Operating Instructions

Fodder mixing trailer

Verti-Mix 750 - 1450
Verti-Mix 1200 D - 2800 D

60900906
08.09
Printed in Germany

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

GB

EC Declaration of Conformity

according to EC machinery directive 98/37/EC, Annex II A

Manufacturer:

B. Strautmann & Söhne GmbH & Co. KG

Bielefelder Str. 53

D-49196 Bad Laer

hereby declares that the machine described below:

Product: **Fodder mixing trailer Verti-Mix / Verti-Mix Double**

Model: **750 - 1450 / 1200 D - 2800 D**

Machine ID number: .....

complies with the provisions of the following EC directives:

- Machinery directive 98/37/EC
- EMC directive 2004/108/EC (electromagnetic compatibility)

Applied standards and technical specifications:

- EN ISO 12100-1:2003
- EN ISO 12100-2:2003
- DIN EN 294:1992
- DIN EN 349:1993
- DIN EN 982:1996
- DIN EN 1553:1999
- DIN EN 703:2005

Bad Laer, 16.02.2009

Dr. J. Marquering
Head of Development

Dipl.-Ing. E. Uhlemann
Chief Designer
Feeding Technology

Dr. K.-P. 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 & Co. KG

Machine ID number:
(nine-digit)

Model:

Year of manufacture:

Manufacturer's address

B. Strautmann & Söhne GmbH & 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 & 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 (nine-digit) of your machine when ordering spare parts.

Formal information about the operating instructions

Document number: 60900906

Date of compilation: 08.09

Foreword

Dear customer,

You have decided in favour of a quality product from the large B Strautmann & Söhne GmbH & 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 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:

Firma B. Strautmann & Söhne GmbH & Co. KG

Bielefelder Straße 53

D-49196 Bad Laer

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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

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 & Co. KG.
machine	… the fodder mixing trailers Verti-Mix 750 / 900 / 1050 / 1250 / 1450 and Verti-Mix 1200 D / 1400 D / 1700 D / 2000 D / 2400 D / 2800 D.
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, 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

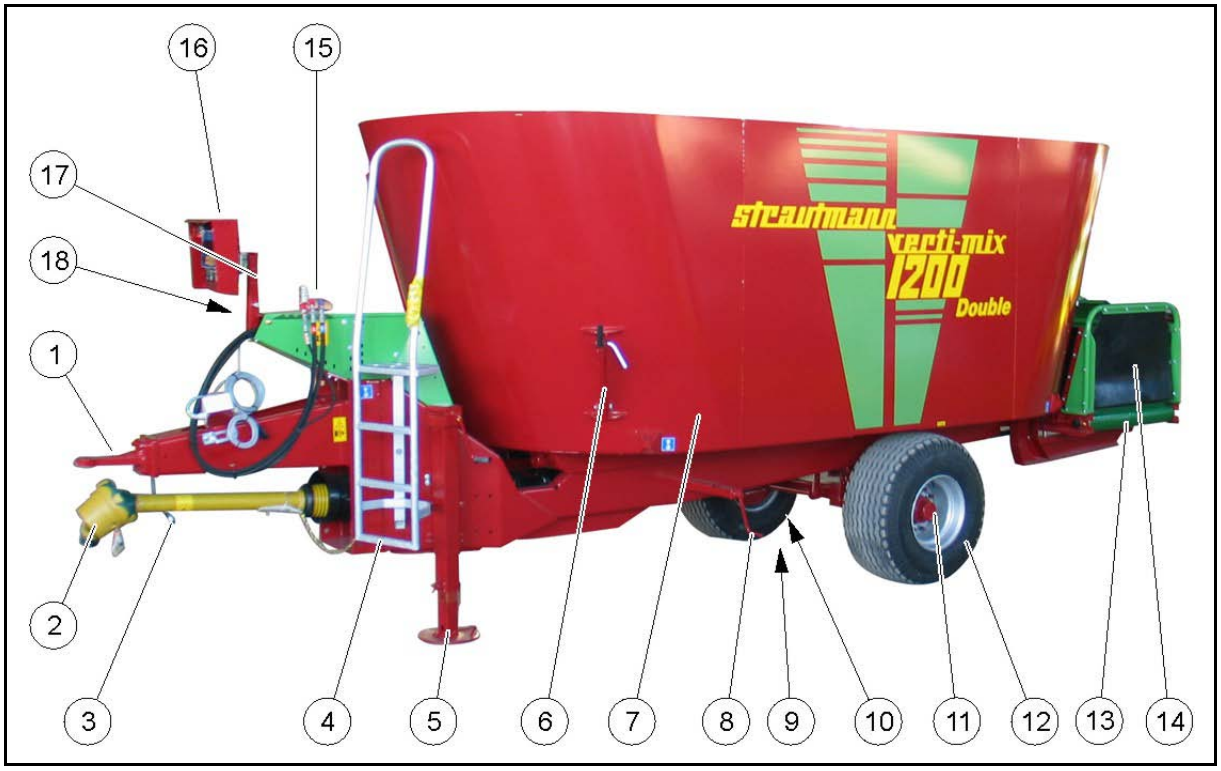


Fig. 1

(1) Drawbar
(2) Propeller shaft
(3) Propeller shaft support
(4) Supporting leg
(5) Ladder, platform
(6) Counter-cutter
(7) Mixing container
(8) Parking brake
(9) Angular gear for mixing auger drive
(10) Shear bolt safety mechanism
(11) Braking axle
(12) Wheels
(13) Rear crossover conveyor (only available with optional extra equipment)
(14) Protective device for left-hand rear crossover conveyor
(15) Hose holder for supply lines
(16) Operating terminal of weighing device (only available with optional extra equipment)
(17) Swivelling holder for operating terminal of weighing device
(18) Electro-hydraulic control block (only available with optional extra equipment)

Fig. 2

(1) Opening scale for discharge door

(2) Pointer for opening width of discharge door,

(3) Chocks

(4) Compensating reservoir for gear lubricant oil of angular gears

(5) Counter-cutter

(6) Rear crossover conveyor (only available with optional extra equipment)

(7) Protective device for right-hand rear crossover conveyor

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) Propeller shaft holder

(2) Protective devices of propeller shaft

(3) Protective sleeve for drive shaft

(4) Hose holder for supply lines

(5) Ladder, platform

(6) Protective device for right-hand and left-hand rear crossover conveyor

(7) Protective device for front side discharge (close-fitting, swivelling protective cover), for protection against accidental contact with the powered mixing auger

(8) Chocks

Fig. 4

2.3 Overview - Supply lines between tractor and machine

(1) Hydraulic connector "Flow line" red

(2) Hydraulic connector "Reverse line" blue

(3) Hydraulic connector for hydraulic service brake

(4) Power supply for control unit 3-pole

(5) Lighting connector 7-pole

(6) Compressed-air brake, feed line red (only with optional extra equipment)

(7) Compressed-air brake, brake line yellow (only with optional extra equipment)

(8) Hydraulic connector for hydraulic brake with hydraulic clutch according to ISO 5676 (only with optional extra equipment, not allowed in Germany)

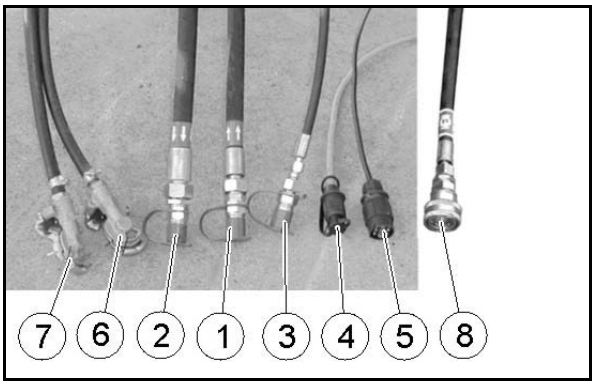


Fig. 5

2.4 Traffic-related equipment

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

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

- a lighting and identification system according to the national road traffic regulations,
- a brake system, for details refer to the chapter "Brake system", page 112.

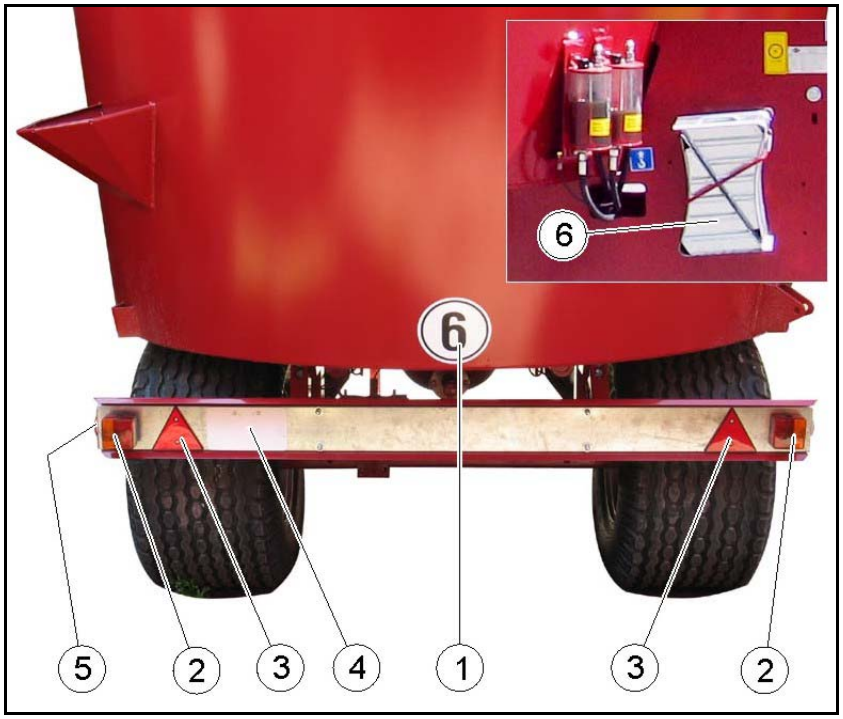


Fig. 6

(1) Speed sign

(2) Multi-function light

(3) Triangular reflectors

(4) License plate

(5) Side reflectors (3 or 4 on each side of machine)

(6) Chocks

2.5 Correct use

The fodder mixing trailers of the Verti-Mix series:

- are designed for chopping, homogeneous mixing, transporting and discharging all types of silage and normal fodders used in keeping livestock if the dry substance content of the total mixture is more than 30 %,
- must not be filled otherwise than by means of:
  - a tractor equipped with a front loader,
  - a yard or wheeled loader,
  - a telescopic loader,
  - the provided feeding aids such as mineral feed funnel, etc.
  - directly from the pipe or conveying device for concentrated feed, mineral feed etc.
- The observance of all operating instructions contained herein,
- the observance of the specified service and maintenance work on the machine,
- the exclusive use of original spare parts

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

Dangerous spots exist:

- within the drawbar area between tractor and machine,
- within the area of the powered propeller shaft,
- within the area of the discharge openings,
- within the area of the powered discharge conveyor, crossover conveyor or conveyor extension,
- in the mixing container with the machine powered or not powered,
- around the discharge pipe and in ejection direction in case of machines equipped with straw blower.

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 identification number (machine ID number) (imprinted into the frame)

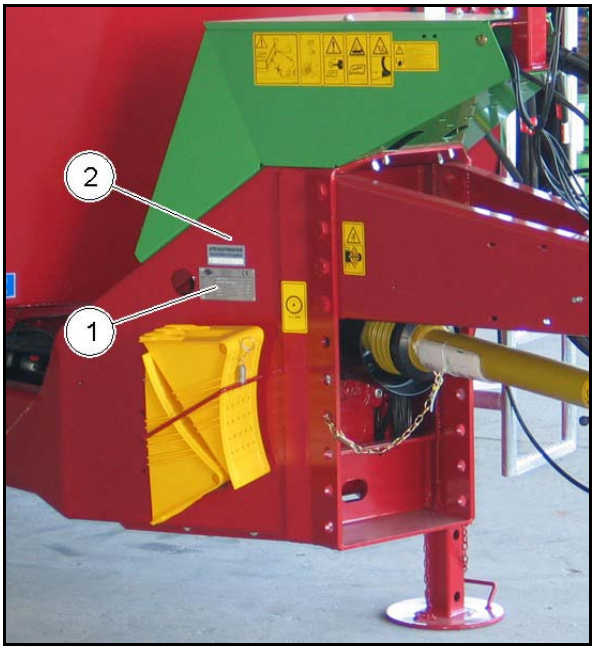


Fig. 7

The type plate includes:

- Manufacturer
- Vehicle / Machine ID number
- Model
- Empty weight in kg
- Zul. Gesamtgew. in kg = Gross vehicle weight rating in kg
- Zul. Stützlast / Achslast vorn in kg = Admissible tongue load / front axle load in kg
- Zul. Achslast hinten in kg = Admissible rear axle load in kg
- Year of manufacture
- Rated speed in rpm
- Zul. Hydr. Druck in bar = Admissible hydraulic pressure in bar
- Zul. Höchstgeschw. in km/h = Speed limit in km/h

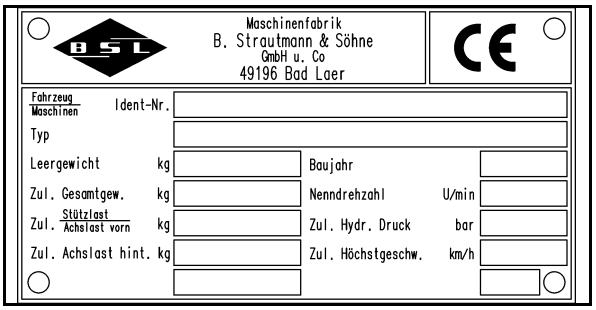


Fig. 8

2.8 Technical data

2.8.1 Verti-Mix

Model		Verti-Mix				
	Unit	750	900	1050	1250	1450
Gross vehicle weight rating when equipped with:						
• Hydraulic service brake	kg	6000	6740	8000	9000	10000
• Overrunning brake	kg	6000	6540	8000	8000	--
• Dual-line service brake system	kg	6000	6740	8000	9000	10000
Admissible axle load when equipped with:						
• Hydraulic service brake	kg	5000	5540	7000	7800	8900
• Overrunning brake	kg	5000	5540	7000	7000	--
• Dual-line service brake system	kg	5000	5540	7000	7800	8900
Admissible tongue load • Admissible tongue load, overrunning brake	kg	1000	1200 1000	1000	1200 1000	1100
Empty weight:						
• with crossover conveyor	kg	3260	3300	3860	4150	4900
• with side discharge on both sides	kg	3010	3140	3750	4040	--
Usable mixing capacity * (loading capacity)	m^3	7.5	9.0	10.5	12.5	14.5
Minimum power required:						
• without switchgear, 20 min^{-1}	kW (HP)	27 / 37	28 / 38	--	--	--
• without switchgear, 26 min^{-1}	kW (HP)	31 / 42	33 / 44	44 / 59	--	--
• with switchgear, 17.3 / 26 min^{-1}	kW (HP)	21 / 28	22 / 30	29 / 40	--	--
• without switchgear, 30 min^{-1}	kW (HP)	39 / 53	41 / 56	50 / 67	--	--
• with switchgear, 20 / 30 min^{-1}	kW (HP)	26 / 35	27 / 37	36 / 49	--	--
• without switchgear, 24 min^{-1}	kW (HP)	--	--	--	50 / 67	--
• with switchgear, 16 / 24 min^{-1}	kW (HP)	--	--	--	33 / 45	--
• without switchgear, 29 min^{-1}	kW (HP)	--	--	--	58 / 78	--
• with switchgear, 19.3 / 29 min^{-1}	kW (HP)	--	--	--	41 / 56	--
• with switchgear, 18.8 / 34 min^{-1}	kW (HP)	--	--	--	--	50 / 68
Maximum operating pressure	bar	210				
Oil flow rate	l/min	25 - 45				
Power supply weighing device / lighting system / electro-hydraulic control set	volt	12 VDC				
P.t.o. speed	min^{-1}	540				
Sound pressure level	dB(A)	≤84				

* Actually usable mixing capacity, mixing augers having been deducted from the capacity.
Figures, technical data and weights may change due to technical development and are not binding for delivery.

Tab. 1

2.8.1.1 Dimensions of vehicle

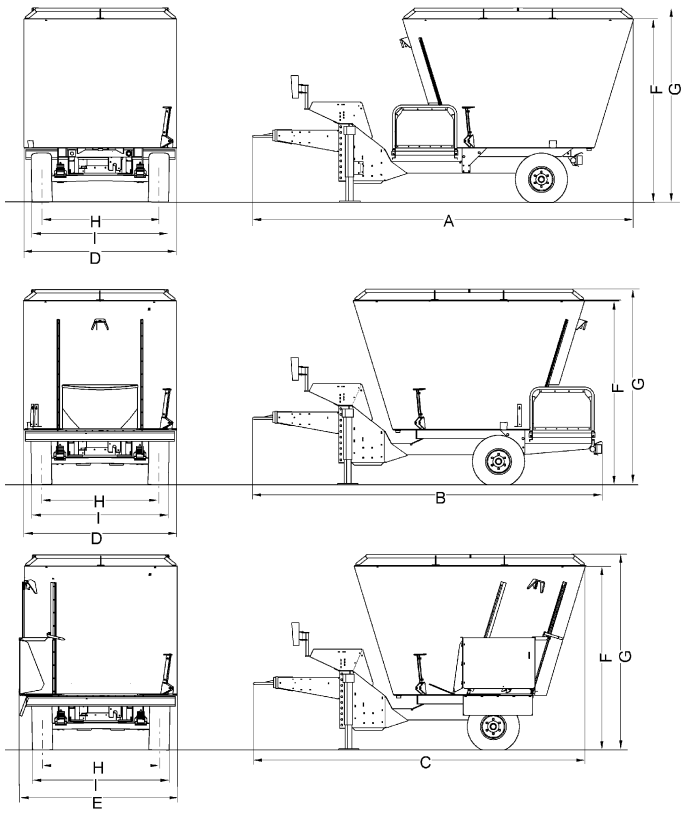


Fig. 9

Model		Verti-Mix				
	Unit	750	900	1050	1250	1450
Length:						
• A = with front crossover conveyor	m	5.10	5.16	5.56	5.64	5.99
• B = with rear crossover conveyor	m	4.62	4.62	4.90	4.98	--
• C = with side discharge / without crossover conveyor	m	4.41	4.47	4.75	4.84	--
Width:						
• D = with crossover conveyor	m	2.16	2.16	2.28	2.42	2.42
• E = with right-hand or left-hand side discharge	m	2.30	2.30	2.42	2.56	--
• E = with side discharge on both sides	m	2.44	2.44	2.56	2.70	--
Height incl. tyres:						
• F = with 10.0/75-15.3 (18 PR)	m	2.38	2.58	--	--	--
• G = with 10.0/75-15.3 (18 PR) + elevated overflow ring	m	2.53	2.73	--	--	--

Model		Verti-Mix				
	Unit	750	900	1050	1250	1450
Height incl. tyres:						
• F = with 26x8.0-14 (16 PR) remoulded	m	2.26				
• G = with 26x8.0-14 (16 PR) remoulded + elevated overflow ring	m	2.41				
• F = with 250/70-15 (18 PR)	m	2.37	2.57	2.70	2.81	--
• G = with 250/70-15 (18 PR) + elevated overflow ring	m	2.42	2.72	2.85	2.96	--
• F = with 400/45 L 17.5	m	2.43	2.63	2.76	2.87	3.12
• G = with 400/45 L 17.5 + elevated overflow ring	m	2.58	2.78	2.91	3.02	3.27
• F = with 400/60-15.5 (14 PR)	m	2.49	2.69	--	--	--
• G = with 400/60-15.5 (14 PR) + elevated overflow ring	m	2.64	2.84	--	--	--
• F = with 400/60-15.5 (18 PR)	m	--	--	2.81	2.93	3.17
• G = with 400/60-15.5 (18 PR) + elevated overflow ring	m	--	--	2.96	3.08	3.32
• F = with 8.15-15 (14 PR) double	m	--	--	2.67	2.78	3.07
• G = with 8.15-15 (14 PR) double + elevated overflow ring	m	--	--	2.82	2.93	3.22
• F = with 19/45-17 (14 PR)	m	--	--	2.81	2.92	--
• G = with 19/45-17 (14 PR) + elevated overflow ring	m	--	--	2.96	3.07	--
• F = with 500/40-17.5 (14 PR) remoulded	m	--	--	2.82	2.94	--
• G = with 500/40-17.5 (14 PR) remoulded + elevated overflow ring	m	--	--	2.97	3.09	--
• F = with 505/50 R 17 (146 G)	m	--	--	2.88	2.99	--
• G = with 505/50 R 17 (146 G) + elevated overflow ring	m	--	--	3.03	3.14	--
• F = with 435/50 R 19.5 remoulded	m	--	--	--	3.01	3.26
• G = with 435/50 R 19.5 remoulded + elevated overflow ring	m	--	--	--	3.16	3.41
H = Track	m	1.50	1.50	1.60	1.60	1.70
I = Outside wheel width incl. standard tyres:	m	1.77	1.77	1.87	2.12	2.22
Discharge height with crossover conveyor	m	0.74	0.74	0.73	0.71	0.71

Tab. 2

2.8.1.2 Tyre pressure

Model		Verti-Mix				
Tyres	**Unit**	**750**	**900**	**1050**	**1250**	**1450**
10.0/75-15.3 (18 PR)	bar / psi	7.0 / 101	7.0 / 101	--	--	--
26x8.0-14 (16 PR)	bar / psi	6.0 / 86.5	--	--	--	--
250/70-15 (18 PR)	bar / psi	9.0 / 130	9.5 / 137	9.5 / 137	9.5 / 137	--
400/45 L 17.5	bar / psi	6.0 / 86.5	6.0 / 86.5	6.0 / 86.5	6.0 / 86.5	6.0 / 86.5
400/60-15.5 (14 PR)	bar / psi	3.5 / 50.5	4.0 / 58	--	--	--
400/60-15.5 (18 PR)	bar / psi	--	--	5.0 / 72	5.5 / 79	6.0 / 86.5
8.15-15 (14 PR)	bar / psi	--	--	8.0 / 116	8.0 / 116	9.0 / 130
19/45-17 (14 PR)	bar / psi	--	--	4.3 / 62	4.3 / 62	--
500/40-17.5 (14 PR)	bar / psi	--	--	4.6 / 66.4	4.6 / 66.4	--
505/50 R 17 (146 G)	bar / psi	--	--	5.0 / 72	5.0 / 72	--
435/50 R 19.5	bar / psi	--	--	--	7.5 / 108.3	8.0 / 116

Tab. 3

2.8.2 Verti-Mix Double

Model		Verti-Mix Double					
	Unit	1200 D	1400 D	1700 D	2000 D	2400 D	2800 D
Gross vehicle weight rating when equipped with:							
• Single axle	kg	10500	11800	11800	11800	--	--
• Bogie axle	kg	--	12880	12880	17500	17800	18000
Admissible axle load when equipped with:							
• Single axle	kg	9000	10000	10000	10000	--	--
• Bogie axle	kg	9000	11080	11080	15800	16000	18200
Admissible tongue load	kg	1500	1800	1800	1800	1800	1800
Empty weight with crossover conveyor:							
• Single axle	kg	4930	6250	6420	7145	--	--
• Bogie axle	kg	--	6430	6550	7325	8500	8900
Usable mixing capacity * (loading capacity)	m^3	12	14	17	20	24	28
Minimum power required:							
• without switchgear, 26 min^{-1}	kW (HP)	54 / 73	--	--	--	--	--
• without switchgear, 30 min^{-1}	kW (HP)	65 / 88	--	--	--	--	--
• with switchgear, 17.3 / 26 min^{-1}	kW (HP)	37 / 50	--	--	--	--	--
• with switchgear, 20 / 30 min^{-1}	kW (HP)	47 / 63	--	--	--	--	--
• with switchgear, 14.4 / 26 min^{-1}	kW (HP)	--	53 / 72	60 / 81	66 / 90	--	--
• with switchgear, 16.7 / 30 min^{-1}	kW (HP)	--	66 / 90	74 / 100	82 / 110	--	--
• with switchgear, 13.3 / 24 min^{-1}	kW (HP)	--	--	--	--	70 / 95	
• with switchgear, 16.1 / 29 min^{-1}	kW (HP)	--	--	--	--	88 / 120	--
• with switchgear, 18.8 / 34 min^{-1}	kW (HP)	--	--	--	--	--	100/135
Maximum operating pressure	bar	210					
Oil flow rate	l/min	25 - 45					
Power supply weighing device / lighting system / electro-hydraulic control set	volt	12 VDC					
P.t.o. speed	min^{-1}	540					
Sound pressure level	dB(A)	≤85					

* Actually usable mixing capacity, mixing augers having been deducted from the capacity

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

Tab. 4

2.8.2.1 Dimensions of vehicle

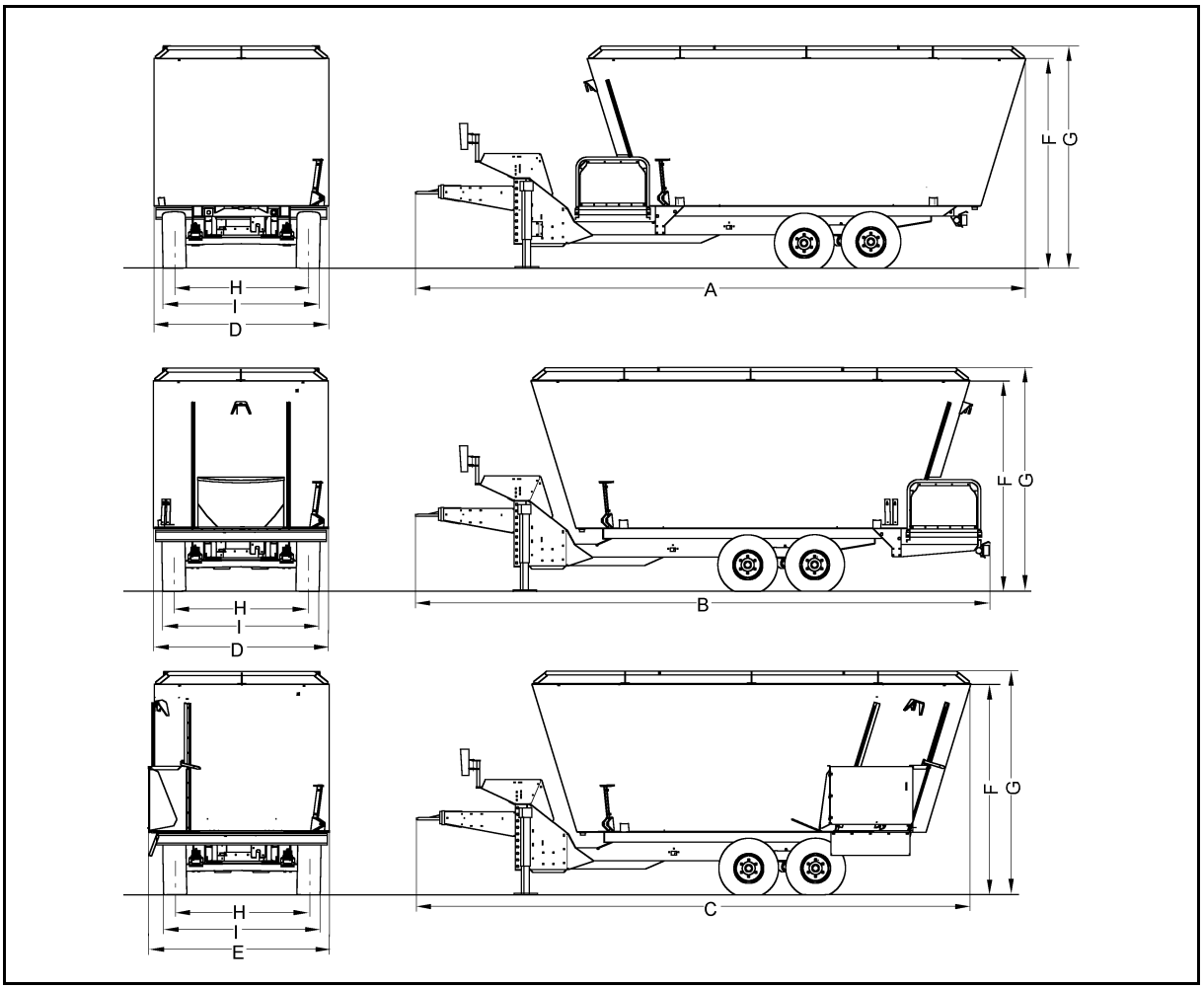


Fig. 10

Model		Verti-Mix Double					
	Unit	1200 D	1400 D	1700 D	2000 D	2400 D	2800 D
Length:							
• A = with front crossover conveyor	m	6.99	7.40	7.46	7.78	8.07	8.22
• B = with rear crossover conveyor	m	6.37	6.92	6.92	7.19	7.45	7.51
• C = with side discharge / without crossover conveyor	m	6.14	6.72	6.77	7.07	7.36	7.51
Width:							
• D = with crossover conveyor	m	1.96	2.16	2.16	2.28	2.42	2.42
• E = with right-hand or left-hand side discharge	m	2.10	2.30	2.30	2.42	2.56	2.56
• E = with side discharge on both sides	m	2.24	2.44	2.44	2.56	2.70	2.70
Height with single axle incl. tyres:							
• F = with 400/60-15.5 (18 PR)							
o Axle, rear	m	2.42	--	--	--	--	--
o Axle, central	m	2.37	--	--	--	--	--

Model		Verti-Mix Double					
	Unit	1200 D	1400 D	1700 D	2000 D	2400 D	2800 D
Height with single axle incl. tyres:							
• G = with 400/60-15.5 (18 PR) + elevated overflow ring							
o Axle, rear	m	2.57	--	--	--	--	--
o Axle, central	m	2.52	--	--	--	--	--
• F = with 435/50 R 19.5 remoulded							
o Axle, rear	m	2.50	2.57	2.77	2.90	--	--
o Axle, central	m	2.46	--	--	--	--	--
• G = with 435/50 R 19.5 remoulded + elevated overflow ring							
o Axle, rear	m	2.65	2.72	2.92	3.05	--	--
o Axle, central	m	2.61	--	--	--	--	--
• F = with 8.15-15 (14 PR) double							
o Axle, rear	m	2.28	2.38	2.58	2.71	--	--
o Axle, central	m	2.26	--	--	--	--	--
• G = with 8.15-15 (14 PR) double + elevated overflow ring							
o Axle, rear	m	2.43	2.53	2.73	2.86	--	--
o Axle, central	m	2.41	--	--	--	--	--
Height with bogie axle incl. tyres:							
• F = with 10.0/75-15.3 (18 PR)	m	--	2.44	2.64	--	--	--
• G = with 10.0/75-15.3 (18 PR) + elevated overflow ring	m	--	2.59	2.79	--	--	--
• F = with 400/60-15.5 (18 PR)	m	--	2.54	2.74	2.88	3.00	--
• G = with 400/60-15.5 (18 PR) + elevated overflow ring	m	--	2.69	2.89	3.03	3.15	--
• F = with 435/50 R 19.5 remoulded	m	--	--	--	--	3.07	3.34
• G = with 435/50 R 19.5 remoulded + elevated overflow ring	m	--	--	--	--	3.22	3.49
Track:							
• H = Single axle	m	1.50	1.50	1.50	1.50	--	--
• H = Bogie axle	m	--	1.65	1.65	1.70	1.93	1.93
Outside wheel width incl. standard tyres:							
• I = Single axle	m	1.91	2.02	2.02	2.02	--	--
• I = Bogie axle	m	--	1.93	1.93	2.13	2.37	2.37
Discharge height with crossover conveyor	m	0.84	0.75	0.75	0.88	1.03	1.03

Tab. 5

2.8.2.2 Tyre pressure

Model		Verti-Mix Double					
Tyres	**Unit**	**1200 D**	**1400 D**	**1700 D**	**2000 D**	**2400 D**	**2800 D**
400/60-15.5 (18 PR)	bar / psi	6.0 / 86.5	--	--	6.0 / 86.5	6.0 / 86.5	--
435/50 R 19.5	bar / psi	8.0 / 116	9.0 / 130	9.0 / 130	7.5 / 108.3	7.5 / 108.3	8.5 / 123
8.15-15 (14 PR)	bar / psi	9.0 / 130	9.0 / 130	9.0 / 130	9.0 / 130	--	--
10.0/75-15.3 (18 PR)	bar / psi	--	7.0 / 101	7.0 / 101	--	--	--

Tab. 6

2.9 Required tractor equipment

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

Engine power of tractor

For the necessary power required, see the chapter "Technical data", page 22.

Electrical system

Battery voltage:	• 12 V (volt)
Socket for lighting:	• 7-pole
Socket for control unit:	• 3-pole (DIN 9680). The feed line of the 3-pole socket should have a minimum cable cross section of 4 mm².

Hydraulic system

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

Maximum operating pressure:	• 210 bar
Delivery rate of hydraulic pump	• min. 25 l/min and max. 45 l/min at 180 bar
Hydraulic oil of machine:	• ATF Hydraulic oil

The hydraulic components can be optionally connected to:

- a double-acting control device,
- to 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 with a low back pressure. Thus, a free reverse pipe reduces the heating 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.

Operation via direct tractor connection (standard equipment)

Hydraulic component:	Required control devices on the tractor:
• Discharge door:	• 1 double-acting control device
• Hydraulic supporting leg:	• 1 double-acting control device
• Hydraulic counter-cutters:	• 1 double-acting control device
• Hydraulic motor for crossover conveyor:	Optional: • 1 double-acting control device or • 1 single-acting control device and 1 pressure-less reverse pipe (max. back pressure in reverse pipe 5 bar)
• Side discharge conveyor:	• 1 double-acting control device (extend and retract)
• Hydraulic motor for side discharge conveyor:	Optional: • 1 double-acting control device or • 1 single-acting control device and 1 pressure-less reverse pipe (max. back pressure in reverse pipe 5 bar)
• Conveyor extension:	• 1 double-acting control device (extend and retract)

Tab. 7

Operation via Bowden cable or electro-hydraulic control (optional extra)

Required control devices on the tractor:	Optional: • 1 double-acting control device or • 1 single-acting control device and 1 pressure-less reverse pipe (max. back pressure in reverse pipe 5 bar)

Tab. 8

Brake system

Hydraulic service brake up to 6 km/h (not licensed for public road traffic):	• 1 single-acting control device
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 service brake (only available for export):	• 1 hydraulic clutch according to ISO 5676 (100 bar)

Tab. 9

Mirrors

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

2.10 Noise specifications

The workplace-related emission value (sound pressure level) is 84 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.

2.11 Conformity

The machine conforms with the basic safety and health requirements of the following directives and standards:

- Machinery directive 98/37/EC
- EMC directive 2004/108/EC
- EN ISO 12100-1
- EN ISO 12100-2
- DIN EN 294
- DIN EN 349
- DIN EN 982
- DIN EN 1553
- DIN EN 703

The manufacturer confirms that the machine conforms with the basic safety and health requirements:

- by drawing up the declaration of conformity,
- by affixing the CE symbol on the machine.

In case of non-authorized structural alterations, extension or modification measures:

- the declaration of conformity and the CE symbol of the machine will become invalid,
- any warranty and liability claims in case of personal injury and material damage against the manufacturer will be excluded,
- the user will be solely responsible.

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 39,
  - the chapter "Warning and instruction signs" included in these operating instructions, page 52, 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 is allowed to operate the machine. The user must clearly define the responsibilities of the members of staff for operation, service and maintenance.

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

The user is only allowed to carry out the work described in these operating instructions.

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

This applies to any work:

- which is not mentioned in these operating instructions,
- which is marked with the annex "Shop work" in these operating instructions.

Staff / Activity	Member of staff especially trained for the activity[1)]	Instructed person [2)]	Members of 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 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 recognize 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 present within the machine's hazardous area. Observe the information in the chapter "Hazardous area and dangerous spots", page . 20.

3.3.2 Safety and protective devices

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

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

3.3.3 Structural alterations

- Vehicles provided with an official operating licence or vehicle-linked devices and equipment provided with an official operating licence or a road traffic licence according to the road traffic regulations must be in the condition specified by the licence.
- You are only allowed to carry out structural alterations and 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 licence 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 licence 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 licence 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:

- incorrect 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 of 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 instructions 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!
- 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.

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!
- 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 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!

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 of the attached / hitched machine and the admissible axle and tongue loads of the tractor! Run the machine with the loading chamber being only partly filled if necessary.
- People are not allowed:
  - within the work / hazardous area of the machine,
  - within the discharge area of the machine,
  - within the turning and swivelling range of moving machine parts,
  - beneath lifted and unsecured moving 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 the 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 moving machine parts to transport position before carrying out transport journeys!

- Secure all moving machine parts in transport position before carrying out transport journeys. Use the transport locks provided for this purpose!

- Before transport journeys, check whether the required transport equipment has been properly mounted on the machine such as lighting, warning and protective devices!

- 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 or 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 down the machine,
  - secure lifted moving 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 penetrate 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 too big 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 of 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 protective cover 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 of 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 between tractor and machine when using a wide-angle propeller shaft!
- In case of propeller shafts equipped with overload or overrunning clutches, these clutches 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 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 filled machine (stability).

3.4.6 Brake system

- Immediately stop the tractor in case of failure of the brake system. Have the failure promptly remedied!
- Only authorized workshops or qualified personnel are allowed to carry out adjustment or 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 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 manometer 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 hose couplings of the feed and brake lines 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 tightening 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 by exclusively using original spare parts,
- mounting improper wheels and tyres by exclusively using original spare parts.

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 Fodder mixing trailer

- The fodder mixing vehicle is only allowed to be operated by one person!
- Before operating the machine, make sure that third persons leave the machine's hazardous area!
- Fill the fodder mixing trailer only by means of a tractor equipped with a front loader or by means of a wheeled loader!
- People are not allowed:
  - above the fodder mixing trailer, e.g. to fill the mixing container manually from a silo or a hayloft! People who are standing above the fodder mixing trailer risk to fall into the mixing container,
  - to climb onto the top edge of the mixing container,
  - to enter or reach into the mixing container as long as the tractor engine is running!
- Meter pourable fodder additives (e.g. mineral feed) or other bulk material through the feed funnel (optional extra) or by means of the loading device into the mixing container!
- Equip your tractor with mirrors, in order to ensure indirect visibility of the work area to the right and to the left of the fodder mixing trailer!
- Risk of crushing when opening and closing the discharge doors. Before opening or closing the discharge doors, make sure that people and animals leave the hazardous area!
- Never reach into the mixing container through a discharge opening as long as the tractor engine is running!
- Risk of injuries caused by the sharp-edged cutting knives of the mixing auger. Wear your personal protective equipment (protective gloves, safety footwear), when carrying out maintenance work on the cutting knives of the mixing auger!
- Only enter the mixing container:
  - with the propeller shaft uncoupled,
  - through a discharge opening with the discharge door completely open,
  - when wearing your personal protective equipment,
  - with greatest possible care. Beware of the cutting knives' position at the mixing auger!
- When using electrical tools, the connecting cables must not be moved over sharp-edged cutting knives!

3.4.10 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 movements of the machine!

  Beware of existing residual energies in the machine when carrying out maintenance work. Warning signs mark the components with residual energies. For detailed information, see 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 medium 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 instructions 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.

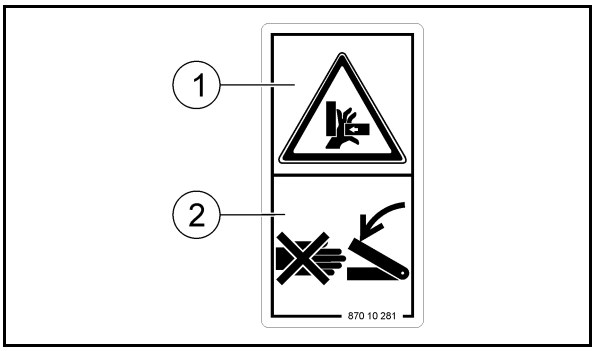


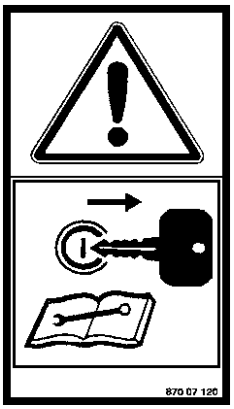
Fig. 11

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 moving 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 area 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."

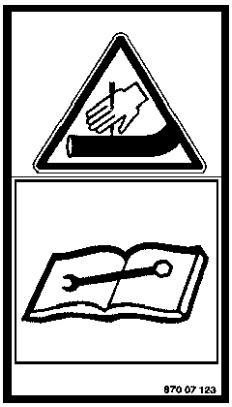
Order number and explanation	Warning signs
870 10 270 Please read and observe the operating and safety instructions before commissioning!	
870 07 120 **Risks when carrying out work on the machine such as mounting, adjusting, trouble-shooting and maintenance, due to accidental starting and rolling of 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 07 117 **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 loading chamber as long as the tractor engine is running with the propeller shaft coupled / the hydraulic / electronic system connected.	

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 penetrates 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.

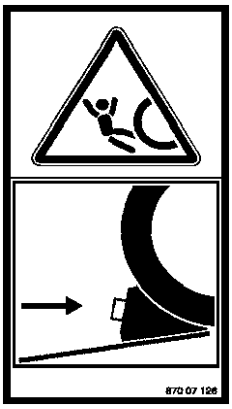


870 07 126

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 10 121

Risk of falling for passengers on treads or platforms!

This risk may cause most serious injuries or even death.

- People are not allowed:
  - as passengers on the machine,
  - to transport objects on the machine,
  - to climb onto travelling machines.
- Ensure that there are no passengers on the machine.

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.

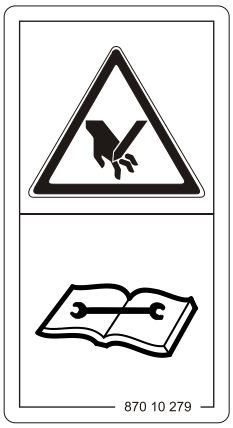
- Keep sufficient safe distance to the propeller shaft, as long as the tractor engine is running with the propeller shaft coupled / the hydraulic system connected.
- Ensure that people keep sufficient safe distance to the powered propeller shaft.

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 10 281

Risk of crushing fingers or hands due to accessible moving machine parts!

This risk may cause most serious injuries involving 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 10 283

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 10 287

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

are not allowed.

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.

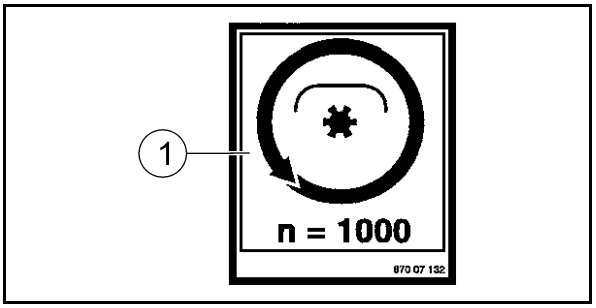
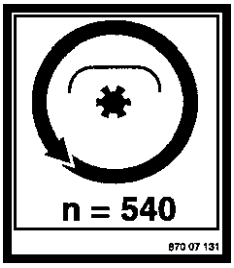
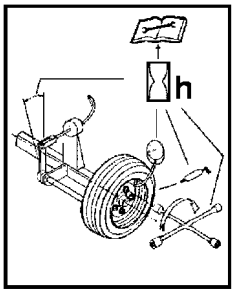
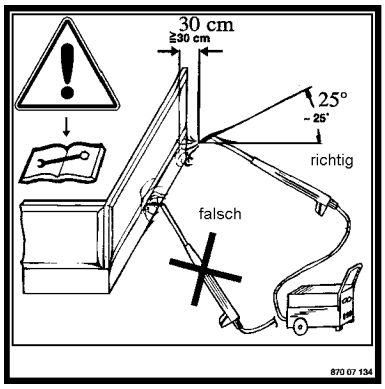
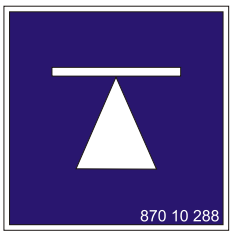


Fig. 12

Order number and explanation	Instruction signs
870 07 131 **The required drive speed of the machine is 540 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 163 when using a pressure washer / steam blaster for cleaning the machine.	

870 10 288

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



870 12 547

The pictograph illustrates fixing points for fixing slings when loading the machine.

3.6.3 Placing of warning and instruction signs

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

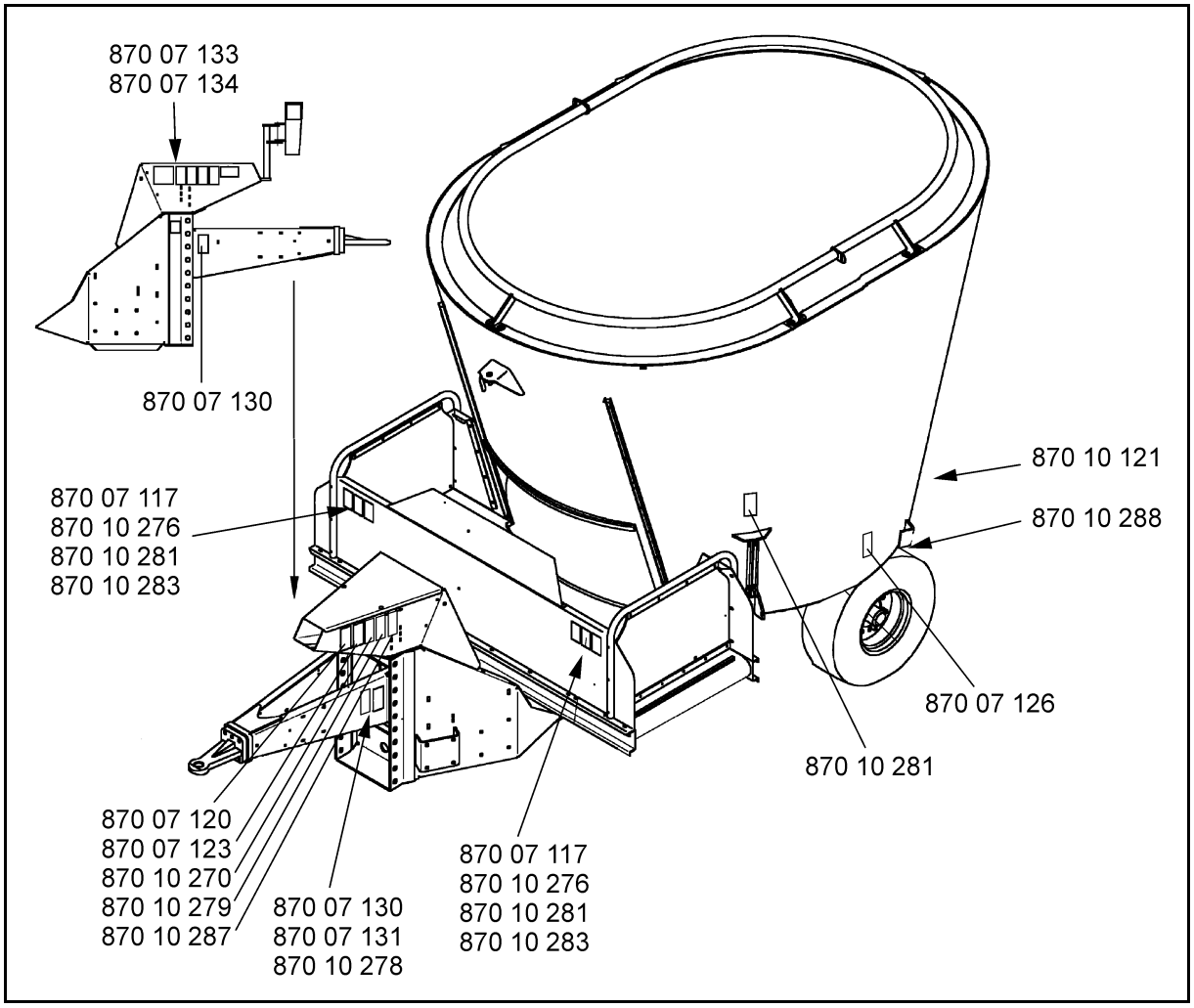


Fig. 13

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 risks 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

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 the machine when the manometer on the tractor indicates 5.0 bar.

Loading and unloading by means of lifting equipment

WARNING

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

- Absolutely use the marked fixing points when fixing slings for loading and unloading the machine by means of a lifting device.
- Use appropriate slings which are able to safely carry the machine's weight.
- Never stand within the lifting zone beneath the lifted machine.

Fixing points on the machine for fixing slings are identified by the pictograph (Fig. 14).

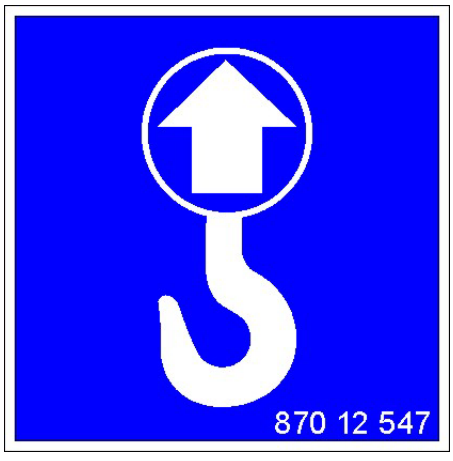


Fig. 14

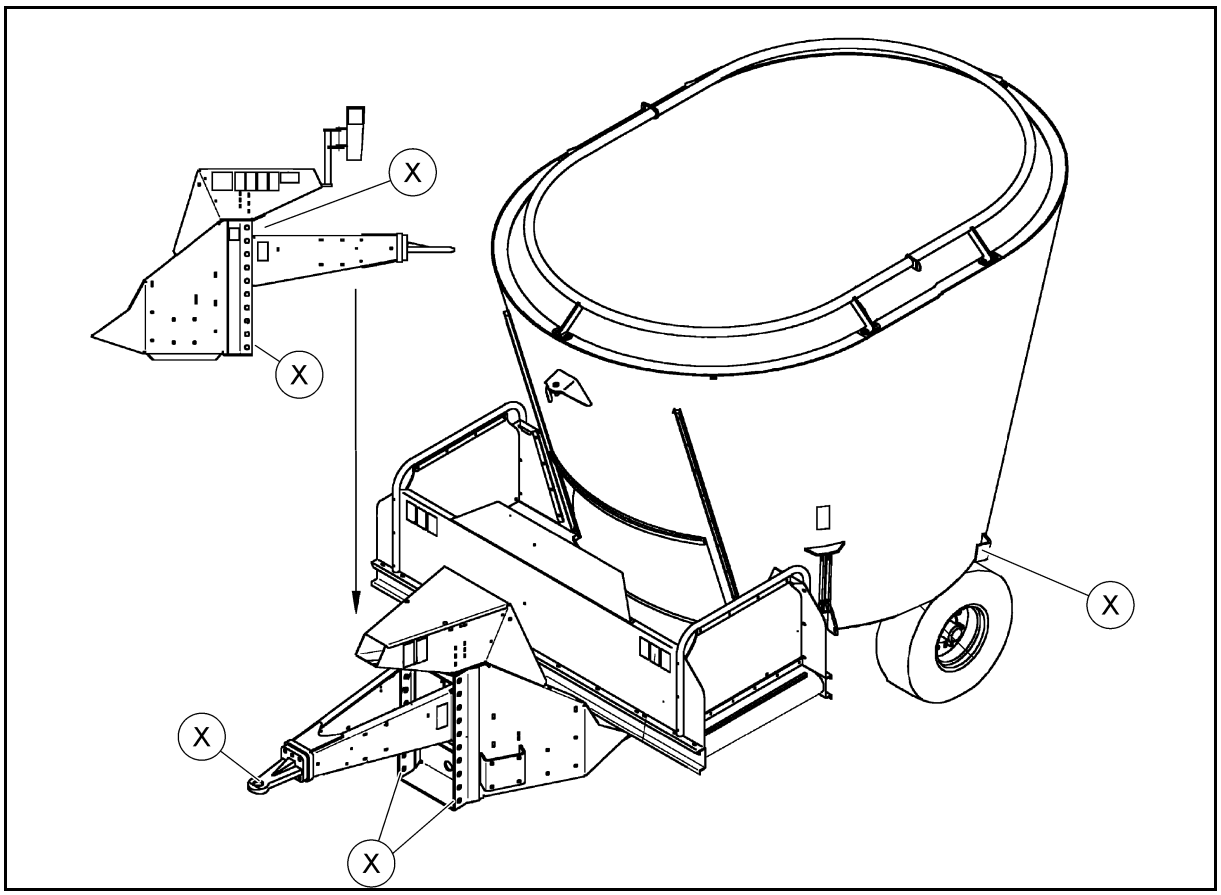


Fig. 15

(X) Lashing points and stops

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 Mixing container and mixing auger

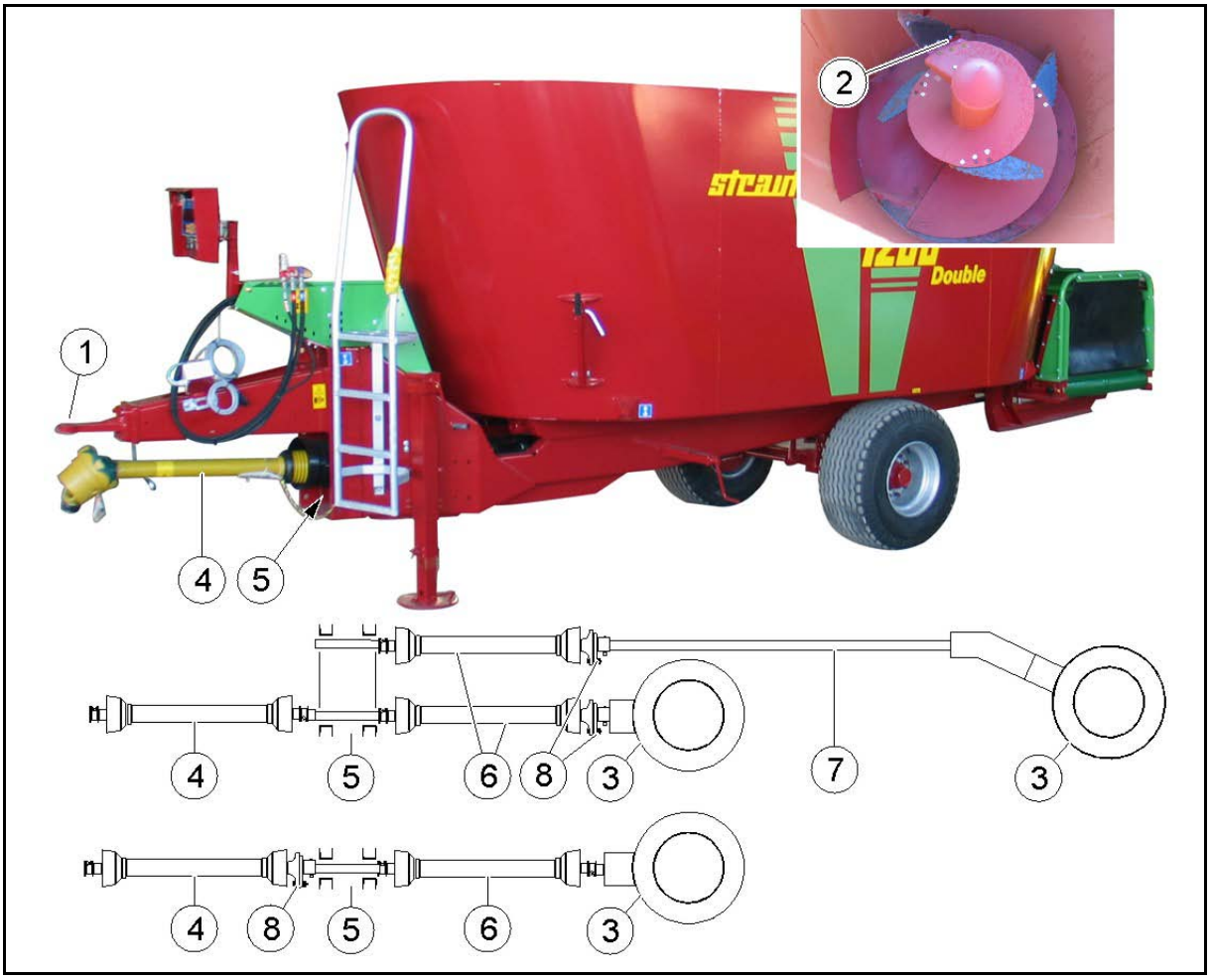


Fig. 16

The fodder mixing trailer is hitched to the tractor by means of the drawbar (1). The tractor's p.t.o. shaft mechanically powers the mixing auger(s) (2) via the angular gear(s) (3):

- In case of the Verti-Mix via the propeller shaft (4), the switchgear (5) (optional extra) and the propeller shaft (6).
- in case of the Verti-Mix Double via the propeller shaft (4), the switchgear (5) (optional extra), the propeller shafts (6) and the intermediate shaft (7).

The propeller shaft (4) is equipped with a shear bolt coupling (8). In case of overload, the shear bolt of the shear bolt coupling shears off and interrupts the power flow between the tractor and the mixing auger(s) thus protecting the power train of the mixing auger(s) from being damaged.

The p.t.o. shaft speed of the tractor and the individual switchgear design determine the drive speed(s) of the mixing auger(s).

During the mixing process, the mixing auger(s) first transport the fodder components filled in upwards in the centre of the mixing auger. The fodder then falls down the container wall so that a mixing cycle is generated.

5.1.1 Cutting knives of mixing augers

In the mixing container, the cutting knives (1) of the mixing auger(s) (2) chop and mix the fodder components filled in. The number of cutting knives mounted on a mixing auger depends on the diameter and the height of the mixing auger.

Additional scrapers mounted opposite the front auger end of the respective mixing augers ensure a uniform discharge of the mixed fodder components.

The cutting knives (1) may be screwed onto the mixing auger in a retracted position (3) (standard) and in an extended position (4). Adjustment of the cutting knives permits to individually adapt the mixing system to the operating conditions and the structure of the fodder components to be mixed.

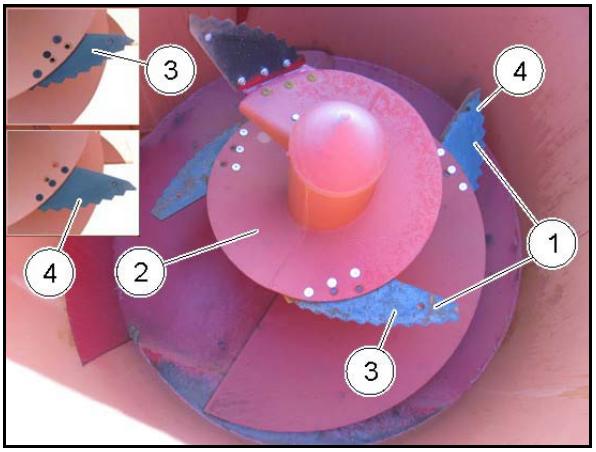


Fig. 17

- **Retracted position of cutting knives:**
  - easier cutting,
  - better undoing of bales,
  - less driving power required.

- **Extended position of cutting knives:**
  - cutting with more effort,
  - helps to discharge highly-structured mixtures at the discharge opening,
  - all cutting knives extended leads to worse undoing of bales,
  - better picking-up and new inclusion in the intensive mixing process of bale components by one extended cutting knife at the top of the mixing auger,
  - requires high driving power.

Different sets of knives for mixing auger

Depending on the operating conditions, different sets of knives are available for the mixing auger.

Standard equipment:

- **Standard set of knives:**
  - Verti-Mix 750, 900
    6 short cutting knives
  - Verti-Mix 1050, 1250, 1450
    8 short cutting knives
  - Verti-Mix 1200 D, 1400 D, 1700 D
    12 short cutting knives
  - Verti-Mix 2000 D, 2400 D, 2800 D
    16 short cutting knives

Optional extras:

- **Set of knives, straw:**
  - Verti-Mix 750, 900
    4 short cutting knives
    2 long cutting knives
  - Verti-Mix 1050, 1250, 1450
    6 short cutting knives
    2 long cutting knives
  - Verti-Mix 1200 D, 1400 D, 1700 D
    8 short cutting knives
    4 long cutting knives
  - Verti-Mix 2000 D, 2400 D, 2800 D
    12 short cutting knives
    4 long cutting knives
- **Set of knives, bales:**
  - Verti-Mix 750, 900
    1 short cutting knife
    4 long cutting knives
    1 bale knife
  - Verti-Mix 1050, 1250, 1450
    1 short cutting knife
    6 long cutting knives
    1 bale knife
  - Verti-Mix 1200 D, 1400 D, 1700 D
    2 short cutting knives
    8 long cutting knives
    2 bale knives
  - Verti-Mix 2000 D, 2400 D, 2800 D
    2 short cutting knives
    12 long cutting knives
    2 bale knives

5.1.2 Driving mechanism with switchgear

Optional extra:

If the power train of the mixing augers is equipped with an additional two-gear switchgear (Fig. 18), the mixing augers can be alternatively powered at gear level I or II providing different speeds.

Two-gear switchgears with the following gear ratios are available:

- 1/1 and 1.5/1 (Verti-Mix 750, 900, 1050, 1250 and Verti-Mix 1200 D):
  - at gear level I, the output speed equals the input speed,
  - at gear level II, the output speed is reduced by 50 percent compared to the input speed.
- 1/1.3 and 1.5/1 (Verti-Mix 750, 900, 1050, 1250 and Verti-Mix 1200 D):
  - at gear level I, the output speed is increased by 30 percent compared to the input speed,
  - at gear level II, the output speed is reduced by 50 percent compared to the input speed.
- 1/1 and 1.8/1 (Verti-Mix 1450 and Verti-Mix 1400 D, 1700 D, 2000 D, 2400 D, 2800 D):
  - at gear level I, the output speed equals the input speed,
  - at gear level II, the output speed is reduced by 80 percent compared to the input speed.

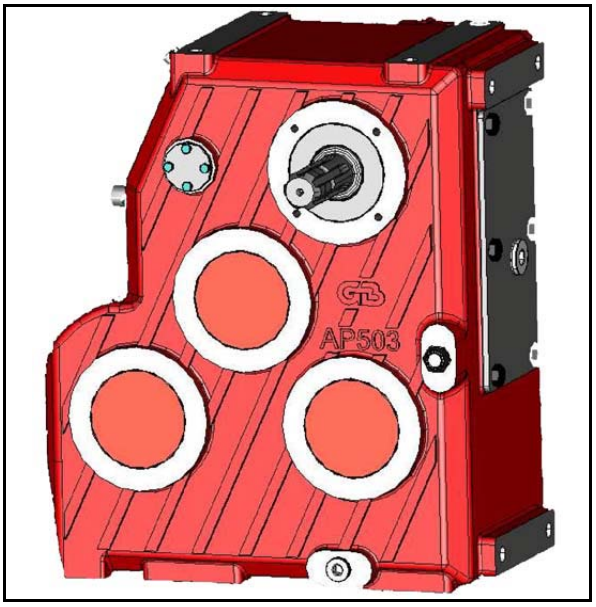


Fig. 18

- 1/1.3 and 1.8/1 (Verti-Mix 1400 D, 1700 D, 2000 D, 2400 D, 2800 D):
  - at gear level I, the output speed is increased by 30 percent compared to the input speed,
  - at gear level II, the output speed is reduced by 80 percent compared to the input speed.

The increased output speed (gear level I) is used:

- for producing small mixtures,
- for evacuating residual quantities from the mixing container.

The reduced output speed (gear level II) is used:

- for mixing with the mixing container completely filled,
- when using a tractor with low driving power,
- when starting a filled container to loosen up the contents,
- when using a straw blower.

Depending on the switchgear design, the gear levels can be changed from the tractor via:

- the Bowden cable lever (Fig. 19/1) in case of mechanical remote control via the Bowden cable (Fig. 19/2),

For changing the gear level, swivel the Bowden cable lever (Fig. 19/1) into the required position. Beware of the fact that the Bowden cable lever (Fig. 19/1) engages in the selected position at the notch after changing gear.

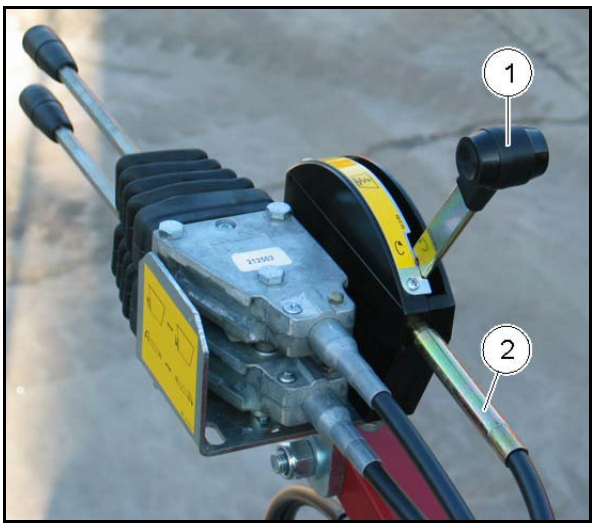


Fig. 19

- the key button (Fig. 20) in case of electrical remote control via the control unit.

For changing the gear level, swivel the key button (Fig. 20) into the required position and keep hold of it there for at least 10 seconds.

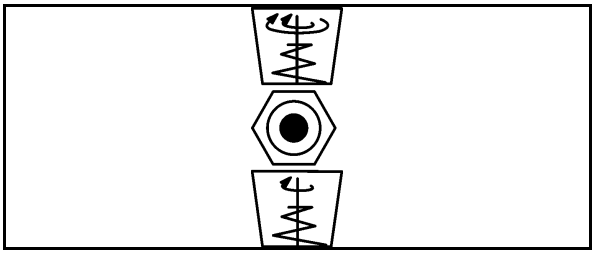


Fig. 20

The position of the indicator pipe (1) of the electrical remote control set indicates the set gear level:

Position of indicator pipe	Drive speed of mixing auger
top	fast
bottom	slow

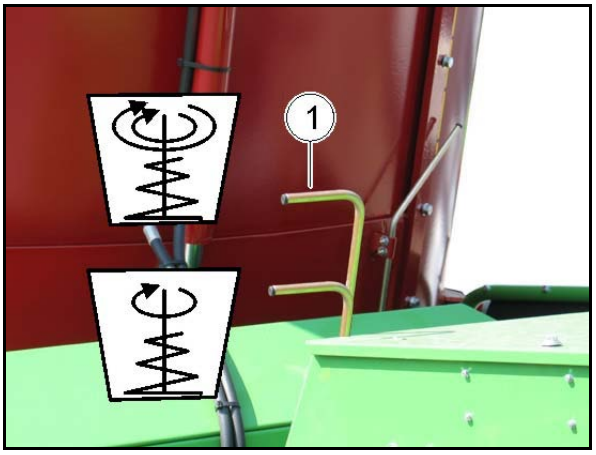


Fig. 21

5.1.2.1 Mount the holder with pocket for mechanical and electrical remote control set

1. Fix the holder (1) with the pocket (2) for the mechanical remote control unit at an appropriate place in the tractor's cabin.
2. Insert the mechanical remote control unit into the pocket (2).

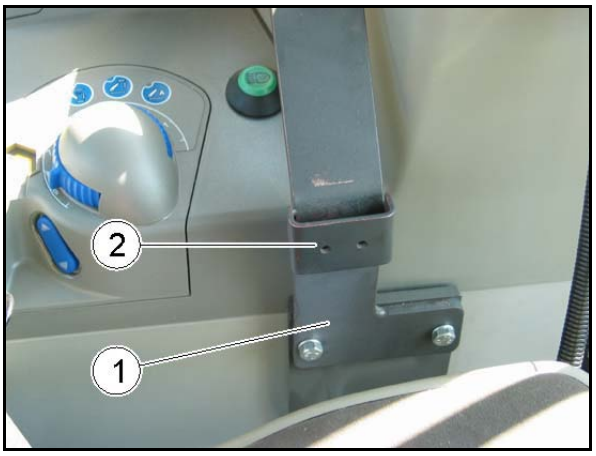


Fig. 22

5.1.2.2 Change gear level by means of switchgear

The switchgear is not synchronized. Changing gear level is only possible when the vehicle is stationary or when it is coasting or starting at low speed.

Different steps may therefore be necessary for changing gear level by means of the switchgear. The necessary steps depend on:

- the type of actuation of the tractor's p.t.o. shaft:
  - after the p.t.o. shaft has been switched off, the p.t.o. shaft drive of the tractor is slowed down during coasting and when stationary,
  - the p.t.o shaft coupling engages very fast when the p.t.o. shaft is switched on.
- the type of remote control of the switchgear:
  - mechanical remote control via Bowden cable,
  - electrical remote control via the control unit.
- the amount of load of the mixing auger in the mixing container:
  - empty or slightly filled mixing container,
  - fully filled mixing container.

Hereinafter, two different procedures for changing gear level by means of the switchgear are described.

Empty or slightly filled mixing container – low amount of load of mixing auger

1. Switch the tractor's p.t.o. shaft off.
2. Use the switchgear to change the gear level via the mechanical / electrical remote control set.
3. Switch the p.t.o. shaft of the tractor on again.

→ During restarting, changing gear level is initiated in the switchgear.

Fully filled mixing container – high amount of load of mixing auger

1. Switch the tractor's p.t.o. shaft off.
2. Prepare changing of gear level:
   - Turn the tractor engine off if the p.t.o. shaft drive of your tractor is slowed down during coasting and when stationary, after the p.t.o. shaft has been switched off.

   → In this state, the p.t.o. shaft is freely movable.
   - Select the function "Switched-off p.t.o. shaft freely movable with the tractor engine running" at your tractor if your tractor is equipped with this function.
3. Use the switchgear to change the gear level via the mechanical / electrical remote control set.
4. Switch the p.t.o. shaft of the tractor on again.

→ During restarting, changing gear level is initiated in the switchgear.

5.1.3 Spur gear for driving mechanism with on-board hydraulic system without switchgear

Optional extra:

If the machine is equipped with an on-board hydraulic system, the gear pump (1) generates the operating pressure required for executing the hydraulic functions.

The gear pump (1) is powered by the spur gear (2) with the propeller shaft powered.

Fig. 23

5.1.4 Overflow ring

Optional extra:

The overflow ring (1) prevents the fodder from being thrown over the container edge during mixing.

The overflow ring is screwed to the top edge (2) of the container and is available in two designs:

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

- an elevated overflow ring (Fig. 24), screwed on the top edge of the container,

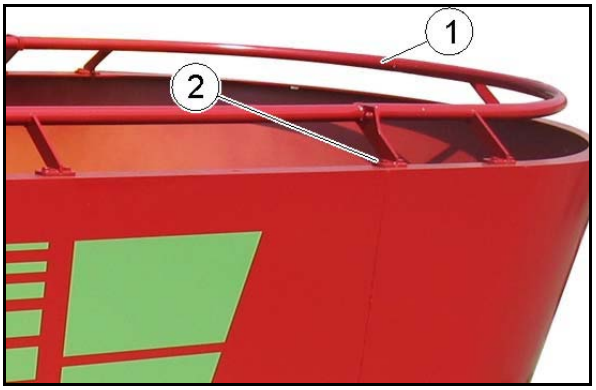


Fig. 24

- an inner overflow ring (Fig. 25) for low overhead clearances, screwed below the top edge of the container.

Fig. 25

5.1.5 Counter-cutters

The use of the counter-cutters (1) allows finer chopping and faster mixing of highly-structured fodder components.

The counter-cutters:

- are e.g. used for chopping and mixing round or cuboid bales,
- can be extended into the mixing container by sticking the bolt (2) in 4 possible positions,
- are working the more effectively, the further the counter-cutters are extended into the mixing container,
- are, as a standard feature, manually extended into the mixing container or retracted.

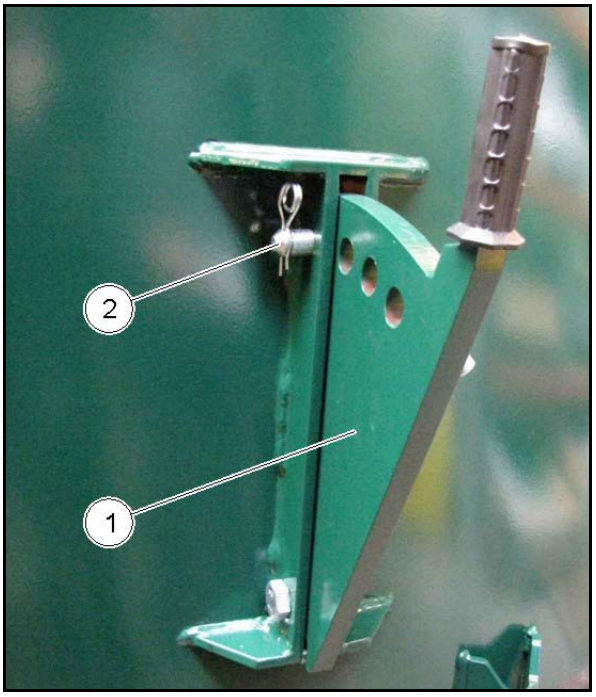


Fig. 26

Optional extra:

The counter-cutters (1) may be equipped with a hydraulic cylinder (2).

The hydraulic cylinders:

- permit the remotely controlled extension and retraction of the counter-cutters,
- can be extended into the mixing container by sticking the bolt (3) in 4 possible positions,
- are operated from the tractor via a double-acting control device of the tractor.

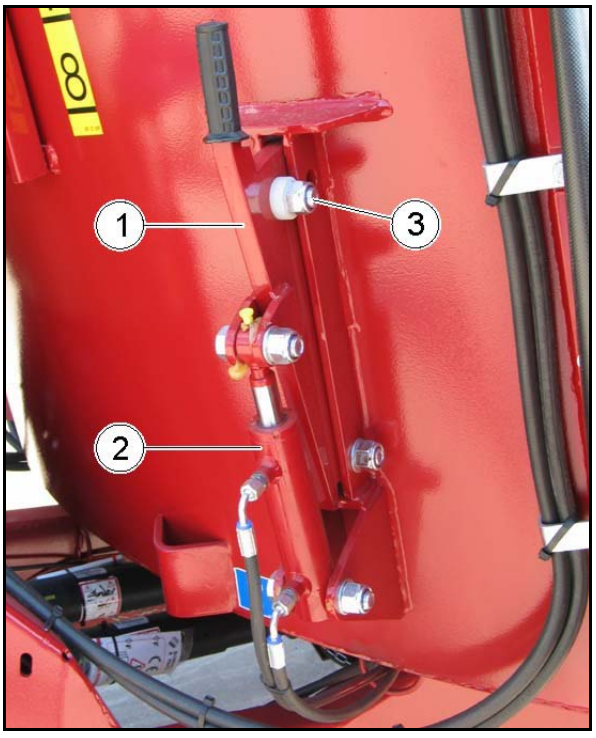


Fig. 27

5.1.6 Feed funnel for mineral feed

Optional extra:

Mineral feed or other pourable fodder additives can easily be filled into the mixing container from the ground through the feed funnel (Fig. 28).

Fig. 28

5.2 Ladder and platform

Depending on the machine's equipment, it is fitted with a ladder or a platform.

5.2.1 Ladder

From the ladder (Fig. 29), the mixing process can easily be monitored / supervised.

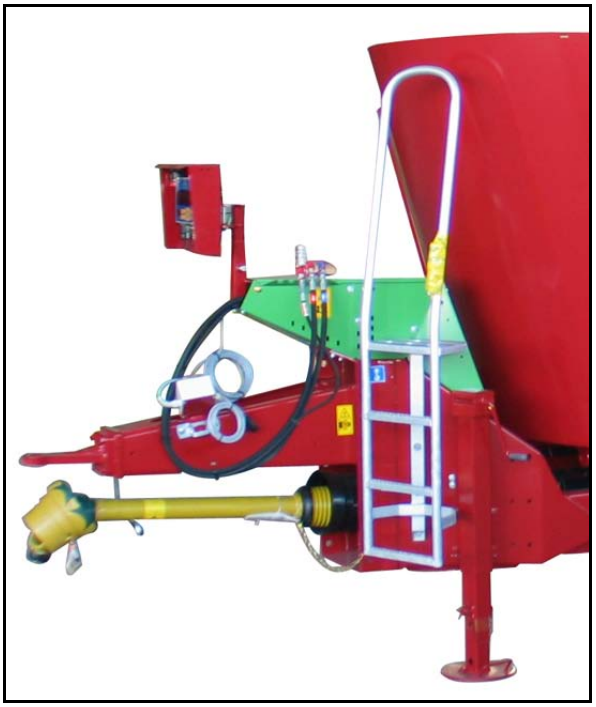


Fig. 29

5.2.2 Platform

From the platform (Fig. 30), the mixing process can easily be monitored / supervised. Furthermore, fodder additives can be filled into the mixing container.

Fig. 30

5.3 Discharge options

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

- a front right-hand discharge device,
- a front left-hand discharge device, (only Verti-Mix Double),
- a front left-hand and right-hand discharge device, (only Verti-Mix Double),
- a front left-hand and a rear right-hand discharge device (only Verti-Mix Double),
- a front right-hand and a rear left-hand discharge device,
- a rear left-hand discharge device,
- a rear right-hand discharge device (only Verti-Mix Double),
- a rear left-hand and right-hand discharge device (delivery behind the vehicle),
- a discharge device at the rear centre with protective device,
- a discharge device for crossover conveyor, front
- a discharge device for crossover conveyor, rear
- a front discharge device for crossover conveyor and at the rear centre with protective device,
- a front discharge device for crossover conveyor and a rear discharge device for straw blower,
- a rear discharge device for crossover conveyor and a front discharge device for straw blower,
- a front right-hand discharge device, a rear left-hand discharge device and a rear discharge device for straw blower (only Verti-Mix),
- a front right-hand discharge device, a rear left-hand discharge device and a front discharge device for straw blower (only Verti-Mix),
- a front left-hand and right-hand discharge device and a rear discharge device for straw blower (only Verti-Mix 1200 D, 1400 D, 1700 D, 2000 D),
- a rear left-hand and right-hand discharge device and a front discharge device for straw blower (only Verti-Mix 1200 D, 1400 D, 1700 D, 2000 D).

Machines equipped with a front right-hand and / or rear left-hand discharge device can be additionally fitted with a discharge conveyor for front / rear side discharge.

Machines equipped with a front or rear crossover conveyor can be additionally fitted with a conveyor extension mounted in front of the conveyor.

5.3.1 Front and rear side discharge

The front and rear side discharge ensures that the mixed fodder components are directly thrown from the mixing container into the feeding trough.

Fig. 31 shows a front left-hand discharge device.

Fig. 31

5.3.1.1 Discharge conveyor for right-hand front and left-hand rear discharge

Optional extra:

The discharge conveyor for right-hand front and left-hand rear discharge (1) helps to transport fodder to elevated feeding troughs which are difficult to access.

The discharge conveyor for side discharge:

- is directly mounted in front of the right-hand front or left-hand rear discharge device,
- is powered by a hydraulic motor (2). The conveyor speed:
  - is not adjustable in the standard model,
  - is infinitely adjustable via a current regulation valve (optional extra). For details, refer to the chapter "Set conveyor speed for crossover conveyor / discharge conveyor for side discharge", page 83
- is swivelled from its transport position to its working position and vice versa by means of the double-acting hydraulic cylinder (3).

  Fig. 32 shows the discharge conveyor for front right-hand discharge in working position.

Switching the driving mechanism on and off and switching from transport position to working position and vice versa is effected via remote control from the tractor:

- directly via a double-acting control device of the tractor (standard equipment),
- via Bowden cable operation (optional extra),
- via electro-hydraulic operation (control unit) (optional extra).

Beware of the local circumstances when swivelling the discharge conveyor.

The discharge conveyor is in transport position only when the hydraulic cylinder (3) has been completely retracted.

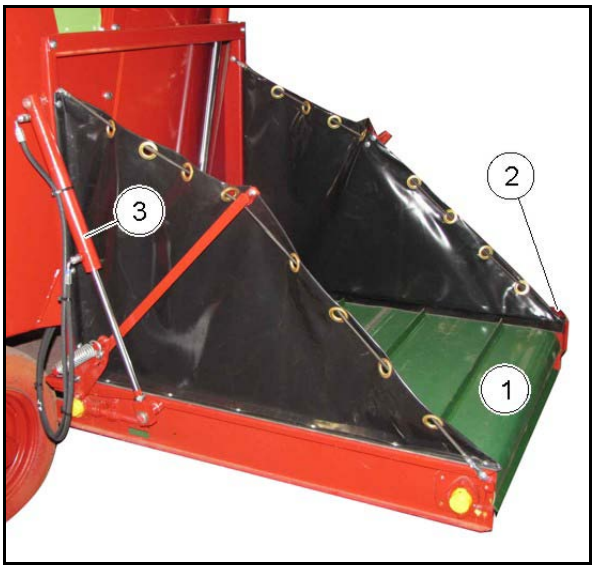


Fig. 32

Fig. 33 shows the discharge conveyor for right-hand front discharge in transport position.

Fig. 33

5.3.2 Rear discharge

The right-hand and left-hand rear discharge device ensures that the mixed fodder components are thrown from the mixing container into the feeding trough behind the vehicle.

5.3.3 Rear centre discharge with protective device

The mixed fodder components are transported from the mixing container to the centre of the feeding table via the rear centre discharge device (Fig. 34).

Fig. 34

5.3.4 Crossover conveyor

Optional extra:

Fig. 35 shows the rear crossover conveyor.

The crossover conveyor:

- is powered by a hydraulic motor. The conveyor speed:
  - is not adjustable in the standard model,
  - is infinitely adjustable via a current regulation valve (optional extra). For details, refer to the chapter "Set conveyor speed for crossover conveyor / discharge conveyor for side discharge", page 83
- can be powered in two driving directions. Depending on the driving direction, the fodder is discharged on the right- or left-hand side of the fodder mixing trailer.

Switching on and off of the driving mechanism and switching over from one driving direction to the other is effected via remote control from the tractor:

- directly via a double-acting control device of the tractor (standard equipment),
- via Bowden cable operation (optional extra),
- via electro-hydraulic operation (control unit) (optional extra).

Fig. 35

5.3.4.1 Conveyor extension

Optional extra:

The conveyor extension (1) extends the crossover conveyor (2) such that fodder can be transported to elevated feeding troughs which are difficult to access.

The conveyor extension (1):

- is powered by the hydraulic motor (3),
- is swivelled from transport position to working position and vice versa via the double-acting hydraulic cylinder (4) by remote control from the tractor.

  Fig. 36 shows the conveyor extension in working position.
- is powered jointly with the crossover conveyor (2).

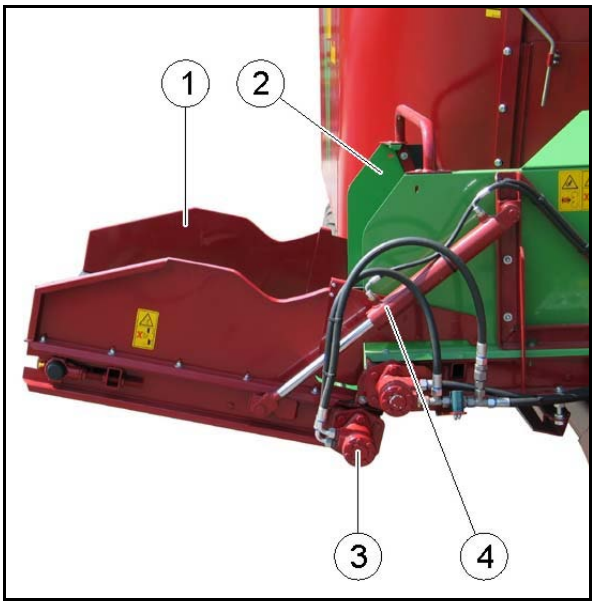


Fig. 36

Beware of the local circumstances when swivelling the conveyor extension.

The conveyor extension is in transport position only when the hydraulic cylinder (4) has been completely retracted.

Fig. 37 shows the conveyor extension in transport position.

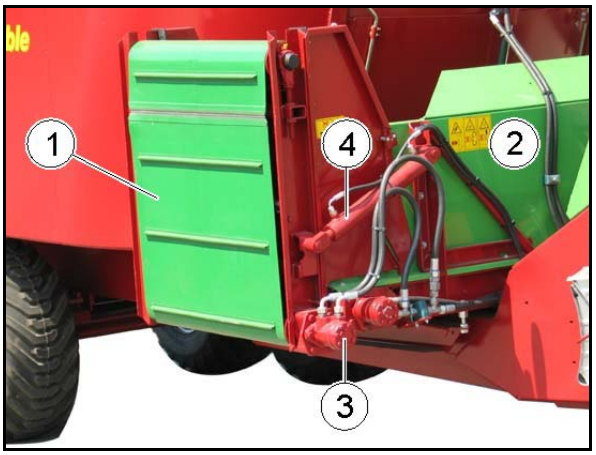


Fig. 37

5.3.5 Straw blower

Optional extra:

The straw blower:

- is used for bedding of lie-down areas in freestall barns for cattle,
- is mounted at the front or rear end of the fodder mixing trailer,
- is equipped with an own on-board hydraulic system,
- is operated electro-hydraulically via remote control (control unit) from the tractor.

Fig. 38 shows the straw blower mounted at the rear.

Fig. 38

5.3.6 Open and close discharge door for discharge opening

The discharge door (1) of the discharge opening (2) is opened and closed via the hydraulic cylinder (3).

Depending on the machine's equipment, the hydraulic cylinder is operated by remote control from the tractor:

- directly via a double-acting control device of the tractor (standard equipment),
- via Bowden cable operation (optional extra),
- via electro-hydraulic operation (control unit) (optional extra).

The opening width of the discharge door (1) and the structure of the mixed fodder components determine the quantity of fodder discharged.

The set opening width of the discharge door is indicated by the pointer (4) on the scale (5).

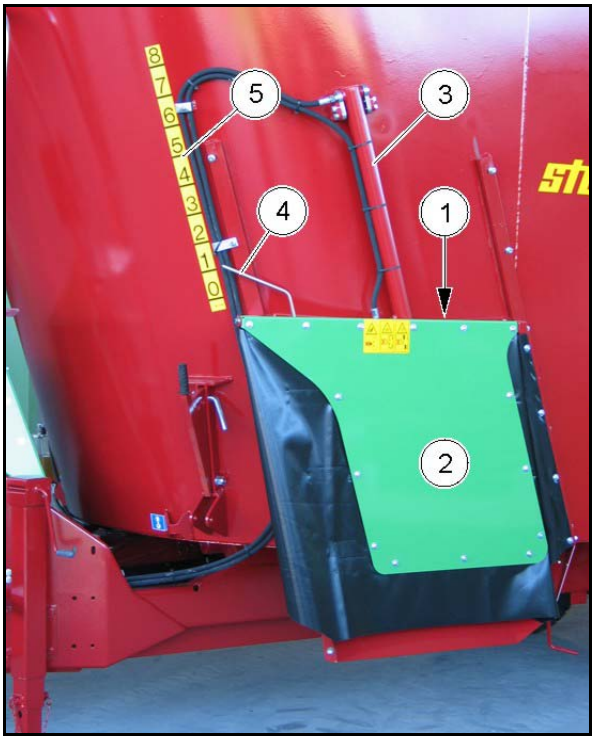


Fig. 39

The set opening width for the rear discharge door is indicated by the pointer (Fig. 40/1) on the scale (Fig. 40/2).

Scale value	Discharge door
0	closed (no fodder discharged)
8	completely open (largest quantity of fodder discharged)

Fig. 40

5.3.7 Set conveyor speed for crossover conveyor / discharge conveyor for side discharge

Optional extra:

The conveyor speed for the crossover conveyor / discharge conveyor for side discharge is infinitely adjustable.

The set conveyor speed determines the lateral delivery distance (throwing range) of the fodder next to the machine. An increasing conveyor speed results in a larger lateral delivery distance of the fodder.

The conveyor speed is infinitely adjusted at the current regulation valve:

- manually directly on the machine,
- by remote control via the control unit from the tractor.

The set scale value is not an absolute value for the conveyor speed, but only a reference value. Depending on the tractor model, the set conveyor speed may differ even if the scale value is identical.

5.3.7.1 Manual setting of conveyor speed

Set the conveyor speed directly on the machine via the rotary knob (1) at the current regulation valve (2). Position (3) indicates the scale value for the set conveyor speed.

- Scale value 0 = lowest conveyor speed,
- Scale value 10 = highest conveyor speed.

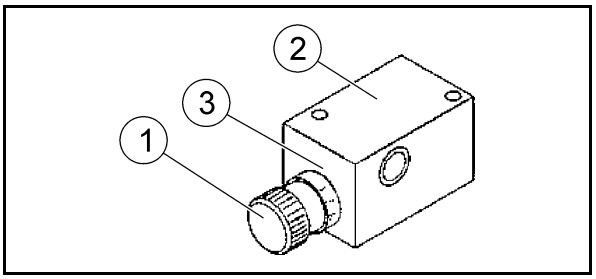


Fig. 41

5.3.7.2 Set conveyor speed via control unit

Set the conveyor speed via the control dial (1) on the control unit. Pointer (2) indicates the scale value for the set conveyor speed:

- Scale value 0 = lowest conveyor speed,
- Scale value 10 = highest conveyor speed.

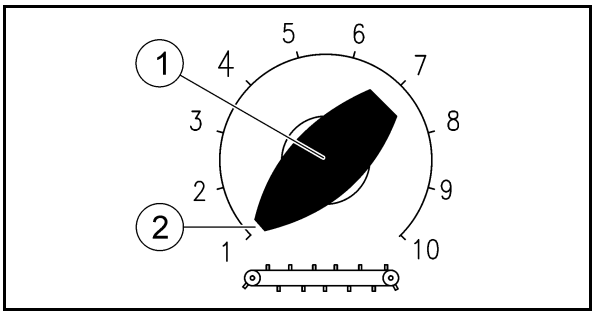


Fig. 42

5.4 Weighing device

Optional extra:

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

- an adding weighing device to determine the quantities of fodder filled in,
- a programmable weighing device offering the possibility to save several recipes,
- a programmable weighing device offering the possibility to save several recipes and to transfer data to the PC.

During filling and distributing, the weight display of the weighing device can be swivelled into the desired direction via the swivelling holder for better visibility.

Observe the included operating instructions of the weighing device.

Fig. 43

The actual weight of the fodder components filled into the mixing container is calculated by means of the 3 weighing rods (1). The weighing rods are mounted between the container and the chassis.

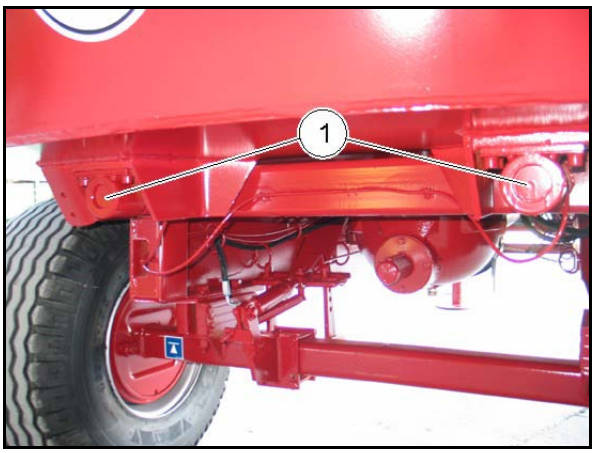


Fig. 44

5.5 Operating elements

Depending on the machine’s equipment, the machine’s hydraulic and electrical function(s) are actuated by remote control from the tractor:

- via direct tractor connection (standard equipment),
- via Bowden cable operation (optional extra),
- via electro-hydraulic operation (control unit) (optional extra).

- 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 / machine's control block may be necessary.
- For information about the required control devices, refer to the chapter "Required tractor equipment“ on page 30.

5.5.1 Direct tractor connection

The individual hydraulic components of the machine are directly connected to the hydraulic system of the tractor via appropriate hydraulic hose pipes for oil supply.

A double-acting control device is required on the tractor for each function (hydraulic component) of the machine.

Each individual function of the machine is then actuated from the tractor via the operating element on the appropriate control device.

Fig. 45

5.5.2 Bowden cable control set

The individual hydraulic components of the machine are connected to a control block. To ensure the oil supply, the control block is 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.

If the machine is equipped with an on-board hydraulic system, it is not necessary to connect the machine to the hydraulic system of the tractor.

The Bowden cable control set serves to actuate the hydraulic functions of the machine from the tractor if the oil circulation between tractor and machine has been switched on via the control device on the tractor.

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

The Bowden cable control set

- is mounted on the tractor within view and easy reach of the operator,
- is equipped with one or several operating element(s).

The operating elements are in touch-control or in latch-in design:

- In touch-control design for folding, swivelling or sliding movable machine parts, e. g. discharge door, hydraulic counter-cutters, supporting leg etc. 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 for constant loads, e. g. hydraulic motor of discharge conveyor.

The operating elements can be set to a maximum of 3 positions:

- Function I,
- Neutral position,
- Function II.

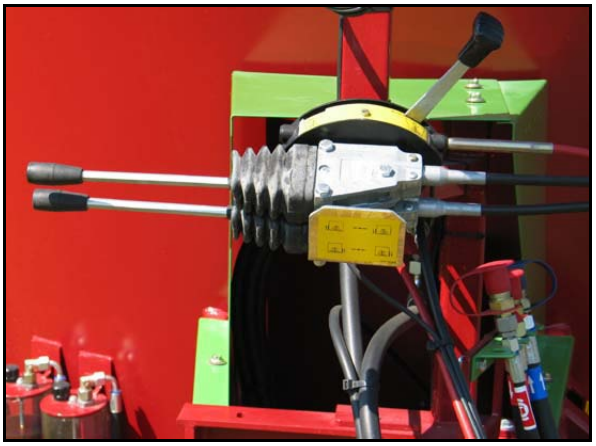
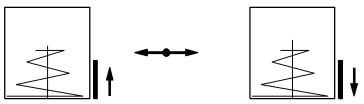
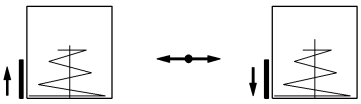
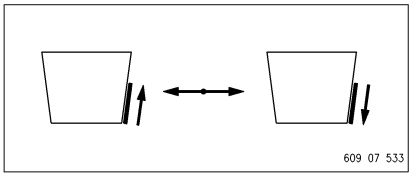


Fig. 46

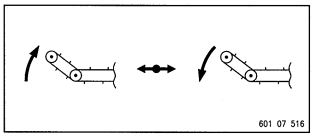
5.5.2.1 Possible symbols and their meaning

The following paragraphs show the possible symbols on the control set and their meaning.

Open / Close discharge door

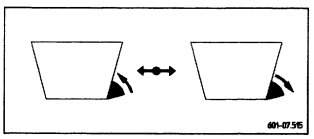
Symbol	Position of hand lever	Discharge door
	front (touch-control)	right open
	neutral position	no action
	rear (touch-control)	right close
	front (touch-control)	left open
	neutral position	no action
	rear (touch-control)	left close
	front (touch-control)	front / rear open
	neutral position	no action
	rear (touch-control)	front / rear close

Switch crossover conveyor / conveyor extension / discharge conveyor

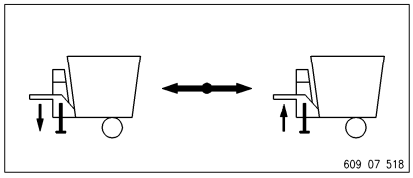
Symbol	Position of hand lever	Crossover conveyor / Conveyor extension / Discharge conveyor
	front (latch-in design)	crossover conveyor * ON to the left
	neutral position	crossover conveyor OFF
	rear (latch-in design)	crossover conveyor * ON to the right
	front (latch-in design)	discharge conveyor ON
	neutral position	discharge conveyor OFF
	Position of hand lever	**Conveyor extension / Discharge conveyor**
	front (touch-control)	swivel up to transport position
	neutral position	action stops
	rear (touch-control)	swivel down to working position

* At the same time, the conveyor extension is powered if a conveyor extension is mounted in the conveying direction of the crossover conveyor. If the material is conveyed away from the conveyor extension, the conveyor extension will stop.

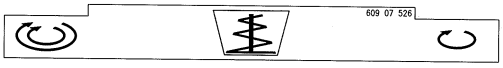
Extend and retract counter-cutters

Symbol	Position of hand lever	Counter-cutters
	front (touch-control)	extend
	neutral position	no action
	rear (touch-control)	retract

Lift / Lower supporting leg

Symbol	Position of hand lever	Supporting leg
	front (touch-control)	lift to transport position
	neutral position	no action
	rear (touch-control)	lower to support position

Change mixing auger speed

Symbol	Position of hand lever	Speed
	front (latch-in design)	fast gear level I
	rear (latch-in design)	slow gear level II

5.5.2.2 Mount holder with pocket for Bowden cable control set

1. Fix the holder (1) with the pocket (2) for the Bowden cable control set within view and easy reach at an appropriate spot in the tractor's cabin.
2. Insert the Bowden cable control set into the pocket (2).

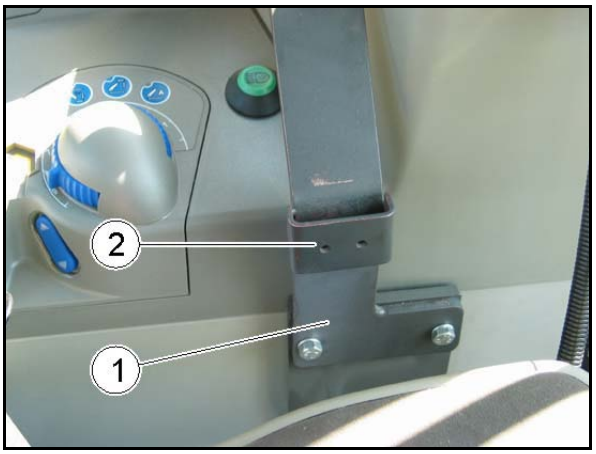


Fig. 47

5.5.3 Electro-hydraulic control (control unit)

The individual hydraulic components of the machine are connected to a control block. To ensure the oil supply, the control block is 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.

If the machine is equipped with an on-board hydraulic system, it is not necessary to connect the machine to the hydraulic system of the tractor.

The electro-hydraulic control (control unit) serves to actuate the hydraulic functions of the machine from the tractor if the oil circulation between tractor and machine has been switched on via the control device on the tractor.

Fig. 48

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

The control unit:

- is differently designed depending to the machine's equipment,
- 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) via the 3-pole plug (DIN 9680),
- is equipped with several operating elements such as key buttons, toggle switches and, where applicable, 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. discharge door, hydraulic counter-cutters, supporting leg etc. 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 for constant loads e. g. hydraulic motors.
- Control dials for setting the actuating speed of the hydraulic functions in 10 steps (e.g. conveyor speed for crossover conveyor / discharge conveyor).

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

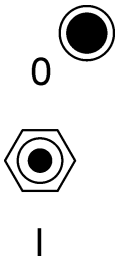
- Function I,
- Neutral position,
- Function II.

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

5.5.3.1 Possible symbols and their meaning

The following paragraphs show the possible symbols on the control set and their meaning.

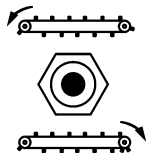
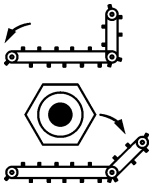
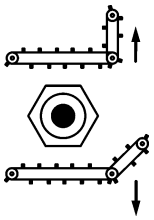
Switch control set on / off

Symbol	Position of toggle switch	Control set
	0 (OFF) top (latch-in design)	OFF (green control lamp does not light up)
	I (ON) bottom (latch-in design)	ON (green control lamp lights up)

Open / Close discharge door

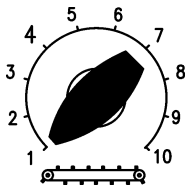
Symbol	Position of key button	Front discharge door
	top (touch-control)	open
	neutral position	action stops
	bottom (touch-control)	close
	top (touch-control)	front / rear open
	neutral position	action stops
	bottom (touch-control)	front / rear close

Switch crossover conveyor / conveyor extension / discharge conveyor

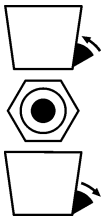
Symbol	Position of toggle switch	Crossover conveyor / Conveyor extension / Discharge conveyor
	top (latch-in design)	crossover conveyor * ON to the left
	neutral position	crossover conveyor OFF
	bottom (latch-in design)	crossover conveyor * ON to the right
	top (latch-in design)	discharge conveyor ON
	neutral position	discharge conveyor OFF
	Position of key button	**Conveyor extension / Discharge conveyor**
	top (touch-control)	swivel up to transport position
	neutral position	action stops
	bottom (touch-control)	swivel down to working position

* At the same time, the conveyor extension is powered if a conveyor extension is mounted in the conveying direction of the crossover conveyor. If the material is conveyed away from the conveyor extension, the conveyor extension will stop.

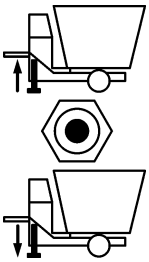
Set conveyor speed for crossover conveyor / discharge conveyor

Symbol	Position of control dial	Conveyor speed and other hydraulic functions
	1	low
	10	high

Extend and retract counter-cutters

Symbol	Position of key button	Counter-cutters
	top (touch-control)	extend
	neutral position	action stops
	bottom (touch-control)	retract

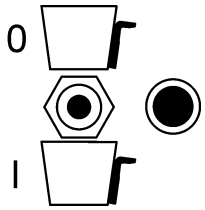
Lift / Lower supporting leg

Symbol	Position of key button	Supporting leg
	top (touch-control)	lift to transport position
	neutral position	action stops
	bottom (touch-control)	lower to support position

Change mixing auger speed

Symbol	Position of key button	Speed
	top (touch-control) keep hold of for at least 10 s	fast gear level I
	neutral position	remains constant
	bottom (touch-control keep hold of for at least 10 s	slow gear level II

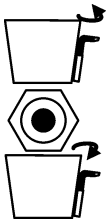
Switch straw blower on / off

Symbol	Position of toggle switch	Straw blower
	0 (OFF) top (latch-in design)	OFF (green control lamp does not light up)
	I (ON) bottom (latch-in design)	ON (green control lamp lights up)

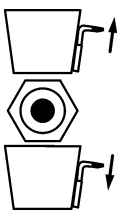
Straw blower - Open / Close discharge door

Symbol	Position of key button	Discharge door
	top (touch-control)	open
	neutral position	action stops
	bottom (touch-control)	close

Straw blower – Rotate tower

Symbol	Position of key button	Tower
	top (touch-control)	turn to the left
	neutral position	action stops
	bottom (touch-control)	turn to the right

Straw blower – Lift / Lower ejection hood

Symbol	Position of key button	Ejection hood
	top (touch-control)	lift (increase throwing range)
	neutral position	action stops
	bottom (touch-control)	lower (reduce throwing range)

5.5.3.2 Mount control set on the tractor

1. Mount the holder (1) with the pocket (2) for the control set on the tractor within view and easy reach to the driver's right.
2. Insert the pocket for the control set into the holder.
3. Plug the 3-pole plug (DIN 9680) of the power cable (2) into the 3-pole socket of the tractor.
   (Pole 15/30 = Plus; Pole 31 = Minus)

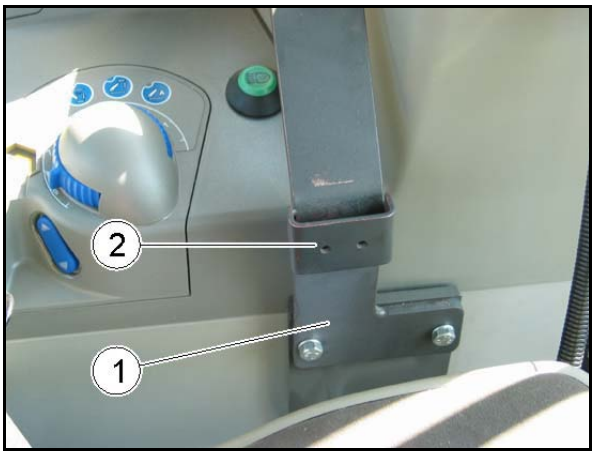


Fig. 49

- 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. Strautmann offers an appropriate retrofit kit.
- 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 habe a minimum cable cross section of 4 mm².

5.5.3.3 Electro-hydraulic control block

(1) Electro-hydraulic control block

(2) Entry plate

(3) Connection pressure pipe P

(4) Control unit with directional control valve for e. g. hydraulic cylinder of discharge door, crossover conveyor drive, hydraulic cylinder of discharge conveyor, hydraulic cylinder of counter-cutters etc.

(5) End plate

(6) Connection reverse pipe T

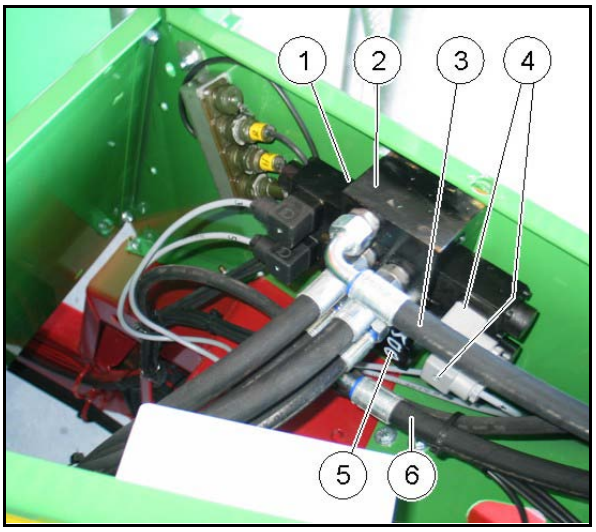


Fig. 50

5.5.3.4 Emergency manual operation in case of failure of electrical system

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

Use a pointed object (1) to push the armature of the solenoid at the respective switch-over valve in to actuate the required hydraulic function.

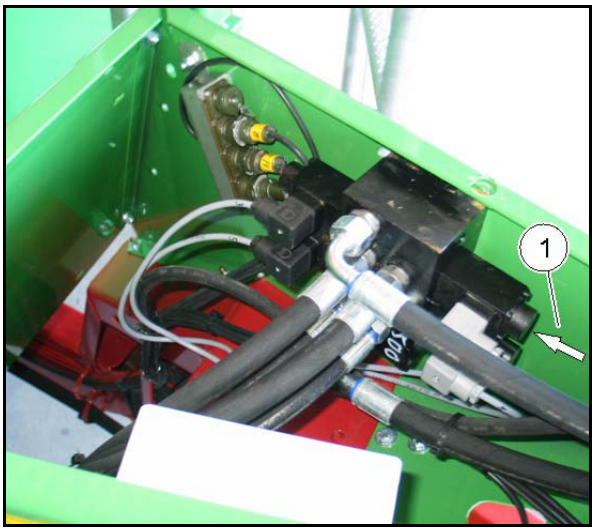


Fig. 51

5.6 Drawbar

The machine is equipped with a vertically adjustable drawbar for:

- Top linkage with drawbar lug 40 mm (6 km/h),
- Top linkage with flanged drawbar lug 40 mm according to DIN 74054-1/2 / ISO 8755 (25 km/h),
- Top linkage with drawbar lug 40 mm according to DIN 74054-1/2 / ISO 8755 (25 km/h) with automatic system for reverse travel (25 km/h) (only Verti-Mix 750, 900, 1050, 1250),
- Bottom linkage with flanged drawbar lug 50 mm (6 km/h),
- Bottom linkage with fixed supporting leg,
- Bottom linkage with flanged drawbar lug 50 mm according to DIN 74053-1 / ISO 1102 (25 km/h).

Within the adjustable range of the positioning holes (2), the drawbar (1) can be screwed on at different levels compared to the chassis (3) (Fig. 52).

This allows optimum adjustment of the drawbar lug (4) to the respective height of the coupling device of the different tractors.

The drawbar lug (4) is coupled by means of an appropriate bolt-type coupling.

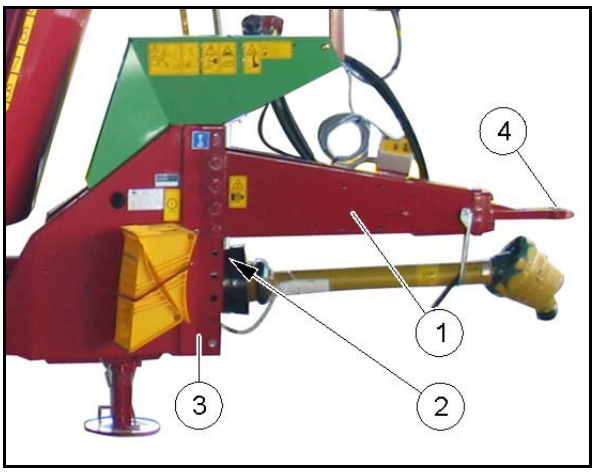


Fig. 52

5.6.1 Top linkage

The drawbar lug (Fig. 53/1) is coupled by means of an appropriate bolt-type coupling.

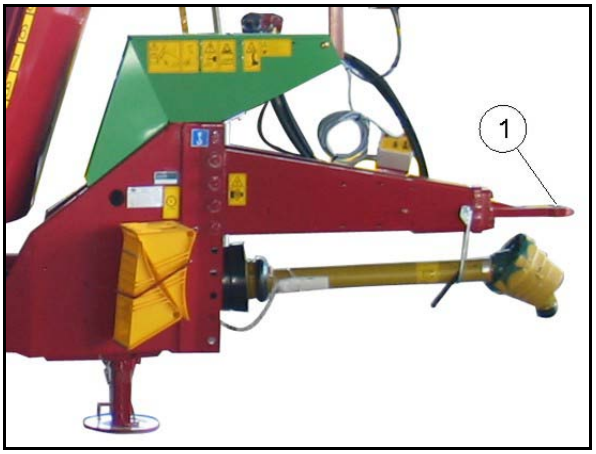


Fig. 53

5.6.2 Bottom linkage

The drawbar lug (Fig. 54/1) is coupled by means of a tow-hook (hitch hook) or a draw pin (Piton-Fix).

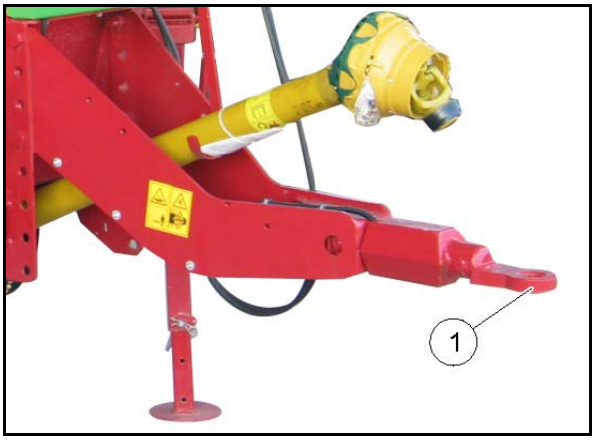


Fig. 54

5.6.3 Couple drawbar

WARNING

Risk of crushing, being 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 chapter "Preconditions for the operation of tractors with rigid drawbar trailers", page 128.
- 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 the tractor and the 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 only after the vehicles have stopped.

5.6.3.1 Bolt-type coupling

1. Secure the machine against rolling.
2. Prepare hitching up:
   - Remove the coupling bolt (not in case of automatic bolt-type coupling).
   - Open the hitch, i.e. it should be in a pre-coupling position (automatic bolt-type coupling).
3. Make sure that people leave the hazardous area between tractor and machine before approaching the machine.
4. Reverse tractor:
   - such that tractor and machine can be coupled by means of the coupling bolt (not in case of automatic bolt-type coupling).
   - until the bolt-type coupling engages into the drawbar lug (automatic bolt-type coupling).
5. Secure the tractor against accidental starting and rolling.
6. Check that the connection is secure after coupling:
   - Secure the inserted coupling bolt by positive locking (not in case of automatic bolt-type coupling).
   - Ensure that the automatic bolt-type coupling is locked (control pin, end position of operating lever, etc.).
7. Connect the supply lines.
8. Lift the supporting leg to transport position.
9. Release the parking brake of the machine.

5.6.3.2 Tow-hook (hitch hook) and drawbar lug

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

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

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

5.6.3.3 Draw pin (Piton-Fix) and drawbar lug

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

5.6.4 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 132.

5.6.4.1 Bolt-type coupling

1. Secure the tractor against accidental starting and rolling.
2. Secure the machine against rolling. Observe the information in the chapter "Secure tractor and machine against accidental starting and rolling", page 132.
3. Lower the supporting leg to support position such that the drawbar no longer transmits any tongue load to the tractor.
4. Disconnect the supply lines.
5. Put the supply lines into the hose holder.
6. Prepare unhitching:
   - Remove the coupling bolt (not in case of automatic bolt-type coupling).
   - Open the trailer hitch (automatic bolt-type coupling).
7. Move the tractor forward.

5.6.4.2 Tow-hook (hitch hook) and drawbar lug

1. Secure the tractor against accidental starting and rolling.
2. Secure the machine against rolling. Observe the information in the chapter "Secure tractor and machine against accidental starting and rolling", page 132.
3. Lower the supporting leg to support position.
4. Lower the tow-hook.
5. Move the tractor forward (approx. 25 cm).
6. Lift the tow-hook.
7. Secure the tractor against accidental starting and rolling.
8. Disconnect the supply lines.
9. Put the supply lines into the hose holder.
10. Move the tractor forward.

5.6.4.3 Draw pin (Piton-Fix) and drawbar lug

1. Secure the tractor against accidental starting and rolling.
2. Secure the machine against rolling. Observe the information in the chapter "Secure tractor and machine against accidental starting and rolling", page 132.
3. Remove the holding-down device (cross bolt) above the draw pin.
4. Lower the supporting leg to support position such that the drawbar lug disengages from the draw pin.
5. Move the tractor forward (approx. 25 cm).
6. Secure the tractor against accidental starting and rolling.
7. Fix and secure the holding-down device (cross bolt) above the draw pin.
8. Disconnect the supply lines.
9. Put the supply lines into the hose holder.
10. Move the tractor forward.

5.7 Supporting leg

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

- a mechanical supporting leg (standard equipment),
- a hydraulic supporting leg (optional extra).

5.7.1 Mechanical supporting leg

Standard equipment:

The mechanical supporting leg (Fig. 55/1) with spindle adjustment and telescopic quick adjustment (2) is rotated via the crank handle (3).

Sense of rotation of crank handle	Supporting leg
clockwise	lift (transport position)
anticlockwise	lower (support position)

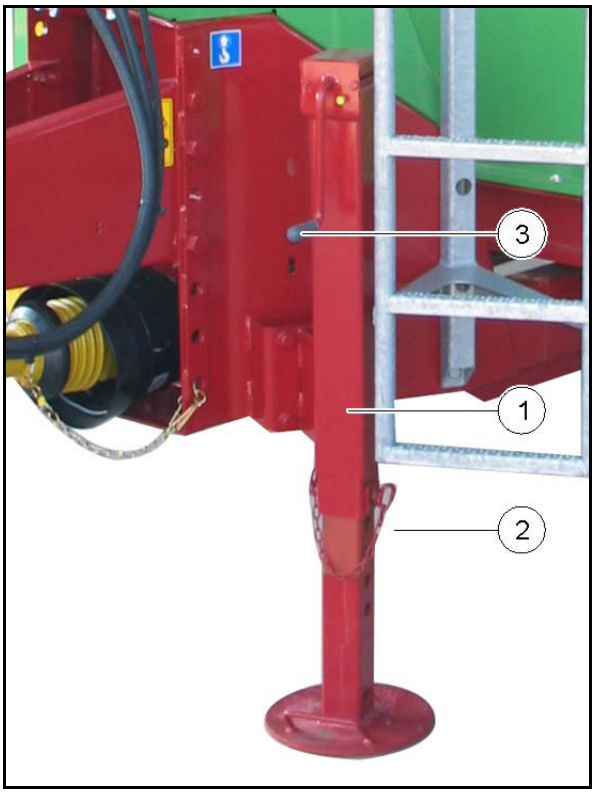


Fig. 55

5.7.1.1 Lift mechanical supporting leg to transport position

1. Hitch the machine to the tractor.
2. Relieve the supporting leg via the crank handle (1).
3. Grip the handle (2) of the telescopic quick adjustment (3).
4. Unlock and remove the locking bolt (4).
5. Lift the supporting leg.
6. Secure the supporting leg in the lifted transport position by means of the locking bolt.
7. Secure the locking bolt against accidental losing by means of the spring cotter (5).

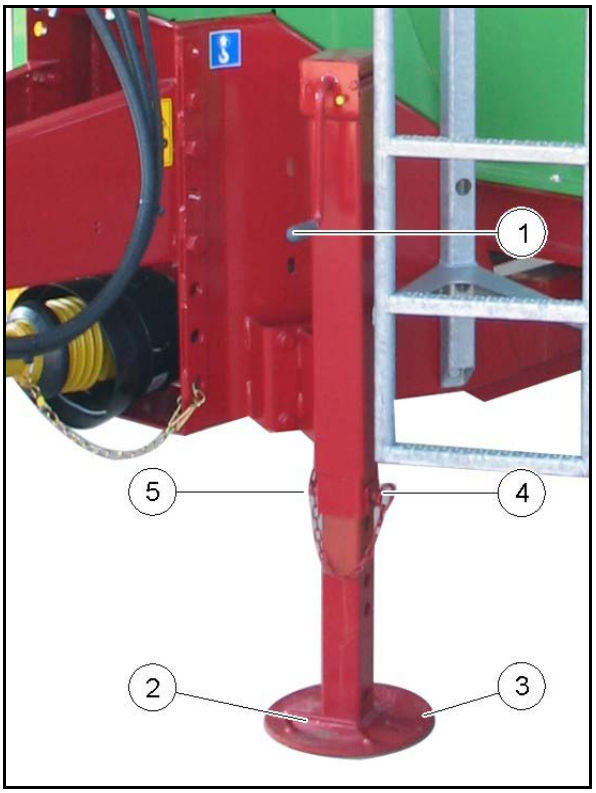


Fig. 56

5.7.1.2 Lower mechanical supporting leg to support position

1. Grip the handle (Fig. 56/2) of the telescopic quick adjustment (Fig. 56/3).
2. Unlock and remove the locking bolt (Fig. 56/4).
3. Lower the supporting leg.
4. Secure the supporting leg in the lowered support position by means of the locking bolt.
5. Secure the locking bolt against accidental losing by means of the spring cotter (Fig. 56/5).
6. Use the crank handle (Fig. 56/1) to further lower the supporting leg.

5.7.2 Hydraulic supporting leg

Optional extra:

Depending on the machine's equipment, the supporting leg (Fig. 57) is operated by remote control from the tractor:

- directly via a double-acting control device of the tractor (standard equipment),
- via Bowden cable operation (optional extra),
- via electro-hydraulic operation (control unit) (optional extra).

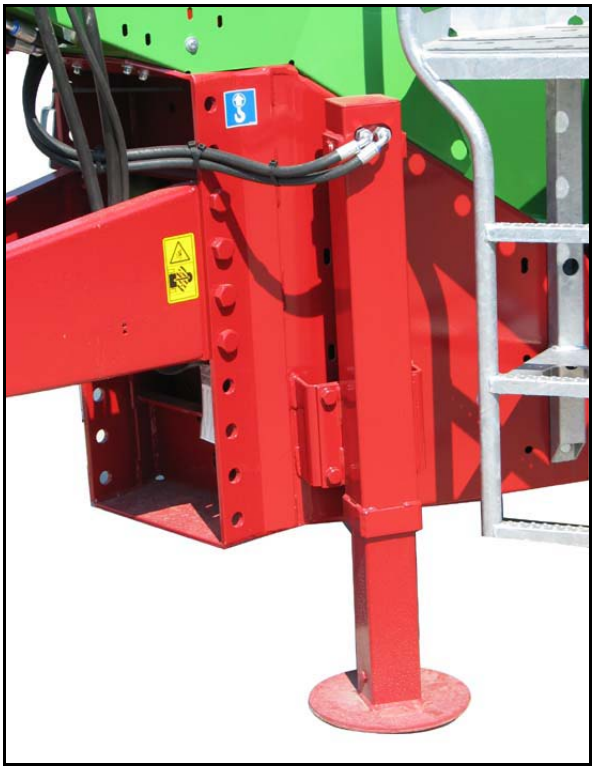


Fig. 57

5.7.2.1 Lift hydraulic supporting leg to transport position

WARNING

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

- When lifting the supporting leg, keep sufficient safe distance to the supporting leg as long as parts are moving.
- Make sure that people leave the hazardous area between tractor and machine before lifting the hydraulic supporting leg.

1. Make sure that people leave the hazardous area between the tractor and the hitched machine before lifting the hydraulic supporting leg.
2. Keep hold of the respective operating element in “Lifting“ position until the supporting leg has been lifted from its support position to its transport position.

5.7.2.2 Lower hydraulic supporting leg to support position

WARNING

Risk to people of crushing their feet when lowering the supporting leg to its support position!

- When lowering the supporting leg, keep sufficient safe distance to the supporting leg as long as parts are moving.
- Make sure that people leave the hazardous area between tractor and machine before lowering the hydraulic supporting leg.

1. Make sure that people leave the hazardous area between tractor and machine before lowering the hydraulic supporting leg.
2. Keep hold of the respective operating element in “Lowering“ position until the supporting leg has been lowered from its transport position to its support position.

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

5.8 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 the 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 thus preventing damage and soiling of the propeller shaft.

  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 prevents 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 138,
  - 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 44.

5.8.1 Couple propeller shaft

1. Secure the tractor against accidental starting and rolling.
2. Clean and lubricate the p.t.o. shaft on the tractor.
3. Start the tractor engine.
4. Hitch the machine to the tractor.
5. Secure the tractor against accidental starting and rolling.
6. Check whether the p.t.o. shaft has been switched off.
7. Release the p.t.o. shaft brake at the tractor if necessary.
8. Slip the propeller shaft fork onto the p.t.o shaft of the tractor until the locking mechanism noticeably engages. When coupling the propeller shaft, observe the included operating instructions for the propeller shaft.
9. Secure the propeller shaft protective device at the tractor and at the machine against rotating by means of the clip chains (1):
   - 9.1 Fix the clip chains at right angles to the propeller shaft if possible.
   - 9.2 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.
10. Check 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.

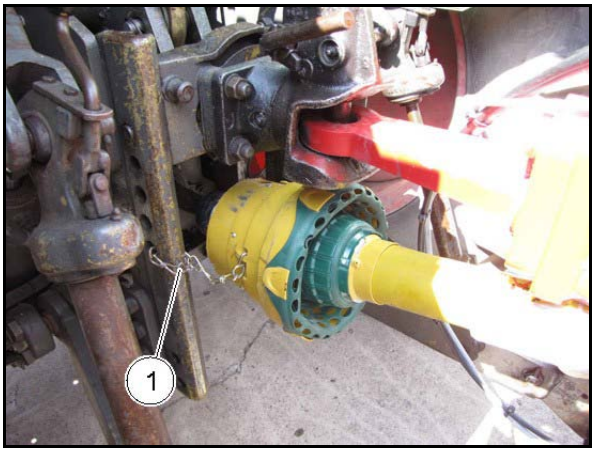


Fig. 58

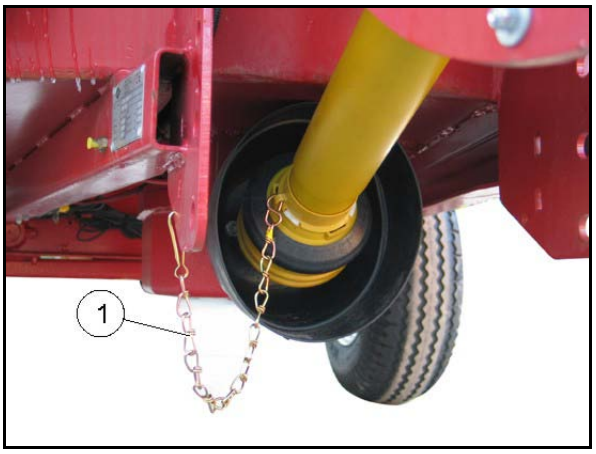


Fig. 59

5.8.2 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. Secure the machine against accidental starting and rolling.
2. Remove the clip chain from the tractor.
3. Unlock the locking mechanism and strip the fork of the propeller shaft off the p.t.o. shaft of the tractor.
4. Place the propeller shaft into the respective support (1).

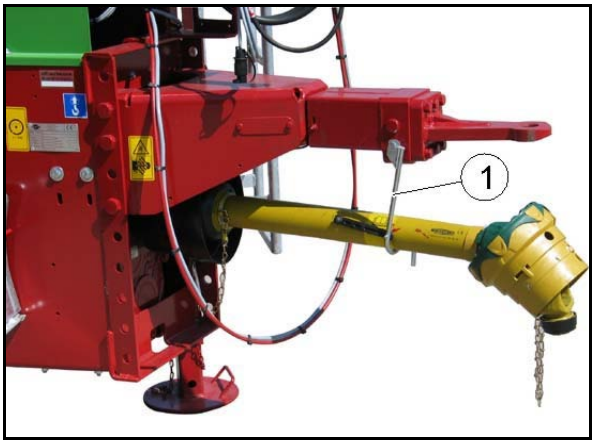


Fig. 60

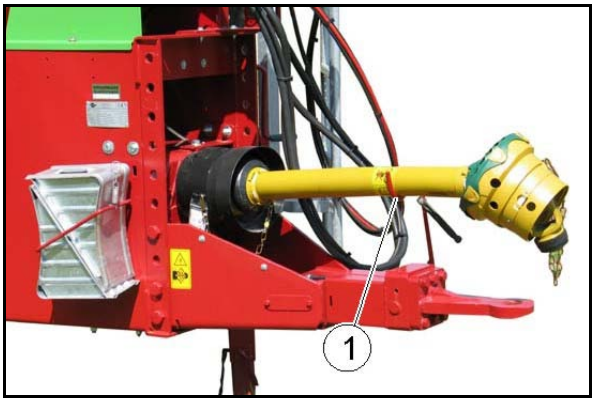


Fig. 61

5.9 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.

5.9.1 Connect hydraulic hose pipes

WARNING

Risk of crushing, cuts, 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 210 bar.
- Only connect clean hydraulic plugs and hydraulic sleeves.
- Make sure that oil cannot escape into the environment during 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 foreign objects!

1. Swivel the respective operating element at the control device on the tractor to open-centre position (neutral position).
2. Clean the hydraulic plugs and the hydraulic sleeves before connecting them.
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 pipe if possible.

5.9.2 Disconnect hydraulic hose pipes

CAUTION	**Risk of burns due to contact with hot hydraulic hose pipes!**
	Do not touch considerably warmed-up components of the hydraulic hose pipes (particularly do not touch any hydraulic plugs and hydraulic sleeves).

1. Swivel the respective operating element at the control device on the tractor to open-centre position (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 into the hose holder (1).

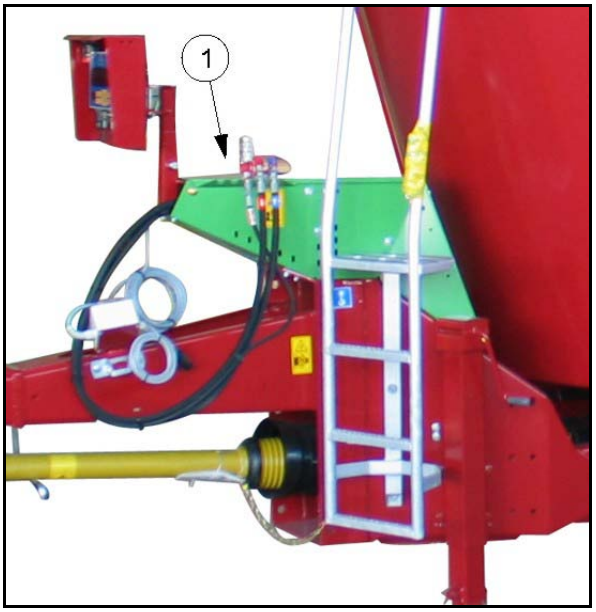


Fig. 62

5.10 Brake system

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

- a hydraulic service brake with parking brake for an admissible maximum speed of 6 km/h (standard equipment),
- an automatic reverse overrunning brake for machines with a gross vehicle weight rating of 8 t and an admissible maximum speed of 25 km/h (optional extra),
- a dual-line service brake system (compressed-air brake system) with manually operated brake pressure regulator and parking brake for an admissible maximum speed of 25 km/h (optional extra),
- a hydraulic service brake system with parking brake for an admissible maximum speed of 25 km/h (optional extra for export). The hydraulic service brake system has been designed for connection to a controlled hydraulic service brake system of a tractor.

- 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.

5.10.1 Hydraulic service brake

The hydraulic service brake is connected to a single-acting control device or to a double-acting control device with open-centre position of the tractor. The operator must actuate the respective control device on the tractor, in order to slow the machine down.

The machine equipped with a hydraulic service brake is a pure yard vehicle and not licensed for use on public roads. The maximum admissible speed is 6 km/h.

We explicitly point out to you the risk to lose insurance coverage if you cause an accident by exceeding the admissible maximum speed of 6 km/h.

When connecting the hydraulic service brake to the tractor, ensure that the full system pressure always acts on the brake connection, even when switching on other hydraulic functions.

(1) Hydraulic plug ISO 7241-A DIN 2353

Fig. 63

(2) Hydraulic cylinder of braking axle

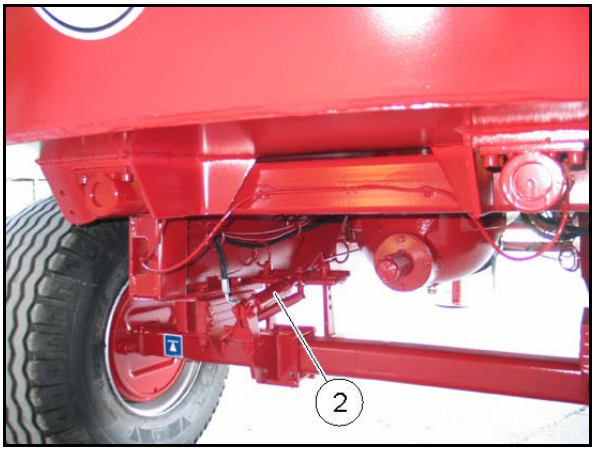


Fig. 64

5.10.1.1 Connect

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

1. Swivel the operating element at the control device on the tractor to open-centre position (neutral position).
2. Remove the dust cap from the hydraulic plug (1).
3. Connect the hydraulic plug with the hydraulic sleeve to a single-acting control device or a double-acting control device with open-centre position of the tractor.
4. Release the parking brake.

Fig. 65

5.10.1.2 Disconnect

1. Apply the parking brake.
2. Relieve the brake hydraulics. Swivel the operating element on the tractor to “Lower“ position such that the hydraulic oil flows back to the tractor.
3. Disconnect the hydraulic plug.
4. Use the dust cap to protect the hydraulic plug against soiling.
5. Put the hydraulic brake pipe (1) into the hose holder.

Fig. 66

5.10.2 Automatic reverse overrunning brake (optional extra)

The automatic reverse overrunning brake:

- serves as service and as parking brake,
- is licensed for machines with a gross vehicle weight rating of 8 t and an admissible maximum speed of 25 km/h determined by its design.

- The automatic reverse function permits direct reversing of the machine, as there will be no braking effect with the wheels running backwards.
- Particularly beware when travelling on extreme uphill gradients. In case of tractors with insufficient power or spinning tractor wheels, the combination of tractor / machine risks to be pulled back down the hill by the filled machine. When reversing, the machines can only be slowed down by means of the hand brake lever.

(1) Hand brake lever,
- serves as parking brake for the unhitched machine,
- is used for slowing down the machine during reverse travel.

(2) Pawl for locking the applied hand brake lever.

(3) Push button for releasing the applied hand brake lever.

(4) Pneumatic spring, automatically retightens the applied hand brake lever if the machine rolls backwards.

(5) Contact breaking cable, serves to actuate the hand brake lever from the tractor.

If the hand brake lever (1) is in position (6), the parking brake is released.

If the hand brake lever (1) is in position (7), the parking brake is applied.

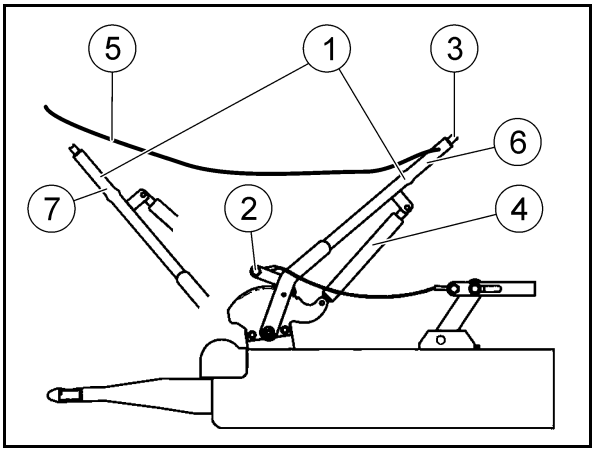


Fig. 67

5.10.3 Connect

WARNING

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

Absolutely fix the contact breaking cable (5) of the hand brake lever to the tractor when hitching the machine to the tractor.

The contact breaking cable (5) actuates the hand brake lever (1) thus slowing down the machine if the machine accidentally loosens from the tractor.

1. Fix the contact breaking cable (5) actuating the hand brake lever to the tractor within your reach.

   The contact breaking cable fixed to the tractor:

   - must easily give way to any movements during cornering without any stress, buckling or chafing,
   - must not chafe against external components.

2. Pull the contact breaking cable (5) from the tractor to unlock the pawl (2).
3. Release the contact breaking cable.

→ The hand brake lever (1) swivels backwards to position (6) and the parking brake is released.

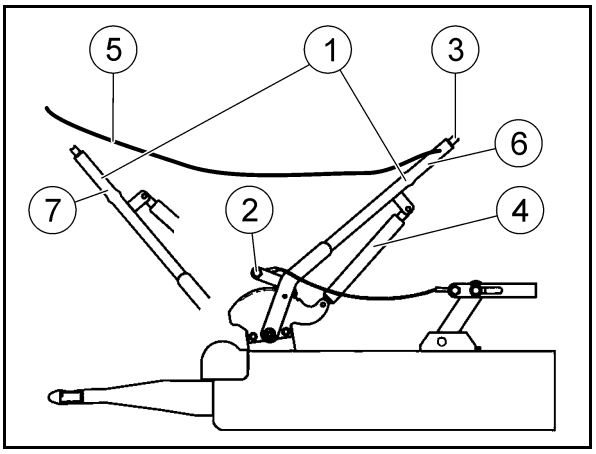


Fig. 68

5.10.3.1 Disconnect

1. Strongly pull the contact breaking cable (5) from the tractor before leaving the tractor.

→ The hand brake lever (1) swivels forward past the dead centre to position (7) and the parking brake is applied.

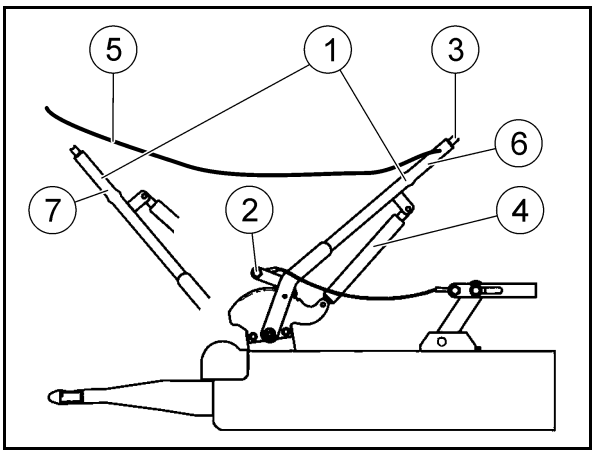


Fig. 69

5.10.4 Dual-line service brake system

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

(1) Feed line with hose coupling (red)
(2) Brake line with hose coupling (yellow)
(3) In-line filter of feed line
(4) In-line filter of brake line
(5) Trailer brake valve with brake pressure regulator
(6) Piston-type brake cylinder
(7) Text connection, piston-type brake cylinder
(8) Compressed air reservoir
(9) Drain valve
(10) Test connection, compressed air reservoir

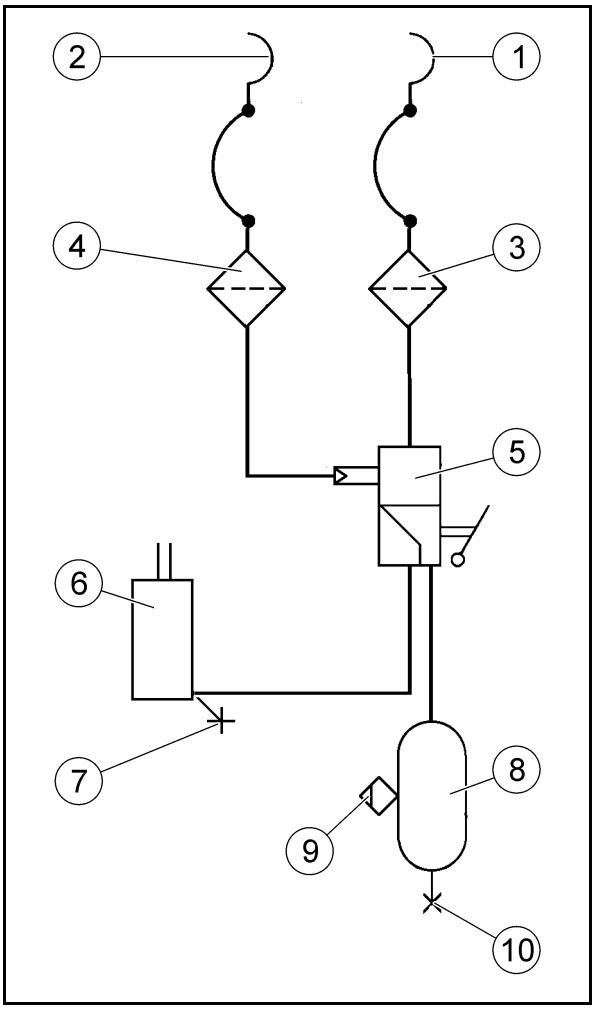


Fig. 70

Brake pressure regulator

The brake pressure regulator can be used to manually adapt the braking effect (braking force) of the dual-line service brake system to the current filling condition of the machine. The following positions are possible:

- Full load = Machine filled
- Half load = Machine partly filled
- Empty = Machine empty
- Release = Release service brake system

The "Release" position allows to manoeuvre the machine with the brake hoses not coupled to the manoeuvring vehicle.

(1) Trailer brake valve
(2) Brake pressure regulator
(3) Feed line with hose coupling (red)
(4) Brake line with hose coupling (yellow)
(5) In-line filter of feed line
(6) In-line filter of brake line
(7) Hand lever for adapting the braking effect
(8) Reading point of the set braking effect

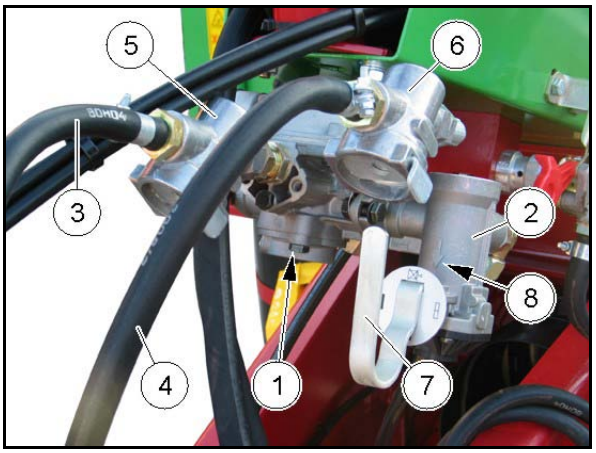
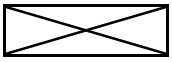


Fig. 71


"Full load"


"Half load"


"Empty"


"Release"

Example:

Machine partly filled = Turn hand lever (7) such that the "Half load" symbol is beneath the reading point (8).

Absolutely adapt the braking effect of the dual-line service brake system via the brake pressure regulator to the current filling condition of the machine before carrying out transport journeys.

Only with the braking effect adapted:

- will the pressure released by the trailer brake valve be limited,
- will there be no run-on pushes,
- will it be possible to sensitively and gradually slow down the combination of tractor / machine,
- will the tractor / machine combination remain in straight position due to advanced braking.

5.10.4.1 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 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 manometer 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 being released!

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

This is the only way to secure the hitched machine against rolling.

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.
8. Use the brake pressure regulator to adapt the braking effect of the service brake system to the current filling condition of the machine.
9. Release the parking brake of the machine and / or remove the chocks.

5.10.4.2 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 being released!

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

This is the only way to secure the hitched machine against rolling.

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 according to the set braking effect.

1. Secure the machine against rolling. Observe the information in the chapter "Secure tractor and machine against accidental starting and rolling", page 132.
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.

5.10.4.3 Manoeuvre unhitched machine by means of a manoeuvring vehicle

WARNING

Risk of crushing, entanglement and impact to people if the machine accidentally rolls during manoeuvring work with the service brake released!

Tightly connect the machine to the braked manoeuvring vehicle before releasing the service brake by means of the hand lever at the brake pressure regulator. Now the machine must be exclusively slowed down by the manoeuvring vehicle.

1. Hitch the machine to the braked manoeuvring vehicle.
2. Release the parking brake of the machine.
3. Swivel the hand lever at the brake pressure regulator to "Release" position.

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

4. Manoeuvre the machine by means of the manoeuvring vehicle.
5. Apply the parking brake of the manoeuvring vehicle after manoeuvring.
6. Swivel the hand lever at the brake pressure regulator back to its initial position after manoeuvring.

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

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

5.10.5 Hydraulic service brake system

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

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

(1) Hydraulic sleeve ISO 5676

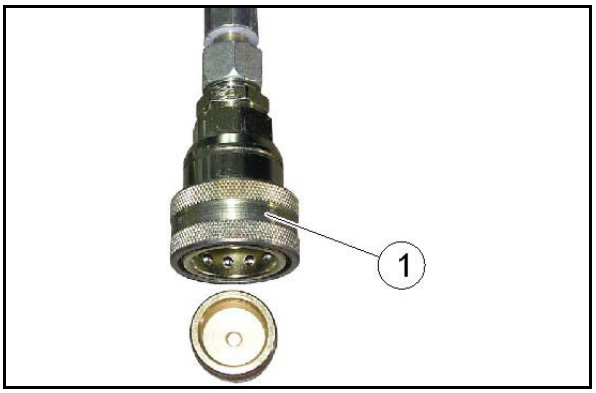


Fig. 72

(2) Hydraulic cylinder of braking axle

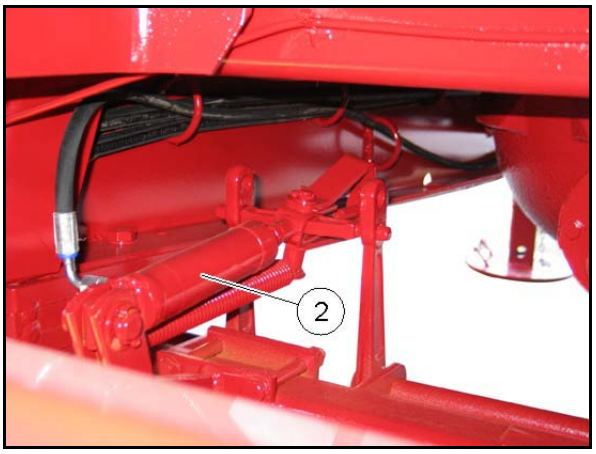


Fig. 73

5.10.5.1 Connect

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

1. Remove 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.

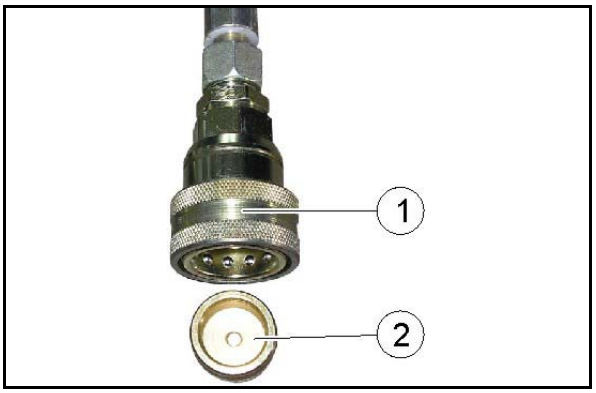


Fig. 74

5.10.5.2 Disconnect

1. Apply the parking brake of the machine.
2. Uncouple the hydraulic sleeve (Fig. 74/1).
3. Slip the hydraulic sleeve onto the machine's blanked-off connecting piece (Fig. 74/2).

5.10.6 Parking brake

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

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

(2) Adjusting position

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

(4) Spindle

(5) Cable

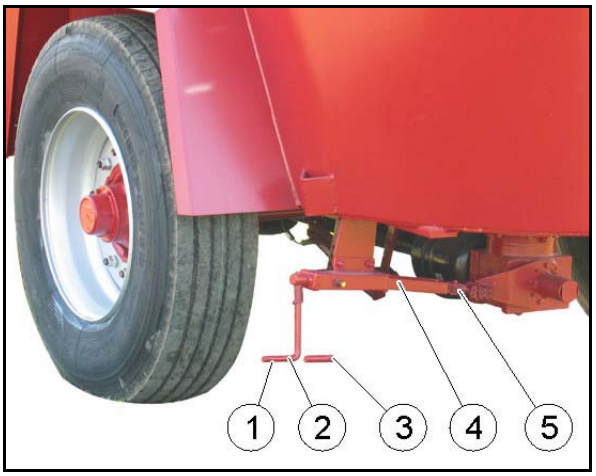


Fig. 75

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 (5) 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 (4) is no longer sufficient.

1. Swivel the crank handle (1) from resting position (3) by 180° to adjusting position (2).
2. Turn the crank handle (1) clockwise and apply the parking brake by means of the cable (5) (the tightening force of the parking brake is approx. 400 N of manual force).

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 have read and understood the operating instructions.
- When commissioning the machine, additionally observe the information included in the chapters:
  - "Operator's obligation", page 35,
  - "Qualification of staff", page 36,
  - "Basic safety instructions", page 39,
  - "Warning and instruction signs", page 52,
  - "Service and maintenance of machine", page 161.

  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!
- The tractor and the 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 hydraulic or electrical components are blocked!

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 movements of devices:

- in continuous action for constant loads,
- with automatic control,
- which, for functional reasons, require an open-centre or pressing position.

WARNING

Dangerous situations for people may occur if the hazardous areas of the machine are not clearly visible from the tractor!

Equip the tractor with mirrors such that the hazardous areas on both sides of the machine are clearly visible from the tractor.

6.1 Road traffic regulations

Observe the national road traffic regulations.

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

6.1.1 Road traffic regulations in Germany

The standard machine model does not have a TÜV certificate (note of transl.: TÜV = German Technical Inspection Agency).

The maximum admissible speed is 6 km/h!

- In terms of the StVZO (note of transl.: German Road Traffic Licensing Code) the fodder mixing trailer is a hitched farming or forestry machine.
- Farming or forestry equipment:
  - with a gross vehicle weight rating of more than 3 t require an operating licence for travelling on public roads,
  - with a gross vehicle weight rating of more than 3 t do not require an operating licence for travelling on public roads if the maximum admissible speed is 6 km/h,
  - are not subject to licence (no licence plate, no technical supervision) if:
    - exclusively used in farming and forestry establishments,
    - exclusively used for farming or forestry purposes.
  - must be equipped with the second licence plate of one of the farm's tractors if they are not subject to licence,
  - are subject to licence for commercial use, e. g. by contractors (licence plate, technical supervision),
  - must be equipped with a proper lighting and identification system when travelling on public roads.

Apply for operating licence or registration

An existing TÜV certificate alone must not be considered as a permit to travel on public roads. An officially approved operating license or registration is always required.

Apply for the operating licence or registration at your local registration office and attach the TÜV certificate to your application.

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 manufacturer even with the machine attached / hitched.

6.2.1 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). You will have to 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.

6.2.1.1 Combination options of coupling devices and drawgears

Tab. 10 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
2500 kg - ≤ 25 km/h 2000 kg - ≤ 40 km/h	Bolt-type coupling DIN 11028 / ISO 6489-2	• Drawbar lug 40 reinforced DIN 11026 / ISO 5692-2 • Drawbar lug 40 for folding drawbar DIN 11043 • Drawbar lug 40 DIN 74054-1/2 / ISO 8755
	Non-automatic bolt-type coupling DIN 11025	• Drawbar lug 40 for folding drawbar DIN 11043 • Drawbar lug 40 DIN 74054-1/2 / ISO 8755
	Automatic bolt-type coupling 40 DIN 74051-1 / ISO 3584	• Drawbar lug 40 DIN 74054-1/2 / ISO 8755
	Automatic bolt-type coupling 50 DIN 74052-1 / ISO 3584	• Drawbar lug 50 DIN 74053-1 / ISO 1102

Maximum admissible tongue load	Tractor's coupling device	Machine's drawgear
4000 kg - ≤ 40 km/h 2000 kg - > 40 km/h	Tow-hook (hitch hook) ISO 6489-1	• Drawbar lug (hitch ring) ISO 20019 • Drawbar lug (hitch ring) ISO 5692-1
	Draw pin (Piton-Fix) ISO 6489-4	• Drawbar lug (hitch ring) ISO 5692-1
4000 kg - ≤ 40 km/h 2000 kg - > 40 km/h	Ball-type coupling 80	• Shell-type coupling 80

Tab. 10

6.2.1.2 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 filling your rigid drawbar trailer.

The actual D_C value of a combination to be coupled is calculated as follows:

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

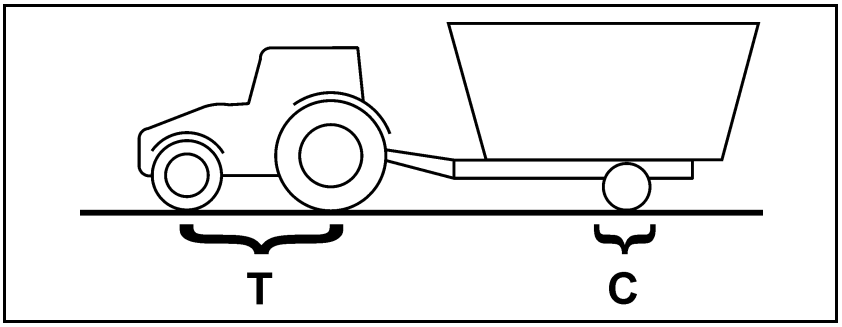


Fig. 76 D_C value of combination

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

C: Axle load of the machine filled 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 value of the tractor's coupling device**
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 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: 4.5 [t]

Admissible axle load(s) of the rigid drawbar trailer: 10 [t]

$$D_C = 9.81\ m/s^2 \times \frac{4.5\ [t] \times 10\ [t]}{4.5\ [t] + 10\ [t]} = 30.4\ [kN]$$

6.2.1.3 Calculate the tractor's admissible towing capacity

The parameters of your tractor's coupling device determine the admissible towing capacity C of your tractor. In case of rigid drawbar trailers, the tractor's towed load is equal to the axle load(s) of the rigid drawbar trailer.

The admissible towing capacity of your tractor determines the admissible load capacity of your rigid drawbar trailer. This calculated towed load / axle load must not be exceeded when filling your rigid drawbar trailer.

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

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

D_C: D_C value of your tractor's coupling device (see type plate attached to the coupling device).

g: Gravitational acceleration (9.81 m/s²)

Example:

Gross vehicle weight rating of the tractor:	4.5 [t]
D_C value of tractor's coupling device	31.3 [kN]
D_C value of drawgear	30.4 [kN]
D_C value of combination	30.4 [kN]

$$C = \frac{4.5\ [t] \times 30.4\ [kN]}{9.81\ m/s^2 \times 4.5\ [t] - 30.4\ [kN]} = 10\ [t]$$

Due to the D_C value of your tractor's coupling device, the admissible axle load is 10 [t]. This calculated axle load must not be exceeded when filling 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 the mixing container

You will have to enter the mixing container, e.g. to carry out maintenance work on the cutting knives of the mixing auger.

WARNING

Risk of crushing, shearing, cuts, amputation, becoming entangled, wound up, being drawn in and risk of impact to people if:

- **lifted, unsecured machine parts accidentally come down or are unintentionally lowered , e.g. an open discharge door,**
- **tractor and machine accidentally start and roll,**
- **the mixing auger is accidentally powered!**
- Secure lifted machine parts against accidental lowering before working beneath lifted parts.
- Secure tractor and machine against accidental starting and rolling before entering the mixing container.

  Observe the information in the chapter "Secure tractor and machine against accidental starting and rolling“, page 132.

WARNING

Risk of falling off the machine if people enter the mixing container by climbing over the top edge of the mixing container!

As a basic principle, enter the mixing container through a discharge opening.

WARNING

Risk of cuts when entering the mixing container if the cutting knives of the mixing auger are directed towards the discharge opening!

Rotate the mixing auger such that the cutting knives are directed away from the discharge opening before entering the mixing container.

WARNING

Risk of slipping, stumbling or falling when moving in the mixing container if people slip due to insufficient stability!

- Wear appropriate protective clothing when entering the mixing container.
- Always ensure a firm standing position. Beware that the standing surface on the mixing auger is inclined.
- Cover the sharp-edged cutting knives before moving inside the mixing container.
- Remove any fodder residues and dampness before moving inside the mixing container.

1. Completely open the discharge door of the discharge opening through which you want to enter the mixing container.
2. Secure tractor and machine against accidental starting and rolling, see information on page 132.
3. Strip the propeller shaft off the tractor's p.t.o. shaft allowing you to manually rotate the mixing auger via the propeller shaft.
4. Rotate the mixing auger such that the cutting knives are directed away from the discharge opening.
5. Unscrew the screwed connections (1) between protective cover (2) and mixing container (3).
6. Remove the screwed connection (4) of the swivel pin and take off the protective cover (2).
7. Enter and leave the mixing container carefully through the discharge opening or the crossover conveyor and the discharge opening.
8. Carefully clean the mixing container from installation material or grinding residues before leaving the mixing container.
9. Ensure that all components, tools etc. are removed from the mixing container.
10. Properly fix the protective cover (2) again at the mixing container after finishing all necessary work in the mixing container.

Fig. 77

6.5 Adjust mounting height of drawbar (shop work)

You must have the mounting height of the drawbar adjusted to the respective tractor model if the fodder mixing trailer hitched to the tractor is not in horizontal position on even ground.

The mixing auger only works at its optimum in horizontally aligned position. When horizontally aligning the fodder mixing trailer, use the top edge of the mixing container for guidance.

WARNING

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

Only an authorized workshop is allowed to adjust the drawbar to the chassis within the adjusting range of the positioning holes for adapting the mounting height.

WARNING

Risk of crushing, becoming entangled, being drawn in and risk of impact to people if the machine starts rolling when adjusting the mounting height of the drawbar!

Secure the machine against rolling before adjusting the mounting height of the drawbar.

WARNING

Risk of crushing and impact to people if the chassis accidentally comes down during screwing work on the drawbar!

Ensure sufficient ground stability when lifting the chassis by means of the supporting leg. Use additional stable, load-distributing supports if necessary.

Assembly instructions for authorized workshop:

1. Park the fodder mixing trailer on even, firm ground.
   1.1 Secure the fodder mixing trailer against rolling by means of the parking brake and / or chocks.
   1.2 Unhitch the machine from the tractor.
   1.3 Move the tractor forward until the coupling device of the tractor uncovers the drawgear of the drawbar.
2. Align the fodder mixing trailer horizontally by means of the supporting leg (1) such that the top edge of the mixing container runs parallel to the ground.
3. Align the coupling device on the tractor such that the coupling device can take up the drawgear (2) of the drawbar.
4. Have the drawbar screwed by an authorized workshop if the adjusting range for the coupling device on the tractor is not sufficient to hitch the fodder mixing trailer in horizontal position.
5. Ensure that there is sufficient free space around the propeller shaft in any operating state. Insufficient free space will lead to damage on the propeller shaft.

Fig. 78

6.6 Adjust length of propeller shaft to tractor (shop work)

WARNING

Risk to people of being drawn in and becoming entangled due to assembly work on the propeller shaft carried out improperly or due to unauthorized structural alterations!

Only an authorized workshop is allowed to carry out structural alterations on the propeller shaft. Observe the included operating instructions of the propeller shaft manufacturer.

Adjustment of the propeller shaft length is allowed if observing the required minimum transverse contact ratio.

Structural alterations to the propeller shaft which are not specified in the included operating instructions for the propeller shaft are not allowed.

WARNING

Risk to people due to blown out objects if the length of the propeller shaft has been improperly adjusted thus being compressed during cornering!

Have the length of the propeller shaft checked in all operating states by an authorized workshop and adjusted if necessary before coupling the propeller shaft to your tractor for the first time.

This will prevent propeller shaft compression or insufficient transverse contact ratio.

WARNING

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

Secure the tractor and the 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 during straight travelling.
- Also observe:
  - possible changes in inclination between tractor and machine, e. g. in case of ramp travels,
  - the specific differences between top and bottom linkage.
- The adjustment of the propeller shaft only applies to the current tractor model. Readjustment of the propeller shaft may be necessary if hitching the machine to another tractor.

Assembly instructions for authorized workshop:

1. Hitch the machine to the tractor (do not couple the propeller shaft).
2. Take the shortest operating position of the propeller shaft.
3. 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 fork 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 fork 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 of the machine before coupling the propeller shaft.

6.7 Check machine for proper functioning

Check the machine for proper functioning before the first start-up and each time before starting work.

1. Hitch the fodder mixing trailer to the tractor.
2. Completely lubricate the fodder mixing trailer and the propeller shaft. Observe the information in the chapter "Lubrication of machine", page 164.
3. Check the oil level of the angular gear in the compensating reservoir for the gear lubricant oil. Observe the information in the chapter "Check oil level", page 167.
4. Check all functions of the machine before filling the mixing container for the first time:
   - 4.1 Open and close discharge door.
   - 4.2 Lower hydraulic supporting leg (if available) to support position and lift it to transport position.
   - 4.3 Extend and retract hydraulic counter-cutters (if available) into and from the mixing container.
   - 4.4 Let crossover conveyor (if available) run in both driving directions.
   - 4.5 Let crossover conveyor (if available) run at different conveyor speeds.
   - 4.6 Lower conveyor extension (if available) to working position and lift it to transport position.
   - 4.7 Lower discharge conveyor for side discharge (if available) to working position and lift it to transport position.
   - 4.8 Let discharge conveyor for side discharge (if available) run in driving direction (in working position).
   - 4.9 Let discharge conveyor for side discharge (if available) run at different conveyor speeds (in working position).
   - 4.10 Check the weighing device (if available) for proper functioning.
   - 4.11 Check the lighting system for proper functioning.
   - 4.12 Check the brake system for proper functioning.

Ensure that the stop valve (5) is open before each start-up. Fig. 79 shows the open stop valve (5).

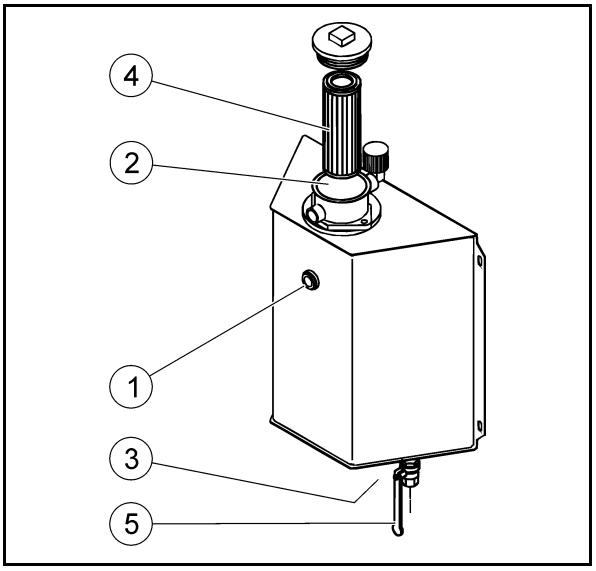


Fig. 79

7 Hitch and unhitch machine

- Additionally observe the chapter "Basic safety instructions", page 39, 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 35.

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 the tractor and the machine for carrying out hitching or unhitching work.

Observe the information in the chapter "Secure tractor and machine against accidental starting and rolling“, page 132.

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 127.

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 the tractor and the 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 only 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.

1. Secure the machine against rolling. Observe the information in the chapter "Secure tractor and machine against accidental starting and rolling“, page 132.
2. Always check the machine for visible defects during hitching. Observe the information in the chapter "Operator's obligation", page 35.
3. Couple the drawbar. Observe the information in the chapter "Couple drawbar", from page 100.
4. Connect the hydraulic hose pipes. Observe the information in the chapter "Connect hydraulic hose pipes", page 110.
5. Connect the brake system. Observe the information in the chapters:
   - Hydraulic service brake, from page 112,
   - Automatic reverse overrunning brake, from page 115,
   - Dual-line service brake system, from page 117.
   - Hydraulic service brake system, from page 122,
6. Couple the propeller shaft. Observe the information in the chapter "Couple propeller shaft", from page 108.
7. Insert the Bowden cable control set / the control unit into the holder of the tractor.
8. Connect the electric supply lines / lighting system.
9. Lift the supporting leg to transport position. Observe the information in the chapters:
   - "Lift mechanical supporting leg to transport position", page 103,
   - "Lift hydraulic supporting leg to transport position", page 105.
10. Release the parking brake of the machine. Observe the information in the chapter "Parking brake", page 124.

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. Lower the supporting leg to support position. Observe the information in the chapters:
   - "Lower mechanical supporting leg to support position", page 103,
   - "Lower hydraulic supporting leg to support position", page 105.
2. Secure the machine against rolling. Observe the information in the chapter "Secure tractor and machine against accidental starting and rolling“, page 132.
3. As a basic principle, check the machine for visible defects during unhitching. Observe the information in the chapter "Operator's obligation", page 35.
4. Disconnect the electric supply lines / lighting system.
5. Disconnect the hydraulic hose pipes. Observe the information in the chapter "Disconnect hydraulic hose pipes", page 111.
6. Disconnect the brake system. Observe the information in the chapters:
   - "Hydraulic service brake", from page 112,
   - "Automatic reverse overrunning brake", from page 115,
   - "Hydraulic service brake system", from page 122,
   - "Dual-line service brake system", from page 117.
7. Uncouple the propeller shaft. Observe the information in the chapter "Uncouple propeller shaft", page 109.
8. Insert the Bowden cable control set / the control unit into the holder on the machine.
   - 8.1 Disconnect the control unit from the power supply.
   - 8.2 Take the control unit out of the holder.
   - 8.3 Fix the control unit to the holder on the machine.
9. Uncouple the drawbar. Observe the information in the chapter "Uncouple drawbar" from page 100.

8 Settings

Before carrying out any adjusting work, observe the information in the chapters:

- "Basic safety instructions", page 39,
- "Warning and instruction signs", page 52.

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 132.

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

9 Use of machine

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

- "Operator's obligation", page 35,
- "Qualification of staff", page 36,
- "Basic safety instructions", page 39,
- "Warning and instruction signs", page 52.

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 start-up of the machine.

  Have damaged safety and protective devices of the propeller shaft immediately replaced by an authorized workshop.
- Ensure that the propeller shaft protective device 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:
  - when the machine is powered,
  - as long as the tractor engine is running with the propeller shaft coupled / the hydraulic system connected,
  - if the ignition key is in the tractor and the tractor engine can be accidentally started with the propeller shaft coupled / the hydraulic system connected.
  - if tractor and machine have not been secured against accidental rolling by means of their respective parking brake and/or the chocks.

  Close open protective devices before powering the machine.

WARNING

Risk to people due to failure of components if the machine is powered at inadmissible high drive speed!

Observe the admissible drive speed of the machine before switching the tractor's p.t.o. shaft on.

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, being 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 to people of being crushed, cut, becoming entangled and being drawn in due to accidental contact with the powered mixing auger!

- Never reach into the mixing container through an open discharge opening with the mixing auger powered.
- Never bend over the top edge of the mixing container with the mixing auger powered.
- Never enter the mixing container with the mixing auger powered or the tractor engine running.

9.1 Fill fodder mixing trailer

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 only with partly-filled mixing container if necessary.

CAUTION

Risk of breakdown of components due to overloading of machine!

Observe the maximum loading capacity of the machine and the filling order of the individual fodder components.

The fodder components should freely move in the mixing container when the mixing auger is powered. Overloading may occur if fodder components become entangled by the counter-cutters and blockages pile up.

Overloading affects the machine's performance and service life. Damages due to overloading are excluded from warranty.

WARNING

Risk of being crushed, cut, becoming entangled and being drawn in if people get into accidental touch with the powered mixing auger due to improper filling of the mixing container!

- Only use appropriate equipment to fill the mixing container.
  Appropriate equipment may be:
  - tractor equipped with a front loader,
  - telescopic loader,
  - wheeled / yard loader.
- People are only allowed to fill the mixing container manually if they cannot accidentally fall into the mixing container.
  People are not allowed on a level with or above the feed opening of the mixing container.
- As a basic principle, fill pourable fodder additives (e. g. mineral feed) into the mixing container by means of the loading device (loading shovel) or through the feed funnel (optional extra).
- Fill liquid or sticky fodder additives into the mixing container by means of the loading device (loading shovel).
  - Fill the loading shovel only partly.
  - Form a hollow in the grass or maize silage.
  - Fill the fodder additives into the hollow.

- Remove baler twines and nets on the ground before filling round or cuboid bales into the mixing container by means of the loading device.
- When filling the mixing container, ensure that the tractor engine runs as equally as possible when powering the mixing auger, i. e. without variations in the tractor engine speed. Variations in the tractor engine speed indicate insufficient engine power of your tractor and cause additional load to all other powered components.

  The required tractor power can be reduced by means of a two-gear switchgear (optional extra) in the powertrain of the mixing auger.

- The total fodder quantity that can be mixed and chopped in one mixing container filling cycle depends on the following factors:
  - mixing container capacity,
  - total dry mass of the fodder components to be mixed,
  - structure (stalk length and quality) of the individual fodder components,
  - way and order of filling,
  - tractor power.
- Due to the different fodder components to be mixed, the filling quantity for one mixing container filling cycle may vary. Avoid overloading of the fodder mixing trailer when filling the mixing container. In case of overload:
  - the individual fodder components cannot be mixed homogeneously,
  - mechanical damage on the powertrain may occur,
  - cutting knives of the mixing auger may bend.
- If only one tractor is available, the mixing container can also be filled when unhitched. The mixing process will, however, be accelerated if the mixing auger is powered during filling.

  If the mixing auger is switched on only after filling or transport journeys, more power will be required to set the fodder components to be mixed in motion.

1. Check the mixing container for foreign objects before starting the tractor engine. Remove foreign objects from the mixing container if necessary.
2. Start the tractor engine.
3. Park the tractor with the hitched fodder mixing trailer on even ground.
4. Secure tractor and fodder mixing trailer against rolling.
5. Close possibly open discharge doors.
6. Swivel the weighing device (if available) from the tractor into filling direction.
7. Switch the weighing device on and start the programme (if available).
8. Make sure that people leave the area where the fodder mixing trailer is filled.
9. Switch the tractor's p.t.o. shaft on.

→ The mixing auger starts.

10. Let the tractor engine run at appropriate speed to ensure that the tractor engine runs equally and does not stall when the mixing container is being filled.
11. Fill the mixing container by means of a tractor equipped with a front loader or by means of a wheeled / yard loader.

Fig. 80

9.1.1 Recommended filling order

- For undoing round or cuboid bales, a higher power is required. The required power can be reduced by means of the two-gear switchgear (gear level II).
- Recommended procedure for processing round or cuboid bales:
  1. Extend the counter-cutters into the mixing container.
  2. Fill round or cuboid bales in at slow mixing auger drive speed.
  3. Increase the drive speed of the mixing auger after the bale has been "undone".
  4. Now retract the counter-cutters from the mixing container.

1. Fill highly-structured fodder components (hay, straw etc.) in with the mixing auger powered.

   Have them possibly mixed for a short time before filling in the next component. A longer mixing ensures better chopping of the long stalks.

2. Fill in concentrated feed, grain feed etc.
3. Fill in mineral feed via the loading tool (shovel) or via the feed funnel (optional extra).
4. Fill in grass silage.
5. Fill in maize silage, grain silage.
6. Fill in fodder components with a high proportion of water, e.g. draff, potato pulp or beet chips.
7. Fill liquid components such as liquid yeast, molasses into the mixing container by means of the loading tool together with the last portion of maize silage.

9.2 Mix fodder components

- The type and the structure of the used fodder components and the desired cutting length of the fodder mixture determine the duration of the last mixing cycle.

  The mixing process will be extended for highly-structured fodder components which must be cut.

- Monitor the mixing process from the ladder.
- Stop the mixing process when the fodder components have been homogeneously mixed. In case of a too long mixing process, the mixture risks to lose its structure
- Depending on the structure of the fodder components, the counter-cutters can be extended into the mixing container at different positions.

  The counter-cutters slow down the horizontal revolving of the fodder in the mixing container, e. g. during chopping and mixing of round or cuboid bales. The further the counter-cutters project into the mixing container, the larger the slowing-down effect.

  Extend the counter-cutters into the mixing container only as far as to ensure that the fodder will not get entangled by / pile up on the counter-cutters.

  Swivel the counter-cutters only with the mixing auger stopped.

- Reduce the drive speed of the mixing auger if light fodder components are thrown over the edge of the mixing container during mixing.

  If, however, the mixing container happens to overflow, an overflow ring (optional extra) may help. Observe the information in the chapter "Overflow ring", page 71.

- Sharp cutting knives reduce the required mixing auger power. Regularly sharpen the cutting knives. Observe the information in the chapter "Grind cutting knives“, page 175.

9.3 Fodder discharge

WARNING

Risk of impact to people and animals if objects are blown out of the discharge opening or the crossover conveyor with the mixing auger powered!

Make sure that people leave the hazardous area of the discharge opening and / or the crossover conveyor before switching the tractor's p.t.o. shaft on.

Keep animals away from the hazardous area.

The fodder discharge can be started after the mixing process has been finished.

The fodder quantity discharged onto the feeding table is set via:

- the drive speed of the mixing auger,
- the opening width of the discharge door,
- the travelling speed of the tractor on the feeding table.

The higher the drive speed of the mixing auger, the wider the opening width of the discharge door and the slower the travelling speed of the tractor, the larger the fodder quantity discharged onto the feeding table.

- The discharge door must be completely opened when discharging very dry, long and highly-structured fodder.
- The discharge door must be opened according to the desired discharge quantity when discharging strongly pourable fodder.
- When discharging the fodder, the 750 p.t.o. shaft can be used if available) and the tractor engine can be run at reduced speed.
- Increase the drive speed of the mixing auger for a short time towards the end of the discharging process (gear level I or p.t.o. shaft speed 1000 min^{-1}) to throw off any fodder residues from the mixing auger and to completely empty the mixing container.

9.3.1 Fodder discharge through discharge openings

1. Make sure the people leave the hazardous area of the machine.
2. Keep animals away from the hazardous area.
3. Switch the p.t.o. shaft on.
4. Power the mixing auger at the desired drive speed.
5. Slowly open the discharge door (1) via the hydraulic cylinder (2) until the fodder is homogeneously coming out of the discharge opening. The set opening width of the discharge door is indicated by the pointer (3) on the scale (4).
6. Travel over the feeding table at the desired travelling speed.
7. Finish fodder discharge:
   - 7.1 Close the discharge door.
   - 7.2 Switch the p.t.o. shaft off.

Fig. 81

9.3.2 Fodder discharge via discharge conveyor for side discharge

1. Make sure the people leave the hazardous area of the machine.
2. Keep animals away from the hazardous area.
3. Swivel the discharge conveyor (1) to working position.
4. Switch the p.t.o. shaft on.
5. Switch the discharge conveyor drive on. Observe the information in the chapter "Discharge conveyor for side discharge" page 78.
6. Power the mixing auger at the desired drive speed.
7. Open the discharge door (2) at the desired opening width. The set opening width of the discharge door is indicated by the pointer (3) on the scale (4).
8. Travel over the feeding table at the desired travelling speed.

Fig. 82

> The discharge conveyor speed is infinitely adjustable, in order to vary the lateral delivery distance (throwing range) of the fodder next to the fodder mixing trailer. Observe the information in the chapter "Set conveyor speed for crossover conveyor / discharge conveyor for side discharge", page 83.

9. Finish fodder discharge:
   - 9.1 Close the discharge door.
   - 9.2 Switch the p.t.o. shaft off.
   - 9.3 Switch the discharge conveyor off only when the fodder discharge has been finished.
10. Swivel the discharge conveyor to transport position.

9.3.3 Fodder discharge via crossover conveyor

1. Make sure the people leave the hazardous area of the machine.
2. Keep animals away from the hazardous area.
3. Switch the p.t.o. shaft on.
4. Switch the crossover conveyor drive on in the desired driving direction.
5. Power the mixing auger at the desired drive speed.
6. Slowly open the discharge door (1) via the hydraulic cylinder (2) until the fodder is homogeneously coming out of the discharge opening. The set opening width of the discharge door is indicated by the pointer (3) on the scale (4).
7. Travel over the feeding table at the desired travelling speed.

Fig. 83

> The crossover conveyor speed is infinitely adjustable, in order to vary the lateral delivery distance (throwing range) of the fodder next to the fodder mixing trailer. Observe the information in the chapter "Set conveyor speed for crossover conveyor / discharge conveyor for side discharge", page 83.

8. Finish fodder discharge:
   - 8.1 Close the discharge door.
   - 8.2 Switch the p.t.o. shaft off.
   - 8.3 Switch the crossover conveyor off only when the fodder discharge has been finished.

9.3.4 Fodder discharge via conveyor extension

1. Make sure the people leave the hazardous area of the machine.
2. Keep animals away from the hazardous area.
3. Swivel the conveyor extension (1) to working position.
4. Switch the p.t.o. shaft on.
5. Switch the crossover conveyor drive on in the desired driving direction.
6. Power the mixing auger at the desired drive speed.

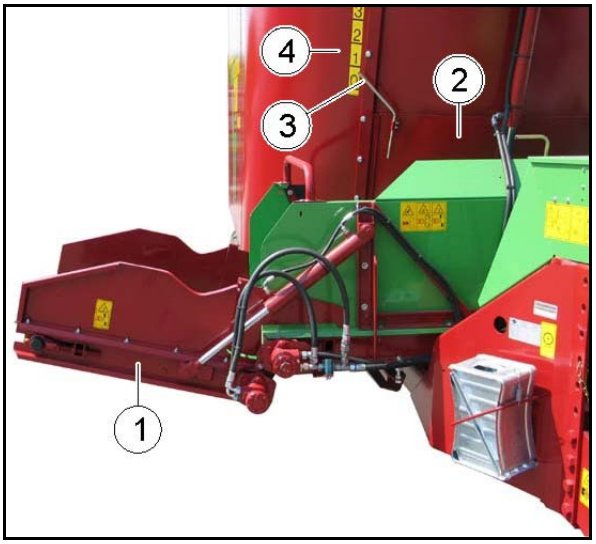


Fig. 84

> The conveyor extension drive is hydraulically coupled with the crossover conveyor drive. If the crossover conveyor is not driven in the conveyor extension's direction, the conveyor extension will stop.

7. Open the discharge door (2) at the desired opening width. The set opening width of the discharge door is indicated by the pointer (3) on the scale (4).
8. Travel over the feeding table at the desired travelling speed.

> The crossover conveyor / conveyor extension speed is infinitely adjustable, in order to vary the lateral delivery distance (throwing range) of the fodder next to the fodder mixing trailer. Observe the information in the chapter "Set conveyor speed for crossover conveyor / discharge conveyor for side discharge", page 83.

9. Finish fodder discharge:
   - 9.1 Close the discharge door.
   - 9.2 Switch the p.t.o. shaft off.
   - 9.3 Switch the crossover conveyor off only when the fodder discharge has been finished.
10. Swivel the conveyor extension to transport position.

9.3.5 Elimination of blockages

WARNING

Risk of crushing, shearing, cuts, amputation, becoming entangled, wound up, being drawn in and risk of impact to people if:

- **lifted, unsecured machine parts accidentally come down or are unintentionally lowered , e.g. an open discharge door,**
- **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 eliminating any blockages on the machine.
- Wait for the machine to stop completely before entering the hazardous area of the machine.

WARNING

Risk of cuts if people reach into sharp cutting knives of the mixing auger when eliminating blockages!

When eliminating blockages, beware that sharp cutting knives of the mixing auger may be within the discharge opening area.

CAUTION

Risk of damage to the machine if you change the sense of rotation of the tractor's p.t.o. shaft for eliminating blockages!

Never change the sense of rotation of the tractor's p.t.o. shaft.

1. Switch the p.t.o. shaft off.
2. Completely open the discharge door of the clogged discharge opening if necessary.
3. Secure tractor and machine against accidental starting and rolling, see information on page 132.
4. Eliminate the blockage such that the discharge opening gets free and the mixed materials can be easily discharged again.
5. Turn the tractor engine on.
6. Close the discharge door.
7. Switch the p.t.o. shaft on.
8. Power the mixing auger at the desired drive speed.
9. Open the discharge door at the desired opening width and continue the fodder discharge.

9.4 Working with the straw blower

Bulk straw or straw bales are filled into the mixing container, chopped and blown into the stable by means of the straw blower.

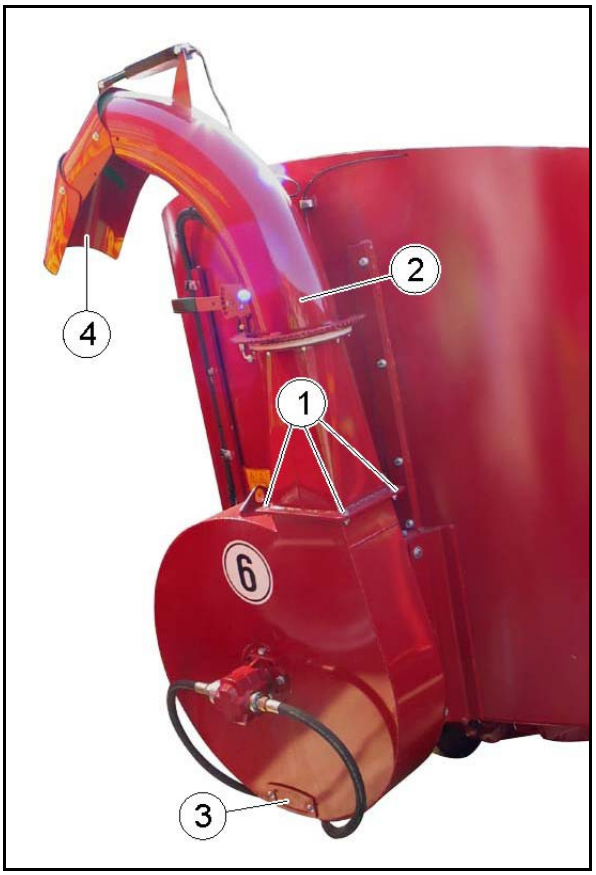


Fig. 85

WARNING

Risk due to substances or foreign objects blown away from or out of the machine if foreign objects (e.g. stones) get into the mixing container while filling the mixing container!

When filling the mixing container, ensure that:

- there are no foreign objects (e.g. stones) in the straw,
- no foreign objects get into the mixing container.

WARNING

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

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

It may be advantageous to extend the counter-cutters a little further into the mixing container for chopping the straw.

Keep strictly to the required operating speed of the straw blower, too low operating speed may cause blockages.

1. Make sure that people and animals leave the hazardous area of the machine / the straw blower.
2. Set the switchgear to gear level II (low drive speed of mixing auger) if the machine is equipped with a switchgear.
3. Rotate the ejection tower and the ejection hood into the desired ejection direction.
4. Switch the tractor's p.t.o. shaft on.
5. Switch the straw blower on.
6. Speed the straw blower up to operating speed.
   - P.t.o. shaft speed 750±100 min^{-1} for machine without switchgear,
   - P.t.o. shaft speed 1000±100 min^{-1} for machine equipped with switchgear.
7. Open the discharge door completely.

   Ensure to reduce the opening width in case of damp or lumpy spreading material or a lower blower speed (risk of blockage).
8. Set the desired spreading range / throwing range by lifting or lowering the ejection hood.

9.4.1 Elimination of blockages

WARNING

Operator's risk of being drawn in or becoming entangled if the straw blower accidentally starts to run during manual elimination of blockages / jams!

Secure tractor and machine against accidental starting and rolling before manually eliminating blockages / jams.

WARNING

Risk due to blower wheel continuing to run for a short time!

Wait for the blower wheel to stop completely before unscrewing the screws (Fig. 85/1) at the blow-out pipe (Fig. 85/2) or removing the cover (Fig. 85/3) or the ejection hood (Fig. 85/4).

1. Close the discharge door.
2. Switch the p.t.o. shaft off.
3. Secure tractor and machine against accidental starting and rolling.
4. Wait for the blower wheel to stop completely.
5. Unscrew 3 screws (Fig. 85/1) from the blow-out pipe (Fig. 85/2) such that the blow-out pipe can be easily rotated around one of the front screws.

CAUTION

Beware of the cable if the blow-out pipe is equipped with an electrical adjusting system for the ejection hood.

6. Swivel the blow-out pipe to the side.
7. Empty the blow-out pipe or the blower casing.

8. Open the cover (Fig. 85/3) at the blower casing, in order to remove e. g. stones from the blower casing.
9. Screw the blow-out pipe and the cover to the blower casing as illustrated in (Fig. 85) before switching the blower on.

10 Transport journeys

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

- Additionally observe the chapter "Basic safety instructions", page 39, 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, being 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!

Before carrying out transport journeys:

- switch the control unit off,
- switch the oil circulation between tractor and machine off,
- always switch the propeller shaft off if an on-board hydraulic system is available.

WARNING

Risk of being drawn in, getting entangled or risk of impact to people if machine parts swivelled to transport position accidentally move off their transport position during transport journeys!

Before carrying out transport journeys:

- lock swivelling machine parts in transport position
- ensure that swivelling machine parts are locked in transport position.

WARNING

Risk of falling off the machine for unauthorized passengers!

Passengers are not allowed on the machine.

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 in the chapters:
  - o "Operator's obligation", page 35,
  - o "Qualification of staff", page 36,
  - o "Basic safety instructions", page 39,
  - o "Warning and instruction signs", page 52.

  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 the legal provisions when disposing of working materials such as oils and greases. These legal provisions also apply to parts coming into contact with those working materials.
- As a basic principle, disconnect all electrical / electronic plug connections to the tractor before carrying out service and maintenance work on the machine. Always unhitch the machine from the tractor before carrying out welding work.
- It is necessary to take protective measures such as covering power supply lines, hydraulic hose pipes, brake and feed lines or removal of such lines at particularly critical spots:
  - o when carrying out welding, drilling or grinding work,
  - o 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 to people if:

- **lifted, unsecured machine parts accidentally come down or are unintentionally lowered,**
- **tractor and machine accidentally start and roll!**
- Secure lifted machine parts against accidental lowering before working beneath lifted parts.
- Secure tractor and machine against accidental starting and rolling before carrying out any service or maintenance work on the machine.

  Observe the information in the chapter "Secure tractor and machine against accidental starting and rolling“, page 132.
- 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

are not allowed.

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.

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 petrol, 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 unit, 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 lubricating 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 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).

Component / Location	Number	Activity	Time / Interval
Lubricating nipple, universal joint in front of gearbox	2	Lubricating	250 h
Lubricating nipple, top bearing, angular gear	1	Lubricating	250 h
Lubricating nipple, drive shaft, bearing block	1	Lubricating	50 h
Lubricating nipple, supporting leg	1	Lubricating	100 h
Lubricating nipple, crossover conveyor	4	Lubricating	25 h
Guide rail, discharge door	2	Greasing	50 h

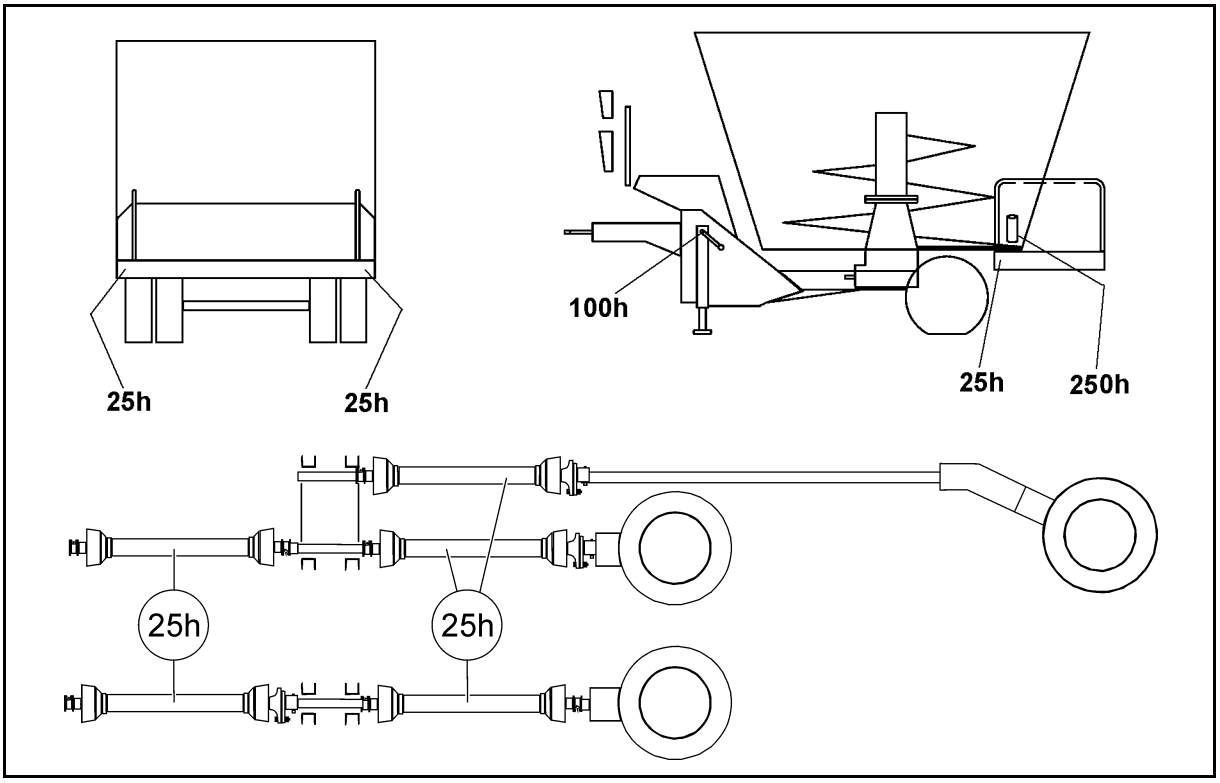


Fig. 86

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

- Change the gear lubricant oil:
  - for the first time after 50 service hours,
  - then every 1000 service hours,
  - but at least once a year (depending on which change interval limit occurs first).
- Dispose of used oil according to regulations. Contact your oil supplier in case of disposal problems!

Gearbox	Gear lubricant oil	Quantity when filled [litres]	Interval
Angular gear	EP 80W-90 / EP VG 220	20	1000 h or once a year
Switchgear	EP 80W-90 / EP VG 220	13	
Gearbox, on-board hydraulic system without switchgear	EP 80W-90 / EP VG 220	0.75	

Tab. 11

11.5.2 Angular gear

The angular gears require:

- check of oil level and topping-up if necessary,
- change of gear lubricant oil.

11.5.2.1 Check oil level

Check the oil level before starting the mixing process, as the oil heats up during the mixing process thus rising in the compensating reservoir.

1. Check the oil level in the angular gears via the lateral compensating reservoir (1).

   The oil level must be visible between the two markings (2, 3) of the sticker (4).

2. Top up oil through the filler neck (5) into the compensating reservoir if necessary.

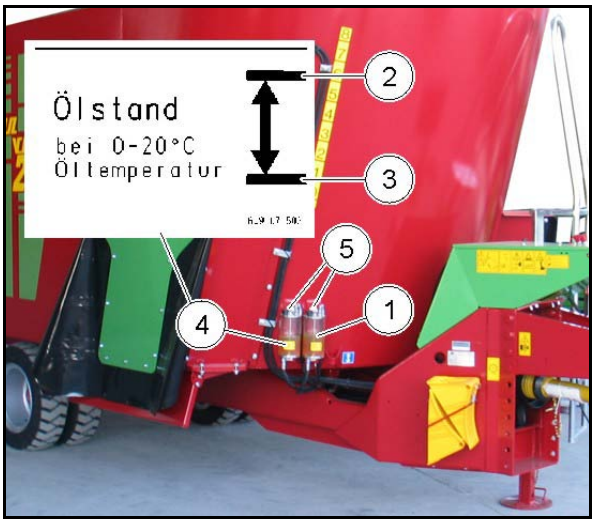


Fig. 87

11.5.2.2 Change gear lubricant oil

1. Secure the machine against rolling.
2. Align the machine in horizontal position.
3. Place a drip tray beneath the gearbox (capacity approx. 25 litres).
4. Open the filler neck (1) at the compensating reservoir.
5. Unscrew oil drain plug (2) from the bottom gearbox.
6. Wait for the oil to stop draining out of the oil drain opening.
7. Screw in again and tighten oil drain plug (2) (use sealant).
8. Fill gear lubricant oil through the filler neck (3) into the compensating reservoir until the oil level becomes visible between the two markings of the sticker (4) (approx. 20 litres).
9. Close the cover (1) at the compensating reservoir.
10. Check the oil level after 5 service hours.

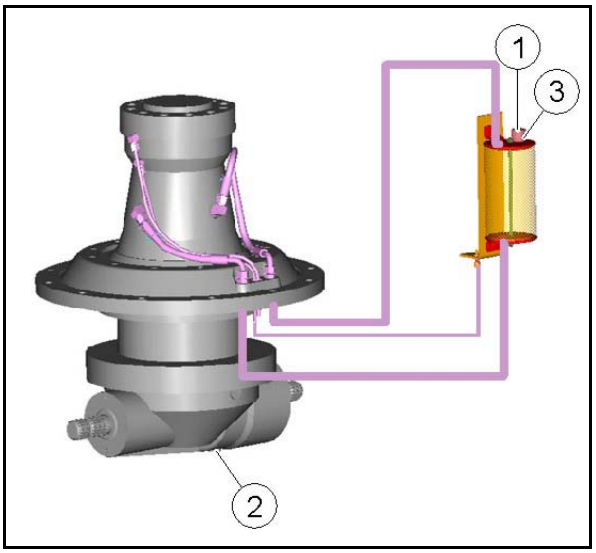


Fig. 88

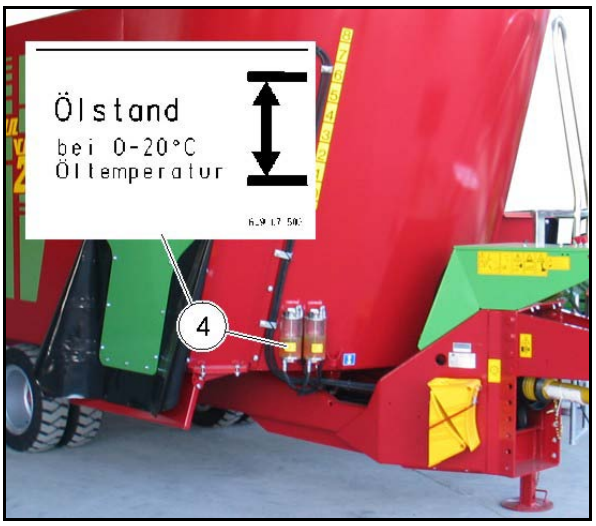


Fig. 89

11.5.3 Switchgear

The switchgear requires:

- check of oil level and topping-up if necessary,
- change of gear lubricant oil.

11.5.3.1 Check oil level

1. Remove the inspection plug (1) to check the oil level.

   The oil level must reach the tap hole.
2. Top up oil through the filler neck (2) if necessary.
3. Screw the inspection plug in again.

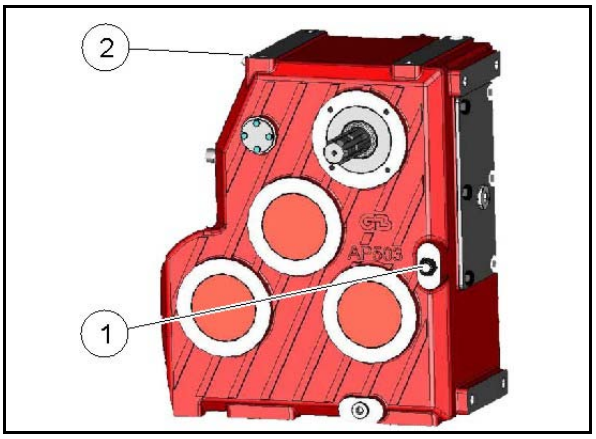


Fig. 90

11.5.3.2 Change gear lubricant oil

1. Secure the machine against rolling.
2. Align the machine in horizontal position.
3. Place a drip tray beneath the gearbox (capacity approx. 15 litres).
4. Unscrew oil drain plug (1) and ventilation screw (2).
5. Wait for the oil to stop draining out of the oil drain opening.
6. Screw in again and tighten oil drain plug (1) (use sealant).
7. Remove the inspection plug (3).
8. Top up 13 litres of oil through the filler neck (4) until the oil level becomes visible at the tap hole.
9. Screw the inspection plug in again.
10. Clean and screw in the ventilation screw (2).
11. Check the oil level after 5 service hours.

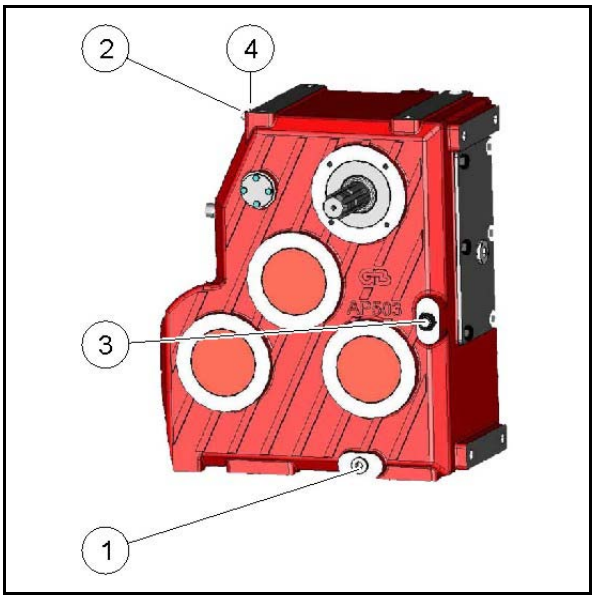


Fig. 91

11.5.4 Spur gear for driving mechanism with on-board hydraulic system without switchgear

The spur gear requires:

- check of oil level and topping-up if necessary,
- change of gear lubricant oil.

11.5.4.1 Check oil level

1. The oil level must be visible at the inspection glass (1) of the spur gear (2).
2. Top up oil through the filler neck (3) if necessary.

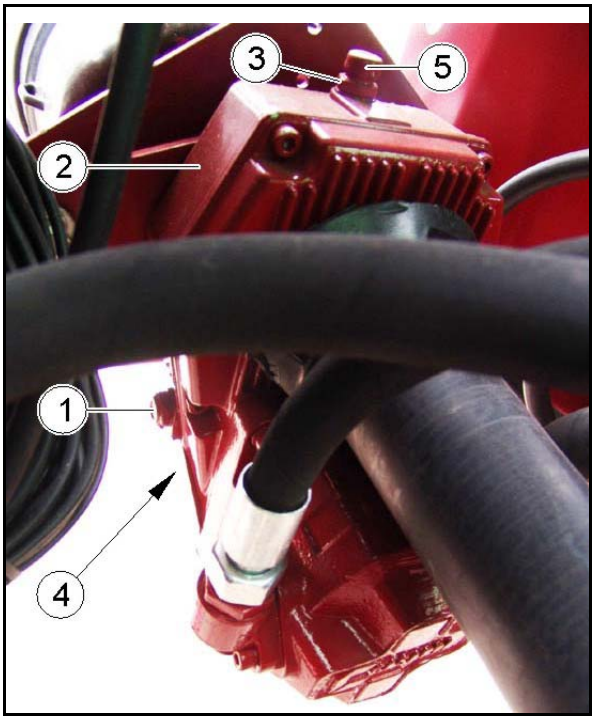


Fig. 92

11.5.4.2 Change gear lubricant oil

1. Secure the machine against rolling.
2. Align the machine in horizontal position.
3. Place a drip tray beneath the gearbox (capacity approx. 2 litres).
4. Unscrew oil drain plug (4) and ventilation screw (5).
5. Wait for the oil to stop draining out of the oil drain opening.
6. Screw in again and tighten oil drain plug (4) (use sealant).
7. Top up 0.75 litres of oil through the filler neck (3) until the oil level becomes visible at the inspection glass (1).
8. Clean and screw in the ventilation screw (5).
9. Check the oil level after 5 service hours.

11.5.5 On-board hydraulic system

The on-board hydraulic system requires:

- check of oil level and topping-up of hydraulic oil if necessary,
- change of hydraulic oil / replacement of filter element.

- Change the hydraulic oil:
  - for the first time after 250 service hours,
  - then every 2000 service hours,
  - but at least every 2 years (depending on which change interval limit occurs first).
- Required hydraulic oil, on-board hydraulic system for hydraulic functions:
  - Hydraulic oil ATX 40 (similar to ATF oil),
  - Filling quantity approx. 21 litres.
- Required hydraulic oil, on-board hydraulic system for blower drive:
  - Hydraulic oil ATX 40 (similar to ATF oil),
  - Filling quantity approx. 52 litres.
- Never mix different types of hydraulic oil
- Dispose of used oil according to regulations. Contact your oil supplier in case of disposal problems!
- Replace the filter element:
  - for the first time after 250 service hours,
  - then every 2000 service hours,
  - but at least every 2 years (depending on which change interval occurs first).

11.5.5.1 Check oil level

1. Check the oil level at the inspection glass (1).

   The oil level must be visible at the inspection glass.

2. Top up hydraulic oil through the filler neck (2) into the hydraulic oil tank of necessary.

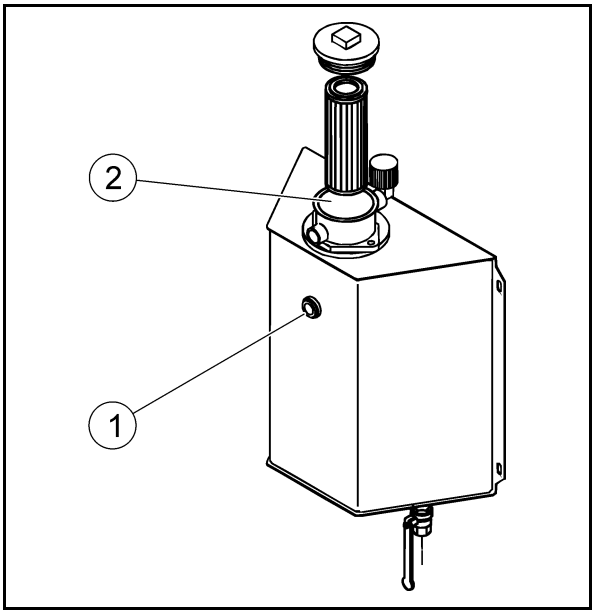


Fig. 93

11.5.5.2 Change hydraulic oil

Ensure that the stop valve (5) is open before each start-up. Fig. 94 shows the open stop valve (5).

1. Secure the machine against rolling.
2. Align the machine in horizontal position.
3. Place a drip tray beneath the hydraulic oil tank:
   - Capacity approx. 25 litres in case of on-board hydraulic system for hydraulic functions,
   - Capacity approx. 60 litres in case of on-board hydraulic system for blower drive.
4. Unscrew oil drain plug (3) from the bottom of the hydraulic oil tank.
5. Wait for the oil to stop draining out of the oil drain opening.
6. Screw in again and tighten oil drain plug (3) (use sealant).
7. Replace the filter element (4) if necessary (ord. no. 870 01 788).
8. Fill the required hydraulic oil and the required oil quantity through the filler neck (2) into the hydraulic oil tank.

   The oil level must be visible at the inspection glass (1).

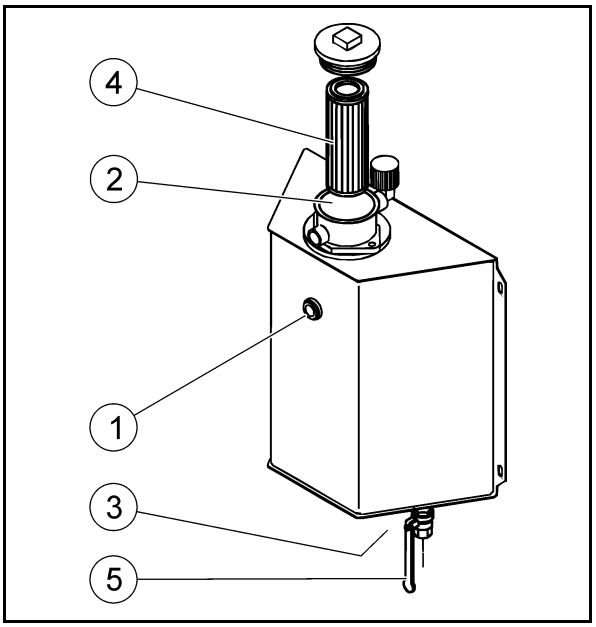


Fig. 94

11.6 Replace shear bolts of shear bolt coupling

1. Secure tractor and machine against accidental starting and rolling, see information on page 132.
2. Eliminate the cause for the overloading (e. g. foreign object in mixing container), see information on page 156.
3. Strip the propeller shaft (1) off the p.t.o. shaft of the tractor.
4. Open the fitting apertures on the protective device. Observe the included operating instructions for the propeller shaft.
5. Remove the residues of the shear bolt (2).
6. Rotate the power train such that the boreholes of the coupling halves (3) and (4) face each other.
7. Replace the shear bolts (2) by a bolt of equal grade (8.8).

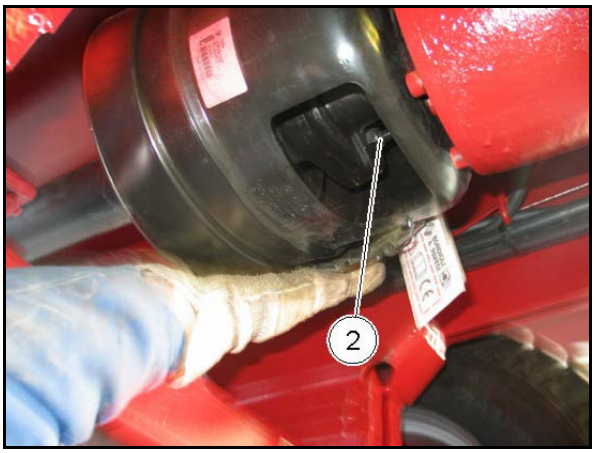


Fig. 95

Drive speed of mixing auger	20 min^{-1}	24 / 29 min^{-1}
Shear bolt	M8 x 50 8.8	M10 x 50 8:8

8. Close the fitting aperture.
9. Couple the propeller shaft.

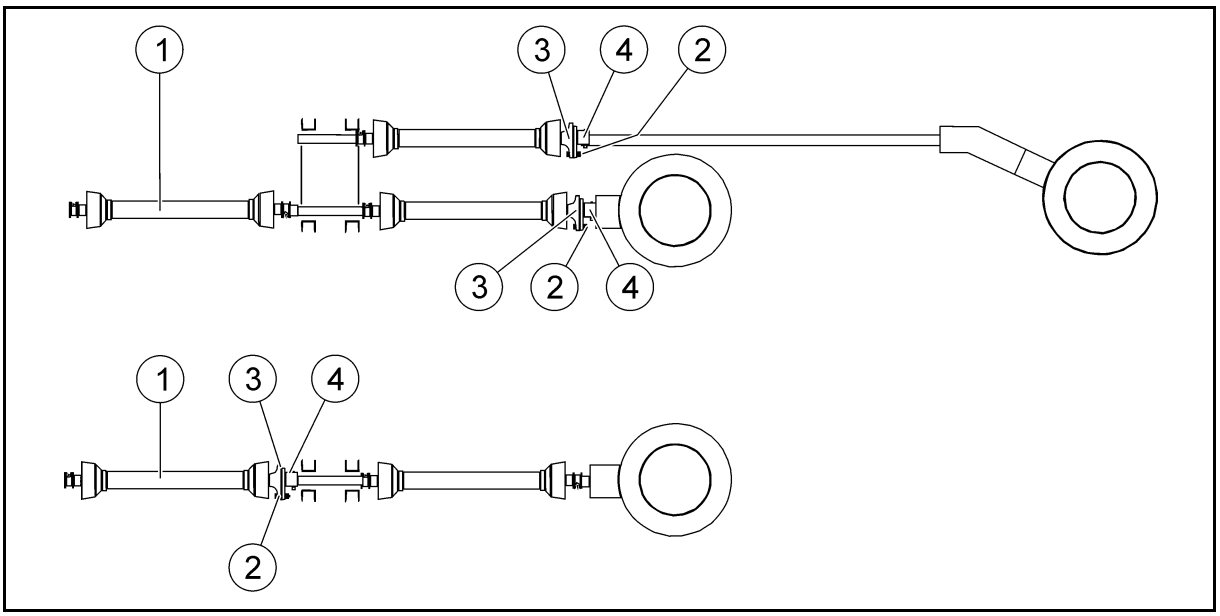


Fig. 96

11.7 Discharge door

1. Check the gap X between the discharge door and the mixing container. The gap X should be approx. 5 mm.

   The gap X can be altered by unscrewing the screws (1) and displacing the L straps (2) in the oblong holes.

2. Align the L straps (2) such that the gap X is again approx. 5 mm.
3. Retighten the screwed connections (1).

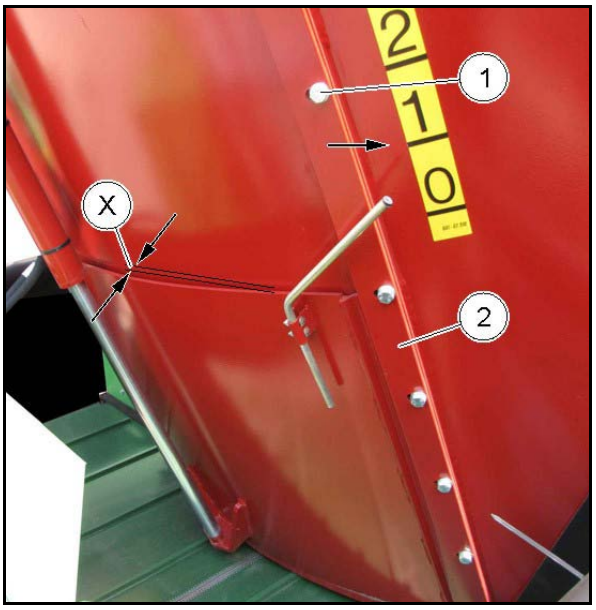


Fig. 97

11.8 Cutting knives of mixing auger

- Grind the cutting knives of the mixing auger if necessary.

  Blunt cutting knives require a higher power of the mixing auger thus also increasing the tractor's fuel consumption.

- Check the cutting knives from the service platform / the ladder for visible defects every day. Replace damaged or worn cutting knives in good time.

11.8.1 Grind cutting knives

WARNING

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

Always wear protective goggles when grinding cutting knives.

- Use a right-angle grinder with a flap grinding wheel (Fig. 98) 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:
  - they have heated up excessively,
  - this will reduce the service life of the cutting knives.

1. For grinding the cutting knives, enter the empty mixing container through a discharge opening. Absolutely observe the information in the chapter "Enter the mixing container", from page 134.
2. Wear protective goggles and protective gloves.
3. Carefully grind the cutting knives on their smooth side.
4. Remove any foreign objects (tools etc.) from the mixing container. Clean the mixing container from grinding residues if necessary.
5. After completing work, leave the mixing container through the discharge opening.

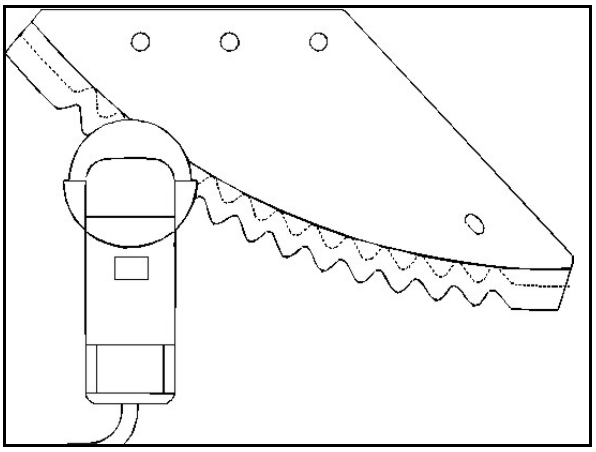


Fig. 98

11.8.2 Swivel / Replace cutting knives

WARNING

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.

For swivelling / replacing the cutting knives, the following items are required:

- various wrenches:
  - 1 x open end or ring wrench, wrench size 24,
  - 1 x hexagon wrench, size 10,
  - 1 x hexagon wrench, size 6, for the top cutting knife with knife supporting plate,
- a scraper or screw driver,
- a hard brush,
- cut-proof protective gloves,
- edge protectors to cover the blades when carrying out assembly work on the cutting knives.

1. For replacing the cutting knives, enter the empty mixing container through a discharge opening. Absolutely observe the information in the chapter "Enter the mixing container", from page 134.
2. Wear protective gloves.
3. Use an edge protector to cover the blade(1) of the respective cutting knife to be mounted.
4. Unscrew and remove the screws (2) (M16 x 45 or M10 x 20 - grade 8.8).
5. Replace the cutting knives or swivel the cutting knives into the desired position (extended or retracted), see information on page 64.
6. Tighten all screws (2) of the cutting knives' screwed connections.
7. Remove any foreign objects (tools etc.) from the mixing container. Clean the mixing container if necessary.
8. After completing work, leave the mixing container through the discharge opening.

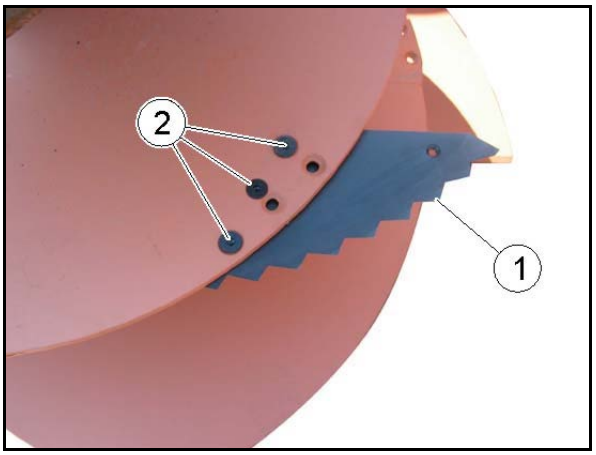


Fig. 99

11.9 Crossover conveyor, discharge conveyor or conveyor extension

- Check the tension of the respective conveyor before each start-up.

  A wrong tension may cause damage to the conveyor.

  A properly tightened conveyor sags by approx. 10 to 15 mm in its centre. Consider the ambient temperature. Low temperatures shorten the conveyor, high temperatures lengthen it.
- Straighten the conveyor by means of the clamping screws (Fig. 101/2) if the conveyor is not running straight or is rubbing along the frame.
- Clean the driving and carrying rollers and the pulleys if fodder residues have piled up on them.
- Lubricate the 4 flanged bearings of the conveyor at least every 25 service hours.

11.9.1 Check conveyor for visible defects

Check the conveyor (1) and the belt fastener (2) of the respective conveyor weekly for visible defects. Replace the conveyor in case of damage (fissures, raised corners).

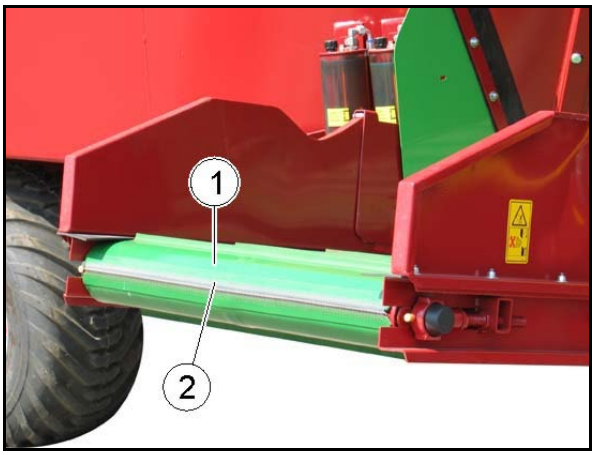


Fig. 100

11.9.2 Tighten / Adjust conveyor

1. Secure tractor and machine against accidental starting and rolling, see information on page 132.
2. Unscrew the counter nut (1) of the right-hand and left-hand radial insert ball bearing (2).
3. Equally turn the two clamping nuts (3):
   - such that the conveyor sags by approx. 10 to 15 mm in its centre,
   - the distance A between the square profiles (4) and the clamping housing (5) is equal on both sides of the conveyor.

     Only if the distance A is equal on both sides of the conveyor, does the conveyor run straight.
4. Carry out a test run to check whether the conveyor has an equal distance to the frame at the return rollers on both sides. If not, correct accordingly by turning the clamping nuts (3).
5. Retighten the counter nut (1) at the right-hand and left-hand radial insert ball bearing (2).

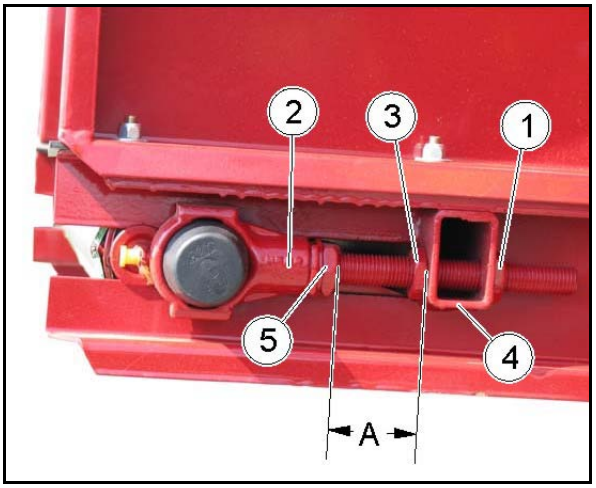


Fig. 101

11.9.3 Clean driving and carrying rollers and pulleys

1. Secure tractor and machine against accidental starting and rolling, see information on page 132.
2. Relieve the conveyor (1).
3. Rotate the relieved conveyor until the side of the belt fastener (2) is positioned on the pulley.
4. Pull the connecting wire out of the belt fastener.
5. Remove the conveyor.
6. Clean:
   - the driving and carrying rollers and the pulleys,
   - the frame,
   - the interior of the conveyor,
   - the rubber seal strips.
7. Reinstall the conveyor.

   Ensure that the rubber seal strips rest on top of the conveyor.
8. Mount the connecting wire.
9. Tighten the conveyor.

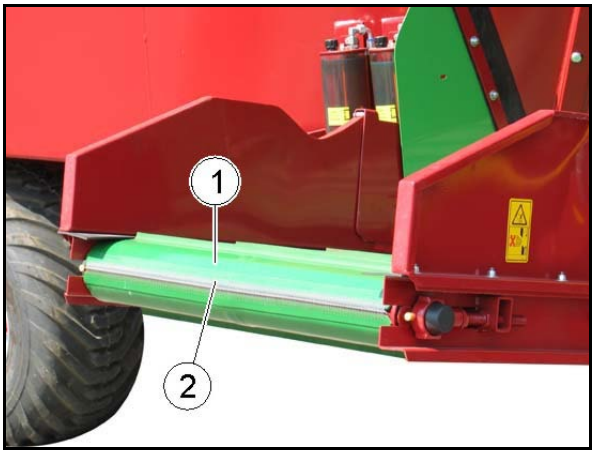


Fig. 102

11.10 Replace remote control cable of mechanical remote control unit

Disassembly

Connection to control valve of control block:

1. Unscrew the counter nut (H).
2. Remove the two screws (P) at the adapter (G).
3. Remove pin (M).
4. Strip the connecting sleeve (F) off the sliding pin (K).

Connection to operating element:

5. Remove the locking screw (A).
6. Operate lever (B) until the connecting pin (C) is visible.
7. Unscrew the threaded sleeve (D) of the remote control cable from connecting pin (C) with operating lever (B) actuated.
8. Release operating lever (B) and draw sleeve (E) completely out of the housing.

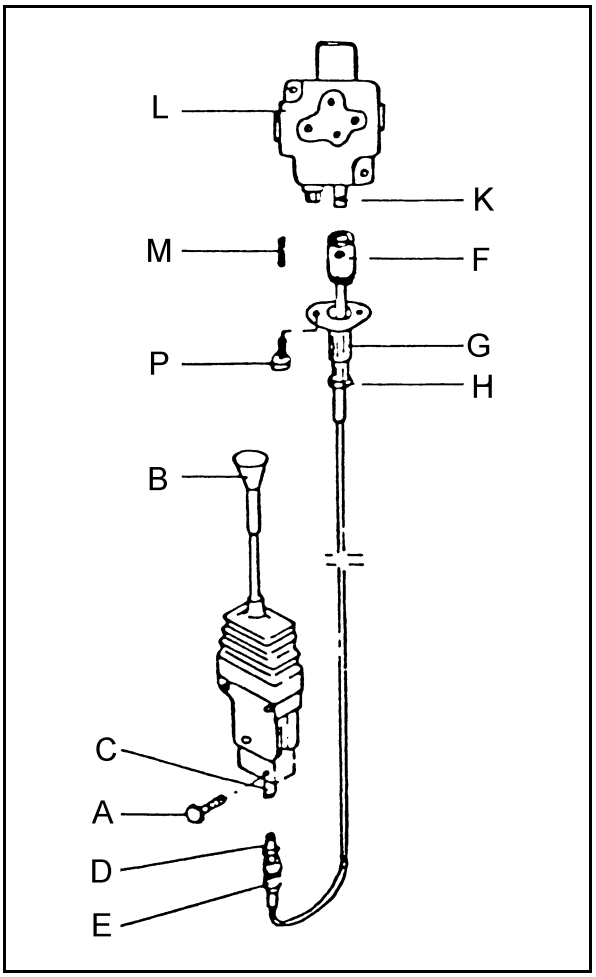


Fig. 103

Assembly

Connection to operating element:

1. Remove the locking screw (A).
2. Operate lever (B) until the connecting pin (C) is visible.
3. Screw the threaded sleeve (D) of the remote control cable into the connecting pin (C) with operating lever (B) actuated.
4. Release operating lever (B).
5. Insert sleeve (E) completely into the housing.
6. Mount locking screw (A).

Connection to control valve of control block:

7. Operate lever (B) until the connecting sleeve (F) is jutting out of the adapter (G).
   Possibly loosen counter nut (H) and turn back adapter (G).
8. Slip the connecting sleeve (F) onto the sliding pin (K).
9. Connect connecting sleeve (F) and sliding pin (K) by means of pin (M).
10. Turn the adapter (G) until it fits closely to the valve box (L).
11. Fasten the adapter (G) to the valve box (L) by means of the two screws (P) M 6 x 16.
12. Tighten counter nut (H).

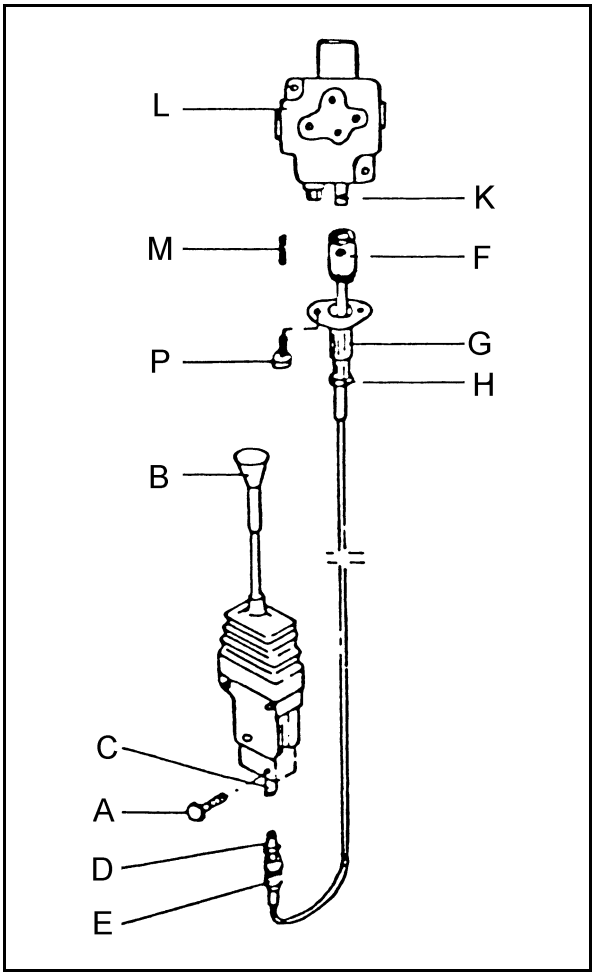


Fig. 104

11.10.1 Replace remote control cable adapter (G)

1. Remove the connector at the control valve of the control block.
2. Unscrew the counter nut from the connecting sleeve (F).
3. Unscrew connecting sleeve (F).
4. Replace adapter (G).
5. Screw connecting sleeve (F) on.
6. Tighten the counter nut of connecting sleeve (F).
7. Install the connector at the control valve of the control block.

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 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 penetrate your skin and your 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 are not allowed.
- Observe the chapter "Basic safety instructions", page 42, 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.

- Make sure that the hydraulic system on the tractor and on the machine has been depressurized when connecting the hydraulic hose pipes to the hydraulic system of the tractor.
- Ensure to properly connect the hydraulic hose pipes.
- Regularly check all hydraulic hose pipes and hydraulic plugs for damage and contamination.
- Have hydraulic hose pipes checked for their operational safety by an expert at least once a year.
- Replace hydraulic hose pipes in case of damage and ageing. Only use original hydraulic hose pipes of the manufacturer.
- 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.
- 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 membrane pressure accumulator!

- Working on the hydraulic system with the system under operating pressure is not allowed.
- Depressurize the hydraulic system before carrying out work on the hydraulic system.
- 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.

11.11.2 Hydraulic hose pipes

11.11.2.1 Marking and period of use of hydraulic hose pipes

The marking on the fitting (Fig. 105) 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)

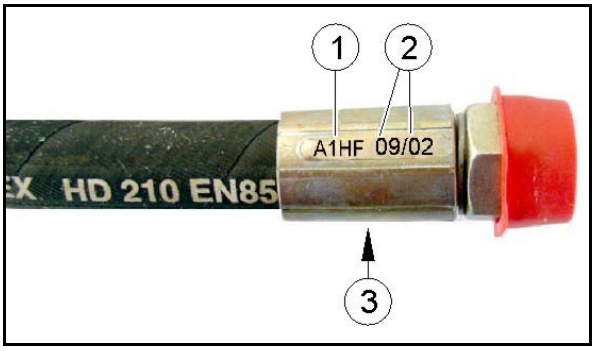


Fig. 105

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) = 09 / 02	February 2009
Period of use expires	February 2015

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 start-up:

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 183.

11.11.2.4 Installation and removal of hydraulic hose pipes (shop work)

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 own weight,
  - there is not 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.
- Over-painting or coating hydraulic hose pipes with lacquer is not allowed.

11.12 Tyres

Good tyre efficiency is a matter of regular checks and travelling at proper tyre pressure.

11.12.1 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, gravel, nails and other foreign objects stuck in the tyre to prevent them from further penetrating 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.

11.12.2 Change tyres

Observe the information in the chapter "Basic safety instructions", page 47, 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 staff equipped with appropriate fitting tools is allowed to carry out repair work on tyres and wheels.
- Never use or repair damaged rims.

1. Secure tractor and machine against accidental starting and rolling, see information on page 132.
2. Place the lifting device at the fixing points marked by the pictograph illustrated in (Fig. 106).

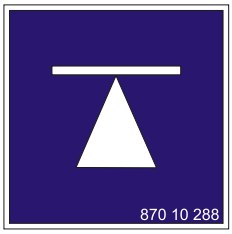


Fig. 106

3. Keep to the order illustrated in Fig. 107 when loosening and tightening the wheel nuts.
4. Tighten wheel nuts at the required tightening torque:
   - o M 18x1.5 – 270^{+20+0} Nm
   - o M 22x1.5 – 450^{+60+0} Nm
5. Check the wheel nuts for tightness after 10 service hours. Retighten wheel nuts if necessary.

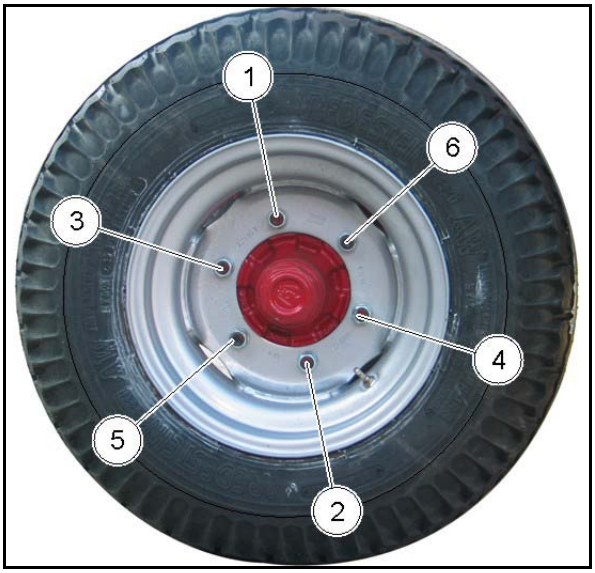


Fig. 107

11.13 Brake system

11.13.1 Check / Clean in-line filters of compressed-air brake system

The in-line filters 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 blocked, an internal bridging-over element opens and unfiltered air passes through the in-line filter. The brake system remains in full working order for both directions of flow.

- Clean the two in-line filters approx. every 3 – 4 months, depending on the operating conditions.
- Replace damaged filter elements.

1. Secure tractor and machine against accidental starting and rolling.
2. Disconnect feed and brake line from the tractor.
3. Push in base plate (1).
4. Release slide valve (2).
5. Remove base plate (1) with O-ring (3), pressure spring (4) and filter element (5) from the casing.
6. Clean (rinse) the filter element with benzine or a dilution and blow dry by means of compressed air.
7. Reinsert filter element, pressure spring and cap with O-ring into the casing.

Ensure that the O-ring will not get jammed in the guiding slot during insertion.

8. Reclose slide valve.
9. Connect the brake and the feed line to the tractor.
10. Check in-line filters for tightness.

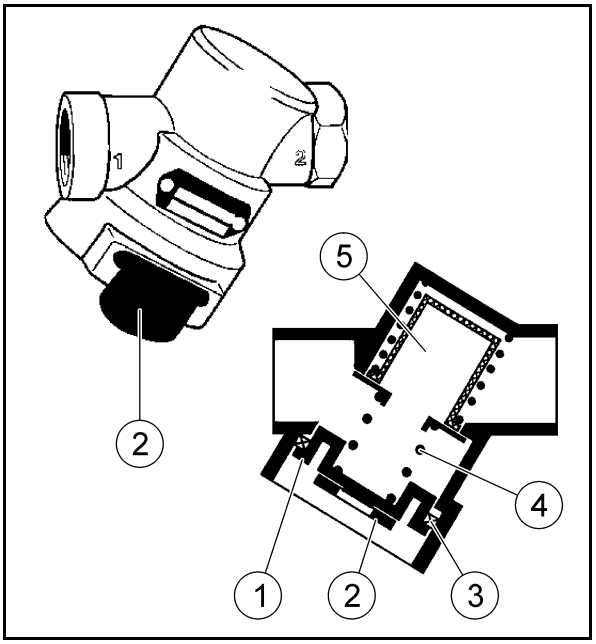
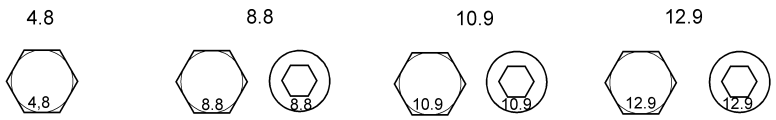


Fig. 108

11.13.2 Check brake system for proper functioning.

- Check the brake system for proper functioning before each start-up of the machine. Have any irregularities or malfunctions of the brake system promptly remedied by an authorised workshop.
- Have the brake system checked by an authorized workshop for proper functioning every 200 service hours.

11.14 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 engine oil, or that phosphated or oiled screws are used.*

° *"Dry" means that normal or galvanized screws without any lubrication are used.*

Tab. 12

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 Trouble-shooting

WARNING

Risk of crushing, shearing, cuts, amputation, becoming entangled, wound up, being drawn in and risk of impact to people if:

- **lifted, unsecured machine parts accidentally come down or are unintentionally lowered , e.g. an open discharge door,**
- **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 eliminating any malfunctions on the machine.
  Observe the information in the chapter "Secure tractor and machine against accidental starting and rolling“ from page 132.
- Wait for the machine to stop completely before entering the hazardous area of the machine.

12.1 Malfunctions and remedy – Machine

Malfunction	Cause	Remedy
The power requirement is too high, shear bolt of the shear bolt coupling in front of the angular gear shears	Cutting knives blunt	Sharpen knives.
	Long stalks have wrapped around the auger front end or the scraper	Clean mixing auger.
	Foreign objects are jamming the mixing auger	Eliminate foreign objects.
	Screwed connection of mixing auger has loosened	Retighten screwed connection.
Mixing auger does not rotate with the p.t.o. shaft powered	Gear levels at the switchgear not selected clearly	Clearly select gear level I or II.
	Shear bolt of the shear bolt coupling in front of the angular gear sheared off	Replace shear bolt.
Machine does not mix well	Fodder is piling up in front of counter-cutter	Extend and retract counter-cutter.
Non-uniform discharge	All cutting knives retracted (out)	Extend lower cutting knives (in).
Crossover conveyor does not start	Operating error	First switch crossover conveyor on, open discharge door only then.
	Crossover conveyor too loose	Tighten crossover conveyor.

Tab. 13

12.2 Malfunctions and remedy – Electrical system

Electro-hydraulic control unit does not work (all functions)	No power (12 V) at the control unit	Plug 3-pole plug (DIN 9680) into the socket for the tractor's power supply.
	Polarity of plug and socket are not compatible	Check polarity of plug and socket and reconnect if necessary.
	Fuse for socket defective	Replace fuse.
	Fuse for control unit defective	Replace fuse.
	Insufficient power supply and amperage	Power requirement approx. 20 A (12 V). Check socket and cabling.
		Check power supply, plugs and cables.
One of the electrically operated functions does not work	Insufficient power supply	Check switches etc. (measurement at valve plug).
	Control valve blocked	Check via emergency operation.
Functions work irregularly	Cable cross sections of feed line too small	Select larger cable cross section - minimum 4 mm².
No hydraulic function available	Hydraulic hose pipes not correctly connected (reverse pipe to pressure connection)	Connect hydraulic hose pipes correctly.
	Hydraulic plugs not correctly locked in hydraulic sleeves	Insert hydraulic plugs into hydraulic sleeves until hydraulic plugs noticeably lock.

Tab. 14

12.3 Malfunctions and remedy – Weighing device

Absolutely observe the included weighing device operating instructions

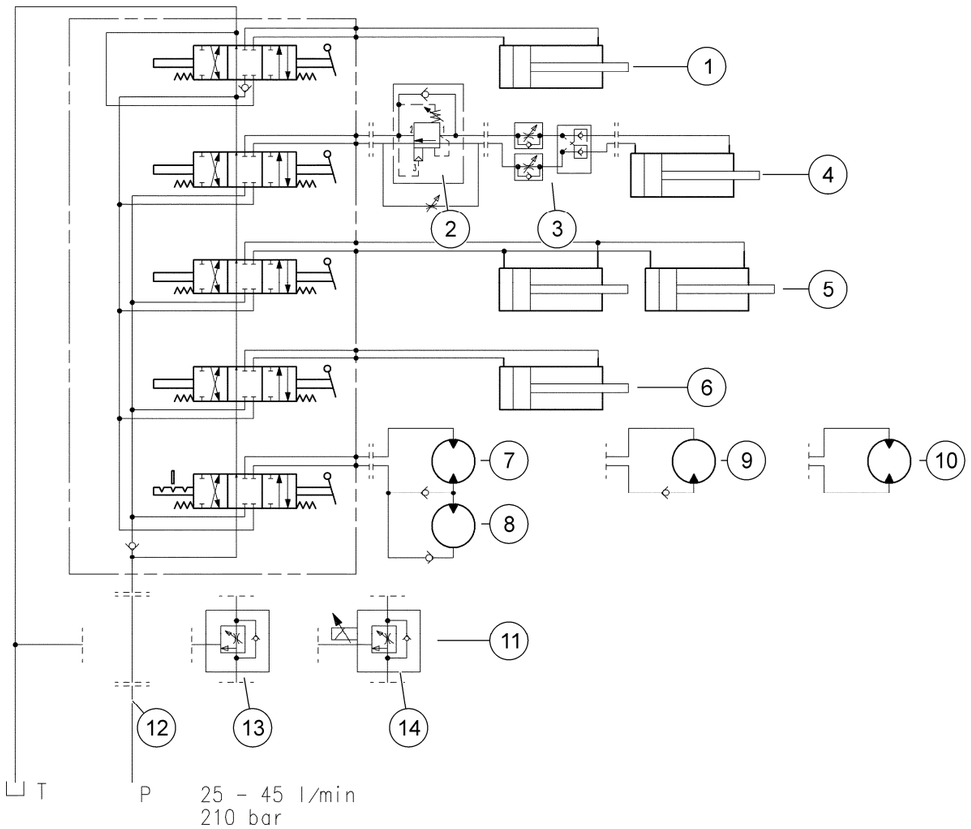
Malfunction	Cause	Remedy
Device cannot be switched on	No power supply	Check connecting cable.
		Switch power supply on, check power supply battery.
	Wrong polarity	Check polarity connecting cable. (The devices are equipped with an automatic fuse).
Device displays bars (top or bottom)	Device	Pull the terminal box plug out of the weighing computer and watch display. If the bars disappear, the weighing computer functions properly.
	Terminal box	Pull out the plugs of all weighing rods with the terminal box plugged into the weighing computer. Watch display. If the bars disappear, the display functions properly.
	Weighing rods	Always plug only one weighing rod into the terminal box or directly into the weighing computer. If the bars disappear, the respective weighing rod functions properly.
Weighed value varies	Device	See malfunction description: "Device displays bars"
	Terminal box	See malfunction description: "Device displays bars"
	Weighing rods	See malfunction description: "Device displays bars"
Scales display wrong weighed value	Weighing rods not properly installed	Always plug only one weighing rod into the terminal box or directly into the weighing computer. The displayed value must increase when load is applied. Always test all rods!
	Weighing system misadjusted	Readjust scales, see included operating instructions "Recalibration".
Device displays ERROR	Internal error	Send device in for repair.

Tab. 15

13 Circuit diagrams

13.1 Hydraulic circuit diagram

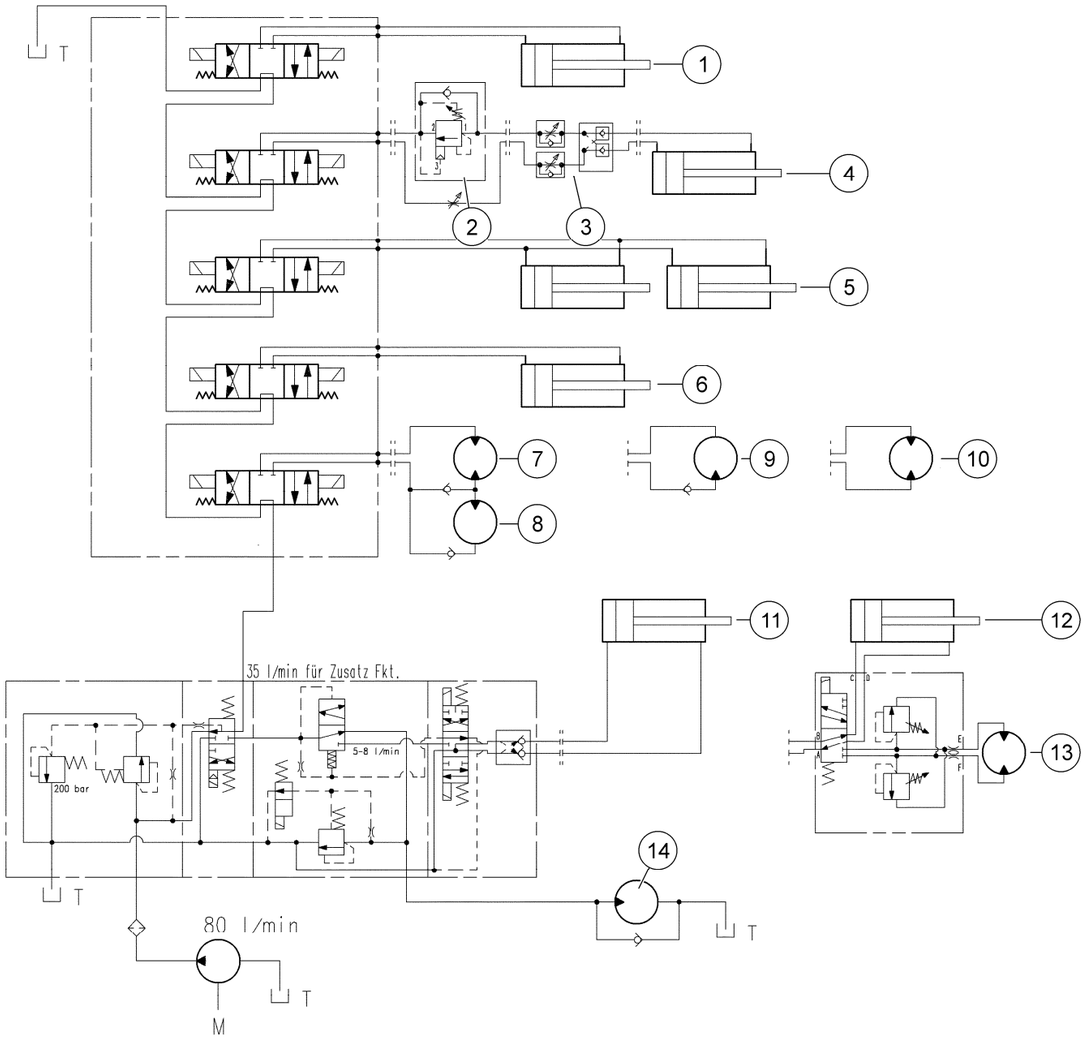
13.1.1 Without on-board hydraulic system



(1) Discharge door
(2) Valve for discharge conveyor for side discharge
(3) Valve for conveyor extension
(4) Height adjustment for conveyor extension
(5) Hydraulic counter-cutters
(6) Hydraulic supporting leg
(7) Hydraulic motor for crossover conveyor
(8) Hydraulic motor for conveyor extension
(9) Hydraulic motor of discharge conveyor for side disharge
(10) Hydraulic motor for crossover conveyor
(11) Conveyor speed regulator
(12) Without conveyor speed regulator
(13) With manually adjustable conveyor speed regulator
(14) With electrically adjustable conveyor speed regulator

Fig. 109

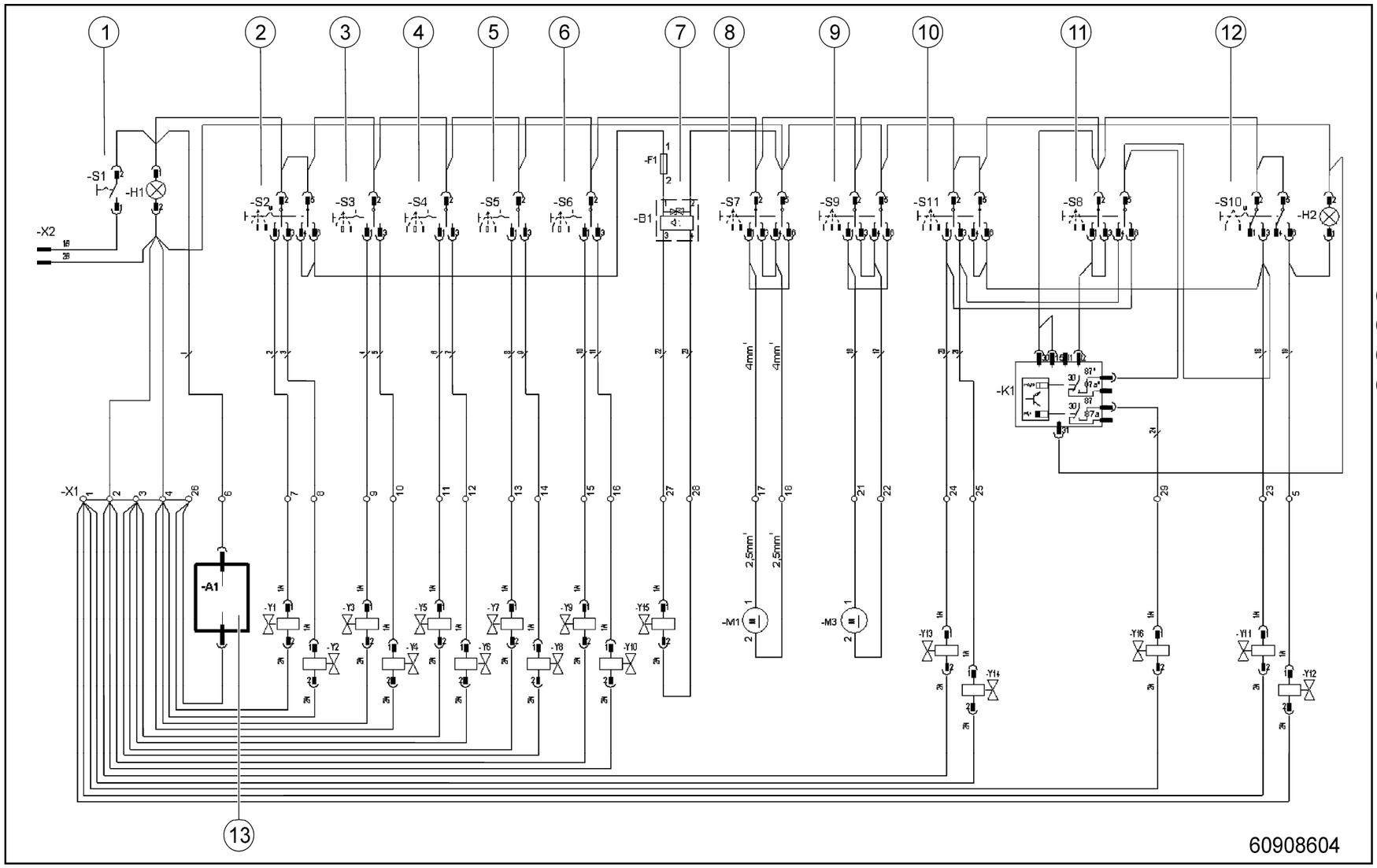
13.1.2 With on-board hydraulic system



(1) Discharge door
(2) Valve for discharge conveyor for side discharge
(3) Valve for conveyor extension
(4) Height adjustment for conveyor extension
(5) Hydraulic counter-cutters
(6) Hydraulic supporting leg
(7) Hydraulic motor for crossover conveyor
(8) Hydraulic motor for conveyor extension
(9) Hydraulic motor of discharge conveyor for side disharge
(10) Hydraulic motor for crossover conveyor
(11) Discharge door, straw blower
(12) Discharge door for straw blower with hydraulic rotary adjustment of tower
(13) Hydraulic motor for hydraulic rotary adjustment of tower
(14) Hydraulic motor for straw blower

Fig. 110

13.2 Electrical circuit diagram



(1) Control ON
(2) Crossover conveyor cw rotation / ccw rotation
(3) Discharge door
(4) Hydraulic supporting leg
(5) Hydraulic counter-cutters
(6) Conveyor extension
(7) Conveyor speed
(8) Switchgear
(9) Ejection hood for straw blower
(10) Discharge door for straw blower
(11) Hydraulic rotating mechanism for ejection tower
(12) Straw blower ON
(13) Weighing device

Fig. 111

13.3 Circuit diagram of weighing device

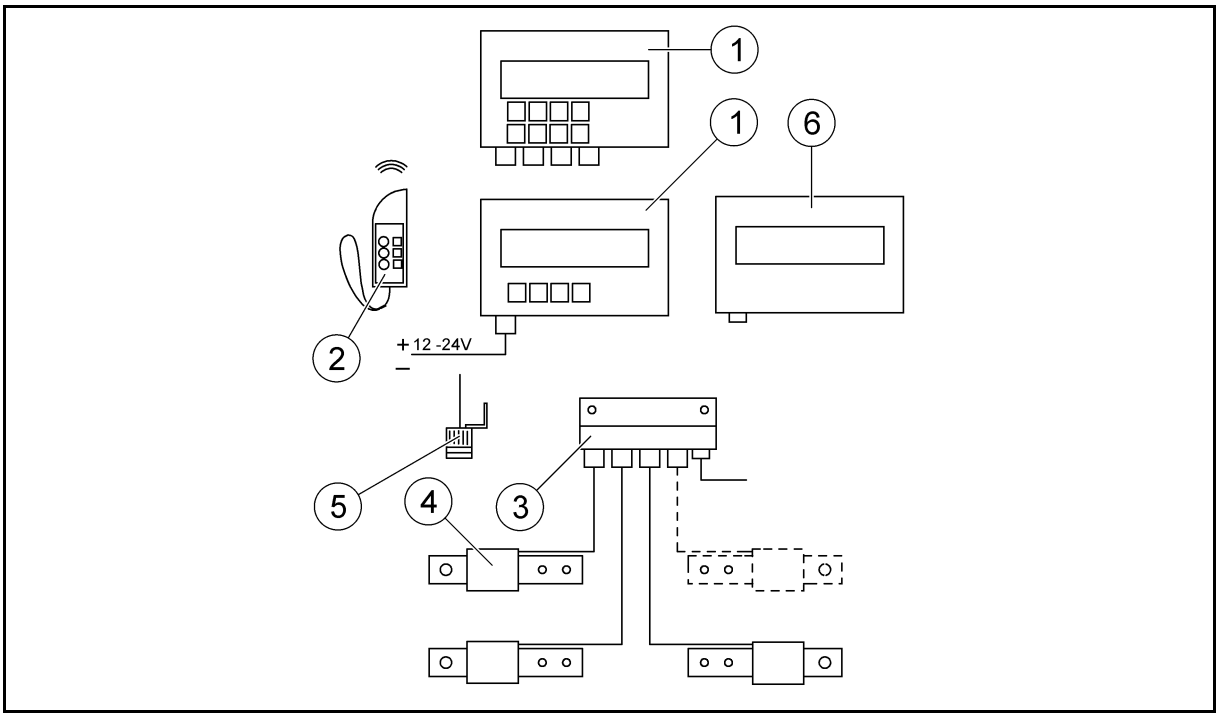


Fig. 112

(1) Weighing computer

(2) Radio remote control

(3) Collecting box

(4) Weighing rod

(5) Signal hooter

(6) Additional large-scale display