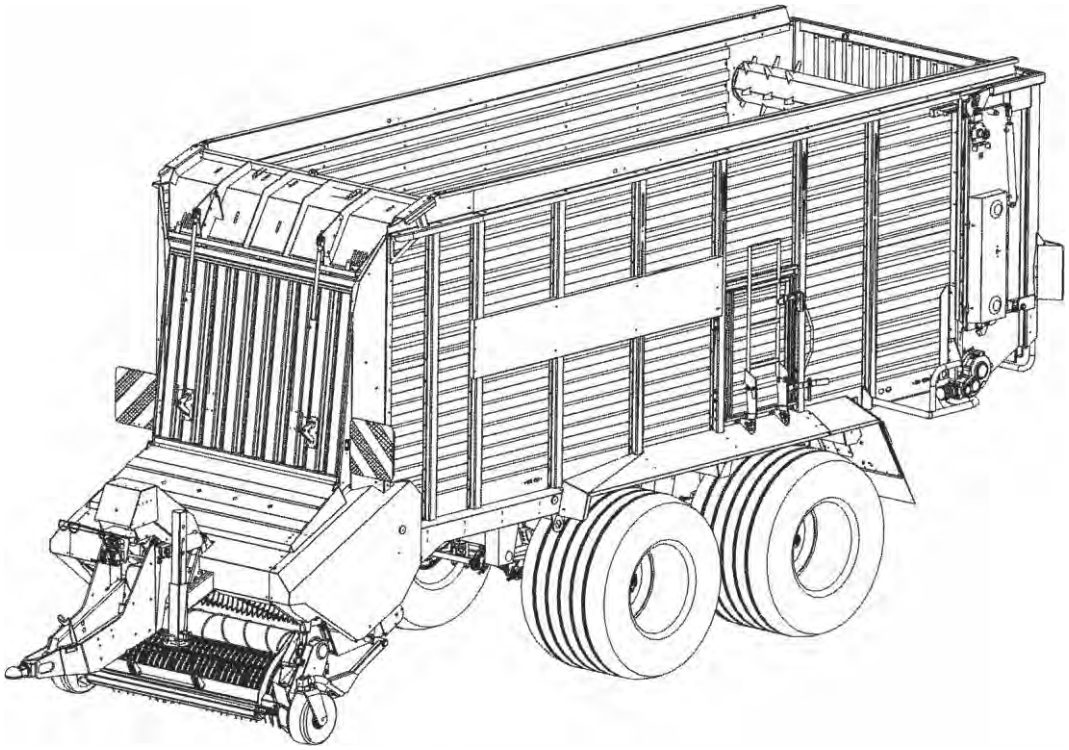
Translation of the Original Operating Instructions

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

Giga-Vitesse CFS 3201-4401, Giga-Vitesse CFS 3601 DO-4401 DO



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GB

MASCHINENFABRIK

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:	Giga-Vitesse CFS / Giga-Vitesse CFS DO
Type:	Giga-Vitesse CFS 3201, 3601, 4001, 4401 Giga-Vitesse CFS 3601 DO, 4001 DO, 4401 DO
Vehicle/Machine ID number:	W09726000_0S38001 - W09733000_0S38999
Trade name:	Giga-Vitesse CFS / Giga-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

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

EN ISO 12100:2010	Safety of machinery - Basic concepts, general principles of design - Risk assessment and risk reduction
EN ISO 13857:2008	Safety of machinery - Safety distances to prevent hazard areas from being reached by upper and lower limbs
EN ISO 4413:2010	Fluid power - General rules and safety requirements for hydraulic systems and their components
EN 953:1997+A1:2009	Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards
EN 12965:2003+A2:2009	Tractors and machinery for agriculture and forestry - Propeller shafts and their guards - Safety
EN 690:1994+A1:2009	Agricultural machinery - Manure spreaders - Safety
EN ISO 4254-1:2009	Agricultural machinery - Safety - Part 1: General requirements
EN ISO 4254-1:2009	Agricultural machinery - Safety - Part 11: Pick-up balers

Bad Laer, 07.01.2013

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

D-49196 Bad Laer

Phone: + 49 (0) 5424 802-0

Fax: + 49 (0) 5424 802-64

E-mail: kontakt@strautmann.com

Spare parts order service

B. Strautmann & Söhne GmbH u. Co. KG

Bielefelder Straße 53

D-49196 Bad Laer

Phone: + 49 (0) 5424 802-31

Fax: + 49 (0) 5424 802-64

E-mail: kontakt@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: 73200933

Date of compilation: 06.13

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!

Please read and observe these operating instructions, in particular the safety instructions, before commissioning. After carefully reading the instructions, you will be 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 Giga-Vitesse CFS 3201-4401, Giga-Vitesse CFS 3601 DO-4401 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.

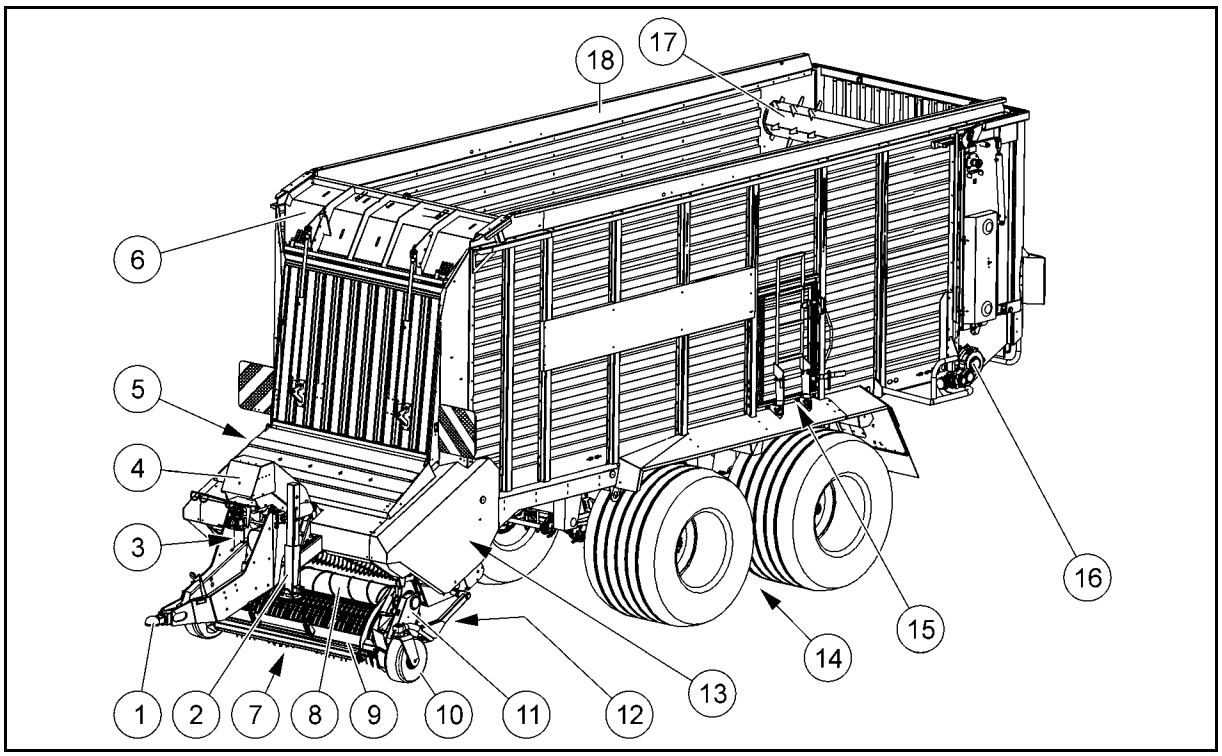


Fig. 1

(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) Feed gearing, transport floor
(17) Dosing drums
(18) Body

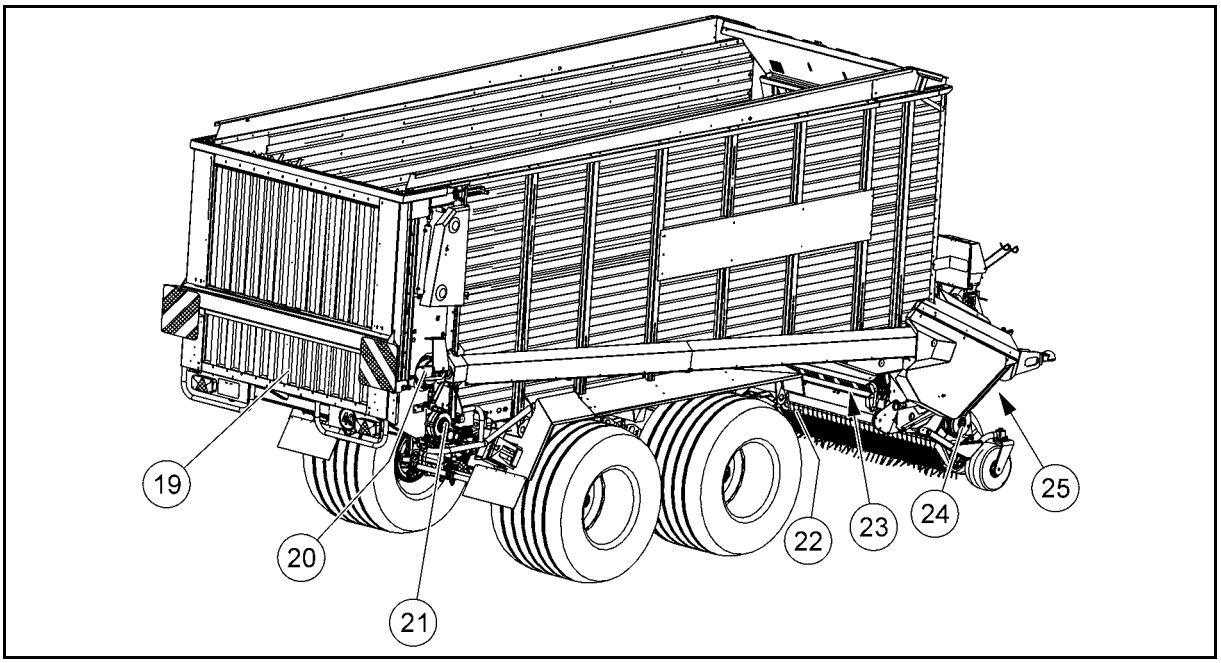


Fig. 2

(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 during operation of machine due to unprotected moving machine parts!

- Start the machine only with the protective devices completely mounted.
- Immediately replace defective protective devices.

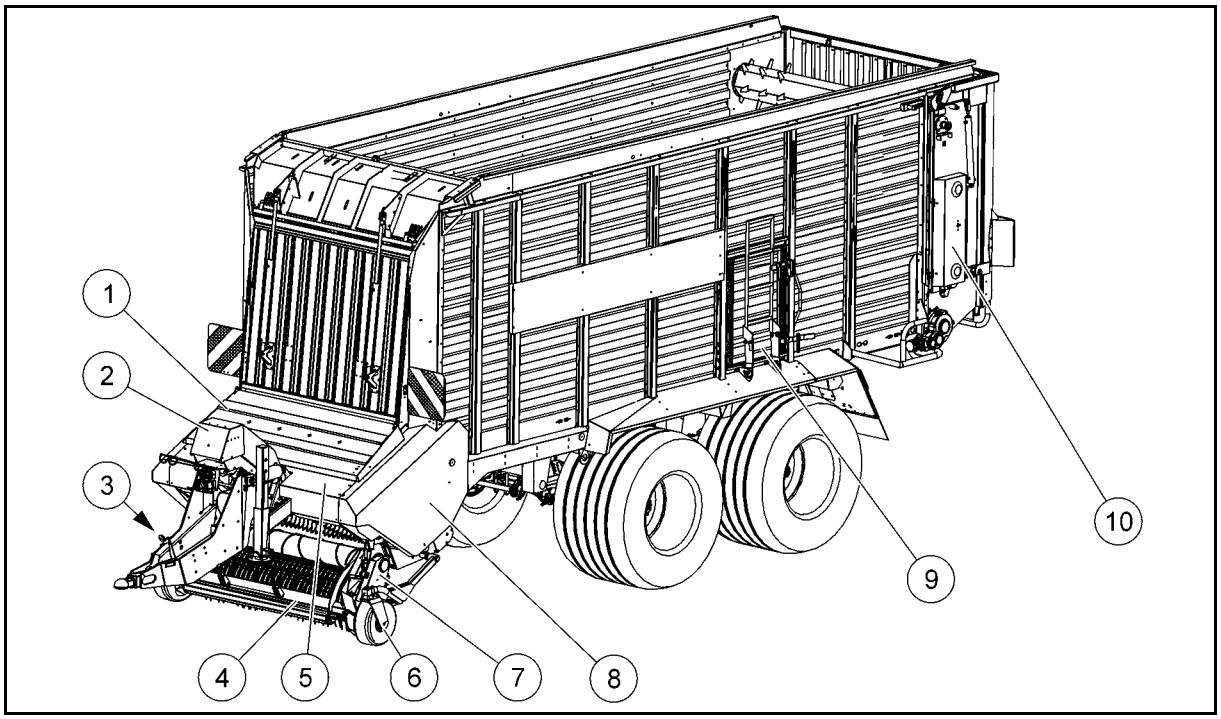


Fig. 3

(1) Bonnet

(2) Hydraulics protective device

(3) Drawbar protective device with forced steering axle (optional extra)

(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

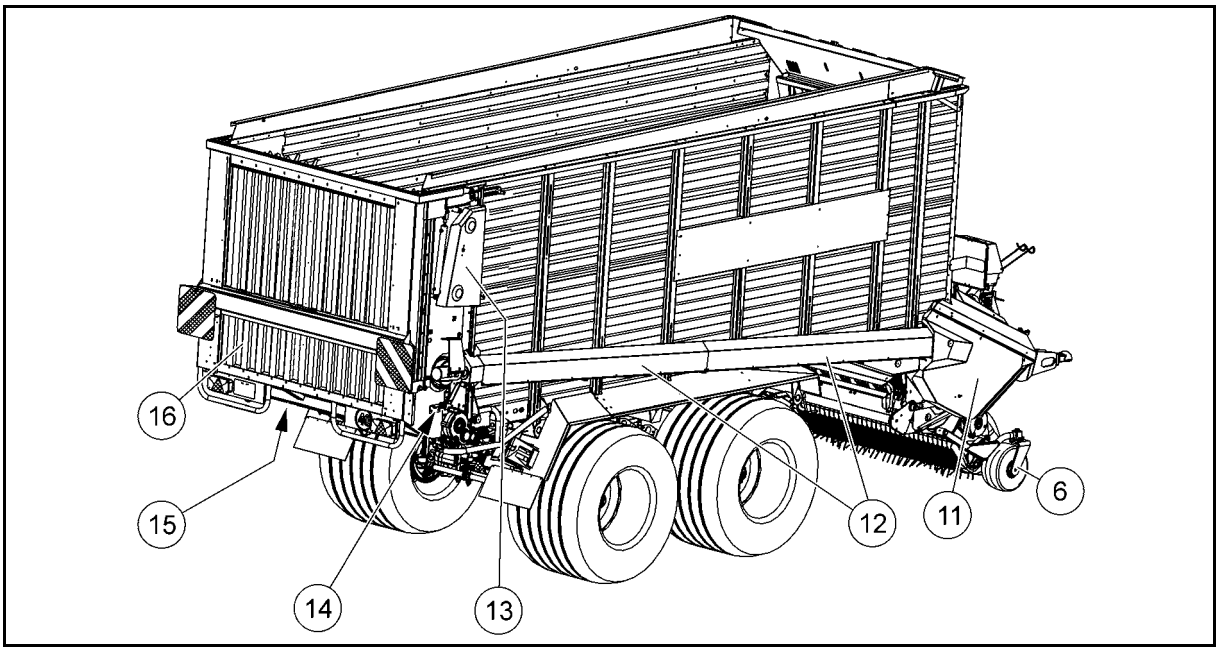


Fig. 4

(11) Side protector

(12) Tunnel cover for dosing drum drive

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

(14) Stop-cock

(15) Bottom cover plates for feed shaft

(16) Tailgate

2.3 Supply lines between tractor and machine

(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)

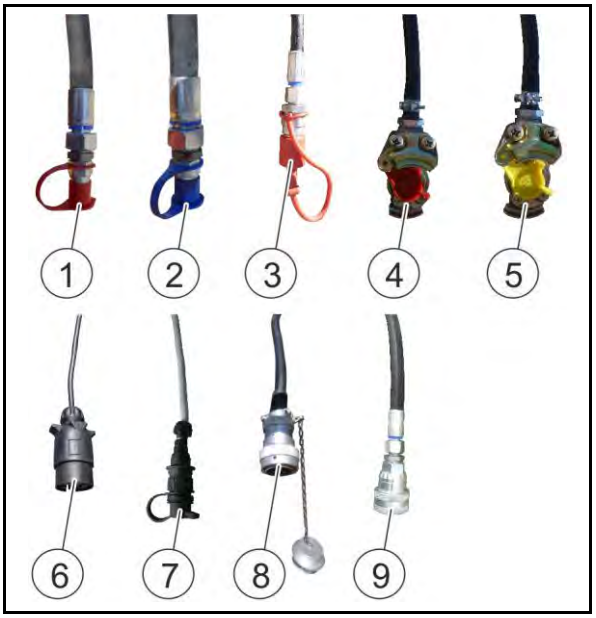


Fig. 5

2.3.1 Marking of hydraulic supply lines

Hydraulic connector "Flow line"

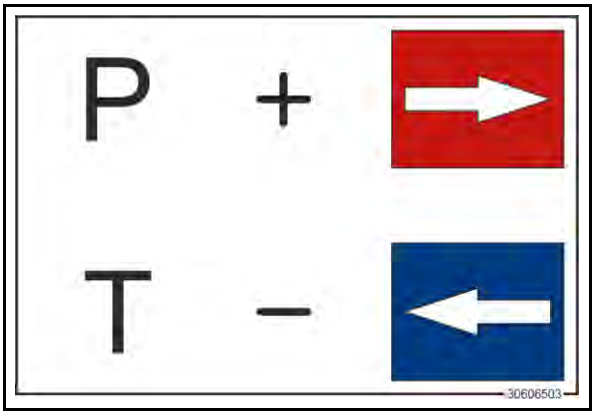
- Label
  Arrows: white
  Background: red

Hydraulic connector "Return line"

- Label
  Arrows: white
  Background: blue

Explanation of hydraulic connector symbols

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

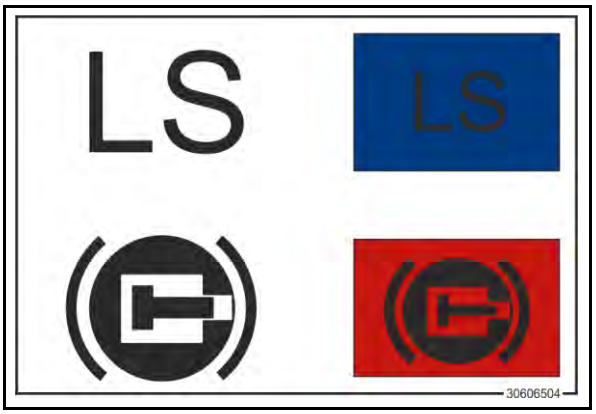


Load-sensing connector

- Label

Explanation of the following symbols:

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



2.4 Traffic-related equipment

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

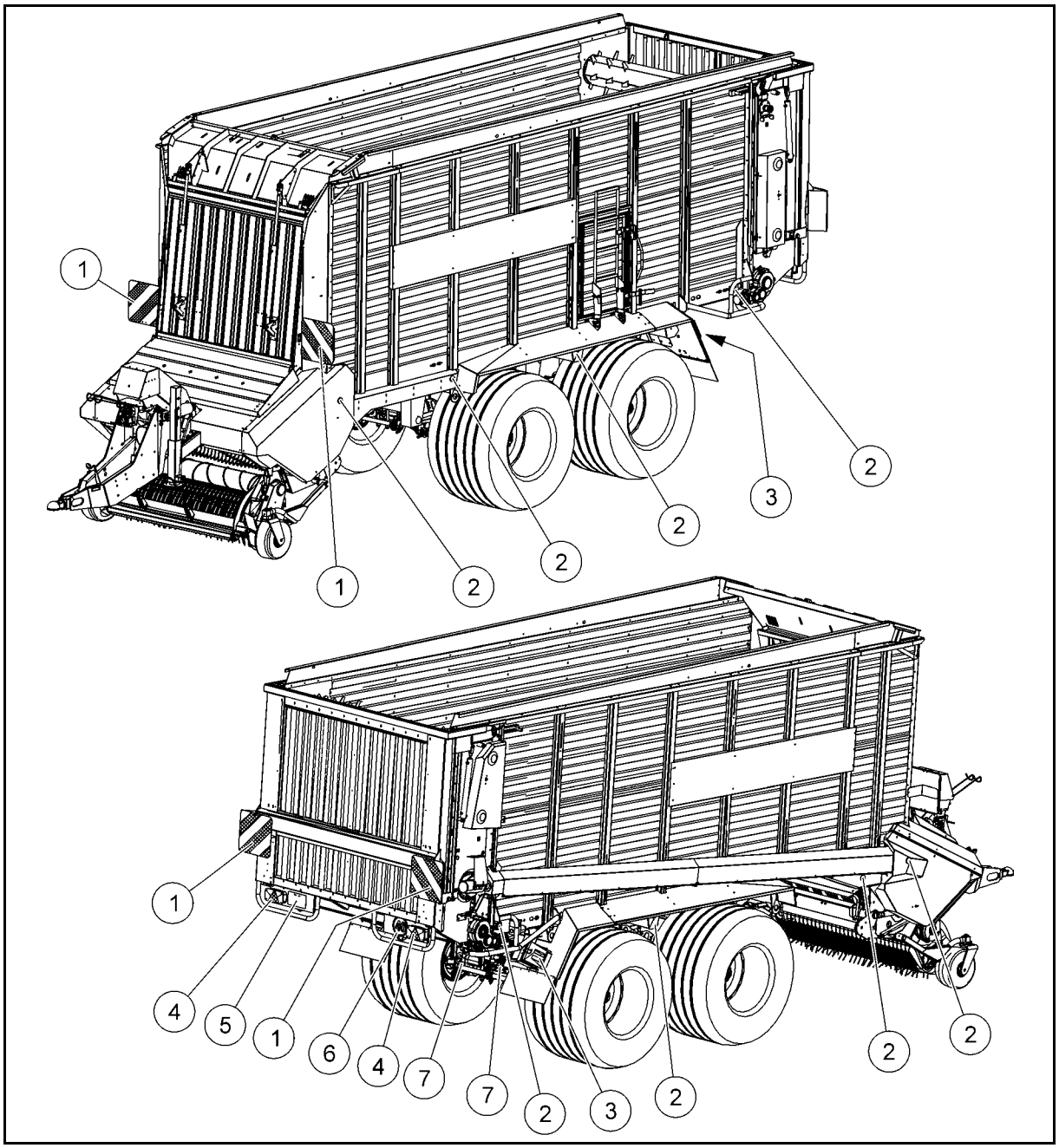


Fig. 6

(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) Triangular 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 %
  - Direction of motion to the right 20 %
- Slope line:
  - uphill 20 %
  - downhill 20 %

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 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 following figures show the position of the type plate, the vehicle/machine ID number and the 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)

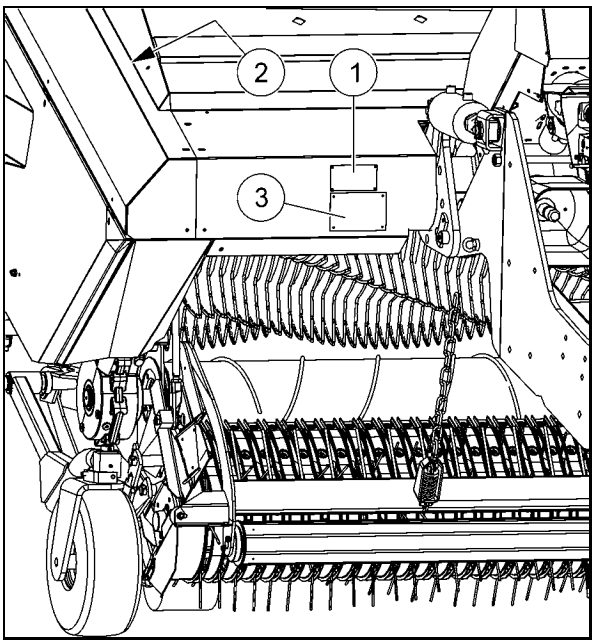


Fig. 7

The type plate includes:

(1) Hersteller = Manufacturer

(2) Fahrzeug-/Maschinen-Ident-Nr. = Vehicle/Machine ID number

(3) Typ = Type

(4) Leergewicht [kg] = Empty weight [kg]

(5) Zul. Gesamtgewicht [kg] = Gross vehicle weight rating [kg]

(6) Zul. Stützlast/Achslast vorn [kg] = Admissible tongue load/front axle load [kg]

(7) Zul. Achslast hint. [kg] = Admissible rear axle load [kg]

(8) Genehmigungs-Nr. = Approval number

(9) Baujahr = Year of manufacture

(10) Nenndrehzahl [min^{-1}] = Rated speed [min^{-1}]

(11) Zul. Hydr. Druck [bar] = Admissible hydraulic pressure [bar]

(12) Zul. Höchstgeschw. [km/h] = Maximum admissible speed [km/h]

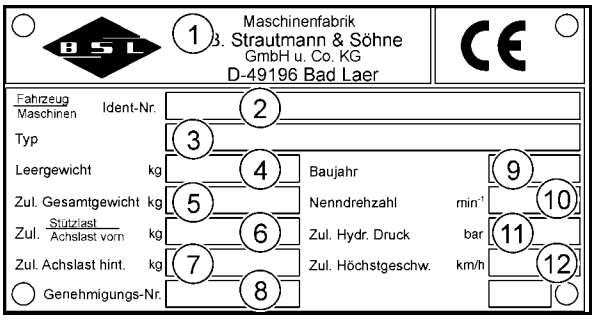


Fig. 8

2.8 License plate

The following license plate sizes are provided:

- for machines with an admissible maximum speed of up to 40 km/h: 255 mm x 130 mm.
- for machines with an admissible maximum speed of more than 40 km/h: 340 mm x 200 mm.

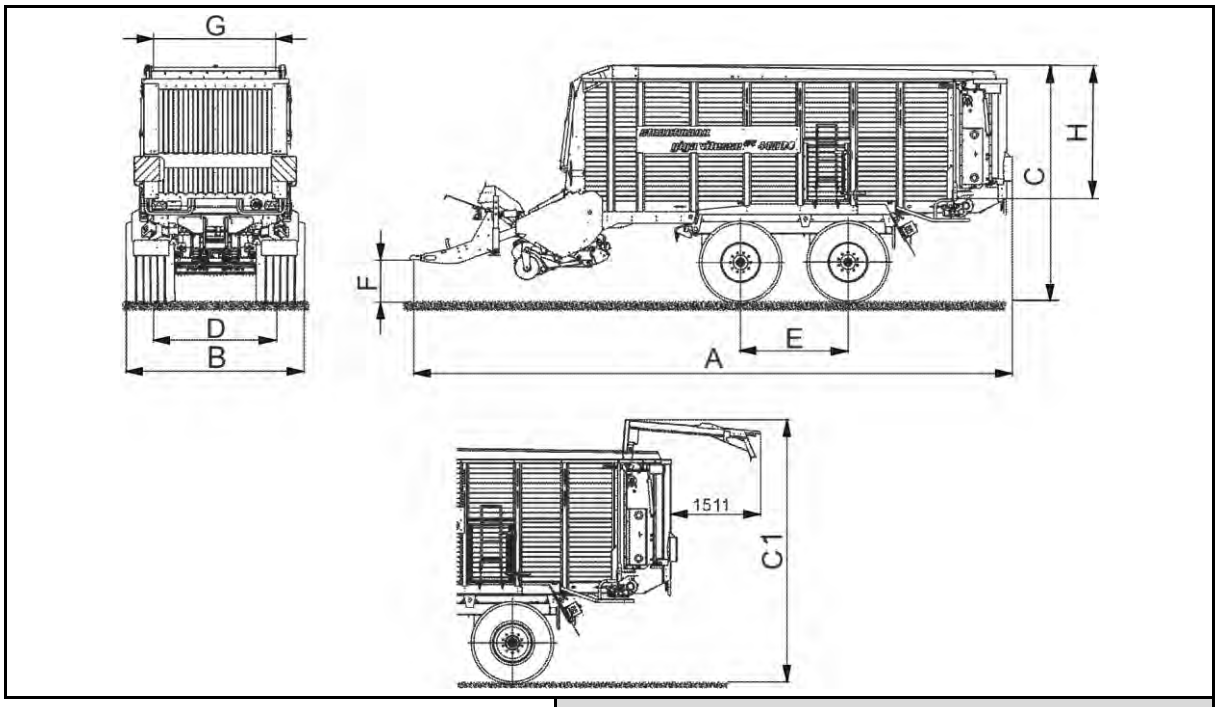
2.9 Technical data

2.9.1 General data

		Giga-Vitesse CFS						
		3201	3601	3601 DO	4001	4001 DO	4401	4401 DO
Gross vehicle weight rating								
Top linkage	kg	20000						
Bottom linkage (up to 40 km/h)	kg	22000						
Bottom linkage (more than 40 km/h)	kg	20000						
Hydro-pneumatic tandem chassis (up to 40 km/h)	kg	--	--		24000		24000	
Hydro-pneumatic tandem chassis (more than 40 km/h)	kg	--	--		22000		22000	
Hydro-pneumatic tridem chassis (up to 40 km/h)	kg	--	--		--		31000	
Hydro-pneumatic tridem chassis (more than 40 km/h)	kg	--	--		--		29000	
Admissible axle load	kg	18000						
Hydro-pneumatic tandem chassis	kg	--	--	--	20000			
Hydro-pneumatic tridem chassis	kg	--	--	--	--	--	27000	
Admissible tongue load								
Top linkage	kg	2000						
Bottom linkage (up to 40 km/h)	kg	4000						
Bottom linkage (more than 40 km/h)	kg	2000						
Empty weight	kg	8500	9000	9400	9400	9800	9900	10200
Loading capacity according to DIN 11741	m³	30	34	32	38	36	42	40
Loading capacity at medium pressing power	m³	57.0	64.6	60.8	72.2	68.4	79.8	76.0
Maximum travel speed	km/h	25/40/60						

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

2.9.2 Dimensions of wagon



		Giga-Vitesse CFS						
		3201	3601	3601 DO	4001	4001 DO	4401	4401 DO
A = Total length	m	8.62	9.42		10.22		11.02	
B = Total width	m	2.90						
C = Total height	m	max. 4.00						
C1 = Total height with open tailgate	m	max. 4.42						
D = Track, tandem axle	m	2.10						
E = Wheelbase	m	1.50/1.80						
F = Drawbar height, top linkage	mm	850-1000						
F = Drawbar height, bottom linkage	m	550-700						
G = Cargo space width	m	2250						
H = Cargo space height	m	2290						
H = Cargo space height with attachment	m	2290						
Picking-up width of pick-up	m	2.00						
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: 800/45 R26.5

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

2.9.3 Tyre pressure

According to the StVZO (note of transl.: German Road Traffic Licensing Code), the maximum internal tyre pressure may be 1.5 bar if the vehicle width of 2.55 m is exceeded due to wide-base tyres.

Tyre pressures for tandem axle (22.5“)

			40 km/h 16 t	40 km/h 18 t	40 km/h 20 t	65 km/h 16 t	65 km/h 18 t	65 km/h 20 t	max.
560/45 R22.5	Nokian Country King	152D	bar	3.2	3.7	--	--	--	--	4.0
600/50 R22.5	Michelin Cargo X-BIB	159D	bar	1.9	2.2	2.7	3.3	--	--	4.0
600/55-22.5	Vredestein Flotation +	159A8	bar	1.8	--	--	--	--	--	2.0
600/55-22.5	Vredestein Flotation +	168A8	bar	1.8	2.2	2.5	--	--	--	2.8
620/40 R22.5	Vredestein Flotation Pro	148D	bar	3.0	--	--	--	--	--	3.2
620/40 R22.5	Vredestein Flotation Pro	154D	bar	3.0	3.5	3.9	--	--	--	4.0
650/50 R22.5	Alliance I-380	163E	bar	1.6	1.9	2.3	2.5	3.1	3.6	4.0
700/40-22.5	Alliance I-328	160A8	bar	1.7	2.0	2.5	--	--	--	2.7
710/35 R22.5	Nokian Country King	158D	bar	2.5	2.9	3.3	3.6	--	--	4.0
710/40 R22.5	Vredestein Flotation Pro	156D	bar	2.2	2.6	3.0	3.2	--	--	3.2
710/40-22.5	Trelleborg T404	158A8	bar	1.9	--	--	--	--	--	2.0
710/45 R22.5	Vredestein Flotation Trac	165D	bar	1.9	2.3	2.6	2.9	3.4	3.9	4.0
750/45 R22.5	Alliance I-380	166A8	bar	1.4	1.7	2.0	2.2	2.7	3.2	4.0

Pick-up Tastrad = 2,5 bar

1 bar = 14.5 psi = 100 kPa

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 (22.5“)

				40 km/h 27 t	40 km/h 30 t	65 km/h 27 t	65 km/h 30 t	max.
560/45 R22.5	Nokian Country King	152D	bar	3.7	--	--	--	4.0
600/50 R22.5	Michelin Cargo X-BIB	159D	bar	2.2	2.7	--	--	4.0
600/55-22.5	Vredestein Flotation +	168A8	bar	2.2	2.5	--	--	2.8
620/40 R22.5	Vredestein Flotation Pro	154D	bar	3.5	3.9	--	--	4.0
650/50 R22.5	Alliance I-380	163E	bar	1.9	2.3	3.1	3.6	4.0
700/40-22.5	Alliance I-328	160A8	bar	2.0	2.5	--	--	2.7
710/35 R22.5	Nokian Country King	158D	bar	2.9	3.3	--	--	4.0
710/40 R22.5	Vredestein Flotation Pro	156D	bar	2.6	3.0	--	--	3.2
710/45 R22.5	Vredestein Flotation Trac	165D	bar	2.3	2.6	3.4	3.9	4.0
750/45 R22.5	Alliance I-380	166A8	bar	1.7	2.0	2.7	3.2	4.0

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

2.10 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

		Giga-Vitesse CFS						
		3201	3601	3601 DO	4001	4001 DO	4401	4401 DO
Power required	kW	110			121		140	
	HP	150			165		180	
P.t.o. speed	min^{-1}	1000						

Electrical system

Battery voltage: 12 V

Socket for lighting: 7-pole

Socket for control set: 3-pole

Hydraulics

Check the compatibility of the hydraulic oils before connecting the machine to the hydraulic system of your tractor.

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 of machine: HLP 46

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

- a double-acting control device,
- a single-acting control device and a depressurized 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 depressurized return line.

The hydraulic hose pipes are marked by colours at the hydraulic plugs, see chapter „Marking of hydraulic supply lines“, page 16.

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 side of the tractor's linkage drawbar.

2.11 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 35,
  - the chapter „Warning and instructions signs“, page 45, 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 user is only allowed to carry out the work described in these operating instructions.

Only authorized workshops are allowed to carry out work on the machine which requires special expert knowledge. Authorized 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 with the annex "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 20.

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

- 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.
- Hydraulic hose pipes must be replaced in case of visible defects, damage and ageing! Only use original hydraulic hose pipes!
- 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!

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!

3.4.4 Propeller shaft operation

- Observe the information included in the operating instructions for the supplied propeller shaft!
- Mounting and dismounting of the propeller shaft is only allowed:
  - with the propeller shaft switched off,
  - with the tractor engine turned off,
  - with the ignition key pulled out,
  - with the parking brake applied!
- 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!
- 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!

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!
- 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!

Compressed-air brake system

- The compressed-air brake systems of the tractor and of the machine must be compatible!
- Hang the couplings of the feed and brake line on the provided blank connections with the machine unhitched!
- Only use the specified brake fluid when topping up or changing the fluid. Observe the relevant regulations when changing the brake fluid!
- 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 (optional extra)!
- 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!
- Secure all operating media such as compressed air and hydraulic oil against accidental startup!
- 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!
- 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 instructions 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 802-31).

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.

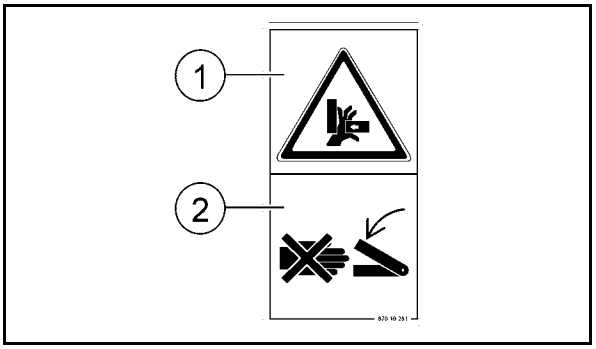


Fig. 9

Explanations of warning signs

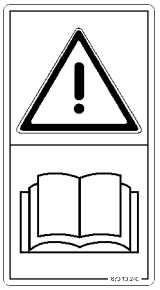
The following list includes:

- 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!

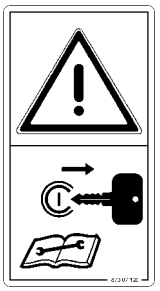


87007120

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.



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.

87007110

Risk to any part of the body of being crushed due to necessary work underneath unsecured, suspended loads or lifted machine parts!

This risk may cause most serious injuries or even death!

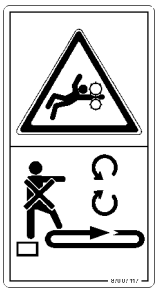
Activate the safety locking mechanism against accidental lowering of suspended loads or lifted machine parts before entering the hazardous area.

87007117

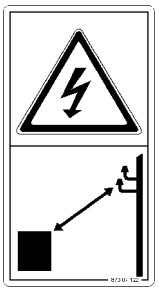
Risk to any part of the body of being drawn in or becoming entangled due to powered working tools!

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.



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	2 m
over 110 up to 220 kV	3 m
over 220 up to 380 kV	4 m

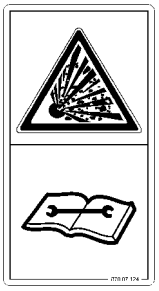
87007123

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.

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.

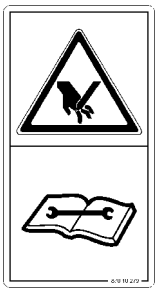
87010278

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.

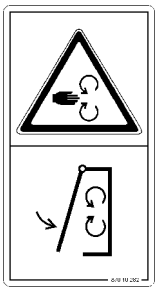
87010281

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.

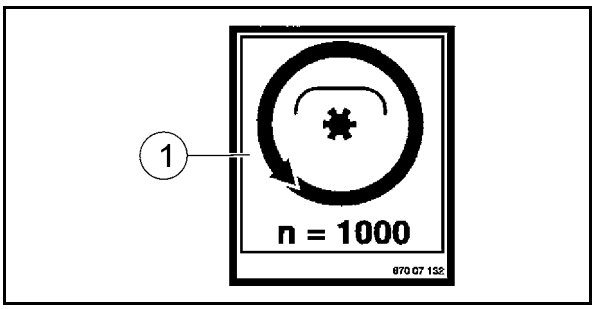
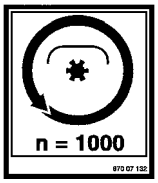


Fig. 10

87007132

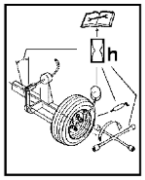
The required drive speed of the machine is 1000 min^{-1}.

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

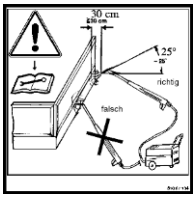
Observe the information for braking axle maintenance included in the operating instructions.



87007134

Risk due to improper cleaning of the machine.

Absolutely observe the information in the chapter "Cleaning of machine", page 173 when using a pressure washer/steam blaster for cleaning the machine.

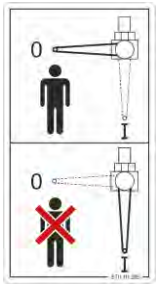


87010288

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

87010285

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



3.6.3 Placing of warning and instruction signs

The following figures illustrate the position of the warning and instruction signs on the machine.

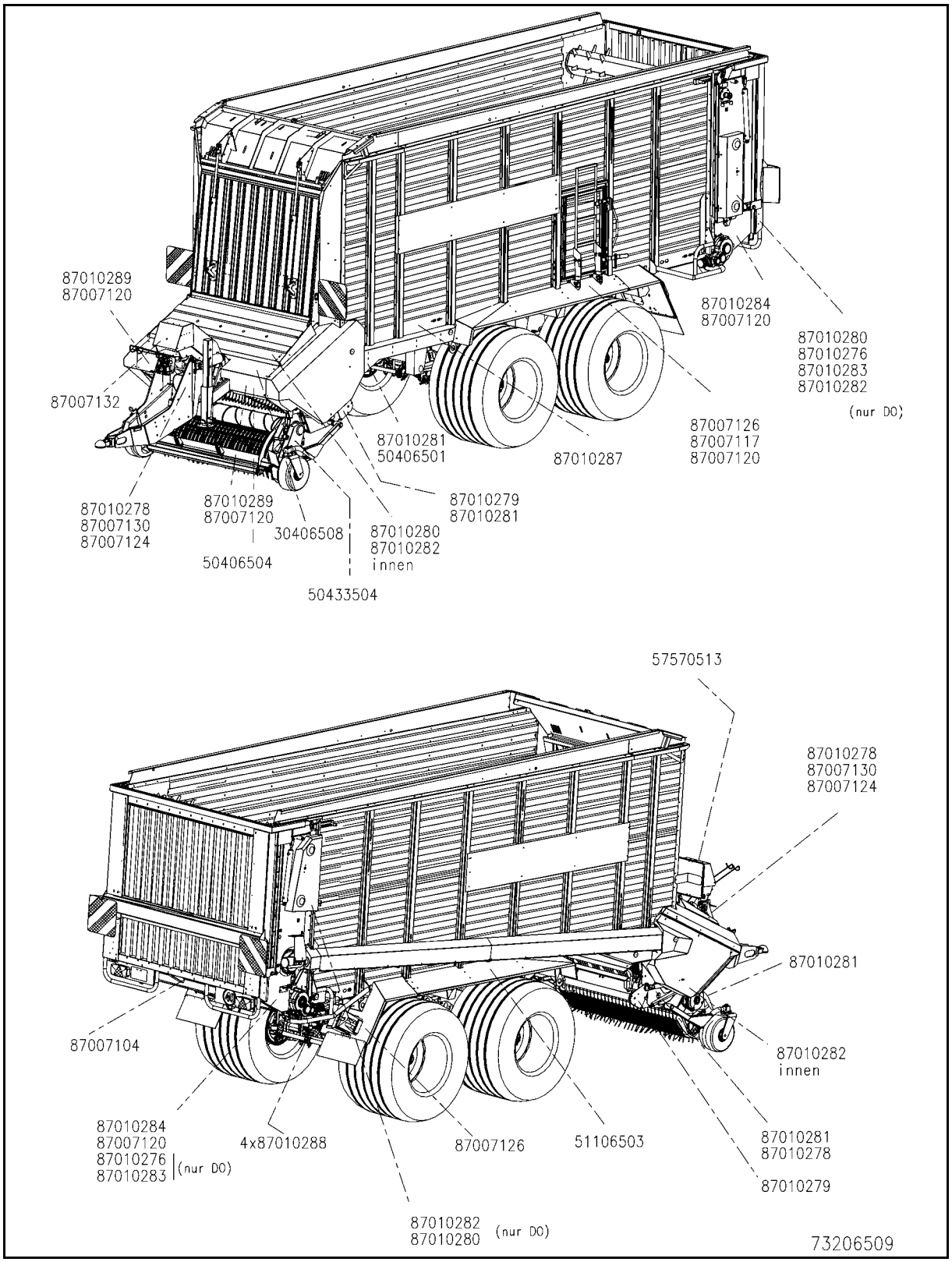


Fig. 11

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

Observe the information in the chapter "Basic safety instructions", page 35.

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.

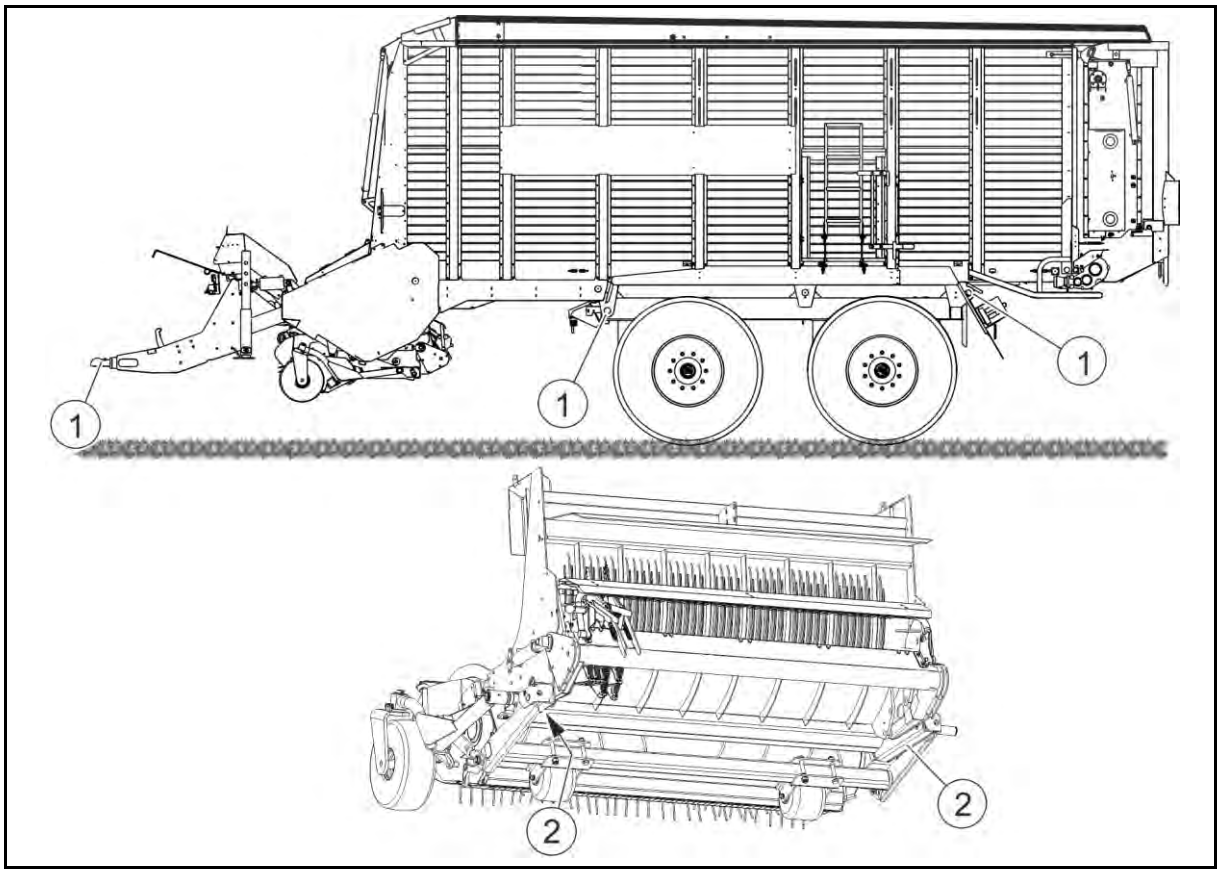


Fig. 12

(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.

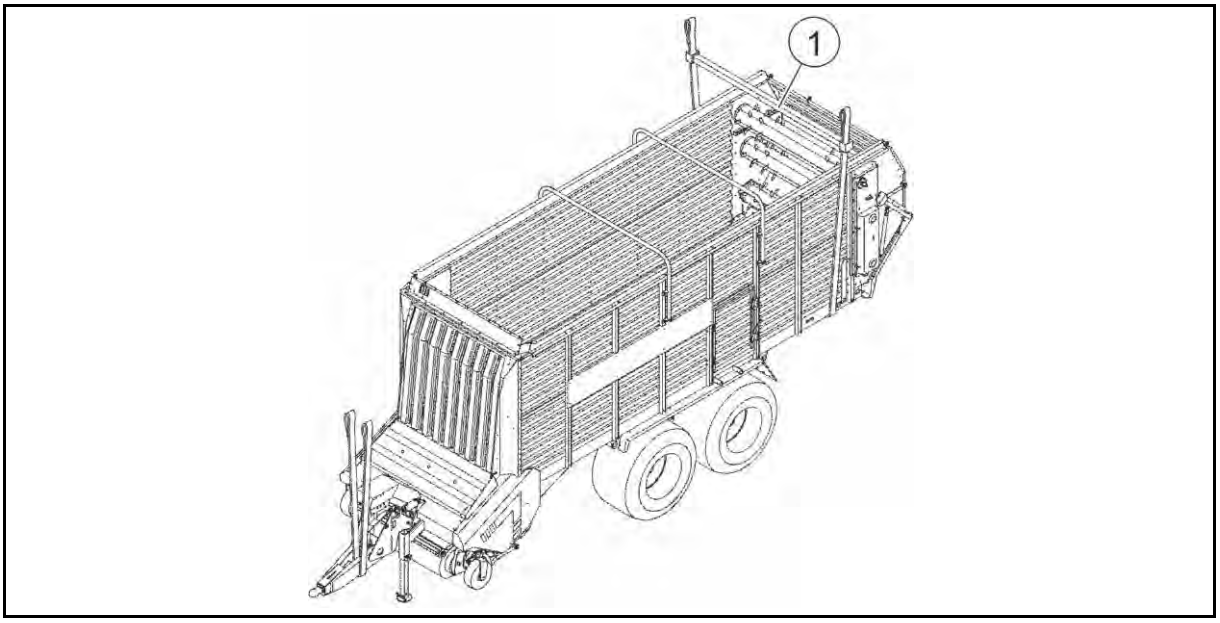


Fig. 13

(1) Spacer

5 Design and function

Observe the information in the chapter "Basic safety instructions", page 35.

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.

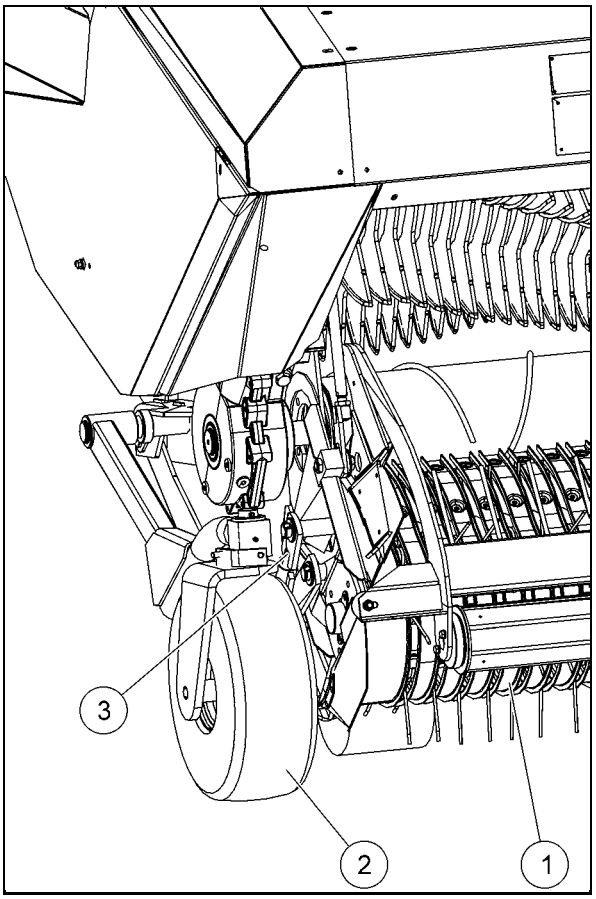


Fig. 14

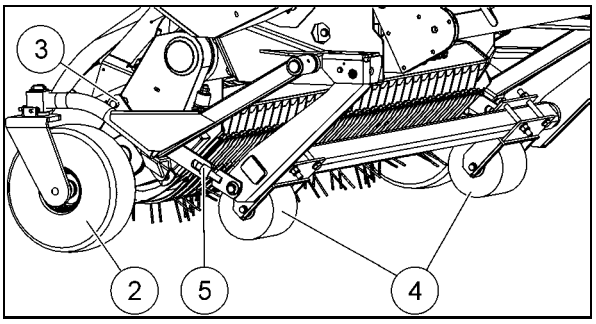


Fig. 15

5.1.1 Pick-up drive

Giga-Vitesse CFS

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.

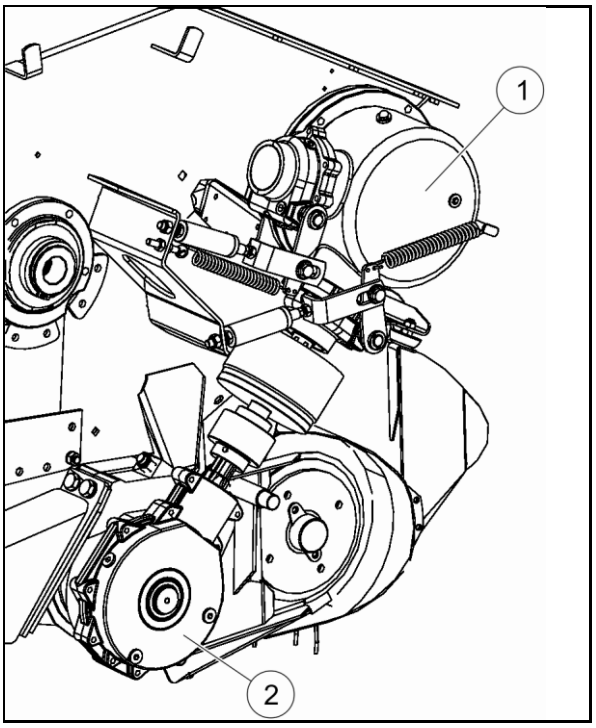


Fig. 16

Giga-Vitesse CFS DO

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.

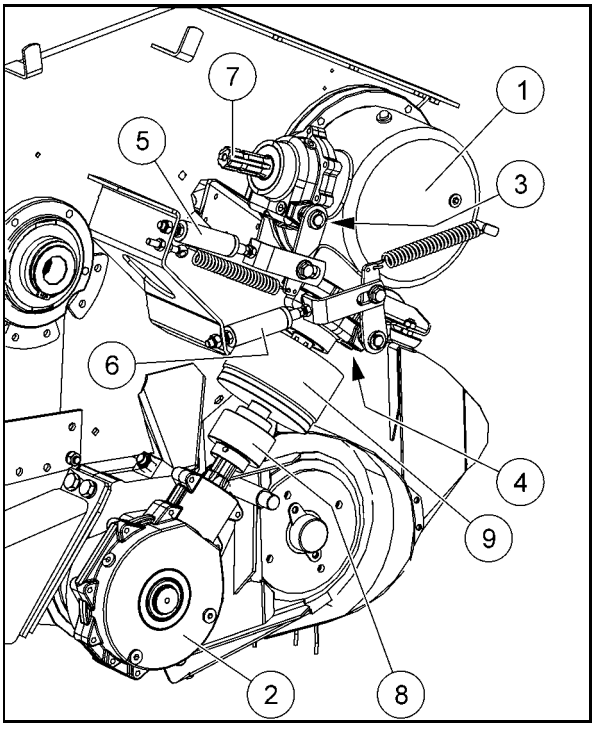


Fig. 17

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 116.

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

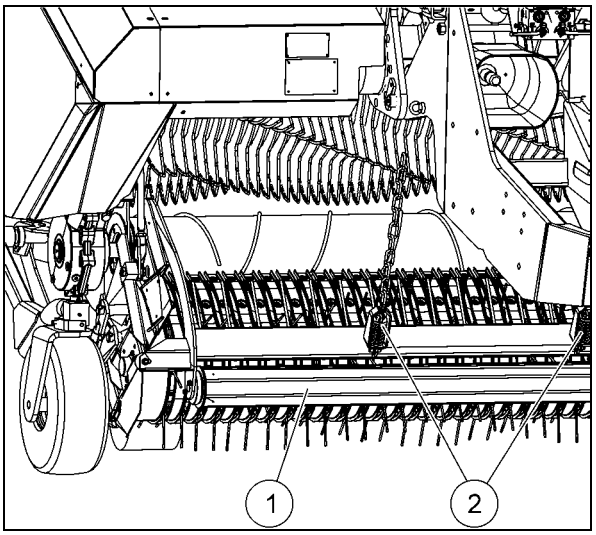


Fig. 18

5.2 Feeder rotor

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.

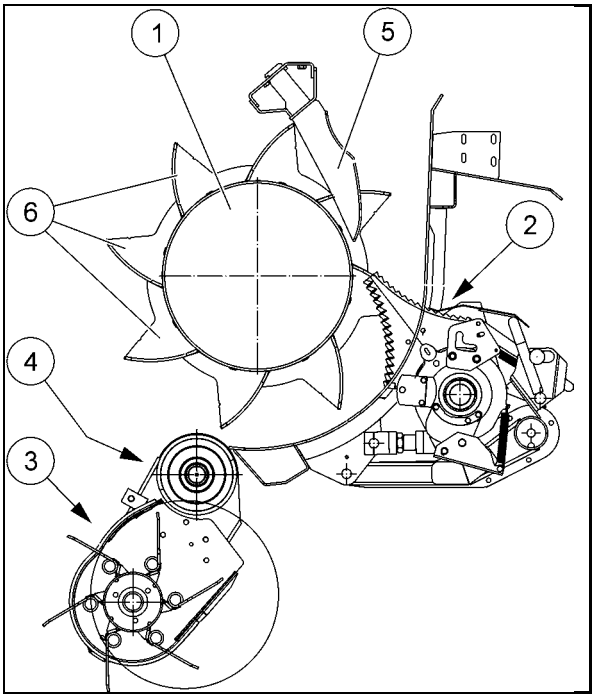


Fig. 19

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. 45 cutting knives can be mounted. The shortest theoretical cutting length is then 35 mm.

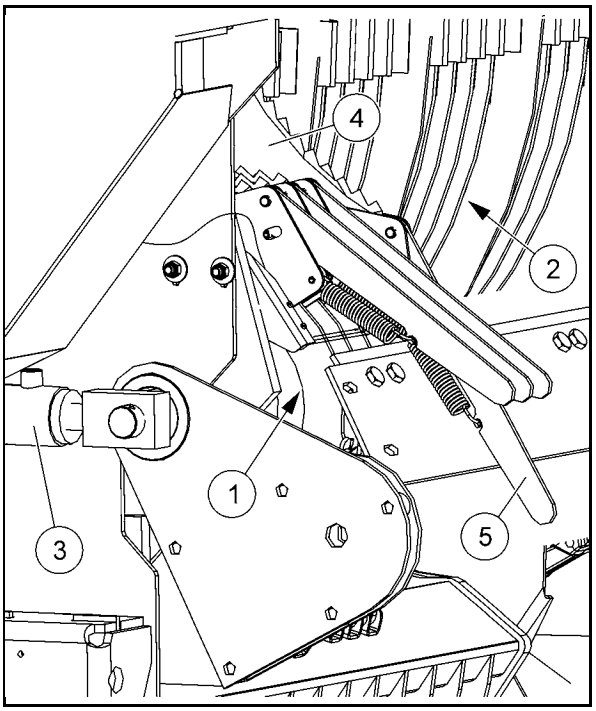


Fig. 20

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.

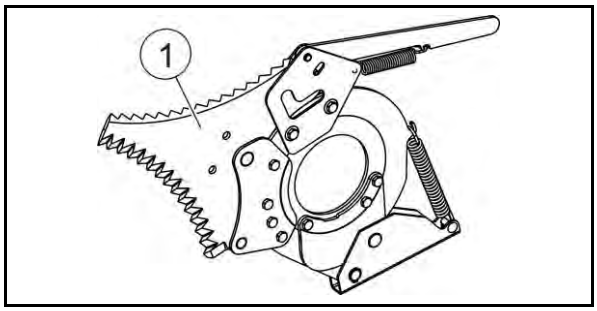


Fig. 21

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.

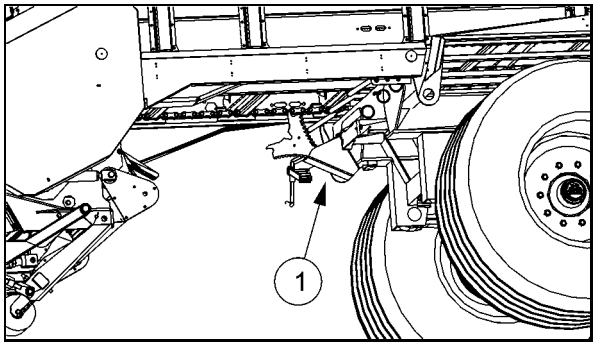


Fig. 22

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.

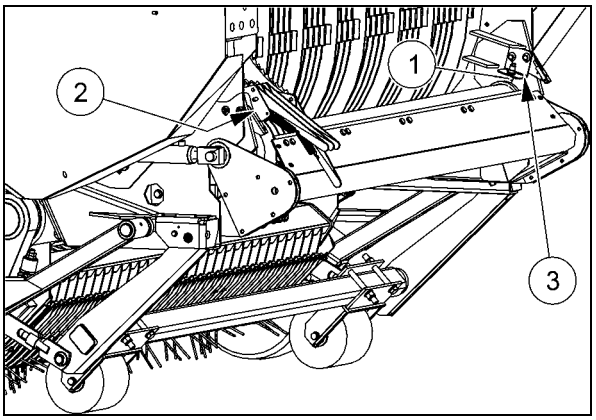


Fig. 23

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.

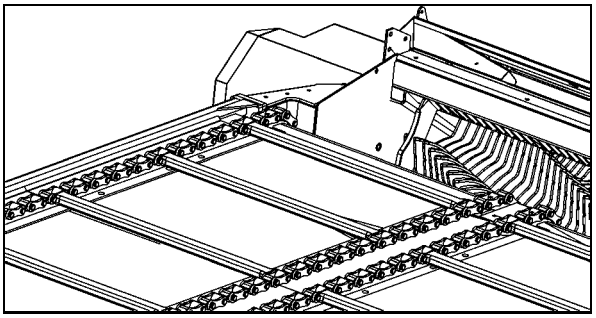


Fig. 24

5.4.1 Set feed rate of transport floor with ISOBUS control Field-Operator 120

The feed rate of the transport floor depends on the set filling degree. Observe the information in the chapter "Pre-select filling degree of loaded material in cargo space", page 126.

5.5 Front panel with incorporated automatic charging system

All machine models are equipped with a standard swivelling front panel (1) with 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 automatic charging system/front panel (1) is swivelled via the control set by means of the two double-acting hydraulic cylinders (2).

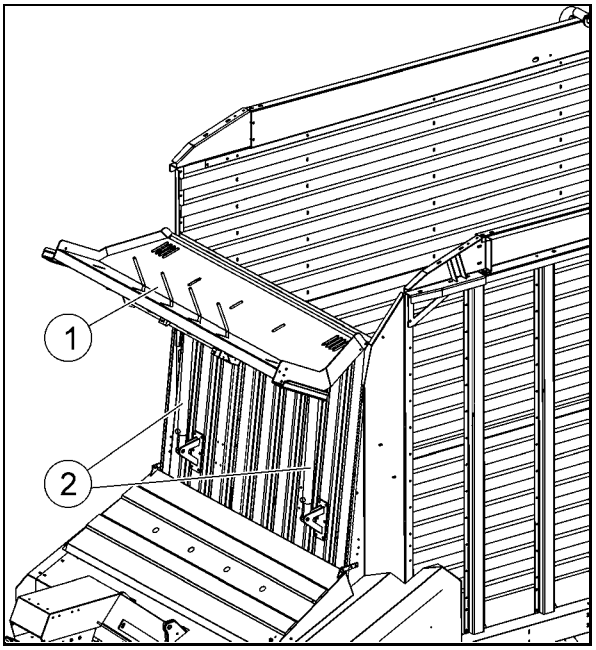


Fig. 25

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.

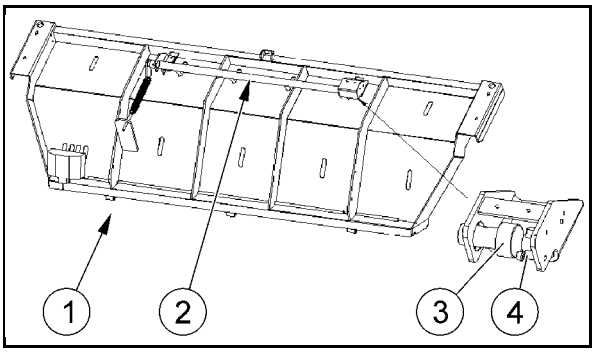


Fig. 26

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 127.

5.5.1 Deactivate automatic charging system and stop transport floor

Giga-Vitesse CFS

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.

Giga-Vitesse CFS DO

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 Body tarpaulin with rewinding and securing mechanism

Optional extra

To secure the loaded material, all machines can be equipped with a reinforced body tarpaulin (1) covering the front section of the cargo space.

The integrated rewinding (2) and securing mechanisms (3) permit easy conversion of the machine for its use as a forage wagon/forage wagon with dosing unit or forage transport wagon.

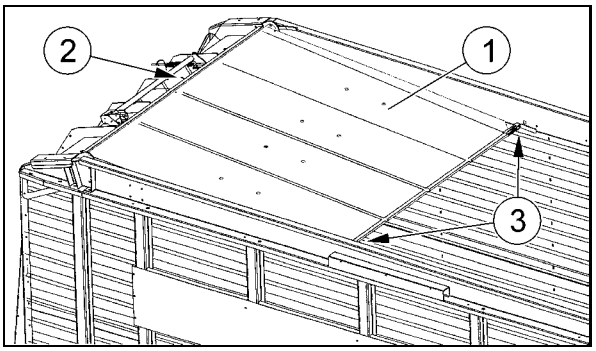


Fig. 27

5.6.1 Unwind body tarpaulin

1. Enter the cargo space through the access door. Observe the information in the chapter "Enter cargo space", page 173.
2. Swivel the locking lever (1) to its top position.
3. Pull the body tarpaulin (2) vertically down until it has been completely unwound. The locking lever in its top position prevents the body tarpaulin from rewinding.
4. Hang the hooks of the body tarpaulin on both sides into the securing mechanism (3).

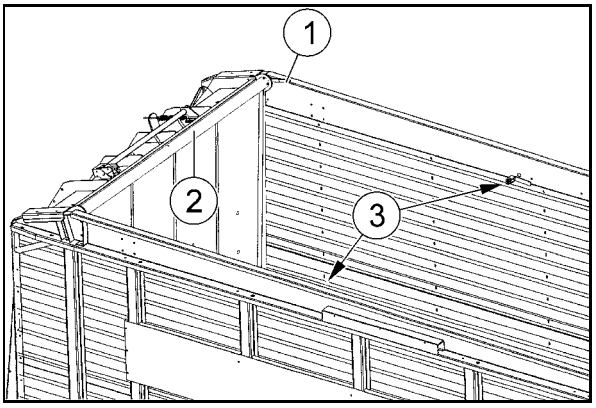


Fig. 28

5.6.2 Rewind body tarpaulin

1. Enter the cargo space through the access door. Observe the information in the chapter "Enter cargo space", page 173.
2. Swivel the locking lever (1) to its top position.
3. Take the body tarpaulin (2) on both sides out of the securing mechanism (3) such that the tarpaulin is vertically hanging down.
4. Swivel the locking lever to its bottom position.

→ The body tarpaulin automatically starts to rewind.

5. Take hold of the body tarpaulin with both hands to prevent if from rewinding too fast.

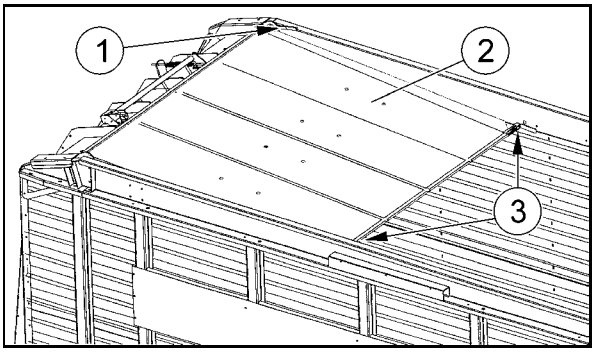


Fig. 29

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.

Giga-Vitesse CFS

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.

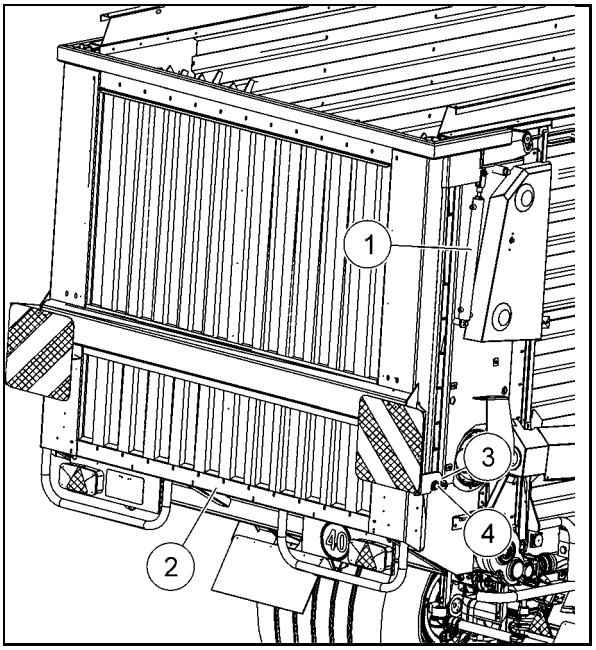


Fig. 30

Giga-Vitesse CFS DO

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. The tailgate is automatically moved to that position when pressing the **Lift tailgate** key. After releasing and pressing the **Lift tailgate** key again, the tailgate raises as long as the key is pressed or until it is 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.

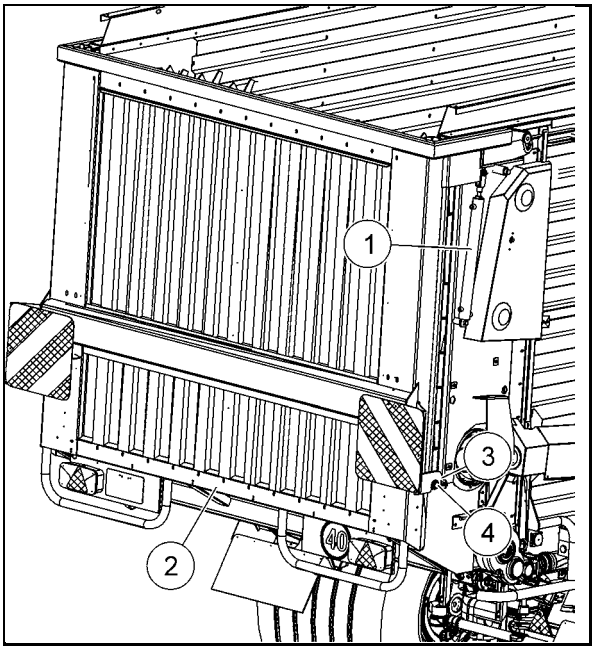


Fig. 31

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 right-hand side of the tailgate.

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

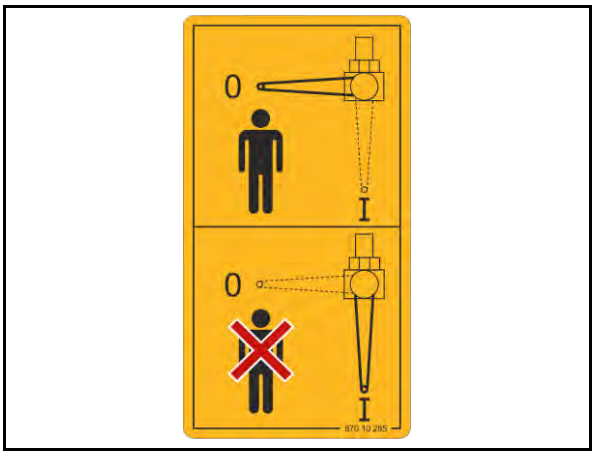


Fig. 32

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

5.8 Dosing drums

The machine is 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 and rear angular gear. The individual dosing drums are connected with each other by means of roller chains. Each roller chain is equipped with a chain tensioner.

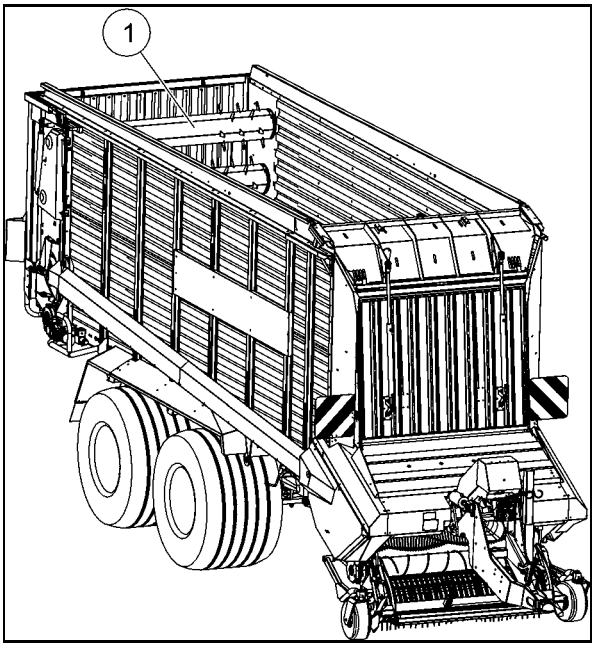


Fig. 33

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.

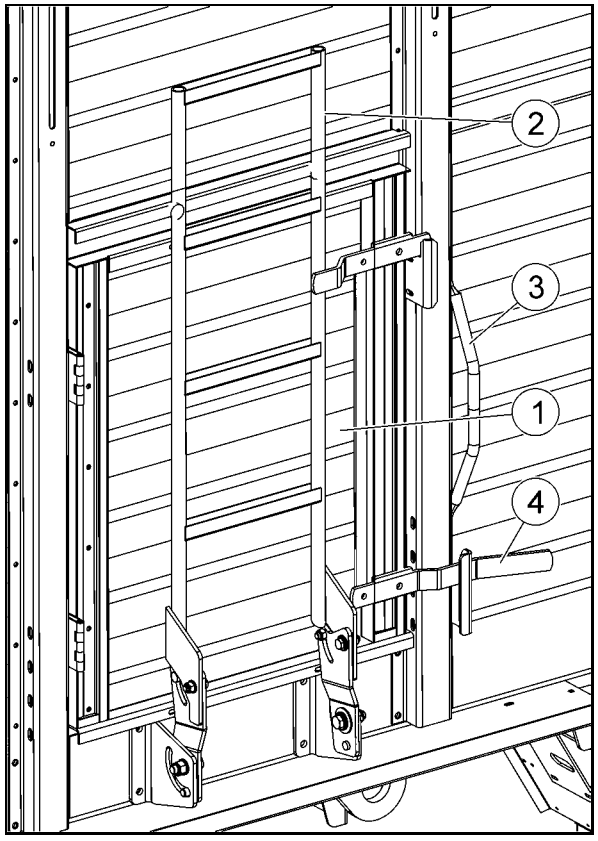


Fig. 34

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 29. For information about the hose markings, refer to the chapter "Marking of hydraulic supply lines", page 16.

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

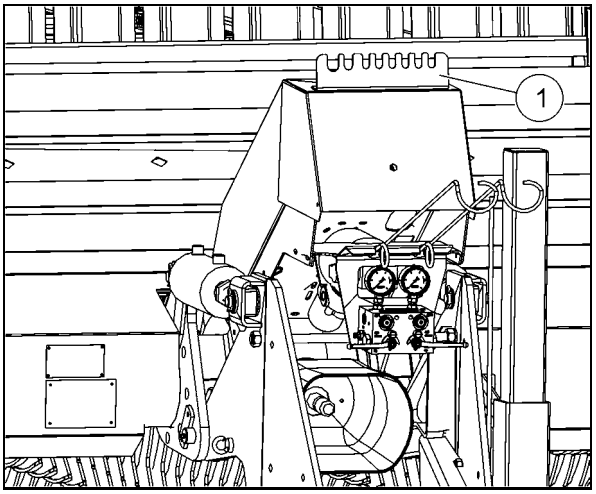


Fig. 35

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 locking 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) Cutting knives
- (3.4) Pressure limiting valve for cutting unit

> 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 FAD or BPW steering axle

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

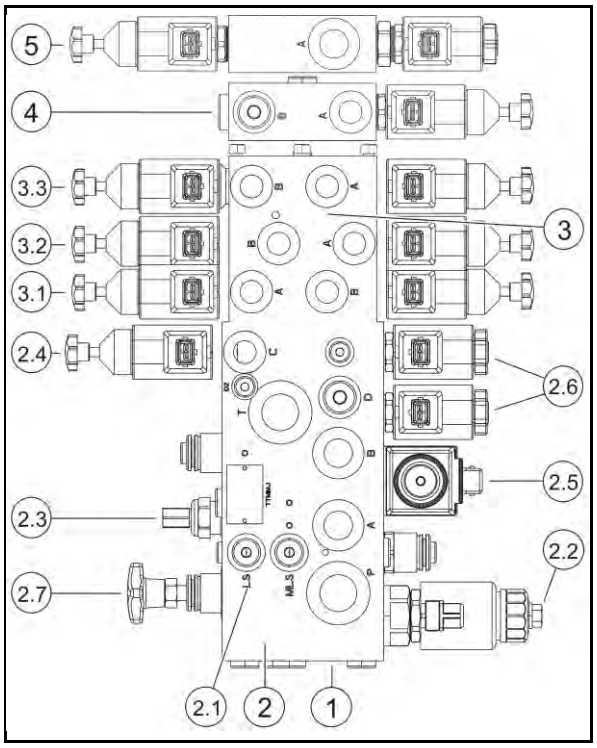


Fig. 36

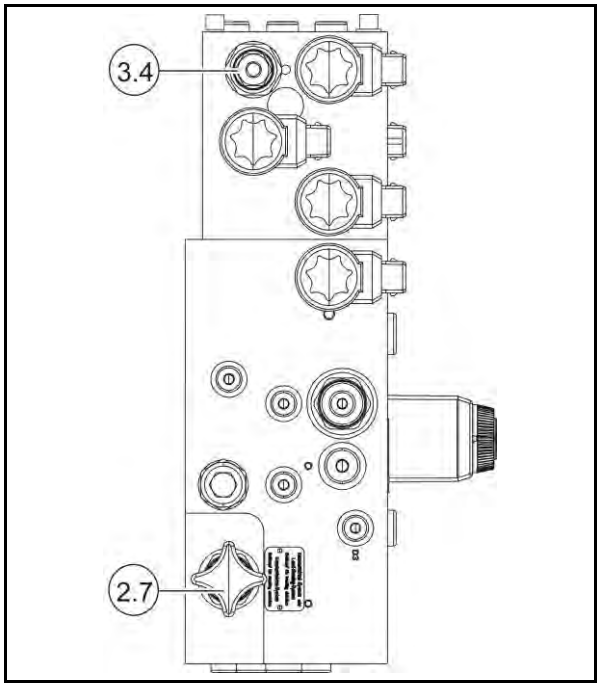


Fig. 37

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.

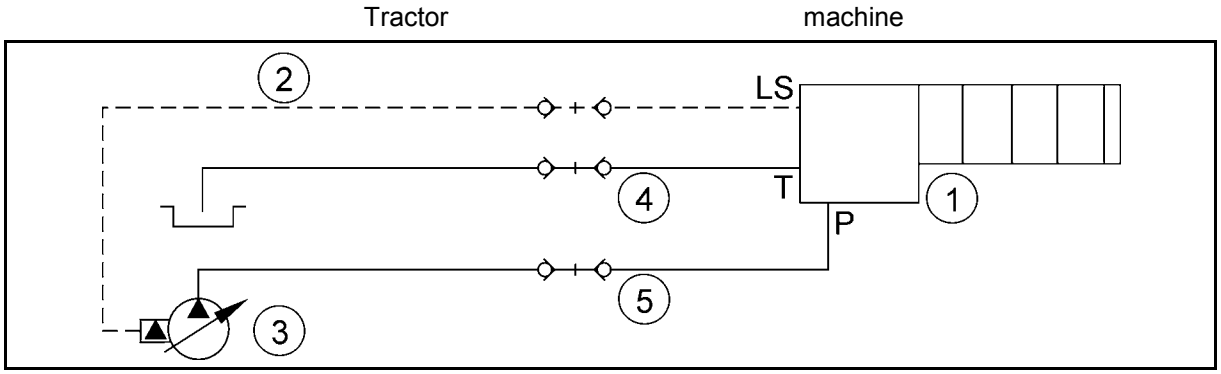


Fig. 38

(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. 36/2.1) 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. 37/2.7) 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.

Absolutely observe the information in the chapter "Electrical system – Emergency manual operation", page 71 when actuating the emergency manual operation function.

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

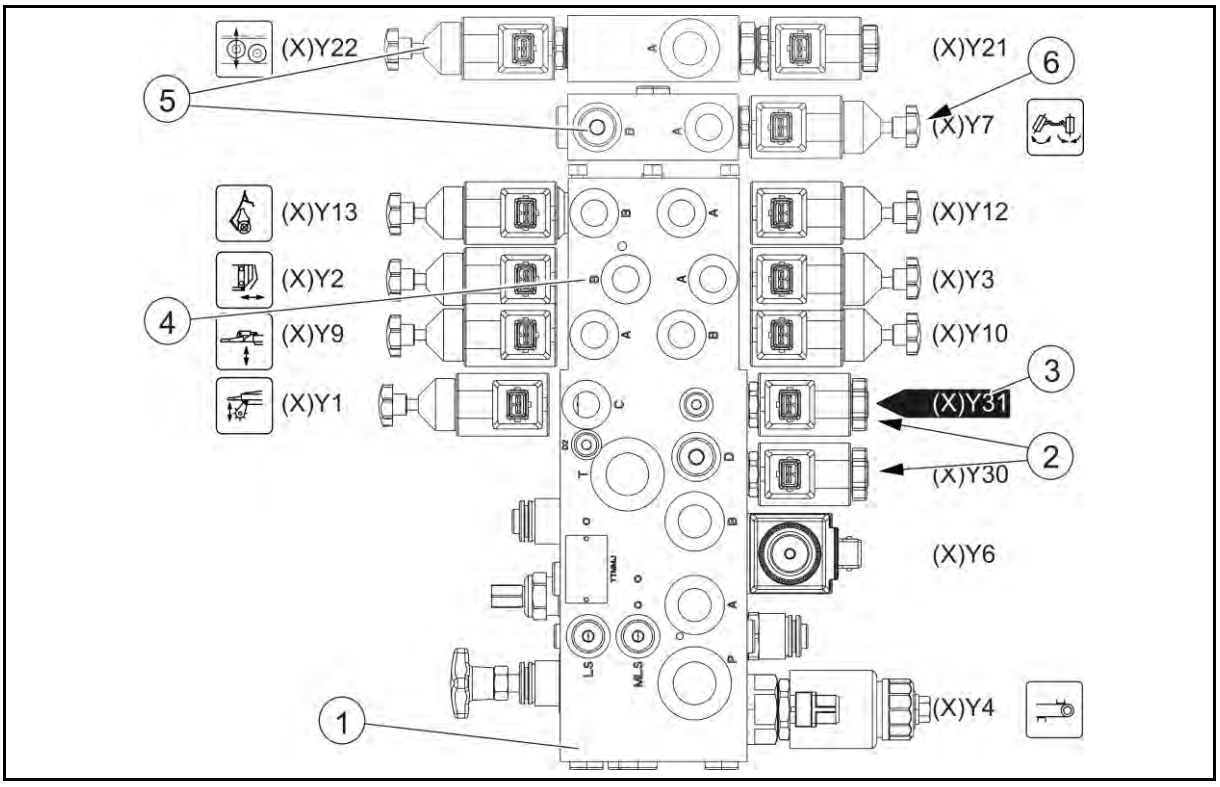


Fig. 39

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	Unlocked	Locked	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)Y7											●							
(X)Y7												●						
(X)Y22													●					
(X)Y21														●				

Solenoid valves \ Functions	Retract (out)	Extend (in)	Lift	Lower	Lift	Lower	Lift	Lower	Forward	Reverse	Unlocked	Locked	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:

Retract cutting unit

1. Screw in the knurled screws (1, 2) at the directional seat valves (X)Y12 and (X)Y13.
2. Use a blunt object to push in the armature of the solenoid (X)Y31 (3).

→ The cutting unit retracts.

3. Unscrew the knurled screws completely again.

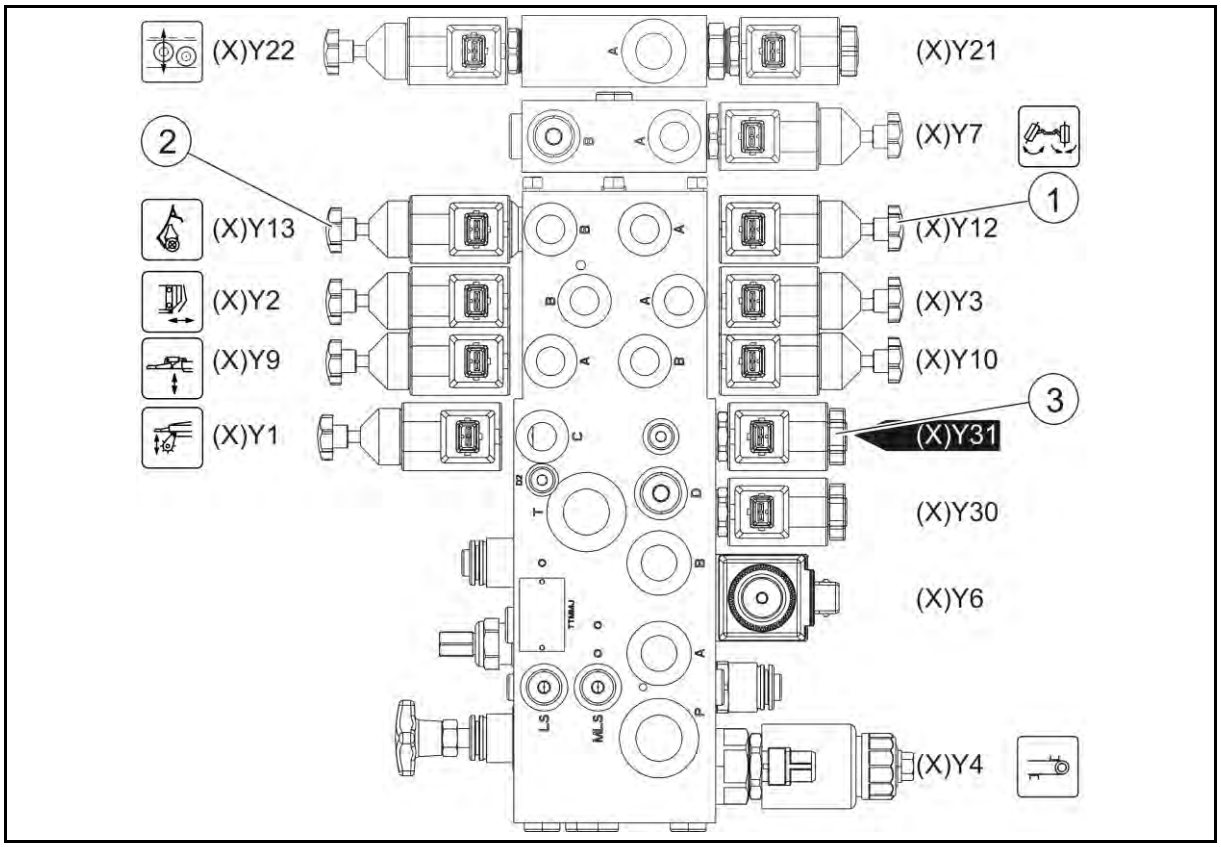

(X)Y22
(X)Y21
2
(X)Y7
1
(X)Y13
(X)Y12
(X)Y2
(X)Y3
(X)Y9
(X)Y10
3
(X)Y1
(X)Y31
(X)Y30
(X)Y6
(X)Y4
LS
MLS
P
A
B
C
D
T
TYMAU

Fig. 40

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!

- Observe the coloured markings at the hydraulic plugs when connecting hydraulic hose pipes. For information refer to the chapter "Marking of hydraulic supply lines", page 16.
- 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 pipe
  - T = Return pipe

- 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. For details refer to the chapter "Required tractor equipment", page 29.
- 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 (neutral 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

1. Swivel the respective operating element at the control device on the tractor to open-centre position (neutral 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.

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 hydro-pneumatic tandem or tridem chassis with hydraulic levelling system:
  - 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 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.

5.11.2 Hydro-pneumatic tandem chassis with hydraulic levelling system

The hydraulic levelling system:

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

The axle suspension and the damping of the machine on the individual wheels of the hydro-pneumatic tandem chassis with separate hydraulic levelling for the right-hand and left-hand machine side is carried out by 4 level-controlled 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 locked with the road travel mode switched off.

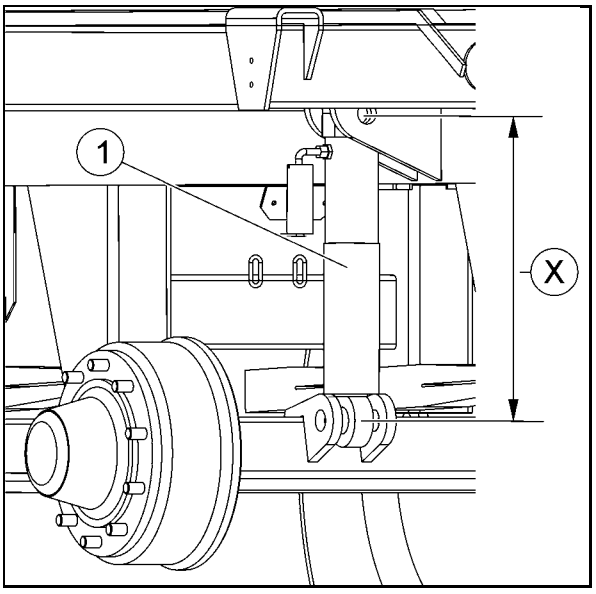


Fig. 41

5.11.2.1 Check travelling height of hydraulic levelling system

The travelling height of the hydraulic levelling system must be checked every day with the machine being empty. The set travelling height may change due to leak oil losses.

On an empty machine with properly set travelling height, the distance between the locating points of the hydraulic cylinder is X = 600±10 mm.

The hydraulic levelling system properly triggers the hydraulic automatic load-sensitive brake-pressure regulator of the dual-line compressed-air brake system for load-sensitive braking force control only with the travelling height properly set.

1. Hitch the machine to the tractor.
2. Park the empty machine on even ground.
3. Secure tractor and machine against accidental rolling.

With the machine being empty, the pressure gauges (1, 2) display approx. 20 bar at the levelling valve.

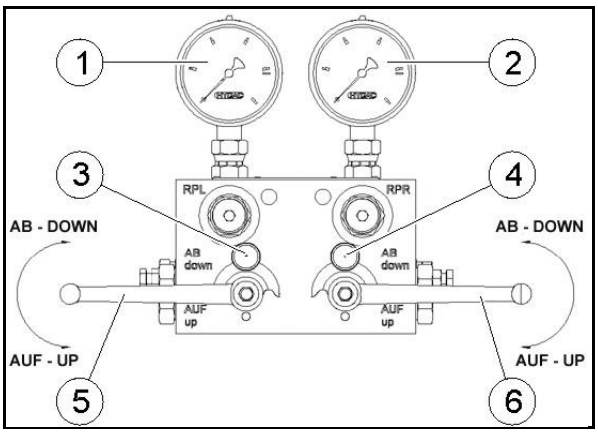


Fig. 42

4. Check the distance X between the locating points on all 4 hydraulic cylinders (1).
5. The travelling height of the tandem axle assembly must be adjusted if the distance is not X = 600±10 mm.

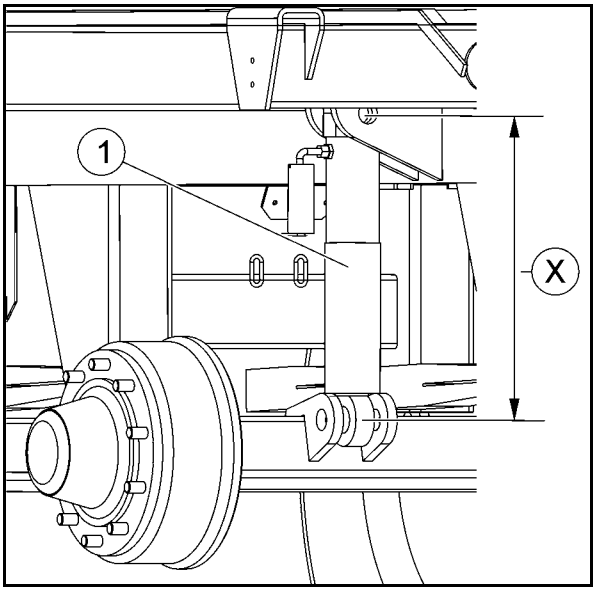


Fig. 43

5.11.2.2 Adjust travelling height of hydraulic levelling system

WARNING

Risk of crushing and impact when adjusting the travelling height!

Make sure people leave the hazardous area beneath the machine before adjusting the travelling height.

- The travelling height of the hydraulic levelling system is adjusted 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).

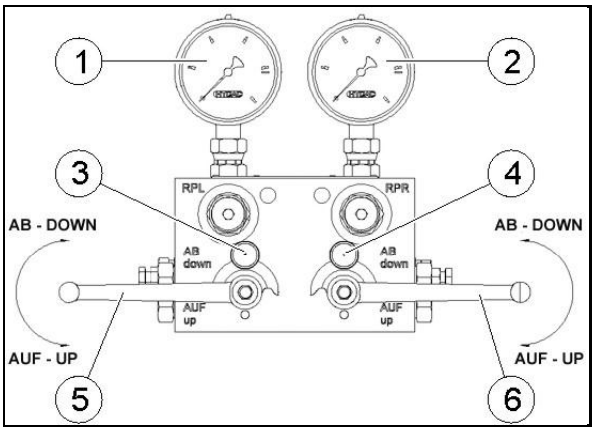


Fig. 44

Set the distance X = 600±10 mm between the locating points of the hydraulic cylinders 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 rolling.

Ensure that the parking brake of the tractor is not applied.

4. Connect the hydraulic hose pipe of the levelling valve with a single-acting control device of the tractor.
5. Turn the stop valve (5 or 6) to position

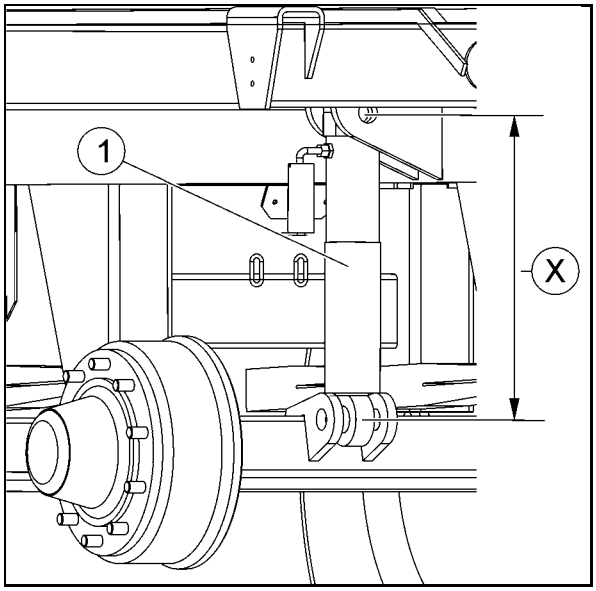


Fig. 45

"AUF" (increase distance X) or "AB" (reduce distance X):

5.1 Press the stop button (3 or 4) to unlock the stop valve.

5.2 Turn the stop valve carefully as far as it will go.

6. Hold the operating element at the tractor's control device in "Lift" position until the distance between the locating points of the hydraulic cylinders is X = 600 mm±10 mm.

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. Put the operating element for the levelling valve at the tractor's control device to neutral position.
8. Turn the stop valve (5 or 6) back to central position until the stop button engages and locks the stop valve in that central position.
9. Hold the operating element for the levelling valve at the tractor's control device in "Open-centre" position to ensure that the check valves incorporated in the levelling valve can properly close.
10. Check the total height of the machine. With the travelling height properly set, the admissible total height must not exceed 4 m.

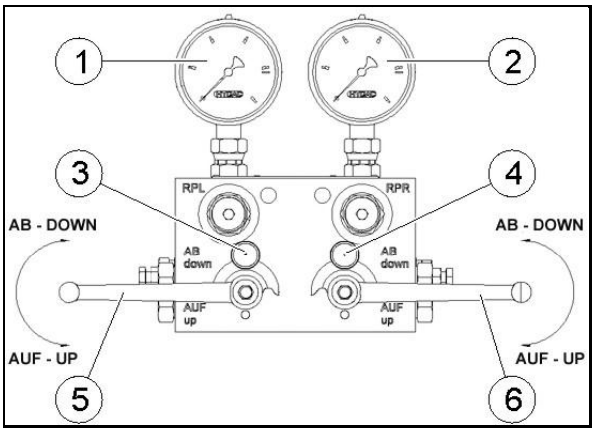


Fig. 46

5.11.3 Hydro-pneumatic tridem chassis with hydraulic levelling system

The hydraulic levelling system:

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

The axle suspension and the damping of the machine on the individual wheels of the hydro-pneumatic tridem chassis with separate hydraulic levelling for the right-hand and left-hand machine side is carried out by 6 level-controlled hydraulic cylinders (1).

2 levelling valves on the central axle will detect a possible too low or excessive travelling height of the hydraulic levelling system. The travelling height will be automatically adjusted if the hydraulic hose pipe of the hydraulic levelling system 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.

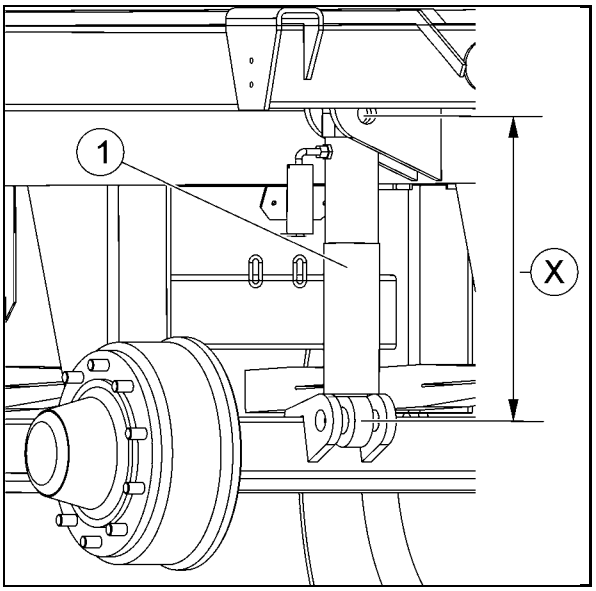


Fig. 47

5.11.3.1 Adjust travelling height of hydraulic levelling system

The travelling height of the hydraulic levelling system must be checked every day with the machine being empty. The set travelling height may change due to leak oil losses.

For adjusting the travelling height, connect the hydraulic hose pipe of the hydraulic levelling system to a single-acting control device of the tractor and pressurise it. The travelling height is then automatically adjusted. If the travelling height has been adjusted, move the control device to neutral position for a short time, in order to relieve the hydraulic hose pipe.

The hydraulic levelling system properly triggers the hydraulic automatic load-sensitive brake-pressure regulator of the dual-line compressed-air brake system for load-sensitive braking force control only with the travelling height properly set.

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

Observe the fact that the steering rod is spring-loaded!

- When coupling the steering rod, a certain resistance must be overcome.
- During uncoupling, the steering rod is pulled towards the drawbar and held there.

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. Couple and secure the steering rod (1) with the ball head to the right-hand side of the tractor.

   Set the steering rod such that the left-hand edge of the reversing element (2) is positioned in one line with the right-hand edge of the orientation notch (3) (A) if tractor and machine are in one line.
3. Completely turn the steering wheel of the tractor.
4. Carefully start to move until the left-hand edge of the reversing element is flush with the right-hand edge of the respective lateral orientation notch (4).

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

→ If the steering range was exceeded, the

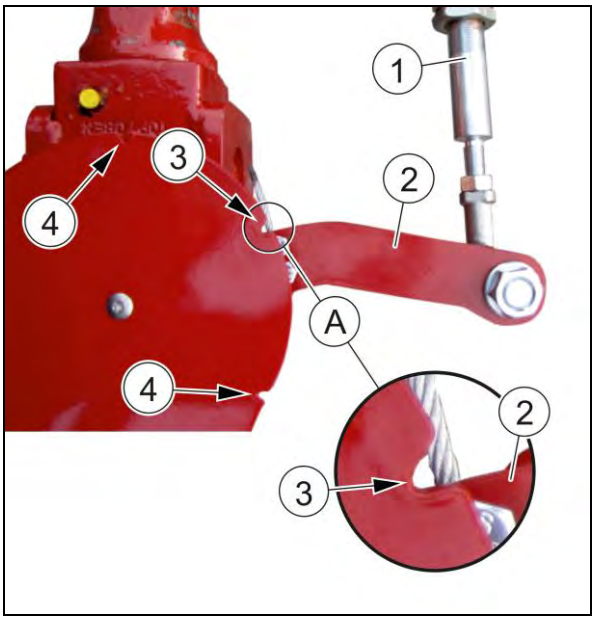


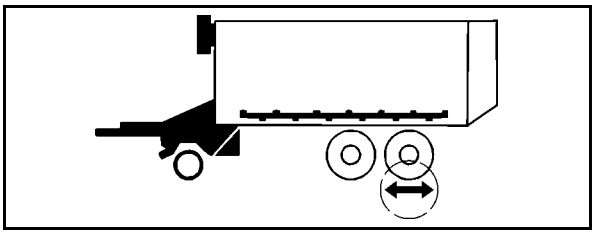
Fig. 48

"Steering axle unlocked" symbol is flashing and a beep is emitted. The follow-up steering is activated.

→ If the system returns to the specified steering range, the "Steering axle unlocked" symbol goes out and a beep is emitted.

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

The screen shows:



5.11.5.2 Lock forced steering axle

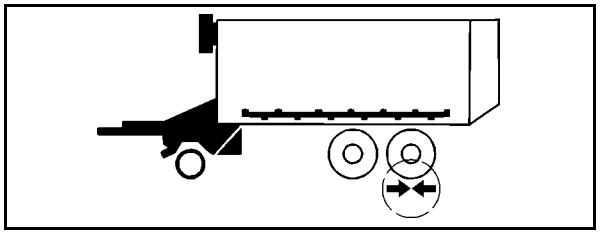
In the case of the electro-hydraulic forced steering axle system, the  key has a touch-control design.

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 end position could not be reached. An error has occurred. The steering system works.

The screen shows:



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.

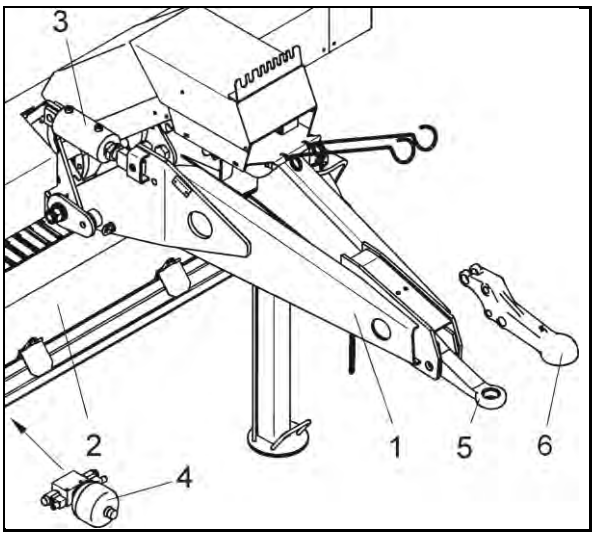


Fig. 49

Depending on the design of the tractor's coupling device, the folding drawbar can be coupled to the tractor by means of a top hitch or bottom hitch.

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

- a drawbar lug 40 according to DIN 11043 for a bolt-type coupling according to DIN 11028/ISO 6489-2,
- a shell 80 (1) for a ball-type coupling 80.

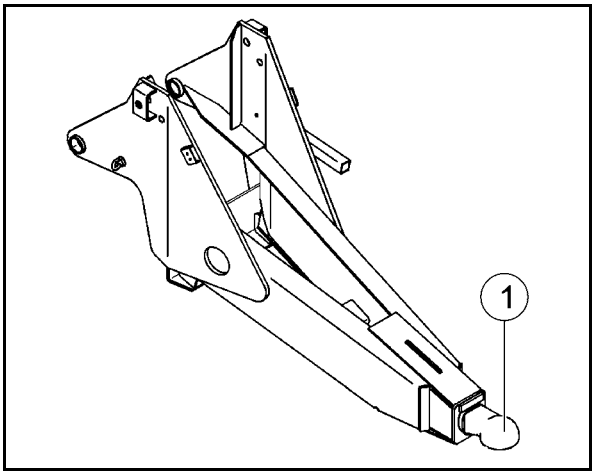


Fig. 50

5.12.2 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 137.

- Properly hitch the machine to the tractor and secure it.
- Never use damaged or deformed trailer systems.

5.12.2.1 Bolt-type coupling

1. Prepare for coupling:
   1.1 Lock the grab jaw of a bolt-type coupling with movable grab jaw (non-automatic bolt-type coupling).
   1.2 Open the hitch, i. e. it should be in a pre-coupling position (automatic bolt-type coupling).
2. Reverse the tractor until the bolt-type coupling engages into the drawbar lug.
3. Secure the tractor against accidental starting and rolling.
4. Check that the connection is secure after coupling:
   4.1 Secure the inserted coupling bolt by positive locking (non-automatic bolt-type coupling).
   4.2 Ensure that the automatic bolt-type coupling is locked (control pin, end position of operating lever, etc.).
5. Connect the supply lines.
6. Release the parking brake of the machine.
7. Lift the supporting leg to transport position.

5.12.2.2 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

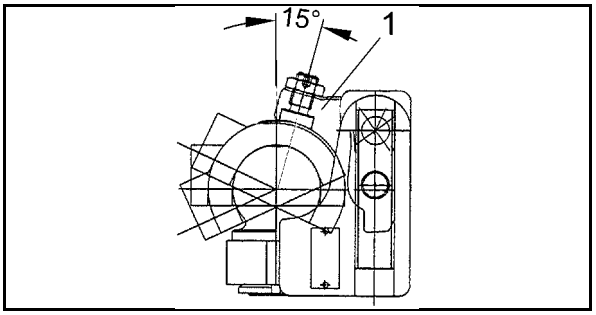


Fig. 51

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.

5.12.3 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.

5.12.3.1 Bolt-type coupling

1. Lower the supporting leg to support position such that the drawbar no longer transmits any tongue load to the tractor.
2. Disconnect the supply lines.
3. Place the supply lines onto the hose holder.
4. Prepare for coupling:
   - 4.1 Remove the coupling bolt (non-automatic bolt-type coupling).
   - 4.2 Open the trailer hitch (automatic bolt-type coupling).
5. Move the tractor forward.

5.12.3.2 Ball-type coupling and shell

1. Lift the folding drawbar.
2. Secure the machine against rolling.
3. Unlock the holding-down device at the bearing block.
4. Swivel the holding-down device to coupling position.
5. Lower the supporting leg to support position such that the shell disengages from the ball head.
6. Move the tractor forward (approx. 25 cm).
7. Secure tractor and machine against accidental starting and rolling.
8. Lock and secure the holding-down device at the bearing block.
9. Disconnect the supply lines.
10. Place the supply lines onto the hose holder.
11. 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 (4). 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.

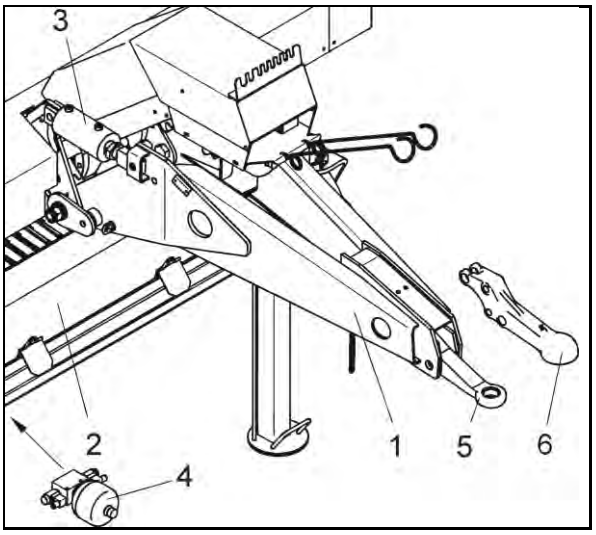


Fig. 52

5.13.1 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.

5.13.2 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.

5.14 Supporting leg

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.

The unhitched machine is supported by the supporting leg. Depending on the machine's equipment, it is fitted with:

- a mechanical supporting leg

5.14.1.1 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. Pull the locking bolt (3) out of the borehole.

(3) Use one hand to grip the handle (4) and lift the supporting leg (2) 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.

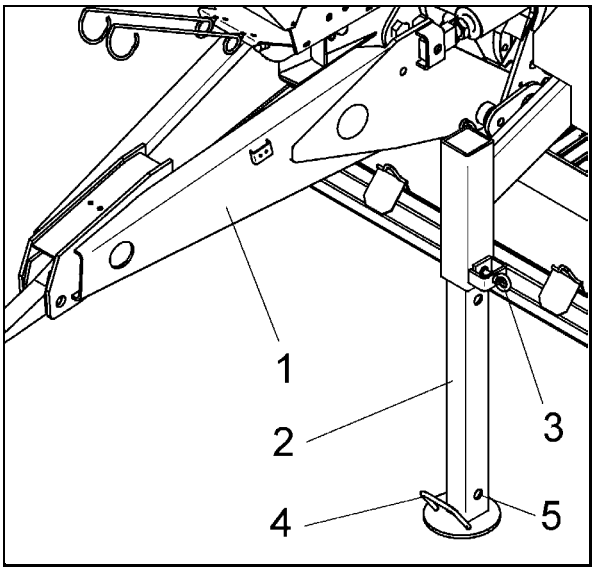


Fig. 53

5.14.1.2 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 (2) of the supporting leg (3).
3. Use the other hand to pull the locking bolt (4) out of the borehole.
4. Lower the supporting leg until the locking bolt engages into the borehole..
5. Check whether the locking bolt has properly engaged into the borehole and properly 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.

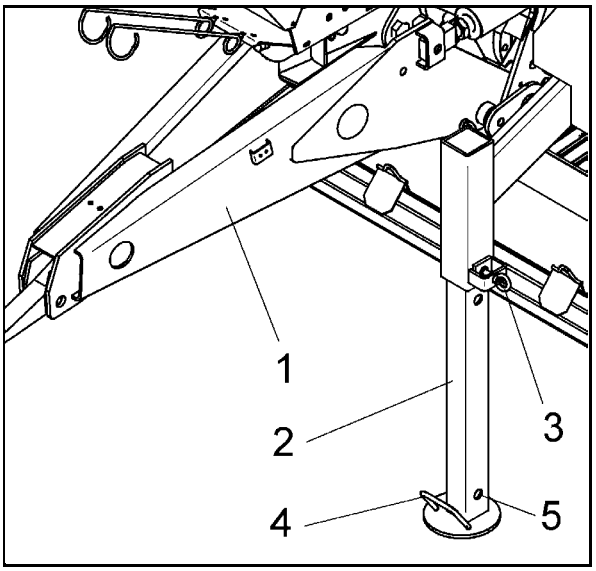


Fig. 54

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:
  - all protective devices of the propeller shaft for proper mounting and functioning,
  - 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 145,
  - 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 siwtching the p.t.o. shaft on, observe the safety instructions for p.t.o. shaft operation included in the chapter "Basic safety instructions", page 35.

5.15.1 Couple propeller shaft to tractor

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 of the propeller shaft 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. Secure the propeller shaft guard at the tractor and at the machine against rotating by means of the clip chains (1):
   - 5.1 Fix the clip chains at right angles to the propeller shaft if possible.
   - 5.2 Fix the clip chains such that a sufficient swivelling range of the propeller shaft is ensured in any operating state. Clip chains must not get entangled in tractor or machine components.
6. 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. 55

5.15.2 Uncouple propeller shaft from tractor

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

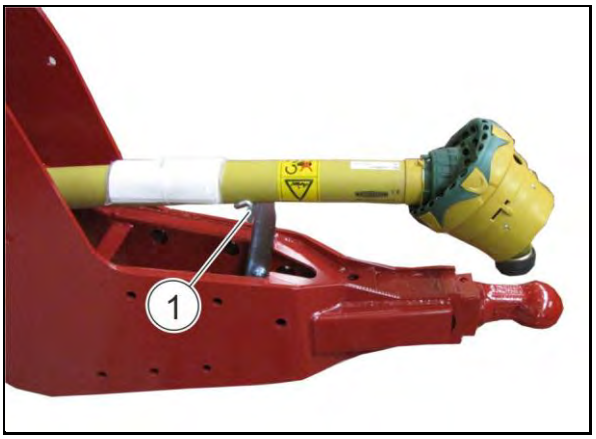


Fig. 56

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.

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):

- o push in as far as it will go and the service brake system releases, e. g. for manoeuvring the unhitched machine
- o 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

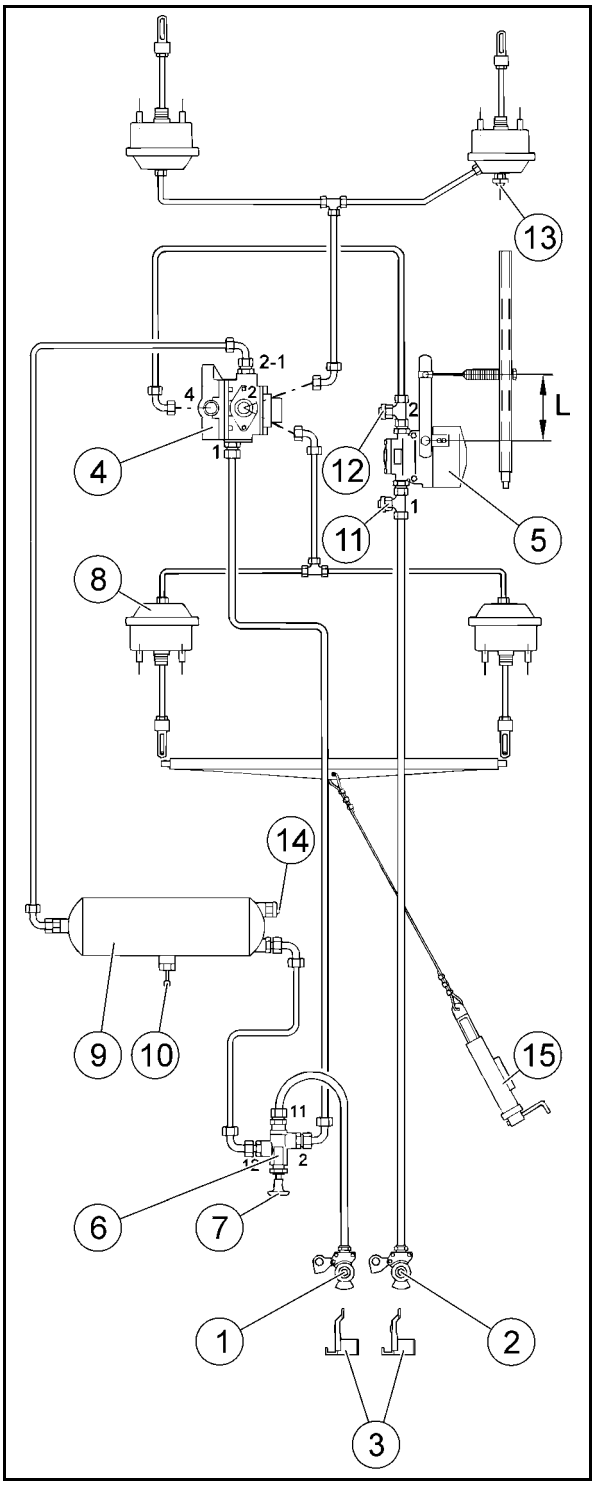


Fig. 57

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 of the hydraulic levelling system has not been properly set!

The hydraulic levelling system properly triggers the hydraulic ALB regulator only with the travelling height properly set. Observe the information in the chapter "Check travelling height of hydraulic levelling system", page 78.

(1) Feed line with hose coupling (red)

(2) Operating element for release valve (can only be actuated in uncoupled condition):
- o push in as far as it will go and the service brake system releases, e. g. for manoeuvring the unhitched machine
- o 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 levelling system of the hydro-pneumatic tandem chassis

(8) Hydraulic cylinders of the hydraulic levelling system

(9) Compressed-air reservoir

(10) Drain valve

(11) Test connection, compressed-air reservoir

(12) Test connection, diaphragm brake cylinder

(13) Parking brake

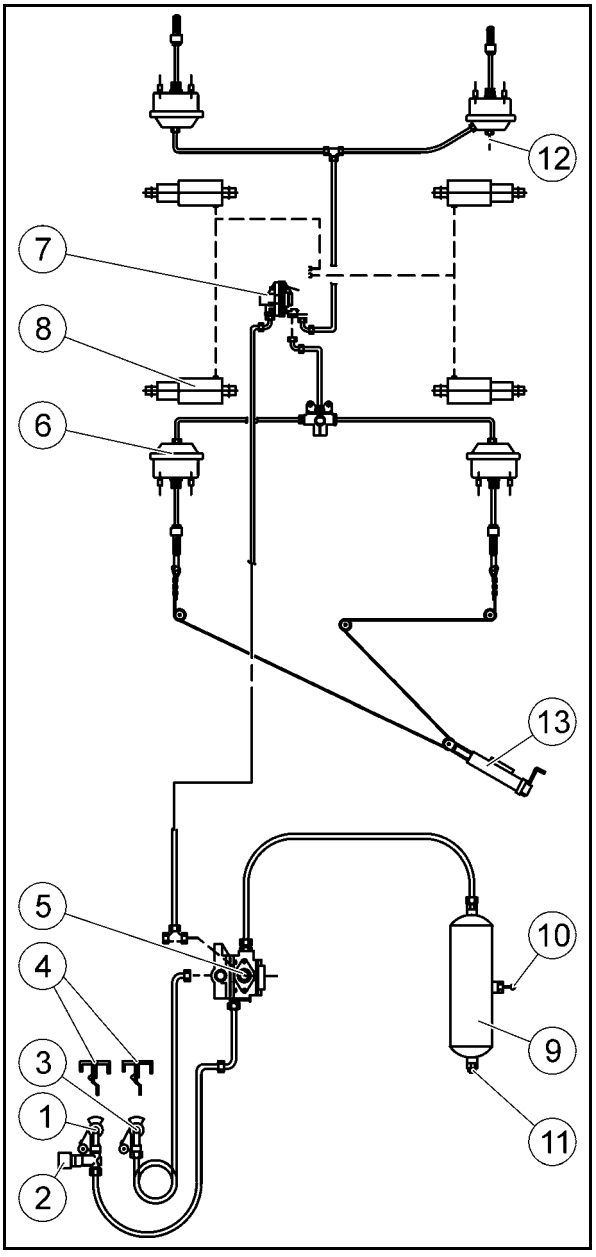


Fig. 58

5.16.1.3 Dual-line compressed-air brake system with hydro-pneumatic automatic load-sensitive brake pressure (ALB) regulator

Tridem chassis

WARNING

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

The hydraulic levelling system properly triggers the hydraulic ALB regulator only with the travelling height properly set. Observe the information in the chapter "Check travelling height of hydraulic levelling system", page 78.

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 (hydro-pneumatic), activated via the hydraulic levelling system of the hydro-pneumatic tridem chassis
(18) Simulator connection for pneumatically activated ALB regulator
(19) Quick-release valve with integrated two-way valve

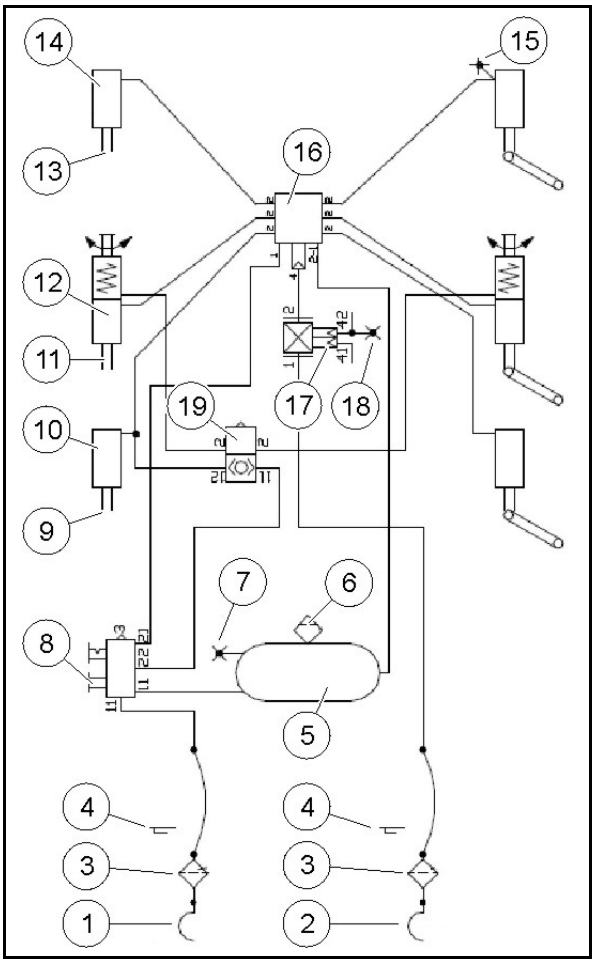


Fig. 59

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. 60

(1) Actuating mechanism for release valve
- o push in as far as it will go and the service brake system releases, e. g. for manoeuvring the unhitched machine
- o 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
- o push in as far as it will go and the spring-loaded brake system releases
- o 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

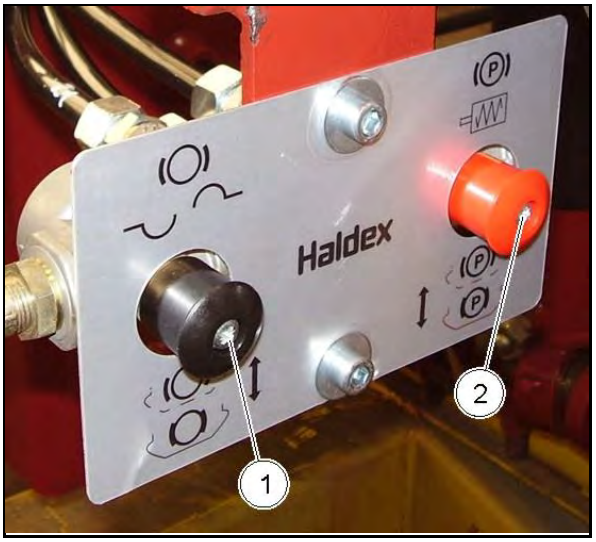


Fig. 61

5.16.1.4 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

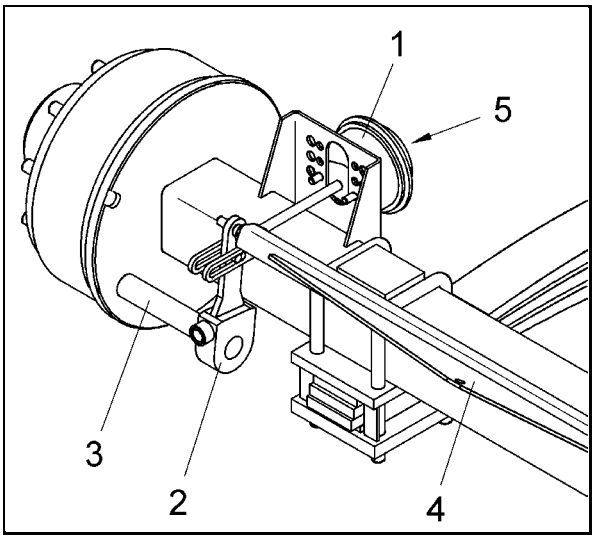


Fig. 62

5.16.1.5 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.

5.16.1.6 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. 63

(2) Hydraulic cylinder of braking axle

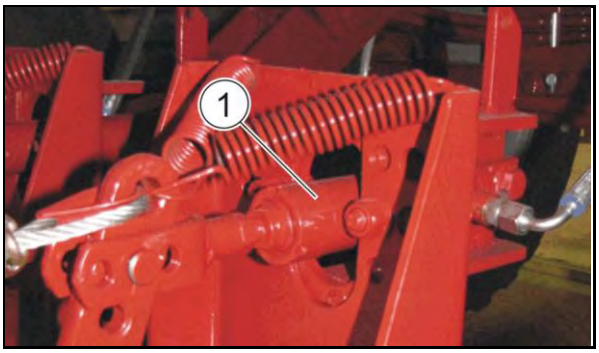


Fig. 64

5.16.2.1 Emergency brake valve

Optional extra

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.

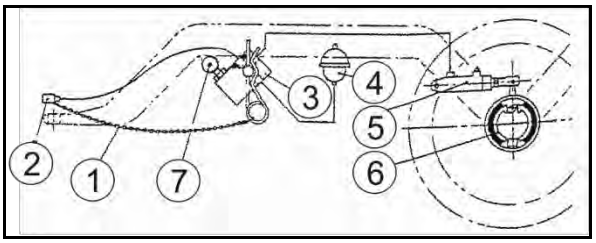


Fig. 65

(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 service brake system

- Only couple clean hydraulic clutches.
- Clean hydraulic plug and hydraulic sleeve if necessary.
- 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 service 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. 66

5.16.2.3 Disconnect hydraulic service brake system

1. Apply the parking brake of the machine.
2. Uncouple the hydraulic sleeve (Fig. 66/1).
3. Slip the hydraulic sleeve onto the machine's blanked-off connecting piece (Fig. 66/2).

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

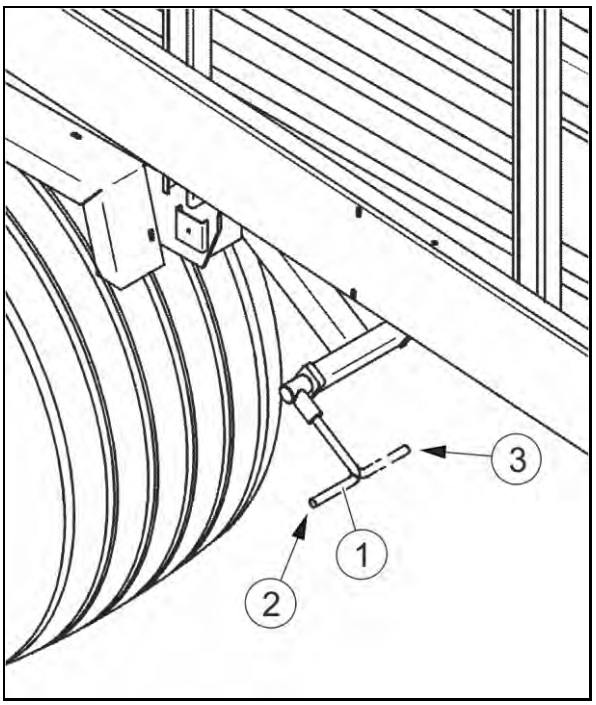


Fig. 67

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.

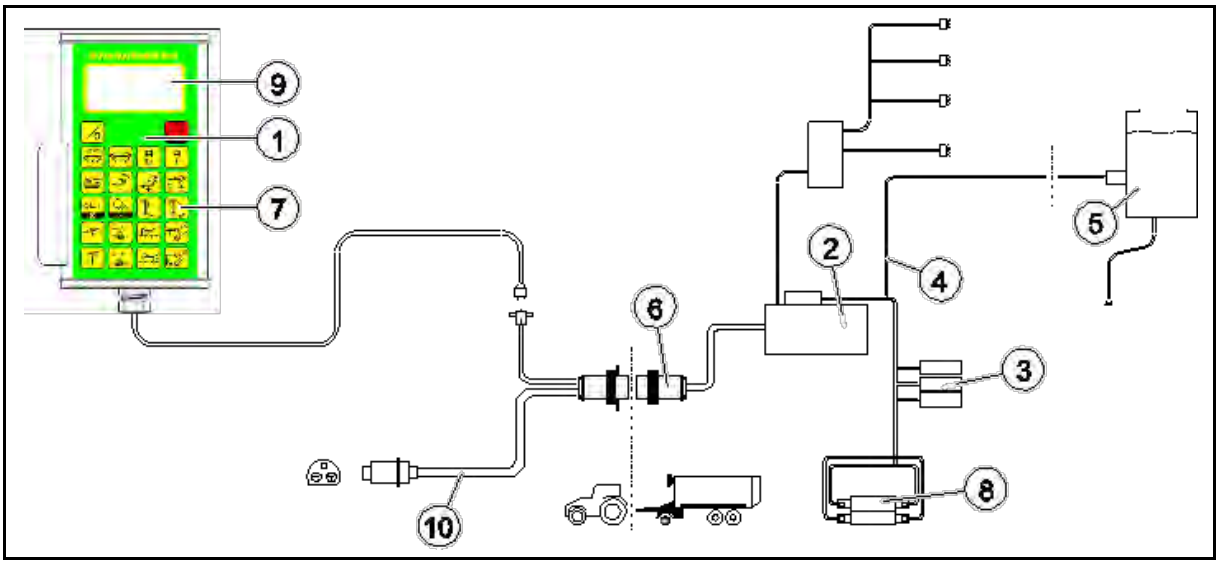


Fig. 68

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:
  - o the software version,
  - o 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)

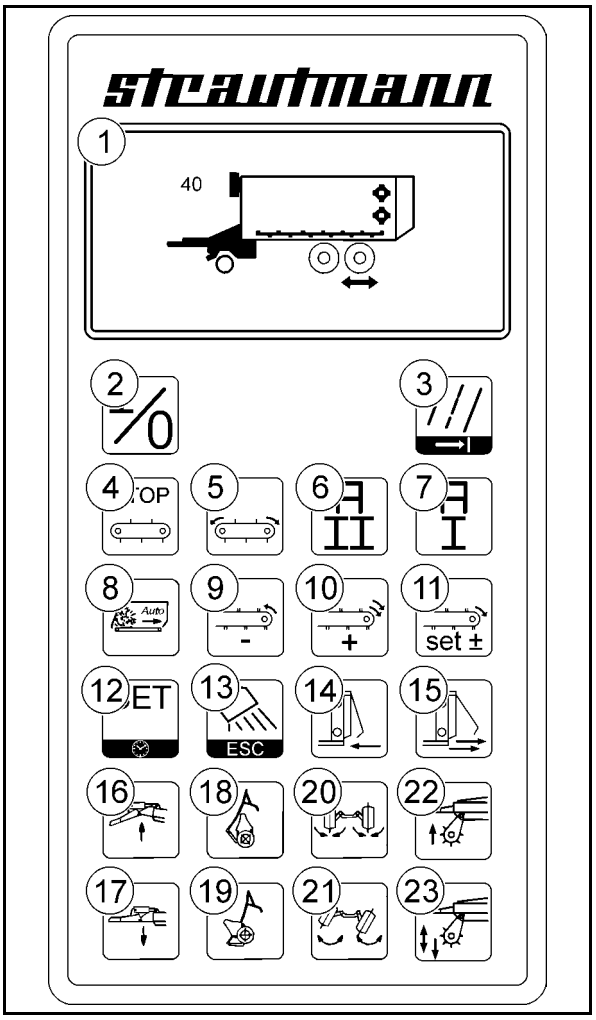


Fig. 69

(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 the 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

(21) Unlock steering axle

(22) Lift pick-up

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

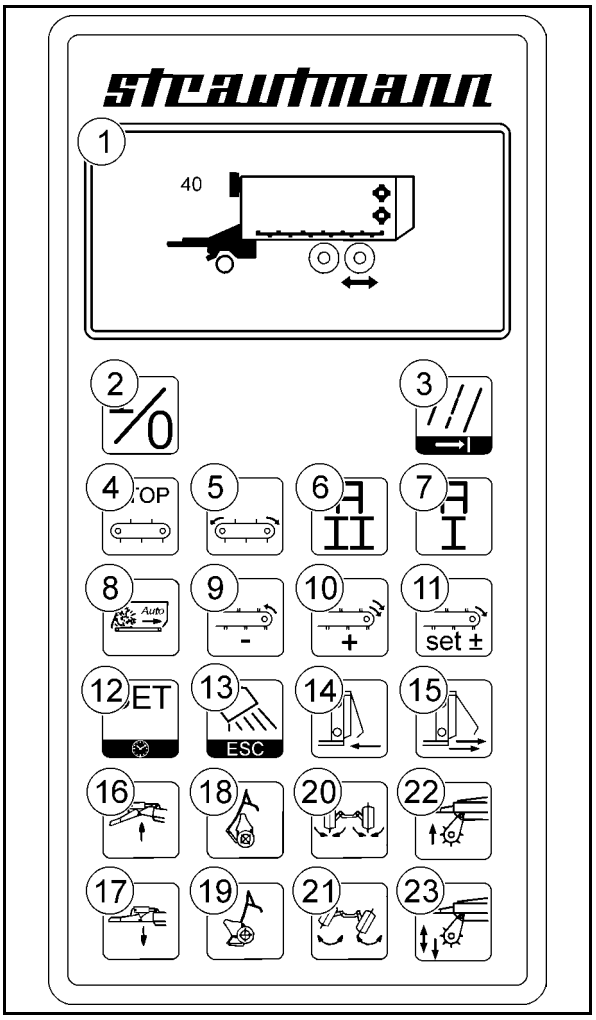
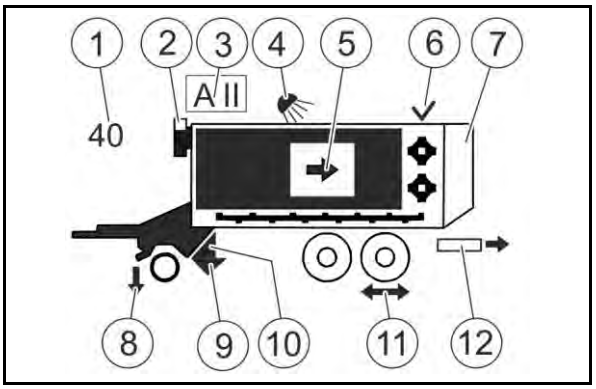


Fig. 70

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"

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

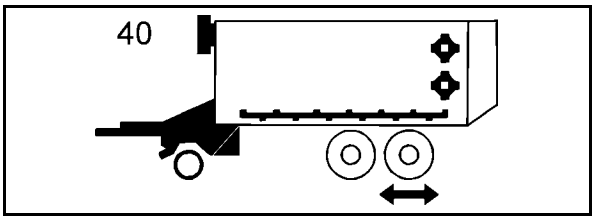
At the same time, this key serves as emergency stop. After the control set has been switched off, all hydraulic functions are also switched off.

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

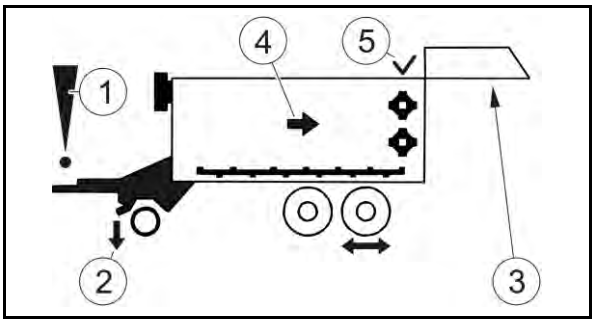
(2) Pick-up down

(3) Tailgate lifted

(4) Transport floor powered

(5) Dosing drums powered

The screen shows:



With the road travel mode switched on:

- the **Road travel menu appears,**
- apart from the functions "Lock steering axle" and "Unlock steering axle", all other functions of the control set are blocked,
- the hydraulic drawbar suspension (optional extra), the axle suspension of the hydro-pneumatic tandem chassis (optional extra) and the warning beacon (optional extra) are switched on,
- the work light (optional extra) is 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 before switching the road travel mode on.

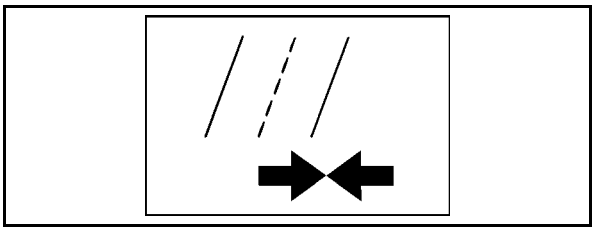
The drawbar suspension will not work if the folding drawbar is lowered to its end position.

1. Press the  key once.

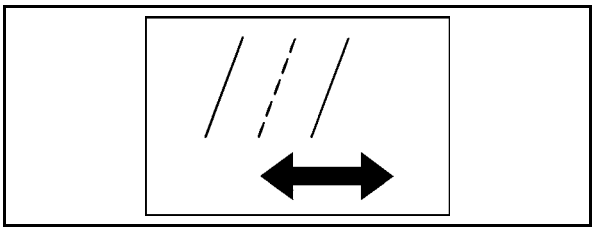
→ Road travel mode is switched on. The **Road travel** menu appears with

- o the "Steering axle locked" symbol or

The screen shows:



- o the "Steering axle unlocked" symbol.



Switch road travel mode off

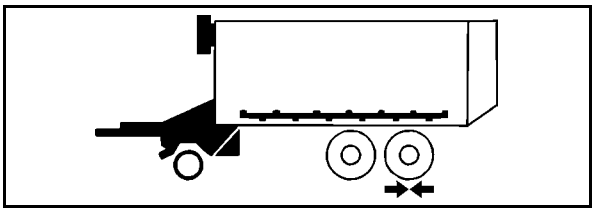
With the road travel mode switched off:

- the **Working menu appears**,
- all functions of the control set are released,
- the hydraulic drawbar suspension (optional extra), the axle suspension of the hydro-pneumatic tandem chassis (optional extra) and the warning beacon (optional extra) are switched off,
- the work light (optional extra) is switched on if the work light was 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.

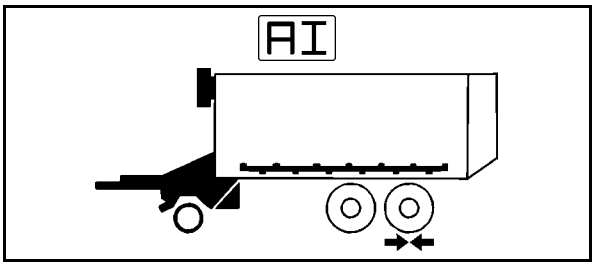
In case of electro-hydraulic forced steering axle system, the steering axle is locked in **Discharge mode A I** up to 12 km/h, see chapter "SES system", page 132.

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

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

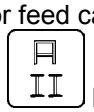
- Lock steering axle
- Lift folding drawbar

The screen shows:



Switch Discharge mode A II on (Giga-Vitesse CFS)

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

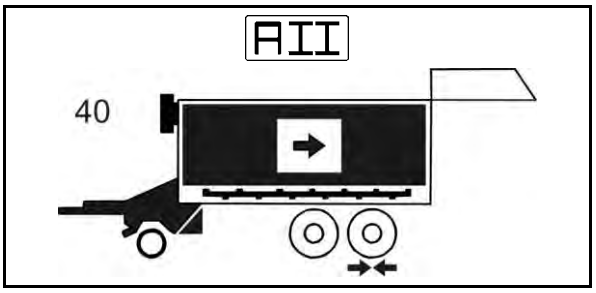
During discharge, the transport floor feed can be switched on and off as often as desired by pressing the  key.

1. Press the AII 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 Discharge mode A II on (Giga-Vitesse CFS DO)

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 AII key.

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

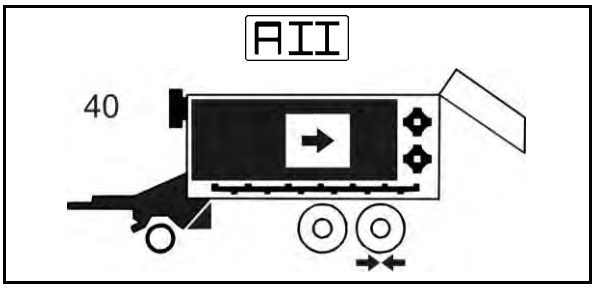
→ The dosing drums and the transport floor stop. The transport floor automatically switches to standby mode and the "Feed On" symbol is flashing.

1. Press the AII 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.

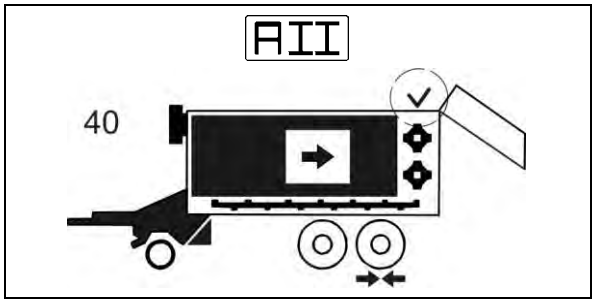
The screen shows:



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:

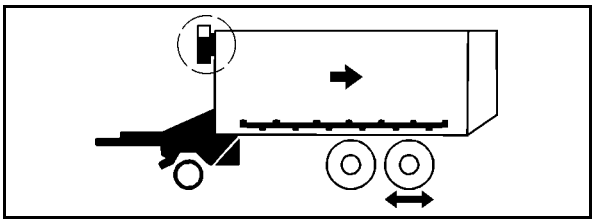
- has to be switched on only once,
- automatically and infinitely variably switches the transport floor on and off during charging,
- will automatically be deactivated if the control set generates the acoustic signal (horn sound) and the visual signal "Forage wagon full",
- will automatically be activated 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 126.

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.

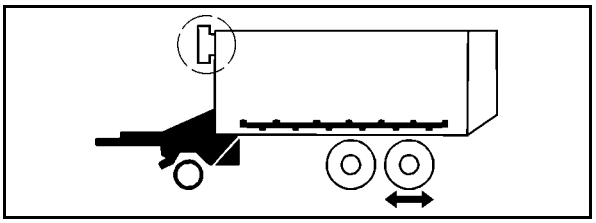
The screen shows:



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 set key.

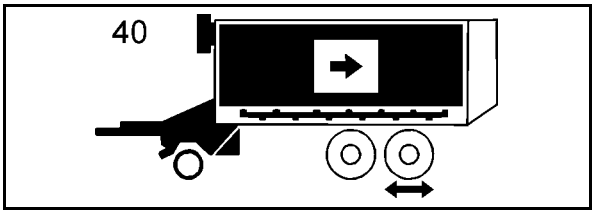
  Stop the charging procedure after the acoustic signal has appeared for the third time at the latest.

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

1. Press the set 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:



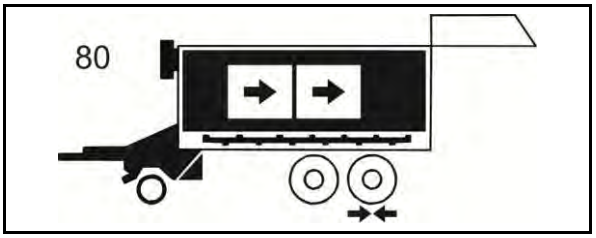
Double feed rate of transport floor for complete emptying (transport floor level II)

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.

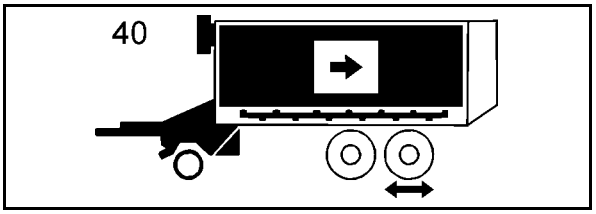
→ The feed rate of the transport floor is increased by 10 % of the maximum feed rate each time the key is pressed.

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:

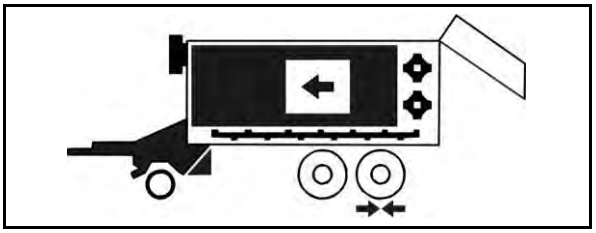
- only for a short time,
- only in case of emergency,
- if the slip clutch responds during discharge or
- in order to reduce the pressing power which the loaded material applies to the dosing drums.

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.

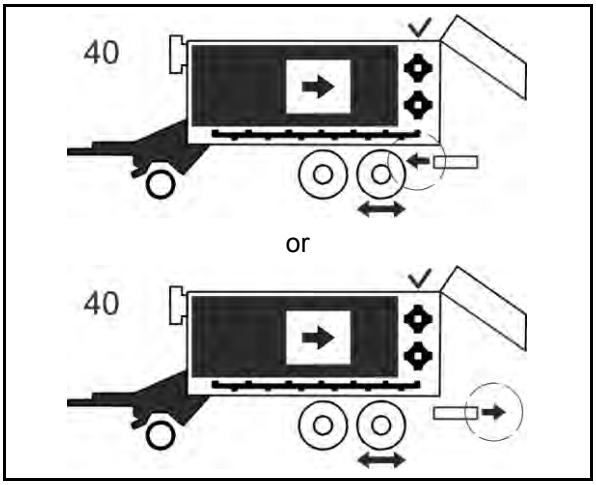
1. Press the  key once.

→ 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:



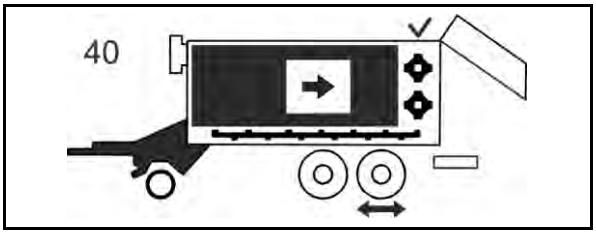
Stop crossover conveyor

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.

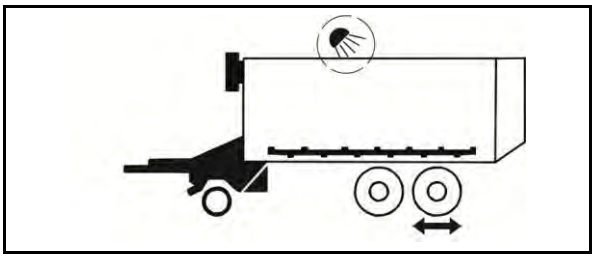
1. Briefly press the ESC key once.

→ 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:



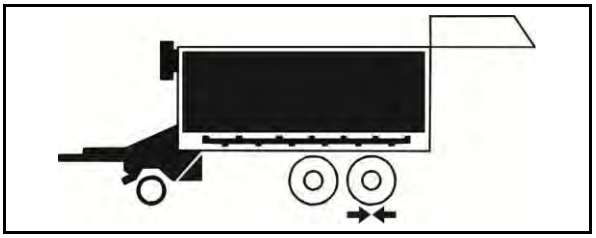
Lift tailgate (Giga-Vitesse CFS)

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 (Giga-Vitesse CFS DO)

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

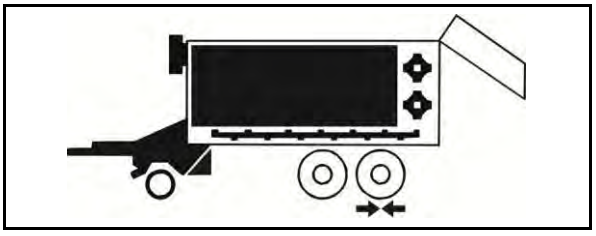
1. Press the key until the tailgate has reached its end position.

→ 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

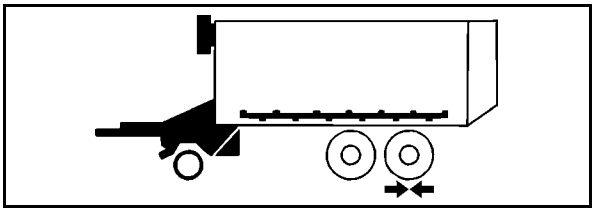
1. Press the  key until the tailgate has reached its end position.

→ 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:

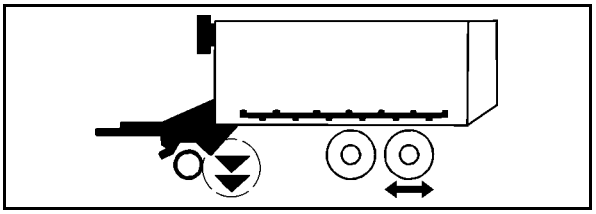
no additional symbol

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.

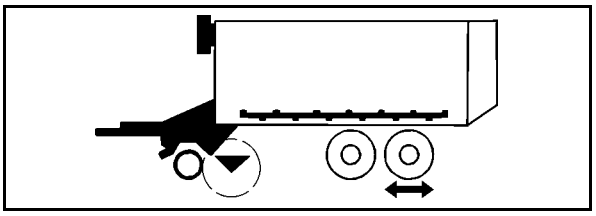
The screen shows:



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:

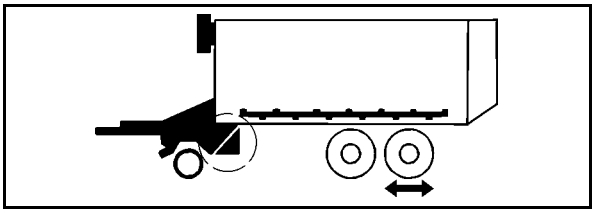
1. Clean the cutting unit.

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.

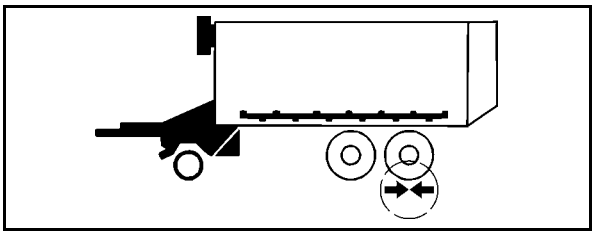
When switching the control set on, the single-acting steering axle is always in unlocked condition.

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:

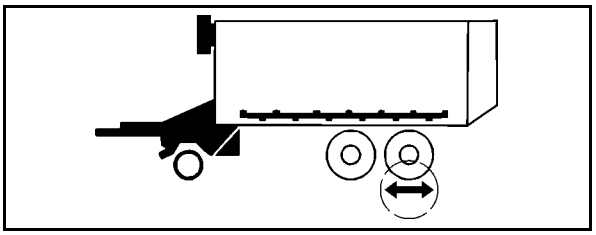


Unlock steering axle

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.

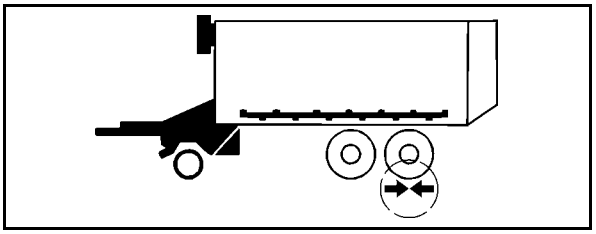
In the case of the electro-hydraulic forced steering axle system, the  key has a touch-control design.

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:



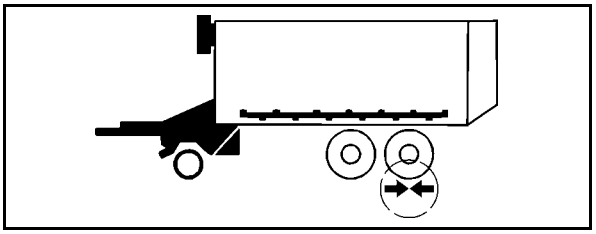
Only in discharge mode A I or A II respectively:

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.

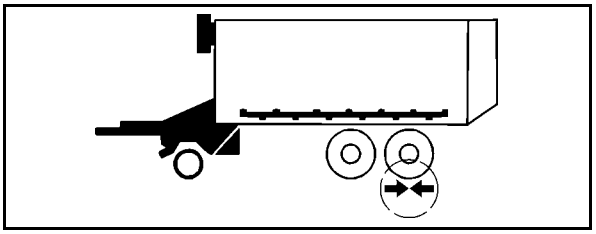
1. Press the  key once.

→ **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.

→ 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:

The screen shows:



1. Press the  key once.

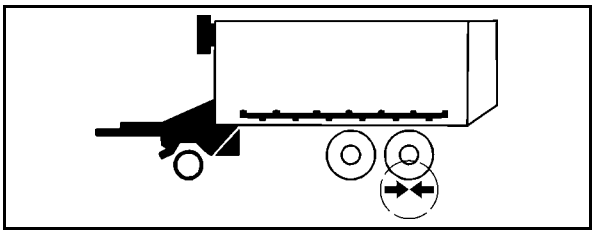
→ The steering axle is force-steered.

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

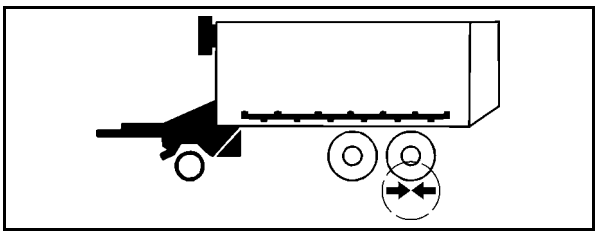
In the case of the electro-hydraulic forced steering axle system, the  key has a touch-control design.

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 end position could not be reached. An error has occurred. The steering system works.

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

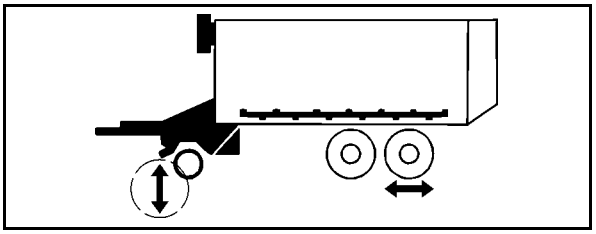
Risk of material damage when travelling on uneven ground with the pick-up lowered/locked.

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

1. Press the  key once.

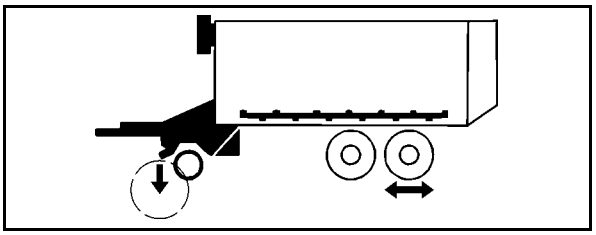
→ The pick-up lowers and is held in open-centre position. The "Lower pick-up/Open-centre position" symbol appears.

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.



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 

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.

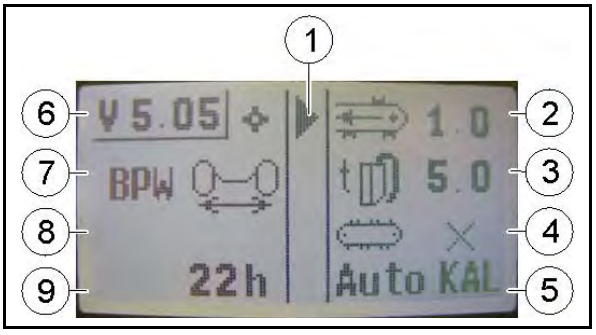
4. Use the  and  keys to change the values by 0.1.

5. Press the 

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.

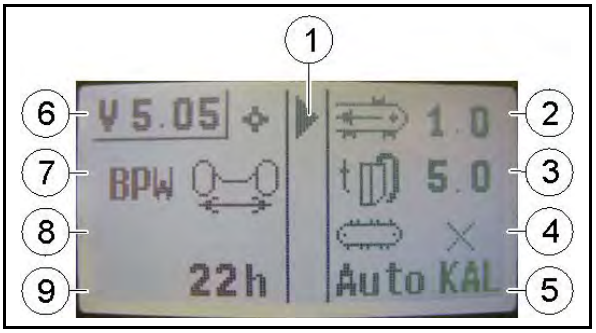
→ The symbol is faded in or out.

- 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.

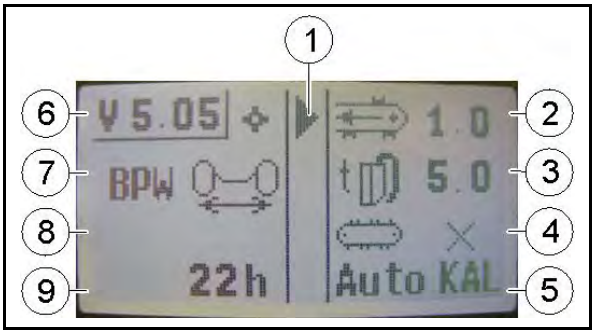
→ The **SET** menu appears.

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.

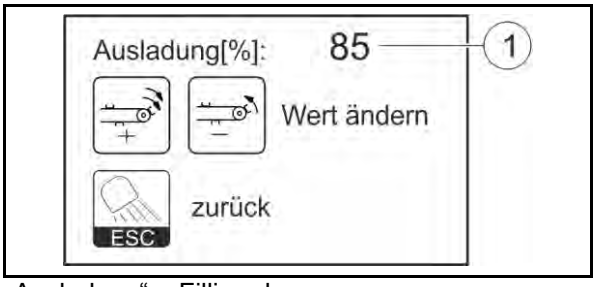
2. Press the or key to change the setting in 5% steps.

→ The filling degree (1) is changed.

3. Press the ESC key.

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

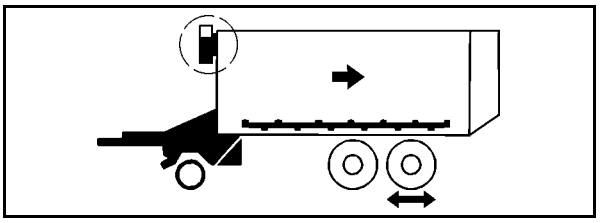
The screen shows:



„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.

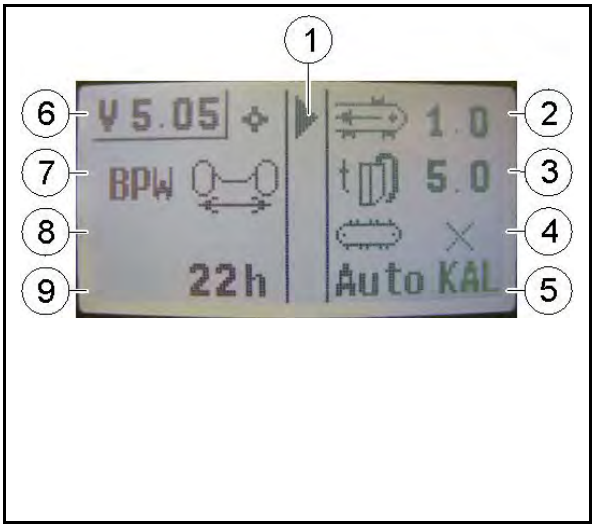


Fig. 71

11. Press the 

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 

key once.

→ The **Working** menu appears.

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 124.

1. Briefly press the SET key once.

→ The **Counter menu appears.**

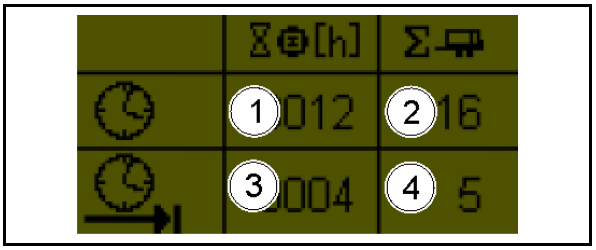
(1) Total operating hours counter

(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.**

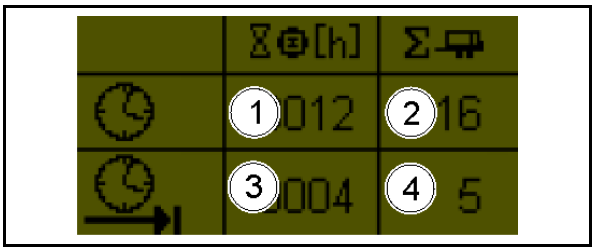
2. Press and hold the SET key once.

→ 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	State
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

6.1.9.1 Call up state overview

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

→ The display shows the **Sensor and state overview** menu:

(1) Sensor number

(2) Sensor status

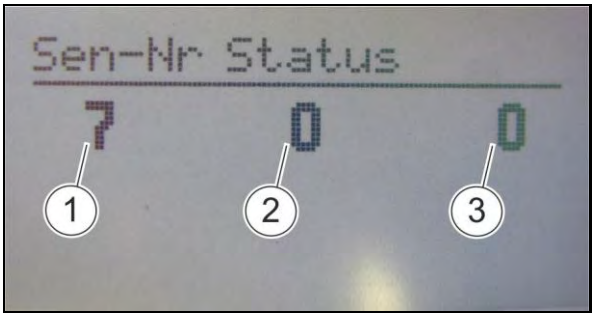
(3) Number of sensor circuits

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

2. Press the ESC key once.

→ The **Working** menu appears.

The screen shows:



6.2 SES system

Optional extra

6.2.1 Design

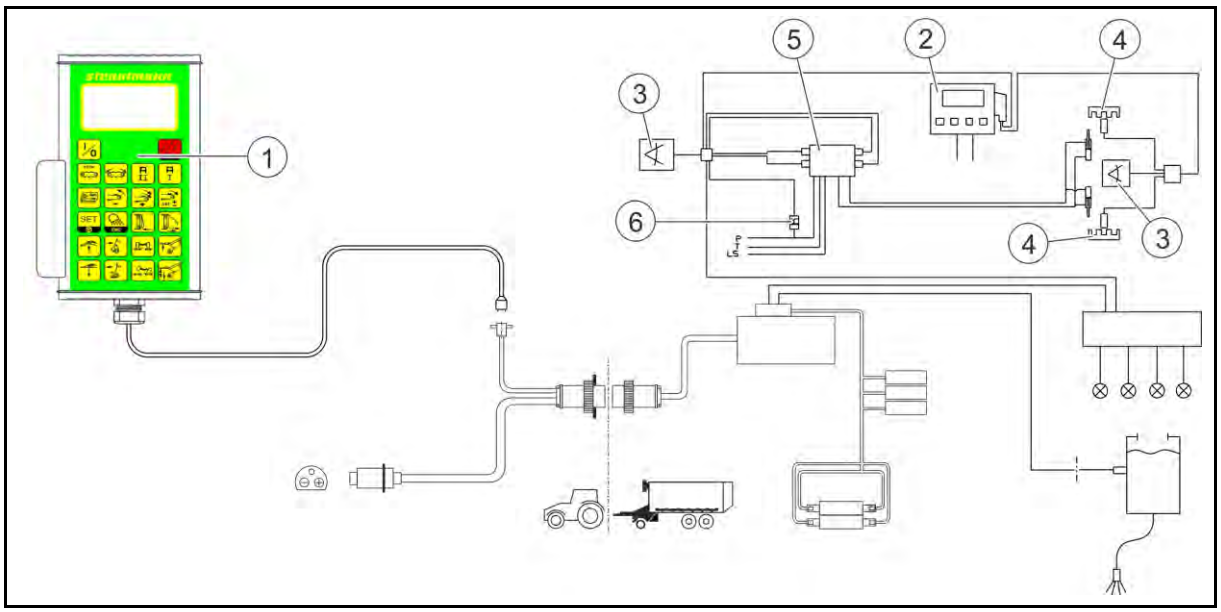


Fig. 72

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.

6.2.2 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.

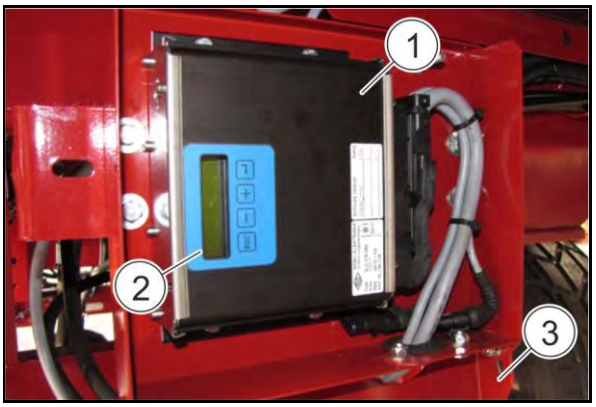


Fig. 73

(1) Display: Depending on the status, the following appears:
- a status indication or
- 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

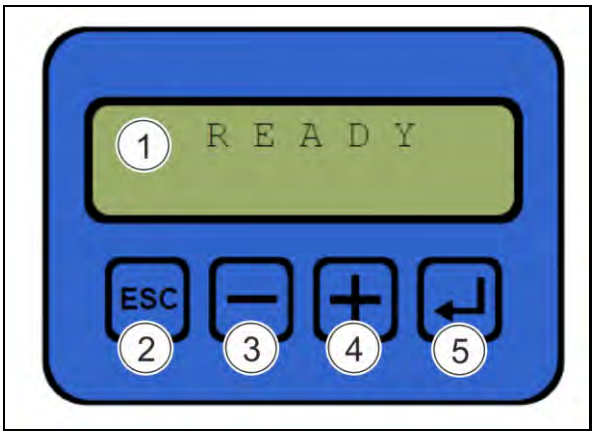


Fig. 74

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.

6.2.3 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 ESC key once.

→ The **Error diagnosis** menu is exited.

7 Commissioning

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 32,
  - "Qualification of staff", page 33,
  - "Basic safety instructions", page 35,
  - "Warning and instructions signs", page 45,
  - "Service and maintenance of machine", page 166.

  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 145,
  - Setting of pressure regulator. Observe the information in the chapter "Load-sensing hydraulic system", page 70.

  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
2000 kg	Bolt-type coupling DIN 11028, ISO 6489-0	Drawbar lug 40 reinforced DIN 11026, ISO 5692-2
		Drawbar lug 40 DIN 74054-1/2, ISO 8755
	Non-automatic bolt-type coupling DIN 11025	Drawbar lug 40 DIN 74054-1/2, ISO 8755
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:

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

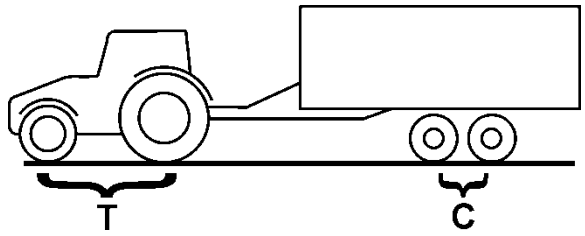


Fig. 75 D_C value of combination

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. 76

7.3 Mount attachment sections, ropes and body tarpaulin

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.

Two people are required for mounting the attachment sections, ropes and the body tarpaulin.

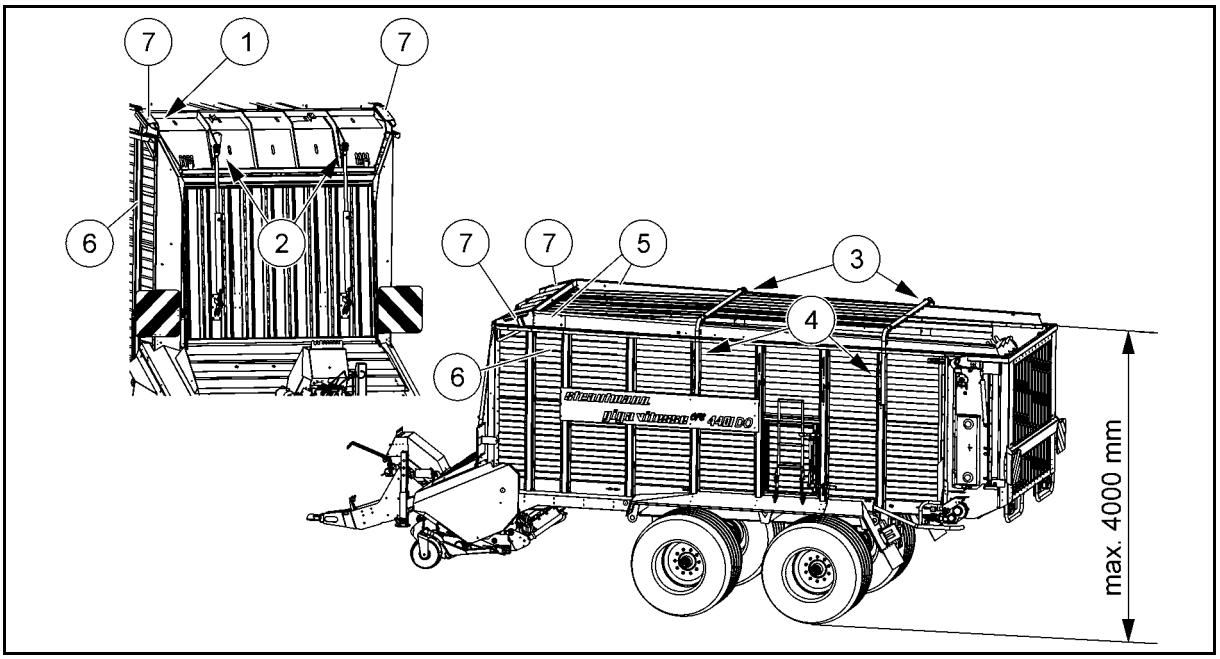


Fig. 77

1. Enter the cargo space through the access door, see chapter "Enter cargo space", page 173.
2. Remove the transport locks at the front panel (1).
3. Connect the two hydraulic cylinders (2) of the front grating with the front panel.
4. Screw the tubular supports (3) to the fixing supports (4) such that the maximum travelling height of 4 m is not exceeded.
5. Screw the attachment sections (5) to the fixing supports (6).
6. Screw the two body tops (7) to the fixing supports at the front.

7. Thread the respective rope (1) through a hole (2) of the front panel (3).
8. Then pull the rope through its loop (4).

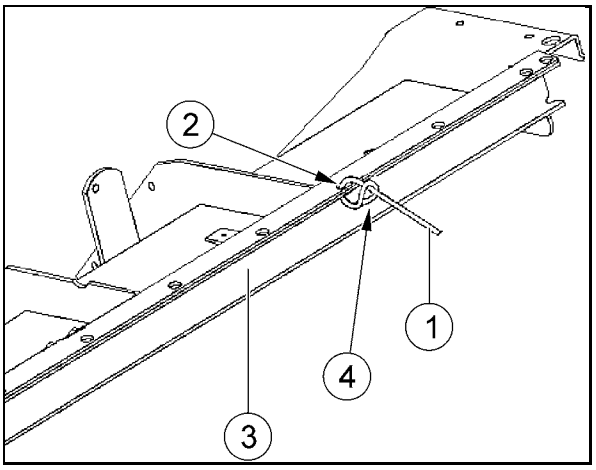


Fig. 78

9. Pull the rope at the central tubular support from below through the chain link.

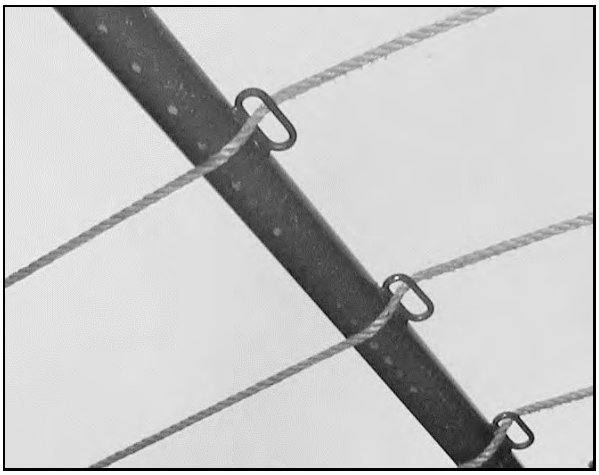


Fig. 79

10. Hang the respective rope hook of the rubber clamp into the rear tubular support (1).

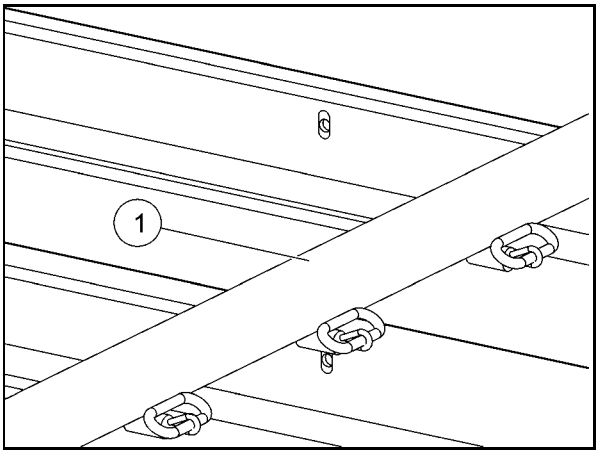


Fig. 80

11. Bend the rope hooks such that they are closed. Thus, unhooking of the ropes will be prevented.

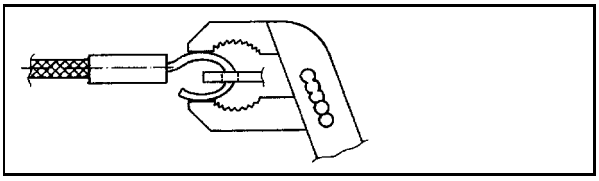


Fig. 81

7.4 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 1180 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 1180 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.

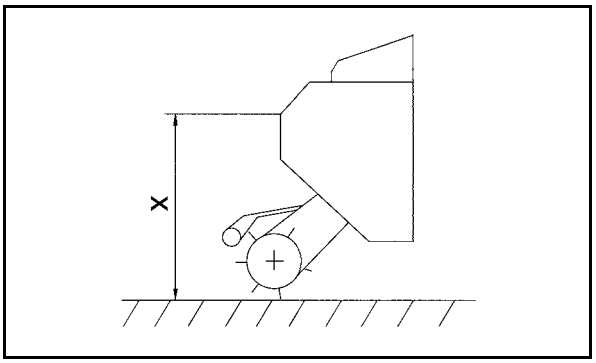


Fig. 82

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. Secure tractor and machine against accidental starting and rolling.
4. Unscrew the counter nut (2) of the threaded spindle (3).

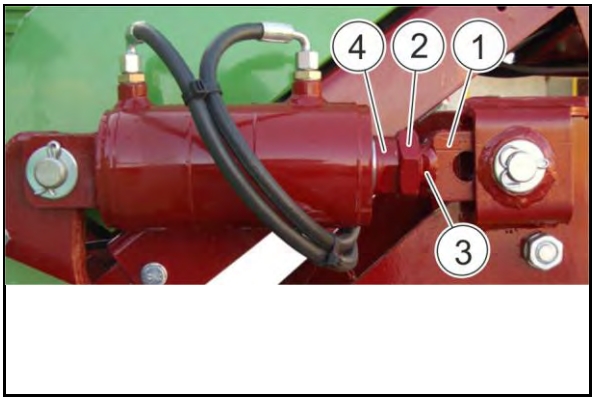


Fig. 83

5. 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

Adjust the two threaded spindles evenly.

6. Retighten the counter nuts of the threaded spindles.
7. Start the tractor engine.
8. Completely lift the folding drawbar.
9. Ensure that there is enough free space between the drawbar lug and the coupling bolt. 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 on the propeller shaft.

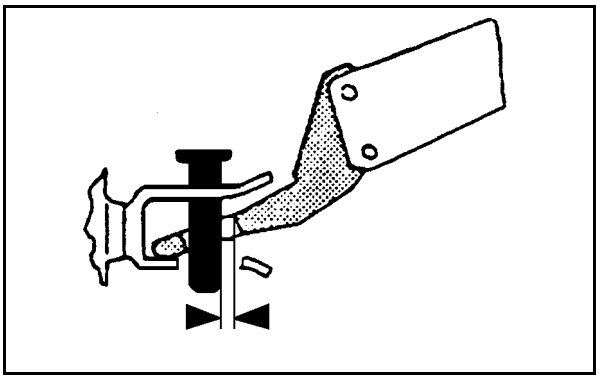


Fig. 84

7.5 Mount shell to folding drawbar

Shop work

Only an authorised workshop is allowed to mount the shell to the folding drawbar.

Assembly instructions for authorized workshop:

1. Mount the washer (1).
2. Fasten the shell (2) by means of the two screws (3).
3. Tighten the nuts of the screws (3) at a tightening torque of 2300 Nm.

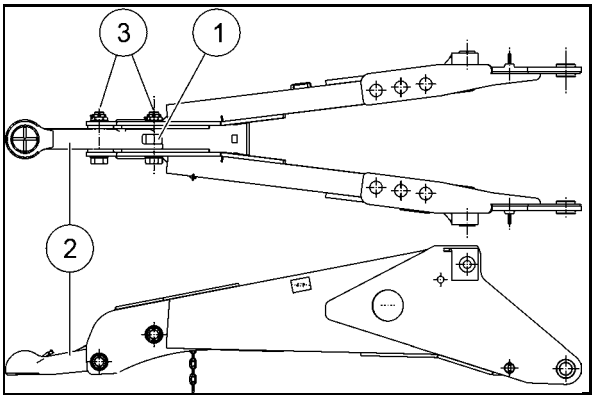


Fig. 85

7.6 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.

- The propeller shaft reaches its shortest operating position during extreme cornering. The propeller shaft reaches its longest operating position during straight travelling.
- 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.
3. Pull the propeller shaft apart.
4. Slip the locking mechanism of the propeller shaft half with the tractor symbol on the protective tube onto the p.t.o. shaft of the tractor until the locking mechanism noticeably engages.
5. Slip the locking mechanism of the other propeller shaft half onto the p.t.o. shaft of the machine until the locking mechanism noticeably engages.
6. Observe the included operating instructions for the propeller shaft when determining the length and when shortening the propeller shaft.
7. Reinsert the shortened propeller shaft halves into each other.
8. Lubricate the p.t.o shaft of the tractor and the machine's p.t.o. shaft before coupling the propeller shaft.

7.7 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 174.
3. Check the oil level of the individual gearboxes. Observe the information in the chapter "Check/Top up oil level", page 181.
4. Bleed the friction clutch of the pick-up. Observe the information in the chapter "Bleed friction clutch of pick-up", page 200.
5. Check all functions of the machine before charging the machine for the first time:
   - 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.
   - Check brake system for proper functioning.
6. Check the set travelling height of the hydraulic levelling system, see chapter "Check travelling height of hydraulic levelling system", page 78.

7.8 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 200.

8 Hitch and unhitch machine

- Additionally observe the information in the chapter "Basic safety instructions", page 35, 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 32.

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 136.

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 70.
  - 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 32.
2. Couple the drawbar. Observe the information in the chapter "Couple drawbar", page 85.
3. Connect the hydraulic hose pipes. Observe the information in the chapter "Connect hydraulic hose pipes", page 75.
4. Connect the service brake system. Observe the information in the chapter "Connect brake and feed line", page 98.
5. Couple the propeller shaft. Observe the information in the chapter "Couple propeller shaft to tractor", page 92.
6. Connect the lighting system.
7. Connect the control set. Observe the information in the chapter "Mount control set on the tractor", page 140.
8. Lift the supporting leg to transport position. Observe the information in the chapter "Supporting leg", page 89.
9. Release the parking brake. Observe the information in the chapter "Parking brake", page 102.

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 89.
2. Apply the parking brake. Observe the information in the chapter "Parking brake", page 102.
3. Always check the machine for visible defects during unhitching. Observe the information in the chapter "Operator's obligation", page 32.
4. Uncouple the drawbar. Observe the information in the chapter "Uncouple drawbar", page 87.
5. Disconnect the hydraulic hose pipes. Observe the information in the chapter "Disconnect hydraulic hose pipes", page 76.
6. Disconnect the brake system. Observe the information in the chapter "Disconnect brake and feed line", page 99.

7. Uncouple the propeller shaft. Observe the information in the chapter "Uncouple propeller shaft from tractor", page 92.
8. Disconnect the lighting system.
9. Disconnect the control set. Observe the information in the chapter "Mount control set on the tractor", page 140.
10. Move the tractor forward.

9 Settings

When carrying out adjusting work, additionally observe the information included in the chapters:

- "Basic safety instructions", page 35.
- "Warning and instructions signs", page 45.

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.

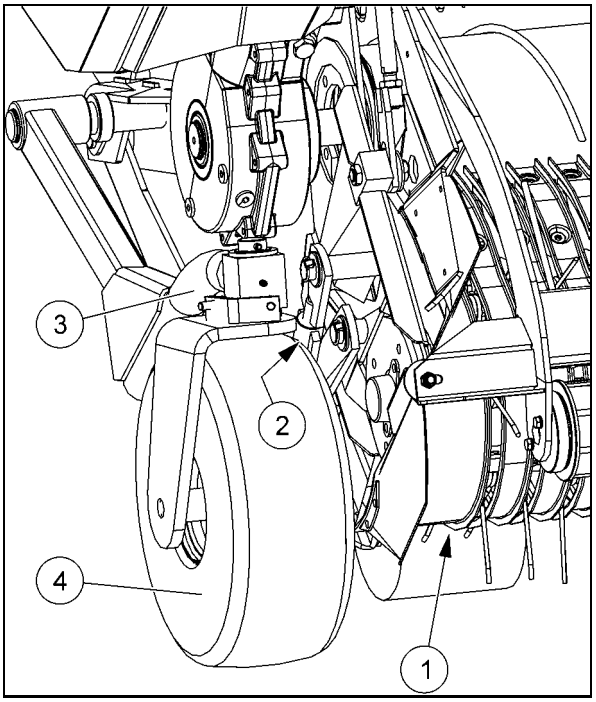


Fig. 86

9.1.2 Set additional roller feelers

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.

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

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 at the same height or slightly higher 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.

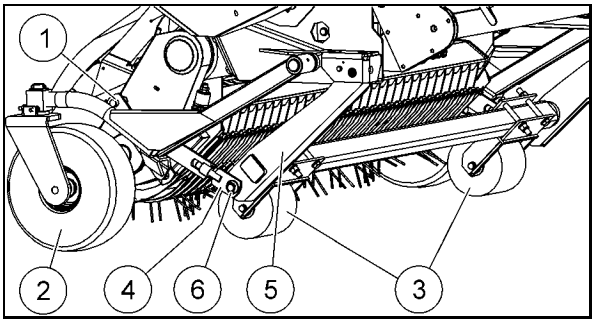


Fig. 87

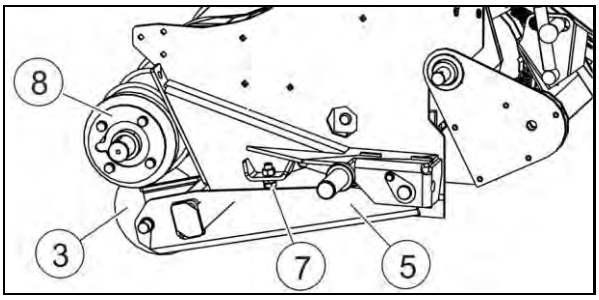


Fig. 88

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).

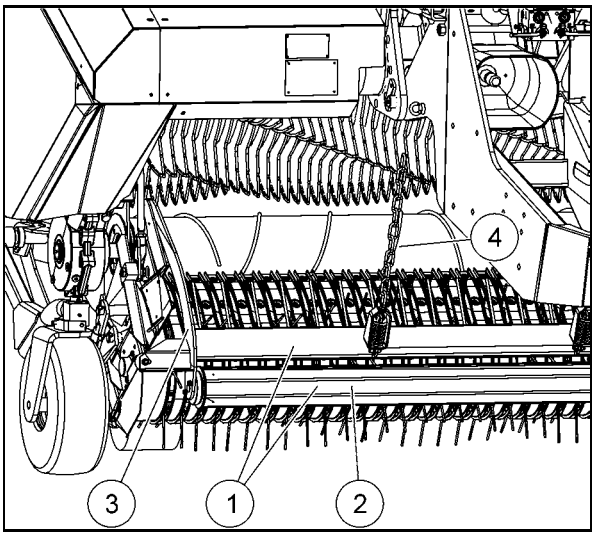


Fig. 89

9.2 Set cutting length

The number of cutting knives mounted in the cutting unit determines the cutting length of the loaded material. 45 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 206.

10 Use of machine

When using the machine, additionally observe the information included in the following chapters:

- "Operator's obligation", page 32,
- "Qualification of staff", page 33,
- "Basic safety instructions", page 35,
- "Warning and instructions signs", page 45.

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 and shearing to people within the hazardous area of the powered transport floor!

- Keep sufficient safe distance to the transport floor, as long as the tractor engine is running with the propeller shaft coupled / the hydraulic system connected.
- Make sure that people leave the hazardous area of the transport floor before powering the transport floor.

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

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 150.
- 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 152.
- 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 153.

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 126.
- 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

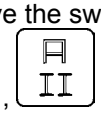
Agricultural products	Weight [kg/m³]	TS content
Grass silage "dry"	approx. 250	approx. 40 %
Grass silage "humid"	approx. 400	approx. 30 %
Maize silage	approx. 400	approx. 30 %

TS = dry matter content of loaded material

10.2 Discharging

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.

Giga-Vitesse CFS

1. Press the  key once to switch the **Road travel mode off**.
2. Press the  key until the pick-up has sufficient ground clearance.

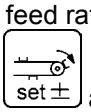
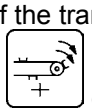
   The following functions will be automatically carried out one after the other:

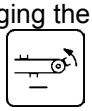
   2.1 Lock steering axle.
   2.2 Lift folding drawbar.
3. Move onto the bunker silo.
4. Press the  key for a short time when being on the bunker silo.

   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.

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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.

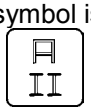
6.5 Switch the tractor's p.t.o. shaft on.

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.

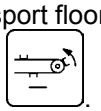
   → The dosing drums and the transport floor stop. The transport floor automatically switches to standby mode and the "Feed on" symbol is flashing on the control set if the transport floor is not separately switched off via the  key.

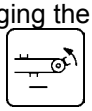
   7.2 Change the lane.

   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, 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 hydraulic functions are accidentally carried out 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.**

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 machine against rolling

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.

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:
   - o on even ground by means of the parking brake or the chocks,
   - o 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 35.

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.

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 blocked,
- the hydraulic drawbar suspension (optional extra), the axle suspension of the hydro-pneumatic tandem chassis (optional extra) and the warning beacon (optional extra) are switched on,
- the work light (optional extra) is 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 32,
  - "Qualification of staff", page 33,
  - "Basic safety instructions", page 35,
  - "Warning and instructions signs", page 45.
- 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 supply 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.

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. Observe the information in the chapter "Secure tractor and machine against accidental starting and rolling", page 163.
- Wait for the machine to stop completely before entering the hazardous area of the machine.

WARNING

Risk of crushing, shearing, cuts, amputation, becoming entangled, wound up and being drawn in to people due to unprotected, powered driving elements!

- Close or mount protective devices which have been opened or removed for carrying out service and maintenance work on the machine before powering the machine.
- Immediately replace defective protective devices.

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

- Carry out the maintenance intervals according to the time limit reached first.
- The time intervals, service hours and maintenance intervals specified in the included sub-supplier documentation shall prevail.

Before first startup

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.

After first startup

- FAD chassis:
  - Check spring clamps for tightness, retighten alternately and in several steps if necessary.
  - Check spring bearing bolts for tightness, retighten alternately and in several steps if necessary.
  - Check axle bolts for tightness, retighten alternately and in several steps if necessary.
- BPW chassis:
  - Check spring clamps for tightness, retighten alternately and in several steps if necessary.
  - Check bushings of spring bolts for tightness, retighten screwed connection if necessary.

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 levelling system of the hydro-pneumatic tandem 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.

After 50 service hours

All daily maintenance work and the additional work specified below.

- Chassis:
  - Check brake lever setting, readjust if necessary (shop work),
  - lubricate bearing of brake camshafts,
  - check tyre pressure, readjust if necessary,
  - check wheel nuts for tightness, retighten if necessary,
  - readjust float of wheel hub bearing:
    Remove cap and split-pin,
    screw on hub axle nut until run of hub slightly stops,
    unscrew hub axle nut again up to the next split-pin hole,
    secure hub axle nut against accidental loosening by means of a split-pin and check run.
- Pick-up:
  - Check tension of the roller chains of the pick-up drive, tighten roller chains if necessary..
- Dosing unit (only Giga-Vitesse CFS DO):
  - 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 condensate from the oil storage tanks at the hydraulic cylinders of the hydraulic levelling system,
  - check oil level in the oil storage tanks at the hydraulic cylinders of the hydraulic levelling system, top up if necessary.

Change the gear lubricant oils.

After 250 service hours

All maintenance work after 50 service hours and the additional work specified below.

- Axles:
  - Check wheel nuts for tightness, retighten if necessary,
  - lubricate brake camshaft bearing (not applicable to nylon bushings),
  - check brake lever setting, readjust if necessary,
  - check brake linings, replace if necessary.
- FAD chassis:
  - Check spring clamps for tightness, retighten alternately and in several steps if necessary,
  - check spring bearing bolts for tightness, retighten alternately and in several steps if necessary,
  - check axle bolts for tightness, retighten alternately and in several steps if necessary.

- BPW chassis:
  - Lubricate dash pot,
  - check all parts for visible defects,
  - check spring clamps for tightness, retighten alternately and in several steps if necessary.
- 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.

After 500 service hours or once a year

Carry out the work at least every 500 service hours or once a year, depending on which change time limit is reached first.

- All maintenance work after 250 service hours and the additional work specified below.
- 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 177.
- 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 199.
- Axles:
  - Check brake linings, replace if necessary,
  - lubricate wheel hub bearing by means of rolling bearing grease,
  - readjust float of wheel hub bearing:
    Remove cap and split-pin,
    screw on hub axle nut until run of hub slightly stops,
    unscrew hub axle nut again up to the next split-pin hole,
    secure hub axle nut against accidental loosening by means of a split-pin and check run.
- FAD chassis:
  - Check rubber pad and central bolt for wear, have replaced if necessary,
  - check bushings of axle bolts for wear, have replaced if necessary.
- BPW chassis:
  - Check dash pots for tightness, seal if necessary,
  - check fastening device of dash pots for tight fit and wear, retighten or have replaced if necessary,

- o check bushings of spring bolts for tightness, retighten screwed connection if necessary.

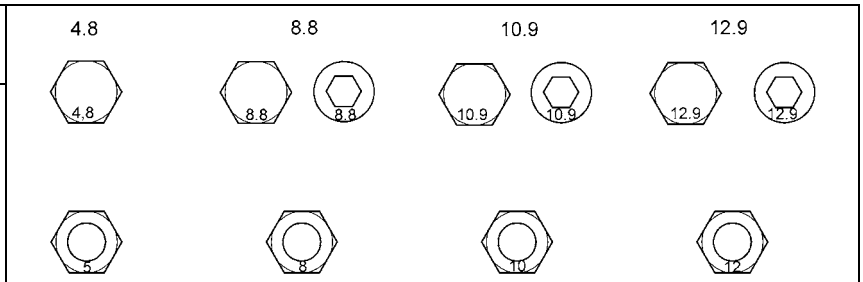
- Have the hydraulic hose pipes checked for their operational safety by an expert.

After end of season

- Remove al cutting knives.
- Grease or lubricate all movable parts of the cutting unit and the machine.

12.2 Tightening torques

12.2.1 Tightening torques for metric screws

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.

The tightening torques listed in the above table are reference values. They apply provided that these operating instructions do not specify other tightening torques for certain screws or nuts.

- Regularly check screws and nuts for tightness.
- Shear bolts are designed such that they shear off at a certain stress. Only use bolts of equal grade when replacing shear bolts.
- When replacing screws and nuts, make sure to use respective parts of equal or higher grade.
- Tighten screws and nuts of higher grade at the same torque as those originally used.
- Ensure that the threads are clean and the screws have been properly fitted before tightening the screwed connections, thus preventing damage during tightening.
- Tighten counter nuts (not the screws) 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.

12.2.2 Tightening torques of wheel nuts

	ADR	FAD	BPW black	BPW galvanized
M18 x 1.5 Spherical collar nut	270 Nm	330 Nm	--	--
M20 x 1.5 Flat collar nut with spring washer	350 Nm	360 Nm	380 Nm	420 Nm
M22 x 1.5 Spherical collar nut	--	630 Nm	--	--
M22 x 1.5 Flat collar nut with spring washer	450 Nm	460 Nm	460 Nm	505 Nm

12.3 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):
   - 1.1 Use your left hand to hold the folding access ladder (2).
   - 1.2. Swivel the locking mechanism (3) upwards.
   - → The ladder and the access door are unlocked.
   - 1.3 Fold the ladder down.
   - 1.4 Open the access door.
2. Use the handle (4) when entering the cargo space.
3. Close the access door:
   - 3.1 Swivel the locking mechanism upwards.
   - 3.2 Close the access door.
   - 3.3 Fold the ladder up.
   - 3.4 Swivel the locking mechanism downwards such that it safely engages behind the locking bars (5).
   - → The ladder and the access door are locked in transport position.

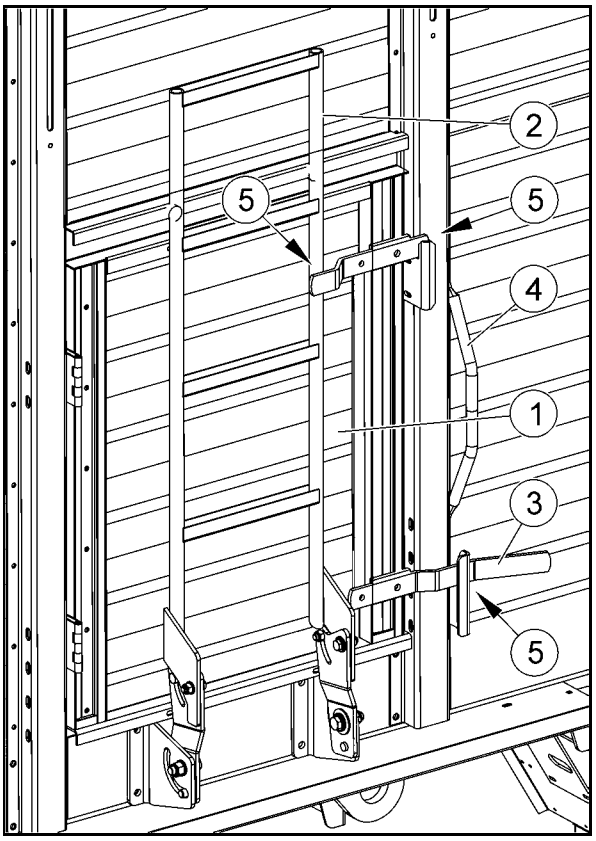


Fig. 90

12.4 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

Absolutely observe the following when using a pressure washer/steam blaster for cleaning:

- Admissible injection pressure: max. 80 bar.
- Water temperature: max. 60°C.
- Distance between cleaning nozzle and machine: min. 300 mm.
- Nozzle spraying angle: min. 25°.

  Never direct the cleaning nozzle jet at machine parts at right angles.
- Never aim the cleaning nozzle jet of the pressure washer/steam blaster:
  - at lubrication points and bearings,
  - at hydraulic components.
- Do not clean electrical components such as control set, weighing rods, distributor boxes, weighing computer etc.
- Do not clean chromium-plated components.
- Do not use any chemical additives.

12.5 Lubrication of machine

- Lubricate all bearings and lubrication points according to the lubrication plan.
- Remove dirt from the lubricating nipples.
- Use environmentally friendly, biodegradable oils and greases where lubricants may penetrate the fodder or the ground. For further information, contact your specialist for agricultural machinery.
- Beware not to exceed a lubricating pressure of 250 bar, when using high-pressure grease guns for lubricating. Damage to bearings, seals etc. may occur if the grease gun used is not equipped with a protective device.

Observe the included sub-supplier documentation for lubrication of the propeller shaft(s)!

12.5.1 Lubrication plan

Giga-Vitesse CFS

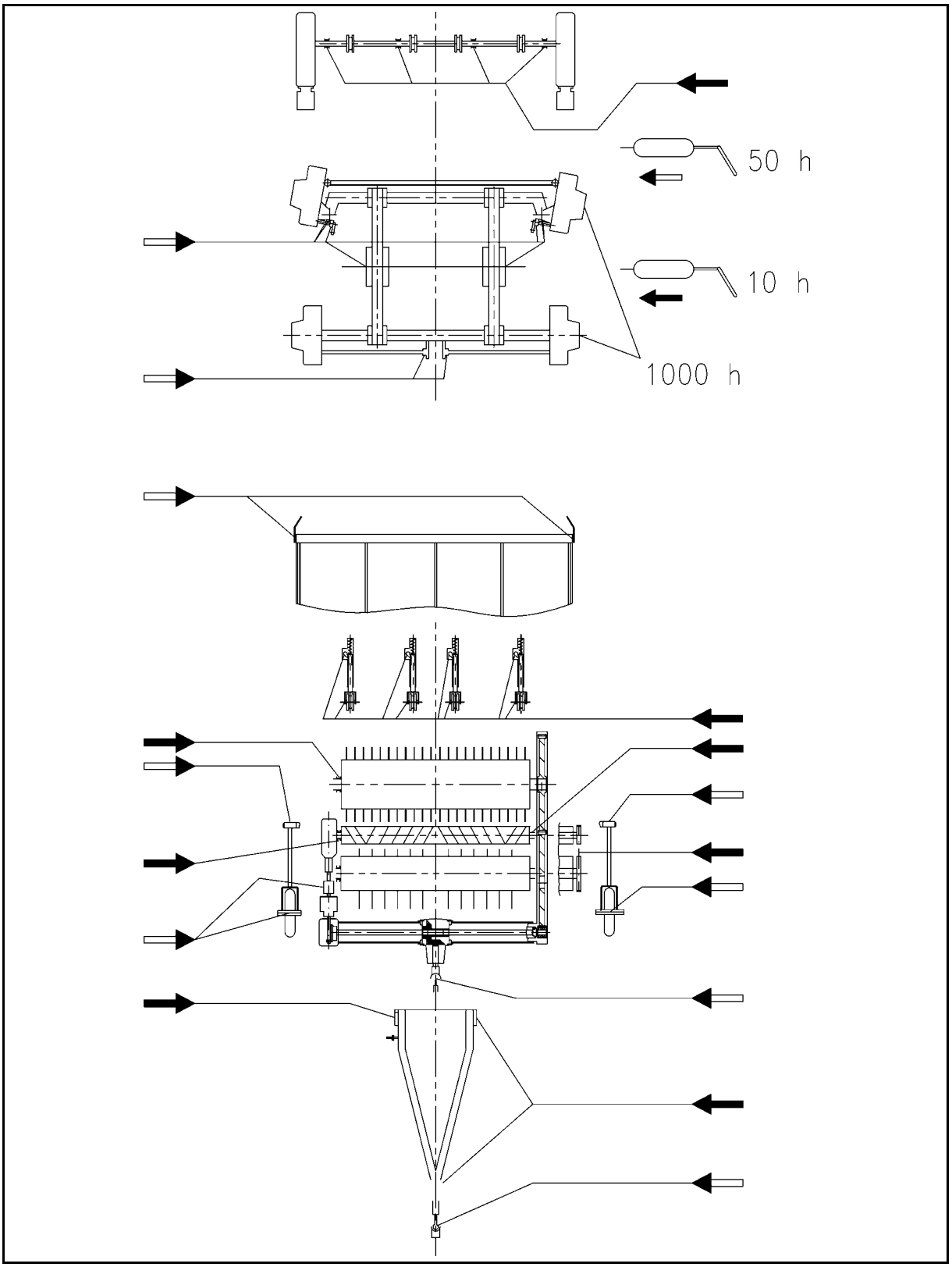


Fig. 91

Giga-Vitesse CFS DO

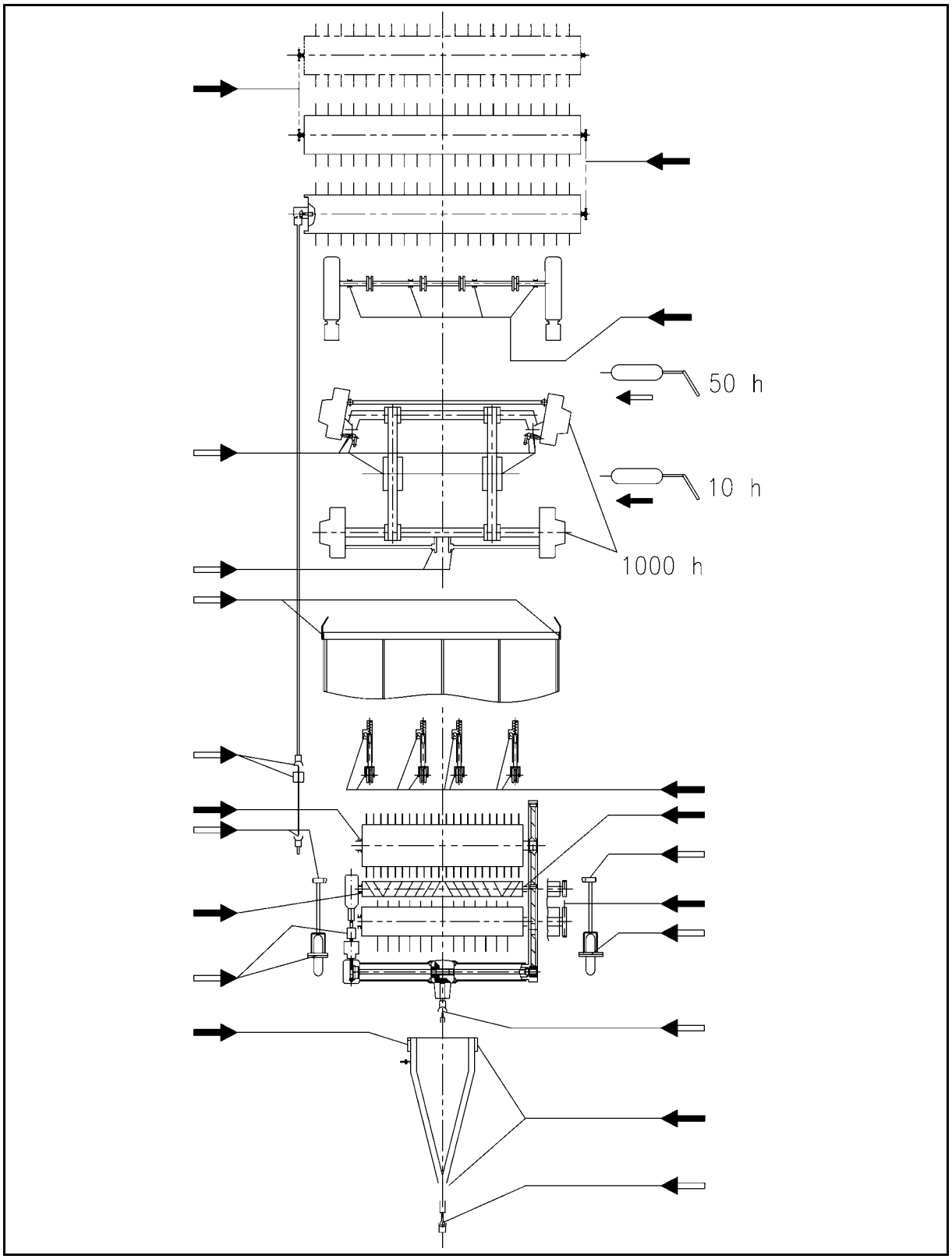


Fig. 92

12.6 Preservation/Longer downtimes

Preparing the machine for longer downtimes shall include:

- thorough cleaning of machine,
- lubrication and greasing of machine,
- touching up of paintwork.

12.7 Check/top up/change gear lubricant oil

CAUTION

Risk of damage to machine components when powering gearboxes without gear lubricant oil!

Always ensure a sufficient oil level in the gearboxes.

- 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.

The gearboxes require:

- regular check/topping-up of oil level,
- change of gear lubricant oil,
- the first oil change after 50 service hours.

12.7.1 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	Lubricant	Quantity when filled [l]	Interval
Transport floor	Feed gearing	Liquid grease EP00	0.75	2000 h
Conveying unit	Main gearbox	EP80W-90 SAE	3.5	500 h
	Rotor gear	Carter EP 680	23.0	
	Angular switchgear	Carter EP 680	2.8	
Dosing unit	Angular gear CFS	Carter EP 680	1.0	
	Angular gear, dosing drums	EP80W-90 SAE	0.4	2000 h

12.7.2 Feed gearing of transport floor

(1) Oil inspection plug
(2) Oil filling screw
(3) Oil drain plug

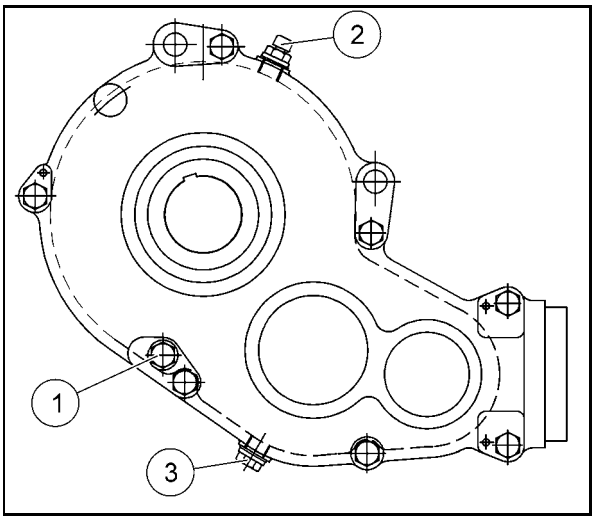


Fig. 93

12.7.3 Main gearbox of cutting unit

(1) Oil inspection plug
(2) Oil filling screw
(3) Oil drain plug

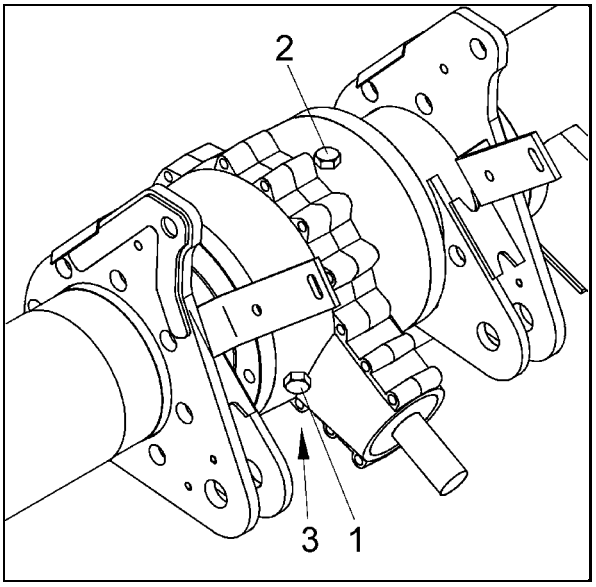


Fig. 94

12.7.4 Rotor gear of cutting unit

(1) Oil inspection plug
(2) Oil filling screw
(3) Oil drain plug

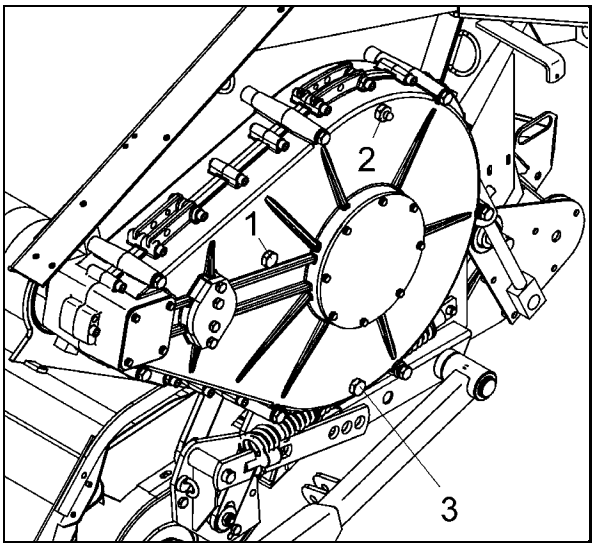


Fig. 95

12.7.5 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

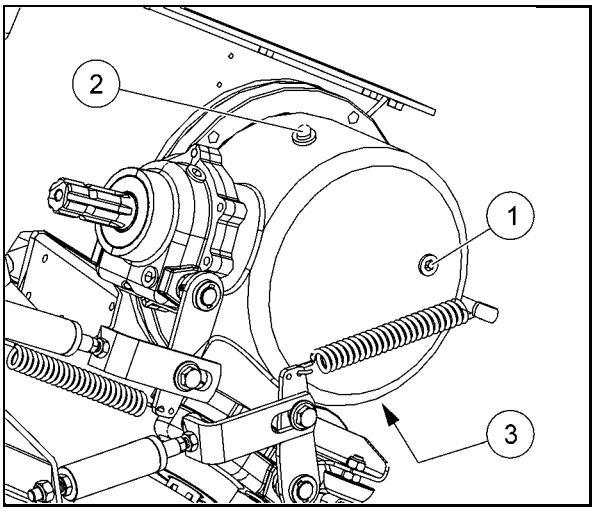


Fig. 96

12.7.6 Angular gear of CFS unit

(1) Oil inspection plug
(2) Oil filling screw
(3) Oil drain plug

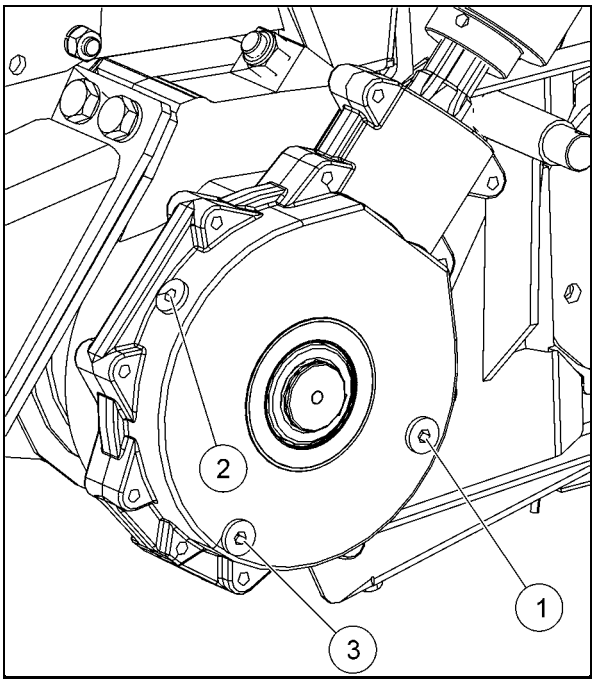


Fig. 97

12.7.7 Angular gear of dosing unit

(1) Oil filling screw
(2) Oil drain plug

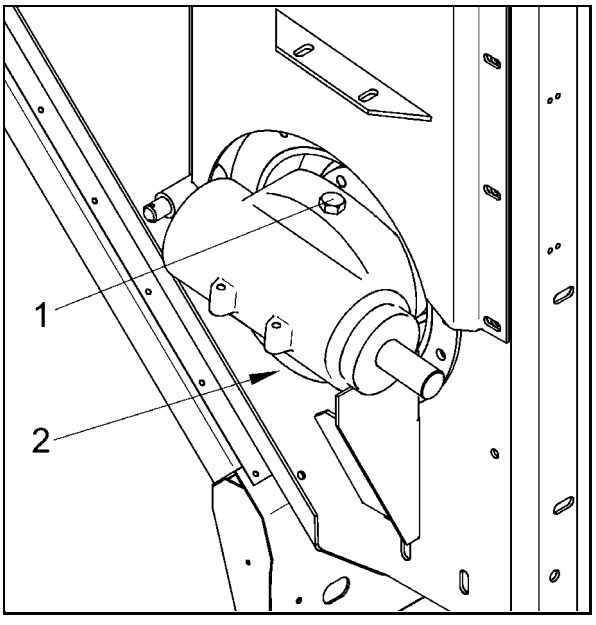


Fig. 98

12.7.8 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.

12.7.9 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.

12.8 Hydraulic system

Observe the information in the chapter "Basic safety instructions", page 35.

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.

12.8.1 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.

12.8.1.1 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.

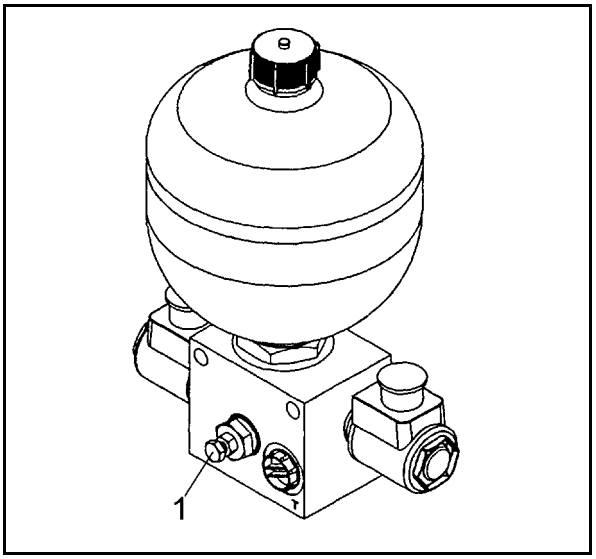


Fig. 99

12.8.2 Hydraulic hose pipes

12.8.2.1 Marking and period of use of hydraulic hose pipes

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 (07/10 = year/month = October 2007)

(3) Maximum admissible operating pressure (210 bar)

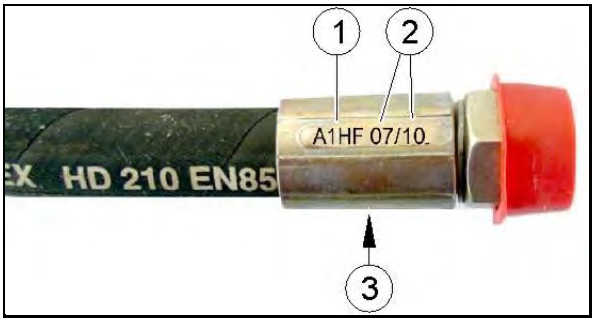


Fig. 100

The period of use of a hydraulic hose pipe expires when the date of manufature (2) of the hydraulic hose pipe is exceeded by more than 6 years.

Example:

Date of manufacture	Period of use expires
07/10 = October 2007	October 2013

After expiration of the period of use, the hydraulic hose pipe must no longer be used.

12.8.2.2 Inspection criteria for hydraulic hose pipes

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. Observe the information in the chapter "Marking and period of use of hydraulic hose pipes", page 183.

12.8.3 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.

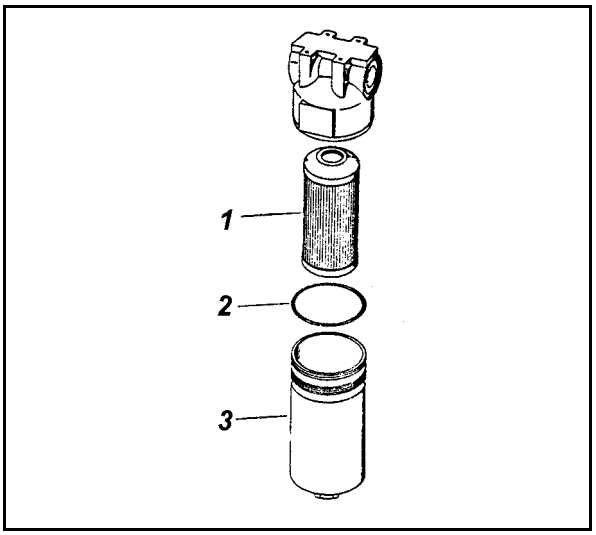


Fig. 101

12.9 Hydraulic levelling system

Observe the information in the chapter „Hydro-pneumatic tandem chassis with hydraulic levelling system“, page 77.

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.

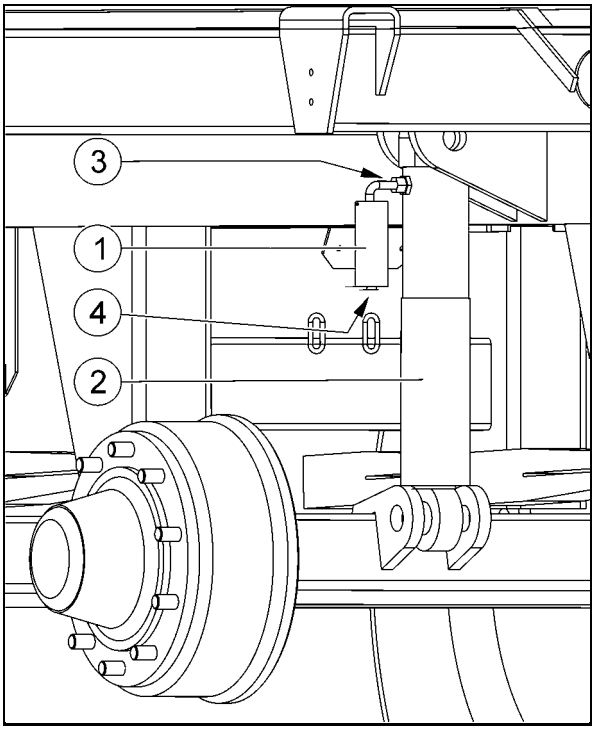


Fig. 102

12.9.1 Drain condensate

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 all 4 hydraulic cylinders (2) of the hydraulic levelling system:
   - 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 control device of the tractor for the levelling system in "Lift" position until the pressure gauges (5, 6) indicate "0 bar".
   - → The hydraulic cylinders of the hydraulic levelling system are completely lowered.
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 as soon as hydraulic oil pours out.

     Torque = 75 Nm
7. Properly readjust the travelling height of the hydraulic levelling system. Observe the information in the chapter "Adjust travelling height of hydraulic levelling system", page 81.

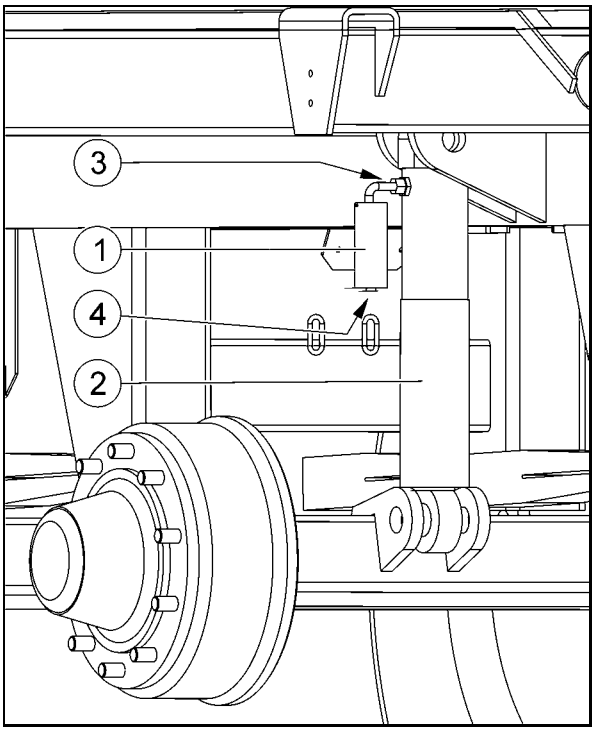


Fig. 103

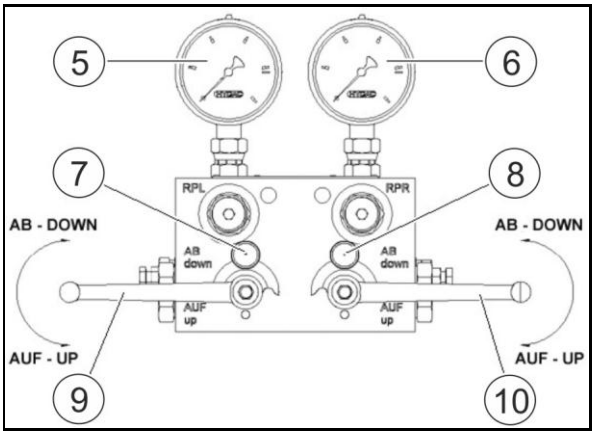


Fig. 104

12.9.2 Check/Top up oil level

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 all 4 hydraulic cylinders (2) of the hydraulic levelling system:
   - 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 control device of the tractor for the levelling system in "Lift" position until the pressure gauges (5, 6) indicate "0 bar".
   - → The hydraulic cylinders of the hydraulic levelling system are completely lowered.
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.

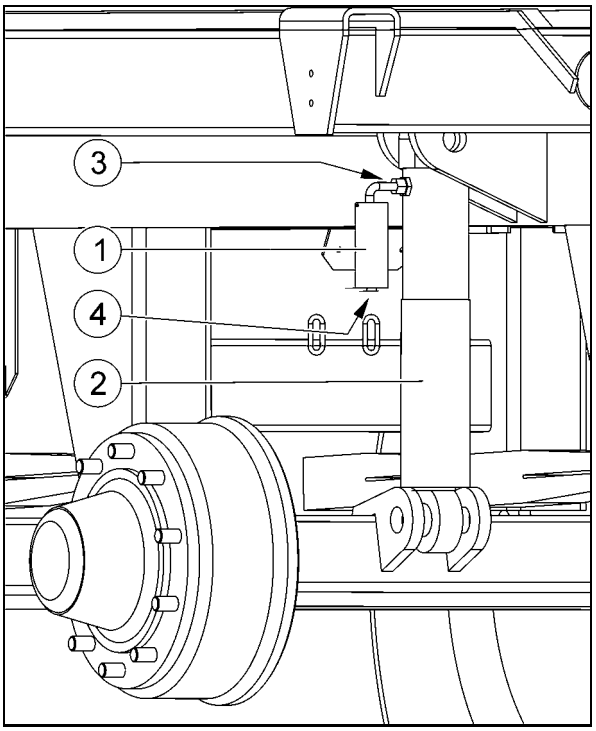


Fig. 105

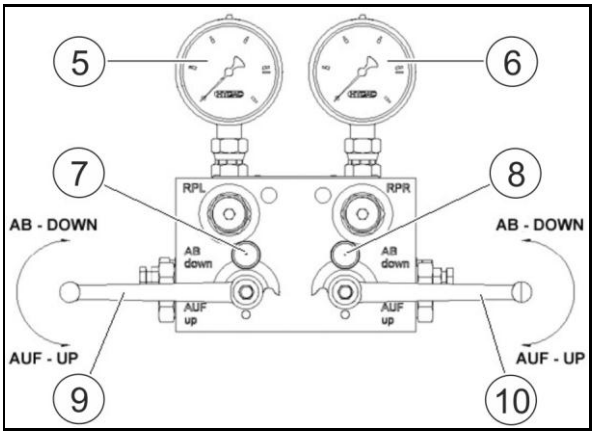


Fig. 106

   - 6.6 Insert this clean object into the filler neck to determine the oil level.
   - 6.7 Top up hydraulic oil if necessary.
   - 6.8 Screw in the drain plug and tighten it.
   - 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 of the hydraulic levelling system. Observe the information in the chapter "Adjust travelling height of hydraulic levelling system", page 81.

12.10 Tyres

12.10.1 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.

12.10.2 Change tyres

Observe the information in the chapter "Basic safety instructions", page 35.

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. 107

2. Keep to the specified order when loosening and tightening the wheel nuts.
3. Tighten the wheel nuts at the required tightening torque, see chapter "Tightening torques of wheel nuts", page 172.
4. Check the wheel nuts for tightness after 10 service hours. Retighten wheel nuts if necessary

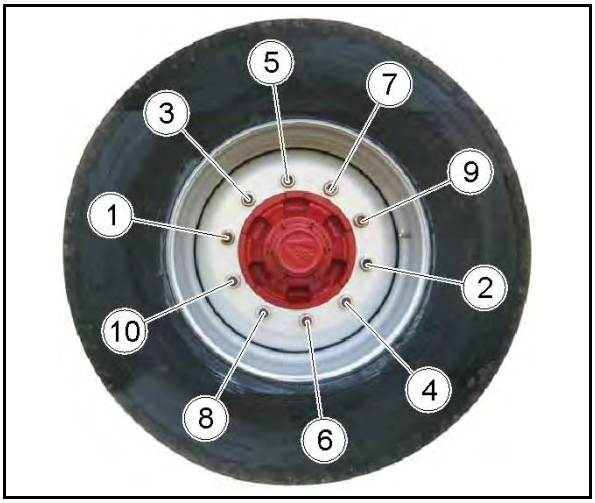


Fig. 108

12.11 Brake system

Only an authorized workshop is allowed to carry out work on the brake system!

12.11.1 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.

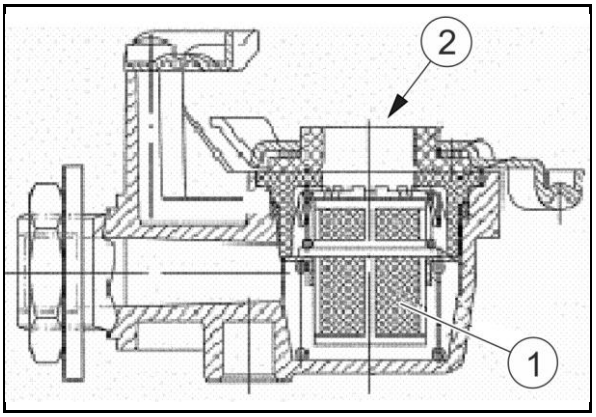


Fig. 109

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 (1) 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.
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.

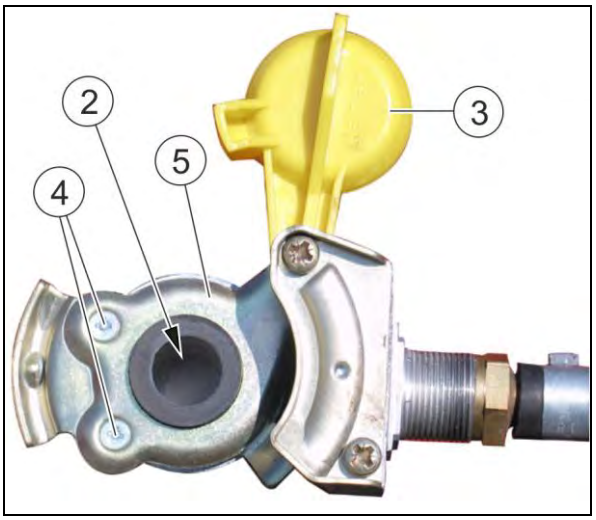


Fig. 110

12.11.2 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.

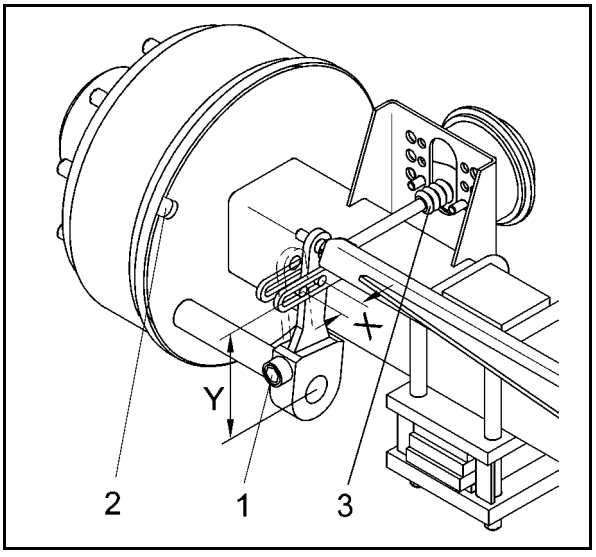


Fig. 111

12.11.3 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.

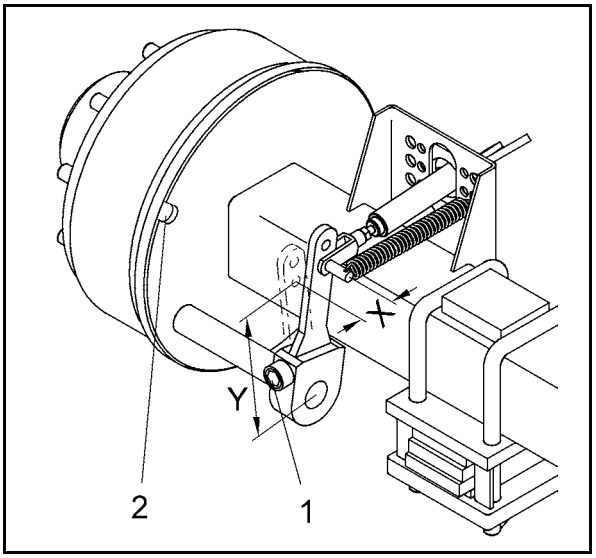


Fig. 112

12.12 Chassis

12.12.1 Maintenance instructions for FAD chassis

(1) Spring fixing
(2) Spring bearing bolt
(3) Rubber pad
(4) Central bolt
(5) Axle bolt

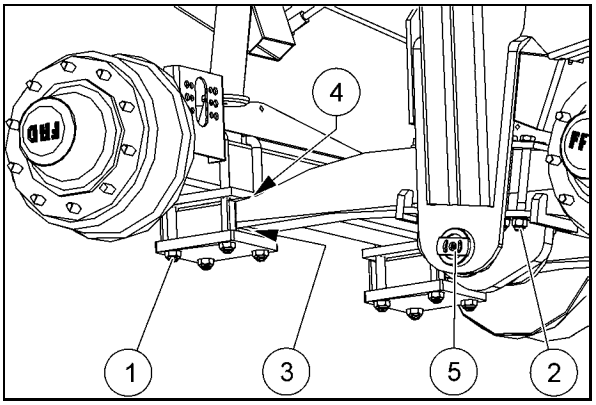


Fig. 113

Spring fixing

Check the spring clamps for tightness after the first journey with loaded material and every 250 service hours!

Observe the fact that welding work on the link spring is not allowed!

1. Check the counter nuts of the spring clamps for tightness.
2. In case of a loosened screwed connection, tighten the nuts alternately and in several steps.

   M24: Torque = 510 Nm (460-560 Nm)

Spring bearing bolts

Check the spring bearing bolts for tightness after the first journey with loaded material and every 250 service hours!

1. Check the counter nuts of the spring bearing bolts for tightness.
2. In case of a loosened screwed connection, tighten the nuts alternately and in several steps.

   M20: Torque = 375 Nm (325-425 Nm)

Rubber pad and central bolt

Check the rubber pad and the central bolt for wear at least every 500 service hours or once a year, depending on which change time limit is reached first!

Axle bolts

Check the axle bolts for tightness after the first journey with loaded material and every 250 service hours!

Check the bushings for wear at least every 500 service hours or once a year, depending on which change time limit is reached first!

Check axle bolts for tightness:

1. Remove the safety bolt.
2. Check the crown nuts of the axle bolts for tightness.
3. Tighten the nuts in case of a loosened screwed connection.

   M30: Torque = 1150 Nm (1000-1300 Nm)
4. Secure the crown nuts by means of the safety bolt.

Check bushings for wear:

1. Remove the axle bolts.
2. Check the bushings for wear.
3. Insert the axle bolts with grease.

12.12.2 Maintenance instructions for BPW chassis

After first startup:

- Check spring clamps for tightness,
- check bushings of spring bolts for tightness.

Every 250 service hours:

- Lubricate dash pots,
- check all parts for visible defects,
- check spring clamps for tightness.

Every 500 service hours or once a year, depending on which change time limit is reached first:

- Check dash pot for tightness,
- check fastening device of dash pots for tightness and wear,
- check bushings of spring bolts for tightness.

(1) Lubrication points of dash pot

1. Grease the lubrication points at the top and bottom of the dash pot on the empty machine until fresh grease is coming out of the bearings.

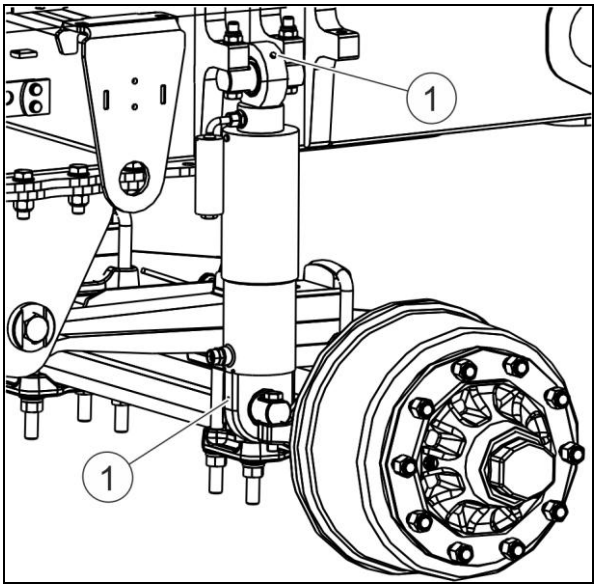


Fig. 114

(2) Fastening device of dash pots

1. Check the fastening device of the dash pots for tightness and wear.

   Before reinserting the screws, provide the screw thread with liquid threadlocker (Loctite 243).

   M16: Torque = 230 Nm (214-253 Nm)

   M18x1.5: Torque = 230 Nm (214-253 Nm)

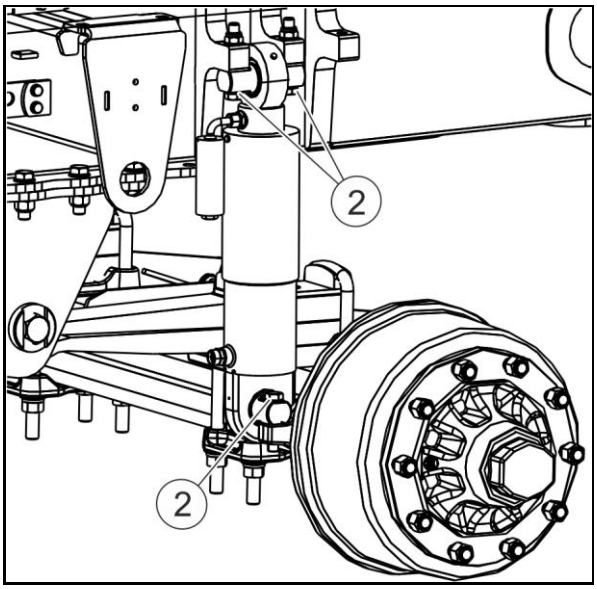


Fig. 115

Type A: Double-sided Seeger circlip

Type B: One-sided Seeger circlip

When mounting the bolt, observe the fact that with type B, the Seeger circlip ø50 must be mounted on the exterior!

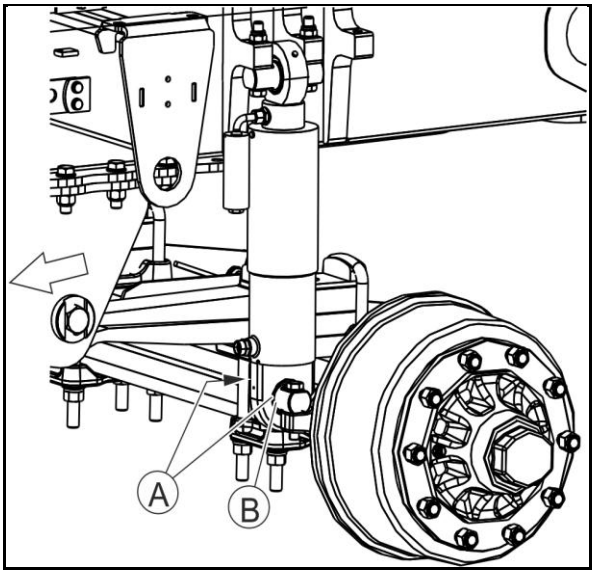


Fig. 116

(3) Spring fixing

1. Check the counter nuts of the spring clamps for tightness.
2. In case of a loosened screwed connection, tighten the nuts alternately and in several steps.

   M24: Torque = 650 Nm (605-715 Nm)

Observe the fact that welding work on the link spring is not allowed!

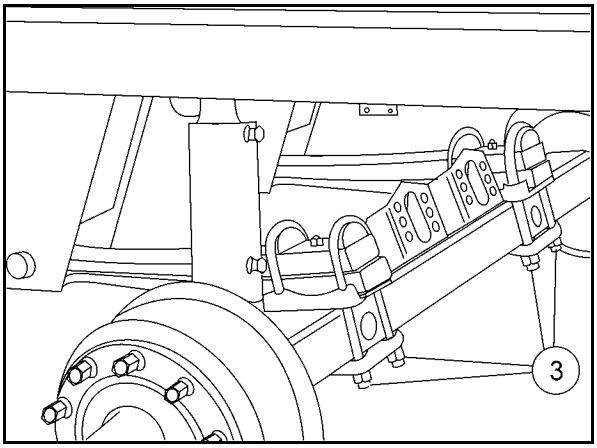


Fig. 117

(4) Spring bolt

Check bushings of spring bolts:

1. Move the machine slightly forward and backwards with the brake system applied or move the spring eyes by means of the mounting lever.

   The spring eye must not show any clearance. In case of loose fixing, the spring bolt may be damaged.

2. Check the lateral wearing washers in the support.

3. Tighten the nuts in case of a loosened screwed connection.

   M30: Torque = 900 Nm (840-990 Nm)

(1) Spring bolt in antitwist protection groove.

(2) Washer

(3) Loose wearing plates

(4) Lateral wearing washers

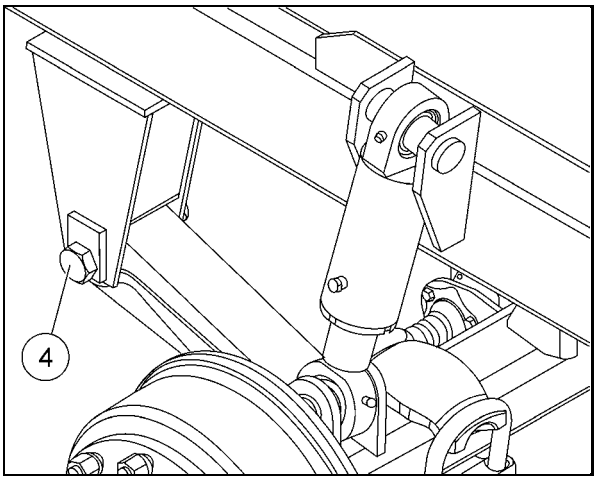


Fig. 118

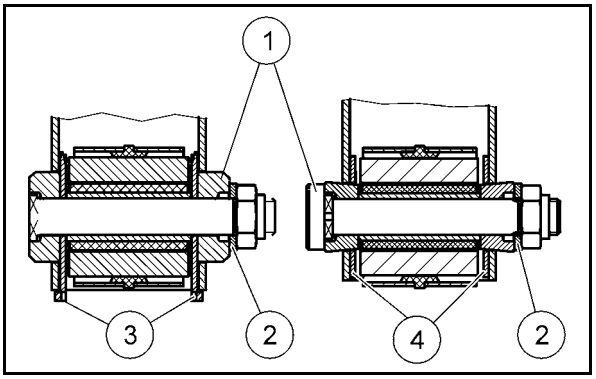


Fig. 119

12.13 Transport floor

WARNING

Risk of becoming entangled, wound up and risk of shearing due to the transport floor accidentally starting!

Only enter the cargo space with the machine switched off and the transport floor 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!

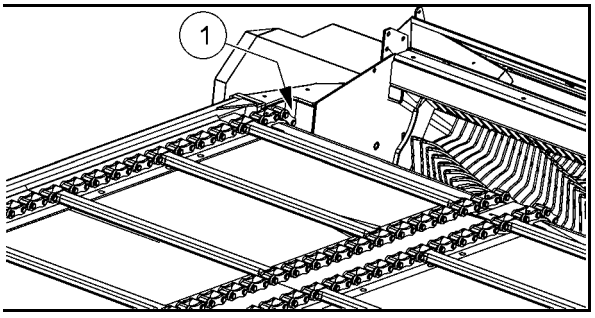


Fig. 120

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.

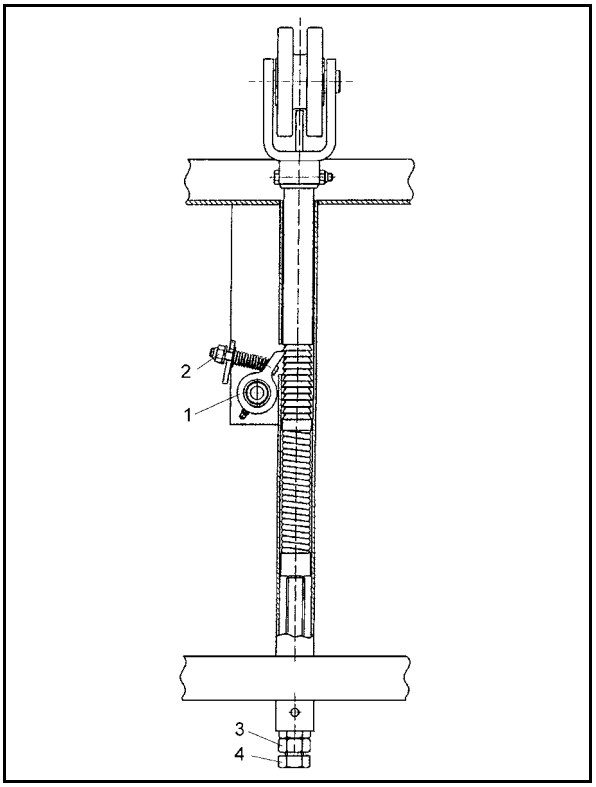


Fig. 121

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 lubricating strip (1).

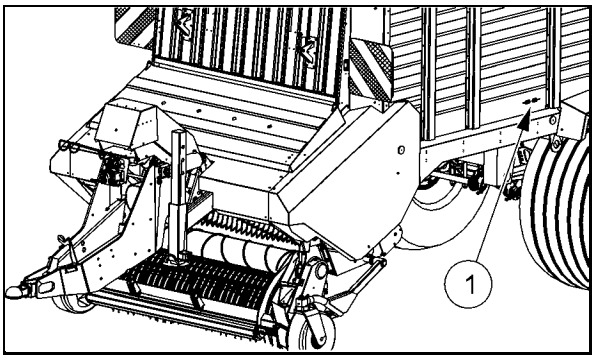


Fig. 122

2. Lubricate the rear deflection points of the transport floor chains via all lubricating nipples of the lubricating strip (2).

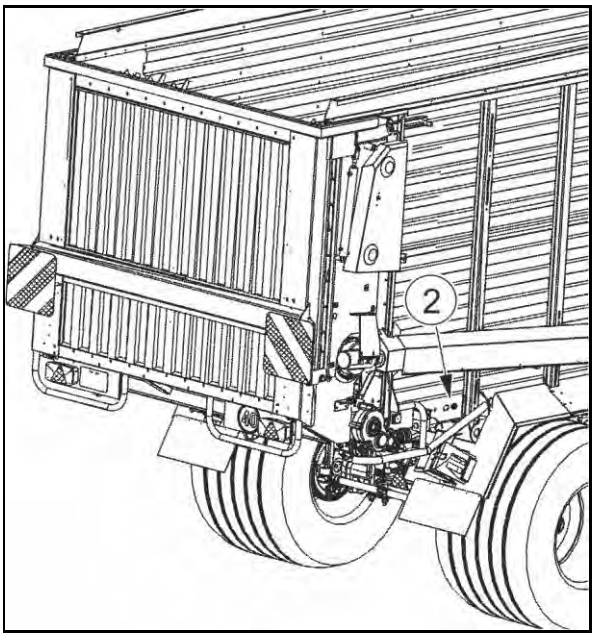


Fig. 123

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.

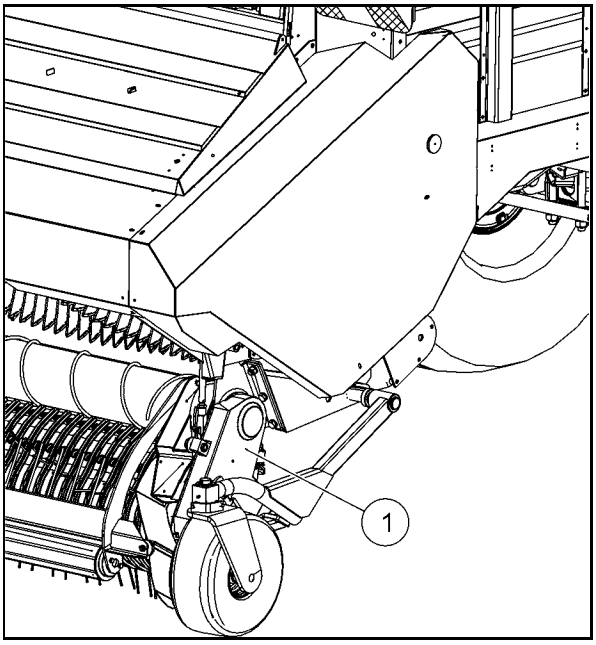


Fig. 124

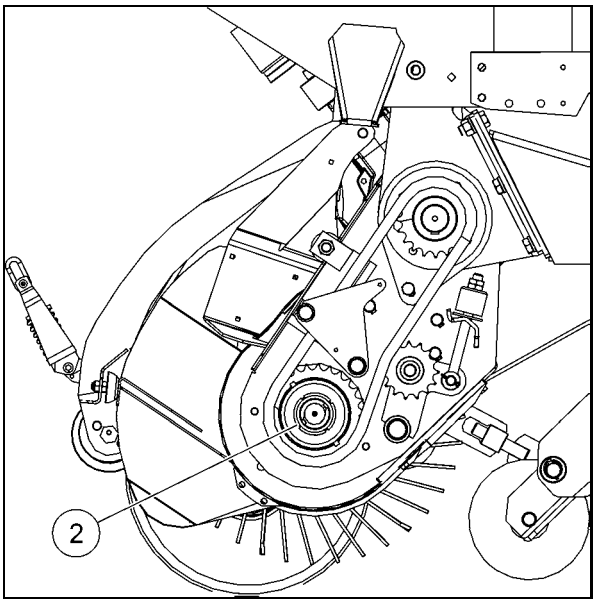


Fig. 125

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.

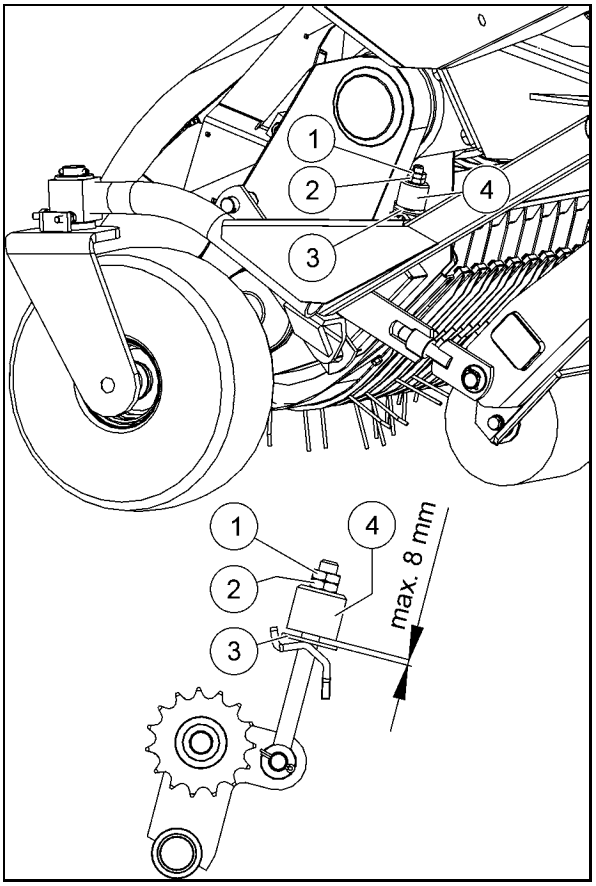


Fig. 126

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.

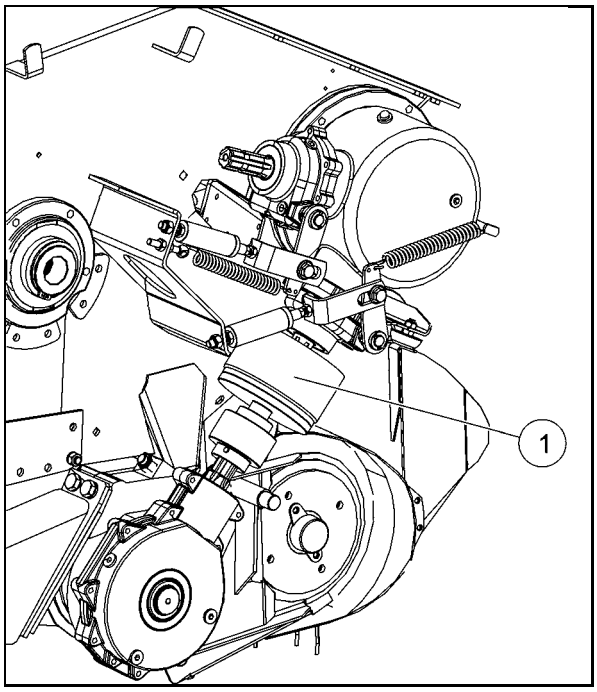


Fig. 127

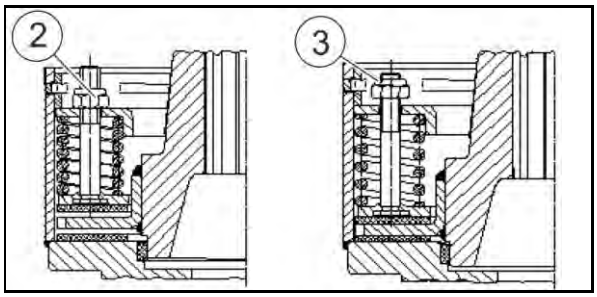


Fig. 128

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.

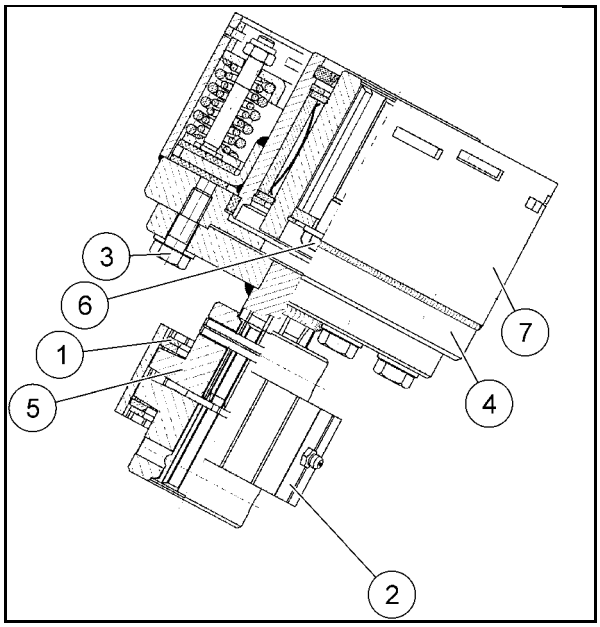


Fig. 129

12.15.3 Align switch rods with respect to the switch levers of the angular switchgear

Giga-Vitesse CFS DO

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).

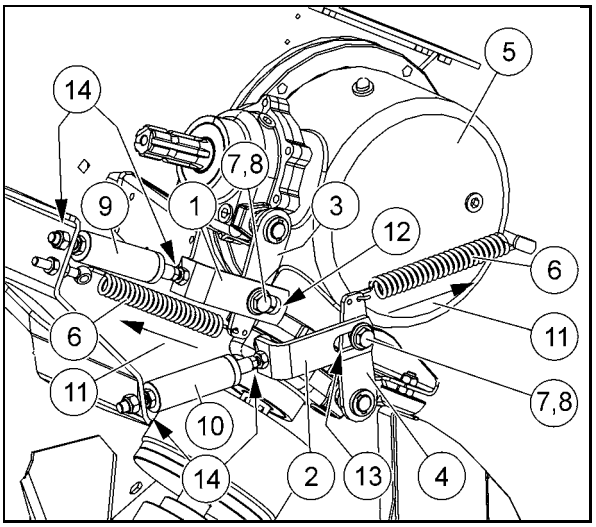


Fig. 130

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.

12.16.2 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.

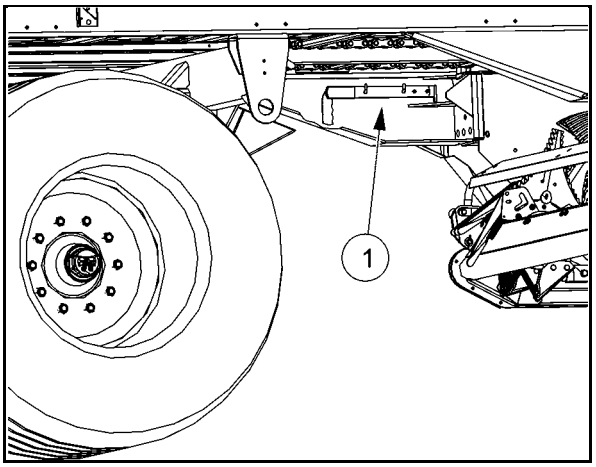


Fig. 131

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.

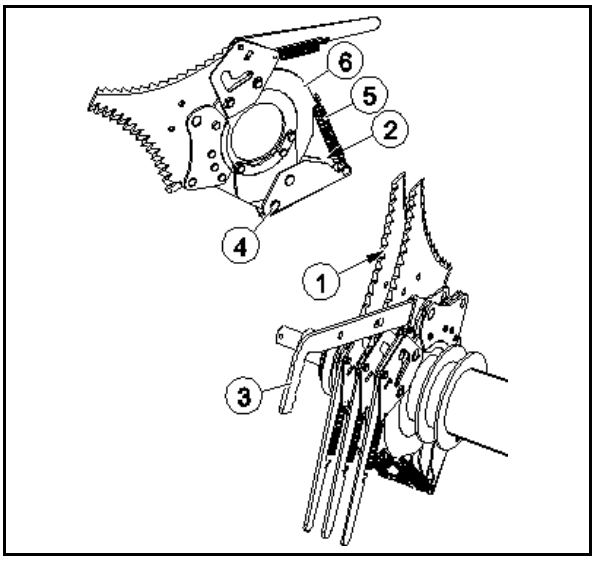


Fig. 132

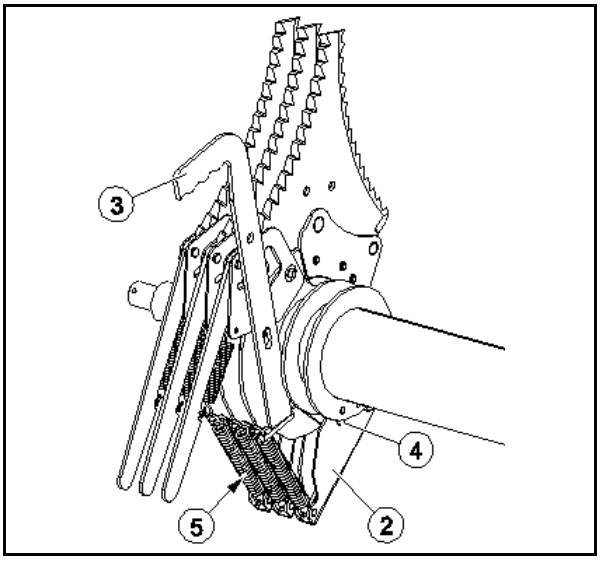


Fig. 133

12.16.3 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.

12.16.3.1 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.

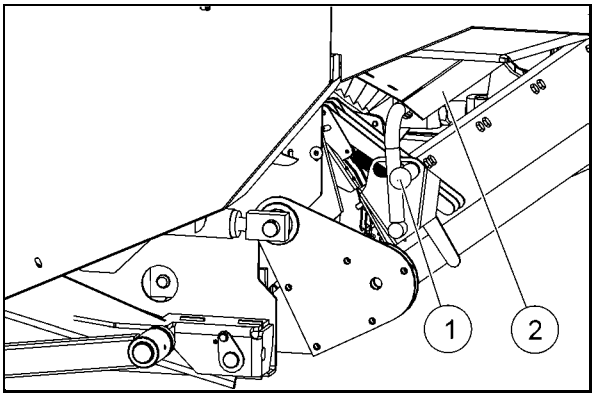


Fig. 134

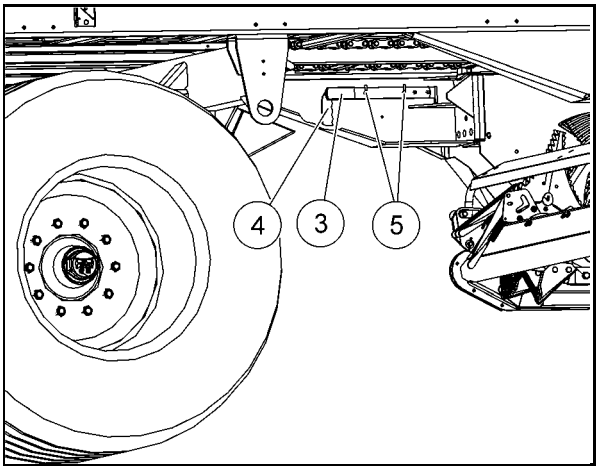


Fig. 135

10. Clean the gaps of the cutting knives/knife holders 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.

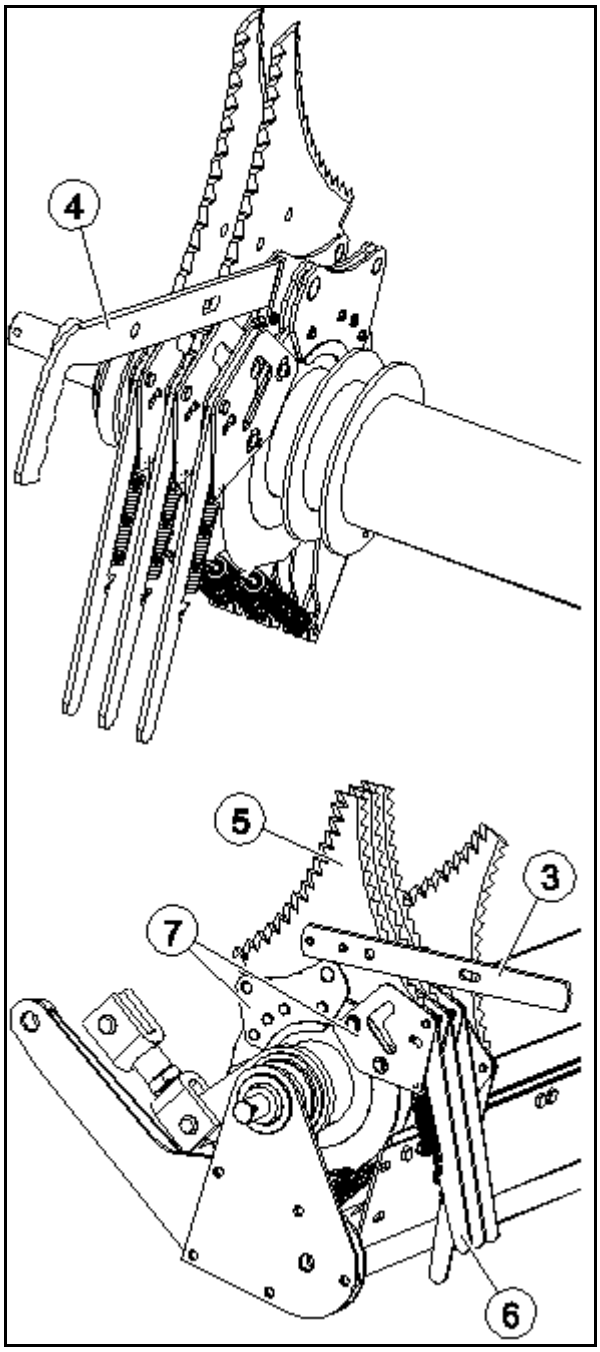


Fig. 136

12.16.3.2 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.

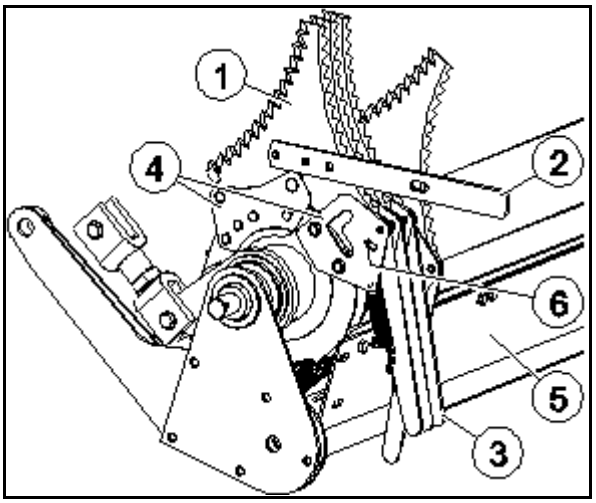


Fig. 137

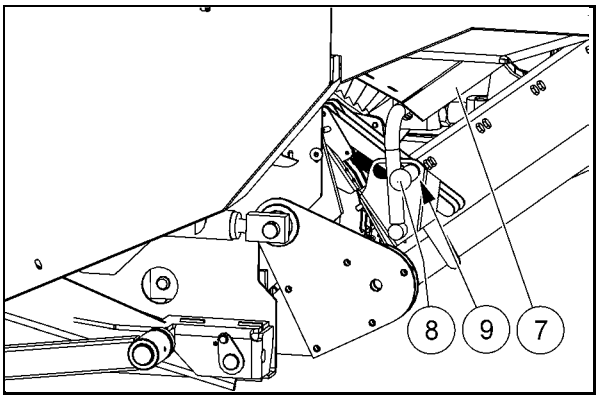


Fig. 138

13. Extend the cutting unit into the conveyor duct via the control set.
14. Lower the folding drawbar.

12.16.4 Grind cutting knives

WARNING

Risk to eyes due to blown-away abrasive particles when grinding the cutting knives!

Always wear protective goggles when grinding cutting knives.

- Check the cutting knives for sharpness every day!
  - o Turn blunt cutting knives over (every 12 hours) or grind them (every 24 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.

Sharp cutting knives:

- reduce the effort required for powering the conveying unit,
- reduce conveying unit wear,
- increase the service life of the conveying unit.

12.16.5 Set distance between cutting knives and rotor

The distance between the cutting knives and the rotor must be approx. 20 mm over the complete 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.

1. Lift the folding drawbar to increase the free space to the cutting knives.
2. Secure tractor and machine against accidental starting and rolling.
3. Enter the cargo space through the access door.
4. Measure:
   - the distance between the cutting 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 complete width of the rotor.
5. Adjust the distance between the cutting knives and the rotor at the respective upper link (Fig. 140/1) on the right-hand and left-hand side of the machine if the measured value is not approx. 20 mm.
   - 5.1 Unscrew the counter nut (Fig. 140/2).
   - 5.2 Remove the bolt (4) to loosen the upper link fork (Fig. 140/3) from the receiver pipe (5).
   - 5.3 Turn the respective upper link fork to set the distance between the cutting knives and the rotor.

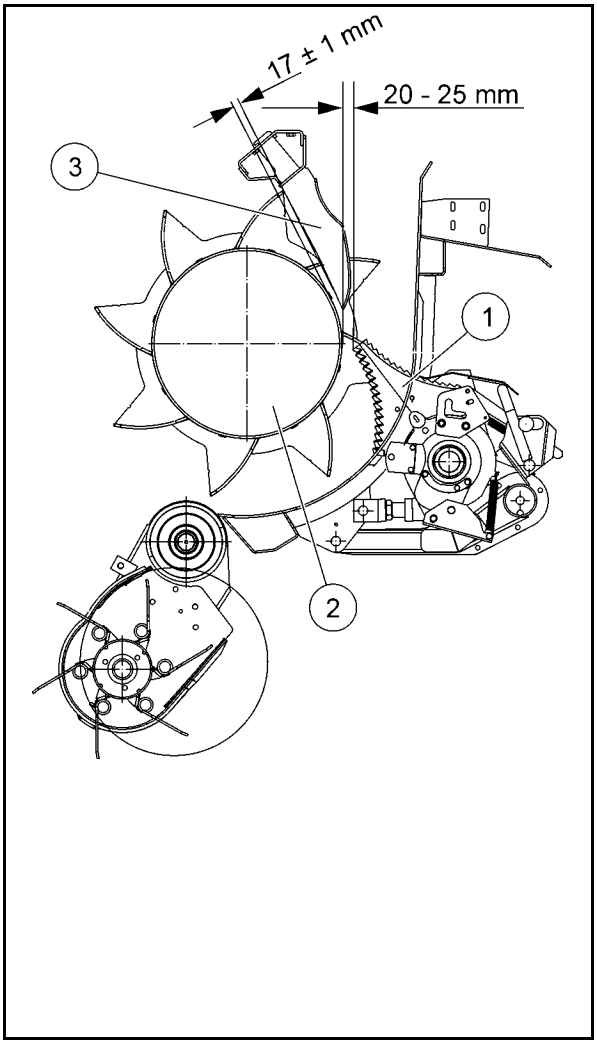


Fig. 139

- 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.

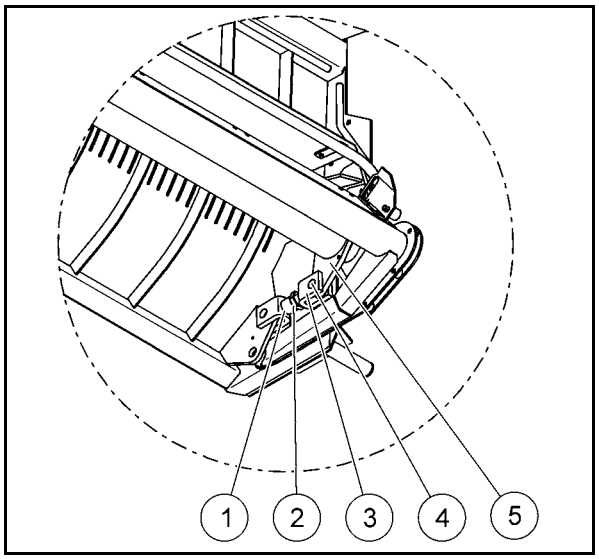


Fig. 140

5.4 Measure again the distance on the right-hand and left-hand side of the rotor to check the set distance.

5.5 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.

5.6 Tighten the counter nut.

12.16.6 Check distance between strippers and rotor

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.

1. Enter the cargo space through the access door.
2. Measure the distance between the strippers (3, Fig. 142/1) and the rotor (2) in the conveyor duct from the cargo space.
3. Replace worn strippers.
   - 3.1 Unscrew the screws (Fig. 142/3).
   - 3.2 Remove the safety rail (4) of the stripper holder by pulling it out to the side.
   - 3.3 Remove worn strippers by pulling them out to the bottom.
   - 3.4 Mount new strippers in reverse order.
4. Have deformed stripper holders replaced by an authorised workshop. (Shop work)

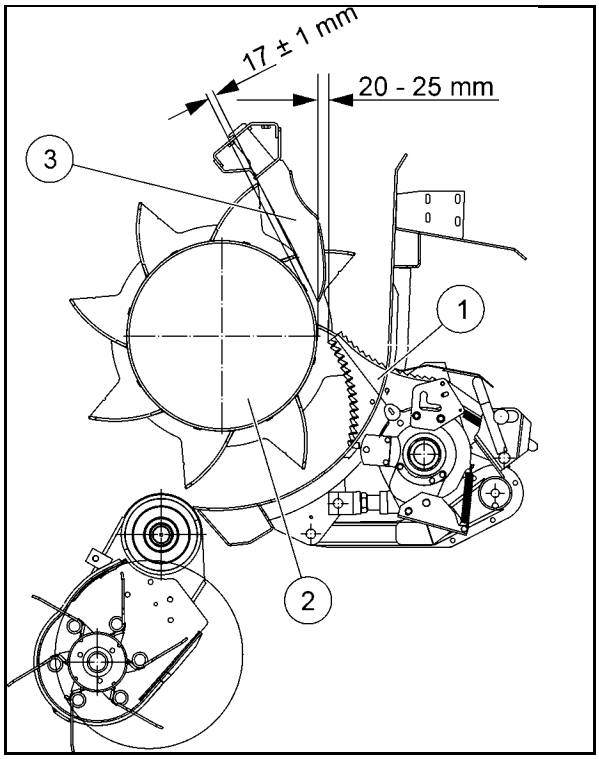


Fig. 141

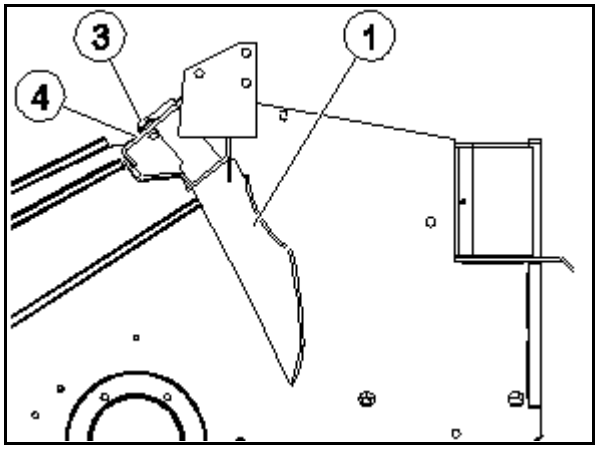


Fig. 142

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.

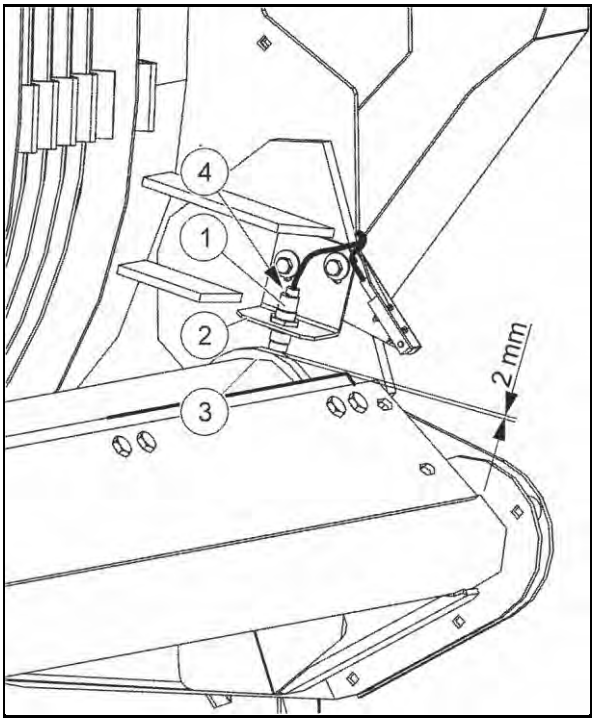


Fig. 143

12.17 Dosing drums

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.

12.17.1 Lubricate roller chains of dosing drums

1. Use a service platform with ladder:
   - to open the protective devices for the roller chains by means of a tool,
   - to obtain safe access to the roller chains.
2. Lubricate the roller chains by means of grease or engine oil.
3. Close the protective devices and lock them in protective position.

12.17.2 Check/Retighten tension of roller chains of dosing drums

The roller chains must be retightened if they can be pushed in by more than 5 mm.

The tightening wheel bolt (1) of the chain tightening wheel (2) for the roller chain (3) is equipped with a left-handed thread. The roller chain (3) links the bottom (4) and the central (5) dosing drum.

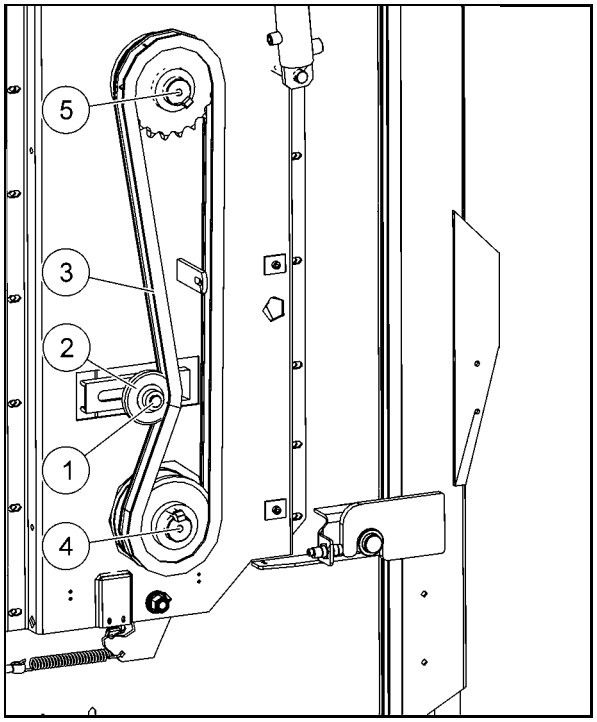


Fig. 144

The tightening wheel bolt (6) of the chain tightening wheel (7) for the roller chain (8) is equipped with a right-handed thread. The roller chain (8) links the central (9) and the top (10) dosing drum.

1. Use a service platform with ladder:
   - to open the protective devices for the roller chains by means of a tool,
   - to obtain safe access to the roller chains.
2. Check the tension of the roller chains of the dosing drum drive.
3. Retighten a loose roller chain by means of the chain tightening wheel:
   - 3.1 Loose the tightening wheel bolt of the chain tightening wheel.
   - 3.2 Move the chain tightening wheel to tighten the roller chain. The chain is properly tightened if the roller chain can only be pushed in by approx. 5 mm.
   - 3.3 Retighten the tightening wheel bolt.
4. Lubricate the respective roller chain by means of grease or engine oil.
5. Close the protective devices and lock them in protective position.

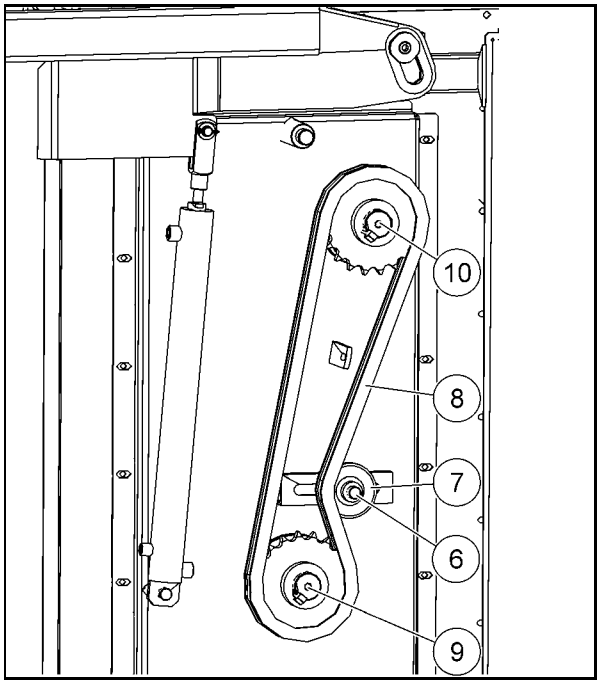


Fig. 145

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 Loctite or sealing tape
In the flow line, the pressure rises to 180 bar, although no valve is being actuated (open system)	Screwed-in load-sensing screw for locking of pressure regulator	Unscrew load-sensing screw
Hydraulic system excessively heating up	Volume flow from tractor too large	Adjust volume flow to tractor valve
	Hydraulic plugs too small	Provide appropriately large hydraulic plugs
	Worn hydraulic plugs	Replace hydraulic plug
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
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

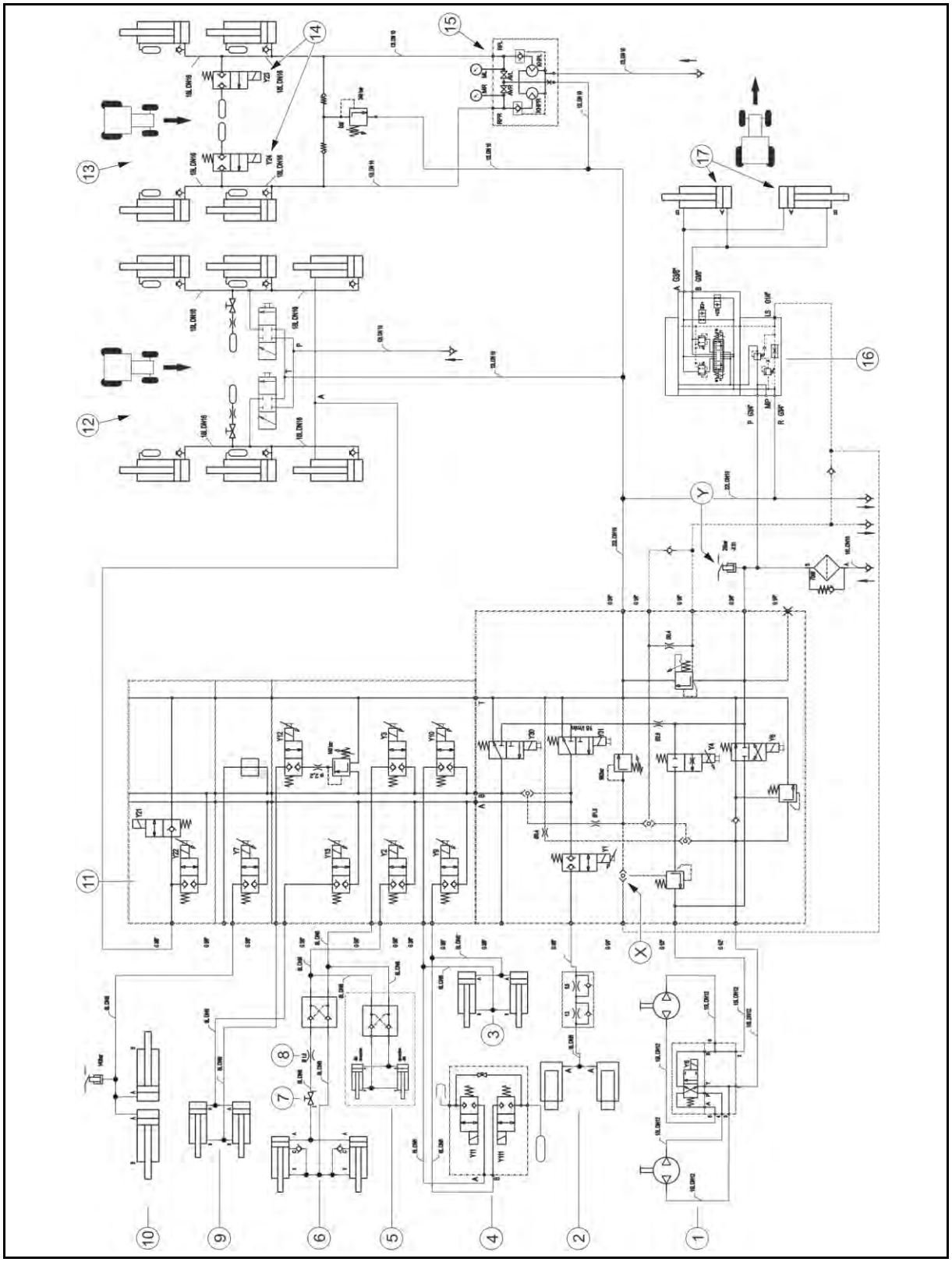
13.3 Working

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 or replace knife protection system
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
	Too little hydraulic oil pressure	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

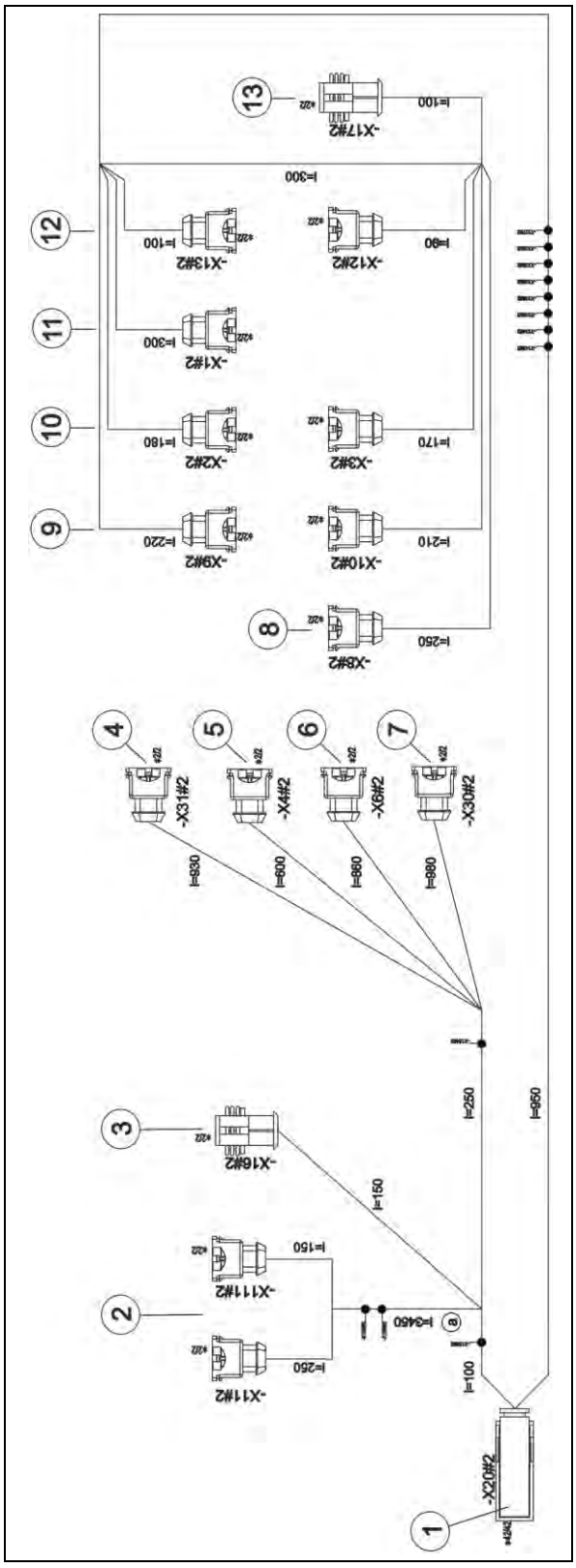
14 Circuit diagrams

14.1 Hydraulics – ISOBUS control



(1) Transport floor
(2) Pick-up
(3) Folding drawbar
(4) Drawbar suspension (optional extra)
(5) Angular switchgear for circuit for dosing unit (only machines equipped with dosing drums)
(6) Tailgate
(7) Stop-cock
(8) Throttle (only machines equipped with dosing drums)
(9) Cutting unit
(10) Steering axle
(11) Axle lift tridem (optional extra)
(12) Hydro-pneumatic chassis (BPW tridem axle control) (optional extra)
(13) Hydro-pneumatic chassis (Hydac tandem axle control) (optional extra)
(14) Y23 and Y24 with active drawbar suspension energised
(15) Levelling system
(16) Electro-hydraulic forced steering axle
(17) Steering cylinder
(X) only mounted with crossover conveyor
(Y) only mounted with electro-hydraulic forced steering axle

14.2 Electronics – ISOBUS control Field-Operator 120 – Cable harness overview



(1) Control unit
(2) Drawbar suspension
(3) Silage additive pump
(4) Pre-selection Y31
(5) Proportional
(6) Return line of transport floor
(7) Pre-selection Y30
(8) Steering axle
(9) Folding drawbar
(10) Tailgate
(11) Pick-up
(12) Cutting unit
(13) Central lubrication

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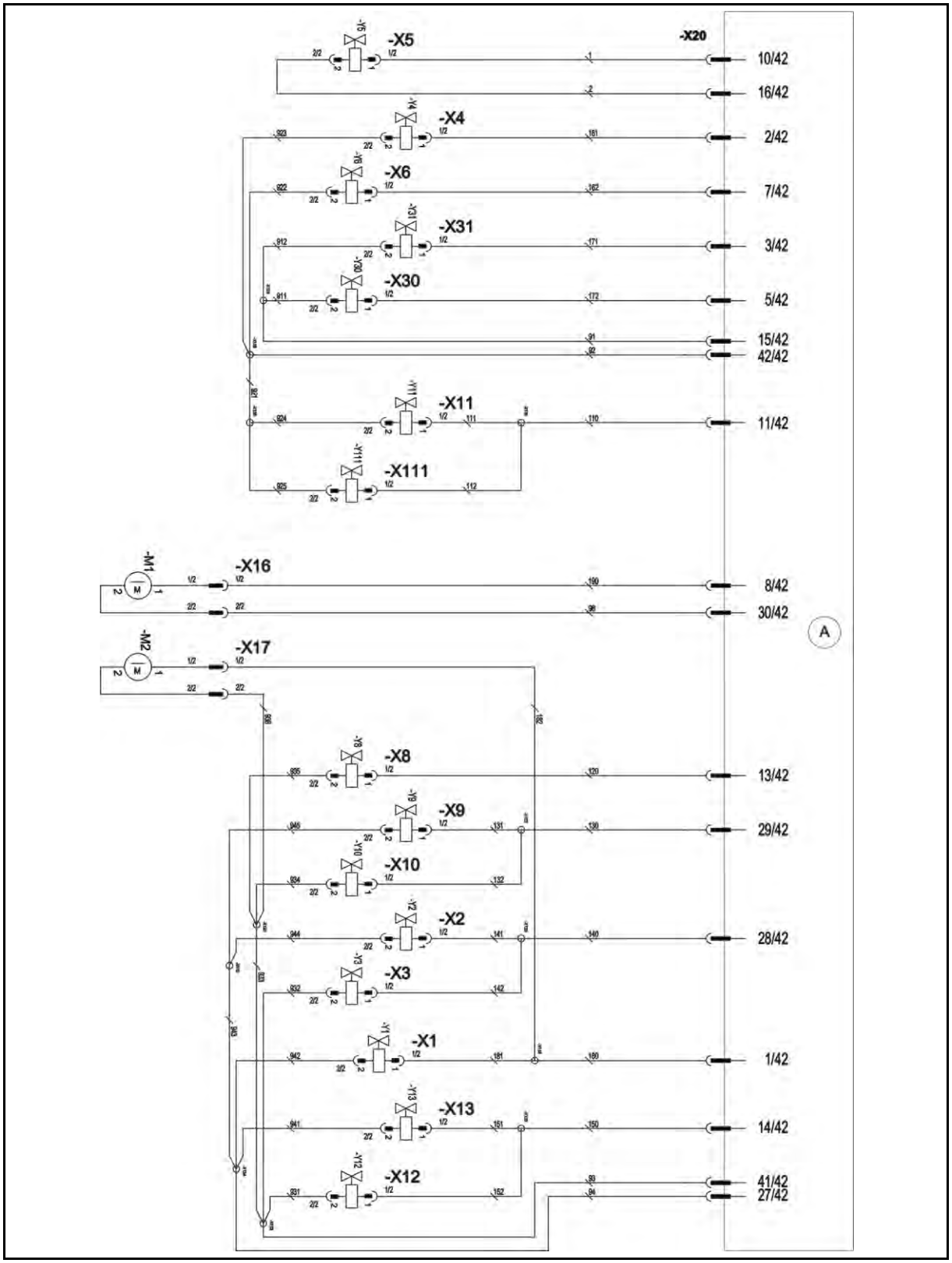
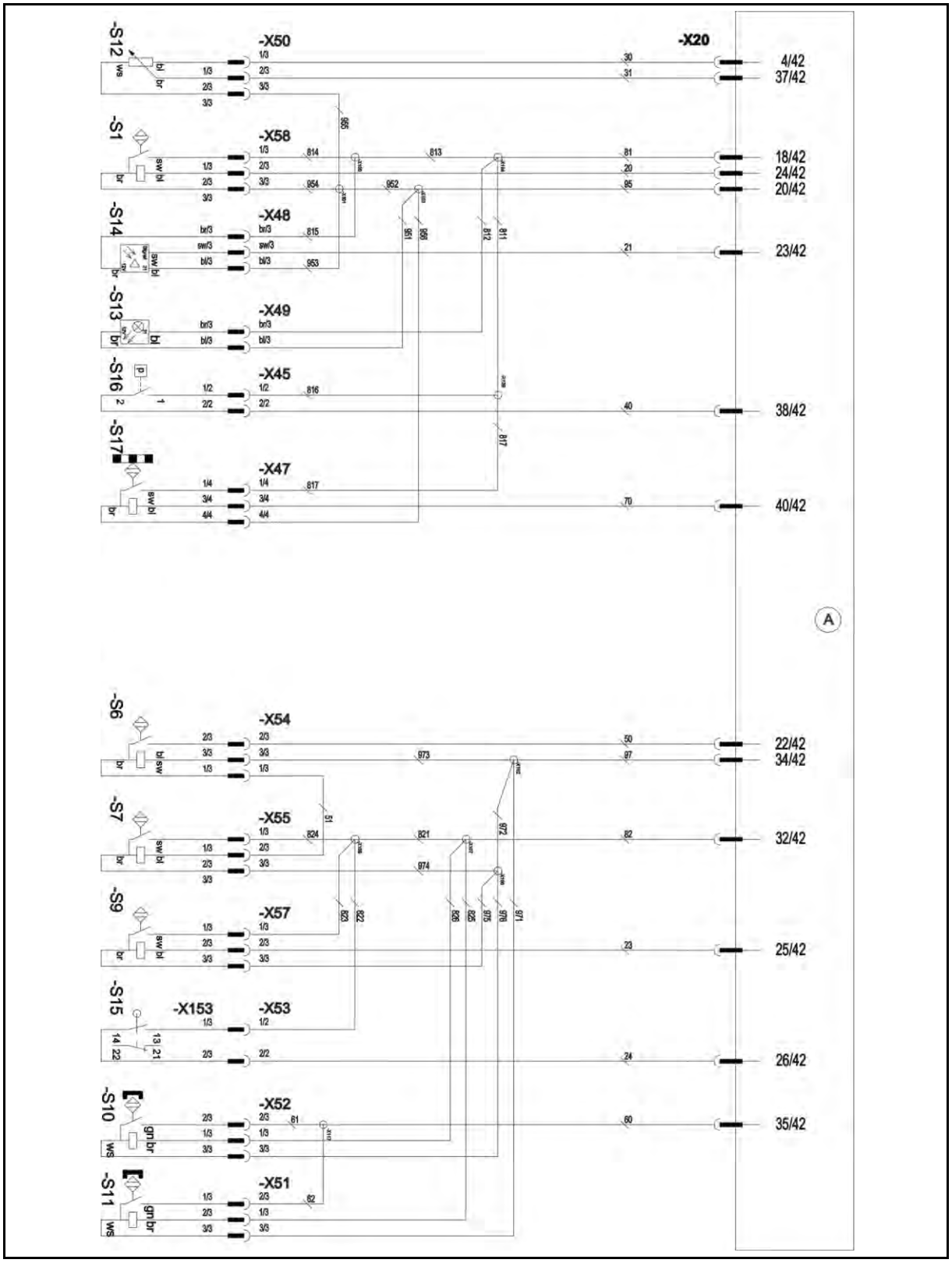
14.3 Electronics – ISOBUS control Field-Operator 120 – Valves



(A)	Control unit
M1	Silage additive pump
M2	Lubricant pump
X1	Pick-up
X2	Tailgate 1
X3	Tailgate 2
X4	Transport floor forward
X5	Transport floor forward level II
X6	Reverse transport floor
X8	Steering axle
X9	Folding drawbar 1
X10	Folding drawbar 2
X11	Drawbar suspension 1
X111	Drawbar suspension 2
X12	Cutting unit 2
X13	Cutting unit 1
X16	Silage additive pump
X17	Central lubrication
X30	Pre-selection Y30
X31	Pre-selection Y31

1/42	Pick-up
2/42	Transport floor forward
3/42	Pre-selection valve Y31
5/42	Pre-selection valve Y30
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, transport floor level II
27/42	Ground, valves 4
28/42	Tailgate
29/42	Folding drawbar
30/42	Ground, silage additive pump
41/42	Ground, valves 3
42/42	Ground, valves 2

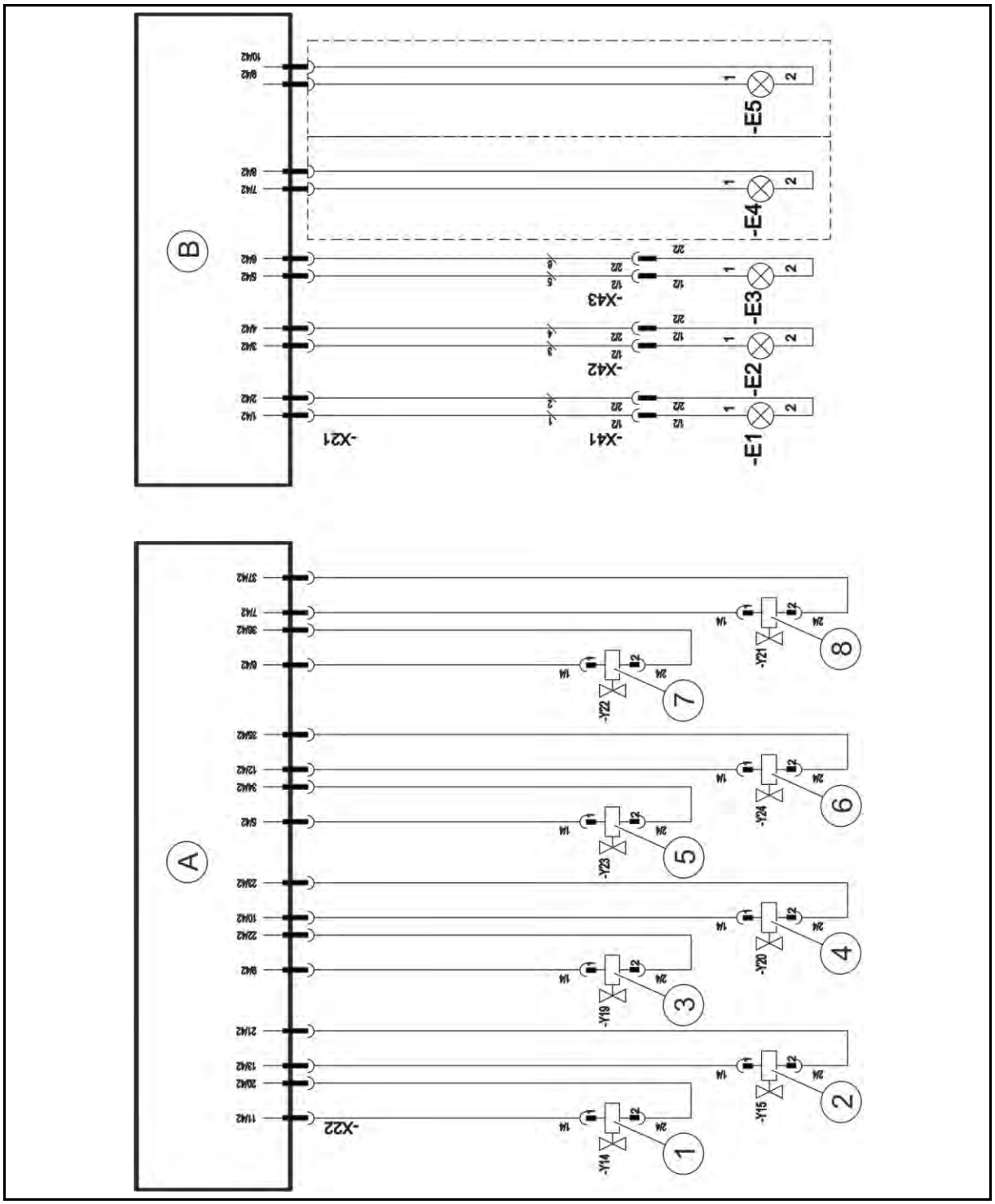
14.4 Electronics – ISOBUS control Field-Operator 120 – Sensors



(A)	Control unit
4/42	Supply, potentiometer, automatic charging system
18/42	12 V sensors 1
20/42	Ground, sensors 1
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
37/42	Signal, automatic charging system
38/42	Signal "Axle locked"
40/42	Signal "Axle unlocked" or in case of SES: error in forced steering axle system

S01	Cutting unit
S06	Tailgate lowered, right-hand (only without dosing drums)
S07	Tailgate lowered, left-hand
S09	Tailgate completely lifted
S10	Speed, dosing drums, left-hand
S11	Speed, dosing drums, right-hand
S12	Potentiometer, automatic charging system
S13	Knife protection system (transmitter)
S14	Knife protection system (receiver)
S15	Machine is full
S16	Pressure switch
S17	Axle unlocked

14.5 Electronics – ISOBUS control Field-Operator 120 – Control unit, extension module/LIN module



(A) Extension module, ISOBUS control

(B) LIN module, ISOBUS control

(1) Crossover conveyor, cw rotation

(2) Crossover conveyor, ccw rotation

(3) Front grating 1 (optional extra)

(4) Front grating 2 (optional extra)

(5) Axle suspension 1 (optional extra)

(6) Axle suspension 2 (optional extra)

(7) Lift axle (optional extra)

(8) Lower axle (optional extra)

E1 Work lights, front grating

E2 Work light, rear, left-hand

E3 Work light, rear, right-hand

E4 Work lights (optional extra)

E5 Warning beacon (optional extra)

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

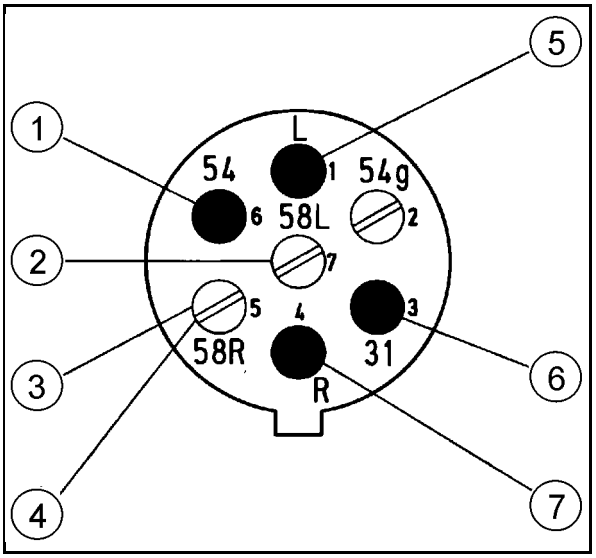


Fig. 146

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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