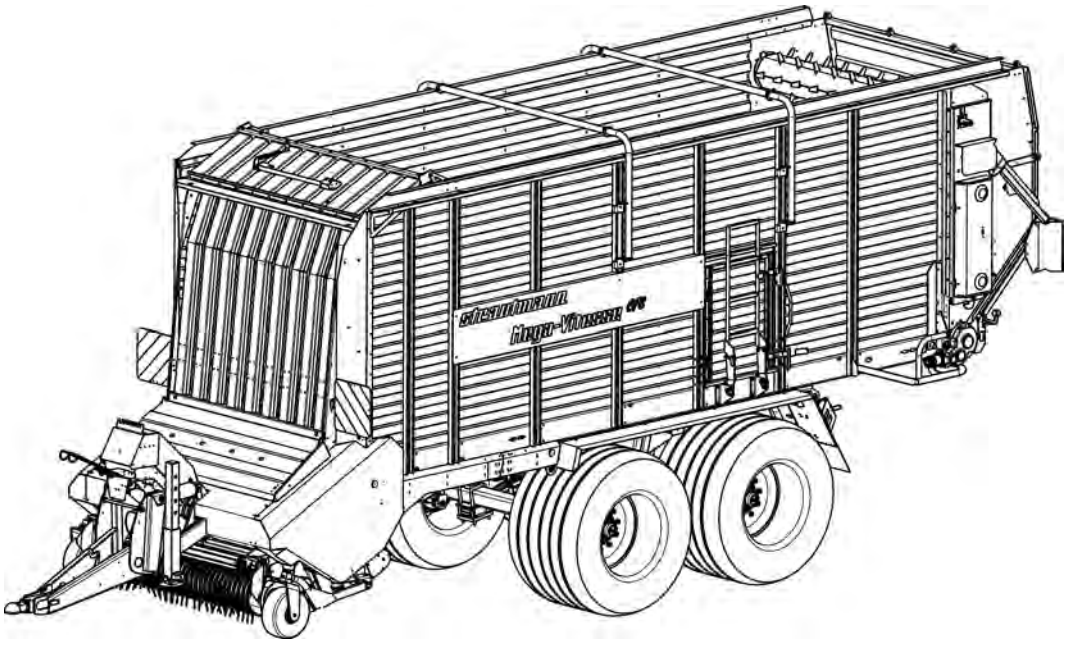
Translation of the original Operating Instructions

Forage Trailer

Mega-Vitesse CFS 3001, 3401, 3801

Mega-Vitesse CFS 3001 DO, 3401 DO, 3801 DO



70500902
04.13
Printed in Germany

CE

Please read and observe these operating instructions before commissioning!
Keep them for further use!

GB

EC Declaration of Conformity

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

Manufacturer:

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

Description and identification of machine:

Designation:	**Forage Trailer**
Function:	Cutting, charging, transport and distribution of green and dried-out forage
Model:	Mega-Vitesse CFS, Mega-Vitesse CFS DO
Type:	Mega-Vitesse CFS 3001, 3401, 3801 Mega-Vitesse CFS 3001 DO, 3401 DO, 3801 Do
Serial number:	W09703000_0S38001 – W09709000_0S38999
Trade name:	Mega-Vitesse CFS, Mega-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, 14.05.2013

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

Machine ID number:
(17-digit)

Type:

Year of manufacture:

Manufacturer's address

B. Strautmann & Söhne GmbH u. Co. KG

Landmaschinenfabrik

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

Landmaschinenfabrik

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 machine ID number (17-digit) of your machine when ordering spare parts.

Formal information about the operating instructions

Document number: 70500902

Date of compilation: 04.13

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.

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.

User evaluation

Dear reader,

Our operating instructions are regularly updated. Your suggestions for improvements will be a great help for drawing up more and more user-friendly operating instructions. Please send your suggestions by fax or e-mail to:

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

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1 User information

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

1.1 Purpose of document

The present operating instructions:

- describe the operation and maintenance procedures for the machine.
- provide important information about safety-conscious and efficient handling of the machine.
- are part of the machine and are always to be carried along on the machine or in the tractor.
- are to be kept for further use.
- are to be handed over to the buyer when the machine is sold.

1.2 Location details in the operating instructions

Any directional data in these operating instructions are specified in direction of motion.

1.3 Applied modes of specification

Instructions and responses

Activities to be carried out by the operator are specified as numbered instructions. Please keep to the order of the specified instructions. The response to the respective instruction is marked by an arrow if applicable. Example:

1. Instruction 1

→ response of machine to instruction 1

2. Instruction 2

Lists

Lists without obligatory 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

1.4 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	… the short-cut forage trailer and the short-cut crop proportioning trailer Mega-Vitesse CFS 3001, 3401, 3801, Mega-Vitesse CFS 3001 DO, 3401 DO, 3801 DO.
operating element	... the component which is directly actuated by the operator, e.g. by pressing. An operating element may be an adjusting lever, a toggle switch, key button, rotary switch 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 product and identification of essential elements.

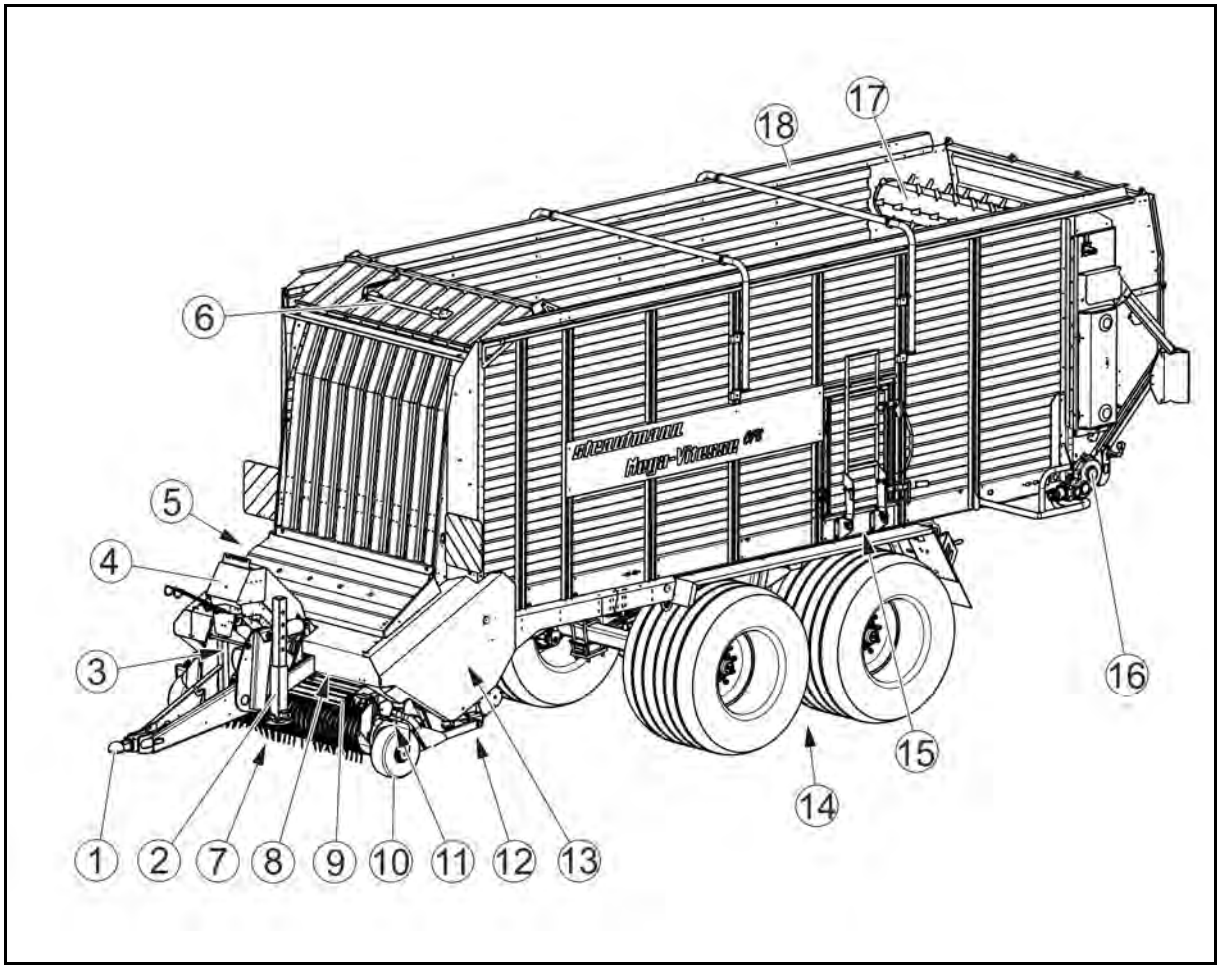


Fig. 1

(1) Hydraulic folding drawbar for top and bottom linkage, bottom linkage with forced steering axle
(2) Supporting leg
(3) Main gearbox
(4) Electro-hydraulic control block
(5) Conveying unit
(6) Hinged automatic charging system (loding frame)
(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 to cargo space and access ladder
(16) Feed gearing, transport floor
(17) Metering drums
(18) Body

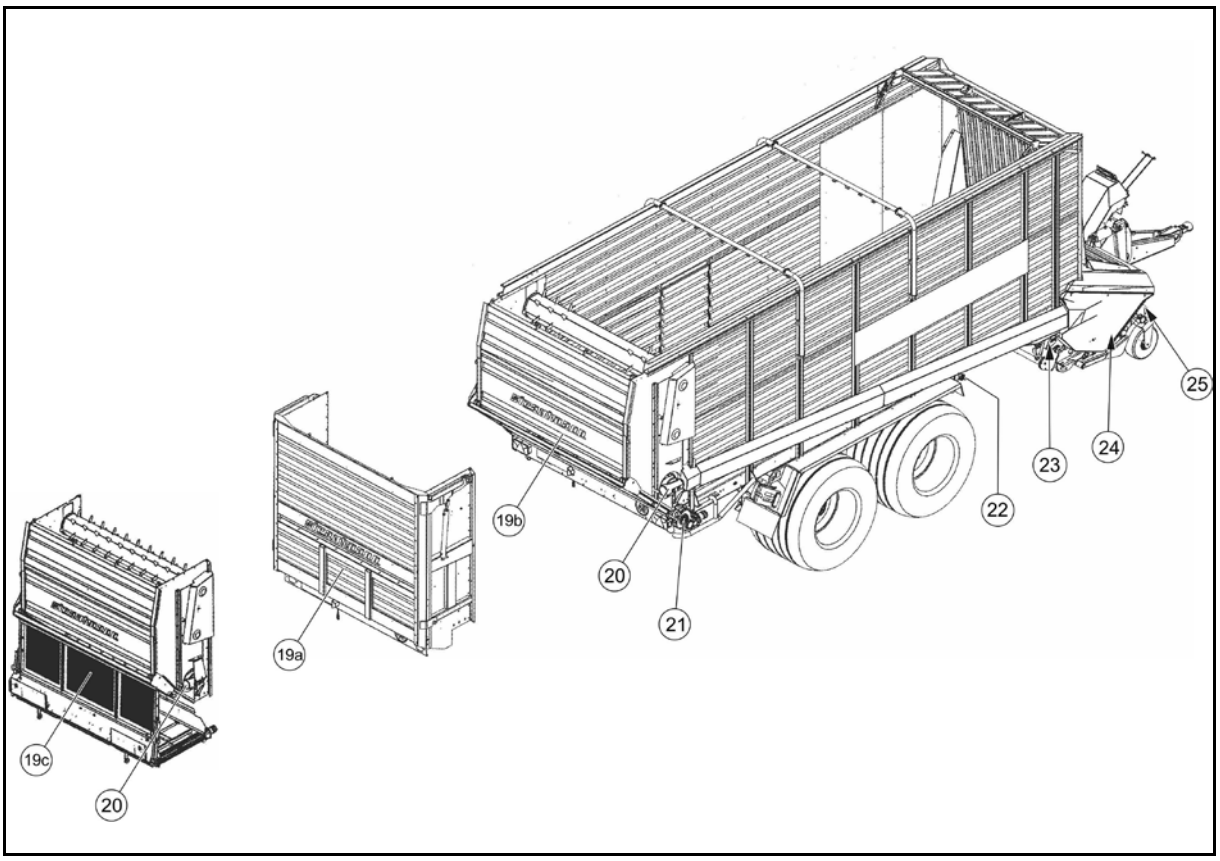


Fig. 2

(19a) Tailgate
(19b) Tailgate with metering drums
(19c) Tailgate with metering drums and crossover conveyor
(20) Angular gear, rear, Mega-Vitesse DO
(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.

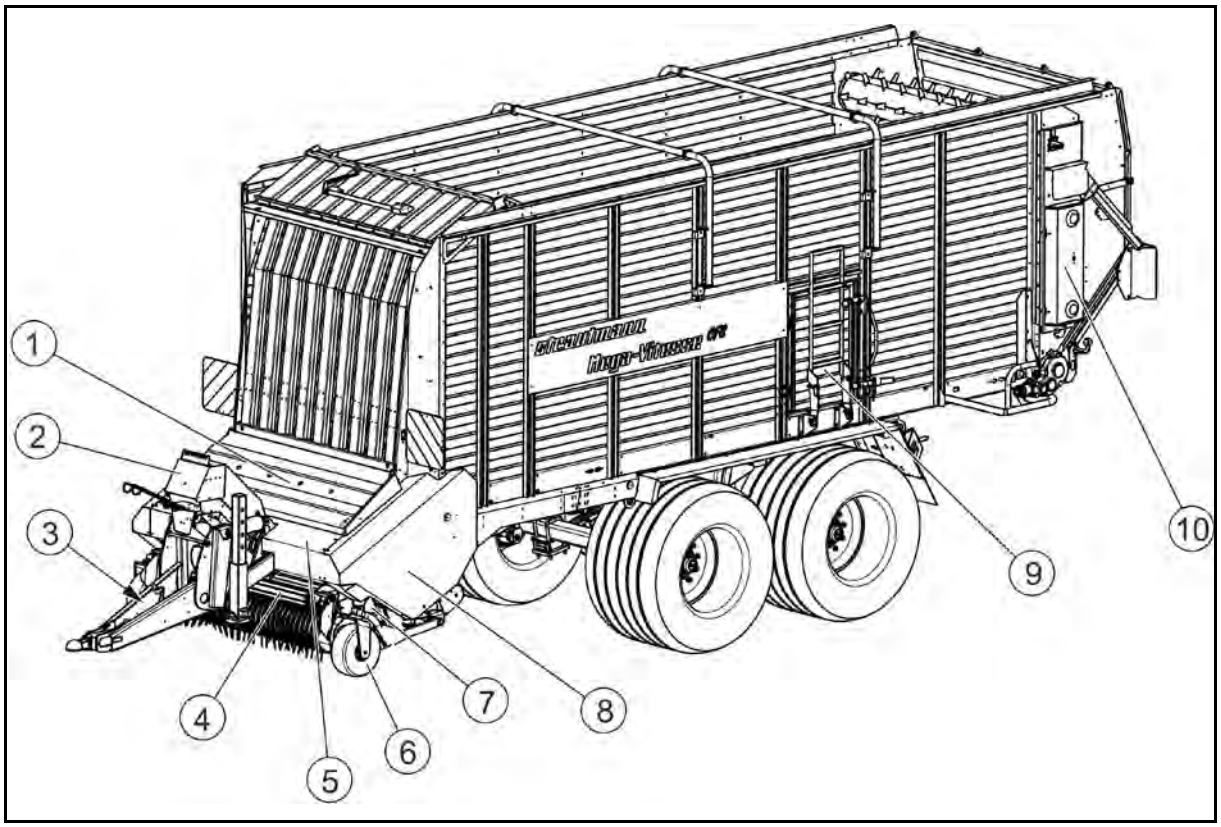


Fig. 3

(1) Bonnet

(2) Hydraulics protective device

(3) Drawbar protective device, protective device for forced steering axle system (only forage trailer with forced steering axle)

(4) Holding-down device with pulley

(5) Drawbar protective device

(6) Roller feeler

(7) Protective casing, pick-up

(8) Side protector

(9) Access door to cargo space

(10) Side protector, metering drum drive, left-hand

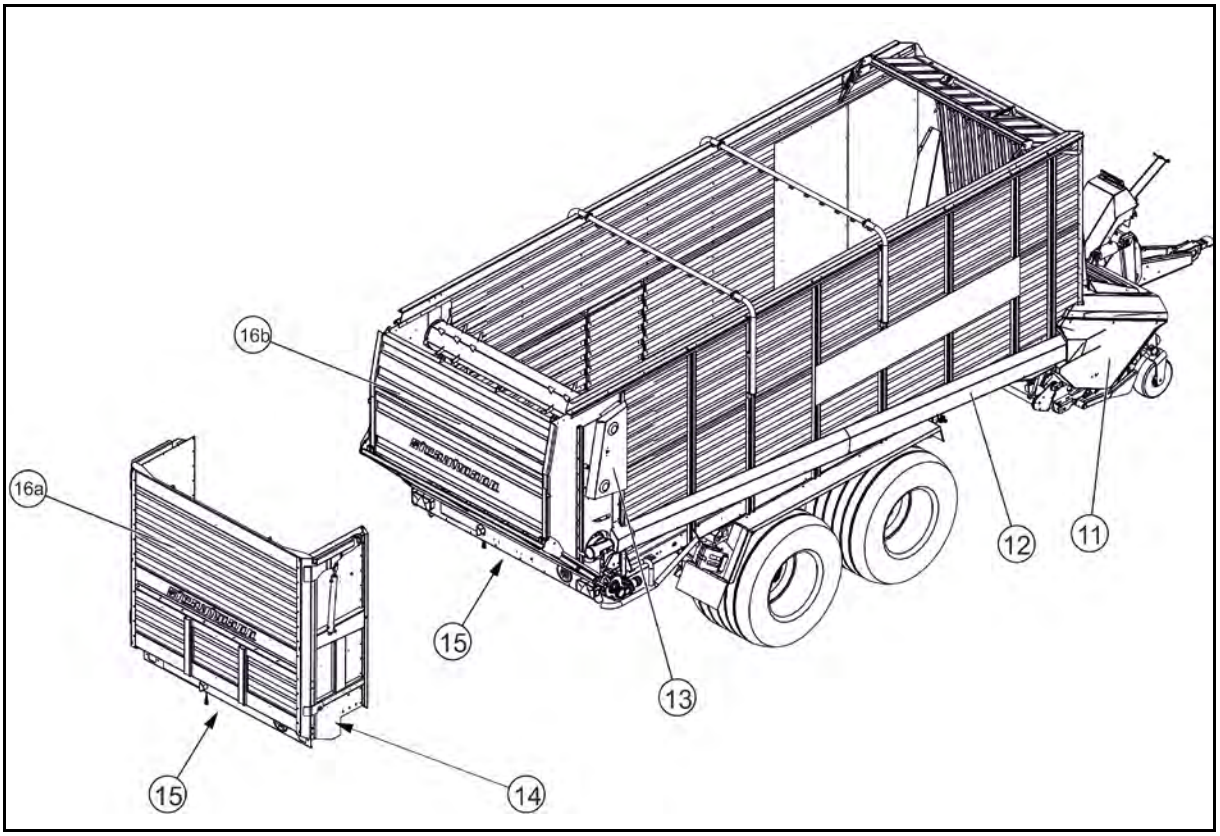


Fig. 4

(11) Side protector, right-hand

(12) Tunnel cover for metering drum drive

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

(14) Stop-cock, for securing tailgate against accidental lowering

(15) Bottom plates for feed shaft (4 pcs.)

(16a) Tailgate

(16b) Tailgate with metering drums

2.3 Overview - Supply lines between tractor and machine

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

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

(3) Load sensing connector SN 6

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

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

(6) Power supply for control unit, 3-pole. The feed line of the 3-pole socket should have a minimum cable cross section of 4 mm².

(7) Lighting connector 7-pole

(8) Hydraulic connector for hydraulic brake with hydraulic clutch according to ISO 5676 (only in case of hydraulic brake system)

(9) ISOBUS connecting cable

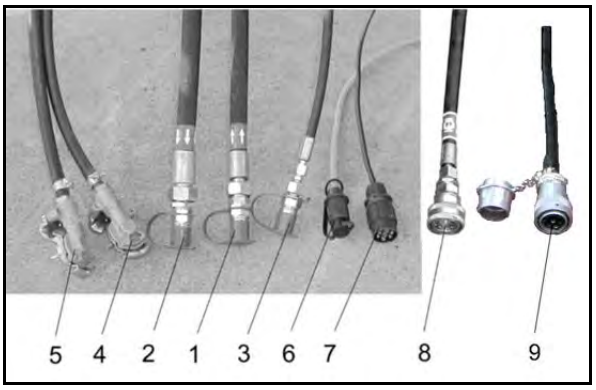


Fig. 5

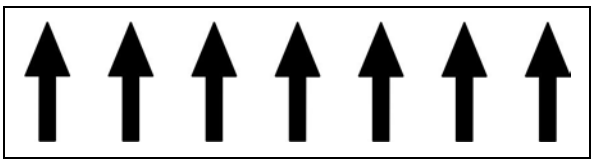
Your tractor should be equipped with the following hydraulic clutches such that you will be able to take full advantage of the whole pump capacity of your tractor's hydraulic pump:

- for the hydraulic connector "Reverse line" (2) - with hydraulic clutches of clutch size 4,
- for the load-sensing connector (3) - with hydraulic clutches of clutch size 2.

2.3.1 Marking of hydraulic supply lines

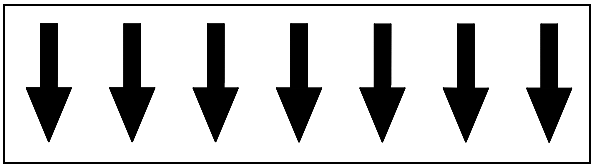
Hydraulic connector "Flow line"

- Label
  Arrows: white
  Background: red



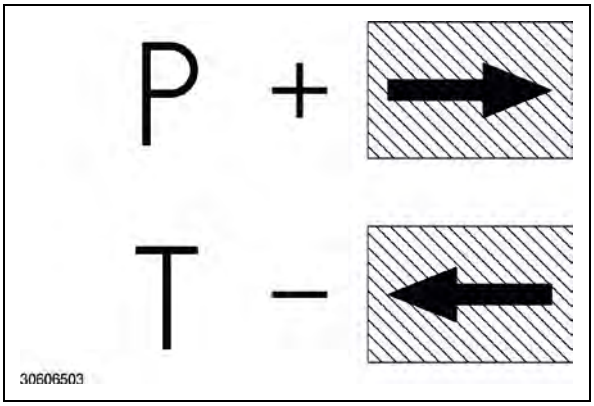
Hydraulic connector "Reverse line"

- Label
  Arrows: white
  Background: blue



Explanation of hydraulic connector symbols

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

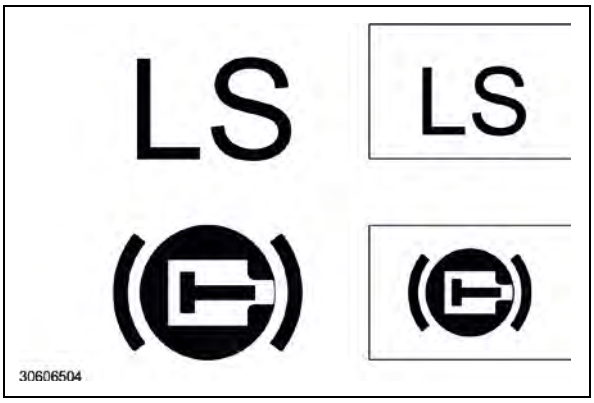


Load-sensing connector

- Label

Explanation of the following symbols:

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



2.4 Traffic-related equipment

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

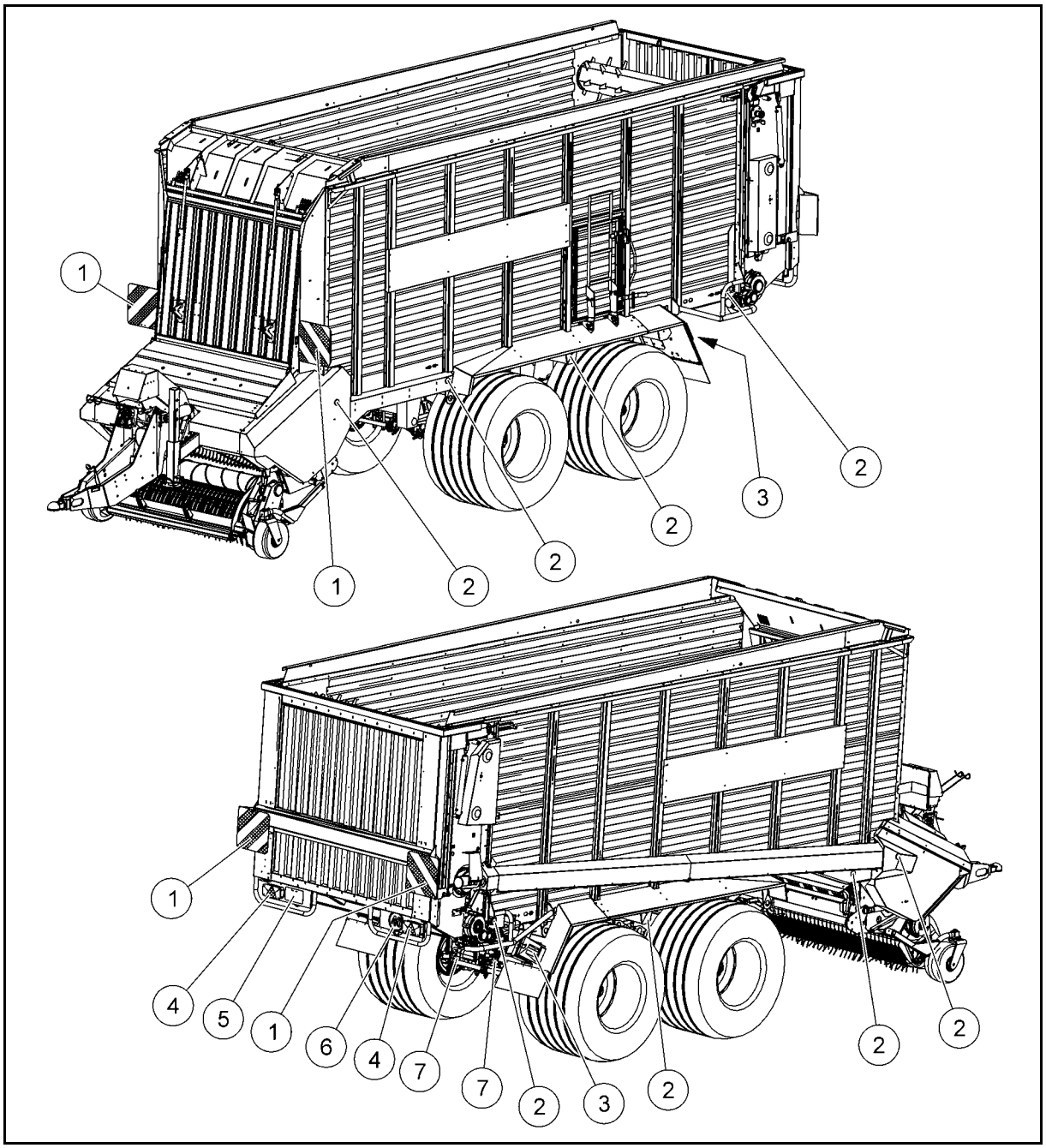


Fig. 6

(1) Warning plate
(2) Side reflectors
(3) Chock
(4) Multi-function light
(5) License plate
(6) Speed sign
(7) Triangle reflectors

2.5 Correct use

The short-cut forage trailers and the short-cut crop proportioning trailers Mega-Vitesse CFS and Mega-Vitesse CFS DO:

- are exclusively intended for normal use in the course of agricultural work,
- are suitable for cutting, charging, transport and distribution of green and dried-out forage.

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 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

form also part of the correct use.

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

- The user will be solely responsible
- The manufacturer will not assume any liability

for any damage resulting from incorrect use.

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/or 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 folding 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 powered metering 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 identification number (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)

(3) Settings for automatic load-sensitive brake pressure regulator

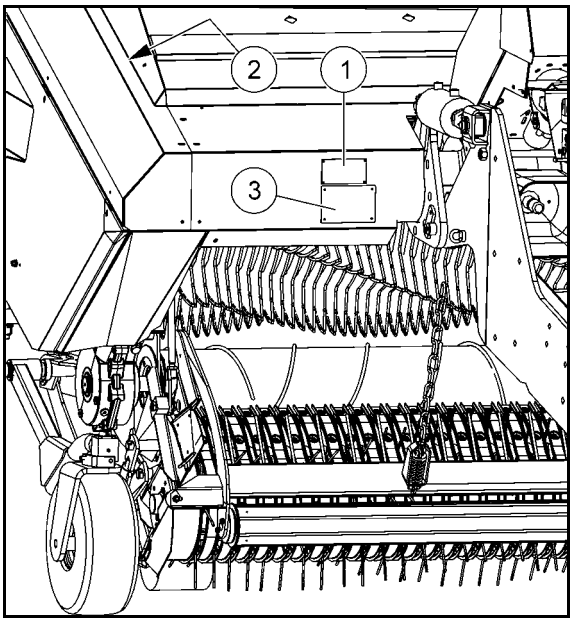


Fig. 7

The type plate includes:

- Manufacturer
- Fahrzeug / Maschinen Ident-Nr. = Vehicle / Machine ID no.
- Typ = Model
- Leergewicht = Empty weight
- Zul. Gesamtgew. = Gross vehicle weight rating
- Zul. Stützlast / Achslast vorn = Admissible tongue load / front axle load
- Zul. Achslast hinten = Admissible rear axle load
- Baujahr = Year of manufacture
- Nenndrehzahl = Rated speed

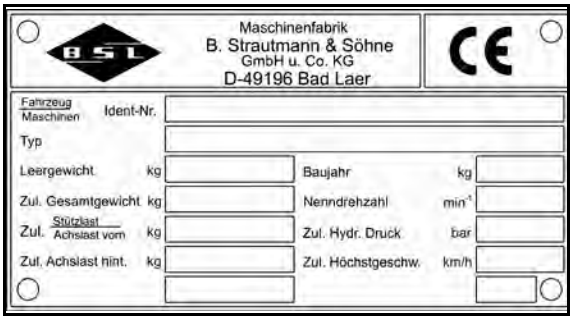


Fig. 8

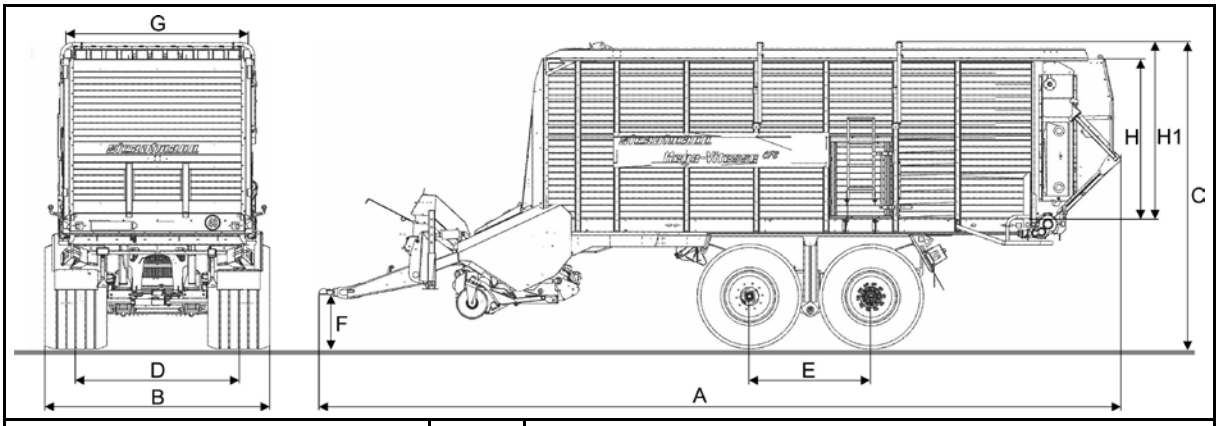
- Zul. Hydr. Druck = Admissible hydraulic pressure
- Zul. Höchstgeschw. = Speed limit

2.8 License plate

The provided license plate sizes are as follows:

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

2.9 Technical data

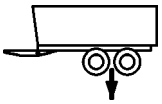


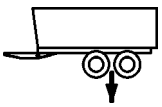
Model		Mega-Vitesse CFS					
		3001	3001 DO	3401	3401 DO	3801	3801 DO
Gross vehicle weight rating	kg	21000		21000		21000	
Admissible axle load	kg	18000		18000		18000	
Admissible tongue load	kg	3000		3000		3000	
Empty weight	kg	8300	8700	8800	9200	9200	9600
Capacity at medium pressing power	m³	50.4	46.8	57.6	54.0	64.8	61.2
Capacity according to DIN 11741	m³	28.0	26.0	32.0	30.0	36.0	34.0
A = total length	m	8.49	8.75	9.29	9.55	10.09	10.35
B = total width (710-type wheel)	m	2.81		2.81		2.81	
C = total height	m	max. 4.00		max. 4.00		max. 4.00	
total height with open tailgate	m	max. 4.42		max. 4.42		max. 4.42	
D = track	m	2.10		2.10		2.10	
E = wheelbase	m	1.56		1.56		1.56	
Picking-up width of pick-up	m	2.00		2.00		2.00	
Number of pick-up tine rows	Pcs.	6		6		6	
Tine spacing of pick-up	mm	55		55		55	
Ground clearance of pick-up	m	with lifted folding drawbar approx. 0.60					

In case of equipment with bottom hitch and Scharmüller ring or ball coupling the tongue load and the gross vehicle weight rating are increased by 2000 kg. This does not apply to the flanged Scharmüller ring or ball coupling and does only apply up to 40 km/h.

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

2.9.1 Tyre pressure

			 40 km/h				
			14 to	16 to	18 to	20 to	max.
600/50 - 22.5	12PR	bar	1.5	-	-	-	2.0
700/40 - 22.5	12PR	bar	-	1.5	1.7	-	2.3
710/40 - 22.5	156D	bar	-	1.5	2.5	-	3.2
710/40 - 22.5	158A8	bar	-	1.9	-	-	2.0
710/45 - R 22.5	165D	bar	-	1.5	1.8	2.0	4.0
750/45 - R 22.5	I-380	bar	-	1.5	1.7	1.8	3.5
750/45 - R 26.5	I-380	bar	-	-	1.5	1.5	3.5
620/55 - R 26.5	166D	bar	-	-	2.2	-	4.0
700/50 - R 26.5	12PR	bar	-	-	1.5	-	2.5
710/45 - R 26.5	169A8	bar	-	-	2.5	-	3.8
710/50 - R 26.5	169D	bar	-	-	1.5	2.0	4.0
710/50 - R 26.5	170	bar	-	-	1.5	-	4.0
750/45 - R 26.5	178A8	bar	-	-	1.5	1.5	4.8
800/40 - R 26.5	172D	bar	-	-	1.5	1.8	2.8
800/45 - R 26.5	174D	bar	-	-	1.1	1.4	4.0

			 65 km/h			
			14 to	16 to	18 to	max.
700/40 - 22.5 HS	16PR	bar	-	1.5	-	3.0
700/50 - 26.5 HS	16PR	bar	-	1.5	-	3.0
600/50 - R 22.5	159D	bar	-	3.6	-	4.0
600/55 - R 26.5	165D	bar	-	2.4	-	4.0

Pick-up roller feeler = 2 bar

1 bar = 14.5 psi

2.10 Required tractor equipment

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

Tractor engine output and p.t.o. speed

		Mega-Vitesse CFS					
		3001	3001 DO	3401	3401 DO	3801	3801 DO
Power required	kW	95		103		110	
	HP	130		140		150	
p.t.o. speed	min^{-1}	1000					

Electrical system

Battery voltage:
- 12 V (volt)

Socket for lighting:
- 7-pole

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

Hydraulics

- 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!

Maximum operating pressure:
- 210 bar

Tractor pump output:
- min. 40 l/min at 180 bar, max. 100 l/min
- with electro-hydraulic forced steering axle system: min. 60 l/min at 180 bar, max. 100 l/min

Hydraulic oil of machine:
- Hydraulic oil HLP 46

Some hydraulic components can be optionally connected to:
- a double-acting control device,
- a single-acting control device and a free reverse pipe leading directly into the hydraulic oil tank of the tractor.

We recommend a single-acting control device and a free reverse pipe. The hydraulic oil flows back into the hydraulic oil tank of the tractor through the free reverse pipe without any back pressure. Thus, a free reverse pipe reduces heating-up of the hydraulic oil.

The hydraulic hose pipes are marked by colours at the hydraulic plugs:

- Delivery pipes (Flow P) are marked red,
- Reverse pipes (Reverse T) are marked blue.

Required control devices

Hydraulic component:	Required control devices
• Electro-hydraulic control block:	Alternatively: • 1 double-acting control device or • 1 single-acting control device and 1 pressure-less reverse pipe with large plug-in coupling (DN 16) (max. back pressure in reverse pipe 5 bar)

Tab. 1

Brake system

Dual-line service brake system	Dual-line compressed-air brake system including: • 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

Tab. 2

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 dB(A), measured during operating mode at the driver’s ear, the cabin being closed.

The sound pressure level mainly depends on the vehicle 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

The machine has been designed according to state of the art and the accepted safety-related rules. When using the machine, risks and impairments might yet arise:

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

For the safety-conscious operation of the machine, please observe:

- these operating instructions, in particular:
  - the basic safety instructions, the activity-related safety instructions and the instructions what to do,
  - the instructions regarding correct use.
- the warning signs on the machine,
- the general national occupational safety, accident prevention and environmental protection rules,
- the national road traffic regulations when carrying out transport journeys.

Only operate the machine in perfect safety-related condition.

WARNING

Risk to people of being crushed, cut, becoming entangled, being drawn in or risk of impact to people 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“ included in these operating instructions, page 35,
  - the chapter "Warning and instruction signs" included in these operating instructions, page 48, and to observe the warning signs when operating the machine,
  - to read 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 are 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.

Activity \ Staff	Member of staff especially trained for the activity [1]	Instructed person [2]	Staff 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
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 area and dangerous spots", page 24.

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!
- Wear your personal protective equipment when carrying out work on the machine!
- 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!
- Make sure that people leave the hazardous area of the machine, before moving or starting the machine! Particularly be aware of children!
- Wait for the machine to stop completely before entering the hazardous area of the machine.
- Never carry passengers or objects on the machine! Carrying passengers and transport of 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 and the driving characteristics of the tractor as well as the influences exerted by the attached / hitched machine.
- Never take a tight curve at excessive travelling speed.
- Avoid sudden changes of direction, in particular when travelling uphill and downhill and when traversing hills!
- Beware when driving in reverse gear.
- 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 devices 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!
- People are not allowed between tractor and machine, when actuating the three-point hydraulic system!
- 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 or moving parts!
- 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!
- Powered (e. g. hydraulically) moving machine parts have crushing and shearing zones!
- 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

- Observe the respective national road traffic regulations when carrying out transport journeys on public roads!
- 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!
- Always ensure sufficient steerability and braking ability of the tractor!

  Machines attached or 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.
- Use front weights if necessary!

  The tractor's front axle load must never fall below 20 % of the tractor's empty weight, in order to ensure sufficient steerability.
- Always properly fix front weights to the fixing points provided for this purpose!
- Observe the maximum loading capacity of the attached / hitched machine and the admissible axle and tongue loads of the tractor!
- Check the braking effect before starting the journey! The tractor must produce the required deceleration for the combination of tractor and attached / hitched machine!
- Observe the broad overhang and the flywheel mass of the machine when cornering with attached or hitched machine!
- Avoid sudden changes of direction, in particular when travelling uphill and downhill and when traversing hills!
- Set all movable machine parts to transport position and secure them before carrying out transport journeys. Use the transport locks provided for this purpose!
- Before transport journeys, check whether the required transport equipment, such as lighting, warning and protective devices, has been properly mounted on the machine!
- Adapt your travelling speed to the conditions prevailing at the time!
- Shift down to a lower gear before travelling uphill!
- Switch the single-wheel brake system off (lock pedals) before carrying out transport journeys!

3.4.2 Hydraulic system

The hydraulic system is under high pressure!

- Ensure to properly connect the hydraulic hose pipes!
- Make sure that the hydraulic system on the tractor and on the machine has been depressurized when connecting 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,
  - apply the parking brake,
  - pull the ignition key out!
- Have hydraulic hose pipes checked for their operational safety by an expert at least once a year!
- Replace hydraulic hose pipes in case of visible defects, damage and ageing! Only use original hydraulic hose pipes!
- The period of use of the hydraulic hose pipes should not exceed six years, including a maximum possible shelf life of two years!

  Even when properly stored and exposed to admissible stress, hoses and hose connections are subject to natural ageing, which involves a limited shelf life and period of use. Notwithstanding these facts, the period of use may be specified according to experience, in particular taking into account the risk potential. For thermoplastic hoses and hose pipes, other reference values may be relevant.
- Never try to block leaking hydraulic hose pipes with your hand or fingers!

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

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

3.4.3 Electrical system

- Before carrying out any work on the electrical system, disconnect the minus pole of the battery!
- 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!
- Always cover the plus pole of the battery as required. Risk of explosion in case of accidental ground!
- Avoid sparking and open fire in the vicinity of the battery! Risk of explosion!
- The machine can be equipped with electronic components and parts, the functioning of which may be affected by electromagnetic emissions of other devices. Such interferences may be a risk to people if the following safety instructions are not observed:
  - In case of a retrofitting of electrical devices or components into the machine and their connection to the on-board electrical system, the user must check on his own responsibility whether the retrofitted parts interfere with the vehicle electronics or other components.
  - Ensure that the retrofitted electrical and electronic components comply with the EMC directive 2004/108/EC as amended from time to time and bear the CE symbol!

3.4.4 P.T.O. shaft operation

- Only use the propeller shafts specified by the manufacturer and equipped with the proper protective devices!
- Observe the information included in the operating instructions for the supplied propeller shaft!
- Check the propeller shaft:
  - protective tube and protective cone of the propeller shaft must be undamaged,
  - a protective cover must be mounted to the tractor's and to the machine's p.t.o. shaft! The protective covers must be in proper condition!
- Working with the protective devices being damaged is not allowed!
- Mounting and dismounting of the propeller shaft is only allowed:
  - with the p.t.o.shaft switched off,
  - with the tractor engine turned off,
  - with the ignition key pulled out,
  - with the parking brake applied!
- Always ensure proper mounting and securing of the propeller shaft!

- Secure the propeller shaft guard against rotation by installing the chain(s)!
- Observe the transport and working position of the specified tubular covers of the propeller shafts!

  Observe the operating instructions for the propeller shaft.
- Observe the admissible angular misalignment and the travel of the propeller shaft when cornering!
- Always mount the wide-angle joint at the pivot point (coupling 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 p.t.o. shaft on, check whether the selected speed and the sense of rotation of the tractor's p.t.o. shaft have been adjusted to the admissible drive speed and the sense of rotation of the machine!
- Make sure that people leave the hazardous area of the machine before switching the p.t.o. shaft on!
- People are not allowed within the range of the rotating p.t.o. or propeller shaft when the p.t.o. shaft is working!
- Never switch the p.t.o. shaft on with the tractor engine turned off!
- Always switch the p.t.o. 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 machine parts continuing to rotate for a short time after the p.t.o. 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 p.t.o. shafts!
- Place the uncoupled propeller shaft on the respective holder!
- Put the protective cover onto the p.t.o. stub shaft after the propeller shaft has been uncoupled!

3.4.5 Hitched machines

- Observe the admissible combination options of the tractor's coupling device and the machine's drawgear!

  Only couple admissible vehicle combinations (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 or 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

- Immediately stop the tractor in case of a malfunction of the brake system. Have the failure promptly remedied!
- Only authorized workshops or qualified personnel are allowed to carry out adjustment and repair work on the brake system!
- Have the brake system regularly and thoroughly checked!

  In order to maintain the operational safety, the wheel brakes must always be properly adjusted.
- Before carrying out any work on the brake system:
  - safely park the machine and secure it against accidental rolling (chocks),
  - secure a lifted machine 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!
- Clean the sealing rings at the couplings of the feed and brake lines from possible soiling before hitching the machine!
- You are only allowed to start the tractor with the hitched machine moving when the pressure gauge on the tractor indicates 5.0 bar!
- Drain the air reservoir every day!
- Cover the tractor's hose couplings before carrying out journeys without machine!
- Hang the couplings of the feed and brake line on the provided blank connections with the machine unhitched!
- Do not modify the specified settings at the brake valves!
- Replace the air reservoir if:
  - the air reservoir can be moved in the tensioning straps,
  - the air reservoir is damaged,
  - the type plate at the air reservoir is getting rusty, is loose or is missing!

Hydraulic brake system for export machines

- Load-independent, hydraulic brake systems are not licensed for road traffic in Germany!

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 inappropriate wheels and tyres.

3.4.8 Tyres

- Only qualified personnel equipped with appropriate fitting tools is allowed to carry out repair work on tyres and wheels!
- Safely park the machine and secure it against accidental lowering and rolling (parking brake, chocks) before carrying out any work on the tyres!
- Place the lifting device at the marked fixing points.
- Use lifting equipment suitable and approved for the machine's weight with sufficient lifting power.
- 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!
- Keep to the side, in front of or behind the wheel when refilling the tyres on the machine! An inflation hose with a minimum length of 1.5 m makes it easier to keep to the side.
- Retighten all fastening screws and nuts according to the manufacturer’s specifications!

3.4.9 Service and maintenance of machine

- Carry out the required service and maintenance work on the machine in due time!
- Secure the tractor against accidental starting and rolling before carrying out any service or maintenance work on 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!
- Regularly check screws and nuts for tightness! Retighten loosened screws and nuts!
- Secure the lifted machine or lifted machine parts against accidental lowering before carrying out service or maintenance work on the machine!
- Use appropriate equipment and gloves when replacing working tools with blades!
- Check unscrewed joints for tightness. After finishing maintenance work, check the safety and protective devices for proper functioning!
- Dispose of oils, greases and filters properly!
- Properly handle and dispose of substances and materials used for cleaning the machine, especially:
  - when working on lubrication systems and devices,
  - when carrying out cleaning work with solvents!
- 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!
- Spare parts must at least comply with the specified technical standards of the manufacturer! This is guaranteed when using original parts!
- Observe the maintenance intervals for wearing parts!

3.5 Activity-related safety instructions and important information

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

3.5.1 Activity-related safety instructions

Activity-related safety instructions:

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

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

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

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

3.5.2 Important information

Important information:

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

IMPORTANT

marks an obligation to behave in a particular manner or to act in a certain way, in order to use the machine properly.

Non-observance of these instructions may cause malfunctions of the machine or in its vicinity.

INFORMATION

marks user hints and particularly useful information.

This information will help you to use all functions of your machine in the best possible way.

3.6 Warning and instruction signs

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

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

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

- from the dealer,
- directly via the Strautmann spare parts warehouse (+ 49 (0) 5424 802-31).

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.

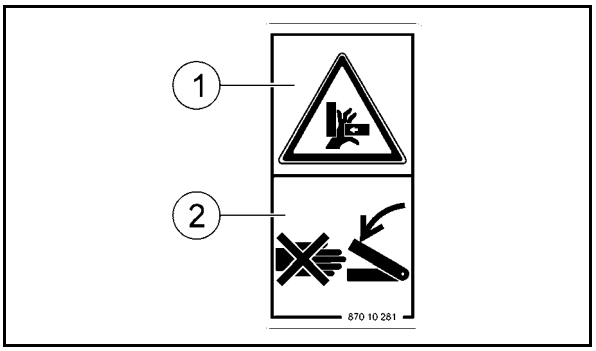


Fig. 9

Explanations of warning signs

The following list includes:

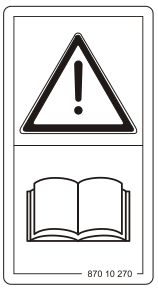
- in the right-hand column all warning signs attached to the machine,
- in the left-hand column the following details referring to the warning sign on the right-hand side:

1. The order number.
2. The description of risk, e. g. "Risk of crushing fingers or hand due to accessible movable machine parts!"
3. 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."
4. 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

870 10 270

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

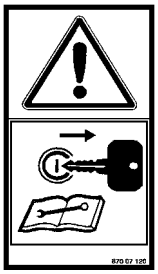


870 07 120

Risks when carrying out work on the machine such as mounting, adjusting, trouble-shooting and maintenance, due to accidental starting and 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.



870 07 104

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.

870 07 110

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.

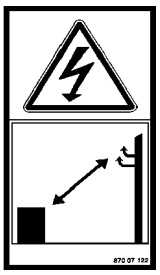
870 07 117

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.

870 07 122



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
from 1 to 110 kV	2 m
from 110 to 220 kV	3 m
from 220 to 380 kV	4 m

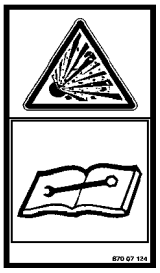
870 07 123

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

870 07 124



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.

870 07 126

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.

870 07 130

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.

870 10 276

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.

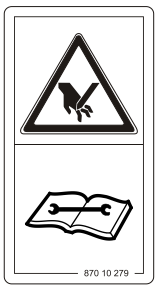
870 10 278

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.

870 10 279



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

This risk may cause most serious injuries including loss of fingers and hands.

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

870 10 280

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.

870 10 281

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.

870 10 282

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.

870 10 283

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.

870 10 284

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.

870 10 287

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,

- 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 is not allowed.

870 10 289

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.

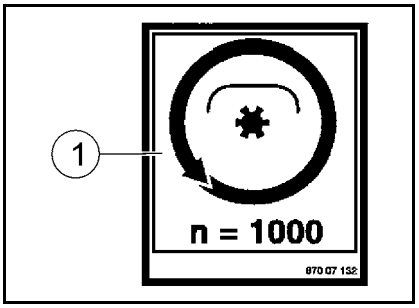
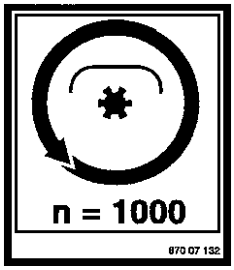
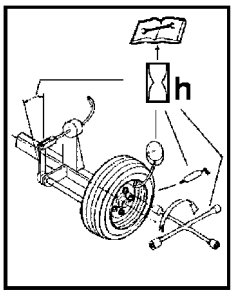
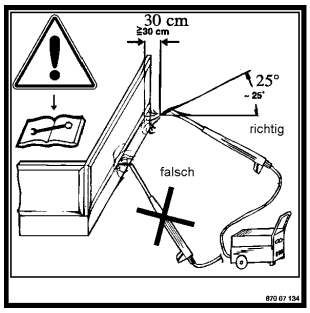
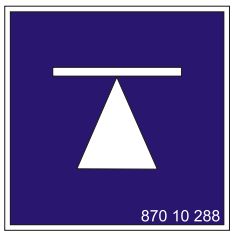


Fig. 10

Order number and explanation	Instruction signs
870 07 132 **The required drive speed of the machine is 1000 min^{-1}.** Before switching the p.t.o. 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!	
870 07 133 Observe the information for braking axle maintenance included in the operating instructions.	
870 07 134 **Risk due to improper cleaning of the machine.** Absolutely observe the information in the chapter "Cleaning by means of pressure washer / steam blaster" on page 203 when using a pressure washer / steam blaster for cleaning the machine.	
870 10 288 This pictograph illustrates fixing points for lifting equipment (jack).	

3.6.3 Placing of warning and instruction signs

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

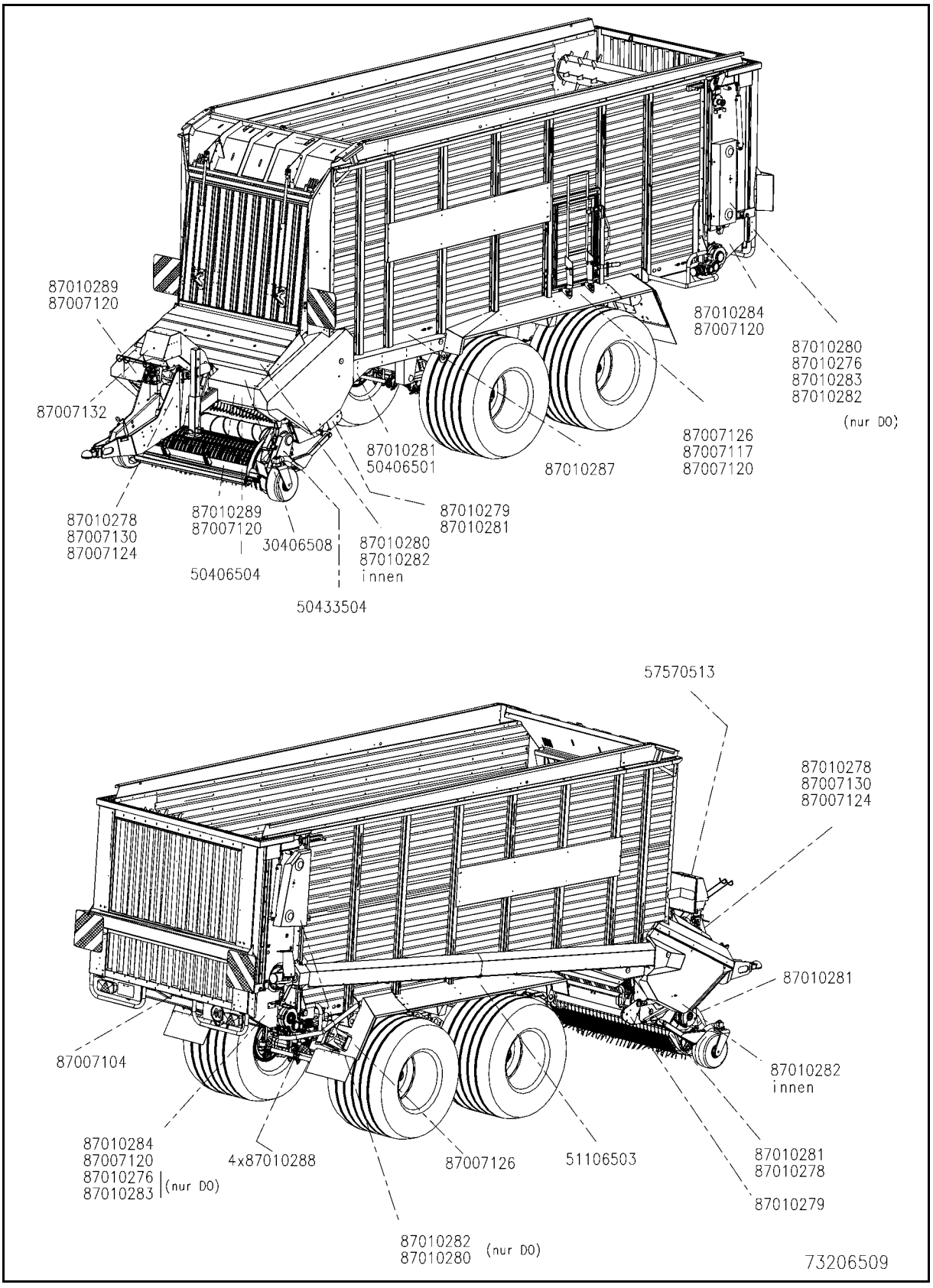


Fig. 11

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

4.1 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.

4.2 Loading and unloading by means of lifting equipment

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.

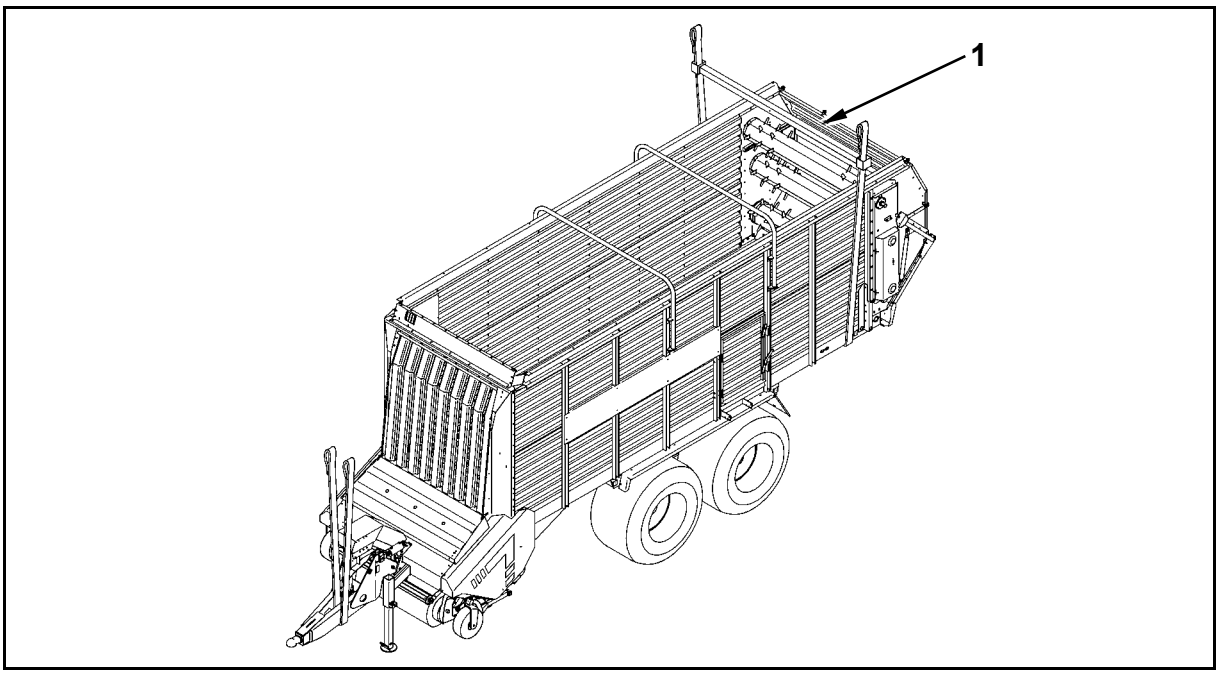


Fig. 12

(1) Spacer

5 Design and function

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 terminal 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 (standard equipment). 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 (2) in guiding the pick-up in working position on particularly soft ground. The operating height is set via the respective perforated struts (3) and (5) on both sides of the pick-up.

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

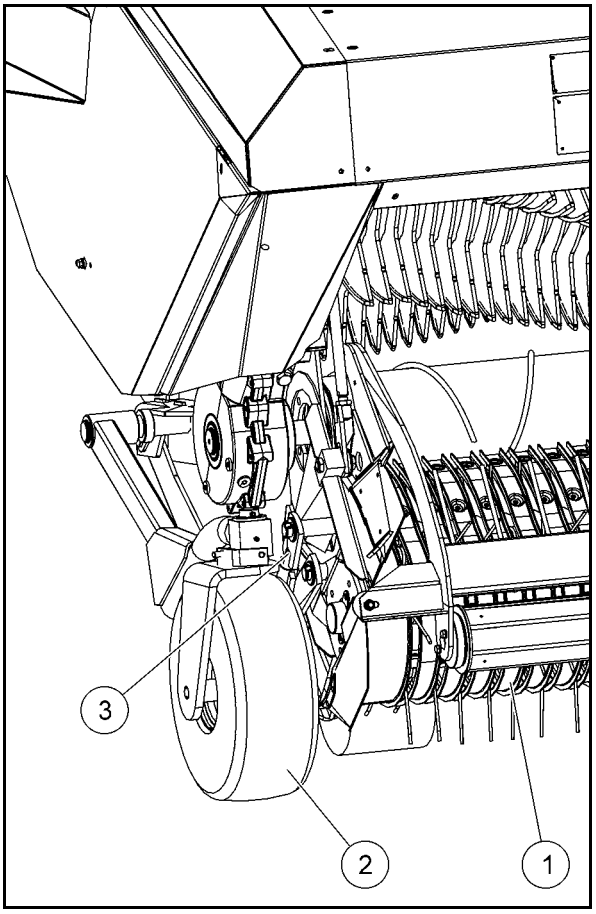


Fig. 13

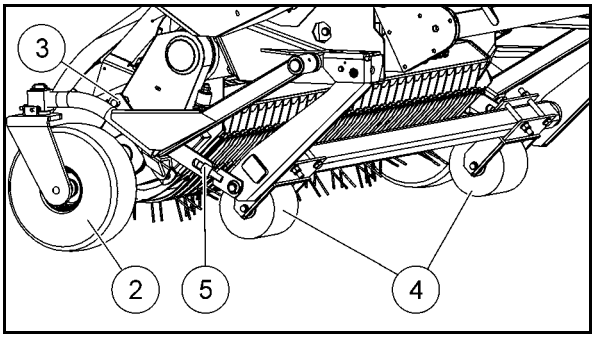


Fig. 14

5.1.1 Pick-up drive

5.1.1.1 Mega-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.

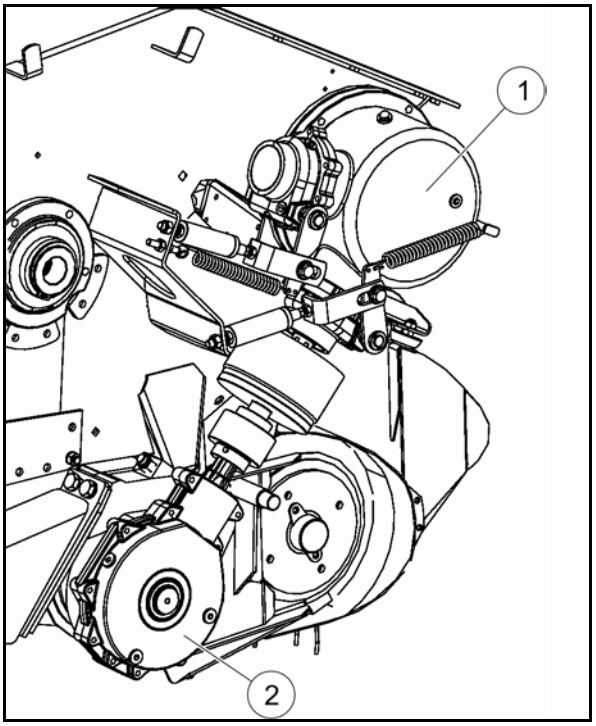


Fig. 15

5.1.1.2 Mega-Vitesse CFS DO

The pick-up and the metering 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) and (4) of the angular switchgear are coupled with the hydraulic cylinders of the tailgate via the hydraulic cylinders (5) and (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 metering 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.

For better view, the side protector has been removed.

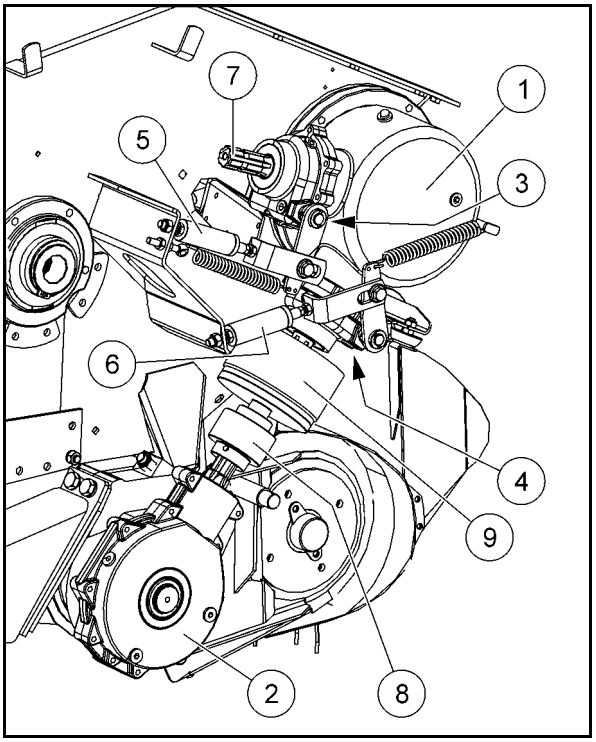


Fig. 16

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 terminal to interrupt the spraying of silage additives, in order to possibly reduce the dosage of the silage additive.

If the machine is equipped with an **ISOBUS control system,** press and hold the "Lighting cargo space“ key on your terminal once to switch on the silage additive pump. Press and hold the "Lighting cargo space“ key once again to switch the silage additive pump completely off. For details, refer to the chapter “Switch lighting in cargo space on / off”.

If the machine is equipped with an **easy-to-use control system**, actuate the switch (1) at the hydraulic mount to switch the silage additive pump on or completely off.

Power supply: 12 V

Maximum current: 3 A

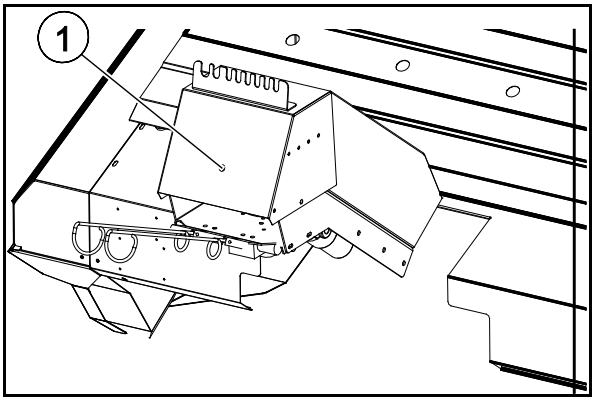


Fig. 17

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 forage trailer 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

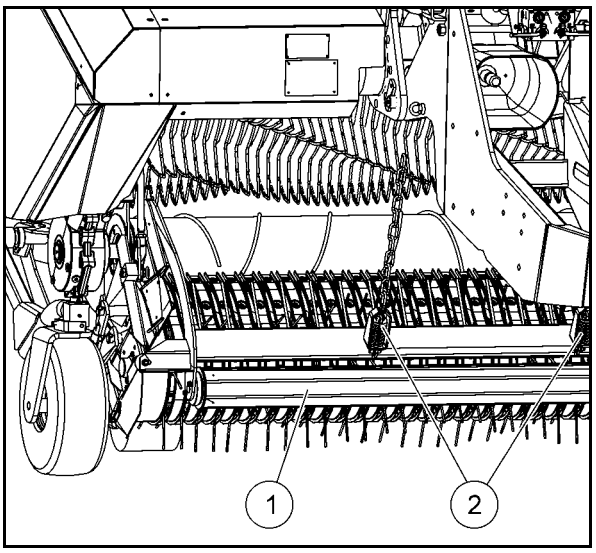


Fig. 18

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 of the forage trailer.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 whole 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.

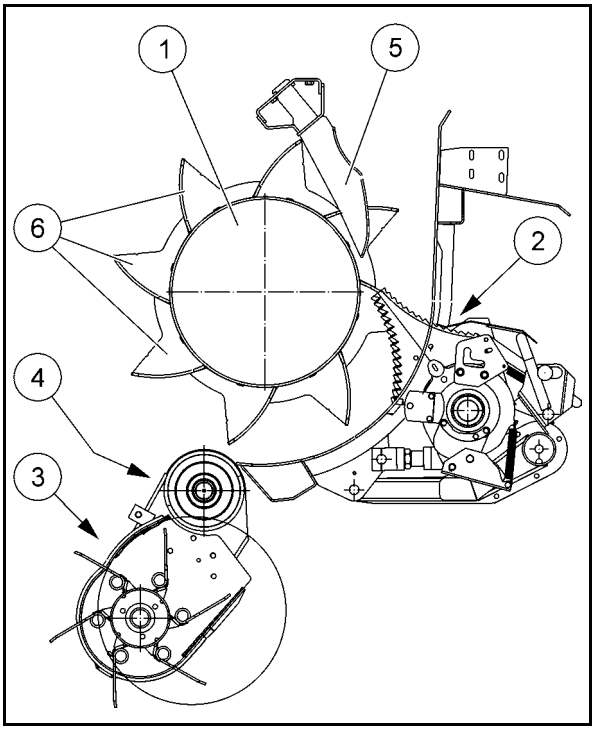


Fig. 19

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 terminal from the tractor seat:

- for elimination of blockages,
- for extension of cutting knives having evaded to the rear,
- 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. 40 cutting knives can be mounted. The shortest theoretical cutting length is then 39 mm.

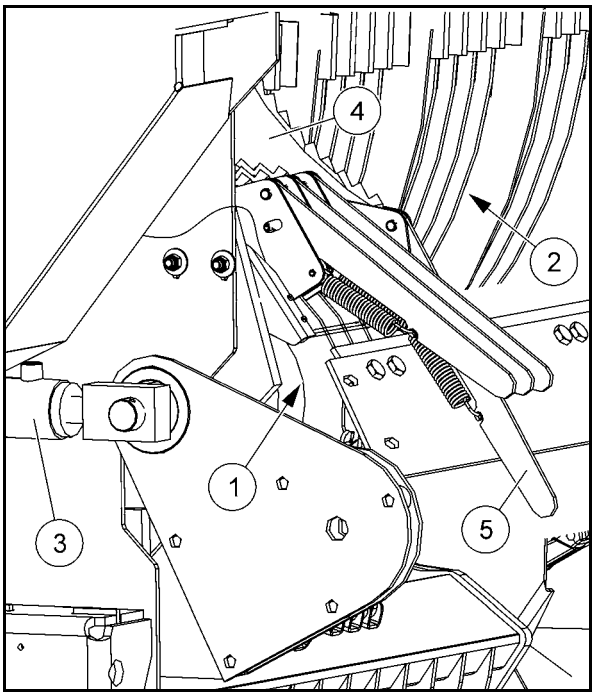


Fig. 20

The cutting knives (1) are equipped with a double-sided, serrated edge. Blunt cutting knives 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 (Fig. 20/5). 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.

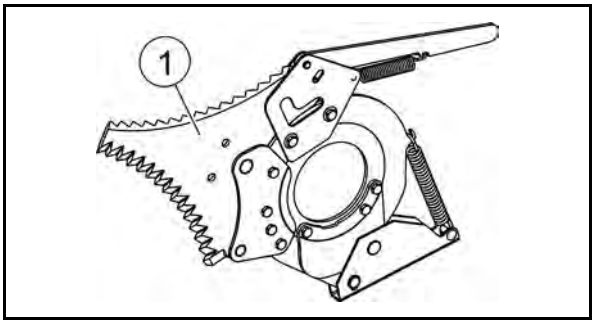


Fig. 21

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.

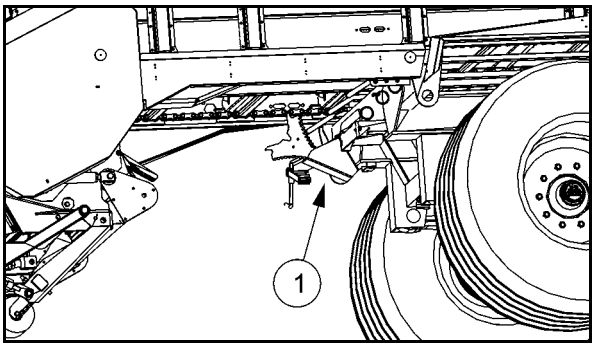


Fig. 22

The sensor (1) monitors the positions 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 terminal:

- "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 evaded" position:
  - as soon as a cutting knife evades to the rear,
  - as soon as the cutting unit is heavily soiled.

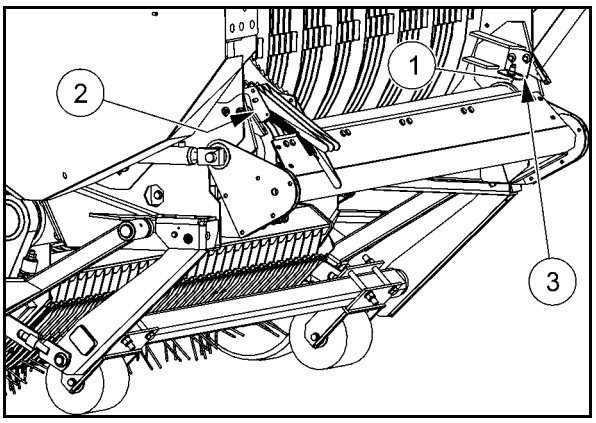


Fig. 23

5.4 Transport floor

The chain of the transport floor is equipped with U-sections and ensures consistent feeding of the loaded material when charging and discharging. Automatic chain tensioners tighten the chain of the transport floor.

The transport floor is driven hydraulically via two feed gearings:

The terminal 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, e. g. to eliminate blockages occurred at the metering drums during discharge.

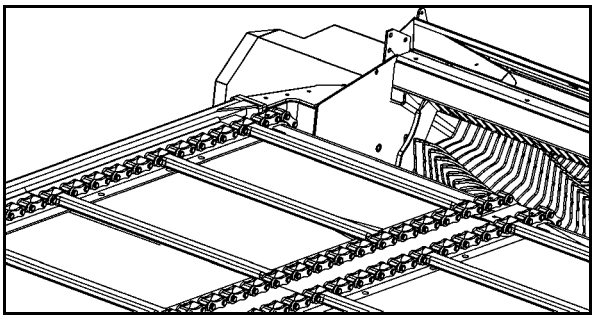


Fig. 24

5.5 Automatic charging system / Loading frame

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 switches the transport floor on and off during charging,
- is automatically deactivated if the easy-to-use control set generates an acoustic signal (horn sound) and a visual signal (control lamp H5: "Forage trailer full"),
- is automatically activated if the forage trailer has been emptied and the pick-up is lowered the next time,
- remains switched on until the automatic charging system is manually switched off.

The automatic charging system only works with the pick-up lowered.

5.5.1 Switch automatic charging system on / off (easy-to-use control)

The automatic charging system:

- is mounted at the load-protection bars and mainly consists of the sensing band (1), the gear shifting gate (2) and the limit switch (3),
- is connected with the hydraulic drive of the transport floor in ON mode,

During charging, the loaded material piles up at the loading frame of the cargo space. If the loaded material piling up deflects the sensing band (1) upwards, the hydraulic drive of the transport floor starts and conveys the loaded material backwards. The transport floor stops as soon as the loaded material does not deflect the sensing band (1) upwards any more.

The position of the gear shifting gate (2) with respect to the sensing band (1) determines the switch-on behaviour for the transport floor. The gear shifting gate (2) can be fixed to the sensing band (1) in different positions, in order to change the filling degree of the cargo space.

Low filling degree = smaller deflection of sensing band

High filling degree = larger deflection of sensing band

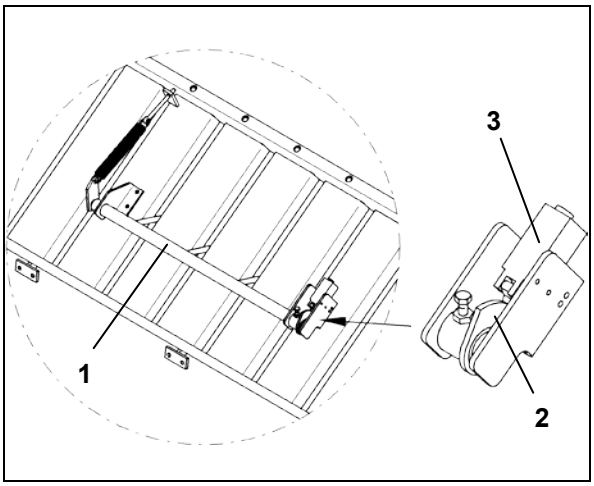


Fig. 25

- Key button in top switch position

→ The automatic charging system is switched on.

5.5.2 Switch automatic charging system on / off (ISOBUS control)

The automatic charging system (1):

- can be switched on and off via the ISOBUS terminal,
- mainly consists of the sensing band (2), the actuating plug (3) and the rotary potentiometer (4),
- switches the transport floor automatically on and off for uniform and complete filling of the cargo space,
- permits to pre-select the filling degree of the loaded material in the cargo space. 80 % and 100 % are the options which are available. Select the filling degree as follows:
  - o 80 % for wet, heavy loaded material,
  - o 100 % for dry, lighter loaded material. At a filling degree of 100 %, the loaded material in the cargo space will be more tightly compressed and the cargo space will be filled to a larger extent.

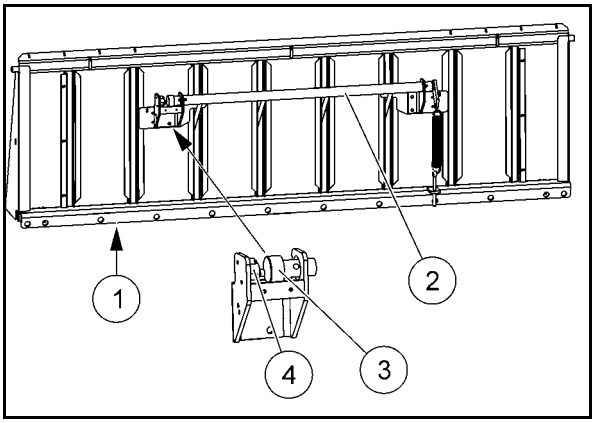


Fig. 26

When using the machine as a forage trailer, the loaded material will pile up at the front grating of the cargo space during charging. The loaded material piling up deflects the sensing band upwards and actuates the rotary potentiometer via the actuating plug.

As soon as the deflected sensing band reaches the adjustable bottom position, the transport floor automatically starts running at low feed rate and conveys the loaded material backwards. Increasing filling of the front section of the cargo space will initiate a further deflection of the sensing band. The feed rate of the transport floor will increase in proportion to the deflection of the sensing band.

As soon as the deflected sensing band reaches the adjustable top position, the loaded material is conveyed backwards 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 will not deflect the sensing band upwards any more.

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.

Observe the information in the chapter "Calibration of automatic charging system", page 144.

Fig. 26

5.6 Tailgate

The tailgate closes the cargo space on the rear side. The tailgate is opened and closed via the ISOBUS terminal.

5.6.1 Forage trailer without metering drums

When opening the tailgate, the hydraulic cylinders (1) first vertically lift the tailgate (2) out of its locking mechanism (3). The tailgate then swivels back upwards and opens completely.

When closing the tailgate, it initially lowers due to its dead weight. The hydraulic cylinders (1) only come into operation at the last moment to close the tailgate and lower it vertically onto the locking pin (4) for being locked.

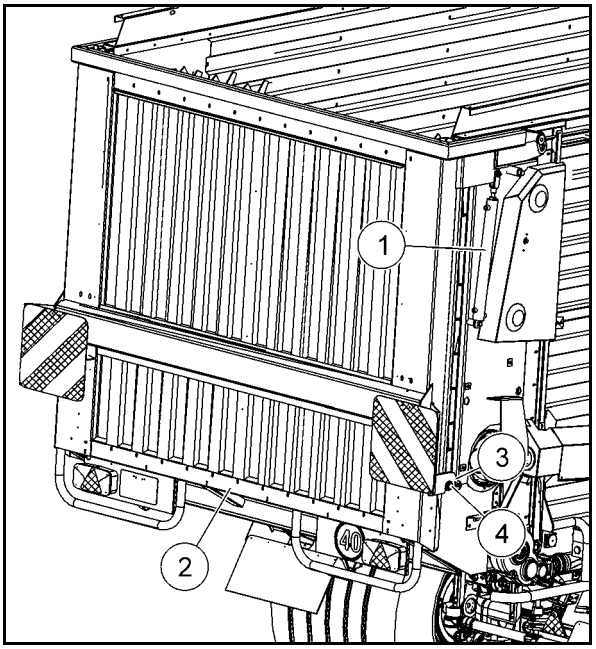


Fig. 27

Hydraulic disconnection of transport floor

An electrical pressure switch as signal generator for the automatic charging system is mounted on the inside of the tailgate. If the forage trailer is full:

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

5.6.2 Forage trailer with metering drums

When opening the tailgate, the hydraulic cylinders (1) first vertically lift the tailgate (2) out of its locking mechanism. 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 ISOBUS terminal. The tailgate is automatically moved to that position when pressing the key "Open tailgate". After releasing and pressing the key "Open tailgate" again, the tailgate opens as long as the key is pressed or until it is completely open.

When closing the tailgate, it initially lowers due to its dead weight. The hydraulic cylinders (1) only come into operation at the last moment to close the tailgate and lower it vertically onto the locking pin (4) for being locked.

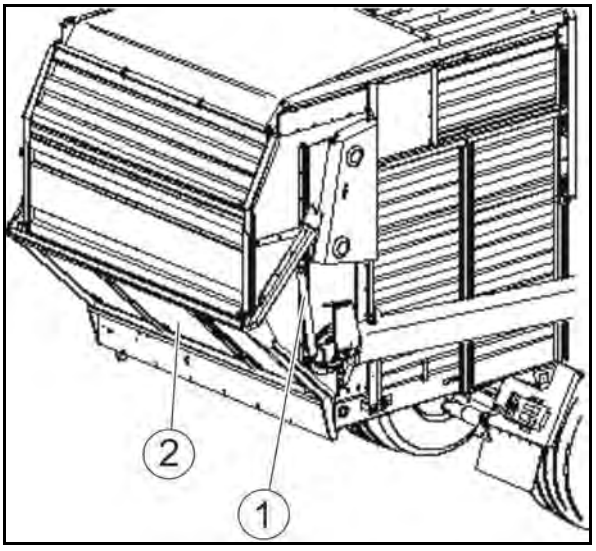


Fig. 28

5.6.2.1 Crossover conveyor

Optional extra:

Forage trailers with metering drums can be equipped with the crossover conveyor for stable-feeding or for charging the following conveying devices.

The crossover conveyor (1):

- is mounted at the rear below the metering drums,
- is powered by a hydraulic motor,
- can be powered in two driving directions. Depending on the driving direction, the green fodder is discharged on the right- or left-hand side of the forage trailer.

The ISOBUS terminal serves to:

- switch the crossover conveyor on and off,
- change the driving direction.

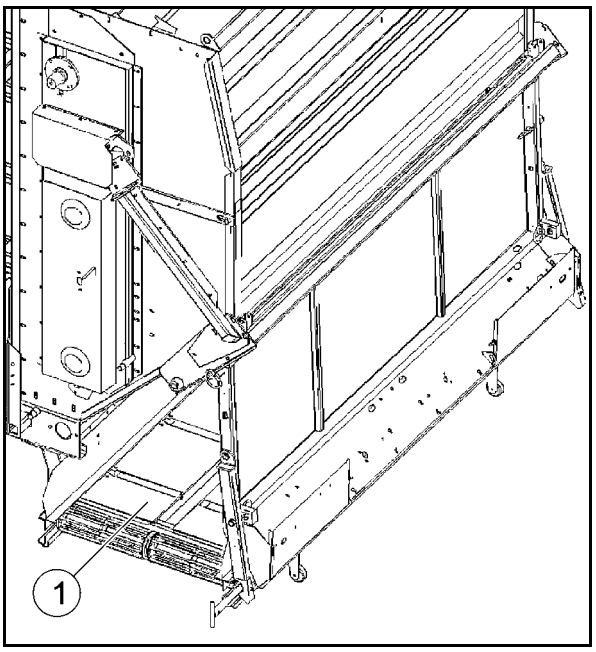


Fig. 29

5.7 Metering drums

The proportioning trailer Mega-Vitesse CFS DO is equipped with 2 or 3 metering drums (1).

The p.t.o. shaft of the tractor powers the bottom metering drum 1 via the propeller shaft, main gearbox, rotor gear, angular switchgear, lateral drive shaft and rear angular gear. The individual metering drums are connected with each other by means of roller chains. Each roller chain is equipped with a chain tensioner.

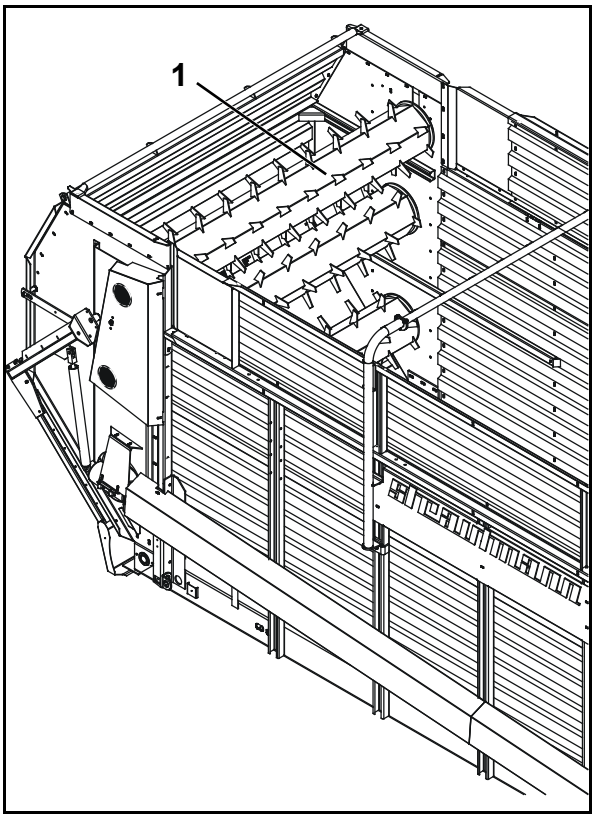


Fig. 30

Hydraulic disconnection of transport floor

The bottom metering drum:

- is movably mounted on the left-hand side in direction of motion,
- evades to the rear if the loaded material applies a particular pressure to this metering drum.

  The switching plate releases an electrical pressure switch and disconnects the hydraulic drive of the transport floor. The ISOBUS terminal simultaneously displays the message "Forage trailer full".

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

5.8 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.

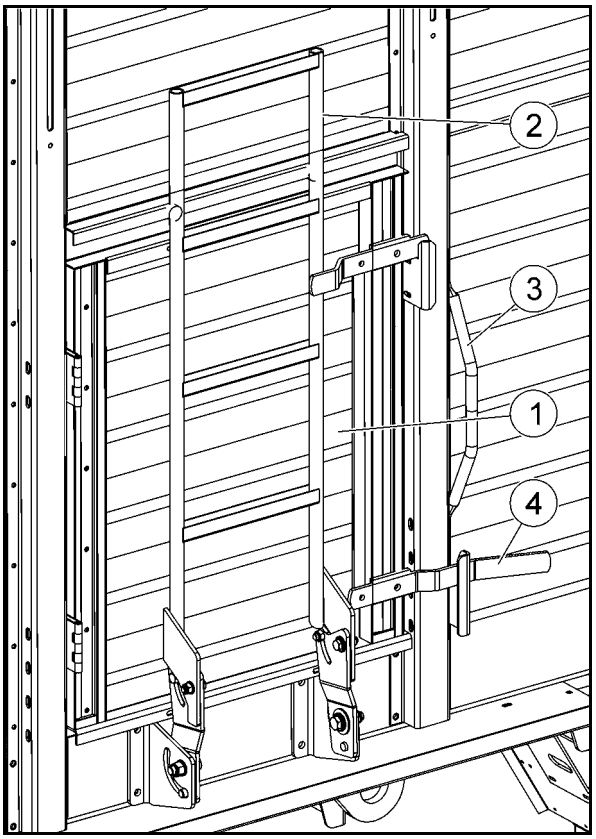


Fig. 31

5.9 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 via a double-acting control device or a single-acting control device and a free reverse pipe, 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 speeds at the tractor's control device / the machine's control block may be necessary.
- For information about the required control devices, please refer to the chapter "Required tractor equipment“ on page 29.

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

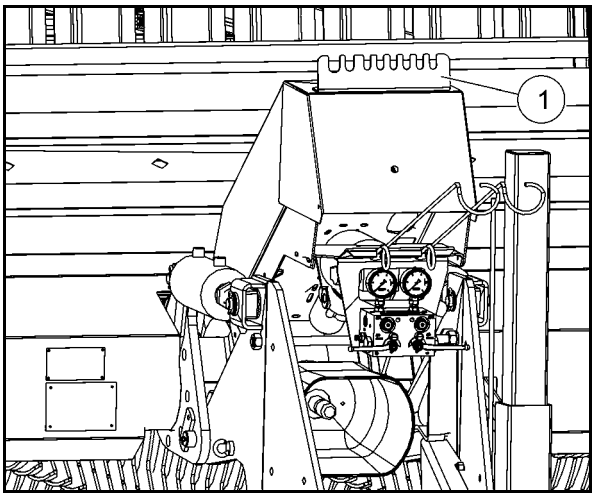


Fig. 32

5.9.1 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 functions (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) Additional block with directional seat valves for:

(3.1) Folding drawbar and drawbar suspension,

(3.2) Tailgate and switchgear, metering 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).

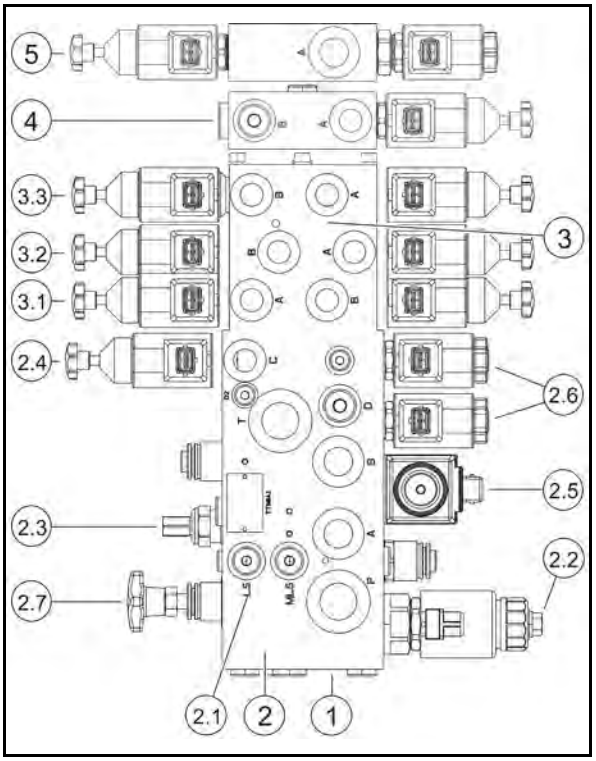


Fig. 33

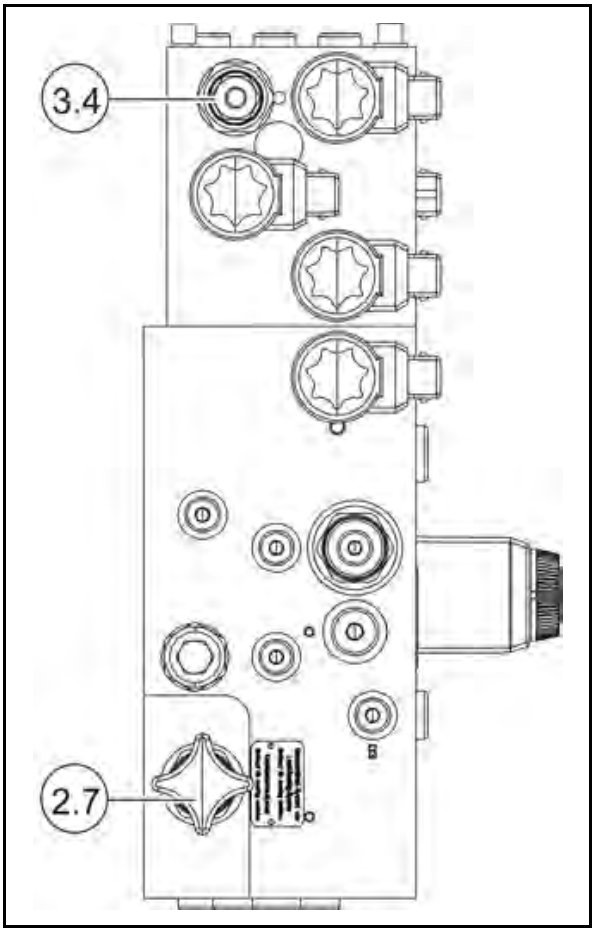


Fig. 34

5.9.1.1 Load-sensing hydraulic system with load-sensing control line

- 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.

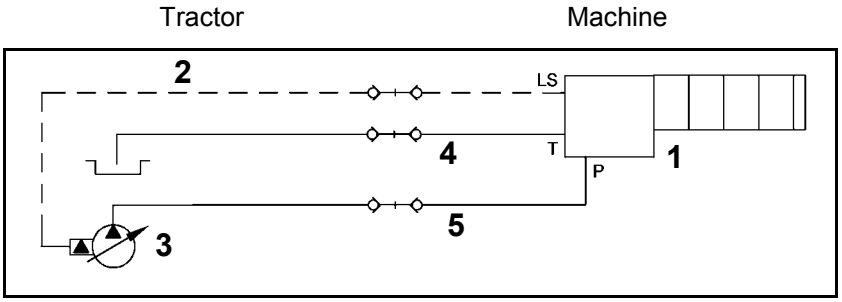


Fig. 35

(1) Electro-hydraulic control block on the machine, see page 72.
(2) Load-sensing control line
(3) Adjustable hydraulic pump of tractor
(4) Hydraulic connector "Reverse line", connected to a free reverse 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. 33/2.1) of the electro-hydraulic control block.
2. Lock the pressure regulator in the electro-hydraulic control block.
   2.1 Screw load-sensing screw (Fig. 34/2.7) 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 "Reverse line" (4) to a free reverse port of the tractor.
5. Connect the hydraulic connector "Flow line" (5) directly to the tractor's hydraulic pump.

Open the pressure regulator via the load-sensing screw (Fig. 34/2.7) in the electro-hydraulic control rblock, when the hydraulic connector "Flow line" has been connected to the control device of the tractor.

5.9.2 Emergency manual operation in case of failure of electrical system

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.

When actuating the emergency manual operation function, absolutely observe the information in the chapter "Functional diagram for emergency manual operation", page 75.

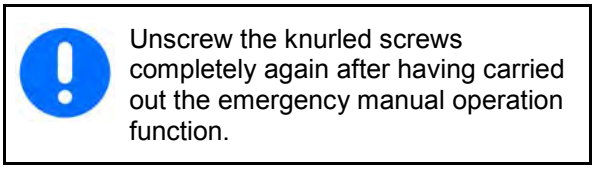
In case of failure of the electrical system, the solenoids for switching the directional seat valves can be actuated directly at the electro-hydraulic control block (1) via the emergency manual operation function.

- Pre-selection valves (2):

  Use a pointed object (3) to push the armature of the solenoid at the respective switch-over valve in to actuate the required hydraulic function.

- Actuation of additional block (4) and end plates (5):

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



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

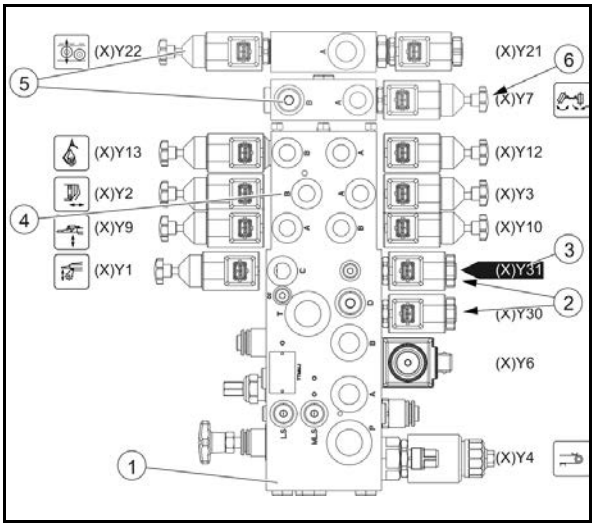


Fig. 36

5.9.2.1 Functional diagram for emergency manual operation

Solenoid valves \ Functions	OFF	ON	Lift	Lower	Open	Close	Lift	Lower	Forward	Backwards	Unlocked	Locked	Lift	Lower	ccw	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														●				
(X)Y15 *															●			
(X)Y14 *																●		
(X)Y16 *																	●	●
(X)Y17 *																	●	●
(X)Y30		●				●		●					●				●	
(X)Y31	●		●		●		●					●						●

* Optional extra

Fig. 37

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

Example:

Retract cutting unit:

1. Screw in the knurled screws (1) and (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.

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

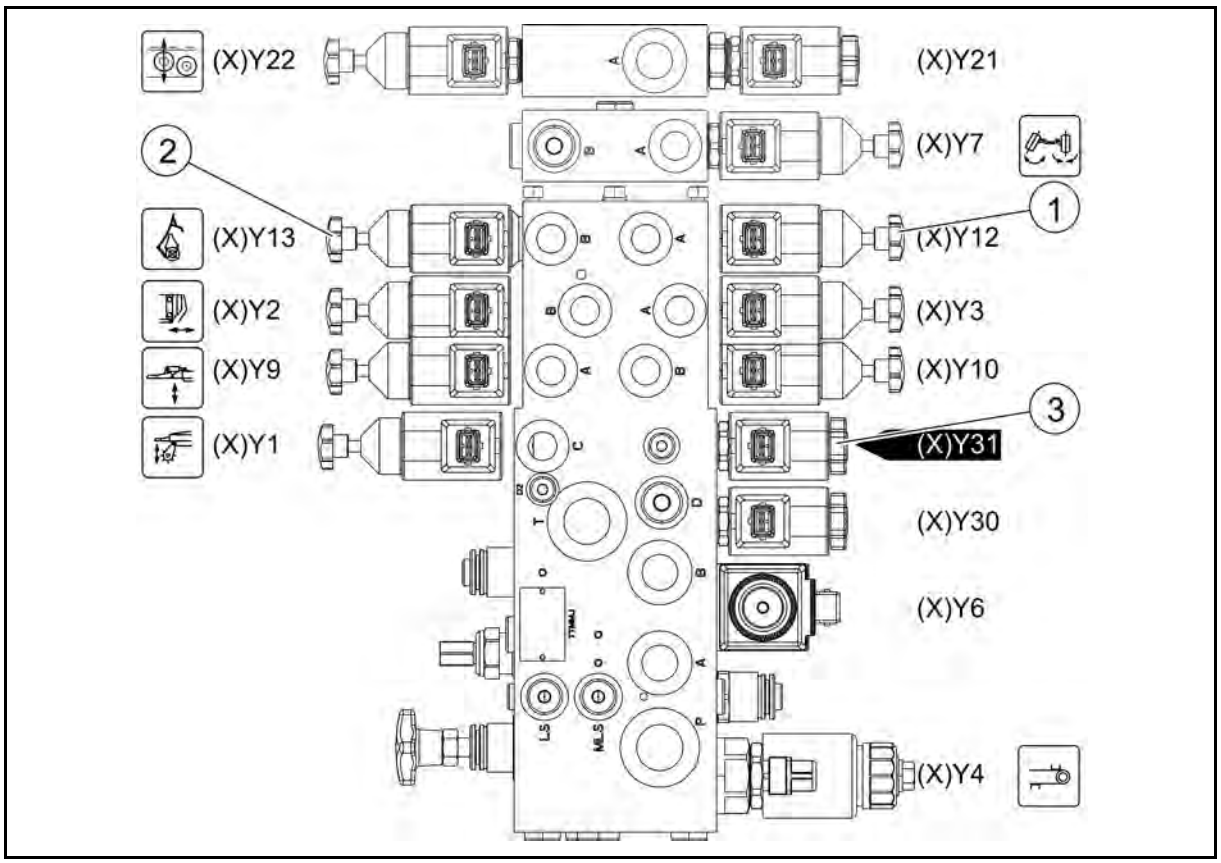


Fig. 38

5.9.3 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.

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

5.9.3.1 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.
- 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 = Reverse 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 of 200 bar.
- Only connect clean hydraulic plugs and hydraulic sleeves.
- Make sure that oil cannot escape into the environment when connecting and disconnecting hydraulic hose pipes.
- 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. Clean the hydraulic plugs before connecting them to the hydraulic sleeves.
3. Connect the hydraulic hose pipes to the control devices of the tractor:
   3.1 Pressure pipe (red dust cap) to a single-acting or double-acting control device.
   3.2 Reverse pipe (blue dust cap) to a pressure-less reverse port if possible.

5.9.3.2 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. Place the hydraulic hose pipes onto the hose holder (Fig. 32/1), page 71.

5.10 Chassis

Depending on the gross vehicle weight rating and the specific practical requirements, the machine is equipped with:

- 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 chassis with hydraulic levelling device:
  - with follow-up steering,
  - with forced steering axle (only in case of bottom linkage),
  - with dual-line compressed-air brake system and hydraulic automatic load-sensitive brake pressure regulator

5.10.1 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.

5.10.2 Hydro-pneumatic tandem chassis with hydraulic levelling device (only with ISOBUS control)

The hydraulic levelling device:

- 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 vehicle on the individual wheels of the hydro-pneumatic tandem chassis with separate hydraulic levelling for the right-hand and left-hand vehicle side is carried out by the 4 level-controlled hydraulic cylinders (1).

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

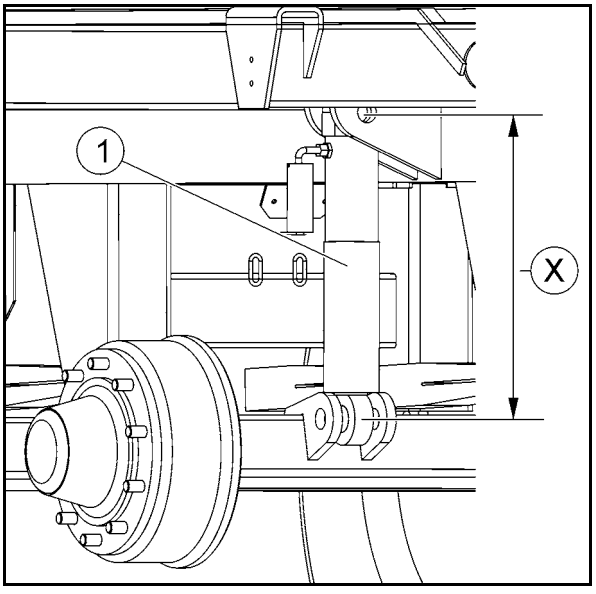


Fig. 39

5.10.2.1 Check travelling height of hydraulic levelling device

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

On an empty machine with properly set travelling height, the distance is X = 600±10 mm between the locating points of the hydraulic cylinder (Fig. 41/1).

The hydraulic levelling device 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) and (2) display approx. 20 bar at the levelling valve (Fig. 40).

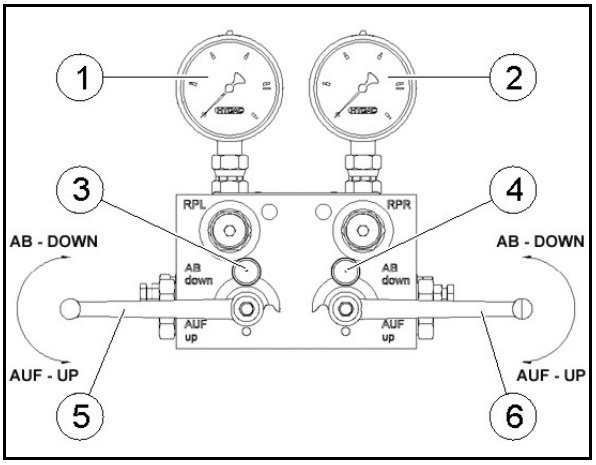


Fig. 40

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

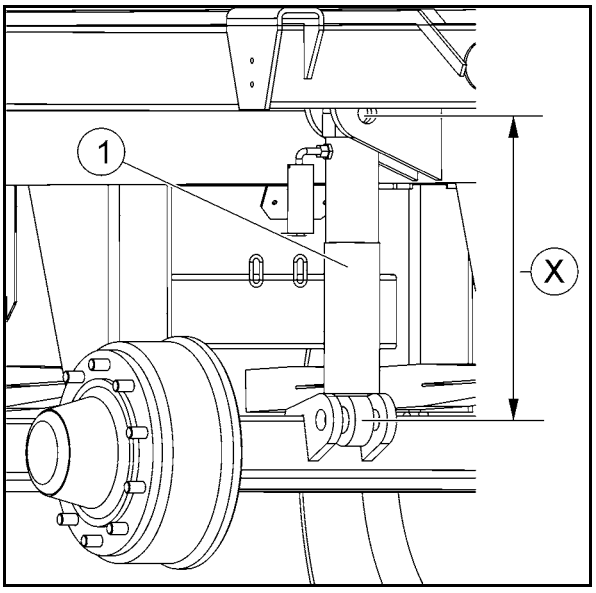


Fig. 41

5.10.2.2 Adjust travelling height of hydraulic levelling device

- The travelling height of the hydraulic levelling device is adjusted via the levelling valve (Fig. 42) with the machine being empty.
- The travelling heights of the right-hand and the left-hand vehicle side are separately set. The procedure for setting the travelling height is the same on both vehicle sides.
- For safety reasons, the machine lowers only slowly.

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 by means of the hydraulic cylinders.

The travelling height is set:

- for the right-hand vehicle side by means of the operating elements (Fig. 42/1), (Fig. 42/3) and (Fig. 42/5),
- for the left-hand vehicle side by means of the operating elements (Fig. 42/2), (Fig. 42/4) and (Fig. 42/6).

Set the distance X = 600 mm between the locating points of the hydraulic cylinders (Fig. 43/1) one after another on the right-hand and left-hand vehicle 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 pipes of the levelling valve with a single-acting control device of the tractor.

5. Turn the stop valve (5) or (6) to "UP" position (increase distance X) or "DOWN" (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 for the levelling valve in "Lift" position until the distance between the locating points of the hydraulic cylinders (Fig. 43/1) is X = 600 mm.

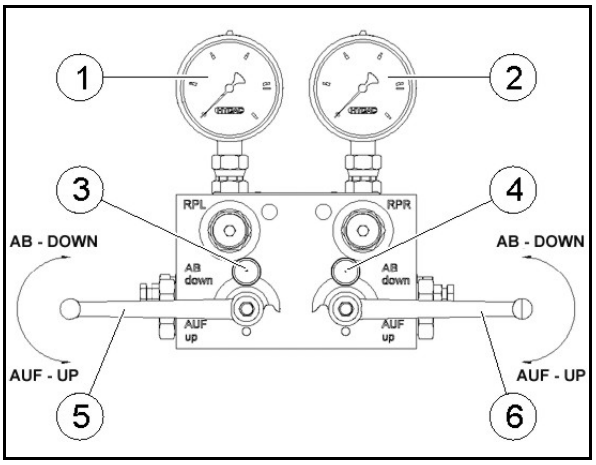


Fig. 42

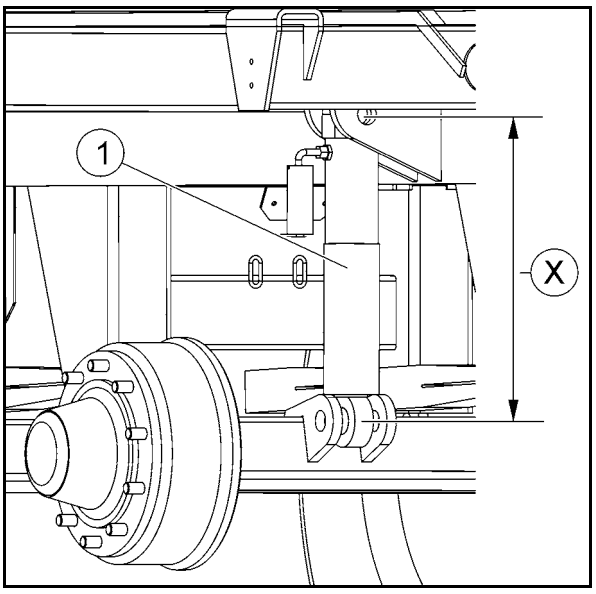


Fig. 43

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 at the tractor's control device for the levelling valve 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 central position.
9. Hold the operating element at the tractor's control device for the levelling valve in "Open-centre position" for a short time 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.

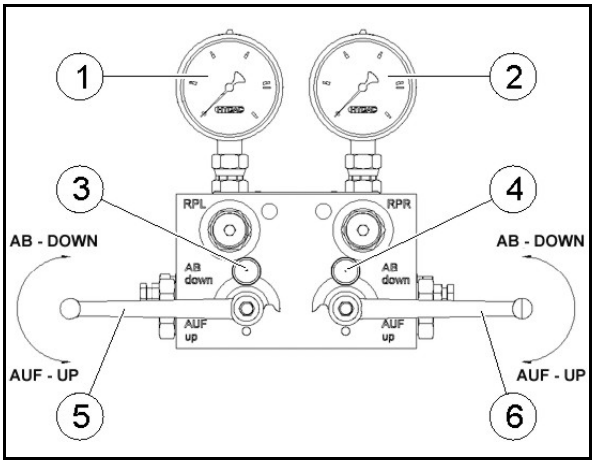


Fig. 42

5.10.3 Steering axle for follow-up steering

Standard equipment:

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 ISOBUS terminal.

5.10.3.1 Unlock steering axle

WARNING

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

Adapt your driving such that you have always safe control over the tractor and the hitched machine.

Never take a tight curve at excessive travelling speed.

1. Press the  key once.

→ The "Steering axle unlocked" symbol appears and a beep is emitted. The steering axle is unlocked.

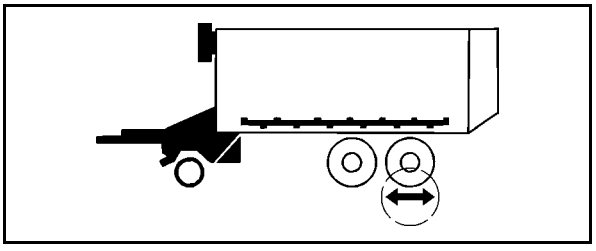


Fig. 44

5.10.3.2 Lock steering axle

WARNING

Risk 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 over 40 km/h,
- on rough road tracks,
- when traversing hills,
- before carrying out reverse travels.

1. 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.
2. Press the  key once.

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

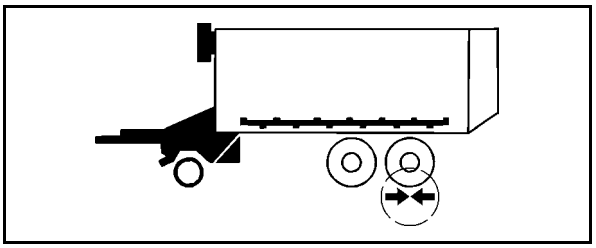


Fig. 45

5.10.4 Steering axle for electro-hydraulic forced steering (only for bottom linkage and ISOBUS control)

Optional extra:

In case of the steering axles for forced steering, the wheels of the steering axles are electronically controlled from the tractor 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.

5.10.4.1 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 (1) such that the left-hand edge of the reversing element (2) is positioned in one line (A) with the right-hand edge of the orientation notch (3) 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 (2) 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 "Steering axle unlocked" symbol flashes 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.

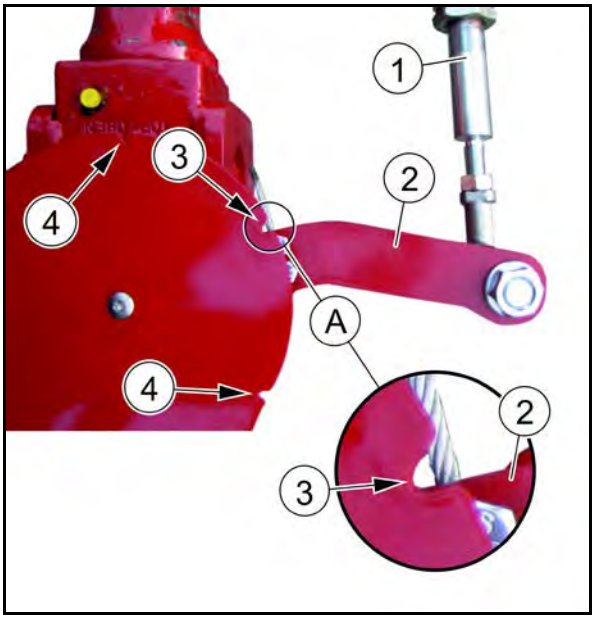
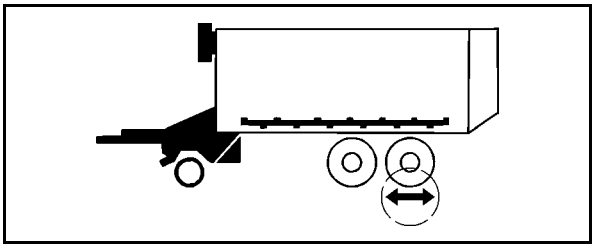


Fig. 46

The display shows:



5.10.4.2 Lock forced steering axle

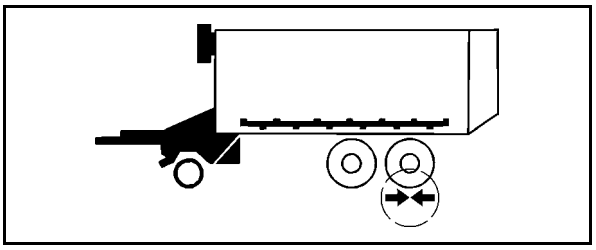
In the case of the electro-hydraulic forced steering axle system, the  key has a touch-control design.

- Press 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 display shows:



5.11 Drawbar

The machine's drawbar is a hydraulic folding drawbar.

5.11.1 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 terminal.

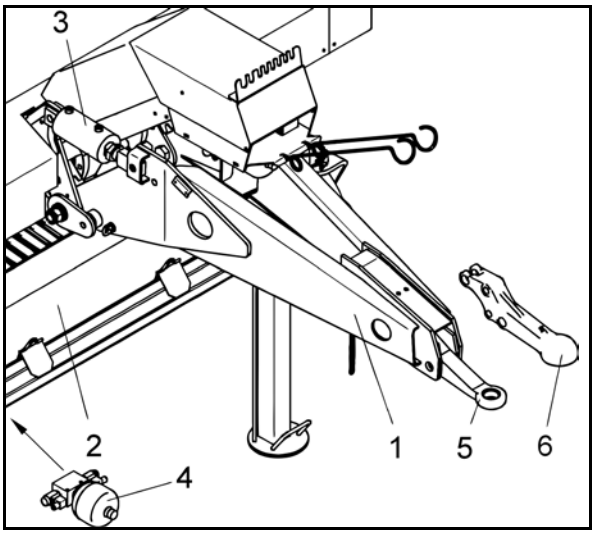


Fig. 47

Depending on the design auf the tractor's coupling device, the folding drawbar can be coupled to the tractor by means of a top hitch (Fig. 47) or a bottom hitch (Fig. 48).

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

- a drawbar lug 40 (Fig. 47/5) according to DIN 11043 for a bolt-type coupling according to DIN 11028 / ISO 6489-2,
- a shell 80 (Fig. 47/6) or (Fig. 48/1) for a ball-type coupling 80.

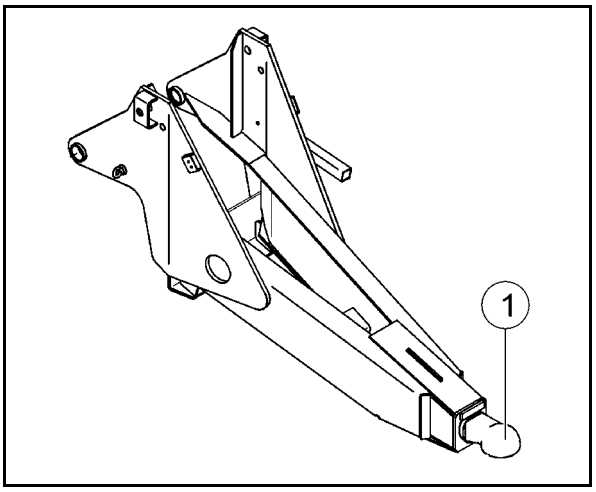


Fig. 48

5.11.2 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 155.
- Properly hitch the machine to the tractor and secure it.
- Never use damaged or deformed trailer systems.

WARNING

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

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 vehicles and to enter the space between the vehicles after the vehicles have stopped.

5.11.2.1 Bolt-type coupling

1. Prepare hitching up:
   - 1.1 Open the hitch, i.e. it should be in a pre-coupling position (automatic bolt-type coupling).
   - 1.2 Lock the grab jaw of a bolt-type coupling with movable grab jaw (non-automatic bolt-type coupling).
2. Reverse the tractor until the automatic bolt-type coupling engages into the drawbar lug.
3. Check that the connection is secure after coupling:
   - 3.1 Check that the automatic bolt-type coupling is closed and secured.
   - 3.2 Secure the inserted coupling bolt by positive locking in case of non-automatic bolt-type coupling.
4. Connect the supply lines.
5. Lift the supporting leg to transport position.

5.11.2.2 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 "Scharmüller ball-type coupling" in case of insufficient free space.

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

(1) Shorter holding-down device for Scharmüller ball-type coupling.
Scharmüller ord. no. 02 481 316

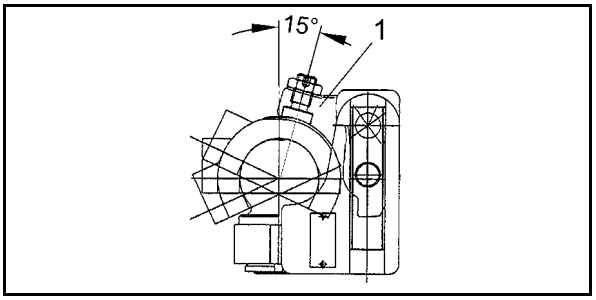


Fig. 49

1. Prepare hitching up:
   - 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 above the folding drawbar as far as possible such that the shell rests on top of the ball head.
5. Lift the folding drawbar to relieve the supporting leg.
6. Lock and secure the holding-down device at the bearing block.
7. Lift the supporting leg to transport position.
8. Release the parking brake.

5.11.3 Uncouple drawbar

WARNING

Risk of crushing when unhitching the machine due to accidental rolling of unhitched machine!

Secure the machine against rolling before unhitching the machine from the tractor. Observe the information in the chapter "Secure tractor and machine against accidental starting and rolling", page 158.

5.11.3.1 Bolt-type coupling

1. Lower the supporting leg to support position.
2. Disconnect the supply lines.
3. Place the supply lines onto the hose holder.
4. Uncouple the drawbar:
   - 4.1 Open the trailer hitch (automatic bolt-type coupling).
   - 4.2 Remove the coupling bolt (non-automatic bolt-type coupling).
5. Move the tractor forward.

5.11.3.2 Ball-type coupling and shell

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

5.11.4 Dual-line compressed-air brake system

The machine is equipped with a brake system consisting of:

- a braking axle with a dual-line compressed-air brake system (service brake) and parking brake for an admissible maximum speed of 40 km/h or 60 km/h,
- an automatic load-sensitive brake pressure regulator (ALB regulator) (brake calculation according to EC directive 98/12/EC). The ALB regulator automatically controls the required braking force depending on the loading condition of the hitched machine.

The brake system acts on all 4 tyres.

- Observe the national road traffic regulations.
- 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.

5.11.4.1 Dual-line compressed-air brake system with mechanical automatic load-sensitive brake pressure 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 automatic load-sensitive brake pressure 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) and integrated in-line filter

(2) Brake line with hose coupling (yellow) and integrated in-line filter

(3) Blank connection for brake line

(4) Trailer brake valve

(5) Automatic load-sensitive brake pressure regulator (ALB regulator) (mechanical)

(6) Release valve

(7) Push button for release valve (can only be actuated in uncoupled condition):

- push in as far as it will go and the service brake releases, e.g. for manoeuvring the unhitched trailer
- pull out as far as it will go and the trailer 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 for ALB input

(12) Test connection for ALB output

(13) Test connection, rear axle

(14) Test connection, compressed-air reservoir

(15) Parking brake

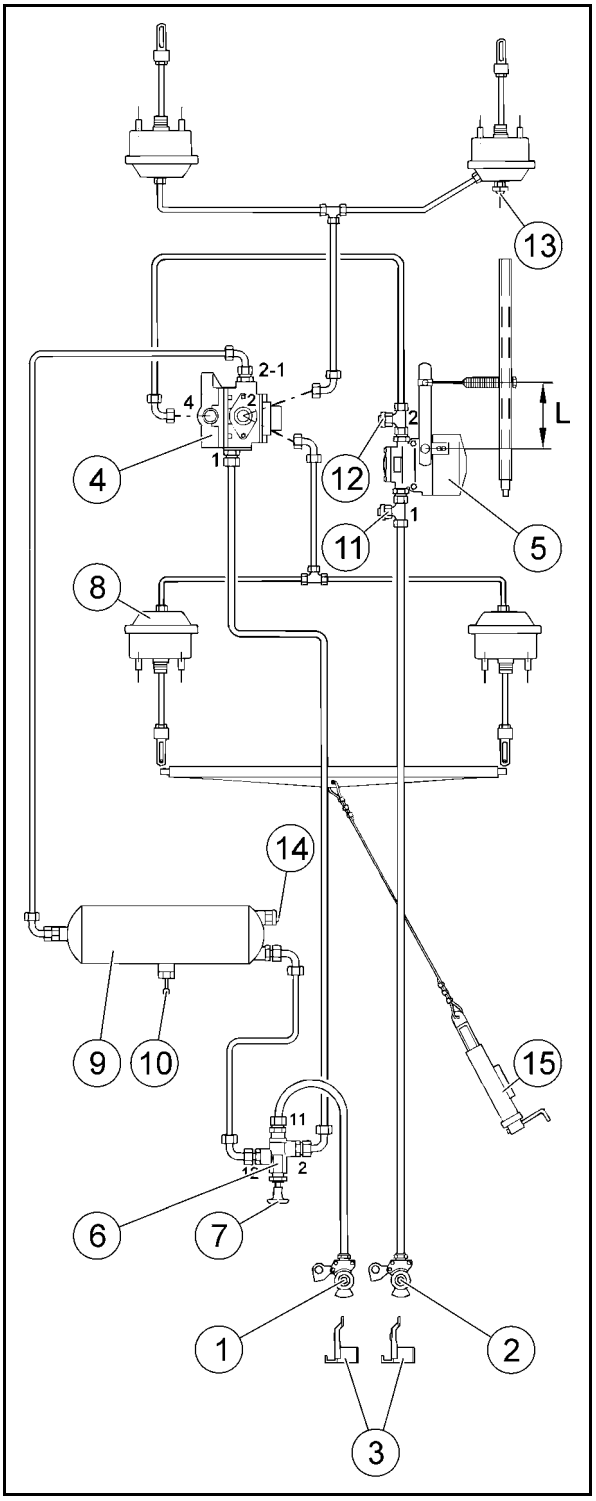


Fig. 50

5.11.4.2 Dual-line compressed-air brake system with hydraulic ALB regulator

WARNING

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

The hydraulic levelling device properly triggers the ALB regulator of the dual-line compressed-air brake system for load-sensitive braking force control only with the travelling height properly set. Observe the information in the chapter "Check travelling height of hydraulic levelling device", page 80.

(1) Feed line with hose coupling (red) and integrated in-line filter

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

(3) Brake line with hose coupling (yellow) and integrated in-line filter

(4) Blank connection for brake line

(5) Trailer brake valve with release valve

(6) Diaphragm brake cylinder

(7) Automatic load-sensitive brake pressure regulator (ALB regulator) (hydraulic), triggered via the hydraulic levelling device of the hydro-pneumatic tandem chassis

(8) Hydraulic cylinder of hydraulic levelling device

(9) Compressed-air reservoir

(10) Drain valve

(11) Test connection, compressed-air reservoir

(12) Test connection for diaphragm brake cylinder

(13) Parking brake

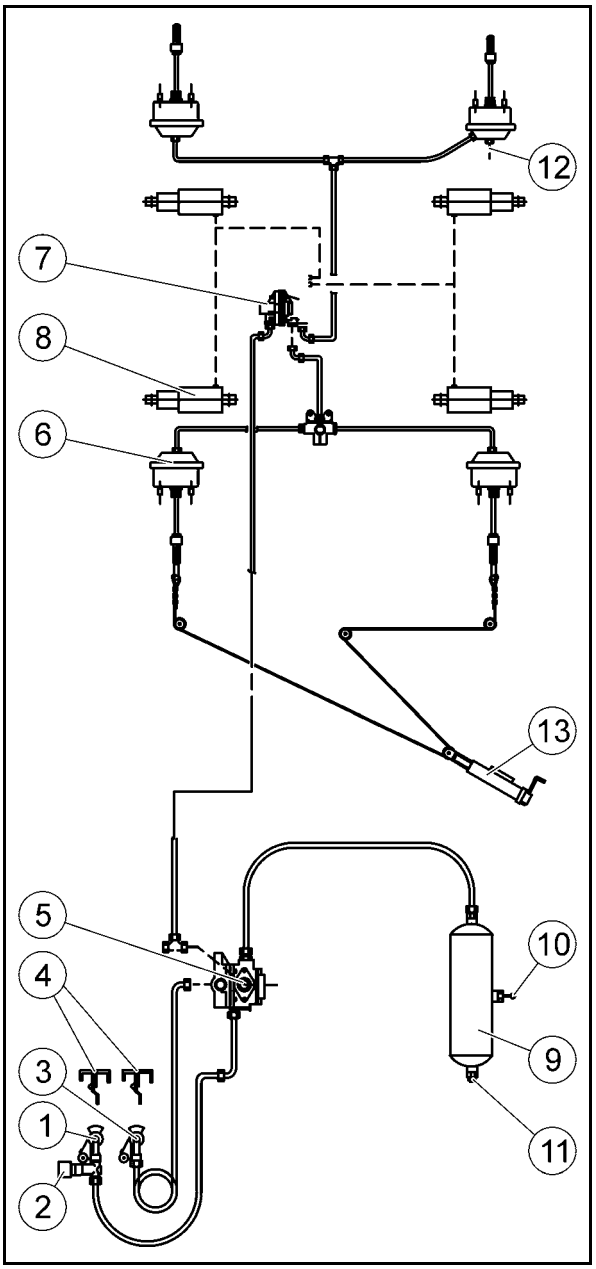


Fig. 51

5.11.4.3 Braking axles

(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

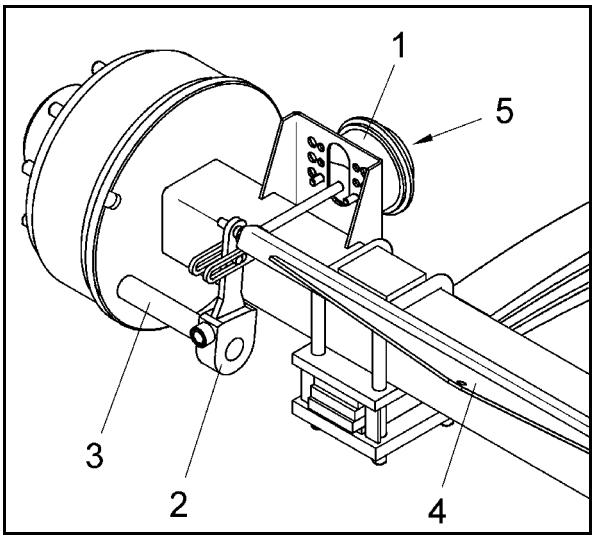


Fig. 52

5.11.4.4 Connect brake and feed line

WARNING

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

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

WARNING

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

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

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

1. Open the caps of the hose couplings on the tractor.
2. Remove the hose coupling of the brake line (yellow) from the blank connection.
3. Clean soiled sealing rings or replace damaged sealing rings.
4. Properly fix the hose coupling of the brake line (yellow) to the yellow marked coupling device at the tractor.
5. Remove the hose coupling of the feed line (red) from the blank connection.
6. Clean soiled sealing rings or replace damaged sealing rings.
7. 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.

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

5.11.4.5 Disconnect brake and feed line

WARNING

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

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

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

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

When the machine is unhitched or torn off, the feed line connected to the trailer brake valve bleeds. The trailer brake valve automatically switches over thus actuating the service brake system in accordance with the automatic load-sensitive brake pressure control.

1. Secure the machine against rolling. Use the parking brake and in addition the chocks for this purpose if necessary.
2. Release the hose coupling of the feed line (red).
3. Release the hose coupling of the brake line (yellow).
4. Fix the hose couplings to the blank connections.
5. Close the caps of the hose couplings at the tractor.

5.12 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:

- can be switched on and off via the key (road travel mode) at the terminal,
- is only allowed to be switched on during transport journeys,
- must, as a basic principle, be switched off when charging and discharging the machine.

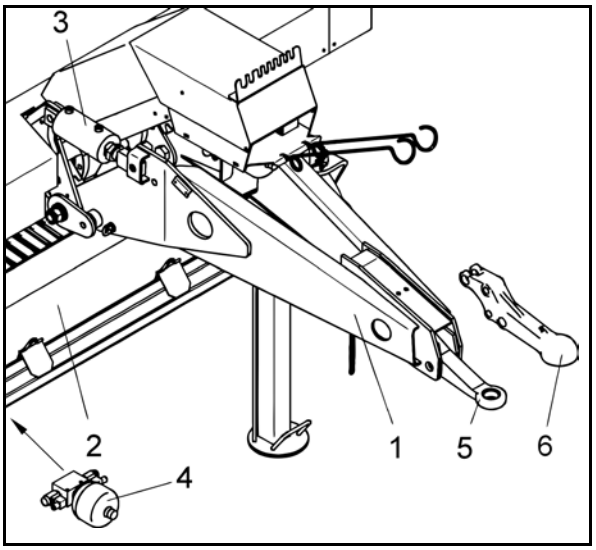


Fig. 53

5.13 Supporting leg

The unhitched machine is supported by the supporting leg. The spring-loaded bolt with ring nut secures the supporting leg in support or transport position when the bolt has engaged into the appropriate boreholes.

WARNING

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

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

WARNING

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

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

5.13.1 Lift supporting leg to transport position

WARNING

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

Check whether the 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 bolt (3) out of the borehole.
3. Grip the handle (4) and lift the supporting leg (2) until the bolt (3) engages into the borehole (5).
4. Check whether the bolt (3) has completely engaged into the borehole (5) and properly locks the supporting leg in its transport position (Fig. 55).

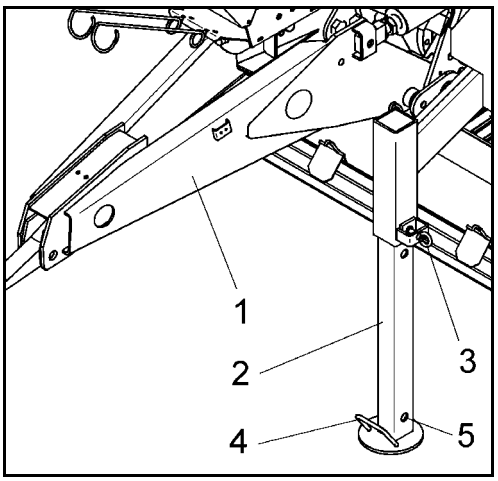


Fig. 54

5.13.2 Lower 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 bolt has properly 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 (Fig. 55/1).
2. Grip the handle (Fig. 55/2) at the supporting leg (Fig. 55/3) and pull the bolt (Fig. 55/4) out of the borehole.
3. Lower the supporting leg until the bolt engages into the borehole.
4. Check whether the bolt has properly engaged into the borehole and properly locks the supporting leg in its support position (Fig. 54).
5. Lower the machine via the folding drawbar until the machine rests on top of the supporting leg.

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

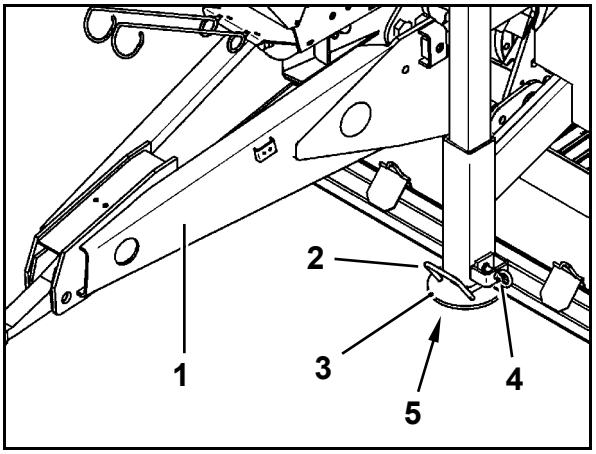


Fig. 55

5.14 Propeller shaft

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

WARNING

Risk to people of being crushed due to the tractor and the machine accidentally starting or rolling!

Only couple or uncouple the propeller shaft to or from the tractor after the tractor and the machine have been secured against accidental starting and rolling.

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.
- Hang the clip chains such that a sufficient swivelling range of the propeller shaft is ensured in any operating position. Clip chains must not get entangled in tractor or machine components.
- 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.
- Place the uncoupled propeller shaft into the respective holder! This will prevent the propeller shaft from being damaged and soiled.

  Never use the clip chain of the propeller shaft to hang up the uncoupled 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.

- Only use the included propeller shaft or the included propeller shaft type.
- Observe the included operating instructions for the propeller shaft. Proper use and maintenance of the propeller shaft prevent serious accidents.
- When coupling the propeller shaft, observe:
  - the included operating instructions for the propeller shaft,
  - the admissible drive speed of the machine,
  - the correct fitting length of the propeller shaft. Observe the information in the chapter "Adjust length of propeller shaft to tractor", page 173,
  - 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.
- In case of the propeller shaft being equipped with an overload or overrunning clutch, this clutch must always be mounted at the machine.
- Before switching the p.t.o. shaft on, observe the safety instructions for p.t.o. shaft operation included in the chapter "Basic safety instructions", page 40.

5.14.1 Couple propeller shaft

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. 56

5.14.2 Uncouple propeller shaft

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).

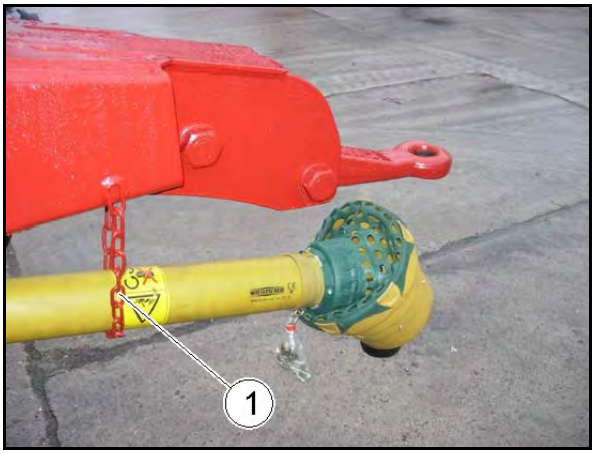


Fig. 57

Fig. 58

5.15 Brake system

5.15.1 Dual-line compressed-air brake system

The machine is equipped with a brake system consisting of:

- a braking axle with a dual-line compressed-air brake system (service brake) and parking brake for an admissible maximum speed of 40 km/h or 60 km/h,
- an automatic load-sensitive brake pressure regulator (ALB regulator) (brake calculation according to EC directive 98/12/EC). The ALB regulator automatically controls the required braking force depending on the loading condition of the hitched machine.

The brake system acts on all 4 tyres.

- Observe the national road traffic regulations.
- 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.

5.15.1.1 Dual-line compressed-air brake system with mechanical automatic load-sensitive brake pressure 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 automatic load-sensitive brake pressure 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) and integrated in-line filter

(2) Brake line with hose coupling (yellow) and integrated in-line filter

(3) Blank connection for brake line

(4) Trailer brake valve

(5) Automatic load-sensitive brake pressure regulator (ALB regulator) (mechanical)

(6) Release valve

(7) Push button for release valve (can only be actuated in uncoupled condition):

- push in as far as it will go and the service brake releases, e.g. for manoeuvring the unhitched trailer
- pull out as far as it will go and the trailer 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 for ALB input

(12) Test connection for ALB output

(13) Test connection, rear axle

(14) Test connection, compressed-air reservoir

(15) Parking brake

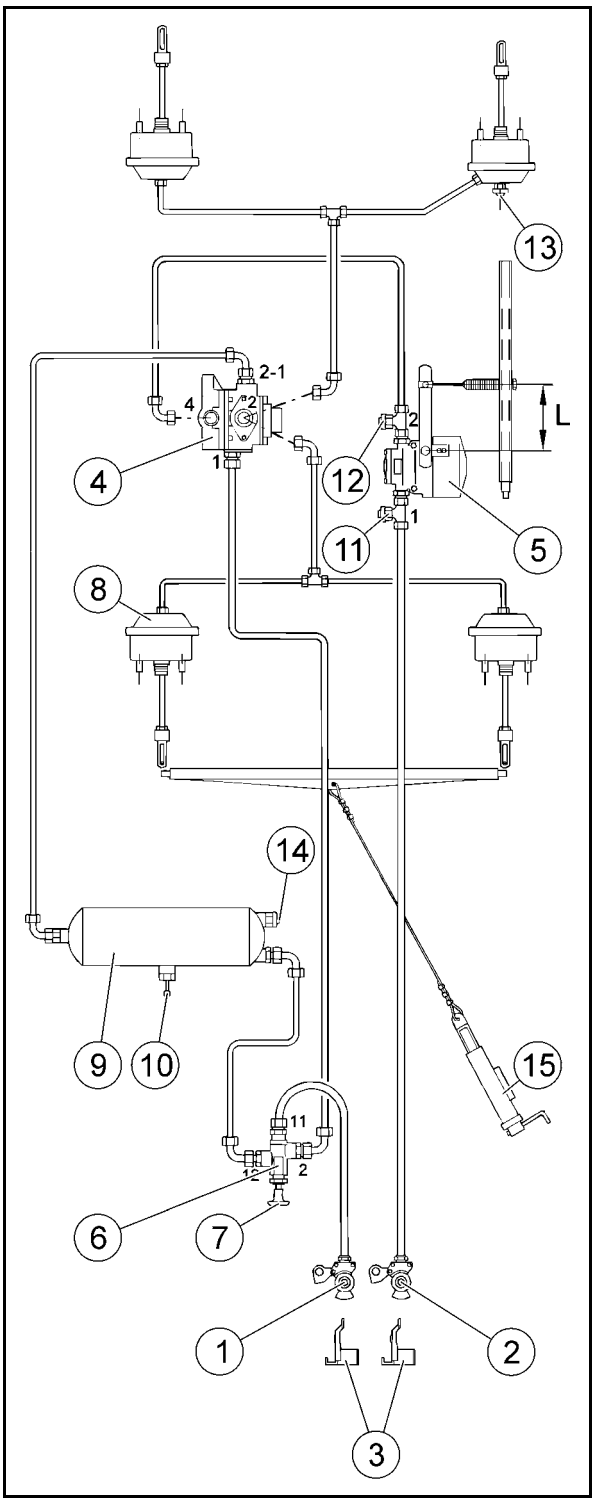


Fig. 59

5.15.1.2 Dual-line compressed-air brake system with hydraulic ALB regulator

WARNING

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

The hydraulic levelling device properly triggers the ALB regulator of the dual-line compressed-air brake system for load-sensitive braking force control only with the travelling height properly set. Observe the information in the chapter "Check travelling height of hydraulic levelling device", page 80.

(1) Feed line with hose coupling (red) and integrated in-line filter

(2) Push button for release valve (can only be actuated in uncoupled condition):

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

(3) Brake line with hose coupling (yellow) and integrated in-line filter

(4) Blank connection for brake line

(5) Trailer brake valve with release valve

(6) Diaphragm brake cylinder

(7) Automatic load-sensitive brake pressure regulator (ALB regulator) (hydraulic), triggered via the hydraulic levelling device of the hydro-pneumatic tandem chassis

(8) Hydraulic cylinder of hydraulic levelling device

(9) Compressed-air reservoir

(10) Drain valve

(11) Test connection, compressed-air reservoir

(12) Test connection for diaphragm brake cylinder

(13) Parking brake

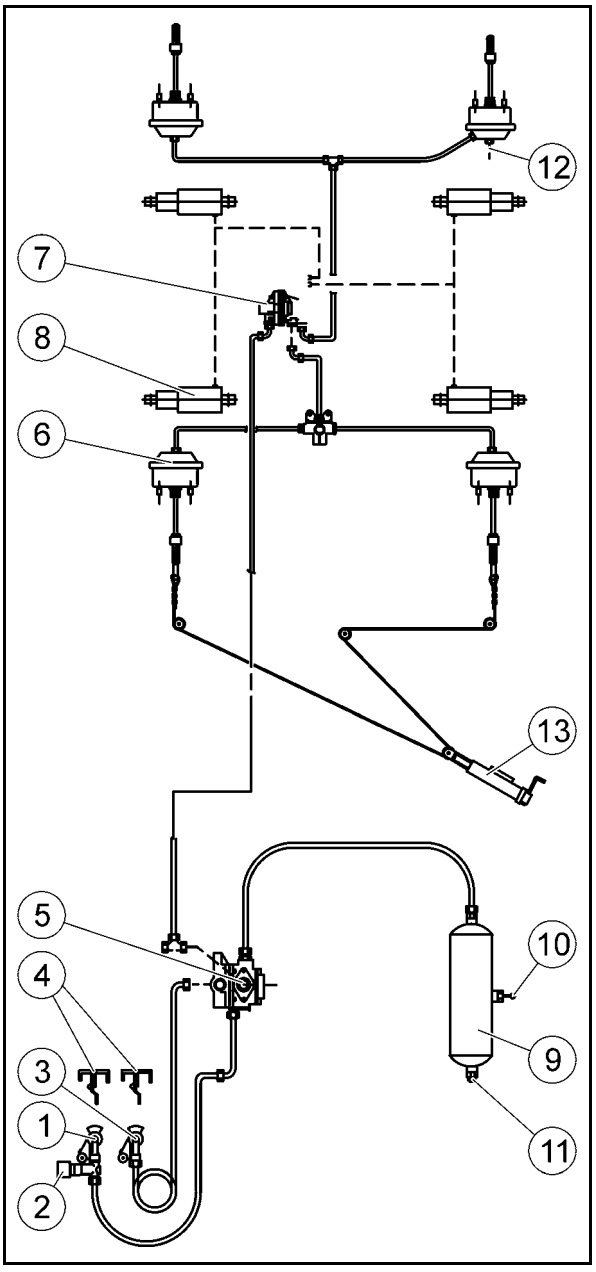


Fig. 60

5.15.1.3 Braking axles

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

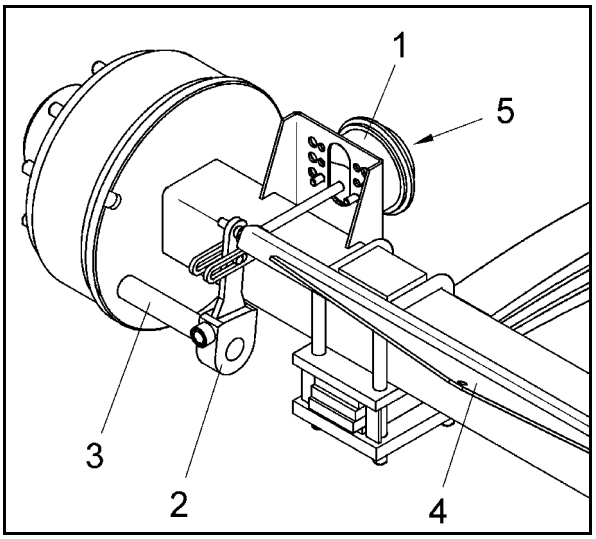


Fig. 61

5.15.1.4 Connect brake and feed line

WARNING

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

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

WARNING

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

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

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

1. Open the caps of the hose couplings on the tractor.
2. Remove the hose coupling of the brake line (yellow) from the blank connection.
3. Clean soiled sealing rings or replace damaged sealing rings.
4. Properly fix the hose coupling of the brake line (yellow) to the yellow marked coupling device at the tractor.
5. Remove the hose coupling of the feed line (red) from the blank connection.
6. Clean soiled sealing rings or replace damaged sealing rings.
7. 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.

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

5.15.1.5 Disconnect brake and feed line

WARNING

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

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

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

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

When the machine is unhitched or torn off, the feed line connected to the trailer brake valve bleeds. The trailer brake valve automatically switches over thus actuating the service brake system in accordance with the automatic load-sensitive brake pressure control.

1. Secure the machine against rolling. Use the parking brake and in addition the chocks for this purpose if necessary.
2. Release the hose coupling of the feed line (red).
3. Release the hose coupling of the brake line (yellow).
4. Fix the hose couplings to the blank connections.
5. Close the caps of the hose couplings at the tractor.

5.15.2 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.

The hydraulic service brake system has not been licensed for Germany.

(1) Hydraulic sleeve ISO 5676

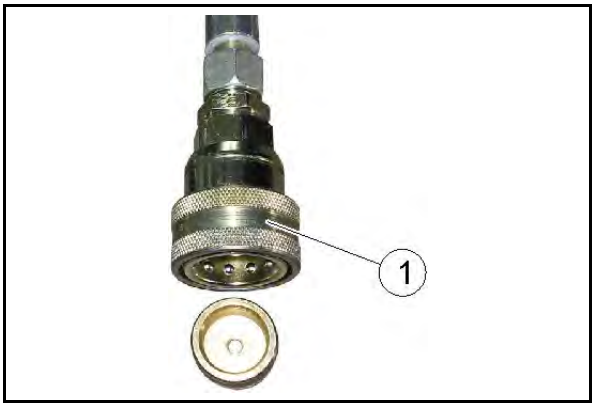


Fig. 62

(2) Hydraulic cylinder of braking axle

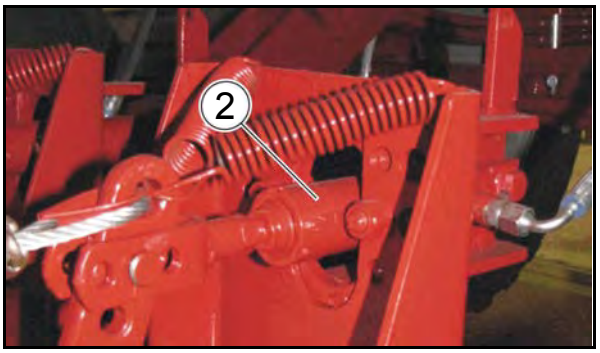


Fig. 63

5.15.2.1 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.

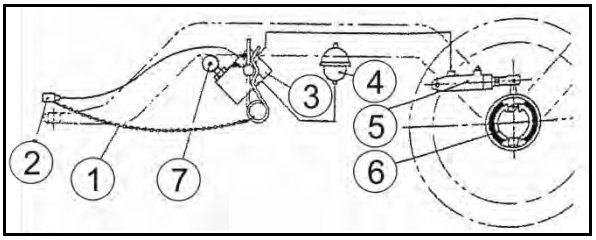


Fig. 64

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

5.15.2.2 Connect hydraulic service brake system

- Only couple clean hydraulic clutches.
- Clean hydraulic sleeve and hydraulic plug 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.

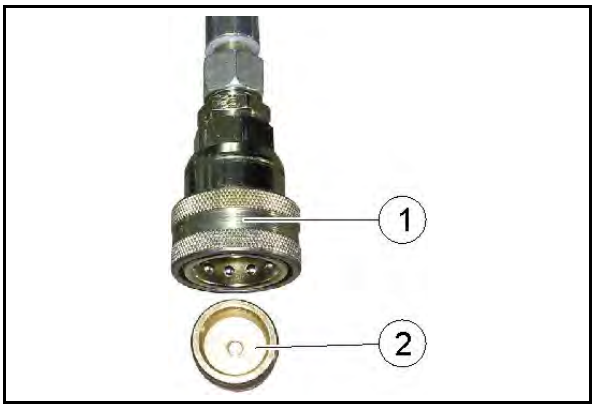


Fig. 65

5.15.2.3 Disconnect hydraulic service brake system

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

5.15.3 Parking brake

The applied parking brake (1) secures the unhitched machine against accidental rolling. The parking brake is actuated via spindle and cable when turning the crank handle.

(1) Crank handle of parking brake; locked in adjusting position (2)

(2) Adjusting position

(3) Resting position

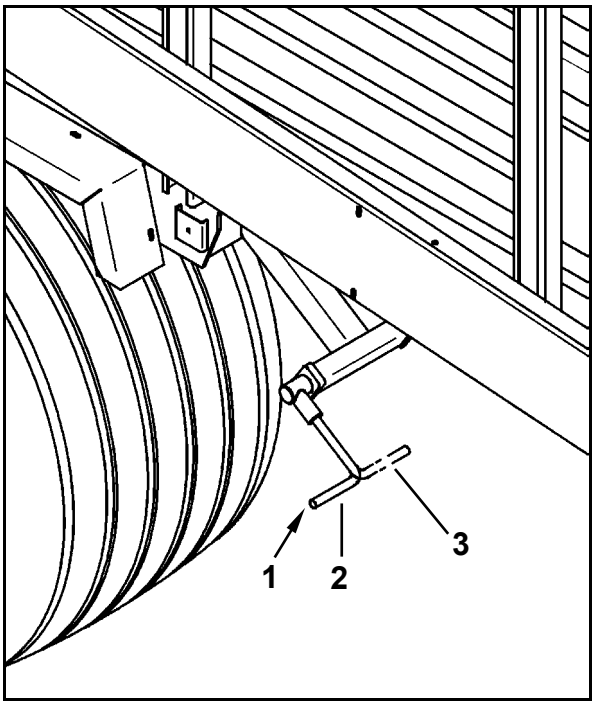


Fig. 66

Release parking brake

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

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

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

→ The parking brake is released.

3. Swivel the crank handle (1) to resting position (3).

Apply parking brake

Correct the setting of the parking brake if the tension path of the spindle 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 (1) clockwise and apply the parking brake by means of the cable (the tightening force of the parking brake is approx. 40 kg of manual force).

5.16 Easy-to-use control / Terminal

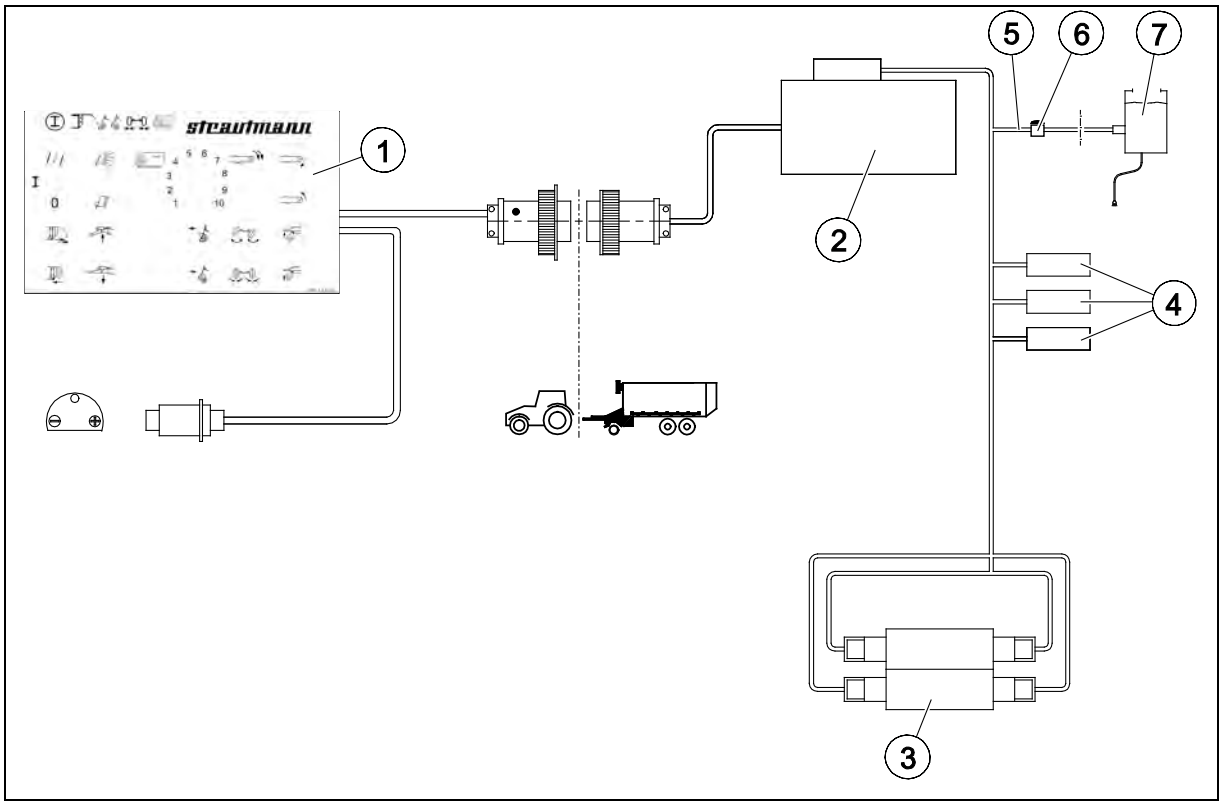


Fig. 67

The easy-to-use control mainly consists of:

- the control set (1),
- the power unit (2),
- the control block (3),
- the sensors (4) for determining the operating states of the individual machine components, e.g. "Tailgate open",
- the connecting cable (5) with ON / OFF switch (6) for the connection of a silage additive pump (7) (optional extra).

The control set is mounted on the tractor and is connected to the power unit (2) of the machine.

All functions required for charging and discharging the forage or proportioning trailer as well as for transport journeys are actuated via the operating elements of the easy-to-use control set. The symbols above the operating elements identify the executable functions.

After an operating element has been actuated, the power unit triggers the corresponding solenoid valve at the electro-hydraulic control block (3) to carry out the selected functions. Individual sensors (4) determine the respective operating state of the selected function / setting, e. g. "Tailgate open".

Depending on the machine's equipment, the forage trailer is fitted with or without metering drums.

One operating element is required for each function of the machine.

The control set:

- is mounted on the tractor within view and easy reach such that

the operating elements are easily accessible,

- must be connected to the tractor's power supply (12 V, min. 25 A) via the 3-pole plug (DIN 9680),
- is equipped with several operating elements such as key buttons, toggle switches and a control dial.

The operating elements are in touch-control design (key buttons), in latch-in design (toggle switches) or in control-dial design:

- In touch-control design for folding, swivelling or sliding movable machine parts, e.g. the tailgate. The function is only carried out when the operating element is activated and kept hold of. As soon as the operating element is released, it returns to its neutral position and the action is stopped.
- In latch-in design for movements requiring continuous action, e.g. work lights.
- Control dials for variably adjusting the transport floor speed to the feed rates I and II.

The operating elements in touch-control or in latch-in design can be set to a maximum of 3 positions:

- Function I
- Neutral position
- Function II.

The easy-to--use control is switched on and off via the main switch.

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.

5.16.1 Easy-to-use control - Functions

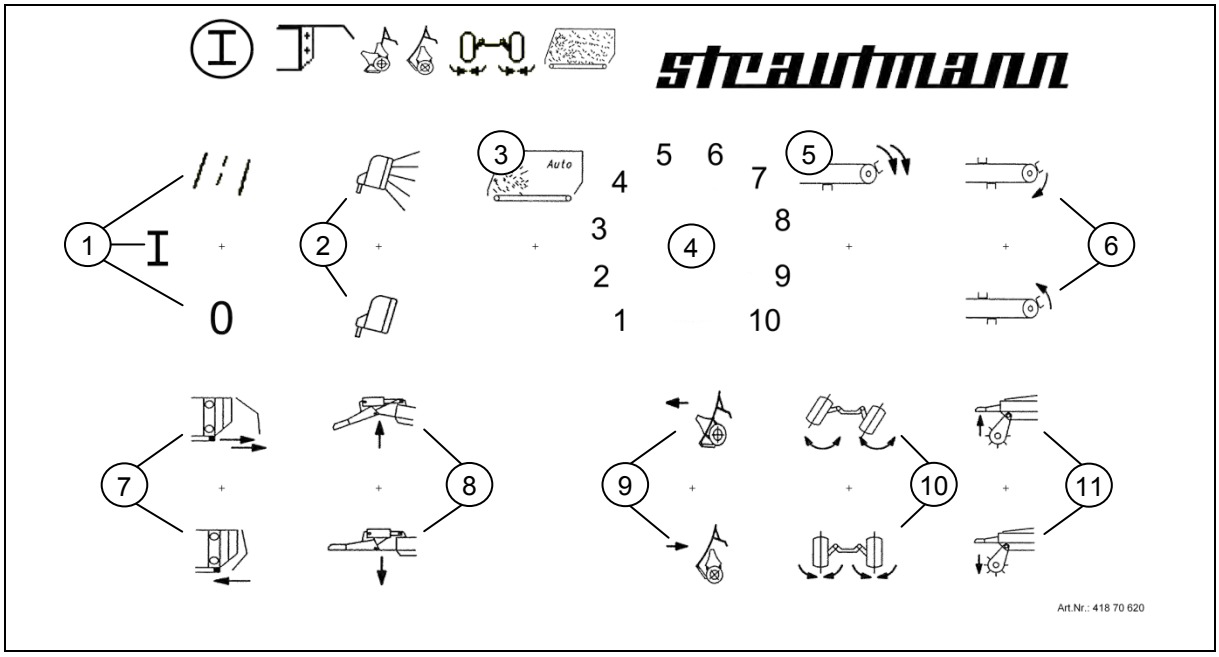


Fig. 68

Functions of switch levers:

(1) Switch operating mode / road travel mode on / switch machine off

(2) Switch work lights on / off

(3) Switch automatic charging system on / off

(4) Adjust feed rate of transport floor

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

(6) Switch feed function on / Reverse feed direction of transport floor for a short time

(7) Open / close tailgate

(8) Lift / lower folding drawbar

(9) Extend / retract cutting unit

(10) Lock / unlock steering axle

(11) Lift / lower pick-up

Simultaneous actuation of two functions is only possible to a certain degree, e.g.:

- the functions "Open tailgate" and "Lift folding drawbar" can be carried out simultaneously,
- the functions "Open tailgate" and "Lower folding drawbar" cannot be carried out simultaneously.

Meaning of control lamps:

(H1) flashes (green): Road travel mode is active

lights up (green): Operating mode is active

(H2) lights up (green): Tailgate is open

(H3) flashes (red): Cutting unit securing function is active

lights up (red): Cutting unit is retracted

(H4) lights up (green): Steering axle is locked

(H5) lights up (red): Cargo space is full

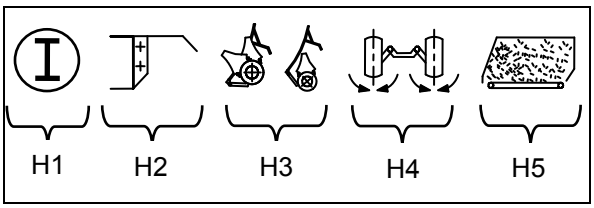


Fig. 69

The intensity of the control lamps can be adjusted manually as follows:

1. switch the control system off,
2. put the toggle switch "Transport floor (level I)“ into its bottom switch position (reverse transport floor) and keep hold of it,
3. put the "Pick-up" key button into its top position (Lift pick-up) and keep hold of it,
4. switch the control system on in operating mode,

   → all LEDs are flashing,
5. operate the control dial:

   → The higher the value set at the control dial, the stronger the intensity of the control lamps.
6. switch the control system off,

   → the setting is stored.

5.16.1.1 Switch road travel mode on

The road travel mode can always be switched on.

However, ensure that:

- the tailgate is closed,
- the pick-up is lifted,
- the transport floor is at a standstill.

If the road travel mode is switched on:

- apart from the functions "Lock steering axle" and "Unlock steering axle", all other functions on the easy-to-use terminal are blocked,
- the work lights are switched off.
- the hydraulic drawbar suspension (optional extra) is switched on,
- the control lamp H1 ("Road travel mode active") flashes,
- the states are indicated by the control lamps H2 ("Tailgate open""), H4 ("Steering axle locked") and H5 ("Cargo space full").

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.

- Toggle switch in top switch position

→ The road travel mode is switched on.

The control lamp H1 ("Road travel mode active") flashes.

5.16.1.2 Switch operating mode on

If the operating mode is switched on:

- all functions on the easy-to-use terminal are released,
- the hydraulic drawbar suspension (optional extra) is switched off,
- the control lamp H1 ("Operating mode active") lights up.

If the control lamp H1 ("Road travel mode active") is flashing with the operating mode being active, the control system is locked due to one / several functions being active.

→ Check the easy-to-use control system for inconsistent active functions and deactivate them. This might refer to:

- the tailgate,
- the folding drawbar,
- the cutting unit,
- the steering axle,
- the pick-up,
- the transport floor.

I

- Toggle switch in central switch position

→ The operating mode is switched on.

The control lamp H1 ("Operating mode active") lights up.

5.16.1.3 Switch machine off

0

- Toggle switch in bottom switch position

→ The machine is switched off.

5.16.1.4 Switch work lights on / off

When switching the road travel mode on, the work lights are automatically switched off.

When switching the road travel mode off, the work lights are automatically switched on again.

- Toggle switch in top switch position

→ The work lights are switched on.

- Toggle switch in bottom switch position

→ The work lights are switched off.

5.16.1.5 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 switches the transport floor on and off during charging,
- is automatically deactivated if the easy-to-use control set generates an acoustic signal (horn sound) and a visual signal (control lamp H5: "Forage trailer full"),
- is automatically activated if the forage trailer has been emptied and the pick-up is lowered the next time,
- remains switched on until the automatic charging system is manually switched off.

The automatic charging system only works with the pick-up lowered.

The automatic charging system:

- is mounted at the load-protection bars and mainly consists of the sensing band (1), the gear shifting gate (2) and the limit switch (3),
- is connected with the hydraulic drive of the transport floor in ON mode,

During charging, the loaded material piles up at the loading frame of the cargo space. If the loaded material piling up deflects the sensing band (1) upwards, the hydraulic drive of the transport floor starts and conveys the loaded material backwards. The transport floor stops as soon as the loaded material does not deflect the sensing band (1) upwards any more.

The position of the gear shifting gate (2) with respect to the sensing band (1) determines the switch-on behaviour for the transport floor. The gear shifting gate (2) can be fixed to the sensing band (1) in different positions, in order to change the filling degree of the cargo space.

Low filling degree = smaller deflection of sensing band

High filling degree = larger deflection of sensing band

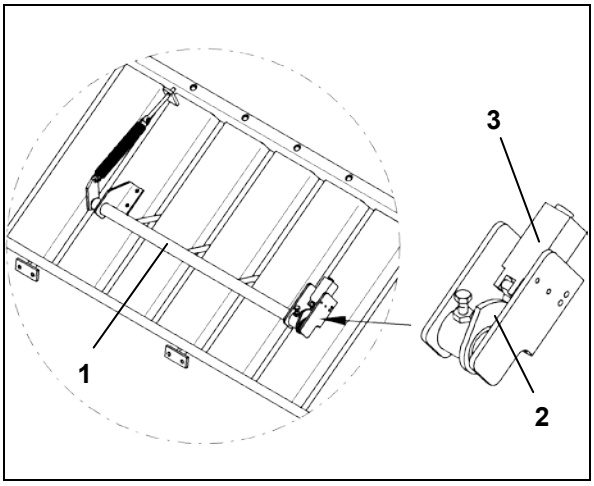


Fig. 70

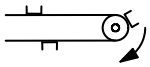
- Key button in top switch position

→ The automatic charging system is switched on.

5.16.1.6 Switch transport floor on (level I)

- If the forage trailer is full, the easy-to-use control set will generate an acoustic signal (horn sound) and a visual signal (control lamp H5: "Forage trailer full"). The automatic charging system is deactivated and the automatic feed function for the transport floor is switched off.

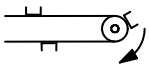
  → The acoustic signal (horn sound) and the visual signal (control lamp H5: "Forage trailer full") can be switched off by deactivating the "Transport floor ON" function.

  You can now still continue to charge forage trailers without metering drums and to switch the transport floor feed manually on for a maximum of three times for a short time of 2 seconds via the  switch lever.

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

- In case of a forage trailer equipped with metering drums, the transport floor will automatically stop for a short time during discharge if the transport floor is running too fast.

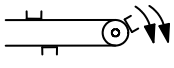
→ Reduce the transport floor speed.



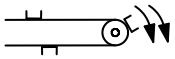
- Toggle switch in top switch position

→ As long as the lever is kept in its top switch position, the transport floor will move at the set feed rate.

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

If the transport floor stops when switching over, increase the set feed rate of the transport floor if necessary before operating the toggle switch  for doubling the feed rate for complete emptying.

At both levels, the feed rate can be set by means of the control dial.



- Toggle switch in top switch position

→ The transport floor moves at fast feed rate (level II).

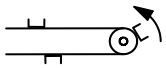
- Toggle switch in bottom switch position

→ The transport floor moves at normal feed rate (level I).

5.16.1.8 Reverse feed direction of transport floor for a short time

The feed direction of the transport floor must be reversed for a short time if the slip clutch responds during discharge.

Thus, the pressing power which the loaded material applies to the metering drums and the starting torque for loosening the metering drums are reduced.

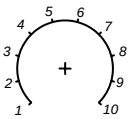


- Toggle switch in bottom switch position

→ The transport floor starts running and conveys the loaded material away from the metering drums for a maximum time of 3 seconds. The pressing power which is applied to the metering drums by the loaded material is reduced.

5.16.1.9 Change feed rate of transport floor

The feed rate of the transport floor is adjusted by means of the control dial at both level I and II.



- Control dial to "1" = low feed rate of transport floor.
- Control dial to "10" = high feed rate of transport floor.

5.16.1.10 Open tailgate

- Key button in top switch position
  - o Forage trailer without metering drums

  → the tailgate opens as long as the the switch position is held or until the end position has been reached.

  As soon as the tailgate has reached its end position, the control lamp H2 ("Tailgate open") lights up.

  - o Forage trailer with metering drums:

  → the tailgate opens as long as the switch position is held or until position I has been reached.

  → when actuated again, the tailgate opens further as long as the switch position is held or until the end position has been reached.

  As soon as the tailgate has reached position I, the control lamp H2 ("Tailgate open") lights up.

5.16.1.11 Close tailgate

- Key button in bottom switch position

→ The tailgate is closed.

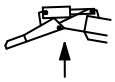
- ○ On forage trailers without metering drums:

  the control lamp H2 ("Tailgate open") goes out as soon as the tailgate is no longer completely open.

- ○ On forage trailers equipped with metering drums:

  the control lamp H2 ("Tailgate open") goes out as soon as the tailgate is below position I.

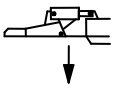
5.16.1.12 Lift folding drawbar



- Leave the key button in its top switch position 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.

5.16.1.13 Lower folding drawbar



- Leave the key button in its bottom switch position 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.

5.16.1.14 Retract cutting unit

- Leave the key button in its bottom switch position until the end position is reached.

→ The cutting unit is retracted from the conveyor duct.

The control lamp H3 ("Cutting retracted") lights up as soon is the cutting unit is retracting.

If the control lamp H3 ("Cutting unit retracted") lights up 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.

One or several cutting knives retracted from the conveyor duct

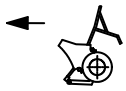
Swivel the cutting unit completely out of the conveyor duct and in again with the feeder rotor running.

The cutting unit is soiled

Clean the cutting unit.

5.16.1.15 Extend cutting unit

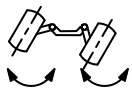
Extend the cutting unit only with the feeder rotor running.



- Leave the key button in its top position until the control lamp H3 ("Cutting unit extended") goes out.

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

5.16.1.16 Unlock steering axle

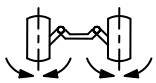


- Key button in top switch position

→ The control lamp H4 ("Steering axle locked") goes out. The steering axle can move freely (is unlocked) and follows the turning radius of the corner during cornering.

5.16.1.17 Lock steering axle

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.



- Key button in bottom switch position

→ The control lamp H4 ("Steering axle locked") lights up. The steering axle is locked in "Straight" position.

5.16.1.18 Lift pick-up

- Leave the key button in its top switch position until the end position is reached.

→ The pick-up is lifted.

5.16.1.19 Lower pick-up

- Toggle switch in bottom switch position

→ The pick-up lowers and is held in open-centre position such that it can adapt to uneven terrain.

5.17 ISOBUS control / Terminal

- 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 terminal. You will then be able to directly operate the machine via your tractor terminal.
- The included ISO cable harness is not compatible with LBS or LBS-Plus.

As supporting information for operation via your tractor terminal, the operating instructions of the ISOBUS control Field-Operator 300 are available on our web site.

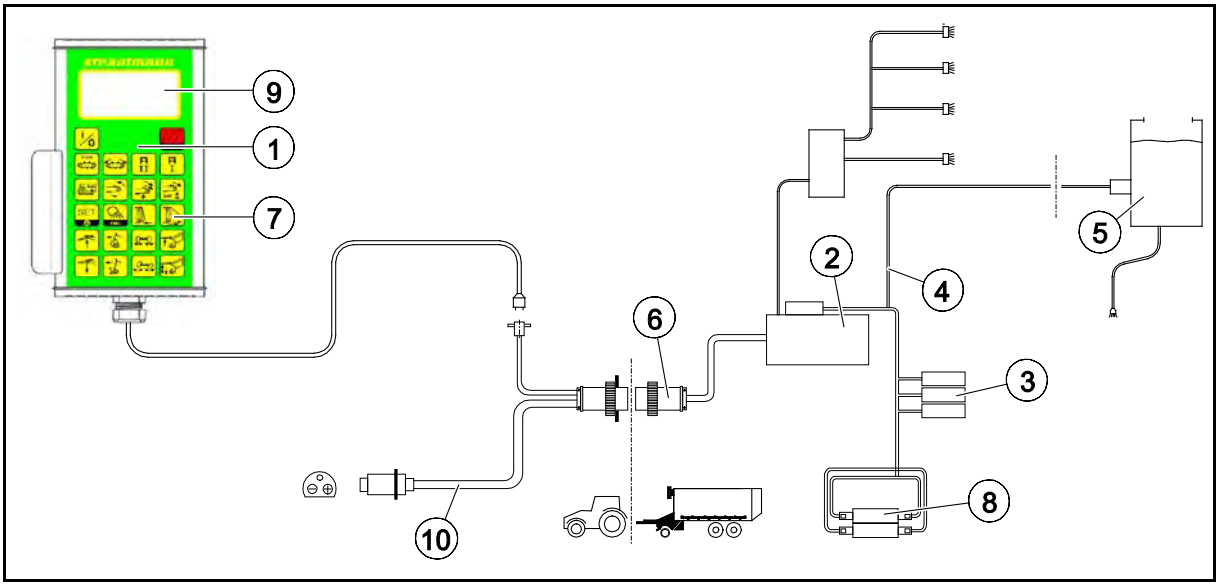


Fig. 71

The ISOBUS control mainly consists of:

- the terminal (1),
- the control unit (2),
- the sensors (3) for determining the operating states of the individual machine components, e. g. tailgate open – closed,
- the connecting cable (4) for the connection of a silage additive pump (5) (optional extra).

The terminal (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 charging and discharging the forage or proportioning trailer as well as for transport journeys are actuated via the keys (7) of the terminal. 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 function / setting, e. g. tailgate open - closed. The operating states are graphically shown in the display (9).

The control system is switched on and off via the I/0 key. In case of longer downtimes, additionally pull the mobile tractor connecting cable (10).

(1) Display. Depending on the selected functions, the following menu appears on the display:

- "Working". The "Working" menu displays the selected functions and the operating states during charging and discharging.
- "Road travel". The "Road travel" menu is displayed when the road travel mode is switched on.
- "SET". The "SET" menu:
  - o displays the software version,
  - o enables the setting of the machine parameters.

Key functions:

(2) ISOBUS control 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 feed direction of transport floor for a short time / Reduce feed rate of transport floor during discharge (in connection 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 connection with key (11))

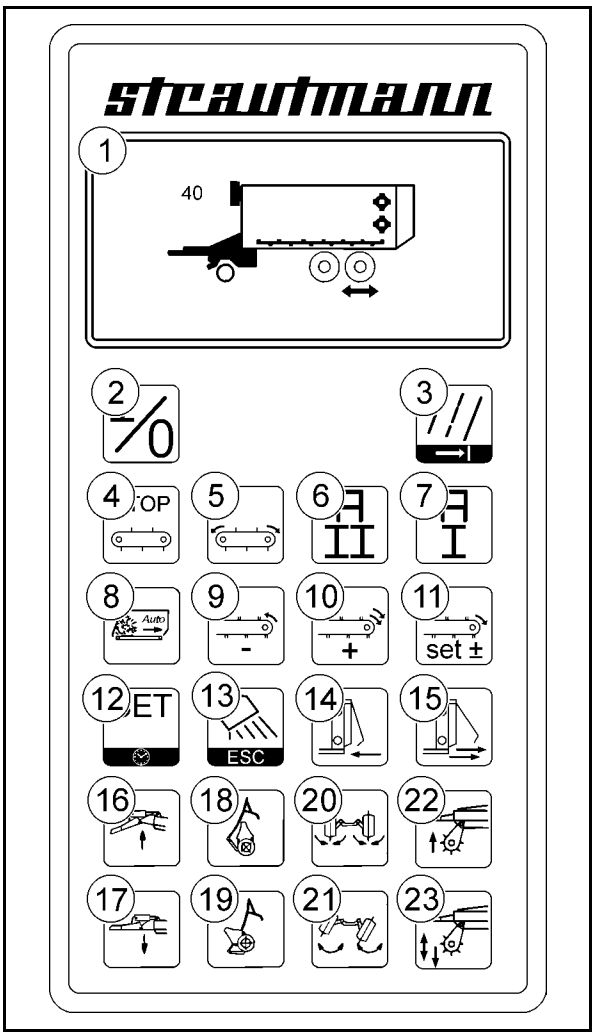


Fig. 72

(11) Switch transport floor on / Set feed rate of transport floor (in connection 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) Close tailgate

(15) Open 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)

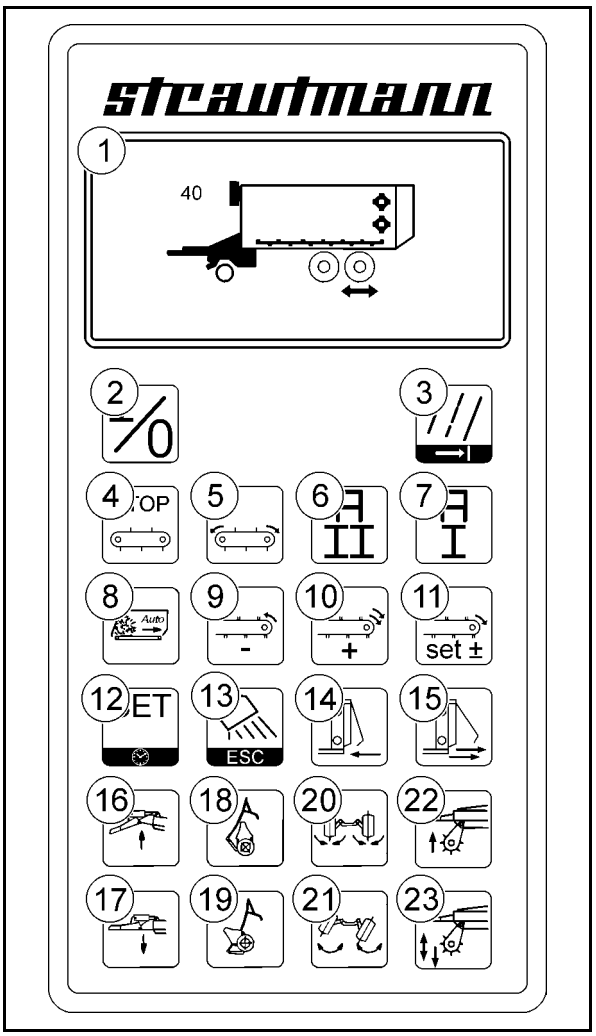


Fig. 73

5.17.1 Field-Operator 120 - Key symbols and their meaning

The following paragraphs explain the symbols of the keys on the Field-Operator 120, their function and the visual indicator in the display.

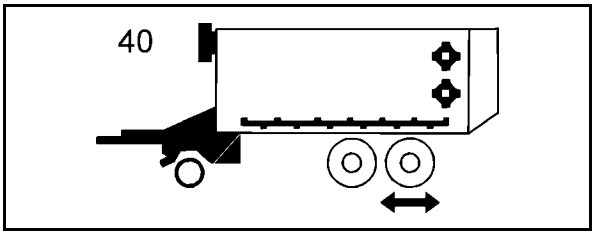
5.17.1.1 Switch Field-Operator 120 on / off

- Press key once.

→ The ISOBUS control is switched on / off.

If the ISOBUS control is switched on, the display shows the "Working" menu. If the ISOBUS control is switched off, the display goes out.

The display shows:



At the same time, the key serves as "EMERGENCY STOP". After the ISOBUS control has been switched off, all hydraulic functions are also switched off.

5.17.1.2 Switch road travel mode on

The road travel mode can only be switched on:

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

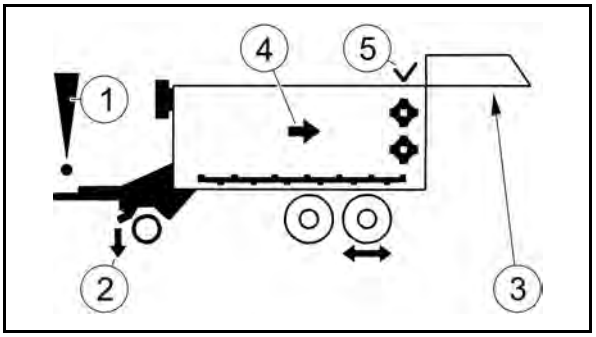
(2) pick-up down,

(3) tailgate open,

(4) transport floor powered,

(5) metering drums powered.

The display shows:



If the road travel mode is switched on:

- the "Road travel" menu appears,
- apart from the functions "Lock steering axle" and "Unlock steering axle", all other functions on the terminal 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 lights (optional extra) are switched off.

If the folding drawbar is equipped with a drawbar suspension, the hydraulic cylinders of the folding drawbar must be extended by approx. 20 mm before switching the road travel mode on.

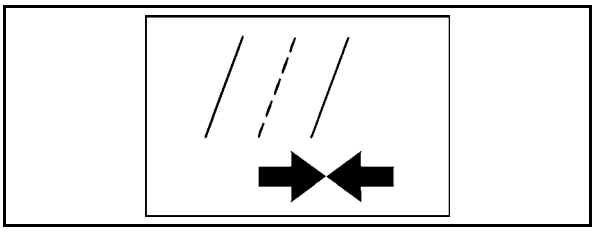
The drawbar suspension will not work if the folding drawbar is lowered to its end position.

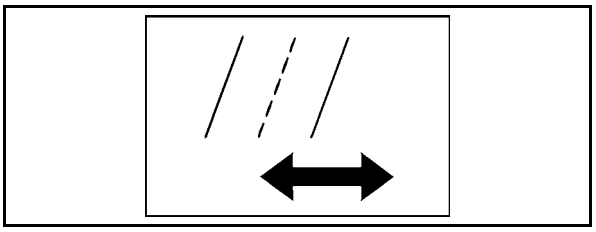
- Press key once.

→ The road travel mode is switched on. The display shows the "Road travel" menu and:

  - the symbol "Steering axle locked" or
  - the symbol "Steering axle unlocked".

The display shows:





5.17.1.3 Switch road travel mode off

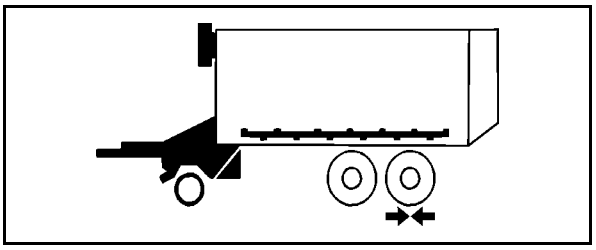
If the road travel mode is switched off:

- the "Working" menu appears,
- all functions on the terminal 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 lights (optional extra) are switched on if they were on when carrying out the function "Switch road travel mode on".

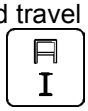
- Press key again.

→ The road travel mode is switched off. The display shows the "Working" menu again.

The display shows:



5.17.1.4 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 pressing the  key.

The discharge mode "A I" is automatically switched off if the tailgate is closed.

In case of electro-hydraulic forced steering axle system, the steering axle is locked in discharge mode "A I", see chapter "SES system", page 149.

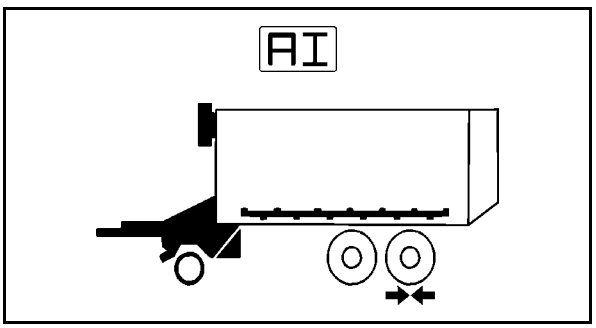
In discharge mode "A I", the steering axle is automatically locked at speeds up to 12 km/h.

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

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

  - o Lock steering axle.
  - o Lift folding drawbar.

The display shows:



5.17.1.5 Switch discharge mode "A II" on (forage trailer without metering drums)

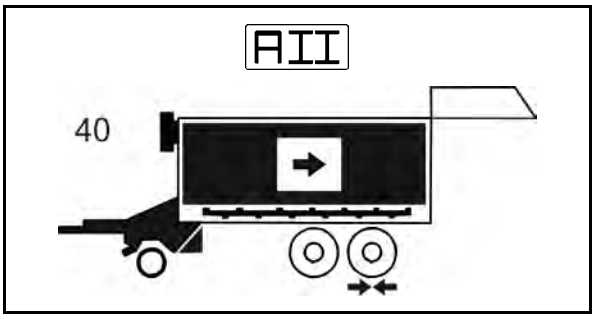
- The discharge mode "A II" is automatically switched off if the tailgate is closed.
- During discharge, the feed of the transport floor can be switched on and off as often as desired by pressing the  key.

- Press key once when being on the bunker silo.

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

  - o Open tailgate.
  - o Switch transport floor on when the tailgate has reached its end position.

The display shows:



5.17.1.6 Switch discharge mode "A II" on (forage trailer with metering drums)

- The discharge mode "A II" is automatically switched off if the tailgate is closed.
- During discharge, the feed of the transport floor can be switched on and off as often as desired by pressing the  key.

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

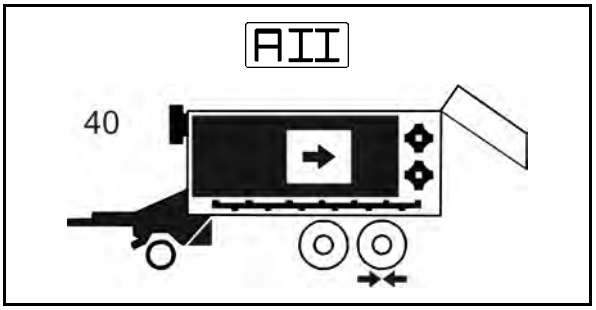
→ The metering drums and the transport floor stop. The transport floor automatically switches to standby mode and the "Feed On" symbol is flashing on the terminal.

- Press key once when being on the bunker silo.

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

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

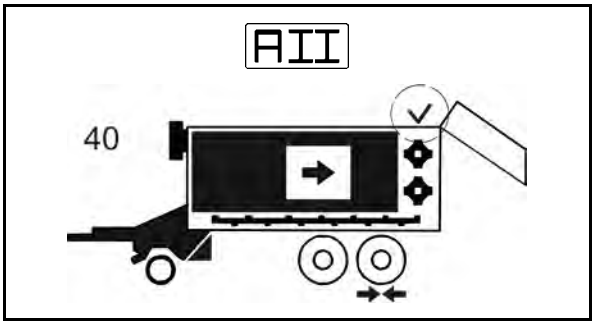
The display shows:



When the p.t.o. shaft is switched on, the metering drums start to run and after a short delay, the transport floor automatically starts.

→ With the metering drums powered, the "Metering drums On" symbol appears.

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



5.17.1.7 Switch automatic charging system on and 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 switches the transport floor on and off during charging,
- is automatically deactivated if the terminal generates the acoustic signal (horn sound) and the visual signal "Forage trailer full",
- is automatically activated if the forage trailer 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 143.

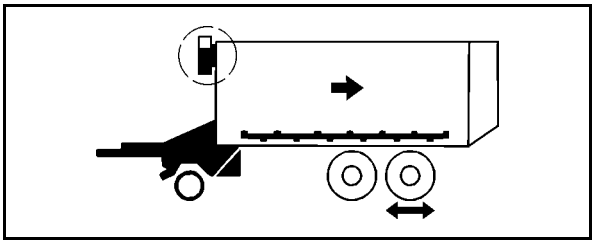
- Press key once.

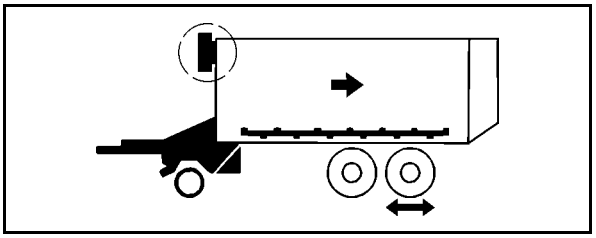
→ The automatic charging system is switched on. Depending on the pre-selected filling degree, the following symbol appears:

  o "Automatic charging system switched on 80 %" or

  o "Automatic charging system switched on 100 %".

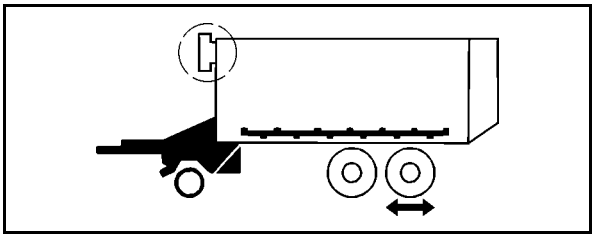
The display shows:





- Press key again.

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



5.17.1.8 Reverse feed direction of transport floor for a short time

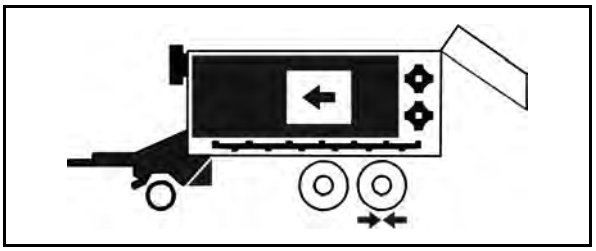
The feed direction of the transport floor must be reversed for a short time if the slip clutch responds during discharge.

Thus, the pressing power which the loaded material applies to the metering drums, and the starting torque for loosening the metering drums are reduced.

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

   The "Reverse feed" symbol appears. The transport floor starts running and conveys the loaded material away from the metering drums for a maximum time of 3 seconds. The pressing power which is applied to the metering drums by the loaded material is reduced.

The display shows:



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

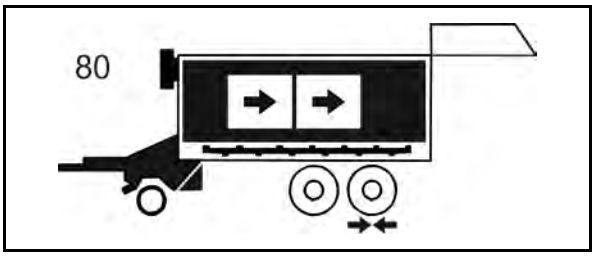
The minimum set feed rate must be "40" before doubling the feed rate of the transport floor for complete emptying.

First increase the set feed rate of the transport floor if necessary, before pressing the  key to double the feed rate for complete emptying.

- Press key once during discharge.

→ The feed rate of the transport floor for complete emptying is doubled. The symbols "double set feed rate" and "double feed" appear.

The display shows:



5.17.1.10 Switch transport floor on

Information for forage trailers without metering drums:

- If the forage trailer is full, the terminal will generate an acoustic signal (horn sound) and a visual signal "Forage trailer full". The automatic charging system is deactivated and the automatic feed function for the transport floor is switched off.

  You can now still continue to charge forage trailers without metering drums and switch the transport floor feed manually on for a maximum of three times for a short time of 2 seconds via the set ± key.

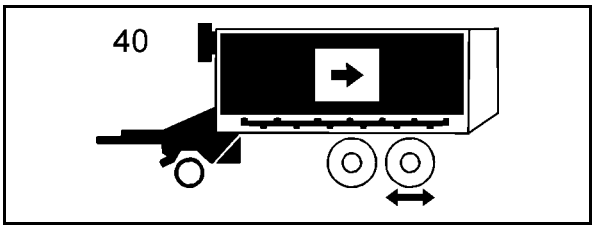
  Stop the charging procedure after the acoustic signal has appeared for the third time at the latest.
- When discharging on the bunker silo, the transport floor is automatically switched on after pressing the II key if the tailgate has reached its end position.

set ±

- Press the key for a maximum time 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 display shows:

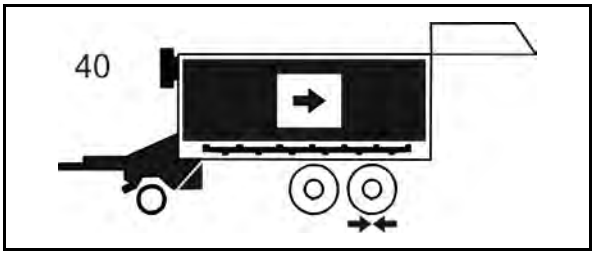


5.17.1.11 Change feed rate of transport floor during discharge

set ± + + −

- During discharge, the feed rate of the transport floor can be changed via the keys set ± and + or −.

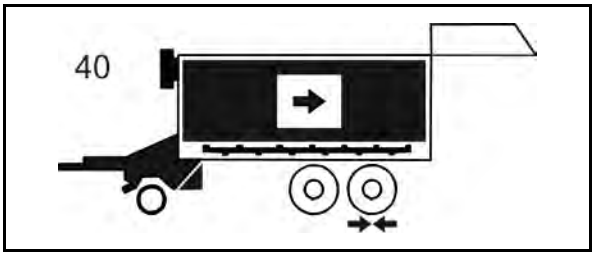
The display shows:



For changing the feed rate, press the set ± key once and the + or − key quickly several times if necessary.

→ The indicated feed rate will be increased by 10 % of the maximum feed rate each time the + key is pressed. The indicated feed rate will be reduced by 10% each time the − key is pressed.

The display shows:



5.17.1.12 Crossover conveyor ccw rotation/cw rotation on

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

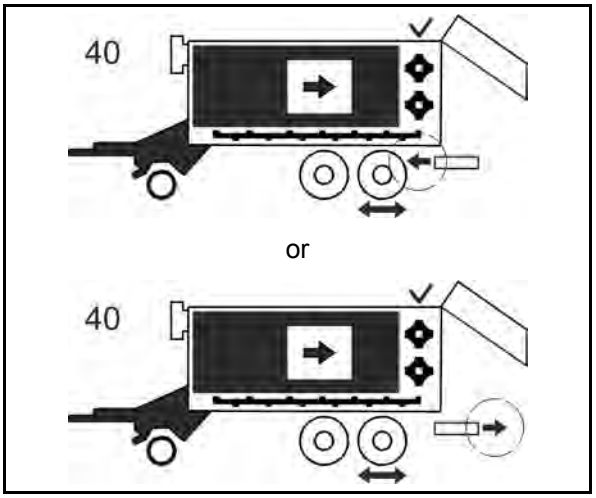
1. Press the key once.

→ 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:



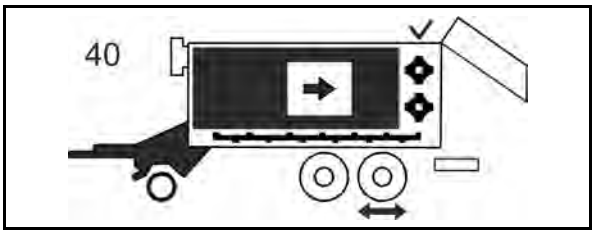
5.17.1.13 Stop crossover conveyor

1. Press the 

key once.

→ The crossover conveyor stops.

The screen shows:



5.17.1.14 Switch lighting in cargo space on / off

- Press key quickly once.

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

- Press key quickly again.

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

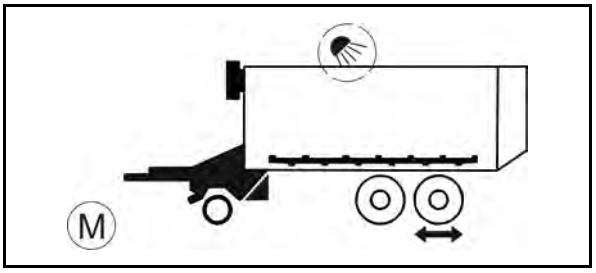
- Press and hold key once.

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

- Press and hold key again.

→ The silage additive pump is switched off. The "Silage additive pump" symbol goes out.

The display shows:



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.

5.17.1.15 Close tailgate

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

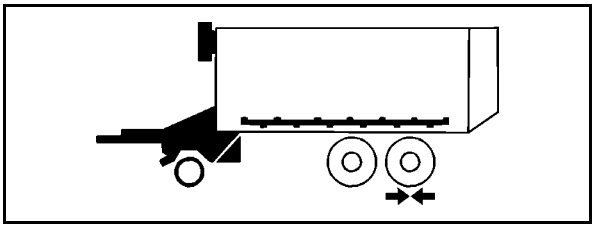
→ The tailgate is closed and the discharge modes "A I" and "A II" are automatically switched off at the same time.

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

1. The transport floor switches off automatically.
2. The tailgate closes.

If the tailgate is completely closed, the "Tailgate closed" symbol appears.

The display shows:



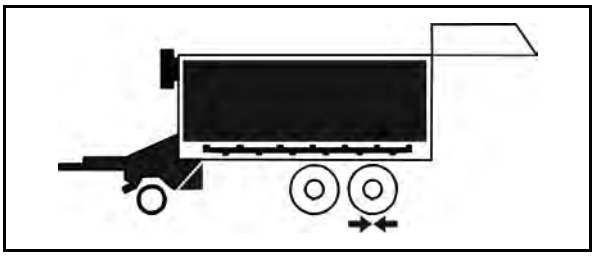
5.17.1.16 Open tailgate

The display shows:

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

  o Forage trailer without metering drums:

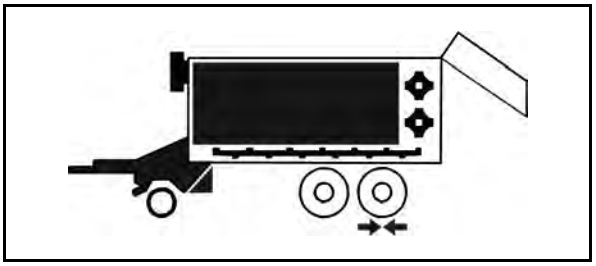
  → If the tailgate is completely open, the "Tailgate open" symbol appears.



  o Forage trailer with metering drums:

  → If the tailgate is open up to the first set opening width, the "Tailgate open" symbol appears.

- Release key and press again. The tailgate opens as long as the key is pressed or until it is completely open.



When discharging on the bunker silo, the tailgate automatically opens after pressing the Discharge Mode II key:

- on forage trailers without metering drums, the tailgate opens completely,
- on forage trailers equipped with metering drums, the tailgate opens up to the set first opening width.

5.17.1.17 Lift folding drawbar

The display shows:

- 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.

no additional symbol

5.17.1.18 Lower folding drawbar

- 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 display shows:

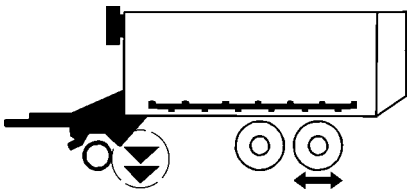
no additional symbol

5.17.1.19 Retract cutting unit

- 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.

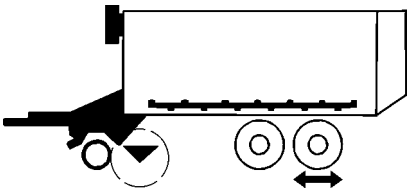
The display shows:



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 display shows:



One or several cutting knives retracted from the conveyor duct

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

The cutting unit is soiled

Clean the cutting unit.

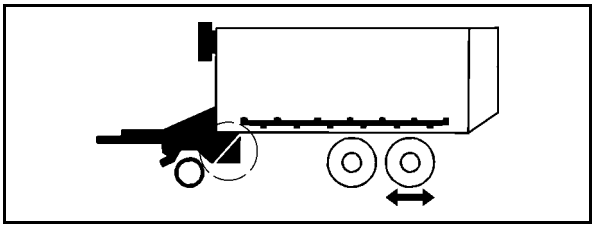
5.17.1.20 Extend cutting unit

Extend the cutting unit only with the feeder rotor running.

- 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 display shows:



5.17.1.21 Lock steering axle

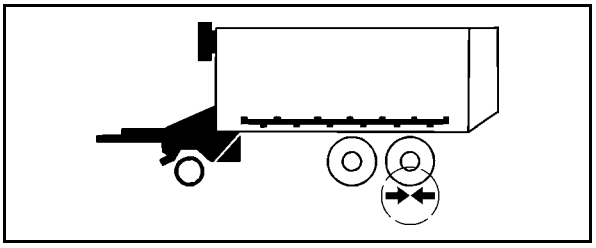
Align the wheels of the steering axle in a straight line by means of a short forward travel of the tractor and the hitched machine before locking the steering axle.

- Press key once.

→ 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 display shows:



Lock steering axle in SES system

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 case of electro-hydraulic forced steering axle system, the steering axle is locked in discharge mode "A I" up to 12 km/h.

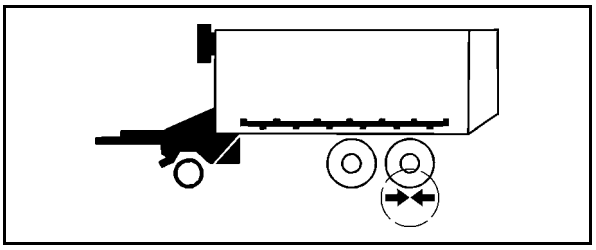
The  key has a touch-control design in the case of the electro-hydraulic forced steering axle system.

- Press 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 display shows:

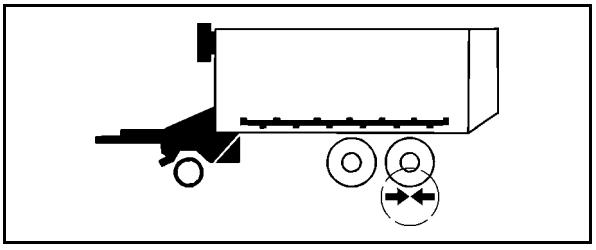


- Press key once.

→ 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 display shows:



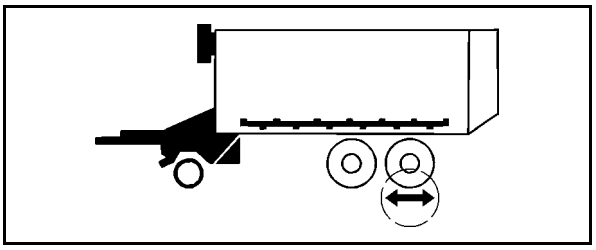
5.17.1.22 Unlock steering axle

- Press key once.

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

→ If the symbol is flashing, the end position could not be reached. An error has occurred. The follow-up steering is activated.

The display shows:



Unlock steering axle in SES system

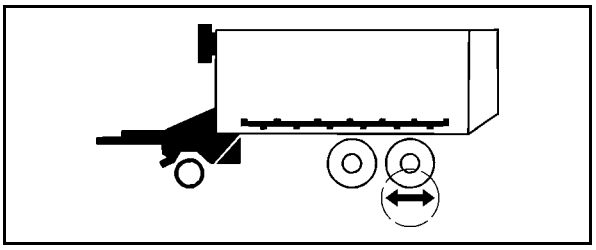
In the case of the electro-hydraulic forced steering axle system, the  key has no function.

- Press key once.

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

→ If the symbol is flashing, the end position could not be reached. An error has occurred. The follow-up steering is activated.

The display shows:



5.17.1.23 Lift pick-up

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

→ The pick-up is lifted.

The display shows:

no additional symbol

5.17.1.24 Lower pick-up

WARNING

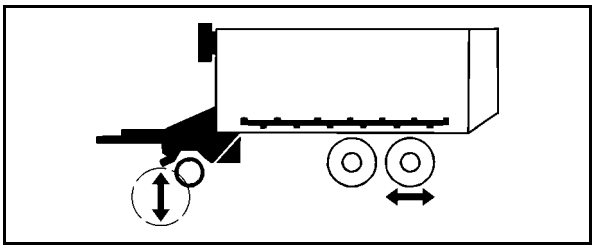
Risk of material damage when travelling on uneven ground with the pick-up lowered / locked.

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

- Press key once.

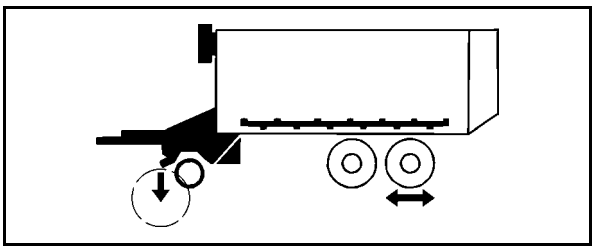
→ The pick-up lowers and is held in open-centre position. The "Lower pick-up / Open-centre position" symbol appears.

The display shows:

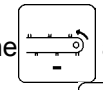


- Press key again.

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



5.17.2 Set machine parameters

The machine parameters can be set in the "SET" menu. Depending on the machine model and the machine's equipment, the indicated symbols may differ. The arrow (1) in the centre indicates which parameter may currently be changed by means of the  and  keys. The arrow (1) can be moved by means of the  key.

5.17.2.1 Switch to "SET" menu

1. Press and hold the  key to switch to the "SET" menu.

→ When 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.

Quickly press the  key to move the arrow (1) down.

Press and hold the  key such that the arrow (1) is pointing to the left. Now the left-hand functions 6 to 7 can be selected.

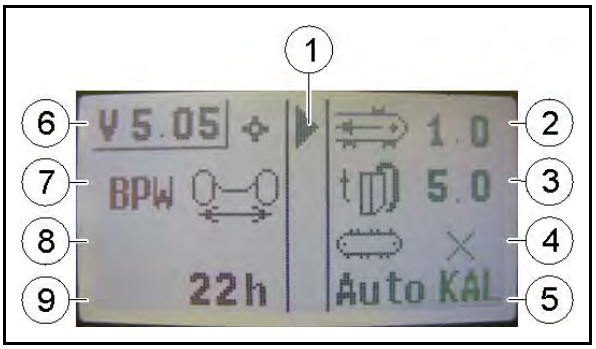
2. Press the  key to return to the "Working" menu.

→ The display shows the "Working" menu.

(2) Time during which the transport floor shall reverse if the "Forage trailer full" switch is switched on when starting the A2 function. (Shall only apply to forage trailers with metering drums!)

(3) Set time (range 0-5 s, step size 0.1 s) during which the tailgate shall be triggered after reaching the sensor "Tailgate 1st opening width". The first opening width can be varied that way. (Shall only apply to forage trailers with metering drums!)

The display shows:



(4) Adjustment of crossover conveyor, possible displays are an arrow to the left, an arrow to the right and a cross. The direction of the arrow specifies the preferred direction of discharge for the crossover conveyor, i.e. the direction in which the crossover conveyor is to start. "Cross" = no crossover conveyor available. Additional setting "W" for "old Wollschläger hydraulic system".

(5) Display of position of potentiometer of automatic charging system (0-100). During calibration of the automatic charging system, "KAL" is displayed instead of the number.

(6) Left-hand: Display of current software version

Right-hand: Select forage trailer model, here forage trailers with metering drums.

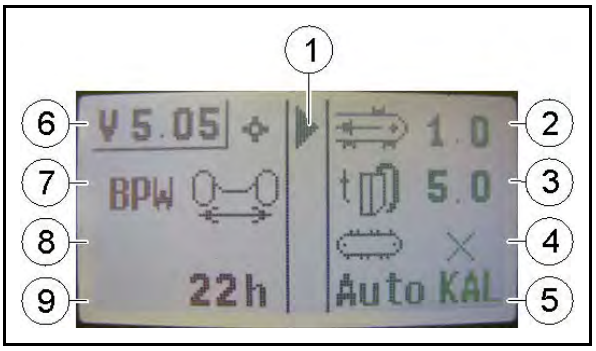
(7) Steering axle model
(BPW / FAD / ZWL / TRI)

(8) Vacant

(9) Total number of service hours

5.17.2.2 Select forage trailer model

The ISOBUS control can only work properly if the correct forage trailer model has been selected.



1. Press and hold the SET key to switch to the "SET" menu.
2. Press and hold the key and select the function (6).
3. Press the keys - and + to change the selected forage trailer model.

→ The symbol is faded in or out.

The symbol:

- must be faded in for forage trailers equipped with metering drums,
- must not be faded in for forage trailers without metering drums.

4. Press the ESC key to return to the "Working" menu.

→ The display shows the "Working" menu.

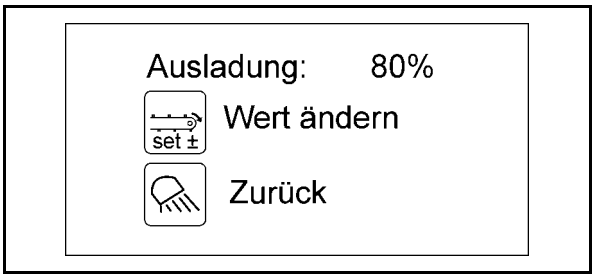
5.17.2.3 Pre-select filling degree of loaded material in cargo space

The filling degree of the loaded material in the cargo space can be pre-selected. 80 % and 100 % are the options which are available. Select the filling degree as follows:

- 80 % for wet, heavy loaded material,
- 100 % for dry, lighter loaded material. At a filling degree of 100 %, the loaded material in the cargo space will be more tightly compressed and the cargo space will be filled to a larger extent.

1. Press the SET and Auto keys to switch to the "Filling degree" menu.
2. Press the set ± key to select the desired filling degree of 80 % or 100 %.

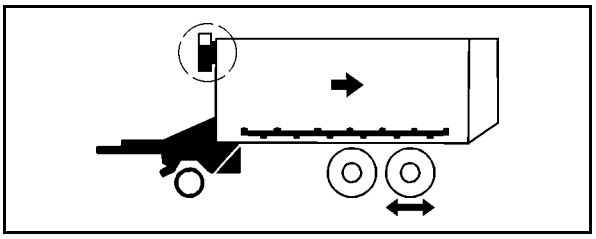
→ The number next to the word "Ausladung" indicates the selected filling degree, 80 % in this case.



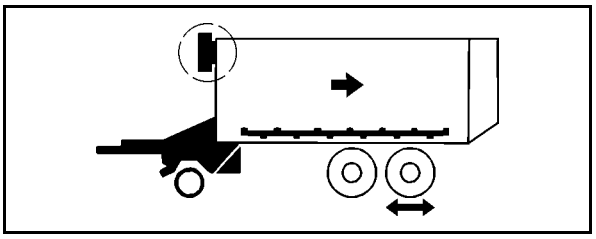
3. Press the ESC key to return to the "Working" menu.

→ The display shows the "Working" menu.

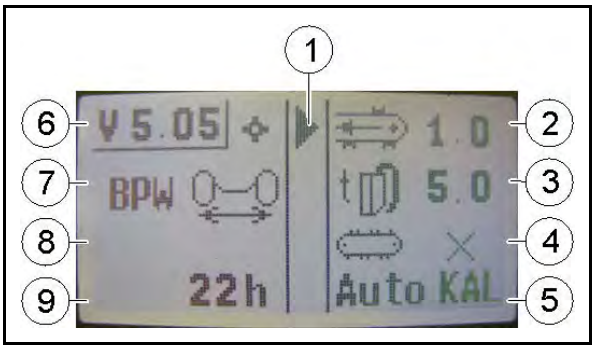
- "Automatic charging system switched on 80 %" or



- "Automatic charging system switched on 100 %".



5.17.2.4 Pre-select axle model for steering axle



1. Press and hold the SET key to switch to the "SET" menu.
2. Press and hold the key and select the function (7).
3. Press the - and + keys to change the selected axle model.

→ The selected axle model for the steering axle is displayed:

- BPW = single-acting hydraulic cylinder = axle model BPW, FAD or forced steering axle,
- FAD = double-acting hydraulic cylinder = axle model FAD,
- ZWL for electronic forced steering axle.

Observe the fact that the setting "BPW" must be selected both for the single-acting BPW-type axle and for the FAD-type axle!

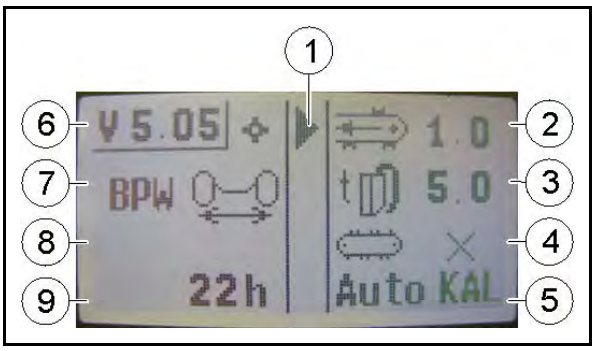
4. Press the ESC key to return to the "Working" menu.

→ The display shows the "Working" menu.

5.17.3 Calibration of 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 terminal on the tractor.

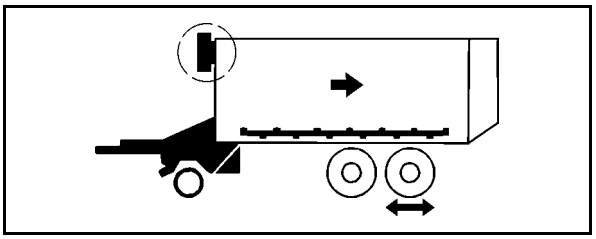
1. Hitch the machine to the tractor.
2. Turn the tractor engine off.
3. Apply the parking brake of the tractor.
4. A second person enters the cargo space through the access door.
5. Switch the tractor ignition on.



6. Press and hold the SET key to switch to the "SET" menu.
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 to start the calibration mode.

→ The display shows the letters KAL.

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 to leave the calibration mode.
11. Press the STOP key to acknowledge the settings and to finish the calibration procedure.
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 collisions.



13. Press the ESC key to return to the "Working" menu.

→ The display shows the "Working" menu.

5.17.4 Service hours and transported loads counter

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

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

- 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, but must be reset manually.
- The total number of service hours counter, the total number of operating hours counter and the total number of transported loads counter cannot be reset.

The total number of service hours counter is displayed in the "SET" menu.

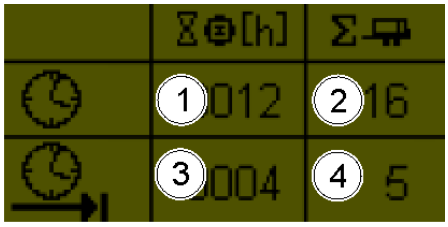
SET

1. Quickly press the SET key.

→ The "Service hours and transported loads counter" menu is displayed:

(1) Total number of operating hours counter
(2) Total number of transported loads counter
(3) Daily operating hours counter
(4) Daily transported loads counter

The display shows:



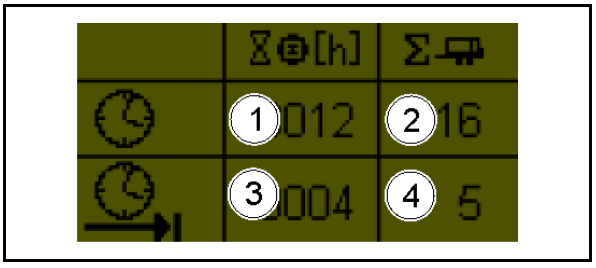
2. Press the ESC key to return to the "Working" menu.

→ The display shows the "Working" menu.

5.17.4.1 Reset daily service hours counter and daily transported loads counter

1. Quickly press the SET key.

→ The "Service hours and transported loads counter" menu is displayed.



2. Press and hold the SET key again.

→ Daily service hours counter and daily transported loads counter are reset.

3. Press the ESC key to return to the "Working" menu.

→ The display shows the "Working" menu.

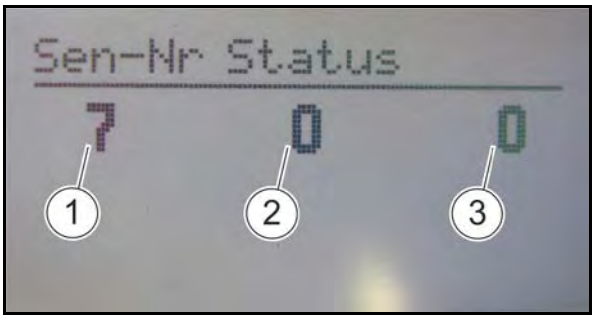
5.17.5 Sensor and state overview

SET

1. Quickly press the SET key and the key one after the other.

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

The display shows:



(1) Sensor number
(2) Sensor state
(3) Number of sensor circuits

2. Press the ESC key to return to the "Working" menu.

→ The display shows the "Working" menu.

5.17.5.1 Sensor connections

Sensor	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 beep is emitted
4: Steering axle free	0: No response of sensor 1: Reponse of sensor
5: Forage trailer full	0: No response of sensor 1: Reponse of sensor
6: Tailgate level 1	0: No response of sensor 1: Reponse of sensor
7: Tailgate level 2	0: No response of sensor 1: Reponse of sensor
8: Tailgate closed	0: No response of sensor 1: Reponse of sensor
9: Speed at metering unit	0: No response of sensor 1: Reponse of sensor

5.18 SES system

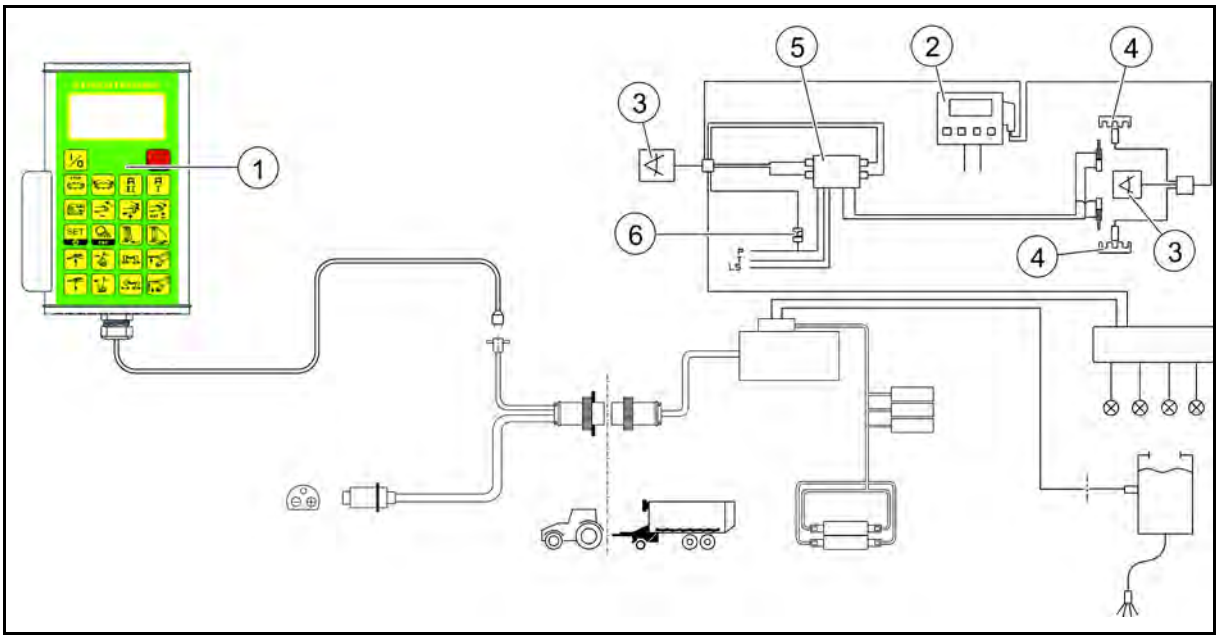


Fig. 74

Optional extra

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

- the terminal (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 two angle sensors (3) and two speed sensors (4), 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 (2) transmits the information to an electrically actuated hydraulic valve and thus controls the steering cylinders of the steerable axles. The pressure switch (6) 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 in the terminal display,
- 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.

5.18.1 Displays on the steering computer

The steering computer (1) is equipped with an additional module (2). As soon as the steering computer (1) is connected to the power supply, the display of the additional module (2) shows a status indicator.

Open the cover (3) to read the status indicator. The cover can be opened by:

1. turning the Camloc lock.
2. slightly lifting and folding down the cover (3).

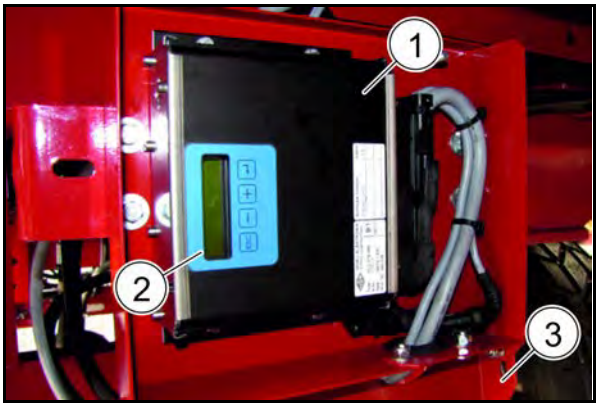


Fig. 75

(1) Display. Depending on the status, the following appears:

- a status indication.
- an error message.

Key functions:

(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

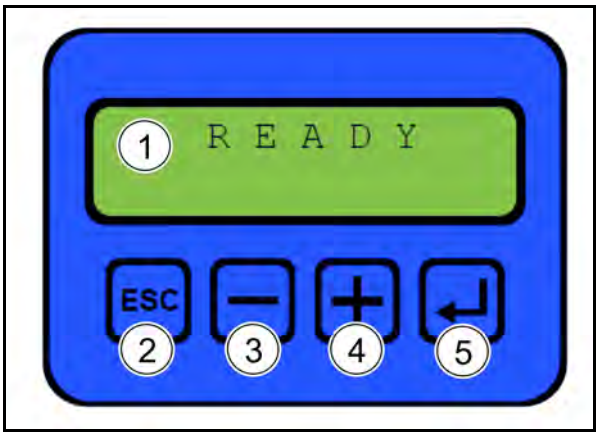


Fig. 76

The following read-outs are available:

Read-out	Explanation
READY	Hydraulic system ready for operation
Standby	Hydraulic system not ready for operation, no hydraulic supply
COUPLING	Steering rods not coupled or specified steering range exceeded
alarm code xxx-xxx-xx	Error message; an active error has been detected

Several active errors are successively indicated in the display of the additional module by means of an error message.

5.18.2 Error diagnosis

In the case of an error message, have the machine ID no. (17-digit) ready and contact our customer service under

Phone: + 49 (0) 5424 802-0.

Individual or all error messages can only be cleared by the Strautmann customer service.

The additional module is equipped with an error diagnosis function indicating the following information:

- "alarm index/code" = message regarding the assignment of errors referring to the electronic system,
- "time first entry" = time of first occurrence,
- "time last entry" = time of last occurrence,
- "frequency" = frequency of occurrence,
- "trouble code" = message regarding the assignment of error referring to the axles.

1. Press the "ENTER" key for approx. 2 seconds.

→ The error diagnosis menu appears.

2. Select the menu item "alarm memory" by means of the "MINUS" or "PLUS" key.
3. Press the "ENTER" key.

→ The first stored error message is displayed.

4. Press the "MINUS" or "PLUS" key as often as to ensure that the desired error message is displayed.
5. Press the "ENTER" key.

→ The details referring to the selected error message are successively displayed.

6. Press the "ESC" key to exit the error diagnosis menu.

6 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:
  - o have read and understood these operating instructions.
  - o lubricate all lubrication points.
- When commissioning the machine, additionally observe the information included in the chapters:
  - o "Operator's obligation", page 31,
  - o "Qualification of staff", page 32,
  - o "Basic safety instructions", page 35,
  - o "Warning and instruction signs", page 48,
  - o "Service and maintenance of machine", page 198.

  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:
  - o length of propeller shaft. Observe the information in the chapter "Adjust length of propeller shaft to tractor", page 173.
  - o Setting of pressure regulator. Observe the information in the chapter "Load-sensing hydraulic system with load-sensing control line", page 73.

  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.

6.1 Road traffic regulations

Observe the national road traffic regulations when travelling on public roads.

Owner (user) and driver (operator) of the vehicle are responsible for observing the national road traffic regulations.

6.2 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.

6.2.1 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.

6.2.2 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.

6.2.2.1 Combination options of coupling devices and drawgears

Tab. 3 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 6489-2	• 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

Tab. 3

6.2.2.2 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, you will have to calculate the admissible towing capacity for your tractor. 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:

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

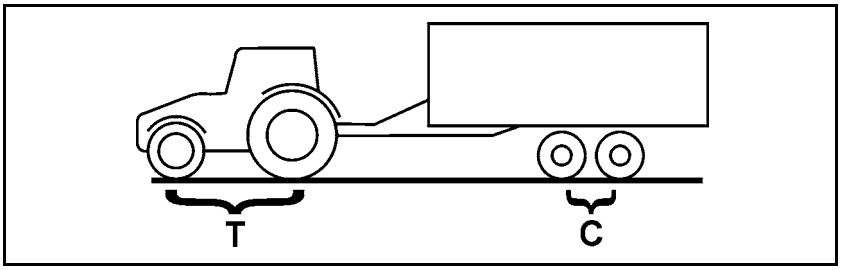


Fig. 77 D_C value of combination

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]

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

6.2.2.3 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 loading 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]

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 [kN]
D_C value of machine's drawgear:	77.5 [kN]
D_C value for the combination to be coupled:	77.2 [kN

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

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.

6.3 Secure tractor and machine against accidental starting and rolling

WARNING

Risk of crushing, shearing, cuts, amputation, becoming entangled, wound up, being drawn in and risk of impact to people during work on the machine:

- **if the unsecured machine not hitched to the tractor accidentally rolls,**
- **if powered working tools are not switched off,**
- **if hydraulic functions are accidentally carried out, working tools or machine parts are unintentionally powered with the machine hitched to the tractor and the tractor engine running,**
- **if the tractor engine is accidentally started,**
- **if tractor and machine accidentally roll,**
- **if lifted machine parts accidentally come down.**

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

Therefore, the following measures are imperative before carrying out any work on the machine such as adjusting work or trouble-shooting:

- secure the machine against rolling with the machine not hitched to the tractor,
- turn the tractor engine off and secure tractor and machine against accidental starting and rolling with the machine hitched to the tractor,
- make sure that third persons (children) leave the tractor,
- secure lifted machine parts against accidental lowering.

Secure 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 if necessary.
7. Secure the machine against rolling:
   - on even ground by means of the parking brake or the chocks,
   - on extremely uneven ground or downhill gradients by means of the parking brake and the chocks.

6.4 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 of the cargo space and entering the cargo space.

1. Open access door (1):
   - 1.1 Use your left hand to hold the folding access ladder (2).
   - 1.2 Swivel the locking mechanism (3) upwards.
   - → Access ladder and access door are unlocked.
   - 1.3 Fold the access ladder down.
   - 1.4 Open the access door.
2. Use the handle (4) when entering the cargo space.
3. Close access door:
   - 3.1 Swivel the locking mechanism upwards.
   - 3.2 Close the access door.
   - 3.3 Fold the access ladder up.
   - 3.4 Swivel the locking mechanism downwards such that it safely engages behind the locking bars (5).
   - → Access ladder and access door are locked in transport position.

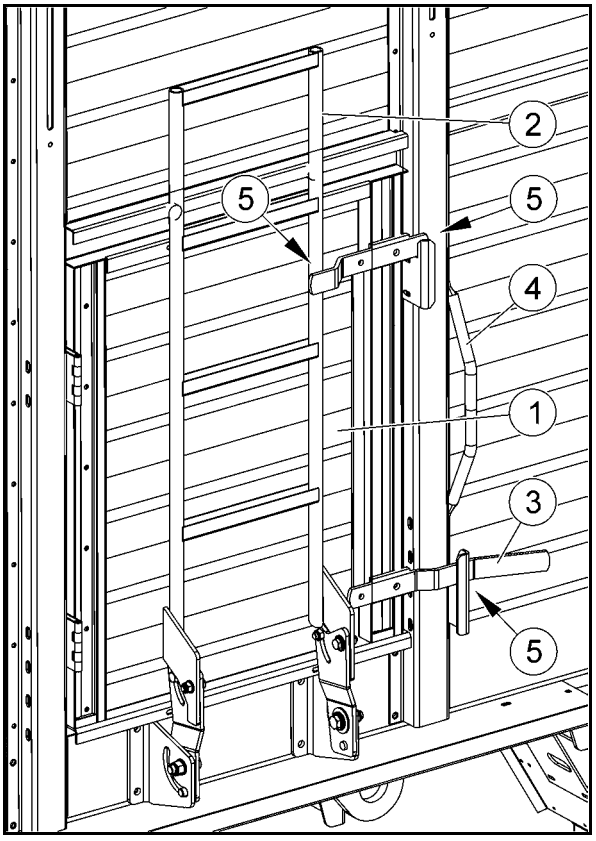


Fig. 78

6.5 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!

Screw the tubular supports to the side panels such that the maximum vehicle height of 4 m is not exceeded.

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

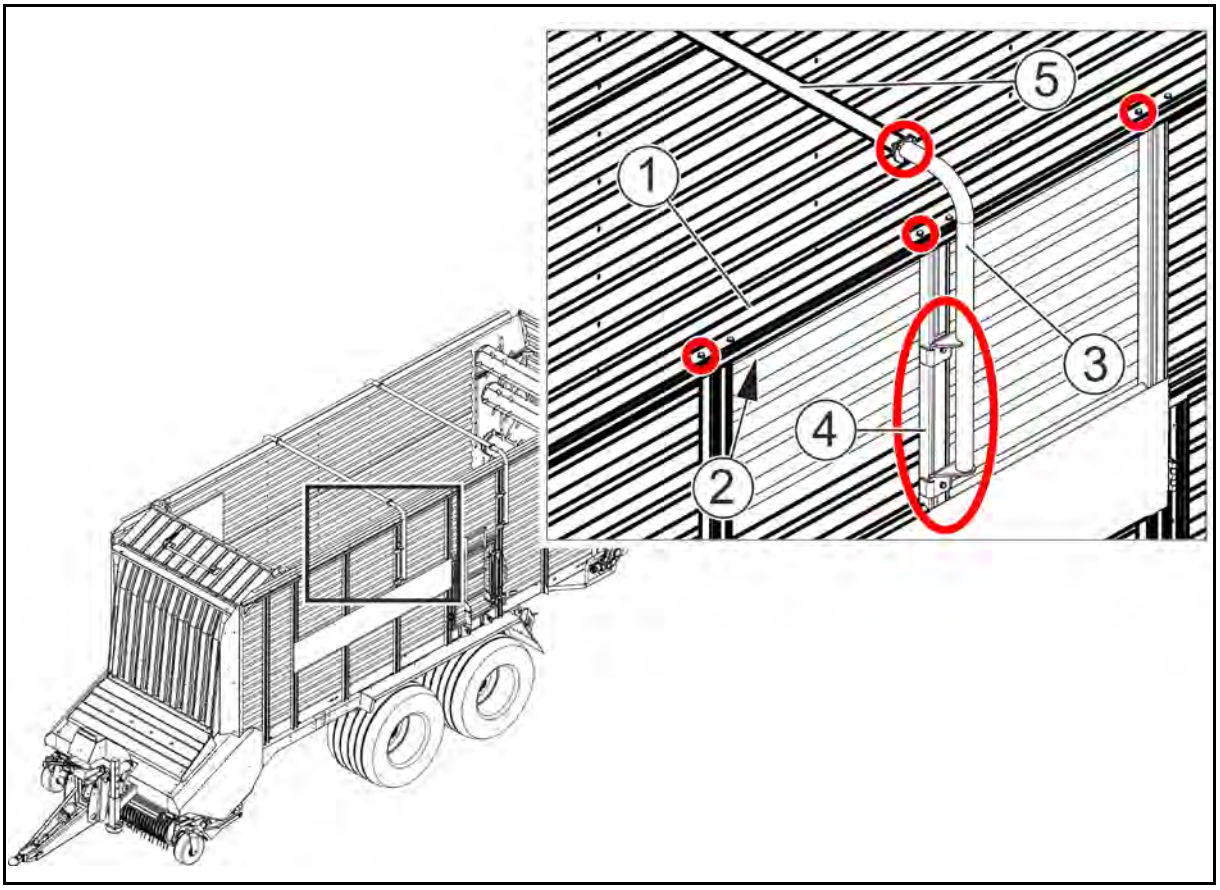


Fig. 79

1. Secure the machine against accidental rolling.

   When the machine has been hitched to the tractor, secure it against accidental starting and rolling.

   For details, refer to the chapter "Secure tractor and machine against accidental starting and rolling“.

2. Mount the attachment sections (1) on the body structures (2). Fitting points: see markings in fig. 79.

3. Mount the side elements of the tubular supports (3) to the fixing supports (4). Fitting points: see markings in fig. 79.

4. Mount the central sections of the tubular supports (5) to the side elements of the tubular supports (3). Fitting points: see markings in fig. 79.

   Please note: The tubular supports can be mounted at different heights. Make sure not to exceed the maximum vehicle height of 4 m.

   The distance between the front tubular support and the front panel varies depending on the machine length. The distance between the tubular supports is always the same (Fig. 80).

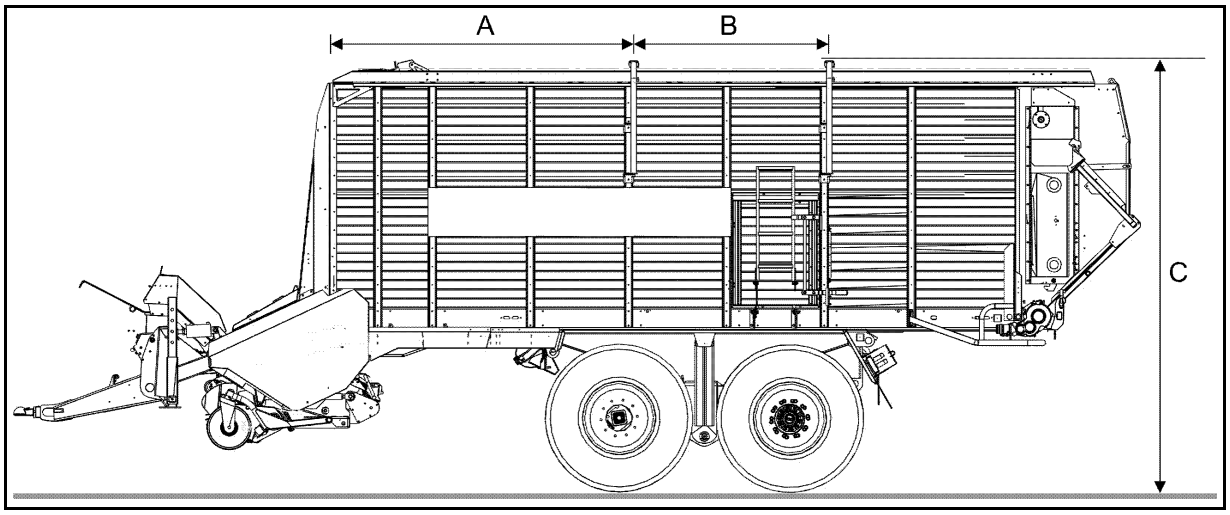


Fig. 80

	Mega-Vitesse CFS					
	3001	**3001 DO**	**3401**	**3401 DO**	**3801**	**3801 DO**
A	1,85 m		2,75 m		2,75 m	
B	constant					
C	max. 4,00 m					

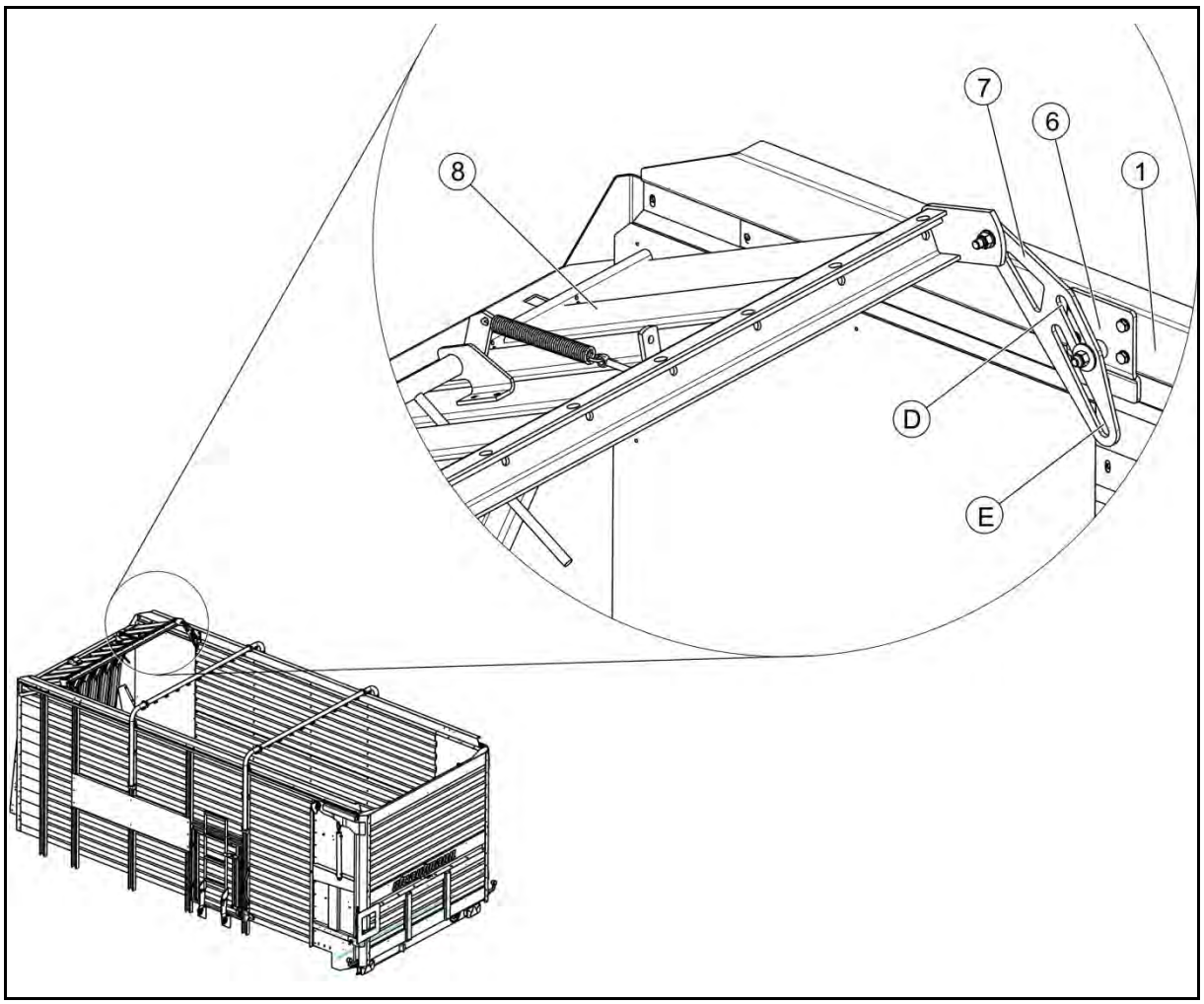


Fig. 81

5. Mount the bearing journals (6) at the attachment sections (1).

6. Mount the slide rails (7) on the bearing journals (6).

7. Swivel the loading frame (8) upwards and screw it to the slide rails (7).

   Observe the fact that the position of the slide rails differs depending on the tyres (Fig. 81):

   D = Position with 22.5″ tyres

   E = Position with 26.5″ tyres

8. Fasten the ropes at the loading frame:

8.1 Thread each rope with the loop (1) through a hole (2) in the loading frame.

8.2 Put the other end (3) of the rope through the loop (2).

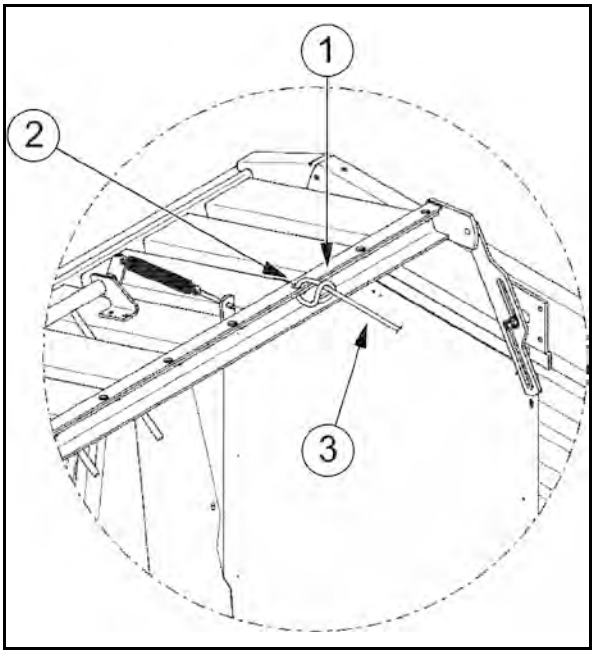


Fig. 82

9. Pull the ropes from the bottom through the eye of the central tubular support.

Fig. 83

10. On **machines with metering drums,** first fasten the body tarpaulin:

10.1 Mount the connecting tube (1) on the attachment sections (2).

10.2 Put the body tarpaulin (3) across the connecting tube (1).
The hemstitch of the body tarpaulin is equipped with slots to accommodate the eyes (5) at the tailgate.

10.3 Push the tarpaulin rod (4) through the eyes (5) at the tailgate and through the hemstitch of the tarpaulin.

10.4 Secure the tarpaulin rod (4) at both ends against slipping out by means of the safety bolts (6).

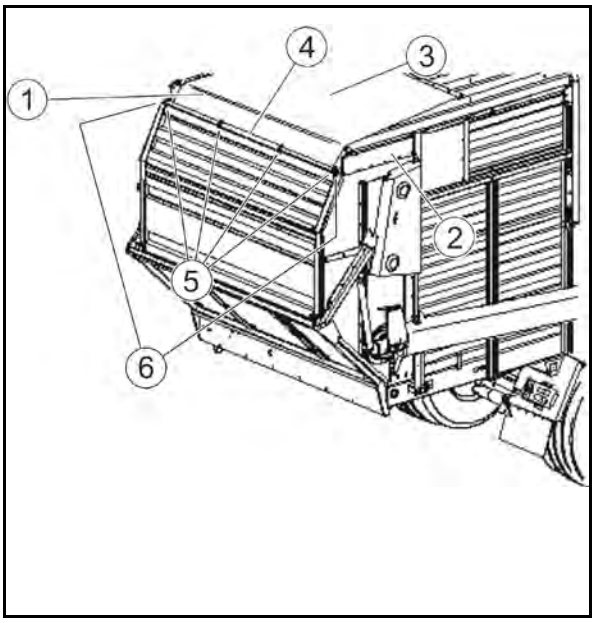


Fig. 84

11. Hang the rope hooks of the rubber clamp into the rear tubular support or into the eyes of the body tarpaulin respectively.

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

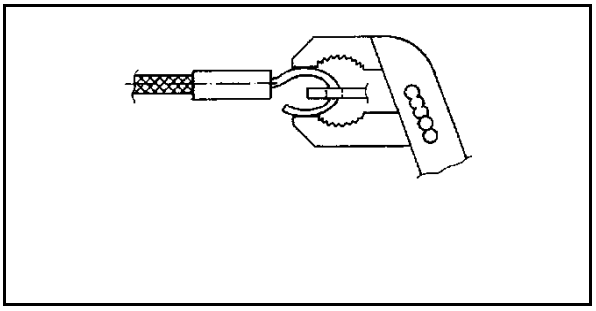


Fig. 85

6.6 Mount terminal on the tractor

6.6.1 Mount easy-to-use terminal on the tractor

1. Fix the control set (1) in the cabin within view and reach to the driver's right.
2. Plug the 3-pole plug (DIN 9680) of the power cable (2) into the socket of the tractor.
   (Pole 15/30 = Plus; Pole 31 = Minus)
3. Plug the control cable (3) of the control set into the socket of the power unit.

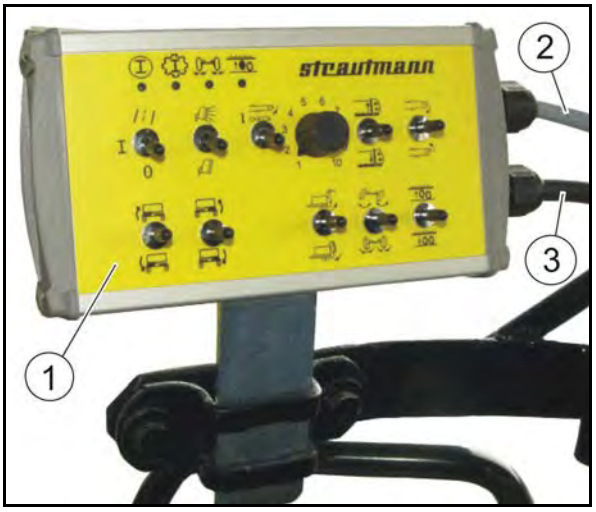


Fig. 86

6.6.2 Mount ISOBUS terminal on the tractor

- 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 should have a minimum cable cross section of 4 mm².

1. Fix the control set (1) in the cabin within view and reach to the driver's right.
2. Connect the signal plug (2) of the terminal 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)

   Not necessary if the tractor is equipped with an ISOBUS cable harness.
4. Depending on the machine's equipment, plug:
   - the ISO socket (5) of the mobile cable harness into the ISO plug of the control unit on the machine.
   - the ISO plug of the control unit into the ISO socket of the tractor.

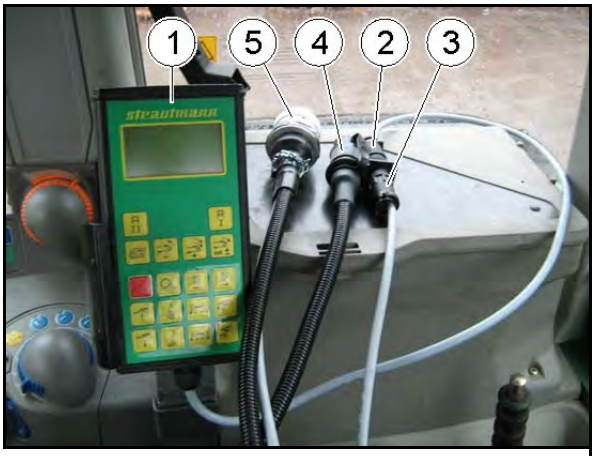


Fig. 87

6.7 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 authorized 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.

WARNING

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

Only an authorized workshop is allowed to adjust the mounting height of the folding drawbar.

WARNING

Risk of crushing, becoming entangled, being drawn in and risk of impact to people when adjusting the mounting height of the folding drawbar due to accidental starting and rolling of the tractor!

Secure tractor and machine against accidental starting and rolling before entering the hazardous area between the tractor and the machine for adjusting the mounting height.

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.

The distance X must be 1180 mm between the ground and the machine frame with the forage trailer 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 (Fig. 89/1) if you cannot reach the required distance X, in particular in case of bottom linkage.

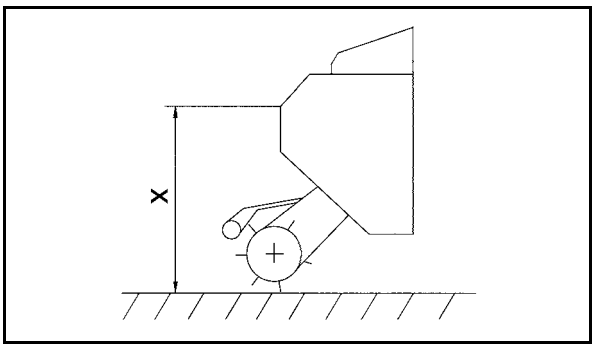


Fig. 88

Instructions for authorized workshop:

1. Park the tractor and the hitched machine on even ground.
2. Lower the folding drawbar. Completely retract the hydraulic cylinders of the folding drawbar.
3. Secure tractor and machine against accidental starting and rolling.

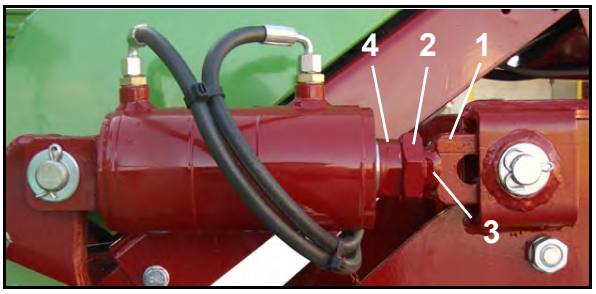


Fig. 89

4. Unscrew the counter nut (2) of the threaded spindle (3).
5. Turn the piston rod (4) of the two hydraulic cylinders alternately in the required direction.

   Increase distance X = turn piston rod clockwise

   Reduce distance X = turn piston rod anticlockwise

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.

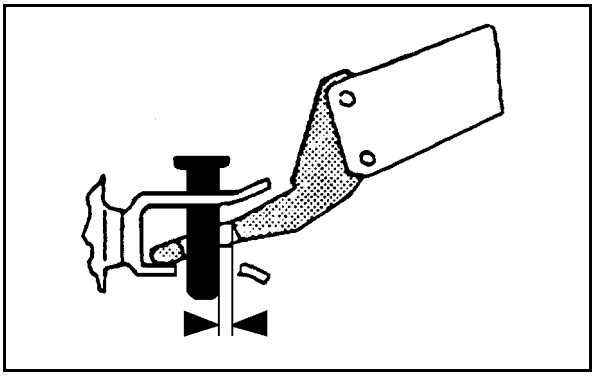


Fig. 90

6.8 Mount shell to folding drawbar (shop work)

WARNING

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

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

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.

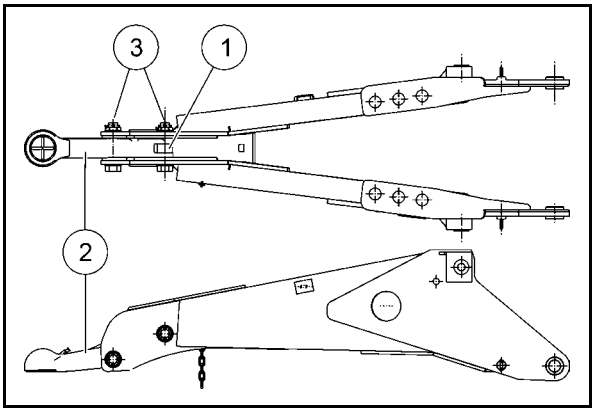


Fig. 91

6.9 Mount crossover conveyor

Two people are required for mounting the crossover conveyor.

1. Hitch the machine to the tractor.
2. Check whether the tailgate is completely closed. If not, close the tailgate completely.
3. Completely lower the folding drawbar.
4. Secure tractor and machine against accidental starting and rolling.
5. Adjust the lamp brackets (1) with respect to the tailgate (2):
   - 5.1 Lift the lamp brackets (1).
   - 5.2 Pull the locking bolt (3) out as far as it will go.
   - 5.3 Tilt the lamp bracket (1) over to the rear.
   - 5.4 Position the lamp bracket (1) in the rear keyhole profile (4) by means of the locking bolt (3).
   - 5.5 Press the lamp bracket (1) down again.
6. Unlock the tailgate from its closed position:
   - 6.1 Always use one hand to hold the tailgate while removing the two locking bolts (5).
   - 6.2 Unlock and remove the two locking bolts (5).
   - → The tailgate swivels downwards / backwards (Fig. 93).

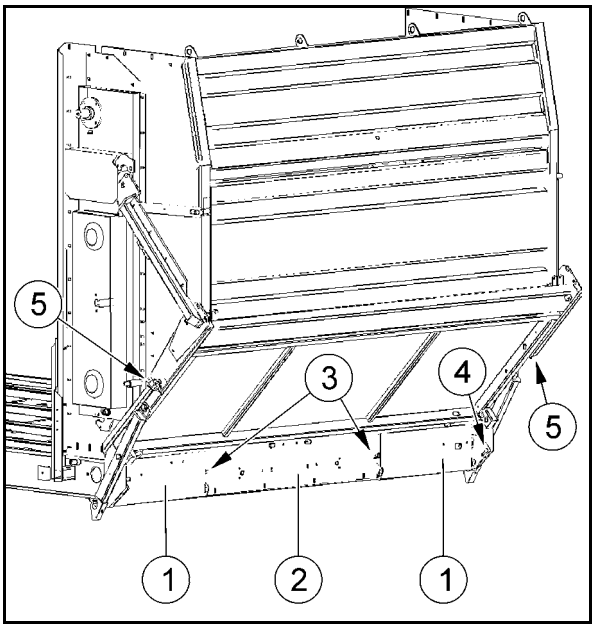


Fig. 92

7. Insert the two locking bolts (5) into the upper boreholes of the side bars (6) and secure them.

→ Thus, the tailgate cannot swivel forward again.

8. Fasten both receiver pipes (7) in the front borehole (8).
9. Remove both locking bolts (9) from each receiver crossbeam (10).
10. Insert one locking tube (11) each at the front of the crossover conveyor.
11. Lift the crossover conveyor above the locking tubes and put the crossover conveyor down onto the pulleys in upright position.
12. Roll the crossover conveyor beneath the transport floor such that the receiver crossbeams (10) can take up the crossover conveyor.
13. Lift the crossover conveyor into the receiver crossbeams.
14. Secure the crossover conveyor in each receiver crossbeam (10) by means of the two locking bolts (9).
15. Insert the locking tubes (11) at the bottom of the crossover conveyor.
16. Remove the locking bolt from each locating hook (12).
17. Swivel the crossover conveyor upwards (Fig. 94).
18. Put the crossover conveyor down onto the locating hooks (12) on both sides.
19. Push the locking tubes (11) into the crossover conveyor.
20. Insert the locking bolt (13) into each locating hook 12).

→ Crossover conveyor and locking tubes are secured.

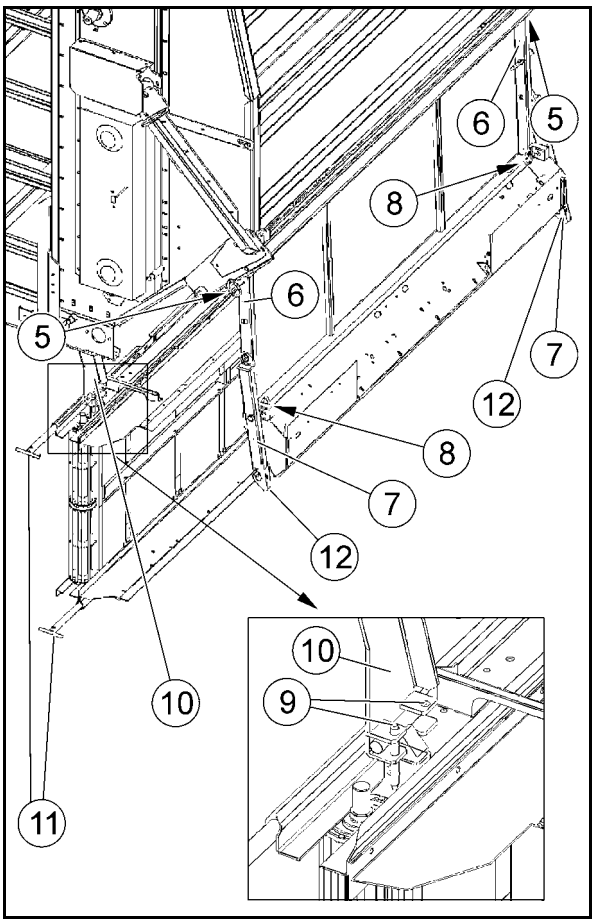


Fig. 93

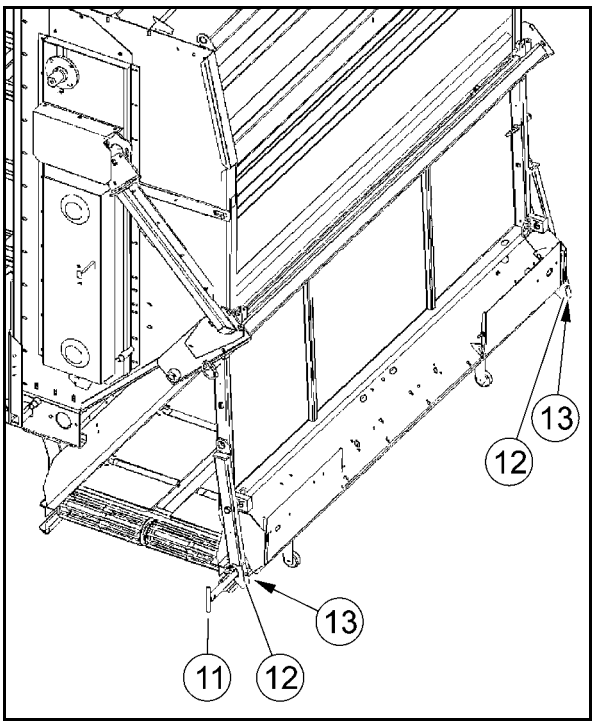


Fig. 94

21. Connect the hydraulic hose pipes (14) of the hydraulic motor (15) with the coupling devices provided for that purpose (16).
22. Close the stop-cock (17) to secure the tailgate against accidental opening.

    Opening of the tailgate with the crossover conveyor mounted will damage the tailgate and the crossover conveyor.
23. Activate the crossover conveyor in the ISOBUS terminal if necessary.

→ The crossover conveyor is ready for use and is operated via the ISOBUS terminal.

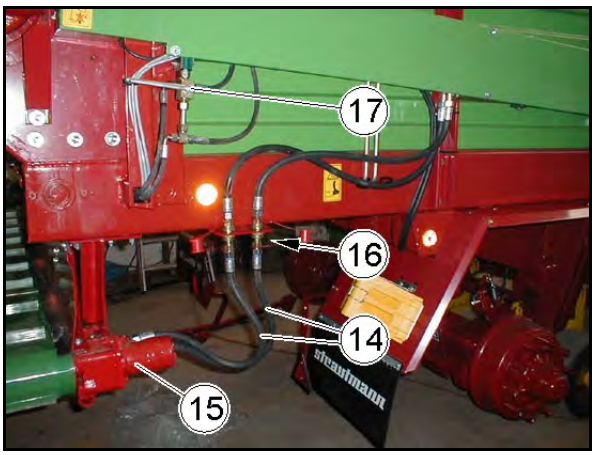


Fig. 95

6.10 Remove crossover conveyor

Two people are required for removing the crossover conveyor.

1. Hitch the machine to the tractor.
2. Completely lower the folding drawbar.
3. Secure tractor and machine against accidental starting and rolling.

4. Disconnect the hydraulic hose pipes (14) coming from the hydraulic motor (15) at the coupling devices (16) provided for that purpose. (Fig. 96)

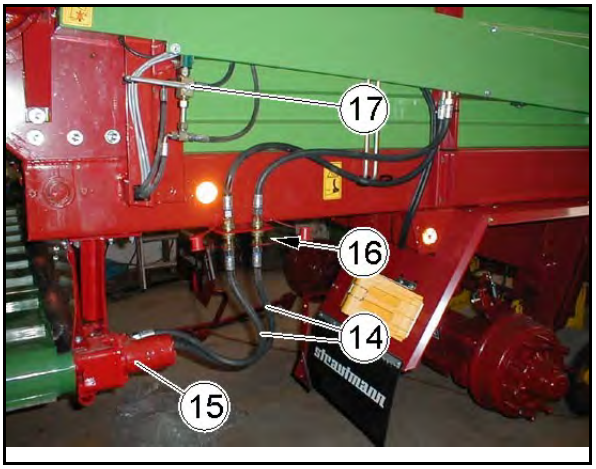


Fig. 96

5. Disconnect the conveyor belt and swivel it to the ground:

5.1 Remove the locking bolt (13) from each locating hook (12).

5.2 Pull the locking tubes (11) out of the crossover conveyor by approx. 15 cm.

5.3 Lift the crossover conveyor out of the locating hooks (12) and swivel it to the ground.

5.4 Insert the locking bolt (13) into each locating hook (12).

5.5 Insert the locking tubes (11) at the top of the crossover conveyor.

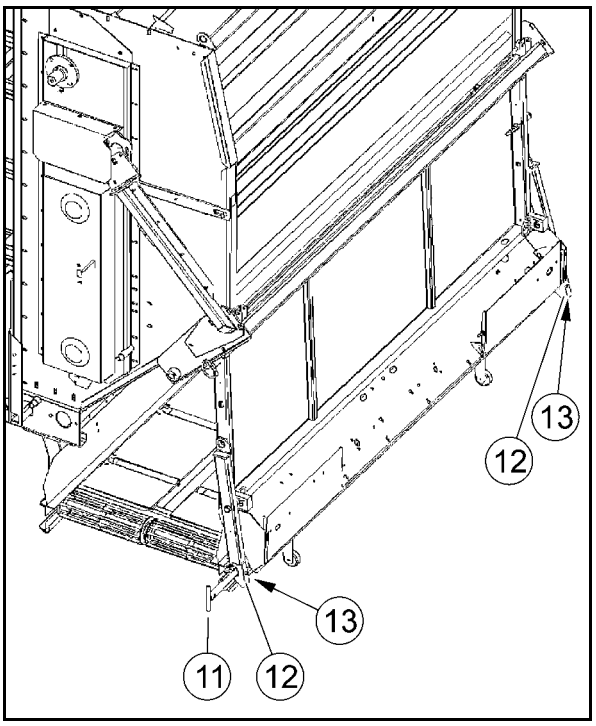


Fig. 97

5.6 Unlock the crossover conveyor at each receiver crossbeam (10) by means of the two locking bolts (9).

5.7 Lift the crossover conveyor out of the receiver crossbeams and roll it into its storage position.

5.8 Insert both locking bolts (9) into each receiver crossbeam (10).

6. Fasten both receiver pipes (7) in the rear borehole (8).

7. Secure the tailgate in its closed position:

7.1 Unlock and remove the two locking bolts (5).

7.2 Move the tailgate into its closed position and insert both locking bolts (5) into the upper boreholes of the side bars (6) and secure them.

→ Thus, the tailgate cannot swivel backwards again.

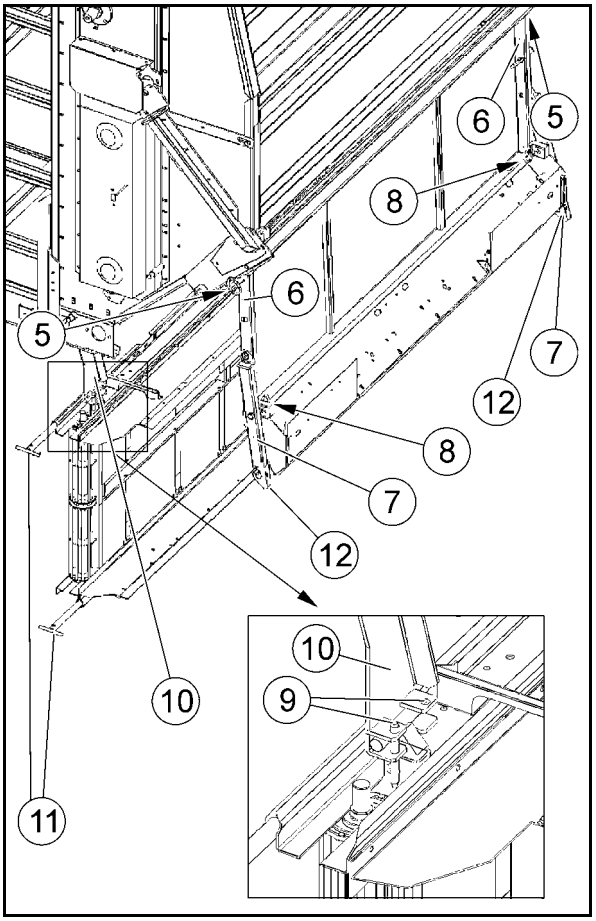


Fig. 98

8. Adjust the lamp brackets (1) with respect to the tailgate (2):

8.1 Lift the lamp brackets (1).

8.2 Pull the locking bolt (3) out as far as it will go.

8.3 Tilt the lamp bracket (1) over to the front.

8.4 Position the lamp bracket (1) in the rear keyhole profile (4) by means of the locking bolt (3).

8.5 Press the lamp bracket (1) down again.

9. Loosen the stop-cock (Fig. 96/17) such that the tailgate can be moved again.

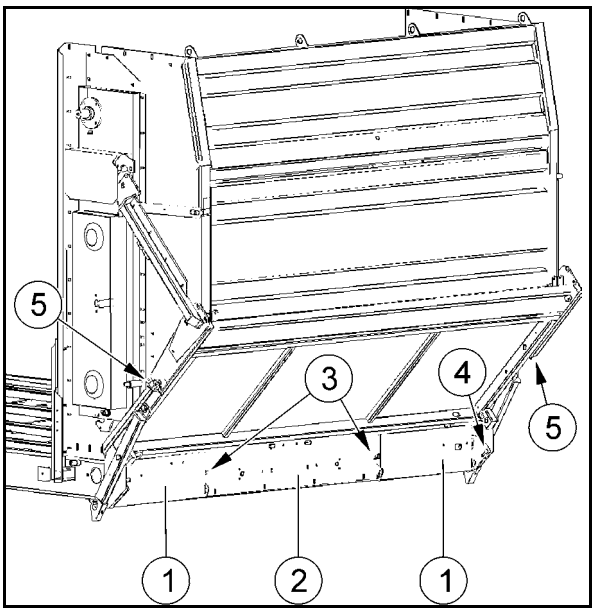


Fig. 99

6.11 Adjust length of propeller shaft to the 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.

WARNING

Risk to people of being crushed due to the tractor and the hitched machine accidentally rolling!

Secure tractor and machine against accidental starting and rolling before entering the hazardous area between the tractor and the hitched machine for adjusting the propeller shaft.

- The propeller shaft reaches its shortest operating position during extreme cornering. The propeller shaft reaches its longest operating position with the folding drawbar folded.
- 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.

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. Secure the tractor against accidental starting and rolling before entering the hazardous area between tractor and machine.
4. Pull the propeller shaft apart.
5. 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.
6. 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.
7. Observe the included operating instructions for the propeller shaft when determining the length and when shortening the propeller shaft.
8. Reinsert the shortened propeller shaft halves into each other.
9. Lubricate the p.t.o shaft of the tractor and the machine's p.t.o. shaft before coupling the propeller shaft.

6.12 Check machine for proper functioning

Check the machine for proper functioning before the first startup and each time before starting work.

1. Completely lubricate the machine and the propeller shaft. Observe the information in the chapter "Lubrication of machine", page 203.
2. Check the oil level of the individual gearboxes. Observe the information in the chapter "Check oil level", page 206.
3. Check all functions of the machine before charging the machine for the first time:
   - 3.1 Lift and lower pick-up.
   - 3.2 Open and close tailgate.
   - 3.3 Check the brake system for proper functioning.
4. Check the set travelling height of the hydraulic levelling device. Observe the information in the chapter "Check travelling height of hydraulic levelling device", page 80.

6.13 Start-up after longer downtime

6.13.1 Bleed friction clutch of pick-up

The friction clutch of the pick-up must be bled before the first start-up and after longer downtimes to ensure its proper functioning. Observe the information in the chapter "Service and maintenance of machine", page 212.

7 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 31.

Observance of these instructions serves your safety.

WARNING

Risk to people of being crushed due to the tractor and the machine accidentally starting and rolling when hitching or unhitching the machine!

Secure tractor and machine against accidental starting and rolling before entering the hazardous area between tractor and machine for carrying out hitching or unhitching work.

Observe the information in the chapter "Secure tractor and machine against accidental starting and rolling“, page 158.

7.1 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 154.

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 vehicles after the vehicles have stopped.

WARNING

Risk of crushing, cuts, being drawn in, becoming entangled and risk of impact to people 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 for load-sensing hydraulic system:

- Check the pressure regulator for correct setting. Observe the information in the chapter "Load-sensing hydraulic system with load-sensing control line", page 73.
  - 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 31.
2. Couple the drawbar. Observe the information in the chapter "Couple drawbar", page 87.
3. Connect the hydraulic hose pipes. Observe the information in the chapter "Connect hydraulic hose pipes", page 77.
4. Connect the service brake system. Observe the information in the chapter "Connect brake and feed line", page 92.
5. Couple the propeller shaft. Observe the information in the chapter "Couple propeller shaft", page 99.
6. Connect the lighting system.
7. Connect the ISOBUS terminal. Observe the information in the chapter "Mount ISOBUS terminal on the tractor", page 165.
8. Release the parking brake. Observe the information in the chapter "Parking brake", page 109.

7.2 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.

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

1. Always check the machine for visible defects during hitching. Observe the information in the chapter "Operator's obligation", page 31.
2. Uncouple the drawbar. Observe the information in the chapter "Uncouple drawbar", page 89.
3. Disconnect the hydraulic hose pipes. Observe the information in the chapter "Disconnect hydraulic hose pipes", page 77.
4. Disconnect the brake system. Observe the information in the chapter "Disconnect brake and feed line", page 94.
5. Uncouple the propeller shaft. Observe the information in the chapter "Uncouple propeller shaft", page 100.
6. Disconnect the lighting system.
7. Disconnect the ISOBUS terminal. Observe the information in the chapter "Mount ISOBUS terminal on the tractor", page 165.
8. Move the tractor forward.

8 Settings

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

- "Basic safety instructions", page 35,
- "Warning and instruction signs", page 48.

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 adjusting 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!**

- Secure tractor and machine against accidental starting and rolling before carrying out adjusting work on the machine hitched to the tractor.

  Observe the information in the chapter "Secure tractor and machine against accidental starting and rolling“, page 158.

- Wait for the machine to stop completely before entering the hazardous area of the machine.

8.1 Pick-up

8.1.1 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.

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 (2) into the desired borehole.
5. Secure the pick-up spindle by means of the bottom linch pin.

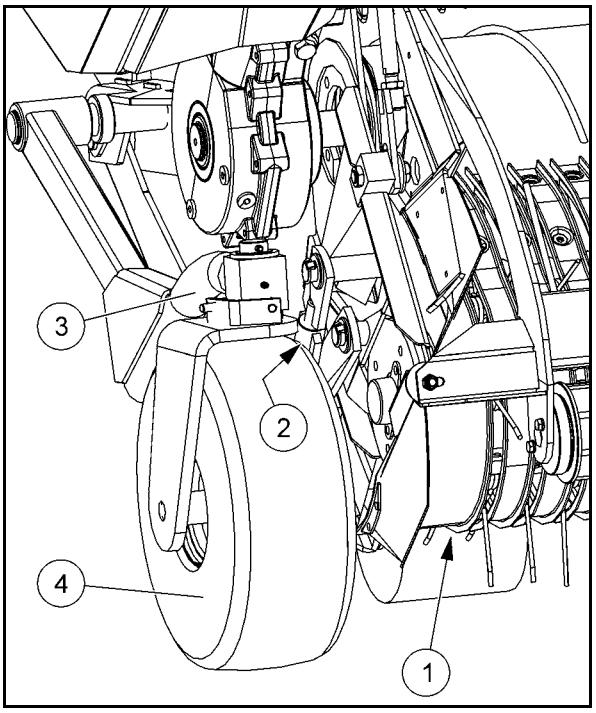


Fig. 100

The boreholes of the perforated strut of the pick-up spindle (2) serve to preset the operating height of the pick-up, while its fine adjustment is carried out by means of the spindle.

- Bottom borehole = highest operating height of pick-up
- Top borehole = lowest operating height of pick-up
- Spindle unscrewed = highest operating height of pick-up
- Spindle screwed in = lowest operating height of pick-up

8.1.1.1 Set additional roller feelers

WARNING

- **Risk of being crushed and of impact to lower limbs of people when lowering the pick-up!**
- **Risk to fingers and hands of being crushed between the movable pick-up and the rigid conveying trough when lowering the pick-up!**
- **Risk to fingers and hands of being crushed between the carrier of the roller feelers and the frame of the additional roller feelers when lifting the pick-up!**

Make sure that people leave the hazardous area of the pick-up before lowering / lifting the pick-up.

1. First 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 (2) bear the largest load.

   For this purpose, the frame (5) of the additional roller feelers (3) must be aligned via the two spindles (4) such that the additional roller feelers are set at the same height or slightly higher than the roller feelers (2).

   4.1 Remove the bottom linch pin (6).

   4.2 Use one hand to hold up the frame (5), while using your other hand to turn the spindle (4).

   4.3 Secure the spindle (4) by means of the linch pin (6).

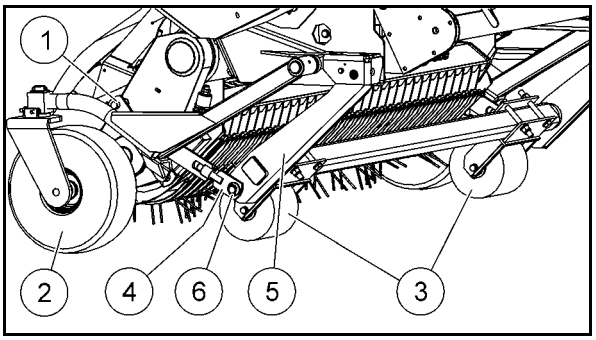


Fig. 101

The height of the additional roller feelers is set by means of the spindle (4):

- Spindle unscrewed = Additional roller feelers carry more weight
- Spindle screwed in = Additional roller feelers carry less weight

5. Completely lift the pick-up.

→ The frame (5) must be beneath the check screws (7). The minimum distance between the additional roller feelers (3) and the CFS drum (12) must be 10 mm. Adjust the distance if necessary.

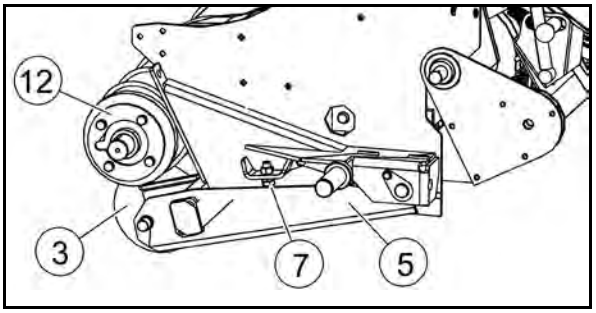


Fig. 102

8.1.2 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 (Fig. 103/1). Holding-down device and pulley simultaneously 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 / pulley.

The pulley (Fig. 103/2) must easily turn to guide the holding-down device properly.

1. Make sure that people leave the swivelling range of the carriers (3) before setting the distance between pick-up and holding-down device / pulley.
2. Set the desired distance between pick-up and holding-down device / pulley by means of the chain length (4).
   - Large swathe = large distance between pick-up and holding-down device / pulley. If the distance is too small, picking-up of the material to be loaded is impeded.
   - Small swathe = small distance between pick-up and holding-down device / pulley. If the distance is too large, the material to be loaded is not picked up properly.

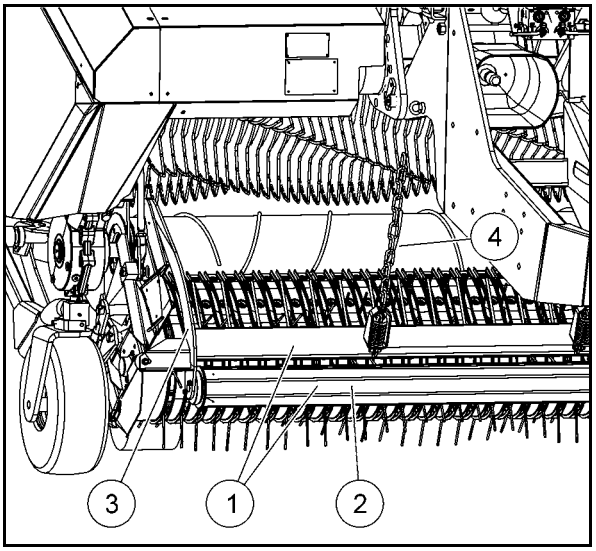


Fig. 103

8.2 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 220.

9 Use of machine

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

- "Operator's obligation", page 31,
- "Qualification of staff", page 32,
- "Basic safety instructions", page 35,
- "Warning and instruction signs", page 48.

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.
- Ensure that the propeller shaft guard is secured against twisting by means of the clip chain.
- Keep sufficient safe distance to the powered propeller shaft.
- Make sure that people leave the hazardous area of the powered propeller shaft.
- 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:
  - o when the machine is powered,
  - o as long as the tractor engine is running with the propeller shaft coupled / the hydraulic system connected,
  - o 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.
  - o 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.

CAUTION

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.

This will prevent damage of the overload clutch.

WARNING

Risk of being crushed, drawn in, becoming entangled or risk of impact to people if tractor and machine tip over due to insufficient stability!

Adapt your driving such that you have always safe control over the tractor and the attached / hitched machine:

- Consider your personal abilities as well as the road, cornering, traffic, visibility and weather conditions, the driving characteristics of the tractor as well as the influences exerted by the attached / hitched machine.
- Never take a tight curve at excessive travelling speed.
- Avoid sudden changes of direction when travelling uphill and downhill and when traversing hills (risk of tipping over!).

WARNING

Risk of crushing and shearing due to 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.
- Ensure that people keep sufficient safe distance to the powered transport floor.

Permanent oil circulation between tractor and machine is required for initiating the individual hydraulic functions.

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.

9.1 Charging

WARNING

- **Risk of being crushed and of impact to lower limbs of people when lowering the pick-up!**
- **Risk to fingers and hands of being crushed between the movable pick-up and the rigid conveying trough when lowering the pick-up!**
- **Risk to fingers and hands of being crushed between the carrier of the roller feelers and the frame of the additional roller feelers when lifting the pick-up!**

Make sure that people leave the hazardous area of the pick-up before lowering / 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.

WARNING

Risk of crushing and shearing within the area between the pick-up and the carriers for the holding-down device and the pulley!

Make sure that people leave the swivelling range of the pick-up before lifting the pick-up.

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 information in the chapter "Preconditions for the operation of tractors with rigid drawbar trailers", page 155.
- Observe the maximum load capacity of the hitched machine and the admissible axle and tongue loads of the tractor. Run the machine being only partly filled if necessary.
- Determine the admissible loading capacity for the material to be loaded before charging the forage trailer. Observe the information in the chapter "Determine admissible loading capacity", page 189.

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.

- The swathes should be homogeneous and loose.
- Sharp cutting knives:
  - reduce the effort required for powering the conveying unit,
  - reduce conveying unit wear,
  - increase the service life of the conveying unit.

Check:

- the machine for visible defects every day.
  - o Immediately remedy or have remedied visible defects.
- the cutting knives for sharpness every day.
  - o 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. For details refer to page 179.
- check the set distance between pick-up and holding-down device / pulley and readjust if necessary. For details refer to page 181.
- check whether the desired cutting length of the loaded material can be achieved by means of the number of mounted cutting knives. For details refer to page 182.

When charging the machine, absolutely observe the following information:

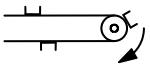
- Only lift the pick-up with the conveyor duct being empty.
- Reduce the tractor engine speed during cornering.
- Switch the p.t.o. shaft off and lift the pick-up when taking tight curves.
- Avoid uneven charging of the machine which might cause overloading of the drawbar.
- Switch the automatic charging system on for even and complete filling of the cargo space or start the transport floor manually several times for a short period.

  The automatic charging system:
  - o has to be switched on only once,
  - o is automatically deactivated if the terminal generates the acoustic signal (horn sound) and the visual signal "Forage trailer full",
  - o is automatically activated if the forage trailer has been emptied and the pick-up is lowered the next time,
  - o remains switched on until the automatic charging system is manually switched off.
- Select the desired / required filling degree of the loaded material in the cargo space.
- Observe the visual and acoustic signals of the terminal during charging.
- Observe the maximum admissible load capacity of the machine.

9.1.1 Charging with easy-to-use control

1. Set switch (1) to the middle position **I** to switch on the operating mode.
2. Set switch (3) to the upper position  to switch on the automatic charging system.

   Or:

   Set switch (6) to the upper position  to switch on the transport floor feed.

   The feed rate of the transport floor can be set by means of the control dial (4).
3. Lower the folding drawbar if necessary:

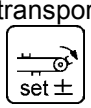
   Keep hold of switch (8) in the lower position  until the folding drawbar has reached the desired height.
4. Set switch (11) to the lower position  to lower the pick-up.
5. Switch the tractor's p.t.o. shaft on (1000 min^{-1}).
6. Start charging. Select the tractor speed according to the swathe size and cutting length.

9.1.2 Charging with ISOBUS control

1. Press the  key to switch off the road travel mode on the field.
2. Press the  key to switch the automatic charging system on (is only required once).
3. Adapt the desired / required filling degree of the loaded material in the cargo space to the loaded material if necessary. Observe the information in the chapter "Pre-select filling degree of loaded material in the cargo space", page 143.
4. Make sure that people leave the hazardous area of the folding drawbar / pick-up.
5. Press the  key to lower the folding drawbar if necessary.
6. Press the  key to lower the pick-up.
7. Switch the tractor's p.t.o. shaft (1000 min^{-1}) on.
8. Start charging. Select the tractor speed according to the swathe size and cutting length.
9. If the forage trailer is full, the terminal will generate an acoustic signal (horn sound) and a visual signal "Forage trailer full".

→ The automatic charging system will be deactivated and the automatic feed for the transport floor will be switched off.

Forage trailer without metering drums

9.1 You can now still continue to charge the forage trailer and switch the transport floor feed manually on for a maximum of three times for 2 seconds each via the 

key.

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

Forage trailer with metering drums:

9.1 The front section of the cargo space can still be topped up.

10. Stop the charging procedure and let the p.t.o. shaft continue to run until the conveyor duct is free from any loaded material.
11. Switch the tractor's p.t.o. shaft off.
12. Press the  key to lift the pick-up.
13. Press the  key to switch the road travel mode on for transport journeys on public roads.

9.1.3 Eliminate clogging / blockages at the pick-up and the feeder rotor

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 if the clogging / blockages have been eliminated.

- 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.

9.1.4 Clogging / Blockages at the pick-up and the feeder rotor cannot be eliminated 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.

9.1.5 Determine admissible loading capacity

Observe the different specific weights [kg/m³] of the various loaded materials when charging the machine. Heavy loaded materials lead to a reduced admissible loading capacity.

Maximum admissible loading capacity = admissible axle load - empty weight

The admissible axle load and the empty weight are indicated on the type plate or in the chapter "Technical data", page 26.

The following table provides some reference values for specific weights of common loaded materials:

	Grass silage "dry"	Grass silage "humid"	Maize silage
TS content	approx. 40 %	approx. 30 %	approx. 30 %
Specific weight of loaded material	approx. 250 kg/m³	approx. 400 kg/m³	approx. 400 kg/m³

TS = dry matter of loaded material

$$\text{Max. admissible loading capacity} = \frac{\text{Maximum load [kg]}}{\text{Specific weight of loaded material [kg/m³]}}$$

Only charge the forage trailer with the determined maximum loading capacity. Observe also other general conditions such as the tractor size, hillside locations, ground, etc.

9.2 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 you start discharging.

- 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.

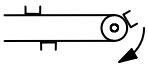
  Insufficient ground clearance may cause bending of the pick-up carriers.

9.2.1 Discharging with easy-to-use control

9.2.1.1 Machine without metering drums

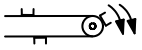
1. Set switch (1) to the middle position **I** to switch on the **operating mode**.
2. Keep hold of switch (11) in the upper position  until the pick-up has sufficient ground clearance.
3. Keep hold of switch (10) in the lower position  until the steering axle is locked.

   → The control lamp (H4) lights up.
4. Move onto the bunker silo.
5. Keep hold of switch (7) in the upper position  until the tailgate is open.

   → The control lamp (H2) lights up.
6. Set switch (6) to the upper position  to switch on the transport floor.
7. Start to move and select the travelling speed of the tractor according to the height of the desired discharged material stack.

   For step-by-step discharge, the transport floor feed can be repeatedly switched off by setting switch (6) to the middle position for a short time.

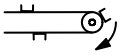
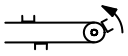
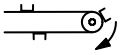
- During discharge, the feed rate of the transport floor can be changed via the control dial (4).
- For lowering the folding drawbar again during discharge on the bunker silo, keep hold of switch (8) in the lower position  until the folding drawbar has reached the desired height.

8. Set switch (5) to the upper position to double the feed rate of the transport floor for complete emptying  .
9. Keep hold of switch (7) in the upper position  to close the tailgate.
10. Drive off the bunker silo.
11. Keep hold of switch (8) in the lower position  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.
12. Set switch (1) to the upper position  to switch on the **road travel mode** for transport journeys.

9.2.1.2 Machine with metering drums

1. Set switch (1) to the middle position **I** to switch on the **operating mode**.
2. Keep hold of switch (11) in the upper position  until the pick-up has sufficient ground clearance.
3. Keep hold of switch (10) in the lower position  until the steering axle is locked.
   → The control lamp (H4) lights up.
4. Move onto the bunker silo.
5. Keep hold of switch (7) in the upper position  until the tailgate is open.
   → The control lamp (H2) lights up.

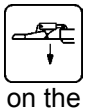
   Gearbox and clutch are switched automatically.
6. Switch the tractor's p.t.o. shaft on.
7. Let the tractor's p.t.o. shaft smoothly start to run such that the metering drums are able to loosen themselves.
8. Set switch (6) to the upper position  to switch on the transport floor.
9. Switch the tractor's p.t.o. shaft immediately off if the slip clutch responds.
10. Set switch (6) to the middle position to switch off the transport floor feed.
11. Keep hold of switch (6) in the lower position  to reverse the transport floor feed for 3 seconds.
    Thus, the pressing power which the loaded material applies to the metering drums, and the starting torque for loosening the metering drums are reduced.
12. Switch the tractor's p.t.o. shaft on.
13. Let the tractor's p.t.o. shaft smoothly start to run such that the metering drums are able to loosen themselves.
14. Set switch (6) to the upper position  to switch on the transport floor.
15. Switch the p.t.o. shaft off when the cargo space has been emptied up to the metering drums.
16. Set switch (5) to the lower position to stop the doubling of the transport floor speed.
17. Set switch (6) to the middle position to switch off the transport floor feed.
18. Set switch (7) to the lower position  to close the tailgate.
19. Drive off the bunker silo.
20. Keep hold of switch (8) in the lower position  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.
21. Set switch (1) to the upper position  to switch on the **road travel mode** for transport journeys.

9.2.2 Discharging with ISOBUS control

9.2.2.1 Machine without metering drums

1. Press the  key 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. Make sure that people leave the swivelling range of the tailgate before pressing the  key.
5. 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:
   5.1 Open tailgate.
   5.2 Switch transport floor on when the tailgate has reached its end position.
6. 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 feed of the transport floor 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 several times if necessary.
- Press the  key to lower the folding drawbar during discharge on the bunker silo.

7. Press the  key to double the feed rate of the transport floor for complete emptying.
8. Make sure that people leave the swivelling range of the tailgate

before closing the tailgate.

9. Press the  key to close the tailgate.

→ The discharge modes "A I" and "A II" are deactivated and the transport floor is automatically switched off.

10. Drive off the bunker silo.

11. Press the  key to lower the folding drawbar.

    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.

12. Press the  key to switch the road travel mode on for transport journeys.

9.2.2.2 Machine with metering drums

WARNING

Risk of being drawn in and becoming entangled within the area of powered metering 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 keys  ,  or  .

- 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 (Mega-Vitesse CFS DO) for coupling the powertrain to the metering drums.

- Reduce the feed rate for the transport floor during discharge if the ISOBUS terminal frequently generates the acoustic and visual signal "Forage trailer full".

  The metering drums may become clogged if the feed rate for the transport floor is not reduced.

1. Press the  key 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. Make sure that people leave the swivelling range of the tailgate and the spreading range of the metering drums.
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 Open tailgate to level I.

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 ISOBUS terminal.

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 metering drums are able to loosen themselves.

→ The metering 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 metering drums, and the starting torque for loosening the metering drums are reduced.

6.4 Press the  key again.

→ The transport floor switches to standby mode and the "Feed On" symbol is flashing on the ISOBUS terminal.

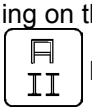
6.5 Switch the p.t.o. shaft of the tractor on again.

6.6 Let the p.t.o. shaft smoothly start to run.

→ The metering 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 when changing the lane on the bunker silo.

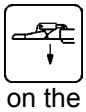
→ The metering drums and the transport floor stop. The transport floor automatically switches to standby mode and the "Feed On" symbol is flashing on the ISOBUS terminal if the transport floor is not separately switched off via the  key.

7.2 Switch the p.t.o. shaft on again and let it smoothly start to run after having changed the lane on the bunker silo.

→ The metering 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 several times if necessary.

- Press the  key to lower the folding drawbar during discharge on the bunker silo.

8. Press the  key 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 metering drums.

→ The transport floor will not switch off if the  key has been pressed for complete emptying.

10. Make sure that people leave the swivelling range of the tailgate.
11. Press the  key to close the tailgate.

→ The discharge modes "A I" and "A II" are deactivated and the transport floor is automatically switched off.

12. Drive off the bunker silo.
13. Press the  key to lower the folding drawbar.

    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.

14. Press the  key to switch the road travel mode on for transport journeys.

10 Transport journeys

A transport journey is a journey of the charged or empty machine to or from the place of operation.

- Additionally observe the chapter "Basic safety instructions", page 35, when carrying out transport journeys.
- 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.

WARNING

Risk of being crushed, drawn in, becoming entangled or risk of impact to people if tractor and machine tip over due to insufficient stability!

Adapt your driving such that you have always safe control over the tractor and the attached / hitched machine:

- Consider your personal abilities as well as the road, cornering, traffic, visibility and weather conditions, the driving characteristics of the tractor as well as the influences exerted by the attached / hitched machine.
- Never take a tight curve at excessive travelling speed.
- Avoid sudden changes of direction when travelling uphill and downhill and when traversing hills (risk of tipping over!).

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 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 over 40 km/h,
- on rough road tracks,
- when traversing hills,
- before carrying out reverse travels.

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. Switch off the automatic charge system and close the loading frame.
2. Switch on the road travel mode.

→ If the road travel mode is switched on:

- the "Road travel" menu appears,
- apart from the functions "Lock steering axle" and "Unlock steering axle", all other functions on the ISOBUS terminal are blocked,
- the hydraulic drawbar suspension (optional extra) and the axle suspension of the hydro-pneumatic tandem chassis are switched on,
- the work lights and the cargo space lighting are switched off.

3. Lock the follow-up steering axle when travelling at a speed of more than 40 km/h.
4. Start your transport journey.

11 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 31,
  - "Qualification of staff", page 32,
  - "Basic safety instructions", page 35,
  - "Warning and instruction signs", page 48.

  Observance of these chapters serves your safety.
- Only use original spare parts.
- Observe environmental measures when carrying out service and maintenance work on the machine.
- Observe legal provisions when disposing of operating materials such as oils and greases. These legal provisions also apply to parts having come into contact with those operating materials.
- 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.

WARNING

Risk of crushing, shearing, cuts, amputation, becoming entangled, wound up, being drawn in and risk of impact for 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 158.
- 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!

- Secure tractor and machine against accidental starting and rolling before opening protective devices.
- 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,

- drilling at the frame or chassis,
- boring up of existing holes at the frame or chassis,
- welding on load-bearing parts is not allowed.

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, 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 of the cargo space and entering the cargo space.

WARNING 	**Risk of crushing and impact to people due to accidental lowering of the open tailgate.** Secure the open tailgate against accidental lowering by means of the stop-cock before entering the hazardous area beneath the open tailgate.

11.1 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 loose wheel nuts.
- all screwed connections for:
  - drawbar.
  - chassis.
- the hydraulic system for tightness.
- the oil level of all gearboxes.
- the tyre pressure.

Tightening torques of wheel nuts

	ADR	FAD	BPW black	BPW galvanized
M18x1.5 Spherical collar nut	270 Nm	330 Nm	-	-
M20x1.5 Flat collar nut with spring washer	350 Nm	360 Nm	380 Nm	420 Nm
M22x1.5 Spherical collar nut	-	630 Nm	-	-
M22x1.5 Flat collar nut with spring washer	450 Nm	460 Nm	460 Nm	505 Nm

Tab. 4

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 hydraulic levelling device of the hydro-pneumatic tandem chassis for proper travelling height.
- the condition of the ball heads.
  - Immediately remedy or have remedied visible defects such as a worn-out ball head.

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. A soiled cutting unit leads to worse response characteristics of the knife security system.

Every 10 days

- All daily maintenance work and the additional work specified below.
- Check tension of the roller chains of the CFS drum drive, tighten roller chain if necessary.
- Check tension of the roller chains of the metering drum drive, tighten roller chain if necessary
  (only Mega-Vitesse CFS DO).
- Check tension of the transport floor chains, shorten chain if necessary.
- Chassis:
  - Check brake lever setting, readjust if necessary.
  - Check tyre pressure, readjust if necessary.

Every 50 days

- All every-10-days work and the additional work specified below.
- Check the axles:
  - 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 and unscrew up to the next split-pin hole.

    Secure nut against accidental loosening by means of a split-pin and check run.
  - Check brake linings.
- 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.
  - The borehole of drawbar lug 40 must not exceed 41.5 mm.
  - Maximum admissible wear at the annular cross-section of the drawbar lug 2.5 mm.
- Check drawbar connection and retighten: crown nut tightening torques 800 $^{+10}$ Nm.
- Check all bearings.
- Check oil level of all gearboxes.
- Check all cables for damage.

Every 100 days

- All every-50-days work 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.

After end of season

- Remove all cutting knives and grease or lubricate all movable parts of the cutting unit and the vehicle.

11.2 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.
- Observe the legal provisions for handling and disposal of cleaning agents.
- Continuously inspect the machine for corrosion damage! Remedy corrosion damage by touching up paintwork.
- Check brake lines, air pipes and hydraulic hose pipes with special care for visible defects.
- Never treat brake lines, air pipes and hydraulic hose pipes with benzine, benzol, paraffin or mineral oils.

Cleaning by means of pressure washer / steam blaster

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

- The maximum admissible injection pressure is 80 bar.
- The maximum admissible water temperature is 60°C.
- Do not clean electrical components such as control set, weighing rods, distributor boxes, weighing computer etc.
- Do not clean chromium-plated components.
- Never aim the cleaning nozzle jet of the pressure washer / steam blaster:
  - at lubrication points and bearings,
  - directly at hydraulic components.
- Always keep a minimum nozzle distance of 300 mm between the cleaning nozzle and the machine.
- Never aim the cleaning nozzle jet at the machine parts at right angles. The nozzle spray angle must at least be 25°.
- Do not use any chemical additives.
- Observe the safety instructions when handling pressure washers.

11.3 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.

11.3.1 Lubrication plan

Observe the included operating instructions of the propeller shaft manufacturer(s) when lubricating the propeller shaft(s).

11.3.2 Lubrication plan Mega-Vitesse CFS

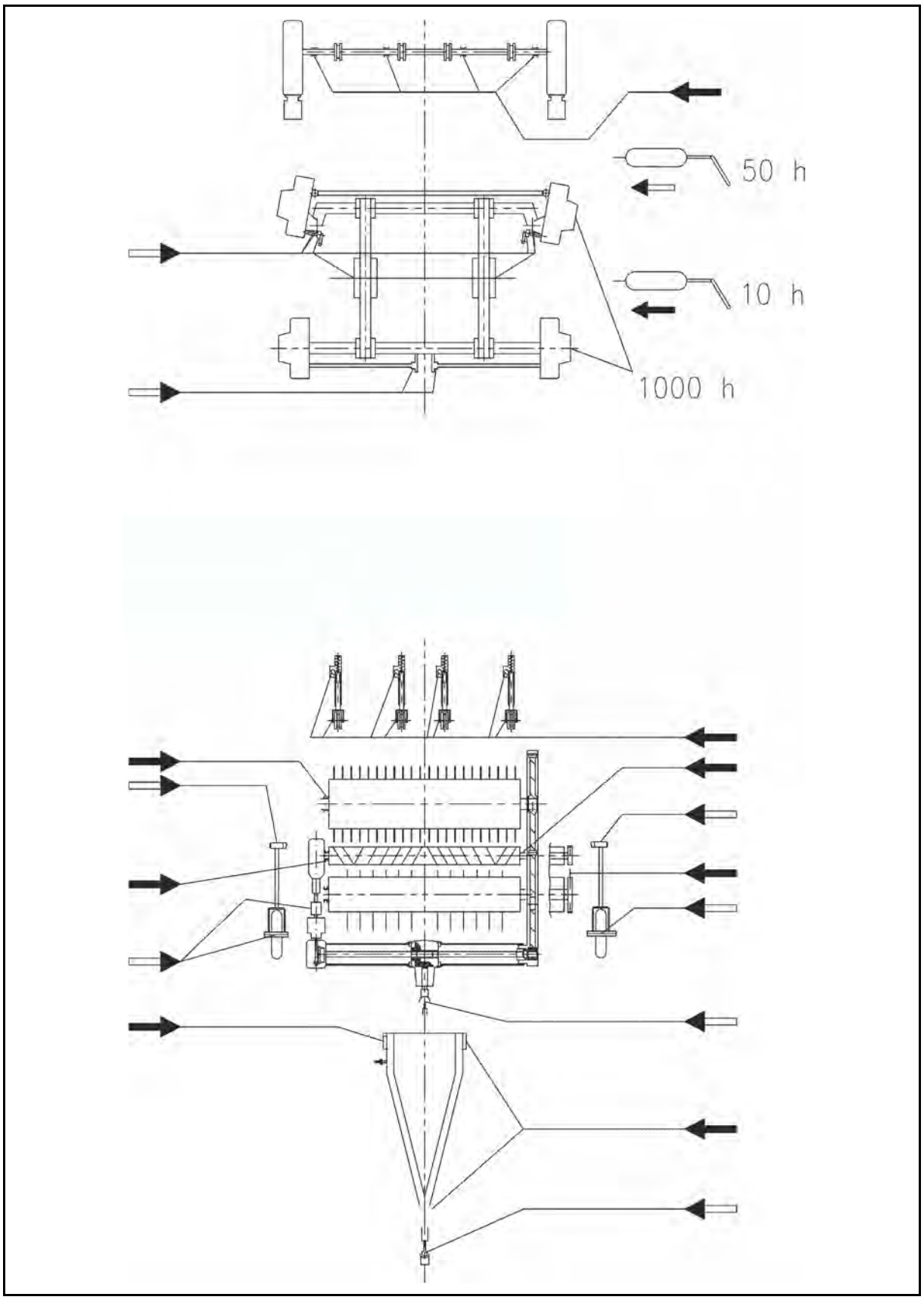


Fig. 104

11.3.3 Lubrication plan Mega-Vitesse CFS DO

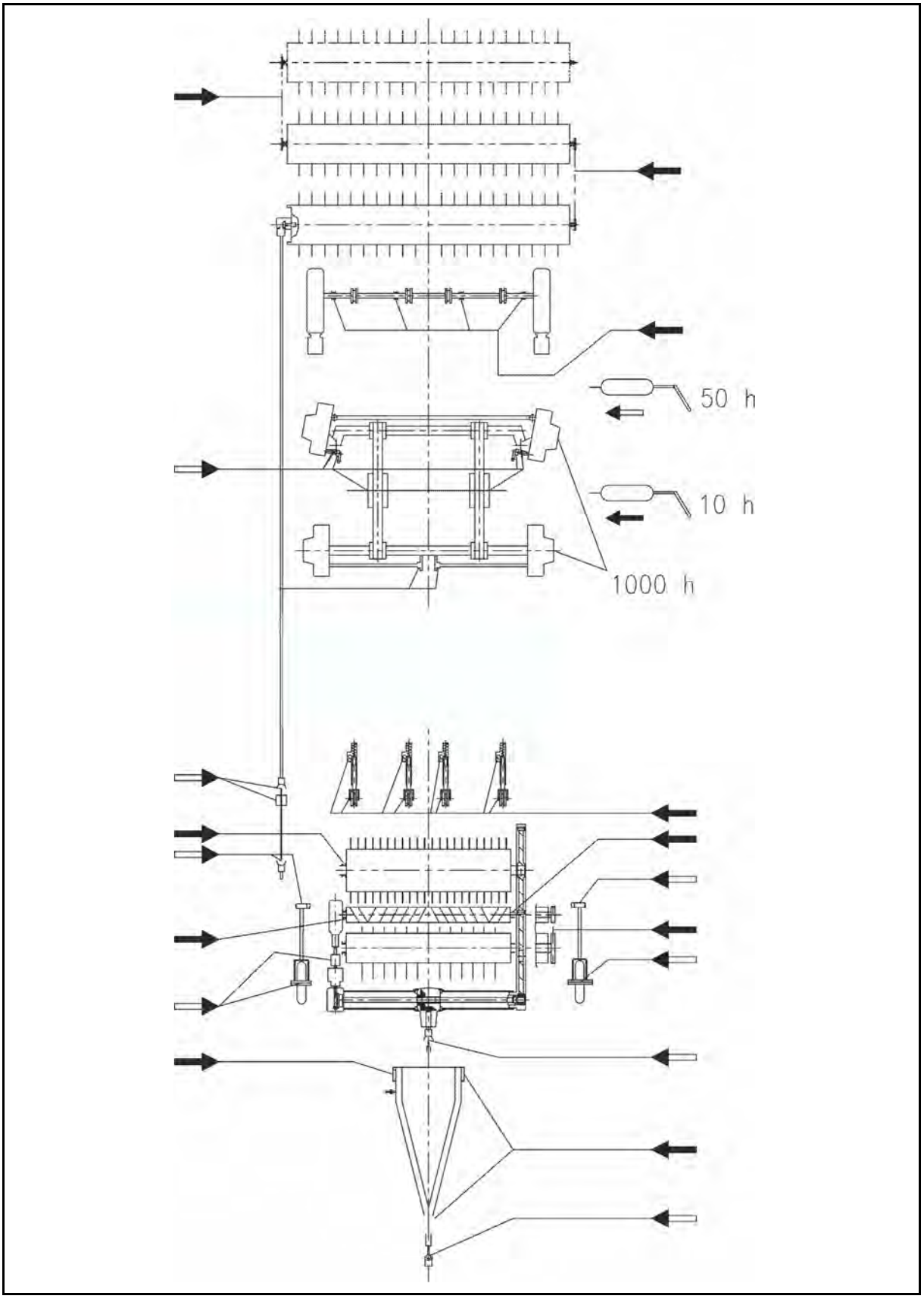


Fig. 105

11.4 Preservation / Longer downtimes

Preparing the machine for longer downtimes shall include:

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

11.5 Check / top up / change gear lubricant oil

The individual gearboxes require:

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

CAUTION

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

Always ensure a sufficient oil level in the gearboxes.

WARNING

Risk of slipping to people due to leaking gear lubricant oil during topping-up of oil / oil change!

Immediately remove fresh oil stains by means of binding agents.

- Change the oil when the gear lubricant oil has reached its operating temperature (30 – 40°C) if possible. At operating temperature, the flow capability of the gear lubricant oil is at its optimum.
- The optimum oil level is reached at an oil temperature of 0 - 20°C.

11.5.1 Quantities when filled and change intervals

Gearbox	Gear lubricant oil	Quantity when filled	Maximum service hours
Feed gearing	Liquid grease EP00	0.75 litres	2000 h
Main gearbox	EP80W-90	3.5 litres	500 h
Rotor gear	Carter EP680	23 litres	
Angular switchgear	Carter EP680	2.8 litres	
Angular gear CFS	Carter EP680	1 litres	
Rear angular gear	EP80W-90	0.4 litre	2000 h

11.5.2 Main gearbox

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

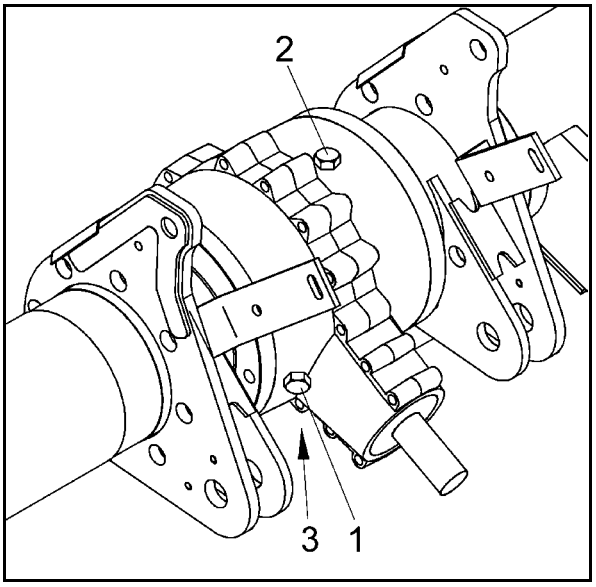


Fig. 106

11.5.3 Rotor gear

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

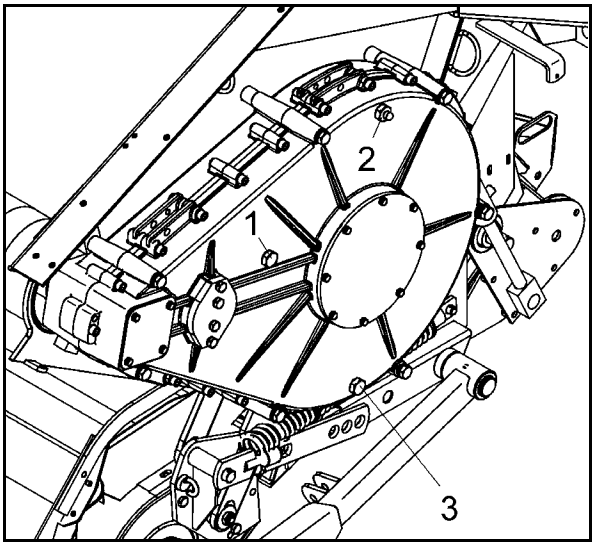


Fig. 107

11.5.4 Feed gearing

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

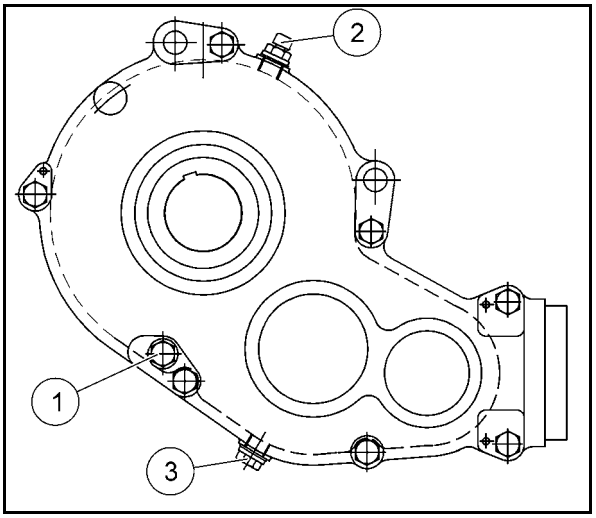


Fig. 108

11.5.5 Angular switchgear

Check the oil level with the pick-up lowered.

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

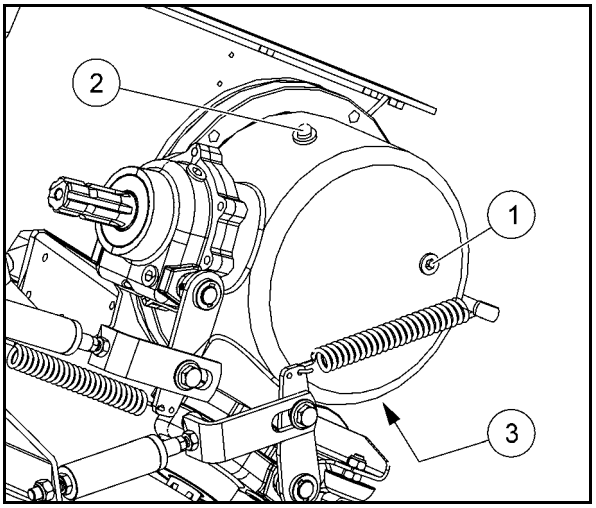


Fig. 109

11.5.6 Angular gear CFS

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

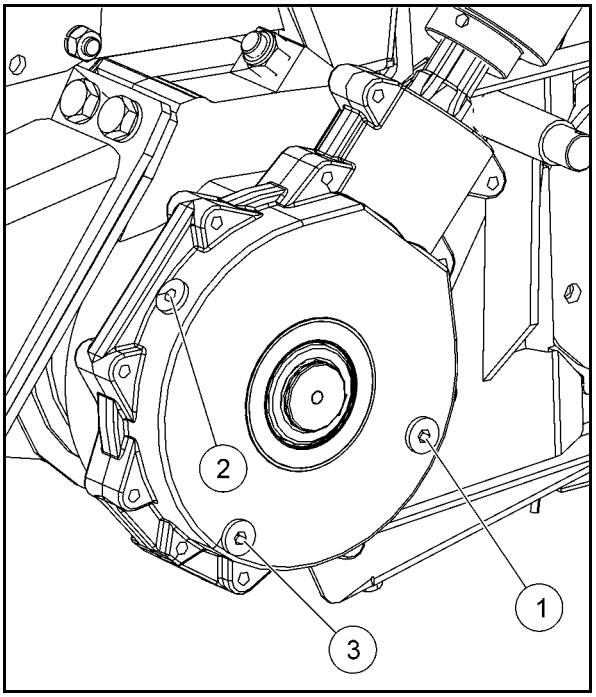


Fig. 110

11.5.7 Metering unit, rear angular gear Mega-Vitesse CFS DO

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

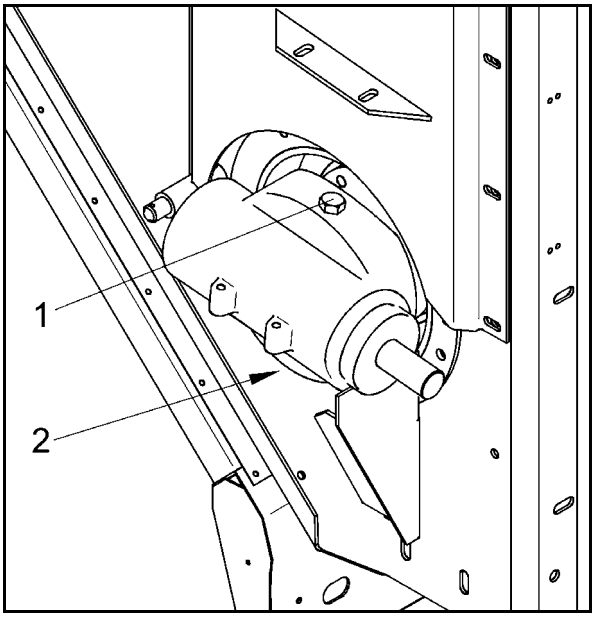


Fig. 111

11.5.8 Check / top up oil level

1. Align the machine in horizontal position.
2. Unscrew the oil inspection plug (1).

   The oil level must be visible through the opening of the oil inspection plug.
3. Top up oil through the oil filling screw (2) if necessary.
4. Clean and screw in the oil filling screw (2).

11.5.9 Gear lubricant oil change

1. Align the machine in horizontal position.
2. Place a drip tray beneath the respective gearbox (capacity must at least be equivalent to the quantity filled in).
3. Unscrew the oil drain plug (3).
4. Unscrew the oil filling screw (2).
5. Wait for the oil to stop draining out of the oil drain plug.
6. Screw in again and tighten the oil drain plug (2) (use sealant).
7. Fill the specified oil quantity in through the oil filler neck (2).
8. Clean and screw in the oil filling screw (2).
9. Check the oil level after 5 service hours. The oil must be visible at the oil inspection plug (1).

11.6 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 and/or the protective casing of the pick-up removed. Fix the protective casing of the pick-up properly to the forage trailer and close the right-hand movable side protector before powering the forage trailer (pick-up).

11.6.1 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. Retighten the counter nut.

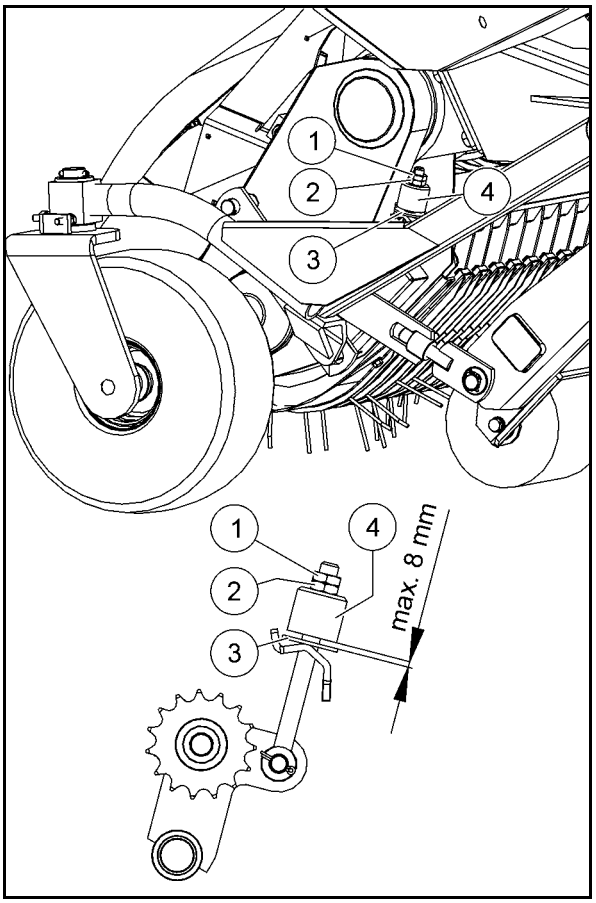


Fig. 112

11.6.2 Bleed friction clutch of pick-up

The friction clutch of the pick-up 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 forage trailer with material to be loaded for a short time with the groove nut unscrewed such that the stuck friction clutch temporarily slips.

1. Unscrew and remove the two screws from the protective casing of the pick-up (1).
2. Remove the protective casing of the pick-up (1).

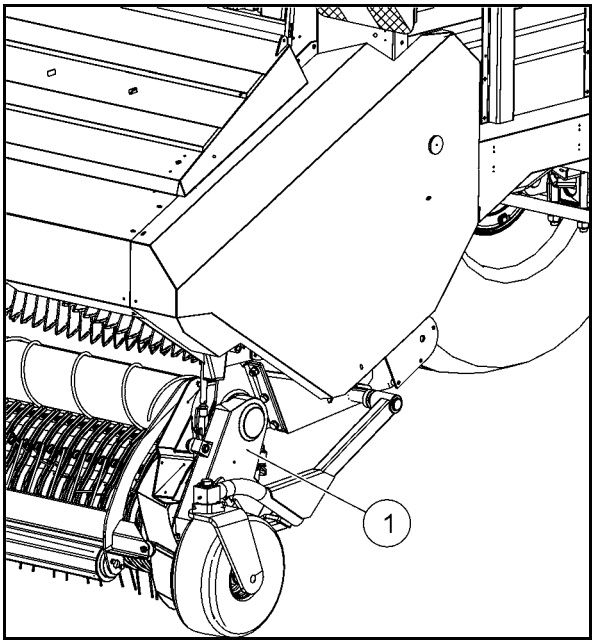


Fig. 113

3. Unlock the groove nut (2).
4. 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.

5. Fix the protective casing of the pick-up (Fig. 113/1) to the forage trailer by means of the two screws.
6. Start the tractor engine.
7. Charge the forage trailer 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.
8. Turn the tractor engine off.
9. Pull the ignition key out.
10. Unscrew and remove the two screws from the protective casing of the pick-up (Fig. 113/1).
11. Remove the protective casing of the pick-up (Fig. 113/1).
12. Retighten the groove nut (2) with the exact number of turns made for unscrewing (torque of the friction clutch must be between 900 and 1000 Nm).
13. Lock the groove nut (2).
14. Fix the protective casing of the pick-up (Fig. 113/1) to the forage trailer by means of the two screws.

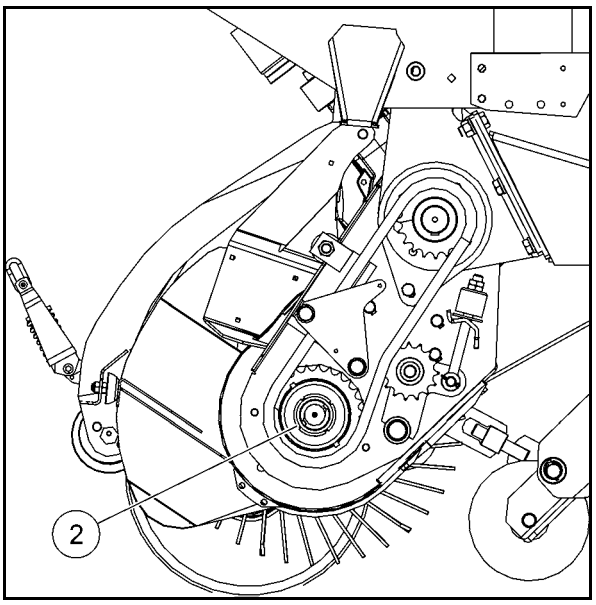


Fig. 114

11.7 CFS drum

WARNING

Risk of becoming entangled and wound up due to the CFS drum powered with the driving elements being unprotected!

Close the right-hand movable side protector before powering the machine.

11.7.1 Bleed friction and compensating clutch of CFS drum

The friction and compensating clutch (1) of the CFS drum must be bled before the first start-up and after longer downtimes to ensure its proper functioning.

1. Use a tool to 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 forage trailer 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.

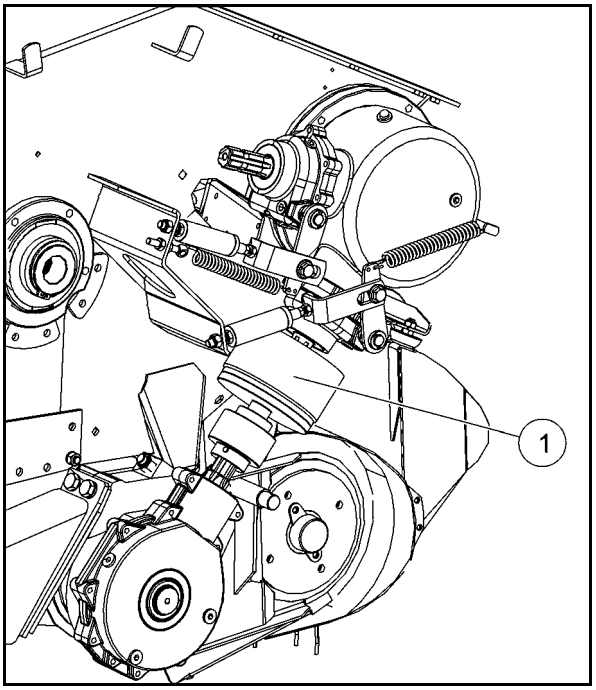


Fig. 115

8. Pull the ignition key out.
9. Use a tool to 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 nuts back up to the end of thread (3).
12. Close the right-hand movable side protector and lock it in protective position.

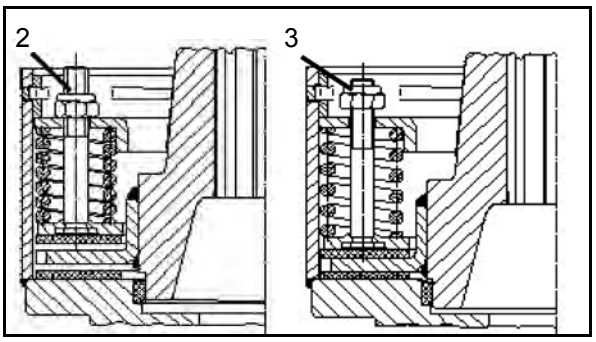


Fig. 116

11.7.2 Remove / Mount friction and compensating clutch

1. Secure tractor and machine against accidental starting and rolling.
2. Use a tool to open the right-hand movable side protector.
3. Secure the open right-hand side protector against accidental slamming.
4. Remove the circlip (1).
5. Move the casing (2) downward.
6. Remove the hexagon screws (3).
7. Pull the flange (4) with the coupling half (5) off to the side.
8. Remove the hexagon screw (6).
9. Push the friction and overrunning clutch downward.
10. Pull the friction and overrunning clutch off to the side.
11. Mount the friction and overrunning clutch in reverse order.
12. Close the right-hand movable side protector and lock it in protective position.

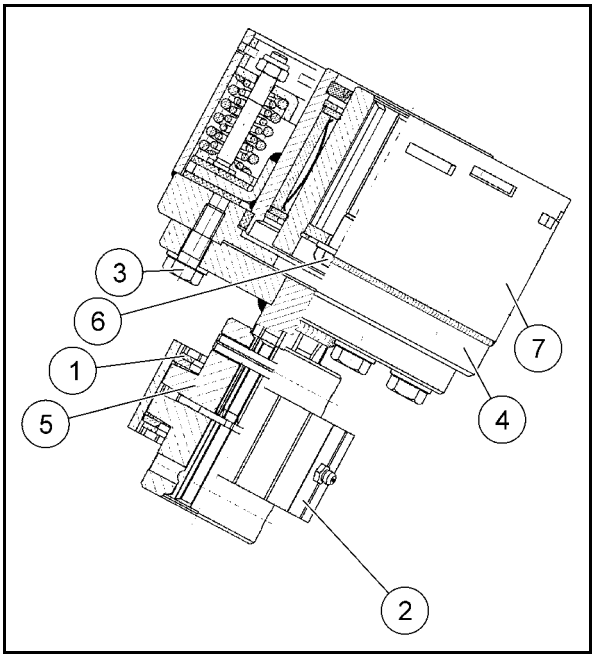


Fig. 117

11.7.3 Align the switch rods with respect to the switch levers of the angular switchgear (only Mega-Vitesse CFS DO)

Align the switch rods (1, 2) with respect to the switch levers (3, 4) of the angular switchgear (5), when the pick-up is powered and the tailgate is open.

1. Use a tool to open the right-hand 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).

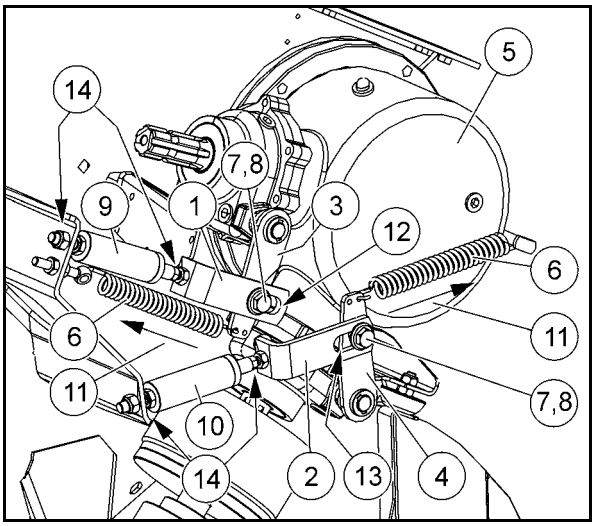


Fig. 118

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 (1, 2) with respect to the switch lever (3, 4) if necessary by modifying the fitting length of the hydraulic cylinders (9, 10) and the switch rods (1, 2) via the adjusting screws (14).
9. Screw the switch lever and the switch rod together by means of the screwed connection (7) and the collar bushing (8).
10. Mount the two springs (6).
11. Close and lock the right-hand side protector.
12. Close the tailgate.

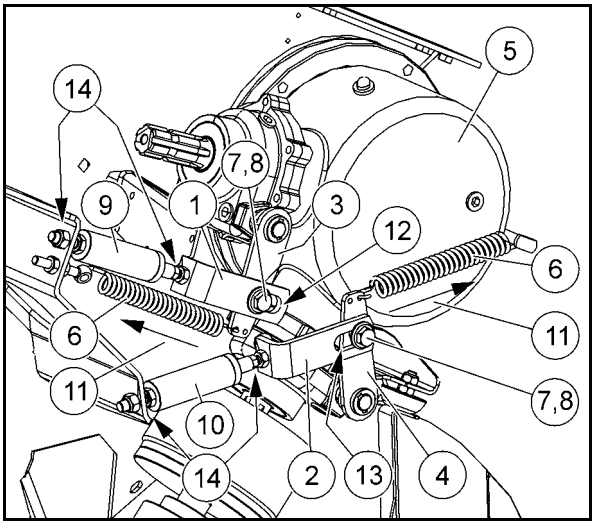


Fig. 118

11.8 Cutting unit

WARNING

Risk of crushing, shearing, cuts, amputation, becoming entangled, wound up, being drawn in and risk of impact to people during maintenance and service work being carried out on the cutting unit if:

- **the machine not hitched to the tractor rolls,**
- **lifted, unsecured machine parts accidentally come down or are unintentionally lowered,**
- **tractor and machine accidentally start and roll!**

- Secure the machine against accidental rolling.
- 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 158.
- Wait for the machine to stop completely before entering the hazardous area of the machine.

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.

11.8.1 Clean cutting unit

Use compressed air to clean the knife security system of the cutting knives every day.

Soiled knife security systems prevent cutting knives from retracting from the conveyor duct when striking foreign objects.

1. Use compressed air to clean the retainer of the cutting knives before removing the cutting knives.
2. Use compressed air to clean the slots of the cutting knives before reinstalling the cutting knives.

   These measures will support easier removal and reinstallation of the cutting knives.

WARNING

Risk due to blown-away grass and dirt particles when blowing out the retainers, slots and knife security systems of the cutting knives by means of compressed air!

Always wear protective goggles when blowing out the retainer, slots and knife security systems of the cutting knives by means of compressed air.

11.8.1.1 Clean knife security system

Mounting lever and knife lever are accommodated in the holder (1) on the left-hand machine side (in direction of motion) in the vehicle frame at the cutting unit.

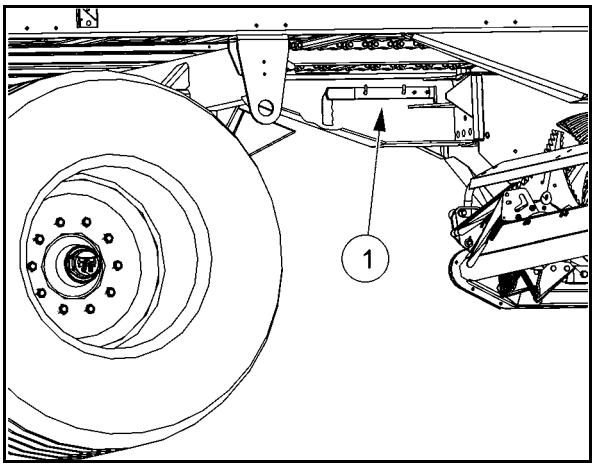


Fig. 119

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 (2) 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 (3).

   → The lever pocket (2) 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.

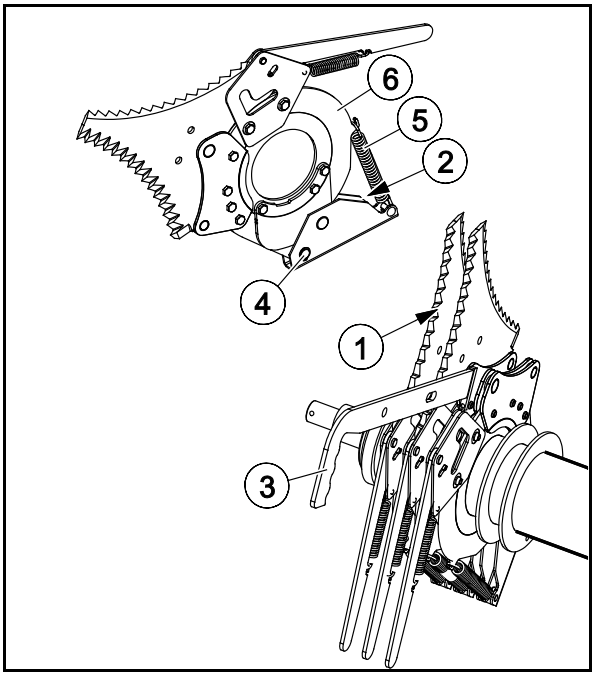


Fig. 120

2.4 Hang up the spring (5) at the outer ring (6) of the knife holder by means of the mounting lever (3).

2.5 Repeat steps 2.1 to 2.4 for the other knife holders.

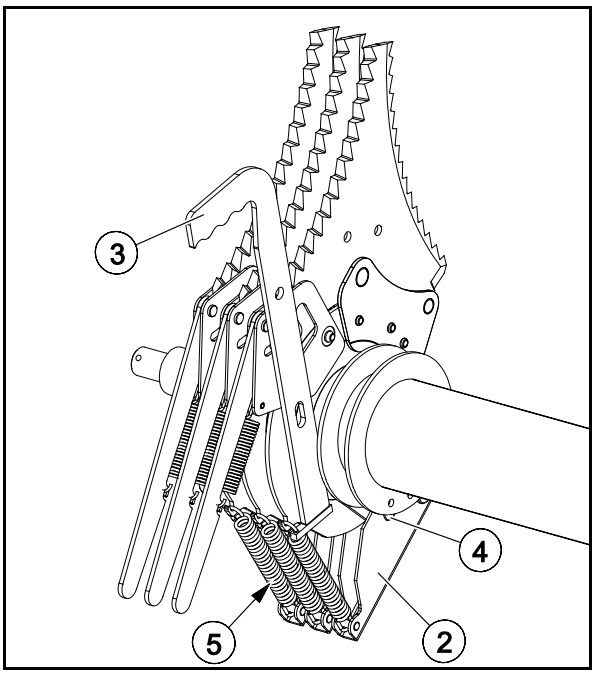


Fig. 121

11.8.2 Remove and install cutting knives

The cutting knives must be removed and installed:

- for setting the cutting length of the loaded material,
- for turning over the double-sided cutting knives,
- for grinding the cutting knives.

11.8.2.1 Remove cutting knives

1. Switch the oil circulation between tractor and machine on with the tractor engine running.
2. Make sure that people leave the swivelling range next to the cutting unit and beneath the machine.
3. Retract the cutting unit hydraulically from the conveyor duct via the terminal.
4. Fold the folding drawbar by means of the hydraulic cylinders to increase the free space to the cutting knives.
5. Switch the oil circulation between tractor and machine off.
6. Secure tractor and machine against accidental starting and rolling.
7. Pull the bolt (1) out.
8. Fold the cover plate (2) down.
9. Wear protective goggles.
10. Wear protective gloves.
11. Remove the knife lever (3) and the mounting lever (4) out of the holder (5). The holder (5) is positioned on the left-hand machine side (in direction of motion) in the vehicle frame at the cutting unit.

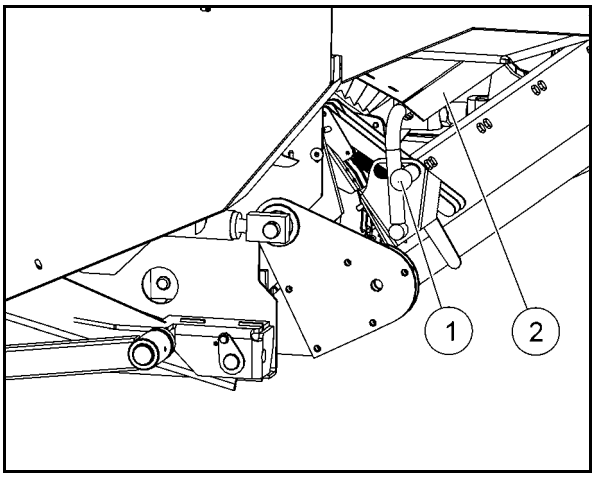


Fig. 122

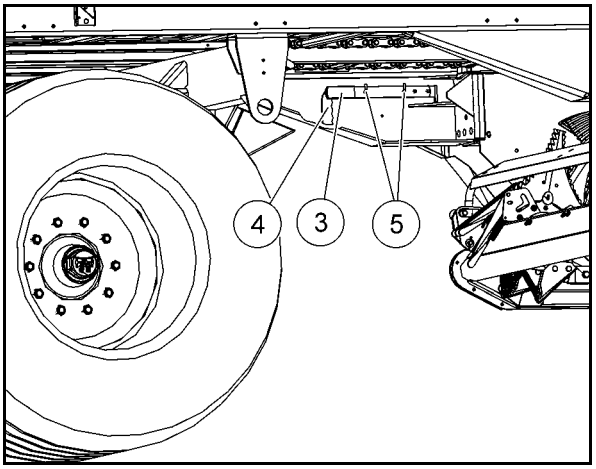


Fig. 123

12. Clean the gaps of the cutting knives / knife holders by means of the mounting lever (4) and compressed air.
13. Insert the knife lever (3) into the boreholes of the cutting knife (5).
14. Pull the locking lever (6) up and lift the cutting knife (5) out of the knife holder (6).

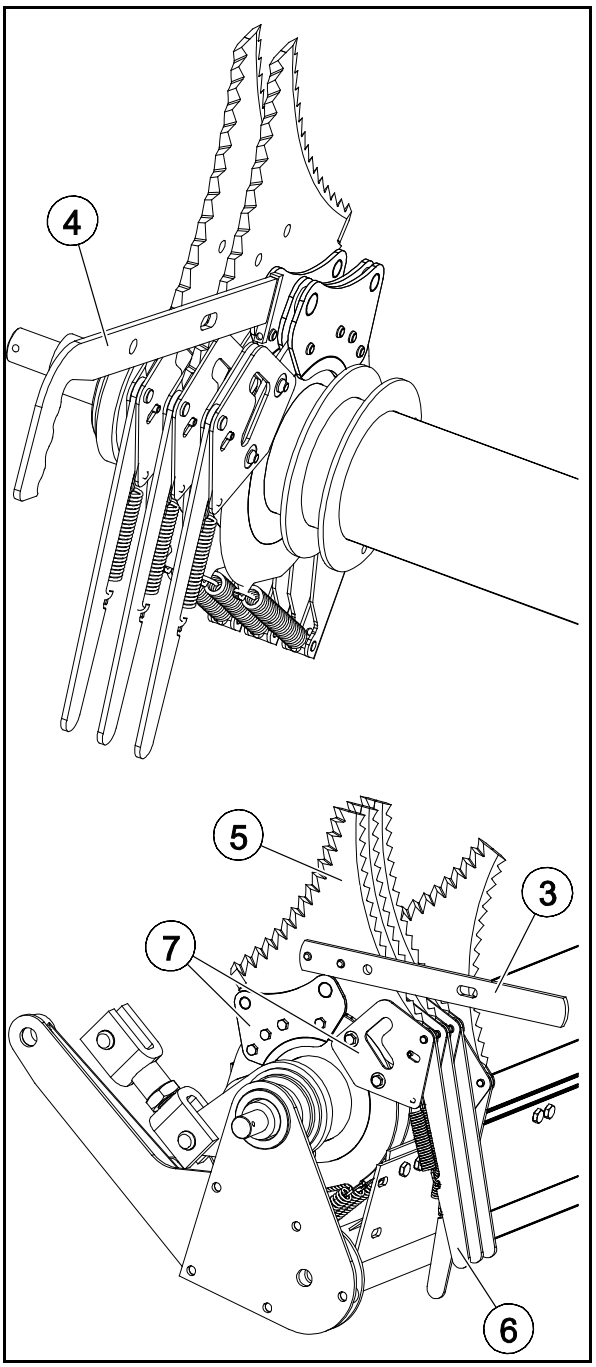


Fig. 124

11.8.2.2 Install cutting knives

WARNING

Risk of crushing and shearing when extending the cutting unit into the conveyor duct!

Extending the cutting unit into the conveyor duct is not allowed if:

- people are beneath the machine,
- people may reach or reach into the dangerous spots alongside the cutting unit.

1. Wear protective goggles.
2. Use compressed air to clean the slots for the cutting knives.
3. Put the cutting knife (1) onto the knife lever (2).
4. Pull the locking lever (3) up and insert the cutting knife (1) from the top into the knife holder (4).

When installing the cutting knives (1), ensure that the locking lever (3) 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 (2) in the holder (Fig. 123/4).
6. Fold the cover plate (7) up again.
7. Lock the cover plate (7) by means of the bolt (8) in the oblong hole (9).
8. Release the parking brake of the forage trailer 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. Make sure that people leave the swivelling range next to the cutting unit and beneath the forage trailer.
12. Lower the pick-up.
13. Switch the tractor's p.t.o. shaft on.

→ Pick-up and feeder rotor are powered.

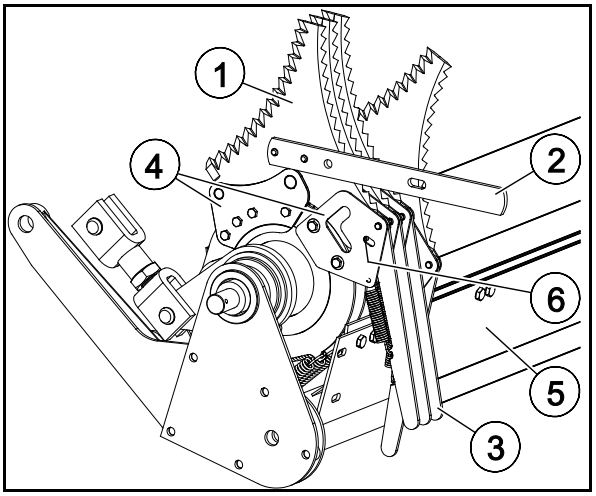


Fig. 125

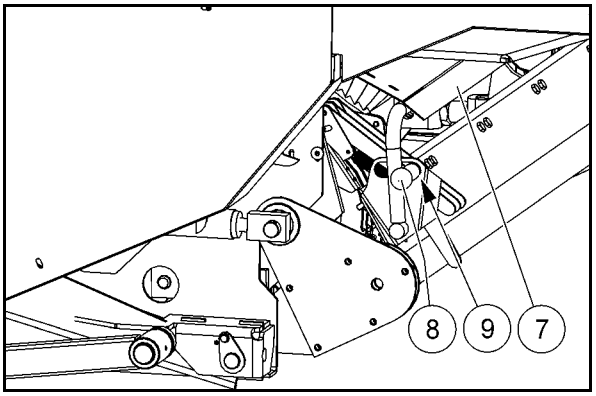


Fig. 126

14. Extend the cutting unit hydraulically back into the conveyor duct via the terminal.
15. Lower the folding drawbar.

11.8.3 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.
- Carefully regrind the cutting knives such that they do not heat up much. If the cutting knives change colour during grinding:
  - o they have heated up excessively,
  - o this will reduce the service life of the cutting knives,
  - o cutting knives will break.

Sharp cutting knives:

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

Strautmann offers a special device for grinding cutting knives which ensures even and quick grinding of cutting knives.

11.8.4 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.
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. 128/1) on the right-hand and left-hand side of the forage trailer if the measured value is not approx. 20 mm.
   - 5.1 Unscrew the counter nut (2).
   - 5.2 Remove the bolt (4) to loosen the upper link fork (3) from the receiver pipe (5).
   - 5.3 Turn the respective upper link fork (3) to set the distance between the cutting knives and the rotor.

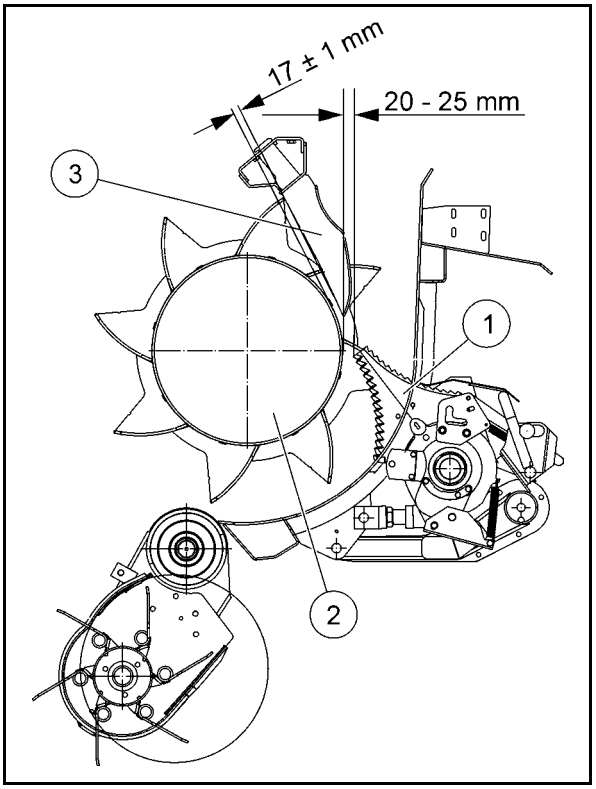


Fig. 127

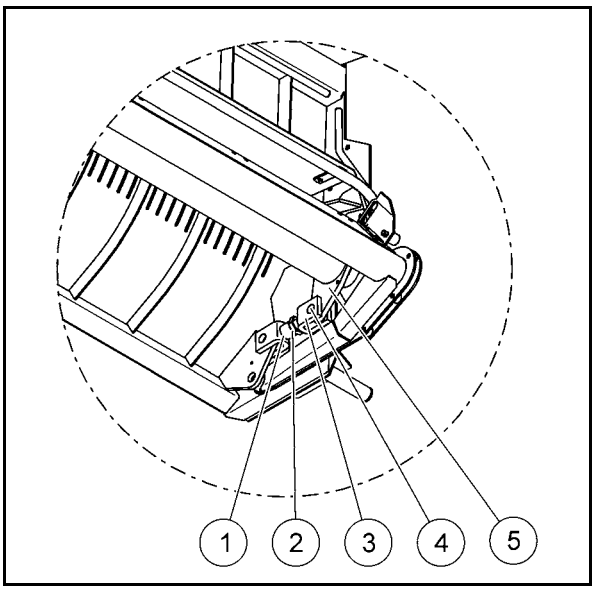


Fig. 128

- Increase distance between cutting knives and rotor = shorten upper link = turn upper link fork (3) clockwise.
- Reduce distance between cutting knives and rotor = lengthen upper link = turn upper link fork anticlockwise.

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 (3) to the receiver pipe (5) by means of the bolt (4) if the distance between cutting knives and rotor has been properly set.

5.6 Retighten the counter nut (2).

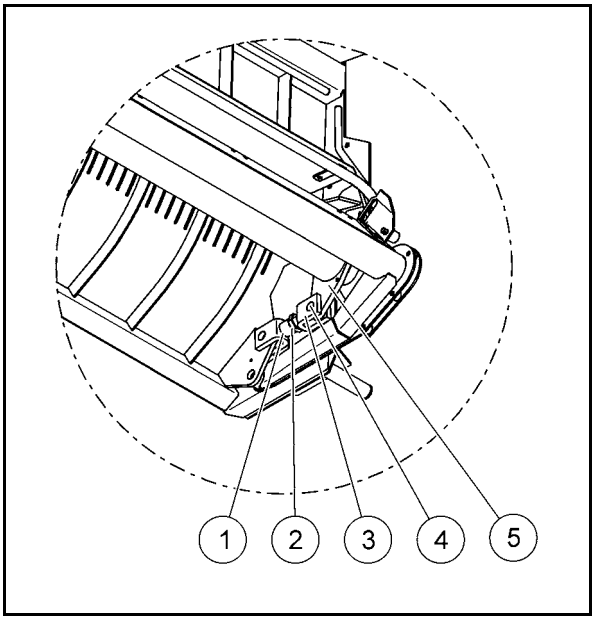


Fig. 128

11.8.5 Check distance between strippers and rotor

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.
2. Measure the distance between the strippers (1) and the rotor (2) in the conveyor duct from the cargo space.
   - 2a. If worn strippers (1) must be replaced:
   - 2a.1 Unscrew the screws (3).
   - 2a.2 Remove the safety rail (4) of the stripper holder by pulling it out to the side.
   - 2a.3 Remove worn strippers (1) by pulling them out to the bottom.
   - 2a.4 Mount new strippers in reverse assembly order.
5. If deformed stripper holders must be replaced, contact an authorized workshop (shop work).

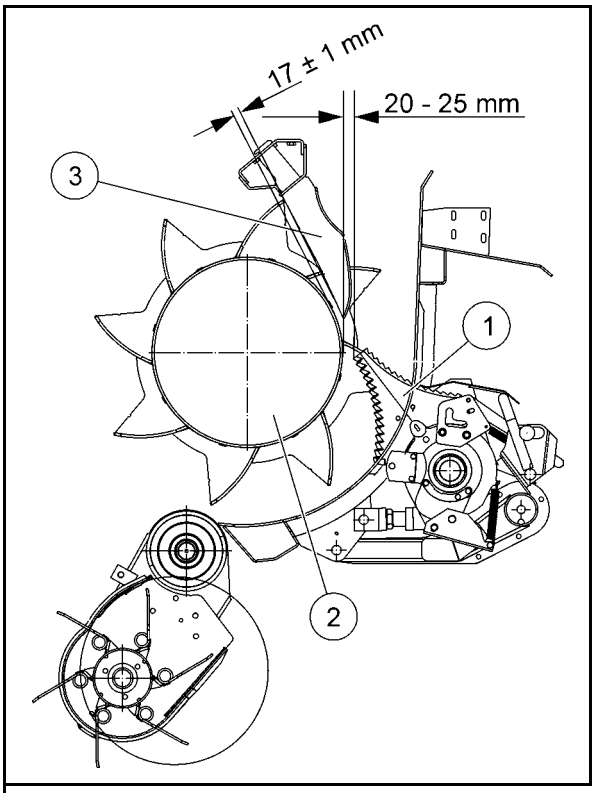


Fig. 129

Deformed stripper holders must be immediately replaced by an authorized workshop. Only an authorized workshop is allowed to carry out this work.

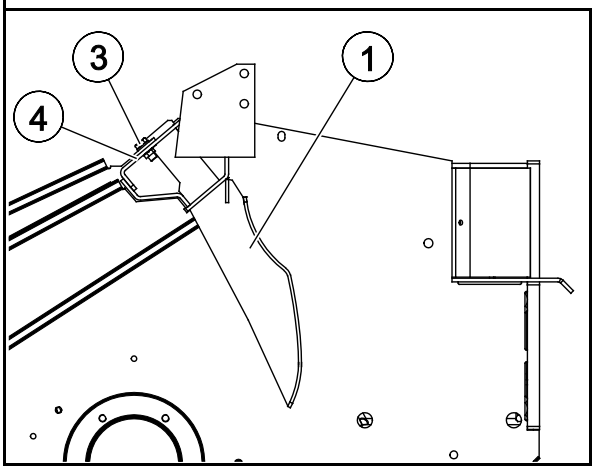


Fig. 130

11.8.6 Set sensor "Cutting unit retracted"

WARNING

Risk of crushing and shearing during setting of the sensor "Cutting unit retracted" if the forage trailer is unintentionally powered or hydraulic functions of the forage trailer are accidentally carried out!

Secure tractor and machine against accidental starting and rolling before setting the sensor "Cutting unit retracted".

1. Completely extend the cutting unit.
2. Turn the tractor engine off.
3. Switch the ignition on at the tractor.
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 from the single-acting control device.
8. Fix the sensor "Cutting unit retracted" (1) to the holder (2) such that the distance between the sensor and the frame of the cutting unit (3) is approx. 4 mm.

→ The light emitting diode (4) lights up and the "Cutting unit" symbol on the terminal simultaneously changes from position "Cutting unit retracted" to position "Cutting unit extended".

9. Screw the sensor in this position.

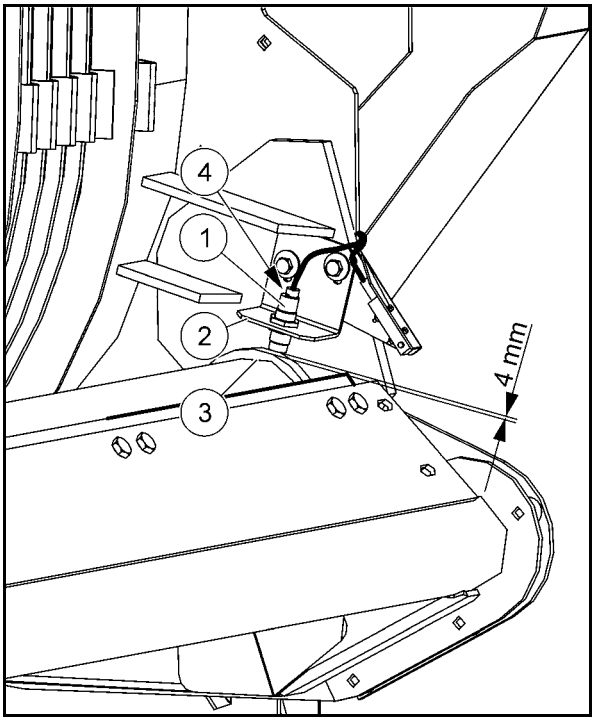


Fig. 131

11.9 Transport floor

- Ensure that the transport floor strips on the right-hand and left-hand side do not bump against the frame (1).
- Shorten the chain of the transport floor if the tension path of the chain tensioner is no longer sufficient.

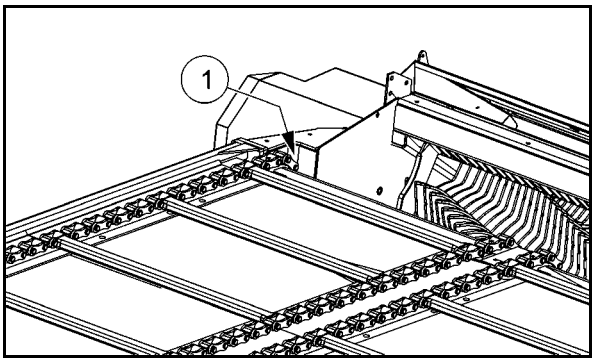


Fig. 132

The chains of the transport floor:
- must be tightened equally, but not too firmly,
- are only allowed to sag slightly.

11.9.1 Shorten 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 chain of the transport floor such that the chain connecting links are within the central and rear area of the cargo space.
2. Open the tailgate if necessary.
3. Secure tractor and machine against accidental starting and rolling.
4. Swivel the stop-cock to position "0" (stop-cock closed).

→ Tailgate is secured against accidental lowering.

5. Tighten the respective nut (2) to loosen the respective pawl (1) of the chain tensioners.
6. Unscrew the counter nuts (3) of the clamping screws (4).
7. Turn the 4 clamping screws (4) anticlockwise.

→ The chain of the transport floor sags.

8. Fold the access ladder down.
9. Open the access door.
10. Enter the cargo space to shorten the chain.

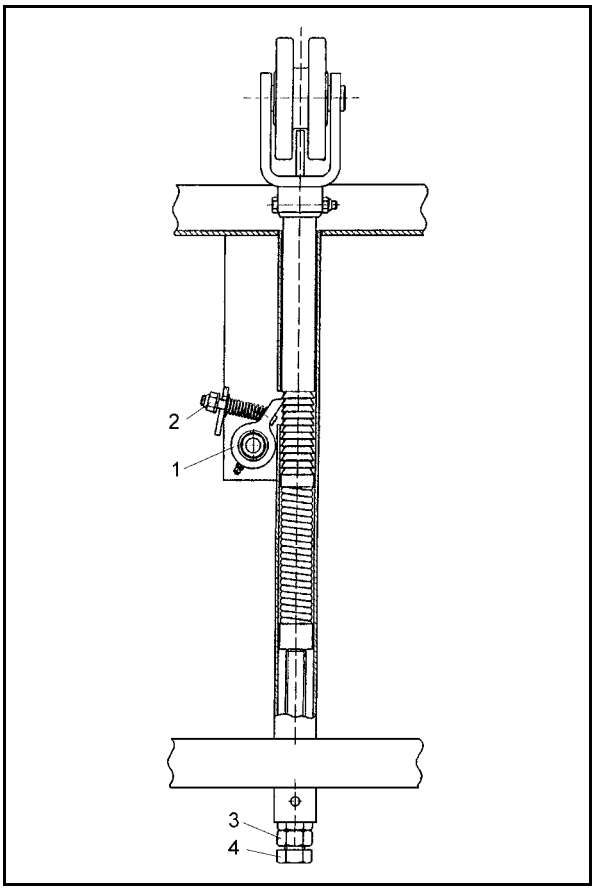


Fig. 133

11. Open and remove the chain connecting links.
12. Always cut out an even number of chain links (2, 4, 6) at all 4 chains by means of a right-angle grinder.
13. Put the shortened chains together again by means of new chain connecting links.
14. Turn the 4 clamping screws (4) clockwise.

→ The chain of the transport floor is tightened.

15. Unscrew the nuts (2) of the pawls (1) again.
16. 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.
17. Retighten the counter nuts (3).
18. Close the access door.
19. Fold the access ladder up.
20. Lock the access ladder and the access door by means of the locking mechanism.

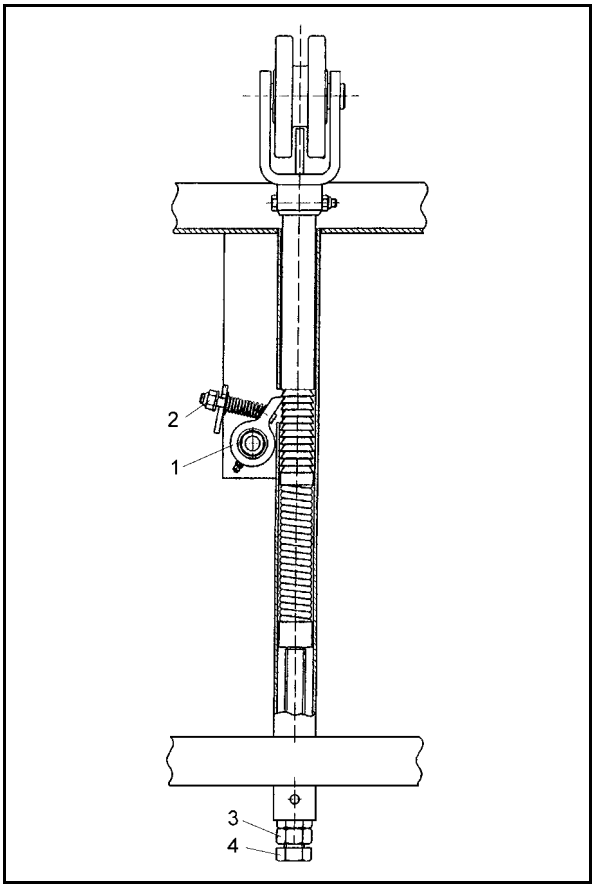


Fig. 133

11.9.2 Lubricate chain tensioners and deflection points of transport floor chain

11.9.2.1 Lubricate centralized lubrication points

1. Lubricate the chain tensioner and the front deflection points of the transport floor chain by means of all lubricating nipples of the lubricating strip (1).

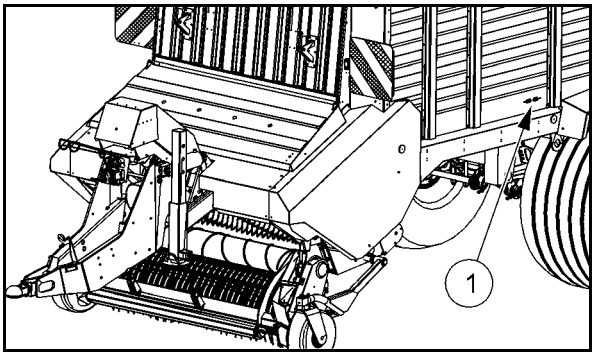


Fig. 134

2. Lubricate the rear deflection points of the transport floor chain by means of all lubricating nipples of the lubricating strip (2).

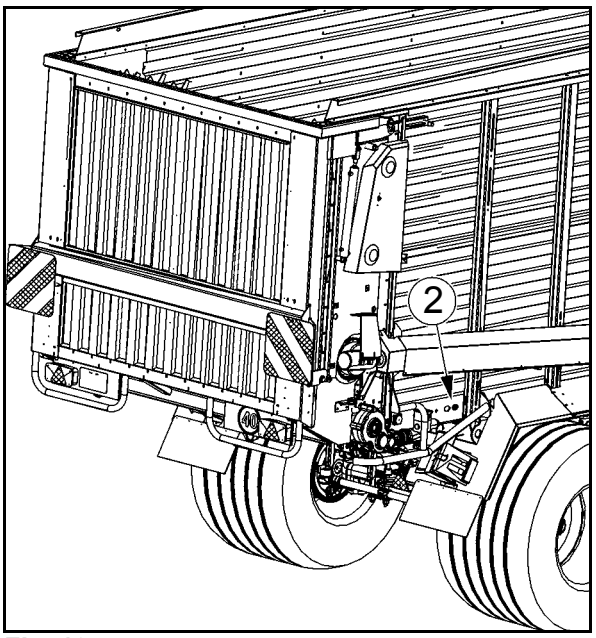


Fig. 135

11.9.2.2 Lubricate decentralized lubrication points

11.9.2.2.1 Lubricate chain tensioners and front deflection points of transport floor chain

1. Lift the folding drawbar to increase the free space to the chain tensioners.
2. Secure tractor and machine against accidental starting and rolling.
3. Lubricate the chain tensioners.
4. Lubricate the front deflection points of the transport floor chain.

11.9.2.2.2 Lubricate rear deflection points of transport floor chain

1. Open the tailgate.
2. Secure tractor and machine against accidental starting and rolling.
3. Swivel the stop-cock to position "0" (stop-cock closed).

→ Tailgate is secured against accidental lowering.

4. Lubricate the rear deflection points of the transport floor chain.

11.10 Metering drums

WARNING

Risk of slipping, stumbling or falling when carrying out service and maintenance work on the roller chains for the metering drum drive!

Absolutely use a mobile service platform with ladder when carrying out service and maintenance work on the roller chains for the metering drum drive.

11.10.1 Lubricate roller chains of metering drums

1. Use a service platform with ladder:
   - to open the protective devices for the roller chains of the metering drums 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.

11.10.2 Check / Retighten tension of roller chains of metering drums

Retighten the roller chains 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) metering drum.

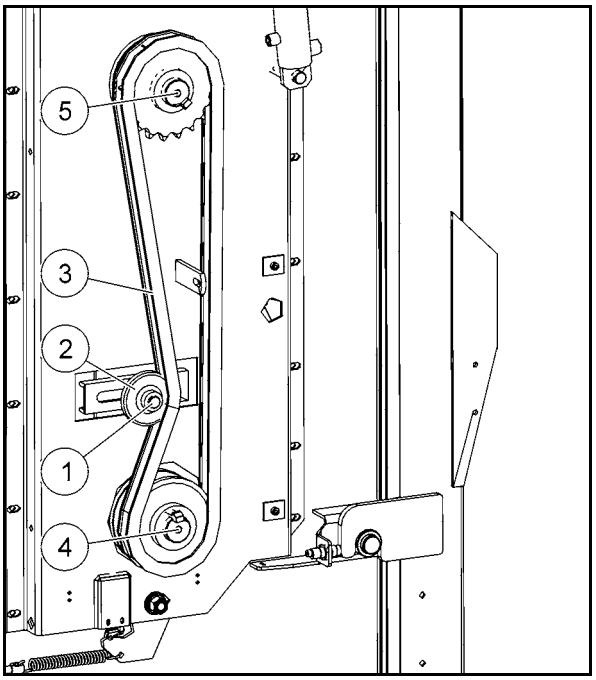


Fig. 136

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) metering drum.

1. Use a service platform with ladder:
   - to open the protective devices for the roller chains of the metering drums by means of a tool,
   - to obtain safe access to the roller chains.
2. Check the tension of the roller chains of the metering drum drive.
3. Retighten the loose roller chain (3, 8) by means of the chain tightening wheel (2, 7):
   3.1 Loose the tightening wheel bolt (1, 6) of the chain tightening wheel (2, 7).
   3.2 Move the chain tightening wheel (2, 7) to tighten the roller chain. The chain is properly tightened if the roller chain can only be pressed in by approx. 5 mm.
   3.3 Retighten the tightening wheel bolt (1, 6).
4. Lubricate the respective roller chain by means of grease or engine oil.
5. Close the protective devices and lock them in protective position.

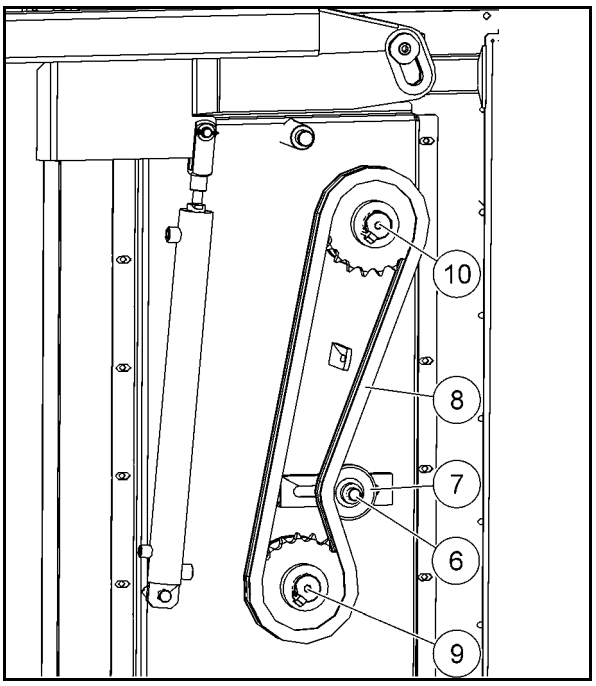


Fig. 137

11.11 Hydraulic system

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.
- Depressurize the hydraulic system before starting to work on the hydraulic system.
- Absolutely use appropriate means when trying to locate leakages.
- Never try to block hydraulic hose pipe leaks with your hands or fingers.

  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.
- 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.
- Observe the chapter "Basic safety instructions", page 39, when carrying out maintenance work on the hydraulic system.

WARNING

Risk of slipping to people due to leaking oil during work on the hydraulic system!

Immediately remove fresh oil stains by means of binding agents.

- Regularly check all hydraulic hose pipes and hydraulic plugs for damage and contamination.
- Dispose of used oil according to regulations. Contact your oil supplier in case of disposal problems.
- Do not keep hydraulic oil within reach of children.
- Beware that no hydraulic oil penetrates the soil or water.

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

1. Relieve the respective hydraulic cylinder via the corresponding operating element with the hydraulic pump switched off.

11.11.1.1 Depressurize folding drawbar with drawbar suspension

1. Completely lower the folding drawbar.
2. Adjusting lever at the double-acting control device of the tractor to "Open-centre position" (if a free reverse port is not available).
3. Unscrew the plug screw (1).

→ The hydraulic oil flows through the free reverse pipe or the double-acting control device to the tractor.

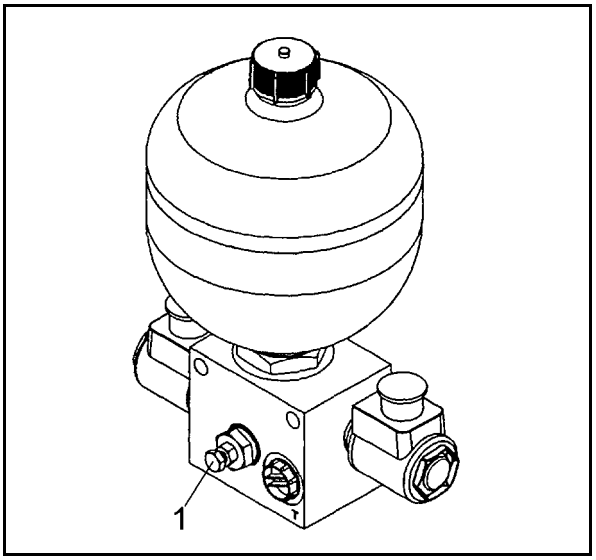


Fig. 138

11.11.1.2 Depressurize forced steering axle

1. Open the stop-cocks (1, 2, 3, 4) of the forced steering axle.

   Fig. 139 shows open stop-cocks.
2. Swivel the valve (5) of the hydraulic hand pump (6) to "Lower" position = pos. 11.

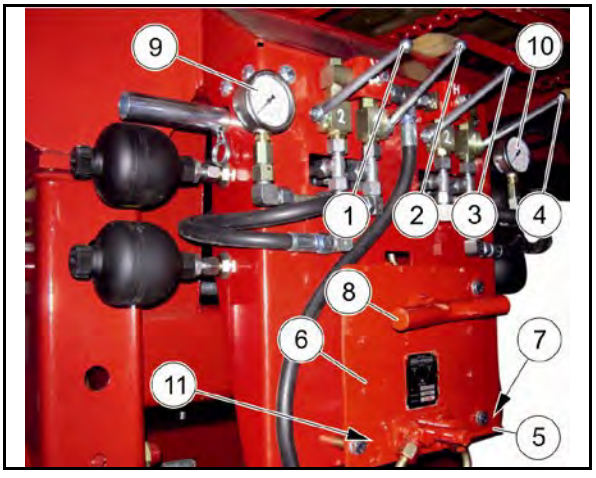


Fig. 139

11.11.2 Hydraulic hose pipes

11.11.2.1 Marking and period of use of hydraulic hose pipes

The marking on the fitting (Fig. 140) provides the following information:

(1) Identification of the hydraulic hose pipe manufacturer (A1HF)

(2) Date of manufacture of the hydraulic hose pipe (09 / 02 = year / month = February 2009)

(3) Maximum admissible operating pressure (210 bar)

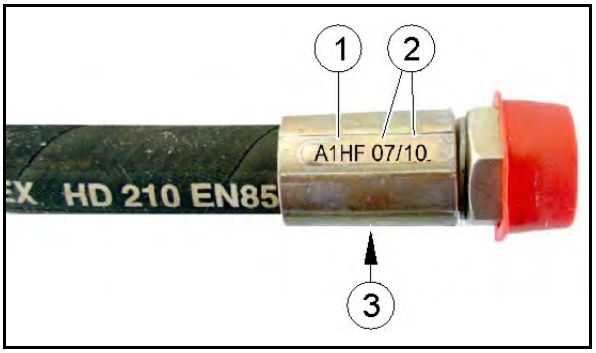


Fig. 140

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

Example:

Date of manufacture (2) = 07 / 10	October 2007
Period of use expires	October 2013

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

11.11.2.2 Maintenance intervals

After the first 10 service hours and then every 50 service hours:

1. Check all components of the hydraulic system for tightness.
2. Retighten screwed connections if necessary.

Before each startup:

Check hydraulic hose pipes for visible defects. Immediately remedy the following defects:

1. Eliminate chafing points on hydraulic hose pipes and tubes.
2. Immediately replace worn, damaged or overaged hydraulic hose pipes (shop work).

11.11.2.3 Inspection criteria for hydraulic hose pipes

For your own safety:

Immediately replace hydraulic hose pipes 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 hose 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 235.

11.11.2.4 Installation and removal of hydraulic hose pipes (shop work)

Instructions for authorized workshop:

When installing and removing hydraulic hose pipes, absolutely observe the following information:

- Only use hydraulic hose pipes of the manufacturer.
- Ensure cleanliness.
- Install hydraulic hose pipes such that the following applies to all operating states:
  - there is no tensile stress, except for that due to the dead weight,
  - there is no upsetting stress in case of short lengths,
  - external mechanical influences on the hydraulic hose pipes are avoided.

    Ensure to avoid chafing of hydraulic hose pipes against components or against each other by suitable arrangement and fixing. Protect hydraulic hose pipes by means of protective coatings if necessary. Cover sharp-edged components.
  - the bending radii do not fall below the admissible limits.
- When connecting a hydraulic hose pipe to moving parts, the hose length must be such that:
  - in the complete range of motion the bending radius does not fall below the minimum admissible limit,
  - the hydraulic hose pipe is not subject to tensile stress.
- Fix the hydraulic hose pipes to the specified fixing points. Avoid additional hose supports which affect the natural motion and length variation of the hose.
- Overcoating of hydraulic hose pipes is not allowed.

11.11.3 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.
- If injuries caused by hydraulic oil occur, immediately contact the medical services.

WARNING

Risk of slipping to people due to leaking oil during work on the hydraulic system!

Immediately remove fresh oil stains by means of binding agents.

Instructions for authorized workshop:

1. Disconnect the hydraulic system of the machine from the tractor.

→ The hydraulic system 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.

   O-Ring Dr 67.95 x 2.62
   Ord. no. 865 07 588

7. Lubricate the O-ring (2) of the new filter cartridge.
8. Slip the new filter element on as far as it will go.

   Filter element ord. no. 870 08 887

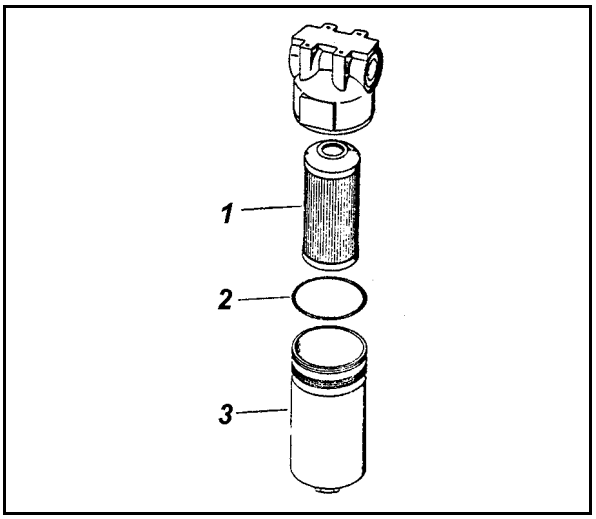


Fig. 141

9. Screw the filter casing into the filter head.
10. Tighten the screwed connection at a torque of 150 Nm.

11.12 Hydraulic levelling device

Observe the information in the chapters "Check travelling height of hydraulic levelling device", page 80 and "Adjust travelling height of hydraulic levelling device", page 81.

11.12.1 Oil storage tank at the hydraulic cylinder of the hydraulic levelling device

If the machine is in permanent use, the following measures must be carried out every month:

- drain the condensate from the oil storage tank (Fig. 142/1),
- check / top up oil level in the oil storage tank (Fig. 142/1). Each of the four oil storage tanks must be half filled with hydraulic oil HLP 46, i.e. the quantity when filled is 100 ml.

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.

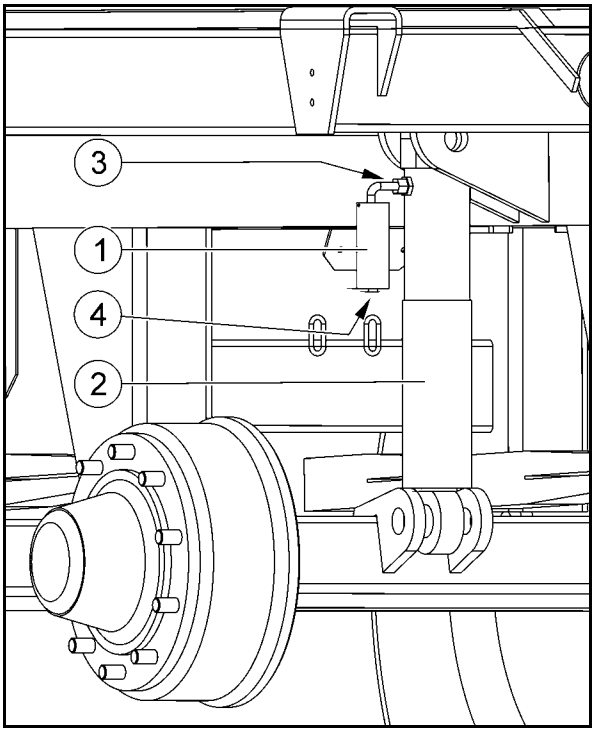


Fig. 142

11.12.1.1 Drain condensate and check / top up oil level

Successively carry out the required work for the right-hand and left-hand vehicle 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 pipes of the levelling valve with a single-acting control device of the tractor.

5.Completely lower all four hydraulic cylinders (Fig. 142/4) of the hydraulic levelling device:

5.1 Press the stop button (3) or (4) to unlock the stop valve (5) or (6).

5.2 Turn the stop valve carefully to position "DOWN" as far as it will go.

5.3 Hold the operating element at the tractor's control device for the levelling valve in "Lift" position until the pressure gauges (1) and (2) indicate 0 bar.

→ The hydraulic cylinders (Fig. 142/4) of the hydraulic levelling device are completely lowered.

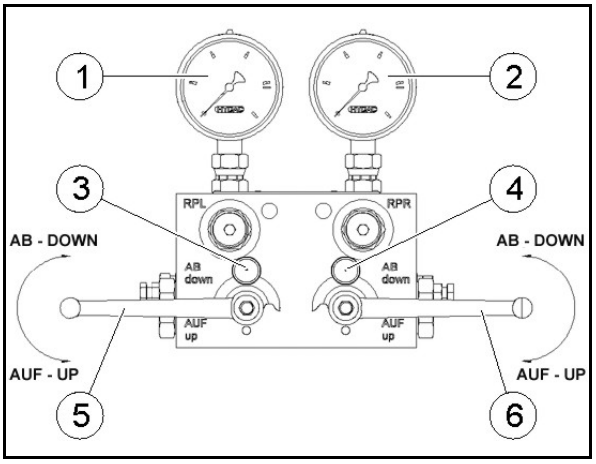


Fig. 143

6. Drain the condensate from the oil storage tank (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.

6.4 Properly dispose of the condensate.

7. Check / Top up oil level in the oil storage tank (1):

7.1 Unscrew the screwed connection (3).

7.2 Swivel the oil storage tank up.

7.3 Retighten the screwed connection.

7.4 Remove the drain plug (4).

7.5 Take a clean object to be used as a dipstick.

7.6 Insert this clean object into the filler neck to determine the oil level.

7.7 Top up hydraulic oil if necessary.

7.8 Screw in and tighten drain plug.

7.9 Unscrew the screwed connection (3).

7.10 Swivel the oil storage tank down.

7.11 Retighten the screwed connection.

8. Properly readjust the travelling height of the hydraulic levelling device. Observe the information in the chapter "Adjust travelling height of hydraulic levelling device", page 81.

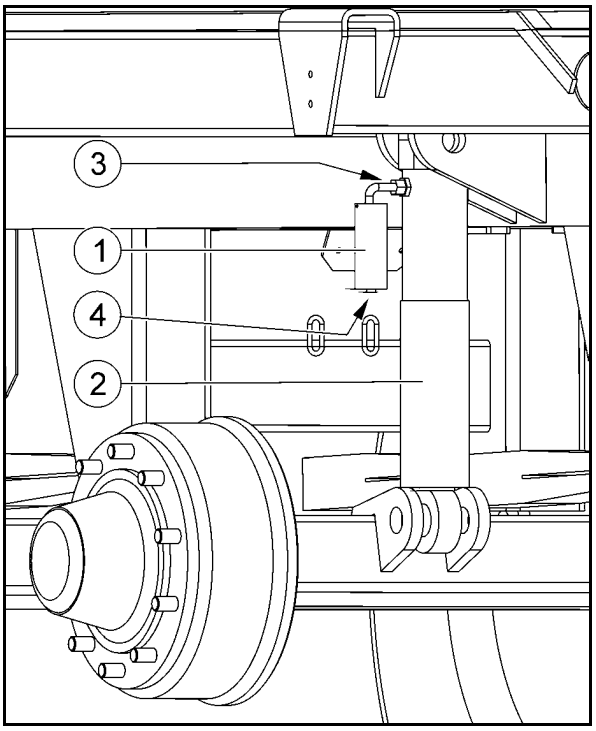


Fig. 142

11.13 Tyres

Good tyre efficiency is a matter of regular checks and travelling at proper tyre pressure.

11.13.1 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.
- Relieve the tyres if the vehicle is not intended to be used for a longer period thus avoiding deformation of the tyres.
- 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.

11.13.2 Change tyres

Observe the information in the chapter "Basic safety instructions", page 44, when carrying out repair work on tyres and wheels.

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. Use additional solid, load-distributing supports if necessary.
- Never stand under a lifted, unsecured machine.

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.

1. Place the lifting device at the fixing points marked by the pictograph illustrated in (Fig. 144).

Fig. 144

2. Keep to the order illustrated in Fig. 145 when loosening and tightening the wheel nuts.
3. Tighten wheel nuts at the required tightening torque.

   Observe the table listing the tightening torques for wheel nuts, page 200.
4. Check the wheel nuts for tightness after 10 service hours. Retighten wheel nuts if necessary.

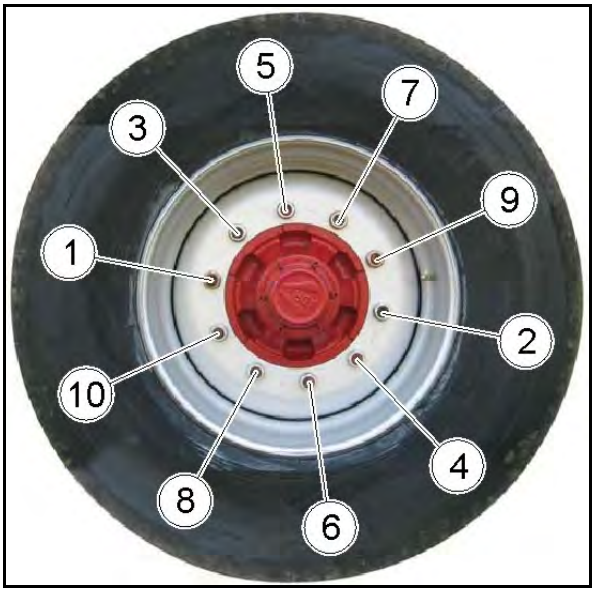


Fig. 145

11.14 Brake system

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

11.14.1 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 elements.

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.

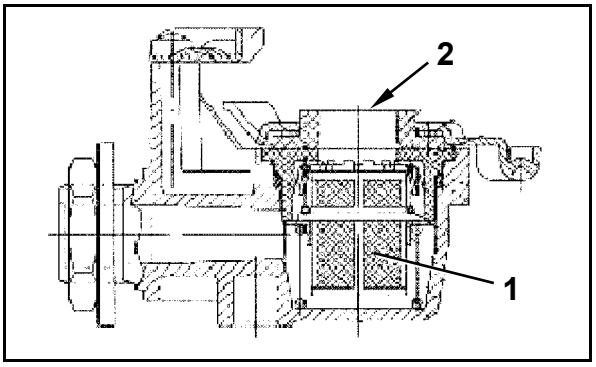


Fig. 146

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. Use compressed air to blow out the filter element or clean the filter element by means of benzine or thinner.
6. Reinsert the filter element into the hose coupling.
7. Close the cover (5).
8. Screw the cover by means of the two Phillips screws (4).
9. Connect the brake and the feed line to the tractor.
10. Check the hose couplings for tightness.

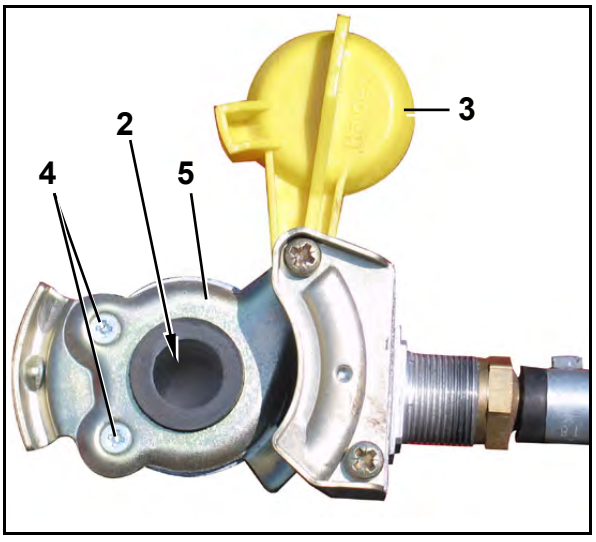


Fig. 147

11.14.2 Set compressed-air brake system

Manually actuate brake lever in pressing direction.

In case of a maximum free travel (X) of 30 mm, the wheel brake must be adjusted.

The adjustment is carried out by means of the adjusting screw (1) (press down circlip)

Set the free travel (X) at 0.1 time the brake lever length (Y).

Brake lining check (2)

In case of a remaining lining thickness of

- 5 mm for riveted linings
- 2 mm for glued linings

the brake lining must be replaced.

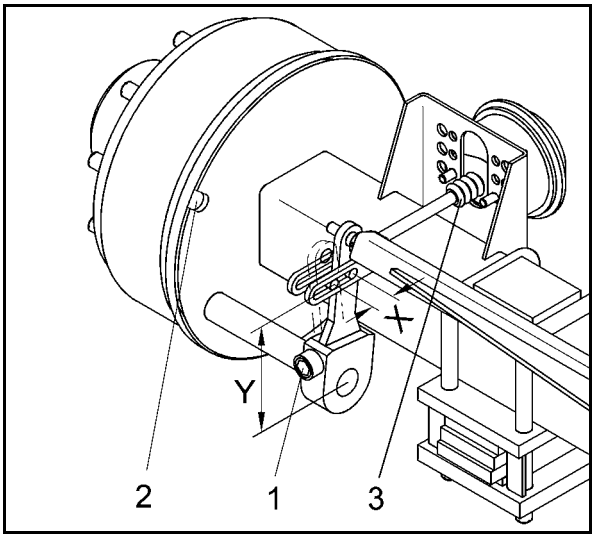


Fig. 148

11.14.3 Set hydraulic brake system

Actuate brake lever in pressing direction.

In case of a maximum free travel (X) of 40 mm, the wheel brake must be adjusted.

The adjustment is carried out by means of the adjusting screw (1) (press down circlip)

Set the free travel (X) at 0.1 time the brake lever length (Y).

Brake lining check (2)

The brake lining must be replaced in case of a remaining lining thickness of:

- 5 mm for riveted linings,
- 2 mm for glued linings.

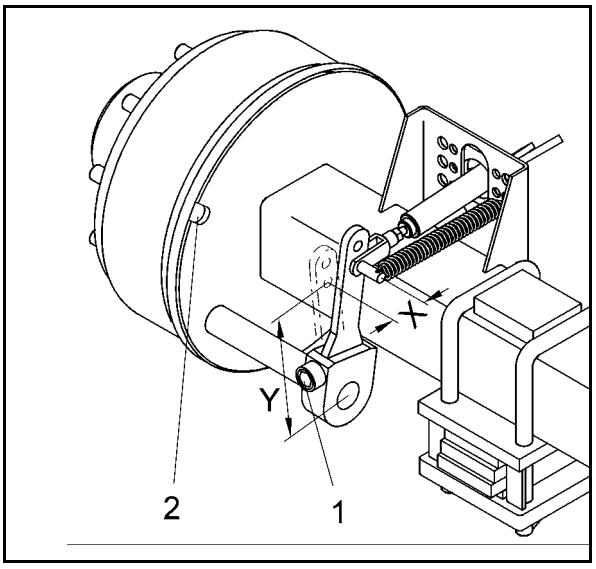


Fig. 149

11.15 Maintenance instructions for standard chassis

- Spring fixing (1):
  - every 200 service hours, first service after the **first** journey with loaded material:

    Check counter nuts of spring clamps for tightness. In case of loosened screwed connection, tighten nuts alternately and in several steps. Do not carry out welding work on the link spring! Tightening torque with torque wrench:

    M 24
    M = 510 Nm (460 - 560 Nm)
- Spring bearing bolt (2):
  - every 200 service hours, first service after the **first** journey with loaded material:

    Check counter nuts of spring bearing bolts for tightness. In case of loosened screwed connection, tighten nuts alternately and in several steps. Tightening torque with torque wrench:

    M 20
    M = 375 Nm (325 - 425 Nm)
- Rubber pad (3) and central bolt (4):
  - check for wear every 500 service hours, once a year at the latest.
- Axle bolt (5):
  - every 200 service hours, first service after the **first** journey with loaded material:

    Remove safety bolt and check crown nuts of axle bolts for tightness. In case of loosened screwed connection, tighten nuts alternately and in several steps. Secure crown nut by means of safety bolt. Tightening torque with torque wrench:

    M 30
    M = 1150 Nm (1000 - 1300 Nm)
  - every 500 service hours, once a year at the latest:

    Remove axle bolt.

    Check bushings for wear.

    Insert axle bolt with grease.

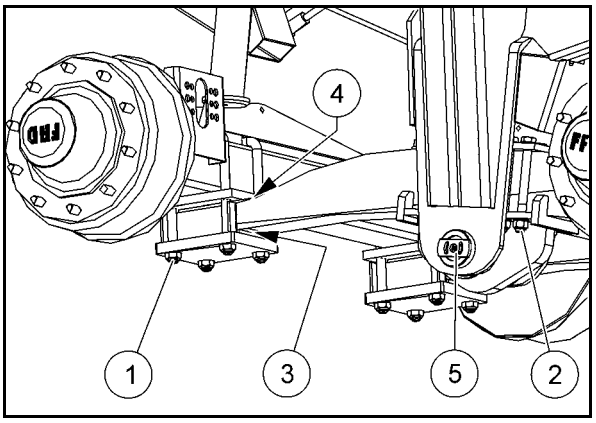


Fig. 150

11.16 Maintenance instructions for BPW hydraulic tandem chassis

- Dash pot, top and bottom:
  - o every 200 service hours:
    Grease the lubrication points (1) at the hydraulic cylinder on the empty machine until fresh grease is coming out of the bearings.

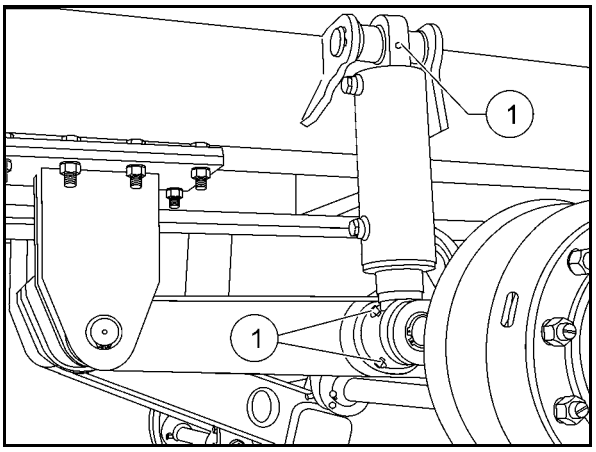


Fig. 151

- Visual check:
  - o every 200 service hours:
    Check all components for damage and wear.
- Check dash pot (1) for its condition and its tightness:
  - o every 500 service hours, once a year at the latest.

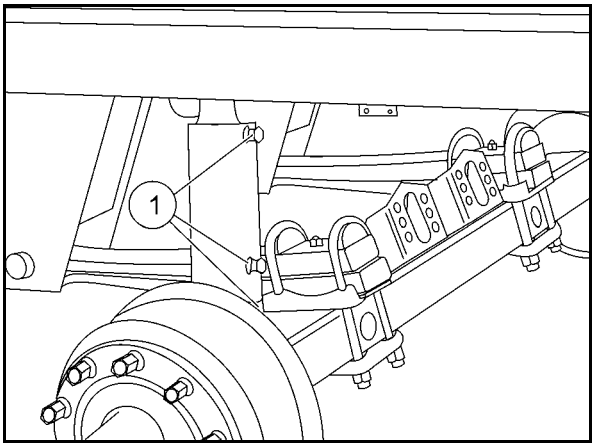


Fig. 152

- Check fastening device (2) of dash pots for tightness and wear:
  - o every 500 service hours, once a year at the latest.

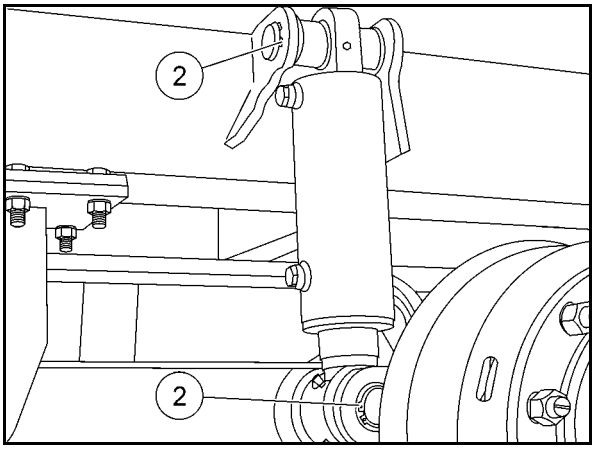


Fig. 153

- Spring fixing (3):
  - o every 200 service hours, first service after the **first** journey with loaded material:

    Check counter nuts of spring clamps for tightness. In case of loosened screwed connection, tighten nuts alternately and in several steps. Do not carry out welding work on the link spring! Tightening torque with torque wrench:

    M 24
    M = 650 Nm (605 - 715 Nm)

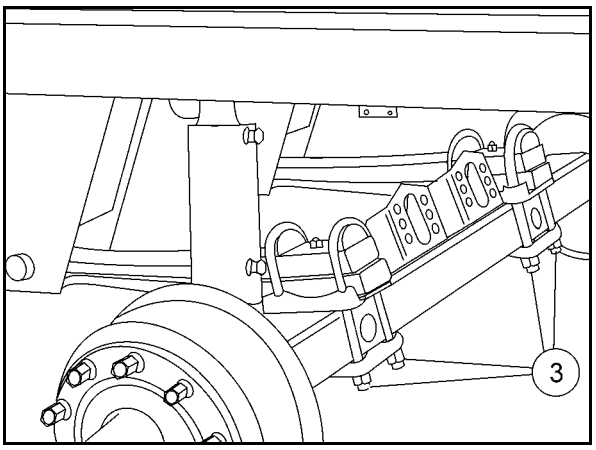


Fig. 154

- Spring bolt (4):
  - o every 500 service hours, once a year at the latest, first service after the **first** journey with loaded material:

    Check bushings, move vehicle slightly forward and backwards with the brake applied or move spring eyes by means of mounting lever. The spring eye must not show any clearance. In case of loose fixing, the spring bolt may be damaged.
    - o Check lateral wearing washers in the support.
    - o Check counter nut M 30 at the spring bolts for tightness.

    Tightening torque with torque wrench:

    M 30
    M = 900 Nm (840 - 990 Nm)

    The service life of the rubber steel bush bearing depends on the tightness of the inner steel bush.

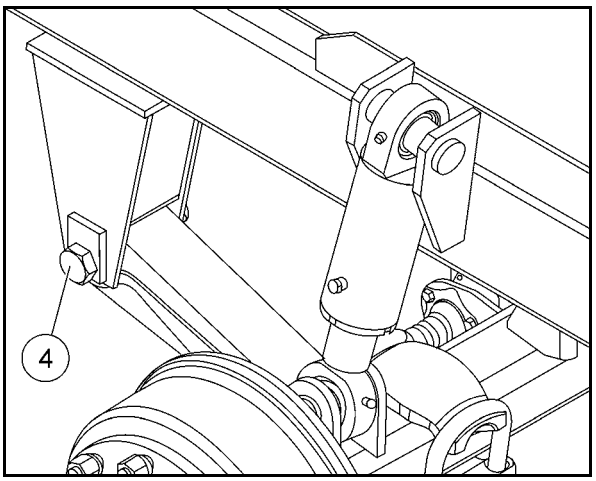


Fig. 155

(1) Spring bolt in antitwist protection groove.

(2) Washer

(3) Loose wearing plates

(4) Lateral wearing washers

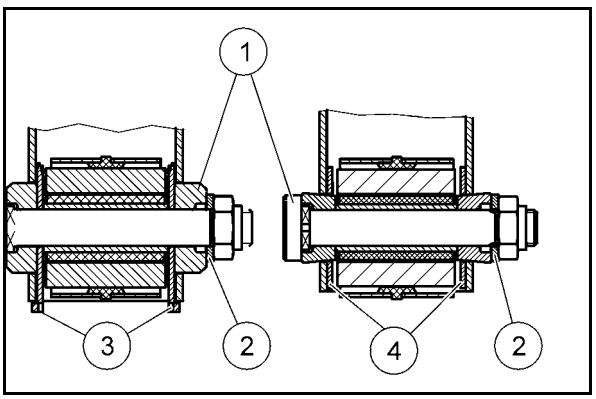
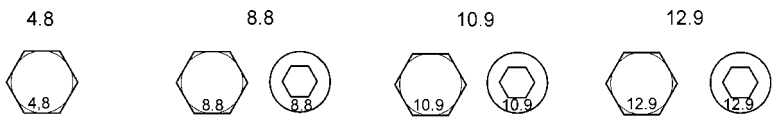


Fig. 156

11.17 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
M 6	4.8	3.5	6	4.5	9	6.5	11	8.5	13	9.5	17	12	15	11.5	19	14.5
M 8	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 phosphated or oiled screws are used.*

° *"Dry" means that normal or galvanized screws without any lubrication are used.*

Tab. 5

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, ensure 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 Malfunctions

12.1 Malfunctions and remedy – Work

Malfunction	Cause	Remedy
Verstopfungen im Einzugsbereich	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	Adapt travelling speed.
	Cutting knives blunt	Remove and sharpen cutting knives.
	Loaded material too heavily compressed	Switch feed function on in good time.
Bad cutting quality	Cutting knives blunt	Sharpen cutting knives in good time.
	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 springs of response threshold.
Cutting knives break frequently	Knife security system defective	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.
	Pick-up heavily soiled in its interior.	Remove dirt.
Machine wobbles heavily during road travel	Tyre pressure too low	Adjust tyre pressure according to table.
	Trailer overloaded	Empty trailer.

Malfunction	Cause	Remedy
One vehicle side strongly lowers in case of hydraulic chassis	Machine overloaded. Oil escapes through 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.

Tab. 6

12.2 Malfunctions and remedy – Hydraulic system

Malfunction	Cause	Remedy
Machine does not work	Oil flow interrupted	Check quick coupling. Switch control device on tractor to pressure.
	System screw at hydraulic block not properly set	Check setting and adjust if necessary.
Hydraulic system excessively heating up	Volume flow from tractor too large	Adjust volume flow at tractor valve.
	Hydraulic clutches too small	Provide appropriately large clutches.
	Hydraulic clutches worn	Provide new clutches.
	Hydraulic system not converted to open system	Set properly.
Too little hydraulic power in LS mode	Hydraulic clutches too small	Use appropriately large clutches.
	LS control pressure too low	Possibly use pressure intensifier. Consult the manufacturer.
Folding drawbar does not move up	Machine overloaded	Discharge machine.
	Pressure at tractor too low	Set pressure at tractor to a minimum value of 180 bar.
Function: Pick-up, folding drawbar and tailgate sink during work	Leaking cylinder	Reseal cylinder
Cutting unit slowly swivelling back during work	Piston in hydraulic cylinder leaking	Reseal cylinder piston.
	Leaking cylinder	Reseal cylinder
	Too little oil pressure	Actuate key button a little bit longer.

Tab. 7

12.3 Malfunctions and remedy – Electrical system

Malfunction	Cause	Remedy
No function working	No voltage, 12 volts, at switch box	Provide a voltage of 12 volts at the tractor.
	Fuse defective	Replace fuse.
	Loose contact in socket	Remedy loose contact.
	Tractor off	Tractor on.
Functions work irregularly	Cable cross sections of feed line too small	Select larger cable cross section - minimum 4 mm².
Fuse frequently defective	Fuse protection too weak	Install min. 25 A fuse.
Fuse permanently defective	Cable damaged	Replace cable.
Feed function cannot be controlled	No 12-V voltage at tractor or machine	Provide a voltage of 12 V.
Feed function can only temporarily be controlled	Cable cross section of feed line too small	Select larger cable cross section - minimum 4 mm².
Feed function does not work	Solenoid of feed function defective	Replace solenoid.
2 or more functions work simultaneously	Cable damaged, 2 solenoids are simultaneously energized.	Replace cable.
Transport floor does not move although voltage of 12 V available at solenoid	Solenoid defective	Replace solenoid.
No readouts on the display	No voltage	Check voltage source.
	Fuse defective	Replace fuse.
No status indicator of a function in the display	Wiring defective (short-circuit)	Check / replace wires.
	Sensor not properly set	Adjust sensor.
	Sensor defective	Replace sensor.
No status indicator of any function in the display	Wiring defective (short-circuit)	Check / replace wires.
	Sensors not properly set	Adjust sensors.
	One or several sensors defective	Replace sensors.
Automatic charging system switches too late	Range not set	Recalibrate automatic charging system.
	No oil from the tractor	Switch control device on.
System does not work	Malfunction in the system	Restart system to reload software
Discharge mode A I does not switch	Steering axle does not lock completely due to blocked wheels	Move vehicle slightly forward to lock the steering axle.

Tab. 8

13 Circuit diagrams

13.1 Hydraulic circuit diagram – Easy-to-use control / ISOBUS control

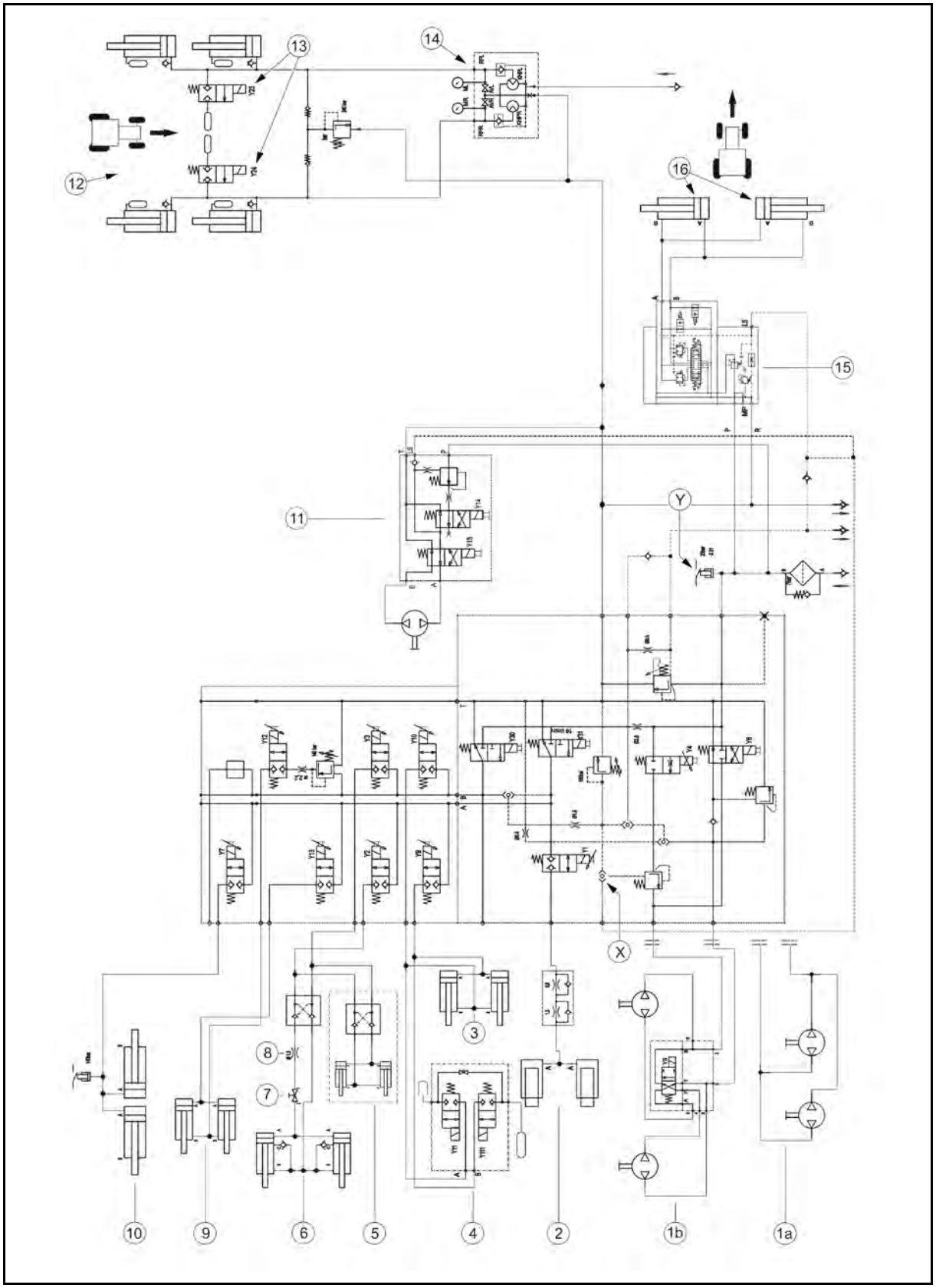


Fig. 157

(1a) Transport floor (one-level)
(1b) Transport floor (two-level)
(2) Pick-up
(3) Folding drawbar
(4) Drawbar suspension (optional extra)
(5) Angular switchgear DO circuit (only forage trailer with metering drums)
(6) Tailgate
(7) Stop-cock
(8) Throttle (only forage trailer with metering drums)
(9) Cutting unit
(10) Steering axle BPW or FAD
(11) Crossover conveyor
(12) Hydro-pneumatic chassis (Hydac tandem axle control) (optional extra)
(13) Y23 and Y24 with active drawbar suspension energized
(14) Hydraulic levelling device
(15) Electro-hydraulic forced steering axle
(16) Steering cylinder
(X) only mounted with crossover conveyor
(Y) only mounted with electro-hydraulic forced steering axle

13.2 Electrical circuit diagrams Mega-Vitesse CFS /DO

13.2.1 Electrical circuit diagram - Easy-to-use control / ISOBUS control - Sensors

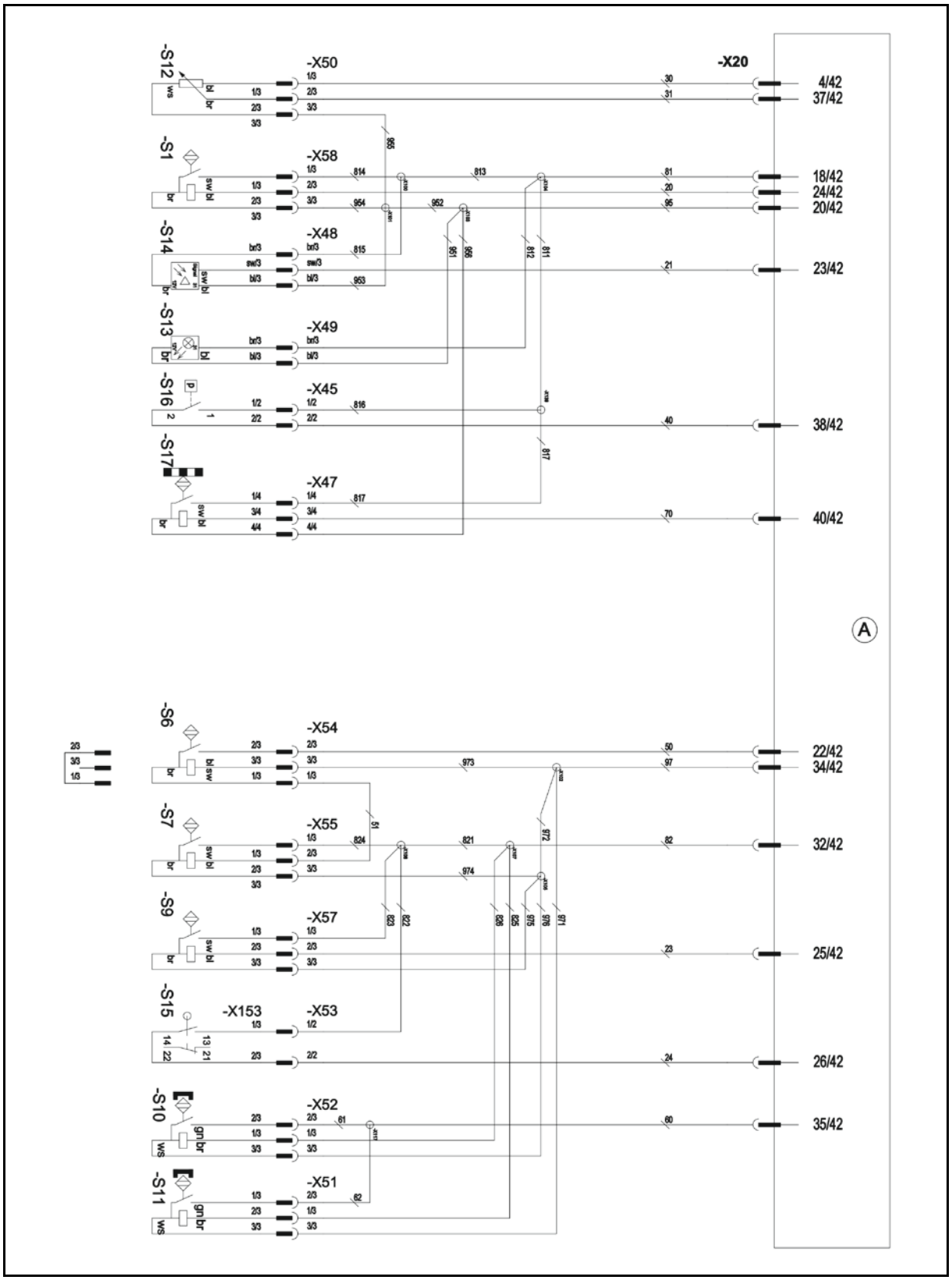


Fig. 158

(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 closed"
23/42 Signal, light barrier
24/42 Signal, cutting unit
25/42 Signal "Tailgate completely open"
26/42 Signal "Forage trailer full"
32/42 12 V sensors 2
34/42 Ground sensors 2
35/42 Signal "Speed metering drums"
37/42 Signal, automatic charging system
38/42 Signal "Axle locked"
40/42 Signal "Axle free" or
in case of SES: error in forced steering axle system

S1 Cutting unit
S6 Tailgate closed, right-hand (only forage trailers without metering drums)
S7 Tailgate closed, left-hand
S9 Tailgate completely open
S10 Speed, metering drums, left-hand
S11 Speed, metering drums, right-hand
S12 Potentiometer, automatic charging system
S13 Cutting knife fixing device (transmitter)
S14 Cutting knife fixing device (receiver)
S15 Forage trailer is full
S16 Pressure switch
S17 Axle free

13.2.2 Electrical circuit diagram – Easy-to-use control / ISOBUS control – Valves

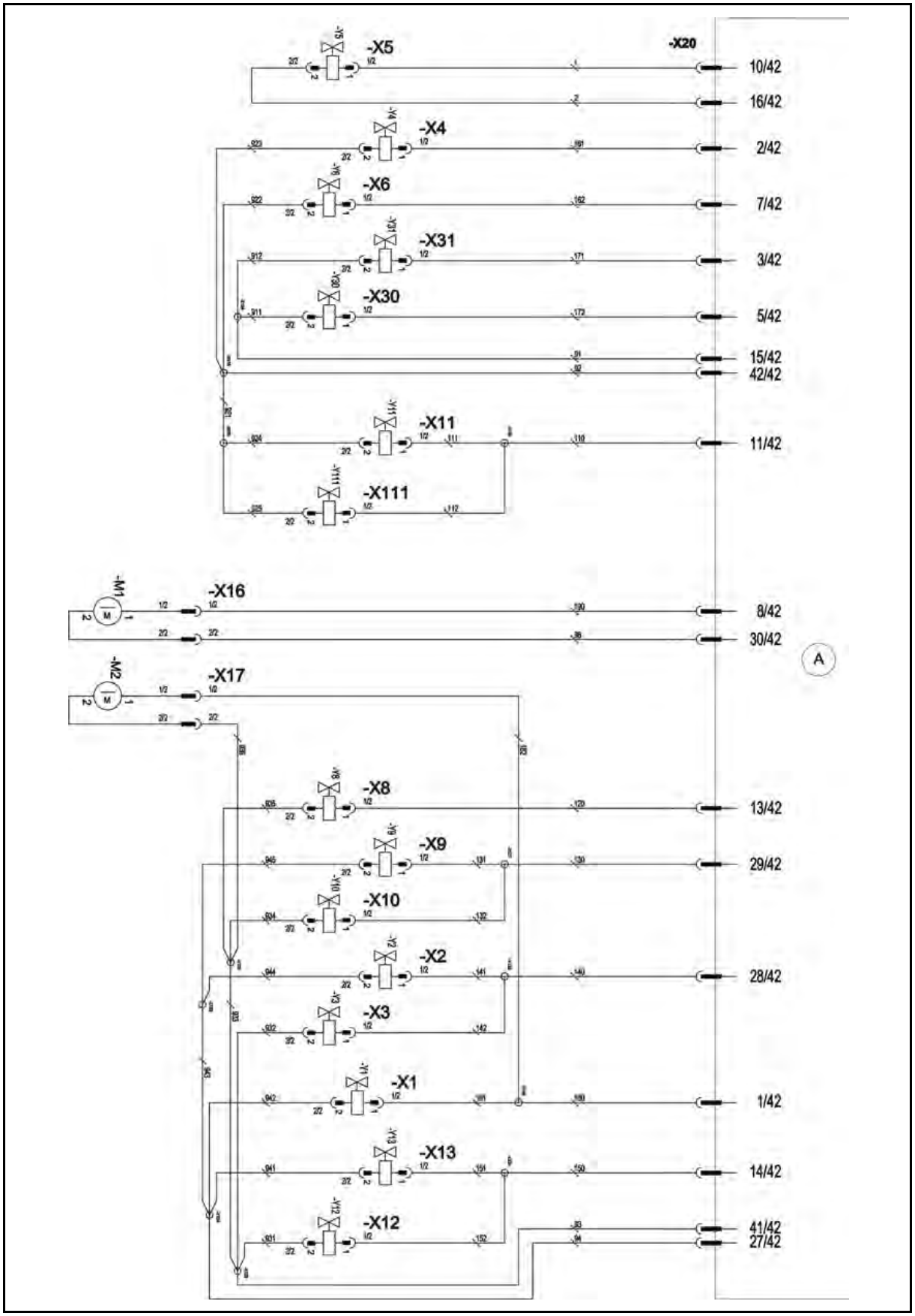


Fig. 159

(A)	Control unit
1/42	Triggering, pick-up
2/42	Triggering "Transport floor forward", proportional valve
3/42	Triggering, pre-selection 31
5/42	Triggering, pre-selection 30
7/42	Triggering "Transport floor reverse"
8/42	Triggering, silage additive pump
10/42	Triggering, transport floor, 2nd level
11/42	Triggering, drawbar suspension
13/42	Triggering, steering axle or in the case of the SES system: triggering, lock steering axle
14/42	Triggering, cutting knives
15/42	Ground, valves 1
16/42	Ground, transport floor, 2nd level
27/42	Ground, valves 4
28/42	Triggering, tailgate
29/42	Triggering, folding drawbar
30/42	Ground, silage additive pump
41/42	Ground, valves 3
42/42	Ground, valves 2
M1	Silage additive pump
M2	Lubricant pump
X1	Pick-up
X2	Tailgate 1
X3	Tailgate 2
X4	"Transport floor forward", proportional valve
X5	Transport floor, 2nd level
X6	"Transport floor reverse"
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
X17	Central lubrication
X30	Preselection 30
X31	Preselection 31

13.2.3 Electrical circuit diagram – Easy-to-use control / ISOBUS control – Control unit

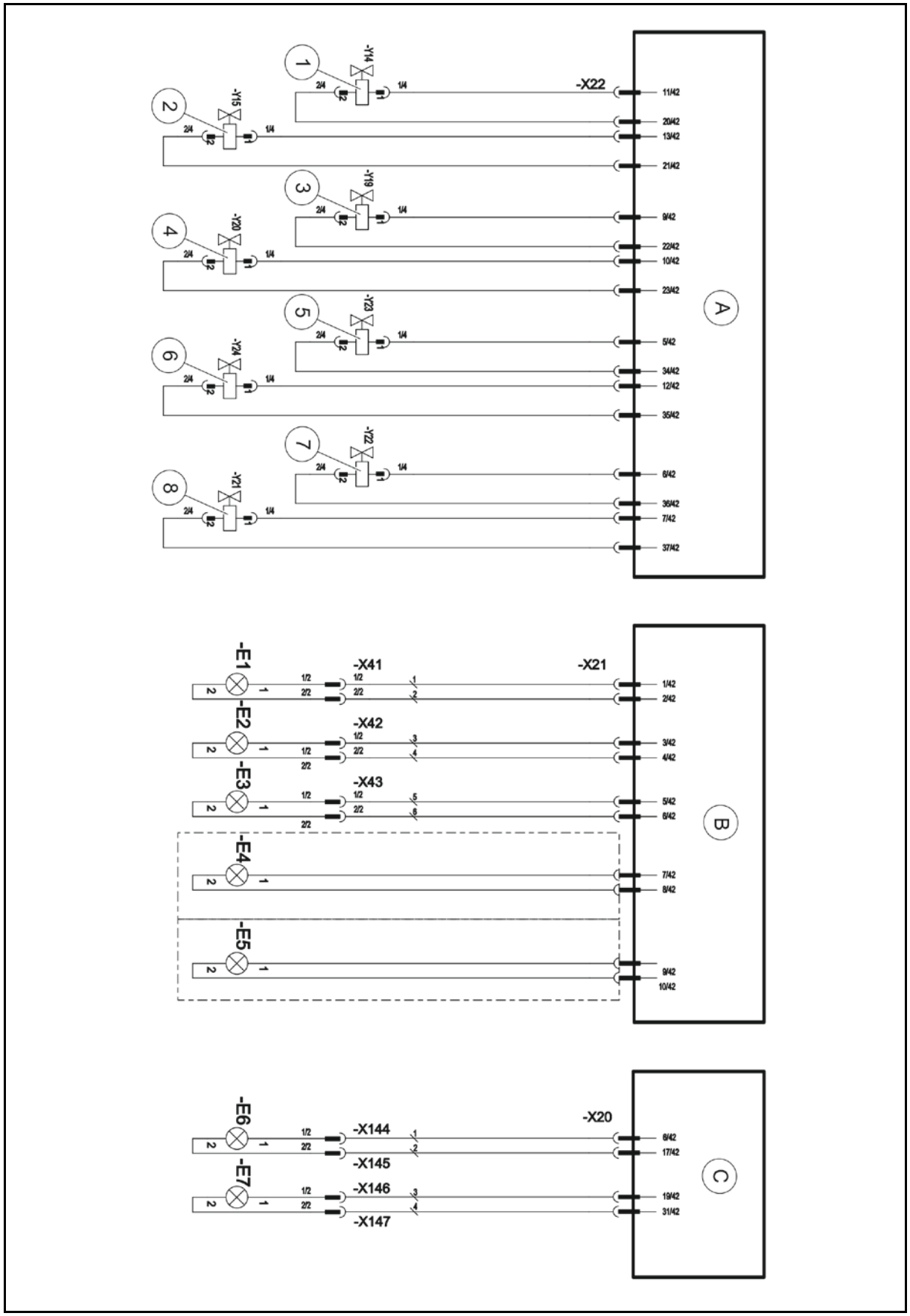


Fig. 160

(A) Extension module, ISOBUS control
(B) LIN module, ISOBUS control
(C) Power unit, easy-to-use 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) No function
(8) No function

E1 Work lights, front grating
E2 Work lights, rear, left-hand
E3 Work lights, rear, right-hand
E4 Work lights (optional extra)
E5 Warning beacon (optional extra)

13.2.4 Easy-to-use control / ISOBUS control – Overview, cable harness, valves

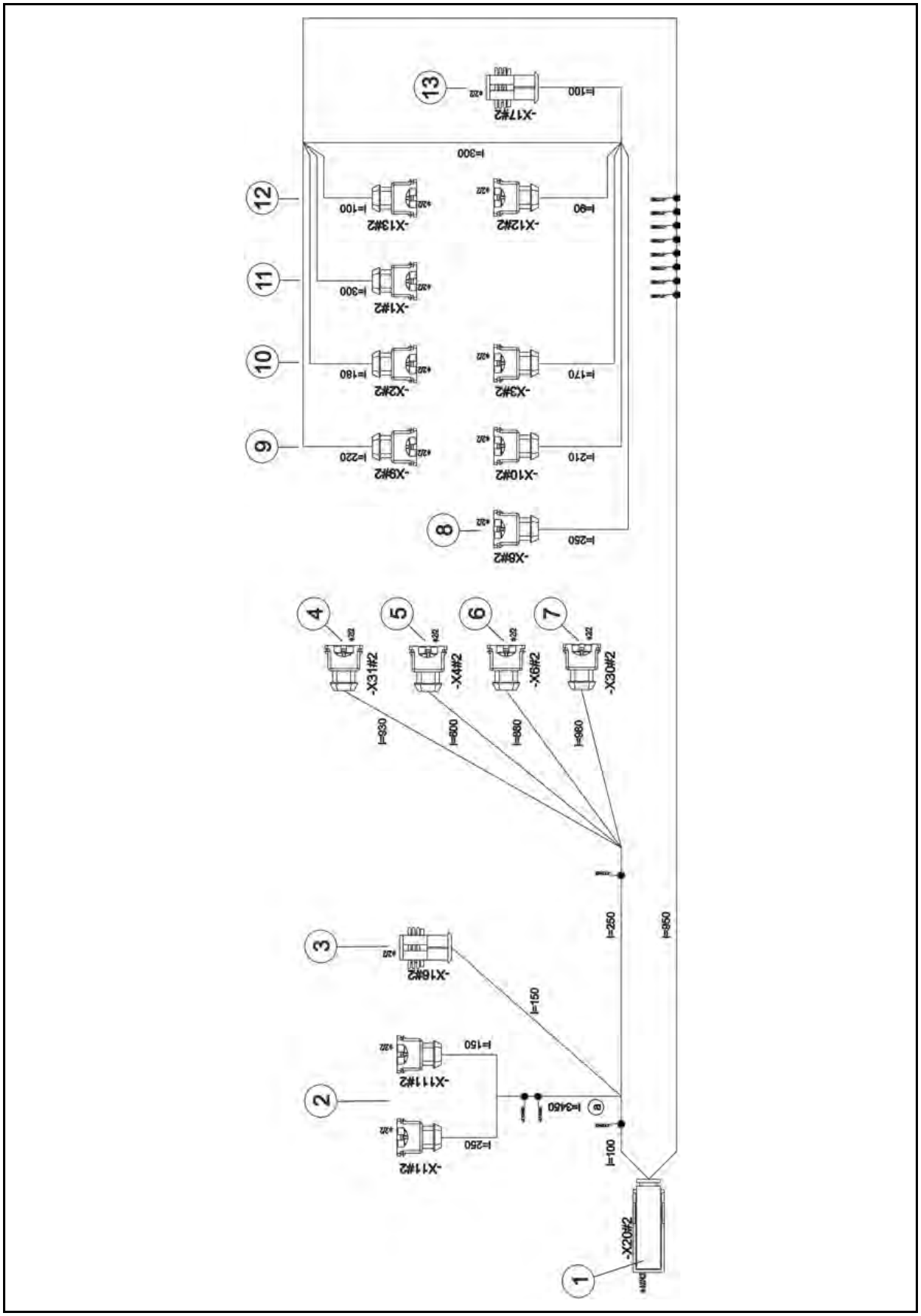


Fig. 161

(1) Control unit
(2) Drawbar suspension
(3) Silage additive pump
(4) Pre-selection Y31
(5) Proportional
(6) Transport floor reverse
(7) Pre-selection Y30
(8) Steering axle
(9) Folding drawbar
(10) Tailgate
(11) Pick-up
(12) Cutting unit
(13) Lubrication system

13.3 Connection, 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

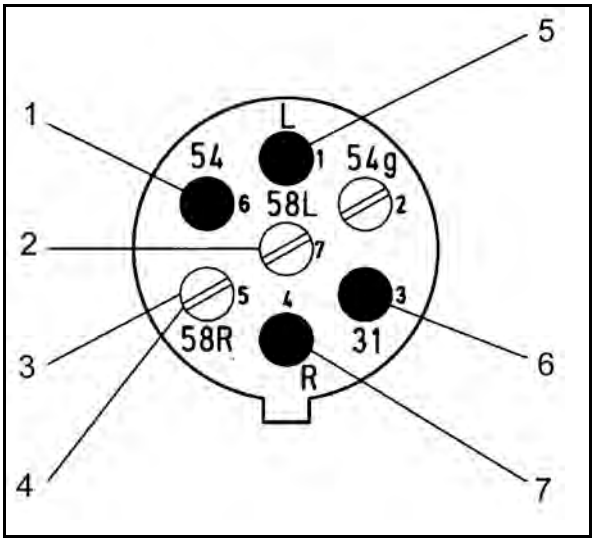


Fig. 162

13.4 Connection, 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 accessories for additional electrical loads.