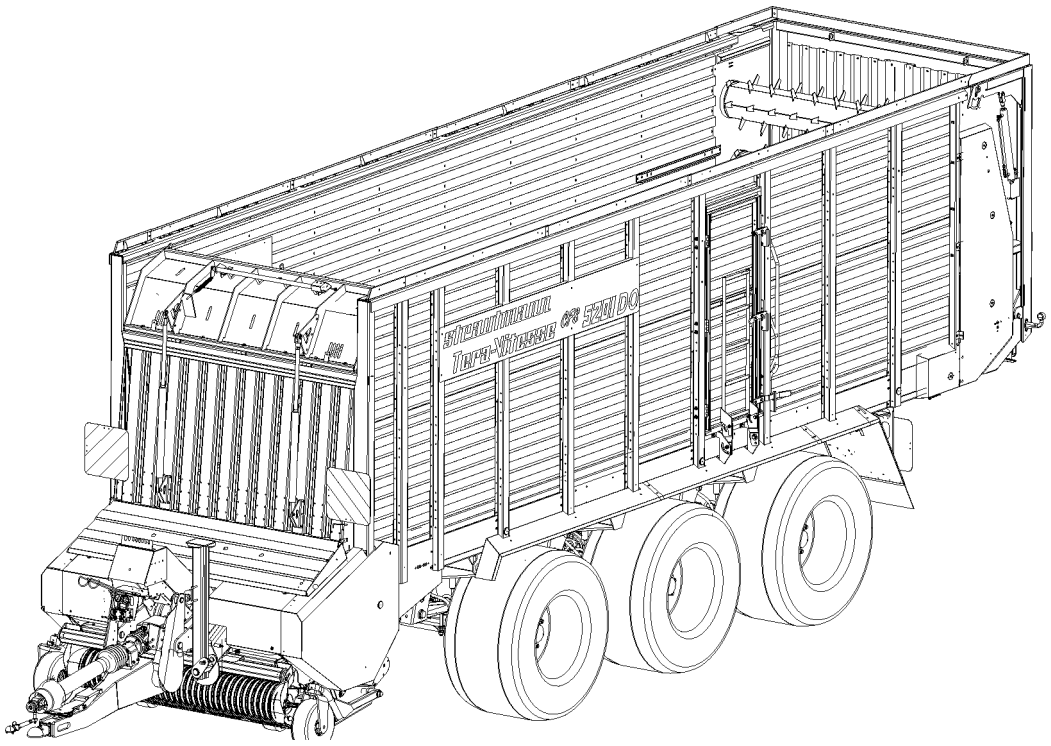
Translation of the Original Operating Instructions

Short-cut forage wagon
Short-cut forage wagon with dosing unit

Tera-Vitesse CFS 4201-5201
Tera-Vitesse CFS 4201 DO-5201 DO



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11.14

EN

EC Declaration of Conformity

according to the EC machinery directive 2006/42/EC, Annex II, 1.A

Manufacturer:
B. Strautmann & Söhne GmbH u. Co. KG
Bielefelder Str. 53
D-49196 Bad Laer

Legal person established within the EC and authorized 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:	Short-cut forage wagon / Short-cut forage wagon with dosing unit
Function:	Cutting, charging, transport and distribution of green and dried-out forage
Model:	Tera-Vitesse CFS / Tera-Vitesse CFS DO
Type:	Tera-Vitesse CFS 4201-5201, Tera-Vitesse CFS 4201 DO-5201 DO
Vehicle/Machine ID number:	W09736000_0S38001 - W09743000_0S38999
Trade name:	Tera-Vitesse CFS / Tera-Vitesse CFS DO

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

2006/42/EC:2006-05-17	EC machinery directive 2006/42/EC
2004/108/EC:2004-12-15	(Electromagnetic compatibility) Directive 2004/108/EC of the European Parliament and the Council dated 15 December 2004 for approximation of laws of the member states on the electromagnetic compatibility and for repeal of directive 89/336/EEC

Bad Laer, 07.01.2014

R. Kleine Niesse
Chief Designer
Vehicle Technology

Dr. J. Marquering
Head of Development

Dipl.-Kfm. W. Strautmann
Managing Director

Identification data

Please enter the machine's identification data here. They are registered on the type plate.

Manufacturer: B. Strautmann & Söhne GmbH u. Co. KG

Vehicle/Machine ID number: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Type:

Year of manufacture:

Manufacturer's address

B. Strautmann & Söhne GmbH u. Co. KG

Bielefelder Straße 53

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Phone: + 49 (0) 5424 802-0

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Spare parts order service

B. Strautmann & Söhne GmbH u. Co. KG

Bielefelder Straße 53

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Phone: + 49 (0) 5424 802-30

Fax: + 49 (0) 5424 802-64

E-mail: parts@strautmann.com

Spare parts catalogue online: www.strautmann-elise.de

Please always refer to the vehicle/machine ID number of your machine when ordering spare parts.

Formal information about the operating instructions

Document number: 73500907 a.000

Date of compilation: 11.14

Foreword

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! Check the delivered machine for its 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 included operating instructions for individual machine components before the first start-up; in case of doubt, the details and information contained in such sub-supplier documentation shall prevail! In particular observe the safety instructions, thus being able to fully benefit from the advantages of your recently acquired machine.

Please make sure that all operators of the machine have read these operating instructions before starting the machine.

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

Contents

1 User information

The chapter “User information“ provides information about how to use the operating instructions.

1.1 Purpose of document

These operating instructions:

- describe the operation, service and maintenance of the machine,
- provide important information about safety-conscious and efficient handling of the machine.

Please contact us for further inquiries.

1.2 Keeping of operating instructions

The operating instructions are part of the machine. Therefore, keep these operating instructions:

- always in the immediate vicinity of the machine or in the tractor,
- for further use.

Hand these operating instructions over to the buyer when the machine is sold.

1.3 Location details in the operating instructions

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

1.4 Applied modes of specification

Instructions and responses

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

Example:

1. Instruction 1

→ Response of machine to instruction 1

2. Instruction 2

Lists

Lists without predetermined order are specified as lists with bullet points.

Example:

- Item 1
- Item 2

Position numbers in figures

Numbers in parentheses refer to position numbers in figures. The first number refers to the figure, the second number to the position number in the figure.

Example (Fig. 3/6):

- Figure 3
- Position 6

1.5 Applied terms

Term	The term means
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	… Short-cut forage wagon / Short-cut forage wagon with dosing unit Tera-Vitesse CFS 4201-5201, Tera-Vitesse CFS 4201 DO-5201 DO.
operating element	… the component of an operating element system 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.

2 Product description

This chapter includes

- comprehensive information about the machine design,
- the designations of the individual assemblies and operating elements.

Please read this chapter in the immediate vicinity of the machine if possible, thus acquainting yourself with the machine in the best possible way.

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.

2.1 Overview – Assemblies

Illustration of the machine and identification of essential elements.

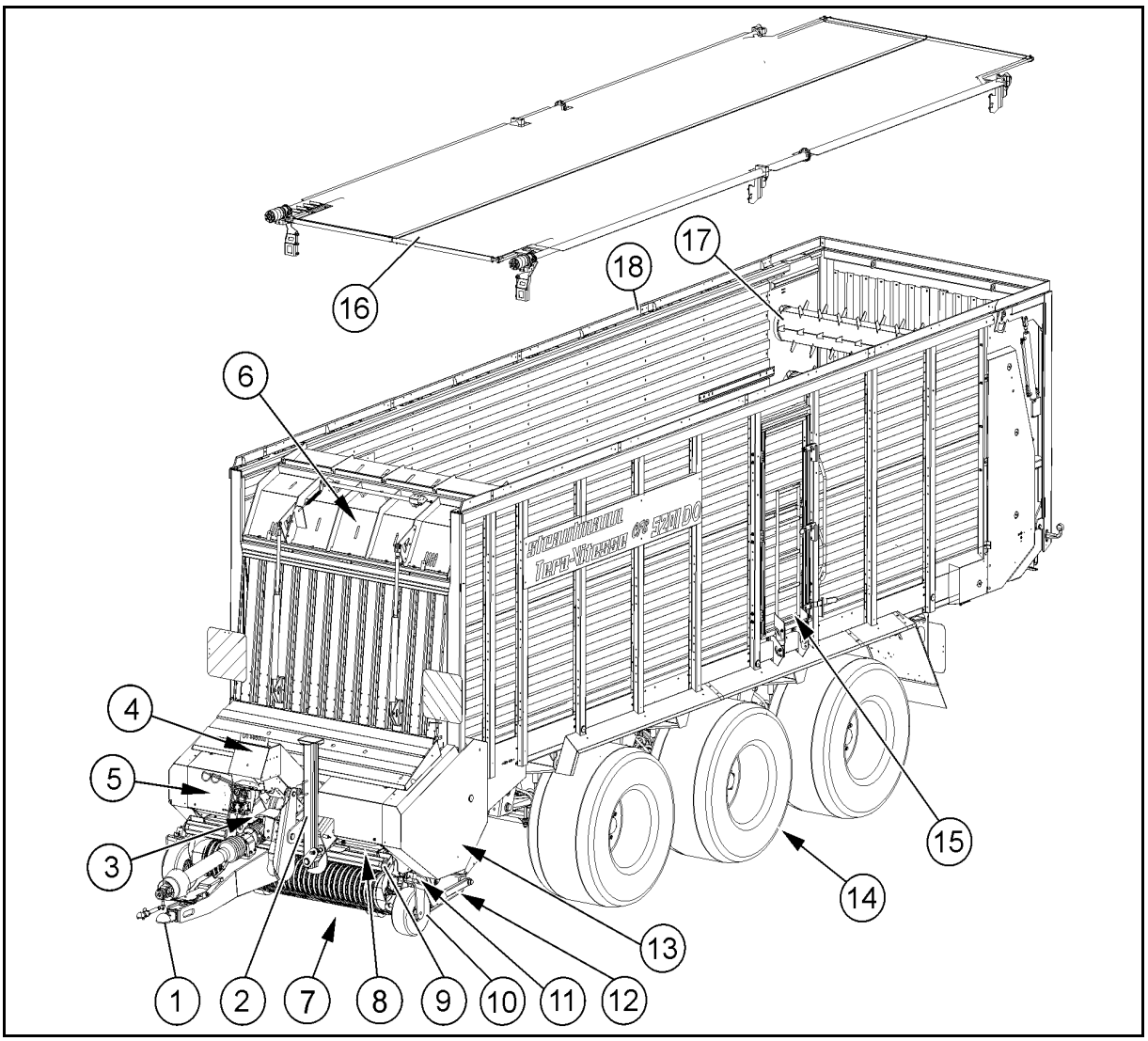


Fig. 1

(1) Drawbar
(2) Supporting leg
(3) Main gearbox
(4) Electro-hydraulic control block
(5) Conveying unit
(6) Hinged automatic charging system (Front panel)
(7) Pick-up
(8) CFS drum
(9) Holding-down device with pulley
(10) Roller feeler
(11) Chain drive, CFS drum
(12) Additional roller feeler
(13) Rotor gear
(14) Chassis
(15) Access door and ladder
(16) Covering system
(17) Dosing drums
(18) Body

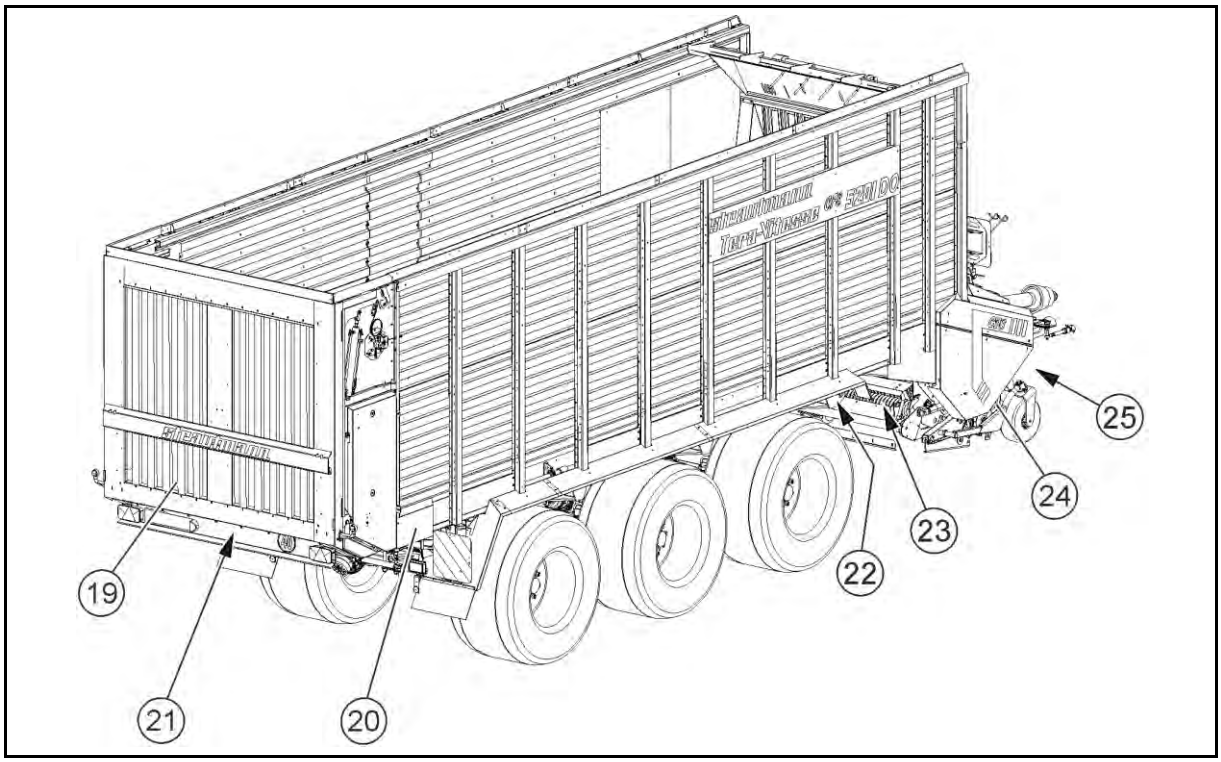


Fig. 2

(19) Tailgate

(20) Rear angular gear, dosing unit

(21) Feed gearing, transport floor

(22) Parking brake

(23) Cutting unit

(24) Angular gear CFS

(25) Angular switchgear

2.2 Safety and protective devices

This chapter shows the location of the properly installed protective devices in protective position.

WARNING

Risk to people of being crushed, drawn in and becoming entangled due to unprotected powered driving elements during machine operation!

- Start the machine only with the protective devices completely mounted.
- 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.

  Close open protective devices before powering the machine.

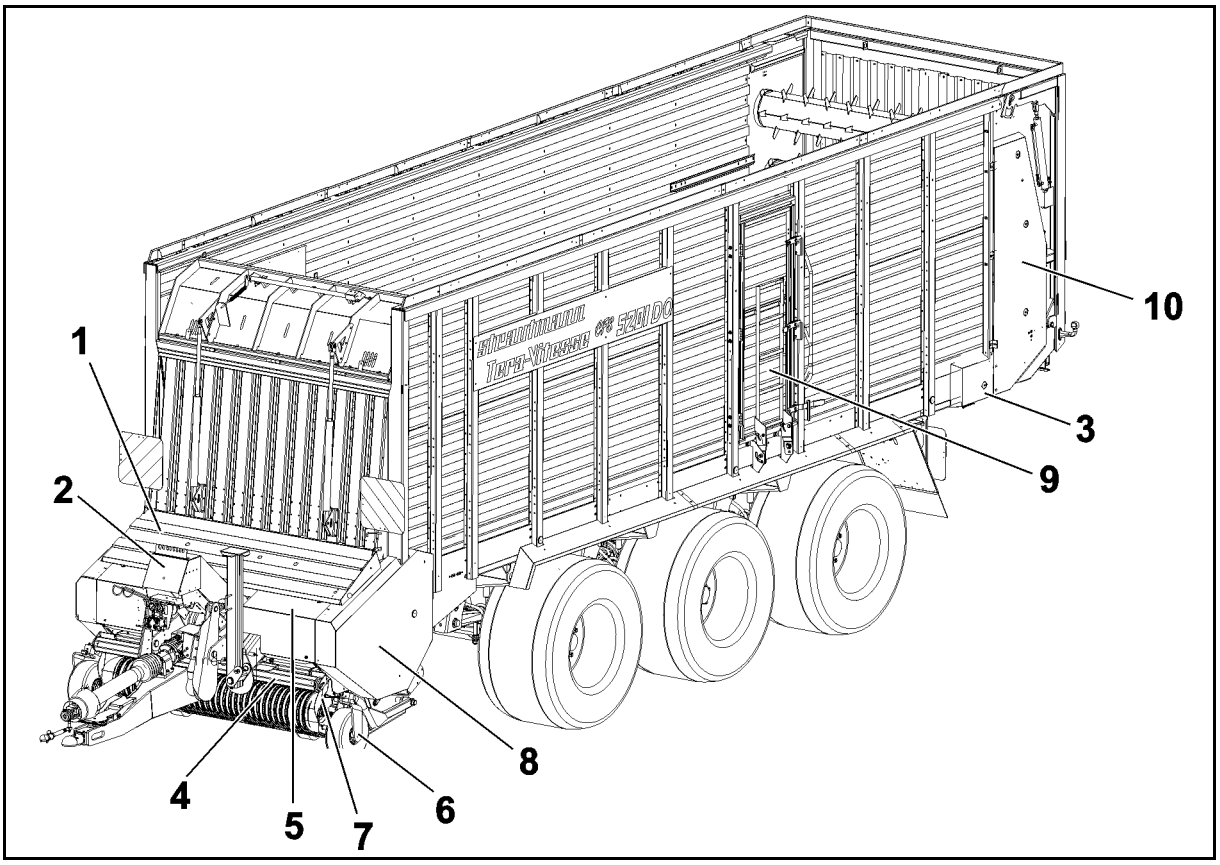


Fig. 3

(1) Bonnet
(2) Hydraulics protective device
(3) Stop-cock
(4) Holding-down device with pulley
(5) Drawbar protective device
(6) Roller feeler
(7) Protective casing, pick-up
(8) Side protector
(9) Access door
(10) Side protector, dosing drum drive, left-hand

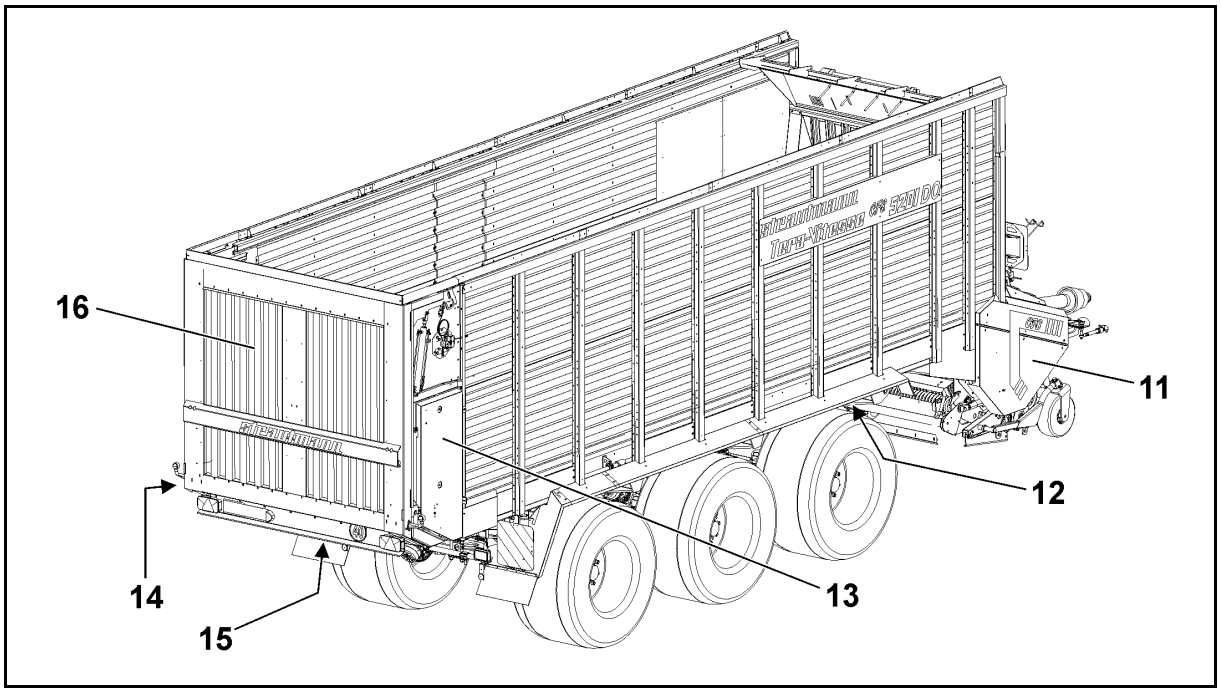


Fig. 4

(11) Side protector

(12) Cover, drive shaft, dosing drums

(13) Side protector, dosing drum drive, right-hand

(14) Stop-cock

(15) Bottom cover plates for feed shaft

(16) Tailgate

(12) Cover, drive shaft, dosing drums

(15) Bottom cover plates for feed shaft

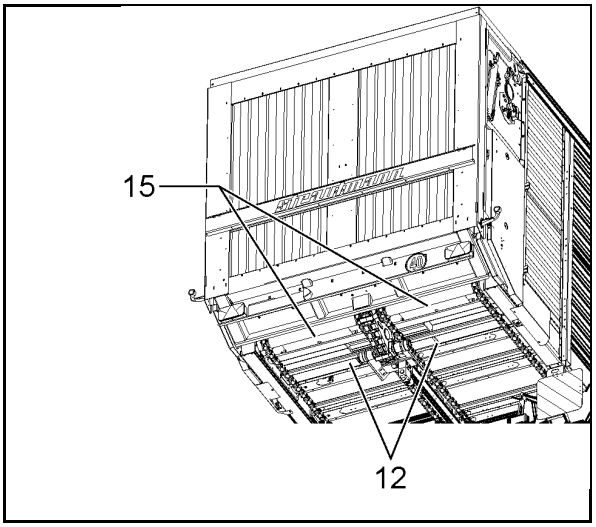


Fig. 5

2.3 Supply lines between tractor and machine

Depending on the machine's equipment, more or less supply lines than shown here may be available.

(1) Hydraulic connector "Flow line" SN 16 (red)

(2) Hydraulic connector "Return line" SN 20 (blue)

(3) Load-sensing connector SN 6 (only with available load-sensing connector)

(4) Compressed-air brake, feed line (red)

(5) Compressed-air brake, brake line (yellow)

(6) Lighting connector, 7-pole

(7) Power supply, 3-pole

(8) ISOBUS connector for ISOBUS control unit (only with available ISOBUS control unit)

(9) Hydraulic connector for hydraulic brake system with hydraulic clutch according to ISO 5676 (only with available hydraulic brake system)

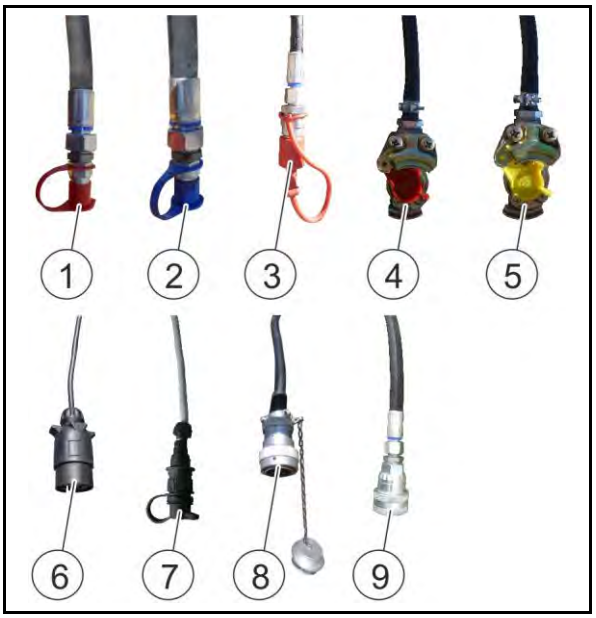


Fig. 6

2.3.1 Marking of hydraulic supply lines

Hydraulic connector "Flow line"

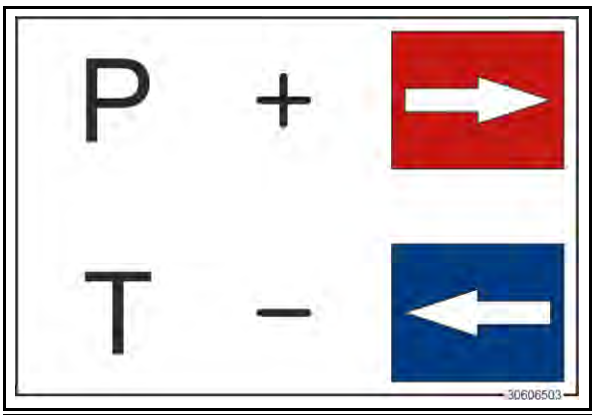
- Label
  Arrows: white
  Background: red

Hydraulic connector "Return line"

- Label
  Arrows: white
  Background: blue

Explanation of hydraulic connector symbols

- P: Pressure pipe (red)
- T: Tank line (blue)

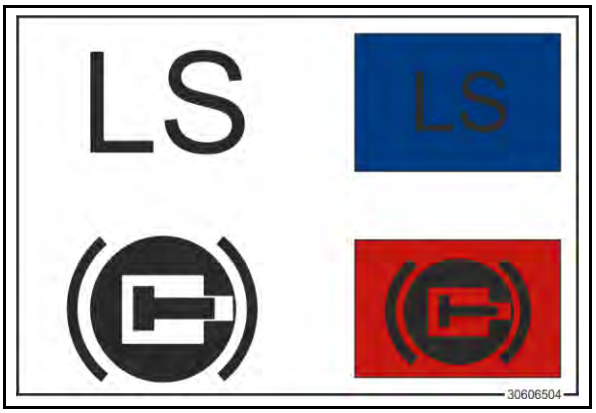


Load-sensing connector

- Label

Explanation of the following symbols:

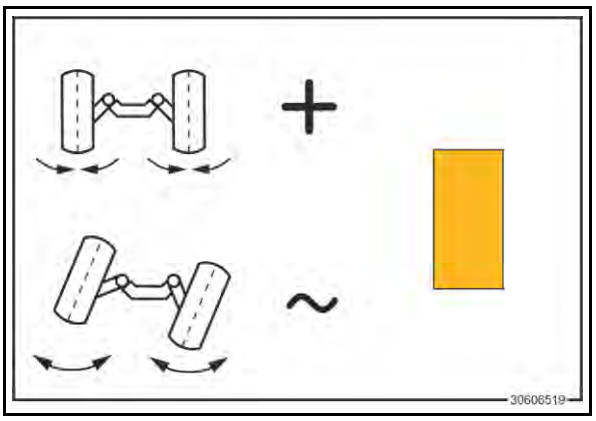
- Load-sensing connector (blue)
- Hydraulic brake system (red)



Steering axle

- Flow line, return line: 1 yellow cable tie

→ Lock or unlock steering axle



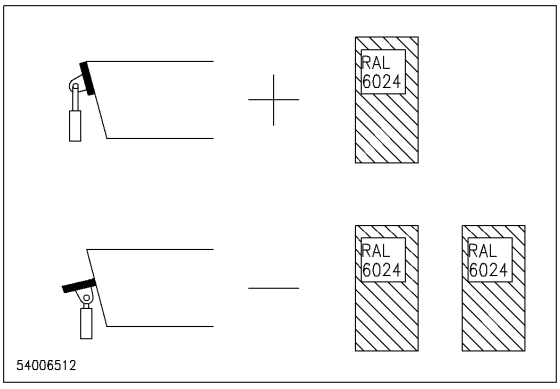
Front panel

- Flow line: 1 green cable tie

→ Close front panel

- Return line: 2 green cable ties

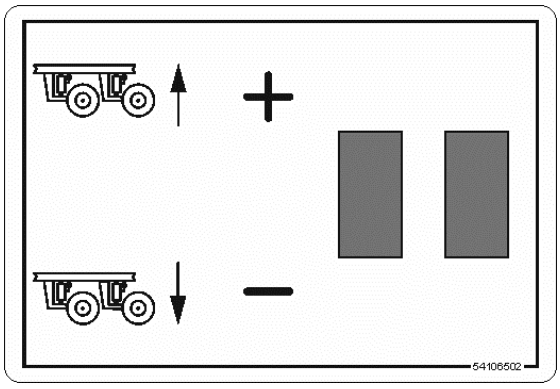
→ Open front panel



Hydraulic chassis

- Flow line, return line: 2 grey cable ties

→ Lift or lower chassis



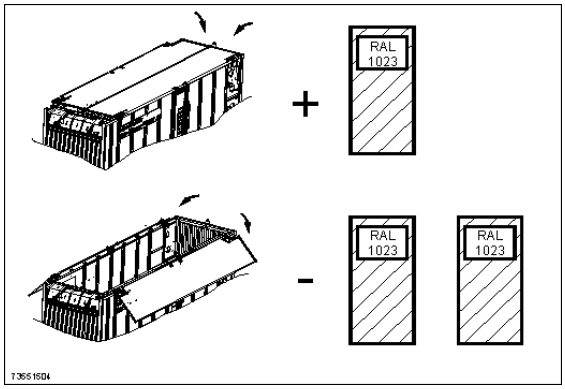
Covering system

- Flow line: 1 yellow cable tie

→ Close covering system

- Return line: 2 yellow cable ties

→ Open covering system



2.4 Traffic-related equipment

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

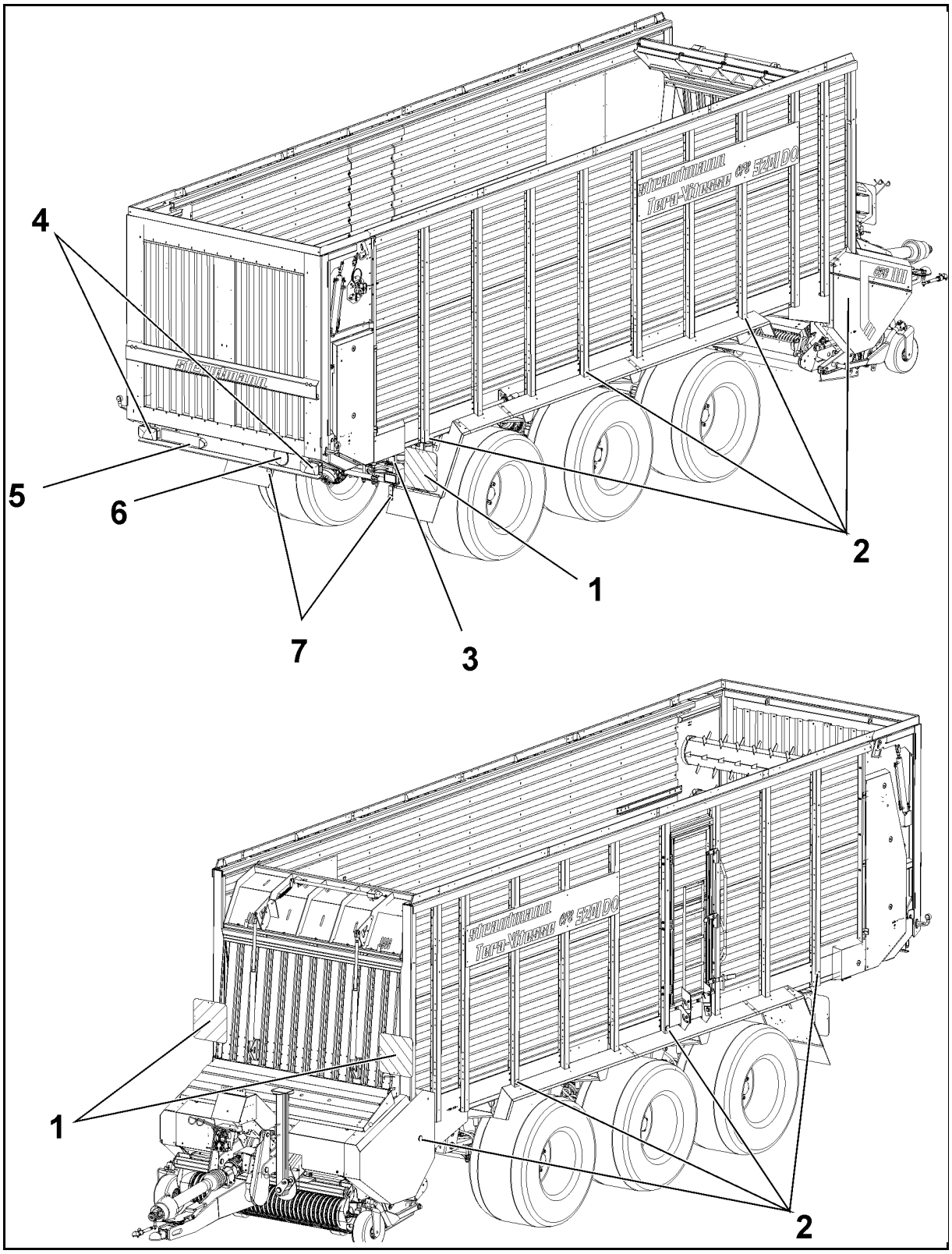


Fig. 7

(1) Warning plates
(2) Side reflectors (4 on each side of machine)
(3) Chocks
(4) Multi-function light
(5) License plate
(6) Speed sign
(7) Reflectors

2.5 Correct use

The machine:

- is exclusively intended for normal use in the course of agricultural work,
- is suitable for cutting, charging, transport and distribution of green and dried-out forage,
- is only allowed to be operated by one person from the driver seat of the tractor.

Slopes can be travelled on as follows:

- Traversing hills:
  - Direction of motion to the left 20 % uphill/downhill gradient
  - Direction of motion to the right 20 % uphill/downhill gradient
- Slope line:
  - Uphill 20 % gradient
  - Downhill 20 % gradient

The following is also part of the correct use:

- the observance of all instructions contained herein,
- the observance of the specified service and maintenance work on the machine,
- the exclusive use of original spare parts.

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

For any damage resulting from incorrect use:

- the user will be solely responsible,
- the manufacturer will not assume any liability.

2.6 Hazardous areas 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 if no people are 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.

Within the hazardous area, risks occur at dangerous spots which cannot be completely eliminated due to the operational safety of the machine. The risks exist permanently or may occur unexpectedly.

Dangerous spots are marked by warning signs attached to the machine, which warn about existing residual risks.

In these operating instructions, activity-related safety instructions mark the existing residual risks.

Risks may arise:

- due to work-related movements of the machine and its working tools,
- due to substances or foreign objects blown out of the machine,
- due to accidental lowering of the lifted machine/of lifted machine parts,
- due to accidental starting and rolling of the machine / of tractor and machine.

Dangerous spots exist:

- within the drawbar area between tractor and machine,
- within the area of the powered propeller shaft,
- 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,
- beneath the machine,
- beneath the lifted, unsecured tailgate,
- within the area of the powered dosing drums,
- within the area of the powered transport floor,
- in the cargo space with the machine powered.

2.7 Type plate and CE symbol

The complete marking is treated as a document and must not be altered or made unrecognizable.

(1) Type plate with CE symbol

(2) Vehicle/Machine ID number (embossed into the frame)

(3) ALB plate

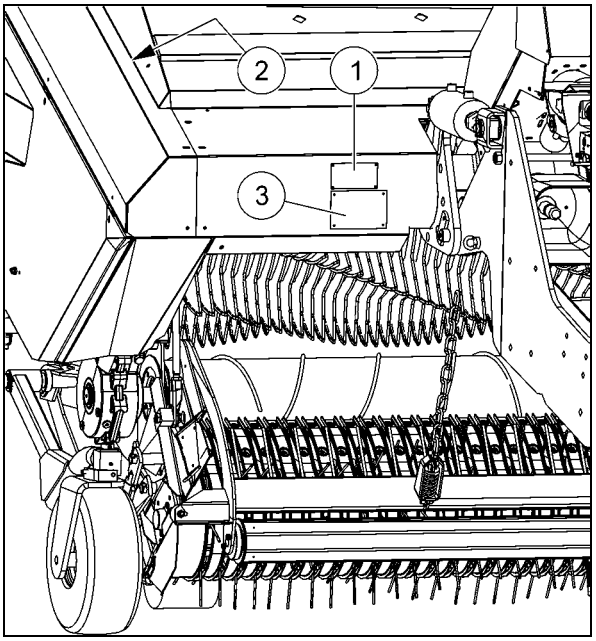


Fig. 8

Information on the type plate:

(1) Manufacturer
(2) CE symbol
(3) Vehicle/Machine ID number
(4) Type
(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]

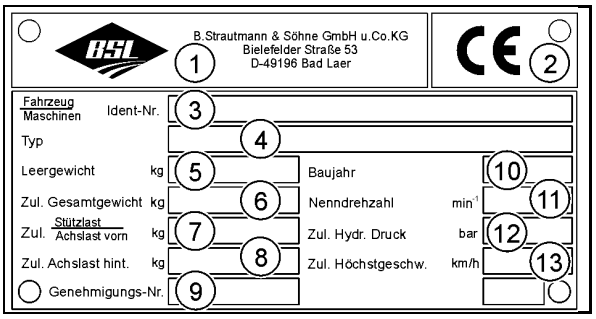


Fig. 9

2.8 Technical data

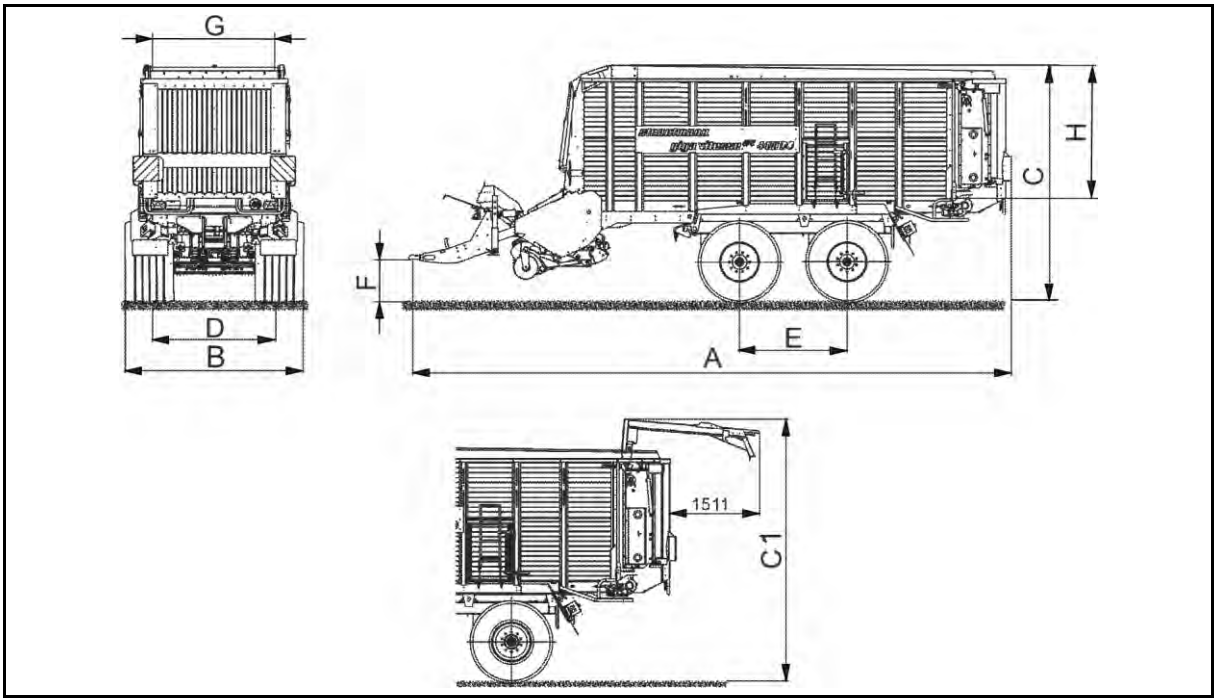
2.8.1 General data

		Tera-Vitesse CFS					
		4201	**4201 DO**	**4601**	**4601 DO**	**5201**	**5201 DO**
Gross vehicle weight rating							
Bottom linkage (up to 40 km/h)	kg	22000		22000		--	
Bottom linkage (more than 40 km/h)	kg	20000		20000		--	
Hydraulic tandem chassis (up to 40 km/h)	kg	24000		24000		--	
Hydraulic tandem chassis (more than 40 km/h)	kg	22000		22000		--	
Hydraulic tridem chassis (up to 40 km/h)	kg	--		31000		34000	
Hydraulic tridem chassis (more than 40 km/h)	kg	--		29000		32000	
Admissible axle load	kg	18000		18000		--	
Hydraulic tandem chassis	kg	20000		20000		--	
Hydraulic tridem chassis	kg	--		27000		30000	
Admissible tongue load							
Bottom linkage (up to 40 km/h)	kg	4000					
Bottom linkage (more than 40 km/h)	kg	2000					
Empty weight	kg	10400	10900	11000	11500	13000	13500

		Tera-Vitesse CFS					
		4201	4201 DO	4601	4601 DO	5201	5201 DO
Loading capacity according to DIN 11741	m³	40.0	38.0	44.0	42.0	50.0	48.0
Loading capacity at medium pressing power	m³	76.0	72.2	83.6	79.8	95.0	91.2
Maximum travel speed	km/h	25 / 40 / 60 / 62					

Figures, technical data and weights may change due to technical development and are not binding for delivery.

2.8.2 Dimensions of wagon



		Tera-Vitesse CFS					
		4201	4201 DO	4601	4601 DO	5201	5201 DO
A = Total length	m	10.08		10.83		11.97	
B = Total width	m	3.00					
C = Total height	m	max. 4.00					
C1 = Total height with open tailgate	m	max. 4.42					
D = Track							
Tandem axle	m	2.10		2.10		2.10	
Tridem axle 60 km/h	m	--		2.05		2.10	
Tridem axle 62 km/h	m	--		1.95		2.10	
E = Wheelbase							
Bogie chassis	m	1.60		1.60		1.60	
Hydr. Tandem chassis	m	1.81		1.81		--	

Hydr. Tridem chassis	m	--	1.55	1.81
F = Drawbar height, bottom linkage	m	0.55-0,70		
G = Cargo space width	m	2.40		
H = Cargo space height				
without covering system	m	2.34		
with covering system	m	2.25		
Picking-up width of pick-up	m	2.12		
Number of pick-up tine rows	pcs.	6		
Tine spacing of pick-up	mm	55		
Ground clearance of pick-up	m	With lifted folding drawbar approx. 0.60		

Tyres taken as a basis for the measured dimension: 710/40 R26.5

Figures, technical data and weights may change due to technical development and are not binding for delivery.

2.8.3 Tyre pressure

Tyre pressures for tandem axle (26.5“)

				40 km/h 16 t	40 km/h 18 t	40 km/h 20 t	65 km/h 18 t	65 km/h 20 t	max.
600/55 R26.5	Michelin Cargo X-BIB	165D	bar	1.5	1.8	2.1	2.9	4.0	4.0
680/55 R26.5	Trelleborg Twin Radial	165D	bar	1.4	1.7	2.0	2.7	3.1	3.2
700/50-26.5	Alliance I-328	169A8	bar	1.8	2.0	2.2	--	--	2.5
700/50-26.5	Alliance I-328 HS	166C	bar	1.2	1.3	1.4	A	B	3.3
710/45-26.5	Trelleborg T404	169A8	bar	1.5	1.8	2.0	--	--	2.4
710/50 R26.5	Vredestein Flotation Pro	170D	bar	1.6	1.9	2.2	2.8	3.2	4.0
750/45 R26.5	Vredestein Flotation Trac	170D	bar	1.6	1.9	2.2	2.8	3.2	4.0
800/45-26.5	BKT Flotation 648	177A8	bar	1.0	1.0	1.2	--	--	3.0
800/45-26.5	Alliance I-328	170A8	bar	1.1	1.1	1.3	--	--	2.3
800/45 R26.5	Vredestein Flotation Pro	174D	bar	1.4	1.6	1.9	2.5	2.8	4.0

A = 2.0 bar up to a max. speed of 60 km/h

B = 2.2 bar up to a max. speed of 60 km/h

Pick-up roller feeler = 2.5 bar

1 bar = 14.5 psi = 100 kPa

Tyre pressures for tridem axle (26.5“)

			40 km/h 27 t	40 km/h 30 t	65 km/h 27 t	65 km/h 30 t	max.
600/55 R26.5	Michelin Cargo X-BIB	165D	bar	1.8	2.1	2.9	4.0	4.0
680/55 R26.5	Trelleborg Twin Radial	165D	bar	1.7	2.0	2.7	3.1	3.2
700/50-26.5	Alliance I-328	169A8	bar	2.0	2.2	--	--	2.5
700/50-26.5	Alliance I-328 HS	166C	bar	1.3	1.4	A	B	3.3
710/45-26.5	Trelleborg T404	169A8	bar	1.8	2.0	--	--	2.4
710/50 R26.5	Vredestein Flotation Pro	170D	bar	1.9	2.2	2.8	3.2	4.0
750/45 R26.5	Vredestein Flotation Trac	170D	bar	1.9	2.2	2.8	3.2	4.0
800/45-26.5	BKT Flotation 648	177A8	bar	1.0	1.2	--	--	3.0
800/45-26.5	Alliance I-328	170A8	bar	1.1	1.3	--	--	2.3
800/45 R26.5	Vredestein Flotation Pro	174D	bar	1.6	1.9	2.5	2.0	4.0

A = 2.0 bar up to a max. speed of 60 km/h

B = 2.2 bar up to a max. speed of 60 km/h

Pick-up roller feeler = 2.5 bar

1 bar = 14.5 psi = 100 kPa

2.9 Required tractor equipment

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

Tractor engine output and p.t.o. speed

		Tera-Vitesse CFS					
		4201	4201 DO	4601	4601 DO	5201	5201 DO
Power required	kW	140		155		176	
	HP	190		210		240	
P.t.o. speed	min^{-1}	1000					

Electrical system

Battery voltage:
- 12 V (volt)

Socket for lighting:
- 7-pole

Socket for control set:
- 3-pole (DIN 9680). The feed line of the 3-pole socket should have a minimum cable cross section of 4 mm².

For a more fail-safe power supply, your tractor can be retrofitted with an additional ISOBUS socket.

This is particularly recommended when using functions requiring an increased power consumption, such as the electro-hydraulic forced steering axle system SES.

Hydraulics

- Check the compatibility of the hydraulic oils before connecting the machine to the hydraulic system of your tractor. For details about checking the compatibility of the hydraulic oils, contact your agricultural machinery dealer if necessary.
- Do not mix mineral oils with bio oils.

Operating pressure: min. 180 bar, max. 210 bar

Delivery rate: min. 40 l/min, max. 100 l/min

Delivery rate with electro-hydraulic forced steering axle system: min. 60 l/min, max. 100 l/min

Hydraulic oil according to Dexron-II D

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 back pressure. Thus, a free return line reduces heating-up of the hydraulic oil.

The hydraulic hose pipes are marked by colours at the hydraulic plugs, see chapter „Marking of hydraulic supply lines“, page 17.

Control devices

Hydraulic component	Required control device
Electro-hydraulic control block	Optional: • 1 single-acting control device with return line or • 1 double-acting control device or • 1 load-sensing connector
Electro-hydraulic forced steering axle system (SES system)	1 load-sensing connector

Brake system

Brake system	Required connectors
Dual-line compressed-air brake system	• 1 hose coupling (red) for the feed line • 1 hose coupling (yellow) for the brake line
Hydraulic brake system	1 hydraulic clutch according to ISO 5676

Additional equipment

When using the SES system, an additional ball head K 50 is required on the right-hand or left-hand side of the tractor's linkage drawbar.

2.10 Noise specifications

The workplace-related emission value (sound pressure level) is 74.0 dB(A), measured during operating mode at the driver's ear, the cabin being closed.

The sound pressure level mainly depends on the tractor used.

3 Safety instructions

This chapter contains important information for the user and the operator on how to operate the machine in a safety-conscious and trouble-free way.

Observe all safety instructions included in these operating instructions!

Most accidents are caused by non-observance of simplest safety rules.

By observing all safety instructions included in these operating instructions, you help to prevent accidents.

3.1 Safety-conscious working

Only operate the machine in perfect safety-related condition.

WARNING

Risk of being crushed, cut, becoming entangled, being drawn in or risk of impact if the tractor and the machine are not in adequate roadworthy and reliable condition!

Check tractor and machine for their road and operational safety before each startup.

3.2 Organisational measures

The operating instructions:

- must always be kept at the machine's place of operation,
- must always be easily accessible for operating and maintenance staff.

3.2.1 User’s obligation

The user is obliged:

- to observe the general national occupational safety, accident prevention and environmental protection rules,
- to exclusively have staff operating the machine who:
  - know the basic occupational safety and accident prevention regulations,
  - have been instructed how to operate the machine,
  - have read and understood these operating instructions.
- to keep all warning signs attached to the machine in legible condition,
- to replace any damaged warning signs,
- to provide the necessary personal protective equipment such as protective goggles, work gloves according to DIN EN 388, safety footwear, protective clothing, skin protectant, etc.

3.2.2 Operator’s obligation

Any members of staff charged to operate the machine are obliged:

- to acquaint themselves with the machine before starting operation,
- to acquaint themselves with the following regulations and to observe them during work:
  - the general national occupational safety, accident prevention and environmental protection rules,
  - the chapter "Basic safety instructions“, page 33,
  - the chapter „Warning and instruction signs“, page 42, and the warning signs when operating the machine,
  - the chapters of these operating instructions which are important for the tasks assigned to them.

If the operator notices that a device is not in a sound safety-related condition, the operator shall be obliged to immediately eliminate this defect. If this is not part of the operator’s scope of tasks or he/she lacks adequate expert knowledge, the operator shall be obliged to report this defect to his/her superior or to the user.

3.2.3 Qualification of staff

Only trained and instructed staff is allowed to operate the machine. The user must clearly define the responsibilities of the members of staff for operation, service and maintenance.

A person to be trained must be supervised when operating the machine.

The operator is only allowed to carry out such work as specified in these operating instructions which is not marked as "Shop work".

Only authorised workshops are allowed to carry out work on the machine which requires special expert knowledge. Authorised workshops have qualified staff and adequate means (tools, lifting and supporting equipment) at their disposal to carry out this work properly.

This applies to any work:

- which is not mentioned in these operating instructions,
- which is marked as "Shop work" in these operating instructions.

Person / Activity	Member of staff especially trained for the activity [1)]	Instructed person [2)]	Person with professional training (authorized workshop) [3)]
Loading/Transport	X	X	X
Commissioning	--	X	X
Setup	--	X	X
Operation	--	X	X
Service and maintenance	--	X	X
Trouble-shooting	--	X	X
Rescue	X	--	--
Disposal	X	--	--

Legend: X..allowed --..not allowed

1) A person who is able to take on a particular task and is allowed to carry it out for an adequately qualified company.

2) A person is considered to be instructed if he or she has been informed about the tasks assigned to him or her and possible risks in case of improper behaviour and if he or she has been instructed, if necessary, and if he or she has been advised of the necessary protective devices and measures.

3) Persons with professional training are considered to be qualified (expert). Due to their professional training and the knowledge of the relevant provisions, they are able to assess the tasks assigned to them and to identify possible risks.

   Please note: A qualification which is equivalent to professional training may also be acquired by several years of practice in the corresponding field of work.

3.3 Product safety

3.3.1 Safety-conscious operation of machine

The machine is only allowed to be operated from the driver's seat of the tractor, provided that no people are within the machine's hazardous area. Observe the information in the chapter "Hazardous areas and dangerous spots", page 21.

3.3.2 Safety and protective devices

- Only operate the machine when all safety and protective devices are properly fixed and in fully operable condition.

  Defective or removed safety and protective devices might cause dangerous situations.
- Check all safety and protective devices for visible damage and functional ability before starting the machine.

3.3.3 Structural alterations

- Vehicles provided with an official operating license or vehicle-linked devices and equipment provided with an official operating license or a road traffic license according to the road traffic regulations must be in the condition specified by that license.
- You are only allowed to carry out structural alterations, extensions or modifications on the machine with the prior written consent of the manufacturer.
- In case of non-authorized structural alterations, extensions or modifications:
  - the declaration of conformity and the CE symbol of the machine will become invalid,
  - the operating license according to national and international regulations will become invalid.
- Exclusively use original parts or modification and accessory parts approved by the manufacturer such that:
  - the declaration of conformity and the CE symbol of the machine will remain unaffected,
  - the operating license according to national and international regulations will remain unaffected,
  - perfect functioning of the machine will be ensured.
- The manufacturer will not assume any liability for damage resulting from:
  - unauthorized alterations of the machine,
  - non-approved modification and accessory parts,
  - welding and drilling work on load-bearing parts of the machine.

3.3.4 Spare and wearing parts, auxiliary materials

Immediately replace machine parts which are not in perfect condition.

Exclusively use original parts of the manufacturer or parts approved by the manufacturer such that the operating license according to national and international regulations will remain unaffected. If spare and wearing parts produced by third-party manufacturers are used, their stress-related and safety-conscious design and production will not be ensured.

The manufacturer will not assume any liability for damage resulting from the use of non-approved spare and wearing parts or auxiliary materials.

3.3.5 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:

- improper use of the machine,
- improper assembly, commissioning, operation and maintenance of the machine,
- operation of the machine, the safety devices being defective or the safety and protective devices having not been properly installed or being not serviceable,
- non-observance of the instructions included in the operating instructions referring to commissioning, operation and maintenance,
- unauthorized structural alterations on the machine,
- insufficient inspection of machine parts which are subject to wear,
- improperly effected repairs,
- disasters due to foreign objects and force majeure.

3.4 Basic safety instructions

Basic safety instructions:

- shall, as a basic principle, apply to the safe operation of the machine,
- are summarized in the subsections below.

3.4.1 General safety and accident prevention instructions

- Observe the general national safety and accident prevention regulations in addition to the safety instructions included in this chapter!
- Observe the warning and instruction signs attached to the machine. They provide important information for the safe and trouble-free operation of the machine!
- Observe the activity-related safety instructions included in the other chapters in addition to the basic safety instructions included in this chapter!
- Wear your personal protective equipment when carrying out work on the machine!
- Make sure that people leave the immediate vicinity of the machine before moving or starting the machine! Particularly be aware of children!
- Never carry passengers, animals or objects on the machine! Carrying passengers and transport of animals or objects are not allowed on the machine!
- Adapt your driving such that you have always safe control over the tractor with the attached/hitched machine!

  Consider your personal abilities as well as the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the influences exerted by the attached/hitched machine.
- The following measures are imperative before carrying out any work on the machine such as adjusting work or trouble-shooting:
  - secure the machine against rolling with the machine not hitched to the tractor,
  - turn the tractor engine off and secure tractor and machine against accidental starting and rolling with the machine hitched to the tractor,
  - secure lifted machine parts/the lifted machine against accidental lowering.

Hitch and unhitch machine

- Only use appropriate tractors to hitch and transport the machine!
- Properly hitch the machine to the specified devices!
- Be sure not to exceed the following values when hitching the machine to the front and/or rear of a tractor:
  - the gross vehicle weight rating of the tractor,
  - the admissible axle loads of the tractor,
  - the admissible tongue load at the tractor's coupling spot,
  - the admissible towing capacity of the coupling device,
  - the admissible load capacities of the tractor tyres,
  - 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.
- 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!

  Present 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 completely stopped.
- Put the support device into support position when hitching and unhitching the machine (stability)!
- Risk of crushing and shearing when actuating support devices!
- Hitching and unhitching the machine to or from the tractor requires particular care! Crushing and shearing zones exist within the area of the coupling spots between tractor and machine!
- Check the connected supply lines. Connected supply lines:
  - must easily give way to any movements during cornering without any stress, buckling or chafing,
  - must not chafe against external components!
- Always park the unhitched machine in a stable position! Pay attention to the ground condition. Beware of soft surfaces.

Use of machine

- Acquaint yourself with all mechanisms and operating elements of the machine and their functions before starting work! During operation it will be too late.
- Wear close-fitting clothing! Loose-fitting clothing increases the risk of becoming entangled in or wound up at drive shafts!
- Start the machine only if all protective devices have been installed and are in protective position!
- Observe the maximum load capacity of the attached/hitched machine and the admissible axle and tongue loads of the tractor! Run the machine with the cargo space being only partly filled 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!
- You are only allowed to operate powered machine parts if there are no people within the machine’s hazardous area!

- Secure the tractor against accidental starting and rolling before leaving it!
- Safely support folded-up covers before standing underneath them!

Transport of machine

- 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,
  - whether the parking brake has been completely released,
  - the brake system for proper functioning,
  - whether the required transport equipment, such as lighting, warning and protective devices, has been properly mounted on the machine!
- Check the braking effect before starting the journey! The tractor must produce the required deceleration for the combination of tractor and attached/hitched machine!
- Always ensure sufficient steerability and braking ability of the tractor!

  Machines attached/hitched to a tractor and front or tail weights influence the driving characteristics as well as the steerability and the braking ability of the tractor.
- Observe the maximum loading capacity of the attached/hitched machine and the admissible axle and tongue loads of the tractor!
- Observe the broad overhang and the flywheel mass of the machine when cornering with attached/hitched machine!
- Set all movable machine parts to transport position and secure them before carrying out transport journeys! Use the transport locks provided for this purpose!

3.4.2 Hydraulic system

- Only an authorised workshop is allowed to carry out work on the hydraulic system!
- Make sure that the hydraulic system on the tractor and on the machine has been depressurized when connecting the hydraulic hose pipes!
- Ensure to properly connect the hydraulic hose pipes!
- Do not block any operating elements on the tractor, which serve to directly initiate hydraulic or electrical movements of components, e. g. folding, swivelling and sliding operations!

  The respective movement must automatically stop as soon as the operating element is released.

  This shall not apply to:
  - continuous movements of devices,
  - automatically controlled movements of devices,
  - movements of devices which, for functional reasons, require an open-centre or pressing position.
- Before carrying out any work on the hydraulic system:
  - put the machine down,
  - secure lifted movable machine parts against accidental lowering,
  - depressurize the hydraulic system,
  - turn the tractor engine off,
  - pull the ignition key out,
  - apply the parking brake.

- Have hydraulic hose pipes checked for their operational safety by an expert at least once a year!
- Hydraulic hose pipes must be replaced in case of visible defects, damage and ageing! Only use original hydraulic hose pipes!
- The period of use of the hydraulic hose pipes should not exceed six years (including a maximum possible shelf life of two years).
- Never try to block leaking hydraulic hose pipes with your hand or fingers! Immediately contact an authorized workshop if a leak is suspected.

  Hydraulic oil squirting out under high pressure may enter the skin and the body and cause serious injuries.

  If injuries caused by hydraulic oil occur, immediately contact the medical services. Risk of infection!
- Never try to detect leakage points with your bare hands. Risk of serious infection! Use appropriate means when trying to locate leakage points (cleaning sprays, special leak detector spray)!

3.4.3 Electrical system

- Before carrying out any work on the electrical system, disconnect the minus pole of the battery!
- Always cover the plus pole of the battery as required. Risk of explosion in case of accidental ground!
- Only use the specified fuses. When using bigger fuses, the electrical system may be destroyed. Risk of fire!
- 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!
- Avoid sparking and open fire in the vicinity of the battery! Risk of explosion!
- The machine can be equipped with electronic components and parts, 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 electrical devices or components into the machine and their connection to the on-board electrical system, the user must check on his own responsibility whether the retrofitted parts interfere with the vehicle electronics or other components.
  - Ensure that the retrofitted electrical and electronic components comply with the EMC directive 2004/108/EC as amended from time to time and bear the CE symbol!
- Never fit the machine with additional work lights without authorisation! The manufacturer will not assume any liability or warranty for subsequent damage on the electrical system.

3.4.4 Propeller shaft operation

- The included operating instructions of the propeller shaft manufacturer shall apply!
- Only use the propeller shafts specified by the manufacturer and equipped with the proper protective devices!
- Always transport the propeller shaft in horizontal position, in order to avoid injuries due to the propeller shaft halves falling apart!
- Check the propeller shaft:
  - protective tube and protective cone of the propeller shaft must be undamaged,

  - a protective cover must be mounted to the tractor's and to the machine's p.t.o. shaft! The protective covers must be in proper condition!
- Working with the protective devices being damaged is not allowed!
- 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!
- Always ensure proper mounting and securing of the propeller shaft!
- Secure the propeller shaft guard against rotation by installing the chain/s!
- Always mount the wide-angle joint at the pivot point between tractor and machine when using a wide-angle propeller shaft!
- In case of propeller shafts equipped with overload or overrunning clutch, this clutch must always be mounted at the machine!
- Before switching the propeller shaft on, check whether the selected speed and the sense of rotation of the tractor's p.t.o. shaft have been adjusted to the admissible drive speed and the sense of rotation of the machine!
- Make sure that people leave the hazardous area of the machine before switching the p.t.o. shaft on!
- Do not use the coupled propeller shaft as a step!
- Never switch the propeller shaft on with the tractor engine turned off!
- Observe the admissible angular misalignment and the travel of the propeller shaft when cornering!
- Observe the transport and working position of the specified tubular covers of the propeller shafts!
- People are not allowed within the range of the rotating propeller shaft when work with the propeller shaft is being carried out!
- Always switch the propeller shaft off if the angular misalignments occurring are too large or when it is not required!
- Risk of injury due to the flywheel mass of the machine parts continuing to rotate for a short time after the propeller shaft has been switched off!

  Do not approach the machine too closely during that time! Do not carry out any work on the machine until all machine parts have completely stopped.
- Secure tractor and machine against accidental starting and rolling before carrying out any maintenance, cleaning, lubrication or setup work on machines powered by propeller shafts or before hitching/unhitching them!
- Place the uncoupled propeller shaft on the respective holder!
  - Put the protective cover onto the p.t.o. shaft stub after the propeller shaft has been uncoupled!

3.4.5 Hitched machines

- Only couple admissible combinations of tractor and hitched machine!
- Observe the maximum admissible tongue load of the tractor at the coupling device in case of single-axle machines!
- Always ensure sufficient steerability and braking ability of the tractor!

Machines attached/hitched to a tractor influence the driving characteristics as well as the steerability and the braking ability of the tractor, in particular single-axle machines with the tongue load being exerted on the tractor.

- Only an authorized workshop is allowed to adjust the height of the drawbar for drawbars with tongue load!
- Ensure sufficient tongue load at the support device when unhitching and parking a single-axle machine!

  Risk of tipping, particularly in case of unevenly charged machine (stability).

3.4.6 Brake system

- The brake system of the tractor must be compatible with the brake system of the machine!
- Immediately stop the tractor in case of a malfunction of the brake system. Have the malfunction promptly remedied by an authorized workshop!
- Only authorized workshops or qualified personnel are allowed to carry out adjustment and repair work on the brake system!
- Have the brake system regularly and thoroughly checked!

  In order to maintain the operational safety, the wheel brakes must always be properly adjusted.
- Before carrying out any work in the brake system:
  - safely park the machine and secure it against accidental rolling (chocks),
  - secure the lifted machine/machine parts against accidental lowering!
- Especially beware when carrying out welding and drilling work and work involving open fire in the vicinity of brake lines!
- As a basic principle, test the brakes after any adjusting and maintenance work on the brake system!
- If your machine is equipped with a combination of compressed-air brake system and hydraulic brake system: Always use only one of the two brake systems during coupling!

  Observe the fact that in Germany it is only allowed to use the compressed-air brake system! Hydraulic brake systems are not licensed in Germany.

Compressed-air brake system

- The compressed-air brake systems of the tractor and of the machine must be compatible!
- Clean the sealing rings at the hose couplings of the feed and brake lines from possible soiling before hitching the machine!
- You are only allowed to start the tractor with the hitched machine moving when the pressure gauge on the tractor indicates 5.0 bar!
- Drain the air reservoir every day!
- Cover the tractor's hose couplings before carrying out journeys without machine!
- Hang the couplings of the feed and brake line on the provided blank connections with the machine unhitched!
- Do not modify the specified settings at the brake valves!
- Replace the air reservoir if:
  - the air reservoir can be moved in the tensioning straps,
  - the air reservoir is damaged,
  - the type plate at the air reservoir is getting rusty, is loose or is missing!

Hydraulic brake system for export machines

- Hydraulic brake systems are not licensed for road traffic in Germany!
- Only use the specified hydraulic oils when topping up or changing oils. Observe the relevant regulations when changing hydraulic oils!

3.4.7 Axles

As a basic principle, never overload the axles. Overloading of axles reduces the service life of the axle bearings and causes damage to the axles.

Therefore avoid:

- overloading of the machine,
- bumping into curbs,
- exceeding the speed limit,
- mounting wheels of wrong inserting depth,
- mounting wheels and tyres of wrong dimensions.

3.4.8 Tyres

- Safely park the machine and secure it against accidental lowering and rolling (parking brake, chocks) before carrying out any work on the tyres!
- Only qualified personnel equipped with appropriate fitting tools is allowed to carry out repair work on tyres and wheels! Mounting of wheels and tyres requires sufficient know-how and appropriate tools.
- Deflate the tyre before removing it!
- Regularly check the tyre pressure!
- Observe the maximum admissible tyre pressure. Risk of explosion in case of excessive pressure!
- Retighten all fastening screws and nuts according to the manufacturer’s specifications!

3.4.9 Operation of machine

- Ensure that the fastening elements fit properly before each startup of the machine!
- People are not allowed within the operating area!
- Do not approach rotating dosing drums!
- Climbing onto the transport floor is not allowed as long as the tractor engine is running!
- Passengers are not allowed on the machine!
- Unhitch the machine from the tractor only when empty!

3.4.10 Service and maintenance of machine

- Carry out the required service and maintenance work on the machine in due time!
- Observe the maintenance intervals for wearing parts!
- Secure the tractor against accidental starting and rolling before carrying out any service or maintenance work on the machine or climbing onto the machine!

- Existing mechanical, hydraulic, pneumatic and electrical or electronic residual energies may cause accidental machine movements!

  Beware of existing residual energies in the machine when carrying out maintenance work. Warning signs mark the components with residual energies. For detailed information, refer to the respective chapters of these operating instructions!

- Fix larger assemblies carefully to lifting equipment and secure them before replacing larger assemblies!
- Secure the lifted machine or lifted machine parts against accidental lowering before carrying out service or maintenance work on the machine!
- Regularly check screws and nuts for tightness! Retighten loosened screws and nuts!
- Check unscrewed joints for tightness. After finishing maintenance work, check the safety and protective devices for proper functioning!
- Use appropriate equipment and gloves when replacing working tools with blades!
- Disconnect the generator and battery cable on the tractor before carrying out electrical welding work on the tractor and/or on the attached/hitched machine!
- Dispose of oils, greases and filters properly!
- Properly handle and dispose of substances and materials used for cleaning the machine, especially:
  - when working on lubrication systems and devices,
  - when carrying out cleaning work with solvents!
- Spare parts must at least comply with the specified technical standards of the manufacturer! This is guaranteed when using original parts!

3.5 Activity-related safety instructions and important information

Activity-related safety instructions and important information are included in the operating instructions. Signal words and symbols help to identify activity-related safety instructions and important information at a glance.

3.5.1 Activity-related safety instructions

Activity-related safety instructions:

- warn about risks which may occur in a certain situation or in connection with a certain behaviour,
- are directly mentioned in front of a hazardous activity in the individual chapters,
- are marked by the triangular hazard symbol and a preceding signal word. The signal word refers to the seriousness of the risk.

DANGER 	**DANGER** **marks a direct danger bearing a high risk, which will cause most serious bodily injury (loss of limbs or long-term harm) or even death if it is not prevented.** **Non-observance of the safety instructions marked by "DANGER" directly causes most serious bodily injury or even death.**

WARNING	WARNING
	**marks a possible danger bearing a moderate risk, which might cause most serious bodily injury or even death if it is not prevented.** **Non-observance of the safety instructions marked by “WARNING“ may cause most serious bodily injury or even death.**

CAUTION	CAUTION
	**marks a possible danger bearing a low risk, which might cause light or moderate bodily injury or material damage if it is not prevented.** **Non-observance of the safety instructions marked by "CAUTION" may cause light or moderate bodily injury or material damage.**

3.5.2 Important information

Important information:

- provides details for proper use of the machine,
- provides user hints for optimum use of the machine,
- is marked by the following symbols.

	IMPORTANT
	**marks an obligation to behave in a particular manner or to act in a certain way, in order to use the machine properly.** **Non-observance of these instructions may cause malfunctions of the machine or in its vicinity.**

	INFORMATION
	**marks user hints and particularly useful information.** **This information will help you to use all functions of your machine in the best possible way.**

3.6 Warning and instruction signs

The following warning and instruction signs are attached to the machine:

- Warning signs mark dangerous spots on the machine and warn about residual risks, which cannot completely be eliminated due to the machine's operational safety.
- Instruction signs include information referring to proper use of the machine.

Always keep these signs in clean and clearly legible condition! Replace illegible signs. Order the warning and instruction signs according to their order number:

- from the dealer,
- directly via the Strautmann spare parts warehouse (+ 49 (0) 5424 802-30).

3.6.1 Warning signs

A warning sign consists of 2 pictographs:

(1) Pictograph for description of risk

The pictograph shows the pictographic description of the risk, surrounded by a triangular hazard symbol.

(2) Pictograph for avoidance of risk

The pictograph shows the pictographic instruction how to avoid the risk.

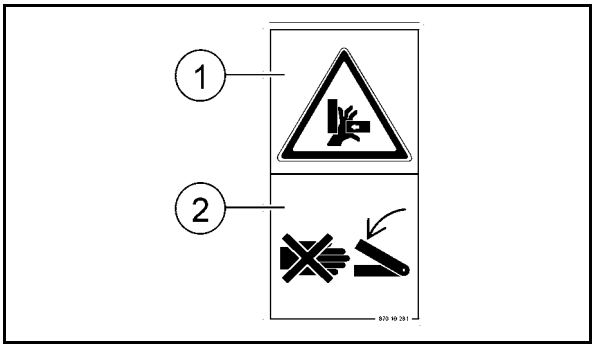


Fig. 10

Explanations of warning signs

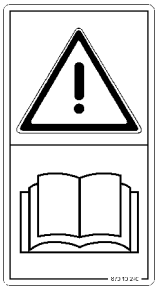
The following list includes:

- in the right-hand column all warning signs attached to the machine,
- in the left-hand column the following details referring to the warning sign on the right-hand side:
  - the order number.
  - the description of risk, e.g. "Risk of crushing fingers or hand due to accessible movable machine parts!"
  - the consequences in case of non-observance of the instruction(s) how to avoid the risk, e.g. "This risk may cause most serious injuries involving loss of limbs."
  - the instruction(s) how to avoid the risk, e.g. "Never reach into the dangerous spot as long as the tractor engine is running with the propeller shaft coupled/the hydraulic/ electronic system connected. Make sure that people leave the hazardous area of the machine before moving machine parts."

Order number and explanation	Warning signs

87010270

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



87007104

Risk to any part of the body of being crushed if people stand within the swivelling range of the tailgate!

This risk may cause most serious injuries or even death.

- 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 the tailgate.

87007117

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

This risk may cause most serious injuries or even death.

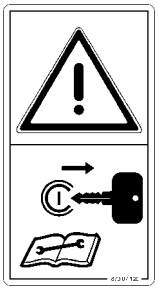
Never enter the cargo space as long as the tractor engine is running with the propeller shaft coupled/the hydraulic/electronic system connected.

87007120

Risks when carrying out work on the machine such as mounting, adjusting, trouble-shooting and maintenance, due to accidental starting or rolling of tractor and machine!

This risk may cause most serious injuries or even death.

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

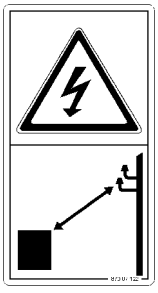


87007122

Risk of electrical shock or burns due to accidental touching of electrical overhead lines or due to inadmissible approach to high-voltage overhead lines!

This risk may cause most serious injuries or even death.

Keep sufficient safe distance to high-voltage overhead lines.



Nominal voltage	Safe distance to overhead lines
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
nominal voltage unknown	5 m

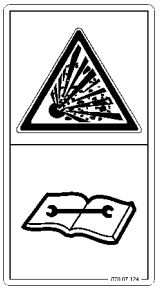
87007123

Risk due to hydraulic oil squirting out under high pressure, caused by leaking hydraulic hose pipes!

This risk may cause most serious injuries or even death if hydraulic oil squirting out under high pressure enters the skin and the body.

- Never try to block hydraulic hose pipe leaks with your hands or fingers.
- Read and observe the information included in the operating instructions before carrying out service and maintenance work on hydraulic hose pipes.

87007124



Risk due to explosion or hydraulic oil squirting out under high pressure, caused by the pressure accumulator being under gas and oil pressure!

This risk may cause most serious injuries or even death if hydraulic oil squirting out under high pressure enters the skin and the body.

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

87007126

Risk to any part of the body of being rolled over by the machine due to accidental rolling of the machine parked in unsecured condition!

This risk may cause most 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 the chock(s) for this purpose.

87007130

Risk to any part of the body of being crushed if people stand within the swivelling range of the drawbar between the tractor and the hitched machine!

This risk may cause most serious injuries or even death.

- People are not allowed within the hazardous area between tractor and machine as long as the tractor engine is running and the tractor has not been secured against accidental rolling.
- Make sure that people leave the hazardous area between tractor and machine as long as the tractor engine is running and the tractor has not been secured against accidental rolling.

87010271

Risk to any part of the body of being crushed and/or risk of impact if people stand within the hazardous area of the machine!

This risk may cause most serious injuries or even death.

People are not allowed to stand within the hazardous area between tractor and machine as long as the tractor engine is running.

87010276

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

This risk may cause most serious injuries or even death.

- Keep sufficient safe distance to powered working tools.
- Ensure that people keep sufficient safe distance to powered working tools.

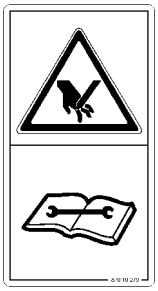
87010278

Risk of becoming entangled and wound up due to the powered propeller shaft!

This risk may cause most serious injuries or even death.

- Keep sufficient safe distance to the propeller shaft as long as the tractor engine is running with the propeller shaft coupled/the hydraulic system connected.
- Ensure that people keep sufficient safe distance to the powered propeller shaft.

87010279



Risk of cuts for fingers and hands due to work on sharp / sharp-edged working tools!

This risk may cause most serious injuries including loss of limbs.

Observe the information in the operating instructions before carrying out work on sharp working tools.

87010280

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

This risk may cause most serious injuries including loss of limbs.

Never open nor remove protective devices as long as the tractor engine is running with the propeller shaft coupled/the hydraulic/electronic system connected.

87010281

Risk to fingers or hands of being crushed due to accessible movable machine parts!

This risk may cause most serious injuries including loss of limbs.

Never reach into the hazardous area as long as the tractor engine is running with the propeller shaft coupled/the hydraulic/electronic system connected.

87010282

Risk of crushing, being drawn in or becoming entangled due to unprotected movable machine parts, caused by missing protective devices!

This risk may cause most serious injuries including loss of limbs.

Close open protective devices or mount previously removed protective devices before powering the machine.

87010283

Risk due to substances or foreign objects blown away from or out of the machine to people standing within the hazardous area of the machine!

This risk may cause most serious injuries to any part of the body.

- Keep sufficient safe distance to the hazardous area of the machine.
- Ensure that people keep sufficient safe distance to the hazardous area of the machine as long as the tractor engine is running.

87010284

Risk to any part of the body of being crushed if people stand beneath the open, unsecured tailgate!

This risk may cause most serious injuries or even death.

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

87010287

Dangerous situations may occur if load-bearing parts break due to mechanical work on frame elements!

This risk may cause most serious injuries or even death.

As a basic principle, the following work is not allowed:

- mechanical processing of the chassis,
- drilling at the chassis,
- boring up of existing holes at the chassis frame or at load-bearing parts,
- welding on load-bearing parts.

87010289

Risk to any part of the body of being drawn in and becoming entangled due to powered working tools (pick-up and feeder rotor)!

This risk may cause most serious injuries or even death.

- Keep sufficient safe distance to powered working tools.
- Never reach into the hazardous are 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 sufficient safe distance to powered working tools.

3.6.2 Instruction signs

An instruction sign consists of a pictograph:

(1) Pictograph including information about proper use of the machine.

The pictograph includes visual or descriptive information or information summarized in a table.

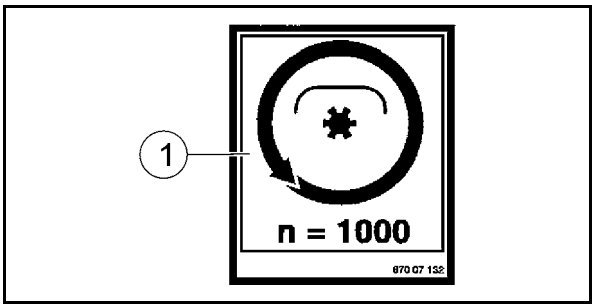
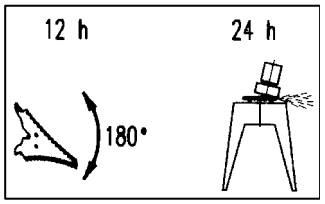


Fig. 11

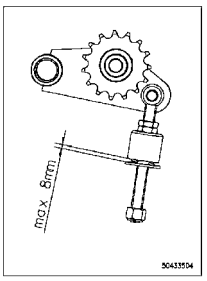
50406501

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



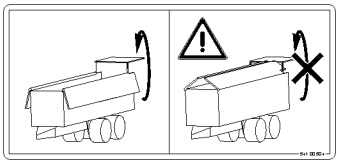
50433504

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



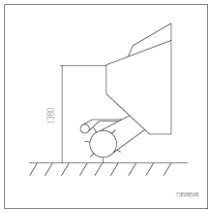
54100504

Only lift or lower the tailgate with the covering system (optional extra) completely opened.



73506506

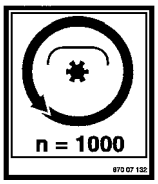
Adjust mounting height of folding drawbar.



87007132

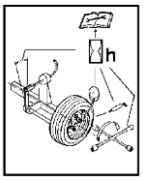
The required drive speed of the machine is 1000 min^{-1}.

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 the admissible speed and sense of rotation of the machine.



87007133

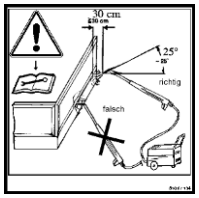
Observe the information for braking axle maintenance included in the operating instructions.



87007134

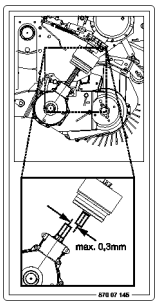
Risk due to improper cleaning of the machine.

Absolutely observe the information in the chapter "Cleaning of machine", page 209 when using a pressure washer/steam blaster for cleaning the machine.



87007145

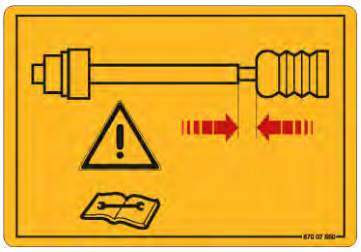
Align the splined shafts of the CFS angular gear with a maximum axial offset of 0.3 mm to each other.



87007550

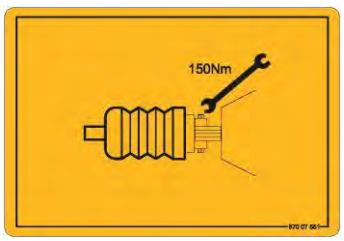
Adjust length of propeller shaft.

Before commissioning the machine, shorten the propeller shaft, in order to avoid damage to the tractor and the machine. Absolutely observe the information in the chapter "Adjust length of propeller shaft to tractor", page 182 as well as the operating instructions provided by the propeller shaft manufacturer along with the propeller shaft.



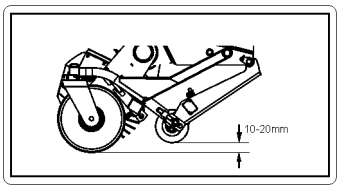
87007551

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



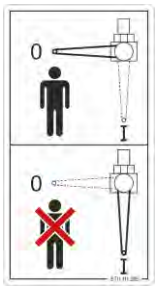
87007556

Set additional roller feelers (optional extra) 10-20 mm higher than the roller feelers.



87010285

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



54106501

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

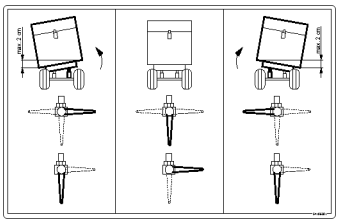
(1) Upper stop-cock to the right (open) = right-hand vehicle side preselected

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)



(1) (2) (3)

87010288

This pictograph illustrates fixing points for lifting equipment (jack).

877 06 091

The pictograph marks anchorage points for fixing slings for transport of the machine.

3.6.3 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.

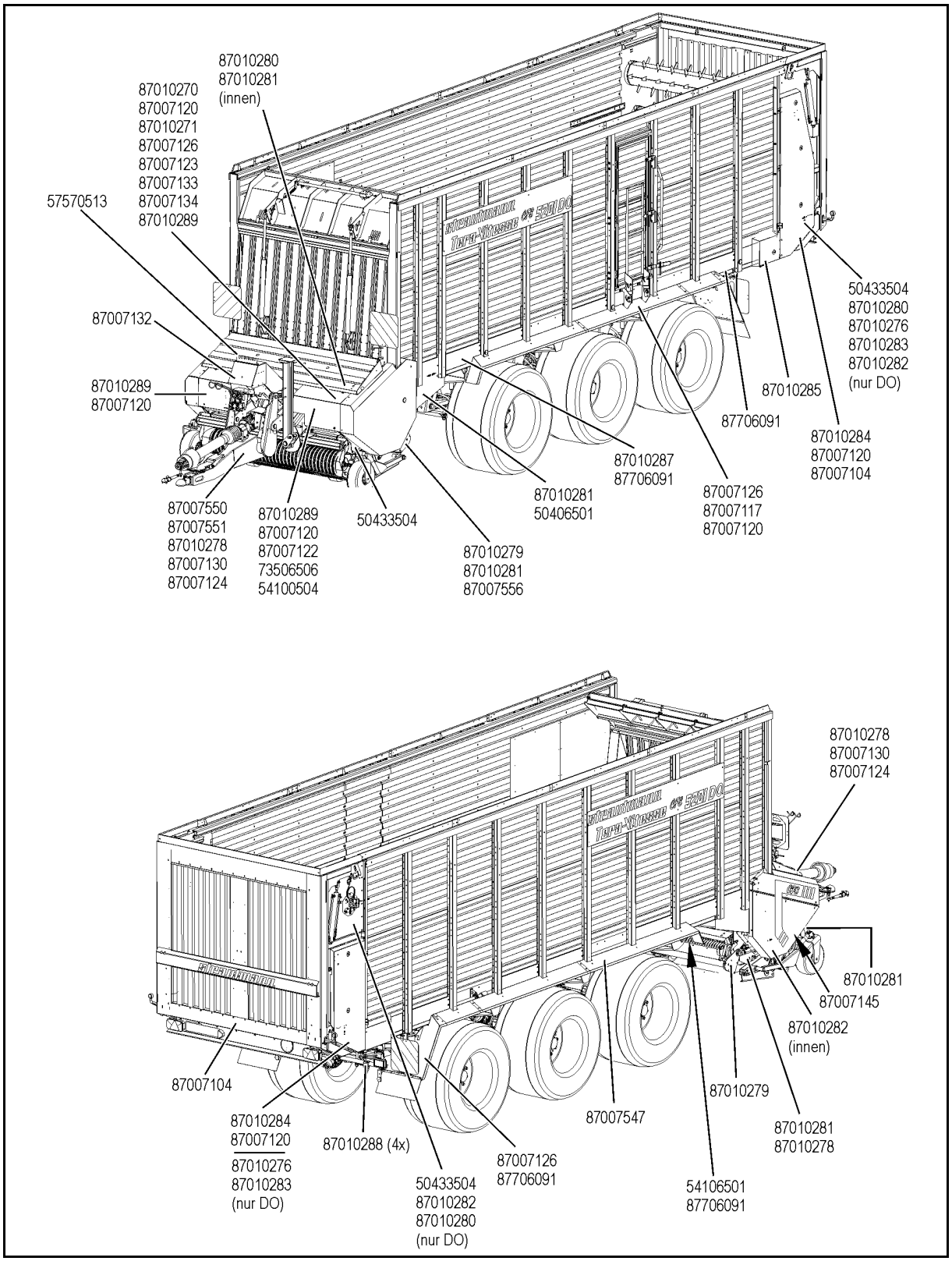


Fig. 12 (shows Tera-Vitesse CFS 5201 DO)

3.7 Risks in case of non-observance of safety instructions and warning signs

Non-observance of the safety instructions and warning signs may:

- cause risk to people, environment and machine such as:
  - risk to people due to non-secured work areas,
  - failure of essential machine functions,
  - failure of specified methods for the use, service and maintenance of the machine,
  - risk to people due to mechanical and chemical effects,
  - threat to the environment due to leaking operating media.
- lead to invalidation of any claims for damages.

4 Loading and unloading

Only the haulage contractor is authorised to carry out this work!

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

Otherwise, this work will impair your safety and the functional ability of the machine during and after its execution.

Loading and unloading by means of tractor

WARNING

Risk to people due to uncontrolled movements of the tractor and the machine if insufficient stability and insufficient steerability and braking ability of the tractor occur!

- Properly hitch the machine to the tractor before loading or unloading the machine onto or from a transport vehicle.
- When hitching and transporting the machine for loading and unloading, only use a tractor which meets the performance requirements and can safely slow down the machine..

  If the machine is equipped with a compressed-air brake system, you are only allowed to start moving the machine when the pressure gauge on the tractor indicates 5.0 bar.

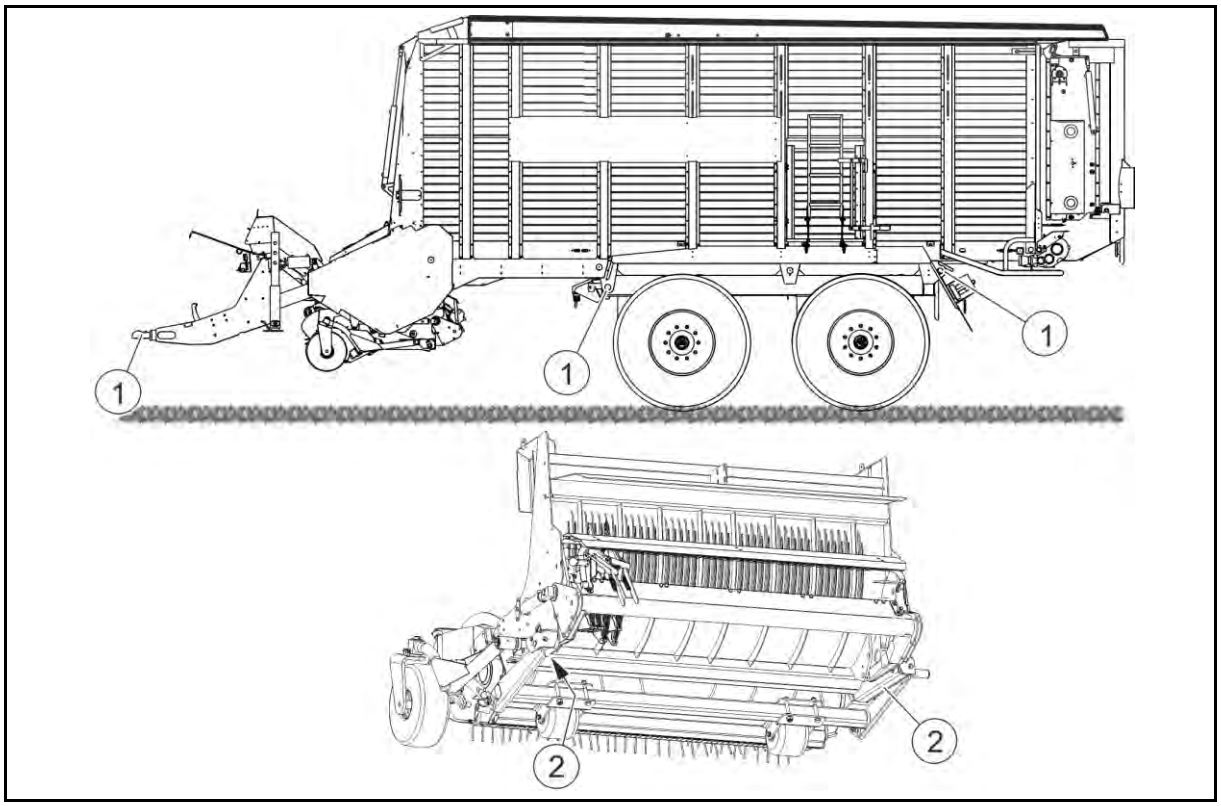


Fig. 13

(1) Load bearing points (on both sides)

(2) Contact surface (on both sides); use a suitable base (e.g. hardwood)

Loading and unloading by means of lifting equipment (for lifting into containers)

WARNING

Risk of crushing and/or impact to people if the lifted machine accidentally comes down!

- Use appropriate slings which are able to safely carry the machine's weight.
- Never stand within the lifting zone beneath the lifted machine.

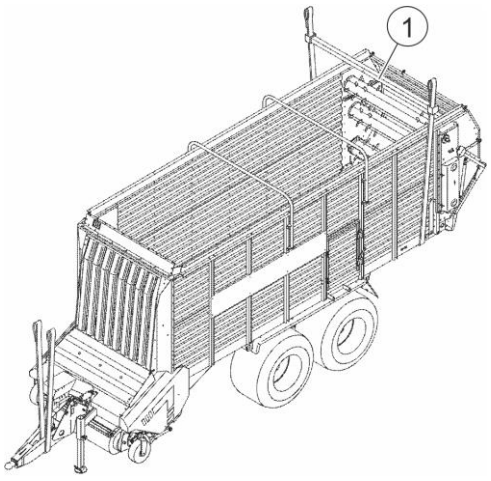


Fig. 14

(1) Spacer

5 Design and function

Observe the information in the chapter "Basic safety instructions", page 33.

The following chapter provides information about the design of the machine, its function and the handling of the individual components.

Some of the machines are illustrated with optional extras. Optional extras are marked in these operating instructions and are available at extra cost.

5.1 Pick-up

The pick-up (1) is movably hinged to the CFS drum and picks up the material to be loaded from the swathe by means of its 6 tine rows.

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 roller feelers (2) move the pick-up into its working position. The roller feelers 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.

The pick-up can be equipped with the additional roller feelers (4) (optional extra). The additional roller feelers run outside the track of the tractor thus assisting the roller feelers in guiding the pick-up in working position on particularly soft ground.

Dangerous spots exist within the area of the pick-up due to functional reasons.

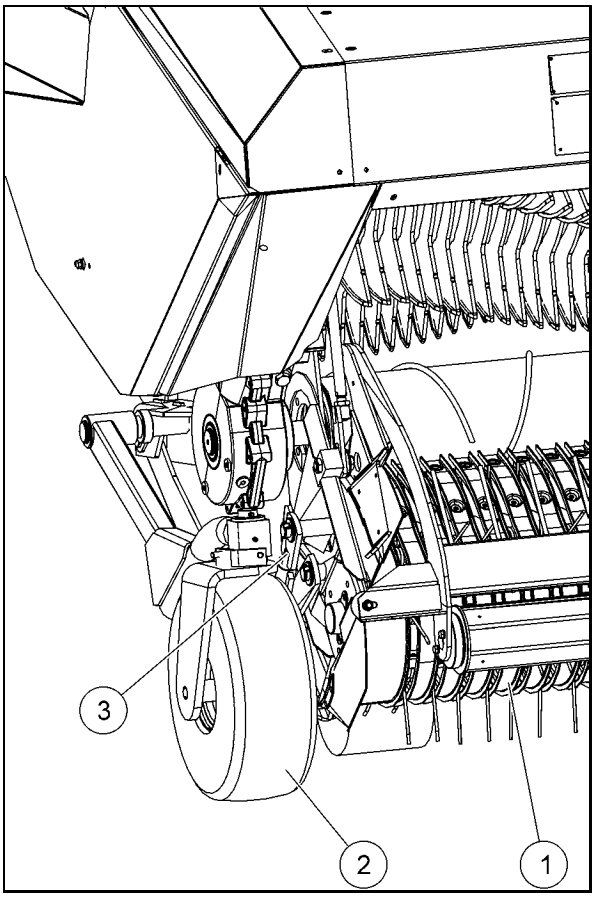


Fig. 15

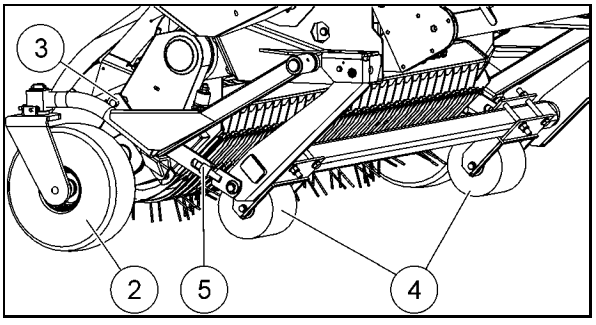


Fig. 16

5.1.1 Pick-up drive

Machine without dosing drums

The pick-up is driven by means of the feeder rotor via the angular switchgear (1) and the angular gear CFS (2).

The friction clutch (2) protects the powertrain leading to the pick-up against damage in case of overload and temporary torque peaks at the pick-up.

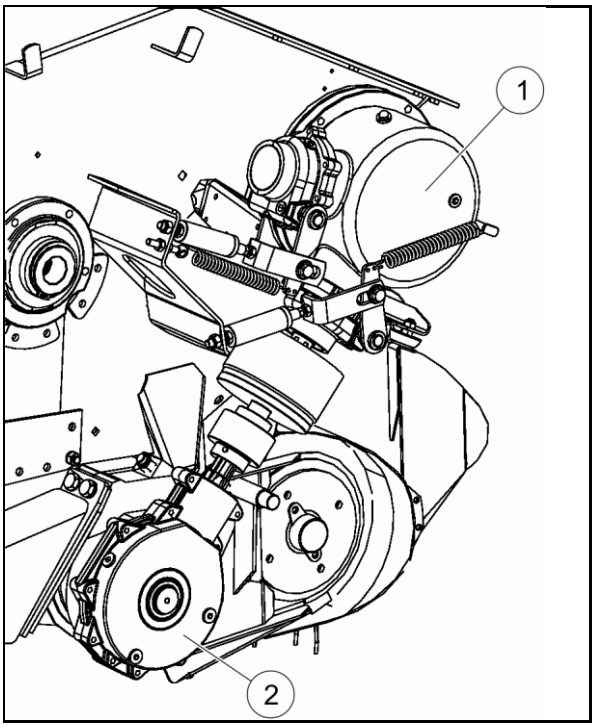


Fig. 17

Machine with dosing drums

The pick-up and the dosing drums are driven by means of the feeder rotor via the angular switchgear (1), the angular gear CFS (2) and the rear angular gear.

The clutches (3, 4) of the angular switchgear are coupled with the hydraulic cylinders of the tailgate via the hydraulic cylinders (5, 6). When opening and closing the tailgate:

- the hydraulic cylinder (5) actuates the clutch (3) and engages or disengages the powertrain (7) leading to the dosing drums.
- the hydraulic cylinder (6) actuates the clutch (4) and engages or disengages the powertrain (8) leading to the pick-up.

The friction clutch (9) protects the powertrain leading to the pick-up against damage in case of overload and temporary torque peaks at the pick-up.

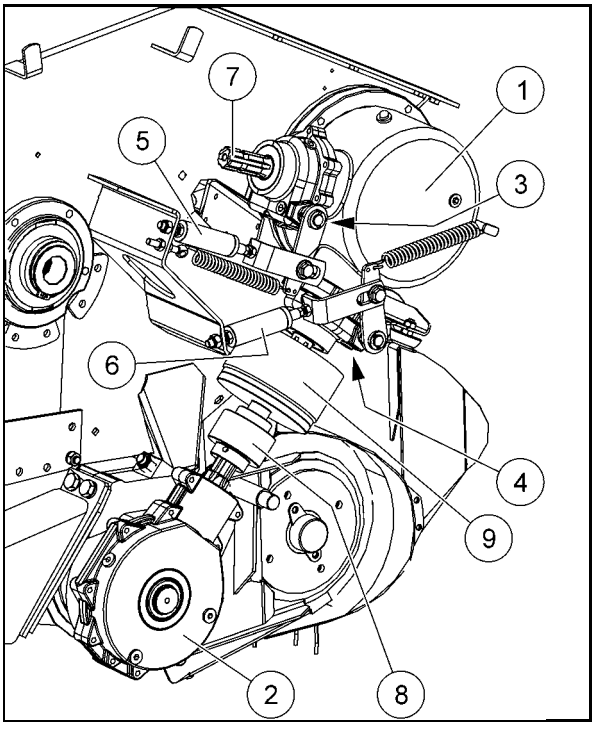


Fig. 18

5.1.2 Silage additive pump

Optional extra

The drive of the silage additive pump is connected with the open-centre position of the pick-up via the control system.

If the pick-up is switched to open-centre position with the control system switched on, the silage additive pump sprays silage additives.

The open-centre position of the pick-up must be switched off at the control set to interrupt the spraying of silage additives, in order to possibly reduce the dosage of the silage additive.

ISOBUS control

Observe the information in the chapter "Switch cargo space lighting on/off", page 105.

Switch on silage additive pump

1. Press and hold the **Lighting cargo space** key once.

→ The silage additive pump is switched on.

Switch off silage additive pump

1. Press and hold the **Lighting cargo space** key once again.

→ The silage additive pump is switched off.

5.1.3 Holding-down device with pulley

WARNING

Risk of being drawn in and becoming entangled by the powered pick-up!

Never use the machine without holding-down device with pulley (1), as holding-down-device and pulley also serve as a protective device.

When picking up the material to be loaded, the holding-down device and the advancing pulley (1) press the material against the spring-loaded tines of the pick-up. The distance set between the holding-down device/pulley and the pick-up is vital for proper picking-up of the material from the swathe.

The length of the chains (2) determines the distance between holding-down device/pulley and pick-up:

- large swathe = large distance between holding-down device/pulley and pick-up
- small swathe = small distance between holding-down device/pulley and pick-up

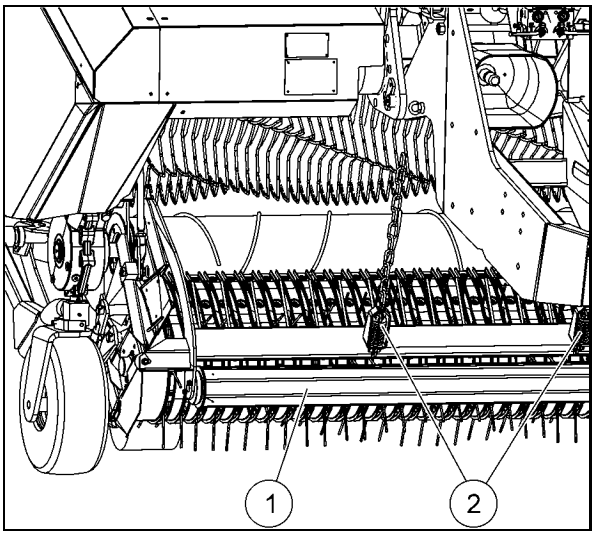


Fig. 19

5.2 Feeder rotor and CFS drum

The feeder rotor (1) interacts with the cutting unit (2) and transports the material picked up by the pick-up (3) through the conveyor duct into the cargo space. The CFS drum (4) conveys the picked-up material into the outer parts of the feeder rotor which are subject to less strain, thus distributing the strain over the entire width of the feeder rotor and the cutting unit.

Strippers (5) protrude into the gaps between the conveying tines (6) of the feeder rotor thus preventing the feeder rotor from becoming clogged.

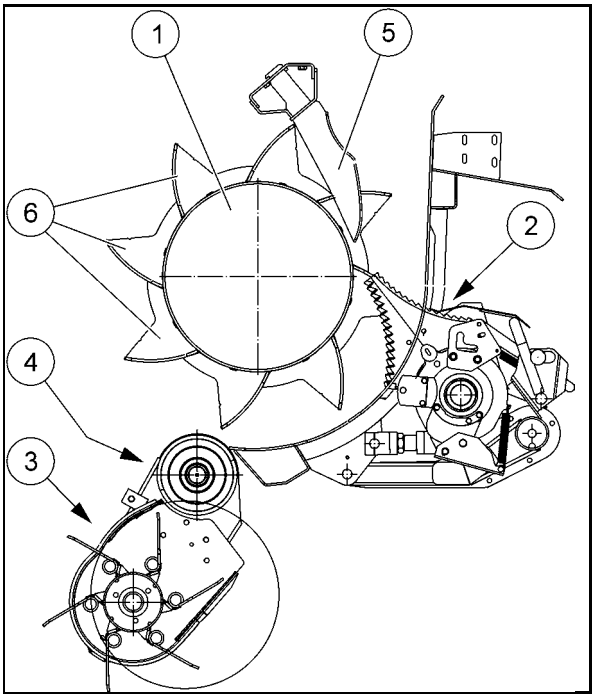


Fig. 20

An rpm sensor (1) at the friction clutch (2) of the CFS drum measures the number of revolutions of the CFS drum (X = distance 2 mm).

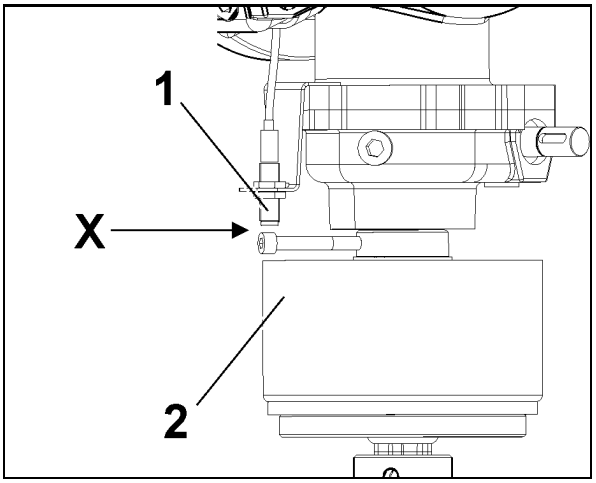


Fig. 21

5.3 Cutting unit

The cutting unit (1) engages into 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 elimination of blockages,
- for return of cutting knives evaded to the rear to their original position,
- for removal and installation of cutting knives.

The number of cutting knives (4) mounted in the cutting unit determines the cutting length of the loaded material. 50 cutting knives can be mounted. The shortest theoretical cutting length is then 35 mm.

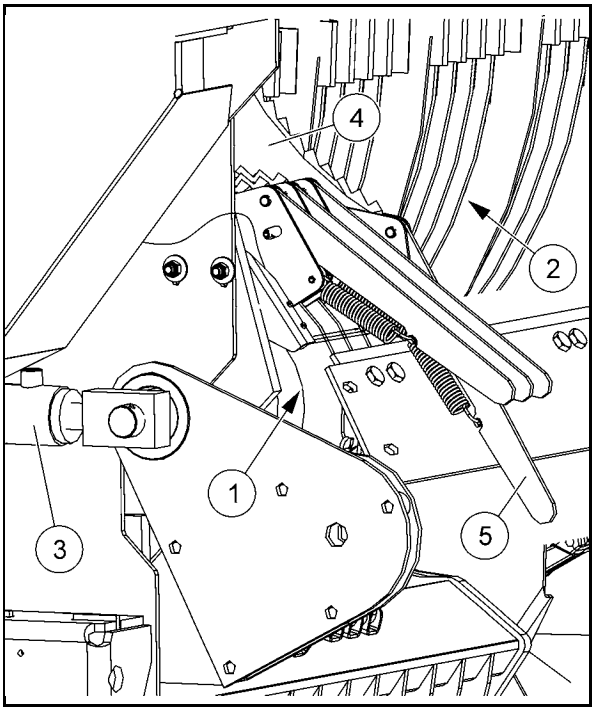


Fig. 22

Blunt cutting knives (1) can be turned over once. Thus, the grinding interval doubles.

Each individual cutting knife is able to evade foreign objects. If a cutting knife encounters a foreign object, it will evade to the rear and remain in that position. This knife security system protects the cutting knives against damage.

In order to return the cutting knife to its working position, the cutting unit must be completely retracted and extended once.

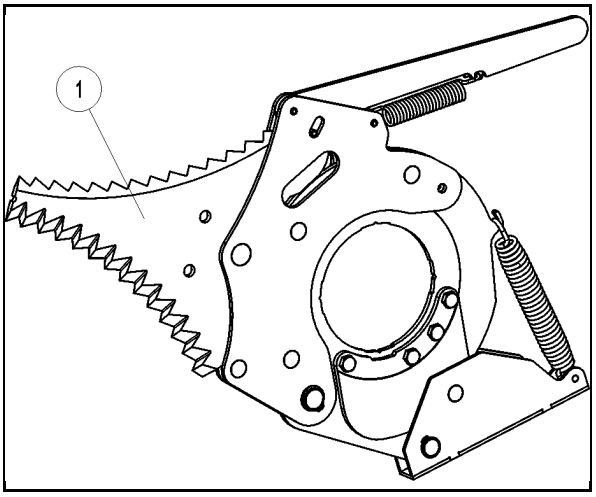


Fig. 23

The knife bag (1) for unused cutting knives or spare cutting knives is positioned at the right-hand front of the axle support close to the parking brake.

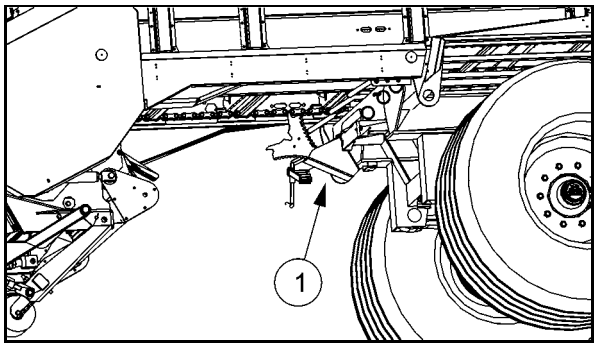


Fig. 24

The sensor (1) monitors the position of the cutting unit.

A light barrier monitors the position of the individual cutting knives and the soiling degree of the cutting unit. The light barrier consists of the transmitter (2) and the receiver (3).

The following positions of the "Cutting Unit" symbol are available on the control set:

- "Cutting unit extended" position if the cutting unit has been completely extended into the conveyor duct.
- "Cutting unit retracted" position if the cutting unit has not been extended into the conveyor duct.
- "Cutting knife out" position:
  - as soon as a cutting knife evades to the rear,
  - as soon as the cutting unit is heavily soiled.

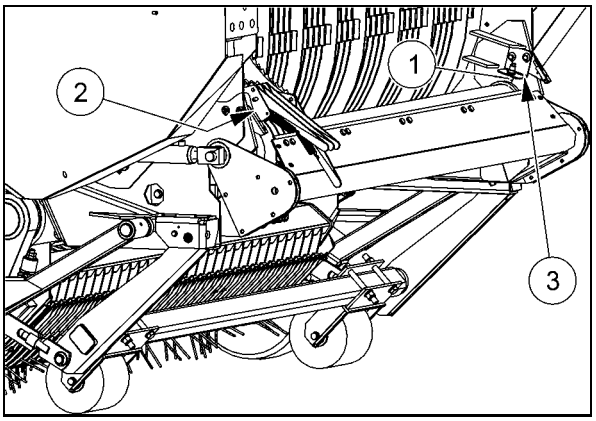


Fig. 25

5.4 Transport floor

The chains (1) of the transport floor are equipped with U-sections (2) and ensure consistent feeding of the loaded material when charging and discharging. Automatic chain tensioners tighten the chains.

The transport floor is driven hydraulically via two feed gearings.

The control set serves to:

- switch the transport floor on and off,
- variably adjust the feed rate of the transport floor. The controllable volume flow of the hydraulic oil is 2-80 l/min.
- reverse the feed direction of the transport floor for a short time (max. 3 seconds), e. g. to eliminate blockages occurred at the dosing drums during discharge.

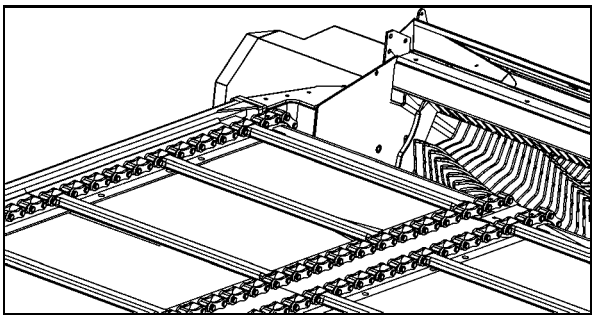


Fig. 26

5.5 Front panel with incorporated automatic charging system

All machine models are equipped with a standard hinged front panel (1) with an incorporated automatic charging system.

The front panel/automatic charging system:

- during operation of the machine as a forage wagon:
  - is swivelled to the rear (closed),
  - is connected with the hydraulic drive of the transport floor in ON mode,
- can, during operation of the machine as a forage transport wagon:
  - be put in vertical position for parallel chopping,
  - be swivelled to the front by 135° for charging.

The front panel/automatic charging system (1) is swivelled via the direct control of the tractor by means of the two double-acting hydraulic cylinders (2).

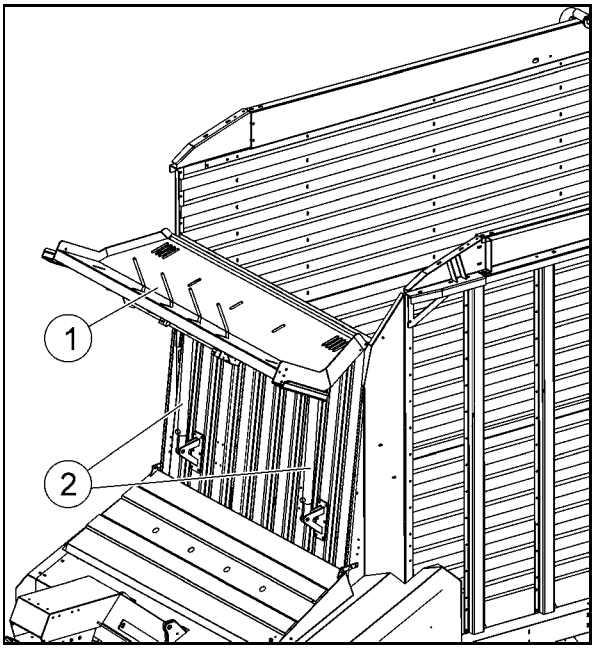


Fig. 27

In order to prevent the nets of the covering system from being torn, do not open the front panel if the covering system (optional extra) of the fully charged machine is closed.

The automatic charging system (1):

- can be switched on and off via the ISOBUS control set,
- mainly consists of the sensing band (2), the actuating plug (3) and the control dial (4),
- switches the transport floor automatically on and off for uniform and complete filling of the cargo space,
- permits to adapt the filling degree of the loaded material in the cargo space in 5% steps.

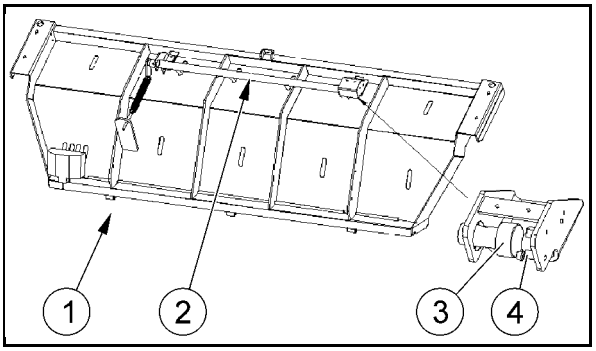


Fig. 28

The higher the set filling degree, the higher the transport floor feed rate and the smaller the filling capacity.

When using the machine as a forage wagon, the loaded material piles up at the front grating of the cargo space during charging. The loaded material piling up deflects the sensing band upwards and actuates the control dial via the actuating plug.

As soon as the deflected sensing band reaches the lowest set position, the transport floor automatically starts running at low feed rate and conveys the loaded material to the back. Increasing

filling of the front section of the cargo space initiates a further deflection of the sensing band. The feed rate of the transport floor increases in proportion to the deflection of the sensing band.

As soon as the deflected sensing band reaches the highest set position, the loaded material is conveyed to the back at maximum feed rate. The transport floor stops as soon as the front section in the cargo space has been cleared and the loaded material does not deflect the sensing band upwards any more.

A calibration of the automatic charging system helps to separately set the lowest position of the sensing band for switching the transport floor on and off and the highest position of the sensing band to switch over to maximum feed rate. Observe the information in the chapter "Calibrate automatic charging system", page 115.

5.5.1 Deactivate automatic charging system and stop transport floor

Machine without dosing drums

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 ISOBUS control set will generate an acoustic signal (horn sound) and a visual signal "Forage wagon full".
- the automatic charging system will be deactivated and the automatic feed function for the transport floor will be switched off.

Machine with dosing drums

The bottom dosing drum will evade to the rear if the loaded material applies a particular pressure to this dosing drum. The switching plate releases an electrical pressure switch and disconnects the automatic charging system and the hydraulic drive of the transport floor. The control set simultaneously displays the message "Forage wagon full".

These measures are intended to prevent the loaded material from being too strongly pressed against the dosing drums and the drums 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 dosing drum.

5.6 Covering system

Optional extra

The machine may be equipped with a covering system to secure the loaded material during transport.

The covering system consists of two net-covered tubular frames (1) which can be swivelled by 270°.

The covering system is connected and actuated via the direct control of the tractor.

For mounting the covering system, please refer to the chapter "Mount covering system", page 177.

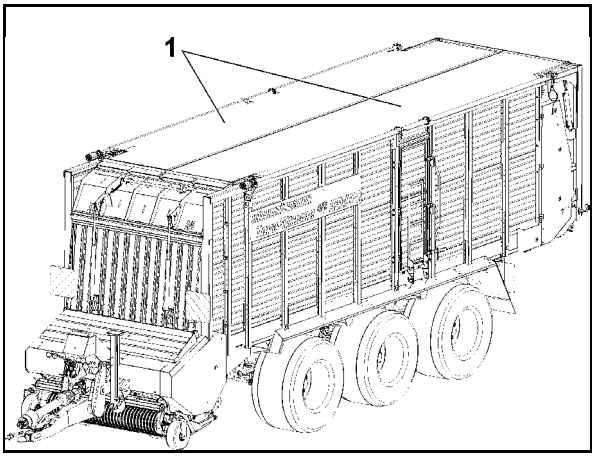


Fig. 29

The covering system must be closed during transport journeys.

In order to prevent the net of the covering system from being torn, do not open the front panel if the covering system (optional extra) of the fully charged machine is closed.

When opening and closing the covering system,

- the tailgate,
- the access door,
- the protective covers of the dosing unit

must be closed.

5.7 Tailgate

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.

Machine without dosing drums

When lifting the tailgate, the hydraulic cylinders (1) first vertically lift the tailgate (2) out of its locking mechanism (3). The tailgate then swivels upwards to the rear and raises completely.

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.

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

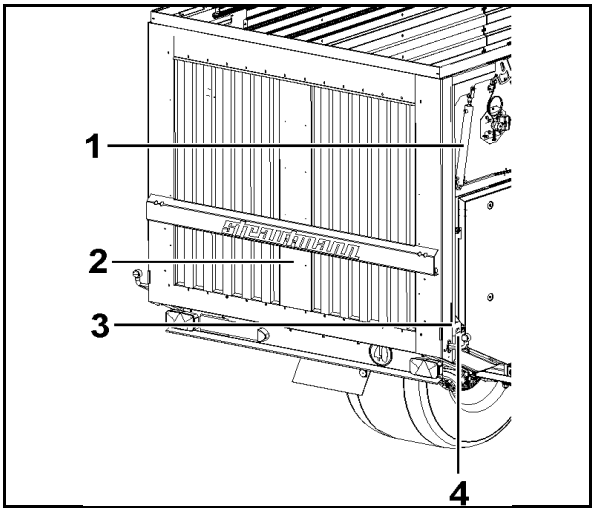


Fig. 30

Machine with dosing drums

When lifting the tailgate, the hydraulic cylinders (1) first vertically lift the tailgate (2) out of its locking mechanism (3). The tailgate can then be opened at different opening widths.

The first opening width of the tailgate (discharge position) can be individually set via the control set and the tailgate is automatically moved to that position when pressing the **Lift tailgate** key. When releasing and pressing the **Lift tailgate** key again, the tailgate rises as long as the key is pressed or until the tailgate has been completely lifted.

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.

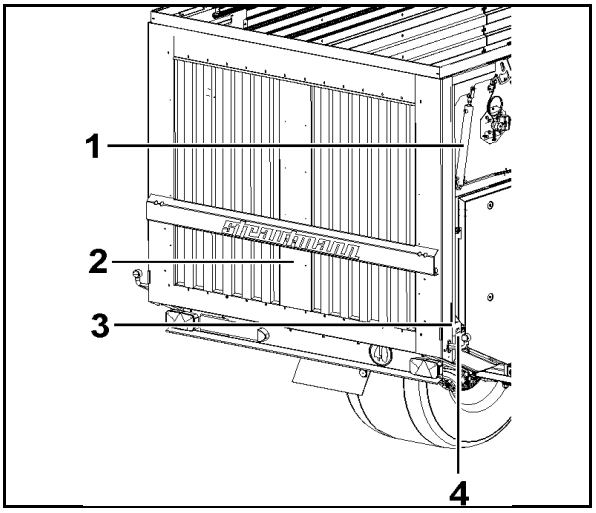


Fig. 31

5.7.1 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 of the tailgate.

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

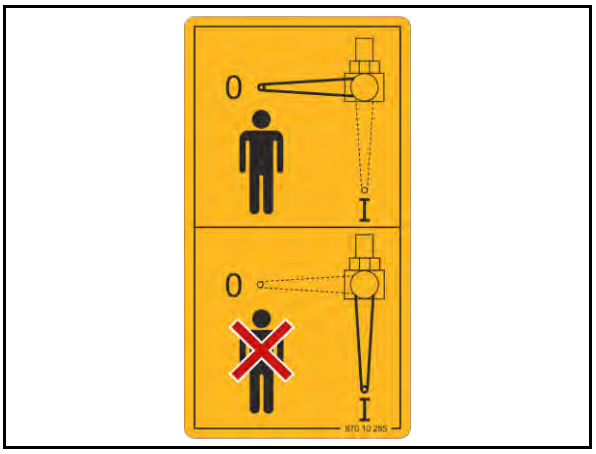


Fig. 32

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 discharging

5.7.2 Sensors of tailgate

(1) Tailgate

(2) "Tailgate open" sensor

(3) Mounting position on machine with dosing drums

(4) Mounting position on machine without dosing drums

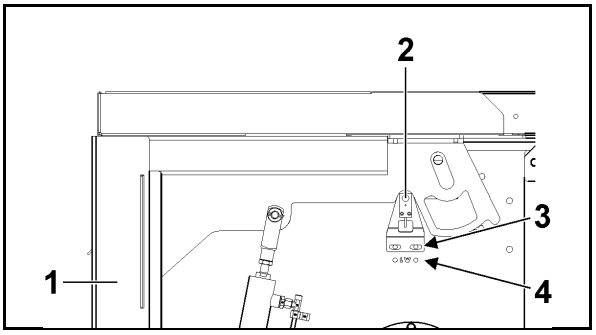


Fig. 33

(1) Tailgate

(2) "Tailgate closed" sensor

X = distance 2 mm

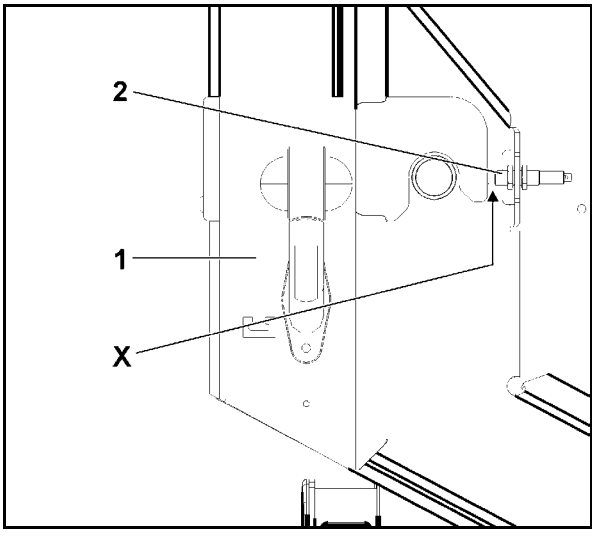


Fig. 34

5.8 Dosing drums

Machines with the type designation "DO" are equipped with 3 dosing drums (1).

The p.t.o. shaft of the tractor powers the bottom dosing drum via the propeller shaft, main gearbox, rotor gear, angular switchgear, lateral drive shaft, rear angular gear and rear drive shaft.

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

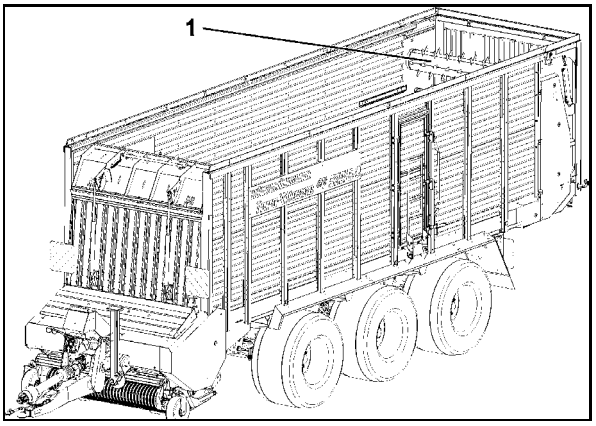


Fig. 35

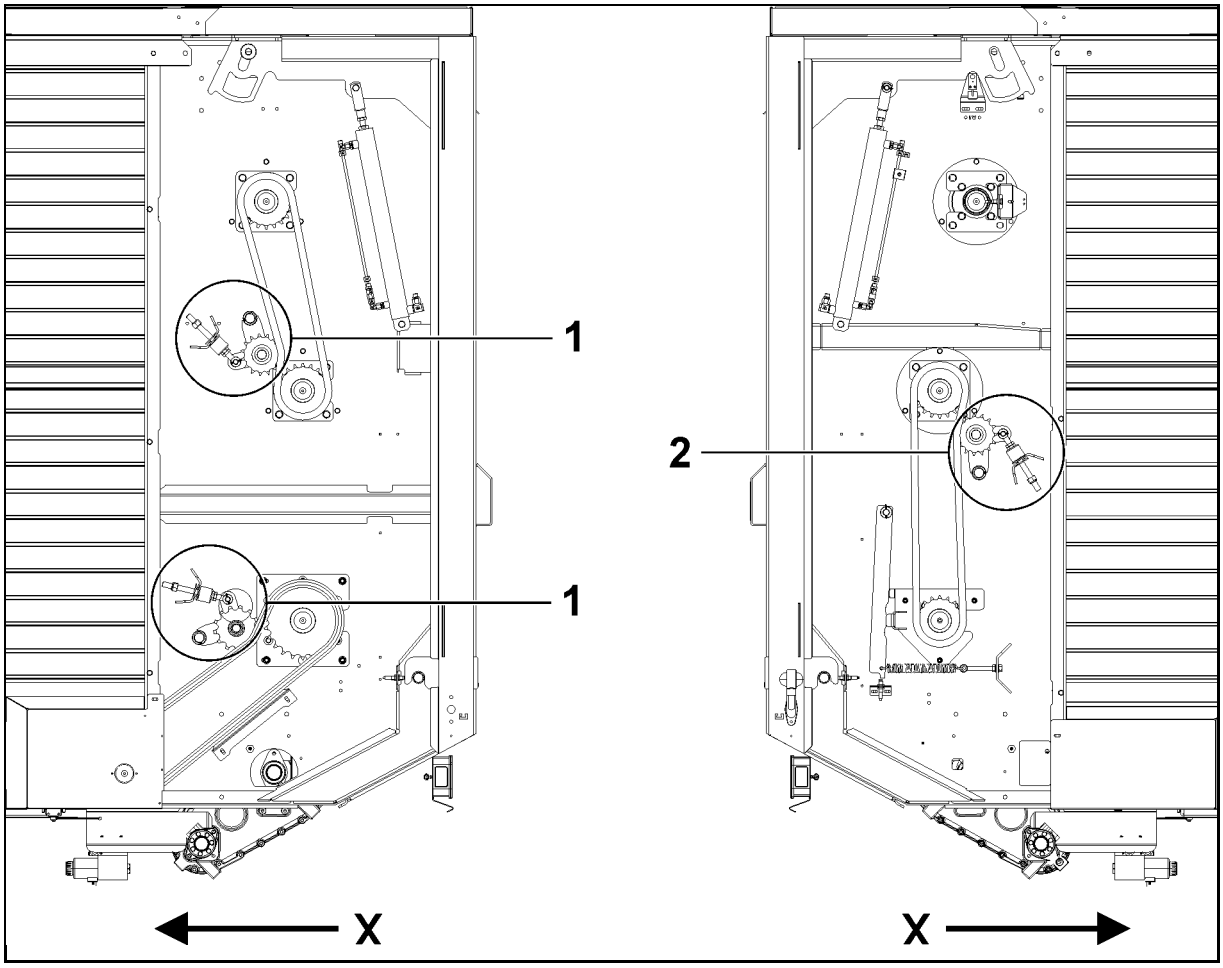


Fig. 36

(X) Direction of motion

(1) automatic chain tensioner, left-hand

(2) automatic chain tensioner, right-hand

5.8.1 Sensors of dosing drums

The sensors of the dosing drums are positioned on the right-hand side of the machine.

(1) Axle of top dosing drum

(2) rpm sensor

X = distance 2 mm

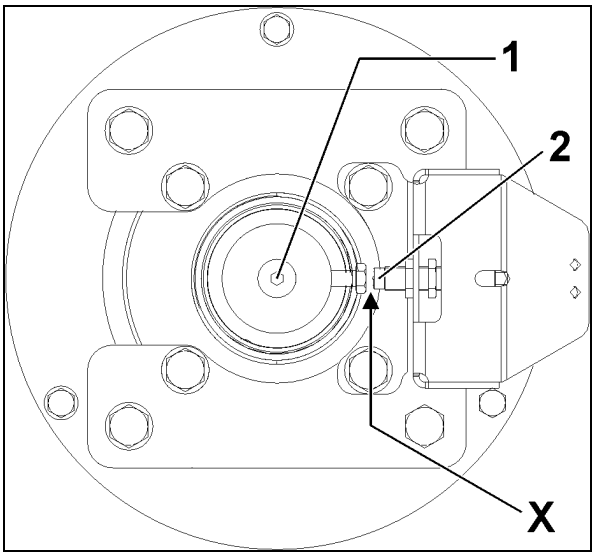


Fig. 37

(1) Axle of bottom dosing drum

(2) "Forage wagon full" sensor

(3) Switching plate

(4) Tension spring

X = distance 20 mm

Y = distance 1 mm

Z = distance 290 mm

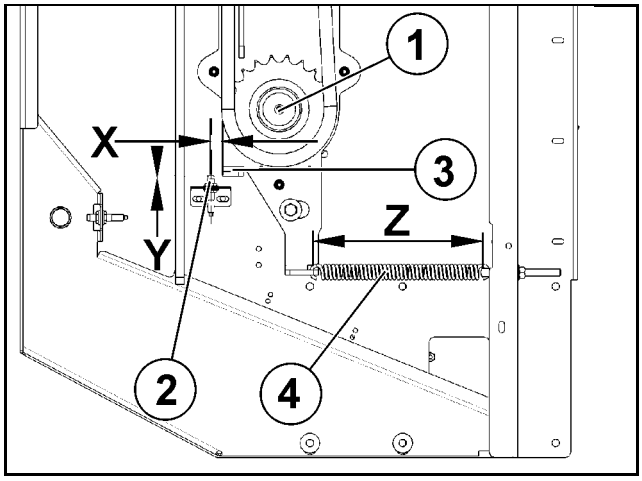


Fig. 38

If the transport floor often switches off when discharging the machine, check the following settings and adjust them if necessary:

- The minimum horizontal distance between the "Forage wagon full" sensor (2) and the switching plate (3) must be 20 mm (X), the minimum vertical distance 1 mm (Y).
- The tension spring (4) of the dosing drum switch-off device must be tensioned by 60 mm, such that it has a length of 290 mm (Z) in tensioned condition.

5.9 Access door and ladder

Access door (1), ladder (2) and handle (3) permit access to the cargo space. The locking mechanism (4) secures the closed access door and the folded-up ladder in transport position.

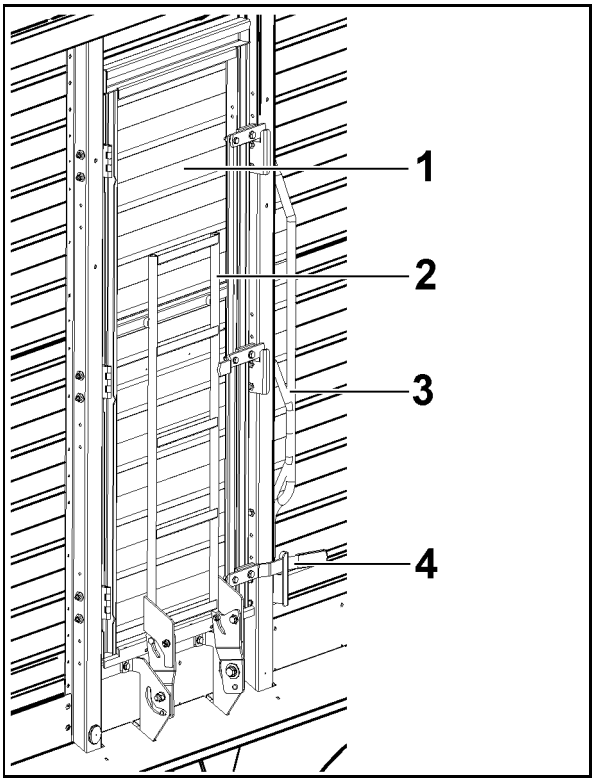


Fig. 39

5.10 Hydraulic system of machine

The hydraulic system of the machine:

- can be operated at a maximum of 100 l/min.,
- has been designed for open or closed-centre hydraulic systems. The conversion from open to closed-centre hydraulic system is carried out by means of the load-sensing screw at the electro-hydraulic control block.

All hydraulic functions of the machine are operated via the control set. The individual hydraulic components of the machine are connected to the electro-hydraulic control block of the machine for this purpose.

The hydraulic system of the machine is ready for operation if:

- the electro-hydraulic control block has been connected to the hydraulic system of the tractor and
- the oil circulation between tractor and machine has been switched on via the control device on the tractor.

- The actuating speed of the hydraulic functions (hydraulic components) depends on the tractor's hydraulic system.

  Depending on the tractor model, a correction of the set actuating speed at the tractor's control device/the machine's control block may be necessary.
- For information about the required control devices, refer to the chapter "Required tractor equipment", page 27. For information about the hose markings, refer to the chapter "Marking of hydraulic supply lines", page 17.

5.10.1 Electro-hydraulic control block

(1) Electro-hydraulic control block

(2) Basic block with proportional directional control valves for transport floor drive with:

- (2.1) Connecting aperture for load-sensing control line
- (2.2) Proportional directional control valve for transport floor
- (2.3) Pressure limiting valve for priority function (190 bar)
- (2.4) Pick-up
- (2.5) Reverse transport floor
- (2.6) Pre-selection solenoids
- (2.7) Load-sensing screw for disabling the pressure regulator with the load-sensing control line mounted:
  - Screw unscrewed = fixed displacement pump
  - Screw screwed in = LS mode

(3) Intermediate plate with directional seat valves for:

- (3.1) Folding drawbar and drawbar suspension
- (3.2) Tailgate and switchgear, dosing unit circuit
- (3.3) Pressure limiting valve for cutting unit

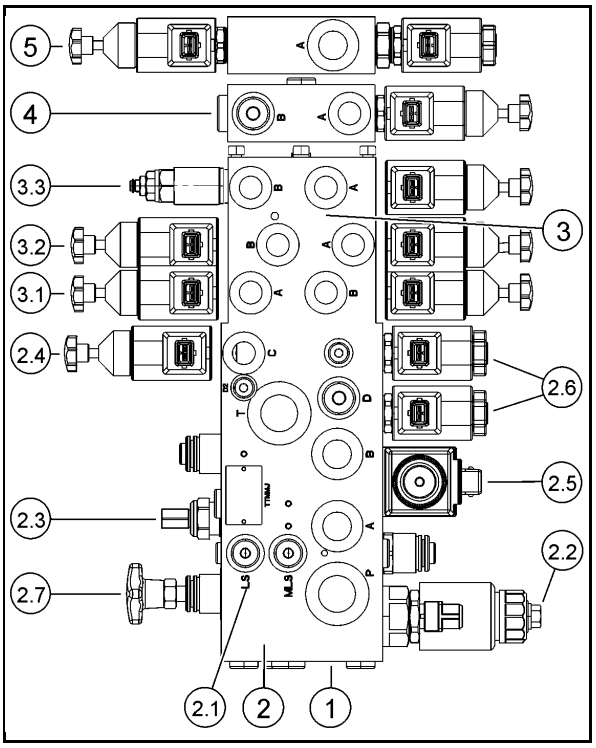


Fig. 40

The pressure limiting valve is set to 140 bar, in order to prevent the cutting unit and the cutting knives from being damaged, while the cutting unit is extended into the conveyor duct.

Optional:

(4) End plate with directional seat valves for steering axle

(5) End plate with directional seat valves for tridem lift axle (optional extra)

5.10.1.1 Load-sensing hydraulic system

- Connect the hydraulic system only after it has been depressurized.
- Turn the tractor engine off before connecting the hydraulic system.
- Always connect the load-sensing control line when connecting the hydraulic connector "Flow line" directly to the hydraulic pump of the tractor.

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

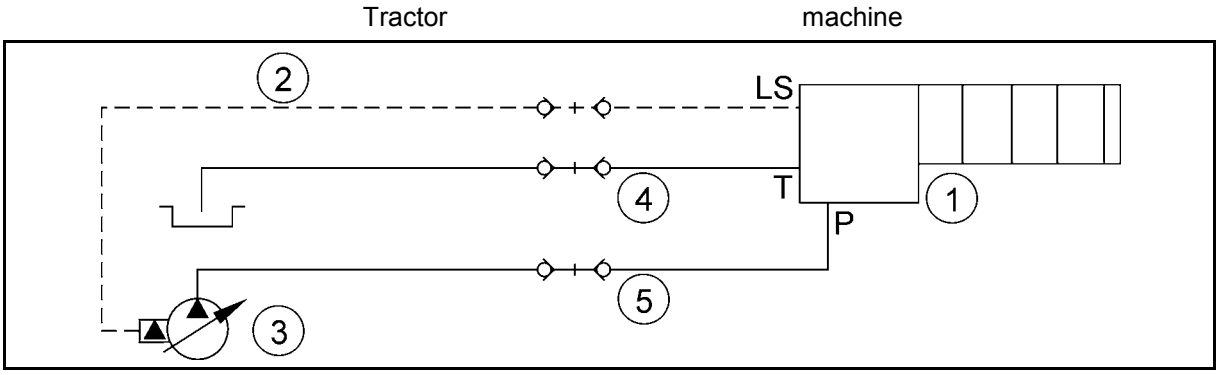


Fig. 41

(1) Electro-hydraulic control block of the machine

(2) Load-sensing control line

(3) Adjustable hydraulic pump of tractor

(4) Hydraulic connector "Return line", connected to a free return port, **not** via control device

(5) Hydraulic connector "Flow line", directly connected to hydraulic pump of tractor, oil supply **not** via control device

Connect load-sensing control line

1. Screw the load-sensing control line (2) into the connecting aperture (Fig. 40/2.1) of the electro-hydraulic control block.
2. Lock the pressure regulator in the electro-hydraulic control block. For this purpose
   2.1 screw the load-sensing screw (Fig. 40/2.7) in as far as it will go.
3. Connect the load-sensing control line (2) to the load-sensing connector of the tractor.
4. Connect the hydraulic connector "Return line" (4) to a free return port of the tractor.
5. Connect the hydraulic connector "Flow line" (5) directly to the hydraulic pump of the tractor.

Open the pressure regulator via the load-sensing screw in the electro-hydraulic control block when the hydraulic connector "Flow line" has been connected to the control device of the tractor. Unscrew the load-sensing screw as far as it will go for this purpose.

Disconnect the load-sensing control line from the load-sensing connector of the tractor before operating the machine with free pressure regulator.

5.10.1.2 Electrical system – Emergency manual operation

DANGER

Risk due to dangerous movements of movable components when actuating the emergency manual operation function!

Before actuating the emergency manual operation function, make sure that third persons leave the machine's hazardous area.

Unscrew the knurled screws completely again after having carried out the emergency manual operation function.

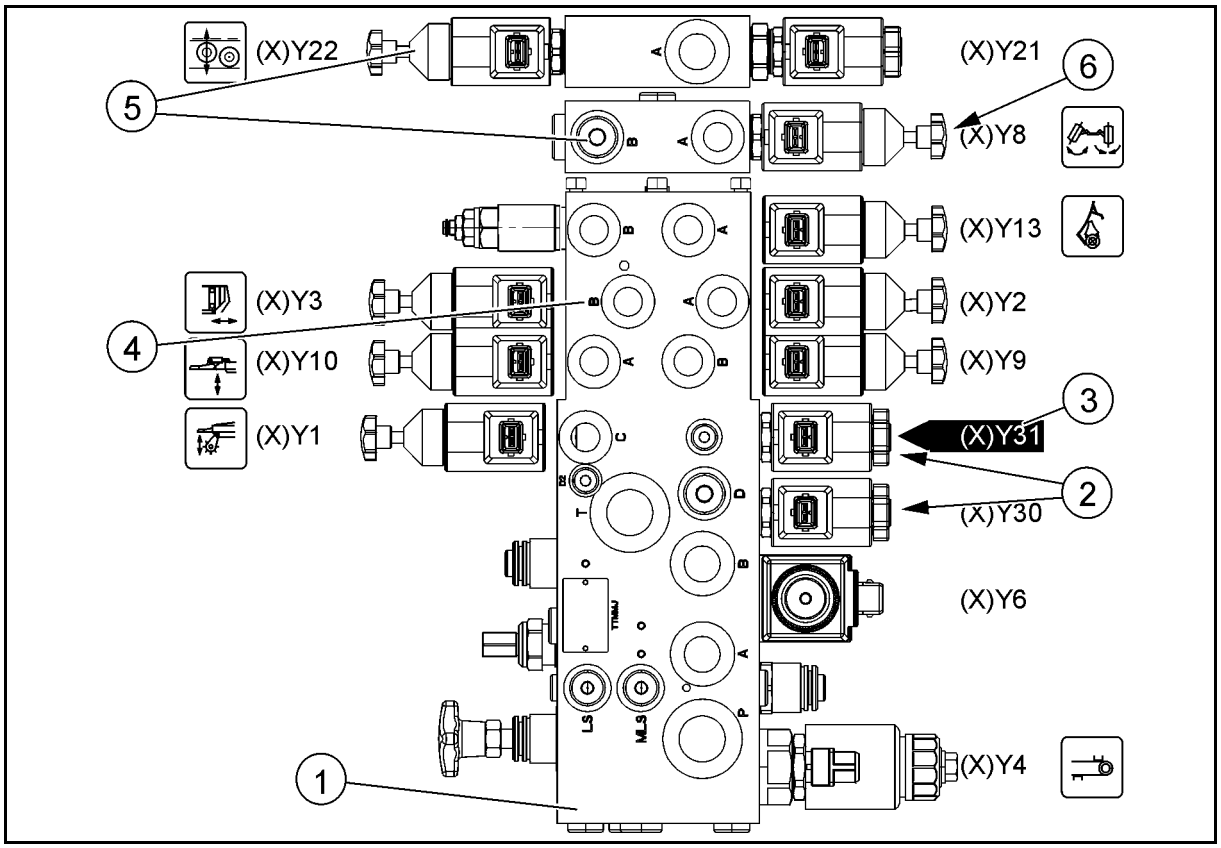


Fig. 42

In case of failure of the electrical system, the solenoids for switching the directional control/seat valves can be actuated directly at the electro-hydraulic control block (1) via the emergency manual operation function.

- Pre-selection valves (2):

  Use a blunt object (3) to push in the armature of the solenoid at the respective control valve to actuate the required hydraulic functions.

- Intermediate plates (4) and end plates (5):

  Screw in the knurled screw (6) at the required directional control/seat valve.

5.10.1.3 Functional diagram for emergency manual operation

Solenoid valves / Functions		Retract (out)	Extend (in)	Lift	Lower	Lift	Lower	Lift	Lower	Forward	Reverse	Enabled	Disabled	Lift	Lower	ccw rotation *	cw rotation *	Closed *	Open
(X)Y12		●	●																
(X)Y13		●	●																
(X)Y1				●	●														
(X)Y2						●	●												
(X)Y3						●	●												
(X)Y9								●	●										
(X)Y10								●	●										
(X)Y4										●									
(X)Y6											●								
(X)Y8												●							
(X)Y8													●						
(X)Y22														●					
(X)Y21															●				

Solenoid valves \ Functions	Retract (out)	Extend (in)	Lift	Lower	Lift	Lower	Lift	Lower	Forward	Reverse	Enabled	Disabled	Lift	Lower	ccw rotation *	cw rotation *	Closed *	Open
(X)Y15 *															●			
(X)Y14 *																●		
(X)Y16 *																	●	●
(X)Y17 *																	●	●
(X)Y30		●				●		●					●				●	
(X)Y31	●		●		●		●					●						●

* Optional extra

The following example explains the procedure for actuating the emergency manual operation function.

Example:

Lift tailgate

1. Screw in the knurled screws (1, 2) at the directional seat valves (X)Y2 and (X)Y3.
2. Use a blunt object to push in the armature of the solenoid (X)Y31 (3).

→ The tailgate lifts.

3. Unscrew the knurled screws (1, 2) completely again.

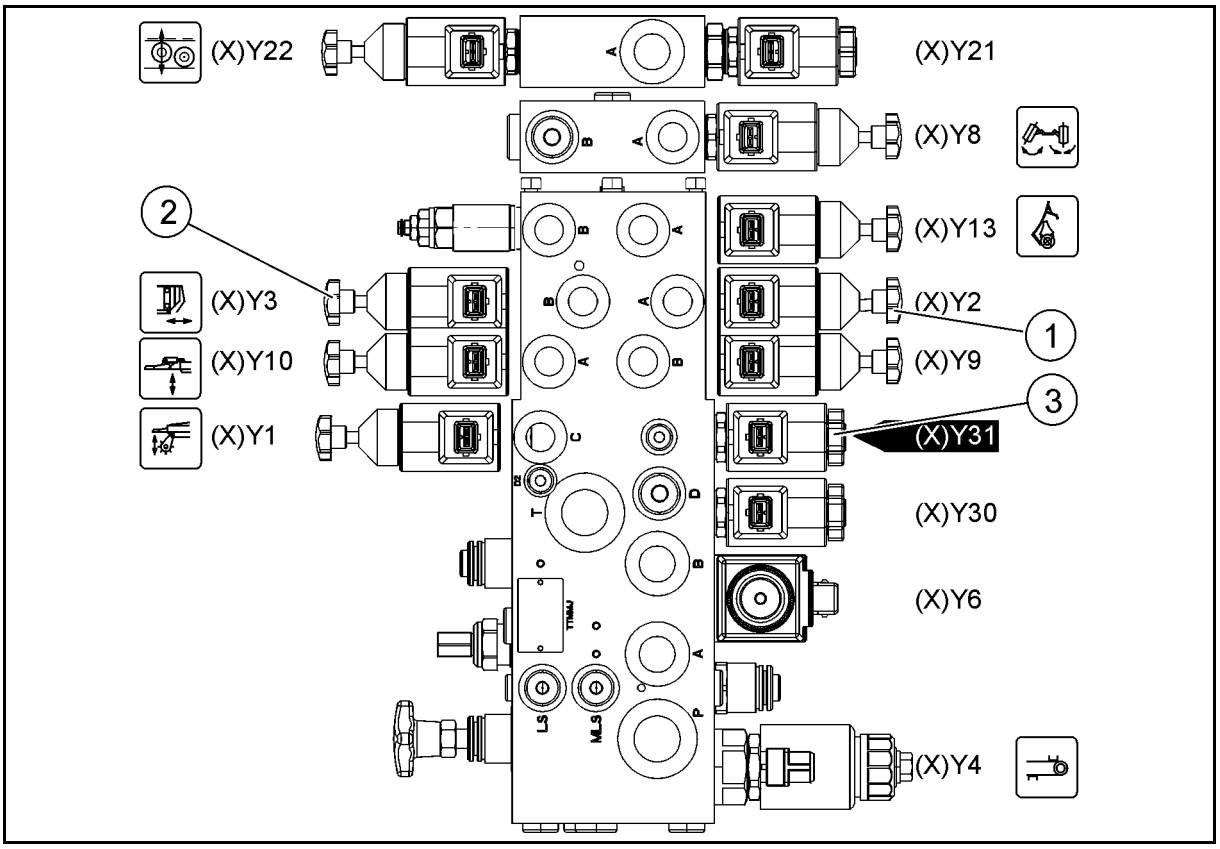


Fig. 43

5.10.2 Hydraulic hose pipes

WARNING

Risk of infection to people due to hydraulic oil squirting out under high pressure and entering the body!

Make sure that the hydraulic system on the tractor and on the machine has been depressurized when connecting and disconnecting the hydraulic hose pipes. Always swivel the operating element at the control device on the tractor to open-centre position.

5.10.2.1 Connect hydraulic hose pipes

WARNING

Risk of being crushed, cut, becoming entangled, being drawn in and risk of impact to people due to malfunctions caused by improperly connected hydraulic hose pipes!

- Check the assignment of the hydraulic hose pipes at the control block of the machine if the coloured markings (dust caps) are missing:
  - P = Pressure line
  - T (R;S) = Return line

- Check the compatibility of the hydraulic oils before connecting the machine to the hydraulic system of your tractor.
- Do not mix mineral oils with bio oils!
- Observe the maximum admissible operating pressure of the hydraulic oil.
- Only connect clean hydraulic plugs and hydraulic sleeves.
- Slip 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,
  - must not chafe against external components.

1. Swivel the respective operating element at the control device on the tractor to open-centre position.
2. Connect the hydraulic hose pipes to the control devices of the tractor:
   2.1 Pressure pipe to a single-acting or double-acting control device.
   2.2 Return pipe to a depressurized return port if possible.

5.10.2.2 Disconnect hydraulic hose pipes

CAUTION

Risk of burns due to contact with hot hydraulic hose pipe components!

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

1. Swivel the respective operating element at the control device on the tractor to open-centre position.
2. Unlock the hydraulic plugs from the hydraulic sleeves.
3. Use the dust caps to protect the hydraulic plugs and the hydraulic sleeves against soiling.
4. Put the hydraulic hose pipes down onto the hose holder.

(1) Hose holder for proper deposition of supply lines.

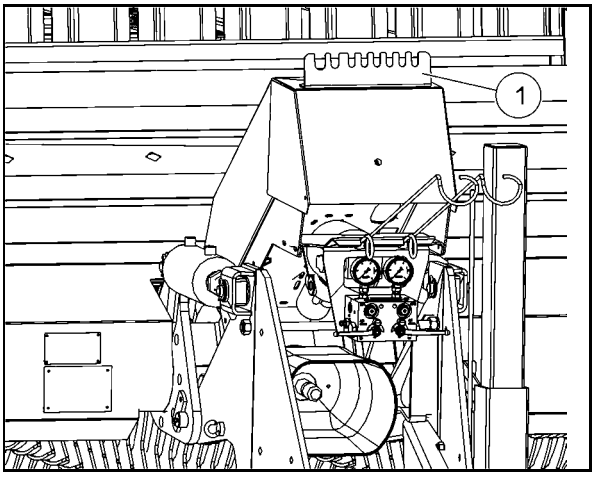


Fig. 44

5.11 Chassis

Depending on the machine's equipment, the chassis consists of:

- a Bogie tandem chassis:
  - with follow-up steering
  - with forced steering axle (only in case of bottom linkage)
  - with dual-line compressed-air brake system and mechanical automatic load-sensitive brake pressure regulator
- a hydraulic tandem or tridem chassis with adjustable travelling height:
  - with follow-up steering
  - with forced steering axle (only in case of tandem chassis with bottom linkage)
  - with dual-line compressed-air brake system and mechanical automatic load-sensitive brake pressure (ALB) regulator

5.11.1 Bogie tandem chassis

3-leaf parabolic springs serve as a compensating rocker arm in the bogie tandem chassis. In case of bumps, the large swing paths ensure an even load distribution onto both axles.

When travelling through tight curves, an offset of up to 80 mm between front and rear axle is allowed.

The reason for the offset is the adding-up of elastic components such as rubber steel bushes, parabolic springs, axle connection and tyres. The offset neutralises itself after a few metres of straight travelling.

5.11.2 Hydraulic tandem chassis with adjustable travelling height

The hydraulic tandem chassis:

- ensures dynamic axle load compensation between the two axles due to the large compensating paths of the hydraulic cylinders, thus constantly ensuring an even load on both axles.
- ensures anti-roll stability on sloping ground and during fast cornering.
- activates the hydraulic ALB regulator of the dual-line compressed-air brake system.

The axle suspension and the damping of the machine on the individual wheels of the hydraulic tandem chassis are carried out by 4 hydraulic cylinders (1).

The axle suspension can be switched on and off via the ISOBUS control set. The axle suspension is active with the road travel mode switched on, the axle suspension is disabled with the road travel mode switched off.

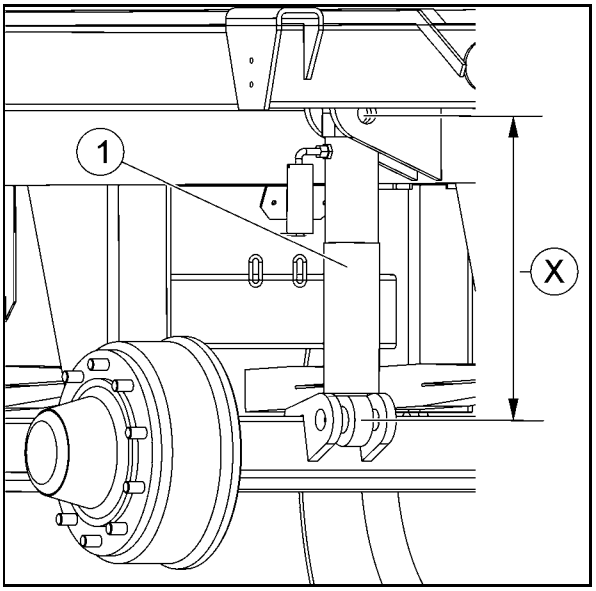


Fig. 45

5.11.3 Hydraulic tridem chassis with adjustable travelling height

The hydraulic tridem chassis:

- ensures dynamic axle load compensation between the three axles due to the large compensating paths of the hydraulic cylinders, thus constantly ensuring an even load on all three axles.
- ensures anti-roll stability on sloping ground and during fast cornering.
- activates the hydraulic ALB regulator of the dual-line compressed-air brake system.

The axle suspension and the damping of the machine on the individual wheels of the hydraulic tridem chassis are carried out by 6 hydraulic cylinders (1).

2 levelling valves on the central axle will detect a possible too low or excessive travelling height. The travelling height will be automatically adjusted if the hydraulic hose pipe of the chassis is connected to a single-acting control device of the tractor and pressurised.

If the machine is empty, the front axle can be lifted via the control set, thus relieving the chassis in case of empty journeys and minimising tyre wear.

The hydraulic oil pushed out when lifting the front axle is distributed to the hydraulic cylinders of the central and the rear axle. This may slightly increase the travelling height.

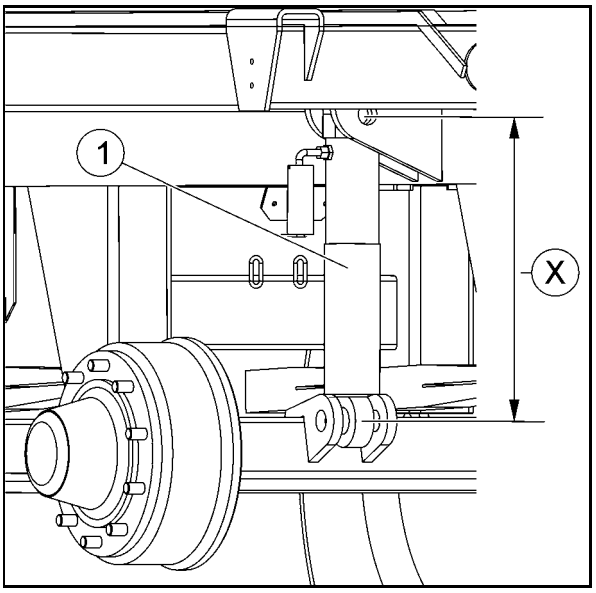


Fig. 46

5.11.4 Steering axle for follow-up steering

The unlocked steering axle for follow-up steering:

- can move freely and follows the turning radius of the corner during cornering,
- ensures careful treatment of farmland during cornering,
- reduces tyre wear during cornering on paved areas.

The steering axle is unlocked and locked from the tractor via the control unit.

5.11.5 Steering axle for electro-hydraulic forced steering axle system SES (only for bottom linkage)

Optional extra

The the wheels of the steering axles for the electro-hydraulic forced steering axle system are electronically controlled from the tractor via a steering rod by means of the SES system.

The steering axle:

- has been designed for ball-type couplings,
- improves the manoeuvrability of the hitched machine and prevents the tyres from being excessively worn during forward and reverse cornering,
- does not require any engaging,
- is locked in **Discharge mode A I** up to 12 km/h,

- can be unlocked and relocked by actuating the **Discharge mode A I** for turning the machine in front of the bunker silo.

5.11.5.1 Couple forced steering axle

The ball head for the steering rod must be fixed at the same level and at a distance of 250±5 mm to the right-hand or left-hand side next to the coupling device of the tractor.

The shell/drawbar lug must be fixed to the coupling device of the tractor free of clearance if possible, such that the forced steering axle can properly work.

1. Hitch the machine to the tractor.
2. Secure tractor and machine against accidental starting and rolling.
3. Couple and secure the steering rod (1) with the ball head to the right-hand side or left-hand side of the tractor.

   Set the steering rod such that the front edge of the lever (2) is positioned in one line with the rear edge of the orientation notch (3) (A) if tractor and machine are in one line.
4. Completely turn the steering wheel of the tractor.
5. Carefully start to move until the front edge of the lever is flush with the rear edge of the respective lateral orientation notch (4).

→ The wheels of the tractor should now be in contact with the drawbar.

6. Check any free space and possible steering angles for collision.

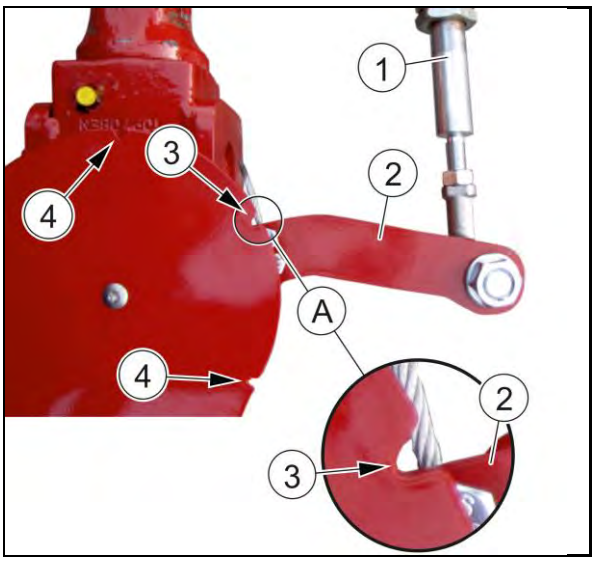


Fig. 47 (shows steering rod on the right-hand side of the tractor's coupling device)

5.12 Drawbar

The machine is equipped with a hydraulic folding drawbar.

5.12.1 Hydraulic folding drawbar

The hydraulic folding drawbar (1) serves to increase the ground clearance of the pick-up (2) when travelling over the silo.

Lifting and lowering of the folding drawbar:

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

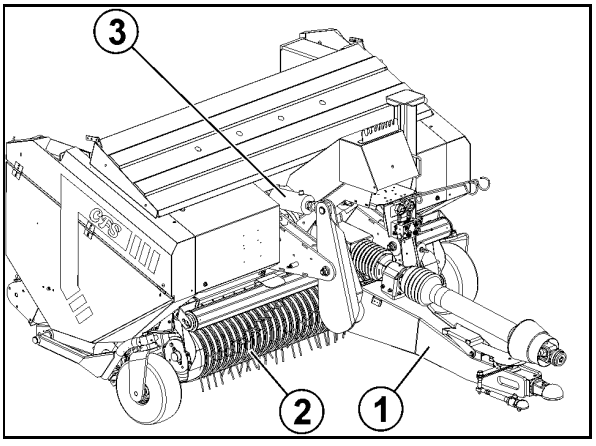


Fig. 48

5.12.2 Bottom linkage

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

(5) a drawbar lug (hitch ring) for a tow-hook (hitch hook) or a draw pin (Piton-Fix) according to ISO 5692-1,

(6) a shell 80 for a ball-type coupling 80.

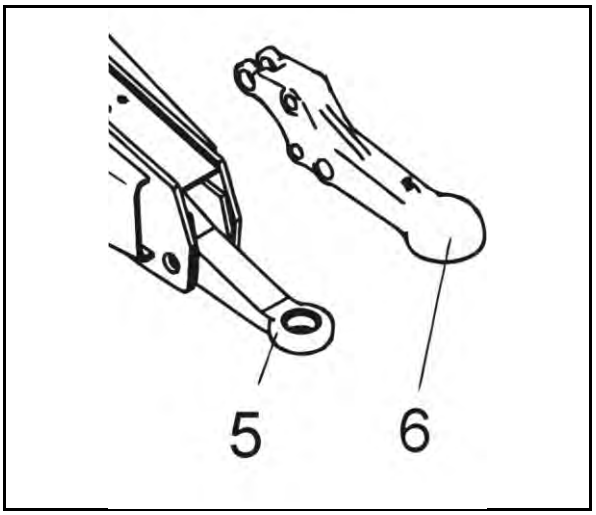


Fig. 49

5.12.3 Couple drawbar

WARNING

Risk of being crushed, drawn in, becoming entangled and risk of impact to people if the machine accidentally loosens from the tractor!

- Check whether the coupling device on your tractor is licensed for taking up the machine's drawgear.

  Absolutely observe the information in the chapter "Preconditions for the operation of tractors with rigid drawbar trailers"“, page 172.
- Properly hitch the machine to the tractor and secure it.
- Never use damaged or deformed trailer systems.

WARNING

Risk of being crushed and of impact to people standing between tractor and machine while the machine is being hitched!

Make sure that people leave the hazardous area between tractor and machine before approaching the machine.

Present helpers are only allowed to act as a guide next to the tractor and the machine and to enter the space between the tractor and the machine after the vehicles have completely stopped.

5.12.3.1 Tow-hook (hitch hook) and drawbar lug (hitch ring)

1. Secure the machine against rolling.
2. Make sure that people leave the hazardous area between tractor and machine before approaching the machine.
3. Lower the tow hook.
4. Approach the machine as closely as possible such that the lowered tow hook can take up the drawbar lug.
5. Lift the tow hook to catch the drawbar lug.

→ After automatic engaging, the drawbar lug is fixed between the tow hook and the locking mechanism (holding-down device).

6. Secure the tractor against accidental starting and rolling.
7. Ensure that the tow hook is properly locked.
8. Connect the supply lines.
9. Release the parking brake of the machine.
10. Lift the supporting leg to transport position.

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

1. Secure the machine against rolling.
2. Make sure that people leave the hazardous area between tractor and machine before approaching the machine.
3. Reverse tractor and approach the machine.
4. Secure the tractor against accidental starting and rolling.
5. Remove the holding-down device (cross bolt) above the draw pin.
6. Connect the supply lines.
7. Approach the machine as closely as possible such that the draw pin can take up the drawbar lug.
8. Lower the drawbar by means of the supporting leg until the draw pin engages in the drawbar lug.
9. Secure the tractor against accidental starting and rolling.
10. Fix and secure the cross bolt above the draw pin.
11. Release the parking brake of the machine.
12. Lift the supporting leg to transport position.

5.12.3.3 Ball-type coupling and shell

WARNING

Risk of being crushed, drawn in, becoming entangled and risk of impact to people if the machine accidentally loosens from the tractor!

- Before travelling on extremely uneven ground/over bunker silos, ensure that there is enough free space at the holding down-device above the shell.
- Mount the shorter holding-down device at the tractor's ball-type coupling in case of insufficient free space.

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

(1) Shorter holding-down device for ball-type coupling

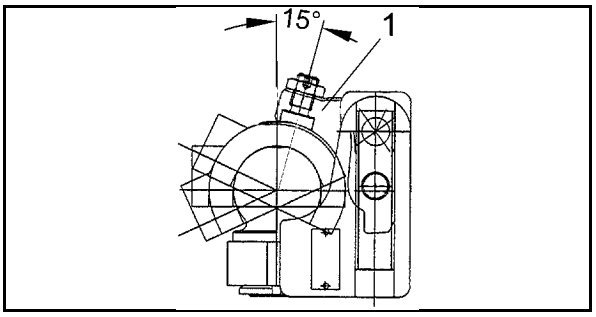


Fig. 50

1. Prepare for coupling:
   1.1 Remove grease and dirt from the ball head, the holding-down device and the shell.
   1.2 Lubricate the ball head and the surface of the shell with new grease.
   1.3 Unlock the holding-down device at the bearing block.
   1.4 Swivel the holding-down device to coupling position.
   1.5 Clean and grease the ball head.
2. Connect the supply lines.
3. Approach the machine as closely as possible such that the ball head can take up the shell.
4. Lower the drawbar by means of the supporting leg until the ball head engages in the shell.
5. Lock and secure the holding-down device at the bearing block.
6. Release the parking brake of the machine.
7. Lift the supporting leg to transport position.

5.12.4 Uncouple drawbar

WARNING

Risk of being crushed, cut, drawn in, becoming entangled and risk of impact to people due to insufficient stability of the unhitched machine!

- Park the empty machine on even, firm ground.
- Secure the machine against rolling.

5.12.4.1 Tow-hook (hitch hook) and drawbar lug (hitch ring)

1. Secure the tractor against accidental starting and rolling.
2. Secure the machine against rolling. Observe the information in the chapter "Secure tractor and machine against accidental starting and 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 the tractor against accidental starting and rolling.
8. Disconnect the supply lines.
9. Place the supply lines onto the hose holder.
10. Move the tractor forward.

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

1. Secure the tractor against accidental starting and rolling.
2. Secure the machine against rolling. Observe the information in the chapter "Secure tractor and machine against accidental starting and rolling".
3. Remove the holding-down device (cross bolt) above the draw pin.
4. Lower the supporting leg to support position such that the drawbar lug disengages from the draw pin.
5. Move the tractor forward (approx. 25 cm).
6. Secure the 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.
9. Place the supply lines onto the hose holder.
10. Move the tractor forward.

5.12.4.3 Ball-type coupling and shell

1. Unlock the holding-down device at the bearing block.
2. Swivel the holding-down device to coupling position.
3. Lower the supporting leg to support position such that the shell disengages from the ball head.
4. Move the tractor forward (approx. 25 cm).
5. Secure tractor and machine against accidental starting and rolling.
6. Lock and secure the holding-down device at the bearing block.
7. Disconnect the supply lines.
8. Place the supply lines onto the hose holder.
9. Move the tractor forward.

5.13 Drawbar suspension for folding drawbar

Optional extra

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, as a basic principle, be switched off when charging and discharging the machine.

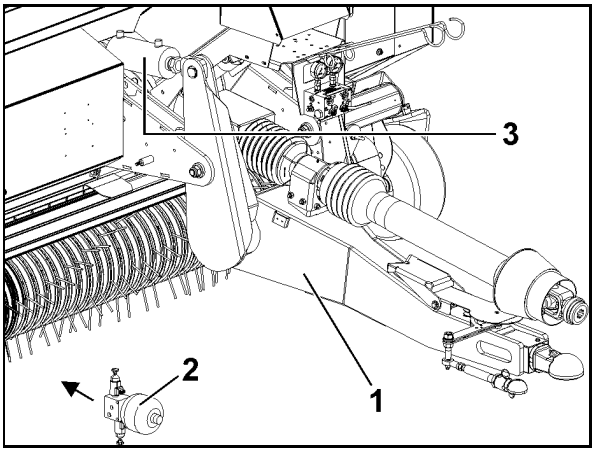


Fig. 51

5.14 Supporting leg

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

WARNING

Risk to people of crushing fingers and hands when lifting the supporting leg to transport position!

When lifting the supporting leg, keep sufficient safe distance to the supporting leg as long as parts are moving.

WARNING

Risk to people of crushing their feet beneath the lowering supporting leg!

When lowering the supporting leg, keep sufficient safe distance to the supporting leg as long as parts are moving.

5.14.1 Lift mechanical supporting leg to transport position

WARNING

Risk to feet of being crushed if the lifted supporting leg accidentally falls down!

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

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

→ The supporting leg is relieved.

2. Use one hand to pull the locking bolt (3) out of the borehole.
3. Use the other hand to grip the handle (4) and turn the supporting leg (2) upwards until the locking bolt engages into the borehole (5).
4. Check whether the locking bolt has completely engaged into the borehole and properly locks the supporting leg in its transport position.

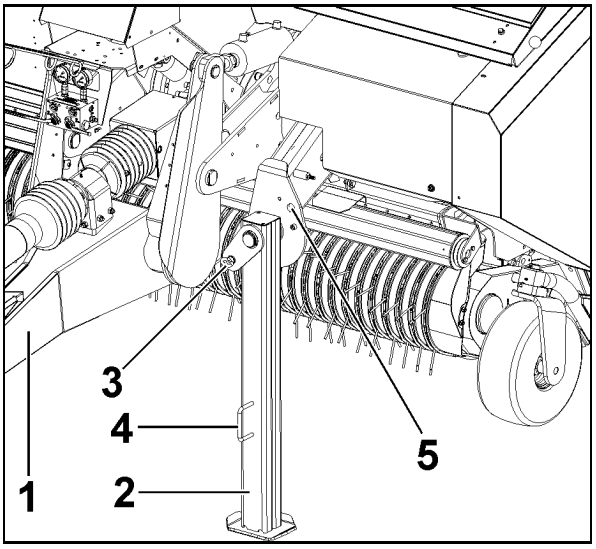


Fig. 52

5.14.2 Lower mechanical supporting leg to support position

WARNING

Risk to people of being crushed due to the unhitched and improperly supported machine falling over!

After lowering the supporting leg to working position, check whether the locking bolt has completely engaged into the borehole and properly locks the supporting leg in its support position.

1. Lift the machine hitched to the tractor via the hydraulic folding drawbar (1).
2. Use one hand to grip the handle (4) of the supporting leg (2).
3. Use the other hand to pull the locking bolt (3) out of the borehole (5).
4. Turn the supporting leg downwards until the locking bolt engages into the borehole.
5. Check whether the locking bolt has engaged into the borehole and locks the supporting leg in its support position.
6. 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.

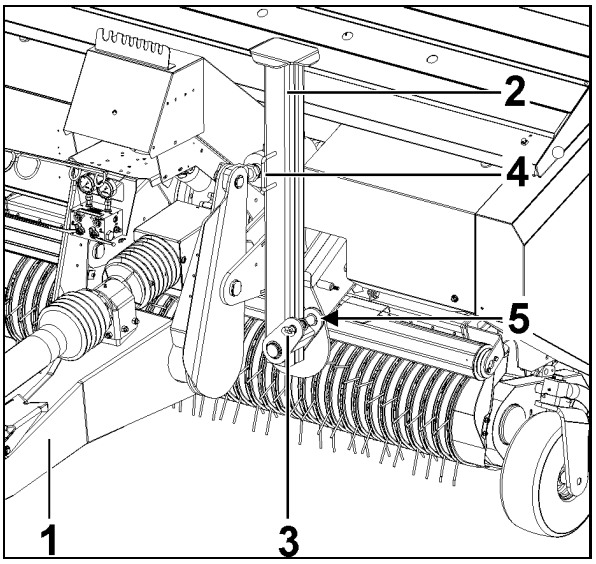


Fig. 53

5.15 Propeller shaft

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

WARNING

Risk to people of becoming entangled and wound up due to an unsecured propeller shaft or damaged protective devices!

- Never use the propeller shaft without protective device or with a damaged protective device or without proper handling of the clip chain.
- Before starting operation, always check:
  - o all protective devices of the propeller shaft for proper mounting and functioning,
  - o whether there is sufficient free space around the propeller shaft in any operating state. Insufficient free space will lead to damage on the propeller shaft.
- Immediately have damaged or missing parts of the propeller shaft replaced by original parts from the propeller shaft manufacturer.

  Observe the fact that only an authorized workshop is allowed to repair a propeller shaft.

WARNING

Risk to people of becoming entangled and wound up due to unprotected propeller shaft parts within the power transmission area between the tractor and the powered machine!

Only carry out work with the drive unit between tractor and powered machine completely protected.

- The unprotected parts of the propeller shaft must always be protected by means of a protective cover mounted on the tractor and a protective sleeve mounted on the machine.
- Check whether the protective cover mounted on the tractor or the protective sleeve mounted on the machine and the safety and protective devices of the extended propeller shaft overlap by at least 50 mm. If not, the machine must not be powered via the propeller shaft.

- Proper use and maintenance of the propeller shaft prevent serious accidents.
- When coupling the propeller shaft, observe:
  - the admissible drive speed of the machine,
  - the correct driving direction of the propeller shaft,
  - the correct fitting length of the propeller shaft, see chapter "Adjust length of propeller shaft to tractor", page 182,
  - the correct fitting position of the propeller shaft. The tractor symbol on the protective tube of the propeller shaft indicates the propeller shaft connection at the tractor.
- Before switching the propeller shaft on, observe the safety instructions for propeller shaft operation.

5.15.1 Couple propeller shaft to tractor

WARNING

Risk of crushing or impact due to accidental movements of tractor and machine!

Secure tractor and machine against accidental starting and rolling!

Make sure that people and animals leave the hazardous area of the tractor and the machine.

1. Clean and lubricate the p.t.o. shaft on the tractor.
2. Hitch the machine to the tractor.
3. Check whether the p.t.o. shaft has been switched off.
4. Slip the locking mechanism (1) of the propeller shaft (2) onto the p.t.o. shaft of the tractor until it noticeably engages. When coupling the propeller shaft, observe the included operating instructions for the propeller shaft.
5. Ensure that there is sufficient free space around the propeller shaft in any operating state. Insufficient free space will lead to damage on the propeller shaft.

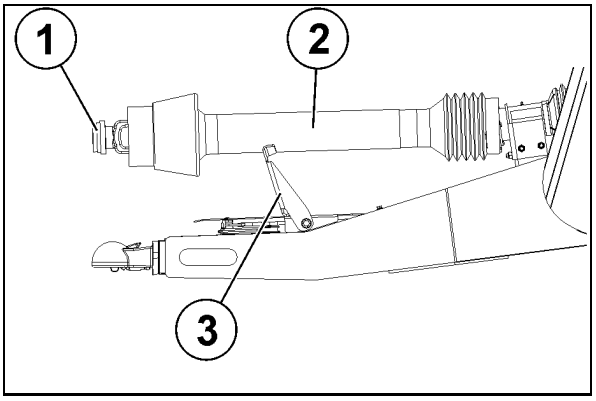


Fig. 54

5.15.2 Uncouple propeller shaft from tractor

WARNING	**Risk of crushing or impact due to accidental movements of tractor and machine!** Secure tractor and machine against accidental starting and rolling! Make sure that people and animals leave the hazardous area of the tractor and the machine.

CAUTION	**Risk of burns due to contact with hot propeller shaft components!** Do not touch considerably warmed-up propeller shaft components (particularly do not touch any couplings).

	Clean and lubricate the propeller shaft before longer downtimes.

1. Pull the locking mechanism (1) of the propeller shaft (2) off the tractor's p.t.o. shaft.
2. Place the propeller shaft onto the respective holder (3).

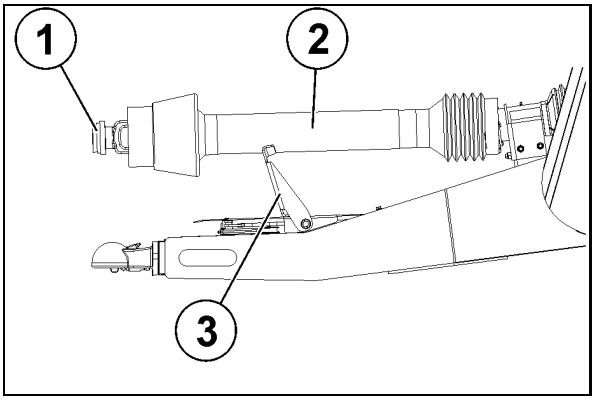


Fig. 55

5.16 Brake system

Depending on the machine’s equipment, the brake system consists of:

- a dual-line compressed-air brake system possibly equipped with automatic load-sensitive brake pressure regulator and parking brake for an admissible maximum speed of 25 km/h or 40 km/h or 60 km/h.
- a hydraulic service brake system (optional extra for export) with parking brake for an admissible maximum speed of 25 km/h or 40 km/h respectively. The hydraulic service brake system has been designed for connection to a controlled hydraulic service brake system of a tractor.
- a combination of dual-line compressed-air brake system and hydraulic service brake system.

5.16.1 Dual-line compressed-air brake system

The brake system consists of:

- a braking axle with a dual-line compressed-air brake system and parking brake for an admissible maximum speed of 25 km/h or 40 km/h or 60 km/h.

- an automatic load-sensitive brake pressure regulator (ALB regulator). The ALB regulator automatically controls the required braking force depending on the loading condition of the hitched machine.

The brake system acts on the braking axle/s.

- Observe the fact that the braking axle needs to run in during the first service hours – the brake lining is adjusting 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 transport journeys.

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

5.16.1.1 Dual-line compressed-air brake system with mechanical automatic load-sensitive brake (ALB) regulator

WARNING

Risk due to insufficient braking ability of the machine if the mechanical ALB regulator has not been properly set!

The setting dimension (L) at the ALB regulator must not be modified. The setting dimension (L) must correspond to the value indicated on the WABCO-ALB plate.

(1) Feed line with hose coupling (red)

(2) Brake line with hose coupling (yellow)

(3) Blank connection for brake line

(4) Trailer brake valve

(5) ALB regulator (mechanical)

(6) Release valve

(7) Operating element for release valve (can only be actuated in uncoupled condition):

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

(8) Diaphragm brake cylinder

(9) Compressed-air reservoir

(10) Drain valve

(11) Test connection in front of ALB regulator

(12) Test connection behind ALB regulator

(13) Test connection, diaphragm brake cylinder

(14) Test connection, compressed-air reservoir

(15) Parking brake

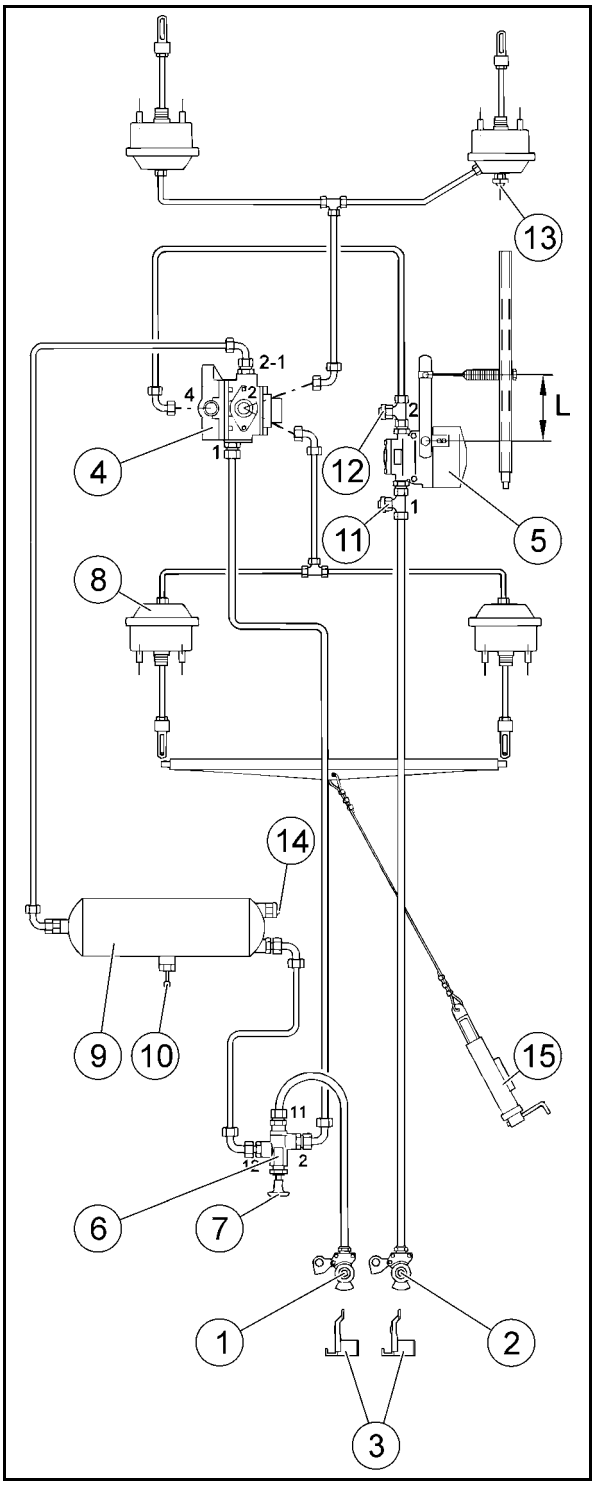


Fig. 56

5.16.1.2 Dual-line compressed-air brake system with hydraulic automatic load-sensitive brake pressure (ALB) regulator

Tandem chassis

WARNING

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

The ALB regulator is only properly activated with the travelling height properly set.

Check the travelling height of the hydraulic chassis every day and readjust it if necessary!

(1) Feed line with hose coupling (red)

(2) Operating element for release valve (can only be actuated in uncoupled condition):
- Push in as far as it will go and the service brake system releases, e. g. for manoeuvring the unhitched machine
- Pull out as far as it will go and the machine is braked again by means of the system pressure coming from the air reservoir

(3) Brake line with hose coupling (yellow)

(4) Blank connection for brake line

(5) Trailer brake valve with release valve

(6) Diaphragm brake cylinder

(7) ALB regulator (hydraulic), activated via the hydraulic travelling height adjustment function of the tandem chassis

(8) Dash pot of tandem chassis

(9) Compressed-air reservoir

(10) Drain valve

(11) Test connection, compressed-air reservoir

(12) Test connection, diaphragm brake cylinder

(13) Parking brake

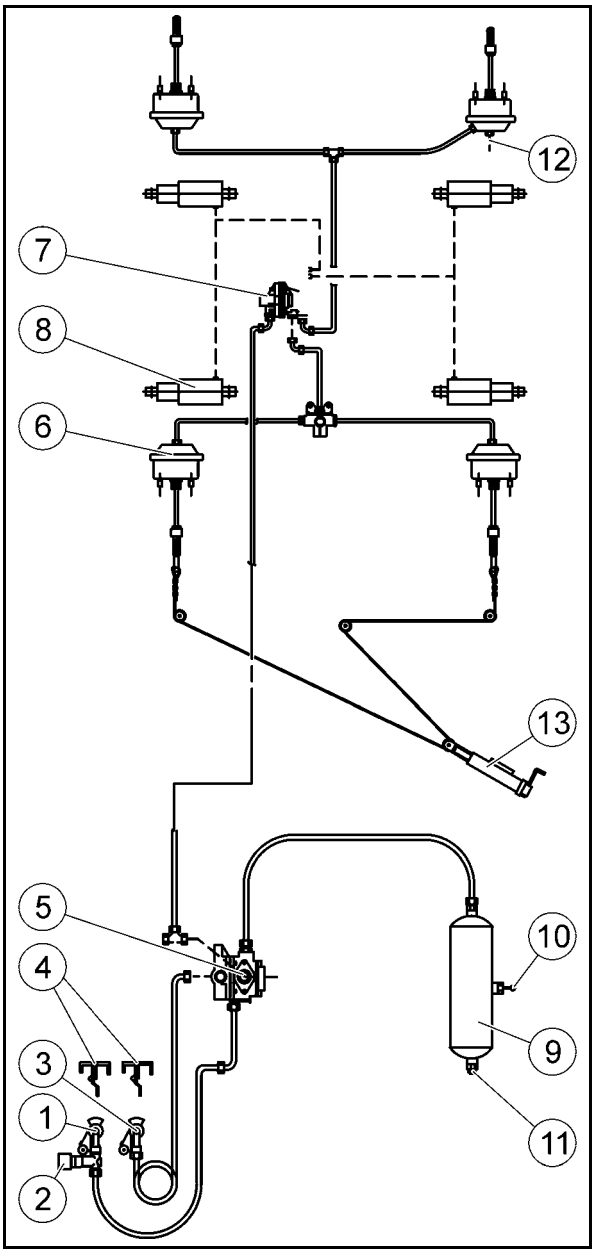


Fig. 57

Tridem chassis

WARNING

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

The ALB regulator is only properly activated with the travelling height properly set.

Check the travelling height of the hydraulic chassis every day and readjust it if necessary!

Observe the included technical documentation for anti-lock brake systems.

(1) Feed line with hose coupling (red)
(2) Brake line with hose coupling (yellow)
(3) Filter for conduit
(4) Blank connection for brake line
(5) Compressed-air reservoir
(6) Drain valve
(7) Test connection, compressed-air reservoir
(8) Double release valve
(9) Fork joint, round hole
(10) Diaphragm brake cylinder
(11) Fork joint, round hole
(12) Double-function brake cylinder
(13) Fork joint, round hole
(14) Diaphragm brake cylinder
(15) Test connection, diaphragm brake cylinder
(16) Trailer brake valve
(17) ALB regulator (hydraulic), activated via the hydraulic travelling height adjustment function of the tridem chassis
(18) Simulator connection for pneumatically activated ALB regulator
(19) Quick-release valve with integrated two-way valve

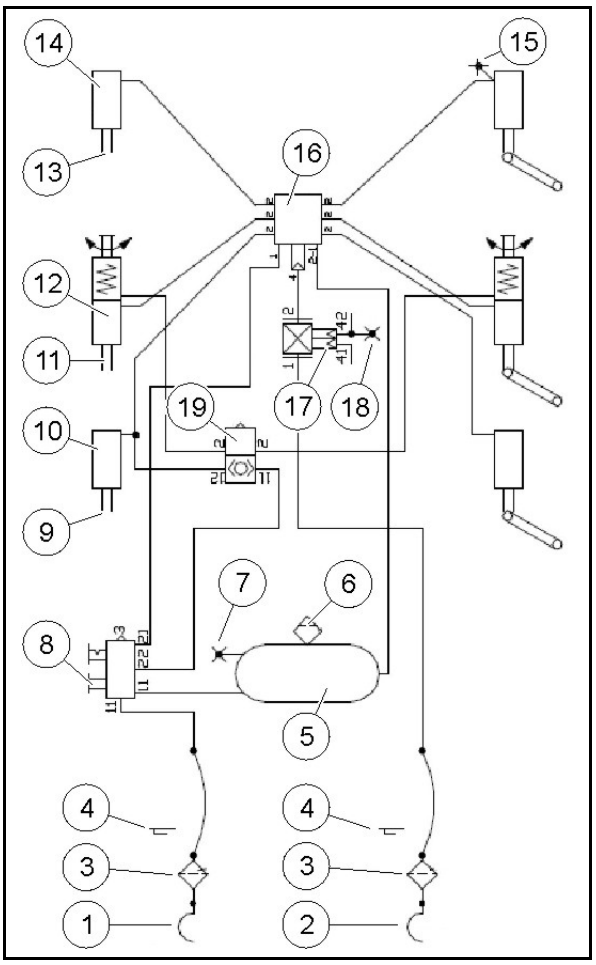


Fig. 58

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

Fig. 59

(1) Actuating mechanism for release valve
- push in as far as it will go and the service brake system releases, e. g. for manoeuvring the unhitched machine
- pull out as far as it will go and the machine is braked again by means of the system pressure coming from the air reservoir

(2) Actuating mechanism for park valve of spring-loaded brake system
- push in as far as it will go and the spring-loaded brake system releases
- pull out as far as it will go and the spring-loaded brake system is actuated, the spring accumulator being, however, only bled (braked) when the two-way valve in the system switches over

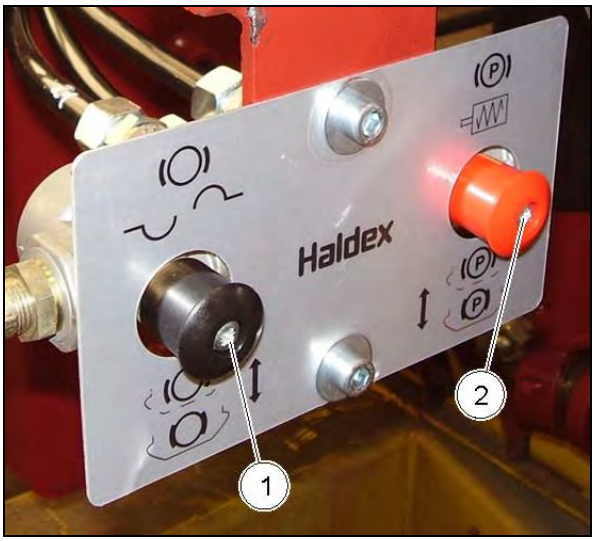


Fig. 60

5.16.1.3 Braking axle

(1) Diaphragm brake cylinder
(2) Slack adjuster for brake camshaft
(3) Brake camshaft
(4) Connecting rods for parking brake
(5) Test connection for pressure gauge

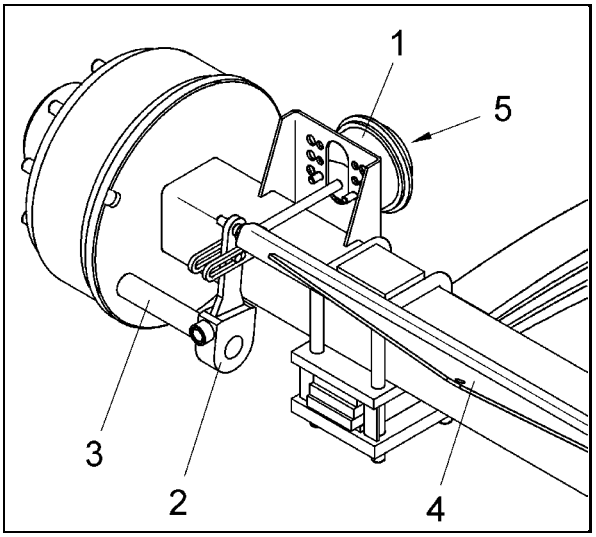


Fig. 61

5.16.1.4 Connect brake and feed line

WARNING

Risk of crushing, cuts, becoming entangled, being drawn in and risk of impact to people due to improper functioning of the service brake system!

- 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 replace damaged sealing rings.
- 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 compressed-air 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

Risk of crushing, cuts, becoming entangled, being drawn in and risk of impact to people if the machine rolls due to the service brake system being released!

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

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

1. Open the caps of the hose couplings on the tractor.
2. Remove the hose coupling of the brake line (yellow) from the blank connection.
3. Properly fix the hose coupling of the brake line (yellow) to the yellow marked coupling device at the tractor.
4. Remove the hose coupling of the feed line (red) from the blank connection.
5. Properly fix the hose coupling of the feed line (red) to the red marked coupling device at the tractor.

→ When connecting the feed line (red), the system pressure coming from the tractor automatically pushes the push button for the release valve on the trailer brake valve out.

6. Release the parking brake and/or remove the chocks.

5.16.1.5 Disconnect brake and feed line

WARNING

Risk of crushing, cuts, becoming entangled, being drawn in and risk of impact to people if the machine rolls due to the service brake system being released!

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

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

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

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 service brake system in accordance with the automatic load-sensitive brake pressure control.

1. Release the hose coupling of the feed line (red).
2. Release the hose coupling of the brake line (yellow).
3. Fix the hose couplings to the blank connections.
4. Close the caps of the hose couplings at the tractor.

5.16.2 Hydraulic service brake system

The controlled hydraulic service brake system is connected to the special brake valve of the tractor. If the brake pedal on the tractor is pressed, the machine is slowed down.

(1) Hydraulic sleeve ISO 5676

Fig. 62

(2) Hydraulic cylinder of braking axle

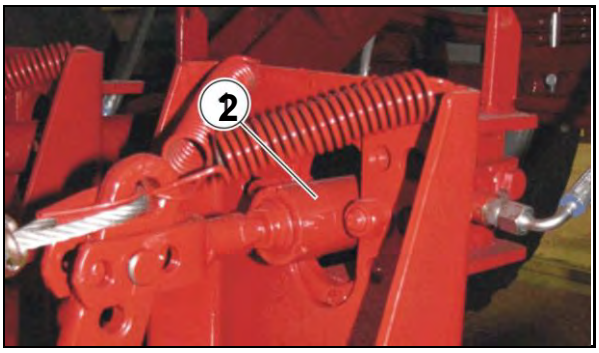


Fig. 63

5.16.2.1 Emergency brake valve

WARNING

Risk of infection to people due to hydraulic oil squirting out under high pressure and entering the body!

Always ensure to depressurize the pressure accumulator before carrying out work on the hydraulic system.

If injuries caused by hydraulic oil occur, immediately contact the medical services.

The brakes must be tested before each journey to refill the pressure accumulator.

If the machine is torn off, the ripcord will actuate the emergency brake valve. The hydraulic oil then flows from the pressure accumulator into the brake cylinders, thus initiating the braking process.

Couple:

1. Fasten the ripcord to the tractor such that in case of the machine being torn off, the ripcord is in a horizontal position between tractor and machine.

Couple after emergency braking:

1. Connect the brake hose to the tractor.
2. Set the brake valve at the tractor such that the hydraulic oil can flow back to the tractor.
3. Press the drain valve at the emergency brake valve.

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

4. Insert the ripcord with the clip connector into the borehole of the operating lever.
5. Set the operating lever back to its initial position.
6. Actuate the brake system of the machine several times.

→ The pressure accumulator is filled and the emergency brake valve is ready for operation again.

Uncouple:

1. Make sure that the hydraulic pipe between tractor and machine has been depressurized.
2. Secure tractor and machine against accidental rolling by means of the parking brake.

The emergency brake valve does not replace the parking brake!

3. Remove the ripcord from the tractor.

Depressurize pressure accumulator

1. Connect the brake hose to the tractor.
2. Set the brake valve at the tractor such that the hydraulic oil can flow back to the tractor.
3. Press the drain valve (7) at the emergency brake valve (3).

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

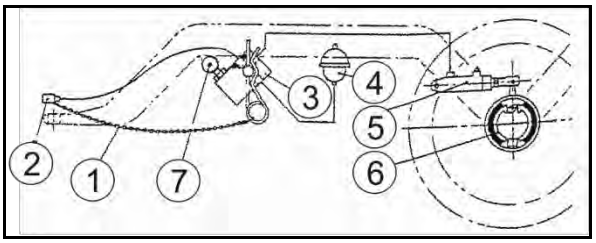


Fig. 64

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

5.16.2.2 Connect hydraulic brake system

- Only couple clean hydraulic clutches.
- Clean hydraulic plug and hydraulic sleeve if necessary.
- Slip the hydraulic plug into the hydraulic sleeve until the hydraulic plug noticeably locks.
- Check the coupling spot of the hydraulic brake line for correct and tight seat.
- The connected hydraulic brake line:
  - must easily give way to any movements during cornering without any stress, buckling or chafing,
  - must not chafe against external components.
- Check the hydraulic brake system for proper functioning before carrying out transport journeys.

1. Remove the hydraulic sleeve (1) from the machine's blanked-off connecting piece (2).
2. Couple the machine's hydraulic sleeve to the tractor's hydraulic plug of the hydraulic brake system.
3. Release the parking brake of the machine.

Fig. 65

5.16.2.3 Disconnect hydraulic brake system

1. Apply the parking brake of the machine.
2. Uncouple the hydraulic sleeve (Fig. 65/1).
3. Slip the hydraulic sleeve onto the machine's blanked-off connecting piece (Fig. 65/2).

5.16.3 Parking brake

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

(1) Crank handle; in adjusting position (2)

(2) Adjusting position

(3) Resting position; swivelled by 180° compared to the adjusting position

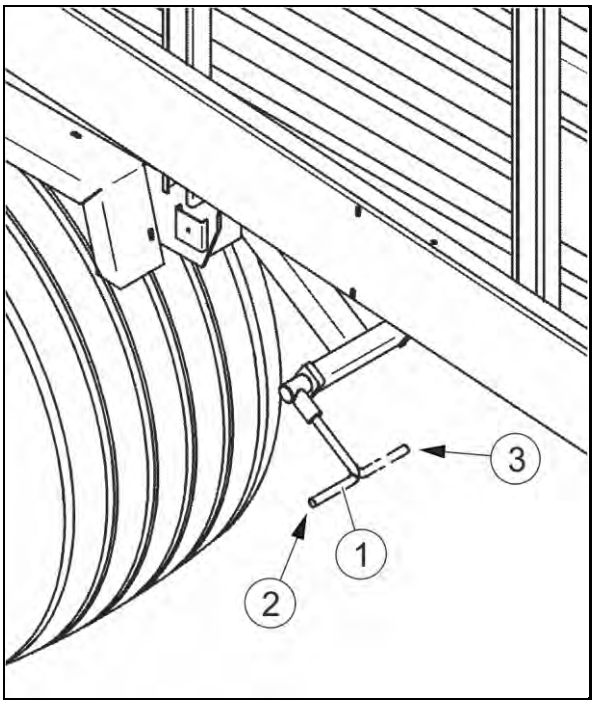


Fig. 66

Release parking brake

Ensure that the cable does not rest on or chafe against other vehicle components.

With the parking brake released, the cable shall slightly sag.

1. Swivel the crank handle (1) from resting position (3) by 180° to adjusting position (2).
2. Turn the crank handle anticlockwise until the cable (5) is relieved.

→ The parking brake is released.

3. Swivel the crank handle to resting position.

Apply parking brake

Correct the setting of the parking brake if the tension path of the spindle (4) is no longer sufficient.

1. Swivel the crank handle (1) from resting position (3) by 180° to adjusting position (2).
2. Turn the crank handle clockwise.

→ The parking brake is applied via the cable (5).

6 Operation

The hydraulic functions of the machine are operated via the ISOBUS control set.

6.1 Operation with ISOBUS control Field-Operator 120

In case of longer downtimes of the machine, switch the control set off, in order to avoid a discharging of the tractor's battery due to switched-on loads!

Protect the control set against moisture and humidity!

6.1.1 Design

The ISOBUS control complies with the latest ISO standard.

If your tractor's software and hardware comply with the latest ISO standard, you will not require our control set. You will then be able to directly operate the machine via your tractor control set.

The included ISO cable harness is not compatible with LBS or LBS-Plus.

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.

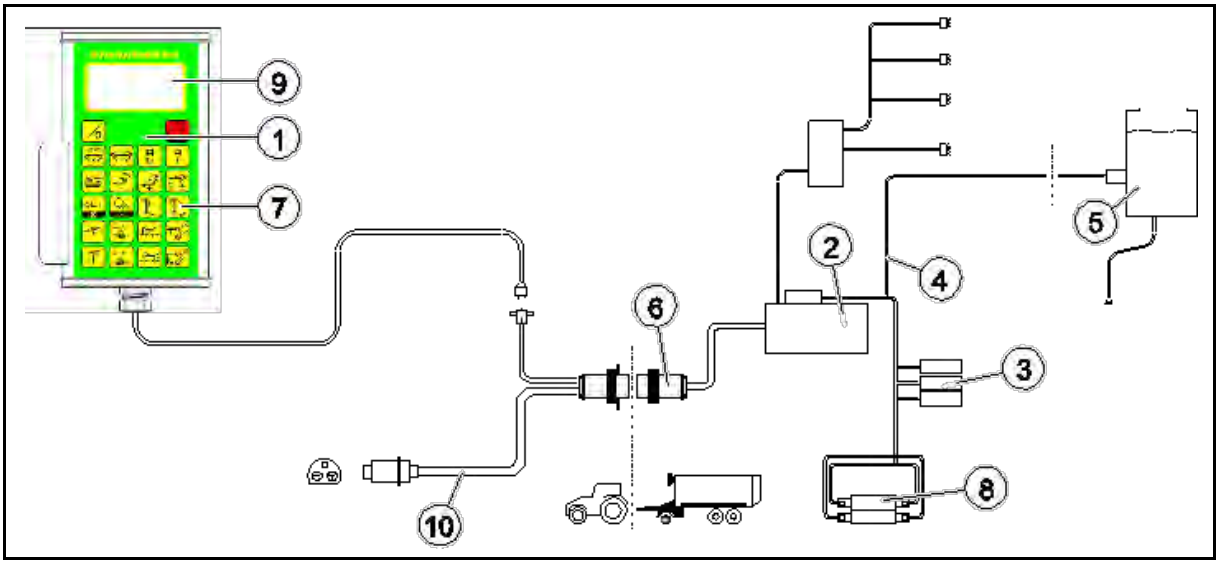


Fig. 67

The ISOBUS control mainly consists of:

- the control set (1),
- the control unit (2),
- the sensors (3) to determine operating states, e. g. Steering axle locked or Steering axle unlocked,
- the connecting cable (4) for the silage additive pump (5) (optional extra).

The control set (1) is mounted on the tractor and is connected to the control unit (2) of the machine via the connecting cable (6).

All functions required for operating the machine as well as for transport journeys are actuated via the keys (7) of the control set. The symbols on the keys identify the executable functions.

After a key has been pressed, the control unit triggers the corresponding solenoid valve at the electro-hydraulic control block (8) to carry out the selected functions. Individual sensors (3) determine the respective operating state of the selected assembly, e. g. Steering axle locked or Steering axle unlocked. The operating states are graphically shown on the screen (9).

(1) Screen. Depending on the selected function, the following menu appears:
- **Working** menu. The **Working** menu displays the selected functions and the operating states during charging and discharging.
- **Road travel** menu. The **Road travel** menu appears with the road travel mode activated.
- **SET** menu. The **SET** menu displays:
  - the software version,
  - machine parameters.

(2) Switch control system on (I)/off (0)

(3) Switch road travel mode on/off/ Scroll through menu

(4) Switch crossover conveyor off

(5) Switch crossover conveyor on and change driving direction

(6) Switch **Discharge mode A II** on/off

(7) Switch **Discharge mode A I** on

(8) Switch automatic charging system on/off

(9) Reverse transport floor/Reduce feed rate of transport floor during discharge (in combination with key 11)

(10) Double feed rate of transport floor for complete emptying (transport floor level II)/Increase feed rate of transport floor during discharge (in combination with key 11)

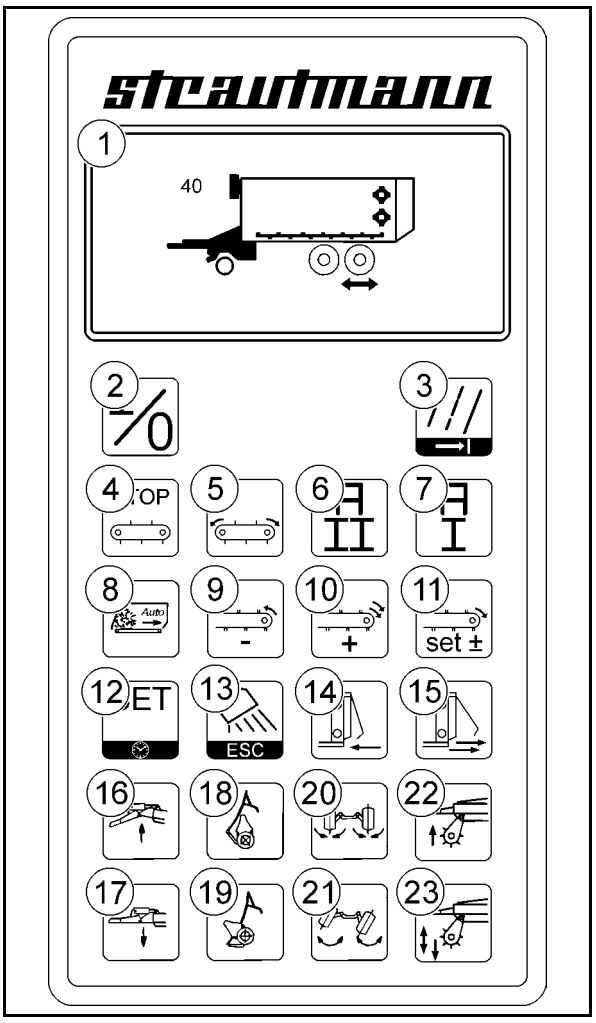


Fig. 68

(11) Switch transport floor on/Set feed rate of transport floor (in combination with keys 9 and 10)

(12) Select **SET** menu/Call service hours and transported loads counter

(13) Switch lighting in cargo space on/off/ Return to **Working** menu

(14) Lower tailgate

(15) Lift tailgate

(16) Lift folding drawbar

(17) Lower folding drawbar

(18) Retract cutting unit

(19) Extend cutting unit

(20) Lock steering axle

With tridem chassis: Lift lift axle

(21) Unlock steering axle

With tridem chassis: Lower lift axle

(22) Lift pick-up

(23) Lower pick-up to open-centre position/ no open-centre position (rigid)

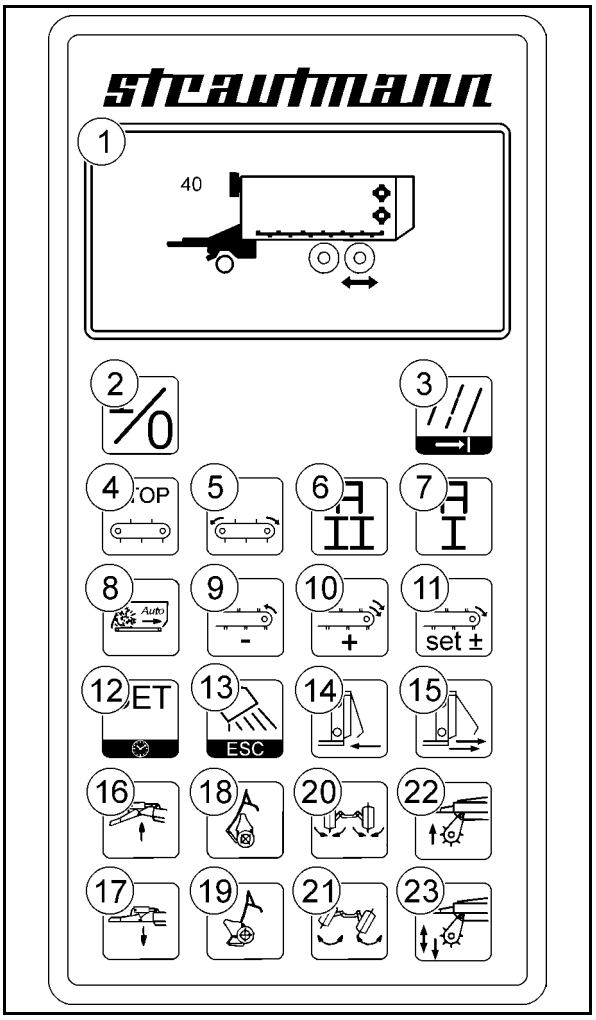


Fig. 69

6.1.2 Display information in Working menu

(1) Display of current transport floor speed

(2) Operating state "Automatic charging system on/off", here "Automatic charging system on"

(3) Operating state "Discharge mode I on/ Discharge mode II on/off", here "Discharge mode II on"

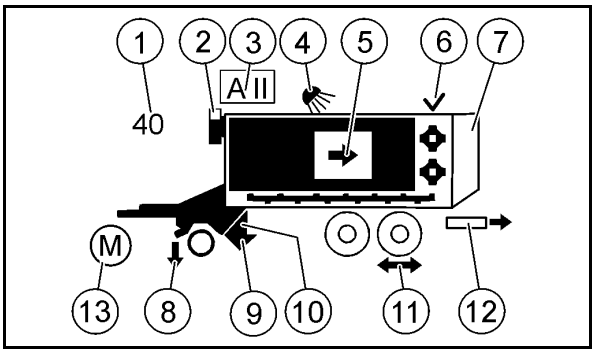
(4) Operating state "Cargo space lighting on/off", here "Cargo space lighting on"

(5) Operating state "Transport floor forward/ forward level II/reverse", here "Transport floor forward"

(6) Operating state "Dosing drums powered/not powered", here "Dosing drums powered"

(7) Operating state "Tailgate lowered/lifted to first opening width/completely lifted", here "Tailgate lowered"

(8) Operating state "Pick-up lifted/lowered, here "Pick-up lowered"



(9) Operating state "Cutting knives extended/retracted", here "Cutting knives retracted"

(10) Operating state "Cutting unit extended/retracted", here "Cutting unit retracted"

(11) Operating state "Steering axle locked/unlocked", here "Steering axle unlocked"

(12) Operating state "Crossover conveyor ccw rotation on/cw rotation/stop", here "Crossover conveyor cw rotation on"

(13) Operating state "Silage additive pump on/off", here "Silage additive pump on"

6.1.3 Functions and their symbols

The following paragraphs show the symbols of the operating elements of the control set, their functions and the displays on the screen.

Switch control set on/off

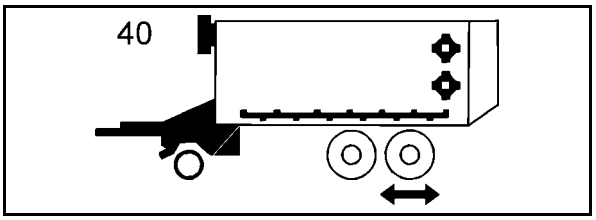
At the same time, this key serves as emergency stop. After the control set has been switched off, all hydraulic functions are also switched off.

1. Press the I/O key once.

→ The control set is switched on or off.

With the control set switched on, the **Working** menu appears on the screen. With the control set switched off, the display on the screen goes out

The screen shows:



Switch road travel mode on

The road travel mode can only be switched on:

- with lifted pick-up (attention, the pick-up is not checked for having been lifted completely),
- with lowered tailgate,
- with the transport floor stationary,
- with the dosing drums stationary.

If these requirements are not fulfilled, a beep is emitted, a corresponding warning message and the non-fulfilled requirement in the **Working** menu appear:

(1) Warning message

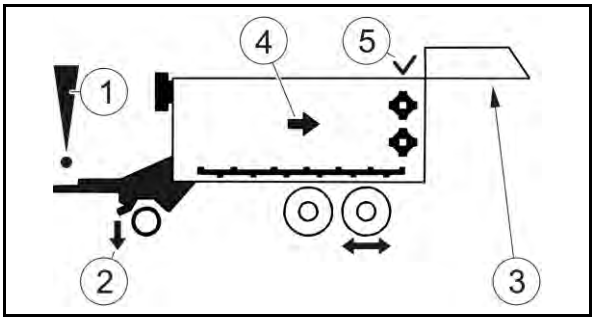
(2) Pick-up down

(3) Tailgate lifted

(4) Transport floor powered

(5) Dosing drums powered

The screen shows:



With the road travel mode switched off:

- the **Working** menu appears,
- all functions of the control set are enabled,
- the hydraulic drawbar suspension, the axle suspension (optional extra) of the hydraulic chassis and the warning beacon (optional extra) are switched off,
- the work lights are switched on if they were on when carrying out the function "Switch on road travel mode".

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.

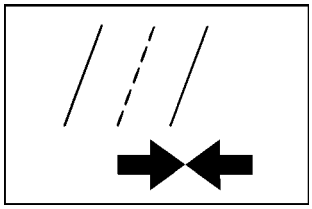
The drawbar suspension will not work if the folding drawbar is lowered to its end position.

1. Press the  key once.

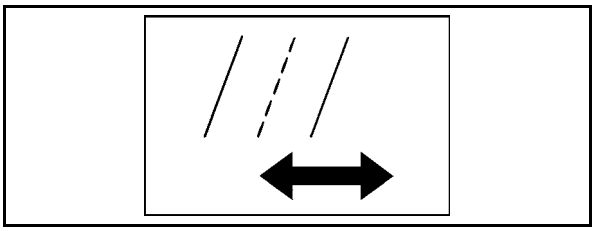
→ Road travel mode is switched on. The **Road travel** menu appears with

- the "Steering axle locked" symbol or

The screen shows:



o the "Steering axle unlocked" symbol.



Switch road travel mode off

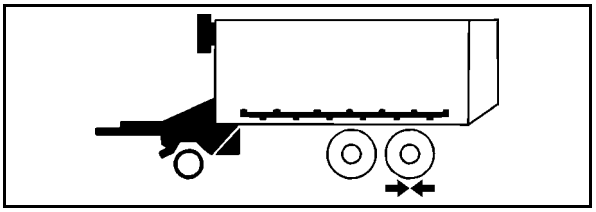
With the road travel mode switched off:

- the **Working** menu appears,
- all functions of the control set are enabled,
- the hydraulic drawbar suspension, the axle suspension (optional extra) of the hydraulic chassis and the warning beacon (optional extra) are switched off,
- the work lights are switched on if they were on when carrying out the function "Switch on road travel mode".

1. Press the  key again.

→ Road travel mode is switched off. The **Working** menu appears.

The screen shows:



Switch Discharge mode A I on

Align the wheels of the steering axle in a straight line by means of a short forward travel of the tractor and the hitched machine before switching the **Discharge mode A I** on.

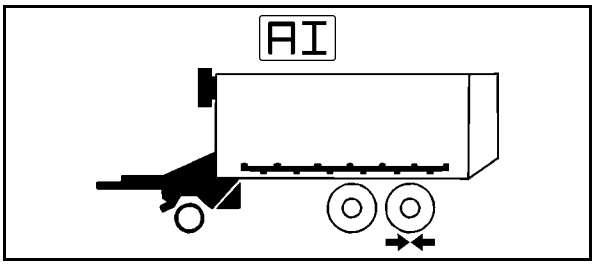
The **Discharge mode A I** is automatically switched off if the tailgate is lowered.

In case of electro-hydraulic forced steering axle system, the steering axle is locked in **Discharge mode A I** up to 12 km/h, see chapter "SES system", page 167.

1. Press the A I key until the pick-up has sufficient ground clearance.

→ The following functions will be automatically carried out one after the other:
- o Lock steering axle
- o Lift folding drawbar

The screen shows:



Switch Discharge mode A II on (Machine without dosing drums)

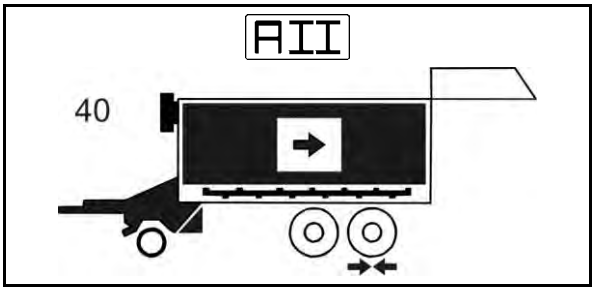
The **Discharge mode A II** is automatically switched off when the tailgate is lowered.

During discharge, the transport floor feed can be switched on and off as often as desired by pressing the A II key.

1. Press the A II key once when being on the bunker silo.

→ The following functions will be automatically carried out one after the other:
- o Lift tailgate
- o Switch transport floor on when the tailgate has reached its end position

The screen shows:



Switch Discharge mode A II on (Machine with dosing drums)

The **Discharge mode A II** is automatically switched off when the tailgate is lowered.

During discharge, the transport floor feed can be switched on and off as often as desired by pressing the A II key.

Switch the p.t.o. shaft off to discharge step by step.

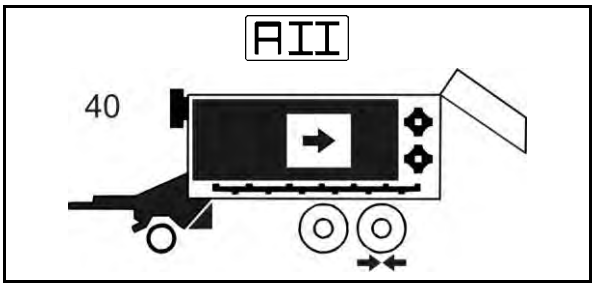
→ The dosing drums and the transport floor stop. The transport floor automatically switches to standby mode and the "Feed On" symbol is flashing.

1. Press the  key once when being on the bunker silo.

→ The following functions will be automatically carried out one after the other:

- Lift tailgate until the set first opening width is reached.
- Switch gearboxes and clutches.
- Switch transport floor to standby mode when the tailgate has reached its set first opening width. The "Feed on" symbol is flashing.

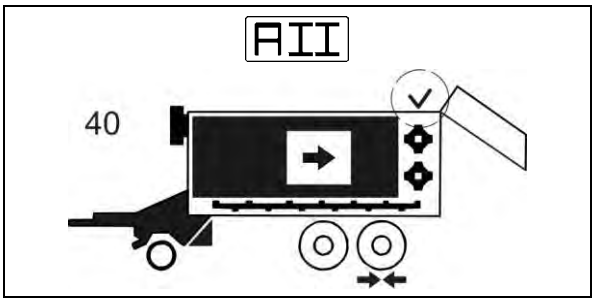
The screen shows:



As soon as the p.t.o. shaft is switched on, the dosing drums start to run and after a short delay, the transport floor automatically starts.

→ With the dosing drums powered, the "Dosing drums On" symbol appears.

With the transport floor powered, the "Feed On" symbol is permanently lit.



Switch automatic charging system on/off

Switch the automatic charging system on for uniform and complete filling of the cargo space.

The automatic charging system:

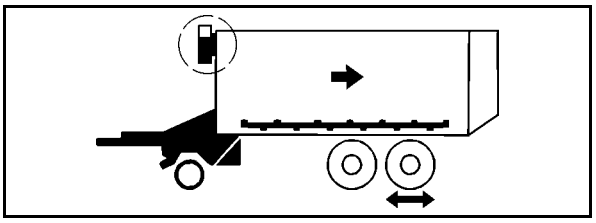
- has to be switched on only once,
- automatically and infinitely variably switches the transport floor on and off during charging,
- will automatically be deactivated if the control set generates the acoustic signal (horn sound) and the visual signal "Forage wagon full",
- will automatically be activated 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,
- permits to pre-select the filling degree of the loaded material in the cargo space. Observe the information in the chapter "Pre-select filling degree of loaded material in cargo space", page 114.

The higher the set filling degree, the higher the transport floor feed rate and the smaller the filling capacity.

1. Press the  key once.

→ The automatic charging system is switched on. The "Automatic charging system on" symbol appears.

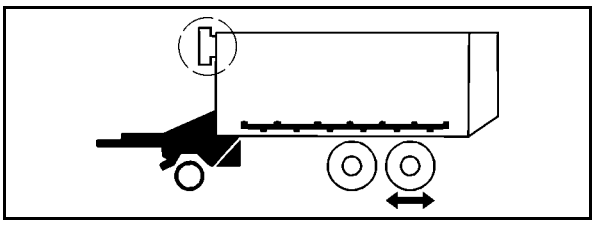
The screen shows:



2. Press the  key again.

→ The automatic charging system is switched off. The "Automatic charging system off" symbol appears.

The screen shows:



Switch transport floor on

Information for machines **without dosing drums:**

- 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.

  You can still continue to charge machines without dosing drums. The feed function of the transport floor can still be switched on for a maximum of three times for a short period of 2 seconds via the  key.

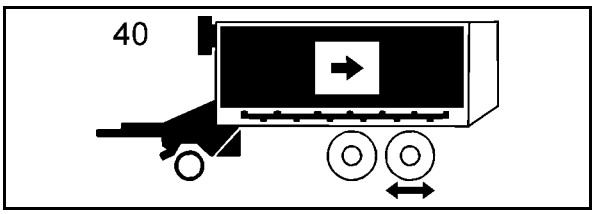
  Stop the charging procedure after the acoustic signal has appeared for the third time at the latest.

- During discharge on the bunker silo, the transport floor is automatically switched on after pressing the  key, when the tailgate has reached its end position.

1. Press the  key for a maximum of 2 seconds during charging to switch the transport floor feed manually on.

→ The transport floor will move at the set feed rate as long as the key is pressed. The "Feed on" symbol appears.

The screen shows:



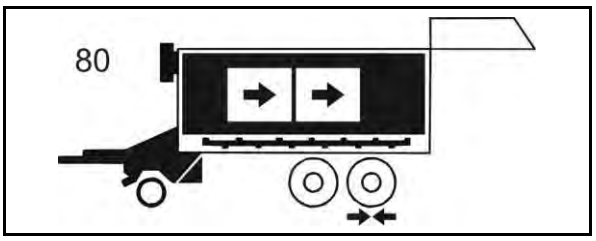
Double feed rate of transport floor for complete emptying (transport floor level II)

The minimum set feed rate must be "40" before doubling the feed rate of the transport floor for complete emptying.

1. Press the  key once during discharge.

→ The feed rate of the transport floor is doubled. The symbols "Double set feed rate" and "Double feed" appear.

The screen shows:



Change feed rate of transport floor during discharge

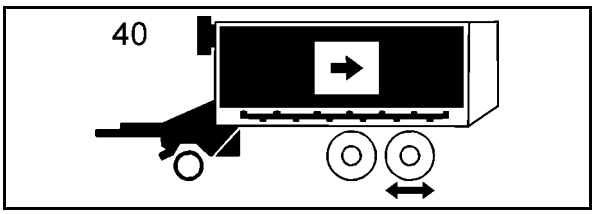
1. Press the  key once and the  key quickly in succession as often as required until the transport floor has reached the desired feed rate.

→ The feed rate of the transport floor is increased by 10 % of the maximum feed rate each time the key is pressed.

2. Press the  key once and the  key quickly in succession as often as required until the transport floor has reached the desired feed rate.

→ The feed rate of the transport floor is reduced by 10 % of the maximum feed rate each time the key is pressed.

The screen shows:



Reverse transport floor

Risk due to failure of components caused by frequent or long reverse of transport floor!

Observe the fact that the feed direction of the transport floor is only allowed to be reversed for a short time (max. 3 seconds).

Check the transport floor chains for proper tension every day, in order to prevent material damage.

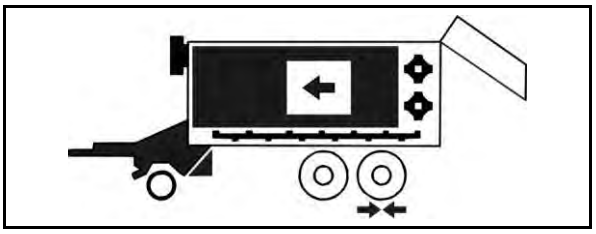
Reverse:

- only for a short time,
- only in case of emergency,
- if the slip clutch responds during discharge or
- in order to reduce the pressing power which the loaded material applies to the dosing drums.

1. Press the  key to switch the transport floor feed off.
2. Press the  key.

→ The transport floor starts running and conveys the loaded material away from the dosing drums for a maximum time of 3 seconds. The "Reverse feed" symbol appears.

The screen shows:



Crossover conveyor ccw rotation/cw rotation on

The preferred sense of rotation of the crossover conveyor is set in the **SET** menu.

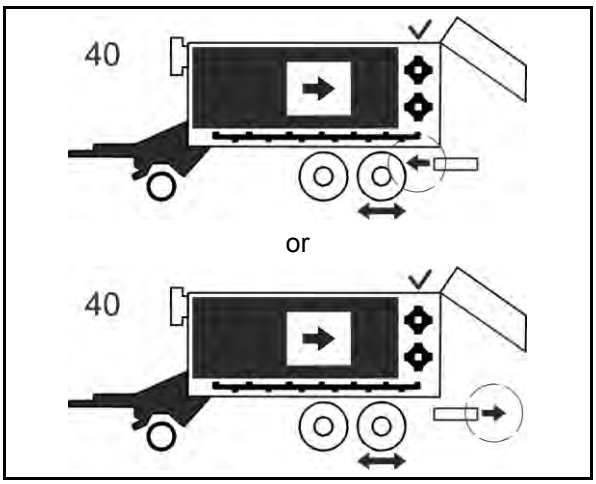
1. Press the  key once.

→ The crossover conveyor starts to run in the most recently set direction.

2. Press the  key again.

→ The sense of rotation of the crossover conveyor alternates between cw and ccw.

The screen shows:



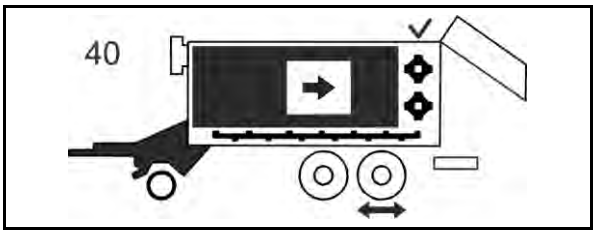
Stop crossover conveyor

1. Press the 

key once.

→ The crossover conveyor stops.

The screen shows:



Switch cargo space lighting on/off

If the cargo space lighting is switched on:

- the lighting is automatically switched off if the road travel mode is switched on,
- the lighting is automatically switched on if the road travel mode is switched off.

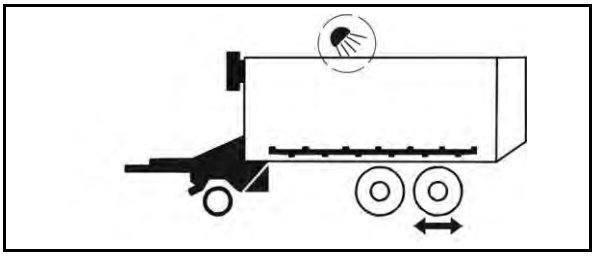
1. Briefly press the ESC key once.

→ The cargo space lighting is switched on. The "Cargo space lighting on" symbol appears.

2. Press the ESC key quickly again.

→ The cargo space lighting is switched off. The "Cargo space lighting on" symbol goes out.

The screen shows:



Switch silage additive pump on/off

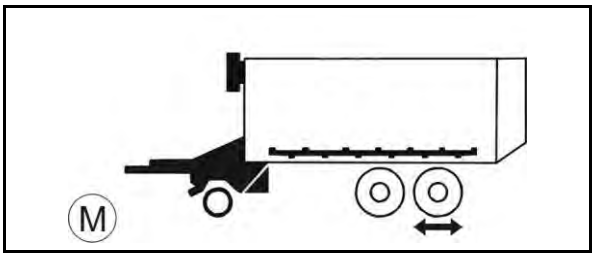
1. Press and hold the ESC key once.

→ The silage additive pump is switched on. The "Silage additive pump on" symbol appears.

2. Press and keep hold of the ESC key again.

→ The silage additive pump is switched off. The "Silage additive pump on" symbol disappears.

The screen shows:



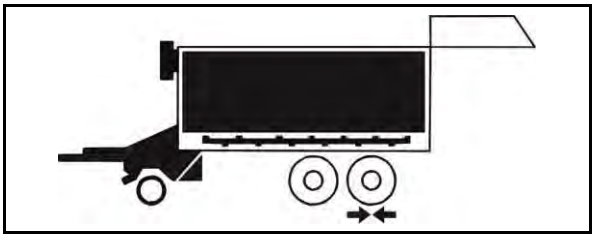
Lift tailgate (Machine without dosing drums)

When discharging on the bunker silo, the tailgate is automatically lifted to its full extent after pressing the key.

1. Press the key until the tailgate has reached its end position.

→ When the tailgate is completely lifted, the "Tailgate lifted" symbol appears.

The screen shows:



Lift tailgate (Machine with dosing drums)

When discharging on the bunker silo, the tailgate is automatically lifted to the set first opening width after pressing the A II key.

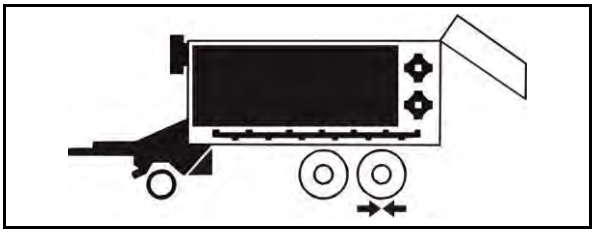
1. Press the key until the tailgate has reached its end position.

→ When the tailgate has been lifted to the set first opening width, the "Tailgate lifted" symbol appears.

2. Release the key and press it again.

→ The tailgate is lifted as long as the key is pressed or until the tailgate has been completely lifted.

The screen shows:



Lower tailgate

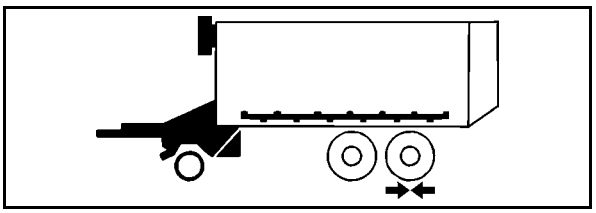
1. Press the key until the tailgate has reached its end position.

→ The tailgate is lowered. At the same time, the **discharge modes A I** and **A II** are automatically stopped:

- The transport floor automatically stops.
- The tailgate is lowered.

As soon as the tailgate is completely lowered, the "Tailgate lowered" symbol appears.

The screen shows:



Lift folding drawbar

1. Press the key until the folding drawbar has been lifted to the desired position or has reached its end position.

→ The ground clearance of the pick-up is increased.

The screen shows:

no additional symbol

Lower folding drawbar

1. Press the key until the folding drawbar has been lowered to the desired position or has reached its end position.

→ The ground clearance of the pick-up is reduced.

The screen shows:

no additional symbol

Switch drawbar suspension on

1. Extend the hydraulic cylinders of the folding drawbar by approx. 20 mm.
2. Press the  key.

→ Road travel mode is switched on. At the same time, the drawbar suspension is automatically switched on. The **Road travel** menu appears.

Switch drawbar suspension off

1. Press the  key again.

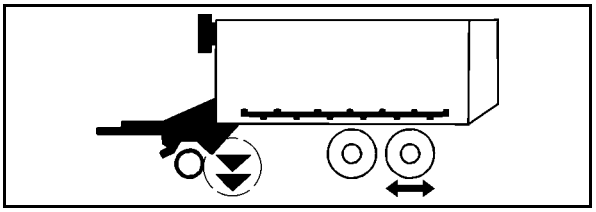
→ Road travel mode is switched off. At the same time, the drawbar suspension is automatically switched off. The **Working** menu appears.

Retract cutting unit

1. Press the  key until the "Cutting unit" symbol is in "Cutting unit retracted" position and a beep is emitted.

→ The cutting unit is retracted from the conveyor duct.

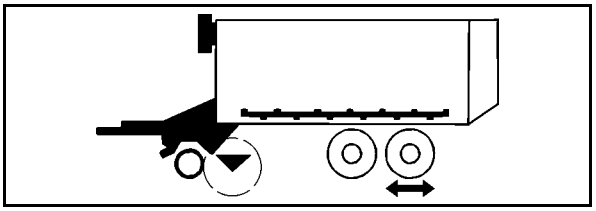
The screen shows:



If the "Cutting unit" symbol moves to "Cutting knives retracted" position during charging:

- at least one cutting knife has been retracted from the conveyor duct due to a foreign object,
- the cutting unit is heavily soiled.

The screen shows:



Remedy in case of cutting knife/knives retracted from the conveyor duct:

1. Swivel the cutting unit completely out of the conveyor duct and in again with the feeder rotor running.

Remedy in case of soiled cutting unit:

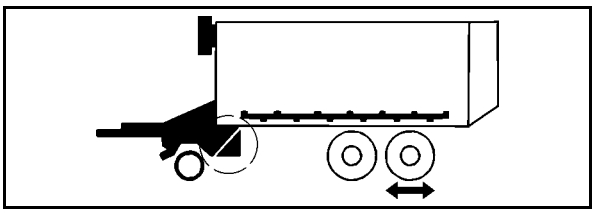
1. Clean the cutting unit.

Extend cutting unit

1. Press the  key until the "Cutting unit" symbol is in "Cutting unit extended" position and a beep is emitted.

→ The cutting unit is completely extended into the conveyor duct.

The screen shows:



Lock steering axle

WARNING

Risk to people due to insufficient stability and tipping over of the machine if the steering axle is not properly used!

It is absolutely necessary to lock the steering axle:

- before travelling over bunker silos,
- at travelling speeds of more than 40 km/h,
- on rough road tracks,
- when traversing hills,
- before carrying out reverse travels.

Align the wheels of the steering axle in a straight line by means of a short forward travel of the tractor and the hitched machine before locking the steering axle.

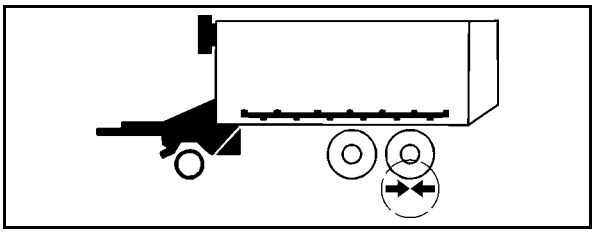
When switching the control set on, the single-acting steering axle is always in unlocked condition.

1. Press the  key once.

→ The steering axle is locked in "Straight" position. The "Steering axle locked" symbol appears and a beep is emitted.

→ If the symbol is flashing, the steering axle could not be completely locked. Check the steering system.

The screen shows:

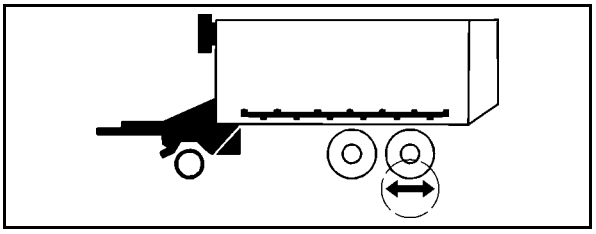


Unlock steering axle

1. Press the  key once.

→ The steering axle can move freely (is unlocked) and follows the turning radius of the corner during cornering. The "Steering axle unlocked" symbol appears and a beep is emitted.

The screen shows:



Lock steering axle in SES system

WARNING

Risk to people due to insufficient stability and tipping over of the machine if the steering axle is not properly used!

Absolutely lock the steering axle before travelling over the bunker silo by means of the **Discharge mode A I** key.

Align the wheels of the steering axle in a straight line by means of a short forward travel of the tractor and the hitched machine before locking the steering axle.

In **Discharge mode A I**, the steering axle is automatically locked at speeds up to 12 km/h.

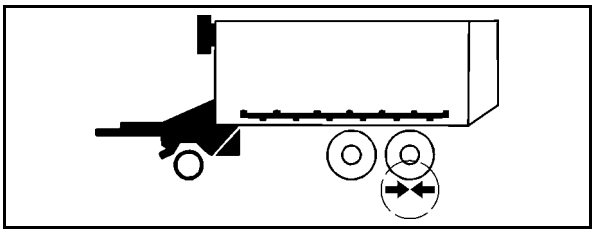
In the case of the electro-hydraulic forced steering axle system, the  key has a touch-control design.

1. Press the  key as long as the steering axle shall be locked.

→ The steering axle is locked in "Straight" position. The "Steering axle locked" symbol appears and a beep is emitted.

→ If the symbol is flashing, the steering axle could not be completely locked. Check the steering system.

The screen shows:



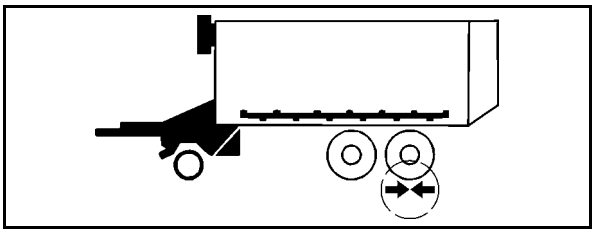
Only in discharge mode A I or A II respectively:

1. Press the  key once.

→ The steering axle is locked in "Straight" position. The "Steering axle locked" symbol appears and a beep is emitted.

→ If the symbol is flashing, the steering axle could not be completely locked. Check the steering system.

The screen shows:



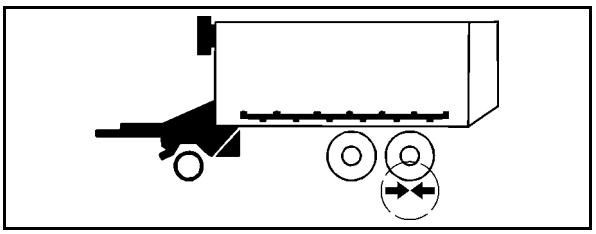
Unlock steering axle in SES system

In the case of the electro-hydraulic forced steering axle system, the  key has no function.

1. Press the  key once.

→ **Discharge mode A I** or **A II** respectively is deactivated. The steering axle is force-steered and follows the turning radius of the corner during cornering. The "Steering axle force-steered" symbol appears and a beep is emitted.

The screen shows:



→ If the symbol is flashing and a beep is emitted, there is a malfunction in the steering system. The follow-up steering is activated. Check the steering system.

Only in discharge mode A I or A II respectively:

1. Press the  key once.

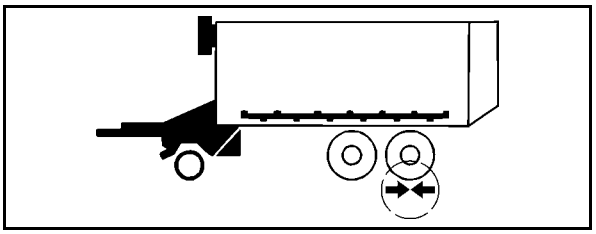
→ The steering axle is force-steered.

2. Press the  key again.

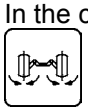
→ The steering axle is locked in "Straight" position. The "Steering axle locked" symbol appears and a beep is emitted.

→ If the symbol is flashing, the steering axle could not be completely locked. Check the steering system.

The screen shows:



Lock forced steering axle

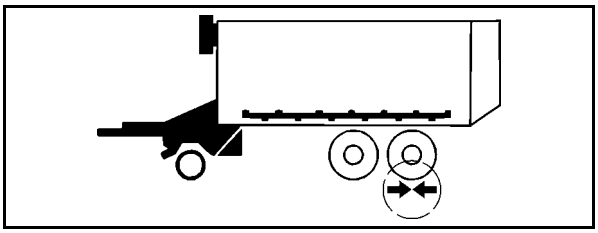
In the case of the electro-hydraulic forced steering axle system, the  key has a touch-control design.

1. Press the  key as long as the steering axle shall be locked.

→ The "Steering axle locked" symbol appears and a beep is emitted. The steering axle is locked in "Straight" position.

→ If the symbol is flashing, the steering axle could not be completely locked. Check the steering system.

The screen shows:



Lift pick-up

1. Press the  key until the pick-up has been lifted to its end position.

→ The pick-up raises.

The screen shows:

no additional symbol

Lower pick-up

WARNING

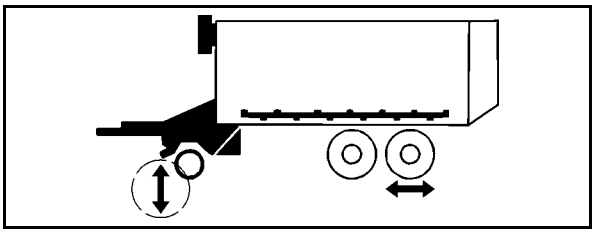
Risk of material damage when travelling on uneven ground with the pick-up lowered/locked.

Only move the machine on uneven ground with the pick-up held in open-centre position.

1. Press the  key once.

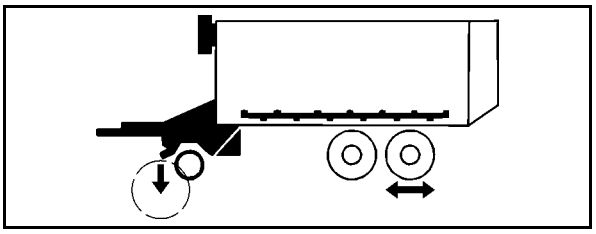
→ The pick-up lowers and is held in open-centre position. The "Lower pick-up/Open-centre position" symbol appears.

The screen shows:



2. Press the  key again.

→ The open-centre position is switched off and the pick-up is fixed. The "Lower pick-up/Locked position" symbol appears.



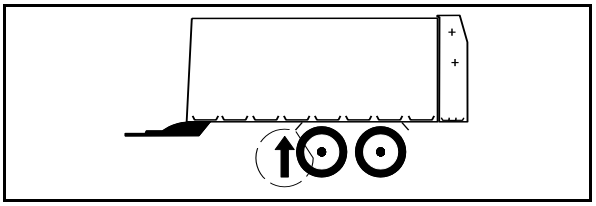
Lift lift axle

Only lift the lift axle with the machine being empty and stationary!

1. Press the  key once.

→ The lift axle rises. The "Lift axle lifted" symbol appears.

The screen shows:



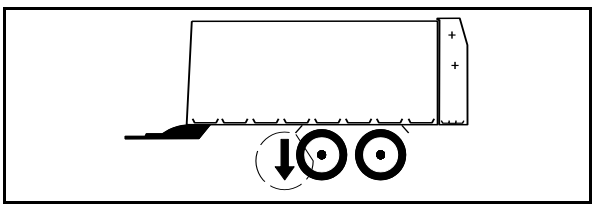
Lower lift axle

Lower the lift axle before starting a charging procedure and before carrying out journeys with the charged machine.

1. Press the  key once.

→ The lift axle lowers. The "Lift axle lowered/Open-centre position" symbol appears.

The screen shows:



6.1.4 Set machine parameters

For proper functioning of the ISOBUS control, setting of the appropriate machine parameters is required.

The machine parameters are set in the **SET** menu. Depending on the machine model and the machine's equipment, the indicated symbols may differ. The arrow in the centre indicates which parameter may currently be changed.

6.1.4.1 Call up SET menu

1. Press and hold the SET key once.

→ After switching to the **SET** menu, the arrow (1) is at the top and is pointing to the right. Now the right-hand functions 2 to 4 can be selected.

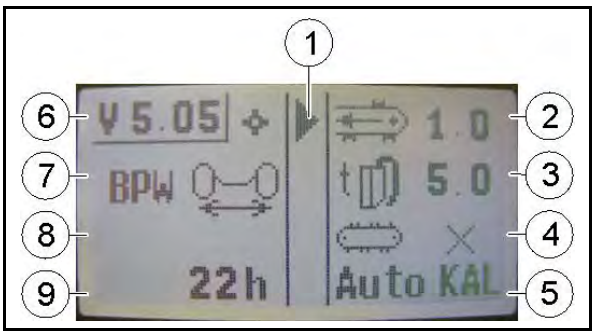
2. Briefly press the key to move the arrow down.
3. Press and hold the key such that the arrow is pointing to the left.

→ Now the left-hand functions 6 to 7 can be selected.

4. Use the and keys to change the values by 0.1.
5. Press the ESC key once.

→ The **Working** menu appears.

The screen shows:



(1) Arrow

(2) Only for machines equipped with dosing drums: Entry of time during which the transport floor shall reverse if the "Forage wagon full" switch is switched on when starting **Discharge mode A II**.

(3) Only for machines equipped with dosing drums: Entry of time during which the tailgate shall be activated after reaching the "First opening width" sensor.

(4) Crossover conveyor display:

- an arrow indicates the direction in which the crossover conveyor starts to run
- "X" indicates that a crossover conveyor is not available
- "W" indicates that the Wollschläger hydraulic system is used

(5) Display of potentiometer position:

- value from 0 to 100
- "KAL" appears during the calibration procedure

(6) Left: Display of current software version

Right: Entry whether equipped with dosing drums or not; here "with dosing drums"

(7) Entry of steering axle model

(8) Vacant

(9) Display of total number of service hours

6.1.4.2 Set machine model

1. Press and hold the SET key once.

→ The **SET** menu appears.

2. Press and hold the key once.

→ The parameter "With/Without dosing drums" (6) is selected.

3. Press the or key to change the setting.

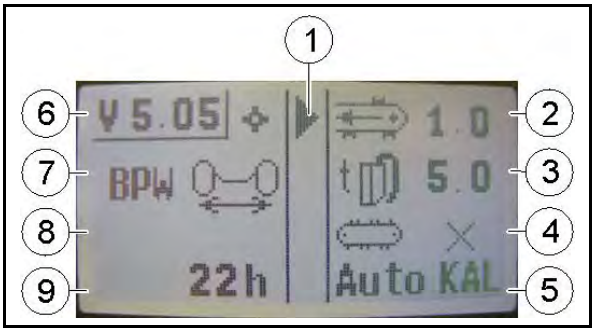
→ The symbol is faded in or out.

- On machines equipped with dosing drums, the symbol must be faded in.
- On machines without dosing drums, the symbol must not be faded in.

4. Press the ESC key.

→ The **Working** menu appears.

The screen shows:



6.1.4.3 Pre-select steering axle model

1. Press and hold the SET key once.

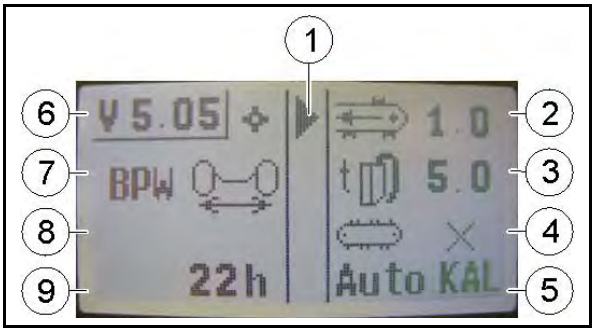
→ The **SET** menu appears.

2. Actuate the key by one long and one short press.

→ The parameter "Steering axle model" (7) is selected.

3. Press the or key to change the setting.

The screen shows:



Observe the fact that the setting "BPW" must be selected both for BPW and FAD axles with single-acting hydraulic cylinders!

Display (7)	Hydraulic cylinder type	Axle model/Steering/Chassis
BPW	Single-acting	BPW, FAD or forced steering axle
FAD	Double-acting	FAD
ZWL		Electronic forced steering axle
TRI		Tridem

4. Press the ESC key once.

→ The **Working** menu appears.

6.1.4.4 Pre-select filling degree of loaded material in cargo space

The higher the set filling degree, the higher the transport floor feed rate and the smaller the filling capacity.

1. Press the SET and keys one after the other.

→ The **Filling degree** menu appears.

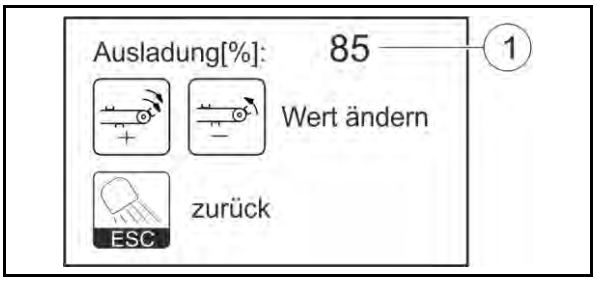
2. Press the or key to change the setting in 5% steps.

→ The filling degree (1) is changed.

3. Press the ESC key.

→ The **Working** menu appears with the "Automatic charging system on" symbol.

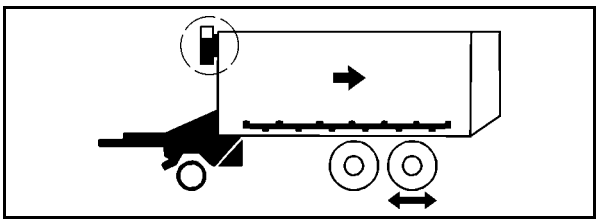
The screen shows:



„Ausladung“ = Filling degree

„Wert ändern“ = Change value

„zurück“ = Backwards



6.1.5 Calibration

6.1.5.1 Calibrate automatic charging system

A calibration of the automatic charging system helps to separately set the bottom position of the sensing band for switching the transport floor on and off and the top position of the sensing band to switch over to maximum feed rate.

Two people are required for calibration of the automatic charging system. One person moves the sensing band in the cargo space, while the other person operates the control set on the tractor.

1. Hitch the machine to the tractor.
2. Turn the tractor engine off.
3. Apply the parking brake of the tractor.
4. A second person enters the cargo space through the access door.
5. Switch the tractor ignition on.
6. Press and hold the SET key once.

→ The **SET** menu appears.

7. The person in the cargo space swivels the sensing band to the bottom position which shall be the automatic start position for the transport floor.
8. Press the key once to start the calibration mode.

→ The display "KAL" (5) appears.

9. The person in the cargo space swivels the sensing band to the top position which shall be the start position for the transport floor running at maximum feed rate.
10. Press the key again.
11. Press the STOP key once to acknowledge the settings and to finish the calibration procedure.

→ A horn sounds.

12. Check the set range for its suitability by manually moving the sensing band from the bottom position (indicated value: 0) to the top position (indicated value: 100). Adjust the range in case of a collision.
13. Press the ESC key once.

→ The **Working** menu appears.

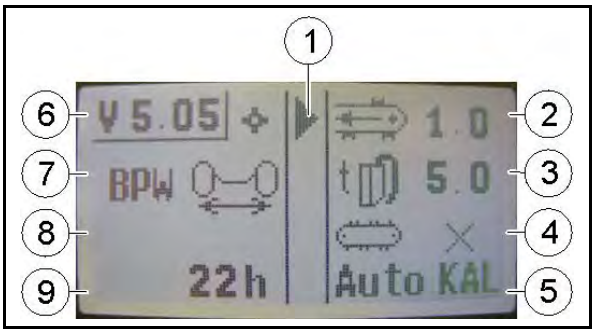


Fig. 70

6.1.6 Operating hours counter, service hours counter and transported loads counter

- The daily operating hours counter and the daily transported loads counter can be reset at any time.
- The daily operating hours counter and the daily transported loads counter are not automatically reset every day. These counters must be reset manually.
- The total service hours counter, the total operating hours counter and the total transported loads counter cannot be reset.

The operating hours counter and the transported loads counter are designed each as daily and total counters. The service hours counter is designed as total counter.

- Daily operating hours counter (operating hours until reset (h)). The operating hours of the machine during which the pick-up is in lowered position are registered.
- Daily transported loads counter (transported loads until reset). The number of transported loads is registered by counting the number of opening cycles of the tailgate.
- Total operating hours counter. The total operating hours counter registers the overall period of use of the machine during which the pick-up is in lowered position.
- Total service hours counter. The total service hours counter registers the overall period of use the machine by registering the time during which the ISOBUS control set is in switched-on mode.
- Total number of transported loads counter. The total number of transported loads counter registers the number of transported loads during the overall period of use of the machine.

6.1.7 Call up Counter menu

The total service hours counter is displayed in the **SET** menu, see chapter "Call up SET menu", page 112.

1. Briefly press the SET key once.

→ The **Counter** menu appears.

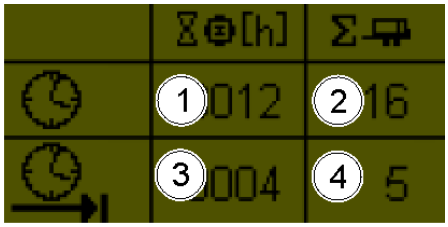
(1) Total operating hours counter

(2) Total number of transported loads counter

(3) Daily operating hours counter

(4) Daily transported loads counter

The screen shows:



2. Press the ESC key once.

→ The **Working** menu appears.

6.1.8 Reset daily counters

1. Briefly press the SET key once.

→ The **Counter** menu appears.

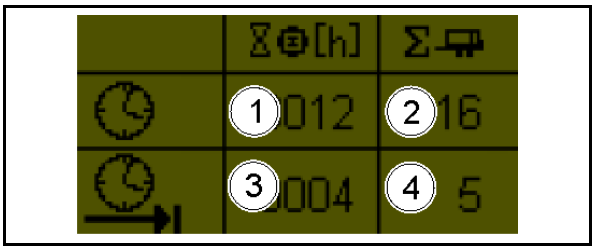
2. Press and hold the SET key once.

→ The daily service hours counter and the daily transported loads counter are reset.

3. Press the ESC key once.

→ The **Working** menu appears.

The screen shows:



6.1.9 Sensor and state overview

Sensor for	Status
1: Cutting knives	0: Extended 1: Retracted
2: Cutting unit	0: Retracted 1: Extended
3: Steering axle locked	0: No response of sensor 1: Response of sensor → A short beep is emitted.
In case of tridem: Lift axle lifted	0: No response of sensor 1: Response of sensor → A short beep is emitted.
4: Steering axle unlocked	0: No response of sensor 1: Response of sensor
In case of tridem: Lift axle lowered	0: No response of sensor 1: Response of sensor
5: Forage wagon full	0: No response of sensor 1: Response of sensor
6: Tailgate lifted up to first opening width	0: No response of sensor 1: Response of sensor
7: Tailgate completely lifted	0: No response of sensor 1: Response of sensor
8: Tailgate completely lowered	0: No response of sensor 1: Response of sensor
9: Speed at dosing unit	0: No response of sensor 1: Response of sensor

Sensor for	Status
10: Covering system	0: No response of sensor 1: Response of sensor
11: Speed at CFS powertrain	0: No response of sensor 1: Response of sensor

6.1.9.1 Call up state overview

1. Press the SET and keys one after the other.

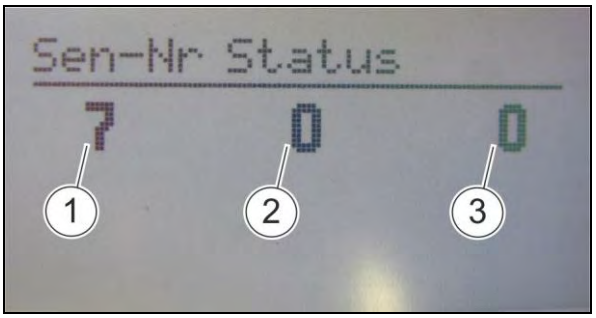
→ The display shows the **Sensor and status overview**:

(1) Sensor number

(2) Sensor status

(3) Number of sensor circuits

The screen shows:



2. Press the or key to display the next or preceding sensor.

3. Press the ESC key once.

→ The **Working** menu appears.

6.2 Operation with ISOBUS control Field Operator 130

In case of longer downtimes of the machine, switch the control set off, in order to avoid a discharging of the tractor's battery due to switched-on loads!

Protect the control set against moisture and humidity!

6.2.1 Design

The ISOBUS control complies with the latest ISO standard.

If your tractor's software and hardware comply with the latest ISO standard, you will not require our control set. You will then be able to directly operate the machine via your tractor control set.

The included ISO cable harness is not compatible with LBS or LBS-Plus.

The ISOBUS control is switched on and off by inserting and pulling out the connecting cable.

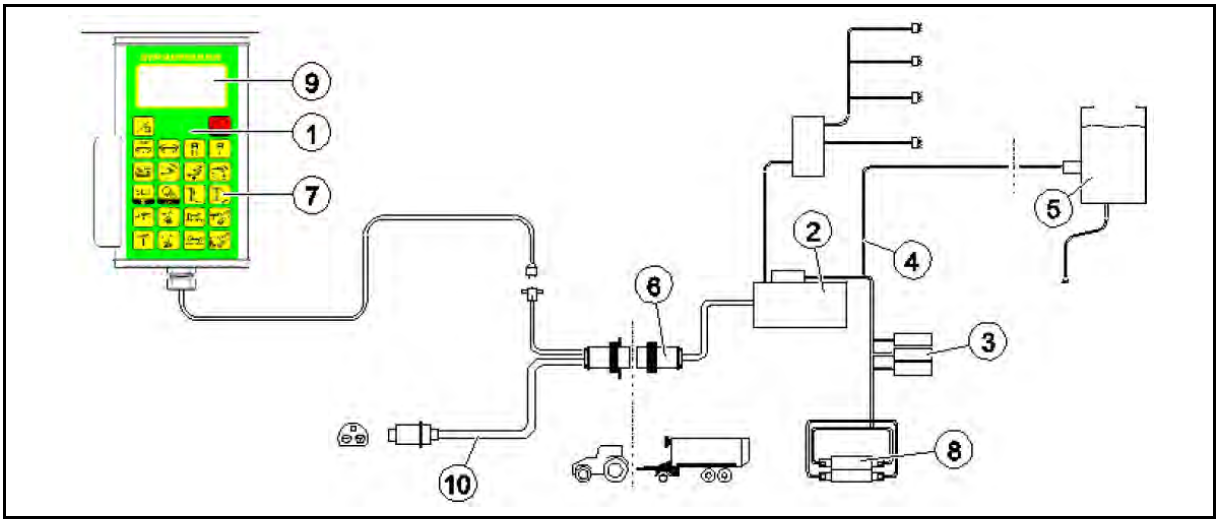


Fig. 71

The ISOBUS control mainly consists of:

- the control set (1),
- the control unit (2),
- the sensors (3) to determine operating states, e. g. Steering axle locked or Steering axle unlocked,
- the connecting cable (4) for the silage additive pump (5) (optional extra).

The control set (1) is mounted on the tractor and is connected to the control unit (2) of the machine via the connecting cable (6).

All functions required for operating the machine as well as for transport journeys are actuated via the keys (7) of the control set. The symbols on the keys identify the executable functions.

After a key has been pressed, the control unit triggers the corresponding solenoid valve at the electro-hydraulic control block (8) to carry out the selected functions. Individual sensors (3) determine the respective operating state of the selected assembly, e. g. Steering axle locked or Steering axle unlocked. The operating states are graphically shown on the screen (9).

(1) Coloured screen for machine monitoring and display
(2) Display for coupled USB stick
(3) Soft keys: The assignment is indicated in the display and varies according to mode, submenu and equipment.
(4) Switch work lights on/off; ESC key for submenu
(5) SET key: Call up set-up menu and change menu level
(6) Retract cutting unit
(7) Extend cutting unit
(8) Charge mode
(9) Road travel mode
(10) Discharge mode
(11) Lock steering axle
(12) Unlock steering axle
(13) Lift folding drawbar
(14) Lower folding drawbar
(15) Lift pick-up
(16) Lower pick-up
(17) Open tailgate, start automatic discharge mode
(18) Close tailgate, finish automatic discharge mode
(19) Switch on transport floor
(20) Reverse transport floor

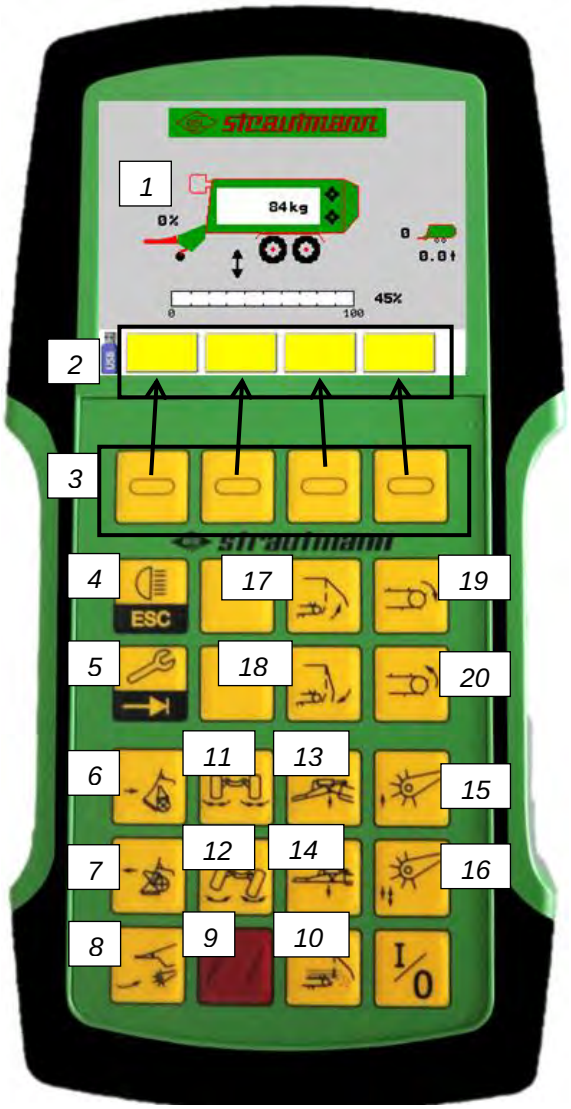
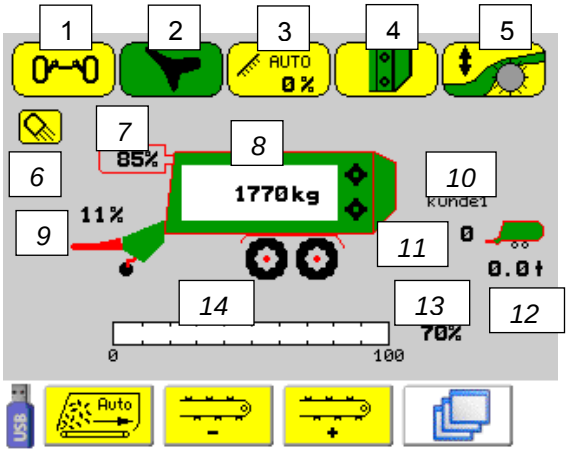


Fig. 72

6.2.2 Displays

6.2.2.1 Display information in charge menu



(1) Status "Steering axle force-steered, locked, free, Error", here "Steering axle force-steered"

(2) Operating state "Cutting knives extended, knife protection system, retracted", here "Cutting knives extended"

(3) Value "Automatic charging system position", here 0 %

(4) Operating state "Tailgate open/closed", here "Tailgate closed"

(5) Operating state "Pick-up lifted /lowered/ open-centre position", here "Pick-up in open-centre position"

(6) Operating state "Work lights on/off", here "Work lights on"

(7) Operating state "Automatic charging system on/off, nominal value", here "Automatic charging system on, 85%"

(8) Load weight, here 1,770 kg

(9) Value "Folding drawbar position", here 11%

(10) Active customer in "Job management", here "Customer 1"

(11) Total number of transported loads for active customer, here 0

(12) Total load for active customer, here 0

(13) Currently selected "Transport floor nominal value in %", here "70 %"

(14) Actual "Transport floor speed in %“, here "0 %"

6.2.2.2 Display information in road travel menu

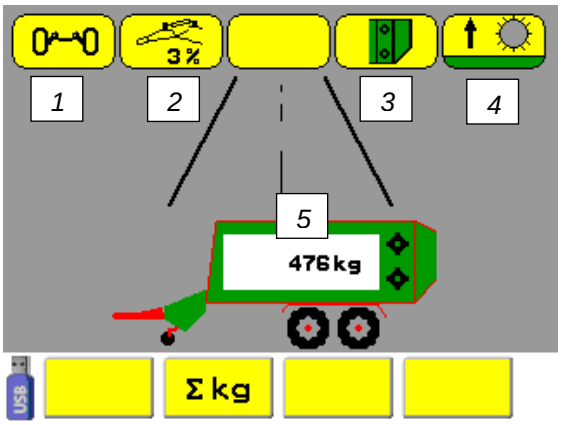
(1) Status "Steering axle force-steered, locked, free, Error", here "Steering axle force-steered"

(2) Value "Folding drawbar position", here 3%

(3) Operating state "Tailgate open/closed", here "Tailgate closed"

(4) Operating state "Pick-up lifted/lowered/open-centre position", here "Pick-up lifted"

(5) Load weight, here 476 kg



6.2.2.3 Display information in discharge menu

(1) Status "Steering axle force-steered, locked, free, Error", here "Steering axle force-steered"

(2) Operating state "Tailgate open/closed", here "Tailgate open"

(3) Operating state "Pick-up lifted /lowered/ open-centre position", here "Pick-up in open-centre position"

(4) Value "Folding drawbar position", here 80%

(5) Load weight, here 1,770 kg

(6) Operating state "Dosing drums powered/off", here "Dosing drums powered"

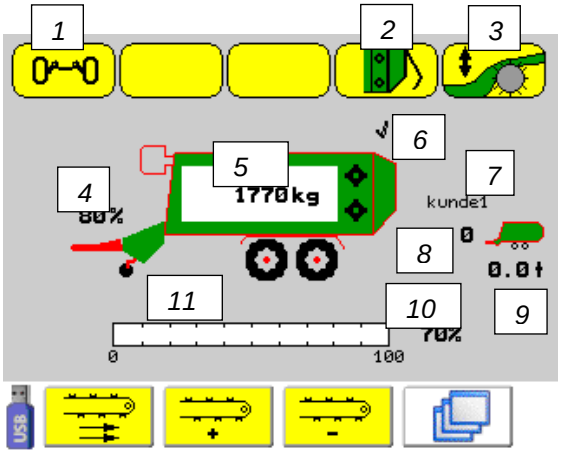
(7) Active customer in "Job management", here "Customer 1"

(8) Total number of transported loads for active customer, here 0

(9) Total load for active customer, here 0 kg

(10) Currently selected "Transport floor nominal value in %", here "70 %"

(11) Actual "Transport floor speed in %", here "0 %"



6.2.3 Functions and their symbols

The following paragraphs show the symbols of the operating elements of the control set, their functions and the displays on the screen.

Switch control set on/off

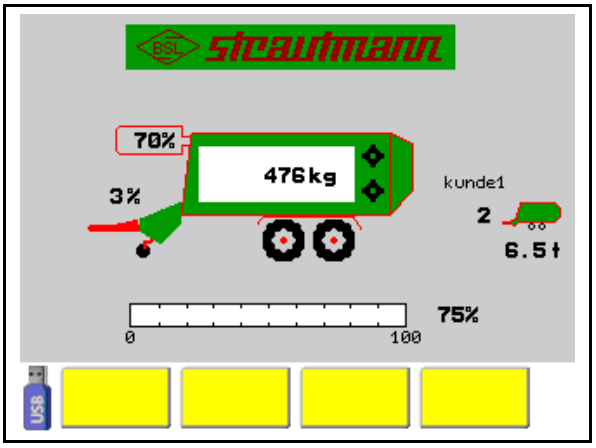
Insert/Pull out the connecting cable to switch the control set on/off.

1. Insert the connecting cable of the control set.

→ The control set is switched on.

When the control set is switched on, the start screen appears. When the control set is switched off, the display on the screen goes out

The screen shows:



Switch road travel mode on

The road travel mode can only be switched on:

- with lifted pick-up (attention, the pick-up is not checked for having been lifted completely),
- with closed tailgate,
- with the transport floor stationary,
- with the dosing drums stationary.

If these requirements are not fulfilled, a beep is emitted, a corresponding warning message and the non-fulfilled requirement appear in the menu:

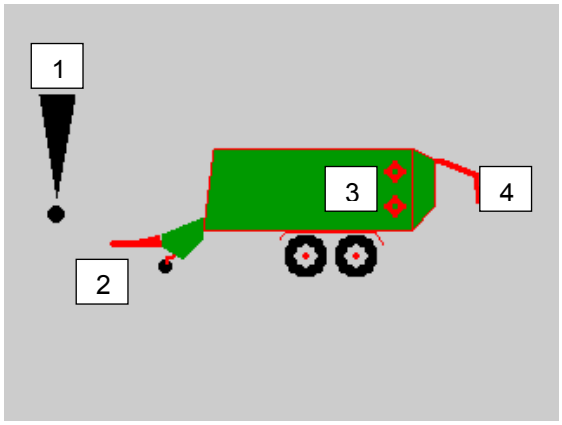
(1) Warning message

(2) Pick-up down

(3) Dosing drums powered

(4) Tailgate open

The screen shows:



With the road travel mode switched on:

- the **Road Travel** menu appears,
- apart from the functions "Lock steering axle", "Unlock steering axle" and "Sum up weight", all other functions of the control set are disabled,
- the hydraulic drawbar suspension, the axle suspension of the hydraulic chassis and the warning beacon (if available) are switched off,
- the folding drawbar moves to the position saved for road travel,
- the steering axle is locked if this function has been activated in the machine set-up menu for road travel,
- the work lights are switched off.

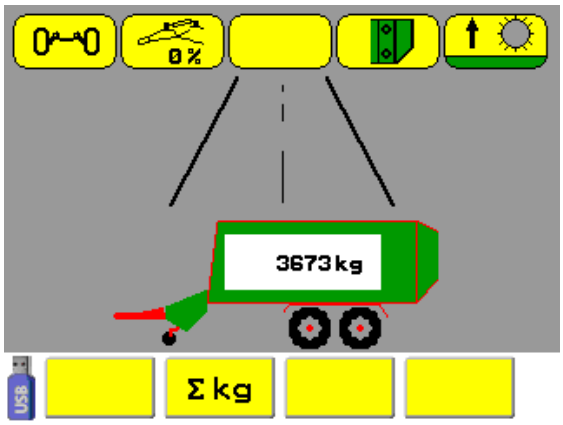
If the folding drawbar is equipped with a drawbar suspension, the hydraulic cylinders of the folding drawbar must be extended by approx. 20 mm.

The drawbar suspension will not work if the folding drawbar is lowered to its end position.

1. Press the  key once.

→ The road travel mode is switched on. The **Road Travel** menu appears

The screen shows:



Switch road travel mode off

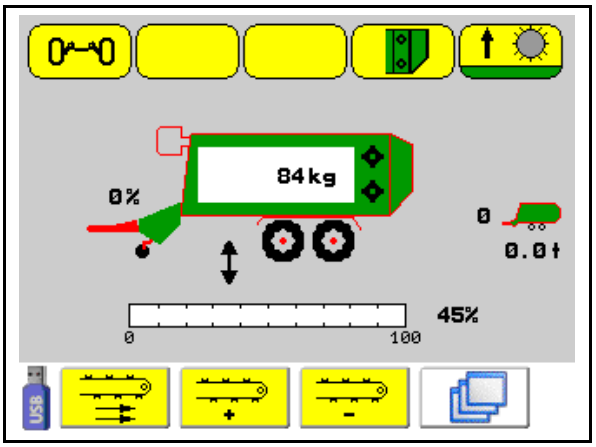
With the road travel mode switched off:

- the Charge and Discharge menu appear alternately; Charging – Road Travel – Discharging – Road Travel - Charging,
- all functions of the control set are enabled,
- the hydraulic drawbar suspension, the axle suspension of the hydraulic chassis and the warning beacon (if available) are switched off,
- the work lights are switched on if they were on when carrying out the function "Switch on road travel mode".

1. Press the /// key again.

→ The road travel mode is switched off. The **Discharge** menu appears.

The screen shows:



Switch discharge mode on

Align the wheels of the steering axle in a straight line by means of a short forward travel of the tractor and the hitched machine before switching over to **Discharge** mode.

The discharge mode is automatically switched off if the tailgate is lowered.

The automatic locking of the steering axle and the automatic positioning of the folding drawbar in discharge mode are set and activated in the machine set-up menu.

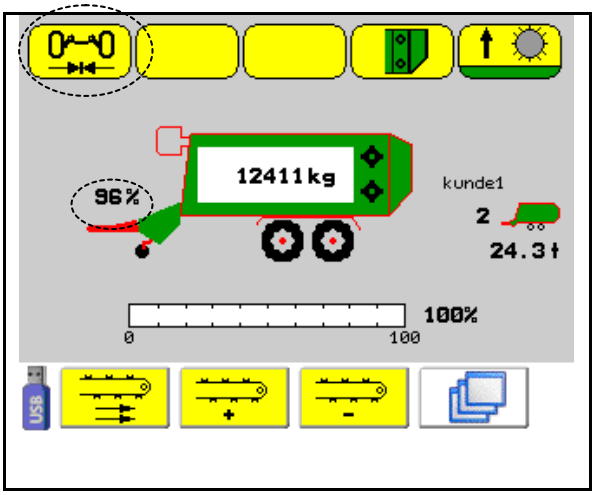
Depending on the equipment, the number and arrangement of the soft keys may vary.

1. Press the key

→ The following functions will be automatically carried out one after the other:

- Lock steering axle
- the folding drawbar takes up the preset value for discharge

The screen shows:



Switch automatic discharge mode on (Machine without dosing drums)

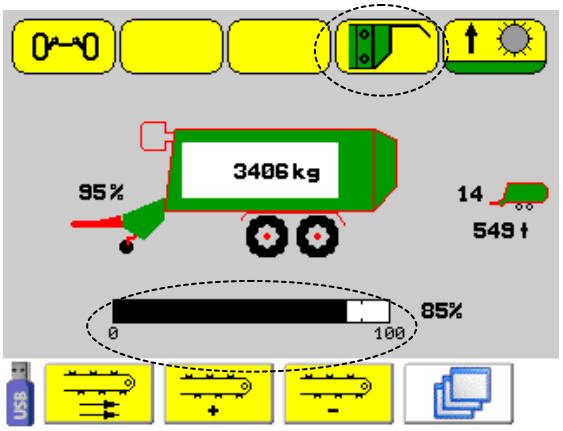
The discharge mode is automatically switched off if the tailgate is lowered.

1. Press the  key once when being on the bunker silo.

→ The following functions will be automatically carried out one after the other:

- Lift tailgate
- Switch transport floor on when the tailgate has reached its end position

The screen shows:



Switch automatic discharge mode on (Machine with dosing drums)

The discharge mode is automatically switched off if the tailgate is lowered (only possible with the p.t.o. shaft switched off).

Switch the p.t.o. shaft off or use the 

soft key to discharge step by step.

→ The dosing drums and the transport floor stop. The transport floor automatically switches to standby mode.

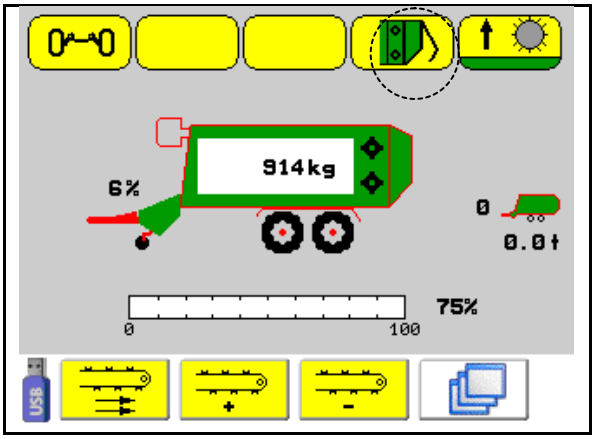
1. Press the  key once when being on the bunker silo.

→ The following functions will be automatically carried out one after the other:

- Lift tailgate until the set first opening width is reached.
- Switch gearboxes and clutches.
- Switch transport floor to standby mode when the tailgate has reached its set first opening width.

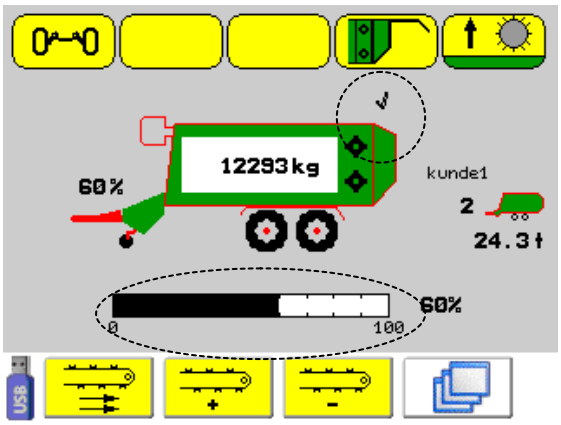
2. Switch p.t.o. shaft on.

The screen shows:

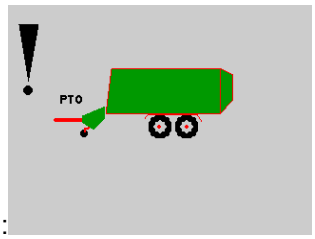


As soon as the p.t.o. shaft is switched on, the dosing drums start to run and after a short delay, the transport floor automatically starts.

→ With the dosing drums powered, the "Dosing drums On" symbol appears.



Warning message PTO (only on forage wagon with dosing unit)



:

Is displayed when pressing the  key if the p.t.o. shaft has already been switched on.

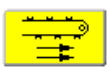
→ Switch p.t.o. shaft off.

→ Actuate  key again.

→ Only switch the dosing drums on with the tailgate open.

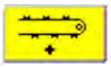
Double feed rate of transport floor for complete emptying (transport floor level II)

The minimum set feed rate must be "40" before doubling the feed rate of the transport floor for complete emptying.

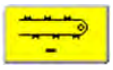
1. Press the  key once during discharge.

→ The transport floor speed is doubled

Change feed rate of transport floor during discharge

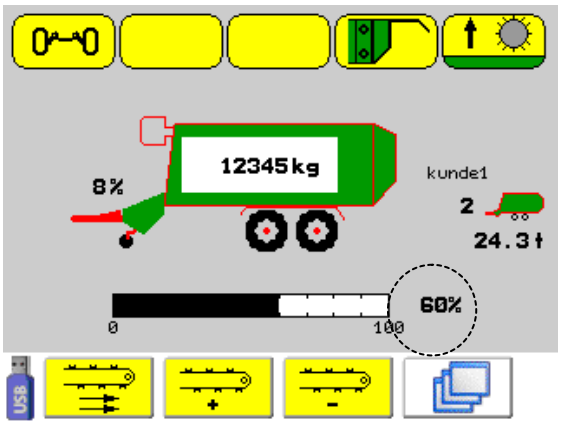
1. Press the  soft key.

→ The feed rate of the transport floor is increased by 5 % each time the key is pressed.

2. Press the  soft key.

→ The feed rate of the transport floor is reduced by 5 % each time the key is pressed.

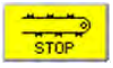
The screen shows:



Stop and restart transport floor during discharge

1. Press the  soft key.

→ The assignment of the soft keys changes.

2. Press the 

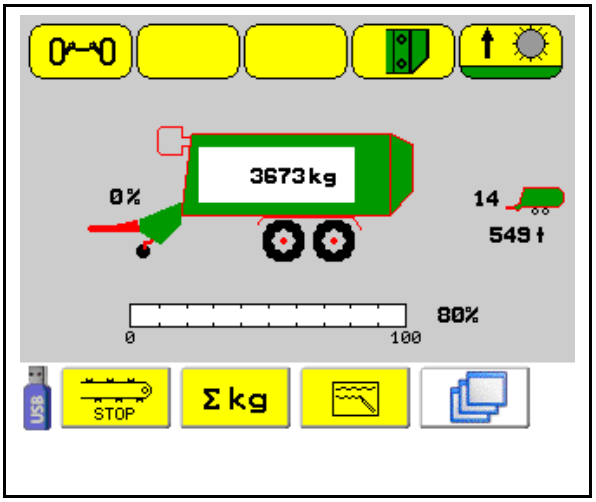
soft key.

→ The transport floor stops.

3. Press the  key.

→ The transport floor restarts.

The screen shows:



Reverse transport floor

Risk due to failure of components caused by frequent or long reverse of transport floor!

Observe the fact that the feed direction of the transport floor is only allowed to be reversed for a short time (max. 3 seconds).

Check the transport floor chains for proper tension every day, in order to prevent material damage.

Reverse:

- only for a short time,
- only in case of emergency,
- if the slip clutch responds during discharge or
- in order to reduce the pressing power which the loaded material applies to the dosing drums.

1. Press the 

soft key to switch the transport floor feed off.
2. Press the  key.

→ The transport floor starts running and conveys the loaded material away from the dosing drums for a maximum time of 3 seconds.

Switch automatic charging system on/off

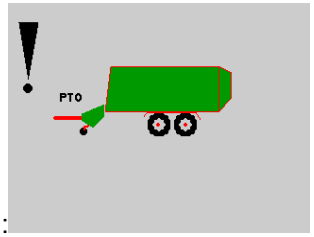
Switch the automatic charging system on for uniform and complete filling of the cargo space.

The automatic charging system:

- has to be switched on only once,
- automatically and infinitely variably switches the transport floor on and off during charging,
- will automatically be deactivated if the control set generates the acoustic signal (horn sound) and the visual signal "Forage wagon full",
- will automatically be activated 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,
- permits to pre-select the filling degree of the loaded material in the cargo space. Observe the instructions from p. 13.

The higher the set filling degree, the **lower** the transport floor feed rate and the **higher** the filling quantity.

Warning message PTO (only on forage wagon with dosing unit)



:

Is indicated when the transport floor is switched on via the  key or when the automatic charging system is switched on via the 

soft key if

→ the p.t.o. shaft has been switched off
→ the sensor is defective

1. Press the  key

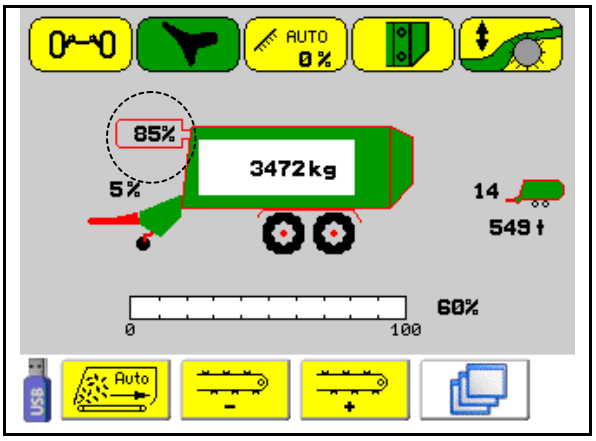
→ The charge mode is activated.

2. Press the 

soft key once.

→ The automatic charging system is switched on. The "Automatic charging system on" symbol appears.

The screen shows:



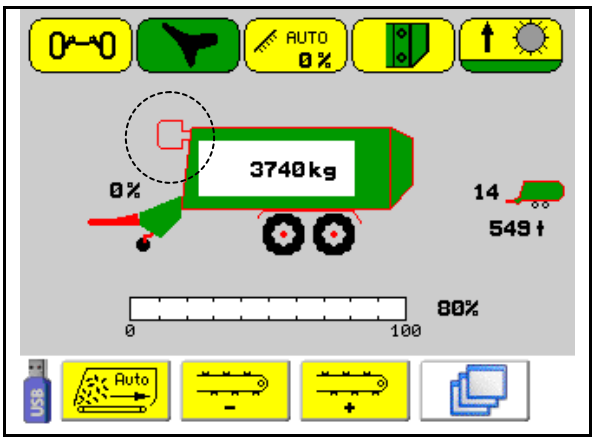
.

3. Press the 

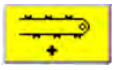
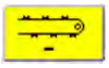
again.

→ The automatic charging system is switched off. The "Automatic charging system off" symbol appears.

The screen shows:

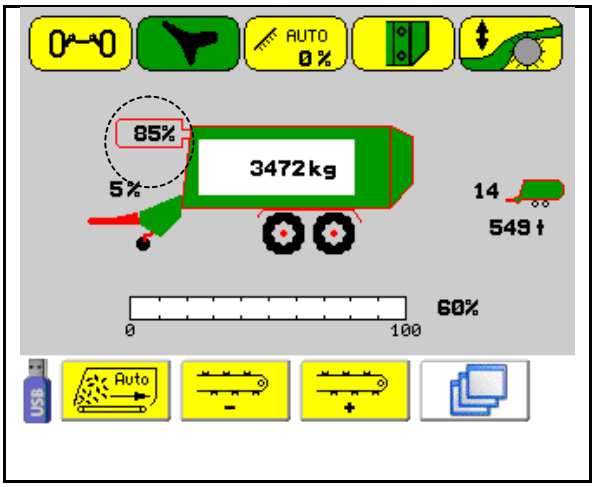


Change filling degree of loaded material in cargo space

1. Press the  soft key to increase the filling degree.
2. Press the  soft key to reduce the filling degree.

→ The filling degree changes in 5 % steps and is indicated in the display.

The screen shows:



Switch transport floor on

Information for machines **without dosing drums:**

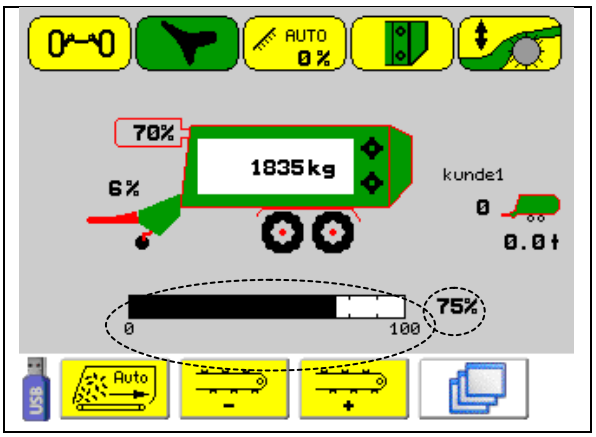
- When the machine is fully charged, the ISOBUS control set generates an acoustic signal (horn sound) and a visual signal "Forage wagon full". The automatic charging system is deactivated and the automatic feed function for the transport floor is switched off.

  You can still continue to charge machines without dosing drums. The feed function of the transport floor can still be switched on for a maximum of three times for a short period of 2 seconds via the  key.
- During discharge on the bunker silo, the transport floor is automatically switched on after pressing the  key, when the tailgate has reached its end position.

1. Press the  key for a maximum of 2 seconds during charging to switch the transport floor feed manually on.

→ The transport floor will move at the set feed rate as long as the key is pressed. The "Feed on" symbol appears.

The screen shows:

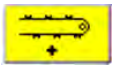


Change transport floor speed

1. Press the 

soft key with the automatic charging system activated.

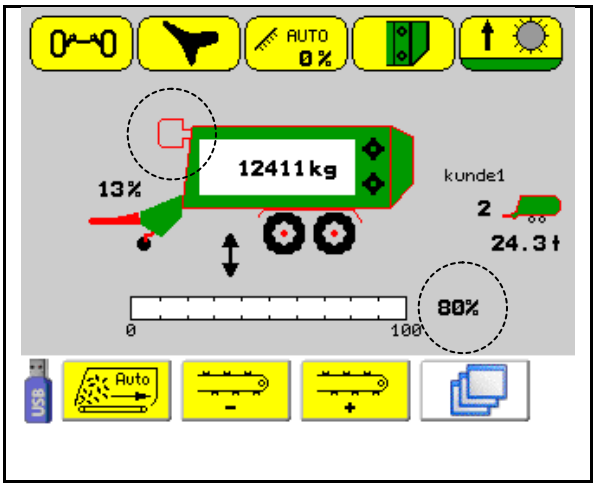
→ The automatic charging system is deactivated.

2. Press the  soft key to increase the transport floor speed.

3. Press the  soft key to reduce the transport floor speed.

→ The transport floor speed changes in 5 % steps and is indicated in the display.

The screen shows:



Switch cargo space lighting on/off

If the cargo space lighting is switched on:

- the lighting is automatically switched off if the road travel mode is switched on.
- the lighting is automatically switched on if the road travel mode is switched off.

1. Briefly press the 

key once.

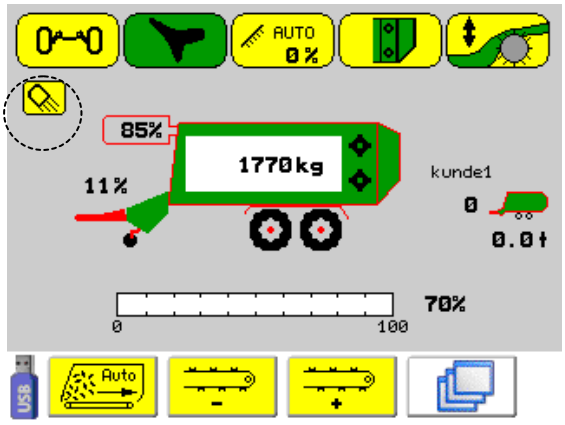
→ The cargo space lighting is switched on. The "Cargo space lighting on" symbol appears.

2. Press the 

key briefly again.

→ The cargo space lighting is switched off. The "Cargo space lighting on" symbol goes out.

The screen shows:



Switch silage additive pump on/off

The silage additive pump is activated in the machine set-up menu, 

symbol; in charge mode, the silage additive pump is switched on when lowering the pick-up. No readout on the display.

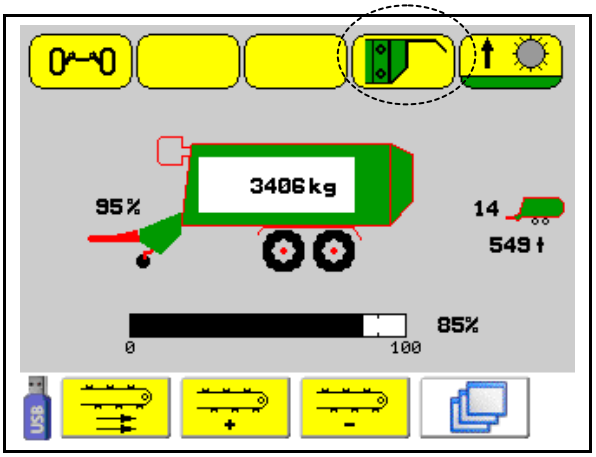
Lift tailgate (machine without dosing drums)

In discharge mode, the tailgate is automatically lifted to its full extent after pressing the  key.

1. Press the  key until the tailgate has reached its end position (manual operation).

→ When the tailgate has been lifted to its full extent, the "Tailgate lifted" symbol appears.

The screen shows:



Lift tailgate (machine with dosing drums)

In discharge mode, the tailgate is automatically lifted to the adjustable first opening width after pressing the  key.

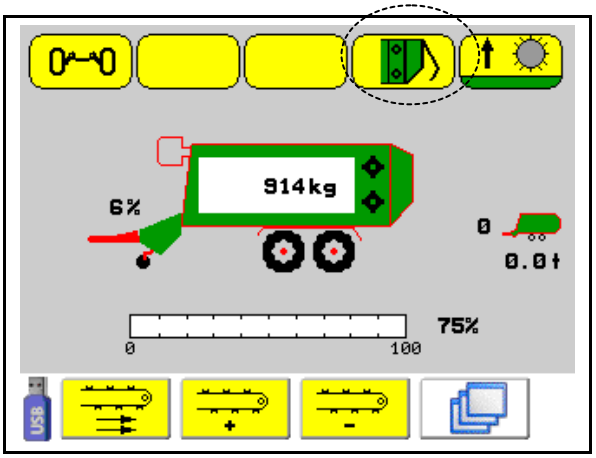
1. Press the  key until the tailgate has reached its end position (manual operation).

→ When the tailgate has been lifted to the set first opening width, the "Tailgate lifted" symbol appears.

2. Release the key and press it again.

→ The tailgate is lifted as long as the key is pressed or until the tailgate has been lifted to its full extent.

The screen shows:



Lower tailgate

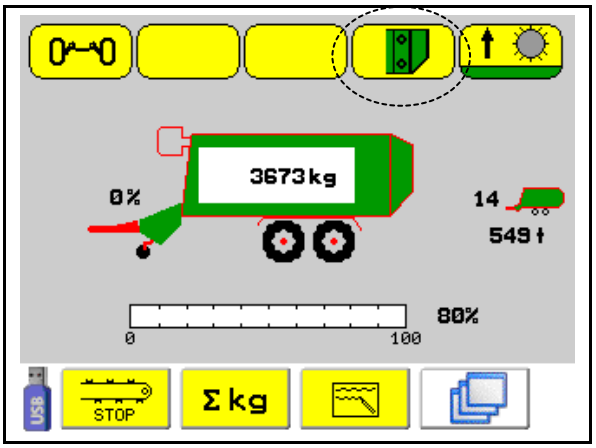
1. Press the  key until the tailgate has reached its end position.

→ The tailgate is lowered. At the same time, the automatic discharge mode automatically stops:

- The transport floor automatically stops.
- The tailgate is lowered.

As soon as the tailgate is completely lowered, the "Tailgate closed" symbol appears.

The screen shows:



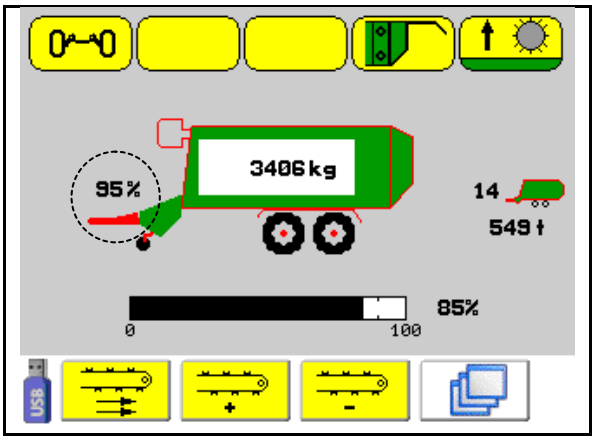
Lift folding drawbar

When switching to the different operating modes, the folding drawbar automatically moves to the saved working positions if the automatic system has been activated.

1. Press the  key until the folding drawbar has been lifted to the desired position or has reached its end position. (The drawbar position is indicated in %; optional extra)

→ The ground clearance of the pick-up is increased.

The screen shows:

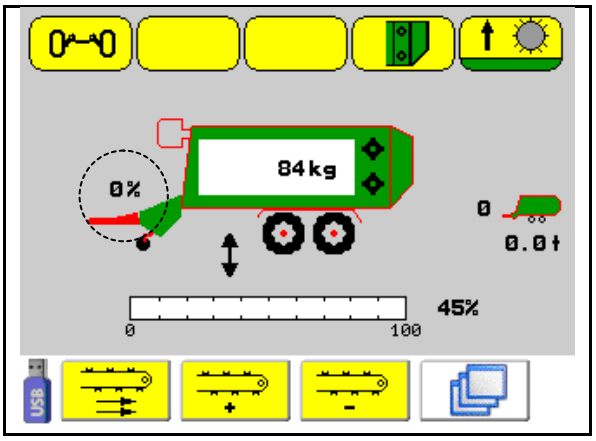


Lower folding drawbar

1. Press the  key until the folding drawbar has been lowered to the desired position or has reached its end position. (The drawbar position is indicated in %; optional extra)

→ The ground clearance of the pick-up is reduced.

The screen shows:

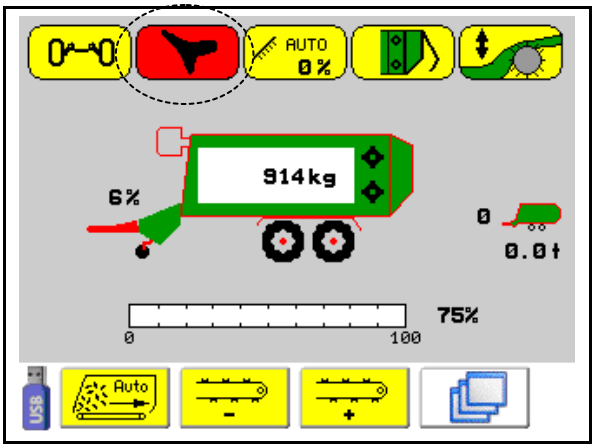


Retract cutting unit

1. Press the  key until the "Cutting unit" symbol has a **RED** background and a beep is emitted.

→ The cutting unit is retracted from the conveyor duct.

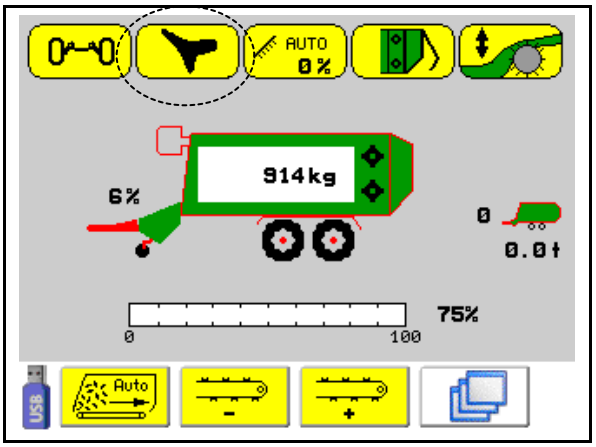
The screen shows:



If the coloured background of the "Cutting unit" symbol changes to **YELLOW** during charging:

- at least one cutting knife has been retracted from the conveyor duct due to a foreign object.
- the cutting unit is heavily soiled.

The screen shows:



Remedy in case of cutting knife/knives retracted from the conveyor duct:

1. Swivel the cutting unit completely out of the conveyor duct and in again with the feeder rotor running.

Remedy in case of soiled cutting unit:

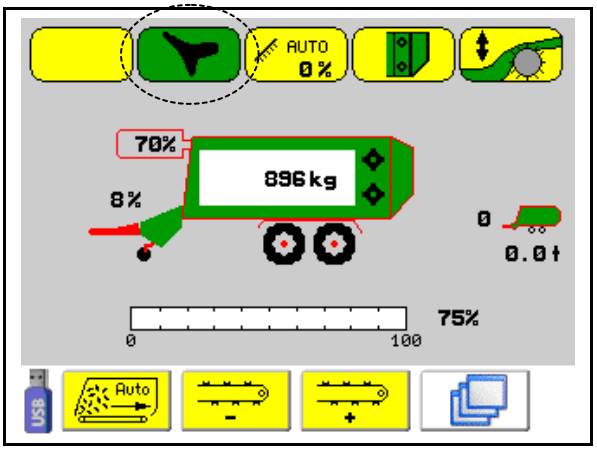
1. Clean the cutting unit.

Extend cutting unit

1. Press the  key until the "Cutting unit" symbol has a **GREEN** background.

→ The cutting unit is completely extended into the conveyor duct.

The screen shows:



Lock steering axle

WARNING

Risk to people due to insufficient stability and tipping over of the machine if the steering axle is not properly used!

It is absolutely necessary to lock the steering axle:

- before travelling over bunker silos,
- at travelling speeds of more than 40 km/h,
- on rough road tracks,
- when traversing hills,
- before carrying out reverse travels.

Align the wheels of the steering axle in a straight line by means of a short forward travel of the tractor and the hitched machine before locking the steering axle.

When switching the control set on, the single-acting steering axle is always in unlocked condition.

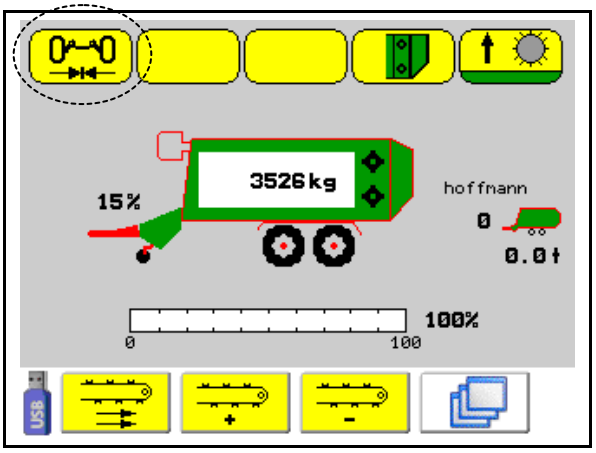
The locking of the steering axle in the individual operating modes and for reverse travel (optional) is set and automated via the machine set-up menu.

1. Press the  key once.

→ The steering axle is locked in "Straight" position. The "Steering axle locked" symbol appears and a beep is emitted.

→ If the symbol is flashing, the steering axle could not be completely locked. Check the steering system.

The screen shows:

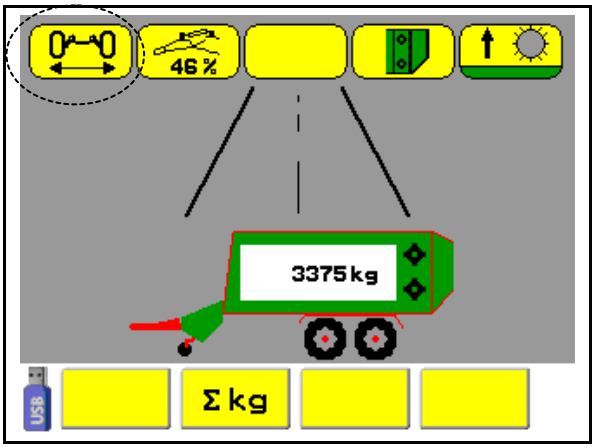


Unlock steering axle

1. Press the  key once.

→ The steering axle can move freely (is unlocked) and follows the turning radius of the corner during cornering. The "Steering axle unlocked" symbol appears and a beep is emitted.

The screen shows:



Lock steering axle in SES system

WARNING

Risk to people due to insufficient stability and tipping over of the machine if the steering axle is not properly used!

Align the wheels of the steering axle in a straight line by means of a short forward travel of the tractor and the hitched machine before locking the steering axle.

With the electro-hydraulic forced steering axle system, the  key has a touch-control design.

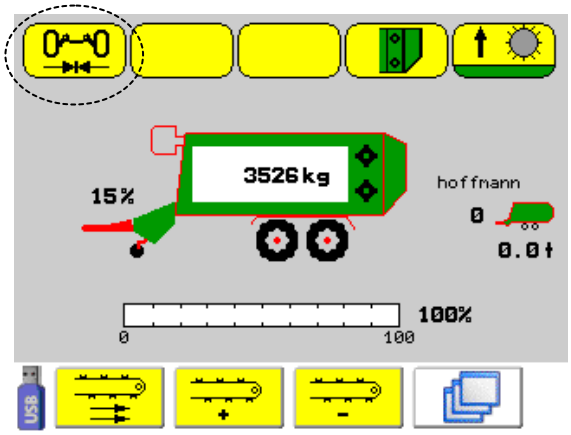
The steering axle is locked by activating the discharge mode if this function has been activated in the machine set-up menu. The  symbol appears in the display. If the symbol is flashing and a beep is emitted, there is a malfunction in the steering system. Check the steering system.

1. Press the  key as long as the steering axle shall be locked.

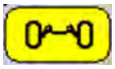
→ The steering axle is locked in "Straight" position. The "Steering axle locked" symbol appears and a beep is emitted.

→ If the symbol is flashing, the steering axle could not be completely locked. Check the steering system.

The screen shows:



Unlock steering axle in SES system

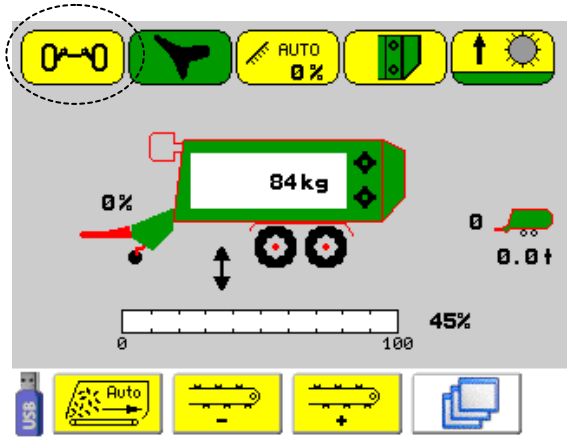
The steering axle is unlocked and force-steered by activating the road travel mode if this function has been activated in the machine set-up menu. The  symbol appears in the display. If the symbol is flashing and a beep is emitted, there is a malfunction in the steering system. Check the steering system.

1. Press the  key.

→ The steering axle is force-steered and follows the turning radius of the corner during cornering. The "Steering axle force-steered" symbol appears.

→ If the symbol is flashing and a beep is emitted, there is a malfunction in the steering system. The follow-up steering is activated. Check the steering system.

The screen shows:



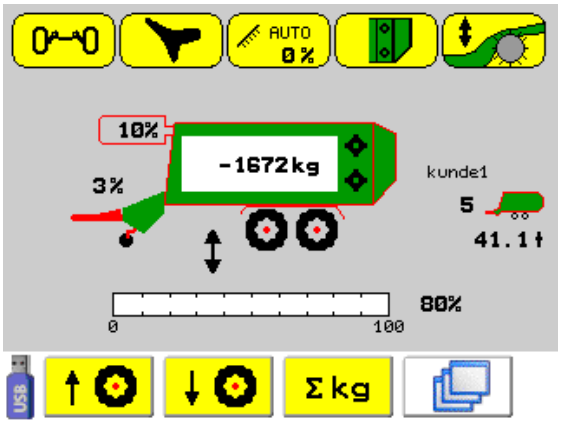
Lift and lower lift axle (tridem chassis)

The lift axle is only available on tridem chassis. Do not lift the lift axle when the vehicle is charged.

1. Press the  soft key in the charge or discharge menu.

→ The assignment of the soft keys changes.

The screen shows:

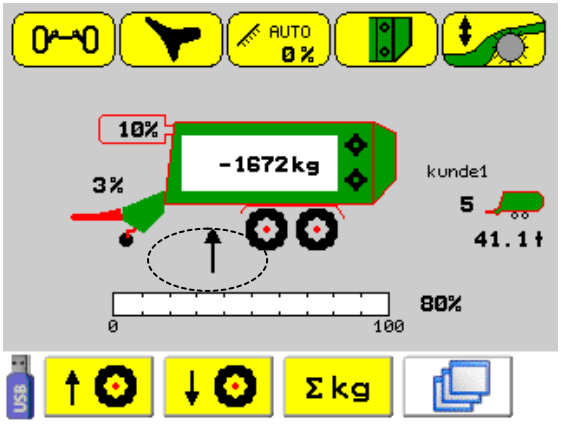


2. Press the  soft key.

→ The lift axle is lifted.

.

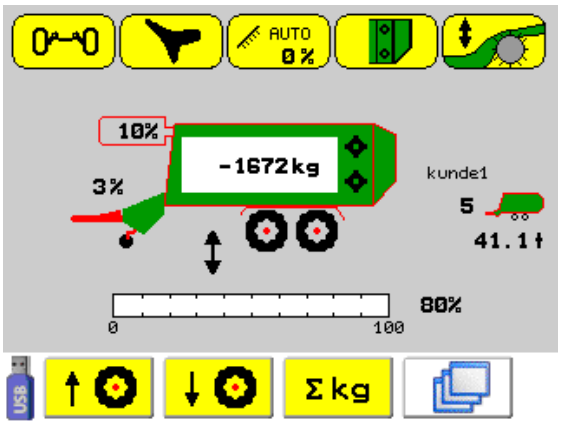
The screen shows:



3. Press the  soft key.

→ The lift axle is lowered and the suspension is activated.

The screen shows:

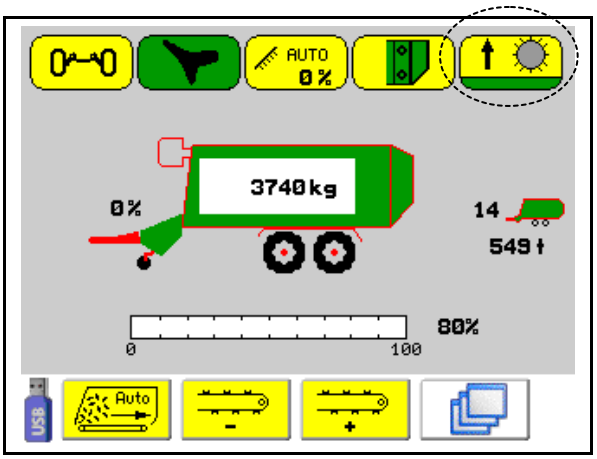


Lift pick-up

1. Press the  key until the pick-up has been lifted to its end position.

→ The pick-up raises.

The screen shows:



Lower pick-up

WARNING

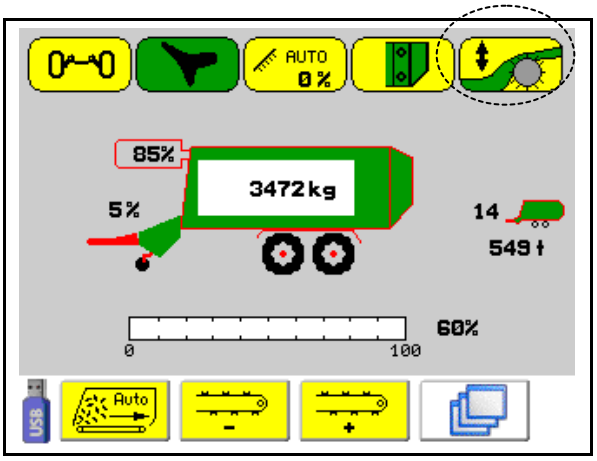
Risk of material damage when travelling on uneven ground with the pick-up lowered/locked!

Only move the machine on uneven ground with the pick-up held in open-centre position.

1. Press the  key once.

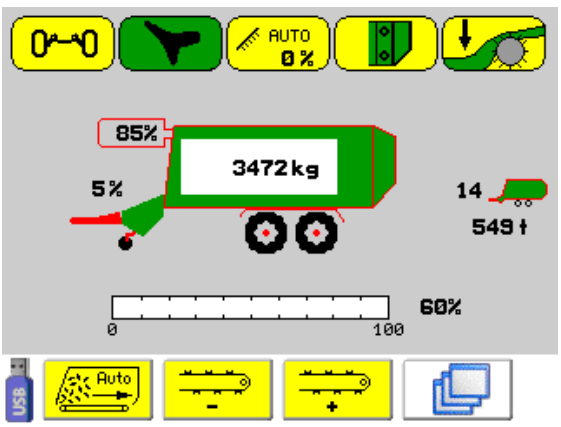
→ The pick-up lowers and is held in open-centre position. The "Lower pick-up/Open-centre position" symbol appears.

The screen shows:



2. Press the  key again.

→ The open-centre position is switched off and the pick-up is fixed. The "Lower pick-up/Locked position" symbol appears.



Change intensity of background lighting

1. Simultaneously press the two middle soft keys in the Charge or Discharge menu.

→ The start menu opens.

2. Press the  soft key.

→ The background lighting becomes brighter.

3. Press the  soft key.

→ The background lighting becomes darker.

4. Simultaneously press the two  soft keys.

→ The last run working menu opens.

The screen shows:

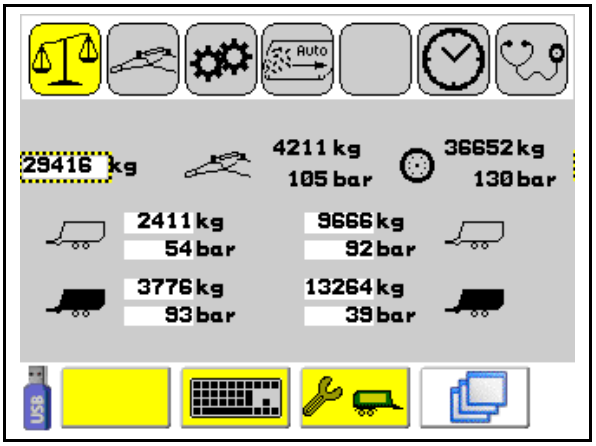
If the intensity of the background lighting is set to less than 50 %, the key lighting is switched on in addition.

6.2.4 Call-up and editing of set-up menu:

1. Press the  key

→ The set-up menu opens.

The screen shows:



Use the  key to switch from any working menu to the set-up menu. Use the  key to return to the previously run working menu.

(1) Setting of weighing system

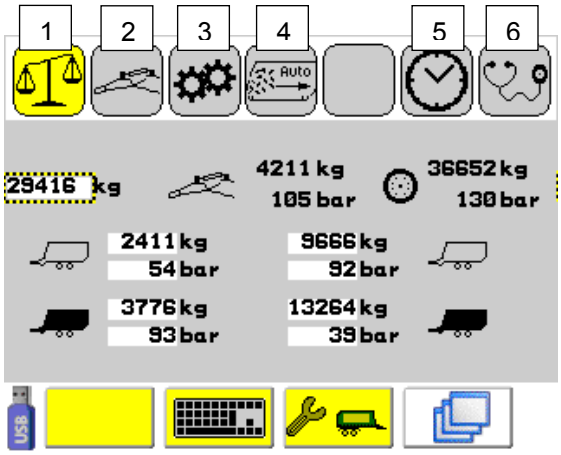
(2) Setting of automatic folding drawbar system

(3) Machine set-up menu

(4) Settings of automatic charging system

(5) Hours and transported loads counter

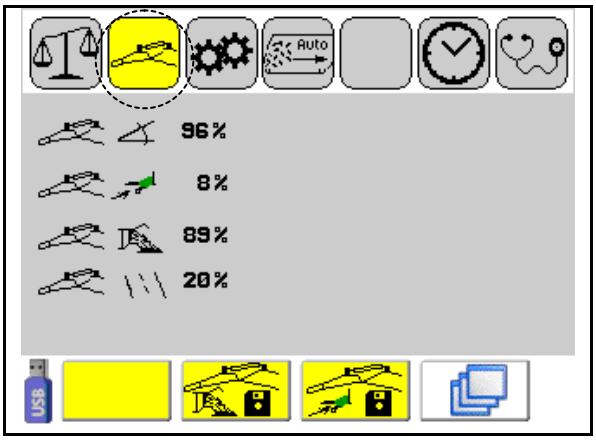
(6) Check menu



2. Press the  key again.

→ You scroll to the next menu item. The settings of the folding drawbar sensor are displayed.

The screen shows:

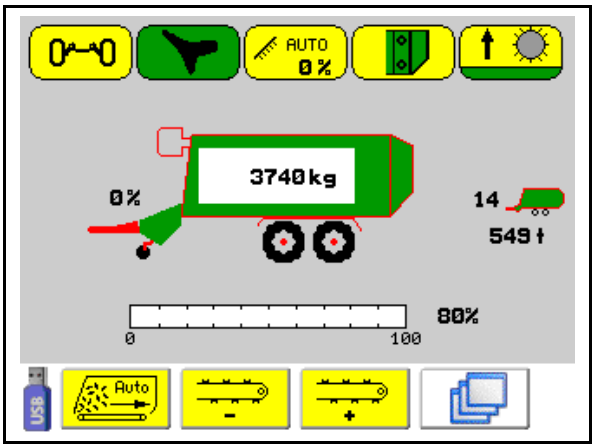


3. Press the  key again to continue to scroll through the set-up menu.

4. Press the  key.

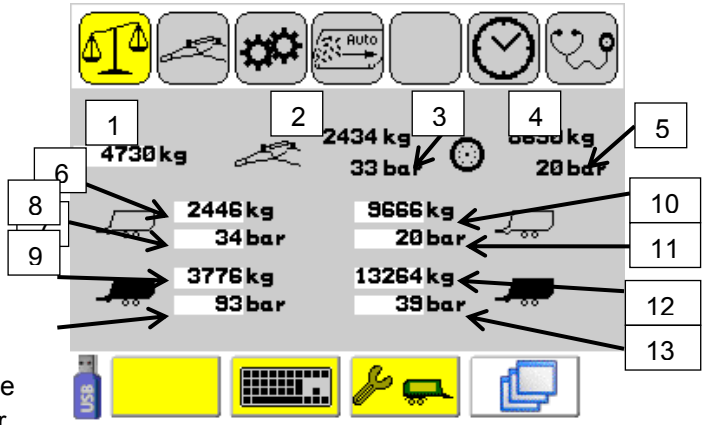
→ You return to the previously run working menu, here "Charge".

The screen shows:



Display information of weighing system

The weighing system is pre-calibrated (the values are based on test runs). Carry out the calibration procedure described from p. 29 for exact weight calculation.



(1) Empty weight of vehicle, here 4,730 kg

(2) Current tongue load, here 2,434 kg

(3) Current pressure from tongue load, here 33 bar

(4) Current weight at chassis, here 8,690 kg

(5) Current pressure at chassis, here 20 bar

(6) Calibration value, tongue load, empty forage wagon, here 2,446 kg

(7) Calibration value, pressure from tongue load, empty forage wagon, here 34 bar

(8) Calibration value, tongue load, full forage wagon, here 3,776 kg

(9) Calibration value, pressure from tongue load, full forage wagon, here 93 bar

(10) Calibration value, weight at chassis, empty forage wagon, here 9,666 kg

(11) Calibration value, pressure at chassis, empty forage wagon, here 20 bar

(12) Calibration value, weight at chassis, full forage wagon, here 13,264 kg

(13) Calibration value, pressure at chassis, full forage wagon, here 39 bar

Display information of folding drawbar sensor

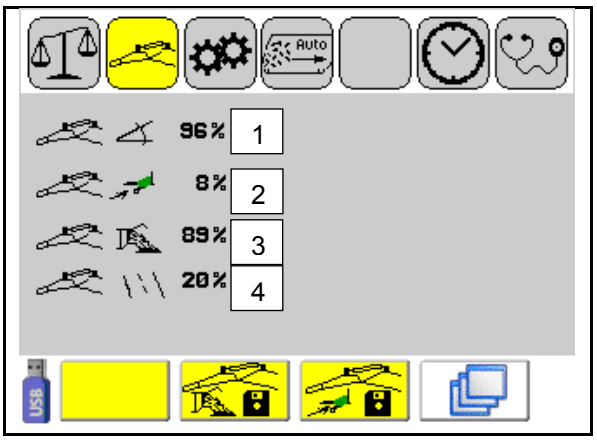
In the folding drawbar menu, the automatic functions for the folding drawbar can be set. Folding drawbar positions can be saved for the three operating modes. In the respective operating modes, the positions are automatically approached if the respective automatic functions have been activated in the machine set-up menu.

(1) Current drawbar position in %, here 96 %

(2) Charging height of folding drawbar, here 8 %; **is automatically approached in charge mode (depending on the setting).**

(3) Discharge height of folding drawbar, here 89 %; **is automatically approached in discharge mode (depending on the setting).**

(4) Road travel height of folding drawbar, here 20 %; **is automatically approached in road travel mode (depending on the setting).**



Display information of machine set-up menu

In the machine set-up menu, automatic functions and features can be activated/deactivated.

(1) Opening time of tailgate after reaching the first opening width (only forage wagon with dosing unit)

(2) Reversing time of transport floor with full wagon (only forage wagon with dosing unit)

(3) Automatic charging system activated/deactivated, here activated

(4) Crossover conveyor mounted / not mounted, here not mounted

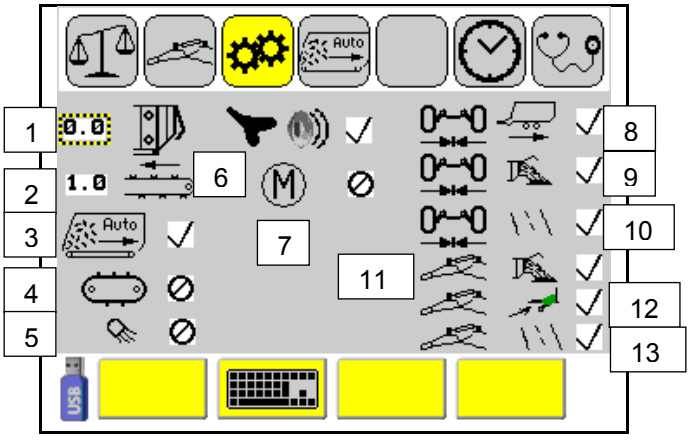
(5) Automatic work light system, always off

(6) Beep upon response of knife protection system activated/deactivated, here activated

(7) Connection of silage additive pump in charge mode activated/deactivated, here activated

(8) Automatic locking of steering axle during

The screen shows



reverse travel activated/deactivated, here activated

(9) Automatic locking of steering axle in discharge mode activated/deactivated, here activated

(10) Automatic locking of steering axle in road travel mode activated/deactivated, here activated

(11) Automatic setting of folding drawbar position in discharge mode activated/deactivated, here activated

(12) Automatic setting of folding drawbar position in charge mode activated/deactivated, here activated

(13) Automatic setting of folding drawbar position in road travel mode activated/deactivated, here activated

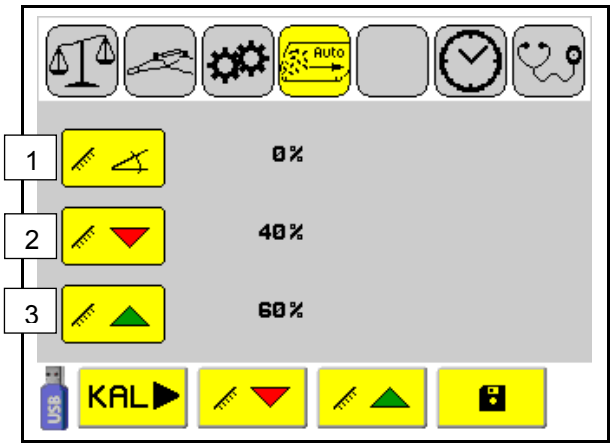
Display information of automatic charging system

In the automatic charging system menu, the start of the charging procedure and the transport floor speed according to the automatic charging system sensor can be set.

(1) Current sensor value of automatic charging system, here 0 %

(2) Lower value for starting the automatic charging system, here 40 %

(3) Upper value for reaching the maximum transport floor speed in automatic mode, here 60 %



Display information of transported loads counter

In the transported loads counter, operating and service hours, transported loads and load weights are saved.

(1) Total counter, **non-erasable**

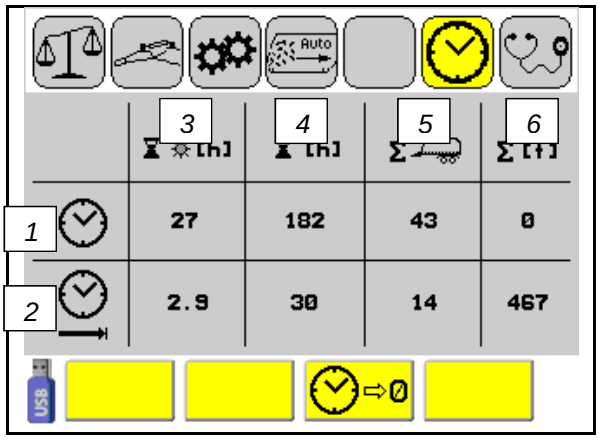
(2) Daily counter, **erasable**

(3) Operating hours, **pick-up in working position**, here a total of 27 h; daily working hours 2.9 h

(4) Total service hours, **counts when the control unit is energised,** here a total of 182 h; daily service hours 30 h

(5) Transported loads counter, here a total of 43, daily transported loads 14

(6) Load weight counter, here a total of 0 t, daily load 467 t



- The daily operating hours counter, the daily transported loads counter and the daily load weight counter can be reset at any time.
- The daily operating hours counter, the daily transported loads counter and the daily load weight counter are not automatically reset every day. These counters must be reset manually.
- The total service hours counter, the total operating hours counter, the total transported loads counter and the total load weight counter cannot be reset.

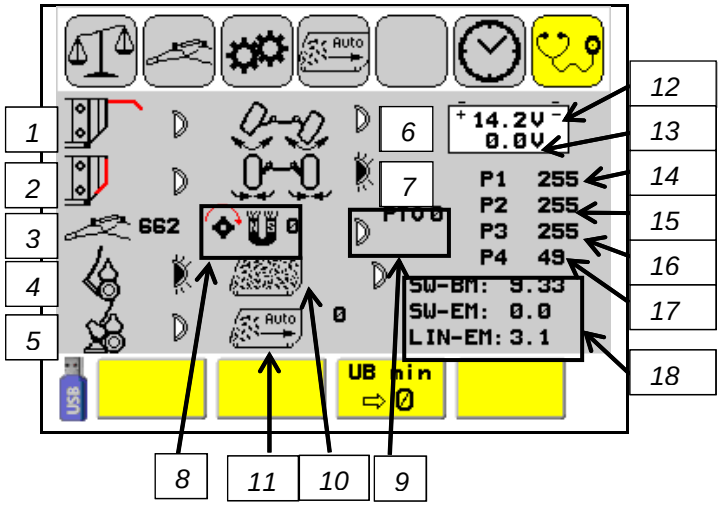
Press the soft key for 5 seconds to delete the daily counter.

The operating hours counter and the transported loads counter are designed each as daily and total counters. The service hours counter is designed as total counter.

- Daily operating hours counter (operating hours until reset (h)). The operating hours of the machine during which the pick-up is in lowered position are registered.
- Daily transported loads counter (transported loads until reset). The number of transported loads is registered by counting the number of opening cycles of the tailgate.
- Daily load counter (total load until reset). The load weight of the machine is registered by adding up the load weights of the individual transported loads.
- Total operating hours counter. The total operating hours counter registers the overall period of use of the machine during which the pick-up is in lowered position.
- Total service hours counter. The total service hours counter registers the overall period of use the machine by registering the time during which the ISOBUS control set is in switched-on mode.
- Total number of transported loads counter. The total number of transported loads counter registers the number of transported loads during the overall period of use of the machine.
- Total load counter. The total load counter adds up the load weights of the individual transported loads during the overall period of use of the machine

Display information of check menu

The check menu displays information about the status of the mounted sensors. White = deactivated; black = activated



(1) Tailgate Open sensor, here deactivated

(2) Tailgate Closed sensor, here deactivated

(3) Sensor value of folding drawbar, here 662

(4) Cutting Unit Retracted sensor, here activated

(5) Cutting Knives Retracted sensor, here deactivated

(6) Steering Axle Open, Reverse Travel, Error, SES sensor, here deactivated

(7) Steering Axle Locked sensor, here activated

(8) Dosing drum speed, here 0 rpm

(9) Propeller shaft speed, here 0 rpm

(10) Cargo Space Full sensor, here deactivated

(11) Sensor value of automatic charging system, here 0

(12) Current voltage value, here 14.2 V

(13) Lowest voltage value since restart, here 0.0 V

(14) Value, pressure sensor 1, chassis, here 255

(15) Value, pressure sensor 2, chassis, here 255

(16) Value, pressure sensor 3, chassis, here 255

(17) Value of pressure sensor 4, drawbar, here 49

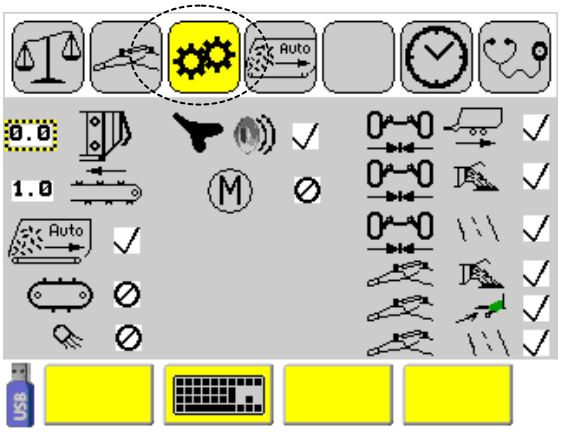
(18) Software version

6.2.5 Machine settings in machine set-up menu

1. Press the  key several times to access the machine set-up menu.

→ The set-up menu opens.

The screen shows:



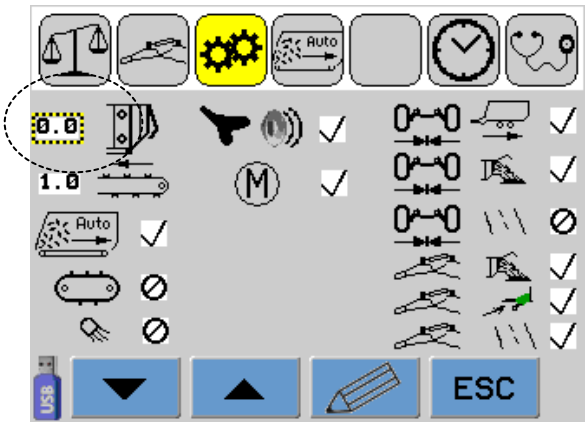
2. Press the  soft key.

→ The assignment of the soft keys changes.

3. Use the  soft keys to select the individual functions.

→ The active function has a yellow border.

The screen shows



4. Press the  soft key to edit a function.

→ The active function appears with a red border.

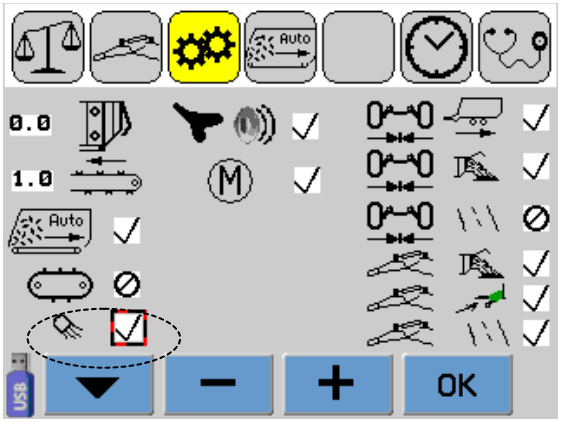
5. Press the  soft keys to activate, deactivate or change a function.

6. Press the  soft key to confirm the entry.

4. Press the  key.

→ The last run working menu is displayed.

The screen shows:



6.2.6 Calibration

Depending on the equipment, the number and arrangement of the soft keys may vary.

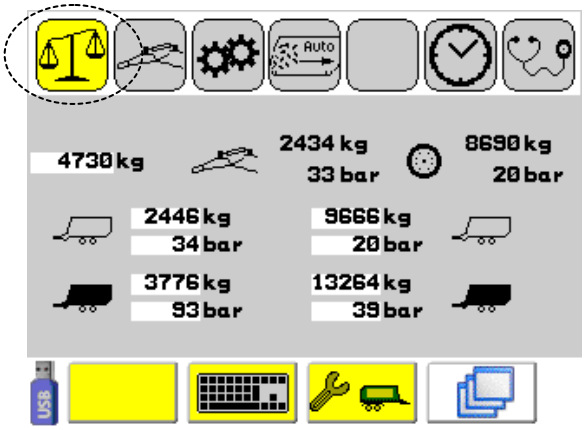
Calibration of weighing device

The weighing device is pre-calibrated. Carry out the calibration procedure for exact weight calculation. It is recommended to repeat the calibration before each season and whenever necessary.

1. Press the  key several times to access the set-up menu of the weighing device.

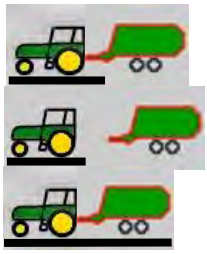
→ The set-up menu for the weighing device opens.

The screen shows:



Determine the following weighed values for the calibration *Forage Wagon Empty*:

1. *Tractor with tongue load, empty*
2. *Tractor*
3. Total weight, empty



Calculate the tongue load and the axle load of the empty forage wagon from the determined values:

Tongue load when empty = Tractor with tongue load, empty (1) – Tractor (2)

Axle load when empty = Total weight, empty (3) – Tractor with tongue load, empty (1)

After weighing, stop the empty combination of tractor and machine on an even surface (without applying the brakes). Enter the values weighed in empty condition and accept the hydraulic pressure values via the  soft key.

2. Press the  soft key

→ The assignment of the soft keys changes.

→ Use the  soft keys to select the individual input fields.

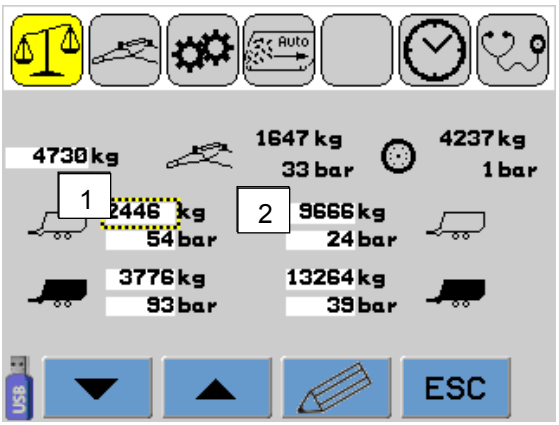
3. Use the  soft key to enter the tongue load when empty in field 1 and the axle load when empty in field 2.

4. Confirm the entries by means of 

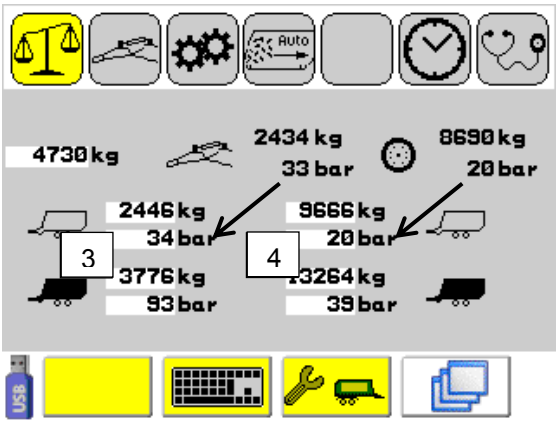
5 Press the  soft key.

→ The hydraulic pressures at the drawbar and the chassis are automatically entered in fields 3 and 4.

The screen shows:

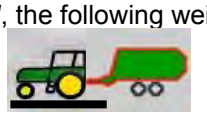


The screen shows



The second calibration step comprises the charging of the forage wagon. Ensure that the material is loaded into the front part of the wagon approximately up to the middle of the axles.

For the calibration *Forage Wagon Charged*, the following weighed values must be determined:

4.Tractor with tongue load, charged 

5.Total weight, charged 

Calculate the tongue load and the axle load of the charged forage wagon from the determined values:

Tongue load when charged = tractor with tongue load when charged (4) – tractor (2)

Axle load when charged = total weight(5) - tractor with tongue load when charged (4)

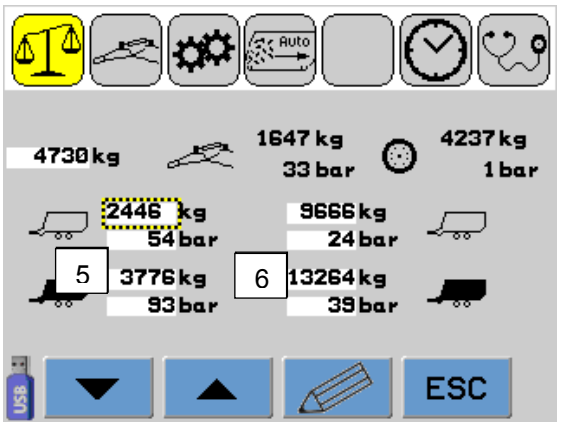
After weighing, stop the charged combination of tractor and machine on an even surface (without applying the brakes). Enter the values weighed in charged condition and accept the hydraulic pressure values via the  soft key.

6. Use the  soft key to enter the tongue load when charged in field 5 and the axle load when charged in field 6.
7. Confirm the entries by means of 
8. Press the  soft key.

→ The assignment of the soft keys changes.

.

The screen shows:



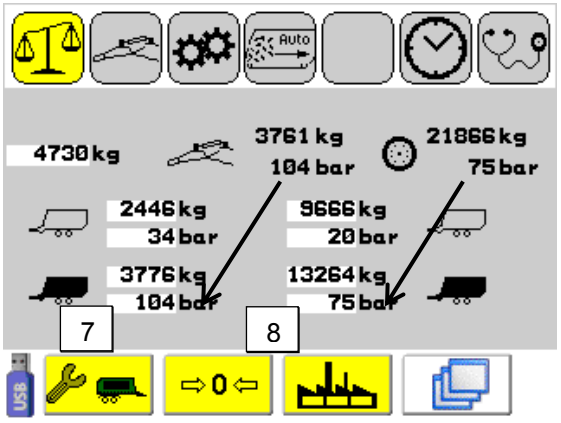
9. Press the  soft key.

→ The hydraulic pressures at the drawbar and the chassis are automatically entered in fields 7 and 8.

10. Press the  key.

→ The last run working menu is displayed.

The screen shows



Reset the weighing device to factory settings

1. Press the  key several times to access the set-up menu of the weighing device.

→ The set-up menu for the weighing device opens.

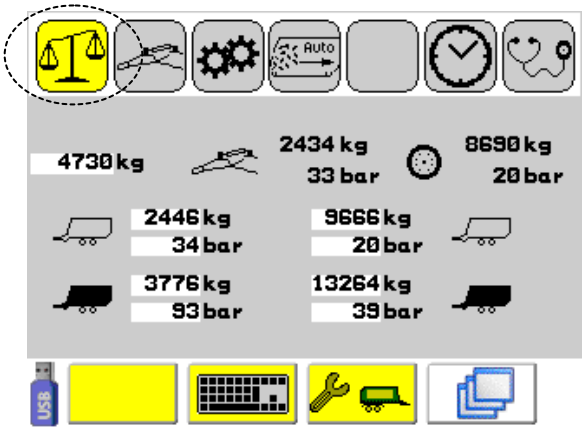
2. Press the  soft key.

→ The assignment of the soft keys changes.

3. Press the  soft key.

→ A further confirmation is required.

The screen shows:



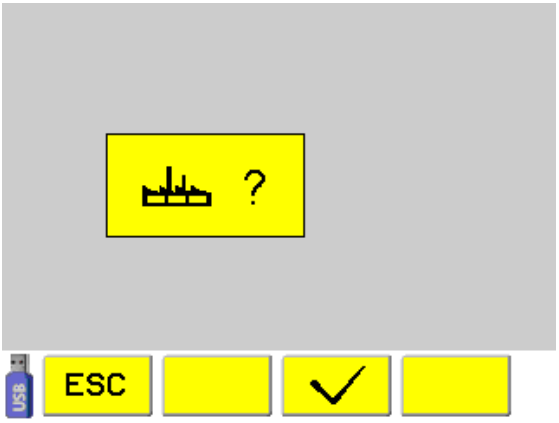
4. Press the  soft key.

→ The settings for the weighing device are reset to the factory settings.

4. Press the  key.

→ The last run working menu is displayed.

The screen shows:



The weighing device is pre-calibrated. A calibration is indispensable for exact weight calculation. It is recommended to repeat the calibration before each season or whenever necessary.

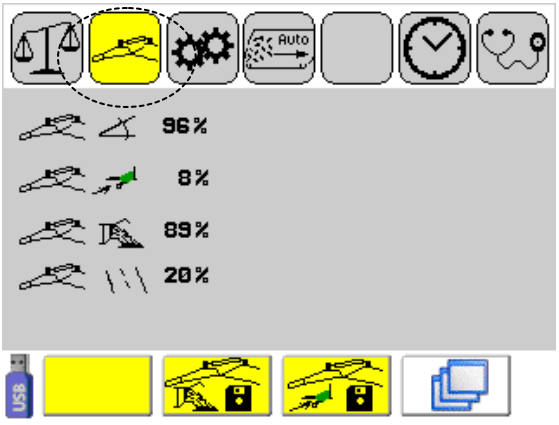
Calibration of folding drawbar sensor

When calibrating the folding drawbar sensor, the sensor values set by the manufacturer for the bottom and top folding drawbar position are changed.

1. Press the  key several times to access the set-up menu of the folding drawbar.

→ The set-up menu for the folding drawbar opens.

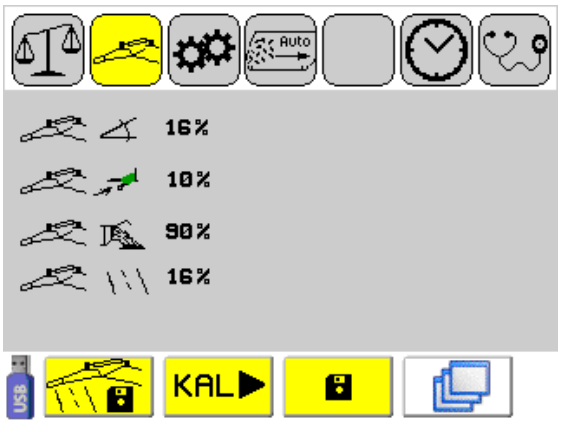
The screen shows:



2. Press the  soft key.

→ The assignment of the soft keys changes.

The screen shows

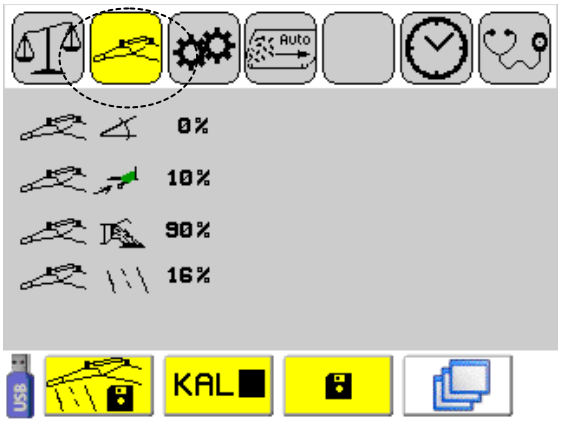


3. Use the  key to move the folding drawbar to the lower end position.

4. Press the  soft key.

→ The assignment of the soft key changes to 

The screen shows:



5. Use the  key to move the folding drawbar to the top end position.

6. Press the  soft key.

→ The sensor for the folding drawbar is recalibrated.

7. Test the sensor calibration: Use the  key to move the folding drawbar to the upper end position.

→ The **Nominal Reading** is 100 %

8. Use the  key to slightly lower the drawbar.

→ The **Nominal Reading** is 90 % - 99 %.

9. Use the  key to move the drawbar to the lower end position.

→ The **Nominal Reading** is 0 %

10. Use the  key to slightly lift the drawbar.

→ The **Nominal Reading** is 1 % - 10 %.

11. Press the 

key.

→ The last run working menu is displayed.

If the **actual values** do not match the **nominal values**, repeat the calibration.

Setting of automatic folding drawbar system

If the folding drawbar is equipped with a drawbar suspension, the hydraulic cylinders of the folding drawbar must be extended by approx. 20 mm.

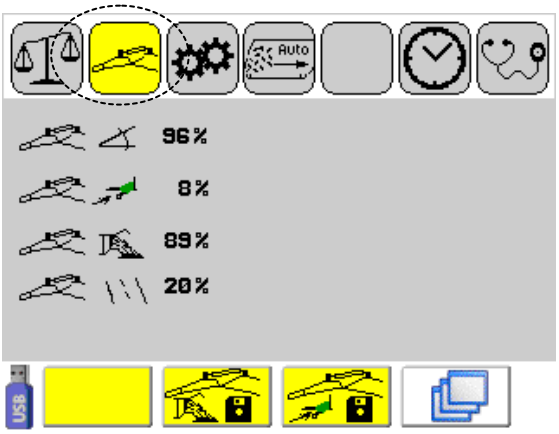
The drawbar suspension will not work if the folding drawbar is lowered to its end position.

For proper functioning of the scale (optional extra) it is imperative that the folding drawbar cylinders are **not completely** retracted. They should be extended by at least 5 mm.

1. Press the  several times to access the set-up menu of the folding drawbar.

→ The set-up menu for the folding drawbar opens.

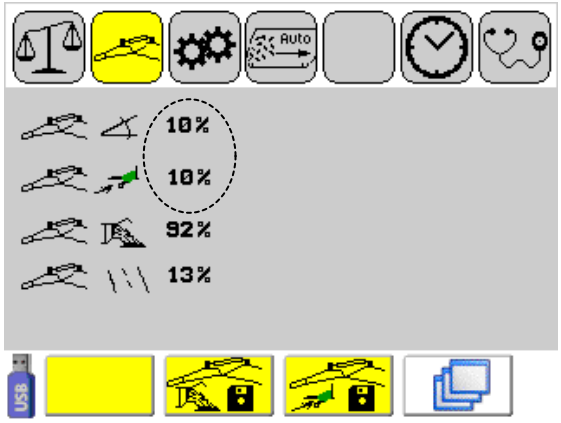
The screen shows:



2. Use the  and  keys to move the folding drawbar to the desired charging position. Press the  soft key.

→ The current folding drawbar position for charge mode is saved.

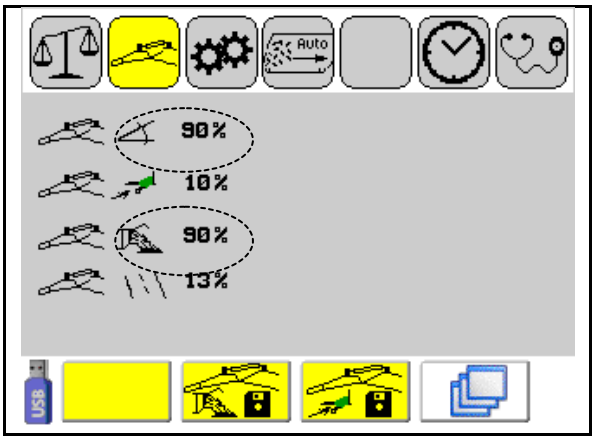
The screen shows



3. Use the  and  keys to move the folding drawbar to the desired discharge position. Press the  soft key.

→ The current folding drawbar position for discharge mode is saved.

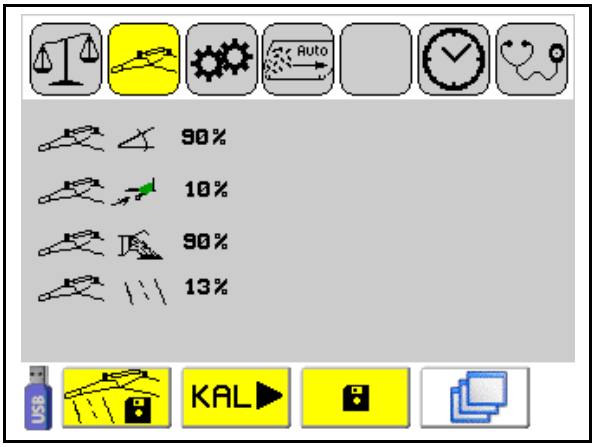
The screen shows:



4. Press the  soft key.

→ The assignment of the soft keys changes.

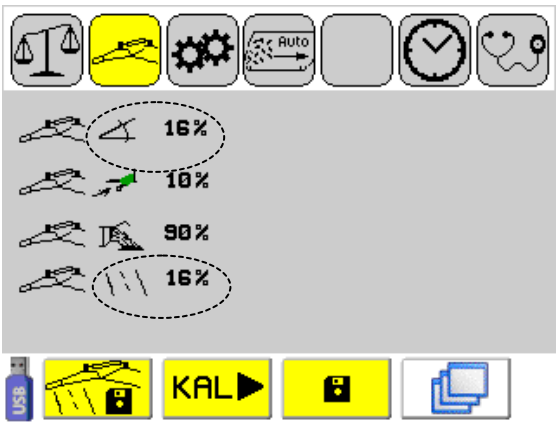
The screen shows



5. Use the  and  keys to move the folding drawbar to the desired road travel position. Press the  soft key.

→ The current folding drawbar position for road travel mode is saved.

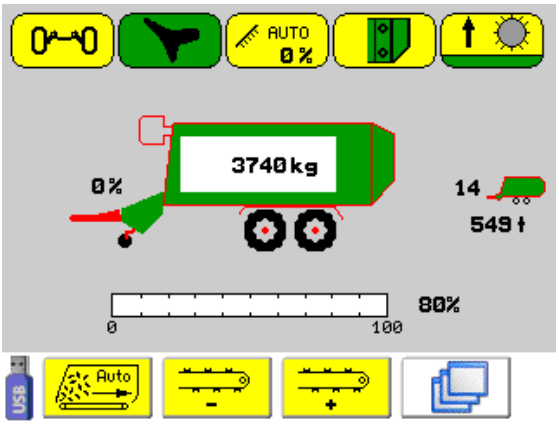
The screen shows:



6. Press the  key.

→ Exit the set-up menu. The last run working menu is displayed, here working menu.

The screen shows:



The saved positions are automatically set when activating the respective operating mode **if the respective automatic function has been activated in the machine set-up menu.**

Calibration of automatic charging system sensor

When calibrating the automatic charging system sensor, the sensor values set by the manufacturer for the bottom and top sensing band position are changed.

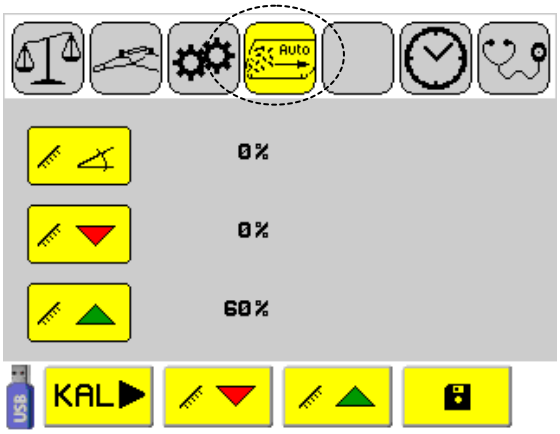
1. Hitch the machine to the tractor.
2. Turn the tractor engine off.
3. Apply the parking brake of the tractor.
4. Switch the tractor ignition on.

5. Press the  key several times.

→ The set-up menu for the automatic charging system appears.

6. Press the  soft key

→ The assignment of the soft key changes to 



7. Move the sensing band from the bottom to the top position and back again.

8. Press the  soft key.

→ The values are saved.

9. Check the calibration. In the top position, the nominal value is 100 %. In the bottom position, the nominal value is 0 %. Ensure proper steps between the end positions.

10. Press the  key once.

→ The last run working menu appears.

If the **actual values** do not match the **nominal values**, repeat the calibration.

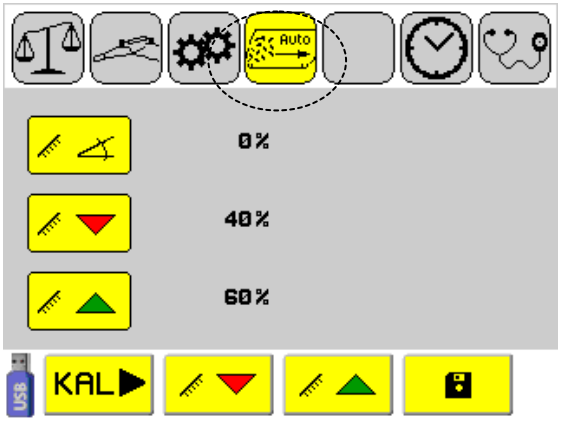
Setting of automatic charging system

Two people are required for the setting of the automatic charging system. One person moves the sensing band in the cargo space, while the other person operates the control set on the tractor.

1. Hitch the machine to the tractor.
2. Turn the tractor engine off.
3. Apply the parking brake of the tractor.
4. A second person enters the cargo space through the access door.
5. Switch the tractor ignition on.

6. Press the  key several times.

→ The set-up menu for the automatic charging system appears.



7. The person in the cargo space swivels the sensing band to the bottom position which shall be the automatic start position for the transport floor.

8. Press the  soft key to save the lower %-value for starting the transport floor.

9. The person in the cargo space swivels the sensing band to the top position which shall be the start position for the transport floor running at maximum feed rate.

10. Press the  soft key to save the upper %-value for reaching the maximum transport floor speed.

11. Press the  key once.

→ The last run working menu appears.

6.2.7 Creation and management of jobs

Creation of jobs

	Depending on the equipment, the number and arrangement of the soft keys may vary.

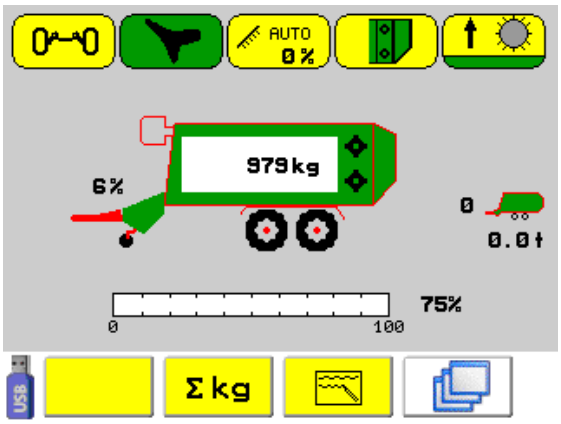
	The job management can be called up and edited from the charge and discharge menu.

	A total of five jobs with respective customers and fields can be created.

1. Press the  soft key in the charge or discharge menu.

→ The assignment of the soft keys changes.

The screen shows:



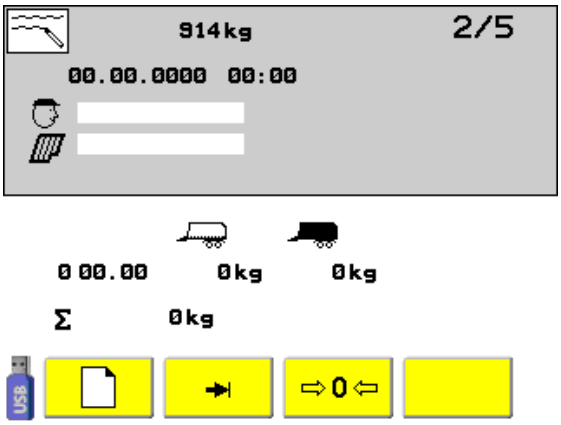
2. Press the  soft key.

→ The job menu opens.

→ Use the  soft key to switch from one job to another.

→ Use the  soft key to enter the current weight as empty weight, thus taring the scale.

The screen shows



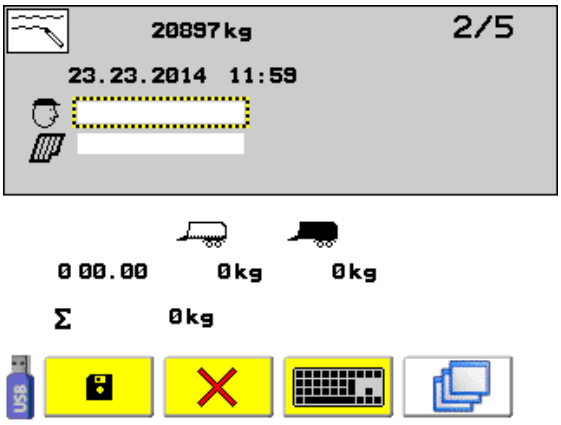
3. Press the  soft key.

→ The job is activated and the assignment of the soft keys changes.

4. Press the  soft key.

→ The assignment of the soft keys changes.

The screen shows:

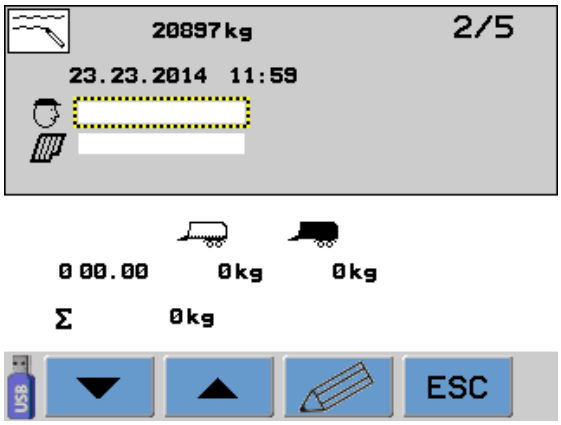


4. Press the  soft key.

→ The assignment of the soft keys changes.

5. Use the  and  soft keys to switch between the input fields for customer and field. The active field has a yellow border.

The screen shows



6. Press the  soft key.

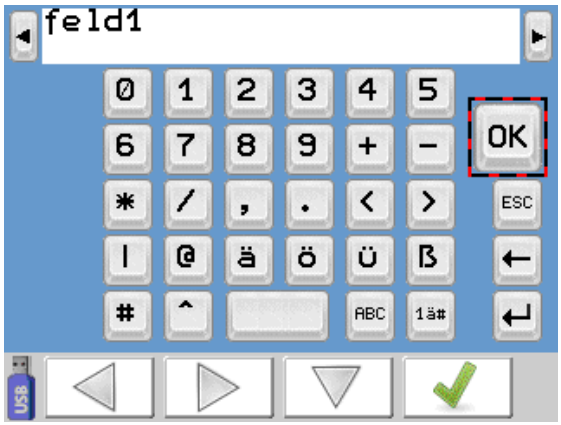
→ The marked input field opens.

7. Use the  soft keys to navigate via the keyboard and to confirm a letter or number via  .

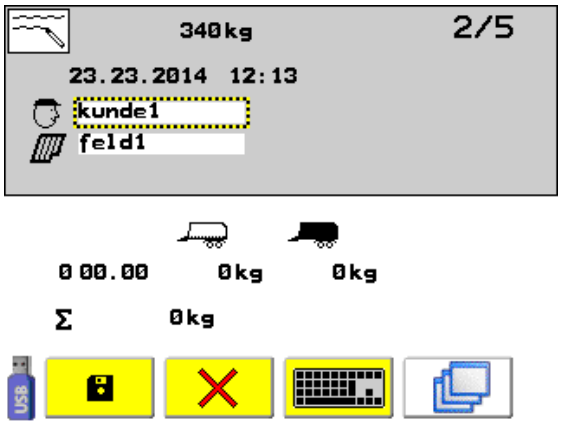
Use  to save and finish the entry.

→ The job menu reopens.

The screen shows:



The screen shows

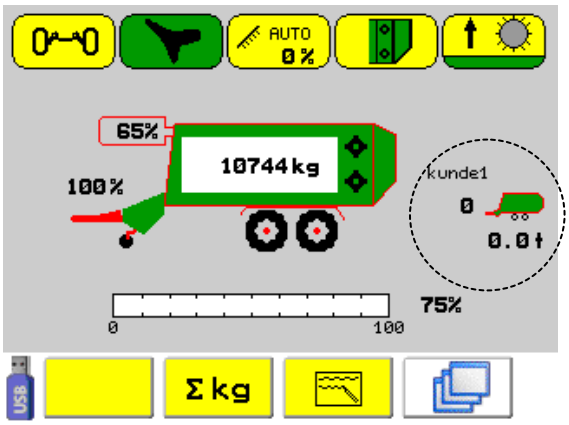


8. Press the ESC key once.

→ The last run working menu appears.

→ The active job is displayed in the working menu.

The screen shows:



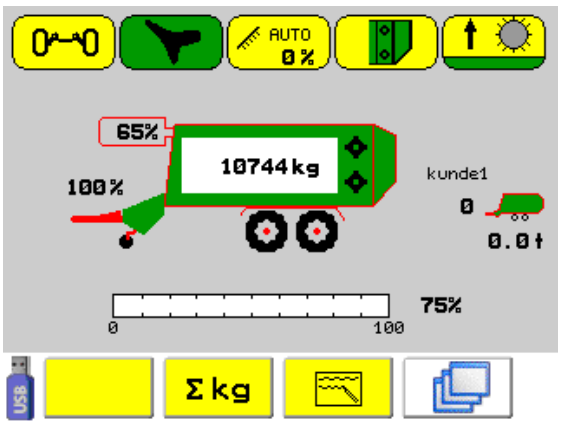
Save load weights in a job

- Carry out an empty weighing before starting the charging procedure and a full weighing before starting discharge by means of the Σ kg soft key to determine the load weights of a transported load.
- Stop the combination of tractor and machine on an even surface (without applying the brakes), in order to obtain consistent weighing results. Stabilise the hydraulic system before weighing by waiting for approx. 15 s (before the weighing procedure).
- During the measurements, the folding drawbar should always be in the same position as during the calibration.
- It is recommended to carry out the measurements in road travel mode.
- The Σ kg soft key is available in all modes.

1. Press the soft key in the working menu.

→ The assignment of the soft keys changes.

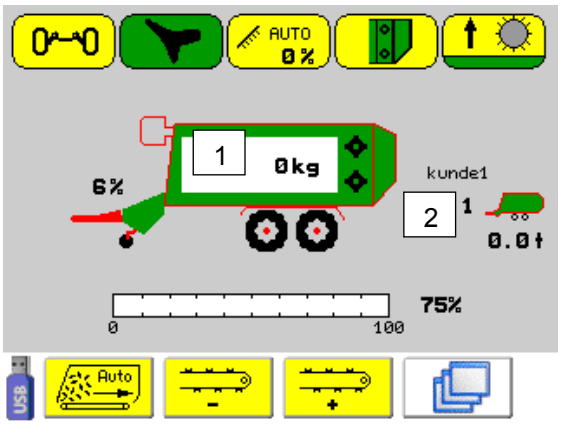
The screen shows:



2. Before starting the charging procedure, press the Σ kg soft key

→ The current load weight (1) is saved. The screen shows the first transported load (2).

The screen shows

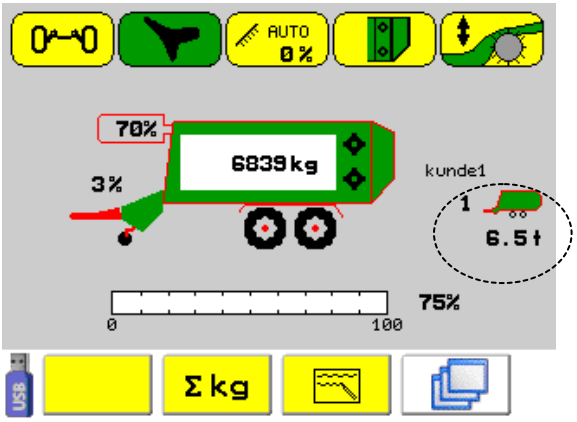


3. Before discharging the wagon, press the Σ kg soft key again.

→ The actual load is calculated from the load weights of the empty and the full wagon and displayed.

→ The Σ kg soft key is available in all modes. Use the soft key to switch from one function to another in charge and discharge mode. In road travel mode, the Σ kg soft key is directly available.

The screen shows:

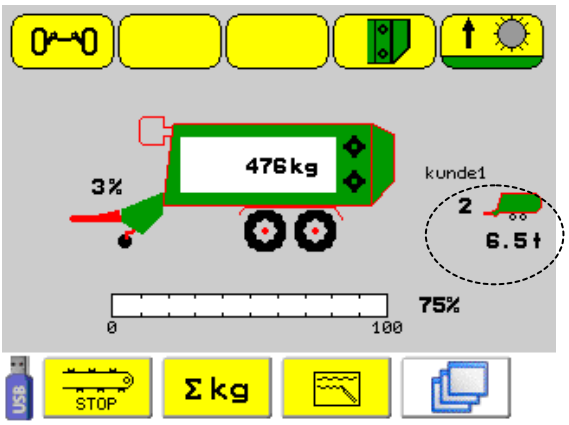


4. After completion of discharge, press the Σ kg soft key again.

→ The second transported load is displayed and the current empty load is saved.

5. Repeat the steps before each charging and discharging procedure.

The screen shows



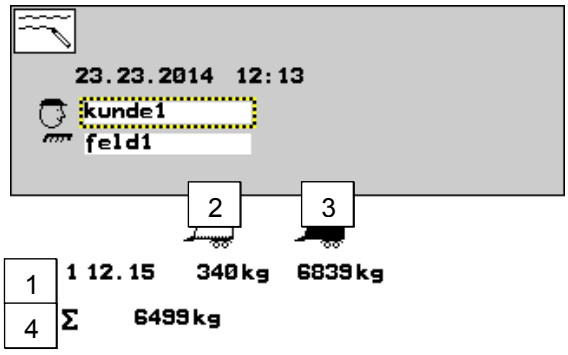
6. Press the  soft key to access the job menu.

→ The current transported load (1), the load weight with empty wagon (2), the load weight with full wagon (3) of the current transported load and the sum of all load weights (4) from all transported loads are displayed.

7. Press the  key.

→ You return to the last run working menu.

The screen shows:



Save a job on a USB stick

- The connecting cable 87011752 is required to connect a USB stick to the FO-130.
- Register the USB stick on the FO-130 before saving.
- After pressing the  or  soft key, the job is blocked and **cannot** be further processed.

1. Connect the FO-130 with the connecting cable 87011752 and a USB stick.

2. Simultaneously press the two middle soft keys in the charge or discharge menu.

→ The start menu opens.

The screen shows:

3. Press the  soft key.

→ Wait until the  display on the screen has a **green** background and the  symbol appears. Only then has the USB stick been registered properly. Press the  soft key once again if necessary.

4 Simultaneously press the two  soft keys.

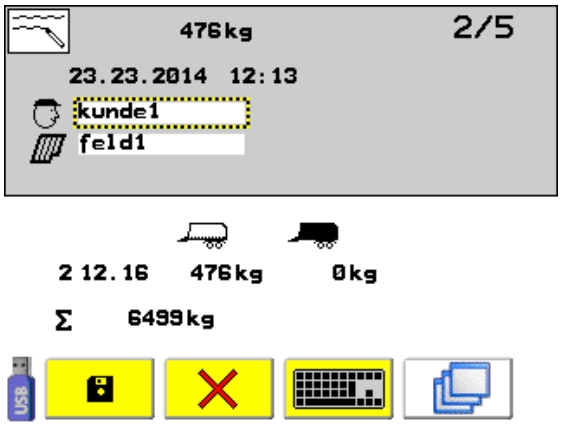
→ The start menu is closed and the last run working menu opens.

5. Open the job menu and use the  soft key to select the job to be saved.

6. Press the  soft key.

→ The assignment of the soft keys changes.

The screen shows:



7. Press the  soft key.

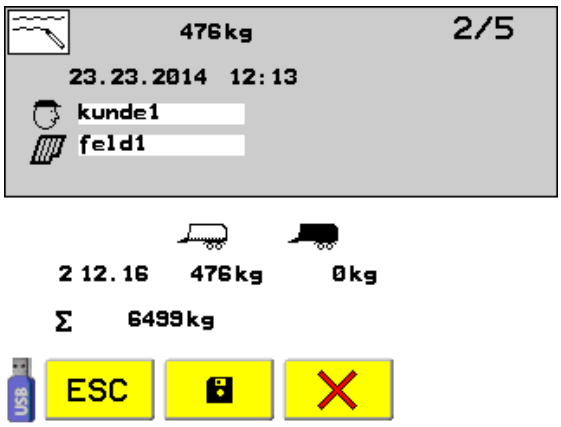
→ The job is saved and **cancelled**.

→ When pressing the  soft key without a USB stick being connected, the job is blocked. Further processing is not possible.

8. Press the  key.

→ You return to the last run working menu.

The screen shows



Log off the USB stick before disconnecting from the device.

Log off a USB stick

1. Simultaneously press the two middle soft keys in the charge or discharge menu.

→ The start menu opens.

2. Press the  soft key.

→ Wait until the  display has a **red** background and the  symbol goes out. Only then has the USB stick been logged off properly.

4 Simultaneously press the two  soft keys.

→ The start menu is closed and the last run working menu opens.

4 Remove the USB stick.

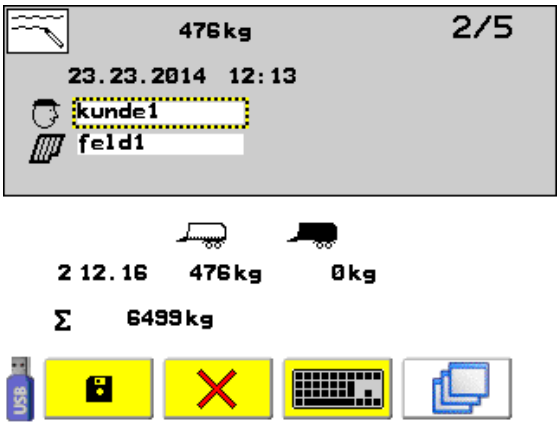
The screen shows:

Delete a job

1. Open the job menu and use the  soft key to select the job to be deleted.
2. Press the  soft key.

→ The assignment of the soft keys changes.

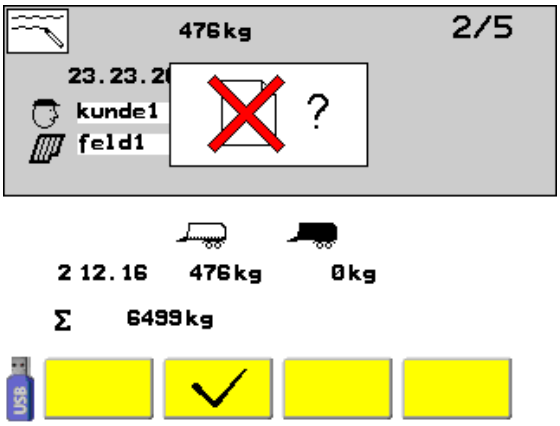
The screen shows:



3. Press the  soft key.

→ You are asked again whether you want to delete the job.

The screen shows



4. Press the  soft key to confirm the deletion procedure.

→ The job is deleted.

5. Press the 

key.

→ You return to the last run working menu.

6.3 SES system

Optional extra

6.3.1 Design

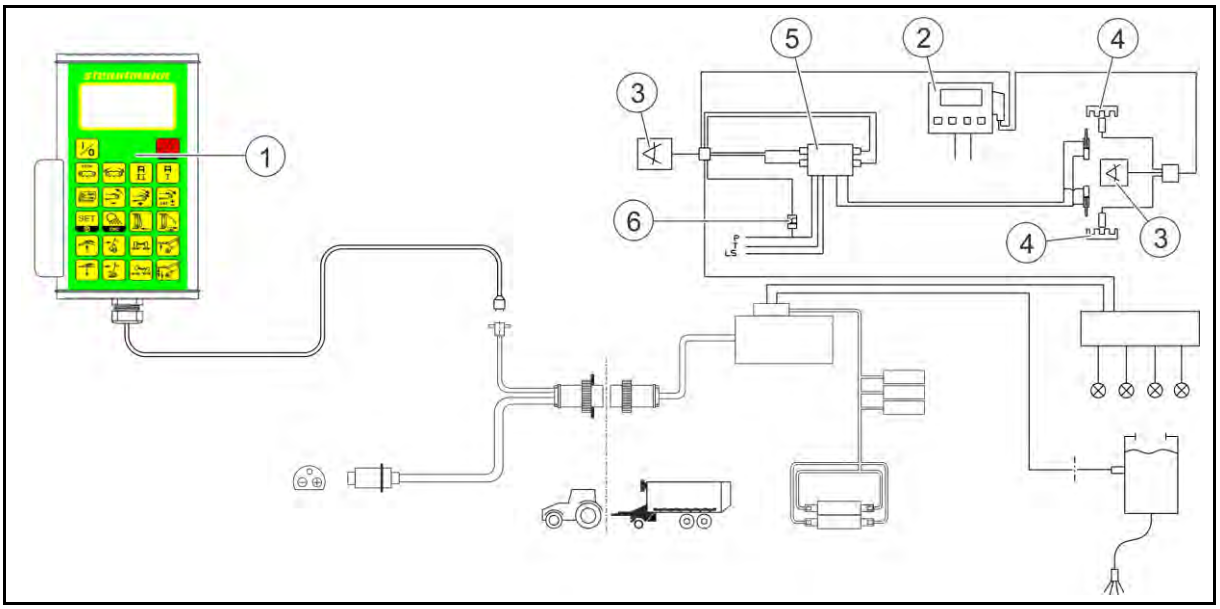


Fig. 73

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

- the control set (1),
- 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).

Via 2 angle sensors and 2 speed sensors, the SES system electronically registers the required steering angle which is adjusted to the speed, and transforms the required steering angle into an electrical signal. The steering computer transmits the information to an electrically actuated hydraulic valve and thus controls the steering cylinders of the steerable axles. The pressure switch registers the pressure in the hydraulic system. If the hydraulic pressure is below 25 bar, the SES system is not ready for operation. The pressure switch reacts as soon as the hydraulic pressure falls below 25 bar and activates the follow-up steering system.

The SES system:

- controls depending on the speed,
- informs about malfunctions of the steering system via acoustic and visual warning messages on the control set,
- is equipped with a safety circuit such that in case of malfunctions the steering system works as a pure follow-up steering system,
- allows error diagnosis.

6.3.2 Steering computer displays

The steering computer (1) is equipped with an additional module (2). As soon as the steering computer is connected to the power supply, the display of the additional module shows a status message.

Open the cover (3) to read the status message.

1. Turn the Camlock lock.
2. Slightly lift the cover and then fold it down.

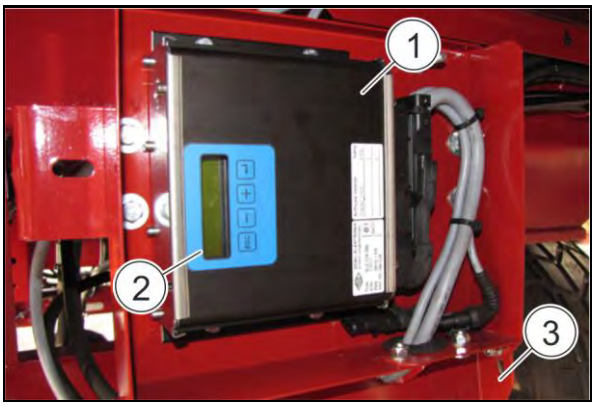


Fig. 74

(1) Display: Depending on the status, the following appears:
- o a status indication or
- o an error message.

(2) ESC; exit menu/ one input position back

(3) MINUS; reduce value/ one selection item back

(4) PLUS; increase value/ one selection item forward

(5) ENTER; confirm value/ store value/ activate selected menu/ one input position forward

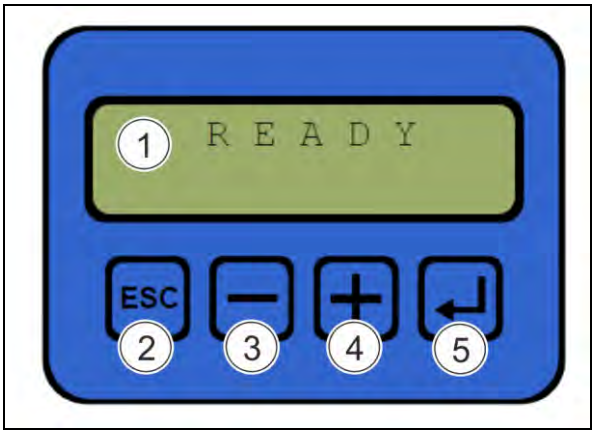


Fig. 75

The following read-outs are available:

Read-out	Explanation
READY	The hydraulic system is ready for operation
Standby	The hydraulic system is not ready for operation, the hydraulic supply is not available
COUPLING	The steering rods are not coupled or the specified steering range has been exceeded
alarm code xxx-xxx-xx	Error message; an active error has been detected

If several active errors are detected, the respective error messages will be displayed one after the other.

6.3.3 Error diagnosis

In the case of an error message, have the vehicle/machine ID no. (17-digit) ready and contact our customer service under

Phone: +49 (0) 5424 802-0.

Individual or all error messages can exclusively be cleared by the Strautmann customer service.

The additional module is equipped with an error diagnosis function. The following read-outs are available:

Read-out	Explanation
alarm index/code	Message regarding the assignment of errors of the electronic system
time first entry	Time of first occurrence of error
time last entry	Time of last occurrence of error
frequency	Frequency of occurrence of error
trouble code	Message regarding the assignment of errors referring to the axles

1. Press the  key for approx. 2 seconds.

→ The **Error diagnosis** menu appears.

2. Press the  or  key until the **Alarm memory** menu item is displayed.
3. Press the  key once.

→ The first stored error message is displayed.

4. Press the  or  key as often as to ensure that the desired error message is displayed.
5. Press the  key once.

→ The details referring to the selected error message are successively displayed.

6. Press the 

key once.

→ The **Error diagnosis** menu is exited.

7 Commissioning

Before initial commissioning, a tractor/machine harmonisation is required (shop work)!

The manufacturer will not assume any warranty or liability for damage due to non-performed tractor/machine harmonisation.

This chapter will provide information:

- on how to proceed when commissioning your machine,
- on how to check whether the machine is licensed for being attached/hitched to your tractor.

- Before commissioning, the operator must:
  - have read and understood these operating instructions.
  - lubricate all lubrication points.
- When commissioning the machine, additionally observe the information included in the chapters:
  - "Operator's obligation", page 30,
  - "Qualification of staff", page 31,
  - "Basic safety instructions", page 33,
  - "Warning and instruction signs", page 42,
  - "Service and maintenance of machine", page 205.

  Observance of these chapters serves your safety.
- Before each startup, the operator must check the tractor and the machine for their road and operational safety.
- Only use appropriate tractors to hitch and transport the machine.
- Check the following adjustments when changing the tractor:
  - Length of propeller shaft. Observe the information in the chapter "Adjust length of propeller shaft to tractor", page 182,
  - Setting of pressure regulator. Observe the information in the chapter "Load-sensing hydraulic system", page 66.

  Readjust if necessary.
- Tractor and machine must comply with the national road traffic regulations.

  Owner (user) and driver (operator) of the vehicle are responsible for observing the national road traffic regulations.

WARNING

Risk of crushing, shearing, cuts, becoming entangled and being drawn in to people if operating elements used to actuate movable components carrying out dangerous movements are blocked!

Do not block any operating elements which serve to initiate movable components to carry out dangerous movements, e. g. folding, swivelling or sliding operations of components.

The movement must automatically stop as soon as the operating element is released.

This shall not apply to movements of devices:

- in continuous action for constant loads,
- with automatic control,
- which, for functional reasons, require an open-centre or pressing position.

7.1 Check tractor's compatibility

WARNING

Risk due to incorrect use of the tractor if this causes failure of components, insufficient stability and insufficient steerability and braking ability of the tractor!

- Check your tractor for compatibility before attaching/hitching the machine to the tractor.

  Only attach/hitch the machine to appropriate tractors.

- Carry out a brake test to check whether the tractor reaches the required deceleration with the machine attached / hitched up.

The following features are crucial prerequisites for the compatibility of the tractor:

- the gross vehicle weight rating of the tractor,
- the admissible axle loads of the tractor,
- the admissible tongue load/towing capacity at the coupling device of the tractor,

  These details are registered on the type plate, in the vehicle registration certificate and in the operating instructions of the tractor.

- the load-bearing capacities of the tyres mounted on the tractor.

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.

7.1.1 Calculate actual values

The gross vehicle weight rating of the tractor, which is specified in the operating instructions/in the tractor's vehicle registration certificate, must exceed the sum of:

- the tractor's empty weight,
- the ballasting mass,
- the tongue load of the hitched machine.

7.1.2 Preconditions for the operation of tractors with rigid drawbar trailers

WARNING

Risk due to failure of components caused by incorrect use of the tractor!

Ensure:

- that the coupling device at the tractor has a sufficient admissible tongue load rating for the actually existing tongue load.
- that the coupling device at the tractor and the drawgear at the rigid drawbar trailer are able to take up the towed load of the rigid drawbar trailer (towed load = axle load). Calculate the tractor’s admissible towing capacity if necessary.
- that the tractor's axle loads and weights influenced by the tongue load are within the admissible limits. Check the weight in case of doubt.
- that the static, actual rear-axle load of the tractor will not exceed the admissible rear-axle load rating.
- that the gross vehicle weight rating of the tractor will not be exceeded.
- that the admissible load-bearing capacities of the tyres mounted on the tractor are not exceeded.

7.1.2.1 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.

The maximum admissible tongue load for your tractor is directly indicated on the type plate of the coupling device/in the operating instructions/in the vehicle registration certificate of your tractor.

Maximum admissible tongue load	Tractor's coupling device	Machine's drawgear
4000 kg ≤ 40 km/h 2000 kg > 40 km/h	Tow-hook (hitch hook) ISO 6489-1	Drawbar lug (hitch ring) ISO 20019
		Drawbar lug (hitch ring) ISO 5692-1
	Draw pin (Piton-Fix) ISO 6489-4	Drawbar lug (hitch ring) ISO 5692-1
4000 kg ≤ 40 km/h 2000 kg > 40 km/h	Ball-type coupling 80	Shell 80

7.1.2.2 Calculate actual D_C value for combination to be coupled

WARNING

Risk to people due to failure of components caused by breaking coupling devices between tractor and machine in case of incorrect use of the tractor!

- Only combine compatible coupling devices and drawgears.
- Calculate the actual D_C value of your combination consisting of tractor and rigid drawbar trailer to check the coupling device of your tractor for the required D_C value. The actual calculated D_C value for the combination must be less than or equal to (≤) the specified D_C value of the coupling device of your tractor and the drawgear of the rigid drawbar trailer. If this is not the case, the admissible towing capacity for your tractor must be calculated. In each case, the lowest D_C value shall be relevant.
- Calculate the admissible towing capacity of your tractor if the calculated D_C value for the combination is higher than the specified D_C value of the coupling device of your tractor or of the drawgear of the rigid drawbar trailer. This calculated towing capacity must not be exceeded when charging your rigid drawbar trailer.

The actual D_C value of a combination to be coupled is calculated as follows:

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

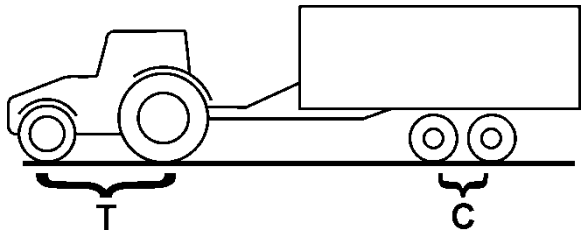


Fig. 76 D_C value of combination

T: Gross vehicle weight rating of your tractor in [t]

(see operating instructions/vehicle registration certificate of tractor)

C: Axle load/sum of axle loads of the machine charged with the admissible mass (loading capacity) in [t] without tongue load

g: Gravitational acceleration (9.81 m/s²)

Actual calculated D_C value for the combination		**Specified D_C values of the tractor's coupling device and the machine's drawgear**
kN	≤	kN

The D_C value:

- for the coupling device is directly indicated on the type plate of the coupling device/in the operating instructions/in the vehicle registration certificate of your tractor.

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

- for the drawgear is directly indicated on the type plate of the drawgear.

Example

Gross vehicle weight rating of the tractor: 14 t

Admissible axle load(s) of the rigid drawbar trailer: 18 t

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

7.1.2.3 Calculate tractor's admissible towing capacity

The lowest D_C value of your tractor's coupling device or of the drawgear of your rigid drawbar trailer determines the admissible towing capacity C of your 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 your tractor determines the admissible load capacity of your rigid drawbar trailer. This calculated towed load/axle load must not be exceeded when charging your rigid drawbar trailer.

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

T: Gross vehicle weight rating of your tractor in [t]

(see operating instructions/vehicle registration certificate of tractor)

D_C: Lowest D_C value of your tractor's coupling device/of your machine's drawgear/of the combination

g: Gravitational acceleration (9.81 m/s²)

Example

Gross vehicle weight rating of the tractor:	14 t
D_C value of tractor's coupling device	70 t
D_C value of machine's drawgear:	77.5 t
D_C value for the combination to be coupled:	77.2 t

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

Due to the D_C value of the tractor's coupling device, the admissible axle load is 14.5 t. This calculated axle load must not be exceeded when charging your rigid drawbar trailer.

7.2 Mount control set on the tractor

7.2.1 Mount control set of ISOBUS control Field-Operator 120

- Do not draw the current from the light socket.
- Retrofit the 3-pole socket if your tractor is not equipped with a 3-pole socket. An appropriate retrofit kit is available.
- A constant power supply of 12 V is required. The 3-pole socket must be protected by a fuse of at least 25 A.
- The feed line of the 3-pole socket must have a minimum cable cross section of 4 mm^2.

1. Fix the control set (1) in the cabin within view and reach to the right of the driver seat.
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. Plug the 3-pole plug (4) (DIN 9680) of the mobile cable harness into the 3-pole socket of the tractor.

   (Pole 15/30 = Plus; Pole 31 = Minus)

   This is not necessary if the tractor is equipped with an ISOBUS cable harness.
4. Depending on the machine's equipment, plug:
   - o the ISO socket (5) of the mobile cable harness into the ISO plug of the control unit on the machine.
   - o the ISO plug of the control unit into the ISO socket of the tractor.

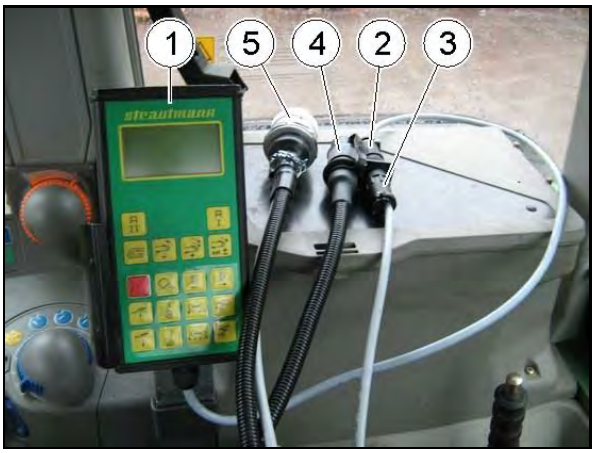


Fig. 77

7.3 Mount attachment sections

DANGER

Risk of electrical shock or burns due to machine components accidentally touching electrical overhead lines or approaching high-voltage overhead lines in an inadmissible manner!

Make sure not to exceed the maximum vehicle height of 4 m.

WARNING

Risk of slipping, stumbling or falling when mounting the attachment sections!

Absolutely use a mobile service platform with ladder for mounting the attachment sections.

Two people are required for mounting the attachment sections.

1. Screw each of the sectional strips A, B and D to one support.
2. Screw sectional strip C:
   - to one support on the Tera-Vitesse CFS 4601 / 4601 DO models,
   - to two supports on the Tera-Vitesse CFS 4201 / 4201 DO and 5201 / 5201 DO models.

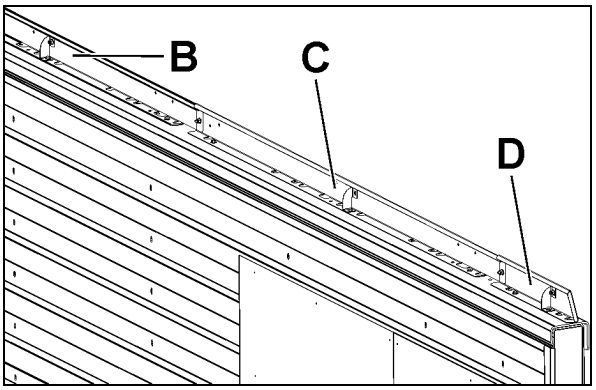


Fig. 78

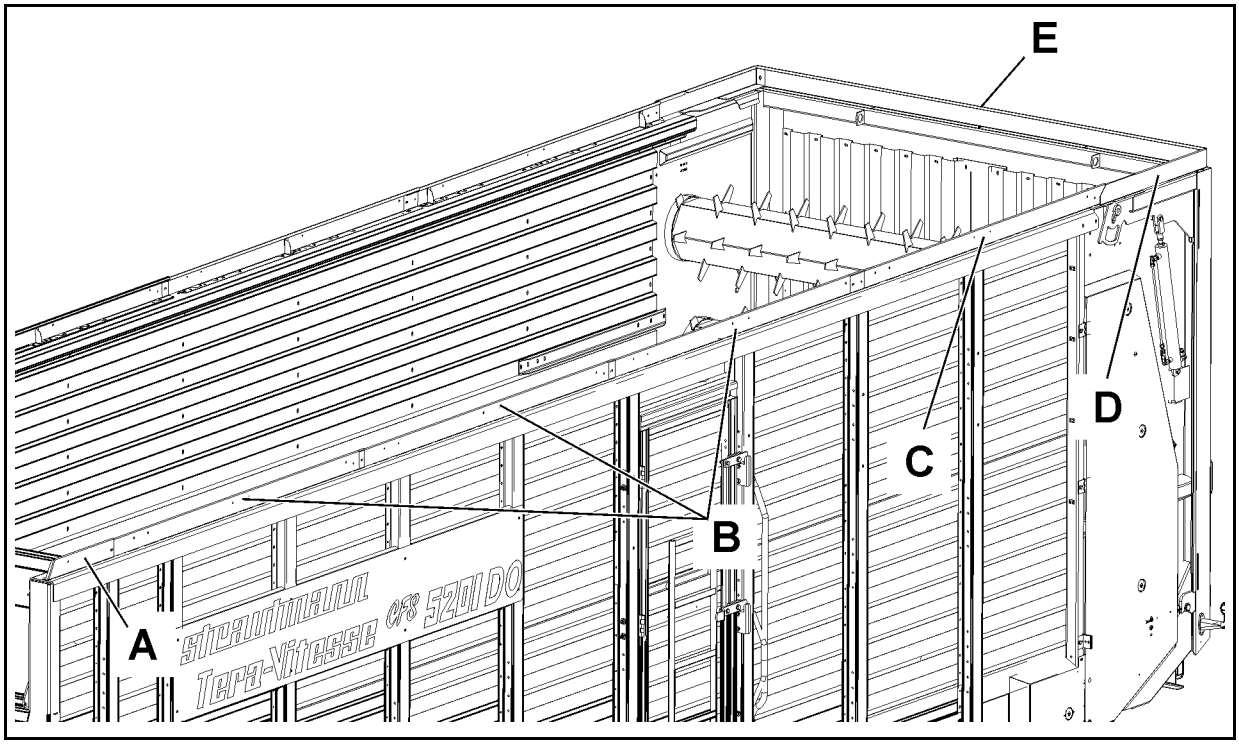


Fig. 79 **(shows Tera-Vitesse CFS 5201 DO)**

	Sectional strips per side (number and length)					
	Tera-Vitesse CFS					
	4201, 4201 DO		4601, 4601 DO		5201, 5201 DO	
	Number (pcs.)	Length (mm)	Number (pcs.)	Length (mm)	Number (pcs.)	Length (mm)
A	1	512	1	512	1	512
B	2	2000	3	2000	3	2000
C	1	2000	1	790	1	2000
D	1	837	1	837	1	837

E = 2493 mm

7.4 Mount covering system

For mounting the covering system:

- two people are required,
- attachment sections must not have been mounted.

7.4.1 Pre-assemble covers

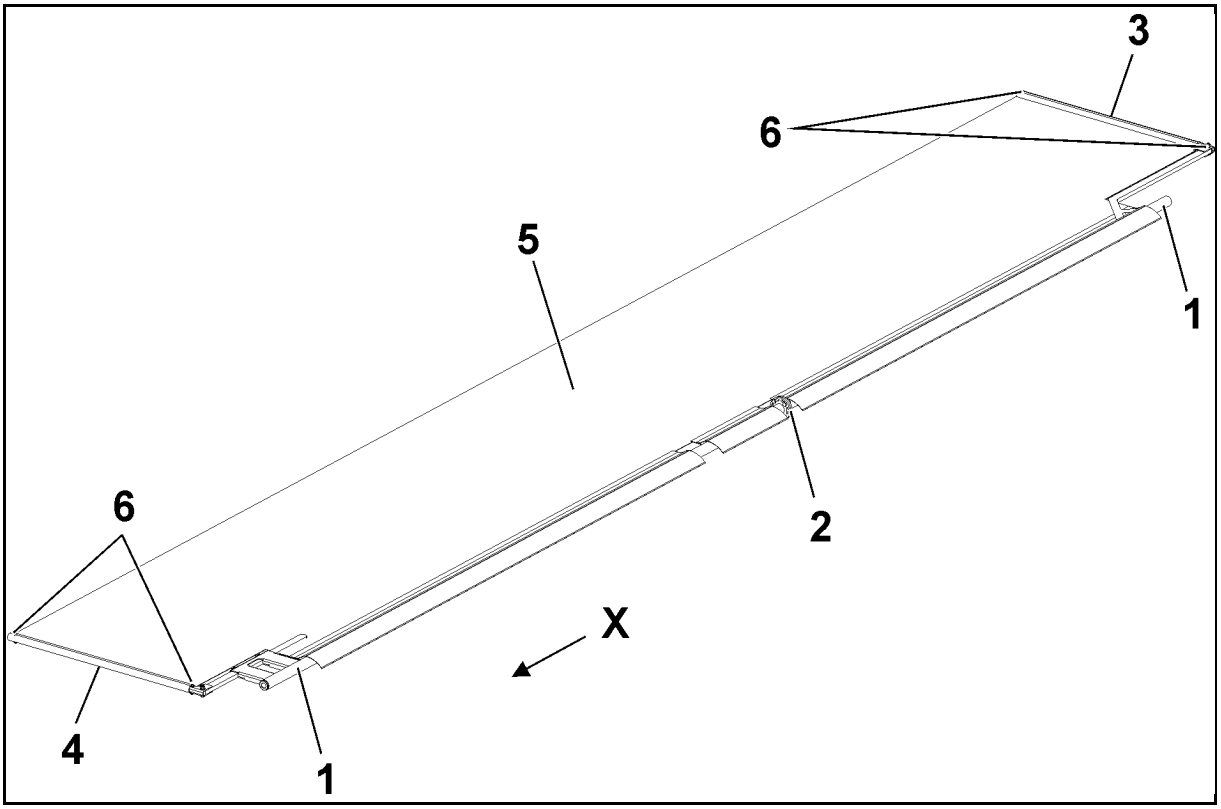


Fig. 80

(X) Direction of motion

(1) Frame tube

(2) Screwed connection of frame tubes

(3) Rear net accommodation, fixed

(4) Front net accommodation, movable

(5) Net

(6) Screws to fix the net

Carry out the following steps one after the other for both covers:

1. Screw the frame tubes (1) of the cover together.

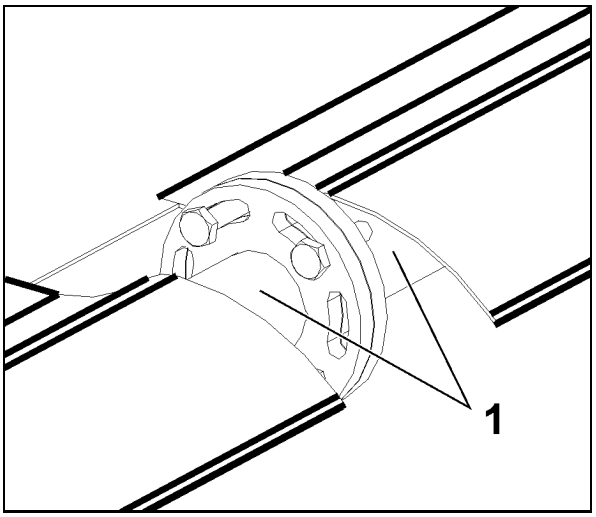


Fig. 81

2. Screw on the net accommodations (4 = front net accommodation) and align them at an angle (90°) to the frame tubes (1).
3. Slip the net (5) onto the net accommodations and fix it by means of the screws (6).
4. Tension the net by moving the front net accommodation (4), such that it does not sag.
5. Put the net (5) around the frame tube (1) and fix it by means of cable ties.

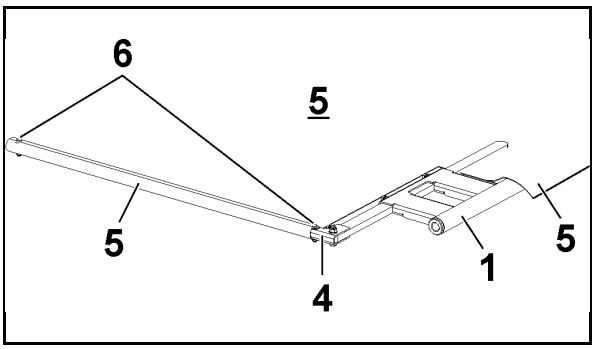


Fig. 82

7.4.2 Mount covers on machine

DANGER 	**Risk of electrical shock or burns due to machine components accidentally touching electrical overhead lines or approaching high-voltage overhead lines in an inadmissible manner!** Make sure not to exceed the maximum vehicle height of 4 m.

WARNING 	**Risk of slipping, stumbling or falling when mounting the covers!** Absolutely use a mobile service platform with ladder for mounting the covers.

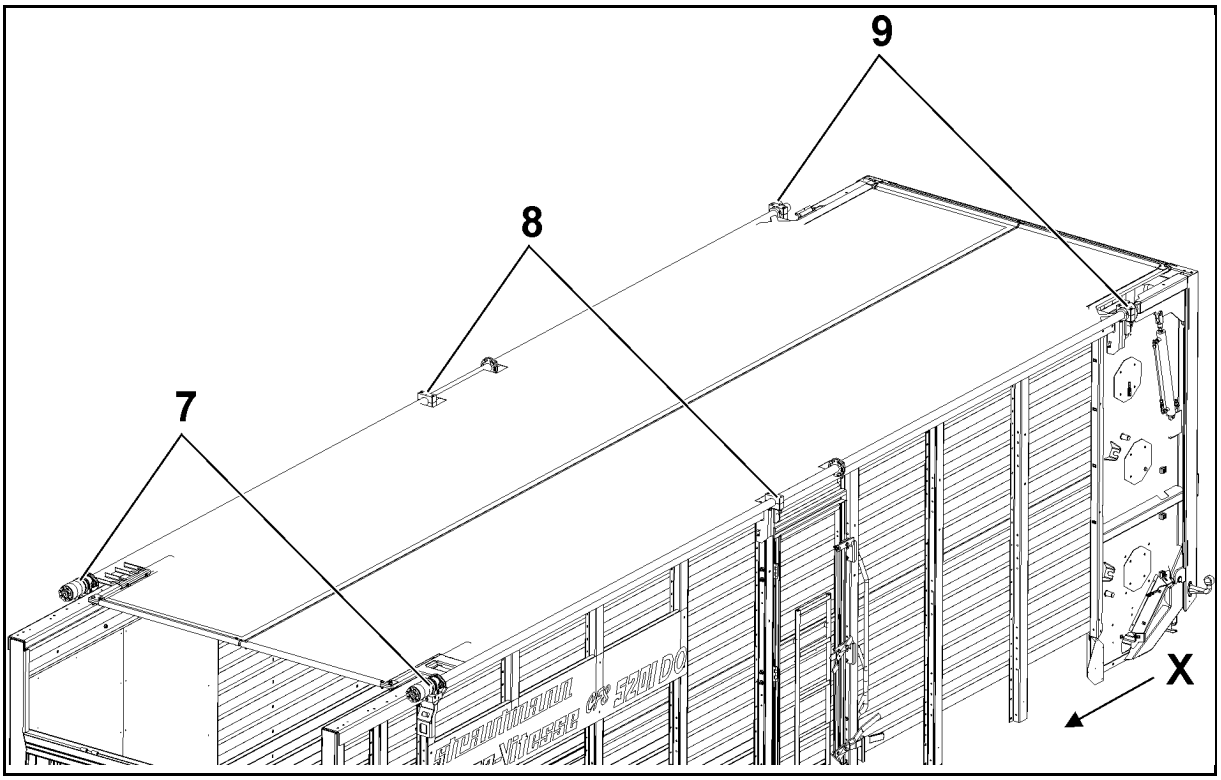


Fig. 83

(X) Direction of motion

(7) Hydraulic motor

(8) Middle tube mounts

(9) Rear tube mounts

Carry out the following steps one after the other for both covers:

1. Mount the tube mount together with the hydraulic motor (7) at the support provided for that purpose.

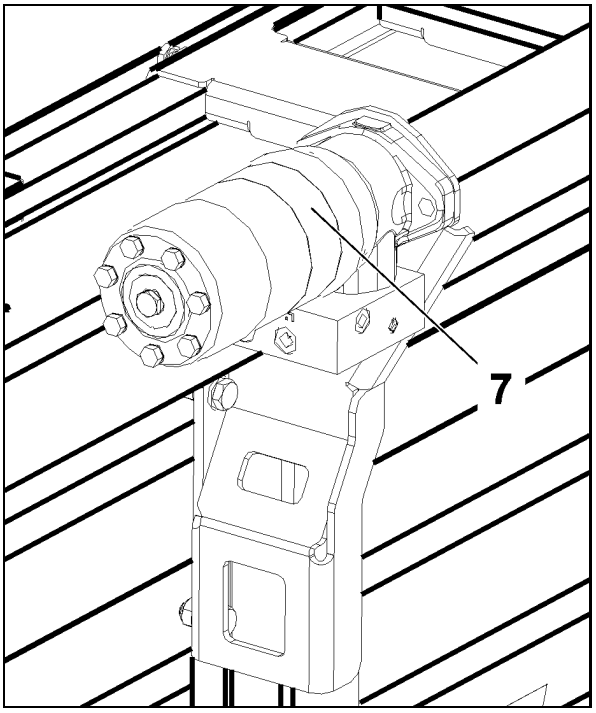


Fig. 84

2. Screw the pre-assembled frame tube (1) to the tube mounts (8 = middle tube mount), slipping the tube onto the hydraulic motor shaft provided with a feather key.

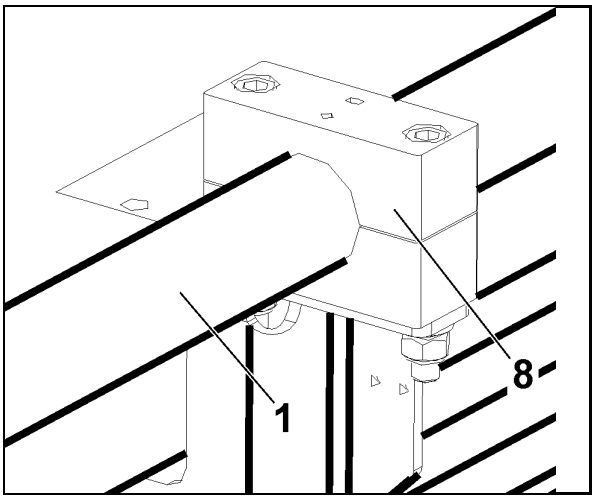


Fig. 85

3. Axially fix the frame tube to the adjusting rings. The adjusting ring with the switching plate (10) must be mounted to the rear tube mount (9).

   Ensure that the sensor (11) is not actuated by the switching plate (10) with the covering system closed or completely opened!

   Align the switching plate correspondingly after removal of the safety bolt (12) if necessary.

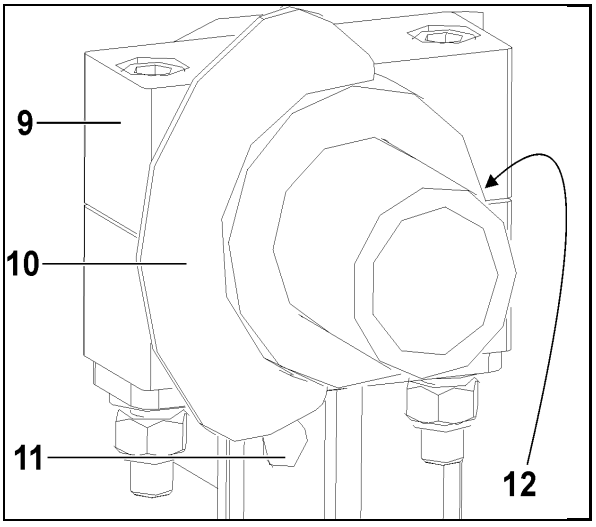


Fig. 86

7.5 Cover conveyor duct

When using the machine for transporting forage, cover the conveyor duct by means of a cover plate (optional extra).

Hang the cover plate (1) into the holders (2), such that the conveyor duct is closed.

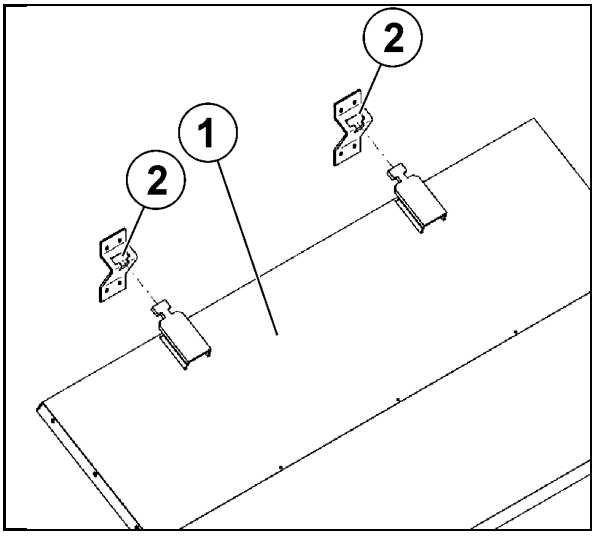


Fig. 87

7.6 Adjust mounting height of folding drawbar

Shop work

You must have the mounting height of the folding drawbar adjusted to the respective tractor model by an authorised workshop, 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.

Only an authorised workshop is allowed to adjust the mounting height of the folding drawbar!

WARNING

Risk of being crushed, drawn in, becoming entangled and risk of impact to people if the hitched machine accidentally loosens from the tractor due to worn drawbar lug and coupling bolt!

Ensure that there is enough free space between the drawbar lug and the coupling bolt when lifting the folding drawbar.

Assembly instructions for authorized workshop:

The distance X must be 1380 mm between the ground and the machine frame with the forage wagon with lowered folding drawbar hitched up to the tractor.

The mounting height of the folding drawbar in relation to the machine frame must be aligned by means of the threaded spindles of the hydraulic cylinders if the actual distance X is not 1380 mm.

Use the rear borehole of the respective screw-on seat (1) if you cannot reach the required distance X, in particular in case of bottom linkage.

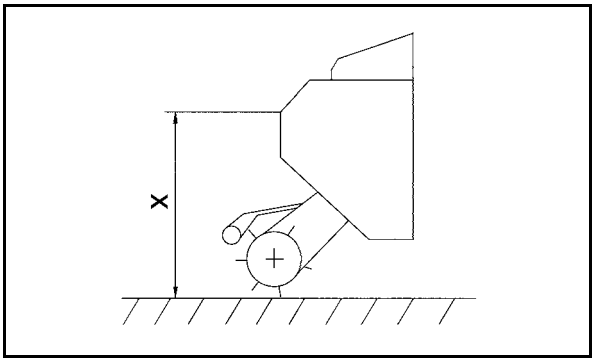


Fig. 88

1. Park the tractor and the hitched machine on even ground.
2. Lower the folding drawbar by completely retracting the hydraulic cylinders of the folding drawbar.
3. Unscrew the counter nut (2) of the threaded spindle (3).
4. Turn the piston rod (4) of the two hydraulic cylinders alternately in the required direction.
   - o Increase distance X = turn piston rod clockwise
   - o Reduce distance X = turn piston rod counterclockwise

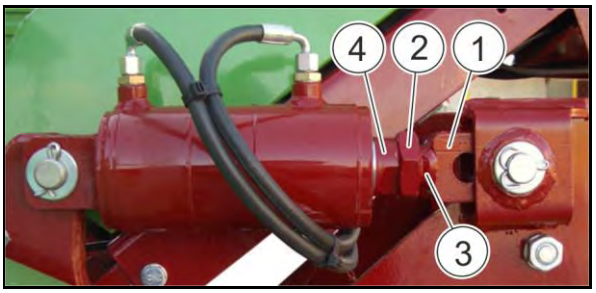


Fig. 89

Adjust the two threaded spindles evenly.

5. Retighten the counter nuts of the threaded spindles.
6. Lift the folding drawbar, until the hydraulic cylinders have been extended half way.
7. Check whether the lever (5) of the angle sensor is in parallel position to the casing (6) of the angle sensor (Fig. 90).

   Align the lever of the angle sensor if necessary:

   7.1 Unscrew the counter nuts (8).

   7.2 Remove the ball head (7).

   7.3 Turn the threaded rod (9).

   7.4 Put the ball head (7) on again.

   7.5 Retighten the counter nuts (8).
8. Completely lift the folding drawbar.
9. Ensure that there is enough free space between the drawbar lug and the coupling bolt (Fig. 91). The coupling bolt must not chafe against the borehole of the drawbar lug.

   Change the level of the bolt-type coupling at the tractor if the coupling bolt is chafing in the borehole of the drawbar lug.
10. Ensure that there is sufficient free space around the propeller shaft in any operating state. Insufficient free space will lead to damage to the propeller shaft.

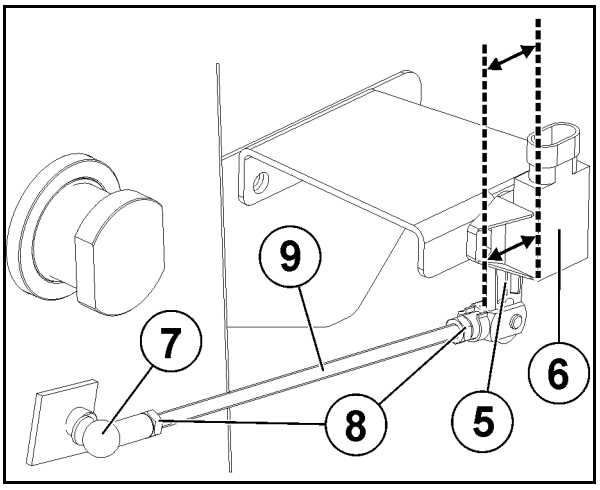


Fig. 90

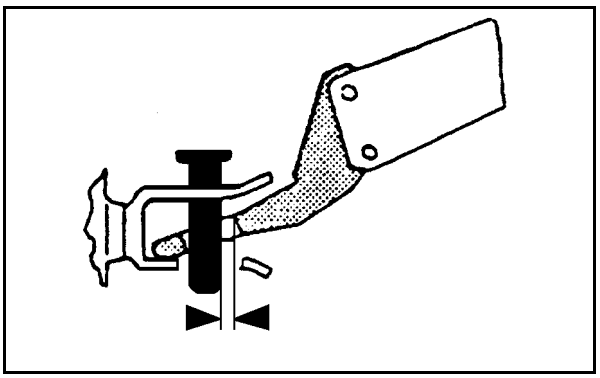


Fig. 91

7.7 Adjust length of propeller shaft to tractor

Shop work

WARNING

Risk to people of being drawn in and becoming entangled due to assembly work on the propeller shaft carried out improperly or due to unauthorized structural alterations!

Only an authorized workshop is allowed to carry out structural alterations on the propeller shaft. Observe the included operating instructions of the propeller shaft manufacturer.

Adjustment of the propeller shaft length is allowed if observing the required minimum transverse contact ratio.

Structural alterations to the propeller shaft which are not specified in the included operating instructions for the propeller shaft are not allowed.

WARNING

Risk to people due to blown out objects if the length of the propeller shaft has been improperly adjusted thus being compressed during cornering!

Have the length of the propeller shaft checked in all operating states by an authorized workshop and adjusted if necessary before coupling the propeller shaft to your tractor for the first time.

This will prevent propeller shaft compression or insufficient transverse contact ratio.

- Absolutely observe the operating instructions provided by the propeller shaft manufacturer along with the propeller shaft when determining the length and shortening the propeller shaft!
- The adjustment of the propeller shaft only applies to the current tractor model. Readjustment of the propeller shaft may be necessary if hitching the machine to another tractor.

Assembly instructions for authorized workshop:

1. Hitch the machine to the tractor (do not couple the propeller shaft).
2. Take the shortest operating position of the propeller shaft.

   The shortest operating position is reached when driving onto the silo with the folding drawbar completely lifted. Depending on the tractor's drawgear, the propeller shaft halves slide together by approx. 150 mm when driving onto the silo with the folding drawbar lifted.
3. Pull the propeller shaft apart.
4. Slip the locking mechanism of the propeller shaft half with the tractor symbol (Fig. 92) on the protective tube onto the p.t.o. shaft of the tractor until the locking mechanism noticeably engages.

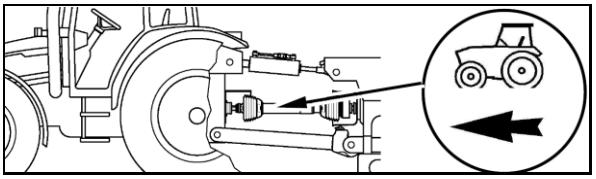


Fig. 92

5. Slip the locking mechanism of the other propeller shaft half onto the p.t.o. shaft of the machine until the M16 screw can be inserted into the C-slot of the p.t.o. shaft, and tighten the M16 screw at a tightening torque of 200 Nm (see also the chapter "Mount propeller shaft on machine", page 184).
6. Shorten the propeller shaft, such that the **minimum free space (X) is at least 40 mm** in its shortest operating position (**Fig.** 93).

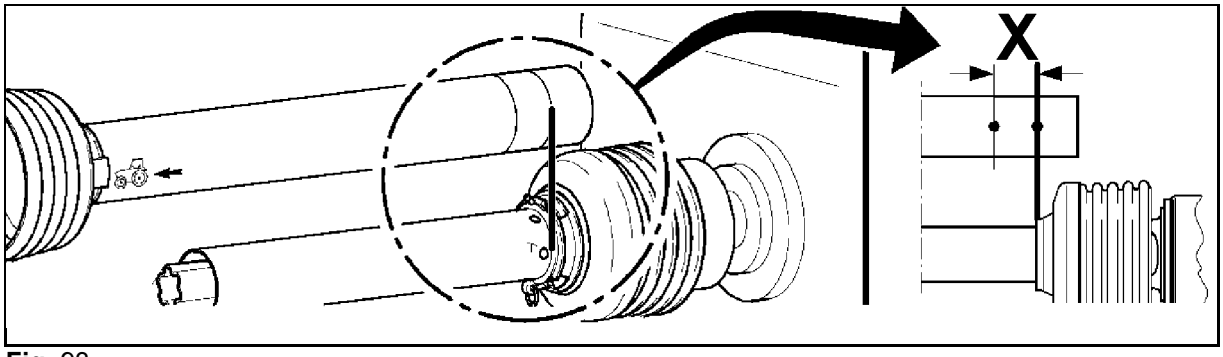


Fig. 93

7. Reinsert the shortened propeller shaft halves into each other.

8. Lubricate the p.t.o. shaft of the tractor and the propeller shaft of the machine before coupling the propeller shaft.

7.8 Mount propeller shaft on machine

1. Secure the machine against accidental starting and rolling.

2. Use a tool (e.g. screw driver) to push in and release both locks of the protective cone.

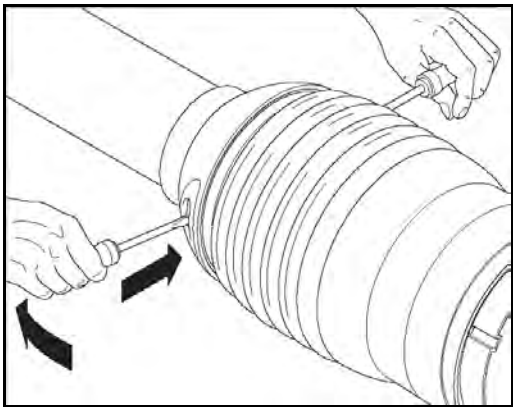


Fig. 94

3. Pull the protective cone back.

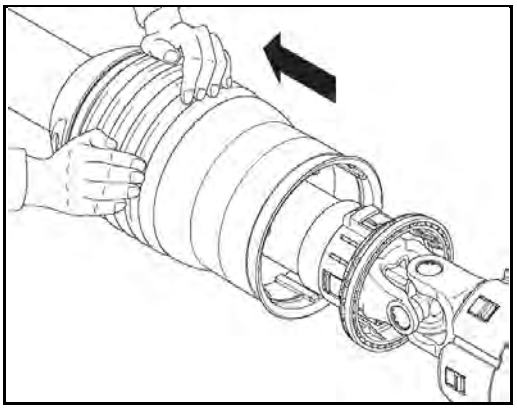


Fig. 95

4. Remove the M16 screw.

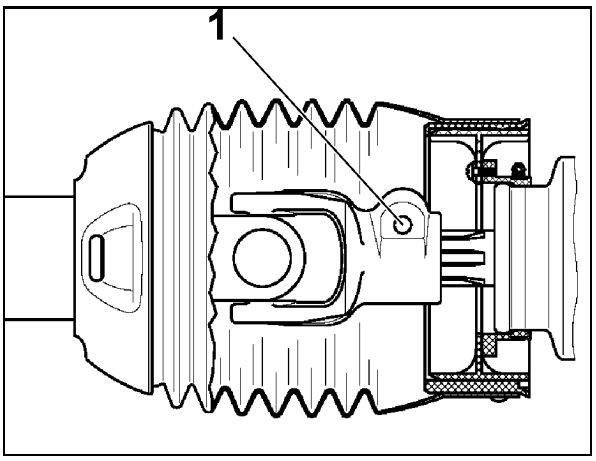


Fig. 96

5. Apply some grease onto the p.t.o. shaft (3) of the machine.
6. Slip the propeller shaft (2) onto the p.t.o. shaft (3) until the M16 screw (1) can be inserted into the C-slot (4) of the p.t.o. shaft thus securing the propeller shaft against shifting.
7. Tighten the M16 screw at a tightening torque of 200 Nm.

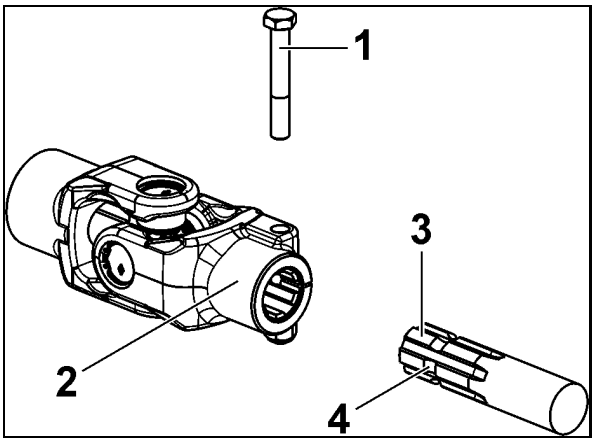


Fig. 97

8. Push the protective cone forward until it locks again on the propeller shaft (audible engaging).

   Ensure that the guding lugs (5) of the protective cone lock into the slots (6) of the adapter, such that the propeller shaft guard is protected against rotating!

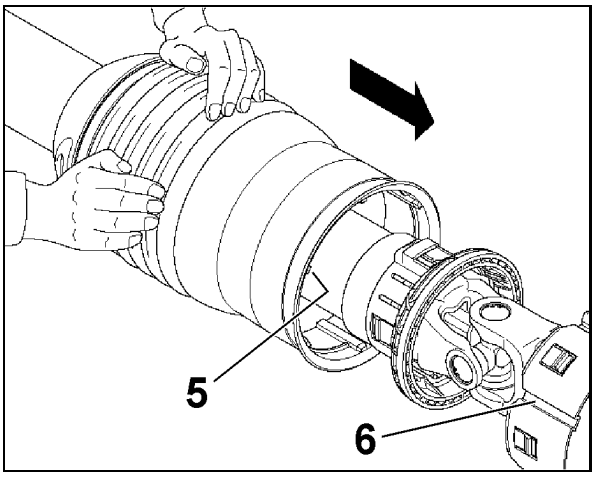


Fig. 98

When coupling the propeller shaft to the tractor, please observe the information in the chapter "Couple propeller shaft to tractor", page 82.

7.9 Remove propeller shaft from machine

1. Secure the machine against accidental starting and rolling.
2. Use a tool (e.g. screw driver) to push in and release both locks of the protective cone.

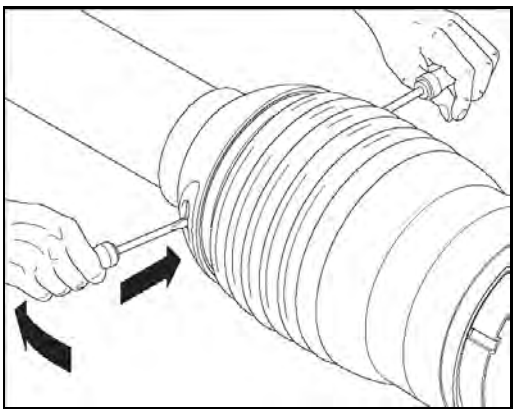


Fig. 99

3. Pull the protective cone back.

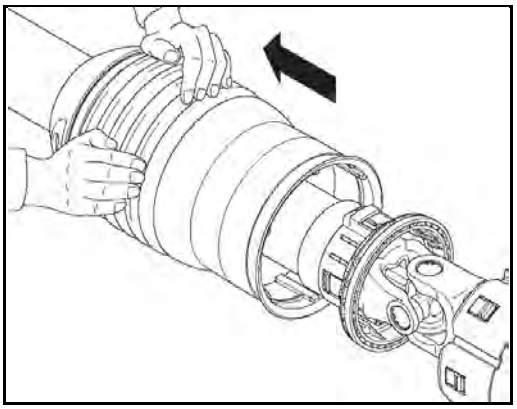


Fig. 100

4. Remove the M16 screw (1).
5. Strip the propeller shaft off the p.t.o. shaft of the tractor.

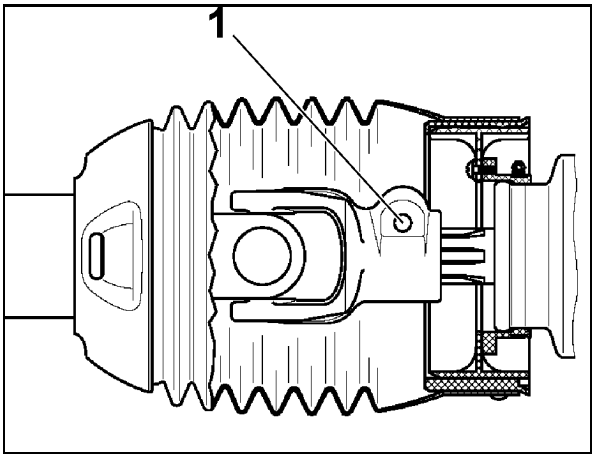


Fig. 101

When uncoupling the propeller shaft from the tractor, please observe the information in the chapter "Uncouple propeller shaft from tractor", page 83.

7.10 Check machine for proper functioning

Check the machine for proper functioning before the first startup and each time before starting work:

1. Hitch the machine to the tractor.
2. Completely lubricate the machine and the propeller shaft. Observe the information in the chapter "Lubrication of machine", page 210.
3. Check the oil level of the individual gearboxes. Observe the information in the chapter "Check/Top up oil level", page 215.
4. Bleed the friction clutch of the pick-up. Observe the information in the chapter "Bleed friction clutch of pick-up", page 240.
5. Bleed the friction and compensating clutch of the CFS drum. Observe the information in the chapter "Bleed friction and compensating clutch of CFS drum", page 242.
6. Check in particular the following functions:
   - Lift and lower pick-up.
   - Extend and retract cutting unit.
   - Lift and lower tailgate.
   - Switch on and reverse transport floor (max. 3 seconds).

- Switch crossover conveyor on and off (if available).
- Lock and unlock steering axle.
- the brake system for proper functioning.

7. Check the set travelling height (with hydraulic chassis).

7.11 Start-up after longer downtime

After a longer downtime of the machine:

- bleed the friction clutch of the pick-up, in order to ensure its proper functioning, see chapter "Bleed friction clutch of pick-up", page 240.
- bleed the friction and compensating clutch of the CFS drum, in order to ensure its proper functioning, see chapter "Bleed friction and compensating clutch of CFS drum", page 242.

8 Hitch and unhitch machine

- Additionally observe the information in the chapter "Basic safety instructions", page 33, when hitching and unhitching the machine.
- Check the machine for visible defects during each hitching and unhitching procedure. Observe the information in the chapter "Operator's obligation", page 30.

8.1 Hitch machine

WARNING

Risk due to incorrect use of the tractor if the attached/ hitched machine causes insufficient stability or insufficient steerability and braking ability of the tractor!

Only attach/hitch the machine to appropriate tractors. Observe the information in the chapter "Check tractor's compatibility", page 171.

WARNING

Risk of being crushed and of impact to people standing between tractor and machine while the machine is being hitched!

Make sure that people leave the hazardous area between tractor and machine before approaching the machine.

Present helpers are only allowed to act as a guide next to the tractor and the machine and to enter the space between the tractor and the machine after the vehicles have completely stopped.

WARNING

Risk of crushing, cuts, being drawn in, becoming entangled and risk of impact if the machine accidentally loosens from the tractor!

- Observe the maximum admissible tongue loads, towing capacities and axle loads of the tractor.
- Properly use and secure the provided coupling devices of the tractor and the machine.

WARNING

Risk to people due to a failure of the power supply between tractor and machine, caused by defective supply lines!

Observe the course of the supply lines during hitching. The supply lines:

- must easily give way to any movements during cornering without any stress, buckling or chafing,
- must not chafe against external components.

Only in case of load-sensing hydraulic system:

- Check the pressure regulator for correct setting. Observe the information in the chapter "Load-sensing hydraulic system", page 66.
  - Lock the pressure regulator in the electro-hydraulic control block if the hydraulic connector "Flow line" is directly connected to the tractor's hydraulic pump.
  - Open the pressure regulator in the electro-hydraulic control block if the hydraulic connector "Flow line" is connected to the control device of the tractor.

1. Always check the machine for visible defects during hitching. Observe the information in the chapter "Operator's obligation", page 30.
2. Couple the drawbar. Observe the information in the chapter "Couple drawbar", page 76.
3. Connect the hydraulic hose pipes. Observe the information in the chapter "Connect hydraulic hose pipes", page 71.
4. Connect the service brake system. Observe the information in the chapter "Connect brake and feed line", page 89.
5. Couple the propeller shaft. Observe the information in the chapter "Couple propeller shaft to tractor", page 82.
6. Connect the lighting system.
7. Connect the control set. Observe the information in the chapter "Mount control set on the tractor", page 175.
8. Lift the supporting leg to transport position. Observe the information in the chapter "Supporting leg", page 80.
9. Release the parking brake. Observe the information in the chapter "Parking brake", page 92.

8.2 Unhitch machine

WARNING

Risk of being crushed, cut, drawn in, becoming entangled and risk of impact to people due to insufficient stability of the unhitched machine!

- Park the empty machine on even, firm ground.
- Secure the machine against rolling.

1. Lower the supporting leg to support position. Observe the information in the chapter "Supporting leg", page 80.
2. Apply the parking brake. Observe the information in the chapter "Parking brake", page 92.

3. Always check the machine for visible defects during unhitching. Observe the information in the chapter "Operator's obligation", page 30.
4. Uncouple the drawbar. Observe the information in the chapter "Uncouple drawbar", page 78.
5. Disconnect the hydraulic hose pipes. Observe the information in the chapter "Disconnect hydraulic hose pipes", page 72.
6. Disconnect the brake system. Observe the information in the chapter "Disconnect brake and feed line", page 89.
7. Uncouple the propeller shaft. Observe the information in the chapter "Uncouple propeller shaft from tractor", page 83.
8. Disconnect the lighting system.
9. Disconnect the control set. Observe the information in the chapter "Mount control set on the tractor", page 175.
10. Move the tractor forward.

9 Settings

When carrying out adjusting work, additionally observe the information included in the chapters:

- "Basic safety instructions", page 33.
- "Warning and instruction signs", page 42.

Observance of these instructions serves your safety.

WARNING

Risk of crushing, shearing, cuts, amputation, becoming entangled, wound up, being drawn in and risk of impact to people during work on the machine:

- **if the unsecured machine not hitched to the tractor accidentally rolls,**
- **if powered working tools are not switched off,**
- **if hydraulic functions are accidentally carried out, working tools or machine parts are unintentionally powered with the machine hitched to the tractor and the tractor engine running,**
- **if the tractor engine is accidentally started,**
- **if tractor and machine accidentally roll,**
- **if lifted machine parts accidentally come down.**

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

Therefore, the following measures are imperative before carrying out any work on the machine such as adjusting work or trouble-shooting:

- Secure the machine against rolling with the machine not hitched to the tractor,
- turn the tractor engine off and secure tractor and machine against accidental starting and rolling with the machine hitched to the tractor,
- make sure that third persons (children) leave the tractor,
- secure lifted machine parts against accidental lowering.

9.1 Pick-up

9.1.1 Set operating height

Loaded material and ground condition determine the operating height of the pick-up.

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

The boreholes of the perforated strut of the pick - up spindle serve to preset the operating height of the pick-up, while its fine adjustment is carried out by means of the pick-up spindle:

- Bottom borehole = highest operating height of pick-up
- Top borehole = lowest operating height of pick-up
- Pick-up spindle unscrewed = highest operating height of pick-up
- Pick-up spindle screwed in = lowest operating height of pick-up

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

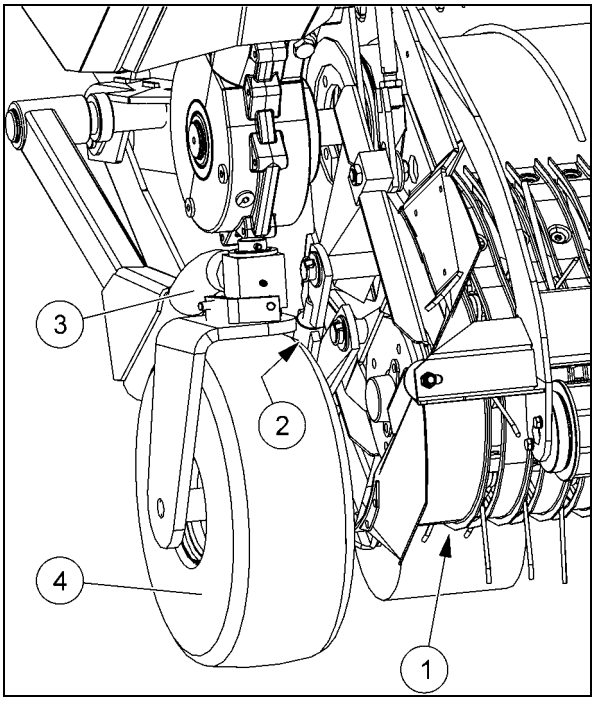


Fig. 102

9.1.2 Set additional roller feelers

Optional extra

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

- Spindle unscrewed = Additional roller feelers carry more weight
- Spindle screwed in = Additional roller feelers carry less weight

WARNING

Risk of crushing, shearing and risk of impact when lowering and lifting the pick-up!

Make sure that people leave the hazardous area of the pick-up before lowering or lifting the pick-up.

1. Set the operating height of the pick-up via the left-hand and right-hand pick-up spindle (1).
2. Lower the roller feelers (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 roller feelers (3) via the left-hand and right-hand spindle (4) such that the roller feelers bear the largest load.

   For this purpose, the frame (5) of the additional roller feelers must be aligned via the two spindles such that the additional roller feelers are set slightly higher (10-20 mm) than the roller feelers.

   4.1 Remove the bottom linch pin (6).

   4.2 Use one hand to hold up the frame, while using your other hand to turn the spindle.

   4.3 Secure the spindle by means of the linch pin.
5. Completely lift the pick-up.

→ The frame must be beneath the check screws (7). The minimum distance between the additional roller feelers and the CFS drum (8) must be 10 mm. Adjust the distance if necessary.

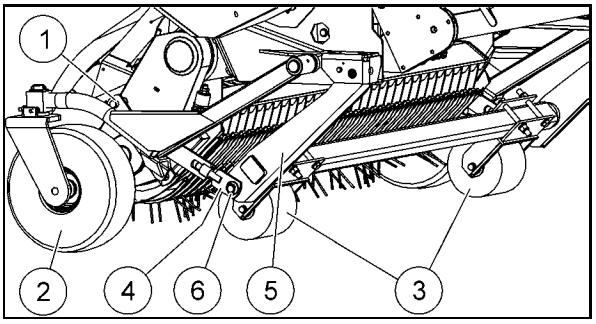


Fig. 103

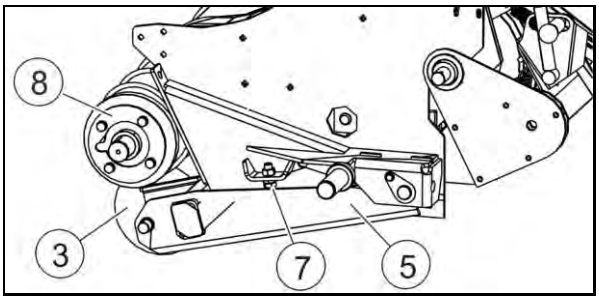


Fig. 104

9.1.3 Set holding-down device with pulley

The swathe size determines the distance between pick-up and holding-down device/pulley.

WARNING

Risk of becoming entangled and being drawn in by the powered pick-up!

It is not allowed to operate the machine without holding-down device and pulley. Holding-down device and pulley also serve as a protective device.

CAUTION

Risk of crushing and shearing within the area between the pick-up and the carriers for the holding-down device with pulley!

Make sure that people leave the swivelling range of the carriers for the holding-down device with pulley before setting the distance between pick-up and holding-down device.

The pulley must easily turn to guide the holding-down device properly!

Set the distance between pick-up and holding-down device/pulley by means of the chain length:

- Large swathe = large distance; if the distance is too small, picking-up of the material to be loaded is impeded
- Small swathe = small distance; if the distance is too large, the material to be loaded is not picked up properly

1. Set the desired distance between pick-up and holding-down device/pulley by means of the chain length (4).

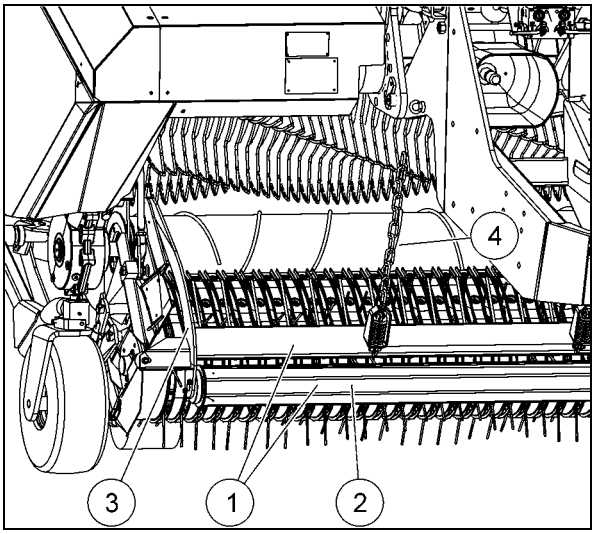


Fig. 105

9.2 Set cutting length

The number of cutting knives mounted in the cutting unit determines the cutting length of the loaded material. 50 cutting knives at one level ensure a cutting length of 35 mm. For information about removal and installation of cutting knives, see chapter "Remove and install cutting knives", page 246.

10 Use of machine

When using the machine, additionally observe the information included in the following chapters:

- "Operator's obligation", page 30,
- "Qualification of staff", page 31,
- "Basic safety instructions", page 33,
- "Warning and instruction signs", page 42.

Observance of these chapters serves your safety.

WARNING

Risk of becoming entangled, wound up and risk due to blown-away foreign objects to people within the hazardous area of the powered propeller shaft!

- Check the safety and protective devices of the propeller shaft for proper functioning and completeness before each startup of the machine.

  Have damaged safety and protective devices of the propeller shaft immediately replaced by an authorized workshop.
- Immediately turn the tractor engine off in case of emergency.

WARNING

Risk to people of being crushed, drawn in and becoming entangled due to unprotected powered driving elements during machine operation!

- Start the machine only with the protective devices completely mounted.
- 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.

  Close open protective devices before powering the machine.

WARNING

Risk to people due to failure of components if the machine is powered at inadmissible high drive speed!

Observe the admissible drive speed of the machine before switching the tractor's p.t.o. shaft on.

WARNING

Risk of crushing, shearing, being drawn in and becoming entangled to people within the hazardous area of the powered transport floor, especially at the deflection points!

- Keep sufficient safe distance to the powered transport floor.
- Make sure that people leave the hazardous area of the transport floor before switching on the transport floor feed.
- Always keep the transport floor chain tightened.
- Switch the transport floor feed off as soon as it is no longer required.

WARNING

Risk due to failure of components in case of actuation of the overload clutch!

Immediately switch the tractor's p.t.o. shaft off in case of actuation of the overload clutch.

WARNING

Risk due to failure of components when moving the charged machine with lifted lift axle (only possible with tridem chassis)!

Always lower the lift axle completely before charging the machine.

Moving the charged machine with lifted lift axle is not allowed.

Check the machine for visible defects every day.

Immediately remedy or have remedied visible defects.

Clean the cutting unit, in particular the retainer of the cutting knives, and the cutting knives themselves every day.

Permanent oil circulation between tractor and machine is required for initiating the individual hydraulic functions.

10.1 Charging

with ISOBUS control FO 120

WARNING

Risk due to incorrect use of the tractor if this causes failure of components, insufficient stability and insufficient steerability and braking ability of the tractor!

Observe the maximum loading capacity of the attached/hitched machine and the admissible axle and tongue loads of the tractor. Run the machine being only partly filled if necessary.

WARNING

Risk of crushing, shearing and risk of impact when lowering and lifting the pick-up!

Make sure that people leave the hazardous area of the pick-up before lowering or lifting the pick-up.

WARNING

Risk of becoming entangled, wound up and being drawn in within the area of the movable pick-up components!

Make sure that people leave the pick-up area before switching the pick-up drive on.

CAUTION

Risk due to failure of components caused by loaded material being still in the conveyor duct when lifting the pick-up!

Only lift the pick-up when there is no more loaded material in the conveyor duct.

Check the cutting knives for sharpness every day. Turn blunt cutting knives over (if possible) or grind them early enough.

Before charging the machine:

- check the set operating height of the pick-up and readjust if necessary, see chapter "Set operating height", page 190.
- check the set distance between pick-up and holding-down device/pulley and readjust if necessary, see chapter "Set holding-down device with pulley", page 191.
- check whether the desired cutting length of the loaded material can be achieved by means of the number of mounted cutting knives, see chapter "Set cutting length", page 192.

When charging the machine, absolutely observe the following information:

- Only lift the pick-up with the conveyor duct being empty!
- Reduce the tractor engine speed during cornering!
- Switch the p.t.o. shaft off and lift the pick-up when taking tight curves!
- Avoid uneven charging of the machine which might cause overloading of the drawbar!
- Switch the automatic charging system on for uniform and complete filling of the cargo space.

  The automatic charging system:

  - has to be switched on only once,
  - automatically and infinitely variably switches the transport floor on and off during charging,
  - will automatically be deactivated if the control set generates the acoustic signal (horn sound) and the visual signal "Forage wagon full",
  - will automatically be activated 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,
- Pre-select the filling degree of the loaded material in the cargo space. Observe the information in the chapter "Pre-select filling degree of loaded material in cargo space", page 114.
- Observe the visual and acoustic signals of the control set during charging.
- Observe the maximum admissible load capacity of the machine.

1. Press the  key once to switch off the **Road travel mode** on the field.
2. Press the  key once to switch on the automatic charging system.
3. Press the  key once if necessary to lower the folding drawbar.
4. Press the  key once to lower the pick-up.
5. Switch the tractor's p.t.o. shaft on (1000 min^{-1}).
6. Start charging. Select the tractor speed according to the swathe size and cutting length.

→ 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.

Machines without dosing drums:

7. You can still continue to charge the machines. The feed function of the transport floor can still be switched on for a maximum of three times for a short period of 2 seconds via the 

key. Stop the charging procedure after the acoustic signal has appeared for the third time at the latest.

Machines equipped with dosing drums:

7. The front section of the cargo space can still be topped up.

8. Stop the charging procedure and let the p.t.o. shaft continue to run until the conveyor duct is free from any loaded material.
9. Switch the tractor's p.t.o. shaft off.
10. Press the  key once to lift the pick-up.
11. Press the  key once to switch on the **Road travel mode** for transport journeys on public roads.

10.1.1 Determine admissible loading capacity

Observe the different specific weights of the various loaded materials when charging the machine! Heavy loaded materials lead to a reduced admissible loading capacity.

The admissible axle load and the empty weight are indicated on the type plate or in the chapter "Technical data", page 23.

Max. admissible load = Admissible axle load - Empty weight

$$\text{Max. admissible loading capacity} = \frac{\text{Max. load [kg]}}{\text{Specific weight of loaded material [kg/m}^3\text{]}}$$

10.1.2 Bulk densities of different materials

Agricultural products	Weight [kg/m³]	TS content
Grass silage "dry"	approx. 250	approx. 40 %
Grass silage "humid"	approx. 400	approx. 30 %
Maize silage	approx. 400	approx. 30 %

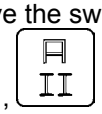
TS = dry matter content of loaded material

10.2 Discharging

with ISOBUS control FO 120

WARNING

Risk of crushing, impact and being drawn in when opening and closing the tailgate!

Make sure that people leave the swivelling range of the tailgate before pressing the  ,  or  key.

- Lift the pick-up completely!
- Lock the steering axle!
- Lift the folding drawbar such that there is enough ground clearance for the pick-up when moving onto the bunker silo und distributing the loaded material!

  Insufficient ground clearance may cause bending of the pick-up carriers.

Machine without dosing drums

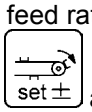
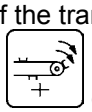
1. Press the  key once to switch the **Road travel mode** off.
2. Press the  key until the pick-up has sufficient ground clearance.

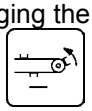
   The following functions will be automatically carried out one after the other:

   2.1 Lock steering axle.
   2.2 Lift folding drawbar.
3. Move onto the bunker silo.
4. Press the  key for a short time when being on the bunker silo.

   The following functions will be automatically carried out one after the other:

   4.1 Lift tailgate
   4.2 Switch transport floor on when the tailgate reaches its end position.
5. Start to move and select the travelling speed of the tractor according to the height of the desired discharged material stack. To discharge in steps, the transport floor feed can be switched on and off as often as desired by pressing the  key.

- During discharge, the feed rate of the transport floor can be changed via the keys  and  or  .

  For changing the feed rate, press the  key once and the  or  key quickly in succession several times if necessary.

- Press the  key to lower the folding drawbar during discharge on the bunker silo.

6. Press the  key once to double the feed rate of the transport floor for complete emptying.
7. Press the  key to lower the tailgate.

→ The **Discharge modes A I** and **A II** are deactivated and the transport floor is automatically switched off.

8. Drive off the bunker silo.
9. Press the  key until the folding drawbar has been lowered to the desired position.

   If the folding drawbar is equipped with a drawbar suspension, lower the folding drawbar just as far as to ensure that the hydraulic cylinders of the folding drawbar are still extended by approx. 20 mm.

10. Press the  key once to switch on the **Road travel mode** for transport journeys.

Machine with dosing drums

WARNING

Risk of being drawn in and becoming entangled within the area of powered dosing drums when opening and closing the tailgate and when discharging the machine!

Make sure that people leave the swivelling range of the tailgate before pressing the  ,  or  key.

- Press the  key only with the tractor's p.t.o. shaft stopped!

  Non-observance of this information may cause damage to the angular switchgear for coupling the powertrain to the dosing drums.
- Reduce the feed rate for the transport floor during discharge if the control set frequently generates the acoustic and visual signal "Forage wagon full".

  The dosing drums may become clogged if the feed rate for the transport floor is not reduced.

1. Press the  key once to switch the **Road travel mode** off.
2. Press the  key until the pick-up has sufficient ground clearance.

   The following functions will be automatically carried out one after the other:

   2.1 Lock steering axle.
   2.2 Lift folding drawbar.
3. Move onto the bunker silo.
4. Press the  key for a short time when being on the bunker silo.

   The following functions will be automatically carried out one after the other:

   4.1 Lift tailgate until the first set opening width is reached.
   4.2 Switch gearboxes and clutches.
   4.3 Switch transport floor to standby mode when the tailgate has reached its end position. The "Feed On" symbol is flashing on the control set.
5. Switch the tractor's p.t.o. shaft on.
6. Let the tractor's p.t.o. shaft smoothly start to run such that the dosing drums are able to loosen themselves.

→ The dosing drums start to run and after a short delay, the transport floor automatically starts.

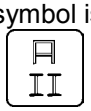
   6.1 Switch the tractor's p.t.o. shaft immediately off if the slip clutch responds.
   6.2 Press the  key to switch the transport floor feed function off.
   6.3 Press the  key once to reverse the feed direction of the transport floor for 3 seconds. Thus, the pressing power which the loaded material applies to the dosing drums, and the starting torque for loosening the dosing drums are reduced.
   6.4 Press the  again.

   → The transport floor automatically switches to standby mode and the "Feed On" symbol is flashing on the control set.

   6.5 Switch the tractor's p.t.o. shaft on.
   6.6 Let the tractor's p.t.o. shaft smoothly start to run such that the dosing drums are able to loosen themselves.

   → The dosing drums start to run and after a short delay, the transport floor automatically starts.
7. Start to move and select the travelling speed of the tractor according to the height of the desired discharged material stack.

7.1 Switch the p.t.o. shaft off before changing the lane on the bunker silo.

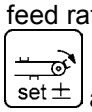
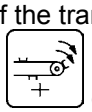
→ The dosing drums and the transport floor stop. The transport floor automatically switches to standby mode and the "Feed on" symbol is flashing on the control set if the transport floor is not separately switched off via the  key.

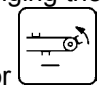
7.2 Change the lane.

7.3 Switch the tractor's p.t.o. shaft on.

7.4 Let the tractor's p.t.o. shaft smoothly start to run such that the dosing drums are able to loosen themselves.

→ The dosing drums start to run and after a short delay, the transport floor automatically starts.

- During discharge, the feed rate of the transport floor can be changed via the keys  and  or  .

  For changing the feed rate, press the  key once and the  or  key quickly in succession several times if necessary.

- Press the  key to lower the folding drawbar during discharge on the bunker silo.

8. Press the  key once to double the feed rate of the transport floor for complete emptying.
9. Switch the p.t.o. shaft off when the cargo space has been emptied up to the dosing drums.

→ The transport floor will not switch off if the  key has been pressed for complete emptying.

10. Press the  key to lower the tailgate.

→ The **Discharge modes A I** and **A II** are deactivated and the transport floor is automatically switched off.

11. Drive off the bunker silo.
12. Press the  key until the folding drawbar has been lowered to the desired position.

    If the folding drawbar is equipped with a drawbar suspension, lower the folding drawbar just as far as to ensure that the hydraulic cylinders of the folding drawbar are still extended by approx. 20 mm.
13. Press the  key once to switch on the **Road travel mode** for transport journeys.

10.3 Eliminate clogging at the pick-up and the feeder rotor

- The clogging/blockages must be manually eliminated if they cannot be eliminated from the tractor seat.
- Only extend the cutting unit with the feeder rotor running.

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/blockages have been eliminated.

Elimination not from the tractor seat:

WARNING

Risk to the operator of being drawn in or becoming entangled if the pick-up accidentally starts to run during manual elimination of clogging/blockages!

Secure tractor and machine against accidental starting and rolling before manually eliminating clogging/blockages.

1. Switch the p.t.o. shaft off.
2. Secure tractor and machine against accidental starting and rolling.
3. Eliminate the clogging/blockages..

10.4 Secure tractor and machine against accidental starting and rolling

WARNING

Risk of crushing, shearing, cuts, amputation, becoming entangled, wound up, being drawn in and risk of impact to people during work on the machine:

- **if the unsecured machine not hitched to the tractor accidentally rolls,**
- **if powered working tools are not switched off,**
- **if hydraulic functions are accidentally carried out, working tools or machine parts are unintentionally powered with the machine hitched to the tractor and the tractor engine running,**
- **if the tractor engine is accidentally started,**
- **if tractor and machine accidentally roll,**
- **if lifted machine parts accidentally come down.**

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

Therefore, the following measures are imperative before carrying out any work on the machine such as adjusting work or trouble-shooting:

- Secure the machine against rolling with the machine not hitched to the tractor,
- turn the tractor engine off and secure tractor and machine against accidental starting and rolling with the machine hitched to the tractor,
- make sure that third persons (children) leave the tractor,
- secure lifted machine parts against accidental lowering.

Secure tractor and machine against accidental starting and rolling

1. Lower lifted, unsecured machine parts to a secure stop position.

→ This will prevent accidental lowering.

2. Apply the parking brake of the tractor.
3. Turn the tractor engine off.
4. Pull the ignition key out.
5. Make sure that third persons (children) leave the tractor.
6. Lock the tractor cabin.
7. Secure the machine against rolling:
   - on even ground by means of the parking brake or the chocks,
   - on extremely uneven ground or downhill gradients by means of the parking brake and the chocks.

11 Transport journeys

A transport journey is a journey of the charged or empty machine to or from the place of operation.

Observe the information in the chapter "Basic safety instructions", page 33.

WARNING

Risk due to incorrect use of the tractor if this causes failure of components, insufficient stability and insufficient steerability and braking ability of the tractor!

Observe the maximum loading capacity of the attached/hitched machine and the admissible axle and tongue loads of the tractor. Run the machine being only partly filled if necessary.

WARNING

Risk to people due to accidental actuation of hydraulic functions during transport journeys!

Switch the **Road travel mode** on before carrying out transport journeys.

WARNING

Risk to people due to insufficient stability and tipping over of the machine if the steering axle is not properly used!

It is absolutely necessary to lock the steering axle:

- before travelling over bunker silos,
- at travelling speeds of more than 40 km/h,
- on rough road tracks,
- when traversing hills,
- before carrying out reverse travels.

The covering system (optional extra) must be closed during transport journeys.

Observe the fact that the driving characteristics of the tractor are influenced by the load, in particular if the machine is partly empty.

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 will not work if the folding drawbar is lowered to its end position.

1. Lower the lift axle completely if available.

   Only with the lift axle completely lowered is the ALB regulator able to properly control the required braking force.

2. Deactivate the automatic charging system and close the front panel.
3. Activate the **Road Travel mode** on your control set.

→ With the **Road Travel mode** switched on:

- the **Road Travel** menu appears,
- apart from the functions "Lock steering axle" and "Unlock steering axle", all other functions on the control set are disabled,
- the hydraulic drawbar suspension, the axle suspension of the hydraulic chassis and the warning beacon (if available) are switched on,
- the work lights are switched off.

4. Lock the follow-up steering axle when travelling at a speed of more than 40 km/h.
5. Start your transport journey.

11.1 Transport journeys with partly discharged machine

Ensure sufficient tongue load when carrying out transport journeys with partly discharged machine. 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. 3 seconds) for this purpose.

Observe the fact that the driving characteristics of the tractor are influenced by the load, in particular if the machine is partly empty.

12 Service and maintenance of machine

Regular and proper service and maintenance:

- will keep your machine ready for use for a long time and avoid early wear,
- will reduce downtimes and repairs,
- is a precondition for our warranty provisions.

- When carrying out service and maintenance work on the machine, additionally observe the information included in the following chapters:
  - "Operator's obligation", page 30,
  - "Qualification of staff", page 31,
  - "Basic safety instructions", page 33,
  - "Warning and instruction signs", page 42.
- Immediately replace worn or damaged components, in particular a worn drawbar.
- Only use original spare parts.
- Observe environmental protection measures when carrying out service and maintenance work on the machine.
- Observe legal provisions when disposing of operating media such as oils and greases. This applies also to parts having come into contact with those operating media.
- The time intervals, service hours and maintenance intervals specified in the included sub-supplier documentation shall prevail.
- As a basic principle, disconnect all electrical/electronic plug connections to the tractor before carrying out service and maintenance work on the machine. This shall particularly apply to welding work.
- It is necessary to take protective measures such as covering power supply lines, hydraulic hose pipes, brake and feed lines or removal of such lines at particularly critical spots:
  - when carrying out welding, drilling and grinding work.
  - when carrying out work by means of cutoff wheels in the vicinity of these pipes and lines.
- Check brake lines, air pipes and hydraulic hose pipes with special care for visible defects.

- Special know-how is required for carrying out testing and maintenance work. This know-how is not imparted by these operating instructions.
- The maintenance intervals depend on the frequency of use of your machine. The maintenance plan has been tailored to medium axle loads and stress exerted on the brakes.

  In case of higher loads and amount of stress, maintenance work must be carried out at respectively shorter intervals. This shall in particular apply to the brakes and chassis.
- Modifications to the maintenance instructions shall be reserved!

WARNING

Risk of crushing, shearing, cuts, amputation, becoming entangled, wound up, being drawn in and risk of impact to people if:

- **lifted, unsecured machine parts accidentally come down or are unintentionally lowered,**
- **tractor and machine accidentally start and roll!**
- Secure lifted machine parts against accidental lowering before working beneath lifted parts.
- Secure tractor and machine against accidental starting and rolling before carrying out any service or maintenance work on the machine.
- Wait for the machine to stop completely before entering the hazardous area of the machine.

WARNING

Risk to people of being crushed, drawn in and becoming entangled due to unprotected powered driving elements during machine operation!

- Start the machine only with the protective devices completely mounted.
- 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.

  Close open protective devices before powering the machine.

WARNING

Dangerous situations may occur if load-bearing parts break due to mechanical work on frame elements!

As a basic principle, the following is not allowed:

- drilling at the frame or chassis,
- boring up of existing holes at the frame or chassis,
- welding on load-bearing parts.

WARNING

Risk of crushing and impact to people due to accidental lowering of the machine lifted via the folding drawbar!

Secure the machine lifted via the folding drawbar against accidental lowering before crawling into the hazardous area beneath the lifted machine.

WARNING

Risk of crushing and impact to people due to accidental lowering of the lifted tailgate.

Secure the lifted tailgate against accidental lowering by means of the stop-cock before entering the hazardous area beneath the lifted tailgate.

12.1 Service and maintenance plan - Overview

- Observe the detailed information in the following chapters about service and maintenance, in particular about the maintenance of chassis and axles.
- The maintenance intervals specified in the included sub-supplier documentation shall prevail.
- Carry out the maintenance intervals according to the time limit reached first.

Before first start-up and after longer downtimes

Check:

- the wheel nuts for tightness, retighten if necessary.
- all screwed connections for:
  - drawbar,
  - chassis,
  - hydraulic system.

  Retighten if necessary.
- the float of the wheel hub bearing.
- all components of the hydraulic system for tightness and visible defects, immediately remedy or have remedied leaks and defects if necessary.
- the oil level of all gearboxes, top up if necessary.
- the tyre pressure, readjust if necessary.

Bleed the friction clutch of the pick-up and the friction and compensating clutch of the CFS drum.

Daily

Check:

- the machine for visible defects.

  Immediately remedy or have remedied visible defects.
- the cutting knives for sharpness. Turn blunt cutting knives over or sharpen them.
- the lighting system for proper functioning.
- the service brake system for proper functioning.
- the parking brake for smooth action.

  Lubricate all movable parts of the parking brake if necessary.
- the travelling height of the hydraulic chassis.

- the tension of the transport floor chains, shorten chain if necessary.
- the tension of the roller chain for the CFS drum drive, retighten if necessary.

Drain the compressed-air reservoir of the compressed-air brake system via the drain valve.

Use compressed air to clean the cutting unit, in particular the retainer of the cutting knives and the knife security system.

Every 50 service hours

- Pick-up:
  - Check tension of the roller chains of the pick-up drive, tighten roller chains if necessary.
- Dosing drums (optional extra):
  - Check tension of the roller chains of the dosing drum drive, tighten roller chains if necessary.
- Hydraulic system:
  - Check hydraulic hose pipes for visible defects, remedy defects if necessary,
  - retighten screwed connections of hydraulic system,
  - drain the condensate from the oil storage tanks at the dash pots (with hydraulic chassis),
  - check the oil level in the oil storage tanks at the dash pots, top up if necessary.
- Change the gear lubricant oils (first after 50 service hours, for further change intervals, please refer to the chapter "Quantities when filled and change intervals", page 212).

Every 250 service hours

- Check compressed-air brake system for tightness:
  - The pressure in the compressed-air reservoir of the unhitched vehicle must not drop more than 0.15 bar within 10 minutes.
- Drawbar lug: Check for wear and screwed connection:
  - Borehole diameter of drawbar lug 40: max. 41.5 mm.
  - Admissible wear at the angular cross-section of the drawbar lug: max. 2.5 mm.
- Check drawbar connection, retighten if necessary:
  - Tightening torque of crown nut: 800^{+50} Nm,
- Check:
  - all bearings,
  - the oil level of all gearboxes, top up if necessary,
  - all cables for visible defects, replace if necessary.

Every 500 service hours or once a year

- Check frame and drawbar for fissures.
- Clean the filter elements of the compressed-air brake system depending on the operating conditions.
- Change the gear lubricant oils. Observe the information in the chapter "Quantities when filled and change intervals", page 212.
- Lubricate the chain tensioner screws of the transport floor. Observe the information in the chapter "Lubricate chain tensioners and deflection points of transport floor", page 240.
- Have the hydraulic hose pipes checked for their operational safety by an expert.

After end of season

- Remove all cutting knives.
- Grease or lubricate all movable parts of the cutting unit and the machine (e.g. transport floor chains).

12.2 Enter cargo space

WARNING

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

Secure tractor and machine against accidental starting and rolling before opening the access door to the cargo space and entering the cargo space.

1. Open the access door:
   - 1.1 Use your left hand to hold the folding access ladder (2).
   - 1.2. Swivel the locking mechanism (4) upwards.
   - → The ladder and the access door are unlocked.
   - 1.3 Fold the ladder (2) down.
   - 1.4 Open the access door (1).
2. Use the handle (3) when entering the cargo space.
3. Close the access door:
   - 3.1 Swivel the locking mechanism (4) upwards.
   - 3.2 Close the access door (1).
   - 3.3 Fold the ladder (2) up.
   - 3.4 Swivel the locking mechanism (4) downwards, such that it safely engages behind the locking bars (5).
   - → The ladder and the access door are locked in transport position.

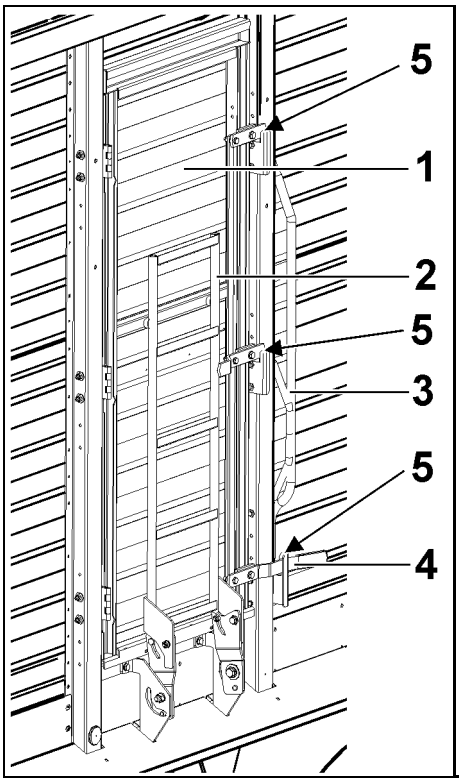


Fig. 106

12.3 Cleaning of machine

- Regularly and thoroughly clean the machine! Dirt may attract humidity thus facilitating the formation of rust.

  Regular cleaning of the machine is the precondition for proper maintenance and makes operation of the machine easier.
- Lubricate the machine after cleaning, especially after cleaning by means of a pressure washer/steam blaster or fat dissolving agents.
- Continuously inspect the machine for corrosion damage! Remedy corrosion damage by touching up paintwork.

Cleaning by means of pressure washer / steam blaster

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

- The maximum admissible injection pressure is 80 bar.
- The maximum admissible water temperature is 60°C.
- Do not clean electrical components such as control set, weighing rods, distributor boxes, weighing computer etc.
- Do not clean chromium-plated components.
- Never aim the cleaning nozzle jet of the pressure washer / steam blaster:
  - directly at lubrication points and bearings,
  - directly at hydraulic components.
  - directly at rubber gaskets.
- Always keep a minimum nozzle distance of 300 mm between the cleaning nozzle and the machine.
- Never aim the cleaning nozzle jet at the machine parts at right angles. The nozzle spray angle must at least be 25°.
- Do not use any chemical additives.
- Observe the safety instructions when handling pressure washers.

12.4 Lubrication of machine

- Remove the dirt from the lubricating nipples before carrying out lubrication work.
- Lubricate until fresh grease comes out of the lubrication point.
- Do not exceed the maximum lubricating pressure of 250 bar, when using high-pressure grease guns. Damage to bearings, seals etc. may occur if the grease gun used is not equipped with a protective device.
- Use environmentally friendly, biodegradable oils and greases where lubricants may penetrate the fodder or the ground.

Observe the included sub-supplier documentation for lubrication of the propeller shaft(s)!

12.4.1 Lubrication plan

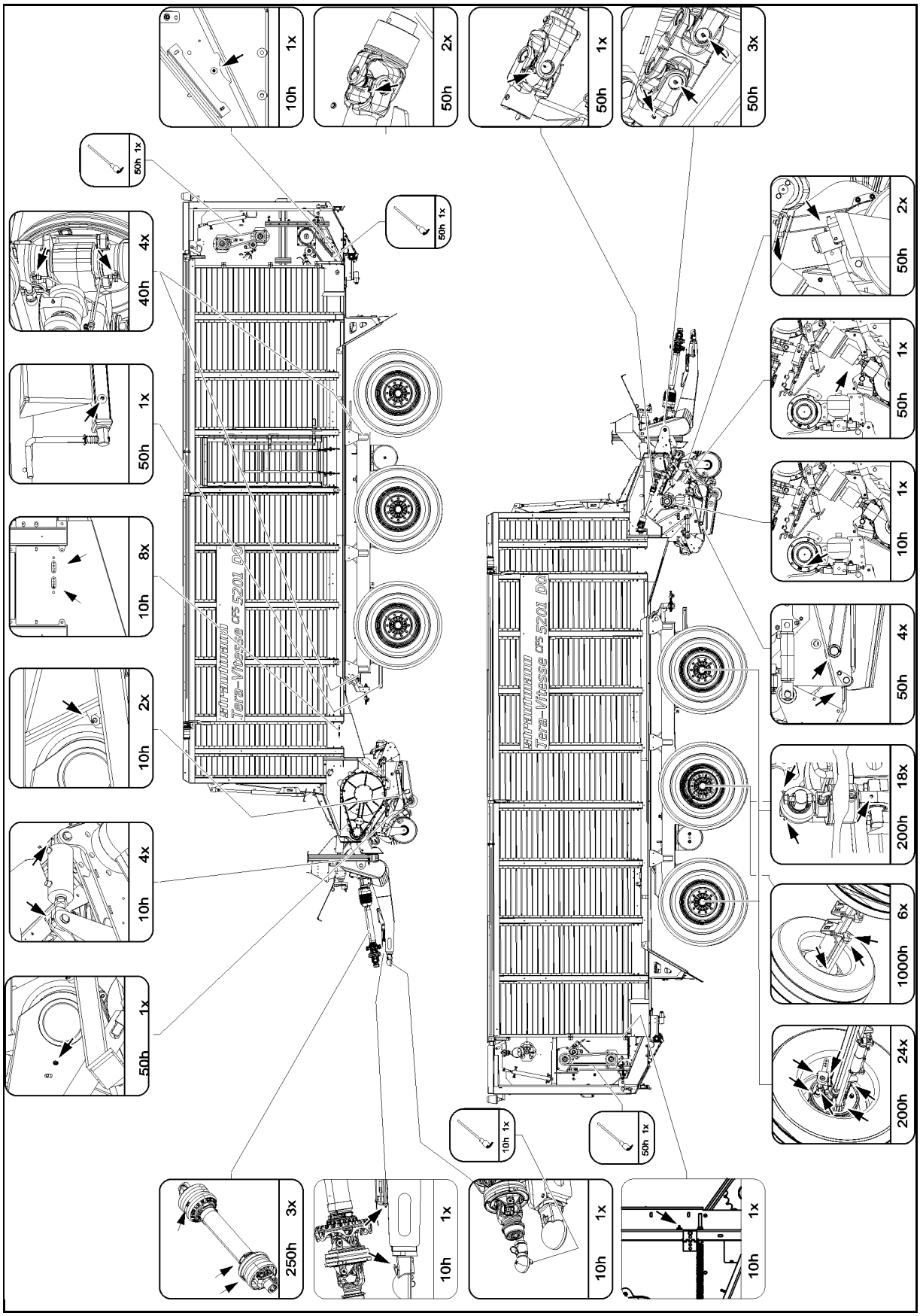


Fig. 107

12.5 Preservation/Longer downtimes

Preparing the machine for longer downtimes shall include:

- thorough cleaning of machine,
- lubrication and greasing of machine,
- touching up of paintwork.

12.6 Check/top up/change gear lubricant oil

The gearboxes require:

- regular check/topping-up of oil level,
- change of gear lubricant oil,
- the first oil change after 50 service hours.

CAUTION

Risk of damage to machine components when powering gearboxes without gear lubricant oil!

Always ensure a sufficient oil level in the gearboxes.

WARNING

Risk of slipping to people due to leaking oil during topping-up of oil / oil change!

Immediately remove fresh oil stains by means of binding agents.

- Change the oil when the gear lubricant oil has reached its operating temperature (30-40°C) if possible. The flowability of the gear lubricant oil is at its optimum at operating temperature.
- The optimum oil level is reached at an oil temperature of 0-20°C.

Dispose of used oil according to regulations. Contact your oil supplier in case of disposal problems!

12.6.1 Quantities when filled and change intervals

Change the lubricant:

- for the first time after 50 service hours,
- then every 500 or 2000 service hours,
- at least once a year (depending on which change interval limit occurs first).

Unit	Gearbox	Quantity when filled [l]	Specification	Trade name	Interval (h)
Transport floor	Feed gearing	3.0	ISO VG 320	Mobilgear 600 XP 320	2000
Conveying unit	Main gearbox	3.5	ISO VG 320	Mobilgear 600 XP 320	500
	Rotor gear	23.0	ISO VG 680	Avilub Gear RSX 680	
	Angular gear	2.8	ISO VG 320	Mobilgear 600 XP 320	
	Angular switchgear	2.8	ISO VG 320	Mobilgear 600 XP 320	
	Angular gear CFS	1.0	ISO VG 320	Mobilgear 600 XP 320	
Dosing unit	Angular gear, dosing drums	2.0	ISO VG 320	Mobilgear 600 XP 320	2000

12.6.2 Feed gearing of transport floor

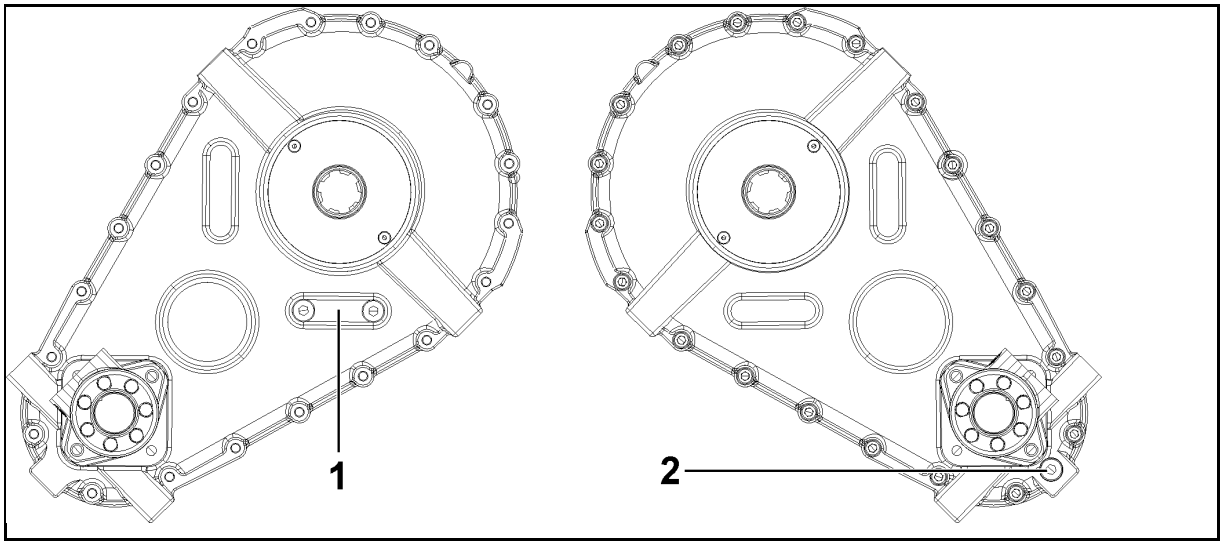


Fig. 108

(1) Oil inspection plug and oil filling screw

(2) Oil drain plug

12.6.3 Main gearbox of cutting unit

(1) Oil inspection plug

(2) Oil filling screw

(3) Oil drain plug

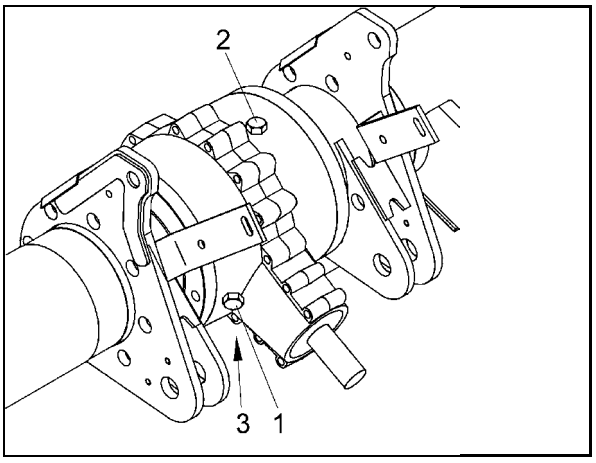


Fig. 109

12.6.4 Rotor gear of cutting unit

(1) Oil inspection plug
(2) Oil filling screw
(3) Oil drain plug

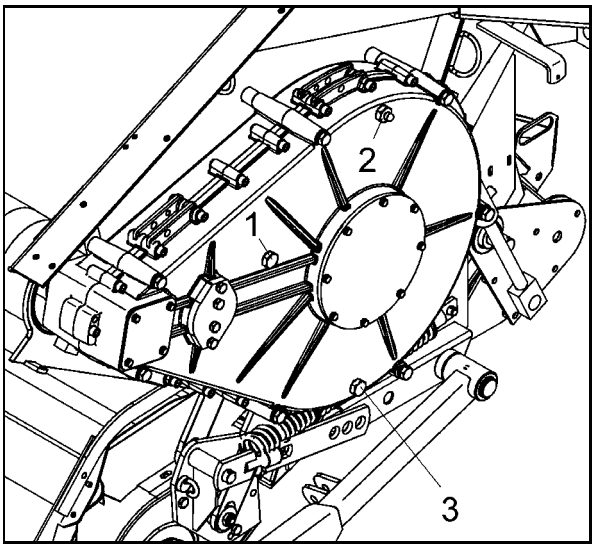


Fig. 110

12.6.5 Angular switchgear of cutting unit

Check the oil level with the pick-up lowered.

(1) Oil inspection plug
(2) Oil filling screw
(3) Oil drain plug

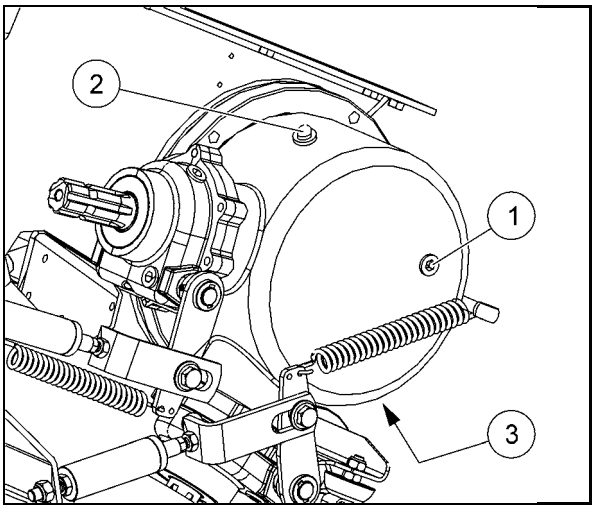


Fig. 111

12.6.6 Angular gear of CFS unit

(1) Oil inspection plug
(2) Oil filling screw
(3) Oil drain plug

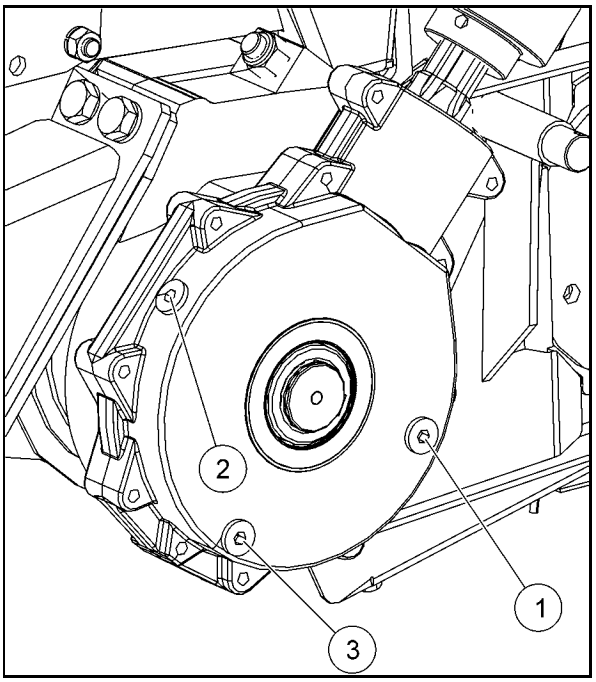


Fig. 112

12.6.7 Angular gear of dosing unit

(1) Oil filling screw
(2) Oil drain plug

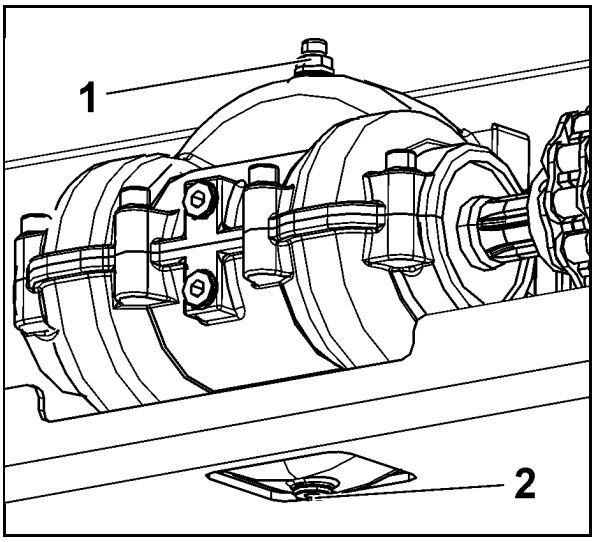


Fig. 113

12.6.8 Check/Top up oil level

1. Align the machine in horizontal position.
2. Unscrew the oil inspection plug.
   → The oil must be visible at the oil inspection plug.
3. Top up gear lubricant oil through the oil filler neck if necessary.

12.6.9 Change gear lubricant oil

1. Align the machine in horizontal position.
2. Place a drip tray beneath the gearbox. The tray's capacity must at least be equivalent to the quantity filled in.
3. Unscrew the oil drain plug.

   → The gear lubricant oil drains off.
4. Unscrew the oil filling screw.
5. Wait for the oil to stop draining out of the oil drain opening.
6. Screw in again and tighten the oil drain plug. Use sealant.
7. Fill the specified oil quantity in through the oil filler neck.
8. Clean the oil filling screw and screw it in.
9. Check the oil level after 5 service hours. The oil must be visible at the oil inspection plug.

12.7 Hydraulic system

Observe the information in the chapter "Basic safety instructions", page 33.

WARNING

Risk of infection to people due to hydraulic oil squirting out under high pressure and entering the body!

- Only an authorized workshop is allowed to carry out work on the hydraulic system.
- Working on the hydraulic system with the system under operating pressure is not allowed.
- Risk of explosion in case of improper working on hydraulic accumulators.

  Welding, soldering, drilling or other work on hydraulic accumulators which might affect the mechanical properties is not allowed.

- Regularly check all hydraulic hose pipes and hydraulic plugs for damage and contamination.
- Have the hydraulic hose pipes checked for their operational safety by an expert at least once a year.
- The period of use of the hydraulic hose pipes should not exceed six years, including a maximum possible shelf life of two years.
- Dispose of hydraulic oil according to regulations. Contact your oil supplier in case of disposal problems.
- Beware that no hydraulic oil penetrates the soil or water.

12.7.1 Depressurize hydraulic system

WARNING

Risk of accidental contact with hydraulic oil due to hydraulic oil squirting out under high pressure and entering the body, in particular in case of hydraulic systems with membrane pressure accumulator!

- Working on the hydraulic system with the system under operating pressure is not allowed.
- Depressurize the hydraulic system before carrying out work on the hydraulic system.

1. Relieve the respective hydraulic cylinder via the corresponding operating element with the hydraulic pump switched off.

12.7.1.1 Depressurise folding drawbar with drawbar suspension

1. Completely lower the folding drawbar.
2. Set the adjusting lever at the double-acting control device of the tractor to "Open-centre" position if a free return line is not available.
3. Unscrew the plug screw (1).

→ The hydraulic oil flows through the free return line or the double-acting control device to the tractor.

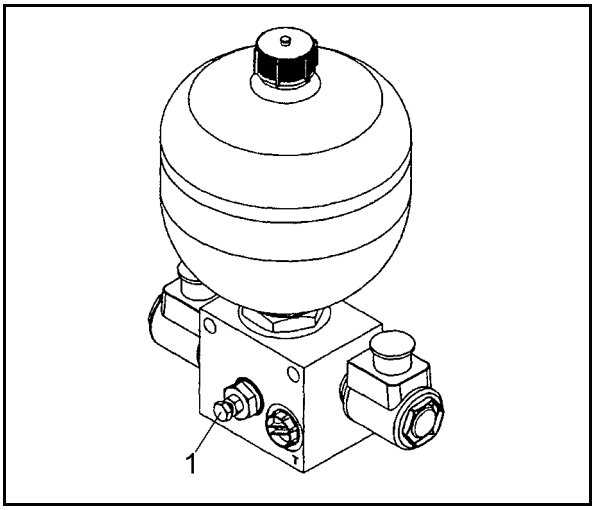


Fig. 114

12.7.2 Hydraulic hose pipes

12.7.2.1 Marking and period of use of hydraulic hose pipes

After expiration of the period of use, the hydraulic hose pipe must no longer be used.

The marking on the fitting provides the following information:

(1) Identification of the hydraulic hose pipe manufacturer (A1HF)

(2) Date of manufacture of the hydraulic hose pipe (14/04 = year/month = April 2014)

(3) Maximum admissible operating pressure (210 bar)

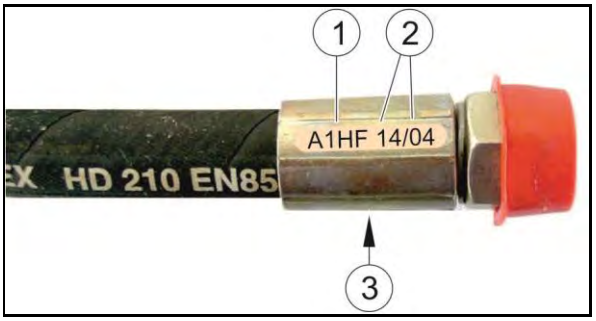


Fig. 115

For your own safety:

Immediately have hydraulic hose pipes replaced (shop work) as soon as you detect any of the following defects:

- Damaged outer layer down to the liner (e. g. due to chafing points, cuts, fissures).
- Embrittled outer layer (visible by cracking of hose material).
- Unnatural deformations of the hydraulic hose pipe in depressurized as well as in pressurized state or when bent (e. g. separation of layers, blistering, pinches, kinks).
- Leaks.
- Damaged, deformed or leaking fitting. Small surface damage is no reason for replacement.
- Hose slipping out of the fitting.
- Corroded fitting which may affect the function and the strength.
- Improperly laid hydraulic hose pipes, e. g. ignored bending radii, laying over sharp edges.
- The period of use of 6 years has been exceeded.

12.7.3 Replace hydraulic filter

Shop work

Replace the filter element (1) after approx. 250 service hours, then as necessary, but at least every 1000 service hours.

Soiled filters cause stronger heating-up of oil.

WARNING

Risk of accidental contact with hydraulic oil due to hydraulic oil squirting out under high pressure and entering the body!

- Replacement of the hydraulic filter is not allowed with the hydraulic system being under operating pressure.
- Only replace the hydraulic filter when the hydraulic system of the machine is not connected to the tractor.

1. Disconnect the hydraulic system of the machine from the tractor.

→ The machine is depressurized.

2. Unscrew the filter casing (3) from the filter head.
3. Remove the soiled filter element (1).
4. Clean the filter casing.
5. Grease the thread at the filter casing.
6. Check the O-ring (2) for damage. Replace a damaged O-Ring (ø 67.95 mm x 2.62 mm).
7. Lubricate the O-ring of the new filter element.
8. Slip the new filter element on as far as it will go.
9. 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.
10. Tighten the screwed connection at a torque of 150 Nm.
11. Switch the hydraulic system on and bleed the filter at an appropriate point.
12. Check the filter for leaks.

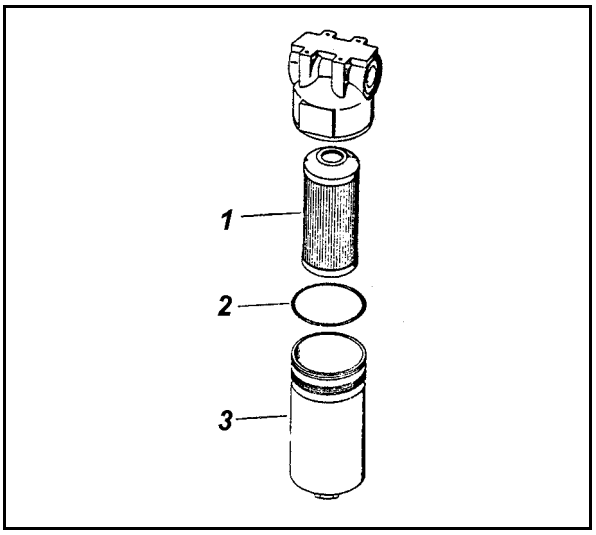


Fig. 116

12.8 Tyres

12.8.1 Check tyres

- Check the tyre pressure at least every 2 weeks. If the machine has not been used for a longer time, the tyre pressure should be checked before putting the machine into operation again.

  Always ensure that the tyre pressure is properly adapted to the load and the kind of work which has generally to be carried out by the machine.
- Never overload the tyres.
- Ensure that the caps are seated on the valves and have been tightened.
- Preferably check the tyres during operation for "folds" or other abnormal deformation.

  Remove stones, pebbles, nails and other foreign objects stuck in the tyre, as otherwise they further penetrate the tyre.

  Have deeper cuts repaired as soon as possible.
- Store "loose" tyres at a dark place, free of oil and other chemicals.
- Do not let tyres come near electric motors. The ozone produced by the electric motors slowly dessicates the rubber.

WARNING

Risk to people due to repair work on tyres and wheels not being carried out in a professional way!

- Only qualified personnel equipped with appropriate fitting tools is allowed to carry out repair work on tyres and wheels.
- Never use or repair damaged rims.

12.8.2 Change tyres

► See also chapter "Tightening torques for wheel nuts", page 226!

Observe the information in the chapter "Basic safety instructions", page 33.

WARNING

Risk of crushing and impact to people due to the machine accidentally lowering when changing wheels!

- Use lifting equipment suitable and approved for the machine's weight with sufficient lifting power.
- Place the lifting device only at the marked fixing points.
- Ensure sufficient ground stability before lifting the machine by means of a lifting device and securing the machine against accidental lowering by means of safety stands. Additionally use solid, load-distributing supports if necessary.
- Never stand under a lifted, unsecured machine.

1. Place the lifting device at the marked fixing points.

Fig. 117

2. Keep to the specified order when loosening and tightening the wheel nuts.
3. Tighten the wheel nuts at the required tightening torque.
4. Check the wheel nuts for tightness after 10 service hours. Retighten wheel nuts if necessary

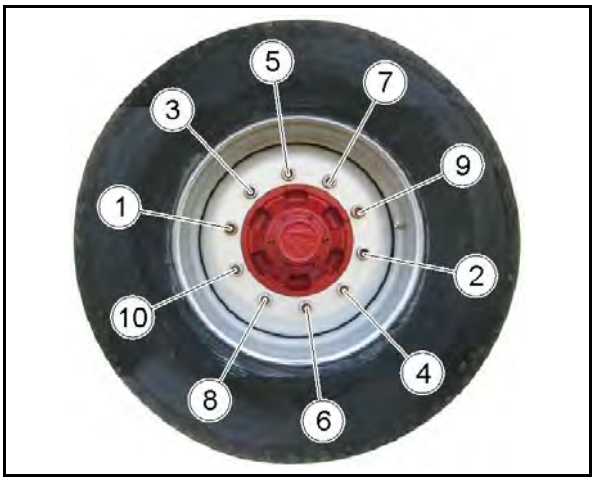


Fig. 118

12.9 Brake system

Only an authorized workshop is allowed to carry out work on the brake system!

12.9.1 Check/Clean in-line filters of compressed-air brake system

The in-line 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 shall 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 element approx. every 3-4 months, depending on the operating conditions.

Check degree of soiling

1. Check the degree of soiling of the filter elements (1) in the hose couplings of the brake and feed line before connecting the hose couplings to the tractor. The filter element can be inspected through the opening (2) beneath the plastic lid.

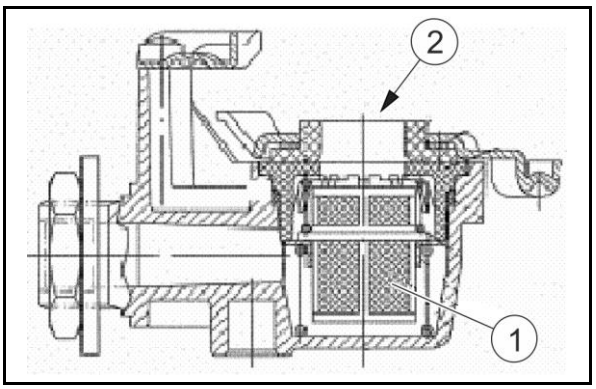


Fig. 119

Clean filter element

1. Open the lid (3).
2. Remove the two Phillips screws (4).
3. Open the cover (5) by swivelling.
4. Remove the filter element (2) from the hose coupling.
5. Clean the filter element with benzene or thinner (rinse).
6. Use compressed air to blow the filter element dry.
7. Reinsert the filter element into the hose coupling.
8. Close the cover.

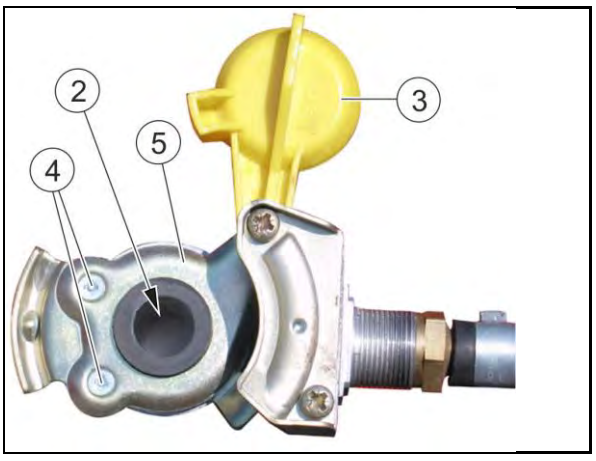


Fig. 120

9. Screw the cover by means of the two Phillips screws.
10. Connect the feed and brake line to the tractor.
11. Check the hose couplings for tightness.

12.9.2 Set compressed-air brake system

The brake system must be readjusted if the free travel (x) is greater than or equal to 30 mm.

1. Manually actuate the brake lever in pressing direction.
2. Press the circlip at the adjusting screw (1) down and set the free travel (X) by means of the adjusting screw.

   Free travel (X) = 0.1 x length of brake lever (Y)
3. Check the brake linings (2).

   The brake linings must be replaced in case of a remaining lining thickness of:

   - 5 mm in case of riveted linings,
   - 2 mm in case of glued linings.
4. Replace the brake linings if necessary.

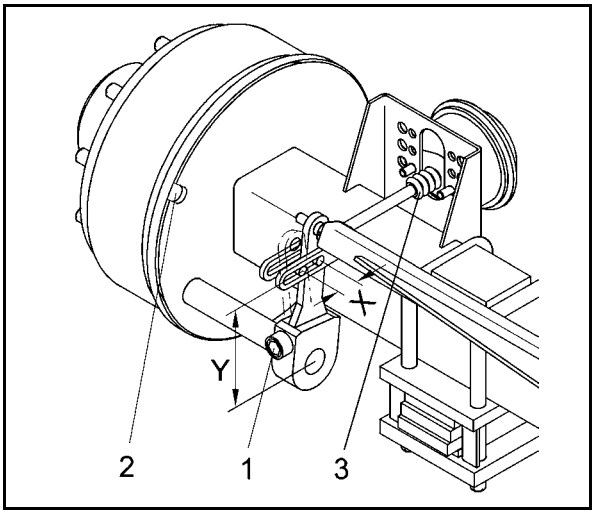


Fig. 121

12.9.3 Set hydraulic brake system

The brake system must be readjusted if the free travel (X) is greater than or equal to 40 mm.

1. Manually actuate the brake lever in pressing direction.
2. Press the circlip at the adjusting screw (1) down and set the free travel (X) by means of the adjusting screw.

   Free travel (X) = 0.1 x length of brake lever (Y)
3. Check the brake linings (2).

   The brake linings must be replaced in case of a remaining lining thickness of:

   - 5 mm in case of riveted linings,
   - 2 mm in case of glued linings.
4. Replace the brake linings if necessary.

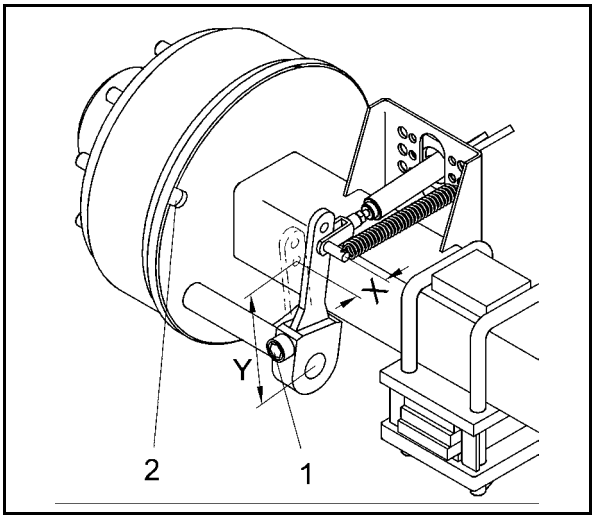


Fig. 122

12.10 Maintenance of axles

Relubricate all lubrication points after cleaning the machine by means of pressure washers.

Lubrication and maintenance plan **Axles**	Before start-up and after longer downtimes	After first journey with loaded material	Every 40 service hours	Every 200 service hours	Every 500 service hours or once a year	Every 1000 service hours or once a year
Lubricate with long-life grease						
(1) Lubricate knuckle arm bearing.			X			
(2) Lubricate locking cylinder heads of follow-up steering axle.				X		
(3) Lubricate brake shaft bearing.	X			X		
(4) Lubricate standard slack adjuster.					X	
(5) Lubricate automatic slack adjuster.					X*	
(6) Have grease of wheel hub bearing changed (shop work!).						X
Maintenance work						
[1] Check wheel nuts for tightness, retighten if necessary.	X**	X			X	
[2] Check clearance of wheel hub bearing, have it readjusted if necessary (shop work!).				X		
[3] Check brake linings for damage and wear, have them replaced if necessary (shop work!).				X		
[4] Check brake setting at brake lever, have it adjusted if necessary (shop work!).				X		
[5] Check brake setting at standard slack adjuster, have it adjusted if necessary (shop work!).				X		
[8] Check brake setting at automatic slack adjuster, have it adjusted if necessary (shop work!).					X	
[9] Check automatic slack adjuster for proper functioning.					X*	

* Also after each change of brake linings.

** Also after each wheel change.

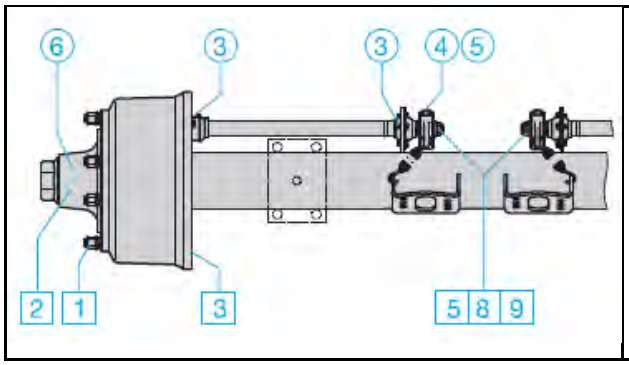


Fig. 123

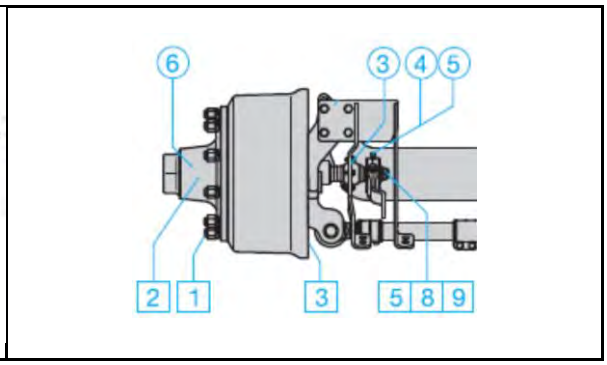


Fig. 124

12.10.1 Lubricate knuckle arm bearing

Lubricate the lubrication points (1) for the knuckle arm bearing with long-life grease until fresh grease comes out of the bearings / the cam disc.

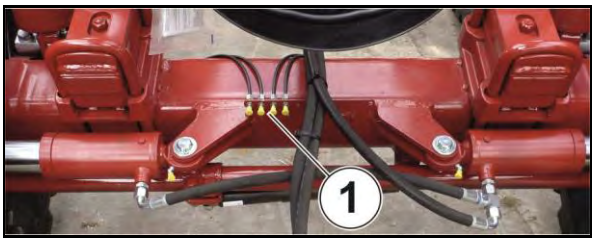


Fig. 125

12.10.2 Lubricate locking cylinder heads at follow-up steering axle

Lubricate the lubrication points (2) of the locking cylinder heads at the follow-up steering axle with long-life grease until fresh grease comes out of the bearings.

Ensure in addition that the locking cylinders and the feed lines are always bled (shop work!).

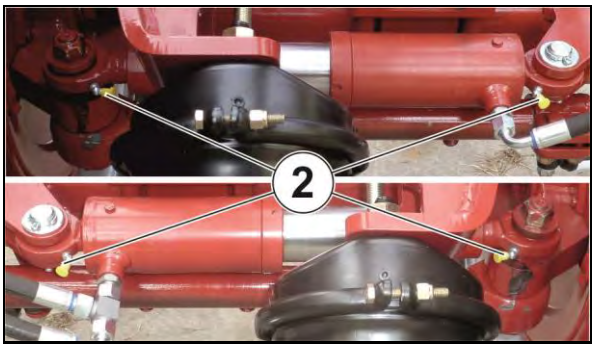


Fig. 126

12.10.3 Lubricate brake shaft bearing

Lubricate the outer and inner lubrication points (3) of the brake shaft 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.

Make sure that no grease or oil enters the brake system!

Depending on the series, the cam bearing may not be sealed on the brake side.

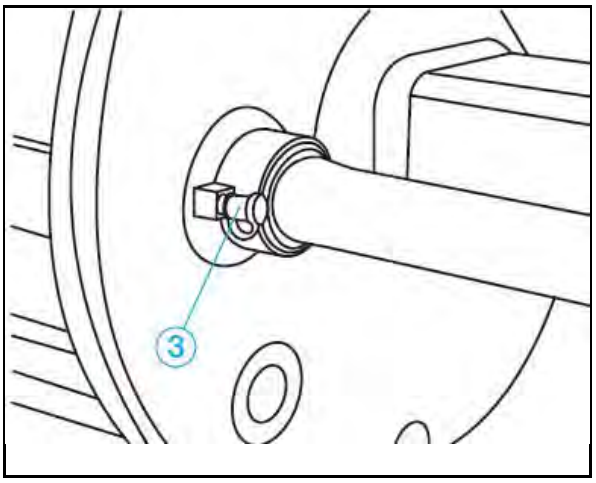


Fig. 127

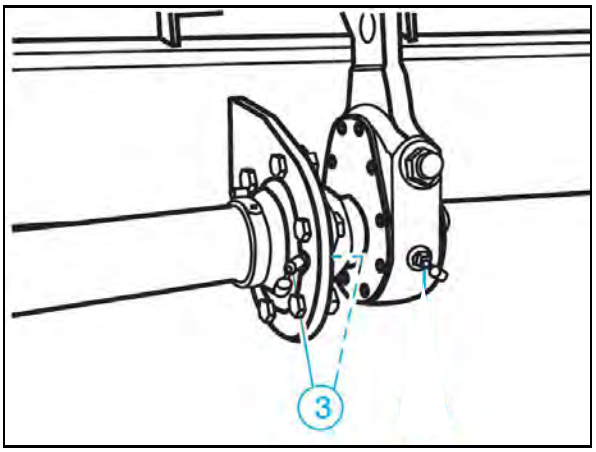


Fig. 128

12.10.4 Lubricate standard slack adjuster

Lubricate the lubrication points (4) of the slack adjuster with long-life grease until fresh grease comes out.

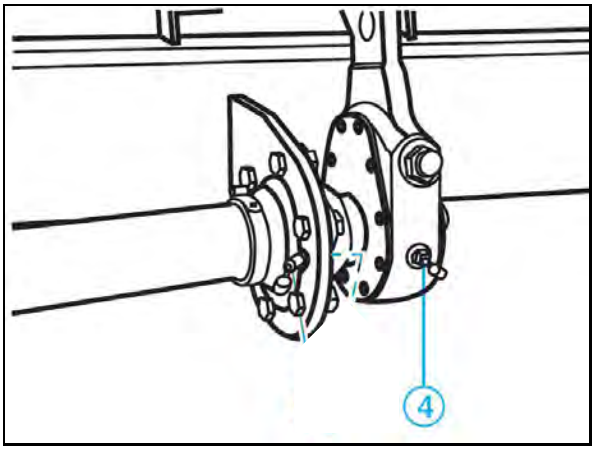


Fig. 129

12.10.5 Lubricate automatic slack adjuster

1. Remove the rubber cap.
2. Lubricate the lubrication point (arrow) of the automatic slack adjuster with long-life grease (80 g) until a sufficient amount of fresh grease comes out at the adjusting screw.
3. Use a ring wrench to turn the adjusting screw back by about one turn.
4. Manually actuate the brake lever several times.

   Automatic readjustment must be easy. Actuate the brake lever again several times if necessary.
5. Retighten the adjusting screw.
6. Reinstall the cap and lubricate with long-life grease one more time.

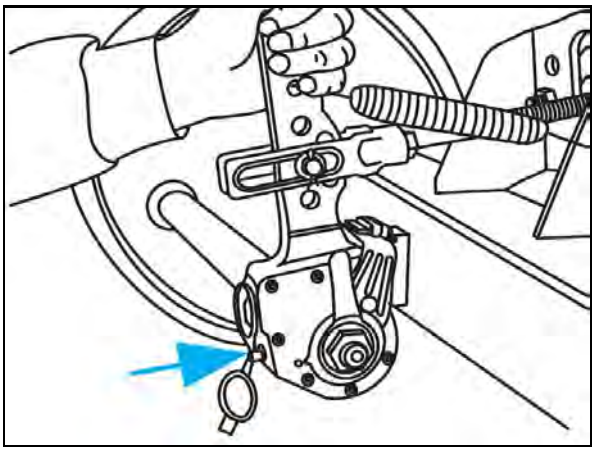


Fig. 130

12.10.6 Tighten wheel nuts

Use a torque wrench to tighten the wheel nuts crosswise at the tightening torque listed in the table below.

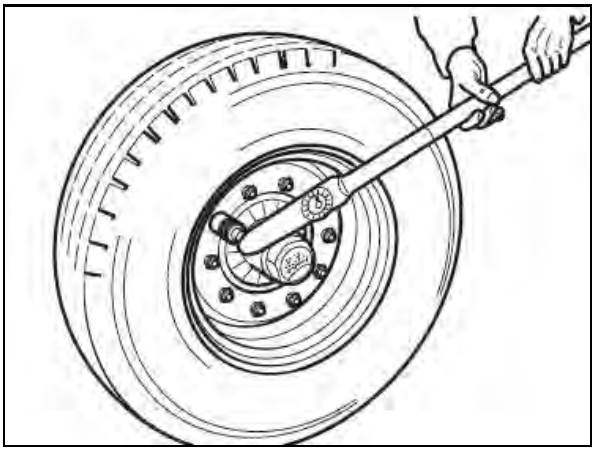


Fig. 131

12.10.6.1 Tightening torques for wheel nuts

Thread	Wrench size (mm)	Number of bolts per hub (pcs.)	Max. tightening torque		
			black	Dacromet	galvanised
M 12 x 1.5	19	4/5	95 Nm (90-100 Nm)	--	95 Nm (90-100 Nm)
M 14 x 1.5	22	5	125 Nm (120-130 Nm)	--	125 Nm (120-130 Nm)
M 18 x 1.5	24	6	290 Nm (275-305 Nm)	270 Nm (250-290 Nm)	320 Nm (300-340 Nm)
M 20 x 1.5	27	8	380 Nm (360-400 Nm)	380 Nm (360-400 Nm)	420 Nm (400-440 Nm)

Thread	Wrench size (mm)	Number of bolts per hub (pcs.)	Max. tightening torque		
			black	Dacromet	galvanised
M 22 x 1.5	32	8/10	510 Nm (485-535 Nm)	510 Nm (485-535 Nm)	560 Nm (535-585 Nm)
M 22 x 2	32	10	460 Nm (435-485 Nm)	--	505 Nm (480-530 Nm)

12.10.7 Check clearance of wheel hub bearing

1. Lift the axle until the tyres are free.
2. Release the brake.
3. Place two levers between tyres and ground and check the bearing clearance.

   If there is a noticeable bearing clearance, have it readjusted (shop work!).

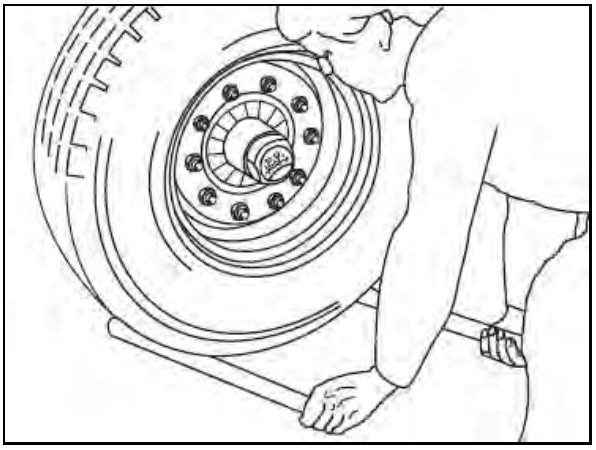


Fig. 132

12.10.8 Check brake linings

1. Pull the rubber plug (if available) out to open the hose hole (3).

   Have the brake linings replaced (shop work!) in case of a remaining lining thickness of:

   5 mm (riveted linings)

   3 mm (N 2504 linings)

   2 mm (glued linings).
2. Reinsert the rubber plug after the check.

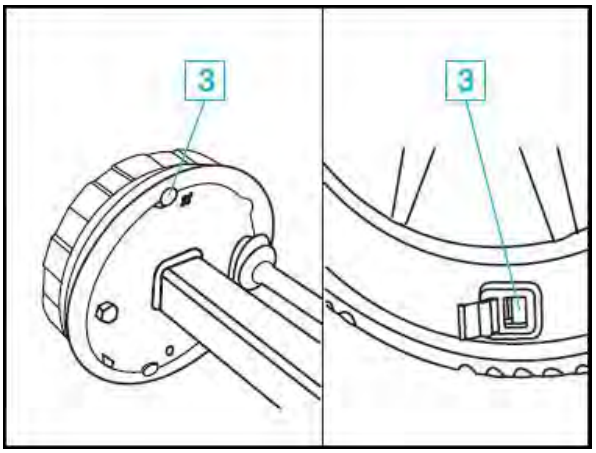


Fig. 133

12.10.9 Check brake

Regularly check the brake for proper functioning and wear.

Have the brake readjusted (shop work!) in case of a use of approx. 2/3 of the maximum cylinder stroke in case of full brake application.

12.10.10 Check automatic slack adjuster

1. Remove the rubber cap.
2. Use a ring wrench to turn the adjusting screw (arrow) back counterclockwise by about three quarters of a turn.

   At a lever length of 150 mm, the minimum free travel must be 50 mm.
3. Manually actuate the brake lever several times. Automatic readjustment must be easy.

→ The gear coupling must audibly engage and the adjusting screw slightly turns clockwise during the return stroke.

4. Retighten the adjusting screw.
5. Reinstall the rubber cap and lubricate with long-life grease.

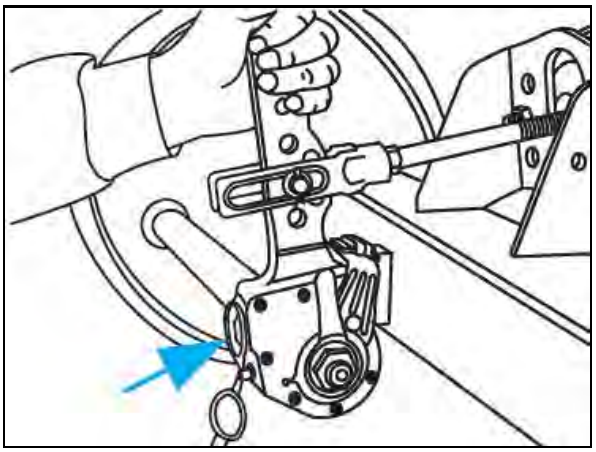


Fig. 134

12.11 Maintenance of Bogie chassis

Maintenance plan Bogie chassis		After first journey with loaded material	Every 500 service hours or every 6 months
Maintenance work			
	Check all components for damage and wear (visual check).		X
[1]	Have spring clamps at the supporting axle checked for tightness (shop work!).	X	X
[2]	Have axle connection at the spring tension casings checked for tightness (shop work!).		X
[3]	Have the bearing bolt at the spring tension casings checked for tightness and readjusted if necessary (shop work!).	X	X

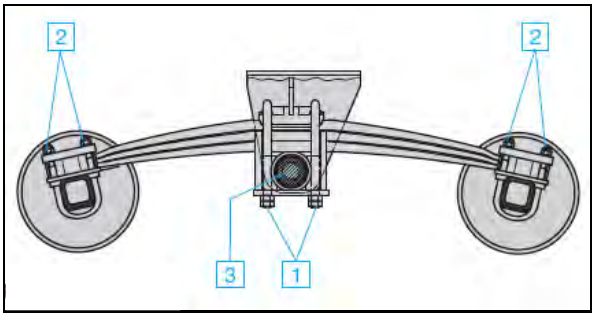


Fig. 135

12.12 Maintenance of hydro-pneumatic chassis

If the machine is in permanent use, the following measures must be carried out every month:

- Drain the condensate from the oil storage tank,
- check the oil level in the oil storage tank and top up if necessary. Each of the 4 oil storage tanks must be half filled with hydraulic oil HLP 46. The quantity when filled is 100 ml each.

The oil storage tank (1) provides the piston chamber of the hydraulic cylinder (2) with hydraulic oil. When the chassis rebounds, the hydraulic cylinder takes in hydraulic oil from the oil storage tank thus continuously moistening the piston chamber with hydraulic oil.

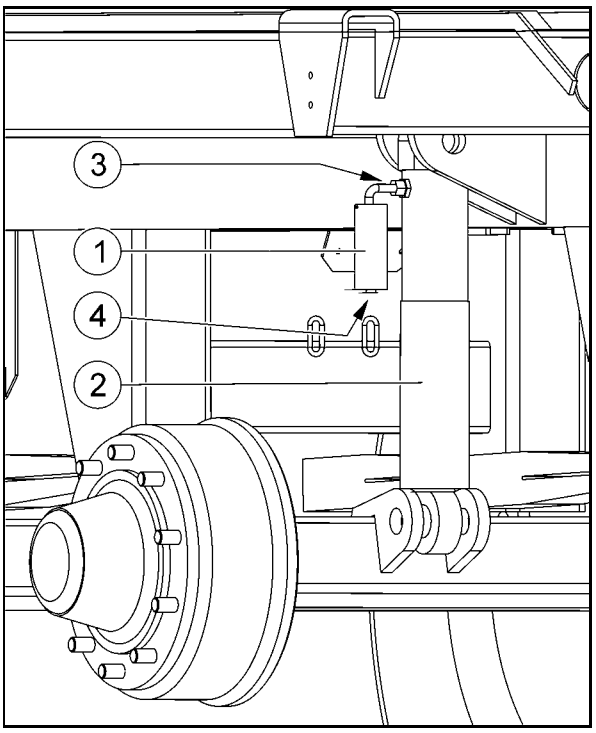


Fig. 136

Lubrication and maintenance plan **Hydro-pneumatic chassis**	Daily	After first journey with loaded material	Every 200 service hours	Every 500 service hours or once a year
Lubricate with long-life grease				
(1) Lubricate bearing of dash pots.			X	
Maintenance work				
Check all components for damage and wear (visual check).			X	
Check travelling height, readjust if necessary.	X			
[1] Check dash pots for their condition and their tightness.				X
[1] Change hydraulic oil of dash pots.				X
[2] Have the fastening device of the dash pots checked for tightness and wear (shop work!).				X

Lubrication and maintenance plan Hydro-pneumatic chassis	Daily	After first journey with loaded material	Every 200 service hours	Every 500 service hours or once a year
[3] Have spring fixing checked for tightness (shop work!).		X	X	
[4] Have spring bolts checked for tightness (shop work!).		X		X

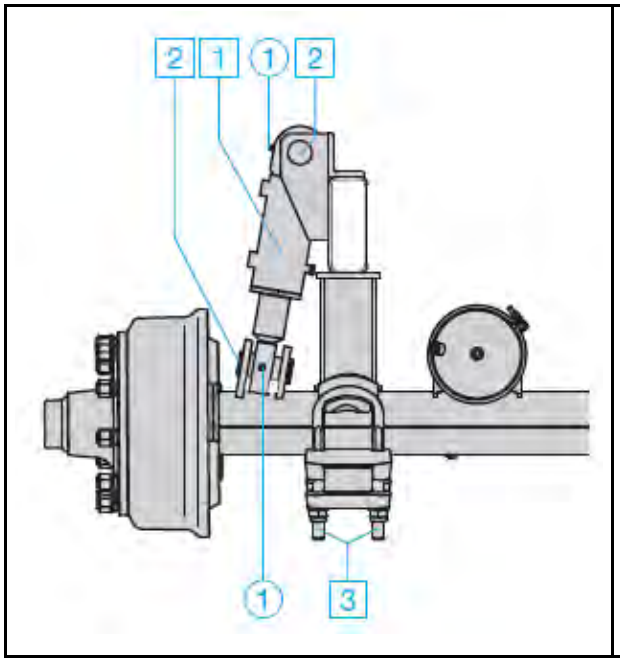


Fig. 137

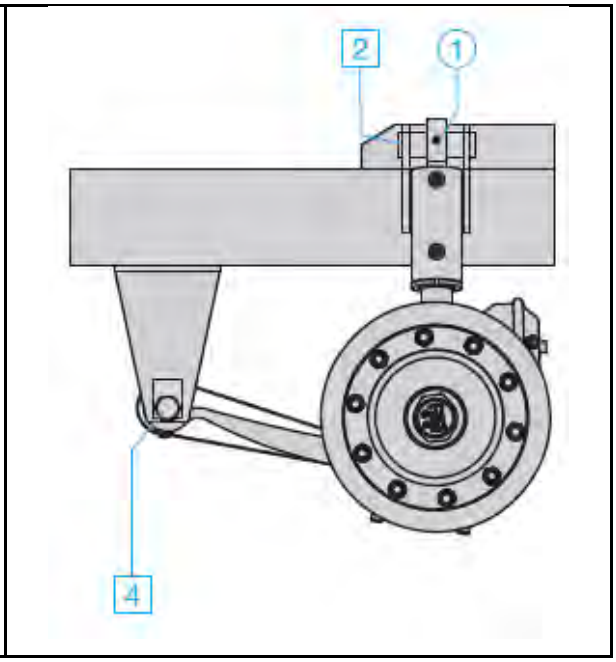


Fig. 138

12.12.1 Lubricate bearing of dash pots

Lubricate the lubrication points (1) at the top and bottom of the dash pot on the empty machine until fresh grease comes out of the bearings.

Ensure in addition that the cylinder and the feed line are always bled (shop work!).

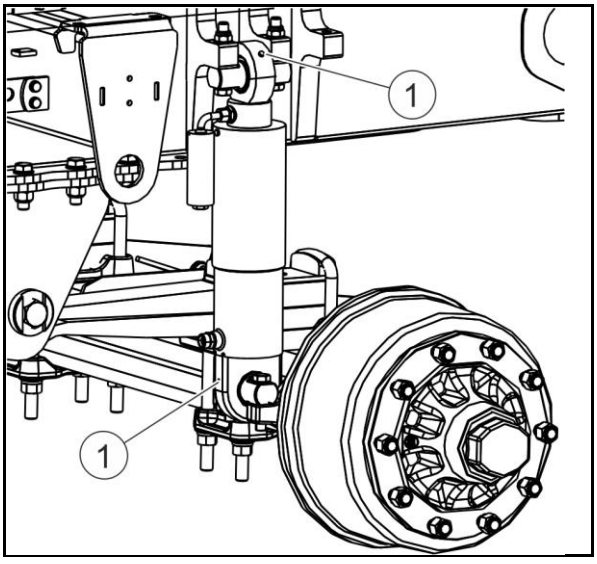


Fig. 139

12.12.2 Drain condensate

Tandem chassis

WARNING

Risk of crushing or impact to people and animals due to the lowering machine!

Make sure that people and animals leave the hazardous area of the machine before lowering the machine!

Successively carry out the required work for 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 rolling.
4. Connect the hydraulic hose pipe of the levelling valve with a single-acting control device of the tractor.
5. Completely lower the dash pots of the chassis:

   With three-way cock:

   5.1 Set the operating element for the levelling valve at the tractor's control device to open-centre position, such that the hydraulic oil can flow back into the hydraulic oil tank of the tractor.

   5.2 Use the upper stop-cock (2) to preselect the vehicle side to be lowered. In middle position, the line is blocked.

   5.3 Slowly turn the lower stop-cock (3) to vertical position.

   → The preselected vehicle side lowers.

   5.4 Turn the lower stop-cock (3) back to horizontal position.

   5.5 Repeat steps 5.2 to 5.4 for the other vehicle side.

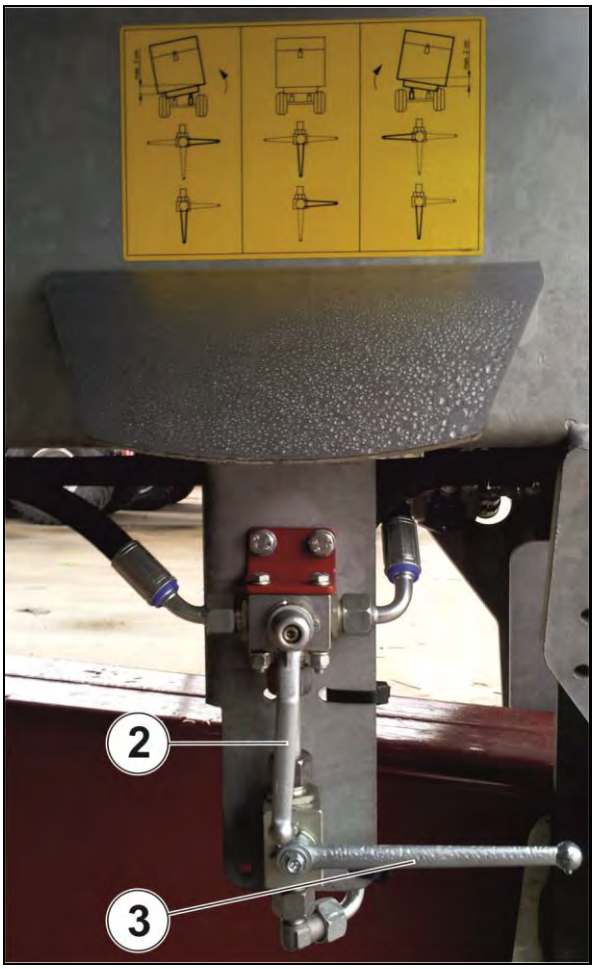


Fig. 140

With easy-to-use block (optional extra):

5.1 Press the stop button (7 or 8) to unlock the stop valve (9 or 10).

5.2 Turn the stop valve carefully to position "AB – down" as far as it will go.

5.3 Hold the operating element at the tractor's control device for the travelling height adjustment in "Lift" position until the pressure gauges (5, 6) indicate "0 bar".

→ The dash pots (2) of the chassis are completely lowered.

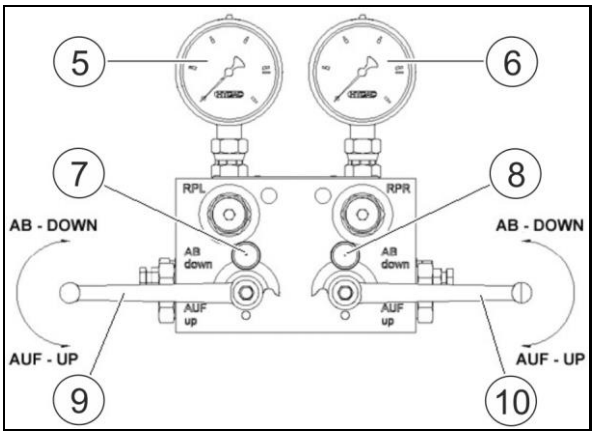


Fig. 141

6. Drain the condensate from the oil storage tanks (1):

6.1 Hold a drip tray beneath the oil storage tank.

6.2 Unscrew the drain plug (4).

→ The condensate pours into the drip tray.

6.3 Retighten the drain plug at 75 Nm as soon as hydraulic oil pours out.

7. Properly readjust the travelling height.

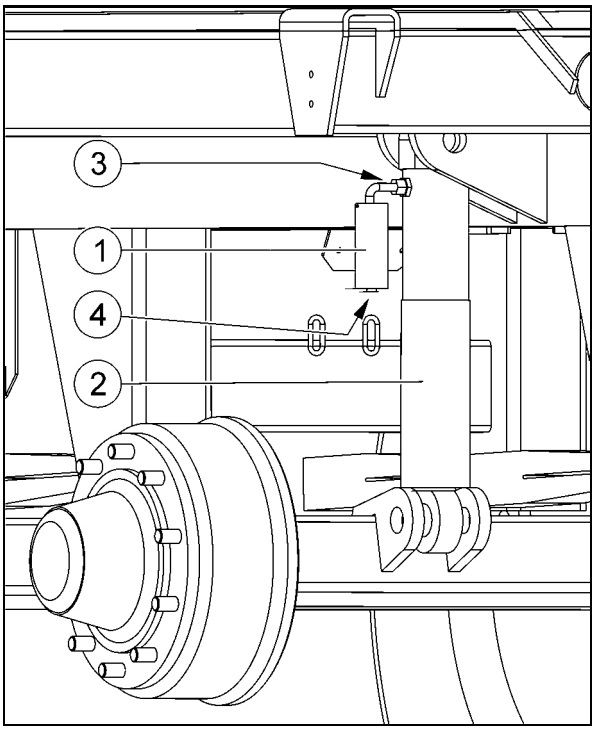


Fig. 142

12.12.3 Check/Top up hydraulic oil of dash pots

Tandem chassis

WARNING

Risk of crushing or impact to people and animals due to the lowering machine!

Make sure that people and animals leave the hazardous area of the machine before lowering the machine!

Successively carry out the required work for 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 rolling.
4. Connect the hydraulic hose pipe of the levelling valve with a single-acting control device of the tractor.
5. Completely lower the dash pots of the chassis:

With three-way cock:

5.1 Set the operating element for the levelling valve at the tractor's control device to open-centre position, such that the hydraulic oil can flow back into the hydraulic oil tank of the tractor.

5.2 Use the upper stop-cock (2) to preselect the vehicle side to be lowered. In middle position, the line is blocked.

5.3 Slowly turn the lower stop-cock (3) to vertical position.

→ The preselected vehicle side lowers.

5.4 Turn the lower stop-cock (3) back to horizontal position.

5.5 Repeat steps 5.2 to 5.4 for the other vehicle side.

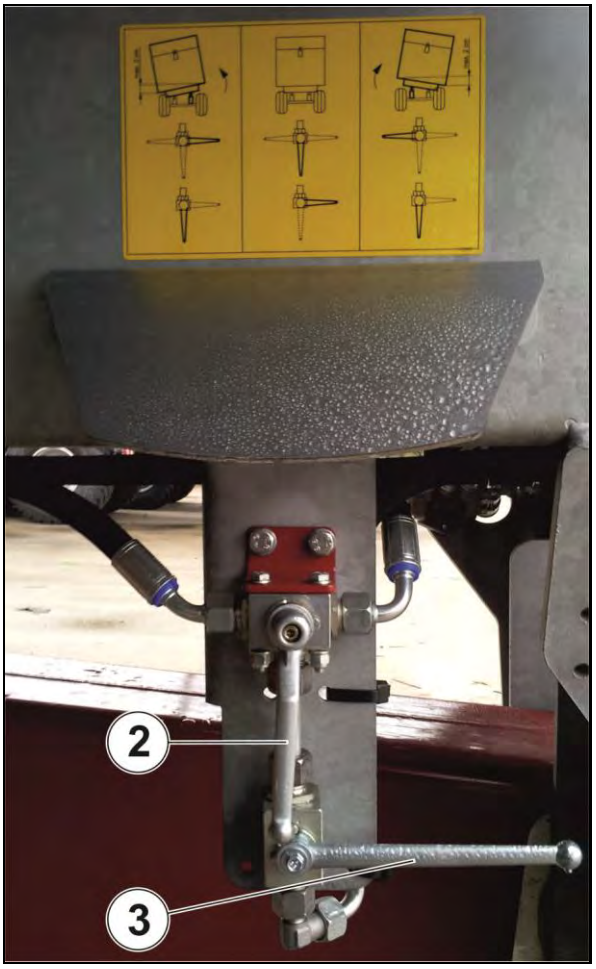


Fig. 143

With easy-to-use block (optional extra):

5.1 Press the stop button (7 or 8) to unlock the stop valve (9 or 10).

5.2 Turn the stop valve carefully to position "AB – down" as far as it will go.

5.3 Hold the operating element at the tractor's control device for the travelling height adjustment in "Lift" position until the pressure gauges (5, 6) indicate "0 bar".

→ The dash pots (2) of the chassis are completely lowered.

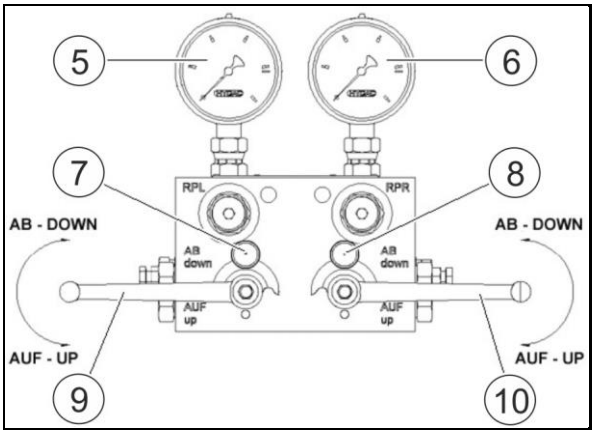


Fig. 144

6. Check the oil level in the oil storage tanks (1):
   - 6.1 Unscrew the screwed connection (3).
   - 6.2 Swivel the oil storage tank up.
   - 6.3 Retighten the screwed connection.
   - 6.4 Remove the drain plug (4).
   - 6.5 Take a clean object to be used as a dipstick.
   - 6.6 Insert this clean object into the filler neck to determine the oil level.
   - 6.7 Top the oil storage tank up halfway with hydraulic oil if necessary.
   - 6.8 Screw the drain plug in again and tighten it at 75 Nm.
   - 6.9 Unscrew the screwed connection (3).
   - 6.10 Swivel the oil storage tank down.
   - 6.11 Retighten the screwed connection.
7. Properly readjust the travelling height.

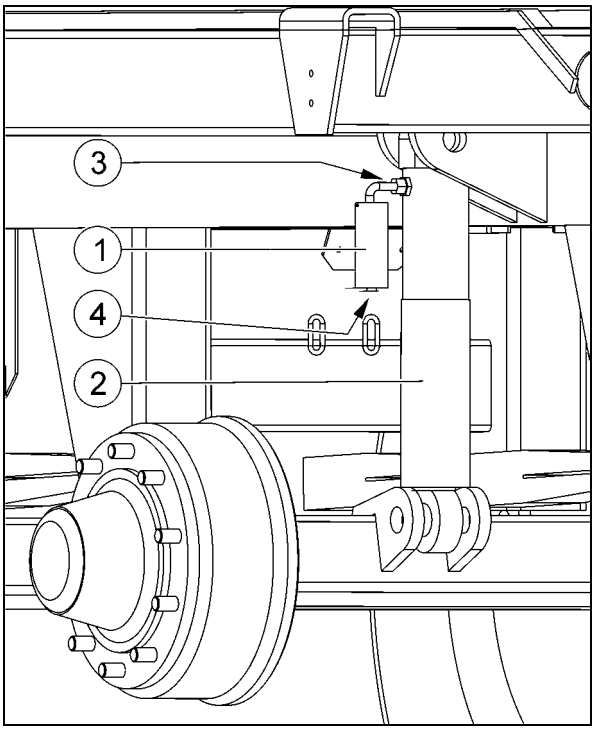


Fig. 145

12.12.4 Adjust travelling height via three-way cock (tandem chassis)

WARNING

Risk of crushing and impact when adjusting the travelling height!

Make sure that people leave the hazardous area beneath the machine before adjusting the travelling height.

- The travelling height is adjusted on firm, even ground via the levelling valve with the machine being empty.
- 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.

Set the correct distance X between the locating points of the hydraulic cylinders (7) 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.

Ensure that the brakes of the machine are not applied.

4. Connect the hydraulic hose pipes of the levelling valve with a single-acting control device of the tractor.
5. Use the upper stop-cock (2) to select the vehicle side to be pressurised. In middle position, the line is blocked.
6. Turn the lower stop-cock (3) slowly to vertical position to increase the distance X.

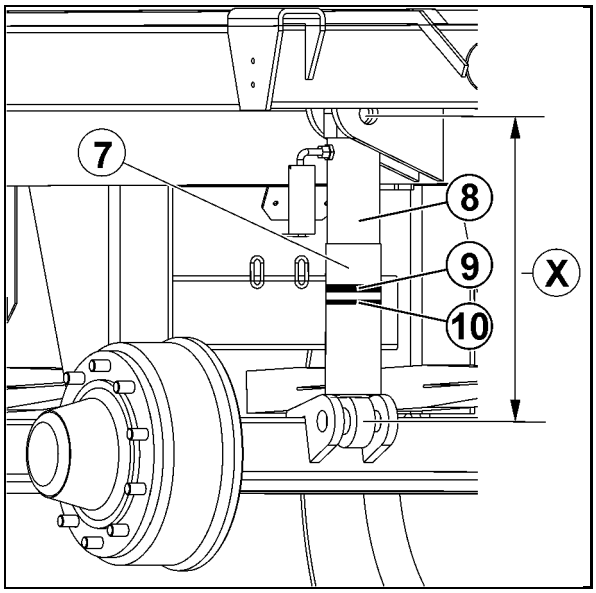


Fig. 146

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.

7. Hold the operating element at the tractor's control device in "Lift" position
   - until the distance X = 600±10 mm or
   - until the lower edge of the protective tube (8) is within the upper, wide marking (9).

     The lower, narrow marking (10) should be reached with the machine being fully charged.
8. Set the operating element for the levelling valve at the tractor's control device to open-centre position.
9. Turn the lower stop-cock (3) back to horizontal position.
10. Repeat steps 5 to 9 for the other vehicle side.

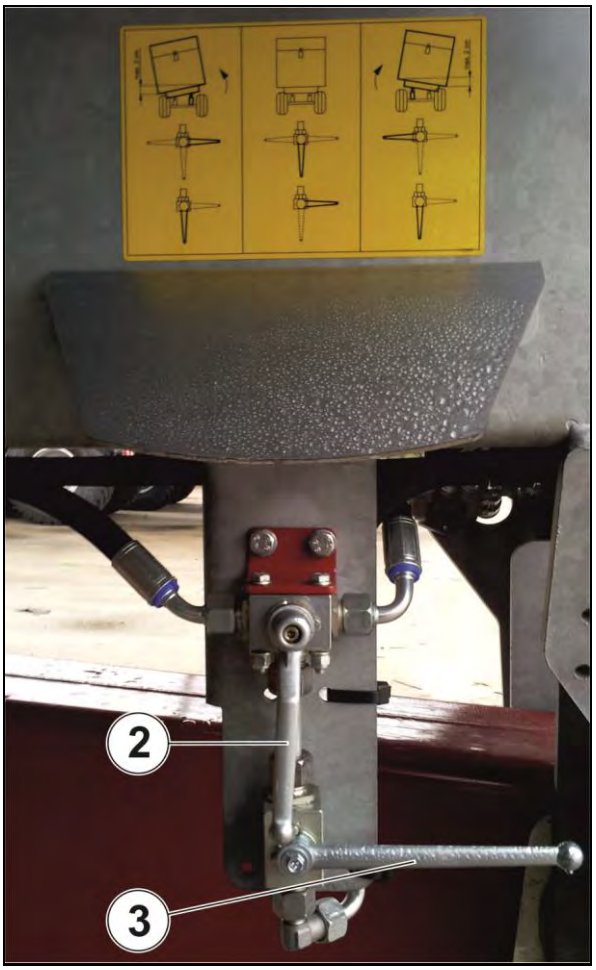


Fig. 147

12.12.5 Adjust travelling height via easy-to-use block (tandem chassis)

Optional extra

WARNING 	**Risk of crushing and impact when adjusting the travelling height!** Make sure that people leave the hazardous area beneath the machine before adjusting the travelling height.

- The travelling height is adjusted on firm, even ground via the levelling valve with the machine being empty.
- 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.

The travelling height is set:

- for the right-hand machine side by means of the operating elements (1, 3, 5),
- for the left-hand machine side by means of the operating elements (2, 4, 6).

With the machine being empty, the pressure gauges (1, 2) display approx. 20 bar at the levelling valve.

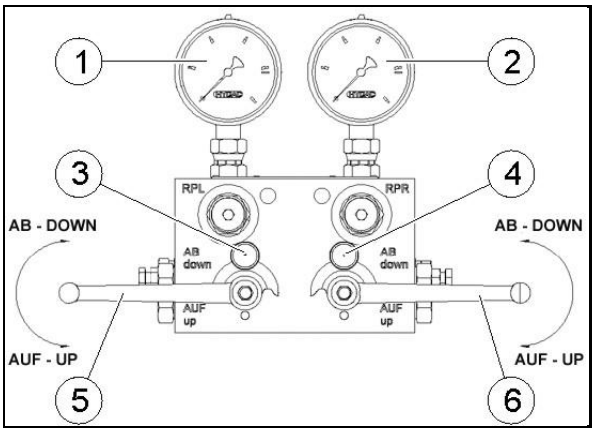


Fig. 148

Set the correct distance X between the locating points of the hydraulic cylinders (7) 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.

Ensure that the brakes of the machine are not applied.

4. Connect the hydraulic hose pipes:
   - 4.1 Connect the pressure line of the levelling valve with a single-acting control device of the tractor.
   - 4.2 Connect the return line of the machine to the return line of the tractor.
5. Turn the stop-cock (5 or 6) to position "AUF" (increase distance X) or "AB" (reduce distance X):
   - 5.1 Press the stop button (3 or 4) to unlock the stop-cock.
   - 5.2 Turn the stop-cock carefully as far as it will go.
6. Hold the operating element at the tractor's control device in "Lift" position
   - until the distance X = 600±10 mm or
   - until the lower edge of the protective tube (8) is within the upper, wide marking (9).

     The lower, narrow marking (10) should be reached with the machine being fully charged.

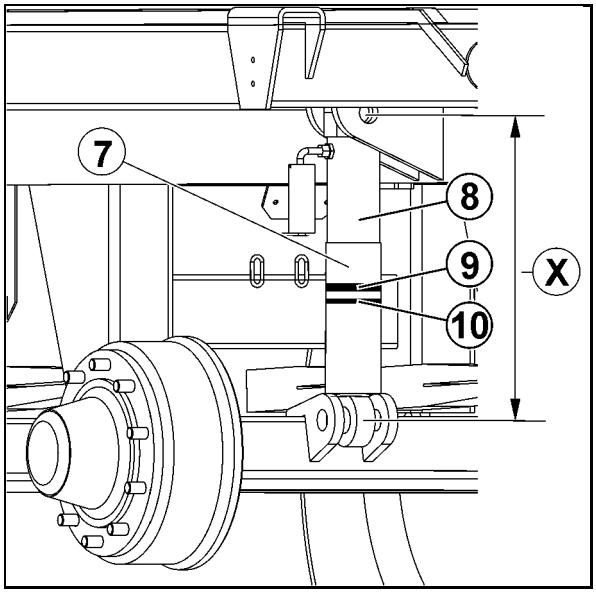


Fig. 149

12.12.6 Adjust travelling height (tridem chassis)

WARNING

Risk of crushing and impact when adjusting the travelling height!

Make sure that people leave the hazardous area beneath the machine before adjusting the travelling height.

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.

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. Lower the lift axle.
6. Hold the operating element for the travelling height adjustment at the tractor's control device in "Lift" position until the levelling valves (1) have lifted or lowered the chassis to the correct travelling height.
7. Set the operating element at the tractor's control device to open-centre position for approx. 10 seconds to ensure that the piloted check valves of the levelling valves can close.

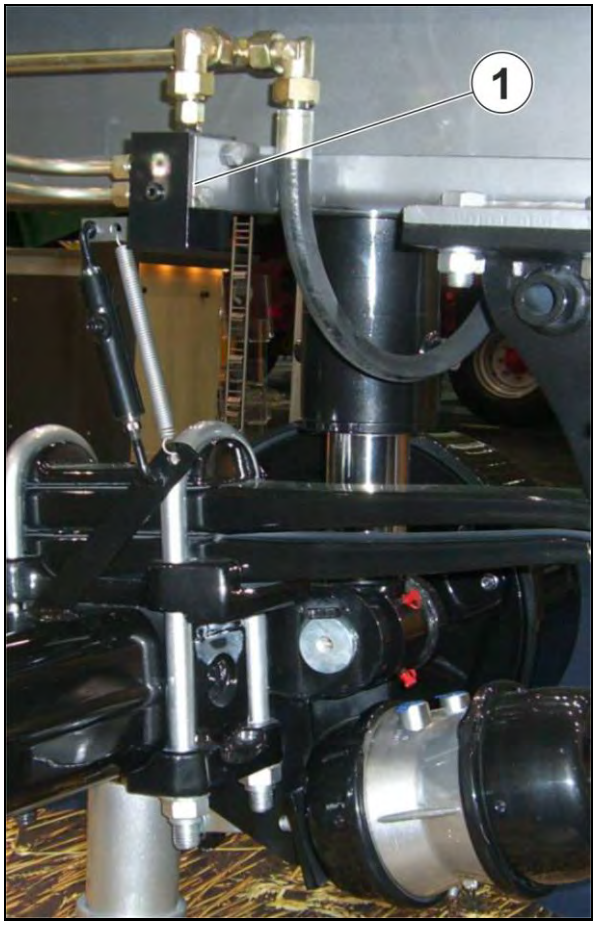


Fig. 150

12.13 Transport floor

WARNING

Risk of becoming entangled, wound up or risk of shearing due to the machine accidentally starting!

Only enter the cargo space with the machine switched off and secured against accidental starting.

Ensure that the transport floor strips on the right-hand and left-hand side do not bump against the frame (1)!

Equally shorten the chains of the transport floor if the tension path of the chain tensioners is no longer sufficient to retighten the chains!

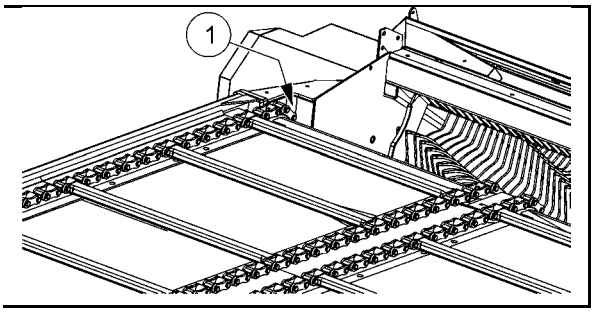


Fig. 151

The chains of the transport floor:

- are automatically pre-tightened,
- must be tightened equally, but not too firmly,
- are only allowed to sag slightly.

12.13.1 Shorten and tighten transport floor chain

WARNING	**Risk to eyes due to blown-away abrasive particles when cutting chain links by means of a right-angle grinder!**
	Wear protective goggles when cutting the chain links by means of the right-angle grinder.

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. Tighten the respective nut (2) to loosen the respective pawl (1) of the chain tensioners.
4. Unscrew the counter nuts (3) of the clamping screws (4).
5. Turn the 4 clamping screws counterclockwise.

→ The chain tension is released and the chains sag.

6. Enter the cargo space through the access door to shorten the chains.
7. Open and remove the chain connecting links.
8. Always cut out an even number of chain links (2, 4, 6) at all chains by means of a right-angle grinder.
9. Put the shortened chains together by means of new chain connecting links.
10. Turn the 4 clamping screws clockwise.

→ The chains are tightened.

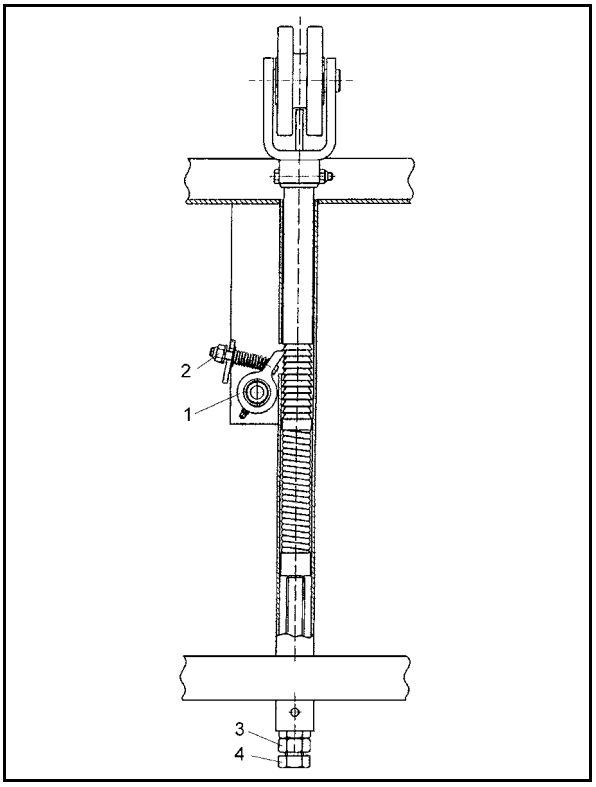


Fig. 152

11. Unscrew the nuts of the pawls.
12. Check the screw-in depth of the clamping screws. The transport floor springs must always be tensioned to maximum. All clamping screws must have the same screw-in depth.
13. Tighten the counter nuts.
14. Close the access door.
15. Fold the ladder up.
16. Lock the ladder and the access door by means of the locking mechanism.
17. Use the stop-cock to unlock the tailgate.

12.13.2 Lubricate chain tensioners and deflection points of transport floor

1. Lubricate the chain tensioners and the front deflection points of the transport floor chains via all lubricating nipples of the front lubricating strip (1).

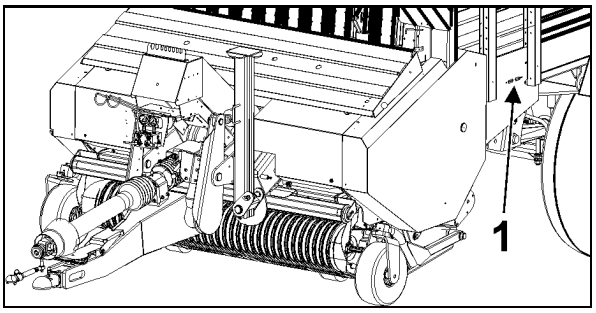


Fig. 153

2. Lubricate the rear lateral feed shaft bearings of the transport floor chains via the rear lubrication points (2).

   If the machine is equipped with dosing drums, open the left-hand and right-hand side protector of the dosing drum drive for that purpose.

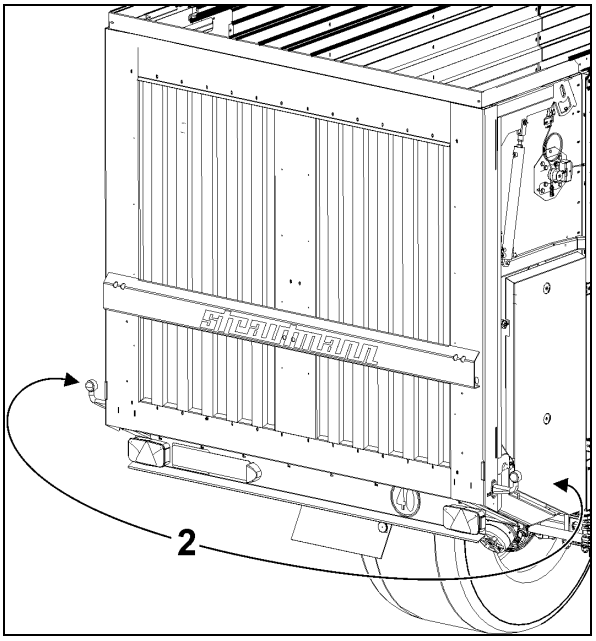


Fig. 154

12.14 Pick-up

WARNING

Risk to people of being crushed, drawn in and becoming entangled due to unsecured powered driving elements!

Powering of the pick-up is not allowed with the side protector opened and/or the protective casing of the pick-up removed. Fix the protective casing of the pick-up properly to the machine and close the right-hand movable side protector before operating the machine.

12.14.1 Bleed friction clutch of pick-up

The friction clutch must be bled before the first start-up and after longer downtimes to ensure its proper functioning.

The easiest way to bleed the stuck friction clutch is to charge the machine with material to be loaded for a short time with the groove nut unscrewed such that the stuck friction clutch slips for a short time.

1. Unscrew and remove the two screws of the protective casing of the pick-up (1).
2. Remove the protective casing of the pick-up.
3. Unlock and unscrew the groove nut (2).

Remember exactly the number of turns made to unscrew the groove nut to ensure that the friction clutch can be properly pre-tightened again!

4. Fix the protective casing of the pick-up to the machine by means of the two screws.
5. Start the tractor engine.
6. Charge the machine with material to be loaded for a short time such that the stuck friction clutch slips for 2 to 3 seconds and is freed (excessive slipping will damage the friction linings).

   Repeat this procedure up to three times if the friction clutch does not slip.
7. Turn the tractor engine off.
8. Pull the ignition key out.
9. Unscrew and remove the two screws of the protective casing of the pick-up.
10. Remove the protective casing of the pick-up.
11. Retighten the groove nut with the exact number of turns made for unscrewing.

    Torque of friction clutch: 900-1000 Nm
12. Lock the groove nut.
13. Fix the protective casing of the pick-up to the machine by means of the two screws.

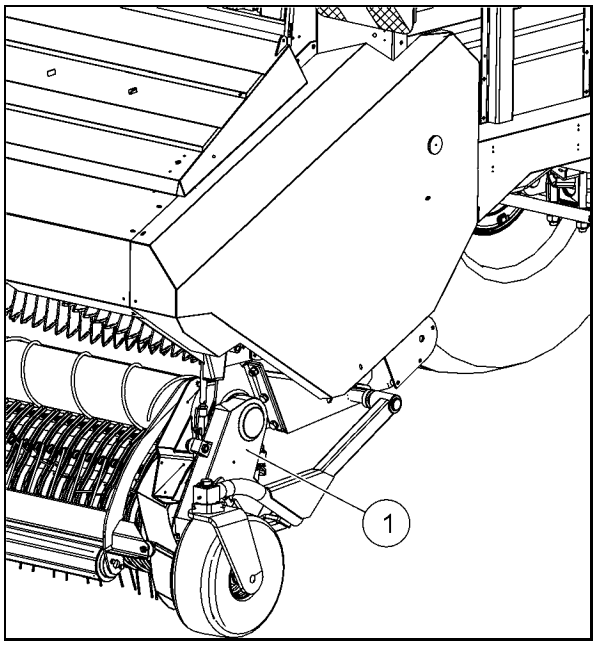


Fig. 155

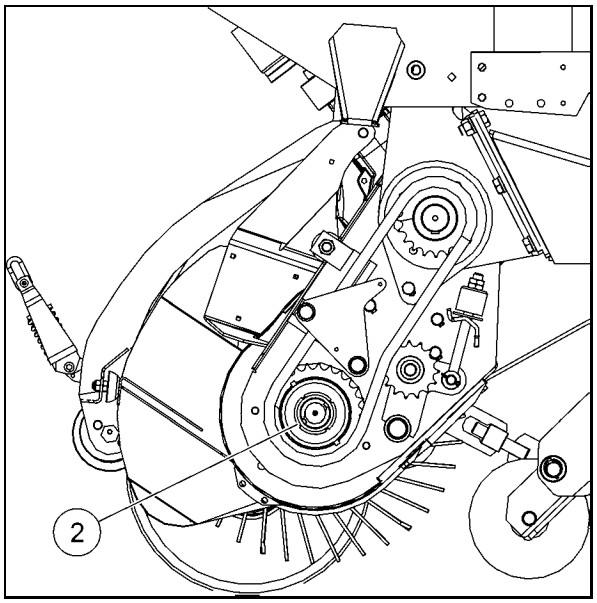


Fig. 156

12.14.2 Check/Retighten tension of roller chain for pick-up drive

Check the tension of the roller chain at the chain tensioner every day. The roller chain must be retightened if the distance between washer and sleeve is more than 8 mm.

1. Lower the pick-up to working position.
2. Secure tractor and machine against accidental starting and rolling.
3. Unscrew the counter nut (1) by means of an open-end wrench (wrench size SW 24).
4. Turn the hexagon nut (2) such that the distance between washer (3) and sleeve (4) is less than 8 mm.
5. Tighten the counter nut.

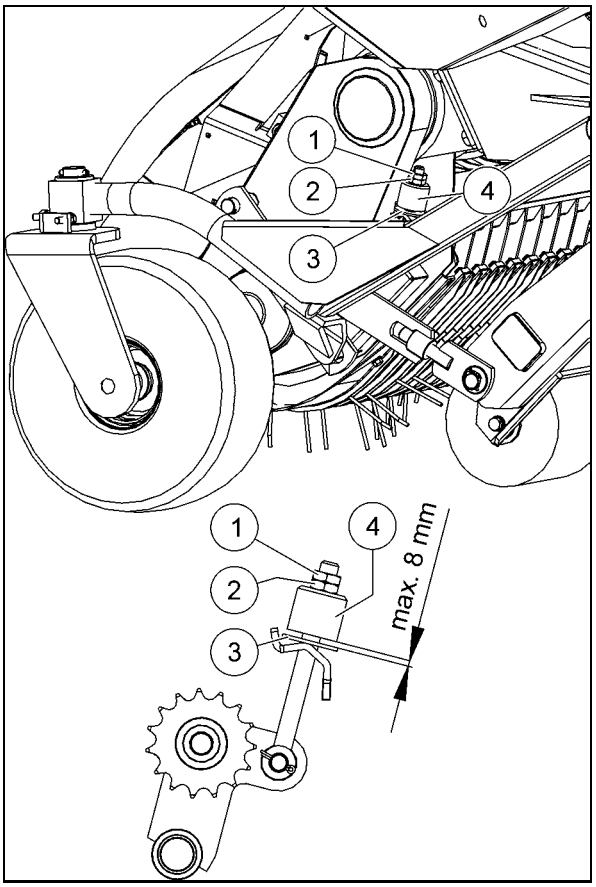


Fig. 157

12.15 CFS drum

WARNING

Risk to people of being crushed, drawn in and becoming entangled due to unsecured powered driving elements!

Powering of the pick-up is not allowed with the side protector opened and/or the protective casing of the pick-up removed. Fix the protective casing of the pick-up properly to the machine and close the right-hand movable side protector before operating the machine.

12.15.1 Bleed friction and compensating clutch of CFS drum

The friction and compensating clutch must be bled before the first start-up and after longer downtimes to ensure its proper functioning.

1. Open the right-hand movable side protector.
2. Secure the open right-hand side protector against accidental slamming.
3. Relieve the friction clutch (1) by equally tightening the nuts (2).
4. Close the right-hand movable side protector and lock it in protective position.
5. Start the tractor engine.
6. Charge the machine with material to be loaded for a short time such that the stuck friction clutch slips for 2 to 3 seconds and is freed (excessive slipping will damage the friction linings).

   Repeat this procedure up to three times if the friction clutch does not slip.
7. Turn the tractor engine off.
8. Pull the ignition key out.
9. Open the right-hand movable side protector.
10. Secure the open right-hand side protector against accidental slamming.
11. Charge the friction clutch by turning the nut back up to the end of thread (3).
12. Close the right-hand movable side protector and lock it in protective position.

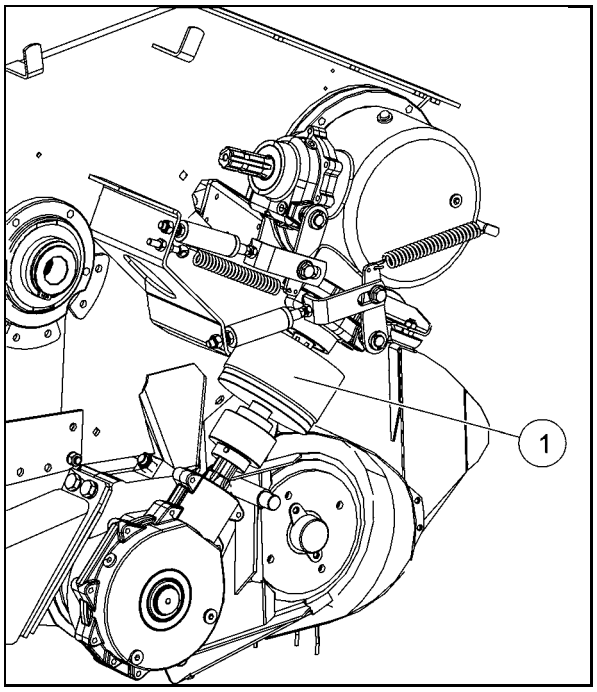


Fig. 158

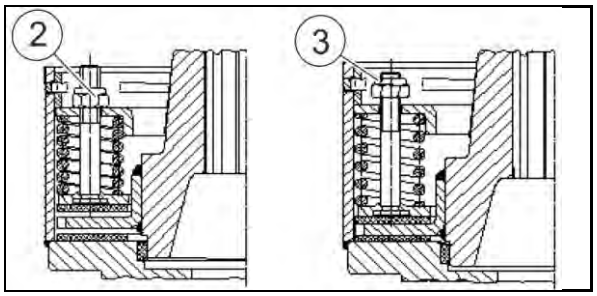


Fig. 159

12.15.2 Remove/Mount friction and compensating clutch of CFS drum

1. Open the right-hand movable side protector.
2. Secure the open right-hand side protector against accidental slamming.
3. Remove the circlip (1).
4. Move the casing (2) downward.
5. Remove the hexagon screws (3).
6. Pull the flange (4) with the coupling half (5) off to the side.
7. Remove the hexagon screw (6).
8. Push the friction and overrunning clutch downward.
9. Pull the friction and overrunning clutch (7) off to the side.
10. Mount the friction and overrunning clutch in reverse order.
11. Close the right-hand movable side protector and lock it in protective position.

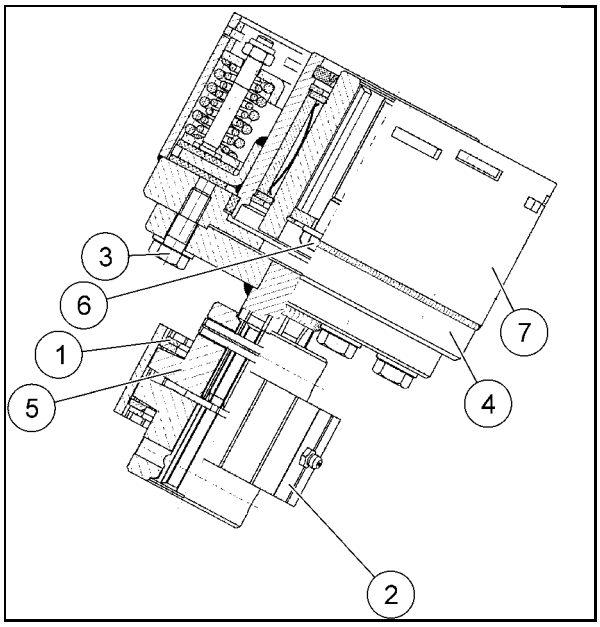


Fig. 160

12.15.3 Align switch rods with respect to the switch levers of the angular switchgear (only when equipped with dosing drums)

Align the switch rods with respect to the switch levers of the angular switchgear when the pick-up is powered and the tailgate is open.

1. Open the right-hand movable side protector.
2. Secure the open right-hand side protector against accidental slamming.
3. Take off the two springs (6).
4. Unscrew and remove the screwed connection (7) and the collar bushing (8).
5. Open the tailgate to completely extend the hydraulic cylinders (9, 10).
6. Turn the two switch levers (3, 4) in the direction of the arrow (11) as far as they will go.
7. Check the alignment of the oblong hole (12, 13) of the switch rod (1, 2) with respect to the borehole in the switch lever (3, 4).

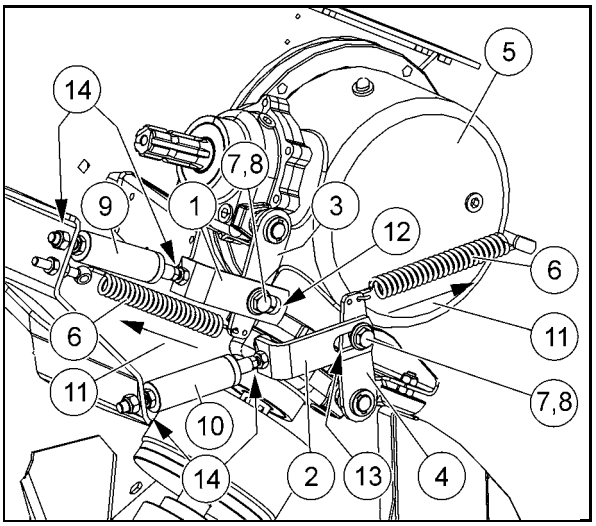


Fig. 161

The switch rod (1) must be aligned such that the borehole of the switch lever (3) has a distance of 3 mm to the left-hand edge of the oblong hole (12).

The switch rod (2) must be aligned such that the borehole of the switch lever (4) has a distance of 3 mm to the right-hand edge of the oblong hole (13).

8. Align the switch rod with respect to the switch lever if necessary by changing the fitting length of the hydraulic cylinders and the switch rod via the adjusting screws (14).
9. Screw the switch lever and the switch rod together by means of the screwed connection and the collar bushing.
10. Mount the two springs.
11. Close the right-hand movable side protector and lock it in protective position.
12. Close the tailgate.

12.16 Cutting unit

CAUTION

Risk of cuts when carrying out assembly work on sharp cutting knives!

Wear cut-proof protective gloves when carrying out work on the cutting knives.

CAUTION

Risk of crushing and shearing when swivelling the cover plate!

- Use the handle when swivelling the cover plate.
- Make sure that people leave the hazardous area on the opposite side before swivelling the cover plate.

12.16.1 Clean cutting unit

The knife security system of the cutting knives must be cleaned by means of compressed air every day!

A soiled cutting unit leads to worse response characteristics of the knife security system.

WARNING

Risk due to blown-away grass and dirt particles when blowing out the retainers, slots and knife security system by means of compressed air!

Always wear protective goggles when blowing out the retainers, slots and knife security system by means of compressed air.

These measures will support easier removal and reinstallation of the cutting knives:

- Use compressed air to clean the retainer of the cutting knives before removing the cutting knives.
- Use compressed air to clean the slots of the cutting knives before reinstalling the cutting knives.

12.16.1.1 Clean knife security system

Mounting lever and knife lever are accommodated in the holder (1) on the left-hand machine side (in direction of motion) in the vehicle frame at the cutting unit.

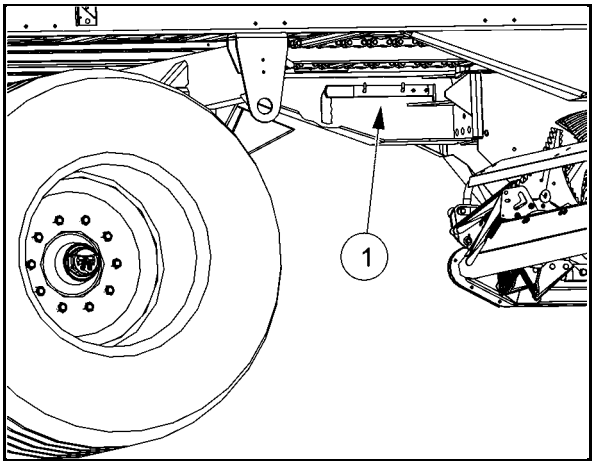


Fig. 162

1. Daily clean:
   - the gaps (1) between the cutting knives/knife holders.
   - the lever pockets (2) of the individual knife holders.

     Use the mounting lever (3) and compressed air for this purpose.
2. Lubricate the roller (4) in the lever pocket of the individual knife holders several times during the season and check the smooth running of the rollers during that procedure as follows:

   2.1 Take off the spring (5) at the outer ring (6) of the knife holder by means of the mounting lever.

   → The lever pocket falls down and the roller can be accessed.

   2.2 Free stuck rollers by means of a pair of water-pump pliers.

   2.3 Lubricate the roller.

   2.4 Hang up the spring at the outer ring of the knife holder by means of the mounting lever.

   2.5 Repeat steps 2.1 to 2.4 for the other knife holders.

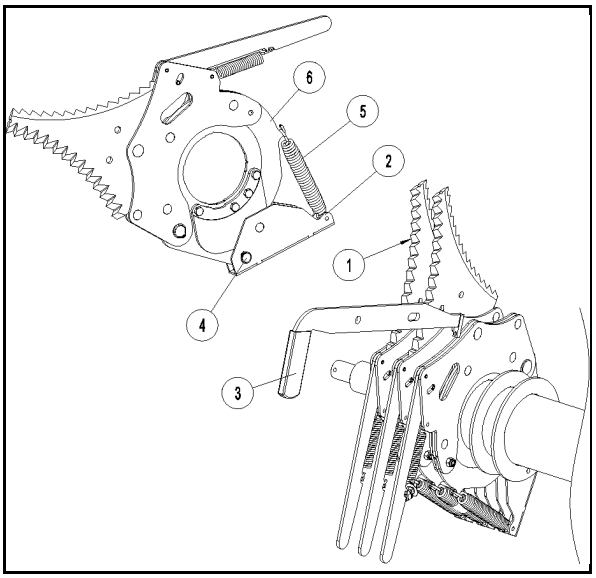


Fig. 163

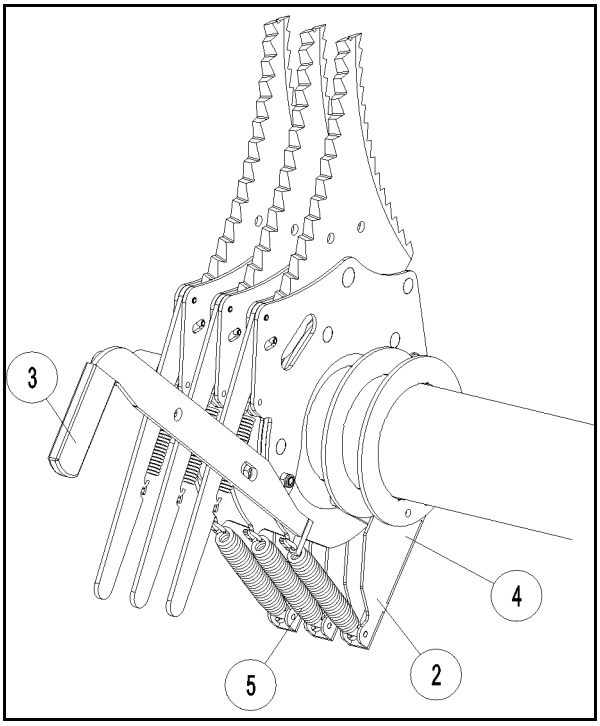


Fig. 164

12.16.2 Remove and install cutting knives

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.

12.16.2.1 Remove cutting knives

1. Retract the cutting unit via the control set.
2. Fold the folding drawbar by means of the hydraulic cylinders to increase the free space to the cutting knives.
3. Switch the oil circulation between tractor and machine off.
4. Secure tractor and machine against accidental starting and rolling.
5. Pull the bolt (1) out.
6. Fold the cover plate (2) down.
7. Wear protective goggles.
8. Wear protective gloves.
9. Remove the knife lever (3) and the mounting lever (4) out of the holder (5). The holder is positioned on the left-hand machine side (in direction of motion) in the vehicle frame at the cutting unit.

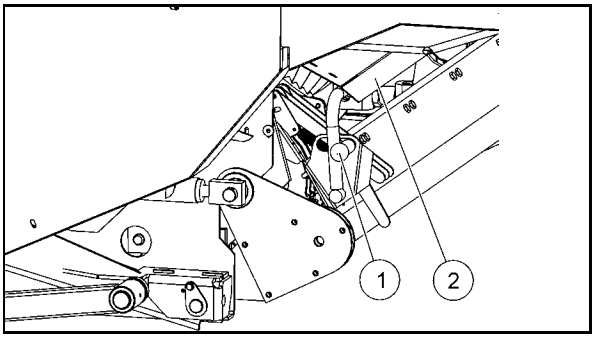


Fig. 165

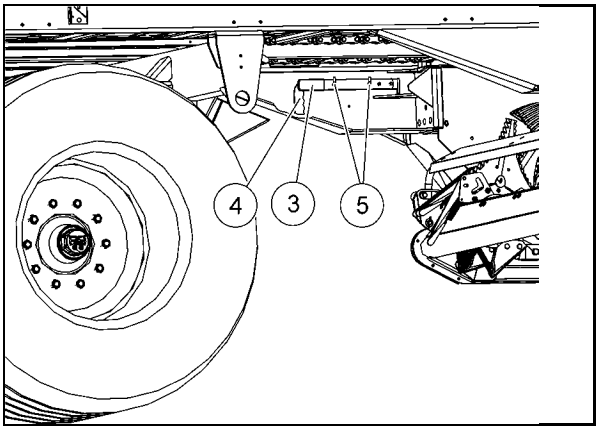


Fig. 166

10. Clean the gaps of the cutting knives (5) / knife holders (7) by means of the mounting lever and compressed air.
11. Insert the knife lever into the boreholes of the cutting knife.
12. Pull the locking lever (6) up and lift the cutting knife out of the knife holder.

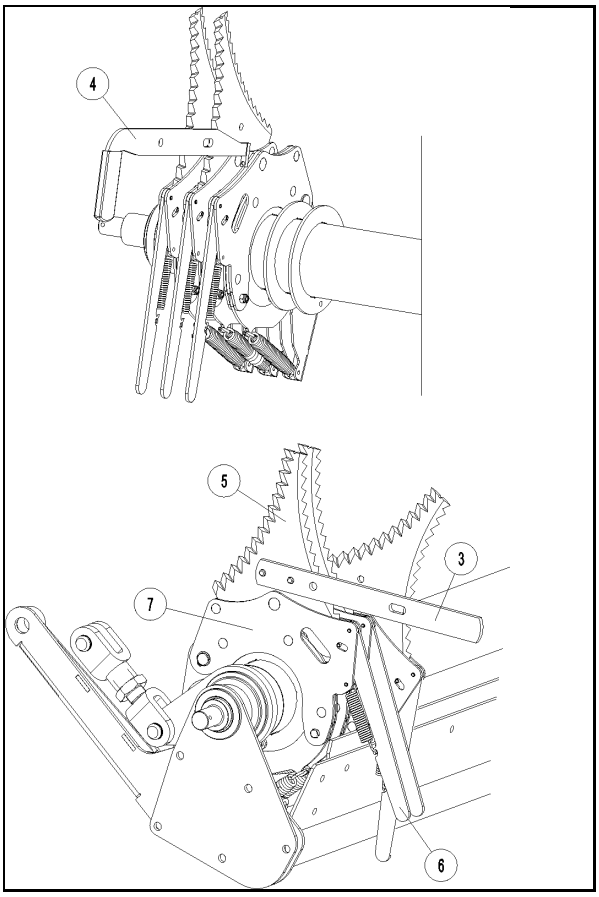


Fig. 167

12.16.2.2 Install cutting knives

WARNING

Risk of crushing and shearing when extending the cutting unit into the conveyor duct!

Extending the cutting unit into the conveyor duct is not allowed if:

- people are beneath the machine,
- people may reach or reach into the dangerous spots alongside the cutting unit.

1. Wear protective goggles.
2. Use compressed air to clean the slots for the cutting knives.
3. Put the cutting knife (1) onto the knife lever (2).
4. Pull the locking lever (3) up and insert the cutting knife from the top into the knife holder (4).

When installing the cutting knives, ensure that the locking lever completely engages again. The locking lever has completely engaged if it is in close contact with the frame (5) of the cutting unit, the slotted dowel pin (6) being at the front in the oblong hole.

5. Refix the mounting lever and the knife lever in the holder.
6. Fold the cover plate (7) up again.
7. Lock the cover plate by means of the bolt (8) in the oblong hole (9).
8. Release the parking brake of the machine after all cutting knives have been reinstalled.
9. Start the tractor engine.
10. Switch the oil circulation between tractor and machine on with the tractor engine running.
11. Lower the pick-up.
12. Switch the tractor's p.t.o. shaft on.

    Pick-up and feeder rotor are powered.

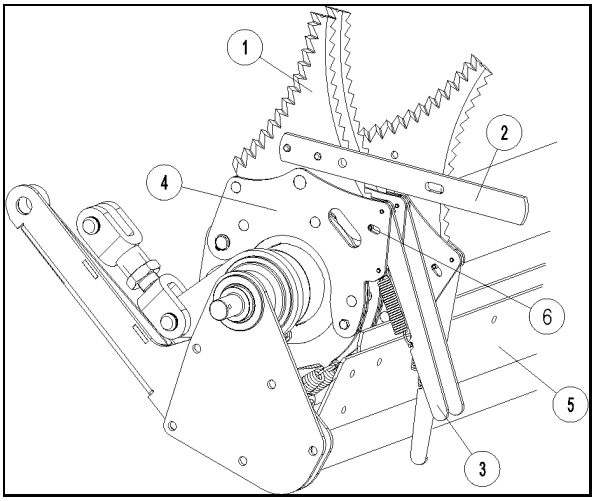


Fig. 168

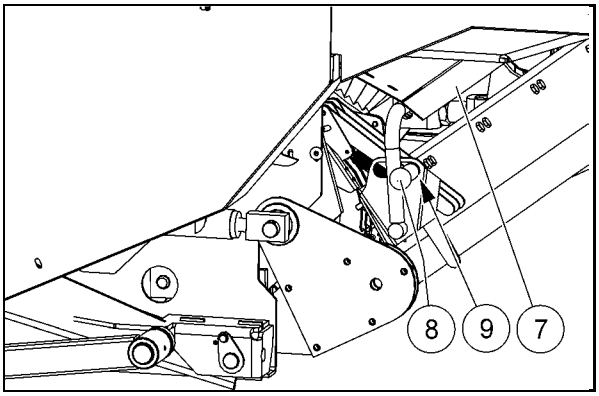


Fig. 169

13. Extend the cutting unit into the conveyor duct via the control set.
14. Lower the folding drawbar.

12.16.3 Grind cutting knives

Sharp cutting knives:

- reduce the effort required for powering the conveying unit,
- reduce conveying unit wear,
- increase the service life of the conveying unit.

- Regularly check the cutting knives for sharpness.
- Turn blunt cutting knives over (every 12 service hours) or grind them (every 24 service hours).
- Use a right-angle grinder with a flap grinding wheel when grinding the cutting knives.
- Only grind the cutting knives on their smooth side, never on their corrugated side!

WARNING

Risk to eyes due to blown-away abrasive particles when grinding the cutting knives!

Always wear protective goggles when grinding cutting knives.

12.16.4 Set distance between cutting knives and rotor

The distance between the cutting knives and the rotor must be approx. 26 mm over the entire width of the rotor. This distance will ensure optimum cutting of the loaded material. The cutting knives must not come into contact with the rotor.

WARNING

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

Secure tractor and machine against accidental starting and rolling before opening the access door to the cargo space and entering the cargo space.

1. Lift the folding drawbar to increase the free space to the cutting knives.
2. Enter the cargo space through the access door.
3. Measure:
   - the distance (X) between the cutting knives (1) and the rotor (2) from the cargo space through the slots of the conveyor duct.
   - the distance on the right-hand and left-hand side of the rotor, as the distance between the cutting knives and the rotor must be equal over the entire width of the rotor.
4. Adjust the distance (X) between the cutting knives (1) and the rotor (2) at the respective upper link (3) on the right-hand and left-hand side of the machine if the measured value is not approx. 26 mm.

   4.1 Unscrew the counter nut (Fig. 171/2).

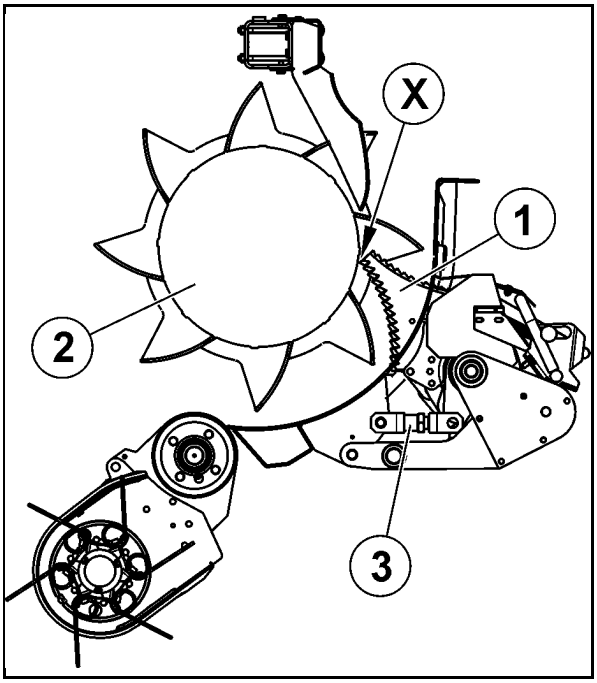


Fig. 170

4.2 Remove the bolt (4) to loosen the upper link fork (Fig. 171/3) from the receiver pipe (5).

4.3 Turn the respective upper link fork to set the distance between the cutting knives and the rotor.

- Increase distance between cutting knives and rotor = shorten upper link = turn upper link fork clockwise.
- Reduce distance between cutting knives and rotor = lengthen upper link = turn upper link fork counterclockwise.

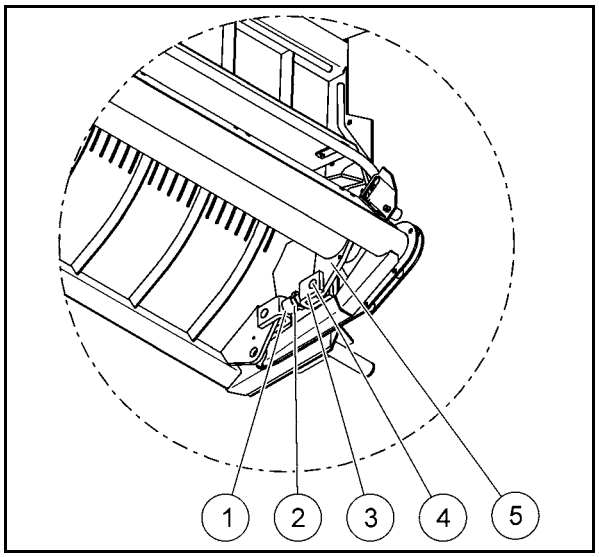


Fig. 171

4.4 Measure again the distance on the right-hand and left-hand side of the rotor to check the set distance.

4.5 Fix the upper link fork to the receiver pipe by means of the bolt if the distance between cutting knives and rotor has been properly set.

4.6 Tighten the counter nut.

5. Reset the bracket (6):

5.1 Unscrew the screws (7).

5.2 Completely retract the cutting unit.

5.3 Push the bracket (6) as far as it will go below the knife mount (8).

5.4 Tighten the screws (7).

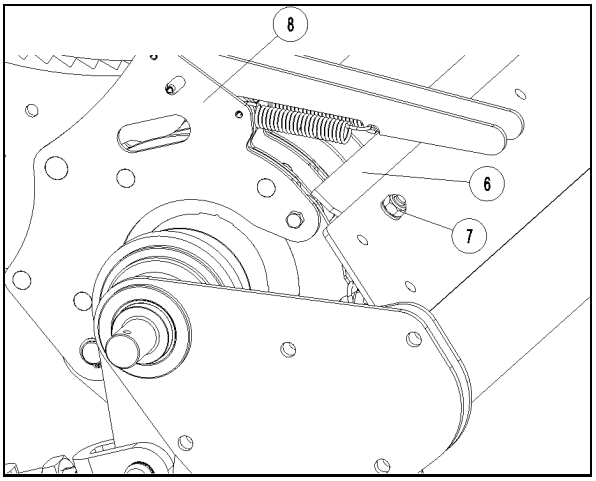


Fig. 172

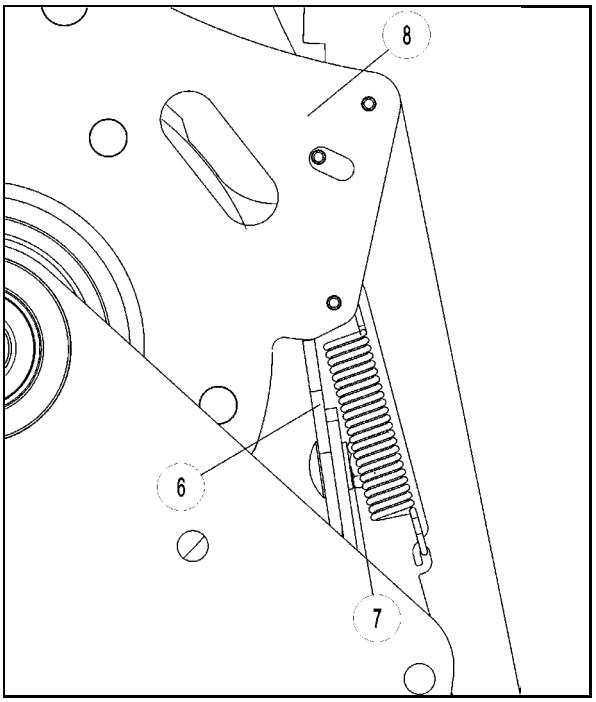


Fig. 173

12.16.5 Check distance between strippers and rotor

Shop work

Deformed stripper holders must be immediately replaced by an authorised workshop! Only an authorised workshop is allowed to carry out this work!

The minimum distance between the strippers and the rotor must be 17 mm over the complete width of the rotor. The distance must not fall below the minimum value.

Reasons for a too small distance between strippers and rotor are:

- worn strippers or
- deformed stripper holders.

WARNING

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

Secure tractor and machine against accidental starting and rolling before opening the access door to the cargo space and entering the cargo space.

1. Secure tractor and machine against accidental starting and rolling.
2. Enter the cargo space through the access door.
3. Check the stripping surfaces (3) of the strippers (1) and measure the distance X between the strippers and the feeder rotor (2).

   Replace all strippers

   - if the stripping surface (3) has been scraped round.
   - if the distance X to the feeder rotor is less than 17 mm.

Deformed stripper holders may also be the reason for a too small distance between strippers and feeder rotor.

Have deformed stripper holders immediately replaced by an authorised workshop! Only an authorised workshop is allowed to carry out this work!

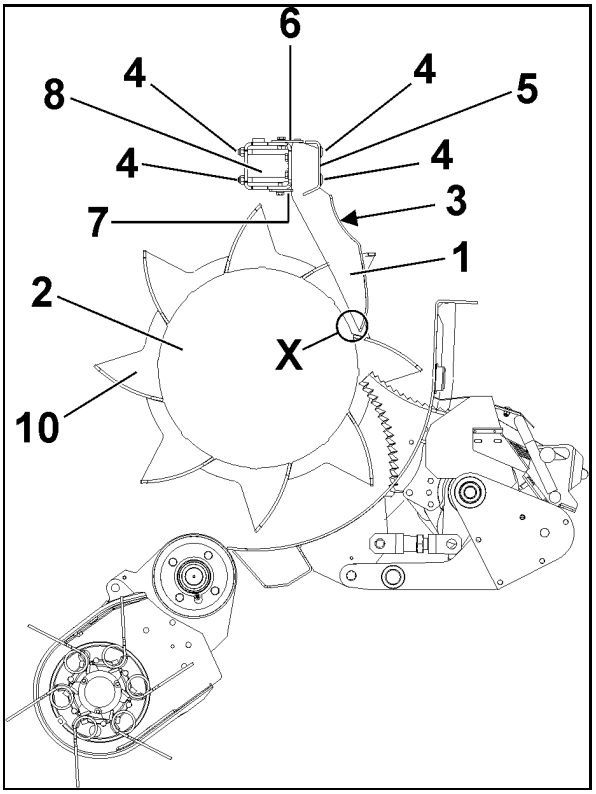


Fig. 174

12.16.6 Replace strippers

Shop work

WARNING

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

Secure tractor and machine against accidental starting and rolling before opening the access door to the cargo space and entering the cargo space.

1. Secure tractor and machine against accidental starting and rolling.
2. Enter the cargo space through the access door.
3. Number the strippers (1) to mount them in the correct position afterwards.
4. Unscrew the screws (4).
5. Remove the safety rail (5) of the stripper holder by pulling it to the rear.

   Have deformed stripper holders immediately replaced by an authorised workshop! Only an authorised workshop is allowed to carry out this work!

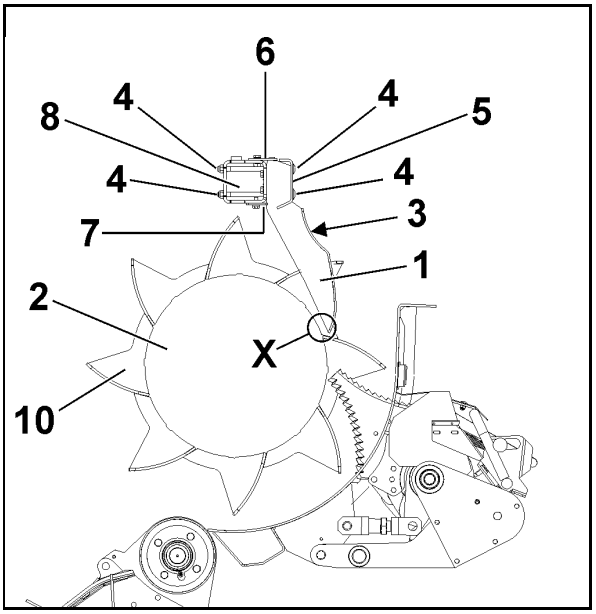


Fig. 175

6. Clean the spaces between the strippers.
7. Remove the strippers by turning the lower tip upwards to the rear.
8. Hang the new strippers into the upper guide plate (6) and move them down until they are accommodated in the lower slot (7) and are in close contact with the stripper pipe (8).

   Use a right-angle grinder to grind the new strippers to size if necessary (wear protective goggles!).
9. Insert the strippers which have not been replaced into their previous position (observe the numbering!).
10. Align the strippers (1) in a centred position between the conveying tines (10) of the feeder rotor and screw them to the safety rail (5) at a tightening torque of 95 Nm (dry).

    All strippers can also be laterally aligned at the same time by means of the guide plate (6) if necessary. This is, however, rarely required (shop work!).

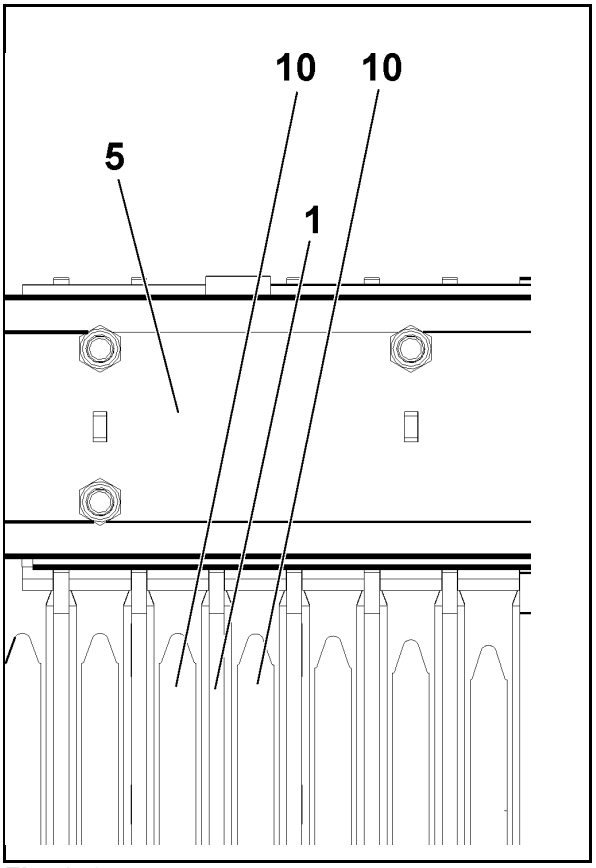


Fig. 176

12.16.7 Set "Cutting unit retracted" sensor

WARNING

Risk of crushing and shearing during setting of the "Cutting unit retracted" sensor if the machine is unintentionally powered or hydraulic functions are accidentally carried out!

Secure tractor and machine against accidental starting and rolling before setting the "Cutting unit retracted" sensor.

1. Completely extend the cutting unit.
2. Turn the tractor engine off.
3. Switch the tractor ignition on.
4. Apply the parking brake of the tractor.
5. Apply the parking brake of the machine.
6. Uncouple the propeller shaft.
7. Disconnect the pressure pipe of the single-acting control device.
8. Fix the "Cutting unit retracted" sensor (1) to 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.

9. Screw the sensor in this position.

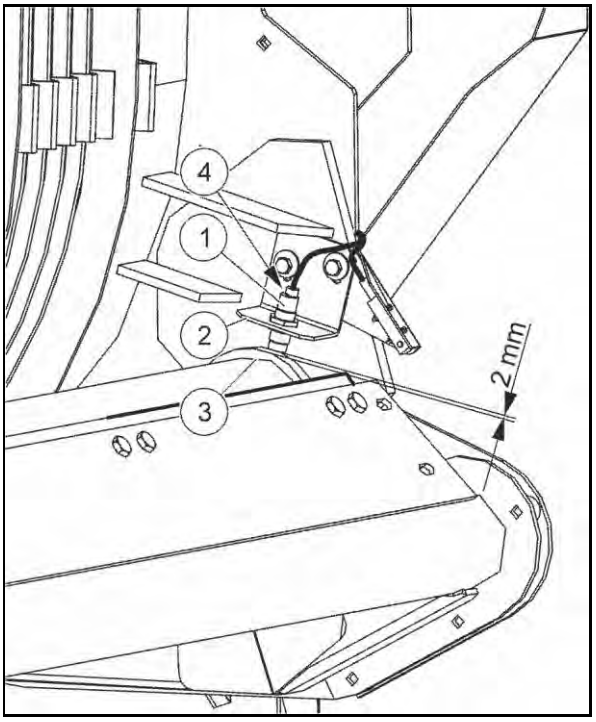


Fig. 177

12.17 Dosing drums

12.17.1 Check/Retighten tension of roller chains of dosing drums

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

The roller chain must be retightened if the distance between washer and sleeve of the chain tensioner is more than 8 mm.

WARNING

Risk of slipping, stumbling or falling when carrying out service and maintenance work on the roller chains for the dosing drum drive!

Absolutely use a mobile service platform with ladder when carrying out service and maintenance work on the roller chains for the dosing drum drive.

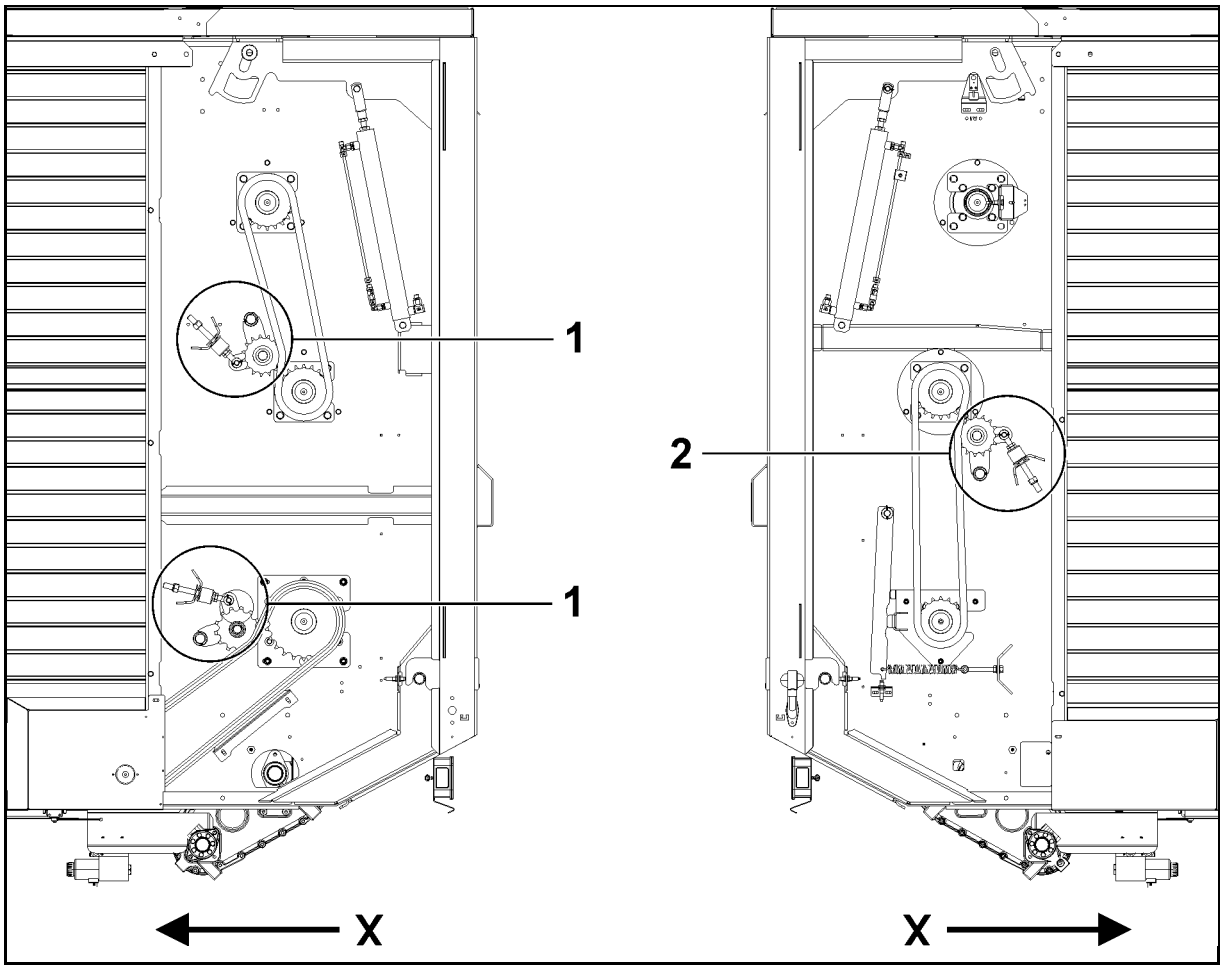


Fig. 178

(X) Direction of motion

(1) Automatic chain tensioner, left-hand

(2) Automatic chain tensioner, right-hand

1. Secure tractor and machine against accidental starting and rolling.
2. Open the protective cover of the dosing drum drive.
3. Unscrew the counter nut (1) by means of an open-end wrench.
4. Turn the hexagon nut (2) such that the distance between washer (3) and sleeve (4) is less than 8 mm.
5. Tighten the counter nut (1).
6. Close and lock the protective cover of the dosing drum drive.

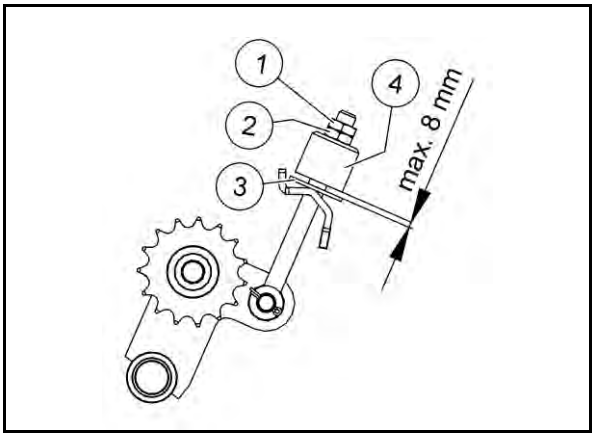


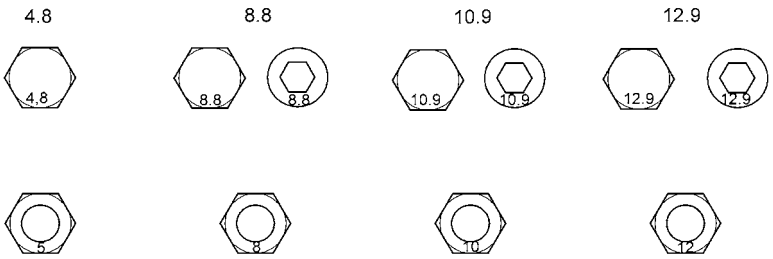
Fig. 179

12.18 Tightening torques

► See also chapter "Tightening torques for wheel nuts", page 226!

12.18.1 Tightening torques for metric screws

These tightening torques are reference values. Differing data specified elsewhere in the operating instructions or the included sub-supplier documentation shall always prevail!

Grade and marking of screw heads	
Grade and marking of nuts	

Size	Grade 4.8				Grade 8.8				Grade 10.9				Grade 12.9			
	lubricated*		dry **		lubricated*		dry **		lubricated*		dry **		lubricated*		dry **	
	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

* "Lubricated“ means that the screws are treated with a lubricant such as e.g. engine oil, or that phosphatized or oiled screws are used.

** "Dry" means that normal or galvanized screws without any lubrication are used.

- Regularly check the screwed connections for tightness.
- Always replace screws and nuts by parts of the same quality.
- Tighten counter nuts with plastic insert and bordered steel counter nuts at approx. 50% of the “dry” value specified in the table.
- Tighten gear or crown nuts at 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.

13 Malfunctions and remedy

13.1 Hydraulics

Malfunction	Cause	Remedy
No hydraulic function available	Interrupted hydraulic oil circulation	Switch hydraulic oil circulation between tractor and machine on
		Check hydraulic plugs for wear
	Hydraulic hose pipes not correctly connected (return line to pressure connection)	Connect hydraulic hose pipes correctly
	Hydraulic plugs not correctly locked in the hydraulic sleeves	Insert hydraulic plugs into the hydraulic sleeves until hydraulic plugs noticeably lock
	System screw at 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	Eliminate 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 screwed plugs	Seal screwed 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

Malfunction	Cause	Remedy
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

13.2 Electrics

Malfunction	Cause	Remedy
No function working	No power at the control set	Provide a voltage of 12 V at the tractor
	Defective fuse	Replace fuse
	Loose contact in socket	Remedy loose contact
	Operating element On/Off not switched	Set operating element to 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 min. 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 the 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
2 or more functions work simultaneously	Damaged cable	Replace cable
	Several simultaneously energised solenoids	Check cable
	Emergeny manual operation function actuated	Check whether knurled screws of control block are unscrewed, unscrew if necessary

Malfunction	Cause	Remedy
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
Automatic charging system switches too late	Range not set	Recalibrate automatic charging system
	Interrupted hydraulic oil circulation	Switch hydraulic oil circulation between tractor and machine on
System does not work	Malfunction in the system	Restart system
Discharge mode A I does not switch	Steering axle not completely locked due to blocked wheels	Move machine slightly forward

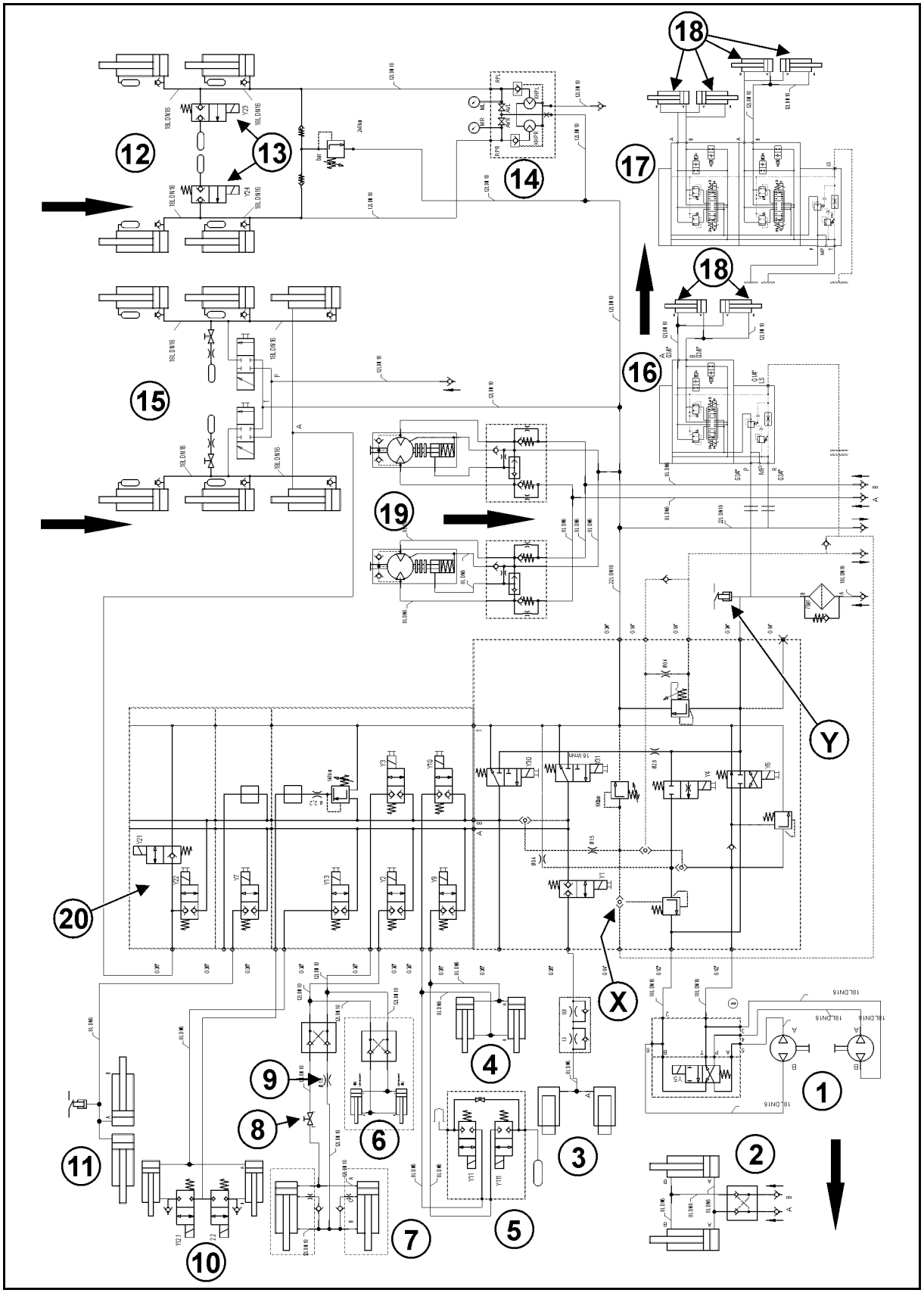
13.3 Working

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
Bad 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 springs of knife protection system, replace if necessary

Malfunction	Cause	Remedy
Cutting knives break frequently	Defective knife security system	Check knife security system
	Roller stuck in lever, lever does not retract	Lubricate roller (must turn easily) or replace lever
	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
	Cutting knives bent	Align or replace cutting knives
Slip clutch of pick-up responds frequently	Pick-up set too low	Readjust setting
	Pick-up heavily soiled in its interior	Clean pick-up
Folding drawbar does not move up	Machine overload	Adapt charging degree
	Hydraulic pressure at tractor too low	Set hydraulic pressure at tractor to a minimum value of 180 bar
Pick-up, folding drawbar and tailgate sink during work	Hydraulic cylinder leaking	Seal hydraulic cylinder
Cutting unit slowly retracting during work	Piston in hydraulic cylinder leaking	Seal piston
	Hydraulic cylinder leaking	Seal hydraulic cylinder
	Hydraulic oil pressure too low	Actuate key longer
Machine wobbles heavily during road travel	Tyre pressure too low	Adjust tyre pressure according to table
	Machine overload	Adapt charging degree
On the hydraulic chassis, one machine side significantly lowers	Machine overload, hydraulic oil escaping via pressure limiting valve	Adapt charging degree
	Plug screw at level block not tightened	Tighten plug screw
	Unequal load of axle one and two	Possibly adjust travelling height
Transport floor often switches off during discharge	"Forage wagon full" sensor or tension spring of dosing drum switch-off device not set properly	Adjust settings

14 Circuit diagrams

14.1 Hydraulics – ISOBUS control

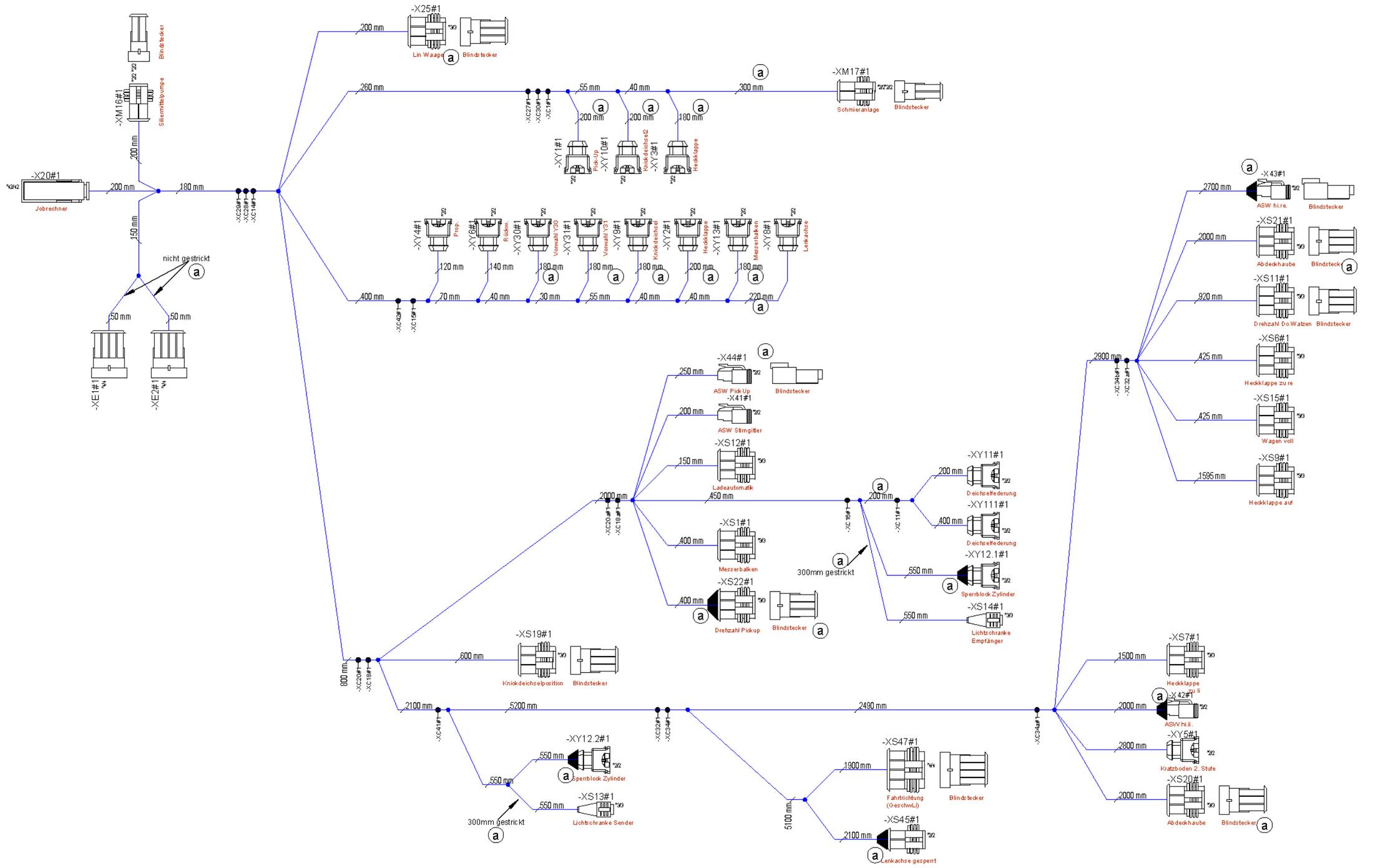


(1) Transport floor
(2) Front panel (optional extra)
(3) Pick-up
(4) Folding drawbar
(5) Drawbar suspension (optional extra)
(6) Angular switchgear for circuit for dosing unit (only machines equipped with dosing drums)
(7) Tailgate
(8) Stop-cock
(9) Throttle
(10) Cutting unit
(11) Steering axle
(12) Hydraulic tandem chassis
(13) Y23 and Y24 with active drawbar suspension energised
(14) Travelling height adjustment
(15) Hydraulic tridem chassis
(16) Electro-hydraulic forced steering axle tandem (optional extra)
(17) Electro-hydraulic forced steering axle tridem (optional extra)
(18) Steering cylinder
(19) Cover (optional extra)
(20) Axle lift tridem (optional extra)
(X) only mounted with crossover conveyor, electro-hydraulic forced steering axle and hydraulic chassis
(Y) only mounted with electro-hydraulic forced steering axle

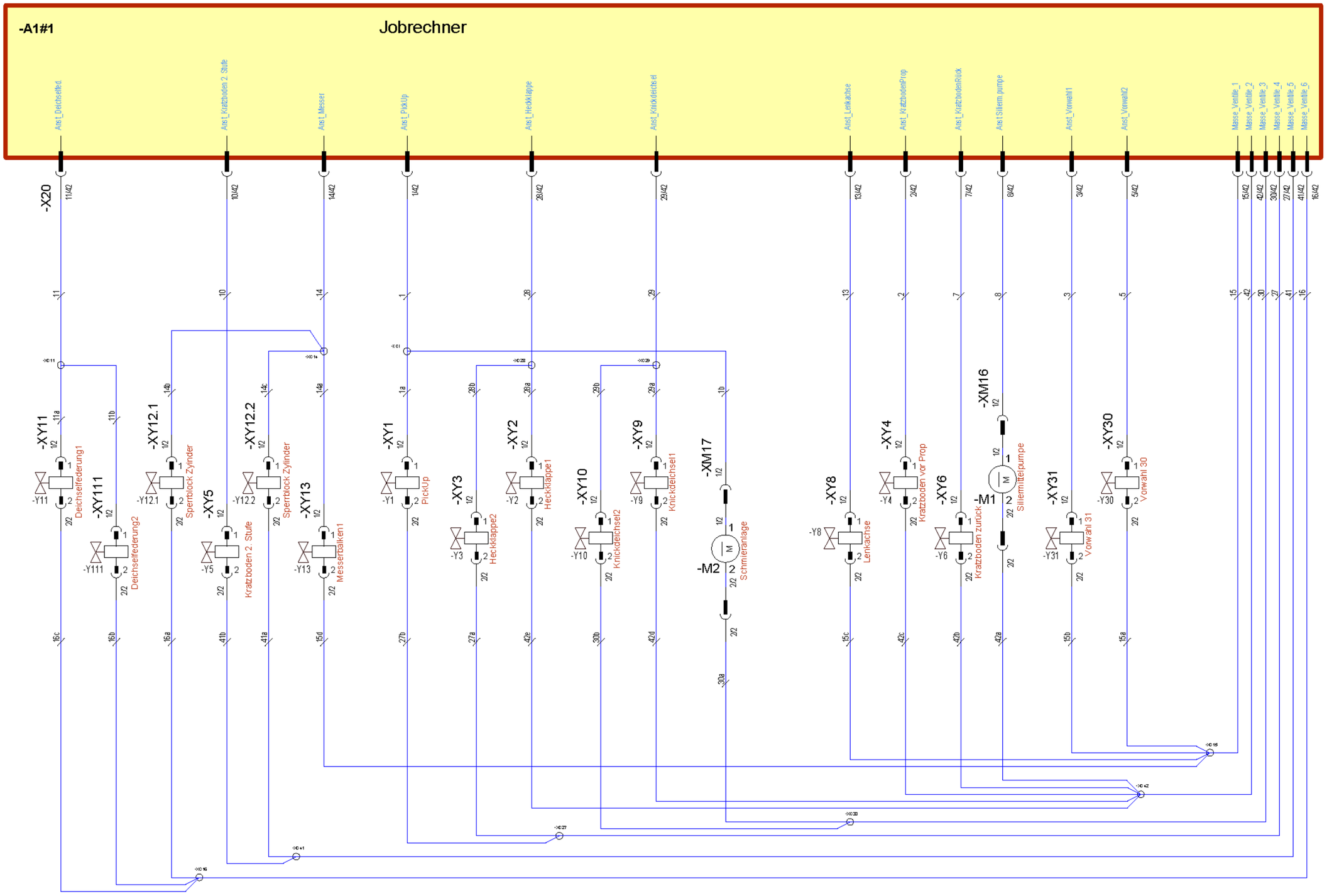
➡ Direction of motion

14.2 Electronics – ISOBUS control Field Operator 120 / 130 – Cable harness overview

X20	Control unit
X25	LIN module, weighing device
X41	Work lights, front grating
X42	Work light, rear, left-hand
X43	Work light, rear, right-hand
X44	Work light, pick-up
XE1	LIN module, work lights
XE2	LIN module, work lights
XM16	Silage additive pump
XM17	Central lubrication
XS1	Cutting unit
XS6	Tailgate lowered, right-hand
XS7	Tailgate lowered, left-hand
XS9	Tailgate lifted
XS11	Speed, dosing drums
XS12	Automatic charging system
XS13	Knife protection system (transmitter)
XS14	Knife protection system (receiver)
XS15	Forage wagon full
XS19	Folding drawbar position
XS20	Covering system 1
XS21	Covering system 2
XS22	Speed, pick-up
XS45	Steering axle locked
XS47	Direction of motion (speed)
XY1	Pick-up
XY2	Tailgate
XY3	Tailgate
XY4	Transport floor forward
XY5	Transport floor forward level II
XY6	Reverse transport floor
XY8	Steering axle
XY9	Folding drawbar 1
XY10	Folding drawbar 2
XY11	Drawbar suspension 1
XY12.1	Double check valve, cylinder
XY12.2	Double check valve, cylinder
XY13	Cutting unit
XY30	Pre-selection valve 30
XY31	Pre-selection valve 31
XY111	Drawbar suspension 2


-X20#1
Jobrechner
-XM16#1
Blindstecker
Silikonmittelpumpe
200 mm
180 mm
150 mm
nicht gestrickt
50 mm
50 mm
-XE1#1
-XE2#1
-X25#1
Lin Waage
Blindstecker
260 mm
55 mm
40 mm
300 mm
-XM17#1
Schmieranlage
Blindstecker
-XY1#1
-XY10#1
Pick-Up
-XY3#1
Heckklappe
400 mm
-XY4#1
Prop.
-XY6#1
Rüsken
-XY30#1
-XY31#1
-XY9#1
-XY2#1
-XY13#1
-XY8#1
Lenkachse
120 mm
140 mm
70 mm
40 mm
30 mm
55 mm
220 mm
-X44#1
ASW Pick Up
Blindstecker
250 mm
-X41#1
ASW Stirngitter
200 mm
-XS12#1
Ladeautomatik
150 mm
2000 mm
450 mm
-XS1#1
Messerbalken
400 mm
-XS22#1
Drehzahl Pickup
Blindstecker
300mm gestrickt
-XY11#1
Deichselfederung
-XY111#1
Deichselfederung
-XY12.1#1
Sperrblock Zylinder
-XS14#1
Lichtschranke Empfänger
-X43#1
ASW hi.re.
Blindstecker
2700 mm
-XS21#1
Abdeckhaube
Blindstecker
2000 mm
-XS11#1
Drehzahl Do.Walzen
Blindstecker
920 mm
-XS6#1
Heckklappe zu re
425 mm
-XS15#1
Wagen voll
425 mm
-XS9#1
Heckklappe auf
1595 mm
2900 mm
-XS19#1
Knickdeichselposition
Blindstecker
600 mm
800 mm
2100 mm
5200 mm
2490 mm
-XY12.2#1
Sperrblock Zylinder
-XS13#1
Lichtschranke Sender
300mm gestrickt
-XS47#1
Fahrtrichtung (GeschwLi)
Blindstecker
1900 mm
5100 mm
-XS45#1
Lenkachse gesperrt
2100 mm
-XS7#1
Heckklappe zu li
1500 mm
-X42#1
ASW hi.li.
2000 mm
-XY5#1
Kratzboden 2. Stufe
2800 mm
-XS20#1
Abdeckhaube
Blindstecker
2000 mm

14.3 Electronics – ISOBUS control Field Operator 120 / 130 – Valves

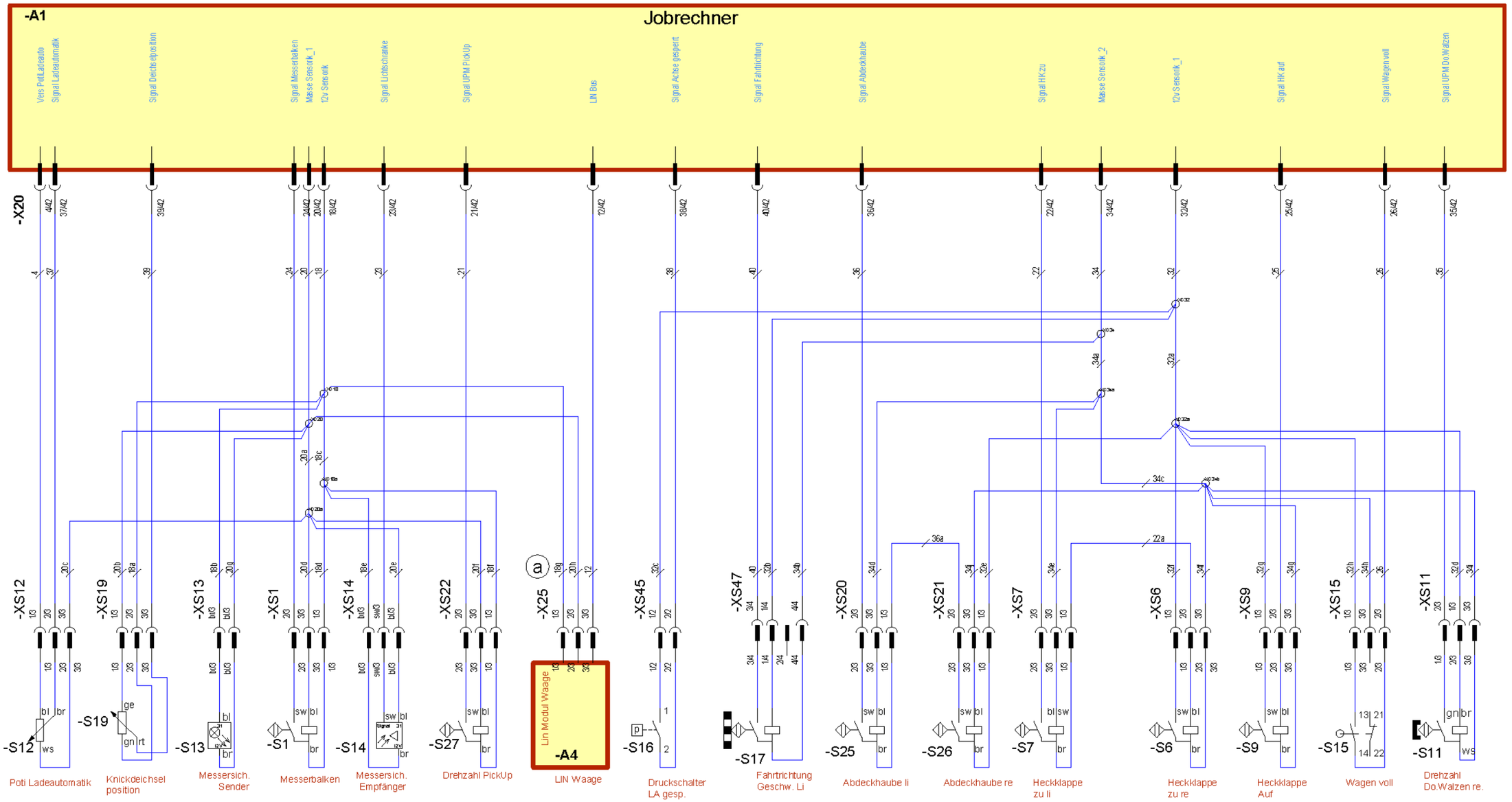


A1	Control unit
M1	Silage additive pump
M2	Central lubrication
XM16	Silage additive pump
XM17	Central lubrication
XY1	Pick-up
XY2	Tailgate 1
XY3	Tailgate 2
XY4	Transport floor forward
XY5	Transport floor forward level II
XY6	Reverse transport floor
XY8	Steering axle
XY9	Folding drawbar 1
XY10	Folding drawbar 2
XY11	Drawbar suspension 1
XY12.1	Double check valve, cylinder
XY12.2	Double check valve, cylinder
XY13	Cutting unit
XY30	Pre-selection valve 30
XY31	Pre-selection valve 31
XY111	Drawbar suspension 2

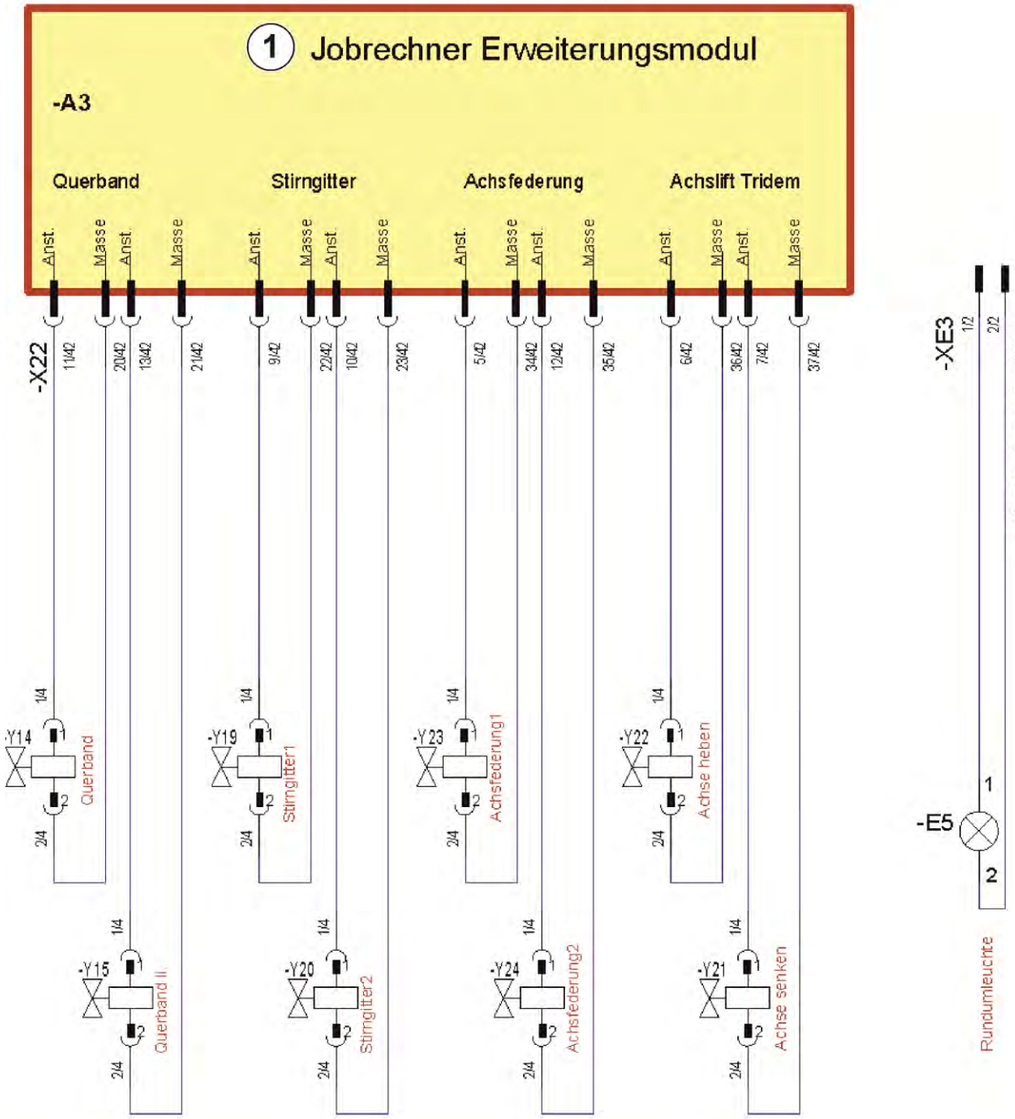
1/42	Pick-up
2/42	Transport floor forward
3/42	Pre-selection valve 31
5/42	Pre-selection valve 30
7/42	Reverse transport floor
8/42	Silage additive pump
10/42	Transport floor level II
11/42	Drawbar suspension
13/42	Lock steering axle
14/42	Cutting knives
15/42	Ground, valves 1
16/42	Ground, valves 6
27/42	Ground, valves 4
28/42	Tailgate
29/42	Folding drawbar
30/42	Ground, valves 3
41/42	Ground, valves 5
42/42	Ground, valves 2

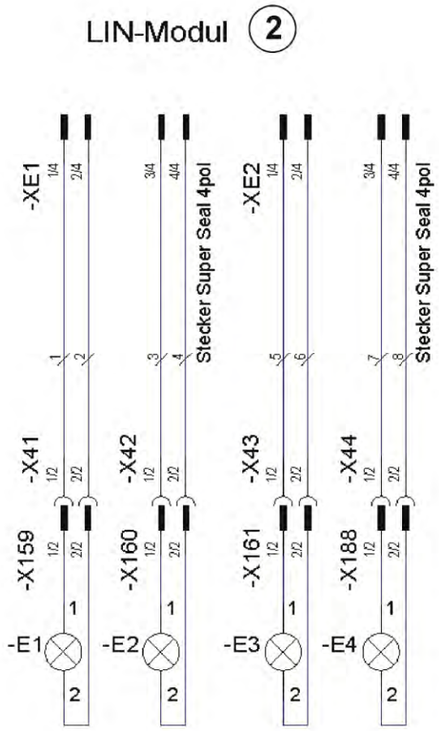
14.4 Electronics – ISOBUS control Field Operator 120 / 130 – Sensors

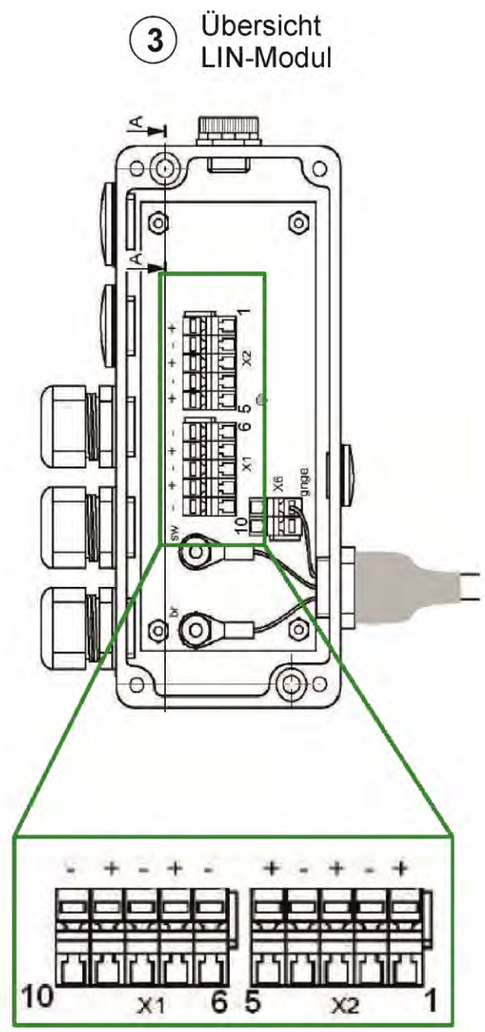
A1	Control unit
A4	LIN module, weighing device
4/42	Supply, potentiometer, automatic charging system
12/42	LIN bus
18/42	12 V sensors 1
20/42	Ground, sensors 1
21/42	Signal, speed, pick-up
22/42	Signal "Tailgate lowered"
23/42	Signal, light barrier
24/42	Signal, cutting unit
25/42	Signal "Tailgate completely lifted"
26/42	Signal "Forage wagon full"
32/42	12 V sensors 2
34/42	Ground, sensors 2
35/42	Signal, speed, dosing drums
36/42	Signal, covering system
37/42	Signal, automatic charging system
38/42	Signal "Steering axle locked"
39/42	Signal, folding drawbar position
40/42	Signal, direction of motion
S1	Cutting unit
S6	Tailgate lowered, right-hand
S7	Tailgate lowered, left-hand
S9	Tailgate completely lifted
S11	Speed, dosing drums, right-hand
S12	Potentiometer, automatic charging system
S13	Knife protection system (transmitter)
S14	Knife protection system (receiver)
S15	Forage wagon is full
S16	Pressure switch "Steering axle locked"
S17	Direction of motion (speed)
S19	Folding drawbar position
S25	Cover, left-hand
S26	Cover, right-hand
S27	Speed, pick-up


-A1
Jobrechner
Vers PotiLadeauto
Signal Ladeautomatik
Signal Deichselposition
Signal Messerbalken
Masse Sensorik_1
12v Sensorik
Signal Lichtschranke
Signal UPM PickUp
LIN Bus
Signal Achse gesperrt
Signal Fahrtrichtung
Signal Abdeckhaube
Signal HK zu
Masse Sensorik_2
12v Sensorik_1
Signal HK auf
Signal Wagen voll
Signal UPM Do.Walzen
-X20
-XS12
-XS19
-XS13
-XS1
-XS14
-XS22
-XS25
-XS45
-XS47
-XS20
-XS21
-XS7
-XS6
-XS9
-XS15
-XS11
Lin Modul Waage
-A4
-S12
-S19
-S13
-S1
-S14
-S27
-S16
-S17
-S25
-S26
-S7
-S6
-S9
-S15
-S11
Poti Ladeautomatik
Knickdeichsel position
Messersich. Sender
Messerbalken
Messersich. Empfänger
Drehzahl PickUp
LIN Waage
Druckschalter LA gesp.
Fahrtrichtung Geschw. Li
Abdeckhaube li
Abdeckhaube re
Heckklappe zu li
Heckklappe zu re
Heckklappe Auf
Wagen voll
Drehzahl Do.Walzen re.

14.5 Electronics – ISOBUS control Field Operator 120 / 130 – Control unit, extension module/LIN module







(1)	Control unit, extension module
(2)	LIN module
(3)	Chart, LIN module

Y14	Crossover conveyor, cw rotation
Y15	Crossover conveyor, ccw rotation
Y19	Front panel 1
Y20	Front panel 2
Y21	Lower lift axle
Y22	Lift lift axle
Y23	Axle suspension 1
Y24	Axle suspension 2

E1	Work lights
E2	Work lights
E3	Work lights
E4	Work lights
E5	Warning beacon

14.6 Connection of lighting system

(1) Brake light: pink
(2) Rear light, left-hand: yellow
(3) Rear light, right-hand: yellow
(4) License plate light: yellow
(5) Indicator, left-hand: blue
(6) Ground: black
(7) Indicator, right-hand: brown

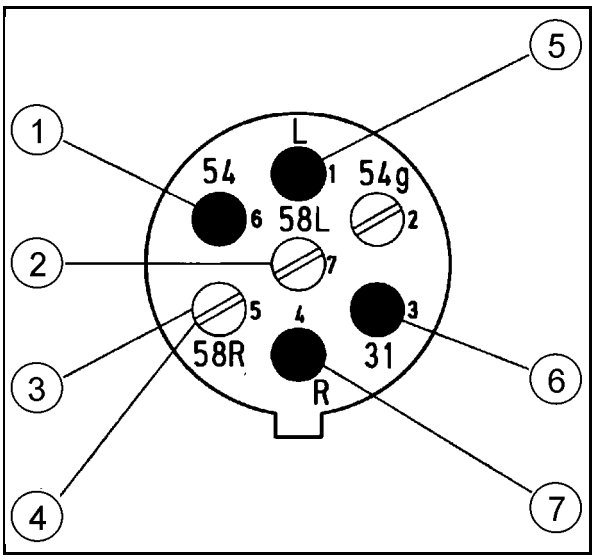


Fig. 180

14.7 Connection of additional electrical loads

Do not connect any additional electrical loads to the control set.

Additional electrical loads are e. g. a silage additive pump or additional lighting (more than 2 lamps).

We offer an additional control for additional loads which triggers these additional loads via relays.

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