
2. Open the tailgate:
   → The cylinder (1) retracts
   → The beater clutch (6/7) is closed
   – The beater drive is switched on
   → The cylinder (2) extends*
   → The pick-up clutch (8/9) is opened*
   – The pick-up is switched off*
3. Close the tailgate again.
   → The cylinder (1) extends
   → The beater clutch (6/7) is opened
   The beater drive is switched off
   → The cylinder (2) retracts*
   → The pick-up clutch (8/9) is closed*
   – The pick-up is switched on*
4. Set the switching plate (3) and the piston rod (4) such that:
   • with the tailgate closed, i.e. the beater drive switched off
   – the two claws of the beater clutch (6) and (7) do not touch one another.
   • the two claws of the pick-up clutch (8) and (9) close completely, such that the bearings (10) of the switch lever (5) can freely move in the shifting claw (8).
   • With the tailgate open, i.e. the beater drive switched on
   • the claws of the beater clutch (6) and (7) close completely, such that the bearings (10) of the switch lever (5) can freely move in the shifting claw (7).
   – the two claws of the pick-up clutch (8) and (9) do not touch one another*.
5. Open the tailgate and briefly switch the propeller shaft on to check the settings.

Repeat setting of the clutch at the piston rod if necessary.

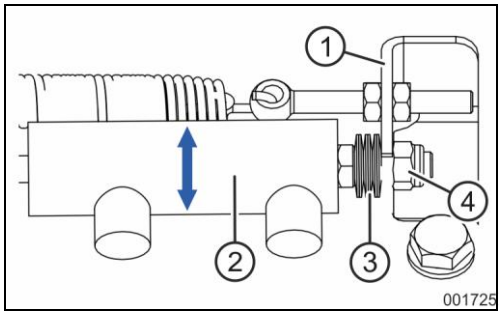


Fig. 228

NOTE

Position at least two disc springs (3) between the locating elbow (1) and the shift cylinder (2). When tightening the hexagon nut (4), ensure that the disc springs (3) are only slightly preloaded (between 5 and 10 Nm), such that the cylinder can make a slight movement in the direction of the arrow during switching, without excessively stressing the cylinder thread.

10.10.4 Set rpm sensor "Beater circuit"

⚠ WARNING

Accidental starting

Risk of crushing and shearing during setting of rpm sensor if the machine is unintentionally powered or hydraulic functions are accidentally carried out!

- Before setting the sensor, secure tractor and machine against accidental starting and rolling.

Operative staff:

- Qualified staff

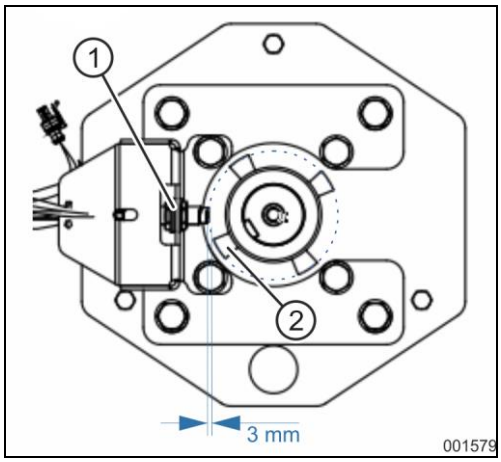


Fig. 229

1. Screw the sensor (1) out or in until the distance to the cams (2) is approx. 3 mm. The light emitting diode indicates switching of the sensor.

10.11 Cutting unit

⚠ WARNING

Cutting unit

Risk of serious injuries due to work on the cutting unit.

- Wear cut-proof gloves when carrying out work on the cutting knives.
- Always wear protective goggles when cleaning the retainers, slots and knife protection system by means of compressed air.
- Use the handles when swivelling the cover plate.
- Make sure that people leave the hazardous area on the opposite side before swivelling the cover plate.

NOTE

Sharp cutting knives:

- improve the cutting quality of the forage wagon.
- reduce the effort required for powering the conveying unit,
- reduce conveying unit wear,
- increase the service life of the forage wagon.

- Regularly check the cutting knives for sharpness.
- Turn blunt cutting knives over (every 12 service hours) or grind them (every 24 service hours).

10.11.1 Fold down knife cover

Fold down the knife cover before carrying out work on the cutting unit.

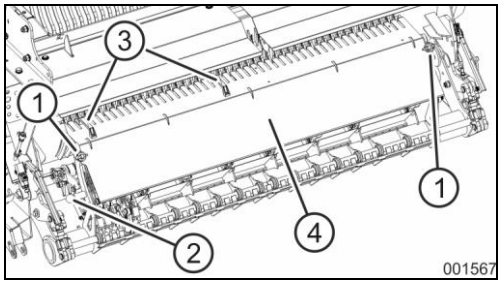


Fig. 230

1. Remove both split pins (1) on the left-hand and right-hand side.
2. Pull the spring-loaded ball head (2) outwards.
3. Use the two grips (3) to fold the cover plate (4) down.

10.11.2 Clean cutting unit

NOTE

A soiled cutting unit leads to worse response characteristics of the knife protection system.

Operative staff:

- Operator

- Use compressed air to clean the entire cutting unit, in particular the knife protection system and the gaps between the cutting knives, every day.
- Use compressed air to clean the retainers of the cutting knives before removing them.
- Use compressed air to clean the slots of the cutting knives before installing them.

10.11.3 Remove and install cutting knives

Operative staff:
- Operator

⚠ CAUTION

Sharp-edged cutting knives

Risk of cuts
- Wear cut-proof gloves.
- Use only appropriate tools to remove and install cutting knives. (The knife lever, article number 735346002, is mounted beneath the platform in its parking position.)

The cutting knives must be removed and installed:
- for setting the cutting length of the loaded material
- for turning over the double-sided cutting knives
- for grinding the cutting knives

10.11.3.1 Remove cutting knives

Operative staff:
- Operator

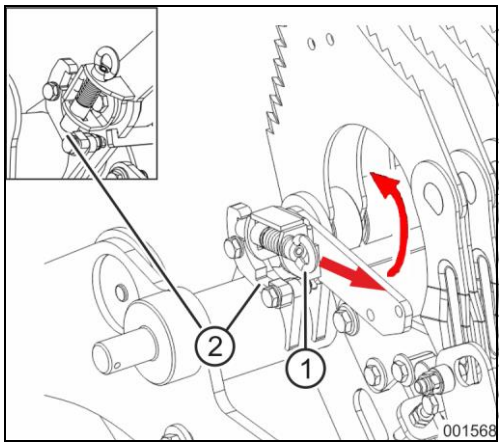


Fig. 231

1. Retract the cutting unit.
2. Lift the folding drawbar to increase the free space at the cutting unit beneath the machine.
3. Secure tractor and machine against accidental starting and rolling.
4. Fold down the knife cover,
   ► see section 10.11.1 Fold down knife cover, page 261
5. For unlocking the cutting knives, pull the ring nut with locking bolt (1) backwards and turn the hinge shaft with the locking lug upwards until the locking bolt engages in the notch (2).

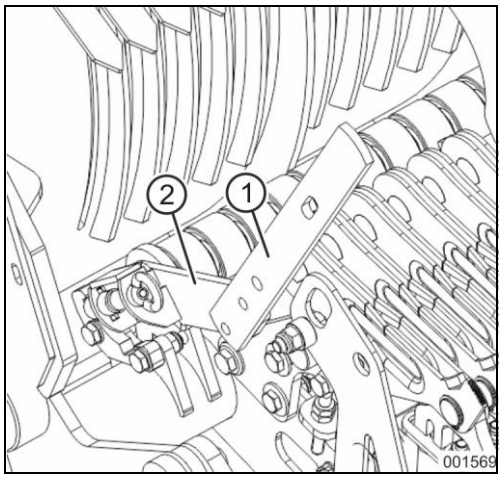


Fig. 232

The knife lever (1) can be inserted into the locking lug (2) to assist with unlocking and locking of the cutting knives.

The knife lever is included in the scope of delivery, see ► page 79

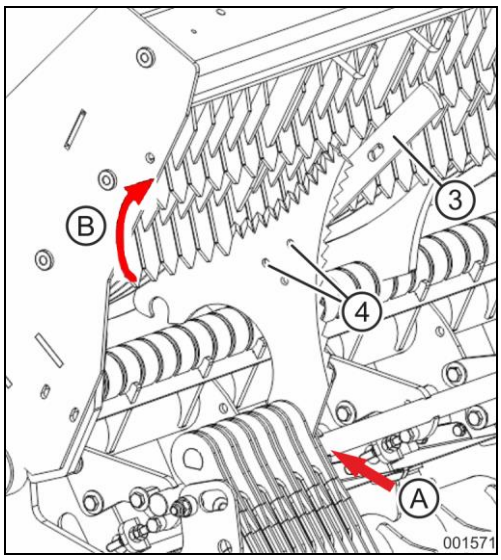


Fig. 233

6. Wear protective gloves.

NOTE

Use the release lever (3) to increase the power (pos. A).

The knife lever, article number 735346002, is mounted beneath the platform in a park position, see ► page 79.

7. Insert the knife lever (3) into the holes in the knife (4).
8. Slightly push the knife forwards (pos. A) and then swivel it backwards (pos. B).

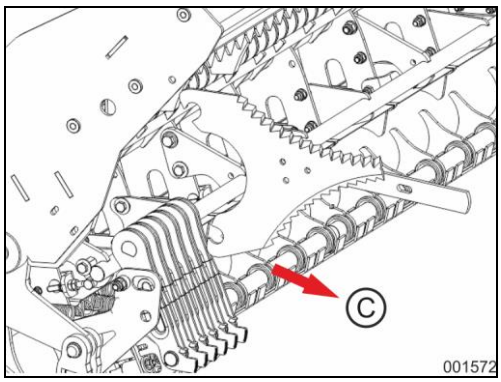


Fig. 234

9. Remove the knife to the rear (pos. C).

10.11.3.2 Install cutting knives

⚠ WARNING

Cutting unit

Risk of crushing and shearing when extending the cutting unit into the conveyor duct.

Do not extend the cutting unit into the conveyor duct if:

- people are standing beneath the machine.
- people can reach into the dangerous spots alongside the cutting unit.

Operative staff:

- Operator

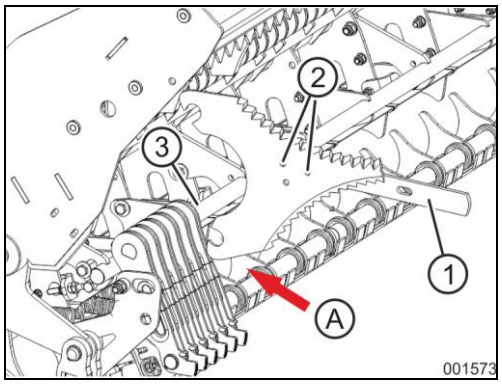


Fig. 235

1. Wear protective goggles.
2. Use compressed air to clean the slots for the cutting knives before installing them.
3. Insert the knife lever (1) into the holes in the knife (2).
4. Insert the knife into the knife holder (3) from behind (pos. A).

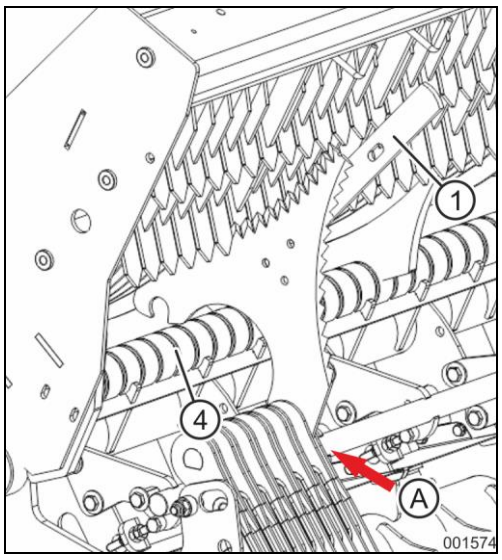


Fig. 236

5. Use the knife lever (1) to push the knife forwards onto the locking shaft (4).
6. Remove the knife lever (1) and fix it at the provided parking position.

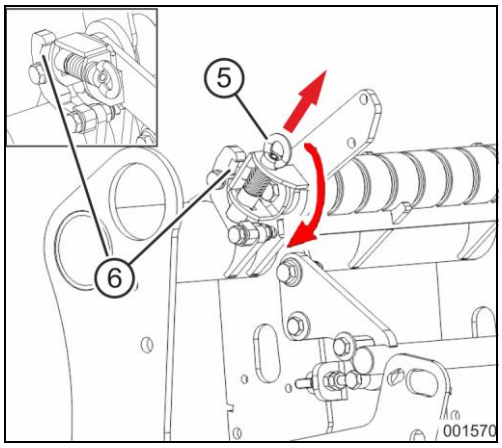


Fig. 237

7. Lock the cutting unit. Pull the ring nut with locking bolt (5) backwards and turn it downwards until the locking bolt (5) engages in the notch (6).
8. Fold the knife cover up.

10.11.4 Grind cutting knives

⚠ CAUTION

Sharp-edged cutting knives

Risk of cuts

- Wear cut-proof protective gloves.

⚠ CAUTION

Eye injuries due to abrasive particles

Flung-away abrasive particles and foreign objects may penetrate the eyes.

- Wear protective goggles.

NOTE

Sharp cutting knives:

- improve the cutting quality of the forage wagon.
- reduce the effort required for powering the conveying unit,
- reduce conveying unit wear,
- increase the service life of the forage wagon.

Operative staff:

- Operator

- Regularly check the cutting knives for sharpness.
- Turn blunt cutting knives over (every 12 service hours)

Operative staff:
- Qualified staff

- Regularly check the cutting knives for sharpness.
- Turn blunt cutting knives over (every 12 service hours) or grind them (every 24 service hours).

NOTE

Improperly ground cutting knives

Prefer knife grinding machine to hand grinding

- To grind cutting knives, use a knife grinding machine with corresponding mounting fixture (grinding template) for Strautmann knives.
- Use a flap grinding wheel when grinding by means of a right-anlge grinder.
- Only grind the cutting knives on their smooth side, never on their corrugated side.

10.11.5 Check distance between strippers and rotor

The minimum distance between the strippers and the rotor tube is 17 mm. The distance must not fall below this value over the entire rotor width.

Laterally, the strippers must be located centrally between the tine rows of the rotor.

The lower end of the strippers must be located between the webs of the tine rows of the rotor.

Reasons for a too small or too large distance between strippers and rotor are:
- worn or deformed strippers,
- deformed stripper holder.

ATTENTION

Incorrect distances between strippers, knives and rotor lead to increased wear and may cause considerable material damage.

Operative staff:
- Measure and check → Operator
- Set and replace → Qualified staff

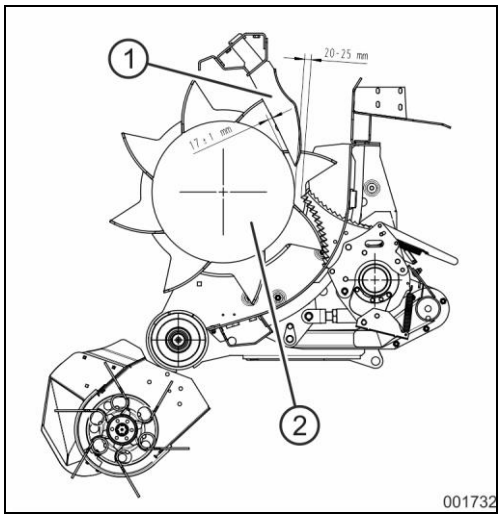


Fig. 238

1. Secure tractor and machine against accidental starting and rolling
2. Enter the cargo space through the access door.
3. Measure the distance between the strippers (1) and the rotor (2) in the conveyor duct from the cargo space.

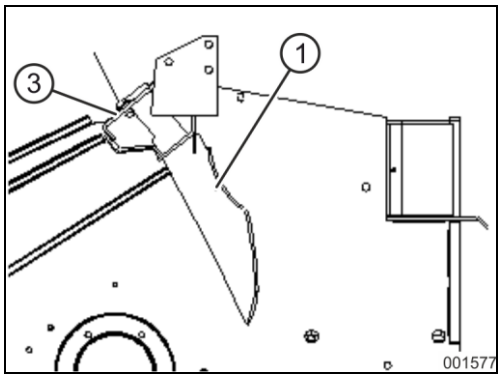


Fig. 239

4. If the measured value is not at least 17 mm, replace worn or deformed strippers as follows.
   - Loosen the screws of the safety rail (3).
   - Remove the safety rail (3) of the stripper holder by pulling it out to the front.
   - Remove worn strippers by pulling them out to the bottom.
   - Reinstall new strippers and safety rail in reverse order.

10.11.6 Set distance between cutting knives and rotor

NOTE

The distance between the cutting knife tips and the rotor tube must be 20-25 mm in the middle of the cutting unit. This distance ensures optimum cutting of the loaded material.

The cutting knives must not come into contact with the rotor.

Operative staff:

- Qualified staff

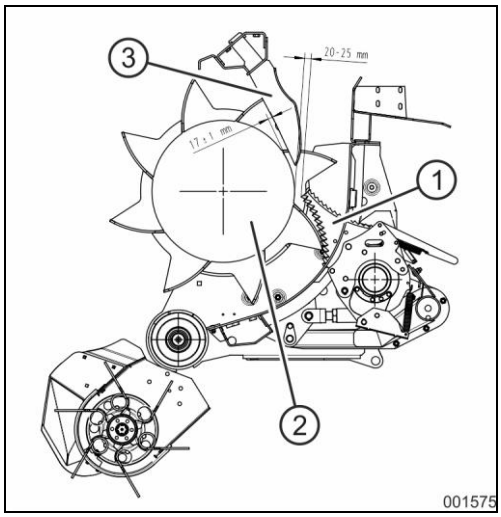


Fig. 240

1. Lift the folding drawbar to increase the free space to the cutting knives.
2. Secure tractor and machine against accidental starting and rolling
3. Enter the cargo space through the access door.
4. Measure the distance between the cutting knife tips (1) and the rotor tube (2) from the cargo space through the slots of the conveyor duct.
5. If the measured value is not 20-25 mm, correct the distance between the cutting knives and the rotor as follows.

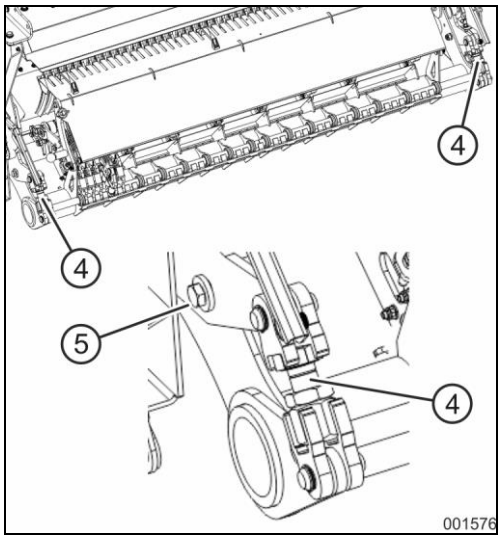


Fig. 241

6. Loosen the safety bolt (5).
   - Open the spindles (4) to increase the distance between cutting knives and rotor.
   - Close the spindles (4) to reduce the distance between cutting knives and rotor.

NOTE

The spindles must be set free of clearance, i.e. the cutting must not be able to settle.

7. Measure the distance between cutting knife tips and rotor tube again in the middle of the cutting unit to check the set distance.
8. Retighten the safety bolt (5).

10.11.7 Set "Cutting unit extended" sensor

⚠ WARNING

Accidental starting

Risk of crushing and shearing during setting of sensor if the machine is unintentionally powered or hydraulic functions are accidentally carried out.

- Before setting the sensor, secure tractor and machine against accidental starting and rolling.

Operative staff:

- Qualified staff

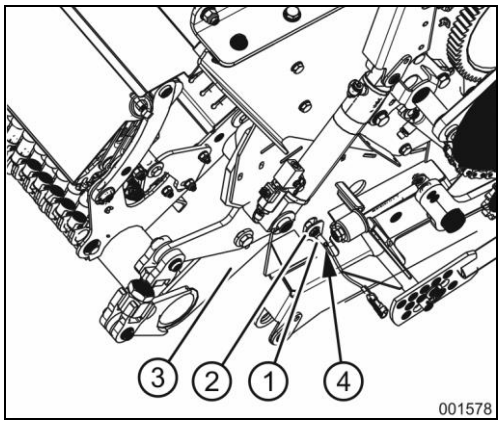


Fig. 242

1. Completely extend the cutting unit.
2. Switch the ignition of the tractor on.
3. Fix the "Cutting unit extended" sensor (1) in the holder (2) such that the distance between the sensor and the frame of the cutting unit (3) is approx. 2 mm.

   The light emitting diode (4) lights up and the "Cutting unit" symbol on the control set simultaneously changes from "Cutting unit retracted" position to "Cutting unit extended" position.
4. Screw the sensor in this position.

10.12 Transport floor

The chains of the transport floor:

- must be tightened equally, but not too firmly.
- are only allowed to sag slightly.
- must be regularly checked for proper tension.
- must be equally shortened if the tension path of the chain tensioners is no longer sufficient for retightening the chains.

In case of insufficient chain tension, the transport floor chain may skip at the chain wheel and bend the conveyor rails.

A too firm chain tension causes increased wear and may also cause damage such as breaking of the transport floor chain.

⚠ WARNING

Unexpected starting of transport floor

Risk of crushing, becoming entangled, wound up, being drawn in and trapped due to the transport floor unexpectedly starting

- Only enter the cargo space with the machine switched off.
- Only carry out work beneath the cargo space with the machine switched off.
- Secure the machine against accidental starting and rolling.

10.12.1 Check / Tighten transport floor chains

Operative staff:
- Operator

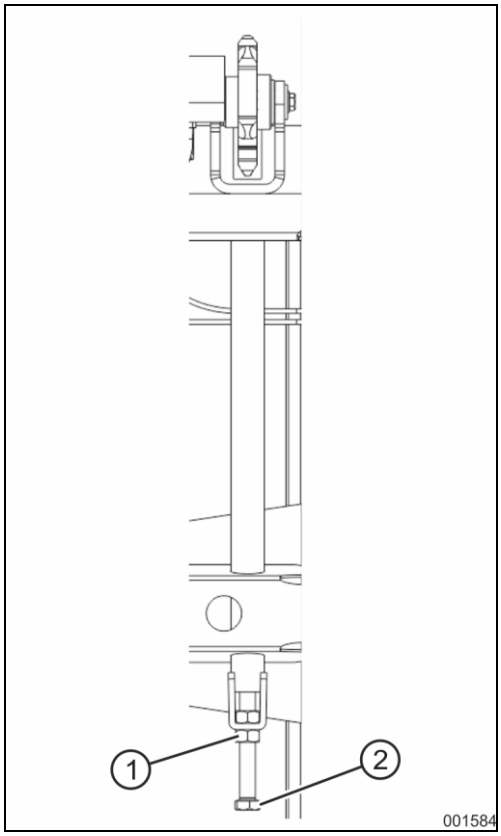


Fig. 243

5. Secure tractor and machine against accidental starting and rolling.
6. In the front area beneath the cargo space between conveying unit and chassis
- the chain tension can be checked best.
- the four chain tensioners for retightening the chains are mounted.

NOTE

It should be possible to move the transport floor chains with your hand up and down by 10 to 20 mm per metre of free-hanging chain.

In the event of insufficient chain tension:

7. Unscrew the counter nuts (1) of the clamping screws (2).
8. Turn the clamping screws clockwise.
   → The chain is tightened.
9. All chains must be tightened equally, but not too firmly.
10. Tighten the counter nuts.

Shorten the chains if the full screw-in depth of the clamping screws is reached.

10.12.2 Shorten / Tighten transport floor chains

- Regularly check chains for proper tension.
- Chains must not sag.

⚠ WARNING

Flung-away abrasive particles

Risk to eyes due to flung-away abrasive particles when cutting chain links using a right-angle grinder.
- Wear protective goggles when cutting the chain links using a right-angle grinder.

Operative staff:
- Qualified staff

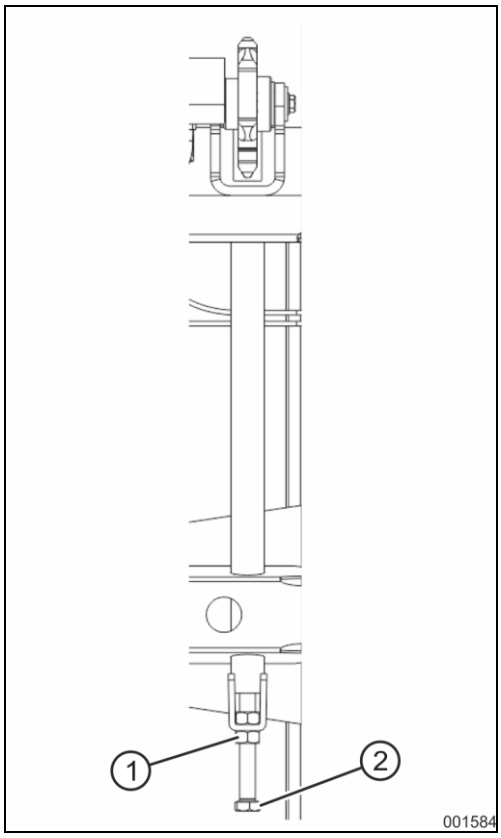


Fig. 244

1. Align the chains of the transport floor such that the chain connecting links are within the central and rear area of the cargo space.
2. Secure tractor and machine against accidental starting and rolling
3. Unscrew the counter nuts (1) of the clamping screws (2).
4. Turn the four clamping screws counterclockwise.

→ The chain tension is released and the chains sag.

5. Enter the cargo space through the access door to shorten the chains.
6. Open and remove the chain connecting links.
7. Always cut out an even number of chain links (2, 4, 6) at all chains by means of a right-angle grinder.
8. Put the shortened chains together by means of new chain connecting links.
9. Turn the four clamping screws clockwise.

→ The chains are tightened.

10. Check the screw-in depth of the clamping screws and the tension of the chains. The transport floor chains must be tightened equally, but not too firmly.
11. Tighten the counter nuts.
12. Exit the cargo space.
13. Close and lock the access door.
14. Lock the ladder.

10.13 Tailgate

10.13.1 Set "Tailgate closed" sensor

⚠ WARNING

Accidental starting

Risk of crushing and shearing during setting of sensor if the machine is unintentionally powered or hydraulic functions are accidentally carried out.

- Before setting the sensor, secure tractor and machine against accidental starting and rolling.

Operative staff:

- Qualified staff

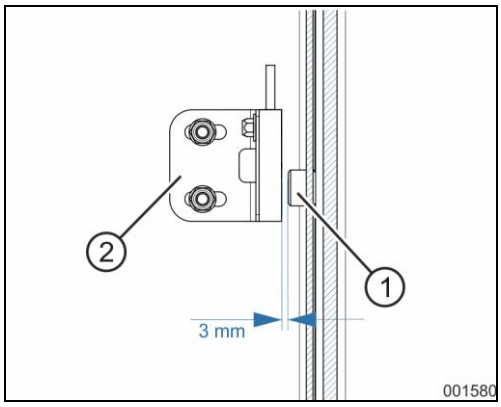


Fig. 245

1. Close the tailgate completely.
2. Fasten the sensor retaining plate (2) such that the distance between the sensor and the trip pad (1) is approx. 3 mm.

→ The light emitting diode lights up.

3. Screw the sensor in this position.

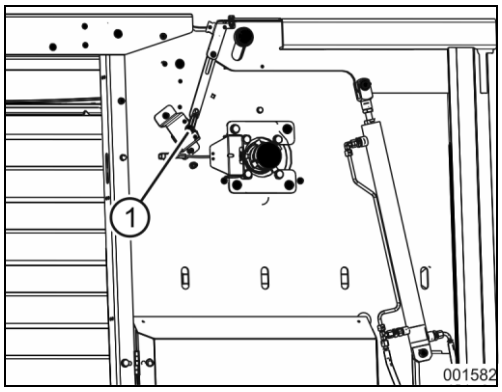


Fig. 246

10.13.2 Set "Tailgate open" sensor

The "Tailgate open" position and the opening angle of the tailgate are detected by the angle sensor (1).

10.14 Hydraulic system

10.14.1 Safety

Hydraulic components under pressure may perform uncontrolled movements in case of improper handling. Furthermore, medium may squirt out under high pressure from pressurised components in case of a malfunction. Risk of serious injuries or even death.

- Only an authorised workshop is allowed to carry out work on hydraulic components.
- Before carrying out any work,
  - depressurise; discharge residual energies.
  - make sure to prevent accidental outflow of the medium.
  - secure lifted movable machine parts against accidental lowering.
  - safely park the machine and secure it against accidental rolling and starting.

- Have all hose pipes checked for their operational safety by an expert at least once a year.
- Regularly check all pipes, hoses and screwed connections for leakage and visible damage. Eliminate damage immediately.
- Never try to plug hose pipe leaks with your hands or fingers. Media squirting out under high pressure may penetrate the skin and enter the body, potentially causing serious injuries.
- Never detect leakages with your bare hands. Immediately contact an authorised workshop if a leak is suspected.
- Immediately contact the medical services if injuries caused by hydraulic oil occur. Risk of serious infection.
- Risk of explosion due to improper work on hydraulic accumulators.
  - Welding, soldering, drilling or other work which might affect the mechanical properties is not allowed.

⚠ CAUTION

Risk of slipping due to leaking oil

Risk of slipping and falling to people due to leaking oil during topping-up of oil or oil change.

- Immediately remove oil spills by means of binding agents.

- Dispose of used oil properly.
- Ensure that no hydraulic oil penetrates the soil or waters.
- Observe the environmental protection rules.

10.14.2 Maintenance intervals

After the first 10 service hours and then every 50 service hours

Operative staff:

- Qualified staff

1. Check the hydraulic system for proper functioning, check components for tightness and proper pipe routing.
2. Retighten all screwed connections if necessary.

Before each start-up

Operative staff:
- Operator

1. Check hydraulic hose pipes for visible defects.
2. Remedy or have remedied defects immediately.
   – Eliminate chafing points at hydraulic hose pipes and tubes (qualified staff/authorised workshop).
   – Have worn, damaged or aged hydraulic hose pipes immediately replaced (authorised workshop).
3. Immediately remove dirt accumulations within the area of hydraulic components. Dirt binds humidity thus causing corrosion, leakages, unnecessary wear and premature failure of drive components.

10.14.3 Depressurise hydraulic system

WARNING

Risk of infection due to hydraulic oil squirting out

Hydraulic oil squirting out under high pressure may penetrate the skin and enter the body, potentially causing serious injuries. Risk of serious infection. This applies in particular to hydraulic systems with a membrane pressure accumulator.
- Never carry out work on the hydraulic system with the system under operating pressure.
- Depressurise the hydraulic system before carrying out work on the system.

- Relieve the respective hydraulic cylinder via the corresponding operating element with the hydraulic pump switched off.

10.14.4 Depressurise folding drawbar with drawbar suspension

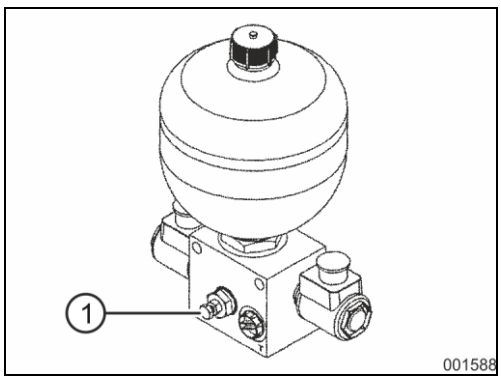


Fig. 247

1. Lower the folding drawbar completely.
2. Set the adjusting lever at the double-acting control device of the tractor to "Floating position" if a free return line is not available.
3. Loosen the plug screw (1).

→ The hydraulic oil flows through the free return line or the double-acting control device to the tractor.

10.14.5 Hydraulic hose pipes

Replace hydraulic hose pipes in case of damage and ageing.

Have hydraulic hose pipes immediately replaced by an authorised workshop if one of the following defects is detected:

- Damaged outer layer down to the liner (e.g. due to chafing points, cuts, cracks)
- Embrittled outer layer (visible by cracking of hose material)
- Unnatural deformations of the hydraulic hose pipe in depressurised as well as in pressurised state or when bent (e.g. separation of layers, blistering, pinches, kinks)
- Leaks
- Damaged, deformed or leaking fitting
- Hose slipping out of the fitting
- Corroded fitting which may affect the function and strength
- Improperly laid hydraulic hose pipes, e.g. ignored bending radii, laying over sharp edges
- Hydraulic hose pipe is older than six years

The period of use of the hydraulic hose pipes must not exceed six years, including a maximum possible shelf life of two years.

Even when properly stored and exposed to admissible stress, hoses and hose connections are subject to natural ageing, which involves a limited shelf life and period of use. Notwithstanding these facts, the period of use may be specified according to experience, in particular taking into account the risk potential.

For thermoplastic hoses and hose pipes, other reference values may be relevant.

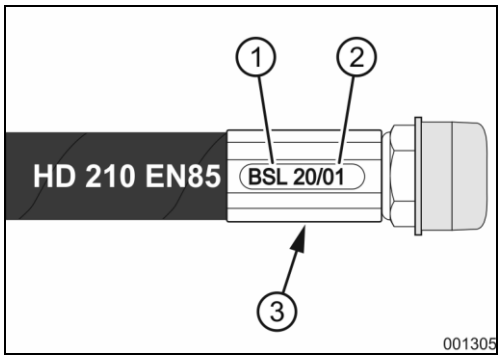


Fig. 248

Markings:

1 Manufacturer (BSL)

2 Date of manufacture (20/01 = year/month = January 2020)

3 Maximum admissible operating pressure (210 bar)

NOTE

After expiration of the period of use, the hydraulic hose pipe must no longer be used.

10.14.5.1 Install and remove hydraulic hose pipes

Operative staff:

- Authorised workshop

- Only use original hydraulic hose pipes of the manufacturer.
- Ensure cleanliness.
- Install hydraulic hose pipes such that in any operating state
  - there is no tensile stress, except for that due to the dead weight.
  - there is no upsetting stress in case of short lengths.
  - the bending radii do not fall below the admissible limits.
  - external mechanical influences on the hydraulic hose pipes are avoided.
- Make sure to avoid chafing of hydraulic hose pipes against components or against each other by suitable arrangement and fixing.
- Protect hydraulic hose pipes by means of protective coatings if necessary.
- Cover sharp-edged components.
- When connecting a hydraulic hose pipe to moving parts, the hose length must be such that
  - in the complete range of motion the bending radius does not fall below the minimum admissible limit.
  - the hydraulic hose pipe is not subject to tensile stress.
- Fix the hydraulic hose pipes to the specified fixing points. Avoid additional hose supports which affect the natural motion and length variation of the hydraulic hose pipes.
- Overcoating of hydraulic hose pipes is not allowed.

10.14.6 Replace hydraulic filter

⚠ WARNING

Risk of infection due to hydraulic oil squirting out

Hydraulic oil squirting out under high pressure may penetrate the skin and enter the body, potentially causing serious injuries. Risk of serious infection.

- Never replace the hydraulic filter when the hydraulic system is pressurised.
- Only replace the hydraulic filter when the hydraulic system of the machine is not connected to the tractor.

Operative staff:

- Authorised workshop

- Have the filter element replaced by an authorised workshop according to the maintenance plan. Then as necessary, at least every 1,000 service hours.
- The filter is equipped with a bypass. If the filter element is contaminated, the oil flows to the hydraulic control block in unfiltered condition and may damage it.
  – Soiled filters cause stronger heating-up of oil.

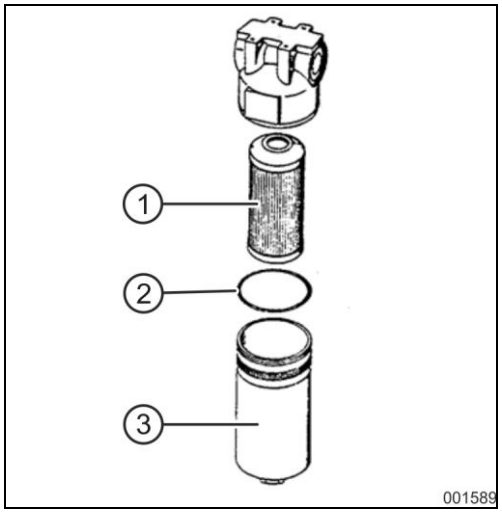


Fig. 249

1. Depressurise the machine.
2. Disconnect the hydraulic system of the machine from the tractor.
3. Unscrew the filter casing (3) from the filter head.
4. Pull off the soiled filter element (1).
5. Clean the filter casing.
6. Grease the thread at the filter casing.
7. Check the O-ring (2) for damage and replace it if necessary (Ø 67.95 mm x 2.62 mm).
8. Lubricate the O-ring of the new filter element.
9. Slip the new filter element on as far as it will go.
10. Screw the filter casing into the filter head as far as it will go and turn it back by a one quarter of a turn.
11. Switch the hydraulic system on and bleed the filter at an appropriate point.
12. Check the filter for leaks.

10.15 Tyres

Assembly and repair work on tyres and wheels requires expert knowledge and appropriate tools.

Operative staff:
- Authorised workshop

10.15.1 Safety

As a basic principle, the following is applicable:
- Park the machine on firm, even ground.
- Safely park the machine and secure it against accidental rolling.
- Use lifting equipment with sufficient lifting power to lift the machine.
- Lift the machine only at the marked fixing points.
- Secure the lifted machine/machine parts against accidental lowering.
- Deflate the tyre before removing it.
- Relieve the tyres if the vehicle is not intended to be used for a longer period, thus avoiding deformation of the tyres.

- Store removed tyres in a dark place, free of oil and other chemicals.
- Do not place tyres near electric motors. The ozone produced by the electric motors slowly desiccates the rubber.
- Never overload the tyres.

10.15.2 Check tyres

Check the condition of the tyres and the tyre pressure every day.

Tyre pressure, ► page 51or documentation of tyre manufacturer.

Operative staff:

- Operator

1. Visually check tyres for damage.
   – Remove foreign objects stuck in the tyre.
   – Have damaged, worn or too old tyres replaced by an authorised workshop.
2. Check tyre pressure and refill if necessary.
   – Keep to the side of the wheel when refilling. A compressed-air hose with a length of approx. 1.5 m between the tyre valve and the air pistol makes work easier.

⚠ WARNING

Burst of tyres.

Do not exceed the maximum admissible tyre pressure.

3. Check whether the caps are firmly seated on the valves.

10.15.3 Change wheel / tyres Tighten wheel nuts

Tighten all wheel nuts according to instructions.

Operative staff:

- Qualified staff

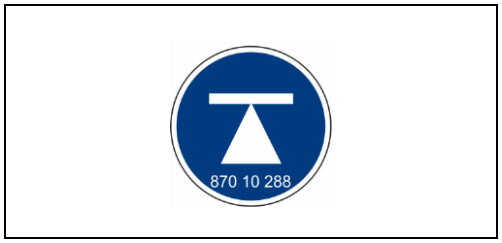


Fig. 250

1. Park the machine on an even, paved surface and secure it against accidental starting and rolling.
2. Place the lifting device at the marked fixing points.
3. Lift the machine.

   ⚠ WARNING – Risk of crushing limbs due to unintentional lowering. Do not stand beneath the lifted machine.

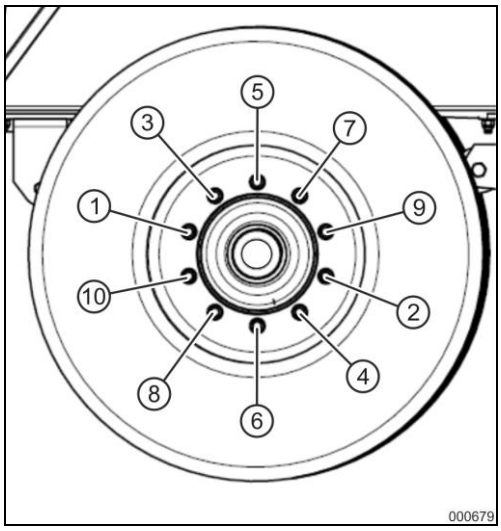


Fig. 251

4. Unscrew the wheel nuts.
   – Keep to the order, always loosen the opposite wheel nut, see numbering.
5. Change the wheel.
6. Tighten the wheel nuts.
   – Use a torque wrench to tighten the wheel nuts crosswise, see numbering.
   – Observe the tightening torque,
   ► see section 10.3.2 Wheel nuts, page 236
   – The threads must be clean, undamaged, free of grease and smooth-running.
   – Check the wheel nuts ten hours after completion of assembly and retighten them if necessary. Then check them every 50 service hours for firm seating.

ATTENTION

Risk due to incorrect settings

Exclusively mount tyres approved by the manufacturer.

When changing the tyre size, have the traffic-related equipment such as the splash guard system, warning plates, lighting, underride guard and the brake system checked for proper setting by qualified staff and adapted if necessary, even if the tyre combination is already included in the vehicle registration documents.

10.16 Brake system

10.16.1 Check brake system for proper functioning

As a basic principle, the operator has to check the brake system for proper functioning before each start-up of the machine.

Immediately contact an authorised workshop in case of irregularities or malfunctions of the brake system.

- Have the brake system checked by an authorised workshop for proper functioning every 250 service hours.
- Have the brake readjusted if the free travel of the brake linkage is more than 12 % of the brake lever length.

Functional check, compressed-air brake system:

- The compressed-air brake system is considered as tight when the pressure loss is equal to or less than 0.2 bar within 5 minutes.
- In case of full brake application, the max. admissible pressure loss is 0.7 bar.

10.16.1.1 Drain compressed-air reservoir

⚠ WARNING

Contact with contaminated liquid

The liquid in the compressed-air reservoir is under high pressure.

- Do not stand directly beneath the compressed-air reservoir when draining.
- Wear personal protective equipment.

Drain the compressed-air reservoir every day before the first journey.

Operative staff:

- Operator

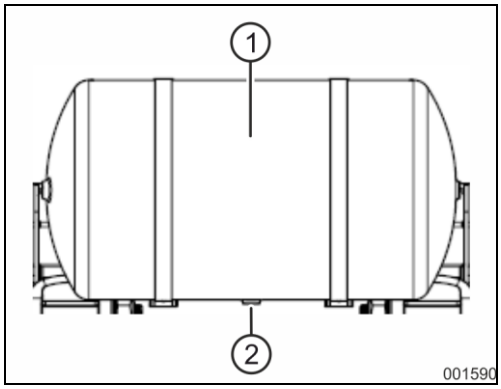


Fig. 252

1. Take the ring (2) and pull the drain valve of the compressed-air reservoir (1) down.
2. Pull until water is no longer pouring out of the compressed-air reservoir.

10.16.1.2 Check and clean filters

The filters incorporated in the hose couplings of the brake and feed line protect the compressed-air brake system from being soiled by solid particles.

The air supply to the brake system should have priority over the protection of the brake system against soiling and must be ensured in all conditions. In case of the filter element being clogged due to soiling, an internal bridging-over element opens and unfiltered air passes through the hose coupling.

- Regularly check the degree of soiling of the filter elements in the hose couplings.
- Clean heavily soiled filter elements approx. every 3-4 months, depending on the operating conditions.
- Replace damaged filter elements.

Operative staff:

- Qualified staff

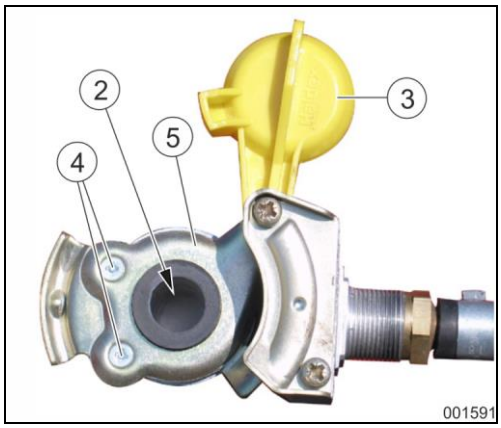


Fig. 253

1. Secure tractor and machine against accidental starting and rolling.
2. Disconnect the feed and brake line from the tractor.
3. Open the lid (3).
4. Remove the two Phillips screws (4).
5. Open the cover (5) by swivelling.
6. Remove the filter element (2) from the hose coupling.
7. Rinse the filter element with benzene or thinner.
8. Use compressed air to blow the filter element dry.
9. Reinsert the filter element into the hose coupling.
10. Close the cover.
11. Screw the cover by means of the two Phillips screws.
12. Connect the feed and brake line to the tractor.
13. Check the in-line filters for tightness.

10.17 Axles

10.17.1 Check brake linings

Operative staff:
- Operator

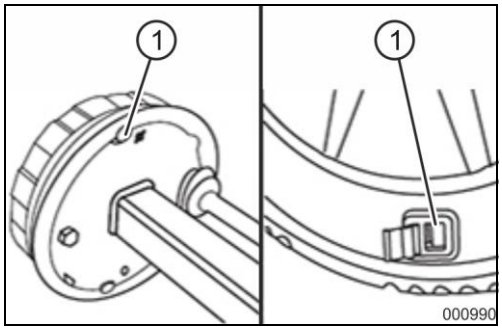


Fig. 254

1. Secure tractor and machine against accidental starting and rolling
2. Open the inspection hole (1).
   – Pull the rubber plug out (if available).
3. Check the brake linings.
   Replace the brake linings when the wear mark is reached or in case of a remaining lining thickness of:
   – 5 mm in case of riveted linings
   – 3 mm in case of glued linings
4. Have the brake linings replaced by an authorised workshop if necessary.
5. Reinsert the rubber plug after the check.

10.17.2 Lubricate brake shaft bearing

Operative staff:
- Operator

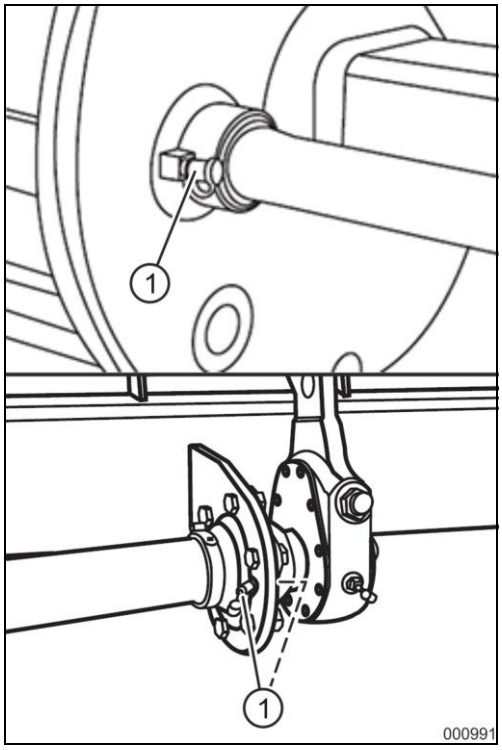


Fig. 255

1. Secure tractor and machine against accidental starting and rolling
2. Lubricate the outer and inner lubrication points (1) with long-life grease until fresh grease comes out of the bearings.
   – Only use lithium-saponified grease with a drop point above 190°C.

NOTE

Depending on the series, the cam bearing may not be sealed on the brake side.

Make sure that no grease or oil enters the brake system.

10.17.3 Lubricate manual slack adjuster

Operative staff:
- Operator

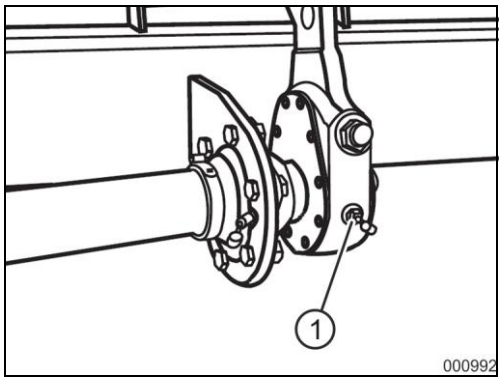


Fig. 256

1. Secure tractor and machine against accidental starting and rolling
2. Lubricate the lubrication points (1) with long-life grease until fresh grease comes out of the bearings.
   – Only use lithium-saponified grease with a drop point above 190°C.

10.17.4 Lubricate automatic slack adjuster

Operative staff:

- Operator

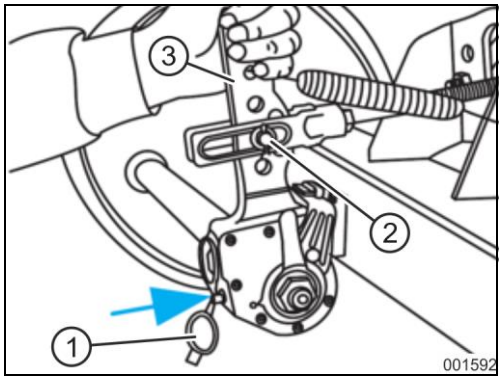


Fig. 257

1. Secure tractor and machine against accidental starting and rolling
2. Remove the rubber cap (1).
3. Lubricate the lubrication points (arrow) with long-life grease (80 g) until fresh grease comes out of the bearings.
   – Only use lithium-saponified grease with a drop point above 190°C.
4. Use a ring wrench to turn the adjusting screw (2) back by about one turn.
5. Manually actuate the brake lever (3) several times.
   – Automatic readjustment must be easy. Actuate the brake lever again several times if necessary.
6. Retighten the adjusting screw.
7. Mount the cap.

10.17.5 Check and set manual slack adjuster

The free travel X of the brake cylinder should be approx. 10-12% of the brake lever length.

Example:

Brake lever length 150 mm = Free travel 15-18 mm

The brake lever length is measured between the centre of the brake shaft and the articulation point of the brake cylinder.

The braking power is transferred 100% if the brake cylinder and the brake lever are positioned in an angle of 90° to one another when the brake is actuated. If the angle is less than 90° with the brake actuated, the braking power is reduced.

Functional check:

1. Manually actuate the slack adjuster in pressing direction.
2. Have the wheel brake readjusted if the free travel X of the brake cylinder exceeds 12 % of the brake lever length.
3. Have the wheel brake readjusted if the angle between the cylinder push rod and the slack adjuster is less than 90°.

Operative staff:

- Authorised workshop

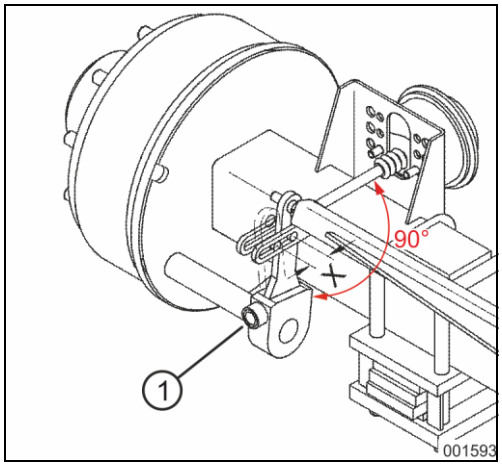


Fig. 258

1. Secure the machine against accidental starting and rolling by means of chocks and the parking brake of the tractor.
2. Release the service and parking brake of the tractor.
3. Disconnect the lines of the machine's brake system.
4. Depressurise the machine's brake system. (Set release valve of compressed-air brake system to manoeuvring mode.)
5. Press the circlip down and turn the adjusting screw (1) clockwise to align the slack adjuster with the brake cylinder clevis.
6. Turn the adjusting screw back counterclockwise and set the free travel X to 10-12% of the brake lever length.
7. The angle between the slack adjuster and the cylinder push rod must now be 90° ± 10° with the brake actuated.

10.17.6 Check automatic slack adjuster

Operative staff:

- Authorised workshop

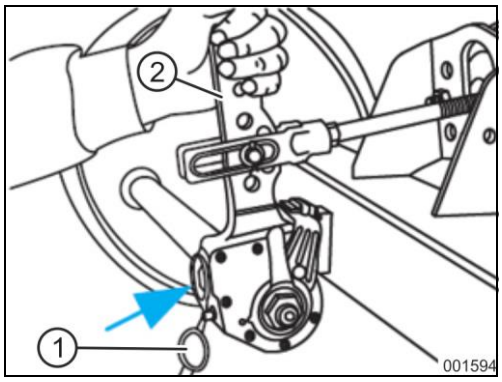


Fig. 259

1. Secure tractor and machine against accidental starting and rolling
2. Remove the rubber cap (1).
3. Use a ring wrench to turn the adjusting screw (arrow) back counterclockwise by about 3/4 of a turn.

   At a lever length of 150 mm, the minimum free travel must be 50 mm.
4. Manually actuate the brake lever (2) several times. The automatic readjustment must be easy.
   – The gear coupling must audibly engage and the adjusting screw slightly turns clockwise during the return stroke.
5. Retighten the adjusting screw.
6. Mount the cap.

10.17.7 Lubricate knuckle arm bearing

Operative staff:
- Operator

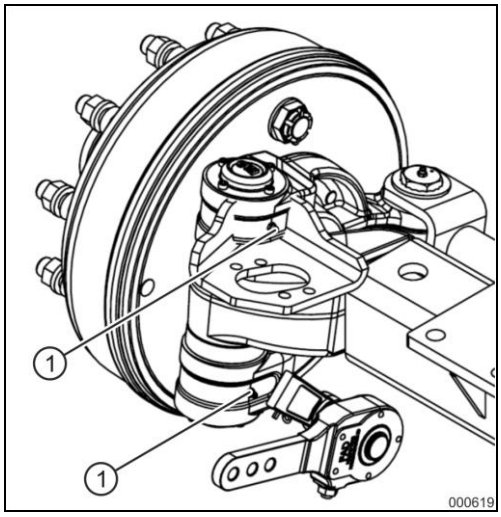


Fig. 260

1. Secure tractor and machine against accidental starting and rolling
2. Lubricate the lubrication points (1) at the top and bottom of the knuckle arm bearing with long-life grease until fresh grease comes out of the bearings.
   – Only use lithium-saponified grease with a drop point above 190°C.

10.17.8 Check play of wheel hub bearing

Operative staff:
- Qualified staff

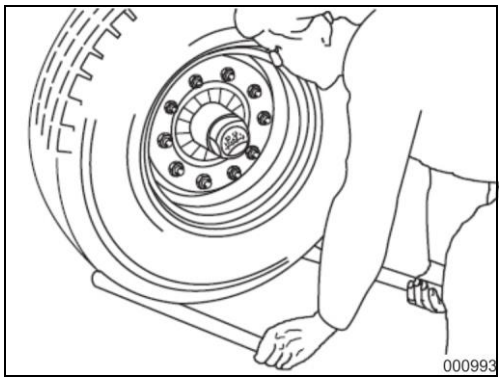


Fig. 261

1. Park tractor and machine on an even surface and secure them against accidental starting and rolling.
2. Place the lifting device (jack) at the marked fixing points.
3. Lift the axle only until the tyres clear the ground.
4. Release the brake of the machine.
5. Place two levers between tyres and ground and check the bearing play.
   – Have the bearing readjusted by an authorised workshop if there is a noticeable bearing play.

10.17.9 Adjust bearing play of wheel hub bearing

Operative staff:
- Qualified staff

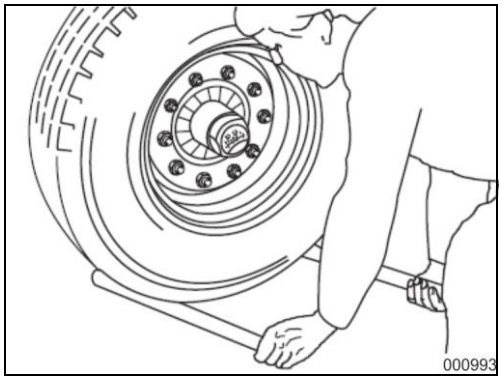


Fig. 262

1. Secure tractor and machine against accidental starting and rolling
2. Place the lifting device (jack) at the marked fixing points.
3. Lift the axle only until the tyres clear the ground.
4. Release the brake.
5. Remove the grease cap and the split-pin.
6. Screw on the hub axle nut until the run of the hub slightly stops.
7. Unscrew the hub axle nut up to the next split-pin hole.
8. Secure the hub axle nut against accidental loosening by means of a split-pin.
9. Check the run.
10. Fill the grease cap with fresh grease and reinsert it.

10.18 Chassis

10.18.1 Lubricate spring bearing

Operative staff:
- Operator

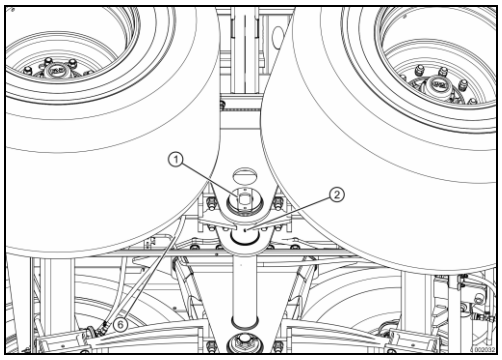


Fig. 263

1. Secure tractor and machine against accidental starting and rolling.
2. Lubricate the lubrication points (2) at the spring bearing (1) on both sides with long-life grease (80 g) with the machine empty until fresh grease comes out of the bearings.
   – Relieve the chassis by lifting using a suitable jack if necessary. (Authorised workshop)
   – Only use lithium-saponified grease with a drop point above 190°C.

10.18.2 Lubricate bearing of chassis cylinders

Operative staff:

- Operator

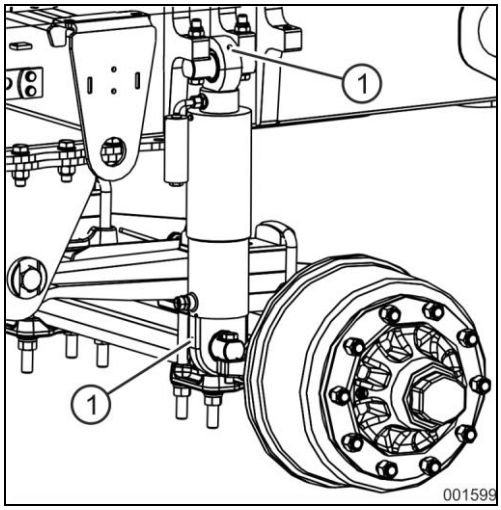


Fig. 264

1. Secure tractor and machine against accidental starting and rolling.
2. Lubricate the lubrication points (1) with long-life grease (80 g) at the top and bottom of the chassis cylinder with the machine empty until fresh grease comes out of the bearings.
   - Relieve the chassis by lifting using a suitable jack if necessary. (Authorised workshop)
   - Only use lithium-saponified grease with a drop point above 190°C.

11 Spare parts

This chapter provides basic information on the procurement of spare parts, auxiliary materials and consumables required for the proper execution of maintenance and repair work.

Immediately replace machine components which are not in perfect condition, in order to ensure faultless function and operational safety as well as a long service life of the machine.

ATTENTION

The manufacturer will not assume any liability for damage resulting from the use of non-approved parts or auxiliary materials and consumables or from repair work carried out improperly.

Have maintenance and repair work carried out by qualified staff of an authorised workshop.

In case of replacement, only use original parts or parts approved by the manufacturer. Use of other parts not meeting the technical specifications of the manufacturer may cause damage.

- Order and sale of spare parts are handled by authorised workshops and Strautmann dealers.
- It is imperative to indicate the data of the front page or of the spare parts list when ordering spare parts:
  - Machine ID number
  - Spare parts list number (if available)
  - Article number (if available)
  - Article designation
  - Quantity
- The manufacturer recommends to stock spare and wearing parts according to the spare parts list, in order to reduce or avoid standby and downtimes in case of a malfunction.
- Our machines and spare parts are constantly being further developed. Therefore, modifications in the spare parts lists or to the spare parts on offer may occur.
- For continuous up-to-date information and spare parts lists, please refer to our online spare parts catalogue.
- Furthermore, our online spare parts catalogue offers you a lot of useful functions such as filtering according to machine type, year of manufacture and equipment options to obtain a reliable and quick selection of the desired parts.
- Our online catalogue is available at www.Strautmann.com under the menu items Service – Ersatzteilservice (Spare parts service) – Ersatzteil Onlinekatalog (Online spare parts catalogue).

12 Other relevant documents

This chapter describes which relevant records and documents are available beyond the original operating instructions, where to find them or how to procure them.

ATTENTION

The manufacturer will not assume any liability for damage caused by repairs and settings resulting from insufficiently qualified staff, lack of expertise, missing documents or false information.

Only adequately qualified and trained staff is allowed to carry out work on the electrical and hydraulic systems.

Other relevant documents for repair and setting work are:

- Workshop manual,
- circuit diagrams,
- repair and assembly instructions,
- tutorial videos
- sub-supplier documentation.

Other relevant documents can be requested from authorised workshops, authorised Strautmann dealers or from the Strautmann customer service.

To ensure that enquiries can be processed as quickly and efficiently as possible, the following information is required:

- Machine number
- Brief description of problem
- Contact (name, company, customer number)
- Phone number
- E-mail address

NOTE

We recommend to attend a Strautmann service training. The "Other relevant documents" are part of the training material.

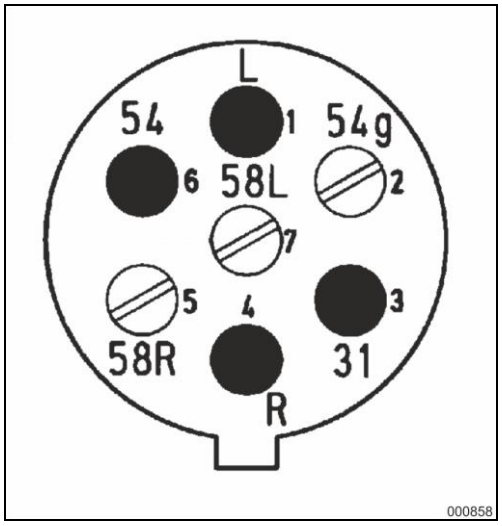


Fig. 265

12.1 Connection, lighting

Line	Number	Designation
1	L	Indicator, left-hand
2	54g NS	Rear fog light or not assigned
3	31	Ground
4	R	Indicator, right-hand
5	58R	Right-hand rear light, clearance lamp, front position light and licence plate light
6	54	Brake light
7	58L	Left-hand rear light, clearance lamp, front position light and licence plate light

Tab. 40: Connection, lighting

12.2 Connection, additional electrical loads

ATTENTION

Risk due to overload of electrical systems

- Do not connect any additional loads to the control set.

– For additional loads, we offer an additional control which triggers these additional loads via relay.

13 Index

Verfasser	Freigeber	Freigabedatum	Sprache
Eva Hoppe	B. Wegmann	24.10.2023	englisch

	Zuordnung
Produktgruppe	Forage wagon
Warengruppe	Warengruppe
Modell	Magnon 8-370 - 8-450 (DO), 10-430 - 10-530 (DO) Continuous-Flow-System