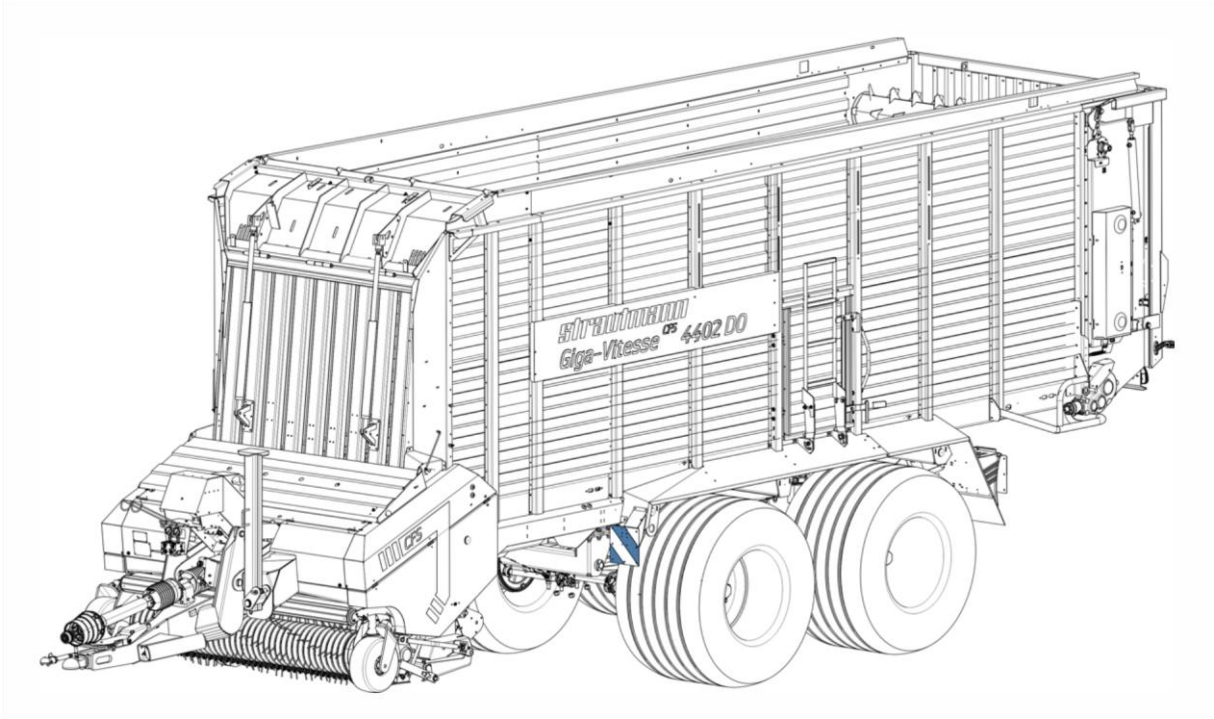
Translation of the Original Operating Instructions

Short-cut forage wagon / Short-cut forage wagon with beaters

Giga-Vitesse CFS 3602 - 4402, Giga-Vitesse CFS 3602 DO - 4402 DO



75500905 a.000

03.18

EN

EU Declaration of Conformity

Manufacturer:

B. Strautmann & Söhne GmbH u. Co. KG

Bielefelder Str. 53

D-49196 Bad Laer

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

B. Strautmann & Söhne GmbH u. Co. KG

Bielefelder Str. 53

D-49196 Bad Laer

Description and identification of machine:

Designation:	Short-cut forage wagon / Short-cut forage wagon with dosing unit
Function:	Cutting, charging, transport and distribution of green and dried-out forage
Model:	Giga-Vitesse CFS / Giga-Vitesse CFS DO
Type:	Giga-Vitesse CFS 4002-4402
	Giga-Vitesse CFS 4002 DO, 4402 DO
Vehicle/Machine ID number:	W09755000_0S38001 - W09762000_0S38999
Trade name:	Giga-Vitesse CFS / Giga-Vitesse CFS DO
	Short-cut forage wagon / Short-cut forage wagon with dosing unit

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

2006/42/EC:2006-05-17	EC machinery directive 2006/42/EC
2014/30/EU:2014-02-26	(Electromagnetic compatibility) directive 2014/30/EU of the European Parliament and the Council dated 26 February 2014 for approximation of laws of the member states on the electromagnetic compatibility and for repeal of directive 2004/108/EC

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

EN ISO 12100:2011	Safety of machinery - Basic concepts, general principles for design - Risk assessment and risk reduction
EN ISO 13857:2008	Safety of machinery - Safety distances to prevent hazard areas from being reached by upper and lower limbs
EN ISO 4254-1:2016-09	Agricultural machinery - Safety - Part 1: General requirements
EN ISO 4254-11:2011-08	Agricultural machinery - Safety - Part 11 - Pick-up balers
EN 690:2014-03	Agricultural machinery - Manure spreaders - Safety
EN ISO 4413:2011-04	Fluid power - General rules and safety requirements for hydraulic systems and their components
DIN EN 60204-1:2014-10	Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 44/709/CDV:2014)
EN ISO 14120:2016-05	Safety of machinery - Guards - General requirements
EN 12965:2009-12	Tractors and machinery for agriculture and forestry - Propeller shafts and their guards - Safety

Bad Laer, den 26.03.2018

Dipl.-Kfm. W. Strautmann
Managing Director

Identification data

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

Manufacturer:	B. Strautmann & Söhne GmbH u. Co. KG
Machine ID number:	_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
(17-digit)	
Type:	
Year of manufacture:	

Manufacturer's address

B. Strautmann & Söhne GmbH u. Co. KG

Bielefelder Straße 53

D-49196 Bad Laer

Phone: + 49 (0) 5424 802-0

Fax: + 49 (0) 5424/802-64

E-mail: info@strautmann.com

Spare parts order service

B. Strautmann & Söhne GmbH u. Co. KG

Bielefelder Straße 53

D-49196 Bad Laer

Phone: + 49 (0) 5424 802-30

Fax: + 49 (0) 5424/802-64

E-mail: parts@strautmann.com

Online spare parts catalogue: www.strautmann-elise.de

Please always refer to the machine ID number (17-digit) of your machine when ordering spare parts.

Formal information about the operating instructions

Article number:	**75500905**
Version:	03.18

Declaration of delivery

The signed declaration of delivery will secure the warranty claim according to the delivery conditions, please return it to B. Strautmann & Söhne GmbH u. Co. KG.

Operating instructions, spare parts lists and brochures are also available in the Strautmann information library on the internet:

www.strautmann-infothek.de

Foreword

Dear customer,

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

Upon receipt of the machine, please check for transport damage or missing parts! Check the delivered machine for its completeness, including the ordered optional extras, by means of the delivery note. Only immediate complaints will give reason to compensation!

Please read and observe these operating instructions, in particular the safety instructions, before commissioning. After carefully reading the instructions, you will be able to fully benefit from the advantages of your recently acquired machine.

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

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

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

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

Contents

1 User information 14

1.1 Purpose of document 14
1.2 Keeping of operating instructions 14
1.3 Location details in the operating instructions 14
1.4 Applied modes of specification 14
1.5 Applied terms 15
1.6 Activity-related safety instructions and important information 16

2 Product description 17

2.1 General overview of the machine 18
2.2 Chassis 19
2.2.1 Bogie tandem chassis 19
2.2.2 Tandem / Tridem chassis with hydr. travelling height adjustment 20
2.2.2.1 Tandem / Tridem chassis with hydro-pneumatic suspension 20
2.3 Drawgear 21
2.3.1 Bottom linkage 21
2.4 Drawbar suspension for folding drawbar 22
2.5 Service brake system 22
2.5.1 Dual-line compressed-air brake system 23
2.5.2 Dual-line compressed-air brake system with mechanical automatic load-sensitive brake (ALB) regulator 23
2.5.3 Dual-line compressed-air brake system with hydraulic automatic load-sensitive brake pressure (ALB) regulator 25
2.5.4 Hydraulic service brake system 27
2.5.5 Braking axle 28
2.6 Steering axle 28
2.6.1 Passive steering axle 28
2.6.2 Detection of travel direction with passive steering axle 28
2.6.3 Steering axle for electro-hydraulic forced steering axle system SES 29
2.7 Hydraulic system 30
2.7.1 Supply lines between tractor and machine 31
2.7.2 Marking of hydraulic supply lines 32
2.7.3 Electro-hydraulic control block 34
2.7.4 Load-sensing hydraulic system 35
2.7.5 Marking of hydraulic hose pipes 36
2.8 Pick-up 36
2.9 Cutting unit 37
2.10 Feeder rotor 37
2.11 Access door and ladder 38
2.12 Transport floor 39
2.13 Front panel with incorporated automatic charging system 39
2.13.1 Front panel with incorporated automatic charging system 40
2.13.2 ISOBUS control of automatic charging system 40
2.13.3 Deactivate automatic charging system and stop transport floor 41
2.13.3.1 Machine without beaters 41
2.13.3.2 Machine equipped with beaters 41
2.14 Tailgate 41
2.14.1 Tailgate on machines without beaters 42
2.14.2 Tailgate on machines equipped with beaters 42
2.15 Beaters 43
2.16 Silage additive pump 43
2.16.1 Switch silage additive pump on/off with ISOBUS control 44
2.17 Traffic-related equipment 45
2.18 Type plate 46

2.19 Technical data 47
2.19.1 General data 47
2.19.2 Tyre pressure 50
2.19.3 Required tractor equipment 53
2.19.3.1 Tractor engine output and p.t.o. speed 53
2.19.3.2 Electrical system 53
2.19.3.3 Hydraulic system 53
2.19.3.4 Control devices 55
2.19.3.5 Brake system 55

3 Safety instructions 56

3.1 Correct use 56
3.2 Organisational measures 57
3.2.1 User’s obligation 57
3.2.2 Operator’s obligation 58
3.2.3 Qualification of staff 58
3.3 Product safety 59
3.3.1 Hazardous area and dangerous spots 59
3.3.2 Risks when handling the machine 60
3.3.3 Safety and protective devices 60
3.3.4 Structural alterations 62
3.3.5 Spare and wearing parts, auxiliary materials 62
3.3.6 Warranty and liability 63
3.4 Basic safety instructions 64
3.4.1 Lock tailgate 65
3.4.2 General safety and accident prevention instructions 66
3.4.2.1 Hitch and unhitch machine 66
3.4.2.2 Use of machine 68
3.4.2.3 Transport journeys 70
3.4.3 Hydraulic system 71
3.4.4 Electrical system 72
3.4.5 Propeller shafts 73
3.4.6 Hitched machines 74
3.4.7 Brake system 75
3.4.7.1 Compressed-air brake system 75
3.4.8 Axles 75
3.4.9 Tyres 76
3.4.10 Cleaning, service, maintenance and trouble-shooting 77
3.4.11 Risks due to residual energy 77
3.5 Warning and instruction signs 78
3.5.1 Warning signs 78
3.5.2 Instruction signs 84
3.5.3 Placing of warning and instruction signs 87
3.6 Risks due to non-observance of safety instructions 88

4 Loading and unloading of machine 89

4.1 Loading and unloading by means of a tractor 90
4.2 Loading and unloading by means of a crane 90
4.3 Overseas dispatch, unlock steering axle 91

5 Commissioning 92

5.1 Road traffic regulations 94
5.1.1 Road traffic regulations in Germany 94
5.2 Check tractor's compatibility 95
5.2.1 Preconditions for the operation of tractors with rigid-drawbar trailers 96
5.2.1.1 Combination options of coupling devices and drawgears 96
5.2.1.2 Calculate actual D_C value for combination to be coupled 97
5.2.1.3 Calculate tractor's admissible towing capacity 98
5.3 Secure tractor and machine against accidental starting and rolling 99
5.4 Parking brake 100

5.4.1 Release parking brake ... 100
5.4.2 Apply parking brake ... 101
5.5 Brake system ... 101
5.6 Lift / Lower supporting leg ... 102
5.6.1 Lift mechanical supporting leg to transport position ... 103
5.6.2 Lower mechanical supporting leg to support position ... 103
5.7 Adjust length of propeller shaft to tractor ... 104
5.8 Adjust mounting height of folding drawbar ... 105
5.9 Pick-up ... 107
5.9.1 Set operating height ... 107
5.9.2 Set additional guide wheels ... 108
5.10 Set cutting length ... 109
5.11 Mount control set on the tractor ... 109
5.11.1 Mount ISOBUS control set on the tractor ... 109
5.12 Hitch machine ... 110
5.12.1 Couple drawgear ... 111
5.12.1.1 Tow-hook (hitch hook) and drawbar lug (hitch ring) ... 111
5.12.1.2 Draw pin (Piton-Fix) and drawbar lug (hitch ring) ... 112
5.12.1.3 Ball-type coupling and shell ... 112
5.12.2 Connect hydraulic hose pipes ... 114
5.12.2.1 Open hydraulic system ... 114
5.12.2.2 Load-sensing mode ... 115
5.12.3 Connect brake system ... 115
5.12.3.1 Connect dual-line service brake system ... 116
5.12.3.2 Connect hydraulic brake system ... 116
5.12.3.3 Connect emergency brake valve ... 117
5.12.4 Couple propeller shaft ... 118
5.12.5 Couple forced steering axle ... 118
5.13 Unhitch machine ... 121
5.13.1 Uncouple drawgear ... 121
5.13.1.1 Tow-hook (hitch hook) and drawbar lug (hitch ring) ... 121
5.13.1.2 Draw pin (Piton-Fix) and drawbar lug (hitch ring) ... 122
5.13.1.3 Ball-type coupling and shell ... 122
5.13.2 Disconnect hydraulic hose pipes ... 122
5.13.3 Disconnect brake system ... 123
5.13.3.1 Disconnect dual-line service brake system ... 123
5.13.3.2 Disconnect hydraulic brake system ... 123
5.13.3.3 Disconnect hydraulic brake system with emergency brake valve ... 124
5.13.4 Uncouple propeller shaft ... 125
5.14 Manoeuvre unhitched machine by means of a manoeuvring vehicle ... 126
5.15 External operation for folding drawbar ... 127
5.16 Mount extension sections, ropes and superstructure tarpaulin ... 127
5.17 Superstructure tarpaulin with rewinding and securing mechanism ... 130
5.17.1 Unwind superstructure tarpaulin ... 130
5.17.2 Rewind superstructure tarpaulin ... 131
5.18 Cover conveyor duct ... 132

6 Operation ... 133

6.1 ISOBUS control / Field Operator 120 ... 134
6.1.1 Design of ISOBUS control ... 134
6.1.2 Display information in Working menu ... 136
6.1.3 Functions of the ISOBUS control ... 137
6.1.3.1 Switch control set on/off ... 137
6.1.3.2 Switch road travel mode on ... 137
6.1.3.3 Switch road travel mode off ... 139
6.1.3.4 Switch discharge mode A I on ... 140
6.1.3.5 Switch Discharge mode A II on (machine without beaters) ... 141
6.1.3.6 Switch discharge mode A II on (machine equipped with beaters) ... 141
6.1.3.7 Switch automatic charging system on/off ... 142

6.1.3.8 Switch transport floor on 143
6.1.3.9 Double feed rate of transport floor for complete emptying (transport floor level II) 144
6.1.3.10 Change feed rate of transport floor during discharge 144
6.1.3.11 Reverse transport floor 145
6.1.3.12 Crossover conveyor ccw rotation/cw rotation on 145
6.1.3.13 Stop crossover conveyor 146
6.1.3.14 Switch cargo space lighting on/off 146
6.1.3.15 Lift tailgate (machine without beaters) 147
6.1.3.16 Lift tailgate (machine equipped with beaters) 147
6.1.3.17 Lower tailgate 148
6.1.3.18 Lift folding drawbar 148
6.1.3.19 Lower folding drawbar 148
6.1.3.20 Switch drawbar suspension on 149
6.1.3.21 Switch drawbar suspension off 149
6.1.3.22 Retract cutting unit 149
6.1.3.23 Remedy in case of cutting knives retracted from the conveyor duct 150
6.1.3.24 Remedy in case of soiled cutting unit 150
6.1.3.25 Extend cutting unit 150
6.1.3.26 Lock steering axle 151
6.1.3.27 Unlock steering axle 152
6.1.3.28 Lock steering axle with SES system 152
6.1.3.29 Unlock steering axle in SES system 153
6.1.3.30 Lock forced steering axle 154
6.1.3.31 Lift pick-up 154
6.1.3.32 Lower pick-up 154
6.1.3.33 Switch silage additive pump on/off 155
6.1.4 Set machine parameters 155
6.1.4.1 Call up SET menu 156
6.1.4.2 Set machine model 157
6.1.4.3 Pre-select steering axle model 158
6.1.4.4 Pre-select filling degree of loaded material in cargo space 159
6.1.5 Calibration 159
6.1.5.1 Calibrate automatic charging system 159
6.1.6 Operating hours counter, service hours counter and transported loads counter 161
6.1.7 Call up Counter menu 161
6.1.8 Reset daily counters 162
6.1.9 Sensor and status overview 162
6.1.9.1 Call up status overview 163
6.2 ISOBUS control / Field Operator 130 163
6.2.1 Design of ISOBUS control 164
6.2.2 Displays 166
6.2.2.1 Display information in charge menu 166
6.2.2.2 Display information in road travel menu 166
6.2.2.3 Display information in discharge menu 167
6.2.3 Functions of the ISOBUS control 167
6.2.3.1 Switch control set on/off 167
6.2.3.2 Switch road travel mode on 168
6.2.3.3 Switch road travel mode off 169
6.2.3.4 Switch discharge mode on 170
6.2.3.5 Switch automatic discharge mode on (Machine without beaters) 171
6.2.3.6 Switch automatic discharge mode on (machine equipped with beaters) 171
6.2.3.7 Double feed rate of transport floor for complete emptying (transport floor level II) 173
6.2.3.8 Change feed rate of transport floor during discharge 173
6.2.3.9 Stop and restart transport floor during discharge 173
6.2.3.10 Reverse transport floor 174
6.2.3.11 Switch automatic charging system on/off 174
6.2.3.12 Change filling degree of loaded material in cargo space 176
6.2.3.13 Switch transport floor on 177
6.2.3.14 Change transport floor speed 178
6.2.3.15 Switch cargo space lighting on/off 178
6.2.3.16 Switch silage additive pump on/off 179
6.2.3.17 Lift tailgate (machine without beaters) 179

6.2.3.18 Lift tailgate (machine equipped with beaters) ... 180
6.2.3.19 Lower tailgate ... 180
6.2.3.20 Lift folding drawbar ... 181
6.2.3.21 Lower folding drawbar ... 181
6.2.3.22 Retract cutting unit ... 182
6.2.3.23 Remedy in case of cutting knives retracted from the conveyor duct ... 182
6.2.3.24 Remedy in case of soiled cutting unit ... 182
6.2.3.25 Extend cutting unit ... 183
6.2.3.26 Lock steering axle ... 184
6.2.3.27 Unlock steering axle ... 185
6.2.3.28 Lock steering axle with SES system ... 186
6.2.3.29 Unlock steering axle with SES system ... 187
6.2.3.30 Lift and lower lift axle (tridem chassis) ... 188
6.2.3.31 Lift pick-up ... 189
6.2.3.32 Lower pick-up ... 189
6.2.3.33 Automatic wayback ... 190
6.2.3.34 Functional description of automatic wayback FO130 ... 190
6.2.3.35 Actuation of automatic wayback ... 191
6.2.3.36 Change intensity of background lighting ... 193
6.2.3.37 Call up and edit set-up menu ... 194
6.2.3.38 Display information of folding drawbar sensor ... 195
6.2.3.39 Display information of machine set-up menu ... 196
6.2.3.40 Display information of automatic charging system ... 197
6.2.3.41 Display information of transported loads counter ... 197
6.2.3.42 Display information of check menu ... 199
6.2.3.43 Machine settings in machine set-up menu ... 200
6.2.3.44 Calibrate folding drawbar sensor ... 201
6.2.3.45 Set automatic folding drawbar system ... 203
6.2.3.46 Calibrate automatic charging system sensor ... 205
6.2.3.47 Set automatic charging system ... 206
6.3 Steering ... 207
6.3.1 Operation of steering computer ... 207
6.3.1.1 Access to steering computer ... 207
6.3.1.2 Operating and display elements of the steering computer ... 208
6.4 Error log, forced steering axle system ... 212

7 Use of machine ... 213

7.1 Transport journeys ... 214
7.2 Transport journeys with partly discharged machine ... 215
7.3 Charge machine ... 215
7.3.1 Determine admissible loading capacity ... 217
7.3.1.1 Bulk densities of different loaded materials ... 217
7.3.2 Charge with ISOBUS control / Field Operator 120 ... 218
7.3.2.1 Machines without beaters ... 218
7.3.2.2 Machines equipped with beaters ... 219
7.3.3 Charge with ISOBUS control / Field Operator 130 ... 219
7.3.3.1 Machines without beaters ... 219
7.3.3.2 Machines equipped with beaters ... 220
7.4 Discharge machine ... 220
7.4.1 Discharge with ISOBUS control / Field Operator 120 ... 221
7.4.1.1 Machine without beaters ... 221
7.4.1.2 Machine equipped with beaters ... 222
7.4.2 Discharge with ISOBUS control / Field Operator 130 ... 225
7.4.2.1 Machine without beaters ... 225
7.4.2.2 Machine equipped with beaters ... 226

8 Service and maintenance of machine ... 229

8.1 Service and maintenance plan – Overview ... 230
8.2 Enter cargo space ... 234
8.3 Cleaning work ... 235
8.3.1 Cleaning by means of pressure washer / steam blaster ... 235

8.4 Lubrication work 236
8.4.1 Lubrication plan 237
8.5 Check / Top up gear lubricant oil 238
8.5.1 Quantities when filled and change intervals 238
8.5.2 Feed gearing of transport floor 238
8.5.3 Main gearbox 239
8.5.4 Rotor gear 239
8.5.5 Angular gear of CFS unit 240
8.5.6 Angular gear of dosing unit 240
8.5.7 Check/Top up oil level 240
8.5.8 Change gear lubricant oil 241
8.6 Pick-up 242
8.6.1 Bleed friction clutch of pick-up 242
8.6.2 Check/Retighten tension of roller chain for pick-up drive 243
8.7 Carry out maintenance work on the cam-type cut-out clutch 244
8.8 Set beater circuit 246
8.9 Set circuit for CFS drum and pick-up 247
8.10 Cutting unit 248
8.10.1 External operation for cutting unit 248
8.10.2 Clean cutting unit 249
8.10.2.1 Unhook cutting unit springs 250
8.10.2.2 Install cutting unit springs 253
8.10.3 Remove and install cutting knives 254
8.10.3.1 Remove cutting knives 255
8.10.3.2 Install cutting knives 257
8.10.4 Grind cutting knives 258
8.10.5 Set distance between cutting knives and rotor 258
8.10.6 Check distance between strippers and rotor 260
8.10.7 Set "Cutting unit retracted" sensor 262
8.10.8 Set rpm sensor "Beaters" 263
8.10.9 Sensor "Tailgate closed" (forage wagon and forage wagon with dosing unit) 263
8.10.10 Set rpm sensor "Beater circuit" 264
8.10.11 </dg_bm "mod_1500444746004_0001"Tailgate open" sensor (only forage wagon) 265
8.11 Transport floor 266
8.11.1 Shorten and tighten transport floor chains 266
8.12 Beaters 268
8.12.1 Lubricate roller chains of beaters 268
8.12.2 Check/Retighten roller chain tension 268
8.13 Hydraulic system 270
8.13.1 Depressurise hydraulic system 271
8.13.2 Depressurise folding drawbar with drawbar suspension 271
8.13.3 Marking of hydraulic hose pipes 271
8.13.4 Inspection criteria for hydraulic hose pipes 272
8.13.5 Replace hydraulic filter 272
8.14 Brake system 274
8.14.1 Check/Clean in-line filters of compressed-air brake system 274
8.14.2 Drain compressed-air reservoir of compressed-air brake system 275
8.15 Maintenance of axles 276
8.15.1 Lubricate knuckle arm bearing 277
8.15.2 Lubricate locking cylinder heads at passive steering axle 277
8.15.3 Lubricate brake shaft bearing 278
8.15.4 Lubricate standard slack adjuster 278
8.15.5 Lubricate automatic slack adjuster 279
8.15.6 Tighten wheel nuts 279
8.15.7 Tightening torques of wheel nuts 280
8.15.8 Check clearance of wheel hub bearing 280
8.15.9 Check brake linings 280
8.15.10 Check brake 281
8.15.11 Check and adjust standard slack adjuster 281
8.15.12 Check automatic slack adjuster 282

8.16 Maintenance of boogie chassis 282
8.17 Maintenance of hydraulic chassis 283
8.17.1 Check oil level in oil storage tank 284
8.17.2 Lubricate bearing of dash pots 285
8.17.3 Drain condensate 286
8.17.4 Check/Top up hydraulic oil of dash pots 288
8.17.5 Adjust travelling height via three-way cock 290
8.17.6 Adjust travelling height via easy-to-use block 291
8.17.7 Adjust travelling height (tridem chassis) 293

9 Remedy of malfunctions 294

9.1 Eliminate clogging at the pick-up and the feeder rotor 294
9.1.1 Elimination from the tractor seat 294
9.1.2 Elimination not from the tractor seat 294
9.2 List of malfunctions, hydraulic system 295
9.3 List of malfunctions, electrical system 296
9.3.1 Meaning of error messages with ISOBUS control 297
9.4 List of malfunctions, working 297
9.5 Emergency manual operation in case of failure of electrical system 299
9.5.1 Functional diagram for emergency manual operation 300
9.6 Emergency manual operation of electro-hydraulic forced steering axle system SES 301

10 Disassembly / Disposal 303

11 Circuit diagrams 304

11.1 Hydraulic circuit diagram 305
11.2 Electronic circuit diagram – ISOBUS control - Valves 308
11.3 Electronic circuit diagram – ISOBUcontrol - Sensors 312
11.4 Electronic circuit diagram – ISOBUS control - Control unit 316
11.5 Connection, lighting 319

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.
- must be kept for further use.
- are to be handed over to the buyer when the machine is sold.

1.2 Keeping of operating instructions

The operating instructions

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

1.3 Location details in the operating instructions

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

1.4 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 number refers to the position number in the figure.

Example (6)

- Position 6

Lines of position in figures

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

A line without an arrow head means:	———	the component can be seen in the figure,
A line with an arrow head means:	———▶	the component cannot be seen in the figure (e.g. hidden by protective device).

1.5 Applied terms

Term	The term means
Third person/party	… all other persons apart from the operator.
Risk	… the source of a possible injury or damage to health.
Manufacturer	… B. Strautmann & Söhne GmbH u. Co. KG.
Machine	… Short-cut forage wagon / Short-cut forage wagon with beaters,Giga-Vitesse CFS 3602 - 4402, Giga-Vitesse CFS 3602 DO - 4402 DO
Operating element	… the component of an operating element system which is directly actuated by the operator, e.g. by pressing. An operating element may be an adjusting lever, a key button, rotary switch, key etc.
Shop work	Special expert knowledge, especially trained and qualified staff and adequate means (tools, lifting and supporting equipment) are required to carry out shop work in a professional and safety-conscious way.
Authorised workshop	Only authorised workshops having special expert knowledge, especially trained and qualified staff and adequate means (tools, lifting and supporting equipment) at their disposal are allowed to carry out shop work on the machine.

1.6 Activity-related safety instructions and important information

Activity-related safety instructions and important information are included in the operating instructions. The safety instructions are marked by the hazard symbol and the preceding signal word.

WARNING 	**WARNING** 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 “WARNING“ directly causes most serious bodily injury or even death.

	**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.

2 Product description

This chapter:

- gives a comprehensive overview of the machine design.
- provides the designations of the individual assemblies and operating elements.

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

The machines illustrated in these operating instructions partly include optional extras which are available at extra cost.

2.1 General overview of the machine

Illustration of product and identification of essential elements.

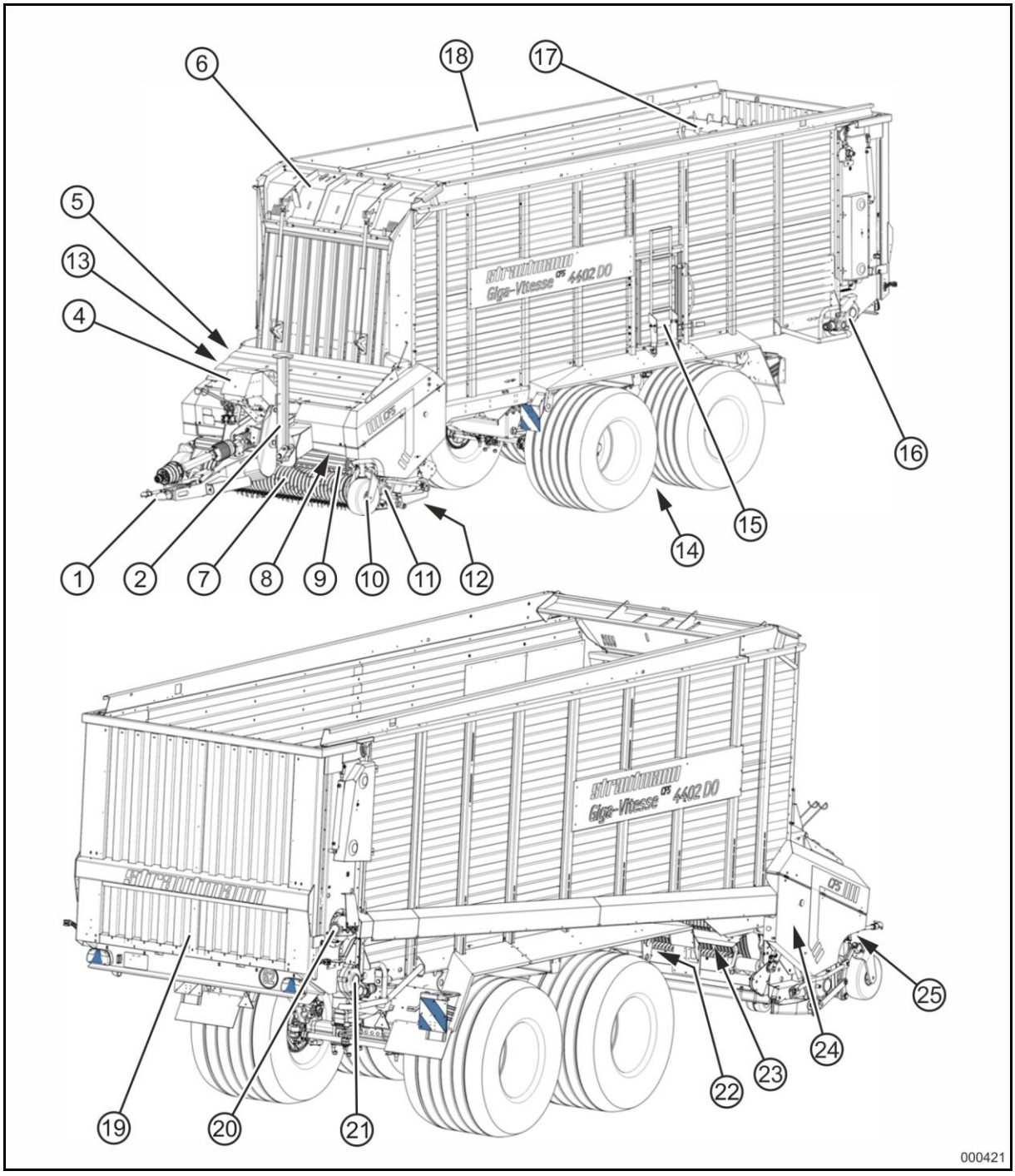


Fig. 1

(1) Drawbar
(2) Supporting leg
(3) Main gearbox
(4) Electro-hydraulic control block
(5) Conveying unit
(6) Folding automatic charging system (front panel)
(7) Pick-up
(8) CFS drum
(9) Holding-down device with pulley
(10) Guide wheel
(11) Chain drive, pick-up
(12) Additional guide wheel
(13) Rotor gear
(14) Chassis
(15) Access door and ladder
(16) Feed gearing, transport floor
(17) Beaters
(18) Superstructure
(19) Tailgate
(20) Rear angular gear, dosing unit
(21) Feed gearing, transport floor
(22) Parking brake
(23) Cutting unit
(24) Angular gear CFS
(25) Rotor, beater and pick-up drive

2.2 Chassis

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

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

2.2.1 Bogie tandem chassis

3-leaf parabolic springs serve as a compensating rocker arm in the bogie tandem chassis.

In case of bumps, the large swing paths ensure an even load distribution onto both axles.

2.2.2 Tandem / Tridem chassis with hydr. travelling height adjustment

The hydraulic travelling height adjustment:

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

In the hydraulic chassis with separate travelling height adjustment for the right-hand and left-hand machine side, the balancing between the wheels on each side is carried out by four or six hydraulic cylinders (1).

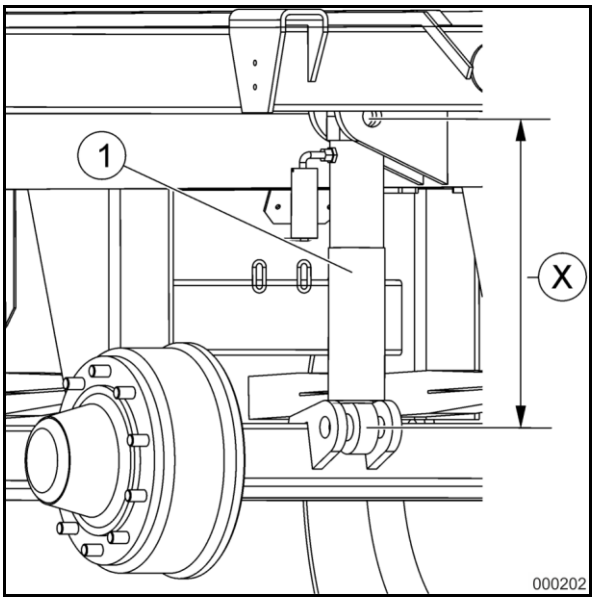


Fig. 2

2 levelling valves on the middle axle of a tridem chassis will detect a too low or excessive travelling height. The travelling height will automatically be adjusted if the hydraulic hose pipe of the chassis is connected to a single-acting control device of the tractor and pressurised. If the machine is empty, the front axle can be lifted via the control set, thus relieving the chassis in case of empty journeys and minimising tyre wear. The hydraulic oil pushed out when lifting the front axle is distributed to the hydraulic cylinders of the central and the rear axle. This may slightly increase the travelling height.

2.2.2.1 Tandem / Tridem chassis with hydro-pneumatic suspension

The hydro-pneumatic suspension:

- ensures higher driving comfort due to active suspension.
- permits travelling speeds of > 40 km/h.
- protects material and tyres.

One nitrogen accumulator on each side ensures the axle suspension and the damping of the machine on the individual wheels.

The axle suspension can be switched on and off via the stop-cock or via the control set.

The axle suspension is active with the road travel mode switched on, the axle suspension is disabled with the road travel mode switched off (only with ISOBUS control).

2.3 Drawgear

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

Lifting and lowering of the folding drawbar:

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

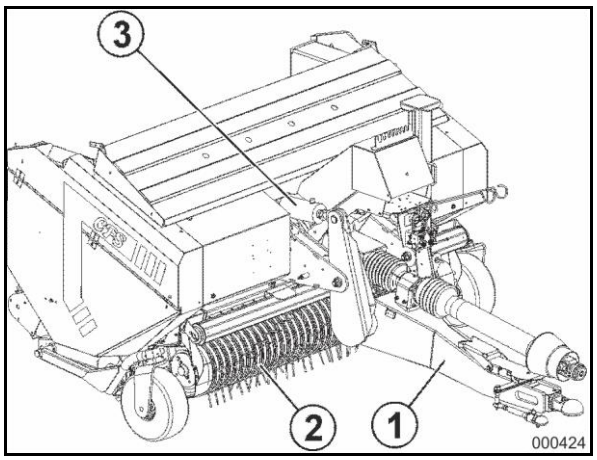


Fig. 3

2.3.1 Bottom linkage

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

- a drawbar lug (hitch ring) (5) for a tow-hook (hitch hook) or a draw pin (Piton-Fix) according to ISO 5692-1,
- a shell K80 (6) for a ball-type coupling 80.

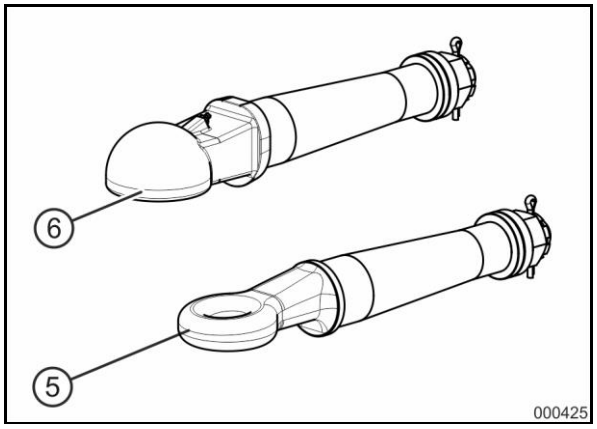


Fig. 4

2.4 Drawbar suspension for folding drawbar

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

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

The drawbar suspension:

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

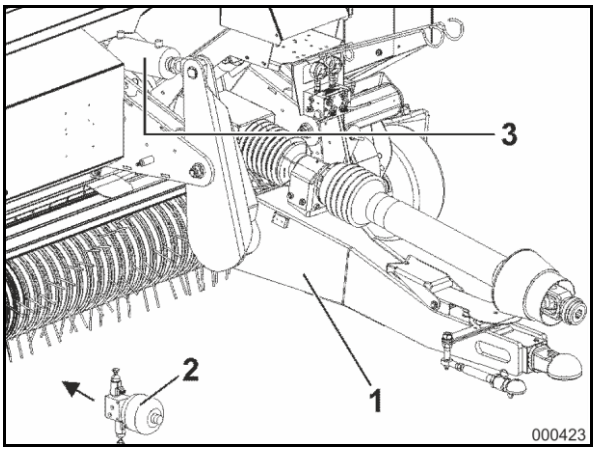


Fig. 5

2.5 Service brake system

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

- a dual-line compressed-air brake system,
- a hydraulic service brake system (only available for export),
- a combination of dual-line compressed-air brake system and hydraulic service brake system

and a parking brake.

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

2.5.1 Dual-line compressed-air brake system

The brake system consists of:

- a braking axle with a dual-line compressed-air brake system and parking brake for an admissible maximum speed of 25 km/h, 40 km/h or 60 km/h. The service brake acts on all tyres.
- an automatic load-sensitive brake pressure regulator (ALB regulator). The ALB regulator automatically controls the required braking force depending on the loading condition of the hitched machine.

The brake system acts on the braking axle/s.

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

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

WARNING

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

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

(1) Feed line with hose coupling (red)

(2) Brake line with hose coupling (yellow)

(3) Blank connection for brake line

(4) Trailer brake valve

(5) ALB regulator (mechanical)

(6) Release valve

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

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

(8) Diaphragm brake cylinder

(9) Compressed-air reservoir

(10) Drain valve

(11) Test connection in front of ALB regulator

(12) Test connection behind ALB regulator

(13) Test connection, diaphragm brake cylinder

(14) Test connection, compressed-air reservoir

(15) Parking brake

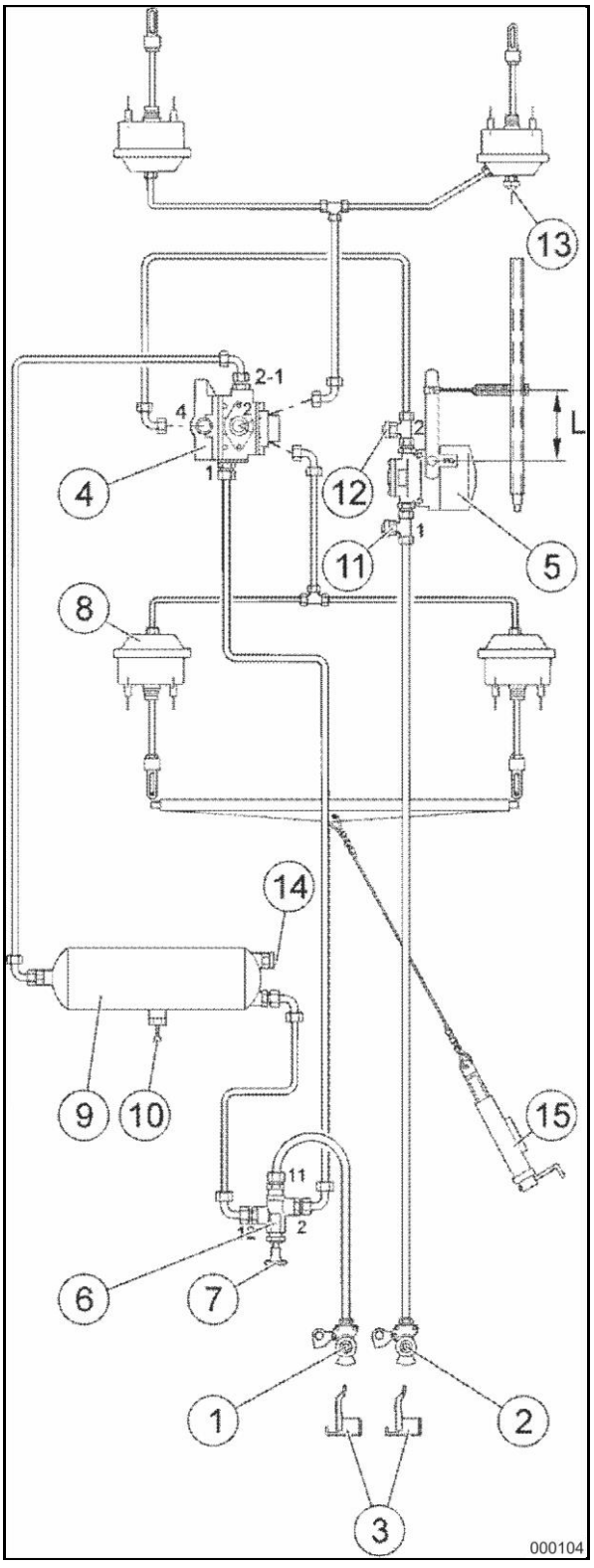


Fig. 6

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

WARNING

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

The hydraulic levelling system properly triggers the ALB regulator only with the travelling height properly set.

Tandem chassis

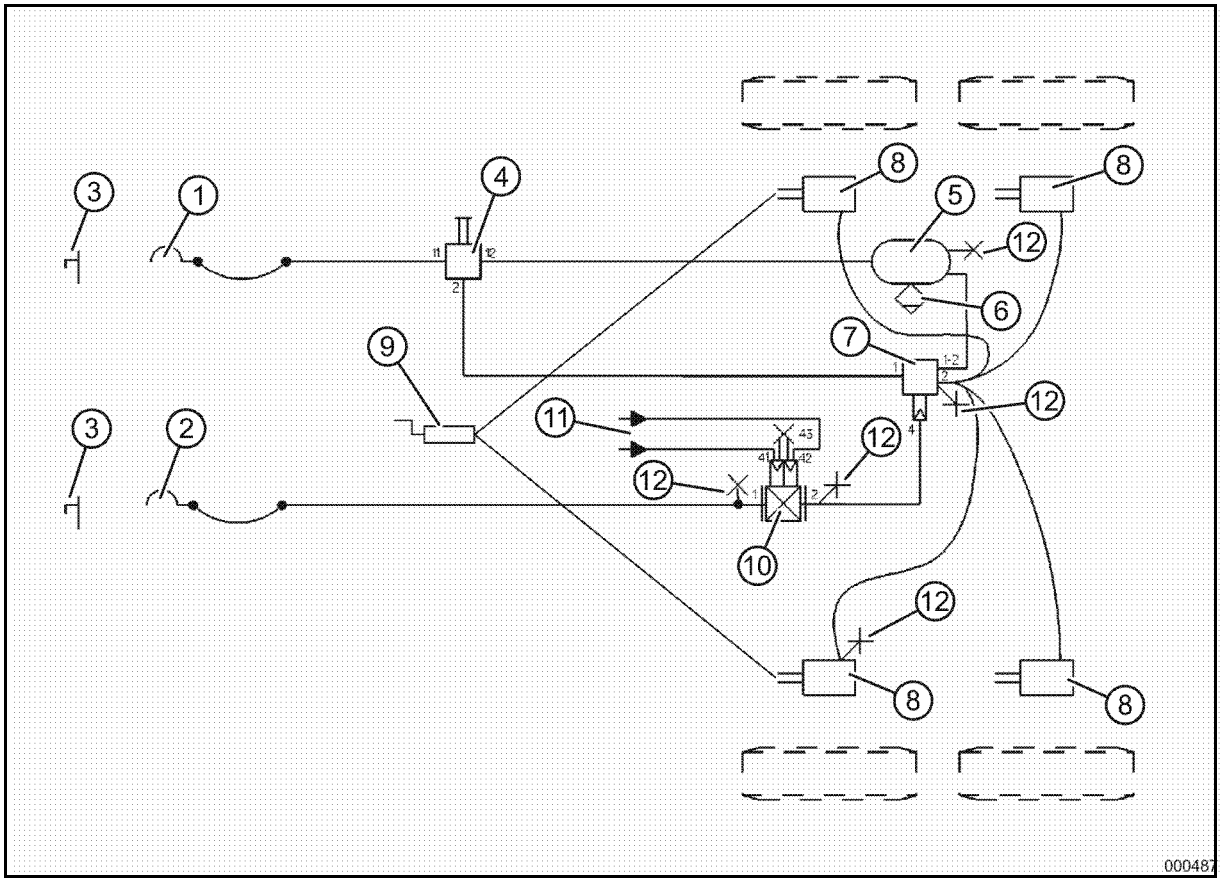


Fig. 7

(1) Hose coupling with filter (feed line red)

(2) Hose coupling with filter (brake line yellow)

(3) Blank connection with fastening mechanism

(4) Release valve

(5) Compressed-air reservoir

(6) Drain valve

(7) Trailer brake valve

(8) Brake cylinder

(9) Parking brake

(10) ALB regulator (hydraulic)

(11) Lines from the hydraulic cylinders of the chassis

(12) Test connection

Tridem chassis

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

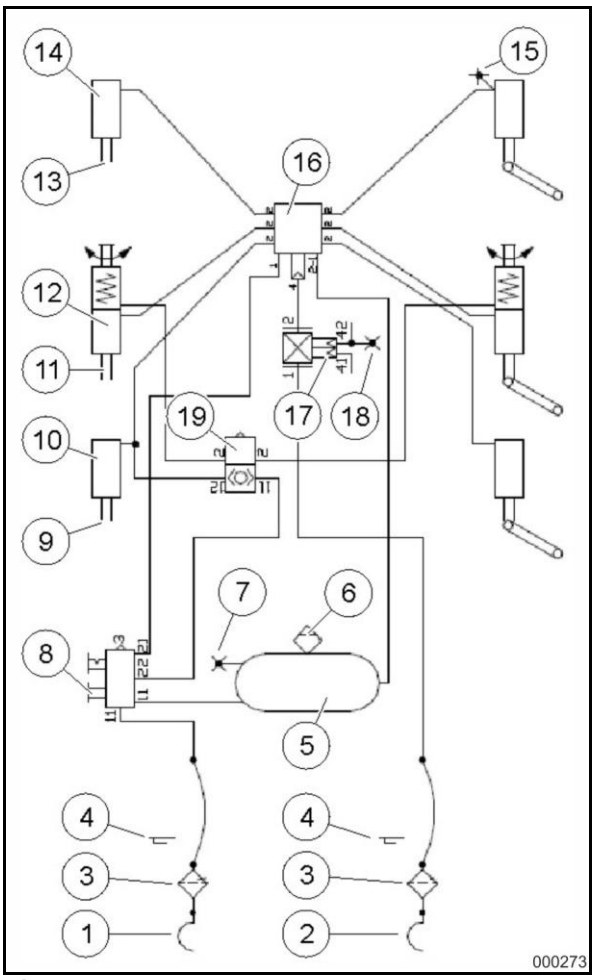


Fig. 8

2.5.4 Hydraulic service brake system

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

The hydraulic service brake system is designed for an admissible maximum speed of 25 km/h or 40 km/h.

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

(1) Hydraulic sleeve ISO 5676

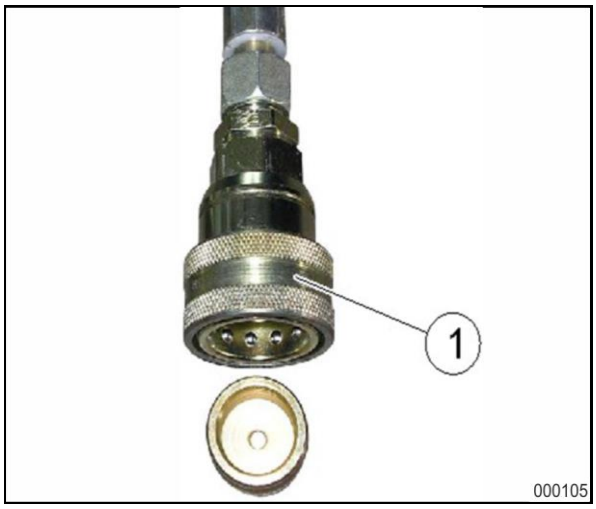


Fig. 9

(2) Hydraulic cylinder of braking axle

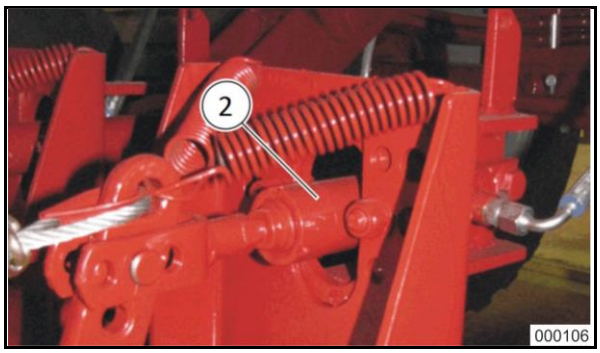


Fig. 10

2.5.5 Braking axle

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

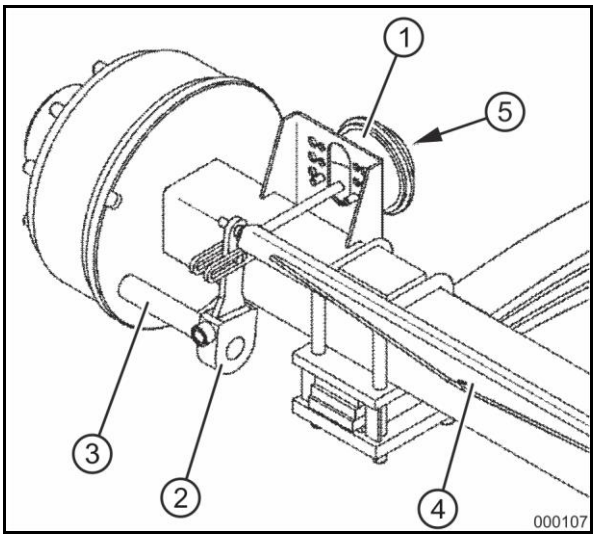


Fig. 11

2.6 Steering axle

2.6.1 Passive steering axle

The unlocked passive steering axle

- can move freely and follows the turning radius of the corner during cornering.
- protects the sward during cornering.
- reduces tyre wear during cornering on paved areas.

The passive steering axle is locked and unlocked via the control set of the tractor.

Fig. 12

2.6.2 Detection of travel direction with passive steering axle

Optional extra in conjunction with ISOBUS control1

With the help of the ABS sensor in the steering axle, the ISOBUS control system detects the direction of travel and automatically locks / unlocks the passive steering axle.

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

Optional extra

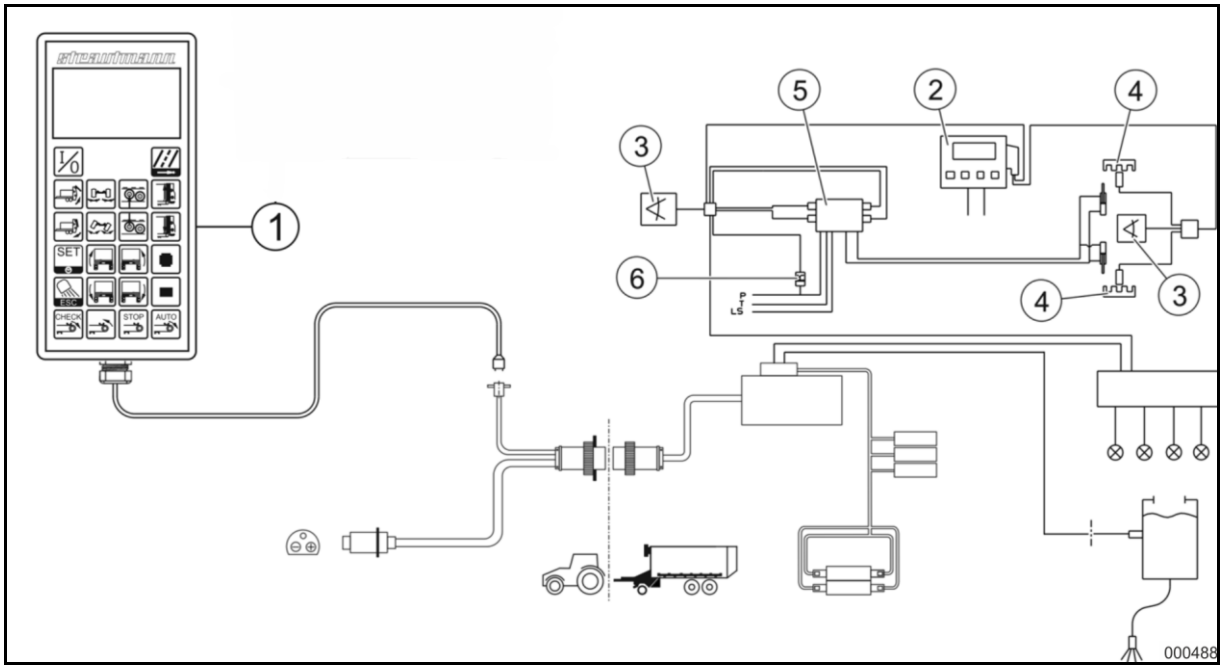


Fig. 13

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

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

The following axles can be steering axles:

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

Via the drawbar angle sensor and 2 speed sensors, the SES system electronically registers the required steering angle and transforms the required steering angle into an electrical signal.

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

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

Please note that the reduction of the steering angle is not displayed on the control set.

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

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

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

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

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

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

2.7 Hydraulic system

The hydraulic system of the machine:

- can be operated at a maximum of 100 l/min.,
- is equipped with connections for load-sensing operation as standard,
- is alternatively suitable for open or closed-centre hydraulic systems. The conversion from open to closed-centre hydraulic system is carried out by means of the load-sensing screw at the electro-hydraulic control block.

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

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

- the electro-hydraulic control block has been connected to the hydraulic system of the tractor and
- the oil circulation between tractor and machine has been switched on via the control device on the tractor. (not required in load-sensing mode)

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

(2) Holder for ISOBUS plug

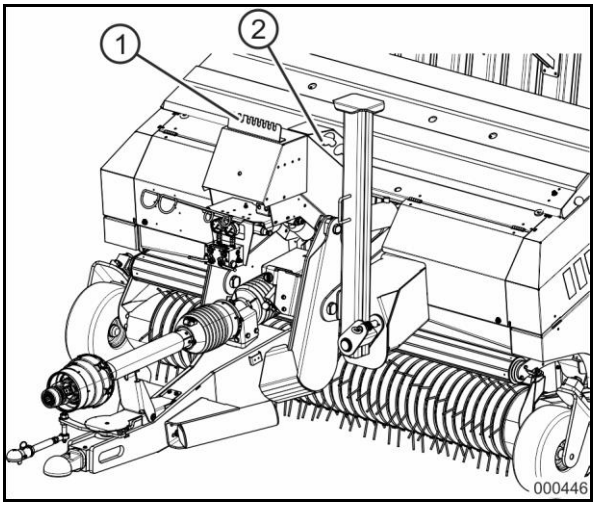


Fig. 14

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

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

2.7.1 Supply lines between tractor and machine

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

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

(3) Load-sensing connector SN 6

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

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

(6) Lighting connector, 7-pole

(7) Power supply for control system, 3-pole

(8) ISOBUS connector for ISOBUS control unit

(9) Hydraulic connector for hydraulic brake system with hydraulic clutch (optional extra)

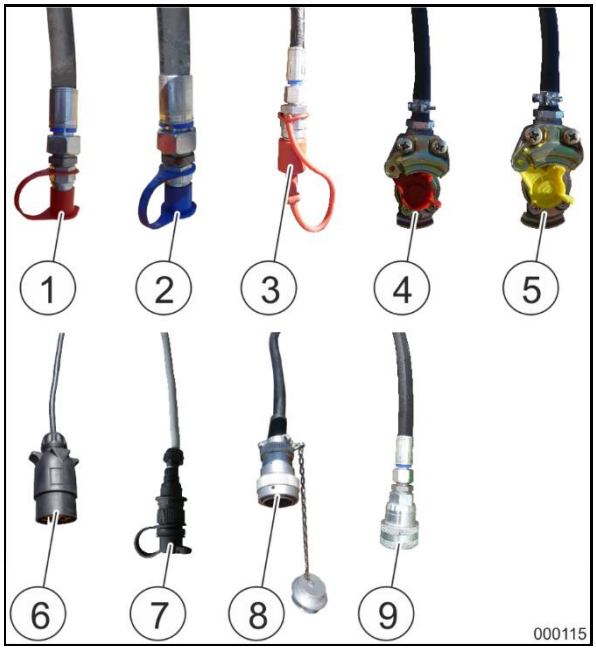


Fig. 15

2.7.2 Marking of hydraulic supply lines

Hydraulic connector "Flow line"

- Label

  Arrows: white

  Background: red

Hydraulic connector "Return line"

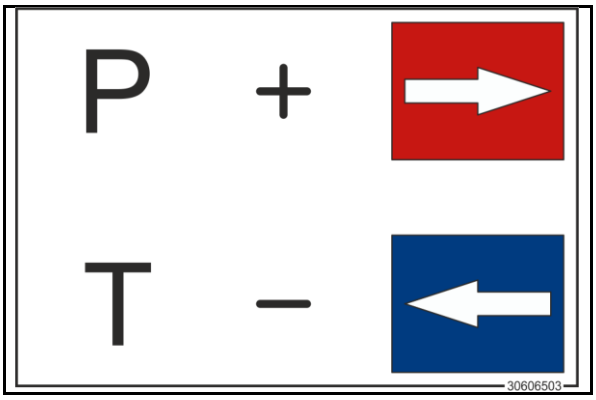
- Label

  Arrows: white

  Background: blue

Explanation of hydraulic connector symbols

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



Load-sensing connector

- Label

Explanation of the following symbols:

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

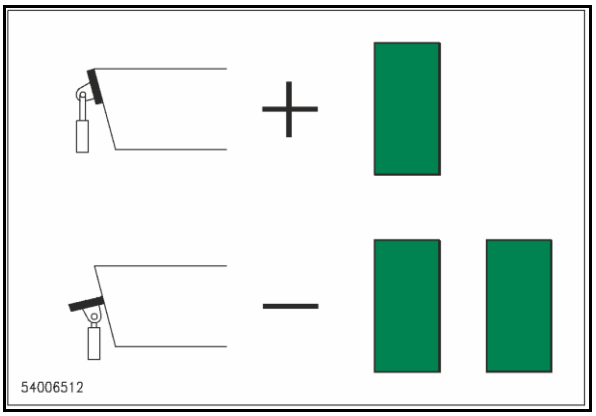
Front panel

- Flow line: 1 green cable tie

→ Close front panel

- Return line: 2 green cable ties

→ Open front panel



2.7.3 Electro-hydraulic control block

Permanent oil circulation between tractor and electro-hydraulic control block is required for initiating the individual hydraulic functions.

(1) Electro-hydraulic control block

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

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

(3) Intermediate plate with directional seat valves for:

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

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

Optional:

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

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

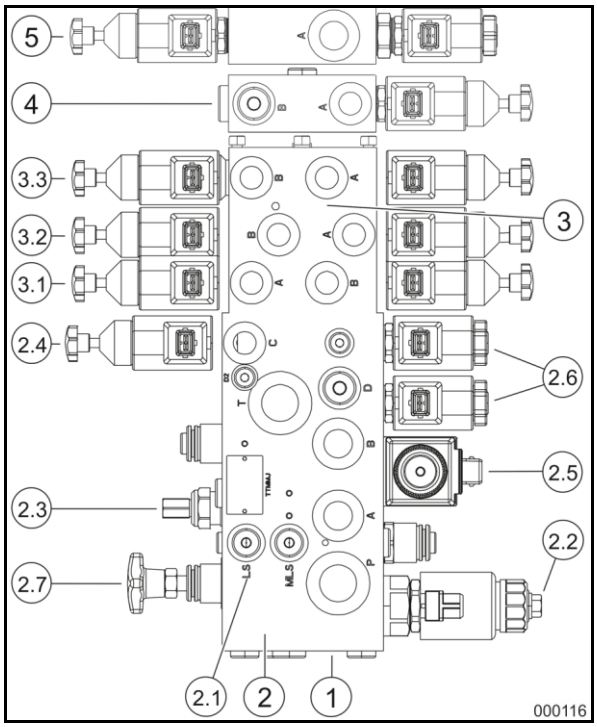


Fig. 16

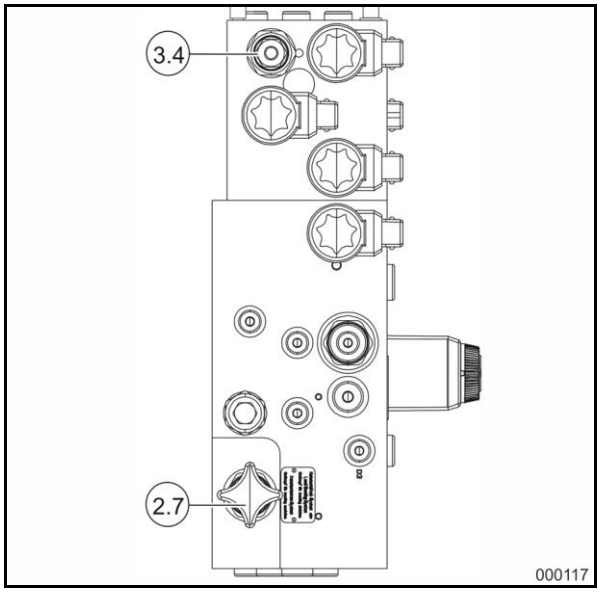


Fig. 17

2.7.4 Load-sensing hydraulic system

- Connect the hydraulic system only after it has been depressurised.
- Turn the tractor engine off before connecting the hydraulic system.
- Always connect the load-sensing control line when connecting the hydraulic connector "Flow line" to the pressure line leading to the hydraulic pump of the tractor provided for this purpose.

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

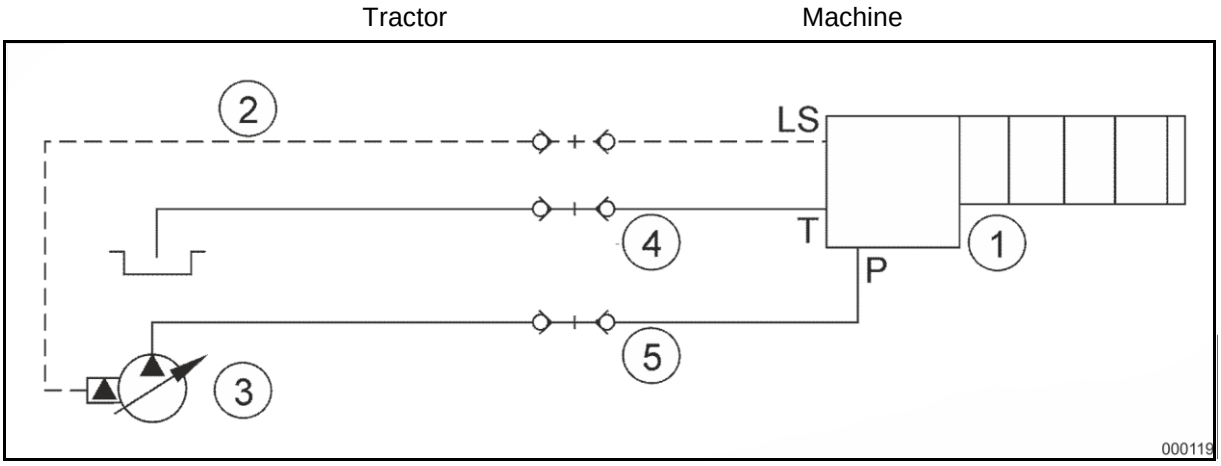


Fig. 18

(1) Electro-hydraulic control block at the machine

(2) Load-sensing control line

(3) Adjustable hydraulic pump of tractor

(4) Hydraulic connector "Return line", connected to the free return port of the tractor provided for this purpose, **not** via control device

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

If the standby pressure in the LS system is too low and cannot be increased at the tractor, it is possible to retrofit an LS amplifier.

Please contact your dealer.

2.7.5 Marking of hydraulic hose pipes

The marking on the fitting provides the following information:

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

(2) Date of manufacture of the hydraulic hose pipe (16/07 = year / month = July 2016) (period of use expires in July 2022)

(3) Maximum admissible operating pressure (210 bar)

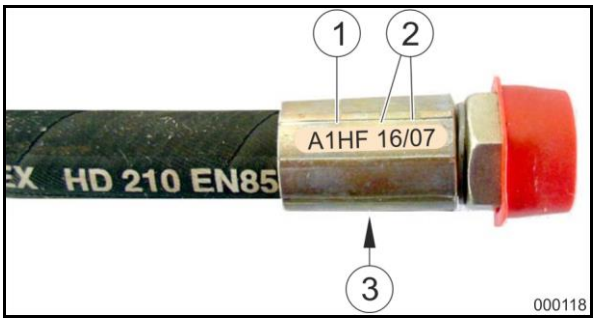


Fig. 19

2.8 Pick-up

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

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

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

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

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

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

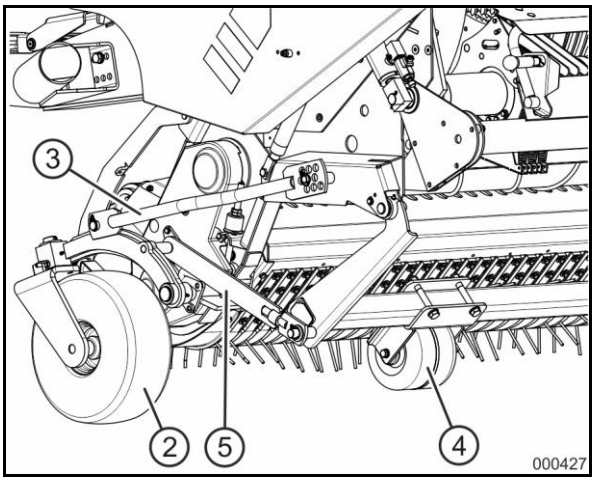


Fig. 20

2.9 Cutting unit

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

- for the elimination of blockages.
- for the return of cutting knives evaded to the rear to their original position,
- for the removal and installation of cutting knives.

The number of cutting knives (4) mounted in the cutting unit determines the cutting length of the loaded material. 44 cutting knives can be mounted. The shortest theoretical cutting length is then 35 mm.

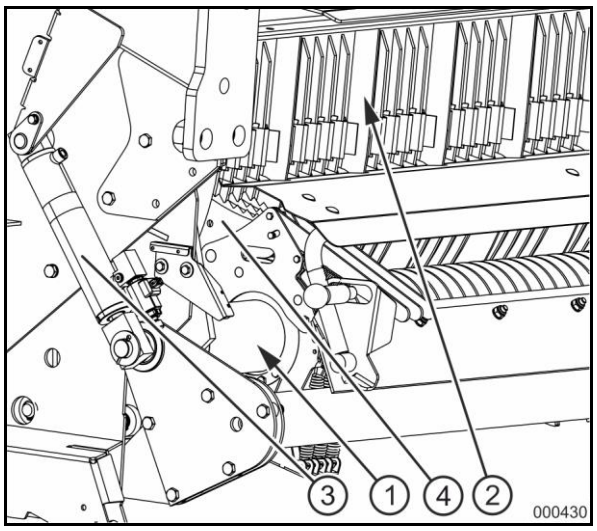


Fig. 21

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

In order to return the cutting knife to its working position, the cutting unit must be completely retracted and extended once, which can be automatically carried out in conjunction with the Field Operator (130) after lifting the pick-up at the end of the swathe.

2.10 Feeder rotor

The feeder rotor (1) interacts with the cutting unit (2) and transports the material picked up by the pick-up (3) through the conveyor duct into the cargo space. The CFS drum (4) homogeneously conveys the picked-up material to the feeder rotor.

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

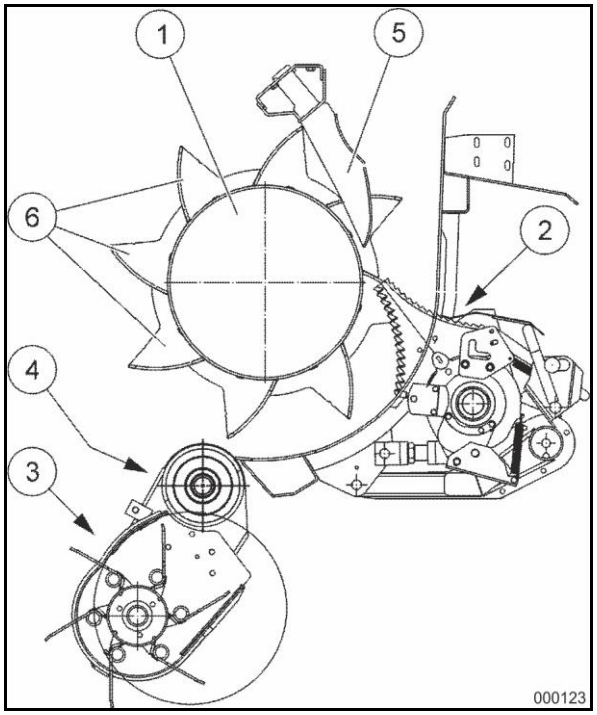


Fig. 22

Narrow swathes are widened by means of the CFS drum (3).

The auger windings (2) and the strippers (4) ensure a merging of the material from the outer sides of the rotor (1) in case of wide swathes or cornering.

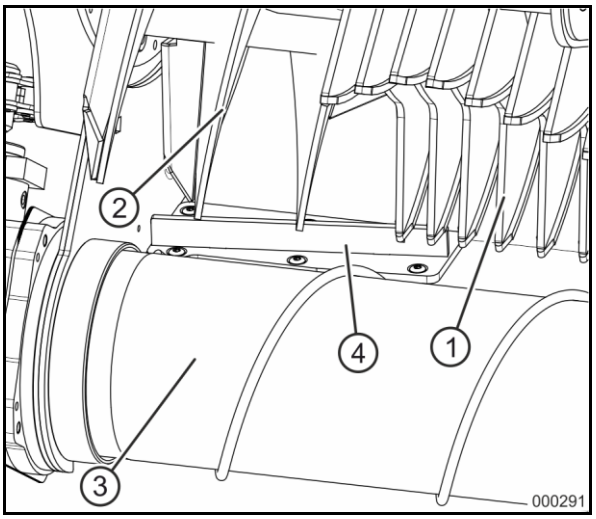


Fig. 23

2.11 Access door and ladder

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

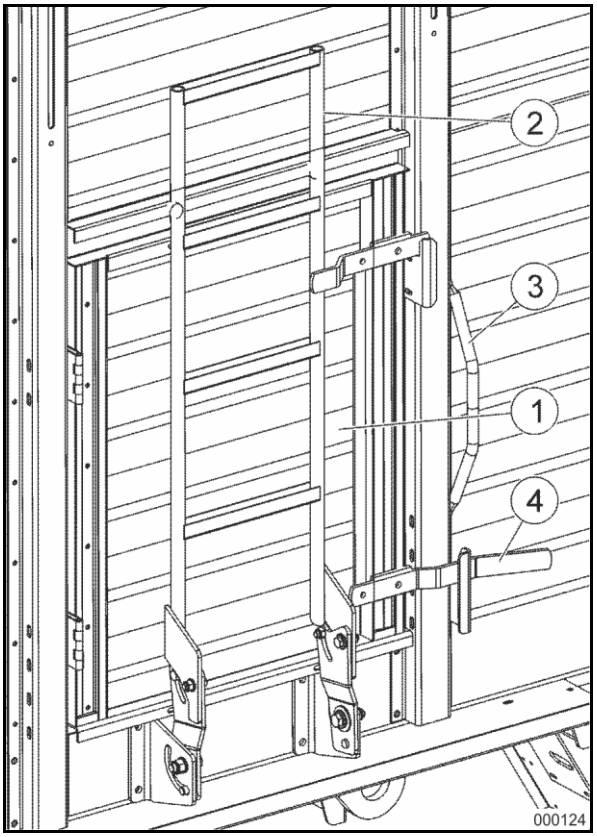


Fig. 24

2.12 Transport floor

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

The transport floor is driven hydraulically via two feed gearings.

The control set serves:

- to switch the transport floor on and off,

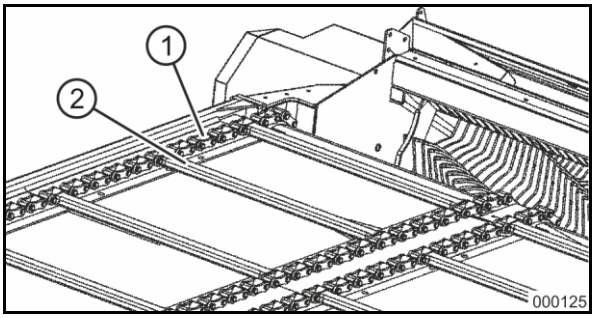


Fig. 25

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

2.13 Front panel with incorporated automatic charging system

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

The automatic charging system:

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

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

2.13.1 Front panel with incorporated automatic charging system

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

The front panel/automatic charging system:

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

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

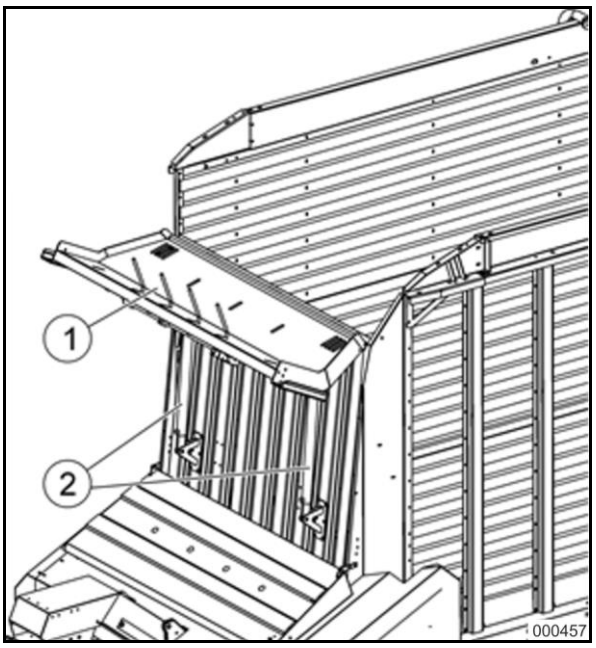


Fig. 26

2.13.2 ISOBUS control of automatic charging system

The automatic charging system (1):

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

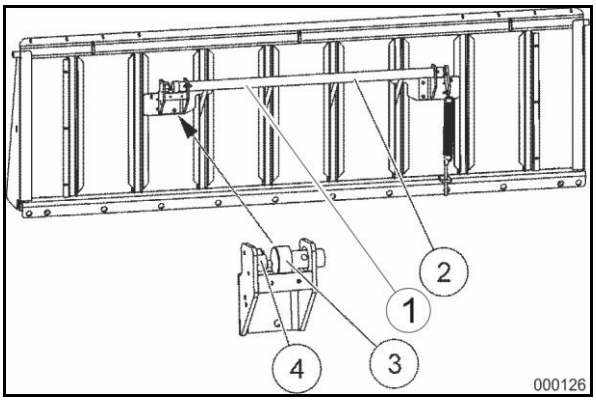


Fig. 27

With Field Operator 120: The higher the set filling degree, the higher the transport floor feed rate and the smaller the filling capacity.

Vice versa with Field Operator 130.

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

As soon as the deflected sensing band reaches the lowest set position, the transport floor automatically starts running at low feed rate and conveys the loaded material to the back. Increasing filling of the front section of the cargo space initiates a further deflection of the sensing band. The feed rate of the transport floor increases in proportion to the deflection of the sensing band.

As soon as the deflected sensing band reaches the highest set position, the loaded material is conveyed to the back at maximum feed rate. The transport floor stops as soon as the front section in the cargo space has been cleared and the loaded material no longer deflects the sensing band upwards.

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

2.13.3 Deactivate automatic charging system and stop transport floor

2.13.3.1 Machine without beaters

An electrical pressure switch as signal generator for the automatic charging system is mounted on the inside of the tailgate. If the machine is fully charged:

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

2.13.3.2 Machine equipped with beaters

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

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

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

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

2.14 Tailgate

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

2.14.1 Tailgate on machines without beaters

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

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

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

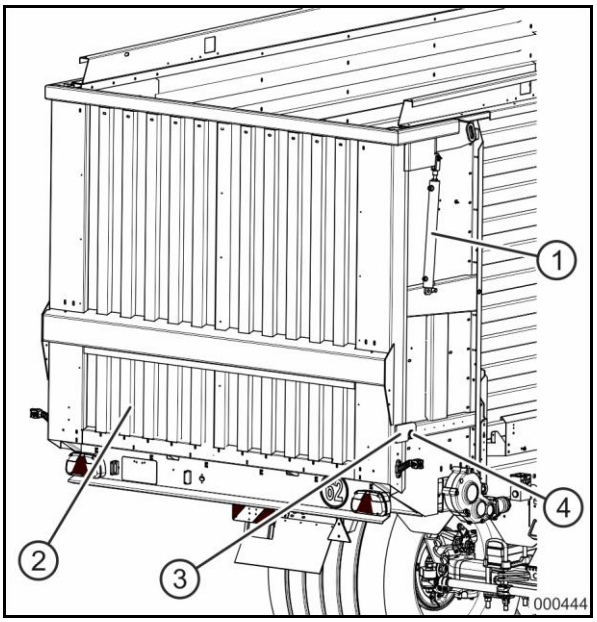


Fig. 28

2.14.2 Tailgate on machines equipped with beaters

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

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

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

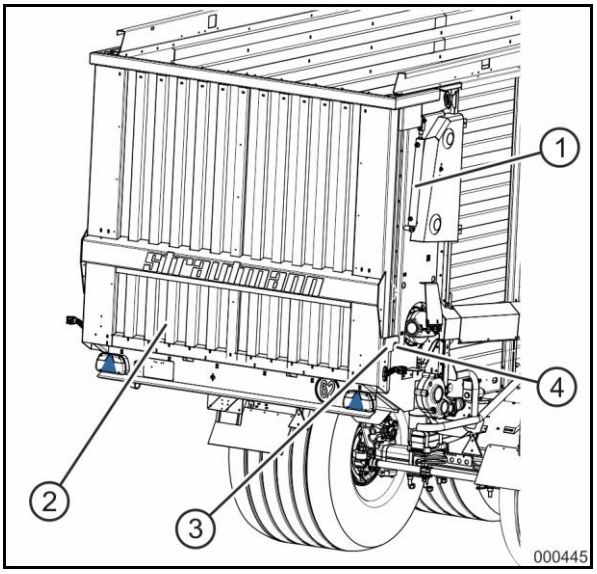


Fig. 29

2.15 Beaters

Machines equipped with 3 beaters (1)

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

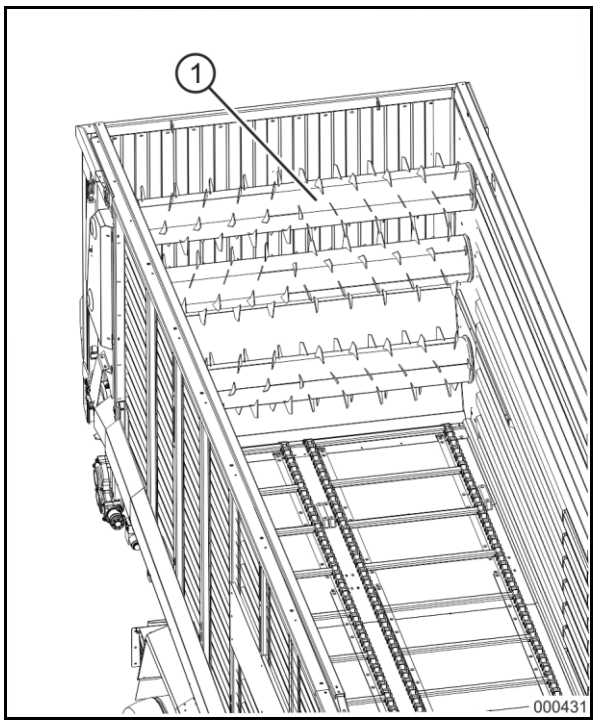


Fig. 30

2.16 Silage additive pump

Optional extra

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

If the pick-up is switched to floating position with the control system switched on, the electrical connection for the silage additive pump is switched on.

Switch the floating position of the pick-up off at the control set to switch the silage additive pump off.

The plug (1) for the connecting cable (2) is mounted at the cable harness near the control unit (3).

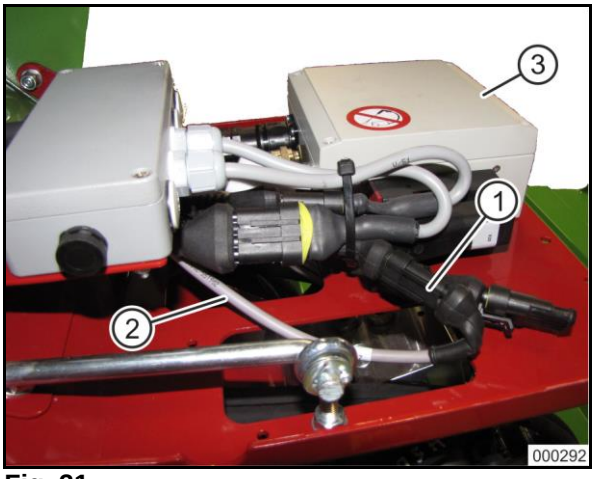


Fig. 31

2.16.1 Switch silage additive pump on/off with ISOBUS control

Field Operator 120

With ISOBUS control by means of Field Operator 120, activate or deactivate the electrical connection for the silage additive pump by a long press on the 

key.

In charge mode, the  symbol appears in the display. If the pick-up is in floating position, the electrical connection for the silage additive pump is switched on.

Field Operator 130

With ISOBUS control by means of Field Operator 130, activate or deactivate the electrical connection for the silage additive pump in the Machine Setup menu.

In charge mode and with the pick-up in floating position, the electrical connection for the silage additive pump is switched on. No readout on the display.

2.17 Traffic-related equipment

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

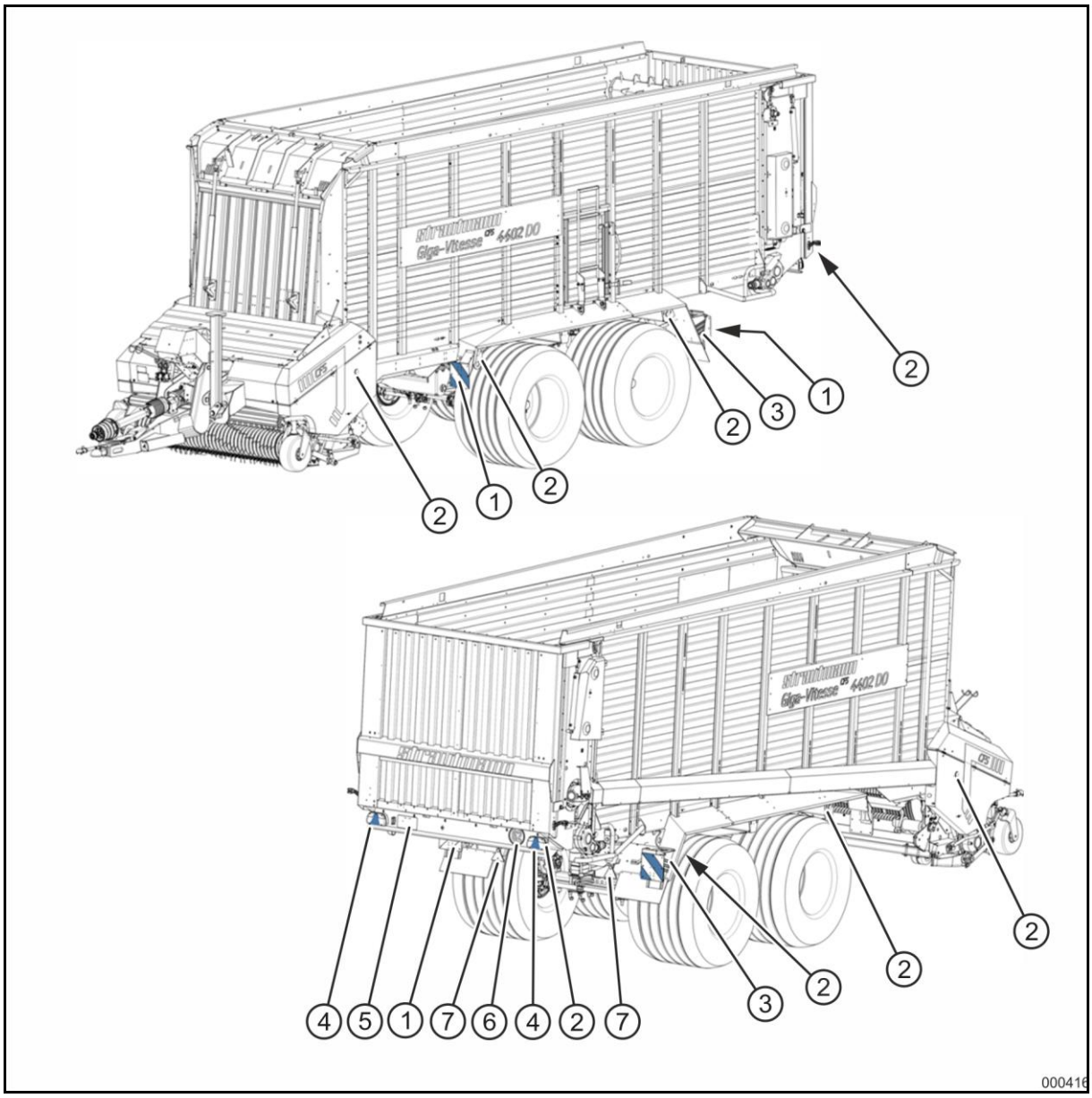


Fig. 32

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

2.18 Type plate

(1) Type plate with CE symbol

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

(3) Settings for ALB regulator

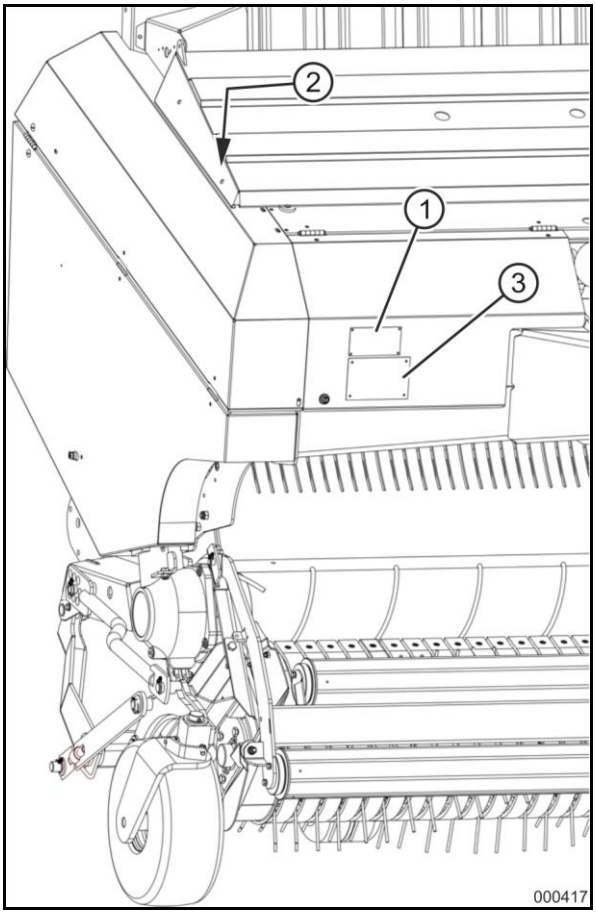


Fig. 33

Information on the type plate:

(1) Manufacturer

(2) CE symbol

(3) Vehicle/Machine ID number

(4) Type

(5) Empty weight [kg]

(6) Gross vehicle weight rating [kg]

(7) Admissible tongue load/front axle load [kg]

(8) Admissible rear axle load [kg]

(9) Approval number

(10) Year of manufacture

(11) Rated speed [min-1]

(12) Admissible hydraulic pressure [bar]

(13) Maximum admissible speed [km/h]

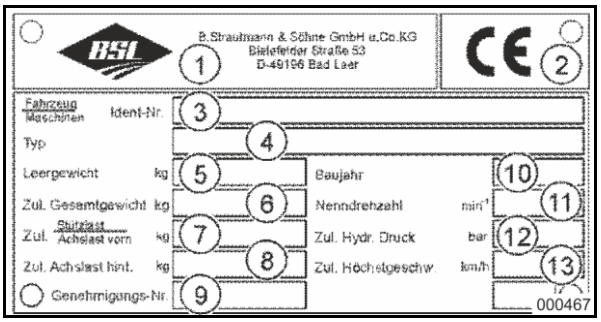


Fig. 34

2.19 Technical data

2.19.1 General data

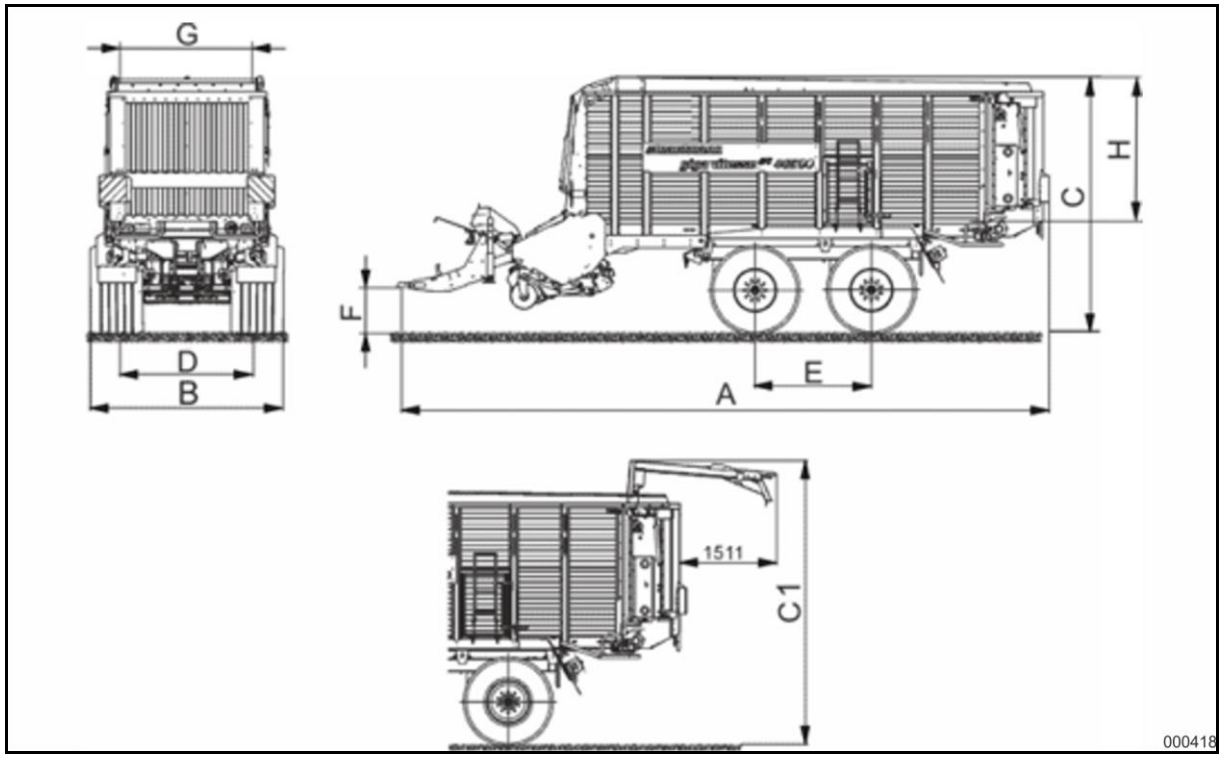


Fig. 35

Weights

	Unit	Giga-Vitesse CFS					
		3602	3602 DO	4002	4002 DO	4402	4402 DO
Gross vehicle weight rating							
with bottom linkage (up to 40 km/h)	kg	22000	22000	22000	22000	22000	22000
with bottom linkage (more than 40 km/h)	kg	20000	20000	20000	20000	20000	20000
hydro-pneumatic tandem chassis (up to 40 km/h)	kg	--	--	24000	24000	24000	24000
hydro-pneumatic tandem chassis (more than 40 km/h)	kg	--	--	22000	22000	22000	22000
hydro-pneumatic tridem chassis (up to 40 km/h)	kg	--	--	--	--	31000	31000
hydro-pneumatic tridem chassis (more than 40 km/h)	kg	--	--	--	--	29000	29000
Admissible tongue load							
with bottom linkage (up to 40 km/h)	kg	4000	4000	4000	4000	4000	4000
with bottom linkage (more than 40 km/h)	kg	2000	2000	2000	2000	2000	2000
Admissible axle load, front							
mechanical tandem chassis	kg	9000	9000	9000	9000	9000	9000
hydro-pneumatic tandem chassis	kg	--	--	10000	10000	10000	10000
hydro-pneumatic tridem chassis	kg	--	--	--	--	9000	9000
Admissible axle load, middle							
hydro-pneumatic tridem chassis	kg	--	--	--	--	9000	9000
Admissible axle load, rear							
mechanical tandem chassis	kg	9000	9000	9000	9000	9000	9000
hydro-pneumatic tandem chassis	kg	--	--	10000	10000	10000	10000
hydro-pneumatic tridem chassis	kg	--	--	--	--	9000	9000
Empty weight with tandem chassis	kg	9000	9400	9400	9800	9900	10200
Empty weight with tridem chassis	kg					11200	11500

Dimensions

	Unit	Giga-Vitesse CFS					
		3602	3602 DO	4002	4002 DO	4402	4402 DO
Loading capacity according to DIN 11741	m³	34	32	38	36	42	40
Loading capacity at medium pressing power	m³	64.6	60.8	72.2	68.4	79.8	76
Maximum travel speed	km/h	25/40/60/62		25/40/60/62		25/40/60/62	
A = Total length	m	9.42	9.42	10.22	10.22	11.02	11.02
B = Total width	m	2.90	2.90	2.90	2.90	2.90	2.90
C = Total height	m	max. 4.00	max. 4.00	max. 4.00	max. 4.00	max. 4.00	max. 4.00
C1 = Total height with open tailgate	m	max. 4.42	max. 4.42	max. 4.42	max. 4.42	max. 4.42	max. 4.42
D = Track, tandem axle	m	2.10	2.10	2.10	2.10	2.10	2.10
E = Wheelbase	m	1.50/1.80	1.50/1.80	1.50/1.80	1.50/1.80	1.50/1.80	1.50/1.80
F = Drawbar height, bottom linkage	m	550 - 700	550 - 700	550 - 700	550 - 700	550 - 700	550 - 700
G = Cargo space width	m	2250	2250	2250	2250	2250	2250
H = Cargo space height H = Cargo space height with extension	m	2290 2290	2290 2290	2290 2290	2290 2290	2290 2290	2290 2290
Picking-up width of pick-up	m	2325	2325	2325	2325	2325	2325
Number of pick-up tine rows	Pcs.	6	6	6	6	6	6
Tine spacing of pick-up	mm	55	55	55	55	55	55
Ground clearance of pick-up	m	With lifted folding drawbar approx. 060					

Tyres taken as a basis for the measured dimension: 800/45 R26.5

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

2.19.2 Tyre pressure

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

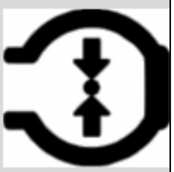
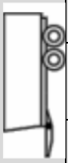
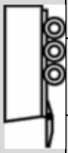
Tyre pressures with 22.5“ wheels

Tyre size	Tyre	Load index	Unit	Tandem 40 km/h 16 t	Tandem 40 km/h 18 t	Tandem 40 km/h 20 t	Tandem 65 km/h 16 t	Tandem 65 km/h 18 t	Tandem 65 km/h 20 t	Tridem 40 km/h 27 t	Tridem 40 km/h 30 t	Tridem 65 km/h 27 t	Tridem 65 km/h 30 t	max.
560/45 R22.5	Nokian Country King	152D	bar	3.2	3.7	--	--	--	--	3.7	--	--	--	4.0
600/50 R22.5	Michelin Cargo X-BIB	159D	bar	1.9	2.2	2.7	3.3	--	--	2.2	2.7	--	--	4.0
600/55 R22.5	Vredestein Flotation +	159A8	bar	1.8	--	--	--	--	--	--	--	--	--	2.0
600/55 R22.5	Vredestein Flotation +	168A8	bar	1.8	2.2	2.5	--	--	--	2.2	2.5	--	--	2.8
620/40 R22.5	Vredestein Flotation Pro	148D	bar	3.0	--	--	--	--	--	--	--	--	--	3.2
620/40 R22.5	Vredestein Flotation Pro	154D	bar	3.0	3.5	3.9	--	--	--	3.5	3.9	--	--	4.0
650/50 R22.5	Alliance I-380	163E	bar	1.6	1.9	2.3	2.5	3.1	3.6	1.9	2.3	3.1	3.6	4.0
700/40 R22.5	Alliance I-328	160A8	bar	1.7	2.0	2.5	--	--	--	2.0	2.5	--	--	2.7
710/35 R22.5	Nokian Country King	158D	bar	2.5	2.9	3.3	3.6	--	--	2.9	3.3	--	--	4.0
710/40 R22.5	Vredestein Flotation Pro	156D	bar	2.2	2.6	3.0	3.2	--	--	2.6	3.0	--	--	3.2
710/40 R22.5	Trelleborg T404	158A8	bar	1.9	--	--	--	--	--	--	--	--	--	2.0
710/45 R22.5	Vredestein Flotation Trac	165D	bar	1.9	2.3	2.6	2.9	3.4	3.9	2.3	2.6	3.4	3.9	4.0
750/45 R22.5	Alliance I-380	166A8	bar	1.4	1.7	2.0	2.2	2.7	3.2	1.7	2.0	3.2	3.2	4.0

Pick-up guide wheel = 2.5 bar

1 bar = 14.5 psi = 100kPa

Tyre pressures with 26.5“ wheels

													
				40 km/h 16 t	40 km/h 18 t	40 km/h 20 t	65 km/h 18 t	65 km/h 20 t	40 km/h 27 t	40 km/h 30 t	65 km/h 27 t	65 km/h 30 t	max.
600/50 R22.5	Michelin Cargo X-BIB	165D	bar	1.5	1.8	2.1	2.9	4.0	1.8	2.1	2.9	4.0	4.0
680/55 R26.5	Trelleborg Twin Radial	165D	bar	1.4	1.7	2.0	2.7	3.1	1.7	2.0	2.7	3.1	3.2
700/50 R26.5	Alliance I-328	169A8	bar	1.8	2.0	2.2	--	--	2.0	2.2	--	--	2.5
700/50 R26.5	Alliance I-328 HS	166C	bar	1.2	1.3	1.4	A	B	1.3	1.4	A	B	3.3
710/45 R26.5	Trelleborg T404	169A8	bar	1.5	1.8	2.0	--	--	1.8	2.0	--	--	2.4
710/45 R26.5	Vredestein Flotation Pro	170D	bar	1.6	1.9	2.2	2.8	3.2	1.9	2.2	2.8	3.2	4.0
750/45 R26.5	Vredestein Flotation Trac	170D	bar	1.6	1.9	2.2	2.8	3.2	1.9	2.2	2.8	3.2	4.0
800/45 R26.5	BKT Flotation 648	177A8	bar	1.0	1.0	1.2	--	--	1.0	1.2	--	--	3.0
800/45 R26.5	Alliance I-328	170A8	bar	1.1	1.1	1.3	--	--	1.1	1.3	--	--	2.3
800/45 R26.5	Vredestein Flotation Pro	174D	bar	1.4	1.6	1.9	2.5	2.8	1.6	1.9	2.5	2.0	4.0

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

1 bar = 14.5 psi = 100 kPa

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

Pick-up guide wheel = 2.5 bar

2.19.3 Required tractor equipment

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

2.19.3.1 Tractor engine output and p.t.o. speed

		Giga-Vitesse CFS					
		3602	3602 DO	4002	4002 DO	4402	4402 DO
Power required	kW	110		121		140	
	HP	150		165		180	
P.t.o. speed	min^{-1}	1000					

2.19.3.2 Electrical system

Battery voltage: 12 V (volt)

Socket for lighting: 7-pole

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

2.19.3.3 Hydraulic system

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

Do not mix mineral oils with bio oils!

Maximum operating pressure: 200 bar

Delivery rate: min. 40 l/min at 180 bar, max. 100 l/min at 200 bar

Hydraulic oil of machine: HLP 46

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

All hydraulic functions connected to the electro-hydraulic control block of the machine are operated via the control set. The electro-hydraulic control block

- is equipped for load-sensing operation as standard and should be connected to the respective connections of the tractor.
- is alternatively suitable for open or closed-centre hydraulic systems. It is then connected to a double-acting control device or to a single-acting control device and a depressurised return line leading directly into the hydraulic oil tank of the tractor.
- The conversion from open to closed-centre hydraulic system is carried out by means of the load-sensing screw at the electro-hydraulic control block.

The hydraulic oil flows back into the hydraulic oil tank of the tractor through the free return line with a low back pressure. Thus, a free return line reduces heating-up of the hydraulic oil.

Preconditions for safe operation of the electro-hydraulic forced steering axle system:

- A load-sensing capable hydraulic system. This is the only way to ensure a sufficient supply of the steering axle(s) with hydraulic oil at any time.
- A standby pressure of the tractor's hydraulic system over 15 bar. The optimum pressure is 30 bar to ensure that the steering system quickly follows the given steering angle. At 15 bar and less, the steering computer switches over to passive steering.
- A sufficient power supply of the steering computer via the control set (cable cross section 2 x 4 mm²). Retrofit an appropriate Strautmann supply line if necessary.
- A ball-type coupling K80 (according to ISO 24347) to couple the drawgear free of clearance and in a fail-safe manner.
- A ball-type coupling K50 (according to DIN 74058 / ISO 1103) at the same level and at a distance of 245-250 mm next to the K80 ball-type coupling to couple the forced steering axle free of clearance and in a fail-safe manner.

2.19.3.4 Control devices

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

2.19.3.5 Brake system

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

3 Safety instructions

This chapter provides important information for safety-conscious operation of the machine.

3.1 Correct use

The forage wagon models "Giga Vitesse CFS / Giga Vitesse CFS DO" are exclusively intended for cutting, charging, transport and distribution of green and dried-out forage.

Depending on the model, the maximum admissible speed is 40/60/62 km/h. Motorway journeys with a 62 km/h model are only allowed in connection with ABS.

Slopes can be travelled on as follows:

- Traversing hills

Direction of motion to the left	23 degrees
Direction of motion to the right	23 degrees

- Slope line

Uphill	23 degrees
Downhill	23 degrees

The following is also part of the correct use:

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

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

For any damage resulting from incorrect use

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

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 must provide the necessary personal protective equipment, such as:

- protective goggles,
- safety footwear,
- protective clothing,
- skin protectant, etc.

The user undertakes 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.

The user undertakes

- to keep all warning signs attached to the machine in legible condition.
- to replace any damaged warning signs.
- to observe the general national occupational safety, accident prevention and environmental protection rules.

Please contact the manufacturer in case of enquiries.

3.2.2 Operator’s obligation

Before starting work, any members of staff charged to operate the machine or carry out work on the machine undertake

- to observe the basic occupational safety and accident prevention regulations.
- to read and observe the chapter "General safety instructions" included in these operating instructions.
- to read the chapter "Warning and instructions signs" being part of these operating instructions and to observe the safety instructions included in the warning signs when operating the machine.
- to acquaint themselves with 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 (user).

Knowledge of the basic safety instructions and safety regulations is the prerequisite for safety-conscious handling and trouble-free operation of the machine.

3.2.3 Qualification of staff

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

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

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

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

This applies to any work:

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

3.3 Product safety

3.3.1 Hazardous area and dangerous spots

The dangerous area is the vicinity of the machine where people might be affected

- due to work-related movements of the machine and its working tools,
- due to loaded material or foreign objects blown out of / falling down from the machine,
- due to unintentional lowering of lifted working tools,
- due to accidental rolling of the tractor and the machine.

Within the hazardous area of the machine, there are dangerous spots where risks permanently exist or may occur unexpectedly. Warning signs mark such dangerous spots and warn about residual risks, which cannot be eliminated by design. The specific safety instructions of the respective chapters shall apply here.

People are not allowed in the hazardous area of the machine,

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

The operator is only allowed to move the machine or set working tools from transport to working position and from working to transport position or power such tools if there are no people within the hazardous area of the machine.

Dangerous spots exist:

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

3.3.2 Risks when handling the machine

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 operators or third parties,
- for the machine itself,
- to other material assets.

Only utilise the machine

- for its intended use.
- in a sound safety-related condition.

Immediately eliminate malfunctions which might impair safety.

3.3.3 Safety and protective devices

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

Check all safety and protective devices for visible damage and functional ability at least once a day.

Defective or removed safety and protective devices might cause dangerous situations.

WARNING 	**Risk of crushing, becoming entangled, wound up and being drawn in due to powered, unprotected driving elements!** This risk may cause most serious injuries, in particular to hands and fingers. • Start the machine only with the protective devices completely mounted and in fully operable condition. • Immediately replace defective protective devices with new ones.

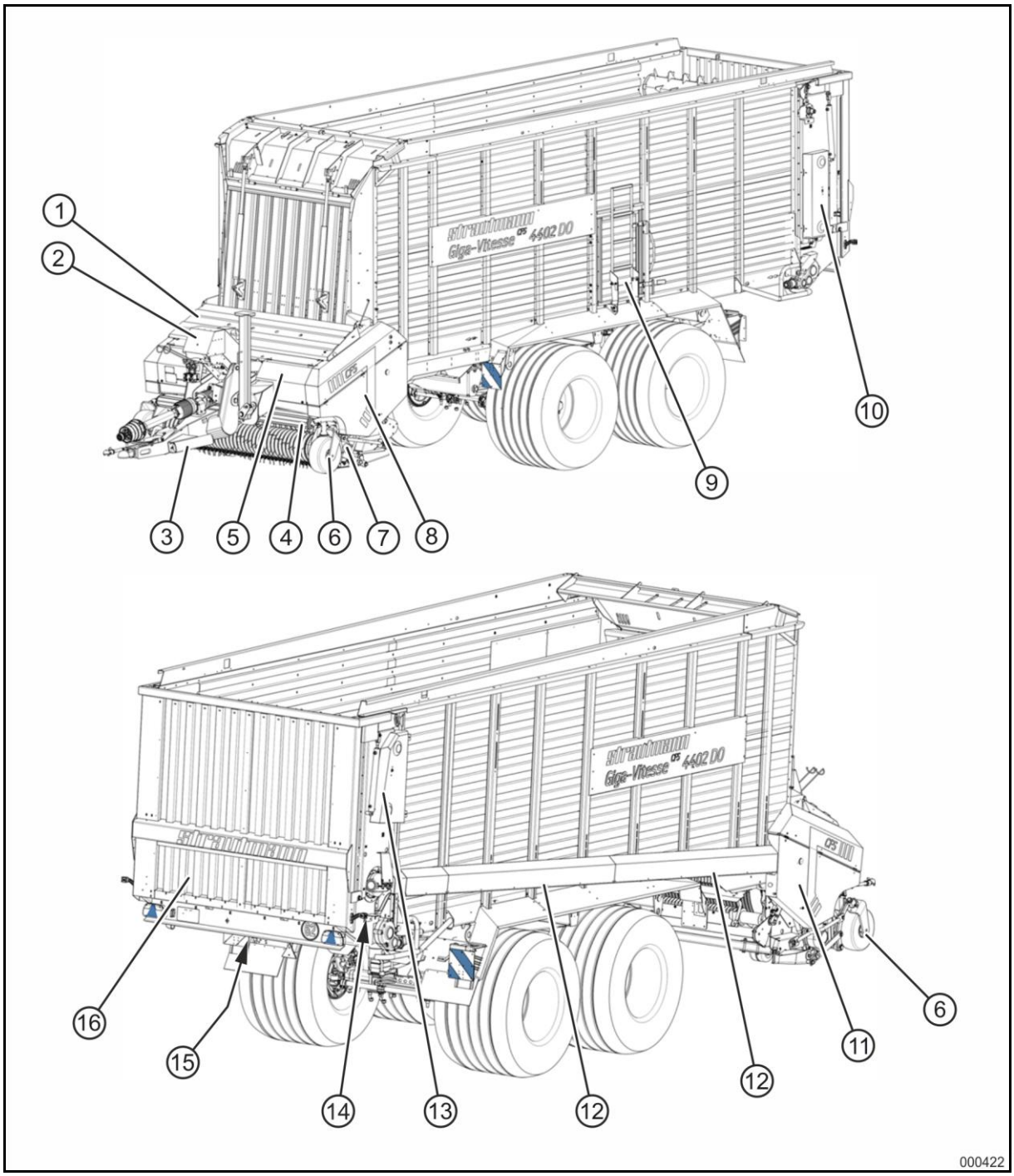


Fig. 36

(1) Bonnet
(2) Hydraulics protective device
(3) Bumper buffer with forced steering axle
(4) Holding-down device with pulley
(5) Drawbar protective device
(6) Guide wheel
(7) Protective casing, pick-up
(8) Side guard
(9) Access door to cargo space
(10) Side guard, beater drive, left-hand
(11) Side guard
(12) Tunnel cover for beater drive
(13) Side guard, beater drive, right-hand
(14) Stop-cock
(15) Bottom cover plates for feed shaft
(16) Tailgate

3.3.4 Structural alterations

Alterations, extensions and modifications on the machine shall only be allowed upon approval by B. Strautmann & Söhne GmbH u. Co.KG. This shall also apply to welding work on load-bearing parts.

All extension or modification measures require a written consent of B. Strautmann & Söhne GmbH u. Co. KG. Only use modification and accessory parts approved by B. Strautmann & Söhne GmbH u. Co. KG, in order to ensure e.g. that the validity of the operating license according to national and international regulations is not affected.

Vehicles provided with an official operating license or vehicle-linked devices and equipment provided with an official operating license or a road traffic license according to the road traffic regulations must be in the condition specified by that license.

WARNING

Risk due to breaking of load-bearing parts!

As a basic principle, the following is not allowed:

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

3.3.5 Spare and wearing parts, auxiliary materials

Immediately replace machine parts which are not in perfect condition.

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

B. Strautmann & Söhne GmbH u. Co. KG will not assume any liability for damage resulting from the use of non-approved spare and wearing parts or auxiliary materials.

3.3.6 Warranty and liability

As a basic principle, our "General Sales Terms and Delivery Conditions" shall apply. They have been available to the user since 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,
- unauthorised structural alterations on the machine,
- insufficient inspection of machine parts which are subject to wear,
- improperly effected repairs,
- disasters due to foreign objects and force majeure.

3.4 Basic safety instructions

WARNING

Before starting work with and on the machine, read and observe the basic safety instructions!

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

Secure lifted machine parts/the lifted machine against accidental lowering!

Make sure that people leave the hazardous areas!

Non-observance of these instructions may cause most serious bodily injury (irreversible) or even death.

WARNING

Risk due to lacking road and operational safety!

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

The machine is only allowed to be operated by one person:

- mainly from the driver seat of the tractor

Secure machine against accidental operation:

- Turn the tractor engine off
- Pull the ignition key out
- Lock the tractor cabin

Secure the machine against accidental rolling:

- By means of the parking brake and/or the chocks

WARNING

As a basic principle, the manipulation of actuating and operating elements is generally prohibited!

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 respective operating element is released. This shall not apply to

- continuous movements or
- automatically controlled movements or
- movements which, for functional reasons, require a floating or pressing position.

3.4.1 Lock tailgate

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

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

I - Stop-cock open

Fig. 37

0 - Stop-cock closed

Fig. 38

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

3.4.2 General safety and accident prevention instructions

- Apart from these safety instructions, observe the general national accident prevention and environmental protection rules!
- Observe the legal road traffic regulations when travelling on public roads and paths.
- The warning signs and other markings attached to the machine provide important information for the safe operation of the machine. Observance of these instructions serves your safety!
- Check the immediate vicinity of the machine (people) before starting moving and putting the machine into operation! Ensure sufficient visibility!
- Carrying passengers and transporting animals or objects are not allowed on the machine!
- Observe the activity-related safety instructions included in the other chapters in addition to the basic safety instructions included in this chapter!
- Wear your personal protective equipment when carrying out work on the machine!
- Adapt your driving such that you have always safe control over the tractor with the attached or hitched machine!

  Consider your personal abilities as well as the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the influences exerted by the attached or hitched machine.

3.4.2.1 Hitch and unhitch machine

WARNING 	**Risk of crushing between tractor and machine when hitching the machine!** Make sure that people leave the hazardous area between tractor and machine before approaching the machine. Present helpers are only allowed to act as a guide next to the tractor and the machine and to enter the space between the vehicles after the vehicles have stopped.

WARNING 	**Risk due to a failure of the power supply between tractor and machine, caused by damaged supply lines!** Observe the course of the supply lines during hitching. The supply lines • must easily give way to any movements of the hitched machine without any stress, buckling or chafing,. • must not chafe against external components.

- Only use appropriate tractors to hitch and transport the machine!
- Properly hitch the machine to the specified devices!
- Unhitch the machine from the tractor only when empty!
- Hitching machines to a tractor must not lead to exceeding
  - the gross vehicle weight rating of the tractor,
  - the admissible axle loads of the tractor,
  - the admissible load capacities of the tractor tyres,

- the admissible tongue load at the tractor's coupling point,
- the admissible towing capacity of the coupling device,
- the tractor's front axle load must never fall below 20 % of the tractor's empty weight.

The tractor must reach the deceleration specified by the tractor's manufacturer even with the machine attached / hitched up.

- Secure tractor and machine against accidental rolling before hitching or unhitching the machine!
- Put the support device into the respective position when hitching and unhitching the machine (stability)!
- Risk of injuries due to crushing and shearing points while actuating the support device!
- Hitching and unhitching machines to or from the tractor requires particular care! Crushing and shearing zones exist within the area of the coupling point between tractor and machine!
- People are not allowed between tractor and machine, while the tractor is approaching the machine!

  Present helpers are only allowed to act as a guide next to the vehicles and to enter the space between the vehicles after the vehicles have completely stopped.
- 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 unhitched machines in a stable position!

3.4.2.2 Use of machine

WARNING

Risk of becoming entangled, wound up and risk due to blown-away foreign objects within the hazardous area of the powered propeller shaft!

- Check the safety and protective devices of the propeller shaft for proper functioning and completeness before each startup of the machine.

  Have damaged safety and protective devices of the propeller shaft immediately replaced by an authorised workshop.
- Ensure that the propeller shaft guard is secured against twisting by means of the clip chain.
- Keep sufficient safe distance to the powered propeller shaft.
- Make sure that people leave the hazardous area of the powered propeller shaft.
- Immediately switch the tractor engine off in case of emergency.

WARNING

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

This risk may cause most serious injuries, in particular to hands and fingers.

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

- 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!
- Ensure that the fastening elements fit properly before each startup of the machine!
- People are not allowed:
  - within the turning and swivelling range of movable machine parts,
  - within the discharge area of the machine,

- within the operating/hazardous area of the machine,
- beneath lifted and unsecured movable machine parts,
- on the transport floor as long as the tractor engine is running.

- Avoid sudden changes of direction when travelling uphill and downhill and when traversing hills (risk of tipping over!).
- Only actuate powered machine parts if people keep sufficient safe distance to the machine!
- Safely support folded-up covers before standing underneath them!
- Immediately switch the tractor's p.t.o. shaft off in case of a response of the overload clutch.
- Secure the tractor against accidental starting and rolling before leaving it!

  For this purpose,

  - apply the parking brake,
  - turn the tractor engine off,
  - pull the ignition key out.

3.4.2.3 Transport journeys

- Observe the respective national road traffic regulations when travelling on public roads!
- Before carrying out transport journeys, check
  - the supply lines for proper connection,
  - the lighting system for damage, proper functioning and cleanliness,
  - the brake and hydraulic system for visible defects,
  - whether the parking brake has been completely released,
  - the brake system for proper functioning.
- Always ensure sufficient steerability and braking ability of the tractor!

  Machines attached or hitched to a tractor and front or tail weights influence the driving characteristics as well as the steerability and the braking ability of the tractor.
- Use front weights if necessary!

  The tractor's front axle load must never fall below 20 % of the tractor's empty weight, in order to ensure sufficient steerability.
- Always properly fix front or tail 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! Run the machine being only partly filled if necessary.
- The tractor must ensure the required deceleration for the charged combination (tractor and attached / hitched machine)!
- Check the braking effect before starting the journey!
- Observe the broad overhang and the flywheel mass of the machine when cornering with attached or hitched machine!
- Set all swivelling machine parts to transport position before carrying out transport journeys, in order to avoid dangerous movements. Use the transport locks provided for this purpose!
- Before carrying out transport journeys, check whether the required transport equipment, such as lighting, warning and protective devices, has been properly mounted on the machine!
- Adapt your travelling speed to the conditions prevailing at the time!
- Shift down to a lower gear before travelling downhill!
- Always switch the single-wheel brake system off (lock pedals) before carrying out transport journeys!
- Never take a tight curve at excessive travelling speed.
- It is imperative to lock the passive steering axle:
  - at travelling speeds of more than 40 km/h,
  - before travelling over clamp silos,
  - on rough road tracks,
  - when traversing hills,
  - before carrying out reverse travels.

3.4.3 Hydraulic system

WARNING 	**Risk of infection due to hydraulic oil squirting out under high pressure!** Make sure that the hydraulic system of the tractor and the machine has been depressurised when connecting and disconnecting the hydraulic hose pipes.

WARNING 	**Risk of being crushed, cut, becoming entangled, being drawn in and risk of impact due to faulty hydraulic functions caused by improperly connected hydraulic hose pipes!** Observe the coloured markings at the hydraulic plugs when connecting hydraulic hose pipes.

- Have work on the hydraulic system carried out by an authorised workshop!
- The settings of the pressure limiting valve must not be changed!
- The hydraulic system is under high pressure!
- Ensure to properly connect the hydraulic hose pipes!
- It is not allowed to block any operating elements on the tractor, which serve to directly initiate hydraulic or electrical movements of components. The respective movement must automatically stop as soon as the respective operating element is released.

  This shall not apply to

  – continuous movements or
  – automatically controlled movements or
  – movements which, for functional reasons, require a floating or pressing position.
- Before carrying out any work on the hydraulic system

  – put the machine down,
  – secure lifted movable machine parts against accidental lowering,
  – depressurise the hydraulic system,
  – turn the tractor engine off,
  – apply the parking brake,
  – pull the ignition key out.
- Have the 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 Strautmann hydraulic hose pipes.
- The period of use of the hydraulic hose pipes should not exceed six years. For thermoplastic hoses and hose pipes, other reference values may be relevant. The possible maximum shelf life of two years must not be exceeded.
- Never try to block hydraulic hose pipe leaks with your hands or fingers!

  Liquid (hydraulic oil) squirting out under high pressure may enter the skin and the body and cause serious injuries! If injuries caused by hydraulic oil occur, immediately seek medical assistance.
- Use appropriate means when trying to locate leakages! Risk of serious infections.
- Risk of explosion due to improper work on hydraulic accumulators!

Welding, soldering, drilling or other work on hydraulic accumulators which might affect the mechanical properties is not allowed.

- Risk due to leaking hydraulic oil!

  This risk may cause serious injuries due to slipping.

  Immediately remove fresh oil stains by means of binding agents.

  Dispose of hydraulic oil according to regulations. Contact your oil supplier in case of disposal problems.

  Beware that no hydraulic oil penetrates the soil or water.

3.4.4 Electrical system

- Always disconnect the battery (minus pole)/control unit when carrying out work on the electrical system!
- Do not connect any additional electrical loads to the control set.
  - Additional electrical loads are e.g. a silage additive pump or additional lighting (more than 2 lamps).
  - For additional loads, we offer an additional control which triggers these additional loads via LIN module/control unit.
- Only use the specified fuses. When using too big fuses, the electrical system may be destroyed – risk of fire!
- Ensure proper connection of 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!
- Risk of explosion! Avoid sparking and open fire in the vicinity of the battery!
- 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 and/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 2014/30/EU as amended from time to time and bear the CE symbol.

3.4.5 Propeller shafts

- Exclusively use the propeller shaft specified or delivered by Strautmann and equipped with proper protective devices!
- Read and observe the operating instructions for the propeller shaft! Proper use and maintenance of the propeller shaft prevent serious accidents.
- The protective tube and the protective cone of the propeller shaft must be undamaged and the protective cover of the tractor and machine propeller shaft must be mounted and in proper condition! The safety and protective devices of the extended propeller shaft must overlap by at least 50 mm. If not, do not power the machine via the propeller shaft.
- Working with damaged protective devices is not allowed!
- Mounting and dismounting of the propeller shaft is only allowed
  - with the propeller shaft switched off
  - with the tractor engine turned off
  - with the ignition key pulled out
  - with the parking brake applied
- Always ensure proper mounting and securing of the propeller shaft!
- Never use the propeller shaft without protective device or with a damaged protective device.
- Always mount the wide-angle joint at the pivot point between tractor and machine when using wide-angle propeller shafts!
- Observe the specified tubular covers of the propeller shafts in transport and working position! (Observe the operating instructions for the propeller shaft!)
- Observe the admissible angular misalignment and the travel of the propeller shaft when cornering!
- Before switching the propeller shaft on, check whether the selected speed of the tractor's p.t.o. shaft has been adjusted to coincide with the admissible driving speed of the machine!
- Make sure that people leave the hazardous area of the machine before switching the propeller shaft on.
- People are not allowed within the range of the rotating propeller shaft when work with the propeller shaft is being carried out.
- Never switch the propeller shaft on with the tractor engine turned off!
- Always switch the propeller shaft off if the angular misalignments occurring are too large or when it is not required!
- Risk of injury due to the flywheel mass of the machine parts continuing to rotate for a short time after the propeller shaft has been switched off!

  Do not approach the machine too closely during that time! Do not carry out any work on the machine until all machine parts have completely stopped!
- Secure tractor and machine against accidental starting and rolling before carrying out any cleaning, lubrication or set-up work on propeller shafts.
- Place the uncoupled propeller shaft onto the respective holder! Never use the clip chain of the propeller shaft to hang up the uncoupled propeller shaft.
- Put the protective cover onto the propeller shaft stub after the propeller shaft has been uncoupled!
- In case of the propeller shaft being equipped with an overload or overrunning clutch, this clutch must always be mounted at the machine.
- Ensure the correct fitting length and fitting position when coupling the propeller shaft. The tractor symbol on the protective tube of the propeller shaft indicates the propeller shaft connection at the tractor.

- Before switching the propeller shaft on, observe the safety instructions for p.t.o. shaft operation included in the chapter "Safety instructions for the operator".
- 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 authorised workshop is allowed to repair a propeller shaft.

3.4.6 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 rigid-drawbar trailers with tongue load!
- Only an authorised workshop is allowed to adjust the height of the drawgear for towing-hook drawbars with tongue load!
- Ensure sufficient tongue load at the support device when unhitching and parking a single-axle machine!

3.4.7 Brake system

WARNING	**Risk of crushing, cuts, becoming entangled, being drawn in and risk of impact due to improper functioning of the brake system!**
	The setting dimension (L) at the automatic load-sensitive brake pressure regulator must not be modified. The setting dimension (L) must correspond to the value indicated on the ALB plate.

If your machine is equipped with a combination of compressed-air brake system and hydraulic brake system: Always use only one of the two brake systems during coupling!

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

- Only authorised workshops or recognised brake services are allowed to carry out adjustment and repair work on the brake system!
- Have the brake system regularly and thoroughly checked!
- In order to maintain the operational safety, the wheel brakes must always be properly adjusted.
- Immediately stop the tractor in case of a malfunction of the brake system. Have the failure promptly remedied!
- Safely park the machine and secure it against accidental rolling (chocks) before carrying out any work on the brake system! Secure the lifted machine parts against accidental lowering!
- Especially beware when carrying out welding and drilling work and work involving open fire in the vicinity of brake lines!
- Always test the brakes after any adjusting and maintenance work on the brake system!
- The brake system of the tractor must be compatible with the brake system of the machine!

3.4.7.1 Compressed-air brake system

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

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

3.4.9 Tyres

- Only qualified personnel equipped with appropriate fitting tools is allowed to carry out repair work on tyres and wheels!
- Only place the lifting device at the marked fixing points when changing tyres.
- Ensure sufficient ground stability before lifting the machine by means of a lifting device and securing the machine against accidental lowering by means of safety stands. Additionally use solid, load-distributing supports if necessary.
- Never stand under a lifted, unsecured machine.
- Regularly check the tyre pressure!
- Observe the specified tyre pressure! Risk of explosion in case of excessive tyre pressure!
- Safely park the trailer and secure it against accidental lowering and rolling (parking brake, chocks) before carrying out any work on the tyres!
- Retighten all fastening screws and nuts according to Strautmann's specifications!
- Check the tyre pressure at least every 2 weeks. If the machine has not been used for a longer time, check the tyre pressure before putting the machine into operation again.
- 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 respective machine.
- Never overload the tyres.
- Ensure that the caps are seated on the valves and have been tightened.
- Preferably check the tyres during operation for "folds" or other abnormal deformation.
- Remove stones, pebbles, nails and other foreign objects stuck in the tyre, as otherwise they further penetrate the tyre.
- Repair deeper cuts as soon as possible.
- Relieve the tyres if they are not intended to be used for a longer period, in order to avoid deformation. Store "loose" tyres at a dark place, free of oil and other chemicals. Do not let tyres come near electric motors, as the ozone produced by the motors slowly dessicates the rubber.

3.4.10 Cleaning, service, maintenance and trouble-shooting

- As a basic principle, carry out cleaning, service and maintenance work on the machine only
  - with the tractor engine turned off,
  - with the ignition key pulled out,
  - with the parking brake applied on the tractor and trailer,
  - with the machine plug removed from the on-board computer.
- Regularly check screws and nuts for tightness and retighten them if necessary!
- Secure the lifted machine or lifted machine parts against accidental lowering before carrying out cleaning, service or maintenance work on the machine!
- Use appropriate equipment and gloves when replacing working tools with blades!
- Dispose of oils, greases and filters properly!
- Disconnect the generator and battery cables on the tractor before carrying out electrical welding work on the tractor and attached machines!
- Spare parts must at least comply with Strautmann's specified technical standards, which is ensured when using original Strautmann spare parts!
- Carry out the stipulated setting, maintenance and inspection work in due time.
- Secure all operating media such as compressed air and hydraulic against accidental startup.
- Fix larger assemblies carefully to lifting equipment and secure them before replacing them.
- Check loosened screwed connections for tightness. After finishing maintenance work, check the safety and protective devices for proper functioning.
- 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.

3.4.11 Risks due to residual energy

Pay attention to the possible occurrence of mechanical, hydraulic, pneumatic and electrical/electronic residual energies on the machine.

Take respective measures when instructing the operating staff. For detailed information, please refer to the respective chapters of these operating instructions!

3.5 Warning and instruction signs

Always keep all warning and instruction signs attached to the machine in clearly legible condition. Replace illegible warning and instruction signs. Order the warning and instruction signs according to their order number (e.g. 870 10 277):

- from the dealer or
- directly via the Strautmann spare parts warehouse

  (+ 49 (0) 5424 802-30)

3.5.1 Warning signs

Design

Warning signs mark dangerous spots on the machine and warn about residual risks. At these dangerous spots, risks exist permanently or may occur unexpectedly.

A warning sign consists of 2 fields:

Field 1

shows the pictographic risk description surrounded by a triangular hazard symbol.

Field 2

shows the pictographic instruction how to avoid the risk.

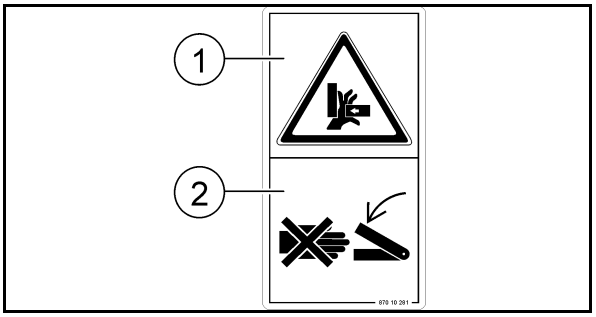


Fig. 39

Explanation

The **Order number** and **Explanation** column provides the description for the illustrated warning sign. The description of the warning sign is always identical and indicates in the following order:

1. The description of risk:

   Risk of crushing due to movable machine parts!

2. The consequences of non-observance of the instruction(s) how to avoid the risk:

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

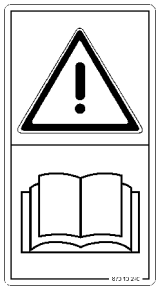
3. The instruction(s) how to avoid the risk:

   Never reach into the hazardous area 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 movable machine parts.

87010270

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

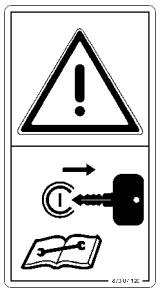


87007120

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

This risk may cause most serious injuries or even death.

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



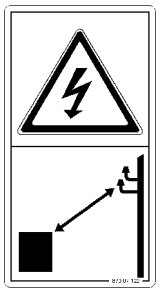
87007122

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

This risk may cause most serious injuries or even death.

Keep sufficient safe distance to high-voltage overhead lines.

Nominal voltage	Safe distance to overhead lines
up to 1 kV	1 m
over 1 up to 110 kV	3 m
over 110 up to 220 kV	4 m
over 220 up to 380 kV	5 m
nominal voltage unknown	5 m



87007104

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

This risk may cause most serious injuries or even death.

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

87007117

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

This risk may cause most serious injuries or even death.

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

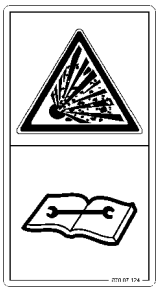
87007123

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

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

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

87007124



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

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

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

87007126

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

This risk may cause most serious injuries or even death.

Before unhitching the machine from the tractor or parking the machine, secure it against accidental rolling by means of the parking brake and/or the chocks.

87007130

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

This risk may cause most serious injuries or even death.

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

87010271

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

This risk may cause most serious injuries or even death.

People are not allowed within the hazardous area of the machine as long as the tractor engine is running.

87010276

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

This risk may cause most serious injuries or even death.

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

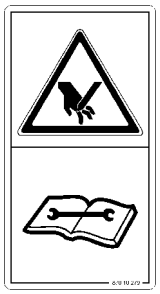
87010278

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

This risk may cause most serious injuries or even death.

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

87010279



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

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

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

87010280

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

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

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

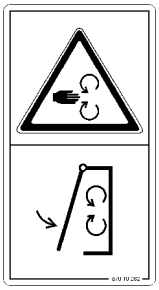
87010281

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

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

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

87010282



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

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

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

87010283

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

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

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

87010284

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

This risk may cause most serious injuries or even death.

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

87010287

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

This risk may cause most serious injuries or even death.

As a basic principle, the following is not allowed:

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

87010289

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

This risk may cause most serious injuries or even death.

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

3.5.2 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 summarised in a table.

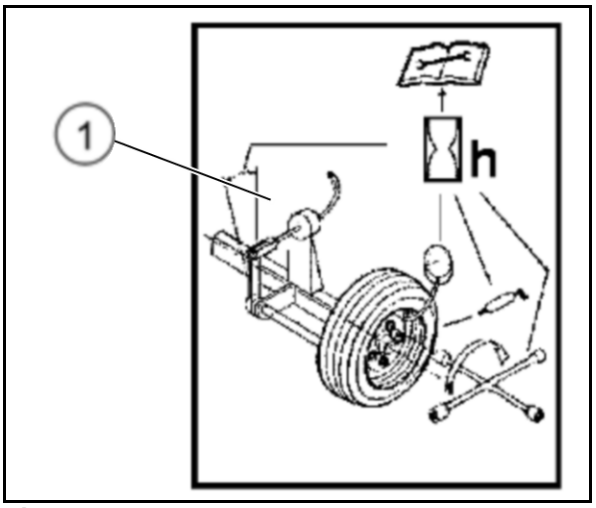
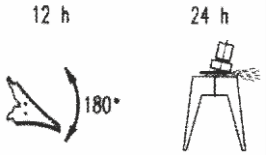


Fig. 40

50406501

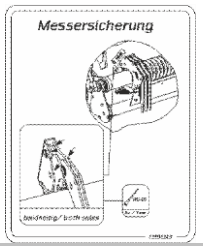
Turn cutting knives over every 12 service hours, grind them every 24 service hours.



73506543

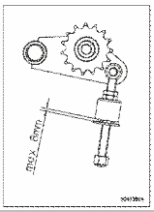
Maintenance instruction, knife protection system

Lubricate the rollers of the knife protection system and check them for smooth running on both sides at least 5 times a year!



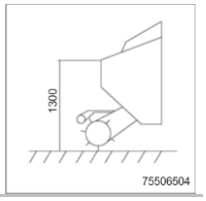
50433504

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



75506504

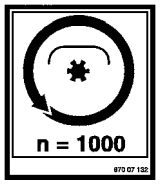
Adjust mounting height of folding drawbar!



87007132

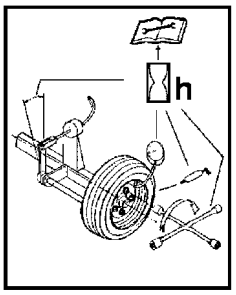
The required driving speed of the machine is 1000 rpm.

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



87007133

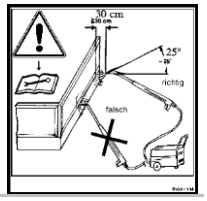
Observe the information for braking axle maintenance included in the operating instructions.



87007134

Risk due to improper cleaning of the machine

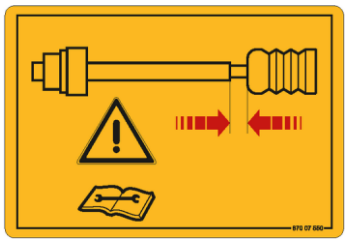
It is imperative to observe the information in the respective chapter when using a pressure washer/steam blaster for cleaning the machine.



87007550

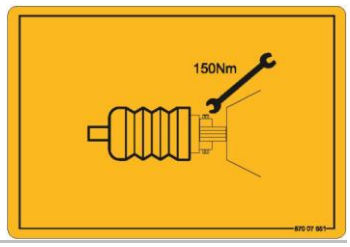
Adjust length of propeller shaft.

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



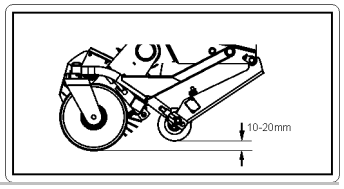
87007551

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



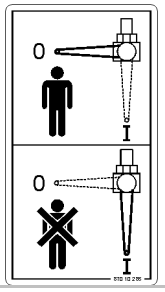
87007556

Set additional guide wheels (optional extra) 10-20 mm higher than the guide wheels.



87010285

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



54106501

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

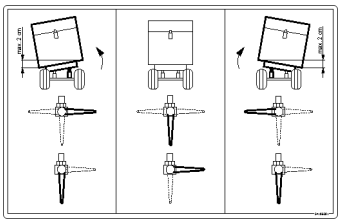
(1) Upper stop-cock to the right (open) = Right-hand vehicle side preselected

→ Lower stop-cock down (open) = Right-hand vehicle side can be lifted (max. 2 cm)

(2) Upper stop-cock down (closed) and lower stop-cock to the right (closed) = Travelling height cannot be changed

(3) Upper stop-cock to the left (open) = Left-hand vehicle side preselected

→ Lower stop-cock down (open) = Left-hand vehicle side can be lifted (max. 2 cm)



(1) (2) (3)

87010288

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

87006091

This pictograph marks lashing points for fixing lashing equipment when transporting the machine.

3.5.3 Placing of warning and instruction signs

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

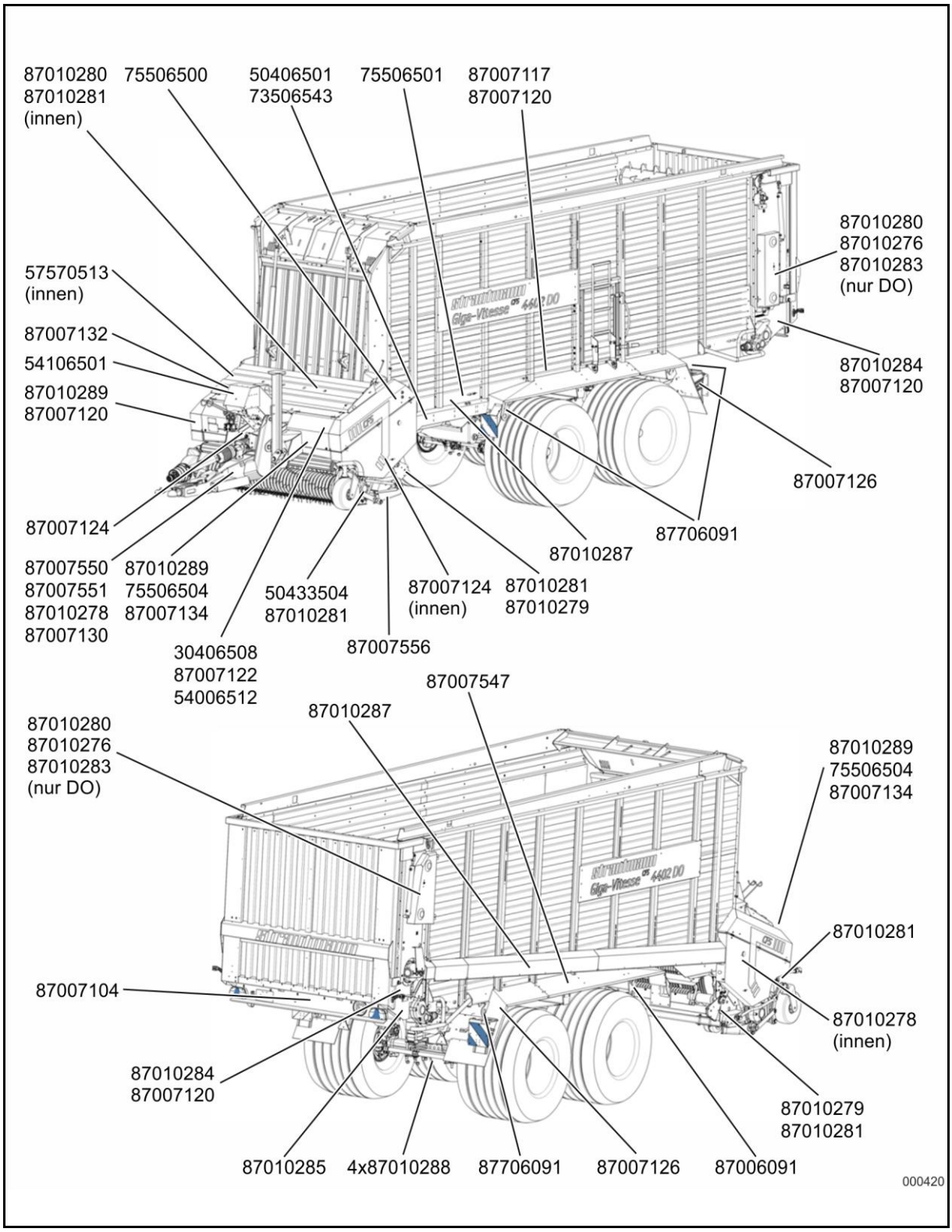


Fig. 1

3.6 Risks due to non-observance of safety instructions

Non-observance of the safety instructions

- may cause a risk to people and a threat to the environment and the machine.
- may lead to invalidation of any claims for damages.

In particular, non-observance of the safety instructions may bring about e.g. the following risks:

- Risk to people due to non-secured work areas.
- Failure of essential machine functions.
- Failure of specified service and maintenance procedures.
- Risk to people due to mechanical and chemical effects.
- Threat to the environment due to leaking hydraulic oil.

4 Loading and unloading of machine

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

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

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

Additionally observe the chapter "Basic safety instructions!

Observe the marked application and lashing points when loading the machine.

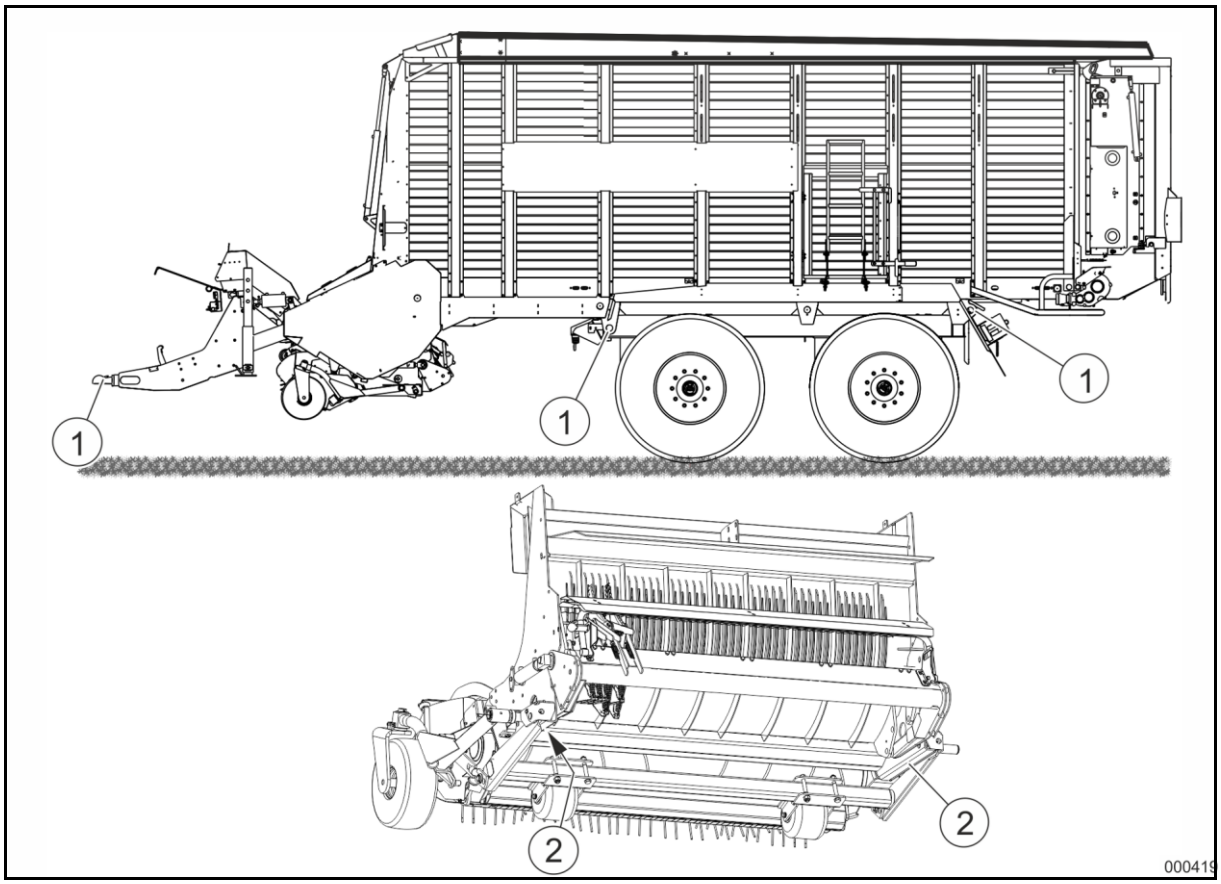


Fig. 41

(1) Load-bearing points (on both sides)

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

4.1 Loading and unloading by means of a tractor

WARNING

Risk of accident if the tractor is not suitable and the brake system of the machine is not connected to the tractor and filled!

Observe the operating instructions for the tractor.

- 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 with the required equipment!
- Only start the tractor with the hitched machine moving when the pressure gauge on the tractor indicates 5.0 bar!

4.2 Loading and unloading by means of a crane

The machine can be loaded and unloaded by means of a crane; a spacer is required for this purpose, (not included in the scope of delivery).

WARNING

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

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

Never use the frame of the guide wheels or additional guide wheels (optional extra) as supporting surface!

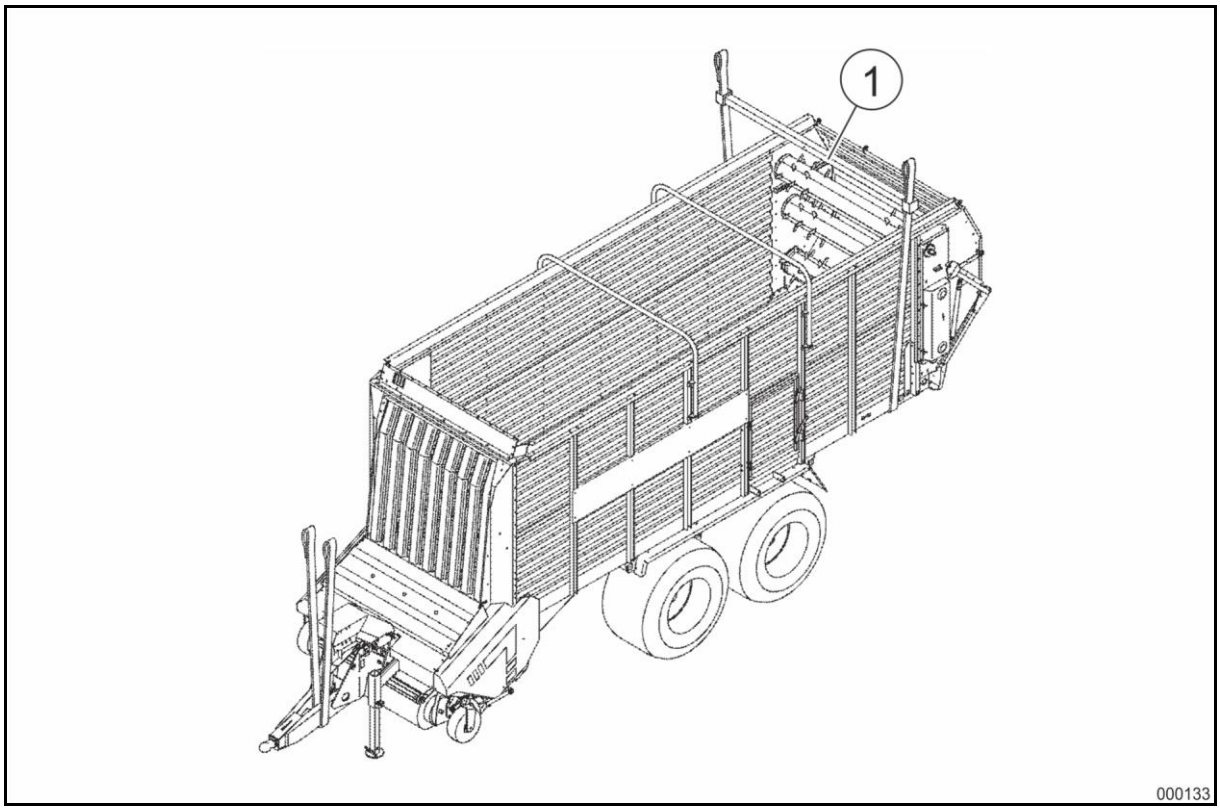


Fig. 42

(1) Spacer

4.3 Overseas dispatch, unlock steering axle

For manoeuvring within the harbour area, the steering axle/s of the machine is/are equipped with stop-cocks and is/are locked or blocked.

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

5 Commissioning

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

- Before commissioning, the operator must have read and understood the operating instructions.
- Observe the information in the chapters:
  - "Operator's obligation"
  - "Training of staff"
  - "Warning and instruction signs"
  - "Safety instructions for the operator"
  - "Basic safety instructions"

  Observance of these chapters serves your safety.
- Only use appropriate tractors to hitch and transport the machine.
- Check the following adjustments when changing the tractor:
  - Mounting height of drawbar.
  - Length of propeller shaft, see information in the chapter "Adjust length of propeller shaft to tractor".
  - System switch-over screw.
  - Setting of pressure regulator. Observe the information in the chapter "Load-sensing hydraulic system".

  Readjust if necessary.
- Tractor and machine must comply with the national road traffic regulations.
- Owner (user) and driver (operator) of the vehicle are responsible for observing the legal provisions of the national road traffic regulations.

WARNING

Before starting work with and on the machine, read and observe the basic safety instructions!

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

Make sure that people leave the hazardous areas!

Non-observance of these instructions may cause most serious bodily injury (irreversible) or even death.

WARNING

Risk of breaking during operation due to incorrect use of the tractor if this causes insufficient stability and insufficient steerability and braking ability of the tractor!

- Check your tractor for compatibility before hitching the machine to the tractor.
- Carry out a brake test to check, whether the tractor reaches the required deceleration with the hitched machine.

Check the machine for proper functioning before the first startup:

1. Hitch the machine to the tractor.
2. Completely lubricate the machine and the propeller shaft.
3. Check the oil level of the individual gearboxes.
4. Bleed the friction clutch of the pick-up.
5. Check all functions of the machine before charging the machine for the first time:
   - Lower and lift pick-up.
   - Extend and retract cutting unit.
   - Lift and lower tailgate.
   - Switch on and reverse transport floor (max. 3 seconds).
   - Switch crossover conveyor on and off (if available).
   - Lock and unlock steering axle.
6. Check the set travelling height of the hydraulic levelling system. Observe the information in the different chapters "Check travelling height".

5.1 Road traffic regulations

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

5.1.1 Road traffic regulations in Germany

Subject to registration (§ 18 StVZO (note of transl.: German Road Traffic Licensing Code))

- Farming or forestry trailers with a maximum speed of more than 25 km/h
  - are, as a basic principle, subject to license,
  - require a separate license plate,
  - are subject to general inspection (up to and including 40 km/h every 2 years, from 40 km/h every year),
  - and a gross vehicle weight rating of more than 10 t must undergo an additional safety check every 6 months. For entirely new trailers, the first safety check shall only be necessary after 24 months.

Subject to operating license (§ 20, 21 StVZO)

- Farming or forestry trailers with a maximum speed of more than 6 km/h up to 25 km/h require an operating license on public roads.

- Farming or forestry trailers are **not** subject to registration but only to operating license if they fulfil the following criteria:
  - Exclusive use in farming and forestry establishments.
  - Exclusive use for farming or forestry purposes.
  - Use only up to a maximum operating speed of 25 km/h (marking by "25 km/h" sign).
- These exceptions only apply to farming or forestry establishments. As a basic principle, contractors are obliged to register farming or forestry trailers from a maximum speed of 6 km/h.
- Equip farming or forestry trailers with a speed limit of less than 25 km/h with the license plate of one of the tractors registered for the establishment.

Apply for operating license or registration

The included 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 license or registration at your local registration office and attach the TÜV certificate to your application.

Required driving license

Driving license according to the Fahrerlaubnisverordnung (note of transl.: German Driving License Rules) - FeV

Holders of a driving license of class T are allowed to drive farming or forestry vehicles and combination of vehicles up to a maximum speed of 60 km/h. However, travelling speeds of more than 40 km/h are only allowed for drivers having attained the age of 18.

If a holder of a driving license of class L is to drive the hitched machine, the rear of the machine must be marked by a "25 km/h" sign (§ 58, StVZO).

5.2 Check tractor's compatibility

The following features are crucial prerequisites for the compatibility of the tractor:

- The gross vehicle weight rating,
- the admissible axle loads,
- the admissible tongue load at the tractor's coupling point,
- the load capacities of the mounted tyres,
- the admissible towing capacity must be sufficient.

  These details are registered on the type plate, in the vehicle registration certificate and in the operating instructions of the tractor.

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

The tractor must reach the deceleration specified by the tractor's manufacturer even with the machine attached or hitched up.

The gross vehicle weight rating of the tractor, which is specified in the vehicle registration certificate, must exceed the sum of

- empty weight of tractor,
- ballasting mass and
- the tongue load of the hitched machine.

This information only applies to Germany:

If, in spite of making use of all reasonable possibilities, the axle loads and / or the gross vehicle weight rating is not complied with, the authority which, according to Federal State law, is competent may, on the basis of the expertise rendered by an officially approved expert for motor traffic, grant an exemption according to § 70 StVZO (note of transl.: German Road Traffic Licensing Code) and the required license according to § 29 paragraph 3 StVO, provided that the tractor manufacturer agrees.

5.2.1 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.
- the coupling device at the tractor and the drawgear at the rigid-drawbar trailer are able to take up the towed load of the rigid-drawbar trailer (towed load = axle load). Calculate the tractor's admissible towing capacity if necessary.
- the tractor's axle loads and weights influenced by the tongue load are within the admissible limits. Check the weight in case of doubt.
- the static, actual rear-axle load of the tractor does not exceed the admissible rear-axle load rating.
- the gross vehicle weight rating of the tractor will not be exceeded.
- the admissible load capacities of the tractor tyres are not exceeded.

5.2.1.1 Combination options of coupling devices and drawgears

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

The maximum admissible tongue load is indicated in the vehicle registration documents or on the type plate of the coupling device of your tractor.

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

5.2.1.2 Calculate actual D_C value for combination to be coupled

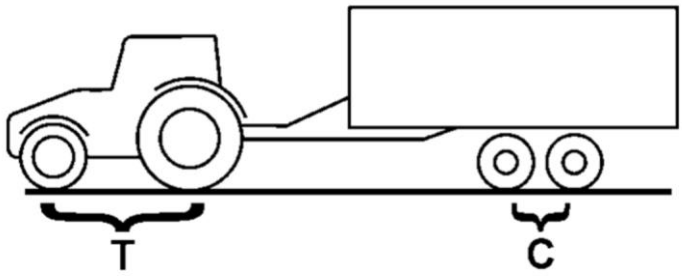
WARNING

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, the admissible towing capacity for your tractor must be calculated. In each case, the lowest D_C value shall be relevant.
- Calculate the admissible towing capacity of your tractor if the calculated D_C value for the combination is higher than the specified D_C value of the coupling device of your tractor or of the drawgear of the rigid drawbar trailer. This calculated towing capacity must not be exceeded when charging your rigid drawbar trailer.

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

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



000470

Fig. 43

T: Gross vehicle weight rating of your tractor in [t]

(see operating instructions/vehicle registration certificate of tractor)

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

g: Gravitational acceleration (9.81 m/s²)

Actual calculated D_C value for the combination		**Specified D_C values of the tractor's coupling device and the machine's drawgear**
kN	≤	kN

The D_C value:

- for the coupling device is directly indicated on the type plate of the coupling device/in the operating instructions/in the vehicle registration certificate of your tractor.

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

- for the drawgear is directly indicated on the type plate of the drawgear.

Example

Gross vehicle weight rating of tractor: 14 t

Admissible axle load(s) of rigid-drawbar trailer: 18 t

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

5.2.1.3 Calculate tractor's admissible towing capacity

The lowest D_C value of your tractor's coupling device or of the drawgear of your rigid-drawbar trailer determines the admissible towing capacity C of your tractor. In case of rigid-drawbar trailers, the tractor's towing capacity is equal to the axle load(s) of the rigid-drawbar trailer.

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

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

T: Gross vehicle weight rating of your tractor in [t]

(see operating instructions/vehicle registration certificate of tractor)

DC: Lowest D_C value of your tractor's coupling device/your machine's drawgear/the combination

g: Gravitational acceleration (9.81 m/s²)

Example

Gross vehicle weight rating of tractor:	14 t
D_C value of tractor's coupling device:	70 t
D_C value of machine's drawgear:	77.5 t
D_C value for the combination to be coupled:	77.2 t

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

Due to the D_C value of the tractor's coupling device, the admissible axle load is 14.5 t. This calculated axle load must not be exceeded when charging your rigid-drawbar trailer.

5.3 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.

Secure tractor and machine against accidental starting and rolling

1. Lower lifted, unsecured machine parts to a secure stop position.

→ This will prevent accidental lowering.

2. Apply the parking brake of the tractor.
3. Turn the tractor engine off.
4. Pull the ignition key out.
5. Make sure that third persons (children) leave the tractor.
6. Lock the tractor cabin.
7. Secure the machine against rolling:
   - on even ground by means of the parking brake or the chocks,
   - on extremely uneven ground or downhill gradients by means of the parking brake and the chocks.

5.4 Parking brake

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

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

(2) Adjusting position

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

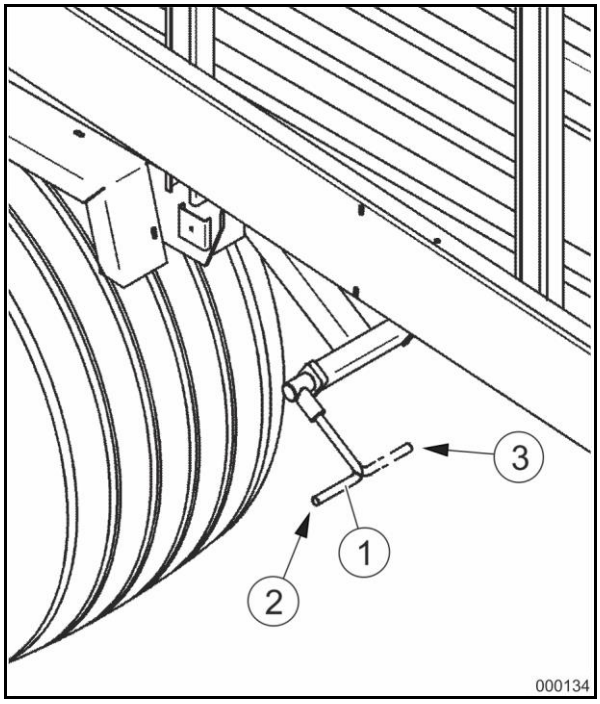


Fig. 44

5.4.1 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 counterclockwise until the cable is relieved.

→ The parking brake is released.

3. Swivel the crank handle to resting position.

5.4.2 Apply parking brake

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

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

→ The parking brake is applied via the cable.

5.5 Brake system

Tridem chassis

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

Fig. 45

(1) Actuating mechanism for release valve

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

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

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

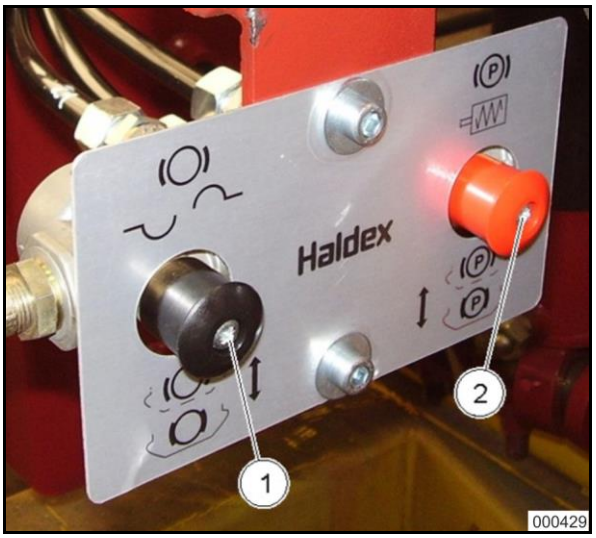


Fig. 46

Tandem chassis

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

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

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

Fig. 47

5.6 Lift / Lower supporting leg

WARNING 	**Risk of crushing limbs to the operator or third persons when lifting or lowering the supporting leg to transport position!** When lifting or lowering the supporting leg, keep sufficient safe distance to the supporting leg as long as parts are moving.

5.6.1 Lift mechanical supporting leg to transport position

WARNING	**Risk to feet of being crushed if the lifted supporting leg accidentally falls down!**
	Check whether the locking bolt has completely engaged into the borehole and properly locks the supporting leg in its transport position.

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

→ The supporting leg is relieved.

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

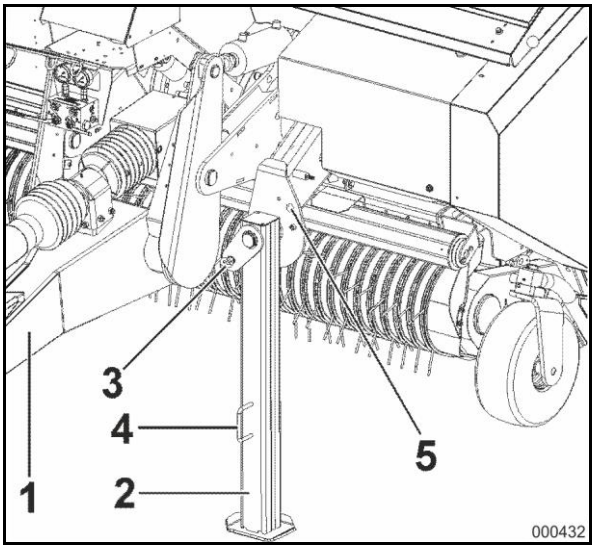


Fig. 48

5.6.2 Lower mechanical supporting leg to support position

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

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

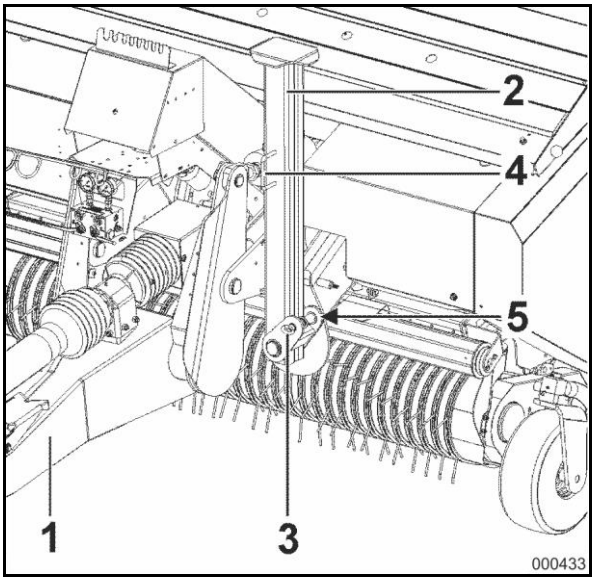


Fig. 49

5.7 Adjust length of propeller shaft to tractor

WARNING

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

Only an authorised workshop is allowed to carry out structural alterations on the propeller shaft. Observe the 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 on the propeller shaft which are not specified in the operating instructions for the propeller shaft are not allowed.

WARNING

Risk due to damaged and/or destroyed components flying away caused by propeller shaft compression during cornering or by the propeller shaft being pulled apart when the folding drawbar is folded, due to improper adjustment of the propeller shaft length!

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

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

- The propeller shaft reaches its shortest and its longest operating position when travelling over the clamp silo, depending on the drawbar type and the drawbar position.
- 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.

1. Hitch the machine to the tractor (do not couple the propeller shaft).
2. Take the shortest operating position of the propeller shaft.
3. Secure the tractor against accidental starting and rolling before entering the hazardous area between tractor and machine.
4. Pull the propeller shaft apart.
5. Slip the locking mechanism of the propeller shaft half with the tractor symbol on the protective tube onto the p.t.o. shaft of the tractor until the locking mechanism noticeably engages.

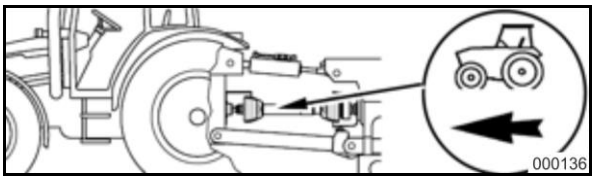


Fig. 50

6. Slip the locking mechanism of the other propeller shaft half onto the p.t.o. shaft of the machine until the M16 screw can be inserted into the C-slot of the p.t.o. shaft, and tighten the M16 screw at a tightening torque of 150 Nm.

7. Shorten the propeller shaft such that the **minimum free space (X) is 40 mm** in its shortest operating position.

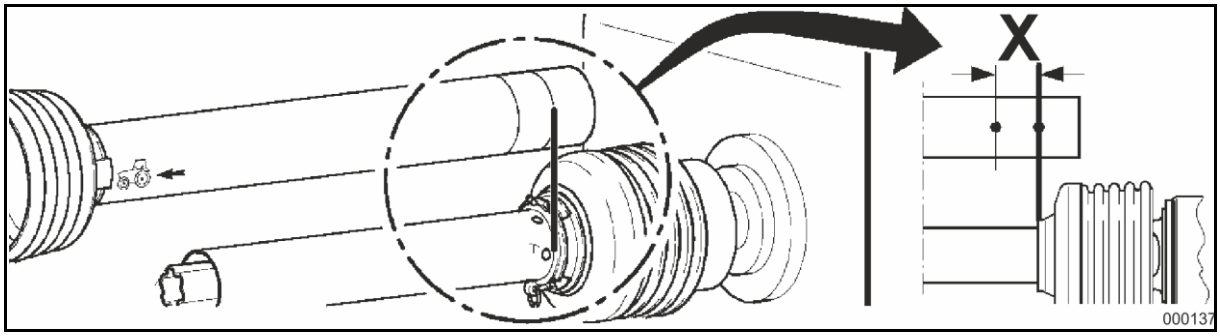


Fig. 51

8. Observe the operating instructions for the propeller shaft when determining the length and when shortening the propeller shaft.
9. Reinsert the shortened propeller shaft halves into each other.
10. Lubricate the p.t.o shaft of the tractor and the input shaft of the gearbox before coupling the propeller shaft.

5.8 Adjust mounting height of folding drawbar

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

WARNING

Risk of being crushed, drawn in, becoming entangled and risk of impact to people if the hitched machine accidentally loosens from the tractor due to worn drawbar lug and coupling bolt!

Ensure that there is enough free space between the drawbar lug and the coupling bolt when lifting the folding drawbar.

Only an authorised workshop is allowed to adjust the mounting height of the folding drawbar!

The distance X between the ground and the machine frame must be 1300 mm with the forage wagon with lowered folding drawbar hitched up to the tractor.

The mounting height of the folding drawbar in relation to the machine frame must be aligned by means of the threaded spindles of the hydraulic cylinders if the actual distance X is not 1300 mm.

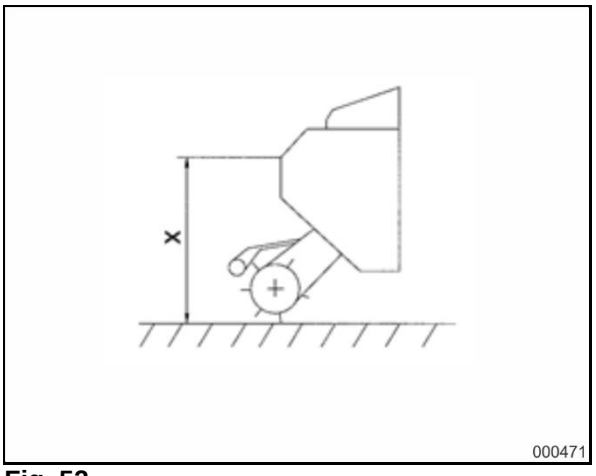


Fig. 52

1. Park the tractor and the hitched machine on even ground.
2. Lower the folding drawbar by completely retracting the hydraulic cylinders of the folding drawbar.
3. Secure tractor and machine against accidental starting and rolling.
4. Unscrew the counter nut (2) of the threaded spindle (3).

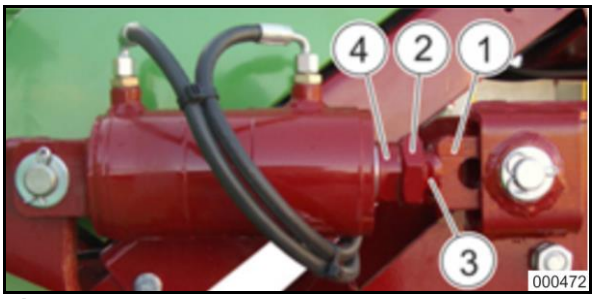


Fig. 53

5. Turn the piston rod (4) of the two hydraulic cylinders alternately in the required direction.
   - Increase distance X = Turn piston rod clockwise
   - Reduce distance X = Turn piston rod counterclockwise

Adjust the two threaded spindles evenly.

6. Retighten the counter nuts of the threaded spindles.
7. Start the tractor engine.
8. Completely lift the folding drawbar.
9. Check whether there is enough free space between the holding-down device (1) and the ball-type shell (2). Observe the fact that the free space is reduced when travelling onto the silo.

   Check also the clearance between holding-down device (1) and ball-type shell.
10. Ensure that there is enough free space around the propeller shaft in any operating state. Insufficient free space will lead to damage to the propeller shaft.

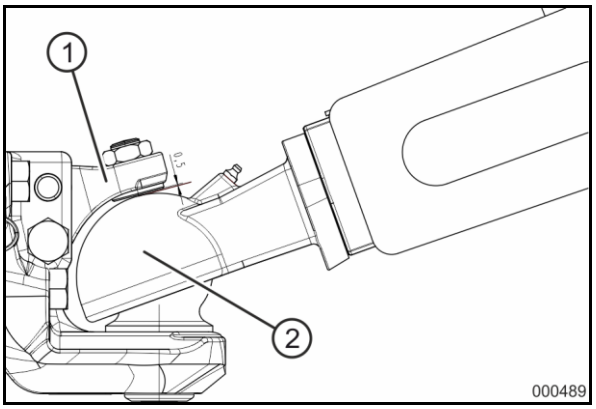


Fig. 54

5.9 Pick-up

5.9.1 Set operating height

Loaded material and ground condition determine the operating height of the pick-up.

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

The operating height of the pick-up is set by means of the two-hole perforated struts (2):

- Front borehole = Lowest operating height of pick-up
- Rear borehole = Highest operating height of pick-up

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

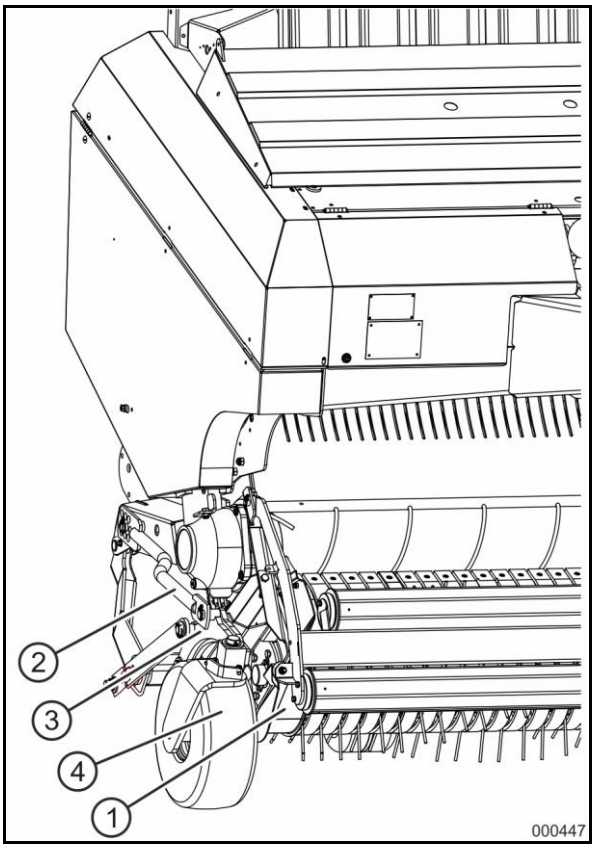


Fig. 55

Check the setting of the additional guide wheels in any case.

5.9.2 Set additional guide wheels

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

- Spindle unscrewed = Additional guide wheels carry more weight
- Spindle screwed in = Additional guide wheels carry less weight

1. Set the operating height of the pick-up via the left-hand and right-hand pick-up perforated strut (2).
2. Lower the guide wheels (4) of the pick-up onto a solid, even surface.
3. Secure tractor and machine against accidental starting and rolling.
4. Set the height of the additional guide wheels (5) via the left-hand and right-hand spindle (6) such that the guide wheels bear the largest load.

   For this purpose, align the frame (5) of the additional guide wheels via the two spindles such that the additional guide wheels are set by 10-20 mm higher than the guide wheels.

   – Remove the linch pin (6).
   – Use one hand to hold up the frame, while using your other hand to turn the spindle.
   – Use the linch pin to secure the spindle.

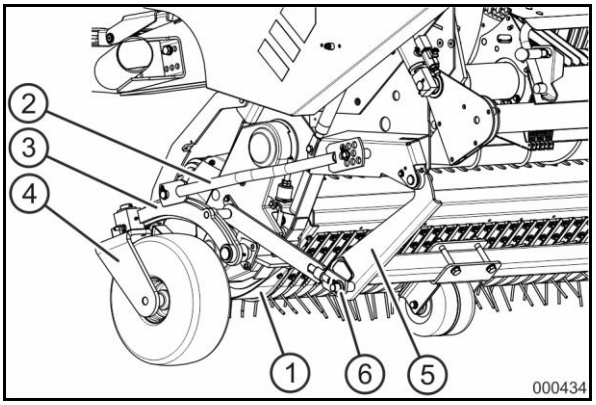


Fig. 56

5. Completely lift the pick-up.

→ The frame must be beneath the check screws (7). The minimum distance between the additional guide wheels and the CFS drum must be 10 mm. Adjust the distance if necessary.

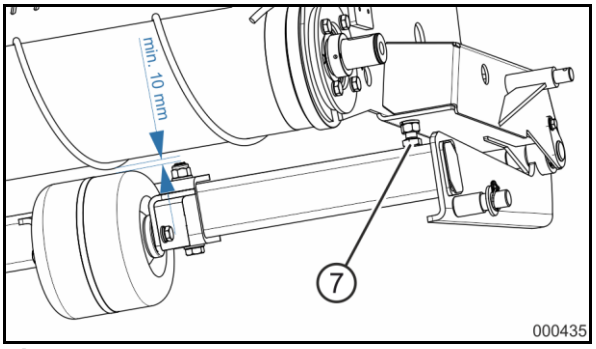


Fig. 57

5.10 Set cutting length

The number of cutting knives mounted in the cutting unit determines the cutting length of the loaded material. 44 cutting knives at one level ensure a cutting length of 35 mm. For information about removal and installation of cutting knives, see chapter "Remove and install cutting knives".

5.11 Mount control set on the tractor

5.11.1 Mount ISOBUS control set on the tractor

- Do not draw the current from the light socket.
- Retrofit the 3-pole socket if your tractor is not equipped with a 3-pole socket. An appropriate retrofit kit is available.
- A constant power supply of 12 V is required. Protect the 3-pole socket by a fuse of at least 25 A.
- The feed line of the 3-pole socket must have a minimum cable cross section of 4 mm^2.
- There are tractor models where the standard socket in the tractor cabin delivers inadequate power for the ISOBUS control set. In this case, have an authorised workshop install a separate battery cable (BSL no. 87008925).

1. Fix the control set (1) in the cabin within view and reach to the right of the driver seat.
2. Connect the signal plug (2) of the control set with the signal socket (3) of the mobile cable harness or with the signal socket of the tractor (if available).
3. Plug the 3-pole plug (4) (DIN 9680) of the mobile cable harness into the 3-pole socket of the tractor.

   (Pole 15/30 = Plus; Pole 31 = Minus)

   This is not necessary if the tractor is equipped with an ISOBUS cable harness.

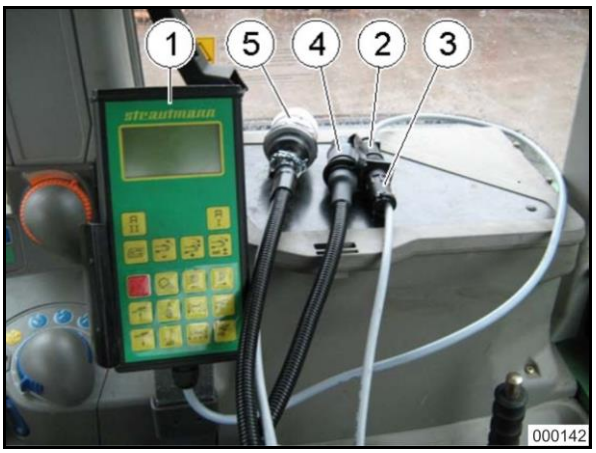


Fig. 58

4. Depending on the equipment, plug:
   - the ISO socket (5) of the mobile cable harness into the ISO plug of the control unit on the machine.
   - the ISO plug of the control unit into the ISO socket of the tractor.

If available, always use the ISOBUS socket on the tractor!

5.12 Hitch machine

- Observe the information in the chapter "Basic safety instructions for the operator" 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".

Only in case of load-sensing hydraulic system:

- Check the pressure regulator for correct setting. Observe the information in the chapter "Load-sensing hydraulic system".
  - Lock the pressure regulator in the electro-hydraulic control block if the hydraulic connector "Flow line" is connected with the pressure line to the tractor's hydraulic pump.
  - Open the pressure regulator in the electro-hydraulic control block if the hydraulic connector "Flow line" is connected to the control device of the tractor.

1. Secure the machine against accidental rolling
2. Always check the machine for visible defects during hitching.
3. Couple the forced steering axle (if available).
4. Couple the drawgear.
5. Connect the hydraulic hose pipes.
6. Connect the service brake system.
7. Couple the propeller shaft.
8. Connect the control set.
9. Connect the lighting system.
10. Lift the supporting leg.
11. Release the parking brake.

5.12.1 Couple drawgear

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. • Properly hitch the machine to the tractor. • Never use damaged or deformed trailer systems.

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

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

→ After automatic engaging, the drawbar lug is fixed between the tow-hook and the 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.
10. Lift the supporting leg to transport position.

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

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

5.12.1.3 Ball-type coupling and shell

WARNING

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

- Before travelling on extremely uneven ground/over clamp silos, ensure that there is enough free space at the holding down-device above the shell.
- Mount the shorter holding-down device at the tractor's ball-type coupling in case of insufficient free space.
- Check the distance between holding-down device and shell. The distance must be 0.5 - 1mm.

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

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

(2) Ball-type shell

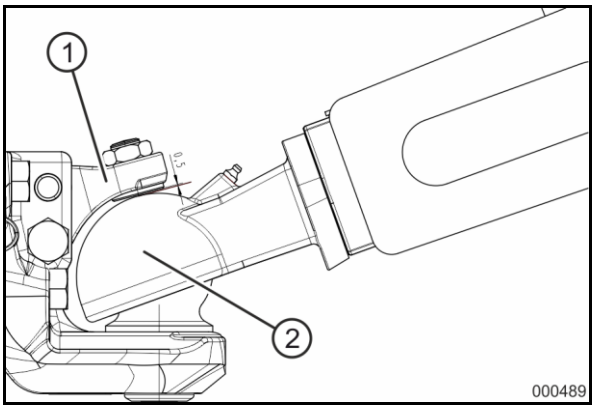


Fig. 59

1. Make sure that people leave the hazardous area between tractor and machine before approaching the machine.
2. Reverse tractor and approach the machine.
3. Secure the tractor against accidental starting and rolling.
4. Secure the machine against rolling.
5. Prepare hitching up:
   - Remove grease and dirt from the ball head, the holding-down device and the shell.
   - Lubricate the ball head and the surface of the shell with new grease.
   - Unlock the holding-down device at the bearing block.
   - Swivel the holding-down device to coupling position.
   - Clean and grease the ball head.
6. Connect the supply lines.
7. Approach the machine as closely as possible such that the ball head can take up the shell.
8. Lower the drawgear by means of the folding drawbar until the ball head engages in the shell.
9. Lock and secure the holding-down device at the bearing block.
10. Release the parking brake.
11. Lift the supporting leg to transport position.

5.12.2 Connect hydraulic hose pipes

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 pressure of the hydraulic oil of 200 bar.
- Only couple clean hydraulic plugs.
- Insert the hydraulic plug(s) into the hydraulic sleeves until the hydraulic plug(s) noticeably lock(s)..
- Check the coupling spots of the hydraulic hose pipes for correct and tight seat.
- Depressurise hydraulic system.
- Check the assignment of the hydraulic hose pipes at the control block of the machine if the coloured markings (dust caps) are missing:
  - P=Pressure line
  - T (R;S)=Return line

5.12.2.1 Open hydraulic system

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

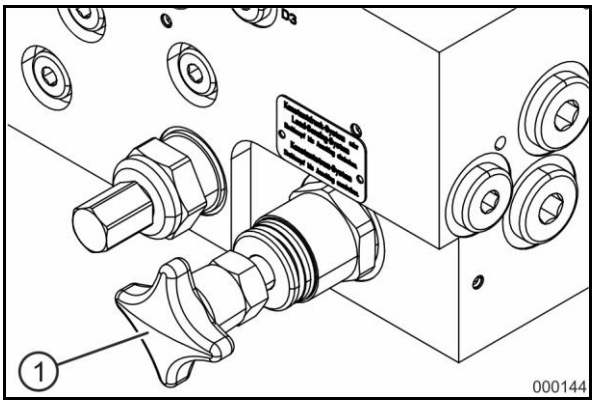


Fig. 60

5.12.2.2 Load-sensing mode

1. Always swivel the respective operating element at the control device on the tractor to floating position.
2. Turn the tractor engine off.
3. Screw the load-sensing control line into the connecting aperture of the electro-hydraulic control block.
4. Screw the load-sensing screw (1) at the electro-hydraulic control block in as far as it will go.
5. Connect the load-sensing control line to the load-sensing control system of the tractor.
6. Connect the tank line (return line) to the free return port of the tractor provided for this purpose.
7. Connect the pressure line (return line) with the pressure line to the hydraulic pump of the tractor provided for this purpose.

5.12.3 Connect brake system

WARNING 	**Risk of crushing, cuts, becoming entangled, being drawn in and risk of impact if the machine accidentally 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). The machine's service brake immediately comes off the brake position if the red hose coupling is connected.

WARNING 	**Risk of crushing, cuts, becoming entangled, being drawn in and risk of impact due to improper functioning of the brake system!** Drain the air reservoir every day before the first trip. Only start the tractor with the hitched machine moving when the pressure gauge of the compressed-air brake system on the tractor indicates 5.0 bar!

5.12.3.1 Connect dual-line service brake system

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

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

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

5.12.3.2 Connect hydraulic brake system

Only couple clean hydraulic clutches.

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

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

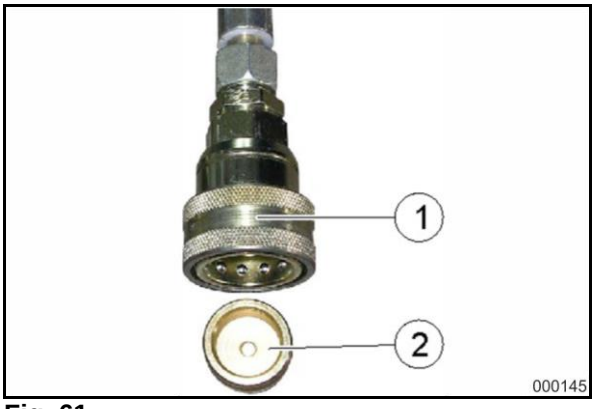


Fig. 61

5.12.3.3 Connect emergency brake valve

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

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

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

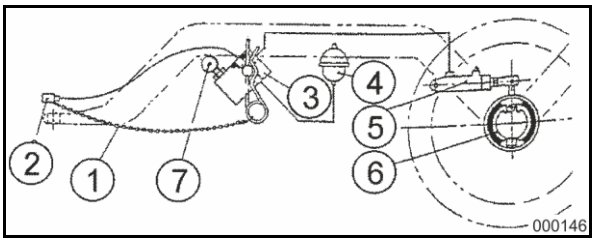


Fig. 62

Couple after emergency braking:

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

→ The hydraulic oil flows back to the tractor and the pressure accumulator (4) is depressurised.

4. Insert the ripcord (1) with the clip connector into the borehole of the operating lever.
5. Set the operating lever back to its initial position.
6. Actuate the brake system of the machine several times.

→ The pressure accumulator (4) is filled and the emergency brake valve (3) is ready for operation again.

5.12.4 Couple propeller shaft

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

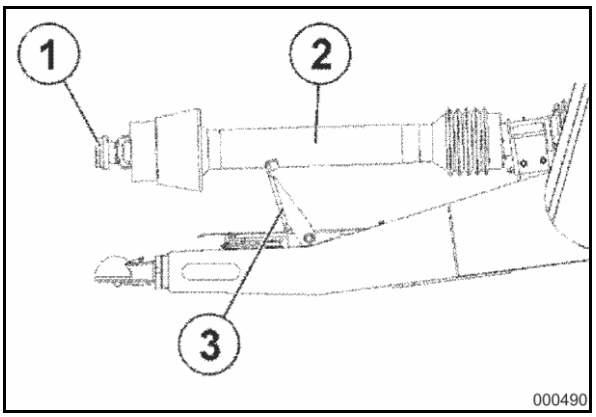


Fig. 63

5.12.5 Couple forced steering axle

WARNING

Risk due to uncontrolled machine movements caused by the absence of a mechanical connection between tractor and forced steering axle system and (a) freely moving steering axle(s) (no passive steering)!

Never move the machine with the forced steering axle uncoupled!

Exclusively couple the forced steering axle to a ball-type coupling K50 (according to DIN 74058/ISO 1103)!

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

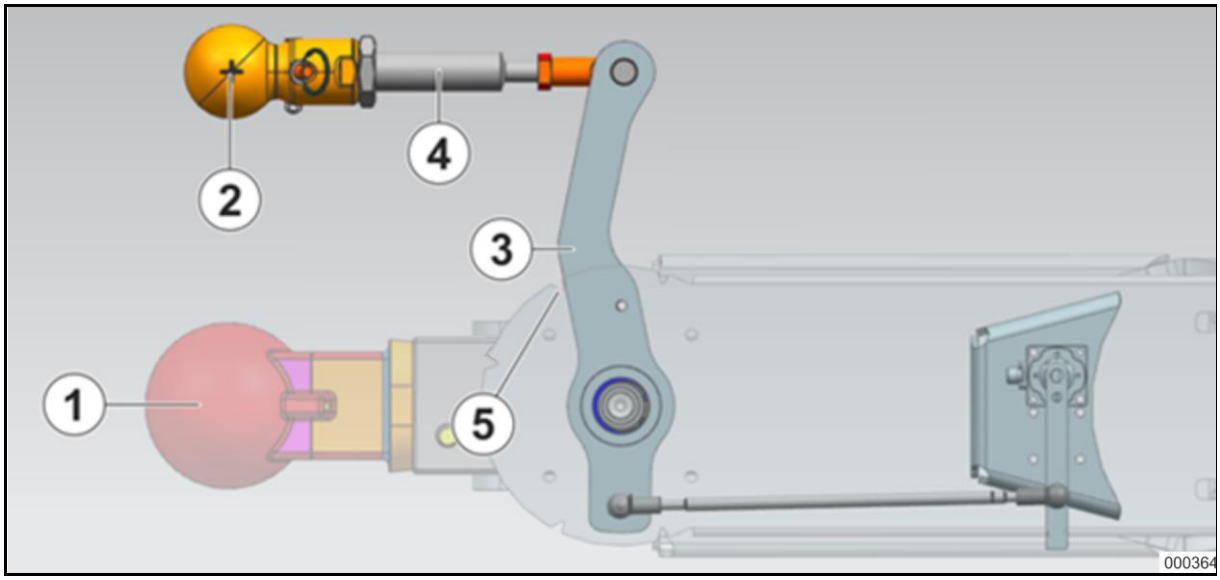


Fig. 64

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

   During initial commissioning:

   – Set the steering rod such that the left-hand edge of the lever (3) is positioned in one line with the right-hand edge of the orientation notch (5) if tractor and machine are in one line.
3. Couple the propeller shaft.
4. Connect the hydraulic system.
5. Connect the brake system.
6. Connect the control set with the power supply of the tractor.
7. Switch the tractor ignition on.

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

Preconditions for proper execution of the power-up test:

- Coupled forced steering axle,
- connected hydraulic system and sufficient hydraulic pressure (minimum 15 bar),
- power supply of control set,
- switched-on ignition of tractor,
- a lowered lift axle with tridem chassis,
- stop of tractor and machine; if the combination of tractor and machine moves, the power-up test will be stopped and restarted when the movement stops.

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

- A beep is emitted twice for max. 5 seconds each.
- The green control lamp "Steering axle locked" on the control set is flashing.

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

If the power-up test could not be successfully completed, check the display of the steering computer (see chapter "Display in case of trouble").

8. During initial commissioning:

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

   The ball socket of the steering rod must not contact the drawbar, not even during maximum cornering to the left or right!

   Have bumper buffers retrofitted by Strautmann if necessary.

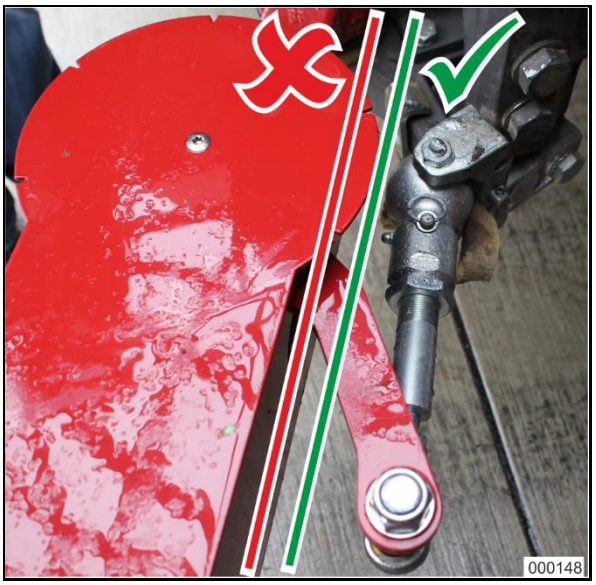


Fig. 65

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

Only set the length of the coupling rod, as described above.

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

Any modifications will invalidate the guarantee!

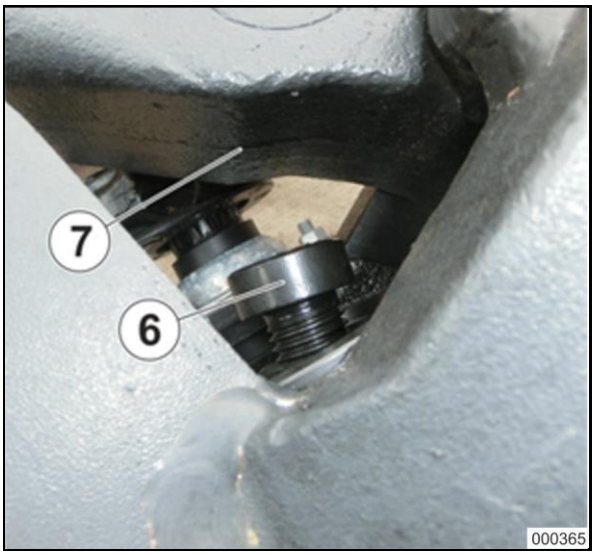


Fig. 66

5.13 Unhitch machine

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. Secure the machine against accidental rolling.
2. Always check the machine for visible defects during unhitching.
3. Lower the supporting leg.
4. Disconnect the hydraulic hose pipes and put the plugs down into the rainproof plug deposit.
5. Disconnect the service brake system.
6. Disconnect the lighting.
7. Uncouple the propeller shaft.
8. Disconnect the control set and put the plug down into the rainproof plug deposit.
9. Uncouple the forced steering axle (if available).
10. Uncouple the drawbar.
11. Move the tractor forward.

5.13.1 Uncouple drawgear

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

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

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

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

5.13.1.3 Ball-type coupling and shell

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

5.13.2 Disconnect hydraulic hose pipes

1. Depressurise hydraulic system.

→ Relieve the hydraulic cylinders by means of the respective operating levers at the control device or the corresponding key on the control set at the tractor or swivel them to floating position.

2. Unlock the hydraulic plugs from the hydraulic sleeves.
3. Use the dust caps to protect the hydraulic plugs and the hydraulic sockets against soiling.
4. Place the hydraulic hose pipes onto the hose holder.

5.13.3 Disconnect brake system

WARNING

Risk of crushing, cuts, becoming entangled, being drawn in and risk of impact if the machine accidentally 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).

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

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

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

5.13.3.1 Disconnect dual-line service brake system

1. Secure the machine against accidental rolling. Use the parking brake and in addition the chocks for this purpose if necessary.
2. Disconnect the hose coupling of the feed line (red).
3. Disconnect 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.

5.13.3.2 Disconnect hydraulic brake system

1. Use the parking brake to secure tractor and machine against accidental rolling.
2. Make sure that the hydraulic pipe between tractor and machine has been depressurised.
3. Uncouple the hydraulic sleeve.
4. Slip the hydraulic sleeve onto the machine's blanked-off connecting piece.

5.13.3.3 Disconnect hydraulic brake system with emergency brake valve

1. Use the parking brake to secure tractor and machine against accidental rolling.
2. Make sure that the hydraulic pipe between tractor and machine has been depressurised.
   - Set the brake control valve at the tractor such that the hydraulic oil can flow back to the tractor.
   - Press the drain valve (7) at the emergency brake valve (3).

→ The hydraulic oil flows back to the tractor and the pressure accumulator (4) is depressurised.

3. Remove the ripcord (1) from the tractor.
4. Uncouple the hydraulic sleeve (2).
5. Slip the hydraulic sleeve onto the machine's blanked-off connecting piece.

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

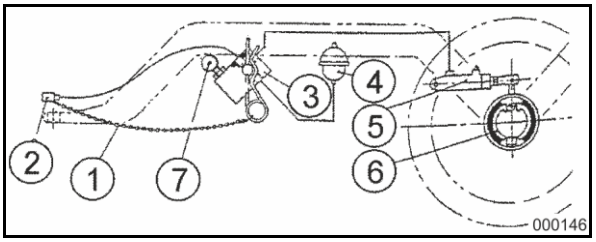


Fig. 67

5.13.4 Uncouple propeller shaft

WARNING	**Risk of burns due to hot propeller shaft components!**
	This risk may cause light to serious injuries to hands.
	Do not touch considerably warmed-up propeller shaft components (particularly do not touch any couplings).

Clean and lubricate the propeller shaft before longer downtimes.

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

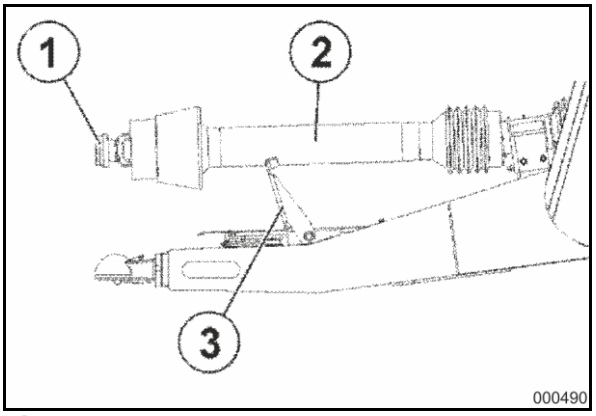


Fig. 68

5.14 Manoeuvre unhitched machine by means of a manoeuvring vehicle

WARNING

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

Tightly connect the machine with 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. Use the manoeuvring vehicle to manoeuvre the machine.
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.

Fig. 69

5.15 External operation for folding drawbar

Optional extra

WARNING

Risk of crushing, shearing and impact when moving the folding drawbar!

Make sure that people leave the vicinity of the folding drawbar.

Always secure the drawgear by means of the holding-down device before swivelling the supporting leg.

Use the two key buttons (1 and 2) on the left-hand vehicle side in the side guard (3) to move the folding drawbar with the hydraulic system connected.

1. Press the key button (1) to lift the vehicle to the required height to adjust the supporting leg.
2. Press the key button (2) to lower the vehicle.

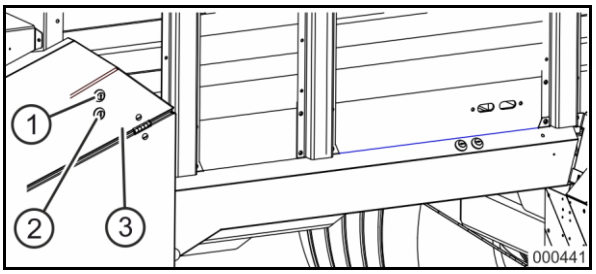


Fig. 70

5.16 Mount extension sections, ropes and superstructure tarpaulin

WARNING

Risk of electrical shock or burns due to machine components accidentally touching electrical overhead lines or approaching high-voltage overhead lines in an inadmissible manner!

Make sure not to exceed the maximum vehicle height of 4 m.

Two people and a platform are required for mounting the superstructure side panels, ropes and tarpaulin.

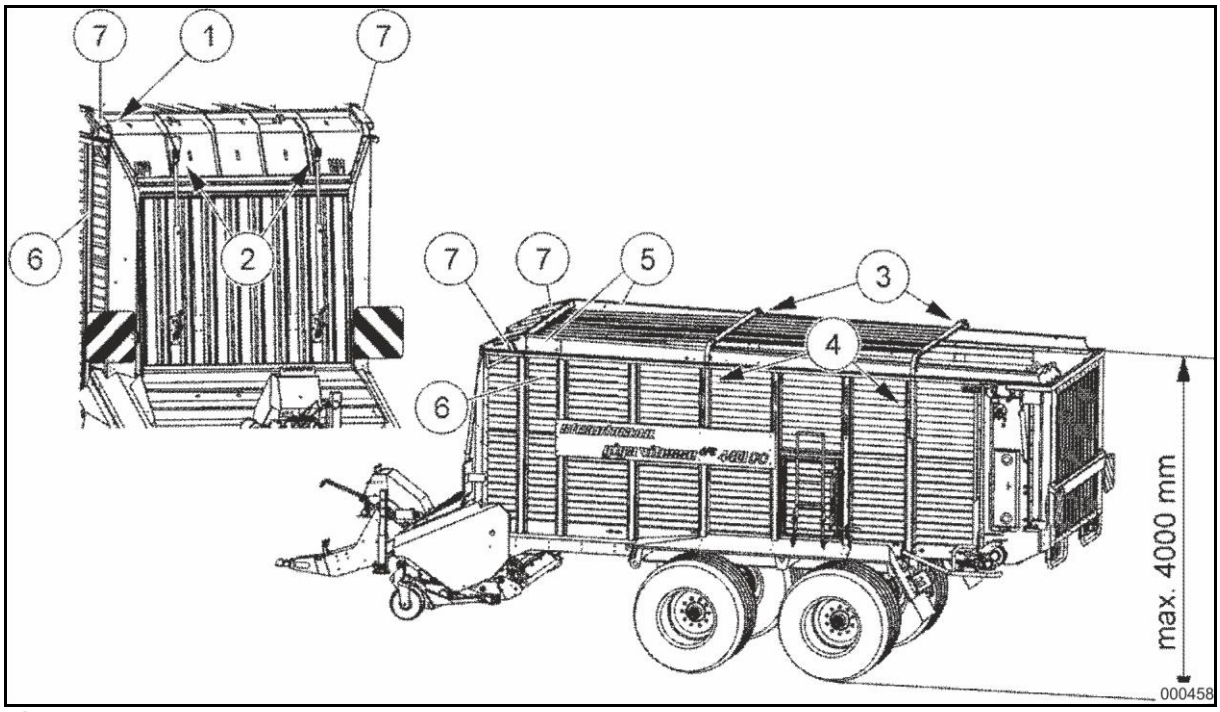


Fig. 71

1. Secure tractor and machine against accidental starting and rolling.
2. Enter the cargo space through the access door.
3. Screw the tubular supports (3) to the superstructure struts, such that the maximum vehicle height of 4 m is not exceeded.
4. Screw the extension sections (5) to the fixing supports (6).
5. Screw the two superstructure tips (7) to the fixing supports at the front.
6. Thread each rope (1) through a hole (2) in the front panel (3).
7. Then pull the rope through its loop (4).

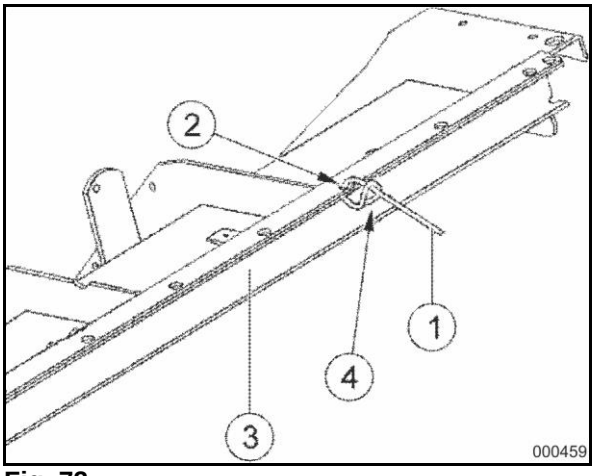


Fig. 72

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

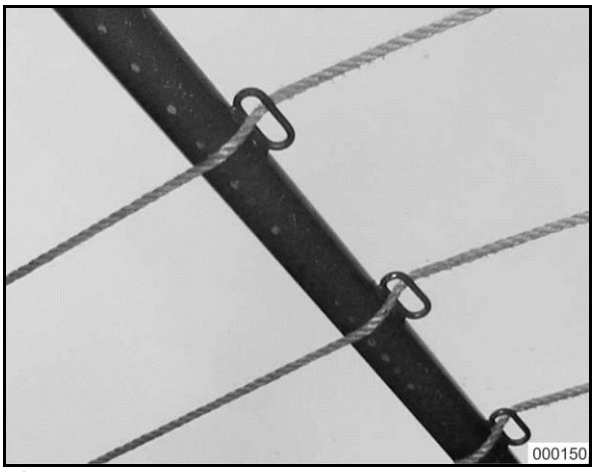


Fig. 73

9. Hang the respective rope hook of the rubber clamp into the rear tubular support (machines without beaters) or into the superstructure tarpaulin (machines equipped with beaters).

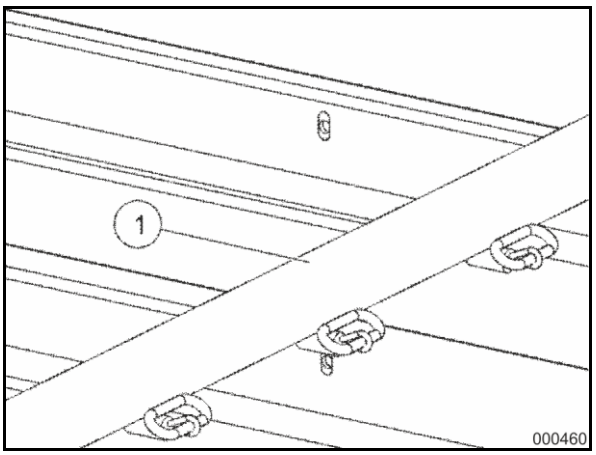


Fig. 74

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

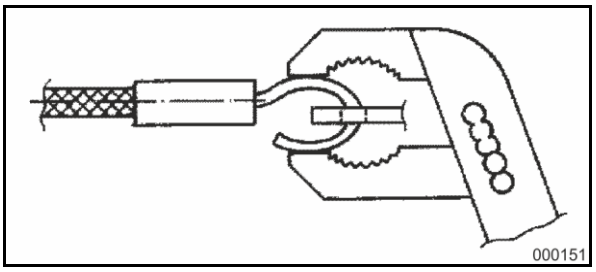


Fig. 75

5.17 Superstructure tarpaulin with rewinding and securing mechanism

Optional extra

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

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

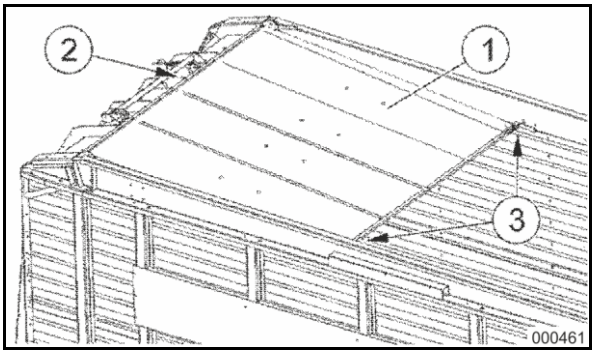


Fig. 76

5.17.1 Unwind superstructure tarpaulin

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

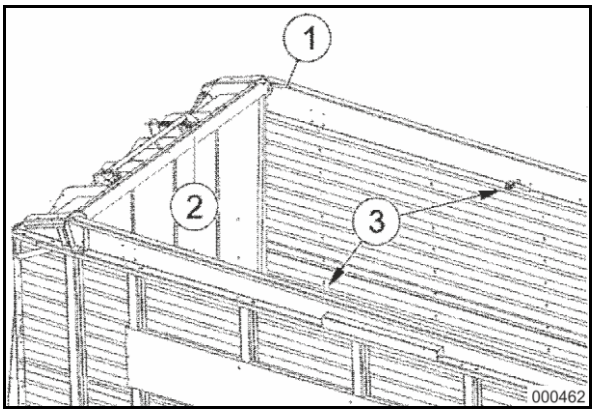


Fig. 77

5.17.2 Rewind superstructure tarpaulin

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

→ The superstructure tarpaulin automatically starts to rewind.

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

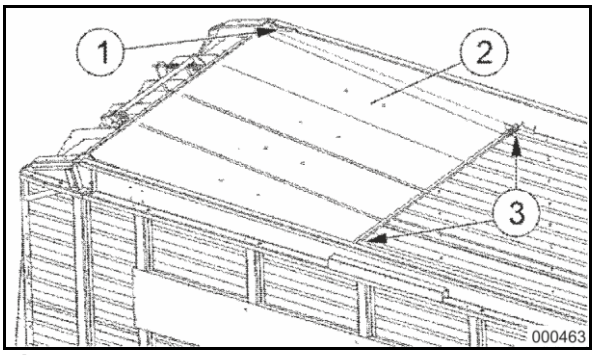


Fig. 78

5.18 Cover conveyor duct

Optional extra

When using the machine for transporting forage, cover the conveyor duct by means of a cover plate (optional extra).

1. Hang the cover plates (1) into the holders (2), such that the conveyor duct is closed.

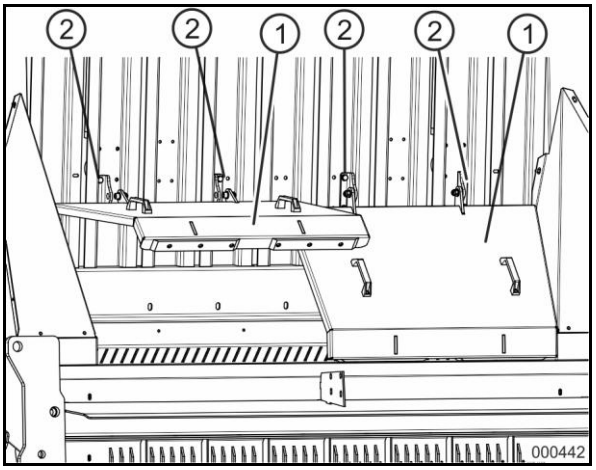


Fig. 79

6 Operation

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

Protect the control set against moisture and humidity!

Place the plugs in the parking garage intended for this purpose with the machine unhitched.

Fig. 80

6.1 ISOBUS control / Field Operator 120

6.1.1 Design of ISOBUS control

The ISOBUS control complies with the latest ISO standard.

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

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

The ISOBUS control set is automatically switched on and off when the tractor ignition is turned on and off. In case of longer downtimes of the machine, additionally disconnect the mobile tractor connecting cable.

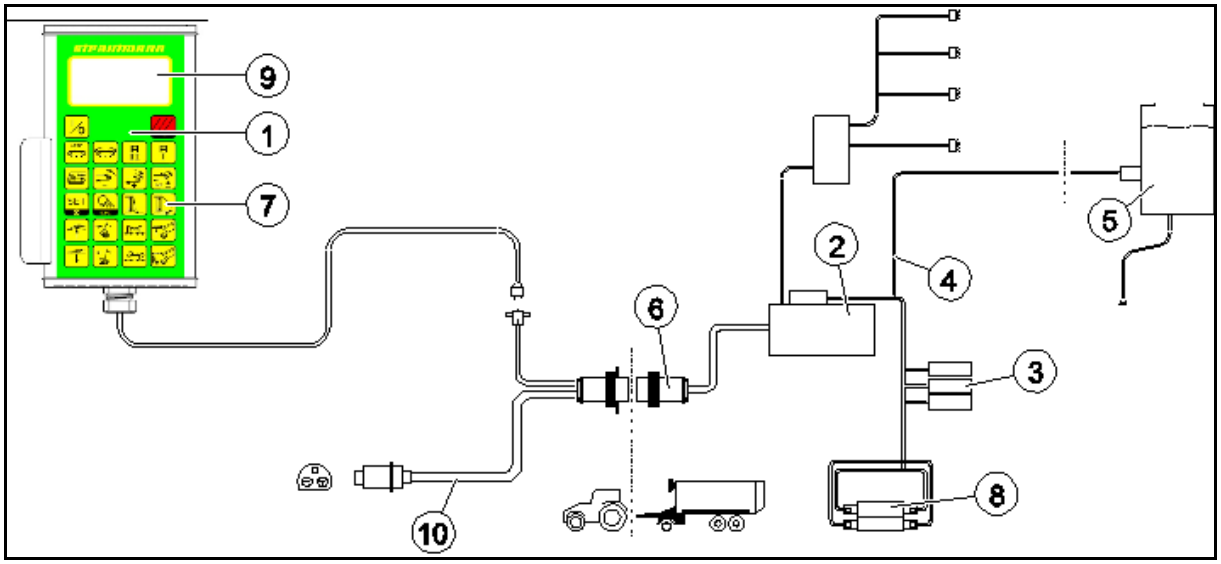


Fig. 81

The ISOBUS control mainly consists of:

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

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

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

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

(1) Screen. Depending on the selected function, the following menu appears:

- **Working** menu. The **Working** menu displays the selected functions and the operating states during charging and discharging.
- **Road Travel** menu. The **Road Travel** menu appears with the road travel mode activated.
- **SET** menu. The **SET** menu displays:
  - the software version,
  - machine parameters.

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

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

(4) Switch crossover conveyor off

(5) Switch crossover conveyor on and change driving direction

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

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

(8) Switch automatic charging system on/off

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

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

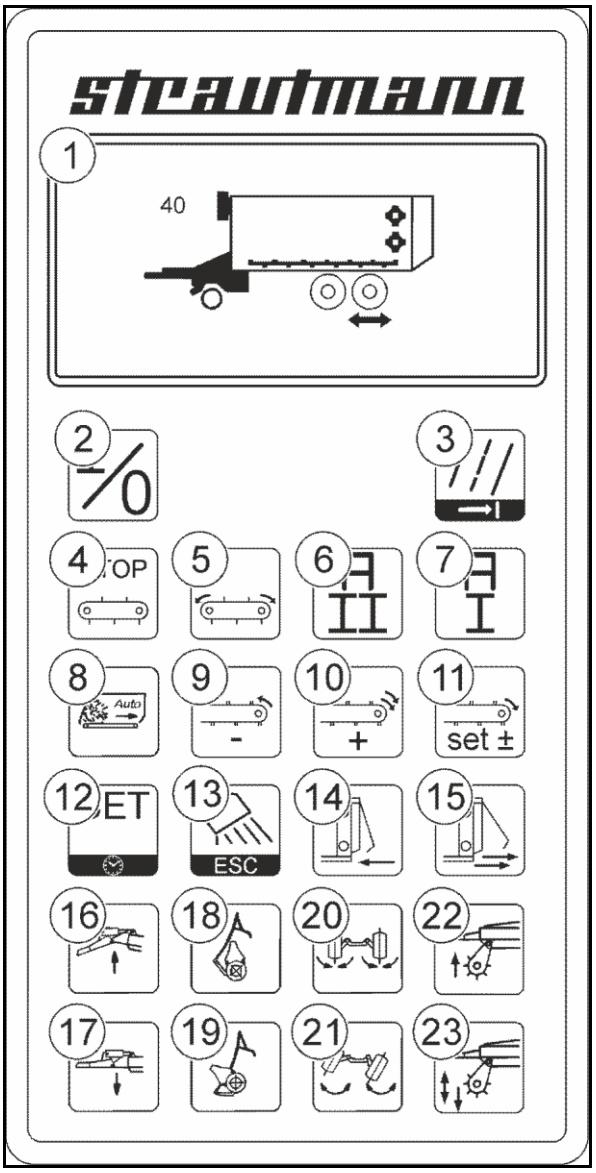


Fig. 82

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

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

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

(14) Lower tailgate

(15) Lift tailgate

(16) Lift folding drawbar

(17) Lower folding drawbar

(18) Retract cutting unit

(19) Extend cutting unit

(20) Lock steering axle

(21) Unlock steering axle

(22) Lift pick-up

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

6.1.2 Display information in Working menu

(1) Display of current transport floor speed

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

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

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

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

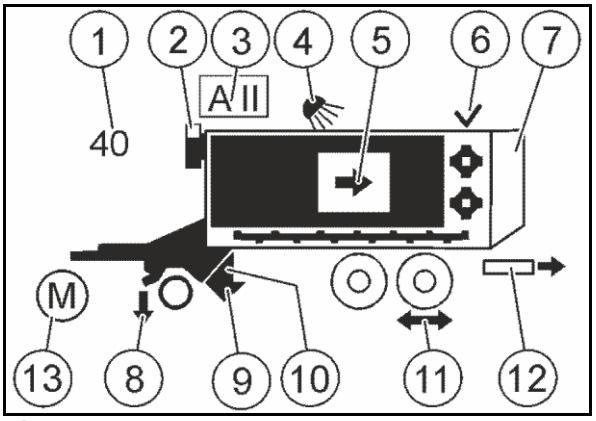


Fig. 83

(6) Operating state "Beaters powered/not powered", here "Beaters powered"

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

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

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

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

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

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

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

6.1.3 Functions of the ISOBUS control

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

6.1.3.1 Switch control set on/off

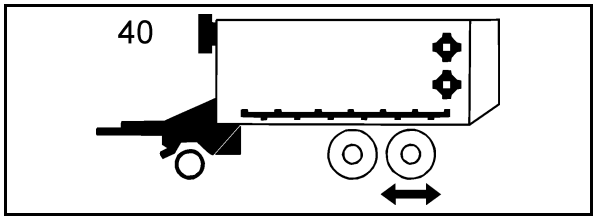
At the same time, this key serves as emergency stop. After the control set has been switched off, all hydraulic functions are also switched off.

1. Press the I/0 key once.

→ The control set is switched on or off.

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

The screen shows:



6.1.3.2 Switch road travel mode on

The road travel mode can only be switched on:

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

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

(1) Warning message

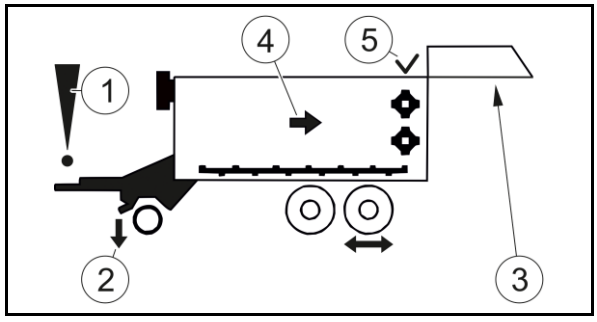
(2) Pick-up down

(3) Tailgate lifted

(4) Transport floor powered

(5) Beaters powered

The screen shows:



With the road travel mode switched on:

- the **Road Travel** menu appears,
- apart from the functions "Lock steering axle" and "Unlock steering axle", all other functions of the control set are disabled,
- the hydraulic drawbar suspension (optional extra), the axle suspension of the hydro-pneumatic chassis and the warning beacon (optional extra) are switched on,
- the work lights (optional extra) are switched off.

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

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

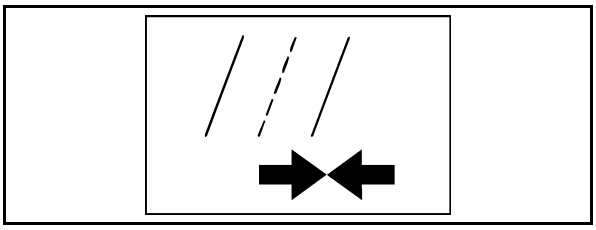
1. Press the  key once.

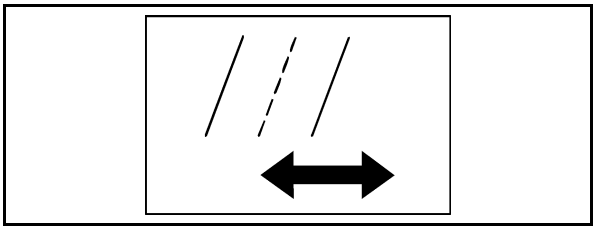
→ Road travel mode is switched on. The **Road Travel** menu appears with

– The "Steering axle locked" symbol or the

– "Steering axle unlocked" symbol appears

The screen shows:





6.1.3.3 Switch road travel mode off

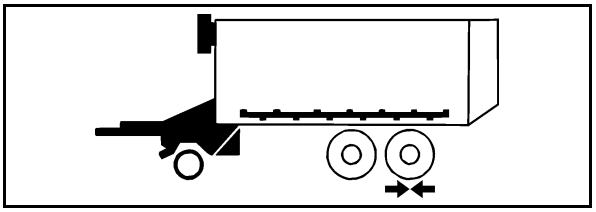
With the road travel mode switched off:

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

1. Press the  key again.

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

The screen shows:



6.1.3.4 Switch discharge mode A I on

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

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

With the electro-hydraulic forced steering axle system, the steering axle is locked in **Discharge mode A I** up to 12 km/h.

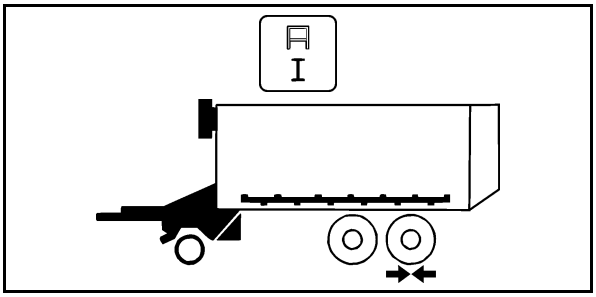
Can be unlocked and relocked by actuating the **Discharge mode A I** for turning the machine in front of the clamp silo.

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

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

- Lock steering axle
- Lift folding drawbar

The screen shows:



6.1.3.5 Switch Discharge mode A II on (machine without beaters)

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

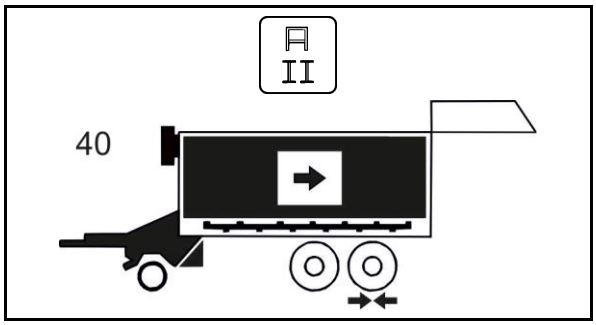
During discharge, the transport floor feed can be switched on and off as often as desired by pressing the A II key.

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

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

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

The screen shows:



6.1.3.6 Switch discharge mode A II on (machine equipped with beaters)

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

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

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

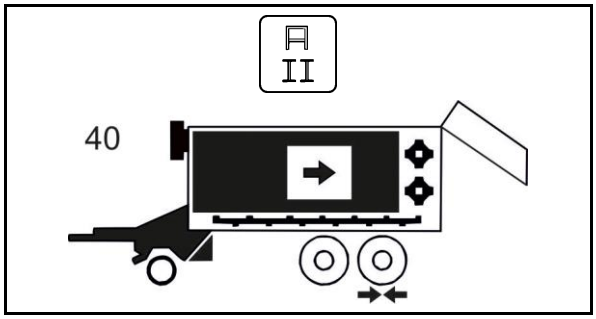
→ The beaters and the transport floor stop. The transport floor automatically switches to standby mode and the "Feed On" symbol is flashing.

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

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

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

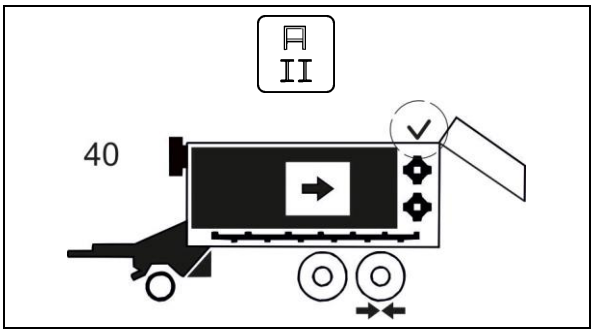
The screen shows:



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

→ With the beaters powered, the "Beaters On" symbol appears.

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



6.1.3.7 Switch automatic charging system on/off

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

The automatic charging system:

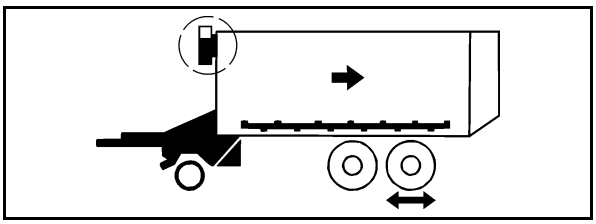
- has to be switched on only once,
- automatically and infinitely variably switches the transport floor on and off during charging,
- will automatically be deactivated if the control set generates the acoustic signal (horn sound) and the visual signal "Forage wagon full",
- will automatically be activated if the machine has been emptied and the pick-up is lowered the next time,
- remains switched on until the automatic charging system is manually switched off,
- permits to pre-select the filling degree of the loaded material in the cargo space.

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

1. Press the  key once.

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

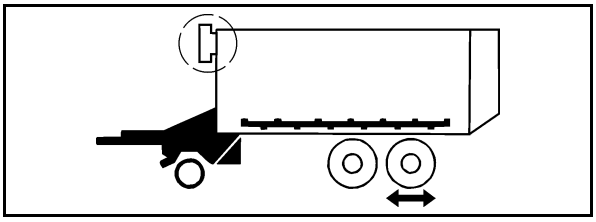
The screen shows:



2. Press the  key again.

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

The screen shows:



6.1.3.8 Switch transport floor on

Information for machines **without beaters:**

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

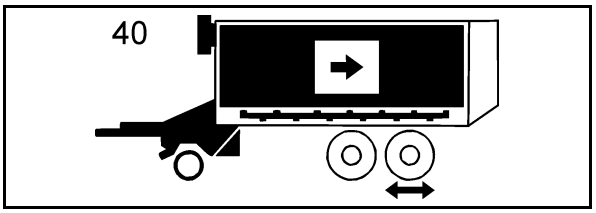
  You can still continue to charge machines without beaters. The feed function of the transport floor can still be switched on for a short period of 3 seconds via the set ± key.

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

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

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

The screen shows:



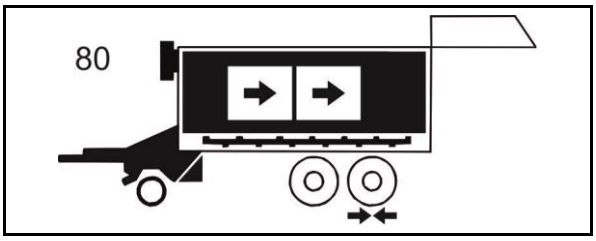
6.1.3.9 Double feed rate of transport floor for complete emptying (transport floor level II)

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

1. Press the  key once during discharge.

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

The screen shows:



6.1.3.10 Change feed rate of transport floor during discharge

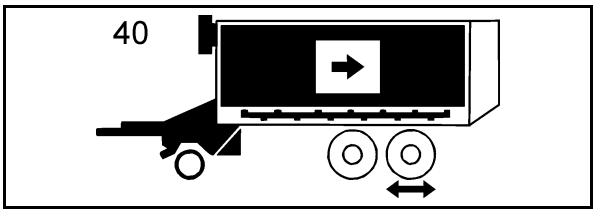
1. Press the  key once and the  key quickly in succession as often as required until the transport floor has reached the desired feed rate.

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

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

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

The screen shows:



6.1.3.11 Reverse transport floor

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

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

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

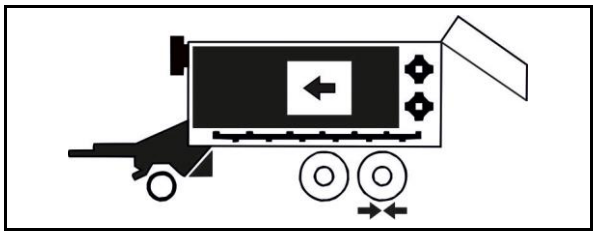
Reverse:

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

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

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

The screen shows:



6.1.3.12 Crossover conveyor ccw rotation/cw rotation on

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

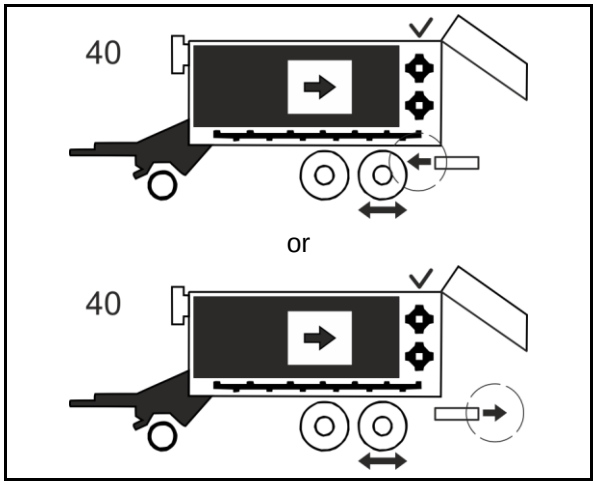
1. Press the  key once.

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

2. Press the  key again.

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

The screen shows:

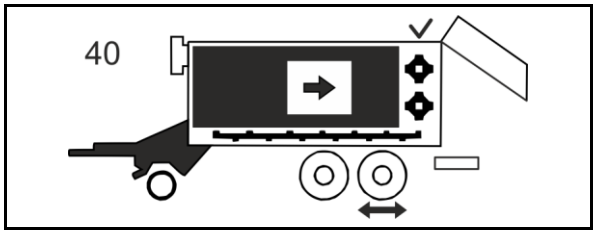


6.1.3.13 Stop crossover conveyor

1. Press the STOP key once.

→ The crossover conveyor stops.

The screen shows:



6.1.3.14 Switch cargo space lighting on/off

If the cargo space lighting is switched on:

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

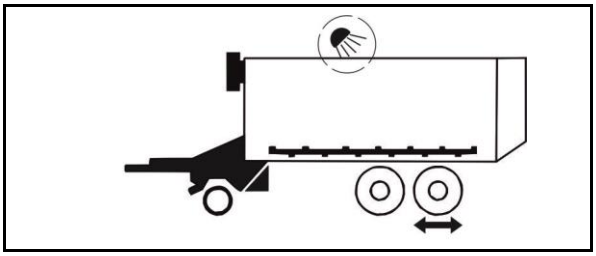
1. Briefly press the ESC key once.

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

2. Press the ESC key briefly again.

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

The screen shows:



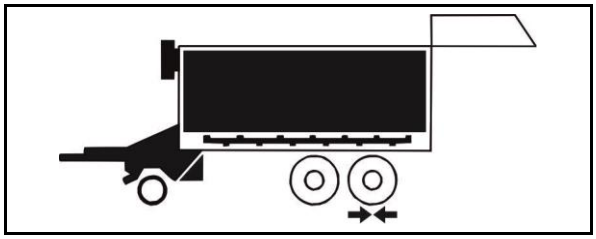
6.1.3.15 Lift tailgate (machine without beaters)

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

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

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

The screen shows:



6.1.3.16 Lift tailgate (machine equipped with beaters)

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

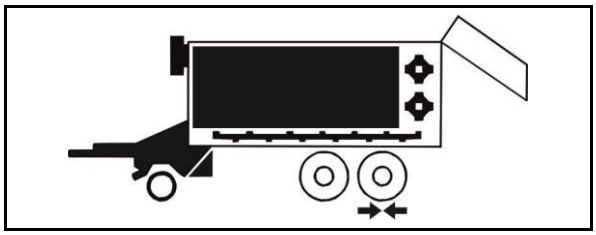
1. Press the key until the tailgate has reached its end position.

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

2. Release the key and press it again.

→ The tailgate is lifted as long as the key is pressed or until the tailgate has been lifted to its full extent.

The screen shows:



6.1.3.17 Lower tailgate

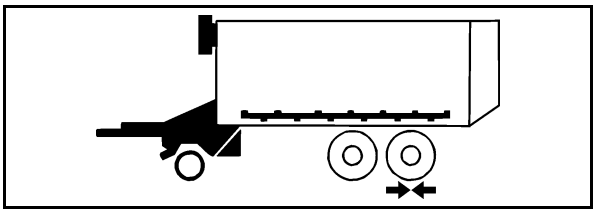
1. Press the  key until the tailgate has reached its end position.

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

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

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

The screen shows:



6.1.3.18 Lift folding drawbar

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

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

The screen shows:

no additional symbol

6.1.3.19 Lower folding drawbar

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

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

The screen shows:

no additional symbol

6.1.3.20 Switch drawbar suspension on

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

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

The screen shows:

no additional symbol

6.1.3.21 Switch drawbar suspension off

3. Press the  key again.

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

The screen shows:

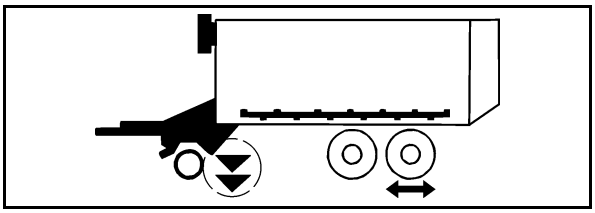
no additional symbol

6.1.3.22 Retract cutting unit

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

→ The cutting unit is retracted from the conveyor duct.

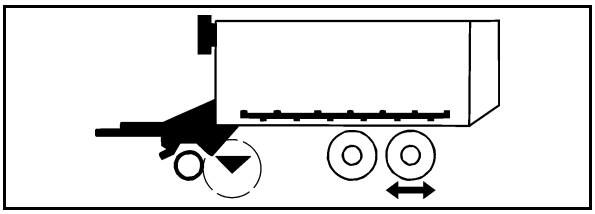
The screen shows:



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

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

The screen shows:



6.1.3.23 Remedy in case of cutting knives retracted from the conveyor duct

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

6.1.3.24 Remedy in case of soiled cutting unit

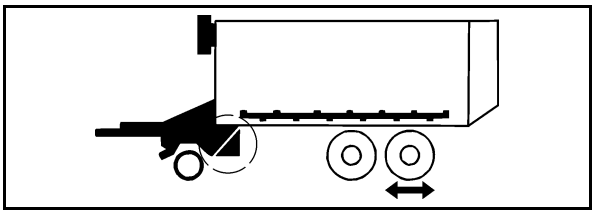
1. Clean the cutting unit.

6.1.3.25 Extend cutting unit

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

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

The screen shows:



6.1.3.26 Lock steering axle

WARNING

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

It is imperative to lock the steering axle/s:

- before travelling over clamp silos,
- at travelling speeds of more than 40 km/h,
- on rough road tracks,
- when traversing hills,
- before carrying out reverse travels,
- before travelling over clamp silos by means of the **Discharge Mode A I** key (with SES system)

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

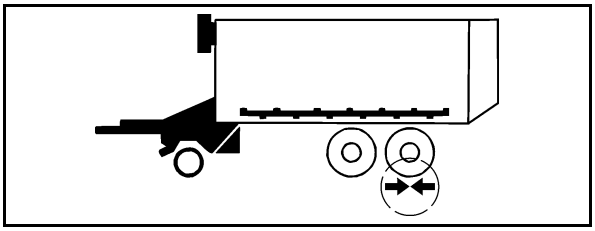
When switching the control set on, the single-acting steering axle is always in unlocked condition.

1. Press the  key once.

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

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

The screen shows:

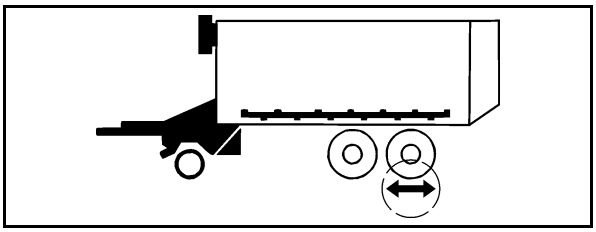


6.1.3.27 Unlock steering axle

1. Press the  key once.

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

The screen shows:



6.1.3.28 Lock steering axle with SES system

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

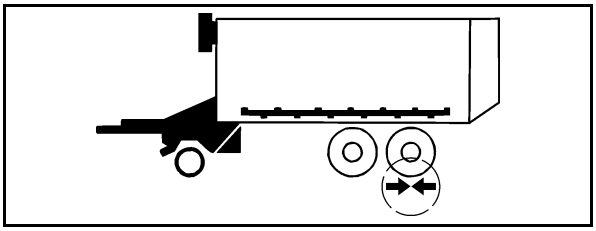
With the electro-hydraulic forced steering axle system, the  key has a touch-control design.

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

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

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

The screen shows:



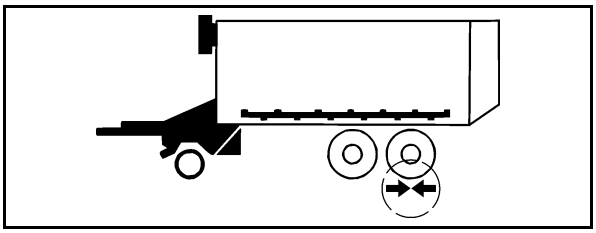
Only in discharge mode A I or A II respectively:

1. Press the  key once.

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

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

The screen shows:



6.1.3.29 Unlock steering axle in SES system

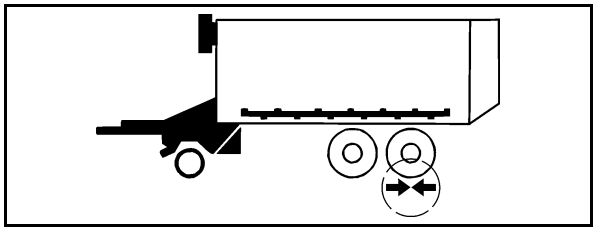
In case of the electro-hydraulic forced steering axle system, the  key has no function.

1. Press the  key once.

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

→ If the symbol is flashing and a horn sound is emitted, there is a malfunction in the steering system. The passive steering is activated. Check the steering system.

The screen shows:



Only in discharge mode A I or A II respectively:

1. Press the  key once.

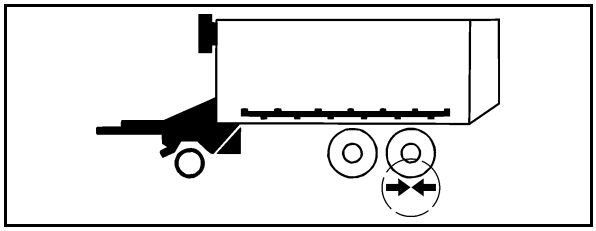
→ The steering axle is force-steered.

2. Press the  key again.

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

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

The screen shows:



6.1.3.30 Lock forced steering axle

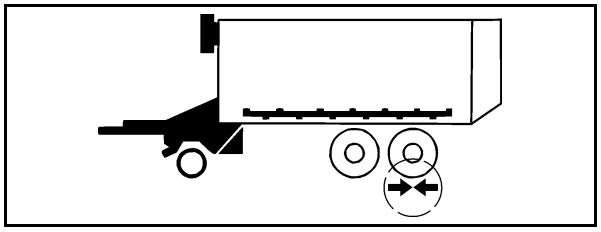
With the electro-hydraulic forced steering axle system, the  key has a touch-control design.

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

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

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

The screen shows:



6.1.3.31 Lift pick-up

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

→ The pick-up lifts.

The screen shows:

no additional symbol

6.1.3.32 Lower pick-up

WARNING

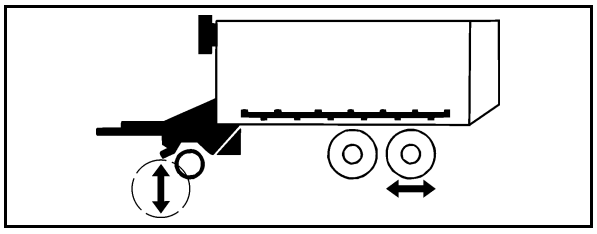
Risk of material damage when travelling on uneven ground with the pick-up lowered/locked!

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

1. Press the  key once.

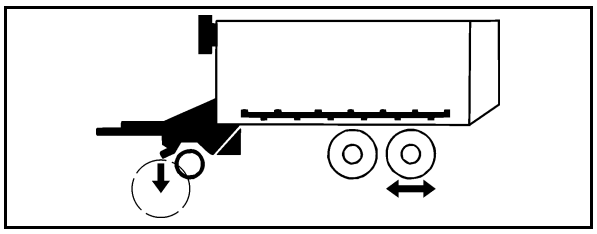
→ The pick-up lowers and is held in floating position. The "Lower pick-up/Floating position" symbol appears.

The screen shows:



2. Press the  key again.

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



6.1.3.33 Switch silage additive pump on/off

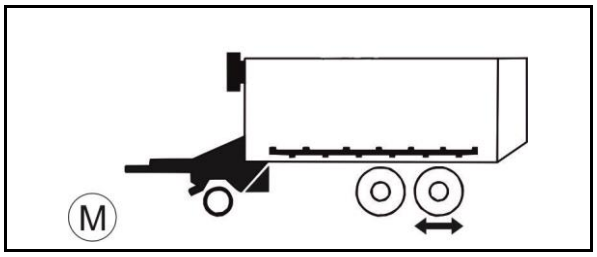
1. Press and hold the ESC key once.

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

2. Press and hold of the ESC key again.

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

The screen shows:



6.1.4 Set machine parameters

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

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

6.1.4.1 Call up SET menu

(1) Arrow

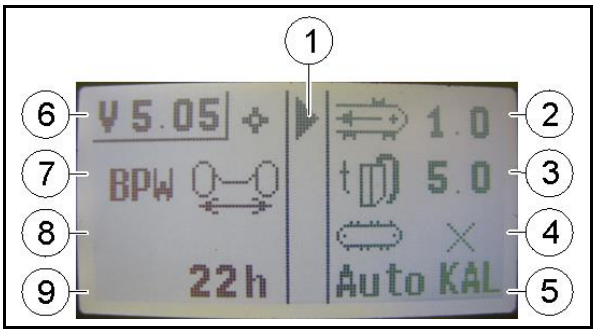
(2) Only for machines equipped with beaters:

Entry of time during which the transport floor shall reverse if the "Forage wagon full" switch is switched on when starting **Discharge Mode A II**.

(3) Only for machines equipped with beaters:

Entry of time during which the tailgate shall be activated after reaching the sensor "First opening width"

The screen shows:



(4) Crossover conveyor display:

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

(5) Display of potentiometer position:

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

(6) Left: Display of current software version

Right: Entry whether equipped with

beaters or not; here "with beaters"

(7) Entry of steering axle model

(8) Vacant

(9) Display of total number of service hours

1. Press and hold the SET key once. After switching to the **SET** menu, the arrow (1) is at the top and is pointing to the right. Now the right-hand functions 2 to 4 can be selected.
2. Briefly press the key to move the arrow down.
3. Press and hold the key such that the arrow is pointing to the left

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

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

→ The **Working** menu appears.

6.1.4.2 Set machine model

1. Press and hold the SET key once.

→ The **SET** menu appears.

2. Press and hold the key once.

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

3. Press the + or − key to change the setting.

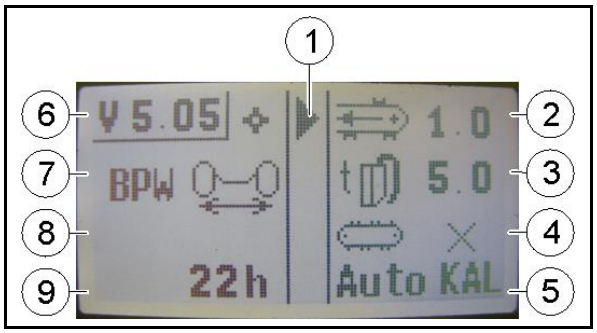
→ The symbol is faded in or out.

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

4. Press the ESC key.

→ The **Working** menu appears.

The screen shows:



6.1.4.3 Pre-select steering axle model

1. Press and hold the SET key once.

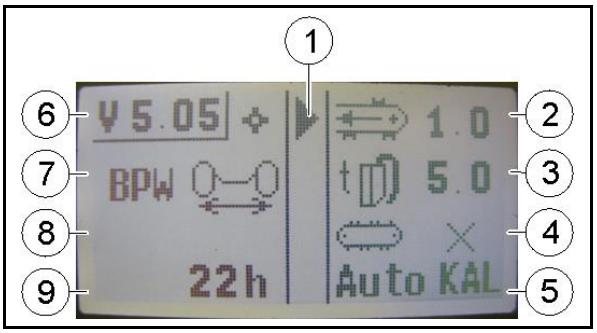
→ The **SET** menu appears.

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

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

3. Press the or key to change the setting.

The screen shows:



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

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

4. Press the ESC key.

→ The **Working** menu appears.

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

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

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

→ The **Filling Degree** menu appears.

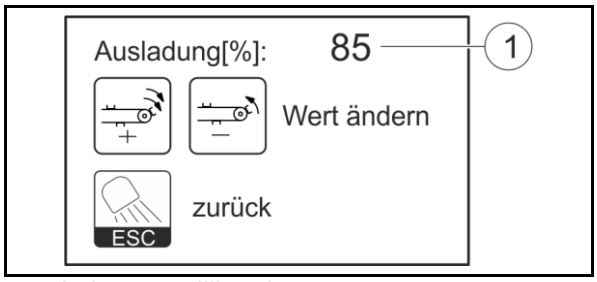
2. Press the + or − key to change the setting in 5% steps.

→ The filling degree (1) is changed.

3. Press the ESC key.

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

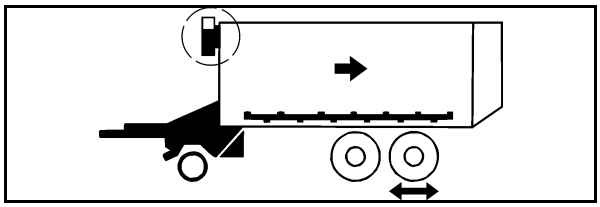
The screen shows:



"Ausladung" = Filling degree

"Wert ändern" = Change value

„Zurück“ = back



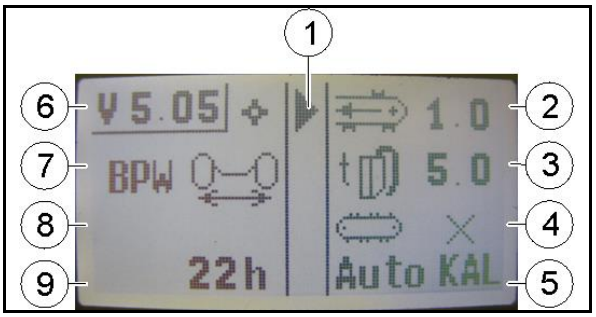
6.1.5 Calibration

6.1.5.1 Calibrate automatic charging system

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

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

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



6. Press and hold the SET key once.

→ The **SET** menu appears.

7. The person in the cargo space swivels the sensing band to the bottom position which shall be the automatic start position for the transport floor.

8. Press the key once to start the calibration mode.

→ The display "KAL" (5) appears.

9. The person in the cargo space swivels the sensing band to the top position which shall be the start position for the transport floor running at maximum feed rate.

10. Press the key again.

11. Press the STOP key once to acknowledge the settings and to finish the calibration procedure.

→ A horn sounds.

12. Check whether the set range is appropriate by manually moving the sensing band from the bottom position (indicated value: 0) to the top position (indicated value: 100). Adjust the range in case of a collision.

13. Press the ESC key once.

→ The **Working** menu appears.

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

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

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

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

6.1.7 Call up Counter menu

The total service hours counter is displayed in the **SET** menu.

1. Briefly press the SET key once.

→ The **Counter** appears:

(1) Total operating hours counter

(2) Total transported loads counter

(3) Daily operating hours counter

(4) Daily transported loads counter

The screen shows:

2. Press the ESC key once.

→ The **Working** menu appears.

6.1.8 Reset daily counters

1. Briefly press the SET key once.

→ The **Counter** appears:

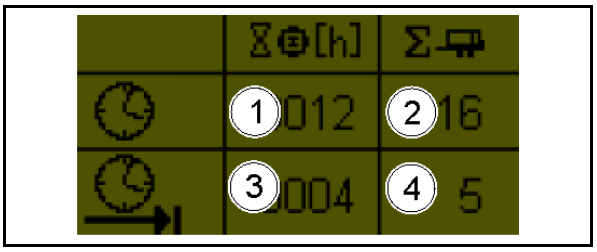
2. Press and hold the SET key once.

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

3. Press the ESC key once.

→ The **Working** menu appears.

The screen shows:



6.1.9 Sensor and status overview

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

6.1.9.1 Call up status overview

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

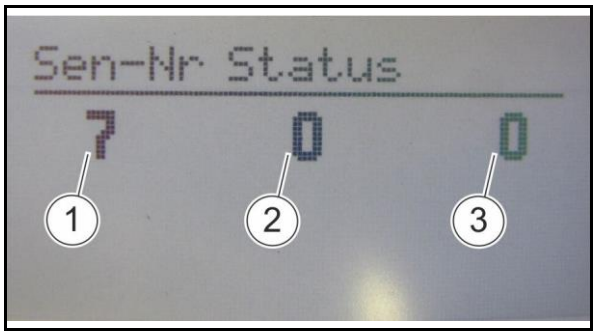
→ The display shows the **Sensor and Status Overview** menu:

(1) Sensor number

(2) Sensor status

(3) Number of sensor circuits

The screen shows:



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

3. Press the ESC key once.

→ The **Working** menu appears.

6.2 ISOBUS control / Field Operator 130

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

Protect the control set against moisture and humidity!

6.2.1 Design of ISOBUS control

The ISOBUS control complies with the latest ISO standard.

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

The ISOBUS control set is automatically switched on and off when the tractor ignition is turned on and off. In case of longer downtimes of the machine, additionally disconnect the mobile tractor connecting cable.

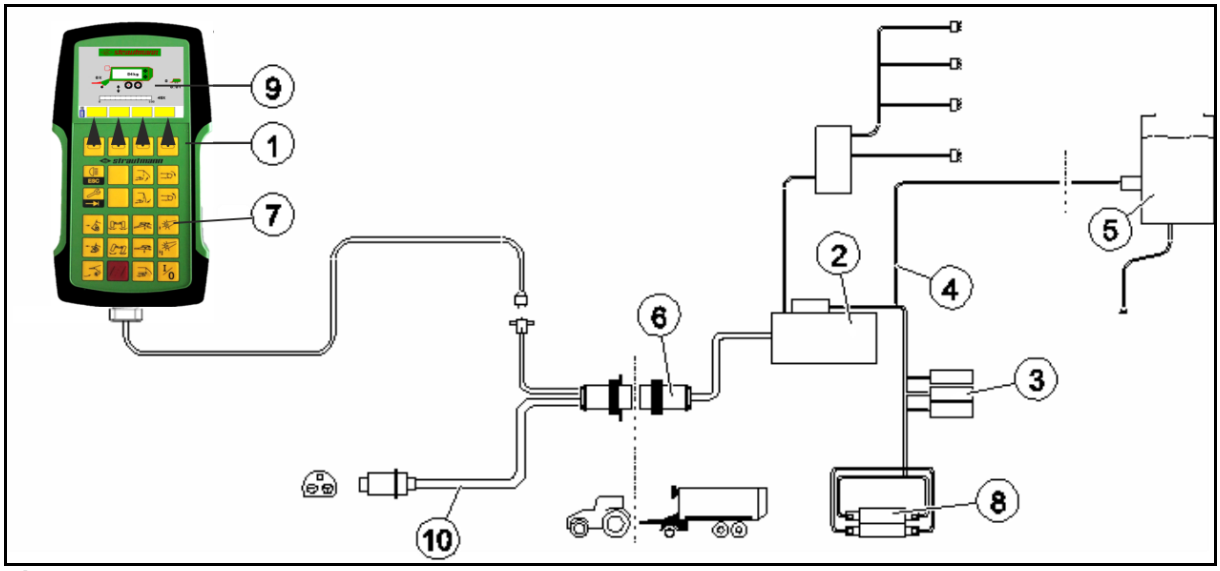


Fig. 84

The ISOBUS control mainly consists of:

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

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

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

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

(1) Coloured screen for machine monitoring and display

(2) Display for coupled USB stick

(3) Soft keys: The assignment is indicated in the display and varies according to mode, submenu and equipment.

(4) Switch work lights on/off; ESC key for submenu

(5) SET key: Call up set-up menu and change menu level

(6) Retract cutting unit

(7) Extend cutting unit

(8) Charge mode

(9) Road travel mode

(10) Discharge mode

(11) Lock steering axle

(12) Unlock steering axle

(13) Lift folding drawbar

(14) Lower folding drawbar

(15) Lift pick-up

(16) Lower pick-up

(17) Open tailgate, start automatic discharge mode

(18) Close tailgate, finish automatic discharge mode

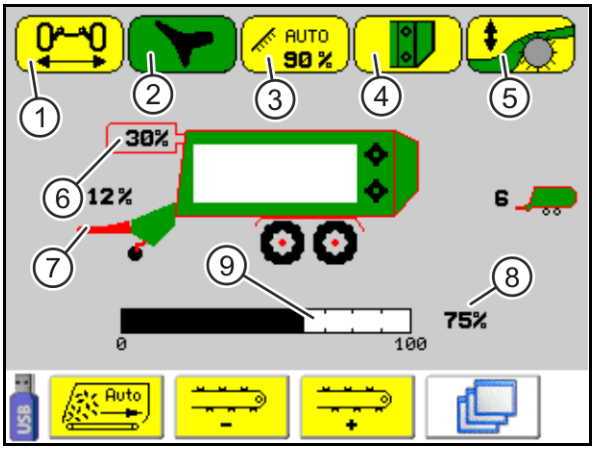
(19) Switch transport floor on

(20) Reverse transport floor

Fig. 85

6.2.2 Displays

6.2.2.1 Display information in charge menu



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

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

(3) Value "Automatic charging system position", here 90 %

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

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

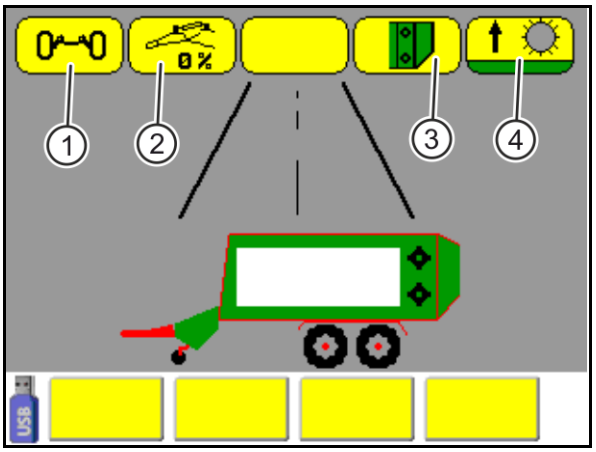
(6) Operating state "Automatic charging system on/off, nominal value", here "Automatic charging system on, 30%"

(7) Value "Folding drawbar position", here 12%

(8) Currently selected "Transport floor nominal value in %", here "75 %"

(9) Actual "Transport floor speed in %“, here "75 %"

6.2.2.2 Display information in road travel menu



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

(2) Value "Folding drawbar position", here 0%

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

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

6.2.2.3 Display information in discharge menu

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

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

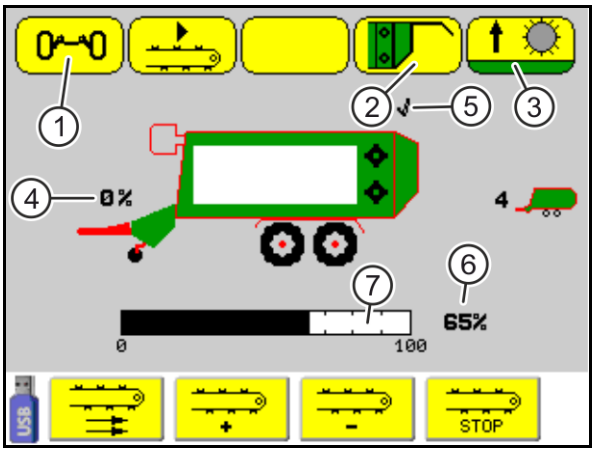
(3) Operating state "Pick-up lifted/lowered/floating position", here "Pick-up lifted"

(4) Value "Folding drawbar position", here 0%

(5) Operating state "Beaters powered/off", here "Beaters powered"

(6) Currently selected "Transport floor nominal value in %", here "65 %"

(7) Actual "Transport floor speed in %", here "65 %"



6.2.3 Functions of the ISOBUS control

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

6.2.3.1 Switch control set on/off

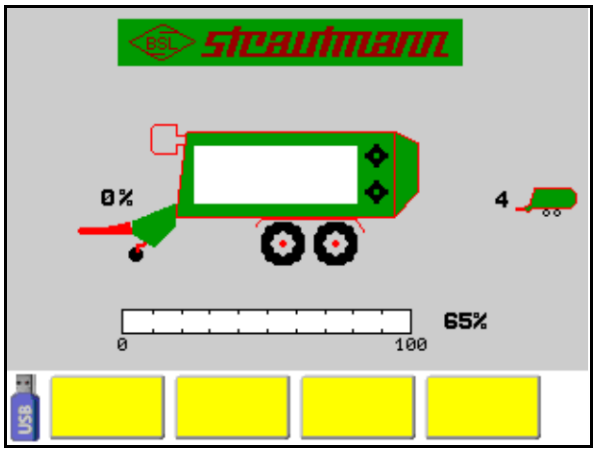
Insert/Pull out the connecting cable to switch the control set on/off.

1. Insert the connecting cable of the control set.

→ The control set is switched on.

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

The screen shows:



6.2.3.2 Switch road travel mode on

The road travel mode can only be switched on:

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

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

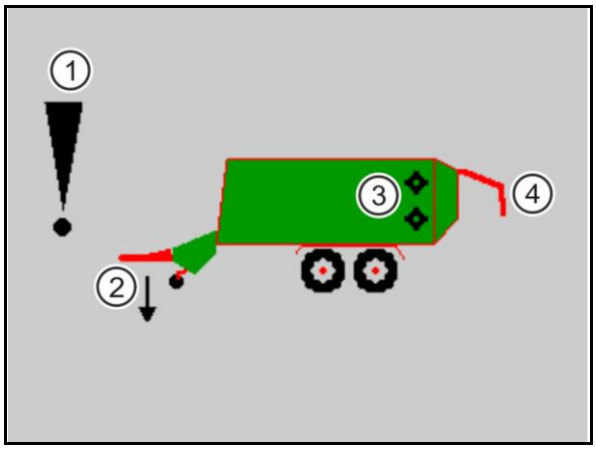
(1) Warning message

(2) Pick-up down

(3) Beaters powered

(4) Tailgate open

The screen shows:



With the road travel mode switched on:

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

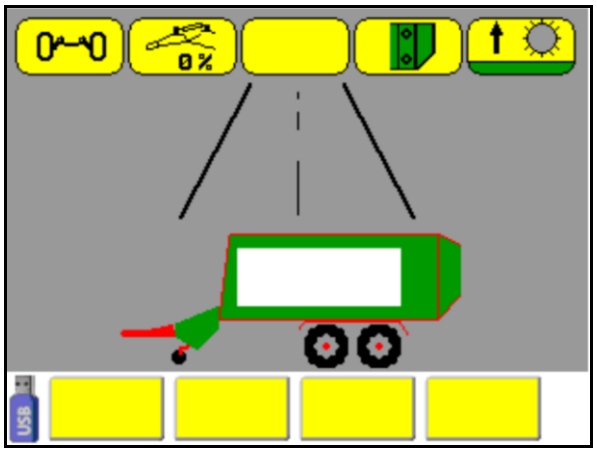
If the folding drawbar is equipped with a drawbar suspension, the hydraulic cylinders of the folding drawbar must be extended by approx. 20 mm before switching the road travel mode on.

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

1. Press the  key once.

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

The screen shows:



6.2.3.3 Switch road travel mode off

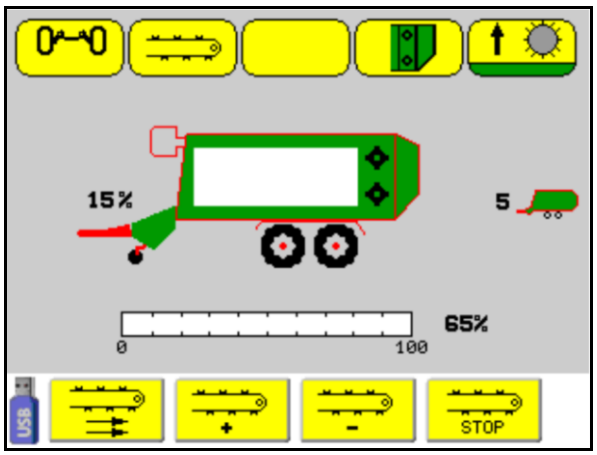
With the road travel mode switched off:

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

1. Press the  key again.

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

The screen shows:



6.2.3.4 Switch discharge mode on

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

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

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

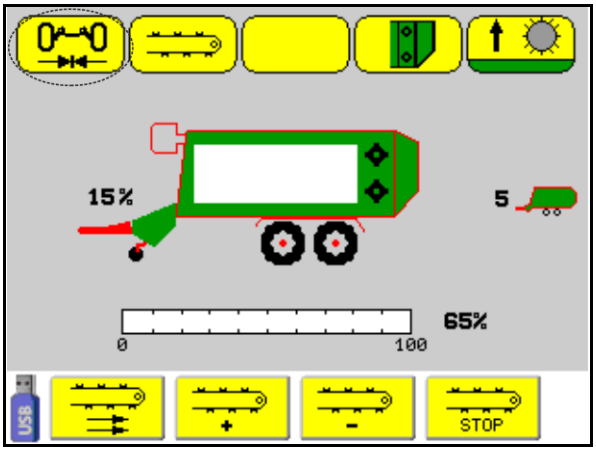
Depending on the equipment, the number and arrangement of the soft keys may vary.

1. Press the  key.

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

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

The screen shows:



6.2.3.5 Switch automatic discharge mode on (Machine without beaters)

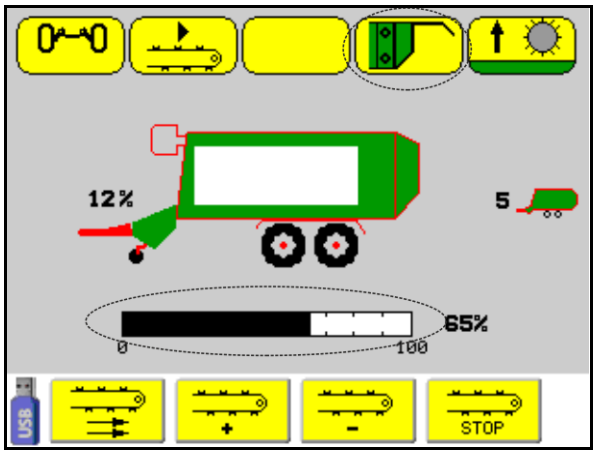
The automatic discharge mode is automatically switched off if the tailgate is lowered.

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

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

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

The screen shows:



6.2.3.6 Switch automatic discharge mode on (machine equipped with beaters)

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

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

soft key to discharge step by step.

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

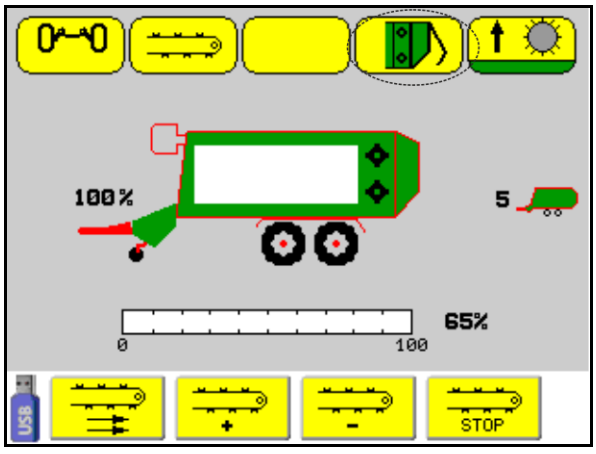
1. Press the  key once when being on the clamp silo.

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

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

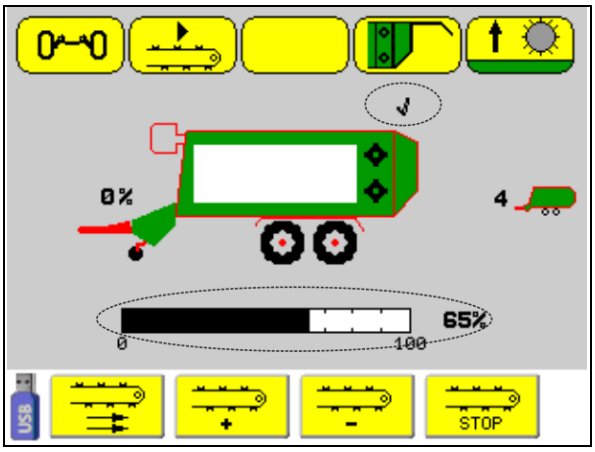
2. Switch the p.t.o. shaft on.

The screen shows:

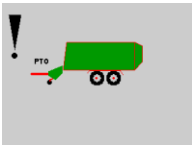


As soon as the p.t.o. shaft is switched on, the beaters start to run and after a short delay, the transport floor automatically starts.

→ With the beaters powered, the "Beaters On" symbol appears.



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



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

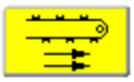
→ Switch p.t.o. shaft off

→ Actuate  key again

→ Only switch the beaters on with the tailgate open

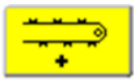
6.2.3.7 Double feed rate of transport floor for complete emptying (transport floor level II)

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

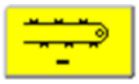
1. Press the  key once during discharge.

→ The transport floor speed is doubled.

6.2.3.8 Change feed rate of transport floor during discharge

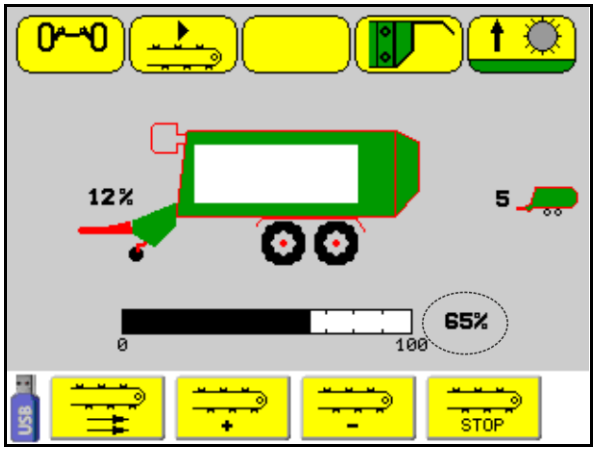
1. Press the  soft key.

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

2. Press the  key.

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

The screen shows:



6.2.3.9 Stop and restart transport floor during discharge

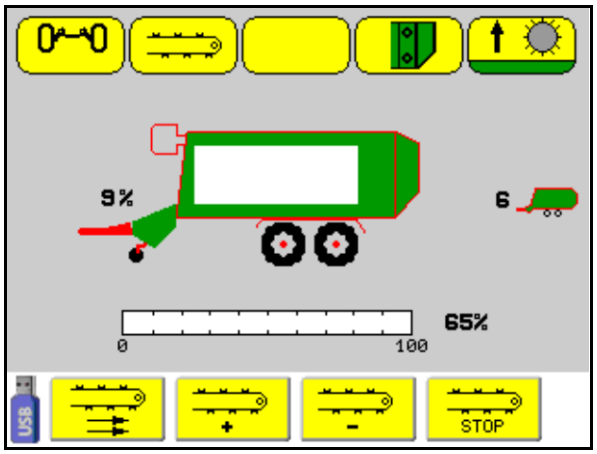
1. Press the  soft key

→ The transport floor stops

2. Press the  key

→ The transport floor restarts

The screen shows:



6.2.3.10 Reverse transport floor

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

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

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

Reverse:

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

1. Press the 

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

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

6.2.3.11 Switch automatic charging system on/off

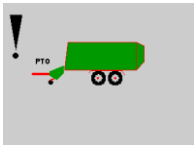
Switch the automatic charging system on for uniform and complete filling of the cargo space.

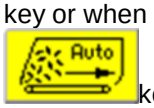
The automatic charging system:

- has to be switched on only once,
- automatically and infinitely variably switches the transport floor on and off during charging,
- will automatically be deactivated if the control set generates the acoustic signal (horn sound) and the visual signal "Forage wagon full",
- will automatically be activated if the machine has been emptied and the pick-up is lowered the next time,
- remains switched on until the automatic charging system is manually switched off,
- permits to pre-select the filling degree of the loaded material in the cargo space.

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

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



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

key if

→ the p.t.o. shaft has been switched off

→ the sensor is defective

1. Press the  key.

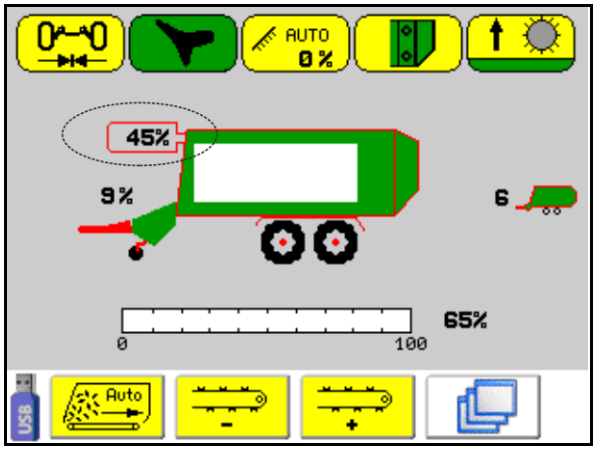
→ The charge mode is activated

2. Press the 

soft key once.

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

The screen shows:

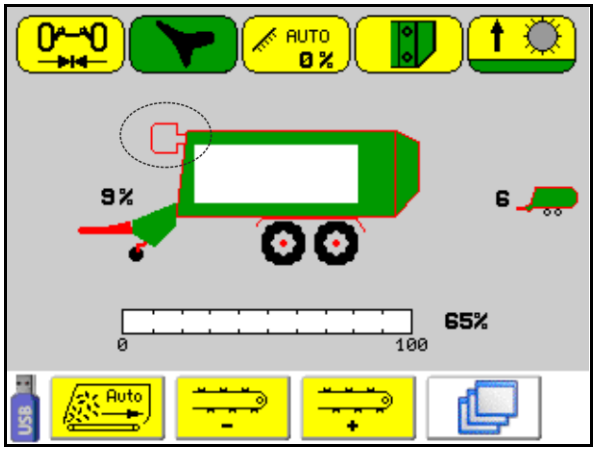


3. Press the 

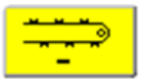
key again.

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

The screen shows:

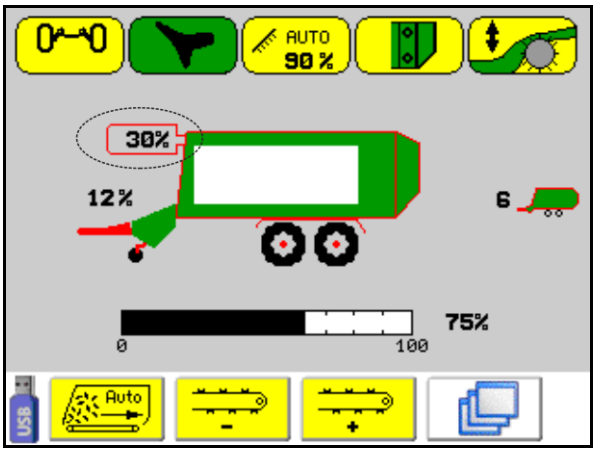


6.2.3.12 Change filling degree of loaded material in cargo space

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

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

The screen shows:



6.2.3.13 Switch transport floor on

Information for machines **without beaters:**

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

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

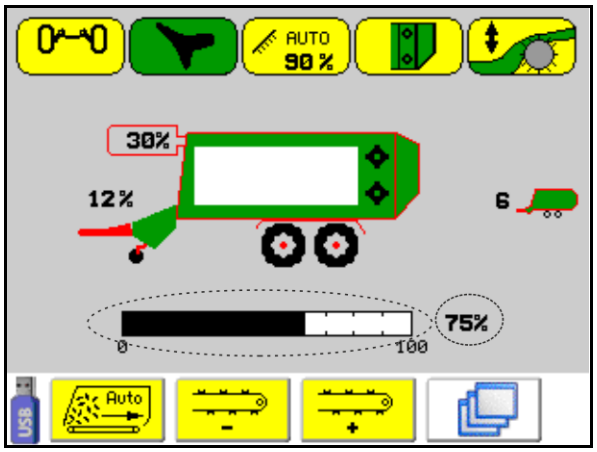
  Stop the charging procedure after the acoustic signal has appeared for the third time at the latest.

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

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

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

The screen shows:



6.2.3.14 Change transport floor speed

1. Press the 

soft key with the automatic charging system activated.

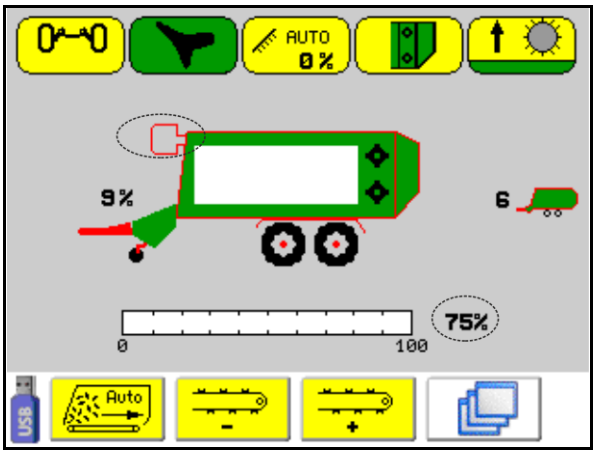
→ The automatic charging system is deactivated.

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

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

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

The screen shows:



6.2.3.15 Switch cargo space lighting on/off

If the cargo space lighting is switched on:

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

1. Briefly press the 

key once.

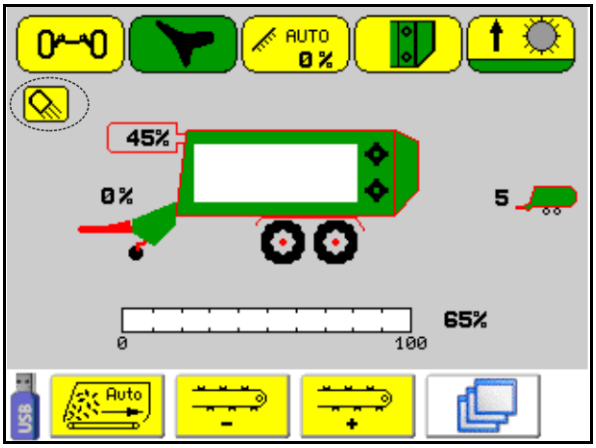
→ The cargo space lighting is switched on. The "Cargo space lighting on" symbol appears.

2. Press the 

key briefly again.

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

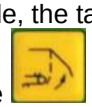
The screen shows:



6.2.3.16 Switch silage additive pump on/off

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

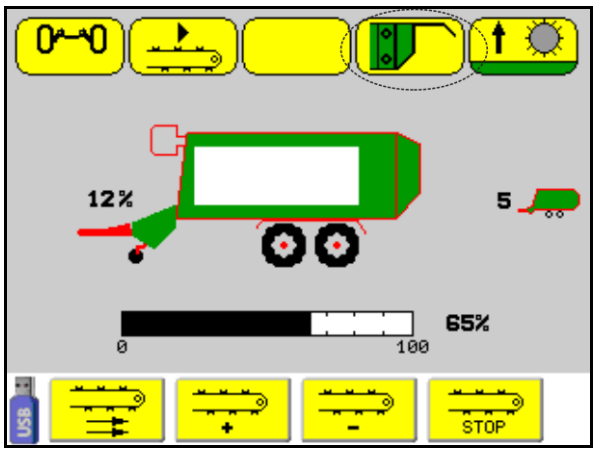
6.2.3.17 Lift tailgate (machine without beaters)

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

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

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

The screen shows:



6.2.3.18 Lift tailgate (machine equipped with beaters)

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

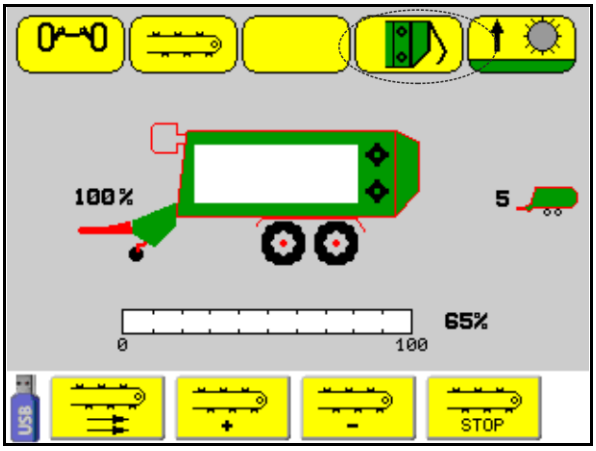
1. Press the  key until the tailgate has reached its end position (manual operation).

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

2. Release the key and press it again.

→ The tailgate is lifted as long as the key is pressed or until the tailgate has been lifted to its full extent.

The screen shows:



6.2.3.19 Lower tailgate

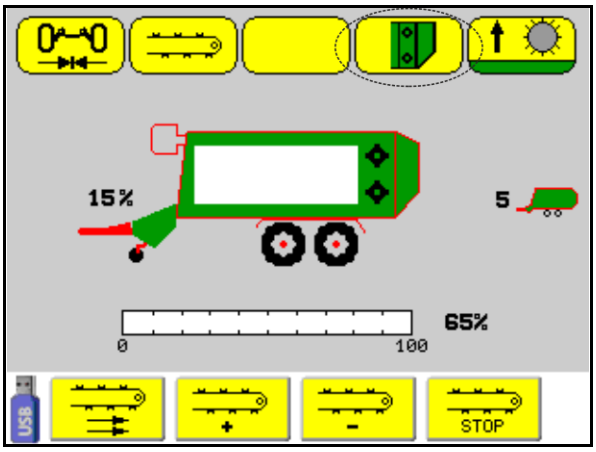
1. Press the  key until the tailgate has reached its end position.

→ The tailgate is lowered. At the same time, the automatic discharge mode automatically stops:

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

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

The screen shows:



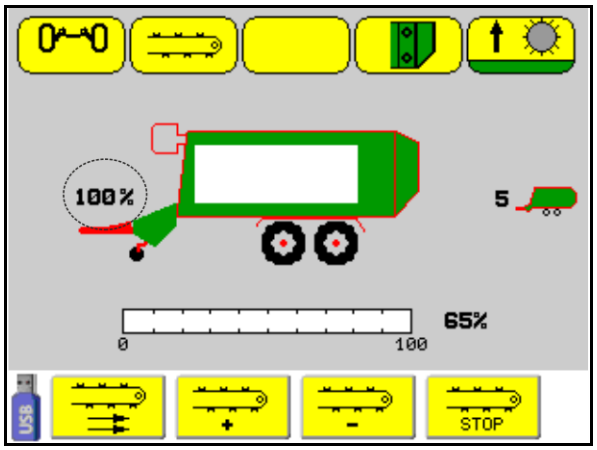
6.2.3.20 Lift folding drawbar

When switching to the different operating modes, the folding drawbar automatically moves to the saved working positions if the automatic system has been activated.

1. Press the  key until the folding drawbar has been lifted to the desired position or has reached its end position (the drawbar position is displayed in %; optional extra).

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

The screen shows:

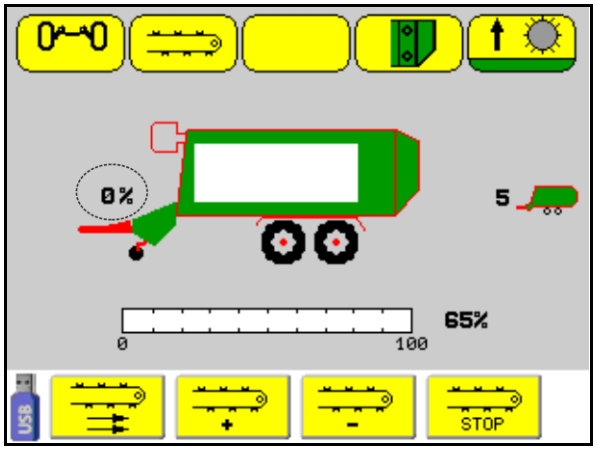


6.2.3.21 Lower folding drawbar

1. Press the  key until the folding drawbar has been lowered to the desired position or has reached its end position (the position is indicated in %; optional extra).

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

The screen shows:

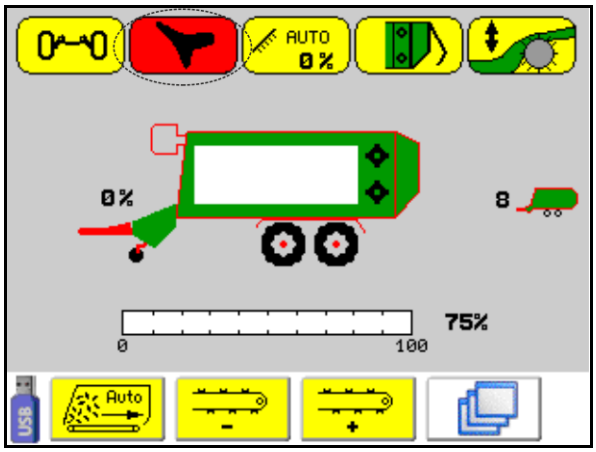


6.2.3.22 Retract cutting unit

1. Press the  key until the "Cutting unit" symbol has a **RED** background and a horn sound is emitted.

→ The cutting unit is retracted from the conveyor duct.

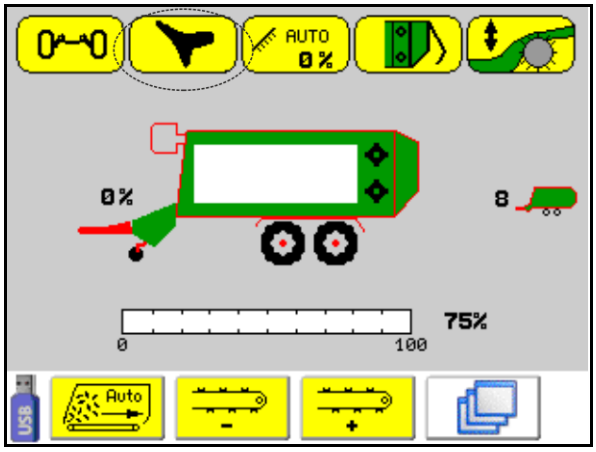
The screen shows:



If the coloured background of the "Cutting unit" symbol changes to **YELLOW** during charging:

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

The screen shows:



6.2.3.23 Remedy in case of cutting knives retracted from the conveyor duct

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

6.2.3.24 Remedy in case of soiled cutting unit

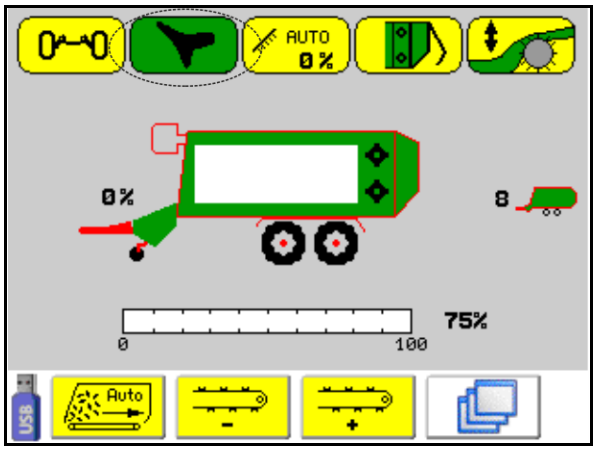
1. Clean the cutting unit.

6.2.3.25 Extend cutting unit

1. Press the  key until the "Cutting unit" symbol has a **GREEN** background.

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

The screen shows:



6.2.3.26 Lock steering axle

WARNING

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

It is imperative to lock the steering axle/s:

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

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

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

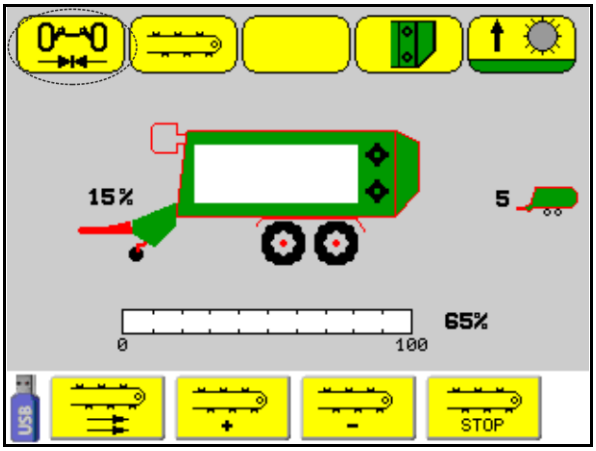
The locking of the steering axle in the individual operating modes and for reverse travel (optional) is set and automated via the machine set-up menu.

1. Press the  key once.

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

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

The screen shows:

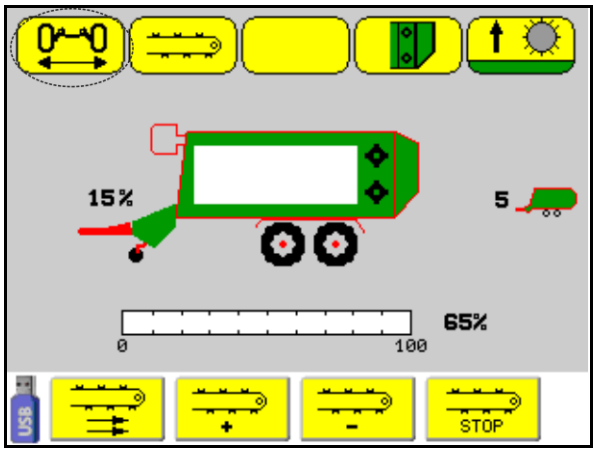


6.2.3.27 Unlock steering axle

1. Press the  key once.

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

The screen shows:



6.2.3.28 Lock steering axle with SES system

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

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

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

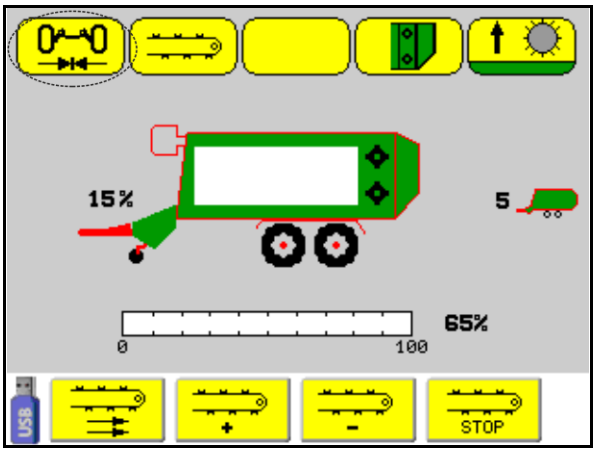
The steering axle is locked by activating the discharge mode if this function has been activated in the machine set-up menu. The symbol appears in the display. If the symbol is flashing and a horn sound is emitted, there is a malfunction in the steering system. Check the steering system.

1. Press the key until the steering axle is locked.

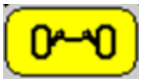
→ The steering axle is locked in "Straight" position. The "Steering axle locked" symbol appears and a horn sound is emitted.

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

The screen shows:



6.2.3.29 Unlock steering axle with SES system

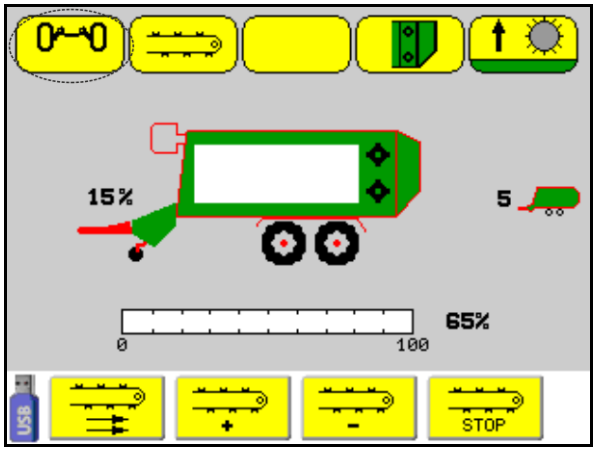
The steering axle is unlocked and force-steered by activating the road travel mode if this function has been activated in the machine set-up menu. The  symbol appears in the display. If the symbol is flashing and a horn sound is emitted, there is a malfunction in the steering system. Check the steering system.

1. Press the  key.

→ The steering axle is force-steered and follows the turning radius of the corner during cornering. The "Steering axle force-steered" symbol appears.

→ If the symbol is flashing and a horn sound is emitted, there is a malfunction in the steering system. The passive steering is activated. Check the steering system.

The screen shows:



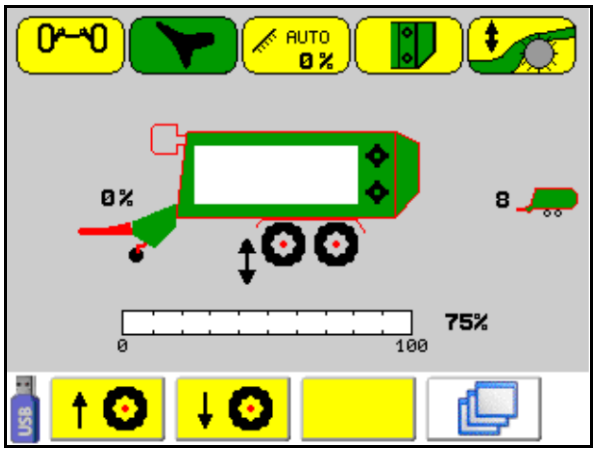
6.2.3.30 Lift and lower lift axle (tridem chassis)

The lift axle is only available on tridem chassis. Do not lift the lift axle with the vehicle charged.

1. Press the  soft key in the charge or discharge menu.

→ The assignment of the soft keys changes.

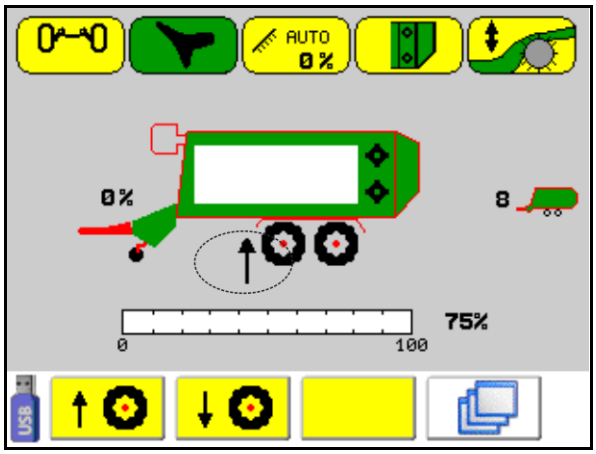
The screen shows:



2. Press the  soft key

→ The lift axle is lifted.

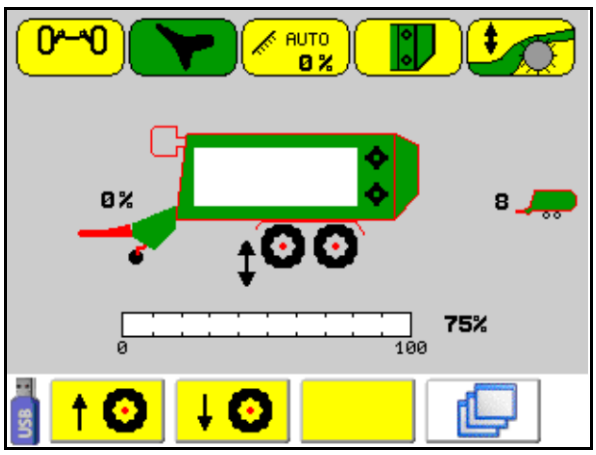
The screen shows:



3. Press the  soft key

→ The lift axle is lowered and the suspension is activated.

The screen shows:

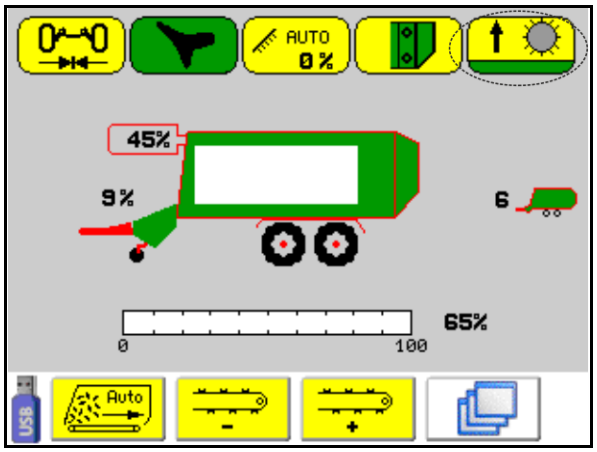


6.2.3.31 Lift pick-up

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

→ The pick-up lifts.

The screen shows:



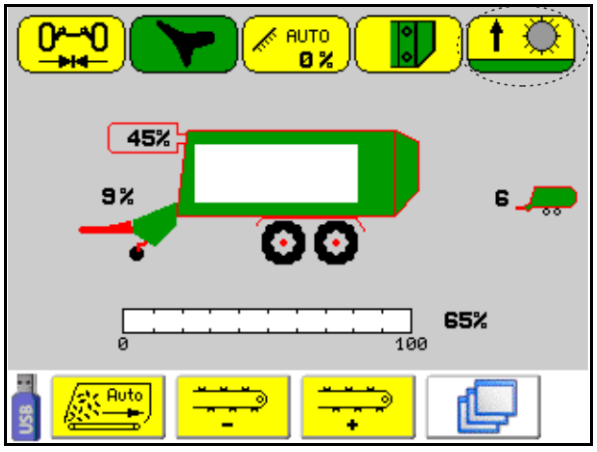
6.2.3.32 Lower pick-up

WARNING	**Risk of material damage when travelling on uneven ground with the pick-up lowered/locked!**
	Only move the machine on uneven ground with the pick-up held in floating position.

1. Press the  key once.

→ The pick-up lowers and is held in floating position. The "Lower pick-up/Floating position" symbol appears.

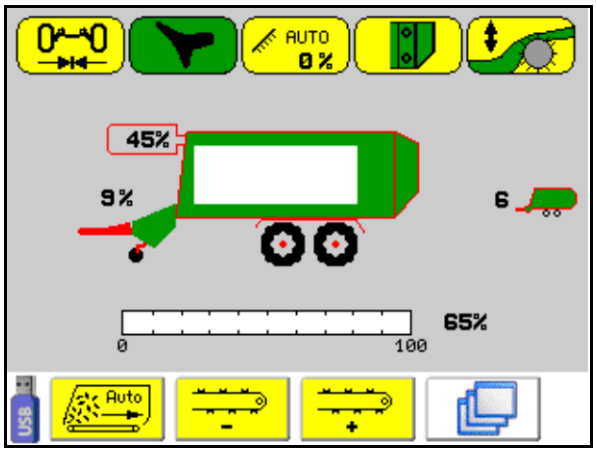
The screen shows:



The screen shows:

2. Press the  key again.

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



6.2.3.33 Automatic wayback

An automatic wayback is integrated in the software 9.47.

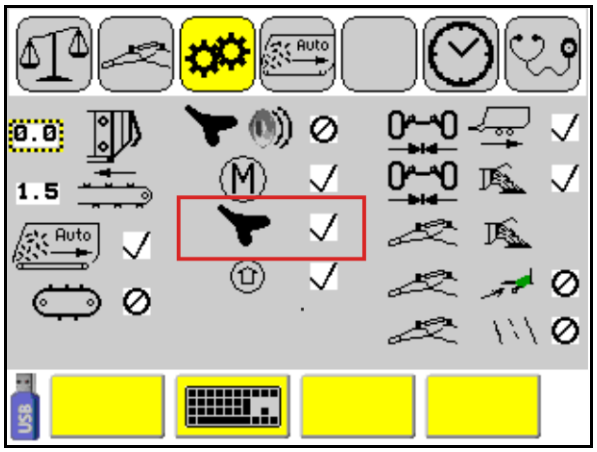
6.2.3.34 Functional description of automatic wayback FO130

Upon actuation of the knife protection system, automatic retracting and extending of the cutting unit is initiated when lifting the pick-up.

6.2.3.35 Actuation of automatic wayback

The automatic wayback is activated by means of a parameter in the set-up menu.

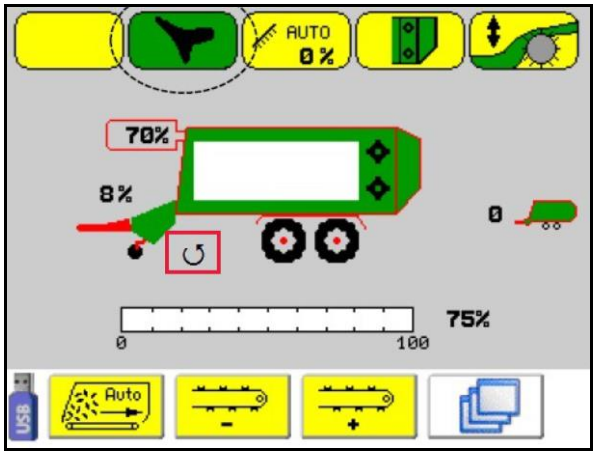
The screen shows:



Actuate the key button/soft key "Extend knives" to activate the wayback function.

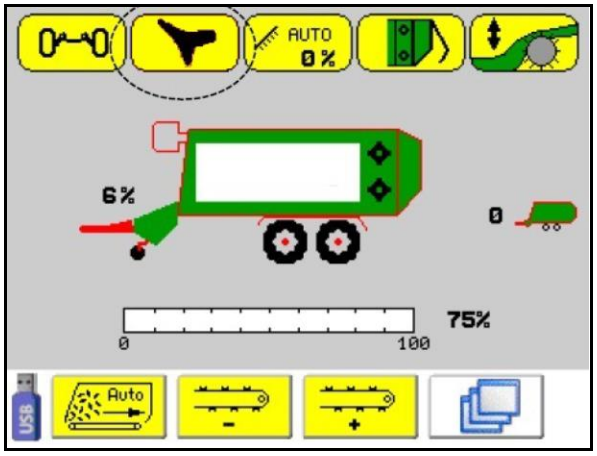
The screen shows:

1. Press the Extend Knives key  until the ↺ symbol appears at the cutting unit. The automatic wayback function is now activated!



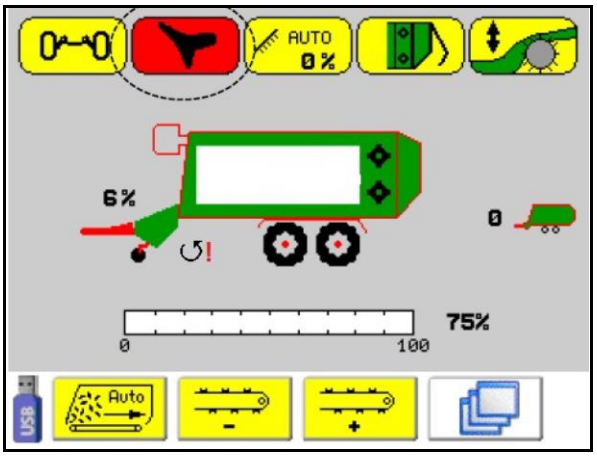
The screen shows:

2. As soon as the sensor detects a retracted knife, the automatic system is activated when actuating the Lift Pick-up function.



3. If the cutting unit is automatically retracted and extended again, this is indicated by an "!" An additional warning beep is emitted for approx. 3 seconds.

The screen shows:

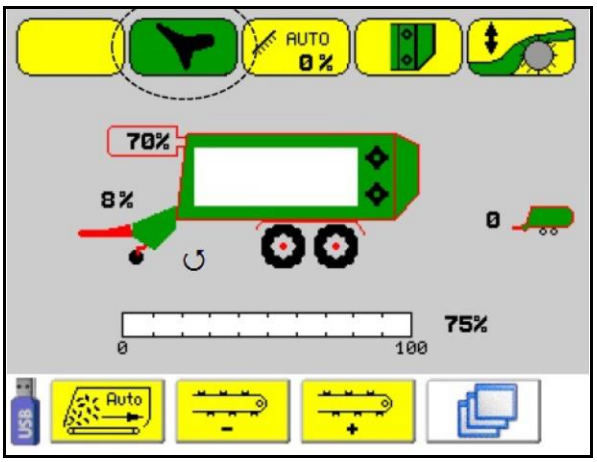


Use the "Retract cutting unit" key  to interrupt the automatic wayback function. If the Retract Cutting Unit key is actuated and the automatic function is interrupted, this is indicated by removal of the "!" symbol.

The cutting unit can now be operated as usual.

Actuate the "Extend cutting unit" key  to activate the automatic system.

The screen shows:



6.2.3.36 Change intensity of background lighting

1. Simultaneously press the two soft keys in the charge or discharge menu twice.

→ The start menu opens.

2. Press the  key

→ The background lighting becomes brighter.

3. Press the  soft key.

→ The background lighting becomes darker.

4. Simultaneously press the two soft keys   .

→ The last run working menu appears.

The screen shows:

6.2.3.37 Call up and edit set-up menu

1. Press the  key.

→ The set-up menu opens (is inactive).

The screen shows:

Use the  key to switch from any working menu to the set-up menu. Use the 

key to return to the previously run working menu.

(1) Setting of weighing system (is inactive)

(2) Setting of automatic folding drawbar system

(3) Machine set-up menu

(4) Settings of automatic charging system

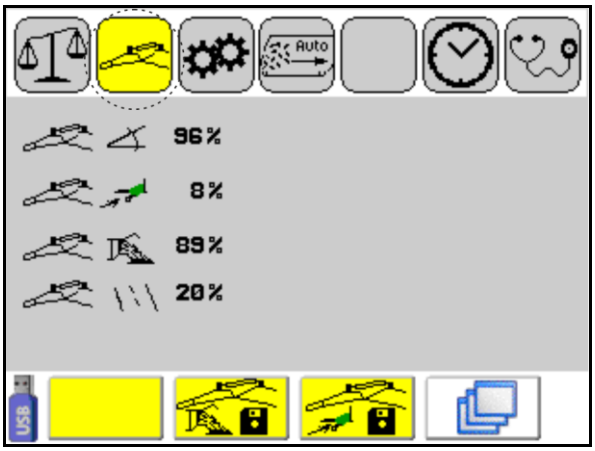
(5) Hours and transported loads counter

(6) Check menu

2. Press the  key again.

→ You scroll to the next menu item. The settings of the folding drawbar sensor are displayed.

The screen shows:

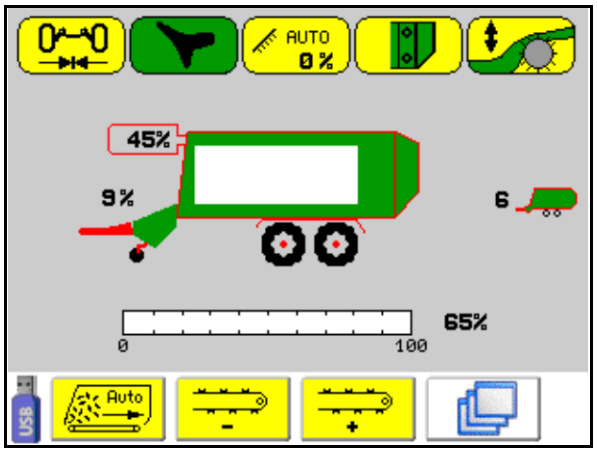


3. Press the  key again to continue to scroll through the set-up menu.

4. Press the  key.

→ You return to the previously run working menu, here "Charge".

The screen shows:



6.2.3.38 Display information of folding drawbar sensor

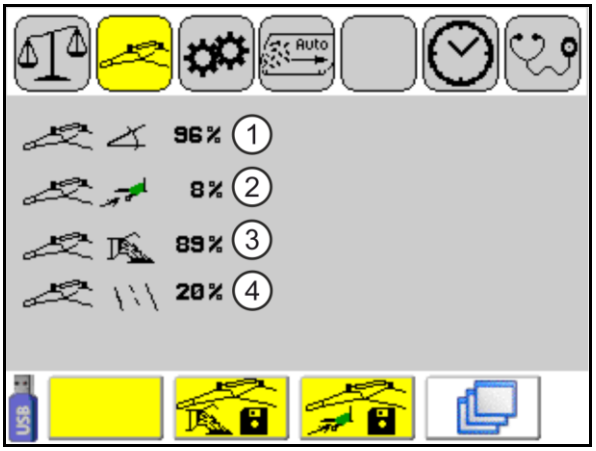
In the folding drawbar menu, the automatic functions for the folding drawbar can be set. Folding drawbar positions can be saved for the three operating modes. In the respective operating modes, the positions are automatically approached if the respective automatic functions have been activated in the machine set-up menu.

(1) Current drawbar position in %, here 96 %

(2) Charging height of drawbar, here 8 %; **is automatically approached in charge mode (depending on the setting)**

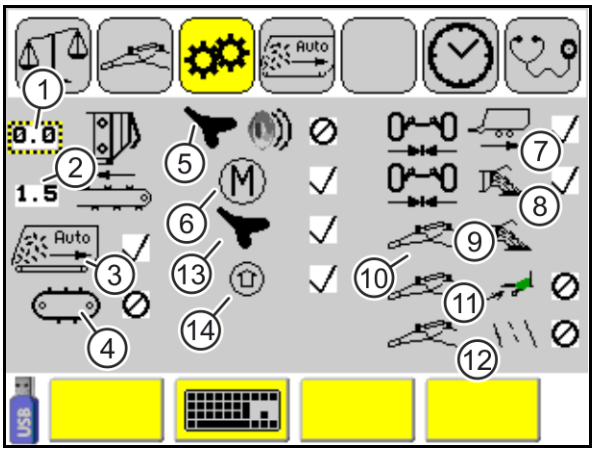
(3) Discharge height of folding drawbar, here 89 %; **is automatically approached in discharge mode (depending on the setting)**

(4) Road travel height of folding drawbar, here 20 %; **is automatically approached in road travel mode (depending on the setting)**



6.2.3.39 Display information of machine set-up menu

In the machine set-up menu, automatic functions and features can be activated/deactivated.



(1) Opening time of tailgate after reaching the first opening width (only forage wagon with dosing unit)

(2) Reversing time of transport floor with full wagon (only forage wagon with dosing unit)

(3) Automatic charging system activated/deactivated, here activated

(4) Crossover conveyor mounted / not mounted, here not mounted

(5) Beep upon response of knife protection system activated/deactivated, here activated

(6) Connection of silage additive pump in charge mode activated/deactivated, here activated

(7) Automatic locking of steering axle during reverse travel activated/deactivated, here activated

(8) Automatic locking of steering axle in discharge mode activated/deactivated, here activated

(9) Automatic locking of steering axle in road travel mode activated/deactivated, here deactivated

(10) Automatic setting of folding drawbar position in discharge mode activated/deactivated, here activated

(11) Automatic setting of folding drawbar position in charge mode activated/deactivated, here deactivated

(12) Automatic setting of folding drawbar position in road travel mode activated/deactivated, here deactivated

(13) Automatic knife system

(14) External operation

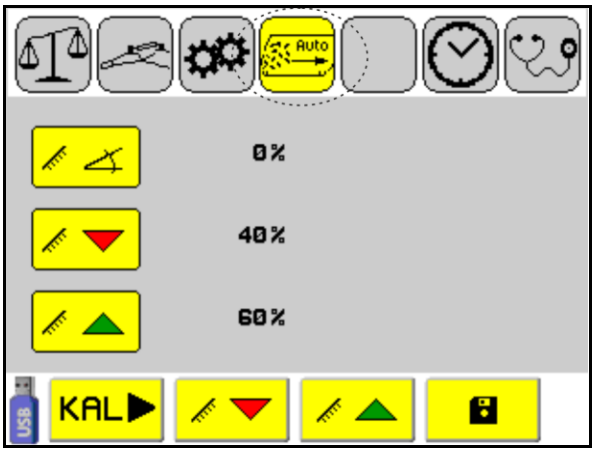
6.2.3.40 Display information of automatic charging system

In the automatic charging system menu, the start of the charging procedure and the transport floor speed can be set according to the automatic charging system sensor.

(1) Current sensor value of automatic charging system, here 0 %

(2) Lower value for starting the automatic charging system, here 40 %

(3) Upper value for reaching the maximum transport floor speed in automatic mode, here 60 %



6.2.3.41 Display information of transported loads counter

In the transported loads counter, operating and service hours, transported loads and load weights are saved.

(1) Total counter, **non-erasable**

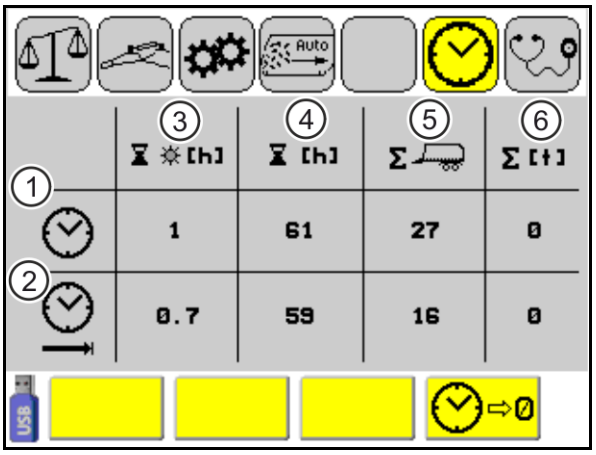
(2) Daily counter, **erasable**

(3) Operating hours, **pick-up in working position**, here a total of 1 h; daily working hours 0.7 h

(4) Total service hours, **counts when the control unit is energised,** here a total of 61 h, daily service hours 59 h.

(5) Transported loads counter, here a total of 27, daily transported loads

(6) Load weight counter, here a total of 0 t, daily load 0



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

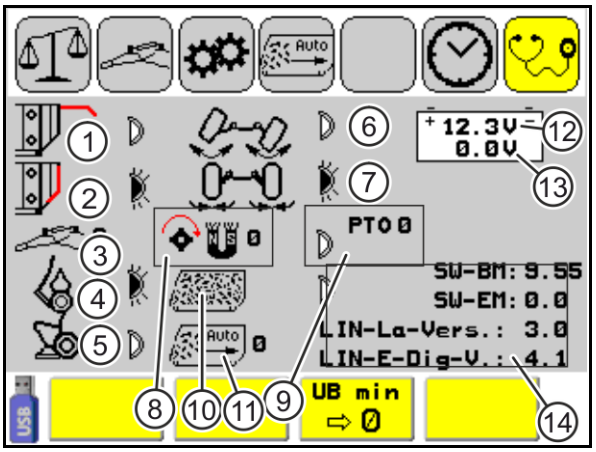
Press the  soft key for 5 seconds to clear the daily counter.

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

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

6.2.3.42 Display information of check menu

The Check menu displays information about the status of the mounted sensors: white = deactivated; black = activated.



(1) Tailgate Open sensor, here deactivated

(2) Tailgate Closed sensor, here deactivated

(3) Sensor value of folding drawbar

(4) Cutting Unit Retracted sensor, here activated

(5) Cutting Knives Retracted sensor, here deactivated

(6) Steering Axle Open, Reverse Travel, Error, SES sensor, here deactivated

(7) Steering Axle Locked sensor, here activated

(8) Beater speed, here 0 min-1

(9) Propeller shaft speed, here 0 min-1

(10) Cargo Space Full sensor, here deactivated

(11) Sensor value of automatic charging system, here 0

(12) Current voltage value, here 12.3 V

(13) Lowest voltage value since restart, here 0.0 V

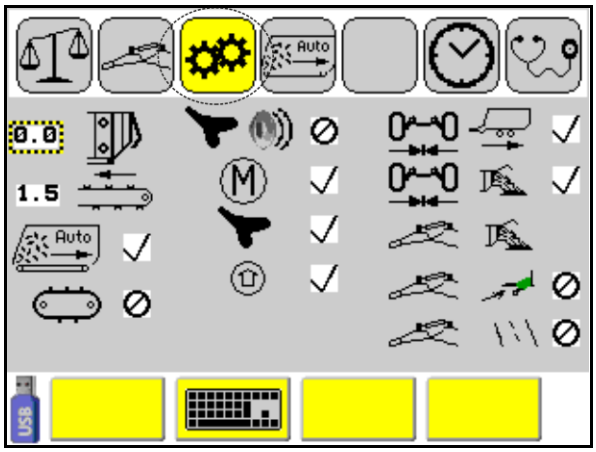
(14) Software versions

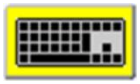
6.2.3.43 Machine settings in machine set-up menu

1. Press the  key several times to access the machine set-up menu.

→ The machine set-up menu opens.

The screen shows:



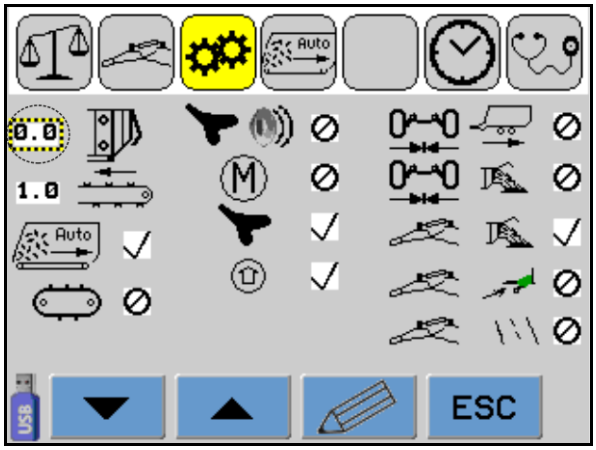
2. Press the  soft key.

→ The assignment of the soft keys changes.

3. Use the  soft keys to select the individual functions.

→ The active function has a yellow border.

The screen shows:



4. Press the  soft key to edit a function.

→ The active function has a yellow border.

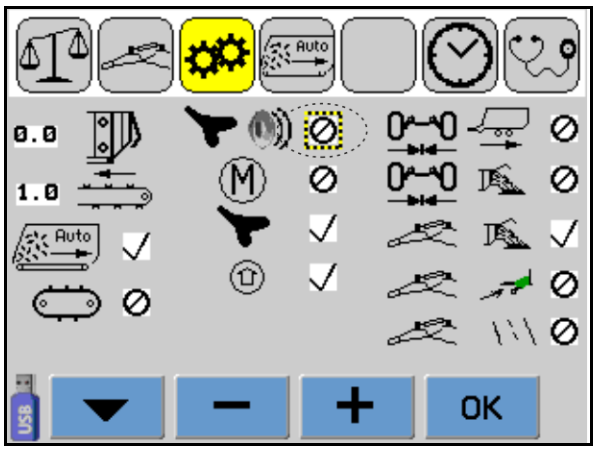
5. Press the  soft keys to activate, deactivate or change a function.

6. Press the  soft key to confirm the entry.

7. Press the  key.

→ The last run working menu is displayed.

The screen shows:



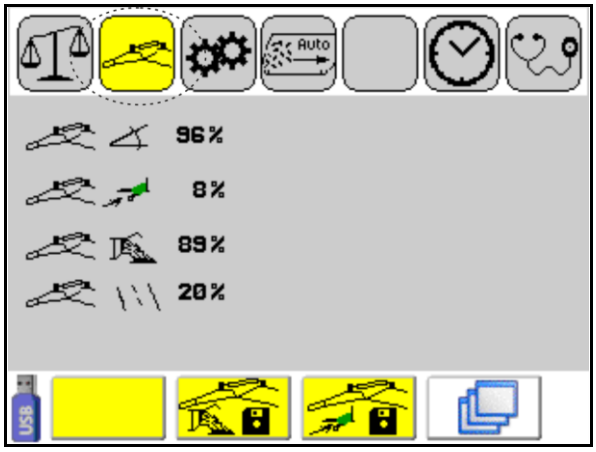
6.2.3.44 Calibrate folding drawbar sensor

The calibration of the folding drawbar sensor involves the change of the sensor values set by the manufacturer for the lowest and highest folding drawbar position.

1. Press the  key several times to access the set-up menu of the folding drawbar.

→ The set-up menu for the folding drawbar opens.

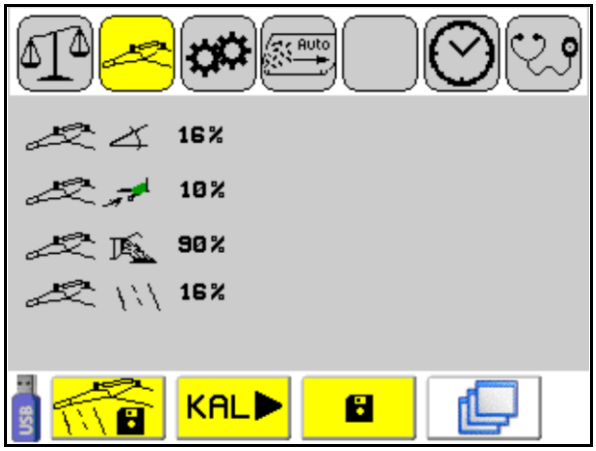
The screen shows:



2. Press the  soft key.

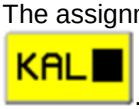
→ The assignment of the soft keys changes.

The screen shows:

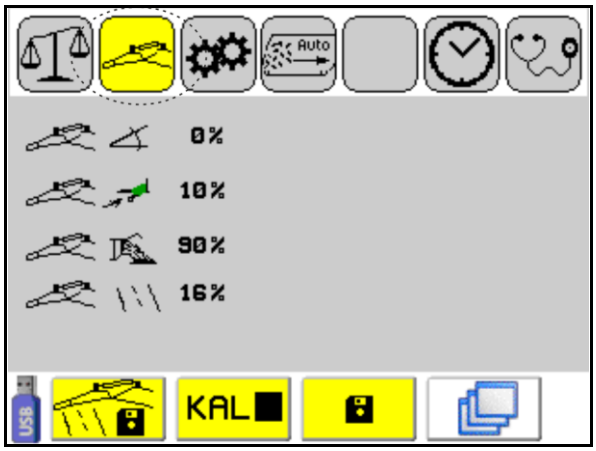


3. Use the  key to move the folding drawbar to the lower end position.

4. Press the  soft key.

→ The assignment of the soft key changes to  .

The screen shows:



5. Use the  key to move the folding drawbar to the upper end position.

6. Press the  soft key.

→ The sensor for the folding drawbar is recalibrated.

7. Test the sensor calibration: Use the  key to move the folding drawbar to the upper end position.

→ The **nominal reading** is 100 %

8. Use the  key to slightly lower the drawbar.

→ The **nominal reading** is 90 % - 99%

9. Use the  key to move the folding drawbar to the lower end position.

→ The **nominal reading** is 0 %.

10. Use the  key to slightly lift the drawbar.

→ The **nominal reading** is 1 % - 10 %.

11. Press the 

key.

→ The last run working menu is displayed.

If the actual values do not match the nominal values, repeat the calibration.

6.2.3.45 Set automatic folding drawbar system

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

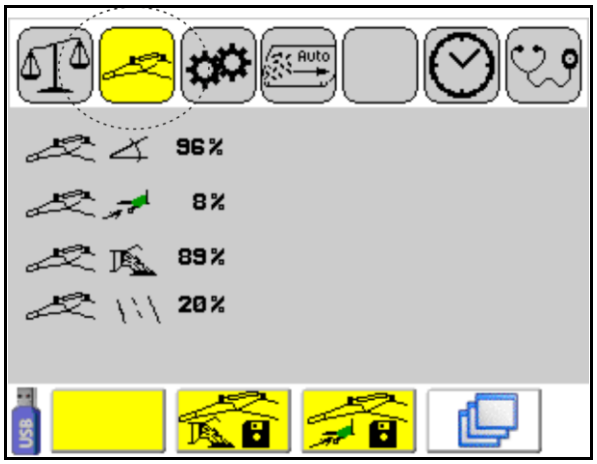
The drawbar suspension will not work if the folding drawbar is lowered to its end position.

For proper functioning of the scale (optional extra) it is imperative that the folding drawbar cylinders are **not completely** retracted. They should be extended by at least 5 mm.

1. Press the  key several times to access the set-up menu for the folding drawbar.

→ The set-up menu for the folding drawbar opens.

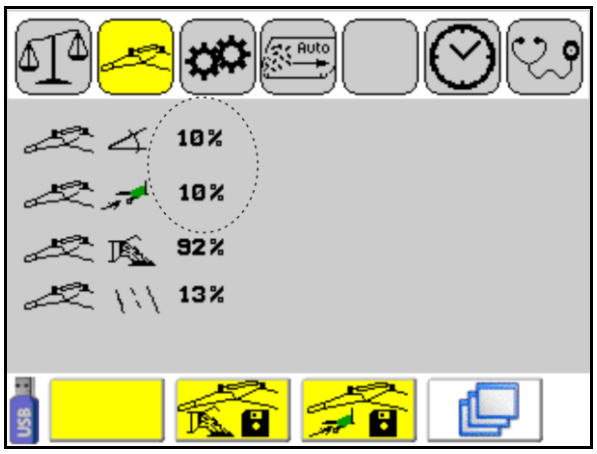
The screen shows:



2. Use the keys  and  to move the folding drawbar to the desired charging position. Press the  soft key.

→ The current folding drawbar position for charge mode is saved.

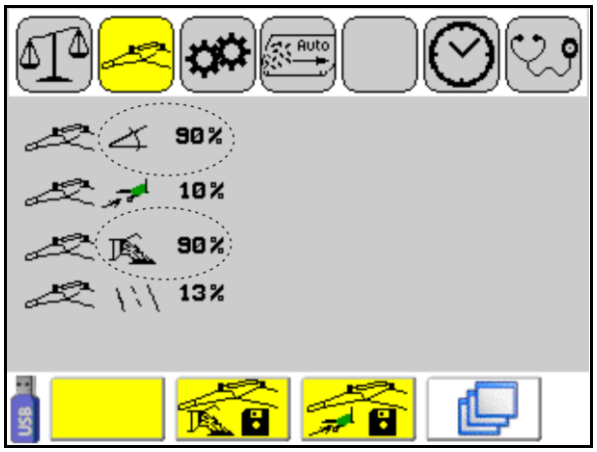
The screen shows:



3. Use the keys  and  to move the folding drawbar to the desired discharge position. Press the  soft key.

→ The current folding drawbar position for discharge mode is saved.

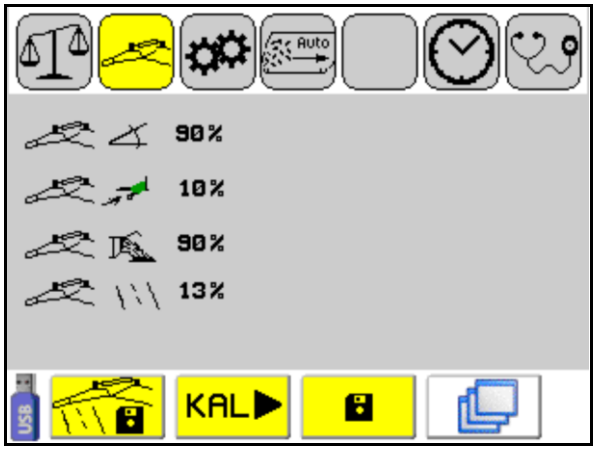
The screen shows:



4. Press the  soft key.

→ The assignment of the soft keys changes.

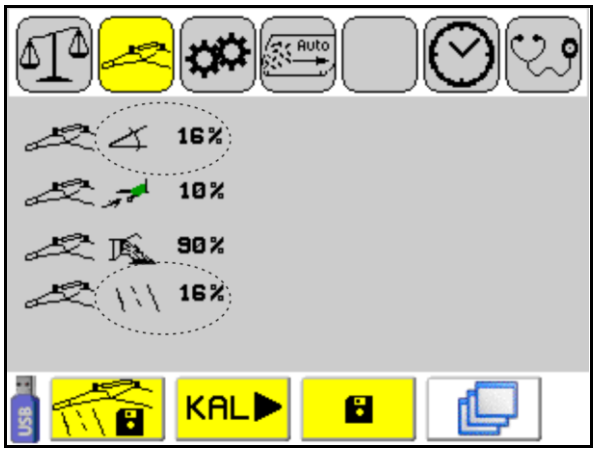
The screen shows:



5. Use the keys  and  to move the folding drawbar to the desired road travel position. Press the  soft key.

→ The current folding drawbar position for road travel mode is saved.

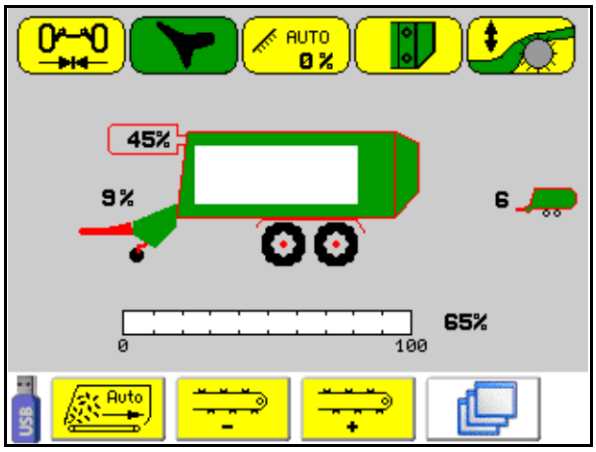
The screen shows:



6. Press the ESC key.

→ Exit the set-up menu. The last run working menu is displayed, here working menu.

The screen shows:



The saved positions are automatically set when activating the respective operating mode **if the respective automatic function has been activated in the machine set-up menu.**

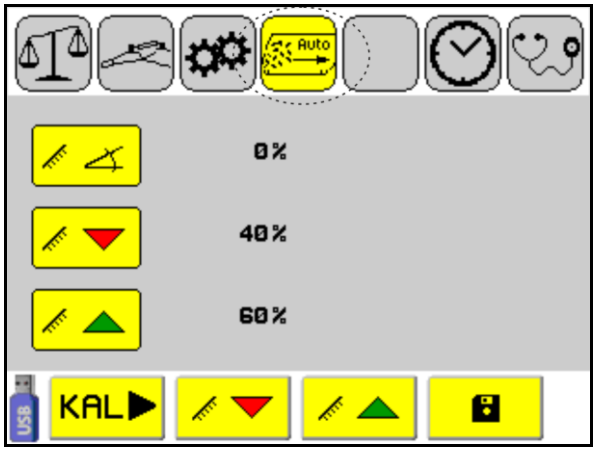
6.2.3.46 Calibrate automatic charging system sensor

The calibration of the automatic charging system sensor involves the change of the sensor values set by the manufacturer for the lowest and highest sensing band position.

1. Hitch the machine to the tractor.
2. Turn the tractor engine off.
3. Apply the parking brake of the tractor.
4. Switch the tractor ignition on.
5. Press the key several times.

→ The set-up menu for the automatic charging system appears.

The screen shows:



6. Press the KAL▶ soft key.

→ The assignment of the soft key changes to KAL■.

7. Move the sensing band from the bottom to the top position and back again.
8. Press the soft key.

→ The values are saved.

9. Check the calibration. In the top position, the nominal value is 100 %. In the bottom position, the nominal value is 0 %. Ensure proper steps between the end positions.

10. Press the 

key once.

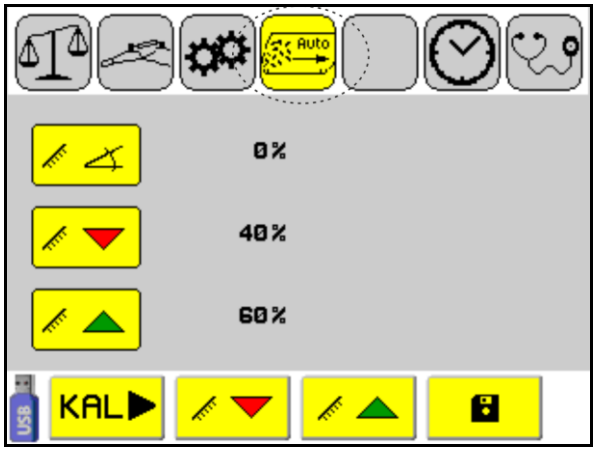
→ The last run working menu appears.

If the **actual values** do not match the **nominal values**, repeat the calibration.

6.2.3.47 Set automatic charging system

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

The screen shows:



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

→ The set-up menu for the automatic charging system appears.

7. The person in the cargo space swivels the sensing band to the bottom position which shall be the automatic start position for the transport floor.
8. Press the 
soft key to save the lower %-value for starting the transport floor.
9. The person in the cargo space swivels the sensing band to the top position which shall be the start position for the transport floor running at maximum feed rate.
10. Press the 
soft key to save the upper %-value for reaching the maximum transport floor speed.
11. Press the 

key once.

→ The last run working menu appears.

6.3 Steering

6.3.1 Operation of steering computer

Usually, you have to make use of the steering computer only:

- for error diagnosis during operation, see chapter "Display in case of trouble".
- for read-out of the fault memory, see chapter "Read out fault memory"(service menu "alarm memory“)".

The steering computer is permanently supplied with power, even after the control set has been switched off.

Therefore, always pull the plug for the power supply out after completion of work.

6.3.1.1 Access to steering computer

The steering computer is mounted behind a protective cover (1) beneath the machine.

Fig. 86

WARNING

Risk of injury due to movements of the machine or its working tools when operating the steering computer!

Secure tractor and machine against accidental starting, rolling and actuation, before accessing the steering computer!

In particular, lock the driver's cabin of the tractor, as the ignition must be switched on when operating the steering computer.

6.3.1.2 Operating and display elements of the steering computer

(1) Display

(2) ESC key: Exit current menu / Exit without saving / One input position back

(3) MINUS key: Reduce value by 1 / One selection item back

(4) PLUS key: Increase value by 1 / One selection item forward

(5) ENTER key: Confirm value / Save value / Activate selected menu / One input position forward

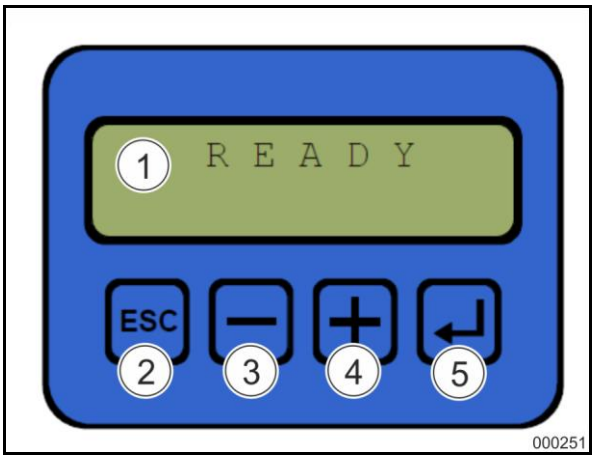


Fig. 87

As a standard, the display shows the main menu.

Main menu

Display in case of trouble-free operation

When no trouble has occurred, the main menu of the steering computer displays one of the following status messages:

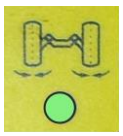
Display	Meaning
R E A D Y >	The axle control of the steering computer is switched on. Regular status during travel and steering.
Standby >	The axle control of the steering computer is switched off. Regular status during vehicle standstill without steering.
no hydr. supply >	There is no hydraulic supply of the forced steering axle system. This display is only active during vehicle standstill.
actuator test >	The steering computer is just carrying out a power-up test. This test is only carried out during vehicle standstill and existing hydraulic supply.

The scroll arrow in the second line indicates that the steering computer is working and that the display functions properly.

Display in case of trouble

A malfunction of the steering system (active error) is displayed at the control set by means of acoustic and visual signals.

- A beep is emitted for 3 seconds.
- The green control lamp "Steering axle locked" on the control set is flashing.



Check the steering computer in this case.

The main menu of the steering computer displays the error in encoded manner.

Display	Meaning
alarm code 044-002-01	Error message (example). The steering computer reports an active error, i.e. a currently existing malfunction. This display has priority over all other displays of the main menu. In most cases, the display remains active until the error has been remedied and the steering system has been restarted. In case of several active errors, the 3-part error codes are alternately displayed in the second line. The error codes are permanently saved in the fault memory.

If the control set reports an error, immediately stop the machine and contact the Strautmann customer service at +49 (0) 5424 802-0.

Tell the Strautmann customer service

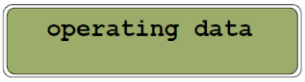
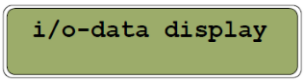
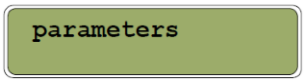
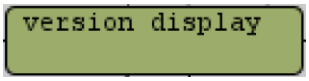
- the 3-part error code,
- the vehicle/machine ID number (17-digit, see type plate).

Press the ENTER key (for at least 2 seconds) to switch over from the main menu to the selection of the service menus.

Usually, the service menus only have to be called up to read out the fault memory or to indicate the service hours.

Selection of service menus

Press the PLUS or MINUS key to display the following service menus one after the other:

Display	Meaning
	Display of operating data, e.g. steering angle, service hours, vehicle speed.
	Display of input and output signals of the steering computer.
	Display of saved active (current) and passive (past) errors.
	Display and change of parameters/settings. Access is protected by a password. Only the customer service staff is allowed to change parameters.
	Display of software versions.
	Entry of an access code to change basic settings. Only the customer service staff is allowed to change these settings.

Press the ENTER key to activate the displayed service menu.

Usually, only the following service menus are required:

- "alarm memory" to read out the fault memory (see chapter "Read out fault memory (service menu "alarm memory")".
- "operating data" to display the service hours (see chapter "Display of service hours (service menu "operating data")".

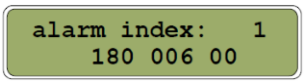
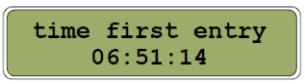
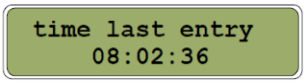
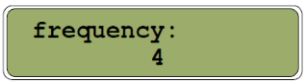
Read out fault memory (service menu "alarm memory")

Press the ENTER key in the selected service menu "alarm memory" to display the first saved error message.

Press the PLUS or MINUS key repeatedly until the desired error message is displayed.

A maximum of 32 error messages is displayed (after the last one the first is displayed again).

Each error message consists of the following data (example):

Display	Meaning
	Error message with consecutive number and 3-part error code. The error code 255 255 255 means: No further errors have been entered in the fault memory or the fault memory has been completely deleted.
	Time of first occurrence of error.
	Time of last occurrence of error.
	Frequency of occurrence of error.

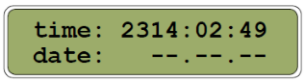
Enter the data of the error messages into the table of the error log.

Press the ESC key to return to the selection of the service menus.

Display of service hours (service menu "operating data")

Press the ENTER key in the selected service menu "operating data".

Press the PLUS or MINUS key repeatedly until the following display of the service hours appears:

Display	Meaning
	Service hours (hours / minutes / seconds)

Enter the service hours into the head of the error log.

Press the ESC key to return to the selection of the service menus.

6.4 Error log, forced steering axle system

Vehicle/Machine ID number:	W09
Model:	
Year of manufacture:	
Customer:	
Technician:	
Date:	
Service hours of SES system:	
Miscellaneous:	

Enter the saved error codes in the list:

No.	**Error code** ***error code***	**First entry** ***time first entry***	**Last entry** ***time last entry***	**Frequency** ***frequency***
Example:	180 006 00	06:51:14	08:02:36	4
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				

Send the completed error log to your dealer, an authorised workshop or the Strautmann customer service:

E-mail: service@strautmann.com

Fax: +49 (0) 5424/802-452

Have the malfunctions remedied and the fault memory cleared.

7 Use of machine

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

- "Safety instructions"
- "Operator's obligation"
- "Qualification of staff"
- "Warning and instruction signs"
- "Basic safety instructions"

Observance of these chapters serves your safety.

WARNING

Risk of crushing due to powered transport floor!

This risk may cause most serious injuries, in particular to hands and fingers.

Keep sufficient safe distance to the transport floor as long as the tractor engine is running with the propeller shaft coupled / the hydraulic system connected.

Ensure that people keep sufficient safe distance to the powered transport floor.

WARNING

Before starting work with and on the machine, read and observe the basic safety instructions!

Make sure that people leave the hazardous areas!

Non-observance of these instructions may cause most serious bodily injury (irreversible) or even death.

WARNING

Risk of breaking during operation in case of overload clutch response!

Immediately switch the tractor's propeller shaft off in case of a response of the overload clutch.

This will prevent damage to the machine and the overload clutch.

WARNING

Risk due to failure of components when moving the charged machine with lifted lift axle (only possible with tridem chassis)!

Always lower the lift axle completely before charging the machine.

Moving the charged machine with lifted lift axle is not allowed.

7.1 Transport journeys

- Additionally observe the information in the following chapters when carrying out transport journeys:
  - "Safety instructions for the operator"
  - "Basic safety instructions"
- 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 dangerous travelling situations due to accidental actuation of hydraulic functions during transport journeys!

Switch the **Road Travel Mode** on before carrying out transport journeys.

The covering system (optional extra) must be closed during transport journeys.

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.

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

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

1. Lower the lift axle completely if available.

→ Only with the lift axle completely lowered is the ALB regulator able to properly control the required braking force.

2. Deactivate the automatic charging system and close the front panel.
3. Activate the **Road Travel Mode** on your control set.

   With the **Road Travel Mode** switched on:

   – the **Road Travel** menu appears,

– apart from the functions "Lock steering axle" and "Unlock steering axle", all other functions on the control set are disabled,

– the hydraulic drawbar suspension (optional extra) and the warning beacon (optional extra) are switched on,

– the work lights (optional extra) are switched off.

4. Lock the passive steering axle when travelling at a speed of more than 40 km/h.

5. Start your transport journey.

7.2 Transport journeys with partly discharged machine

Ensure sufficient tongue load when carrying out transport journeys with partly discharged machine. Transport the loaded material from the rear to the front if the machine has been discharged to an extent of approx. 50%. The transport floor may be reversed for a short time (max. 3 seconds) for this purpose.

Observe the fact that the driving characteristics of the tractor are influenced by the load, in particular if the machine is partly empty.

7.3 Charge machine

When charging the machine, observe

- the different specific weights of the various loaded materials! Heavy loaded materials lead to a reduced admissible loading capacity.
- the total weight of the machine.

WARNING

Risk of crushing, shearing and risk of impact when lowering and lifting the pick-up!

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

WARNING

Risk of becoming entangled, wound up and being drawn in within the area of the movable pick-up components!

Make sure that people leave the pick-up area before switching the pick-up drive on.

Before charging the machine:

- check the set operating height of the pick-up and readjust if necessary, see chapter "Set operating height",
- check whether the desired cutting length of the loaded material can be achieved by means of the number of mounted cutting knives, see chapter "Set cutting length".

When charging the machine, it is imperative to observe the following information:

- Only lift the pick-up with the conveyor duct being empty!
- Reduce the tractor engine speed during cornering!
- Switch the p.t.o. shaft off and lift the pick-up when taking tight curves!
- Avoid uneven charging of the machine which might cause overloading of the drawbar!
- Switch the automatic charging system on for uniform and complete filling of the cargo space.

  The automatic charging system:

  – has to be switched on only once,
  – automatically and infinitely variably switches the transport floor on and off during charging,
  – will automatically be deactivated if the control set generates the acoustic signal (horn sound) and the visual signal "Forage wagon full",
  – will automatically be activated if the machine has been emptied and the pick-up is lowered the next time,
  – remains switched on until the automatic charging system is manually switched off.
- Pre-select the filling degree of the loaded material in the cargo space. Observe the information in the chapter "Pre-select filling degree of loaded material in the cargo space".
- Observe the visual and acoustic signals of the control set during charging.
- Observe the maximum admissible load capacity of the machine.

7.3.1 Determine admissible loading capacity

Observe the different specific weights of the various loaded materials when charging the machine! Heavy loaded materials lead to a reduced admissible loading capacity.

Max. admissible load (loading capacity) = Gross vehicle weight rating - empty weight

The admissible axle load and the empty weight are indicated on the type plate or in the chapter "Technical data", page 47„.

Also observe:

- the gross vehicle weight rating,
- the admissible axle loads,
- the admissible tongue load at the coupling point,
- the load capacities of the mounted tyres,
- the admissible towing capacity

of the tractor.

These details are registered on the type plate or in the vehicle registration certificate and in the operating instructions of the tractor.

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

$$\text{Max. admissible loading capacity} = \frac{\text{Max. load [kg]}}{\text{Specific weight of loaded material [kg/m}^3\text{]}}$$

7.3.1.1 Bulk densities of different loaded materials

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

TS = dry matter content of loaded material

* Weight may vary depending on the compressed density.

7.3.2 Charge with ISOBUS control / Field Operator 120

1. Press the  key once to switch the **Road Travel Mode** off on the field.
2. Press the  key once to switch the automatic charging system on.
3. Press the  key once to lower the folding drawbar if necessary.
4. Press the  key once to lower the pick-up.
5. Switch the tractor's p.t.o. shaft on (1000 min-1).
6. Start charging. Select the tractor speed according to the swathe size and cutting length.

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

7.3.2.1 Machines without beaters

1. You can still continue to charge the machines. The feed function of the transport floor can be still switched on for a short period of 3 seconds via the 

key. Stop the charging procedure after the acoustic signal has appeared for the third time at the latest and the front section of the cargo space is filled.
2. Let the p.t.o. shaft continue to run until the conveyor duct is free from any loaded material.
3. Switch the tractor's p.t.o. shaft off.
4. Press the  key once to lift the pick-up.
5. Press the  key once to switch on the **Road Travel Mode** for transport journeys on public roads.

7.3.2.2 Machines equipped with beaters

1. The front section of the cargo space can still be topped up.
2. Stop the charging procedure and let the p.t.o. shaft continue to run until the conveyor duct is free from any loaded material.
3. Switch the tractor's p.t.o. shaft off.
4. Press the  key until the pick-up has been completely lifted.
5. Press the  key once to switch on the **Road Travel Mode** for transport journeys on public roads.

7.3.3 Charge with ISOBUS control / Field Operator 130

1. Press the  key once to switch on the **Charge Mode** on the field.
   – The folding drawbar moves to the preset charging position.
2. Press the  key once to lower the pick-up.
   – The automatic charging system is activated.
3. Switch the tractor's p.t.o. shaft on (1000 min-1).
4. Start charging. Select the tractor speed according to the swathe size and cutting length.

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

7.3.3.1 Machines without beaters

1. You can still continue to charge the machine. The feed function of the transport floor can be still switched on for a short period of 3 seconds via the  key. Stop the charging procedure after the acoustic signal has appeared for the third time at the latest and the front section of the cargo space is filled.
2. Let the p.t.o. shaft continue to run until the conveyor duct is free from any loaded material.
3. Switch the tractor's p.t.o. shaft off.
4. Press the  key to lift the pick-up.
5. Press the  key once to switch on the **Road Travel Mode** for transport journeys on public roads.

– The folding drawbar moves to the preset position for transport journeys.

7.3.3.2 Machines equipped with beaters

1. The front section of the cargo space can still be topped up.
2. Stop the charging procedure and let the p.t.o. shaft continue to run until the conveyor duct is free from any loaded material.
3. Switch the tractor's p.t.o. shaft off.
4. Press the  key to lift the pick-up.
5. Press the  key once to switch on the **Road Travel Mode** for transport journeys on public roads.

7.4 Discharge machine

WARNING 	**Risk of crushing, impact and being drawn in when opening and closing the tailgate!** Make sure that people leave the swivelling range of the tailgate before starting discharge.

	• Completely lift the pick-up! • Lock the steering axle! • Lift the folding drawbar such that there is enough ground clearance for the pick-up when moving onto the clamp silo und distributing the loaded material! Insufficient ground clearance may cause bending of the pick-up carriers.

7.4.1 Discharge with ISOBUS control / Field Operator 120

7.4.1.1 Machine without beaters

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

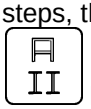
   The following functions will automatically be carried out one after the other:

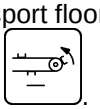
   – Lock steering axle.

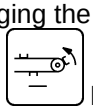
   – Lift folding drawbar.
3. Move onto the clamp silo.
4. Press the  key briefly when being on the clamp silo.

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

   – Lift tailgate.

   – Switch transport floor on when the tailgate has reached its end position
5. Start to move and select the travelling speed of the tractor according to the height of the desired discharged material stack. To discharge in steps, the transport floor feed can be switched on and off as often as desired by pressing the  key.

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

  For changing the feed rate, press the  key once and the  or  key quickly in succession several times if necessary.
- Press the  key to lower the folding drawbar during discharge on the clamp silo.

6. Press the  key once to double the feed rate of the transport floor for complete emptying.
7. Press the  key to lower the tailgate.

→ The **Discharge Modes A I** and **A II** are deactivated and the transport is automatically switched off.

8. Drive off the clamp silo.

9. Press the  key until the folding drawbar has been lowered to the desired position.

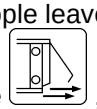
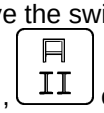
   If the folding drawbar is equipped with a drawbar suspension, lower the folding drawbar just as far as to ensure that the hydraulic cylinders of the folding drawbar are still extended by approx. 20 mm.

10. Press the  key once to switch on the **Road Travel Mode** for transport journeys.

7.4.1.2 Machine equipped with beaters

WARNING

Risk of being drawn in and becoming entangled within the area of powered beaters when opening and closing the tailgate and when discharging the machine!

Make sure that people leave the swivelling range of the tailgate before pressing the  ,  or  key.

- Press the  key only with the tractor's p.t.o. shaft stopped!

  Non-observance of this information may cause damage to the angular switchgear for coupling the powertrain to the beaters.

- Reduce the feed rate for the transport floor during discharge if the control set frequently generates the acoustic and visual signal "Forage wagon full"!

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

1. Press the  key once to switch the **Road Travel Mode** off.

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

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

   – Lock steering axle.

   – Lift folding drawbar.

3. Move onto the clamp silo.

4. Press the  key briefly when being on the clamp silo.

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

   – Lift tailgate until the first set opening width is reached.

   – Switch gearboxes and clutches. Pick-up and CFS drum are switched off.

   – Switch transport floor to standby mode when the tailgate has reached its end position. The "Feed On" symbol is flashing on the control set.

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

6. Let the tractor's p.t.o. shaft smoothly start to run such that the beaters are able to loosen themselves.

→ The beaters start to run and after a short delay, the transport floor automatically starts.

– Switch the tractor's p.t.o. shaft immediately off if the slip clutch responds.

– Press the  key to switch the transport floor feed off.

– Press the  key once to reverse the feed direction of the transport floor for 3 seconds. Thus, the pressing power which the loaded material applies to the beaters, and the starting torque for loosening the beaters are reduced.

– Press the  key again.

→ The transport floor automatically switches to standby mode and the "Feed On" symbol is flashing on the control set.

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

– Let the tractor's p.t.o. shaft smoothly start to run such that the beaters are able to loosen themselves.

→ The beaters start to run and after a short delay, the transport floor automatically starts.

7. Start to move and select the travelling speed of the tractor according to the height of the desired discharged material stack.

– Switch the p.t.o. shaft off before changing the lane on the clamp silo.

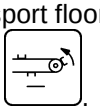
→ The beaters and the transport floor stop. The transport floor automatically switches to standby mode and the "Feed on" symbol is flashing on the control set if the transport floor is not separately switched off via the  key.

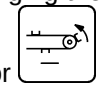
– Change the lane.

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

– Let the tractor's p.t.o. shaft smoothly start to run such that the beaters are able to loosen themselves.

→ The beaters start to run and after a short delay, the transport floor automatically starts.

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

  For changing the feed rate, press the  key once and the  or  key quickly in succession several times if necessary.

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

8. Press the  key once to double the feed rate of the transport floor for complete emptying.

9. Switch the p.t.o. shaft off when the cargo space has been emptied up to the beaters.

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

10. Press the  key to lower the tailgate.

→ The **Discharge Modes A I** and **A II** are deactivated and the transport is automatically switched off.

11. Drive off the clamp silo.

12. Press the  key until the folding drawbar has been lowered to the desired position.

    If the folding drawbar is equipped with a drawbar suspension, lower the folding drawbar just as far as to ensure that the hydraulic cylinders of the folding drawbar are still extended by approx. 20 mm.

13. Press the  key once to switch on the **Road Travel Mode** for transport journeys.

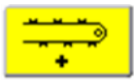
7.4.2 Discharge with ISOBUS control / Field Operator 130

7.4.2.1 Machine without beaters

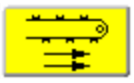
1. Press the  key once to switch the **Discharge Mode** on.
   - The folding drawbar moves to the preset discharge position.
   - The steering axle is locked.
2. Move onto the clamp silo.
3. Press the  key when being on the clamp silo.

   The following functions will automatically be carried out one after the other:
   - Lift tailgate.
   - Switch transport floor on when the tailgate has reached its end position.
4. Start to move and select the travelling speed of the tractor according to the height of the desired discharged material stack. To discharge in steps, the transport floor feed can be switched off by pressing the soft key 

and switched on again by pressing the  key.

- During discharge, the feed rate of the transport floor can be changed via the soft keys  and  .

  The feed rate changes by 5 % each time the key is pressed.
- Press the  key to lower the folding drawbar during discharge on the clamp silo.

5. Press the  soft key once to double the feed rate of the transport floor for complete emptying.
6. Press the  key to close the tailgate.

– The transport floor automatically switches off.

7. Drive off the clamp silo.
8. Press the  key once to switch the Road Travel mode on for transport journeys on public roads.

– The folding drawbar moves to the preset position for transport journeys.

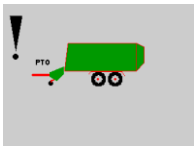
7.4.2.2 Machine equipped with beaters

WARNING

Risk of being drawn in and becoming entangled within the area of powered beaters when opening and closing the tailgate and when discharging the machine!

Make sure that people leave the swivelling range of the tailgate before pressing the keys  ,  or  .

- Press the keys  ,  or  only with the tractor's p.t.o. shaft stopped!

  Instead of the desired function, the warning message PTO  is displayed to prevent damage to the angular switchgear for coupling the powertrain to the beaters.

- Reduce the feed rate for the transport floor during discharge if the control set frequently generates the acoustic and visual signal "Forage wagon full"!

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

1. Press the  key once to switch the **Discharge Mode** on.
   - The folding drawbar moves to the preset discharge position.
   - The steering axle is locked.
2. Move onto the clamp silo.
3. Press the  key briefly when being on the clamp silo.

   The following functions will automatically be carried out one after the other:
   - Lift tailgate until the first set opening width is reached.
   - Switch gearboxes and clutches. Pick-up and CFS drum are switched off.
   - Switch transport floor to standby mode when the tailgate has reached its end position. The "Feed On" symbol is flashing on the control set.
4. Switch the tractor's p.t.o. shaft on.
5. Let the tractor's p.t.o. shaft smoothly start to run such that the beaters are able to loosen themselves.

– The beaters start to run and after a short delay, the transport floor automatically starts.

→ Switch the tractor's p.t.o. shaft immediately off if the slip clutch responds..

→ Press the 

soft key to switch the transport floor feed off.

→ Press the  key once to reverse the feed direction of the transport floor for 3 seconds. Thus, the pressing power which the loaded material applies to the beaters, and the starting torque for loosening the beaters are reduced.

→ Press the  key again.

– The transport floor automatically switches to standby mode and the "Feed On" symbol is flashing on the control set.

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

→ Let the tractor's p.t.o. shaft smoothly start to run such that the beaters are able to loosen themselves.

– The beaters start to run and after a short delay, the transport floor automatically starts.

6. Start to move and select the travelling speed of the tractor according to the height of the desired discharged material stack.

→ Switch the p.t.o. shaft off before changing the lane on the clamp silo.

– The beaters and the transport floor stop. The transport floor automatically switches to standby mode and the "Feed On" symbol is flashing on the control set if the transport floor is not separately switched off via the 

soft key.

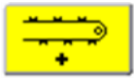
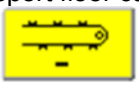
→ Change the lane.

→ Press the  key again.

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

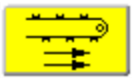
→ Let the tractor's p.t.o. shaft smoothly start to run such that the beaters are able to loosen themselves.

– The beaters start to run and after a short delay, the transport floor automatically starts.

- During discharge, the feed rate of the transport floor can be changed via the soft keys  and  .
  The feed rate changes by 5 % each time the key is pressed.
- Press the  key to lower the folding drawbar during discharge on the clamp silo.

7. Press the  soft key once to double the feed rate of the transport floor for complete emptying.

8. Switch the p.t.o. shaft off when the cargo space has been emptied up to the beaters.

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

9. Press the  key to close the tailgate.
   - The transport floor automatically switches off.
10. Drive off the clamp silo.
11. Press the  key once to switch the Road Travel mode on for transport journeys on public roads.

- The folding drawbar moves to the preset position for transport journeys.

8 Service and maintenance of machine

Regular and proper service and maintenance:

- will keep your machine ready for use for a long time and avoid early wear,
- will reduce downtimes and repairs,
- is a precondition for our warranty provisions.

- When carrying out service and maintenance work on the machine, additionally observe the information included in the following chapters:
  - "Operator's obligation"
  - "Training of staff"
  - "Warning and instruction signs"
  - "Safety instructions for the operator"
- The time intervals, service hours and maintenance intervals specified in the enclosed sub-supplier documentation shall prevail.
- Carry out the maintenance intervals according to the time limit reached first.
- Observe the maintenance intervals for wearing parts!
- Always disconnect all electrical/electronic plug connections to the tractor before carrying out service and maintenance work on the machine.
- Check brake lines, air pipes and hydraulic hose pipes with special care for visible defects!
- Relubricate all lubrication points after cleaning the machine by means of pressure washers.

- Special know-how is required for carrying out testing and maintenance work. This know-how is not imparted by these operating instructions.
- The maintenance intervals depend on the frequency of use of your machine. The maintenance plan has been tailored to medium axle loads and stress exerted on the brakes.

  In case of higher loads and amount of stress, maintenance work must be carried out at respectively shorter intervals. This shall in particular apply to the brakes and chassis.
- Modifications to the maintenance instructions shall be reserved!

WARNING 	**Before starting work with and on the machine, read and observe the basic safety instructions!** **Secure tractor and machine against accidental starting and rolling before carrying out any work with and on the machine!** **Secure lifted machine parts/the lifted machine against accidental lowering!** **Make sure that people leave the hazardous areas!** Non-observance of these instructions may cause most serious bodily injury (irreversible) or even death.

1. Secure lifted machine parts (tailgate by means of the stop-cock) against accidental lowering before working beneath lifted parts.
2. Secure tractor and machine against accidental starting and rolling before carrying out any service or maintenance work on the machine.
3. Secure the machine lifted via the folding drawbar against accidental lowering before crawling into the hazardous area beneath the lifted machine.
4. Wait for the machine to stop completely before entering the hazardous area of the machine.

8.1 Service and maintenance plan – Overview

Before first startup and after longer downtimes

- Check the wheel nuts for tightness, retighten if necessary.
- Check all screwed connections of:
  - drawbar,
  - chassis,
  - hydraulic system.

→ Retighten if necessary.

- Check the float of the wheel hub bearing.
- Check all components of the hydraulic system for tightness and visible defects, immediately remedy or have remedied leaks and defects if necessary.
- Check the oil level of all gearboxes, top up if necessary.
- Check the tyre pressure, readjust if necessary.
- Check the transport floor:
  - Check the tension of the transport floor chains, shorten chain if necessary.
  - Check screwed connection of transport floor strips, retighten if necessary.
- Bleed the friction clutch of the pick-up and the friction clutch of the CFS drum.

Daily

- Check the machine for visible defects.

  Immediately remedy or have remedied visible defects.
- Check the lighting system for proper functioning.
- Check the service brake system for proper functioning.
- Check the parking brake for smooth action.

  Lubricate all movable parts of the parking brake if necessary.
- Drain the compressed-air reservoir of the compressed-air brake system via the drain valve.
- Check the cutting knives for sharpness.

  Turn blunt cutting knives over or sharpen them.
- Use compressed air to clean the cutting unit, in particular the retainer of the cutting knives and the knife protection system.
- Check the transport floor:
  - Check the tension of the transport floor chains, shorten chain if necessary.
  - Check screwed connection of transport floor strips, retighten if necessary.
- Check the travelling height of the hydraulic levelling system of the hydro-pneumatic tandem chassis.
- Check the tension of the roller chain for the pick-up drive, retighten if necessary

Every 50 service hours

- Beaters (optional extra):
  - Check the roller chain tension, retighten if necessary.
- Hydraulic system
  - Check hydraulic hose pipes for visible defects, have defects remedied if necessary.
  - Retighten screwed connections of hydraulic system.
- Pick-up:
  - Check tension of the roller chains of the pick-up drive, retighten if necessary.
- Change the gear lubricant oils after the first 50 service hours.
  - Drain condensate from the oil storage tanks at the dash pots of the hydraulic levelling system.
  - Check condensate from the oil storage tanks at the dash pots of the hydraulic levelling system, top up if necessary.

Every 250 service hours

- Check compressed-air brake system for tightness:
  - The pressure in the compressed-air reservoir of the unhitched vehicle must not drop more than 0.15 bar within 10 minutes.
- Check:
  - all bearings,
  - the oil level of all gearboxes, top up if necessary,
  - all cables for visible defects, have them replaced if necessary.
- Drawbar lug: Check for wear and screwed connection:
  - borehole diameter of drawbar lug 40: max. 41.5 mm,
  - admissible wear at the angular cross-section of the drawbar lug: max. 2.5 mm.
- Have hydraulic oil filter replaced.
- Check the oil level in the oil storage tanks at the dash pots, top up if necessary.
- Grease the chains of the beaters (optional extra).
- Check drawbar connection, retighten if necessary:
  - Tightening torque of crown nut: 800+50 Nm,
- Lubricate the rollers of the knife protection system and check them for smooth running on both sides.

Every six months

- Check the following components at the electro-hydraulic forced steering axle system SES (optional extra):
  - The angle sensor linkage for mechanical damage, corrosion, wear, contamination and clearance. Have damaged parts immediately replaced by an authorised workshop.
  - The steering cylinders for oil leakage at the cylinder rod seal and scores in the cylinder rods. Clean the cylinder rods from contamination.
  - The linkage of the steering cylinders for corrosion and firm seating. Have damaged parts immediately replaced by an authorised workshop.
  - The hydraulic block for corrosion and oil leakage at the screwed connections. Have corroded parts immediately replaced by an authorised workshop.

Every 500 service hours or once a year

- Check frame and drawbar for cracks.
- Clean the filter elements of the compressed-air brake system depending on the operating conditions.
- Have the hydraulic hose pipes checked for their operational safety by an expert.
- Check the hydraulic filter for contamination (observe the cleaning indicator!).
- Read out the fault memory of the electro-hydraulic forced steering axle system SES and have malfunctions remedied by an authorised workshop.
- Change the gear lubricant oils.
- Lubricate the chain tensioner screws of the transport floor.
- Carry out maintenance work on the cam-type cut-out clutch.

Every 2 years

- Have the hydraulic oil changed and the return-flow and pressure filter elements replaced by an authorised workshop.

Before longer downtimes

- Thoroughly clean the machine.
- Lubricate and grease the machine (the piston rods of the hydraulic cylinders as well).
- Touch up paintwork.

Before winter period

- Lubricate the transport floor chains to prevent them from freezing.

After end of season

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

8.2 Enter cargo space

WARNING

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

Secure tractor and machine against accidental starting and rolling before opening the access door to the cargo space and entering the cargo space.

1. Open the access door (1):
   - Use your left hand to hold the folding access ladder (2).
   - Swivel the locking mechanism (4) upwards.
   - → The ladder and the access door are unlocked.
   - Fold the access ladder down.
   - Open the access door.
2. Use the handle (3) when entering the cargo space.
3. Close the access door:
   - Swivel the locking mechanism upwards.
   - Close the access door.
   - Fold the ladder up.
   - Swivel the locking mechanism downwards such that it safely engages behind the locking points.
   - → The ladder and the access door are locked in transport position.

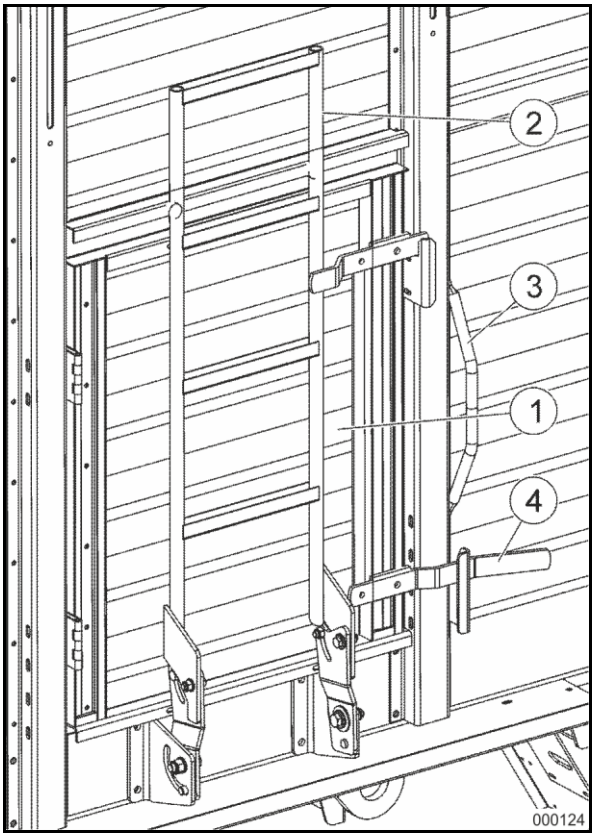


Fig. 88

8.3 Cleaning work

- Regularly clean the machine! Regular cleaning of the machine is the precondition for proper maintenance and makes operation of the machine easier.
- Continuously inspect the machine for corrosion damage! Remedy corrosion damage by touching up paintwork.
- Never treat brake lines, air pipes and hydraulic hose pipes with benzine, benzol, paraffin or mineral oils.
- 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.

8.3.1 Cleaning by means of pressure washer / steam blaster

It is absolutely imperative to observe the following when using a pressure washer / steam blaster for cleaning:

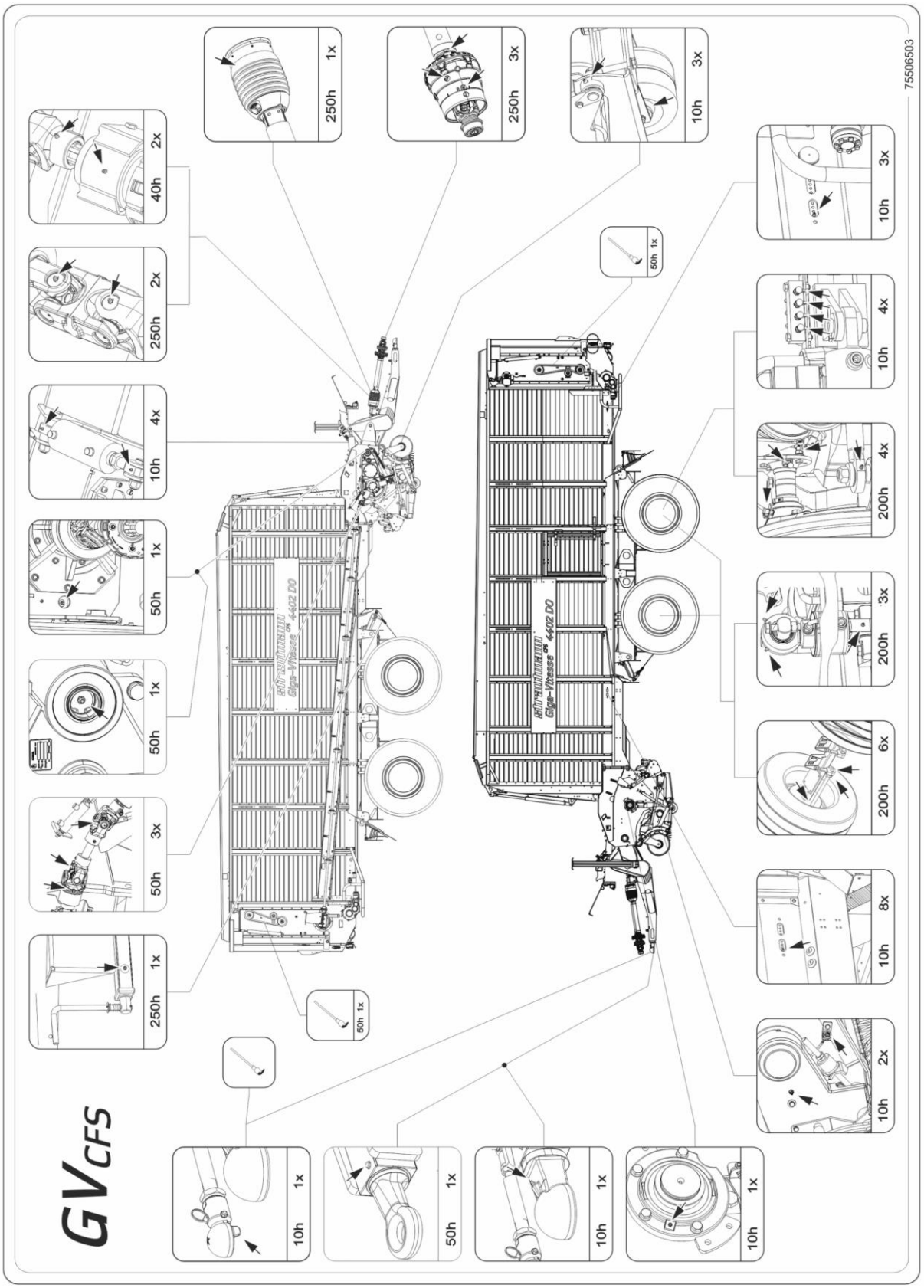
- The maximum admissible injection pressure is 80 bar.
- Water temperature: max. 60°C.
- Do not clean electrical components.
- Do not clean chromium-plated components.
- Never aim the cleaning nozzle jet of the pressure washer / steam blaster
  - directly at lubrication points and bearings.
  - directly at hydraulic and electrical components.
- Always keep a minimum nozzle distance of 300 mm between the cleaning nozzle and the machine.
- Never aim the cleaning nozzle jet at the vehicle 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.

8.4 Lubrication work

- Lubricate all bearings 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.

8.4.1 Lubrication plan

Giga-Vitesse CFS



8.5 Check / Top up gear lubricant oil

- Regularly check the oil level of the individual gearboxes.
- Carry out the first oil change after 50 service hours, then every 500 or 2000 service hours.
- Change the oil when the gear lubricant oil has reached its operating temperature (30-40°C) if possible. The flowability of the gear lubricant oil is at its optimum at operating temperature.
- The optimum oil level is reached at an oil temperature of 0-20°C.

8.5.1 Quantities when filled and change intervals

Gearbox	Quantity when filled [l]	Lubricant	Specification	Trade name (manufacturer)	Interval (h)
Feed gearing, transport floor	0.75	Liquid grease	NLGI-00/000	AVIALITH 000EP	2000
Main gearbox, conveying unit	1.1	Gear lubricant oil	SAE 85W-90	AVIA HYPOID EP 85W-90	500
Rotor gear	7.0	Gear lubricant oil	SAE 85W-90	AVIA HYPOID EP 85W-90	
Angular gear, CFS drum	0.9	Gear lubricant oil	SAE 85W-90	AVIA HYPOID EP 85W-90	
Angular gear, beaters	0.4	Gear lubricant oil	ISO VG 320	Mobilgear 600 XP 320	2000

8.5.2 Feed gearing of transport floor

(1) Inspection plug
(2) Filler neck
(3) Drain plug

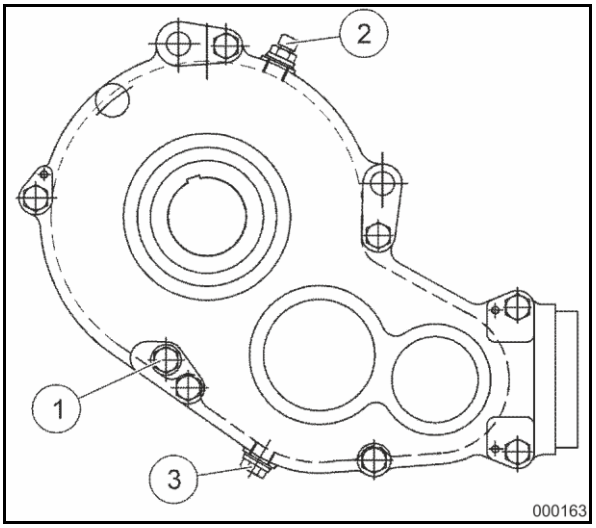


Fig. 89

8.5.3 Main gearbox

(1) Filler neck
(2) Drain plug
(3) Fan and inspection plug

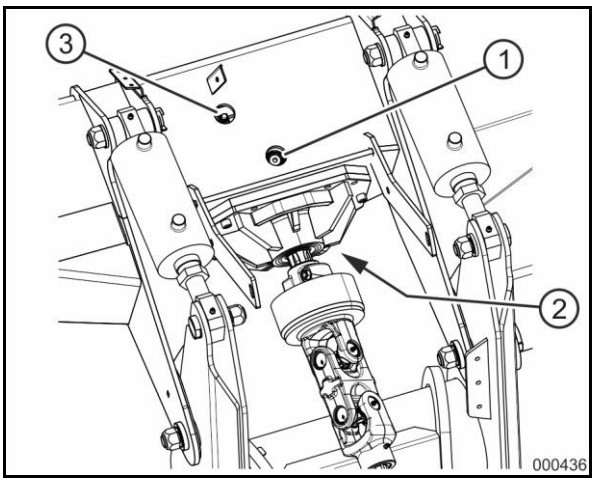


Fig. 90

8.5.4 Rotor gear

(1) Drain plug, spur gear
(2) Drain plug, switchgear
(3) Inspection plug
(4) Filler neck
(5) Fan plug

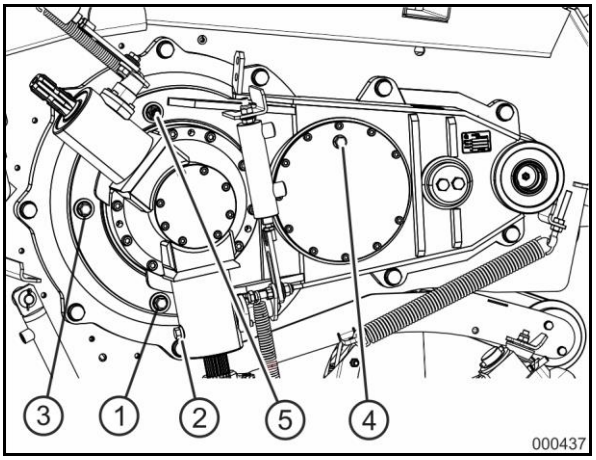


Fig. 91

8.5.5 Angular gear of CFS unit

(1) Drain plug
(2) Filler neck
(3) Fan plug

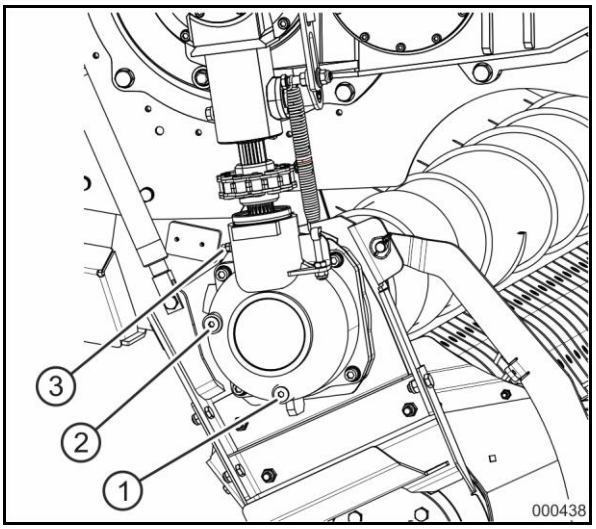


Fig. 92

8.5.6 Angular gear of dosing unit

(1) Filler neck
(2) Drain plug

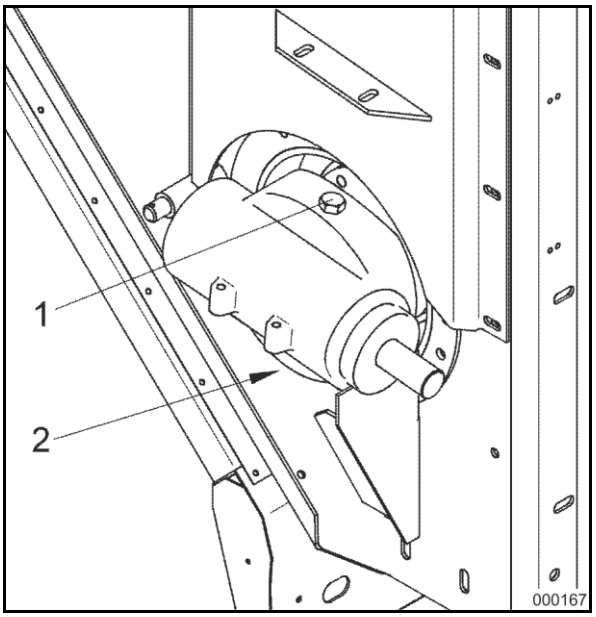


Fig. 93

8.5.7 Check/Top up oil level

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

→ The oil level must be visible at the oil inspection plug.

3. Top up gear lubricant oil through the oil filler neck if necessary.

8.5.8 Change gear lubricant oil

1. Align the machine in horizontal position.
2. Place a drip tray beneath the gearbox.
   The tray's capacity must at least be equivalent to the filling quantity.
3. Unscrew the oil drain plug.

→ The gear lubricant oil drains off.

4. Unscrew the oil filling screw.
5. Wait for the oil to stop draining out of the oil drain opening.
6. Screw the oil drain plug in again and tighten it. Use sealant.
7. Fill the specified oil quantity in through the oil filler neck.
8. Clean the oil filling screw and screw it in.
9. Check the oil level after 5 service hours.
   The oil level must be visible at the oil inspection plug.

8.6 Pick-up

WARNING

Risk to people of being crushed, drawn in and becoming entangled due to unsecured powered driving elements!

Powering of the pick-up is not allowed with the side guard opened and/or the protective casing of the pick-up removed. Fix the protective casing of the pick-up properly to the machine and close the right-hand movable side guard before operating the machine.

8.6.1 Bleed friction clutch of pick-up

The friction clutch must be bled before the first start-up and after longer downtimes to ensure its proper functioning.

The easiest way to bleed the stuck friction clutch is to charge the machine with material to be loaded for a short time with the groove nut unscrewed such that the stuck friction clutch slips for a short time.

1. Unscrew and remove the four screws of the protective casing (1) and the strut of the pick-up.
2. Remove the protective casing of the pick-up.
3. Unlock and unscrew the groove nut (2).

Remember exactly the number of turns made to unscrew the groove nut to ensure that the friction clutch can be properly pre-tightened again!

4. Fix the protective casing of the pick-up to the machine by means of the two screws.
5. Start the tractor engine.
6. Charge the machine with material to be loaded for a short time such that the stuck friction clutch slips for 2 to 3 seconds and is freed (excessive slipping will damage the friction linings).

   Repeat this procedure up to three times if the friction clutch does not slip.

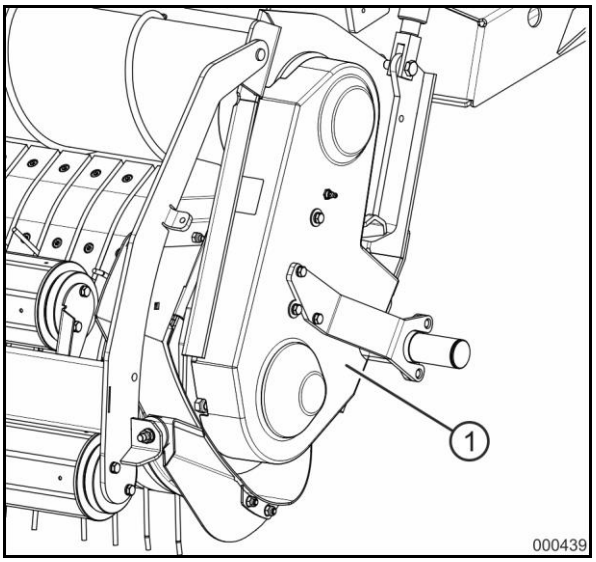


Fig. 94

7. Turn the tractor engine off.
8. Pull the ignition key out.
9. Unscrew and remove the four screws of the protective casing (1) and the strut of the pick-up.
10. Remove the protective casing of the pick-up.
11. Retighten the groove nut with the exact number of turns made for unscrewing.

    Torque of friction clutch: 900-1000 Nm
12. Lock the groove nut.
13. Fix the protective casing of the pick-up to the machine by means of the two screws.

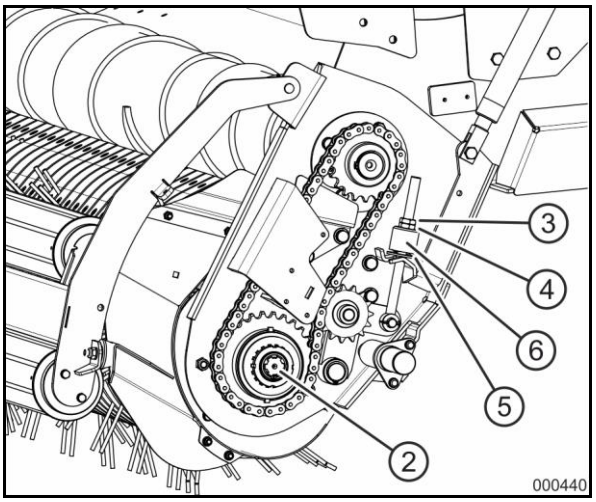


Fig. 95

8.6.2 Check/Retighten tension of roller chain for pick-up drive

Check the tension of the roller chain at the chain tensioner every day. Retighten the roller chain if the distance between washer and sleeve is more than 8 mm.

1. Lower the pick-up to working position.
2. Secure tractor and machine against accidental starting and rolling.
3. Use an open-end wrench (wrench size SW 24) to unscrew the counter nut (3).
4. Turn the hexagon nut (4) until the distance between washer (5) and sleeve (6) is less than 8 mm.
5. Tighten the counter nut.

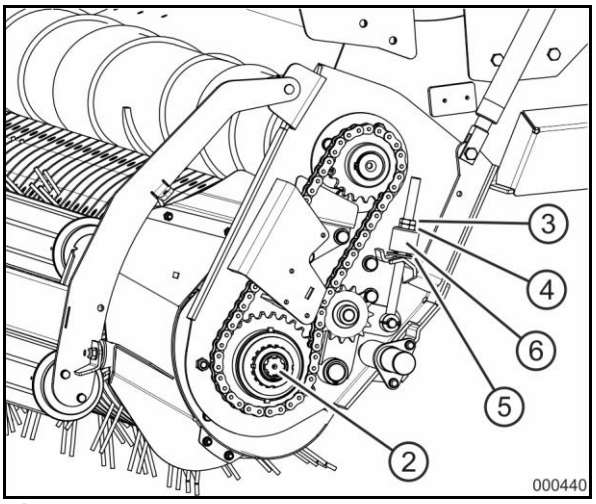


Fig. 96

8.7 Carry out maintenance work on the cam-type cut-out clutch

Cam-type cut-out clutches must transmit high power. In order to ensure perfect functioning and a long service life, regular maintenance (basic lubrication) with special Walterscheid grease every 500h / once a year is imperative.

Never clean cam-type cut-out clutches by means of a pressure washer! Water would penetrate the clutch interior and cause corrosion at the clutch components.

Insufficient or incorrect maintenance / cleaning of the cam-type cut-out clutch may cause serious damage to the machine.

Only an authorised workshop is allowed to carry out the work specified below!

The manufacturer will not assume any warranty and liability for material damage and personal injuries if the work is carried out by insufficiently qualified staff.

Preparation:

- Secure tractor and machine against accidental starting and rolling.
- Remove the cam-type cut-out clutch from the machine.

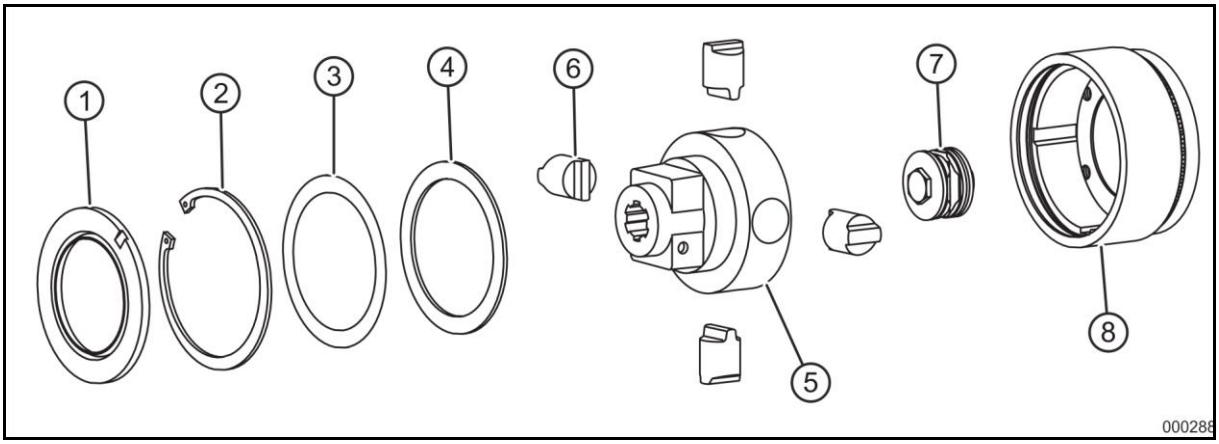


Fig. 97

Disassembly of cam-type cut-out clutch

1. Use a screwdriver to remove the sealing ring (1) from the clutch housing (8).
2. Use an appropriate tool to remove the circlip (2).
3. Remove the adjusting washers (3) and the supporting ring (4).
4. Pull the hub (5) out of the clutch housing (8).

   It is imperative to pay attention to the position of the chamfer of the locking bolt (6) when pulling out!
5. Take the locking bolts (6) and the spring assembly (7) out of the hub.
6. Clean all parts and check them for wear / damage.
7. Grease all parts with special Walterscheid grease "Agraset 116".
8. Fill the grooves in the clutch housing with grease.

Installation of cam-type cut-out clutch

1. Insert the locking cams (6) and the spring assembly (7) into the hub (5).
2. Push the pre-assembled hub (5) into the clutch housing (8).
3. Insert the supporting ring (4) and the adjusting washers (3) and secure them by means of the circlip (2).
4. Again, apply grease to the adjusting washers, supporting ring and circlip.
5. Insert the sealing ring.

Attention! It is imperative to pay attention to the position of the chamfer at the locking cams when inserting the hub.

(1) Correct position of locking cams in the clutch housing.

(2) Incorrect position of locking cams in the clutch housing.

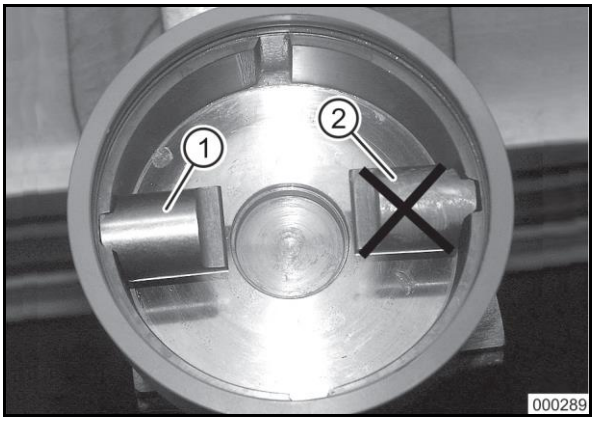


Fig. 98

The guarantee for the machine will immediately become null and void if the set torque of the cam-type cut-out clutch is manipulated.

In case of doubt, have the torque of the cam-type cut-out clutch checked or set, if necessary, by an authorised workshop.

8.8 Set beater circuit

1. Open the tailgate of the vehicle.
2. Take off the spring (1).
3. Close the tailgate of the vehicle again.

→ The cylinder (2) retracts.

4. Adjust the switching plate (3) and the piston rod (4) such that the distance between the borehole of the switch lever (5) and the right-hand edge of the switching plate is 4 mm. The switch lever (5) must have been manually turned clockwise into its end position.
5. Retighten the screw of the collar bushing (6) and the counter nut of the switching plate (3).
6. Open the tailgate of the vehicle again.

→ The cylinder (2) extends.

7. Mount the extension spring (1) and return to the previously set initial tension of the spring.

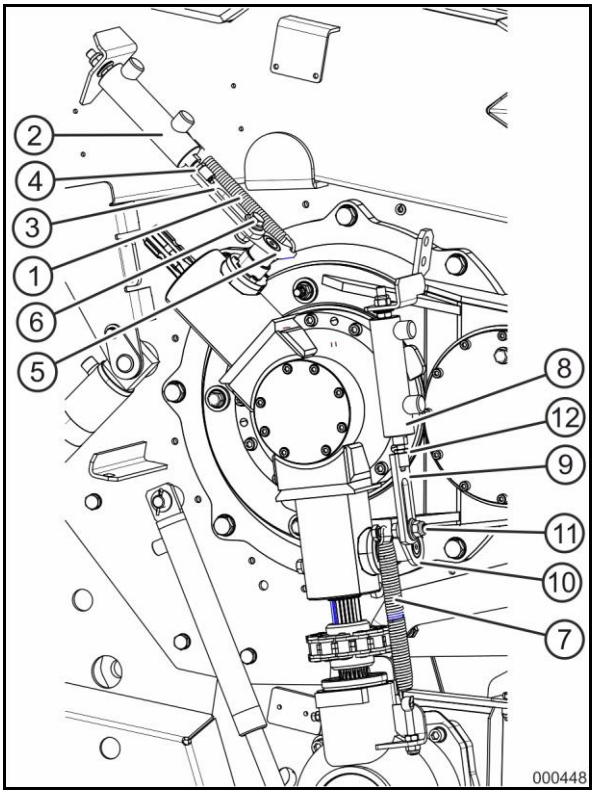


Fig. 99

Then check whether the shift cylinders switch off the gearboxes with the extension spring hooked in. Readjust the respective piston rod if the pick-up or the beaters still rotate.

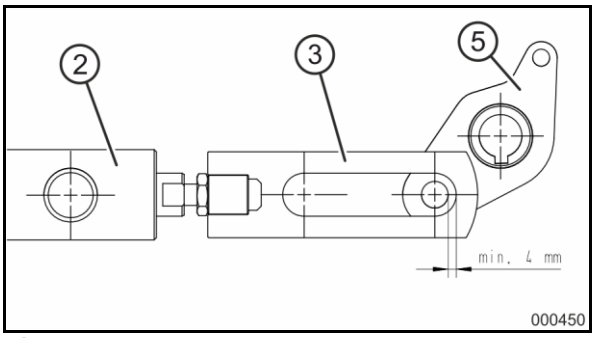


Fig. 100

8.9 Set circuit for CFS drum and pick-up

1. Close the tailgate of the vehicle.

→ The cylinder (8) extends.

2. Take off the spring (7).
3. Open the tailgate of the vehicle again.

→ The cylinder (8) retracts.

4. Adjust the switching plate (9) and the piston rod (12) such that the distance between the borehole of the switch lever (10) and the right-hand edge of the switching plate is 4 mm. The switch lever (10) must have been manually turned clockwise into its end position.
5. Retighten the screw of the collar bushing (11) and the counter nut of the switching plate (9).
6. Close the tailgate of the vehicle again.

→ The cylinder (8) extends.

7. Mount the extension spring (7) and restore the previously set initial tension of the spring.

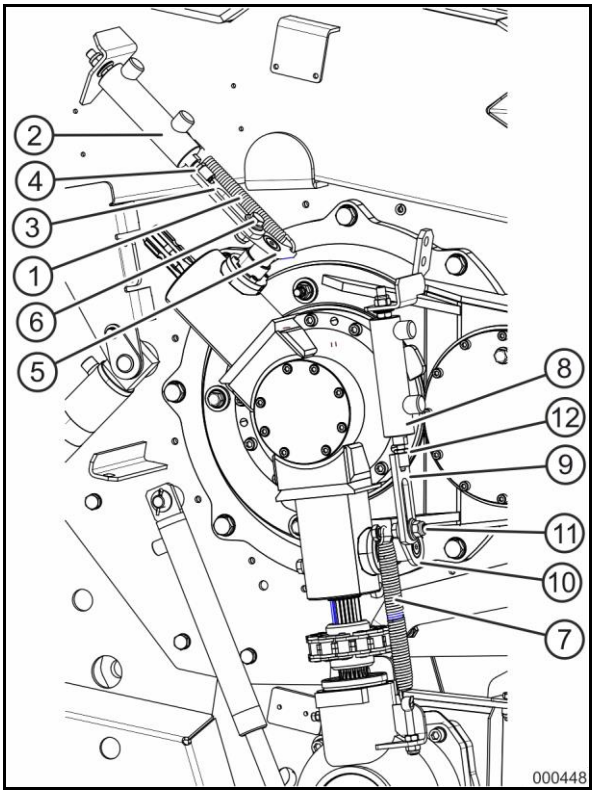


Fig. 101

Then check whether the shift cylinders switch off the gearboxes with the extension spring hooked in. Readjust the respective piston rod if the pick-up or the beaters still rotate.

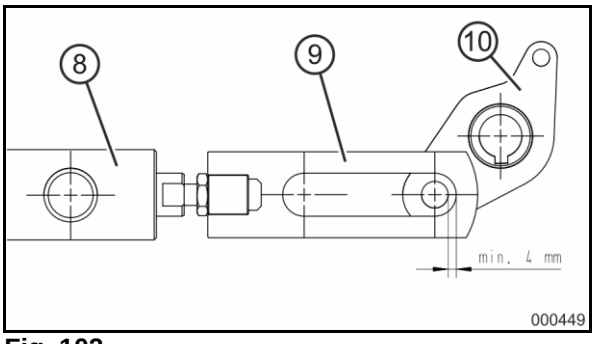


Fig. 102

8.10 Cutting unit

WARNING

Risk of cuts, crushing or shearing when working on the cutting unit!

Wear cut-proof protective gloves when carrying out work on the cutting knives.

Always wear protective goggles when blowing out the retainers, slots and knife protection system by means of compressed air.

Use the handle when swivelling the cover plate.

Make sure that people leave the hazardous area on the opposite side before swivelling the cover plate.

8.10.1 External operation for cutting unit

Optional extra

WARNING

Risk of crushing, shearing and impact when moving the folding cutting unit!

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

Use the two key buttons (1/2) on the left-hand vehicle side in the guard (3) to extend and retract the cutting unit with the hydraulic system connected.

1. Press the key button (1) until the cutting unit has been completely retracted for cleaning or knife change.
2. Press the key button (2) to extend the cutting unit.

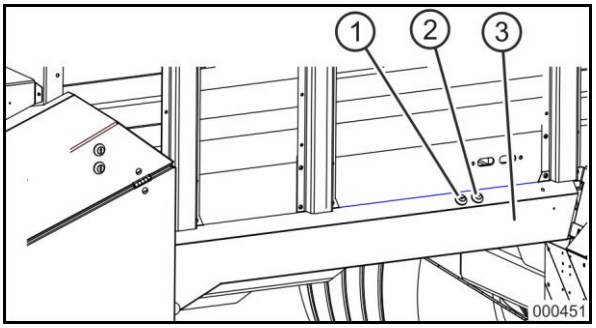


Fig. 103

8.10.2 Clean cutting unit

Use compressed air to clean the knife protection system of the cutting knives every day!

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

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

- Use compressed air to clean the retainer of the cutting knives before removing them.
- Use compressed air to clean the slots of the cutting knives before reinstalling them.

1. Daily clean:
   - the gaps (1) between the cutting knives/knife holders.
   - the lever pockets (2) of the individual knife holders.

     Use the mounting lever (3) and compressed air for this purpose.
2. Lubricate the roller (4) in the lever pocket of the individual knife holders several times during the season. Check the smooth running of the rollers during that procedure as follows:
   - Take off the spring (5) at the outer ring (6) of the knife holder by means of the mounting lever.

   → The lever pocket falls down and the roller can be accessed.

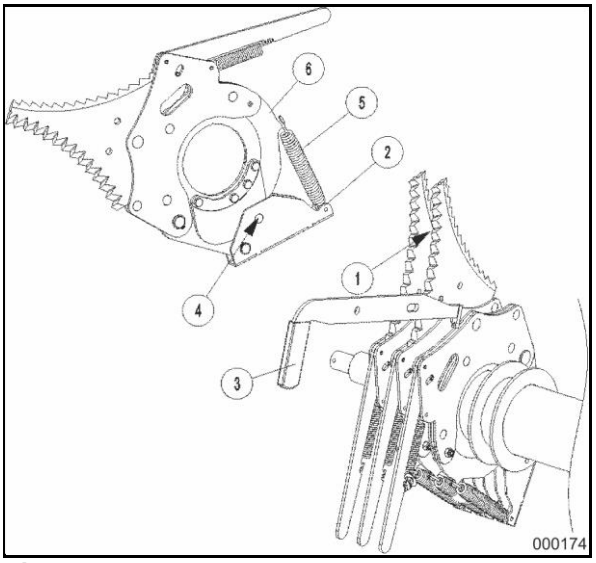


Fig. 104

- Free stuck rollers by means of a pair of water-pump pliers.
- Lubricate the rollers of the knife protection system on both sides.
- Hang up the spring at the outer ring of the knife holder by means of the mounting lever.
- Repeat steps 2.1 to 2.4 for the other knife holders.

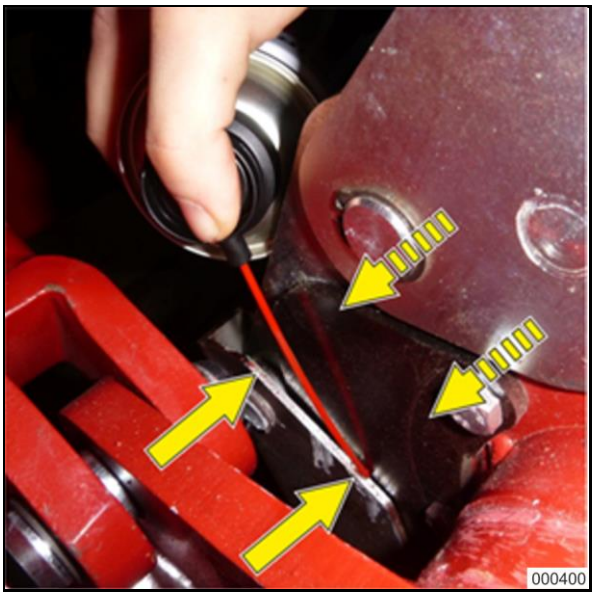


Fig. 105

8.10.2.1 Unhook cutting unit springs

1. Remove all knives from the cutting unit.
2. Extend cutting unit.
3. Remove 5 fastening screws (1) from the bearing plates on the right-hand and left-hand side.

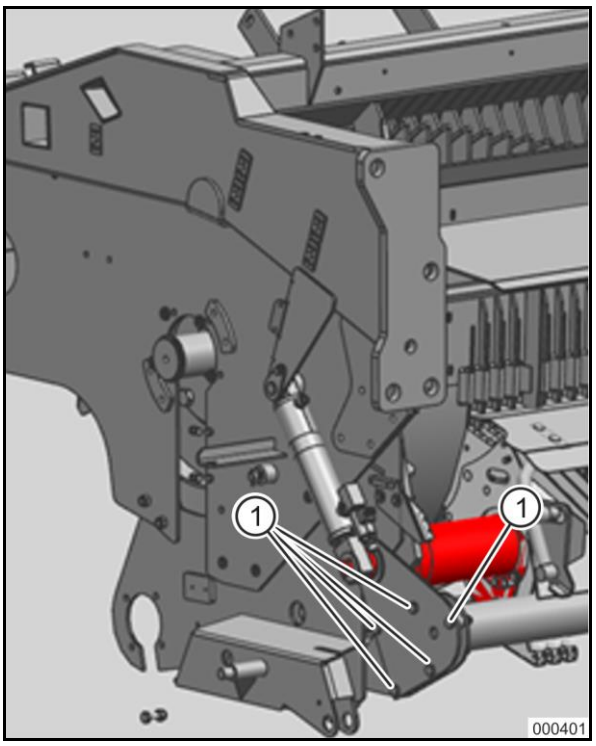


Fig. 106

4. Fold cutting unit frame down.

   2nd person required.

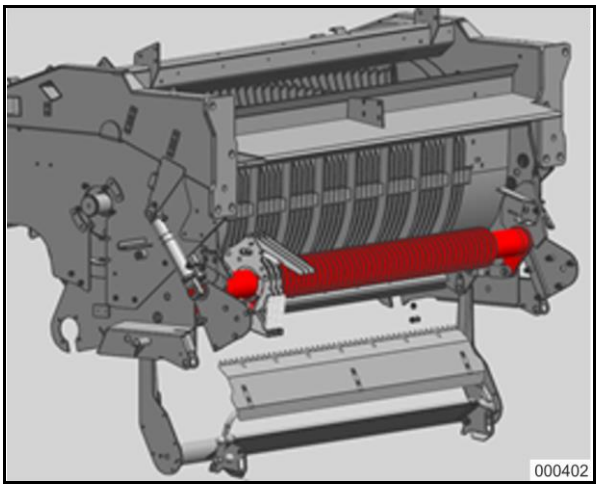


Fig. 107

5. Due to the removal of the upper link (2), the receiver pipe can be freely rotated.

→ Do not change the adjustment of the upper link!

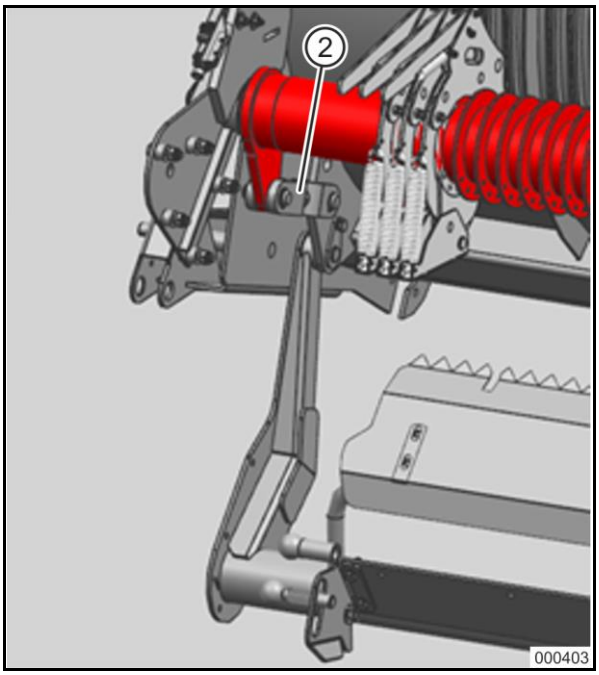


Fig. 108

6. Remove the screws (2) and washers (3) before unhooking the springs (1).

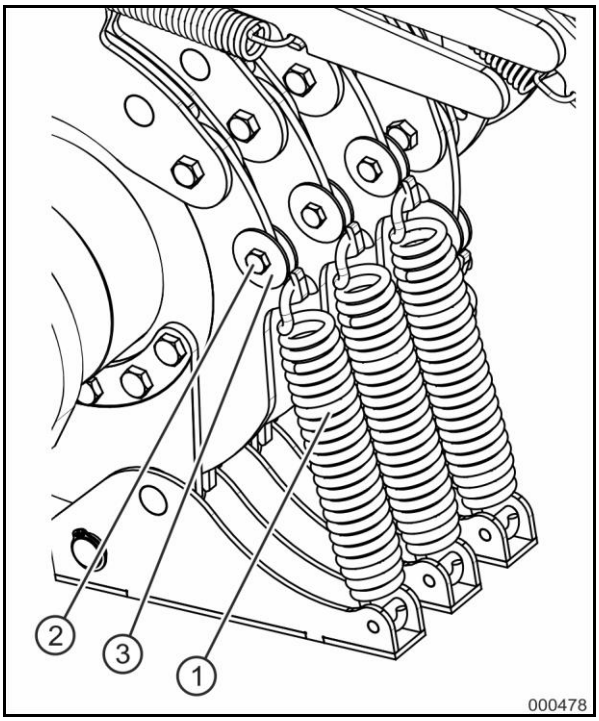


Fig. 109

7. Now use the spring-loaded lever 73236615 to unhook the cutting unit springs.

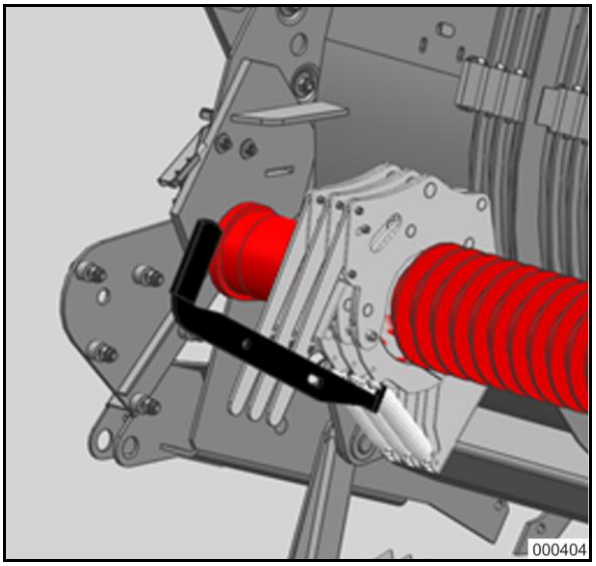


Fig. 110

8.10.2.2 Install cutting unit springs

8. Ensure the correct alignment of the springs when installing them!

   Use the spring-loaded lever 73236615 for the installation.

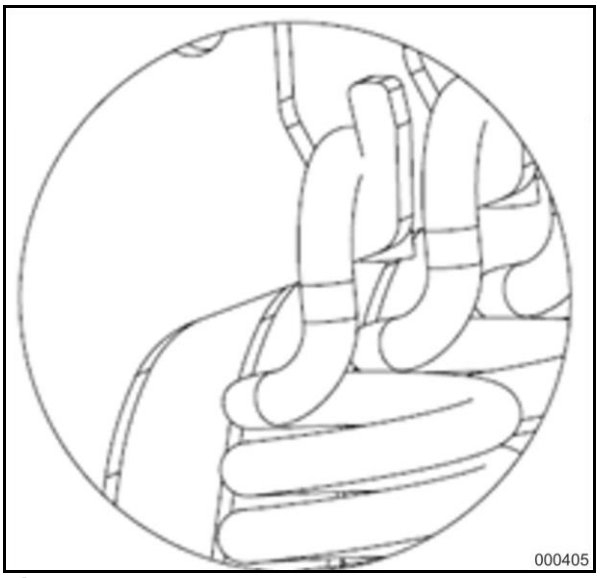


Fig. 111

9. After installation of the springs (1), reinstall them with the screws (2) and washers (3).

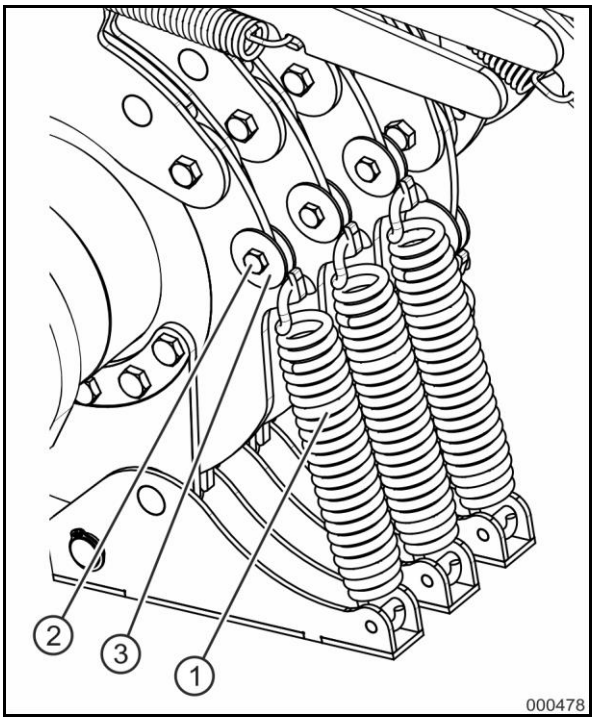


Fig. 112

10. Reinstall the upper link (2) at the receiver pipe and the conveying trough (do not change the adjustment of the upper links!).

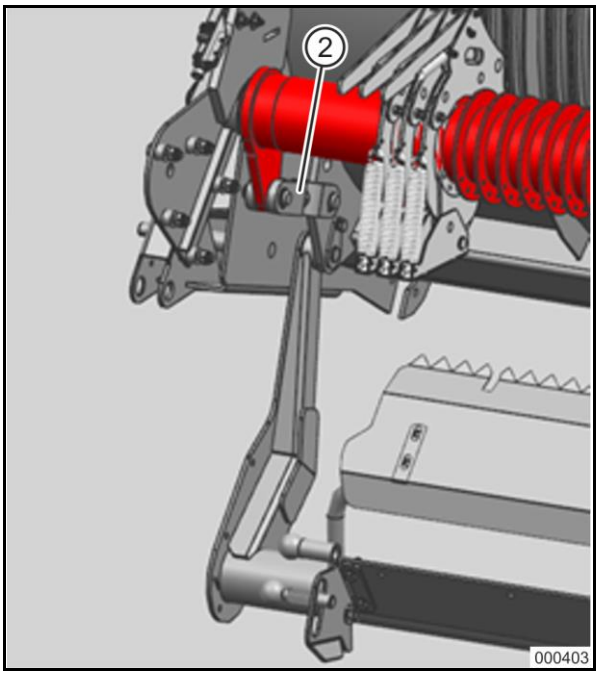


Fig. 113

11. Fold the chassis frame up and screw it to the bearing plates.

    2nd person required.

12. Retract the cutting unit and reinsert the knives.

13. Extend cutting unit.

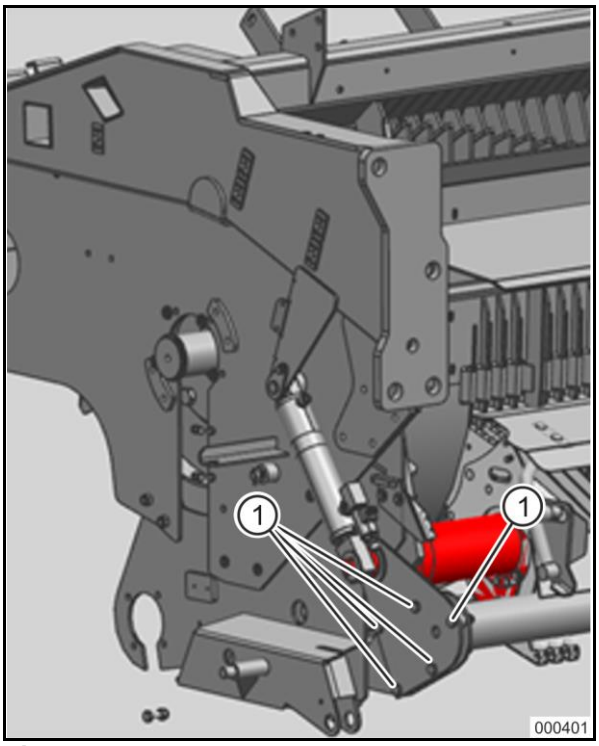


Fig. 114

8.10.3 Remove and install cutting knives

The cutting knives must be removed and installed:

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

8.10.3.1 Remove cutting knives

1. Retract the cutting unit via the control set.
2. Fold the folding drawbar by means of the hydraulic cylinders to increase the free space to the cutting knives.
3. Switch the oil circulation between tractor and machine off.
4. Secure tractor and machine against accidental starting and rolling.
5. Pull the bolt (1) out.
6. Fold the cover plate (2) down.

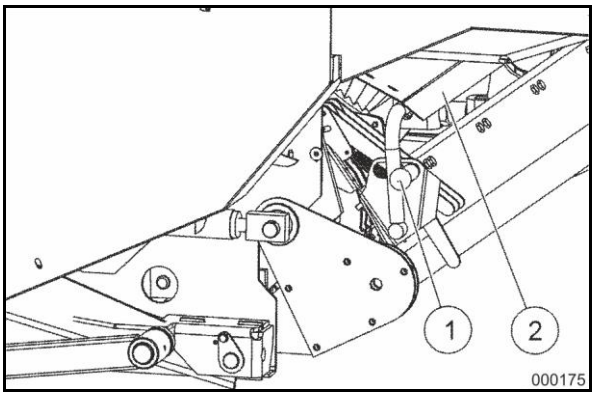


Fig. 115

7. Wear protective goggles.
8. Wear protective gloves.
9. Remove the knife lever (3) and the mounting lever (4) out of the holder (5).

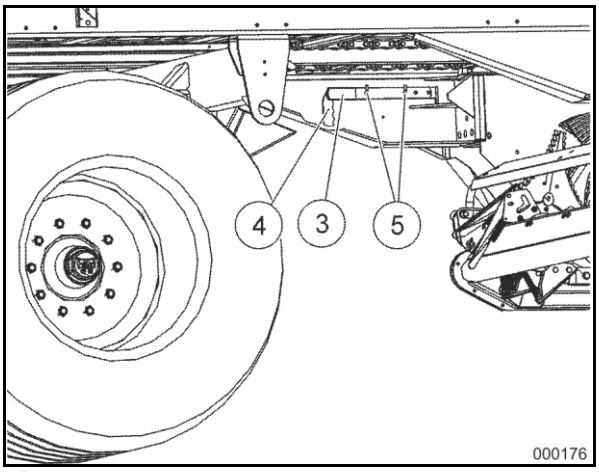


Fig. 116

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

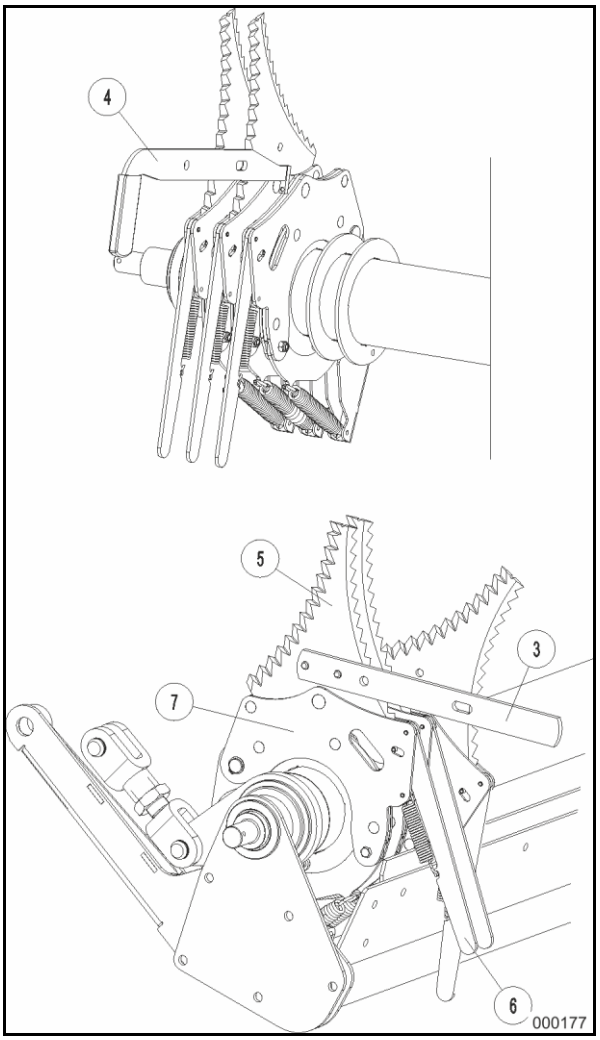


Fig. 117

8.10.3.2 Install cutting knives

WARNING

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

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

- people stand beneath the machine,
- people reach or can reach into the dangerous spots alongside the cutting unit.

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

When installing the cutting knives, ensure that the locking lever completely engages again. The locking lever has completely engaged if it is in close contact with the frame (5) of the cutting unit, the slotted dowel pin (6) being at the front in the oblong hole.

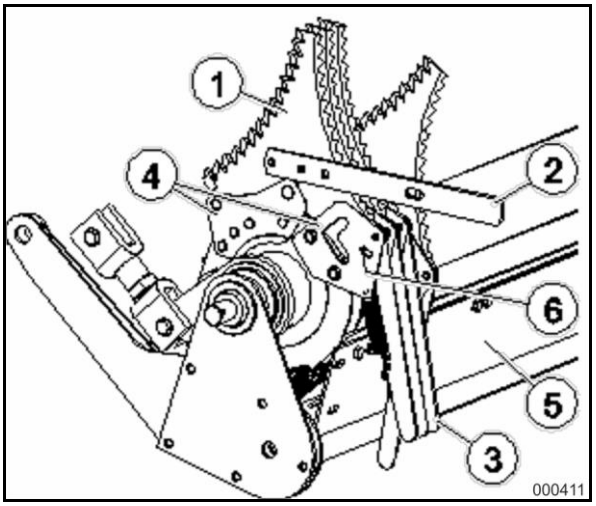


Fig. 118

5. Refix the mounting lever and the knife lever in the holder.
6. Fold the cover plate (7) up again.
7. Lock the cover plate by means of the bolt (8) in the oblong hole (9).
8. Release the parking brake of the machine after all cutting knives have been reinstalled.
9. Start the tractor engine.
10. Switch the oil circulation between tractor and machine on with the tractor engine running.

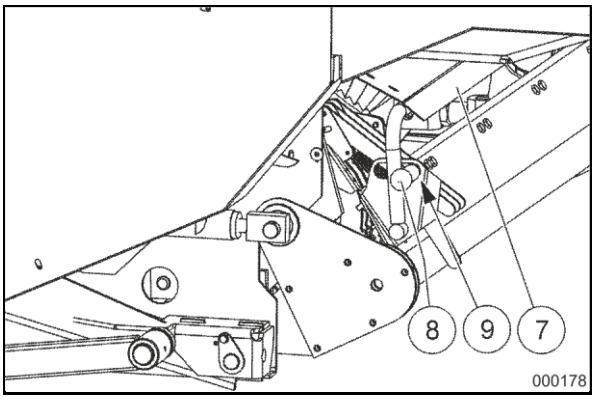


Fig. 119

11. Lower the pick-up.
12. Switch the tractor's p.t.o. shaft on.

    Pick-up and feeder rotor are powered.
13. Extend the cutting unit into the conveyor duct via the control set.
14. Lower the folding drawbar.

8.10.4 Grind cutting knives

WARNING

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

Always wear protective goggles when grinding cutting knives.

- Regularly check the cutting knives for sharpness.
- Turn blunt cutting knives over (every 12 service hours) or grind them (every 24 service hours).
- Use a right-angle grinder with a flap grinding wheel for grinding the cutting knives.
- Only grind the cutting knives on their smooth side, never on their corrugated side!

Sharp cutting knives:

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

8.10.5 Set distance between cutting knives and rotor

The distance between the cutting knives and the rotor must be approx. 20 mm over the complete width of the rotor. This distance will ensure optimum cutting of the loaded material. The cutting knives must not come into contact with the rotor.

1. Lift the folding drawbar to increase the free space to the cutting knives.
2. Secure tractor and machine against accidental starting and rolling.
3. Enter the cargo space through the access door.
4. Measure:
   - the distance between the cutting knives (1) and the rotor (2) from the cargo space through the slots of the conveyor duct.
   - the distance on the right-hand and left-hand side of the rotor, as the distance between the cutting knives and the rotor must be equal over the entire width of the rotor.
5. Adjust the distance between the cutting knives and the rotor at the respective upper link on the right-hand and left-hand side of the machine if the measured value is not approx. 20 mm.

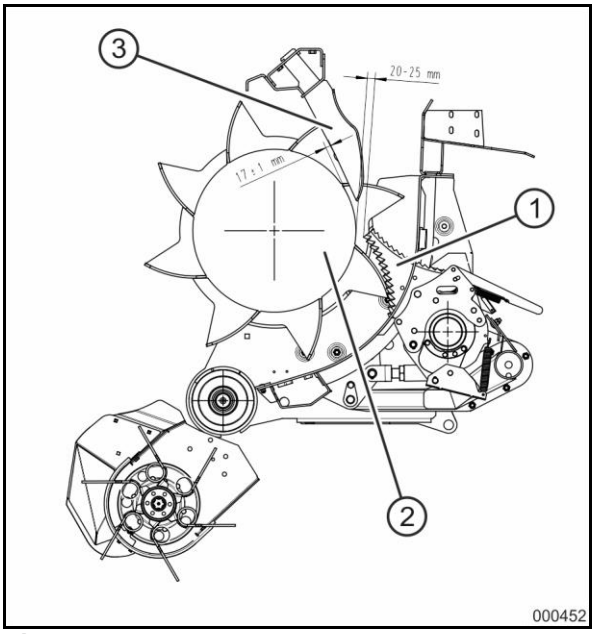


Fig. 120

– Unscrew the counter nut.

– Remove the bolt (4) to loosen the upper link fork from the receiver pipe (5).

– Turn the respective upper link fork to set the distance between the cutting knives and the rotor.

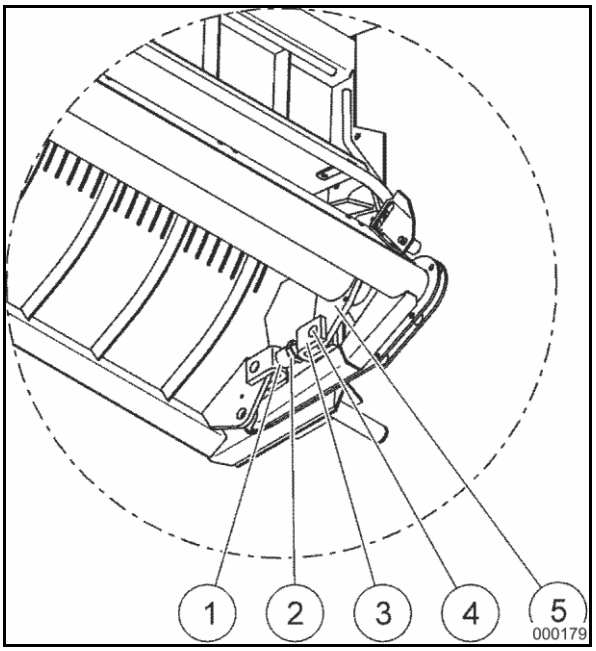


Fig. 121

- Increase distance between cutting knives and rotor = Shorten upper link = Turn upper link fork clockwise.
- Reduce distance between cutting knives and rotor = Lengthen upper link = Turn upper link fork counterclockwise.

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

– Fix the upper link fork to the receiver pipe by means of the bolt if the distance between cutting knives and rotor has been properly set.

– Tighten the counter nut.

6. Reset the bracket (6):

– Unscrew the screws (7).

– Completely retract the cutting unit.

– Push the bracket (6) as far as it will go below the knife mount (8).

– Tighten the screws (7).

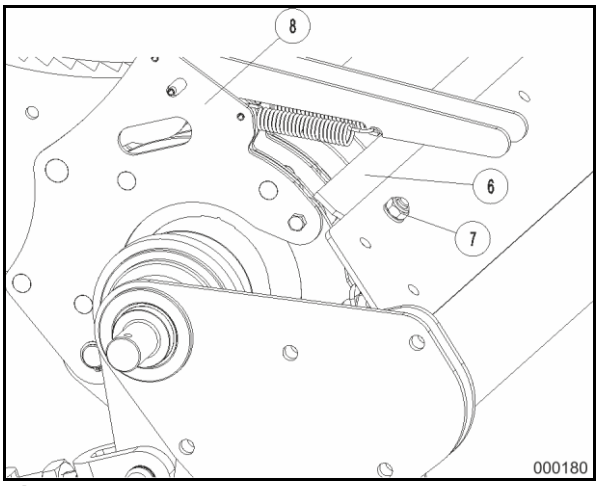


Fig. 122

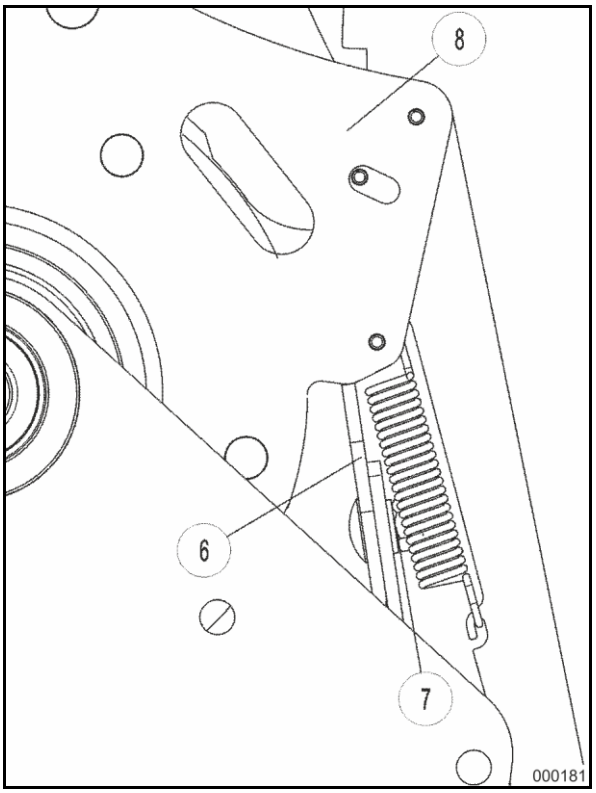


Fig. 123

8.10.6 Check distance between strippers and rotor

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

The minimum distance between the strippers and the rotor must be 17 mm over the entire width of the rotor. This distance will prevent the rotor from becoming clogged. The distance must not fall below the minimum value.

Reasons for a too small distance between strippers and rotor are:

- worn strippers or
- deformed stripper holders.

1. Enter the cargo space through the access door.
2. Measure the distance between the strippers and the rotor (2) in the conveyor duct from the cargo space.
3. Replace worn strippers.
   - Unscrew the screws.
   - Remove the safety rail (4) of the stripper holder by pulling it out to the side.
   - Remove worn strippers by pulling them out to the bottom.
   - Mount new strippers in reverse order.

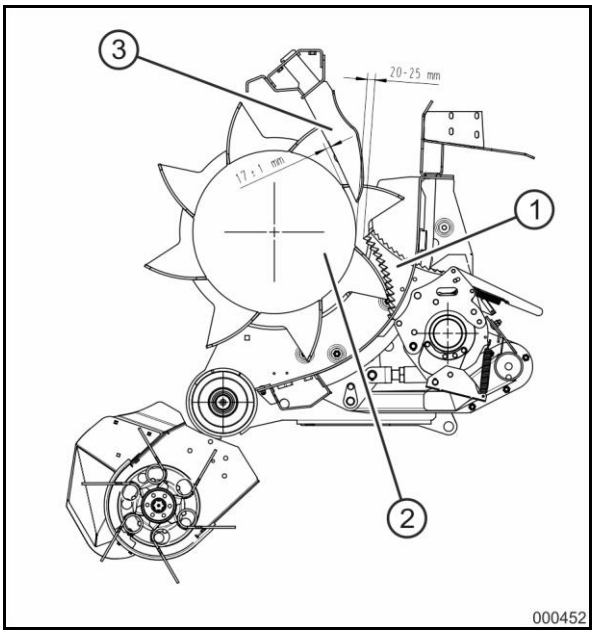


Fig. 124

4. Have deformed stripper holders replaced by an authorised workshop.

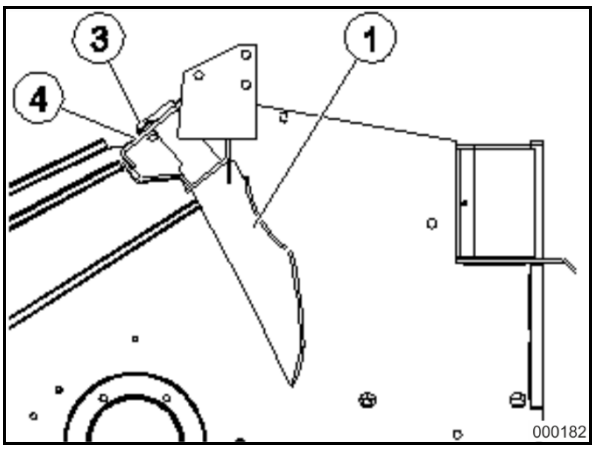


Fig. 125

8.10.7 Set "Cutting unit retracted" sensor

WARNING

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

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

1. Completely extend the cutting unit.
2. Turn the tractor engine off.
3. Switch the tractor ignition on.
4. Apply the parking brake of the tractor.
5. Apply the parking brake of the machine.
6. Uncouple the propeller shaft.
7. Disconnect the pressure line of the single-acting control device.
8. Fix the "Cutting unit retracted" sensor (1) to the holder (2) such that the distance between the sensor and the frame of the cutting unit (3) is approx. 2 mm.

   The light emitting diode (4) lights up and the "Cutting unit" symbol on the control set simultaneously changes from "Cutting unit retracted" position to "Cutting unit extended" position.
9. Screw the sensor in this position.

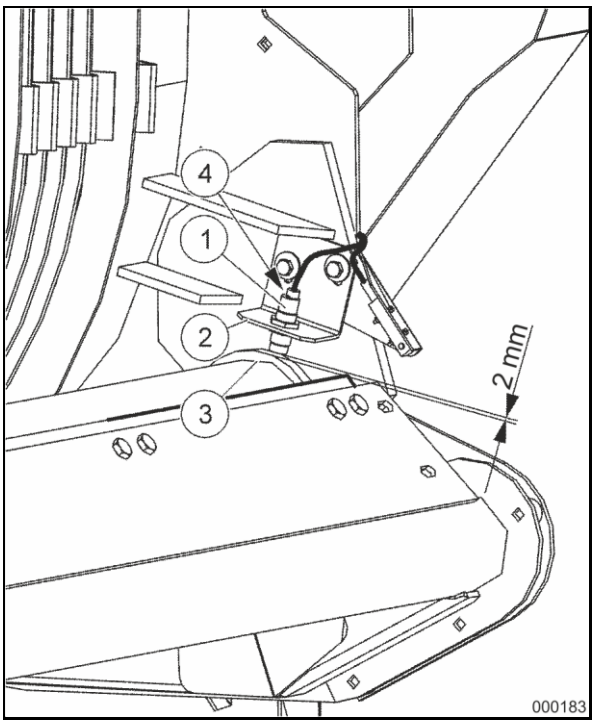


Fig. 126

8.10.8 Set rpm sensor "Beaters"

WARNING

Risk of crushing and being drawn in during setting of rpm sensor "Beaters" if the machine is unintentionally powered or hydraulic functions are accidentally carried out!

Secure tractor and machine against accidental starting and rolling before setting the sensor.

10. Fasten the sensor (3) such that the distance between the sensor and the bolt head (2) is approx. 3 mm.

    The light emitting diode lights up.

11. Screw the sensor in this position.

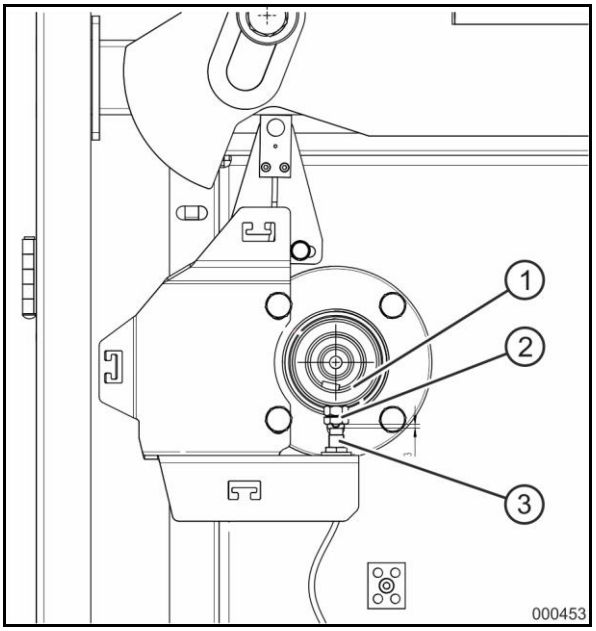


Fig. 127

8.10.9 Sensor "Tailgate closed" (forage wagon and forage wagon with dosing unit)

WARNING

Risk of crushing and being drawn in during setting of the "Tailgate closed" sensor if the machine is unintentionally powered or hydraulic functions are accidentally carried out!

Secure tractor and machine against accidental starting and rolling before setting the sensor.

1. Close the tailgate completely.
2. Fasten the sensor retaining plate (2) such that the distance between the sensor and the trip pad (1) is approx. 3 mm.

   The light emitting diode lights up.

3. Screw the sensor in this position.

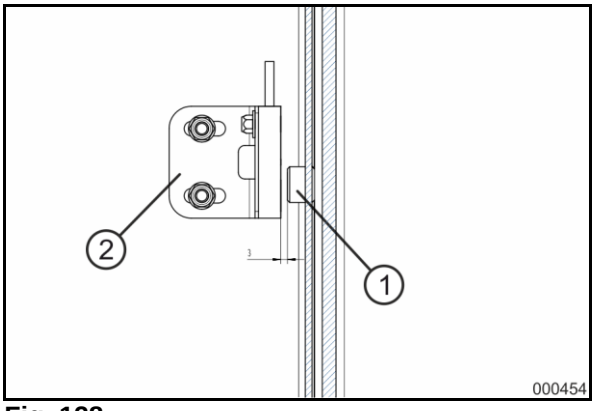


Fig. 128

8.10.10 Set rpm sensor "Beater circuit"

Optional extra

WARNING	**Risk of crushing and being drawn in during setting of rpm sensor "Beater circuit" if the machine is unintentionally powered or hydraulic functions are accidentally carried out!** Secure tractor and machine against accidental starting and rolling before setting the sensor.

4. Fasten the sensor (1) such that the distance between the sensor and the bolt head (2) is approx. 3 mm.

   The light emitting diode lights up.

5. Screw the sensor in this position.

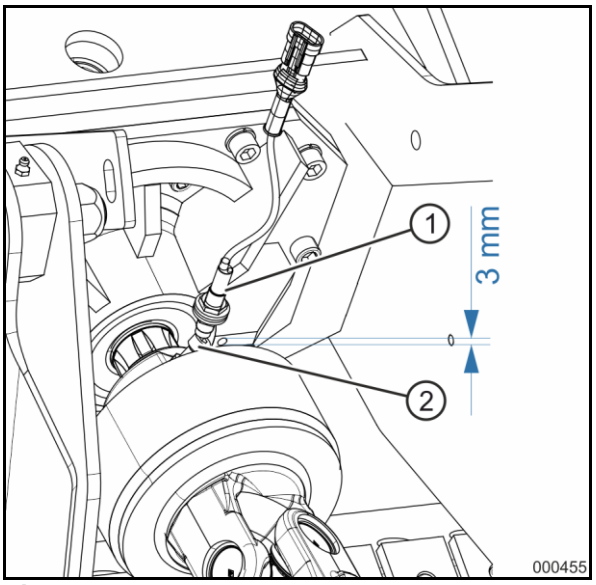


Fig. 129

8.10.11 </dg_bm "mod_1500444746004_0001"Tailgate open" sensor (only forage wagon)

WARNING 	**Risk of crushing and being drawn in during setting of the "Tailgate open" sensor if the machine is unintentionally powered or hydraulic functions are accidentally carried out!** Secure tractor and machine against accidental starting and rolling before setting the sensor.

1. Open the tailgate completely.
2. Fasten the sensor (1) to the holder such that the distance between the sensor and the cylinder (2) is approx. 3 mm.

   The light emitting diode lights up.
3. Screw the sensor in this position.

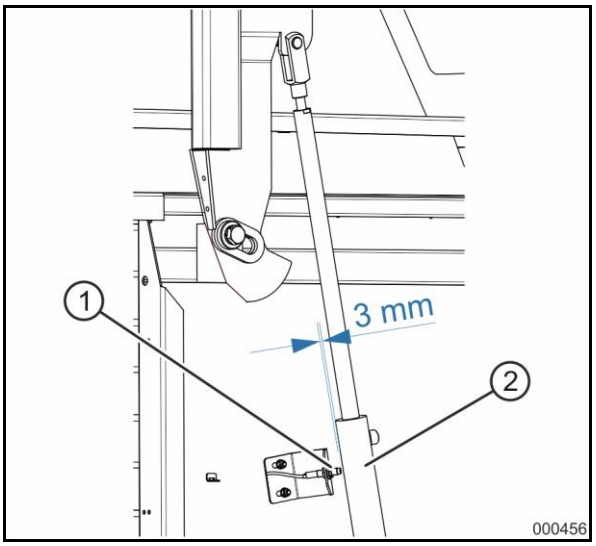


Fig. 130

8.11 Transport floor

WARNING

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

Only enter the cargo space with the machine switched off and the transport floor secured against accidental starting.

Ensure that the transport floor strips on the right-hand and left-hand side do not bump against the frame (1)!

Equally shorten the chains of the transport floor if the tension path of the chain tensioners is no longer sufficient to retighten the chains!

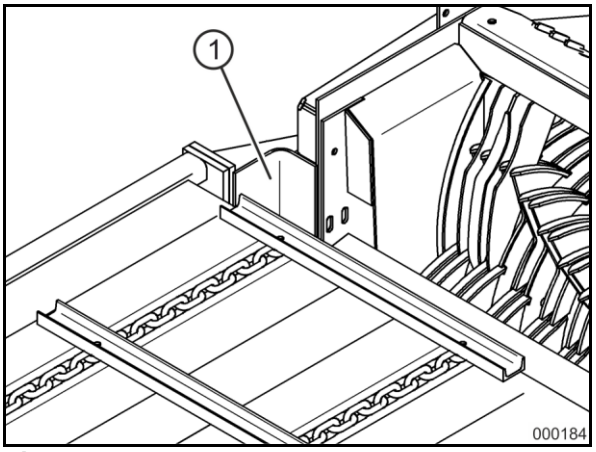


Fig. 131

The chains of the transport floor:

- must be tightened equally, but not too firmly.
- are only allowed to sag slightly.

8.11.1 Shorten and tighten transport floor chains

WARNING

Risk to eyes due to blown-away abrasive particles when cutting chain links by means of a right-angle grinder!

Wear protective goggles when cutting the chain links by means of the right-angle grinder.

1. Align the chains of the transport floor such that the chain connecting links are within the central and rear area of the cargo space.
2. Secure tractor and machine against accidental starting and rolling.
3. Tighten the respective nut (2) to loosen the respective pawl (1) of the chain tensioners.
4. Unscrew the counter nuts (3) of the clamping screws (4).
5. Turn the 4 clamping screws counterclockwise.

→ The chain tension is released and the chains sag.

6. Enter the cargo space through the access door to shorten the chains.
7. Open and remove the chain connecting links.
8. Always cut out an even number of chain links (2, 4, 6) at all chains by means of a right-angle grinder.
9. Put the shortened chains together by means of new chain connecting links.

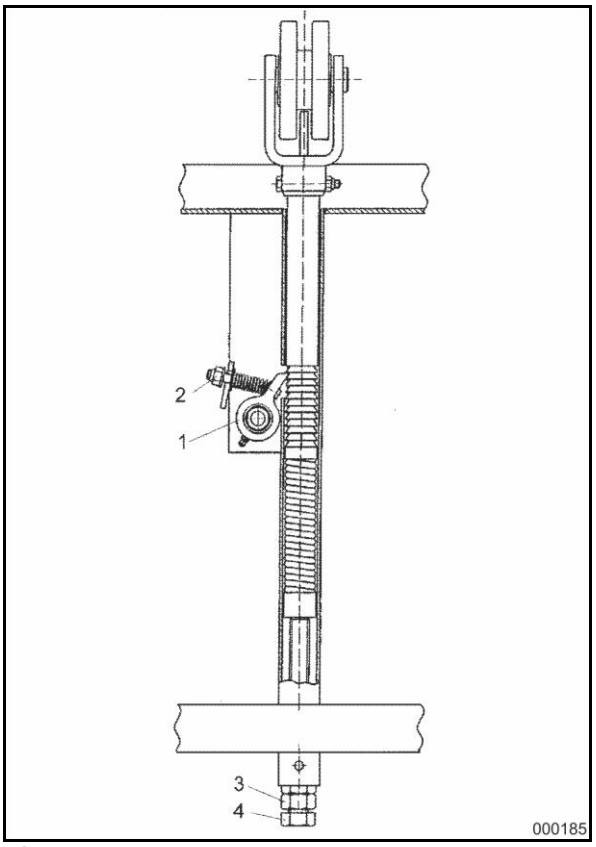


Fig. 132

10. Turn the 4 clamping screws clockwise.

→ The chains are tightened.

11. Unscrew the nuts of the pawls.
12. Check the screw-in depth of the clamping screws. The transport floor springs must always be tensioned to maximum. All clamping screws must have the same screw-in depth.
13. Tighten the counter nuts.
14. Close the access door.
15. Fold the ladder up.
16. Lock the ladder and the access door by means of the locking mechanism.

8.12 Beaters

WARNING

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

It is imperative to use a mobile service platform with ladder when carrying out service and maintenance work on the roller chains for the beater drive.

8.12.1 Lubricate roller chains of beaters

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

8.12.2 Check/Retighten roller chain tension

Retighten the roller chains if they can be depressed by more than 5 mm.

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

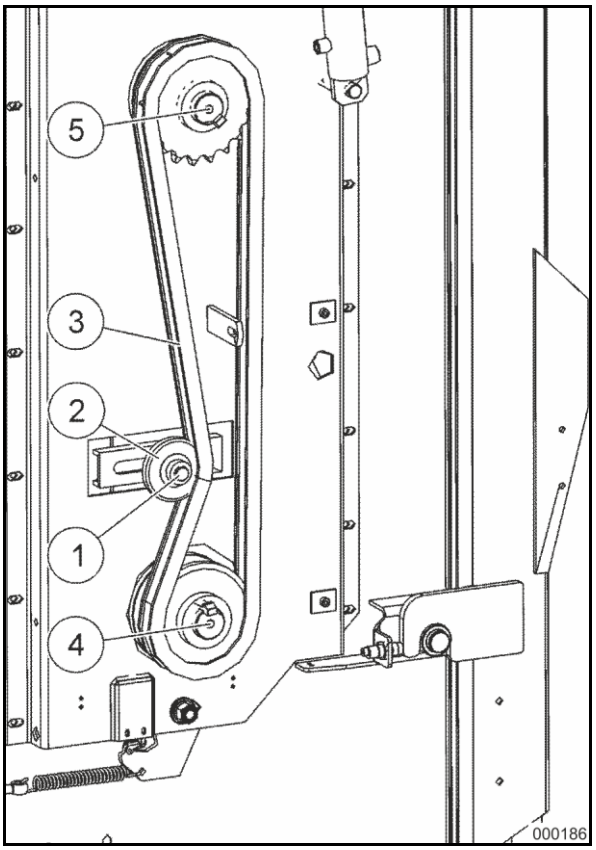


Fig. 133

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

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

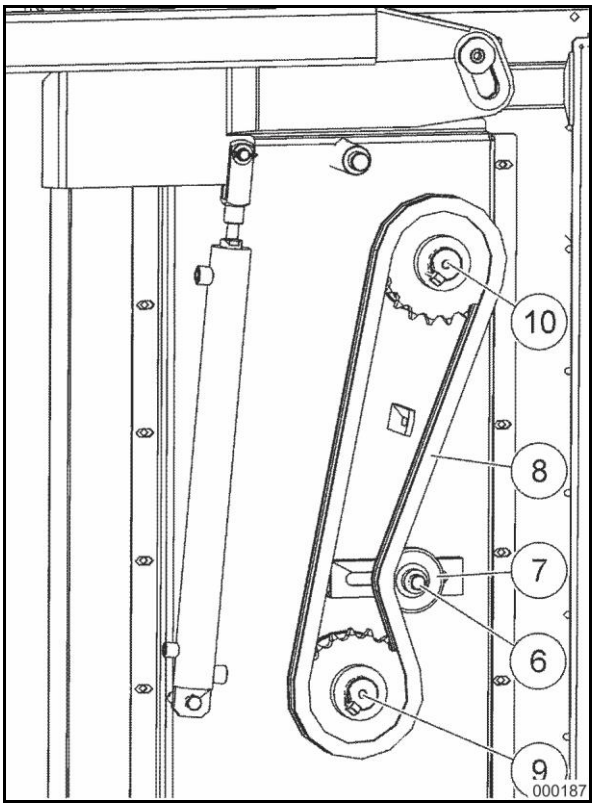


Fig. 134

6. To loosen the tightening wheel bolts (1) and (6), place an open-end wrench onto the hexagon key (2) and turn it to the left or right respectively until the square plate (3) uncovers the teeth (4) in the tensioning rail (5). Do not detach the reinforcement washer (6).

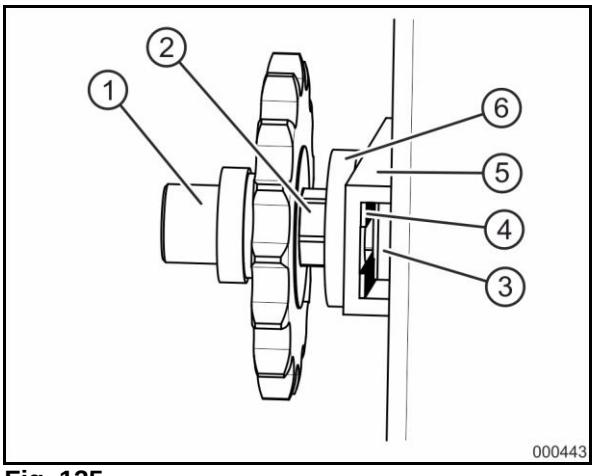


Fig. 135

8.13 Hydraulic system

Only an authorised workshop is allowed to carry out work on the hydraulic system!

Observe the information in the chapter "Activity-related safety instructions and important information", page 16.

WARNING

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

- Only an authorised workshop is allowed to carry out work on the hydraulic system.
- Working on the hydraulic system with the system under operating pressure is not allowed.
- Risk of explosion due to improper work on hydraulic accumulators!

  Welding, soldering, drilling or other work on hydraulic accumulators which might affect the mechanical properties is not allowed.

- Regularly check all hydraulic hose pipes and hydraulic plugs for damage and contamination.
- Have the hydraulic hose pipes checked for their operational safety by an expert at least once a year!
- The period of use of the hydraulic hose pipes should not exceed six years, including a maximum possible shelf life of two years.
- Dispose of hydraulic oil according to regulations. Contact your oil supplier in case of disposal problems.
- Beware that no hydraulic oil penetrates the soil or water.

8.13.1 Depressurise 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.
- Depressurise the hydraulic system before carrying out work on the hydraulic system.

- Relieve the respective hydraulic cylinder via the corresponding operating element with the hydraulic oil supply switched off.

8.13.2 Depressurise folding drawbar with drawbar suspension

1. Completely lower the folding drawbar.
2. Set the adjusting lever at the double-acting control device of the tractor to "Floating Position" if a free return line is not available.
3. Unscrew the plug screw (1).

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

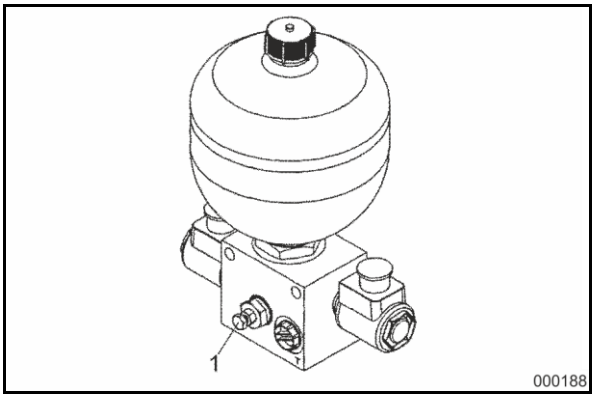


Fig. 136

8.13.3 Marking of hydraulic hose pipes

The marking on the fitting provides the following information:

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

(2) Date of manufacture of the hydraulic hose pipe (16/07 = year / month = July 2016) (period of use expires in July 2022)

(3) Maximum admissible operating pressure (210 bar)

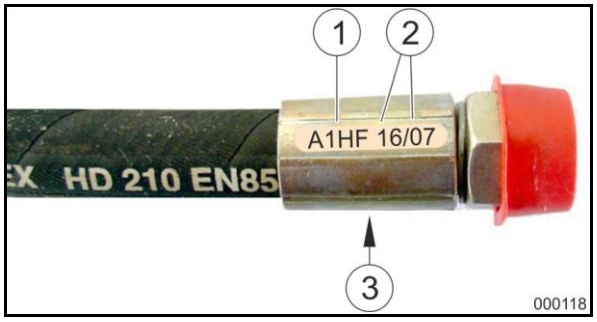


Fig. 137

8.13.4 Inspection criteria for hydraulic hose pipes

Immediately have hydraulic hose pipes replaced by an authorised workshop as soon as you detect any of the following defects:

- Damaged outer layer down to the liner (e.g. due to chafing points, cuts, cracks).
- Embrittled outer layer (visible by cracking of hose material).
- Unnatural deformations of the hydraulic hose pipe in depressurised as well as in pressurised state or when bent (e.g. separation of layers, blistering, pinches, kinks).
- Leaks.
- Damaged, deformed or leaking fitting.
- Hose slipping out of the fitting.
- Corroded fitting which may affect the function and the strength.
- Improperly laid hydraulic hose pipes, e.g. ignored bending radii, laying over sharp edges.
- The hydraulic hose pipe is older than 6 years.

8.13.5 Replace hydraulic filter

Soiled filters cause stronger heating-up of oil.

Have the filter element (1) replaced by an authorised workshop after approx. 250 service hours. Then as necessary, at least every 1000 service hours.

WARNING

Risk of accidental contact with hydraulic oil due to hydraulic oil squirting out under high pressure and entering the body!

- Replacement of the hydraulic filter is not allowed with the hydraulic system being under operating pressure.
- Only replace the hydraulic filter when the hydraulic system of the machine is not connected to the tractor.

1. Disconnect the hydraulic system of the machine from the tractor.

→ The machine is depressurised.

2. Unscrew the filter casing (3) from the filter head.
3. Remove the soiled filter element (1).
4. Clean the filter casing.
5. Grease the thread at the filter casing.
6. Check the O-ring (2) for damage. Replace a damaged O-ring (ø 67.95 mm x 2.62 mm).
7. Lubricate the O-ring of the new filter element.
8. Slip the new filter element on as far as it will go.

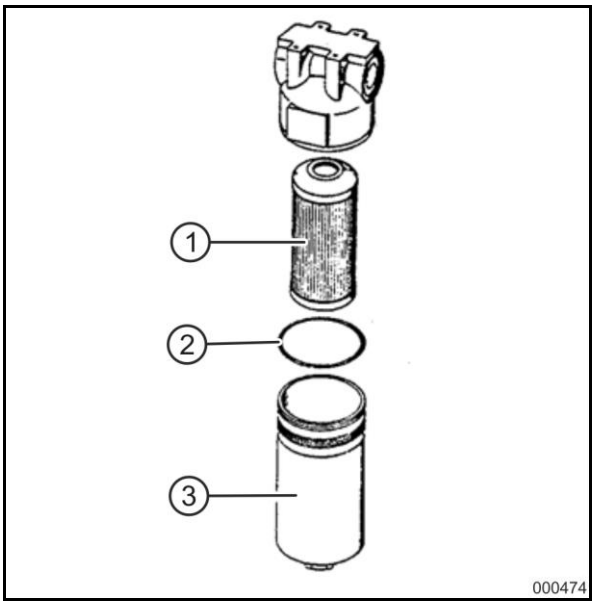


Fig. 138

9. Screw the filter casing into the filter head as far as it will go and turn it back by one quarter of a turn.
10. Tighten the screwed connection at a torque of 150 Nm.
11. Switch the hydraulic system on and bleed the filter.
12. Check the filter for leaks.

8.14 Brake system

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

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

The in-line filters incorporated in the hose couplings of the brake and feed line protect the compressed-air brake system from being soiled by solid particles.

The air supply to the brake system should have priority over the protection of the brake system against soiling and shall be ensured in all conditions. In case of the filter element being clogged due to soiling, an internal bridging-over element opens and unfiltered air passes through the hose coupling.

Check degree of soiling

Check the degree of soiling of the filter elements (1) in the hose couplings of the brake and feed line before connecting the hose couplings to the tractor. The filter element can be inspected through the opening (2) beneath the plastic lid.

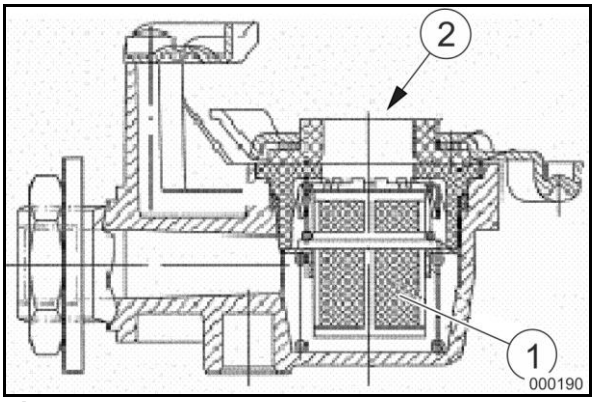


Fig. 139

Clean filter element (shop work)

Clean heavily soiled filter elements approx. every 3-4 months, depending on the operating conditions.

1. Open the lid (3).
2. Remove the two Phillips screws (4).
3. Open the cover (5) by swivelling.
4. Remove the filter element (2) from the hose coupling.
5. Clean the filter element with benzene or thinner (rinse).
6. Use compressed air to blow the filter element dry.
7. Reinsert the filter element into the hose coupling.

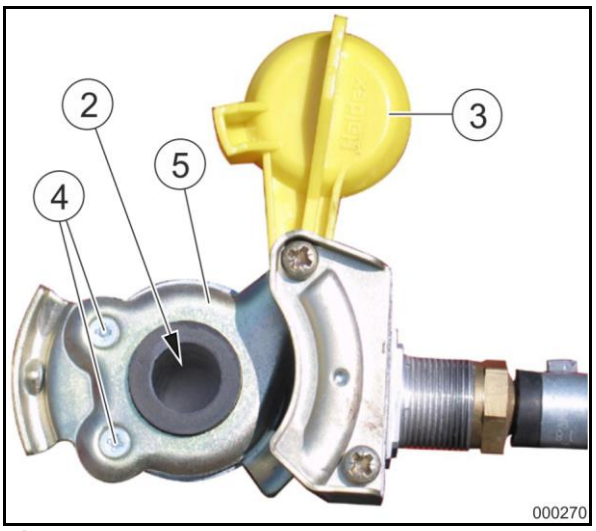


Fig. 140

8. Close the cover.
9. Screw the cover by means of the two Phillips screws.
10. Connect the feed and brake line to the tractor.
11. Check the hose couplings for tightness.

8.14.2 Drain compressed-air reservoir of compressed-air brake system

Drain the compressed-air reservoir every day before the first journey!

The compressed-air reservoir is situated beneath the machine in front of the axle support.

Take the ring (2) and pull the drain valve of the compressed-air reservoir (1) down until water is no longer pouring out of the compressed-air reservoir.

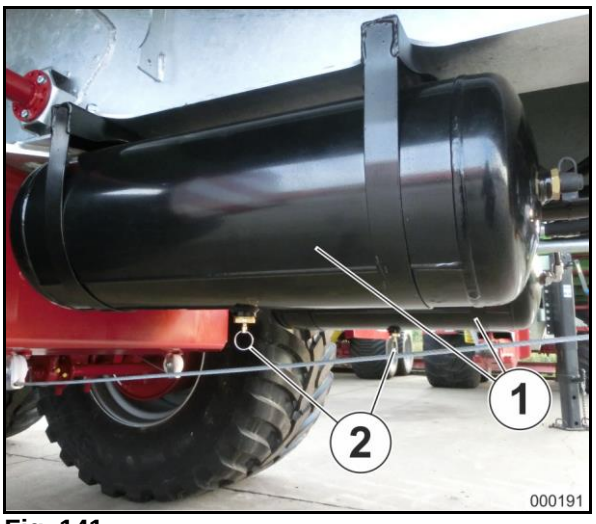


Fig. 141

8.15 Maintenance of axles

Lubrication and maintenance plan Axles		Before start-up and after longer downtimes	After first journey with loaded material	Every 40 service hours	Every 200 service hours	Every 500 service hours or once a year	Every 1000 service hours or once a year
Grease (with long-life grease)							
(1)	Lubricate knuckle arm bearing.			X			
(2)	Lubricate locking cylinder heads at passive steering axle.				X		
(3)	Lubricate brake shaft bearing.	X			X		
(4)	Lubricate standard slack adjuster.					X	
(5)	Lubricate automatic slack adjuster.					X*	
(6)	Have grease of wheel hub bearing changed (shop work!).						X
Maintenance work							
[1]	Check wheel nuts for firm seating, retighten if necessary.	X**	X			X	
[2]	Check clearance of wheel hub bearing, have it readjusted if necessary (shop work!).				X		
[3]	Check brake linings for damage and wear, have them replaced if necessary (shop work!).				X		
[4]	Check brake setting at brake lever, have it adjusted if necessary (shop work!).				X		
[5]	Check brake setting at standard slack adjuster, have it adjusted if necessary (shop work!).				X		
[8]	Check brake setting at automatic slack adjuster, have it adjusted if necessary (shop work!).					X	
[9]	Check automatic slack adjuster for proper function					X*	

* Also after each change of brake linings.

** Also after each wheel change.

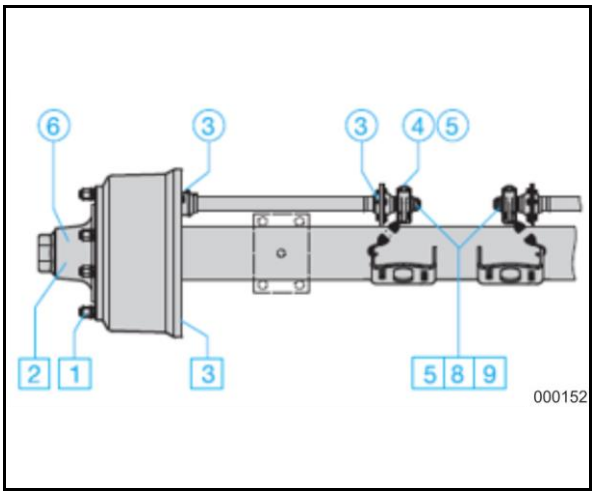


Fig. 142

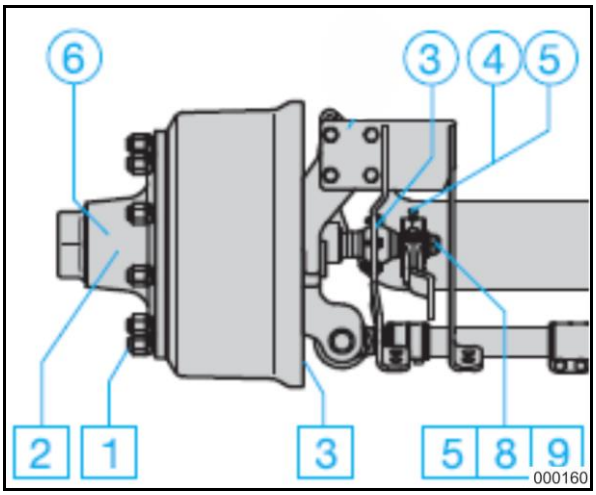


Fig. 143

8.15.1 Lubricate knuckle arm bearing

Lubricate the lubrication points (1) at the top and bottom of the knuckle arm bearing with long-life grease until fresh grease comes out of the bearings / the cam disc.

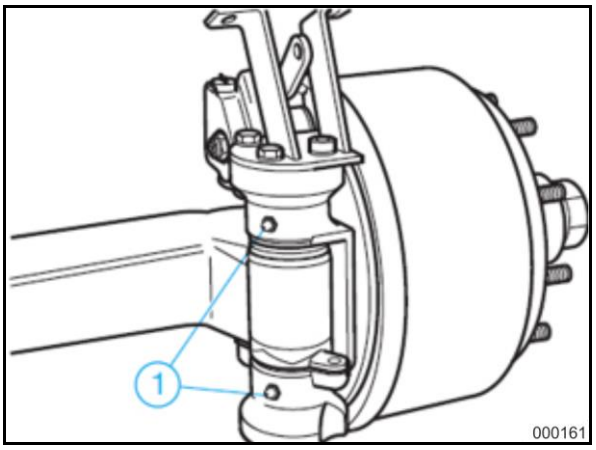


Fig. 144

8.15.2 Lubricate locking cylinder heads at passive steering axle

Lubricate the lubrication points (2) of the locking cylinder heads at the passive steering axle with long-life grease until fresh grease comes out of the bearings.

Ensure in addition that the locking cylinders and the feed lines are always bled (shop work!).

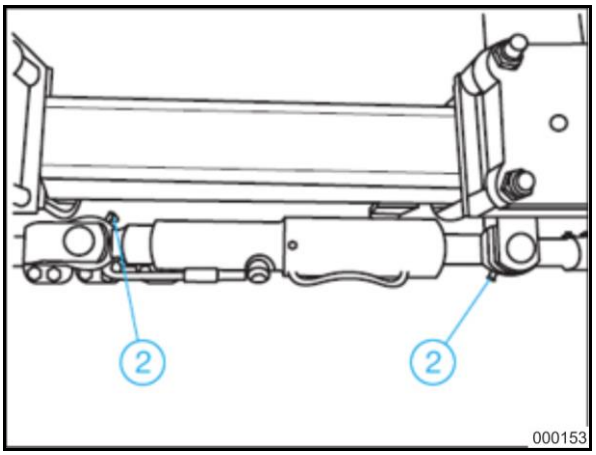


Fig. 145

8.15.3 Lubricate brake shaft bearing

Lubricate the outer and inner lubrication points (3) of the brake shaft bearing with long-life grease until fresh grease comes out of the bearings.

Only use lithium-saponified grease with a drop point above 190°C.

Make sure that no grease or oil enters the brake system!

Depending on the series, the cam bearing may not be sealed on the brake side.

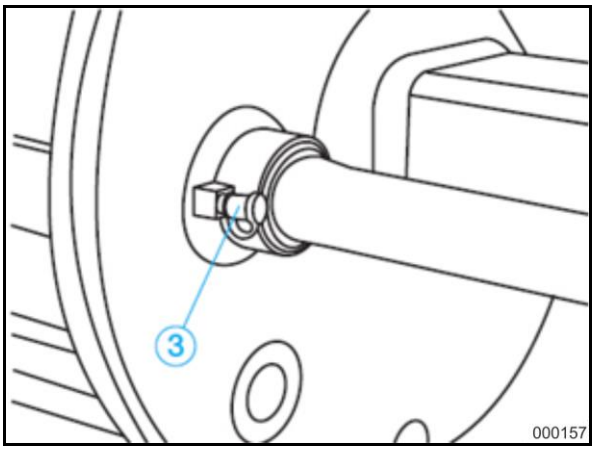


Fig. 146

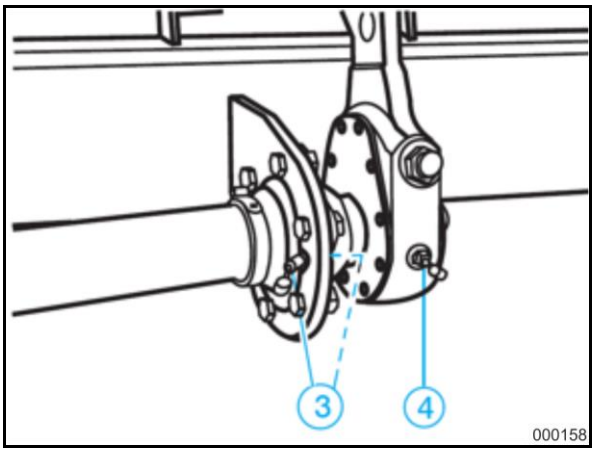


Fig. 147

8.15.4 Lubricate standard slack adjuster

Lubricate the lubrication points (4) of the slack adjuster with long-life grease until fresh grease comes out.

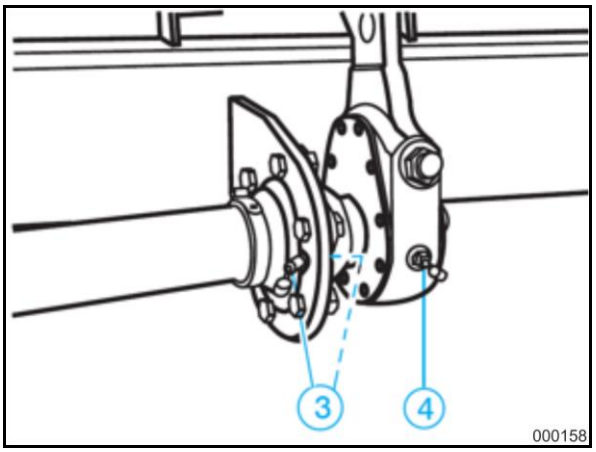


Fig. 148

8.15.5 Lubricate automatic slack adjuster

1. Remove the rubber cap.
2. Lubricate the lubrication point (arrow) of the automatic slack adjuster with long-life grease (80 g) until a sufficient amount of fresh grease comes out at the adjusting screw.
3. Use a ring wrench to turn the adjusting screw back by about one turn.
4. Manually actuate the brake lever several times.

   Automatic readjustment must be easy. Actuate the brake lever again several times if necessary.
5. Retighten the adjusting screw.
6. Reinstall the cap and lubricate with long-life grease one more time.

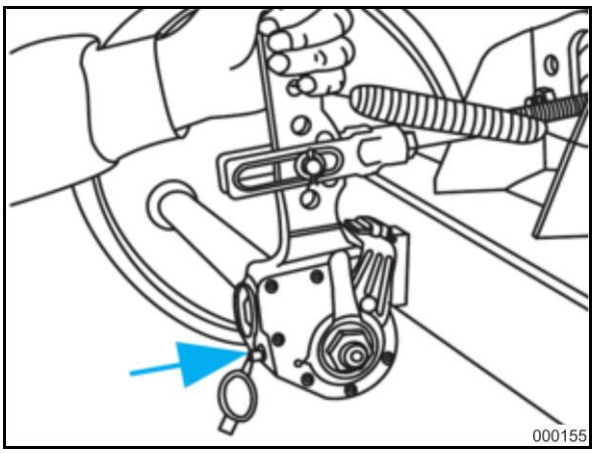


Fig. 149

8.15.6 Tighten wheel nuts

Use a torque wrench to tighten the wheel nuts crosswise at the tightening torque listed in the table below.

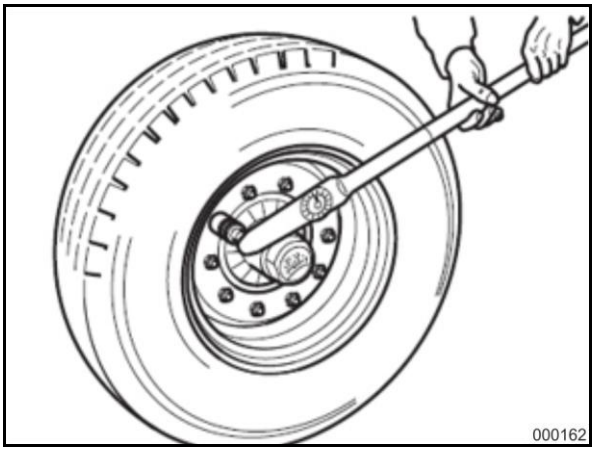


Fig. 150

8.15.7 Tightening torques of wheel nuts

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

8.15.8 Check clearance of wheel hub bearing

1. Lift the axle until the tyres are free.
2. Release the brake.
3. Place two levers between tyres and ground and check the bearing clearance.

   If there is a noticeable bearing clearance, have it readjusted by an authorised workshop.

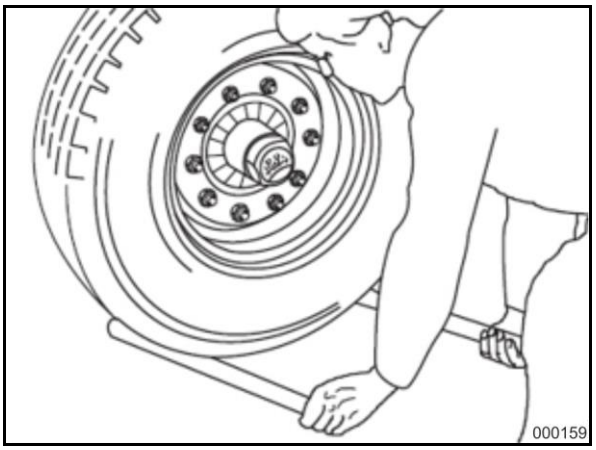


Fig. 151

8.15.9 Check brake linings

1. Open the inspection hole (3) by pulling out the rubber plug (if available).

   Have the brake linings replaced by an authorised workshop in case of a remaining lining thickness of:

   5 mm (riveted linings)

   3 mm (glued linings).
2. Reinsert the rubber plug after the check.

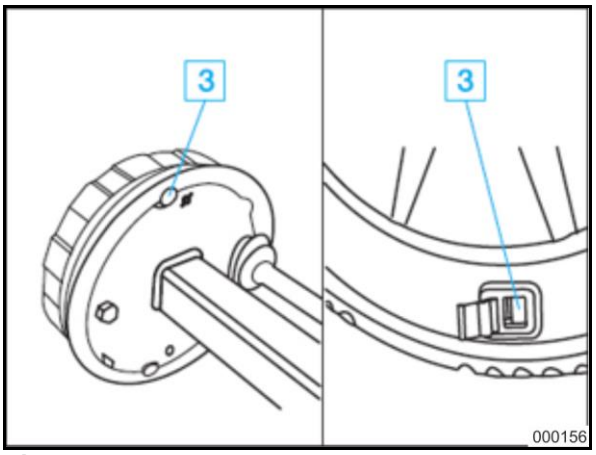


Fig. 152

8.15.10 Check brake

Regularly check the brake for proper functioning and wear.

Have the brake readjusted by an authorised workshop in case of a use of approx. 2/3 of the maximum cylinder stroke in case of full brake application.

8.15.11 Check and adjust standard slack adjuster

The braking power is transferred 100% if the brake cylinder and the brake lever are positioned in an angle von 90° to one another when the brake is actuated (see Fig. 153). If the angle is less than 90° with the brake actuated, the braking power is reduced.

Functional check:

1. Manually actuate the slack adjuster in pressing direction.
2. Have the wheel brake readjusted if the angle between the cylinder push rod and the slack adjuster is less than 90° (see Fig. 153).

- Only authorised and qualified staff of a service workshop is allowed to carry out the work specified below!
- The manufacturer will not assume any warranty and liability for material damage and personal injuries if the work is carried out by insufficiently qualified staff.
- Only use original Strautmann spare parts.

1. Secure the machine against accidental starting and rolling by means of chocks and the parking brake of the tractor.
2. Release the service and parking brake.
3. Disconnect the lines of the brake system.
4. Press the circlip down and turn the adjusting screw (1) clockwise to align the slack adjuster with the brake cylinder clevis.
5. Turn the adjusting screw back counterclockwise and set the free travel X to 10 - 12% of the brake lever length.

   Example:
   Brake lever length 150 mm =
   Free travel 15 - 18 mm
6. The angle between the slack adjuster and the cylinder push rod must now be 90° ± 10° with the brake actuated.

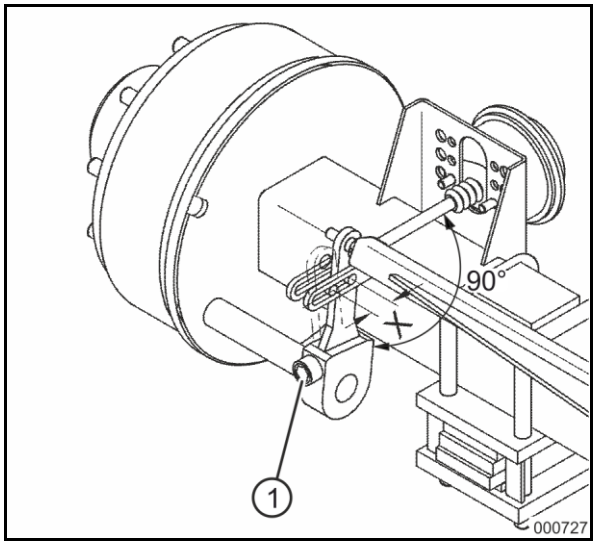


Fig. 153

8.15.12 Check automatic slack adjuster

1. Remove the rubber cap.
2. Use a ring wrench to turn the adjusting screw (arrow) back counterclockwise by about three quarters of a turn.

   At a lever length of 150 mm, the minimum free travel must be 50 mm.
3. Manually actuate the brake lever several times. The automatic readjustment must be easy.

→ The gear coupling must audibly engage and the adjusting screw slightly turns clockwise during the return stroke.

4. Retighten the adjusting screw.
5. Reinstall the rubber cap and lubricate with long-life grease.

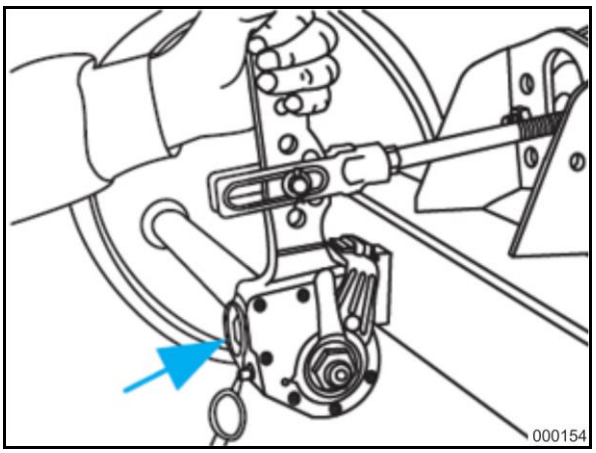
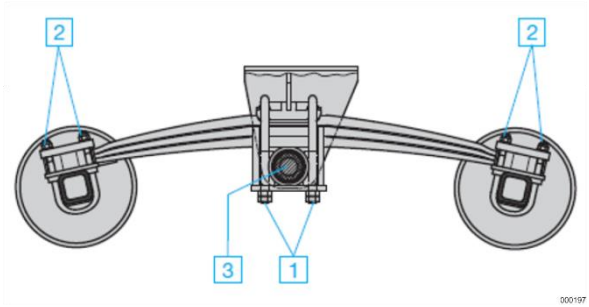


Fig. 154

8.16 Maintenance of boogie chassis

Maintenance plan Boogie chassis 		After first journey with loaded material	Every 500 service hours or every 6 months
Maintenance work			
	Check all components for damage and wear (visual check).		X
[1]	Have spring clamps at the supporting axle checked for firm seating (shop work!).	X	X
[2]	Have axle connection at the spring tension casings checked for firm seating (shop work!).		X
[3]	Have the bearing bolt at the spring tension casings checked for firm seating and readjusted if necessary (shop work!).	X	X

8.17 Maintenance of hydraulic chassis

Lubrication and maintenance plan Hydraulic chassis		Daily	After first journey with loaded material	Every month	Every 200 service hours	Every 500 service hours or once a year
Lubricate with long-life grease						
(1)	Lubricate bearing of dash pots.				X	
Maintenance work						
	Check all components for damage and wear (visual check).				X	
	Check travelling height, readjust if necessary.	X				
	Drain condensate from the oil storage tank.			X		
	Check the oil level in the oil storage tank and top up if necessary.			X		
[1]	Check dash pots for their condition and tightness.					X
[1]	Change hydraulic oil of dash pots.					X
[2]	Have the fastening device of the dash pots checked for firm seating and wear (shop work!).					X
[3]	Have spring fixing checked for firm seating (shop work!).		X		X	
[4]	Have spring bolts checked for firm seating (shop work!).		X			X

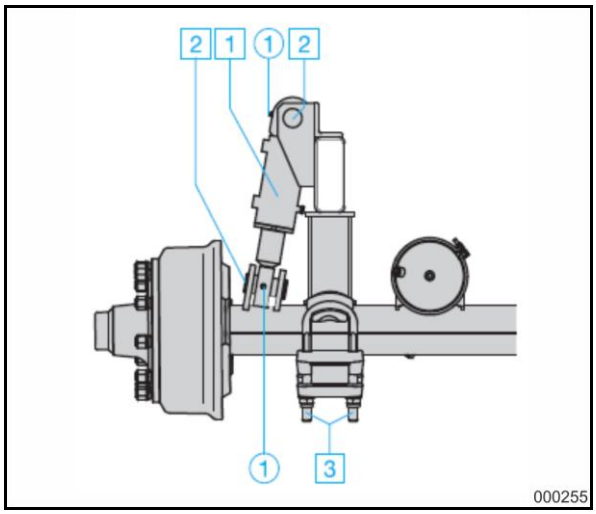


Fig. 155

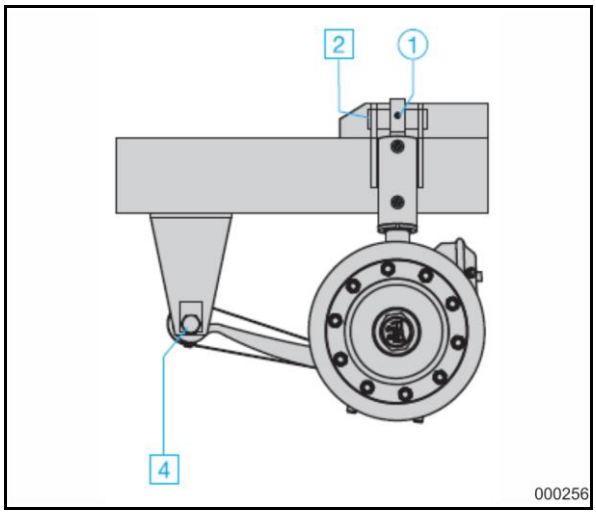


Fig. 156

8.17.1 Check oil level in oil storage tank

Each of the 4 oil storage tanks must be half filled with hydraulic oil HLP 46. The quantity when filled is 100 ml each.

The oil storage tank (1) provides the piston chamber of the hydraulic cylinder (2) with hydraulic oil. When the chassis rebounds, the hydraulic cylinder takes in hydraulic oil from the oil storage tank thus continuously moistening the piston chamber with hydraulic oil.

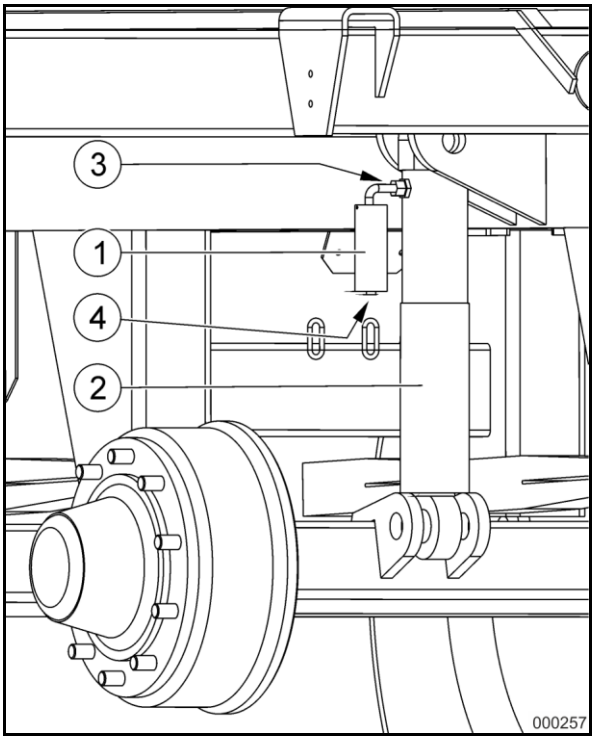


Fig. 157

8.17.2 Lubricate bearing of dash pots

Lubricate the lubrication points (1) at the top and bottom of the dash pot on the empty machine until fresh grease comes out of the bearings.

Ensure in addition that the cylinder and the feed line are always bled (shop work!).

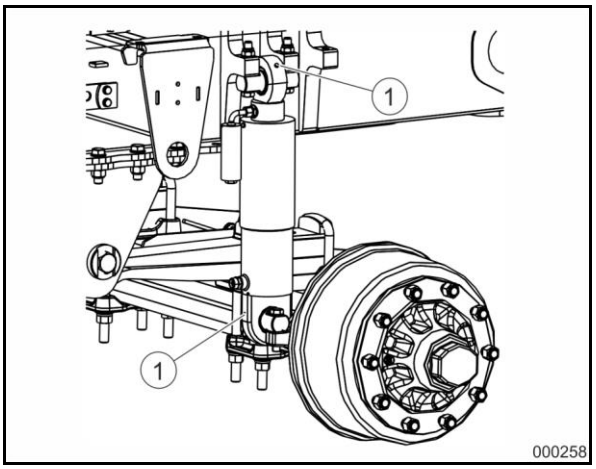


Fig. 158

8.17.3 Drain condensate

Successively carry out the required work for the right-hand and left-hand machine side:

1. Hitch the machine to the tractor.
2. Park the tractor and the empty machine on even ground.
3. Secure tractor and machine against accidental rolling.
4. Connect the hydraulic hose pipe of the levelling valve with a single-acting control device of the tractor.
5. Completely lower the dash pots of the chassis:

With three-way cock:

1. Set the operating element for the levelling valve at the tractor's control device to floating position, such that the hydraulic oil can flow back into the hydraulic oil tank of the tractor.
2. Use the upper stop-cock (2) to preselect the vehicle side to be lowered. In middle position, the line is blocked.
3. Slowly turn the lower stop-cock (3) to vertical position.

→ The preselected vehicle side lowers.

4. Turn the lower stop-cock (3) back to horizontal position.
5. Repeat steps 2 to 4 for the other vehicle side.

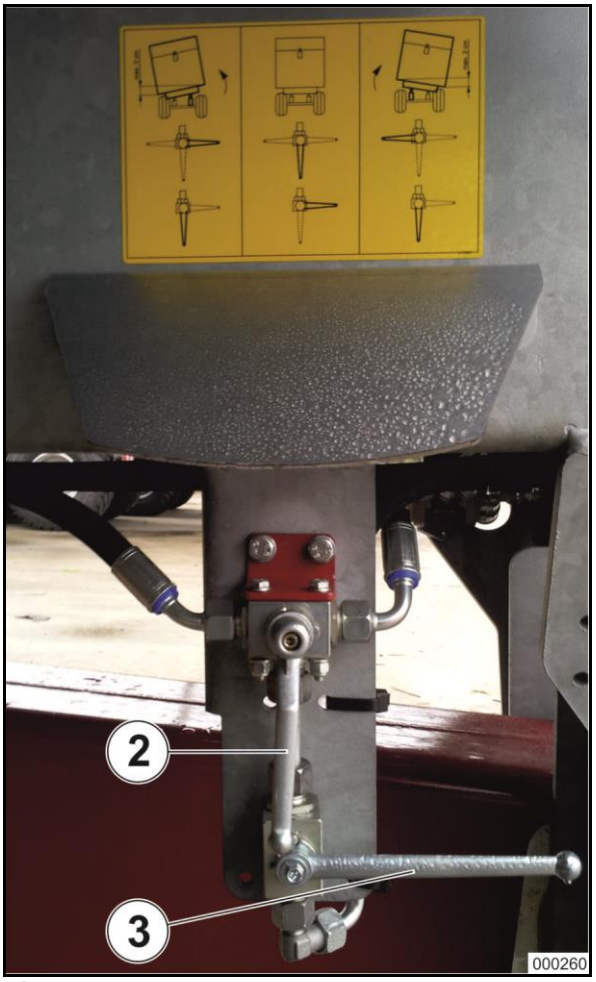


Fig. 159

With easy-to-use block (optional extra):

1. Press the stop button (3 or 4) to unlock the stop-cock (5 or 6).
2. Turn the stop-cock carefully to position "AB – down" as far as it will go.
3. Hold the operating element at the tractor's control device for the travelling height adjustment in "Lift" position until the pressure gauges (1, 2) indicate "0 bar".

→ The dash pots of the chassis are completely lowered.

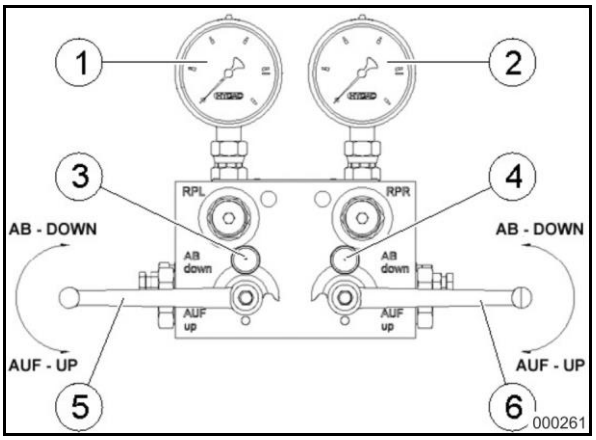


Fig. 160

6. Drain the condensate from the oil storage tanks (1):
   - Hold a drip tray beneath the oil storage tank.
   - Unscrew the drain plug (4).

   → The condensate flows into the drip tray.
   - Retighten the drain plug at 75 Nm as soon as hydraulic oil pours out.
7. Properly readjust the travelling height.

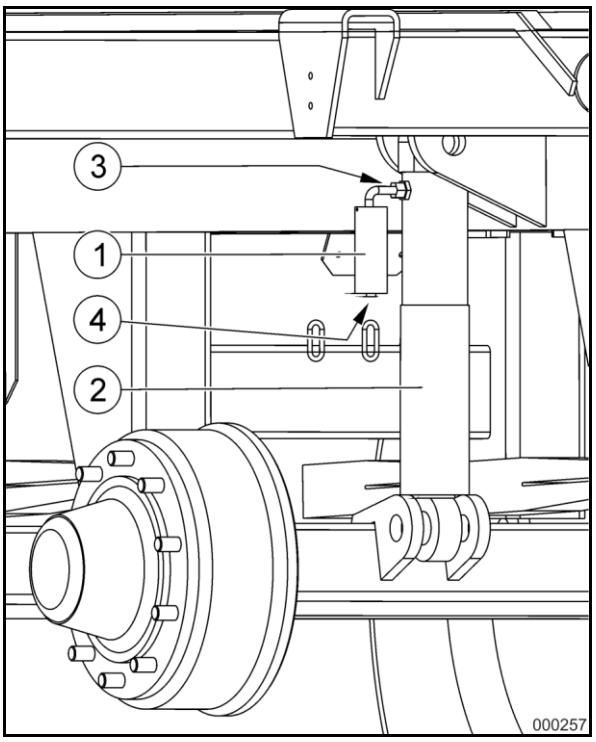


Fig. 161

8.17.4 Check/Top up hydraulic oil of dash pots

Successively carry out the required work for the right-hand and left-hand machine side:

1. Hitch the machine to the tractor.
2. Park the tractor and the empty machine on even ground.
3. Secure tractor and machine against accidental rolling.
4. Connect the hydraulic hose pipe of the levelling valve with a single-acting control device of the tractor.
5. Completely lower the dash pots of the chassis:

With three-way cock:

1. Set the operating element for the levelling valve at the tractor's control device to floating position, such that the hydraulic oil can flow back into the hydraulic oil tank of the tractor.
2. Use the upper stop-cock (2) to preselect the vehicle side to be lowered. In middle position, the line is blocked.
3. Slowly turn the lower stop-cock (3) to vertical position.

→ The preselected vehicle side lowers.

4. Turn the lower stop-cock (3) back to horizontal position.
5. Repeat steps 2 to 4 for the other vehicle side.

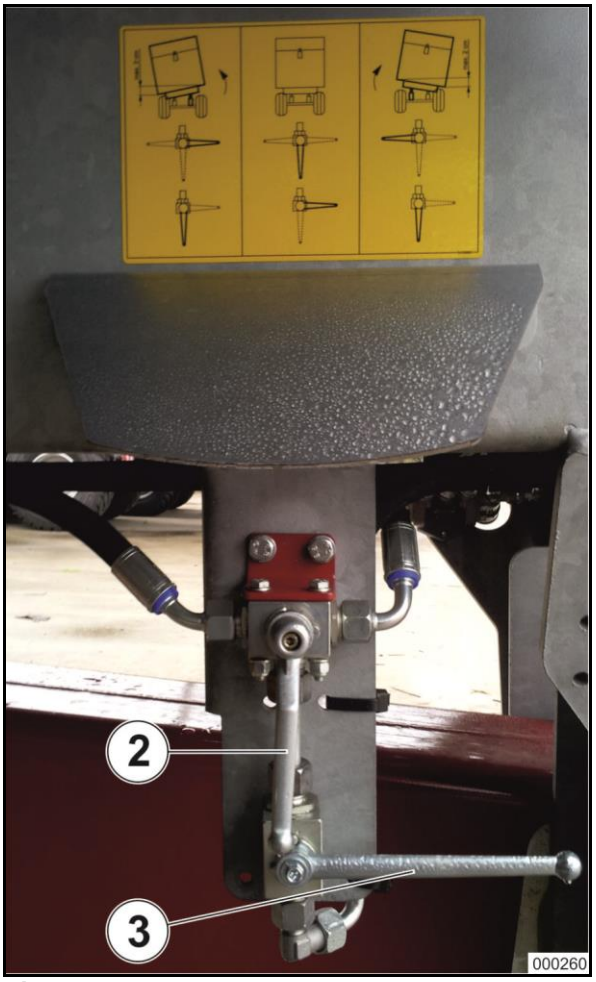


Fig. 162

With easy-to-use block (optional extra):

1. Press the stop button (3 or 4) to unlock the stop valve (5 or 6).
2. Turn the stop valve carefully to position "AB – down" as far as it will go.
3. Hold the operating element at the tractor's control device for the travelling height adjustment in "Lift" position until the pressure gauges (1, 2) indicate "0 bar".

→ The dash pots of the chassis are completely lowered.

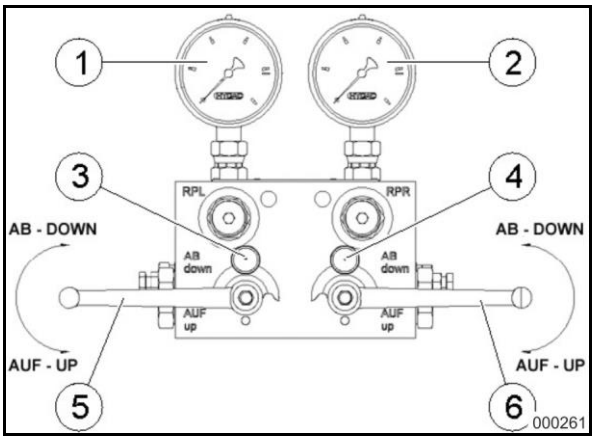


Fig. 163

4. Check the oil level in the oil storage tanks (1):
   - Loosen the screwed connection (3).
   - Swivel the oil storage tank up.
   - Retighten the screwed connection.
   - Remove the drain plug (4).
   - Take a clean object to be used as a dipstick.
   - Insert this clean object into the filler neck to determine the oil level.
   - Top the oil storage tank up halfway with hydraulic oil if necessary.
   - Screw the drain plug in again and tighten it at 75 Nm.
   - Loosen the screwed connection (3).
   - Swivel the oil storage tank down.
   - Retighten the screwed connection.
7. Properly readjust the travelling height.

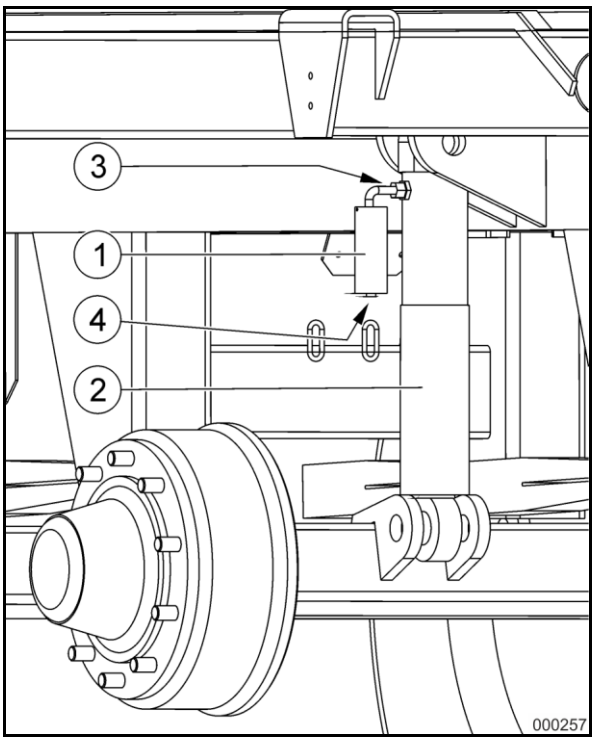


Fig. 164

8.17.5 Adjust travelling height via three-way cock

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

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

- The travelling height is adjusted on firm, even ground via the levelling valve with the machine being empty.
- The travelling heights of the right-hand and left-hand machine side are separately set. The procedure for setting the travelling height is the same on both machine sides.
- For safety reasons, the machine lowers only slowly.

Set the correct distance X between the locating points of the hydraulic cylinders (7) one after another on the right-hand and left-hand machine side.

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

Ensure that the brakes of the machine are not applied.

4. Connect the hydraulic hose pipes of the levelling valve with a single-acting control device of the tractor.

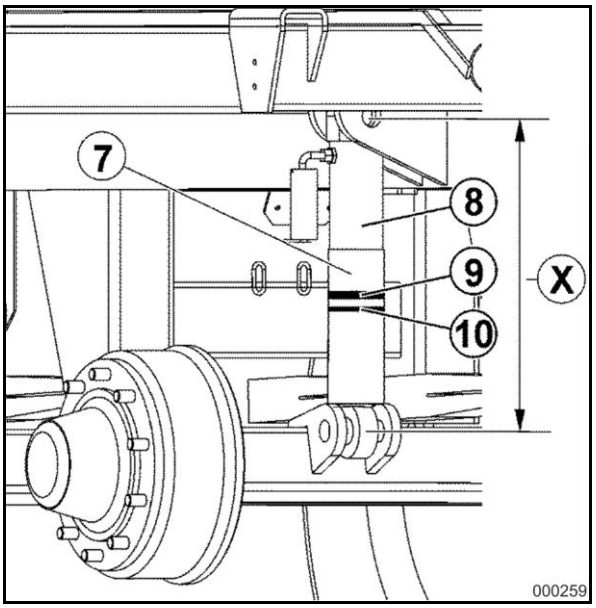


Fig. 165

5. Use the upper stop-cock (2) to preselect the vehicle side to be pressurised. In middle position, the line is blocked.
6. Turn the lower stop-cock (3) slowly to vertical position to increase the distance X.

A second person is helpful for monitoring the setting of the travelling height next to the vehicle and assisting the operator on the tractor with the setting of the hydraulic cylinders.

7. Hold the operating element at the tractor's control device in "Lift" position
   - until the distance X = 600±10 mm or
   - until the lower edge of the protective tube (8) is within the upper, wide marking (9).

     The lower, narrow marking (10) should be reached with the machine being fully charged.
8. Set the operating element for the levelling valve at the tractor's control device to floating position.
9. Turn the lower stop-cock (3) back to horizontal position.
10. Repeat steps 5 to 9 for the other vehicle side.

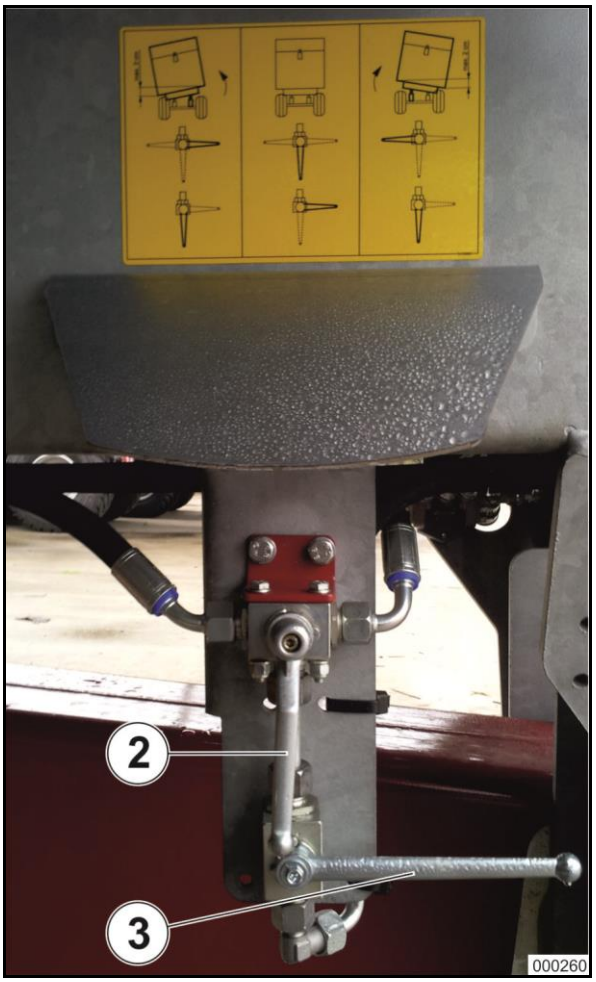


Fig. 166

8.17.6 Adjust travelling height via easy-to-use block

Optional extra

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

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

- The travelling height is adjusted on firm, even ground via the levelling valve with the machine being empty.
- The travelling heights of the right-hand and left-hand machine side are separately set. The procedure for setting the travelling height is the same on both machine sides.
- For safety reasons, the machine lowers only slowly.

Set the correct distance X between the locating points of the hydraulic cylinders (7) one after another on the right-hand and left-hand machine side.

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

> Ensure that the brakes of the machine are not applied.

4. Connect the hydraulic hose pipes of the levelling valve with a single-acting control device of the tractor:

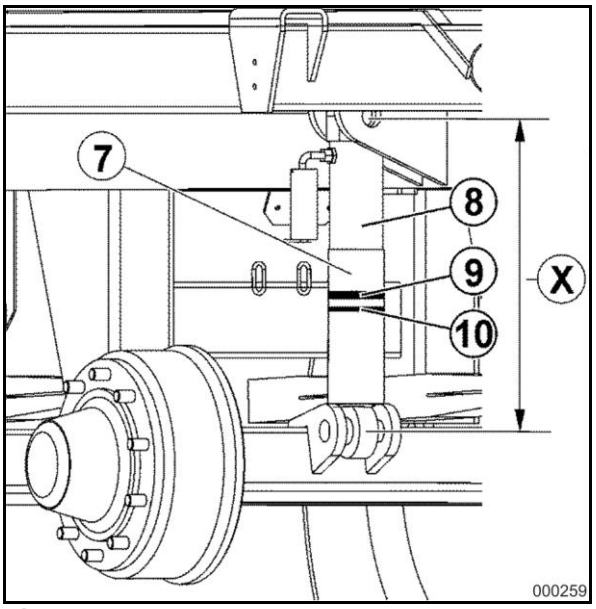


Fig. 167

- Connect the pressure line of the levelling valve with a single-acting control device of the tractor.
- Connect the return line of the machine to the return line of the tractor.

The travelling height is set:

- for the right-hand machine side by means of the operating elements (1, 3, 5),
- for the left-hand machine side by means of the operating elements (2, 4, 6).

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

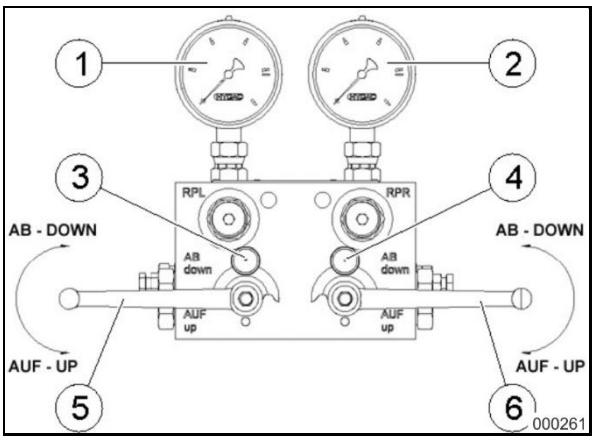


Fig. 168

5. Turn the stop-cock (5 or 6) to position "UP" (increase distance X) or "DOWN" (reduce distance X):
   - Press the stop button (3 or 4) to unlock the stop-cock.
   - Turn the stop-cock carefully as far as it will go.
6. Hold the operating element at the tractor's control device in "Lift" position
   - until the distance X = 600±10 mm or
   - until the lower edge of the protective tube (8) is within the upper, wide marking (9).
   - The lower, narrow marking (10) should be reached with the machine being fully charged.

8.17.7 Adjust travelling height (tridem chassis)

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

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

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

Ensure that the brakes of the machine are not applied.

4. Connect the hydraulic hose pipe of the chassis with a single-acting control device of the tractor.
5. Lower the lift axle.
6. Hold the operating element for the travelling height adjustment at the tractor's control device in "Lift" position until the levelling valves (1) have lifted or lowered the chassis to the correct travelling height.
7. Set the operating element at the tractor's control device to floating position for approx. 10 seconds to ensure that the piloted check valves of the levelling valves can close.

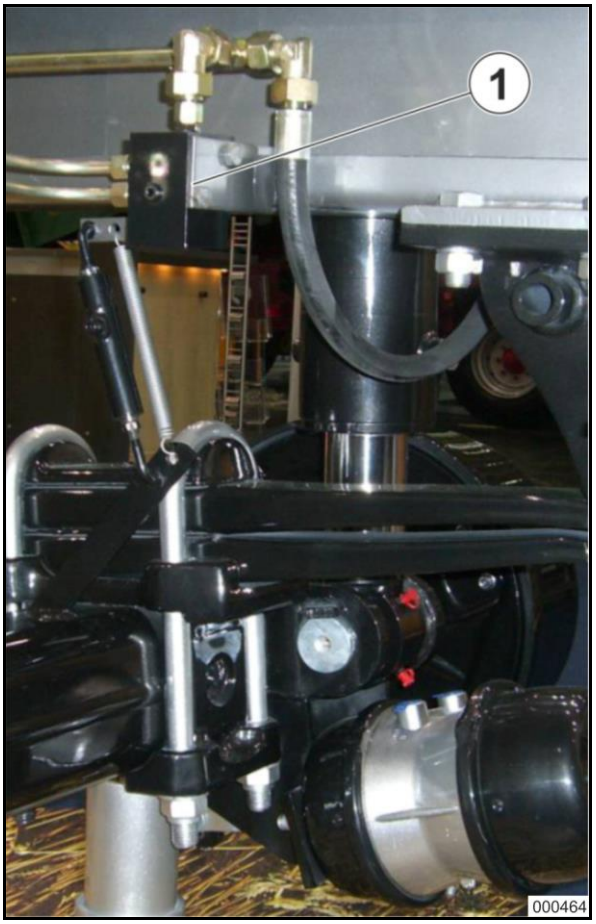


Fig. 169

9 Remedy of malfunctions

WARNING 	**Before starting work with and on the machine, read and observe the basic safety instructions!**

9.1 Eliminate clogging at the pick-up and the feeder rotor

- The clogging/blockages must be manually eliminated if they cannot be eliminated from the tractor seat.
- Extend the cutting unit only with the feeder rotor running.

9.1.1 Elimination from the tractor seat

1. Retract the cutting unit from the conveyor duct.
2. Carefully couple the p.t.o. shaft at low tractor engine speed.

→ The feeder rotor transports the loaded material together with any foreign objects into the cargo space without resistance from the cutting unit.

3. Extend the cutting unit back into the conveyor duct when the clogging/blockages have been eliminated.

9.1.2 Elimination not from the tractor seat

WARNING 	**Risk to the operator of being drawn in or becoming entangled if the pick-up accidentally starts to run during manual elimination of clogging/blockages!** Secure tractor and machine against accidental starting and rolling before manually eliminating clogging/blockages.

1. Switch the p.t.o. shaft off.
2. Secure tractor and machine against accidental starting and rolling.
3. Eliminate the clogging/blockages.

9.2 List of malfunctions, hydraulic system

Malfunction	Cause	Remedy
No hydraulic function available	Interrupted hydraulic oil circulation	Switch hydraulic oil circulation between tractor and machine on
		Check hydraulic plugs for wear
	Hydraulic hose pipes not correctly connected (return line to pressure connection)	Connect hydraulic hose pipes correctly
	Hydraulic plugs not correctly locked in the hydraulic sleeves	Insert hydraulic plugs into the hydraulic sleeves until hydraulic plugs noticeably lock
	System screw at hydraulic control block not properly set	Check setting and readjust if necessary
Transport floor feed does not start	Machine overload	Partly discharge machine manually
	Transport floor blocked by foreign objects	Eliminate foreign objects
Transport floor feed only works temporarily	Jamming control piston of transport floor valve	Clean control piston and check for smoothness during installation
Tailgate does not open	Closed stop-cock	Open stop-cock
Control block leaking	Defective O-rings	Replace O-rings
	Loose tie rod	Tighten tie rod at 22 Nm
	Leaking screwed plugs	Seal screwed plugs by means of liquid threadlocker or sealing tape.
In the flow line, the pressure rises to 180 bar, although no valve is being actuated (open system)	Screwed-in load-sensing screw for locking of pressure regulator	Unscrew load-sensing screw
Hydraulic system excessively heating up	Volume flow from tractor too large	Adjust volume flow to tractor valve
	Hydraulic plugs too small	Provide appropriately large hydraulic plugs
	Worn hydraulic plugs	Replace hydraulic plugs
Too little hydraulic power in load-sensing mode	Hydraulic plugs too small	Provide appropriately large hydraulic plugs
	Load-sensing control pressure too low	Possibly use pressure intensifier; consult the manufacturer

9.3 List of malfunctions, electrical system

Malfunction	Cause	Remedy
No function working	No power at the control set	Provide a voltage of 12 V at the tractor
	Defective fuse	Replace fuse
	Loose contact in socket	Remedy loose contact
	Operating element On/Off not switched	Set operating element to On
Functions work irregularly	Cable cross section of feed line too small	Select larger cable cross section
Fuse at tractor often defective	Fuse protection too weak	Install a fuse of at least 25 A, check cable cross sections (rated cable cross section = min. 4 mm^2)
	Damaged cable	Replace cable
Feed function cannot be controlled	No power, 12 V at the control set	Provide a voltage of 12 V at the tractor
	Cable cross section of feed line too small	Select larger cable cross section
	Defective control set	Have control set checked
	Defective solenoid of a hydraulic valve	Replace solenoid
Feed function can only temporarily be controlled	Loose contact at solenoid	Remedy loose contact
	Cable cross section of feed line too small	Select larger cable cross section
Feed function does not work	Defective solenoid of feed	Replace solenoid
2 or more functions work simultaneously	Damaged cable	Replace cable
	Several simultaneously energised solenoids	Check cable
	Emergency manual operation function actuated	Check whether knurled screws of control block are unscrewed, unscrew if necessary
Function does not work although a voltage of 12 V is available at the solenoid	Defective solenoid	Replace solenoid
Display of control set does not work	No 12 V voltage	Provide a voltage of 12 V at the control set
	Defective fuse at the tractor	Replace fuse
The display of a function does not show a status message on the control set	Defective wiring (short-circuit)	Check wires, replace them if necessary
	Sensor not properly set	Adjust sensor
	Defective sensor	Replace sensor

The displays of all functions do not show a status message on the control set	Defective wiring (short-circuit)	Check wires, replace them if necessary
	Sensors not properly set	Adjust sensors
	Defective sensor/s	Replace sensor/s
Automatic charging system switches too late	Range not set	Recalibrate automatic charging system
	Interrupted hydraulic oil circulation	Switch hydraulic oil circulation between tractor and machine on
System does not work	Malfunction in the system	Restart system
Discharge mode A I does not switch	Steering axle not completely locked due to blocked wheels	Move machine slightly forward

9.3.1 Meaning of error messages with ISOBUS control

BM	Basic module
EM	Extension module
Power	Power supply, e.g. of the solenoid valves
Sen. 12V	Power supply of sensors

9.4 List of malfunctions, working

Malfunction	Cause	Remedy
Blockages in the taking-in area	Unequal or too large swathes	Pick up smaller, more equal swathes
	Excessive travelling speed	Reduce travelling speed
	Too little flow in the taking-in area	Keep to hitching height
Response of overload clutch during charging	Excessive travelling speed	Reduce travelling speed
	Blunt cutting knives	Sharpen/Replace cutting knives
	Loaded material too heavily compressed	Switch transport floor feed function on in good time
Bad cutting quality	Blunt cutting knives	Sharpen/Replace cutting knives
	Cutting unit extended not far enough	Clean and completely extend cutting unit
	Swathe size too small	Increase swathe or travelling speed
	Cutting knives evade too early	Check springs of knife protection system, replace if necessary

Cutting knives break frequently	Defective knife protection system	Check knife protection system
	Roller stuck in lever, lever does not retract	Lubricate roller (must turn easily) or replace lever
	Cutting unit extended not far enough	Clean and completely extend cutting unit
Cutting unit cannot be extended	Cutting unit soiled between cutting knives and conveying trough	Clean cutting unit
	Conveyor duct clogged	Clean conveyor duct
	Cutting knives bent	Align or replace cutting knives
Slip clutch of pick-up responds frequently	Pick-up set too low	Readjust setting
	Pick-up heavily soiled in its interior	Clean pick-up
Folding drawbar does not move up	Machine overload	Adapt charging degree
	Hydraulic pressure at tractor too low	Set hydraulic pressure at tractor to a minimum value of 180 bar
Pick-up, folding drawbar and tailgate sink during work	Hydraulic cylinder leaking	Seal hydraulic cylinder
Cutting unit slowly retracting during work	Piston in hydraulic cylinder leaking	Seal piston
	Hydraulic cylinder leaking	Seal hydraulic cylinder
	Hydraulic oil pressure too low	Actuate key longer
Machine wobbles heavily during road travel	Tyre pressure too low	Adjust tyre pressure according to table
	Machine overload	Adapt charging degree

On the hydraulic chassis, one machine side significantly lowers	Machine overload, hydraulic oil escaping via pressure limiting valve	Adapt charging degree
	Plug screw at level block not tightened	Tighten plug screw
	Unequal load of axle one and two	Possibly adjust travelling height
Transport floor often switches off during discharge	"Forage wagon full" sensor or tension spring of beater switch-off device not set properly	Adjust settings
Rotor conveys the material forward in the integral range	Strippers worn or defective.	Check strippers, replace them if necessary.

9.5 Emergency manual operation in case of failure of electrical system

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

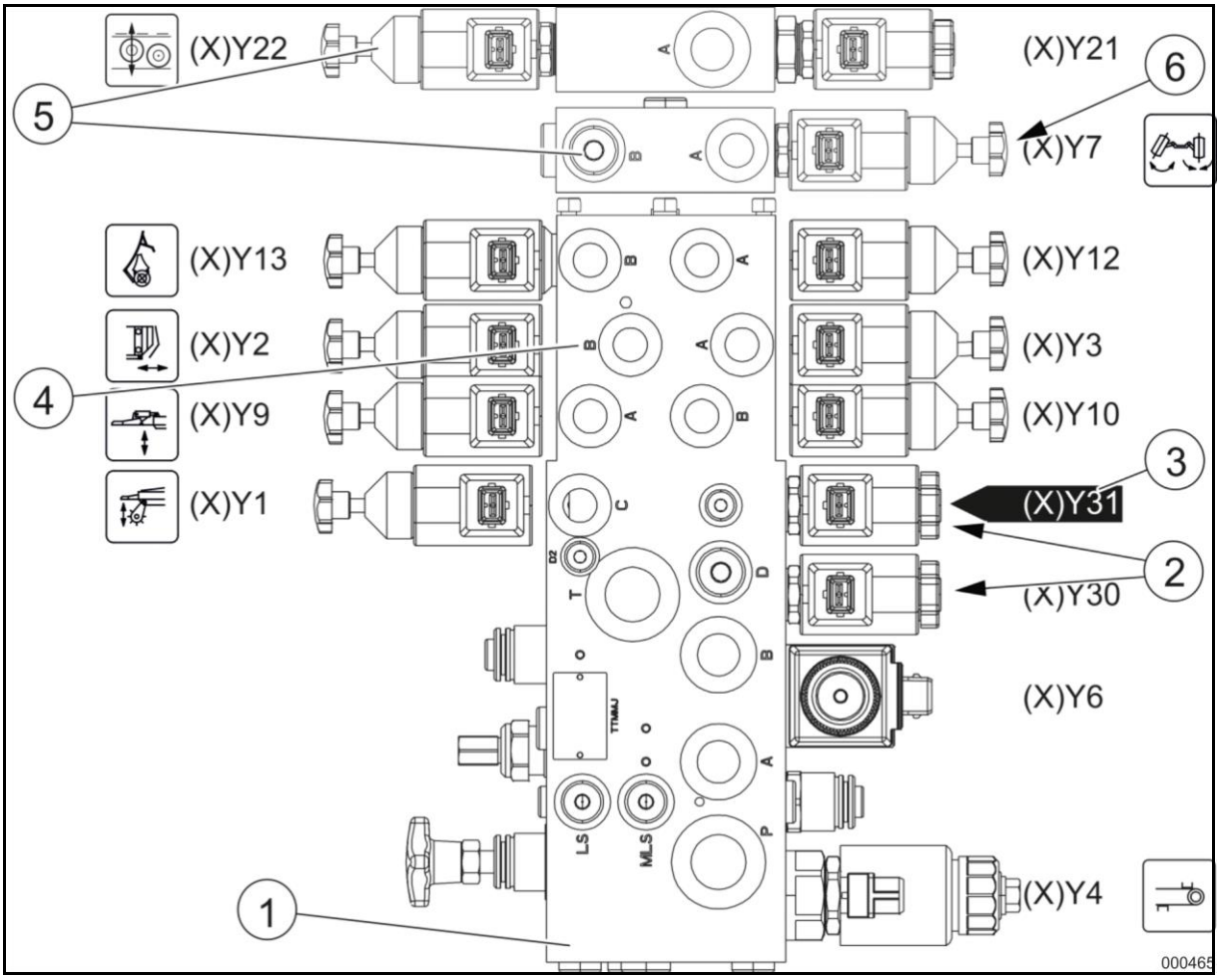


Fig. 170

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

- Pre-selection valves (2):

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

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

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

9.5.1 Functional diagram for emergency manual operation

Solenoid valves \ Functions		Retract (out)	Extend (in)	Lift	Lower	Lift	Lower	Lift	Lower	Forward	Reverse	Enabled	Disabled	Lift	Lower	ccw rotation *	cw rotation *	Closed*	Open*
(X)Y12		●	●																
(X)Y13		●	●																
(X)Y1				●	●														
(X)Y2						●	●												
(X)Y3						●	●												
(X)Y9								●	●										
(X)Y10								●	●										
(X)Y4										●									
(X)Y6											●								
(X)Y7												●							
(X)Y7													●						
(X)Y22														●					
(X)Y21															●				
(X)Y15*																●			
(X)Y14*																	●		
(X)Y16*																		●	●
(X)Y17*																		●	●
(X)Y30			●				●		●					●				●	
(X)Y31		●		●		●		●					●						●

* Optional extra

9.6 Emergency manual operation of electro-hydraulic forced steering axle system SES

In case of a malfunction, the forced steering axle system automatically switches over to passive steering, thus making focused reversing impossible.

Lock the steering axle(s) by means of the emergency manual operation function, in order to be nevertheless able to move the vehicle backwards (over short distances!). The wheels should be in a straight line then.

Emergency manual operation is actuated at the electro-hydraulic control block (1).

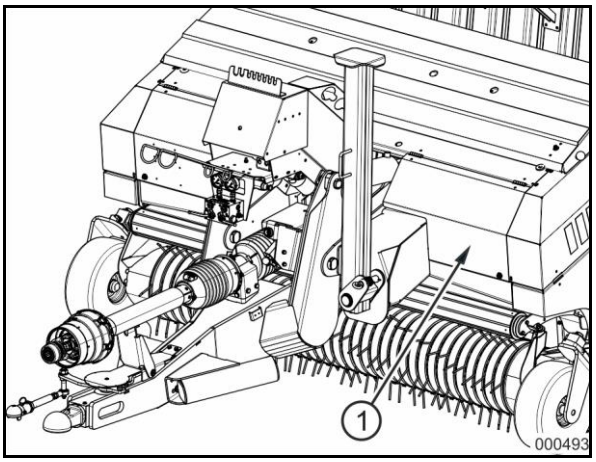


Fig. 171

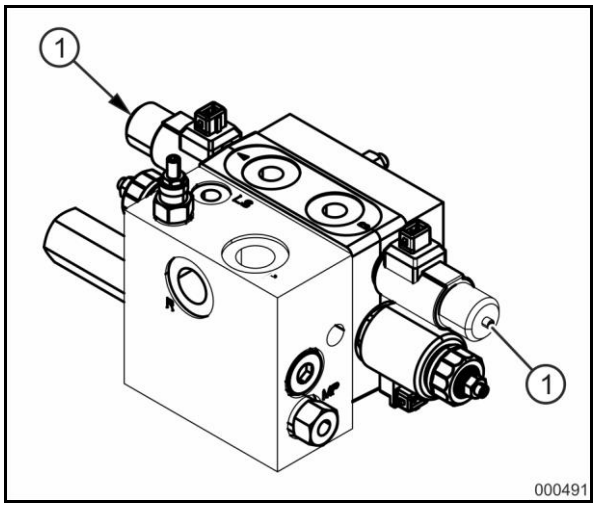


Fig. 172 Control block with tandem chassis

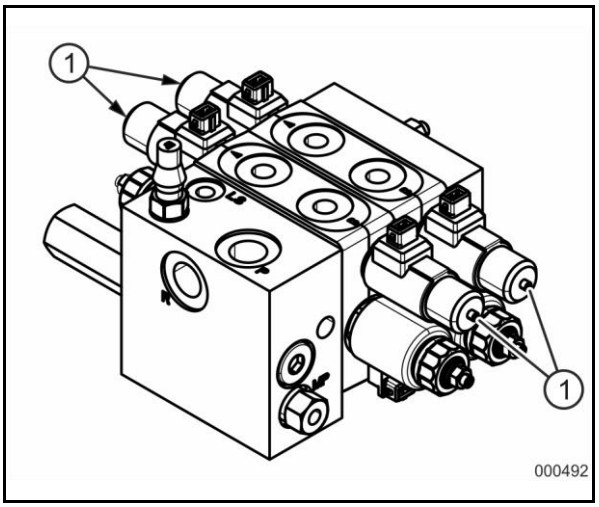


Fig. 173 Control block with tridem chassis

Lock steering axle(s)

1. Secure tractor and machine against accidental starting and rolling.
2. Use a hexagon key SW 3 to screw in the grub screws(1) Fig. 172 / Fig. 173.

   Screw in the grub screws only finger-tight (max. 2 Nm)! Otherwise, the valves may interlock and the emergency manual operation function can no longer be released.

   → Steering axle/s locked.

Only lock steering axles via the emergency manual operation function in case of a malfunction, e.g. for short reverse travel!

Unlock the steering axle(s) again as soon as the malfunction has been remedied!

Long drives with 2 locked steering axles cause increased wear on tyres and chassis, in particular on the tridem chassis.

Unlock steering axle(s)

1. Secure tractor and machine against accidental starting and rolling.
2. Unscrew the grub screws (1) Fig. 172 / Fig. 173 again.
   → Steering axle/s unlocked.

10 Disassembly / Disposal

WARNING 	**Risk due to overturning or falling machine parts and operating media harmful to environment and health!** Only qualified staff is allowed to disassemble the machine. Machine parts and operating media (oils, greases etc.) must be disposed of in accordance with national and international environmental regulations.

- Dispose of used oil according to regulations. Contact your oil supplier in case of problems with the disposal of used oil!
- Do not keep used oil within reach of children!
- Beware that no used oil penetrates the soil or water!

11 Circuit diagrams

11.1 Hydraulic circuit diagram

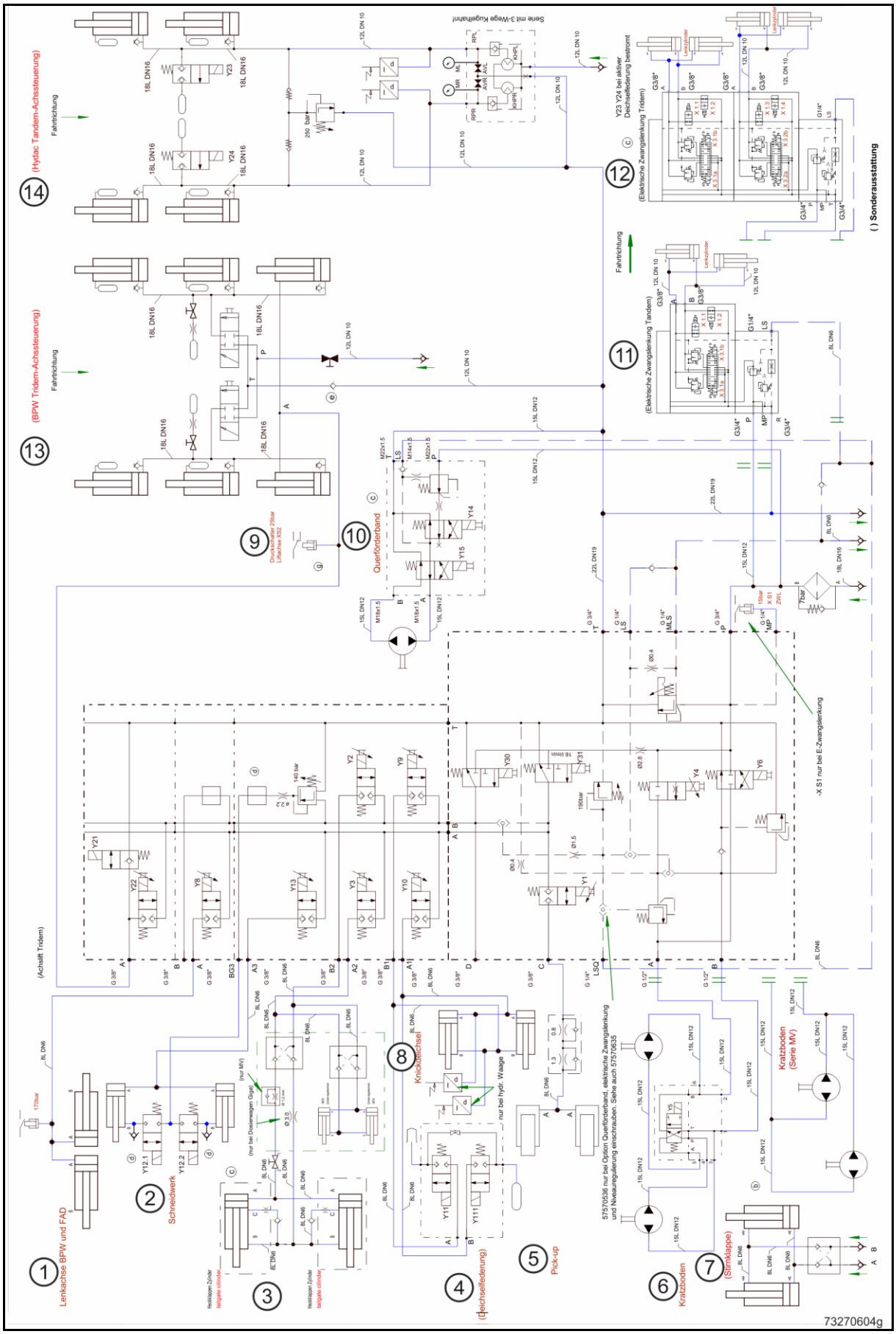

(Hydac Tandem-Achssteuerung)
(BPW Tridem-Achssteuerung)
Fahrtrichtung
Serie mit 3-Wege Kugelhahn
Querförderband
Knickdrehkranz
Kratzboden (Serie MV)
Kratzboden
(Stirnklappe)
Pick-up
Lenkachse BPW und FAD
Schneidwerk
(Achslift Tridem)
(Elektrische Zwangslenkung Tandem)
(Elektrische Zwangslenkung Tridem)
( ) Sonderausstattung
73270604g

Fig. 174

(1) BPW and FAD steering axle

(2) Cutting unit

(3) Tailgate

(4) Drawbar suspension (optional extra)

(5) Pick-up

(6) Transport floor

(7) Front panel (optional extra)

(8) Folding drawbar

(9) Pressure switch, lift axle

(10) Crossover conveyor

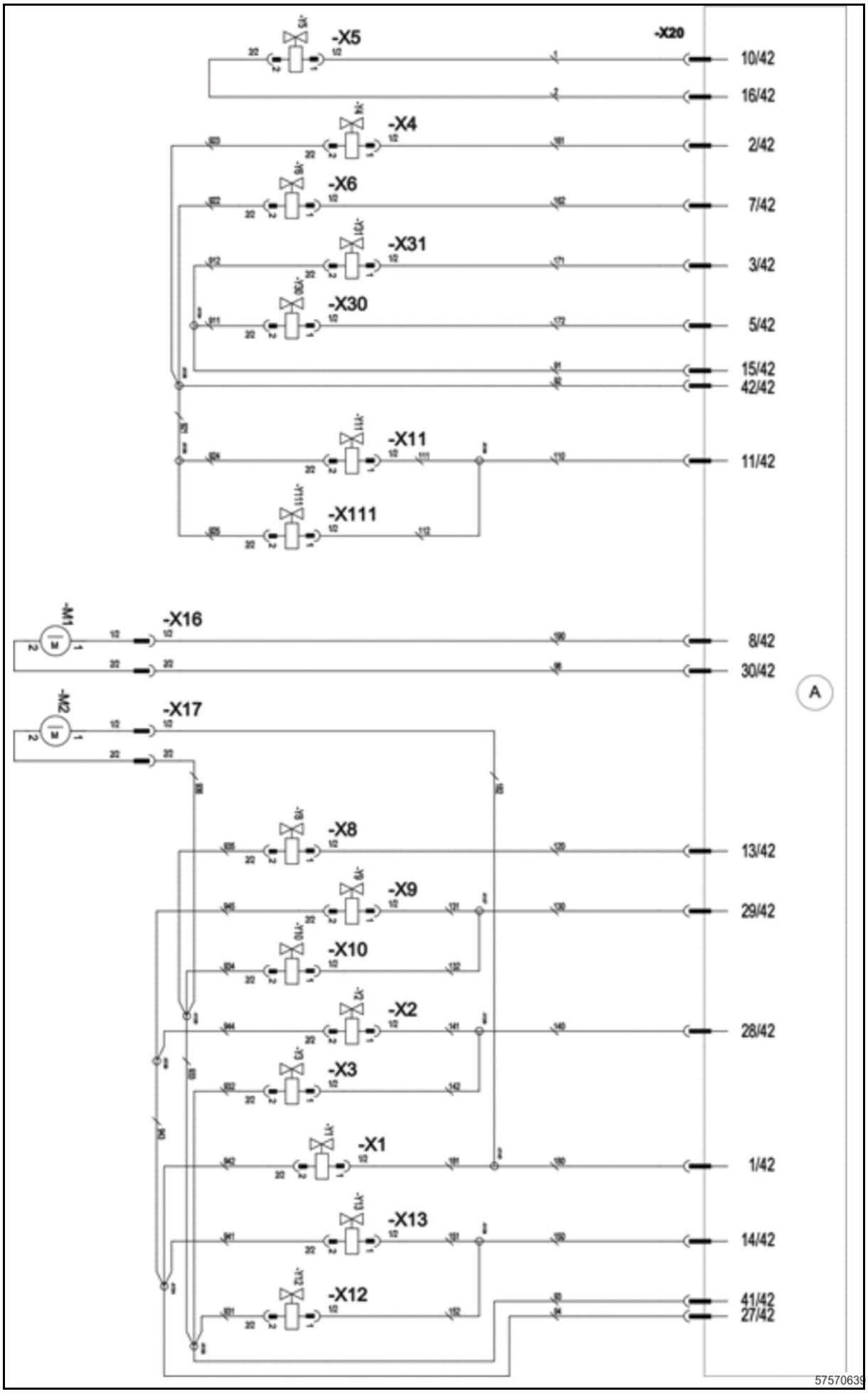
(11) Electrical forced steering axle, tandem

(12) Electrical forced steering axle, tridem

(13) BPW tridem axle control (optional extra)

(14) Hydac tandem axle control (optional extra)

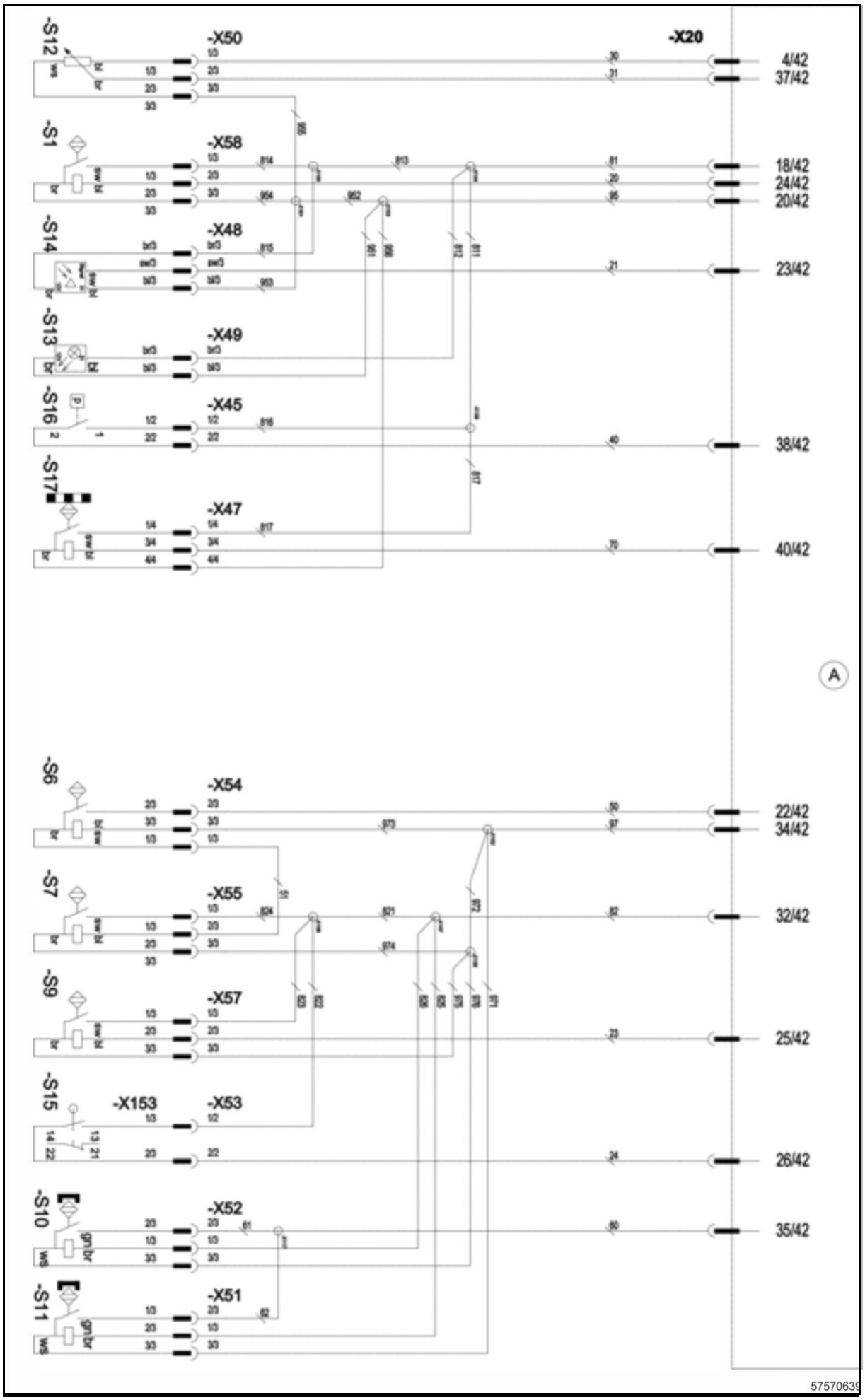
11.2 Electronic circuit diagram – ISOBUS control - Valves


-X5
-X20
10/42
16/42
-X4
2/42
-X6
7/42
-X31
3/42
-X30
5/42
15/42
42/42
-X11
11/42
-X111
-M1
-X16
8/42
30/42
A
-M2
-X17
-X8
13/42
-X9
29/42
-X10
-X2
28/42
-X3
-X1
1/42
-X13
14/42
-X12
41/42
27/42
57570639

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

1/42	Pick-up
2/42	Transport floor forward
3/42	Pre-selection valve Y31
5/42	Pre-selection valve Y30
7/42	Reverse transport floor
8/42	Silage additive pump
10/42	Transport floor level II
11/42	Drawbar suspension
13/42	Lock steering axle
14/42	Schneidmesser
15/42	Ground, valves 1
16/42	Ground, transport floor level II
27/42	Ground, valves 4
28/42	Tailgate
29/42	Folding drawbar
30/42	Ground, silage additive pump
41/42	Ground, valves 3
42/42	Ground, valves 2

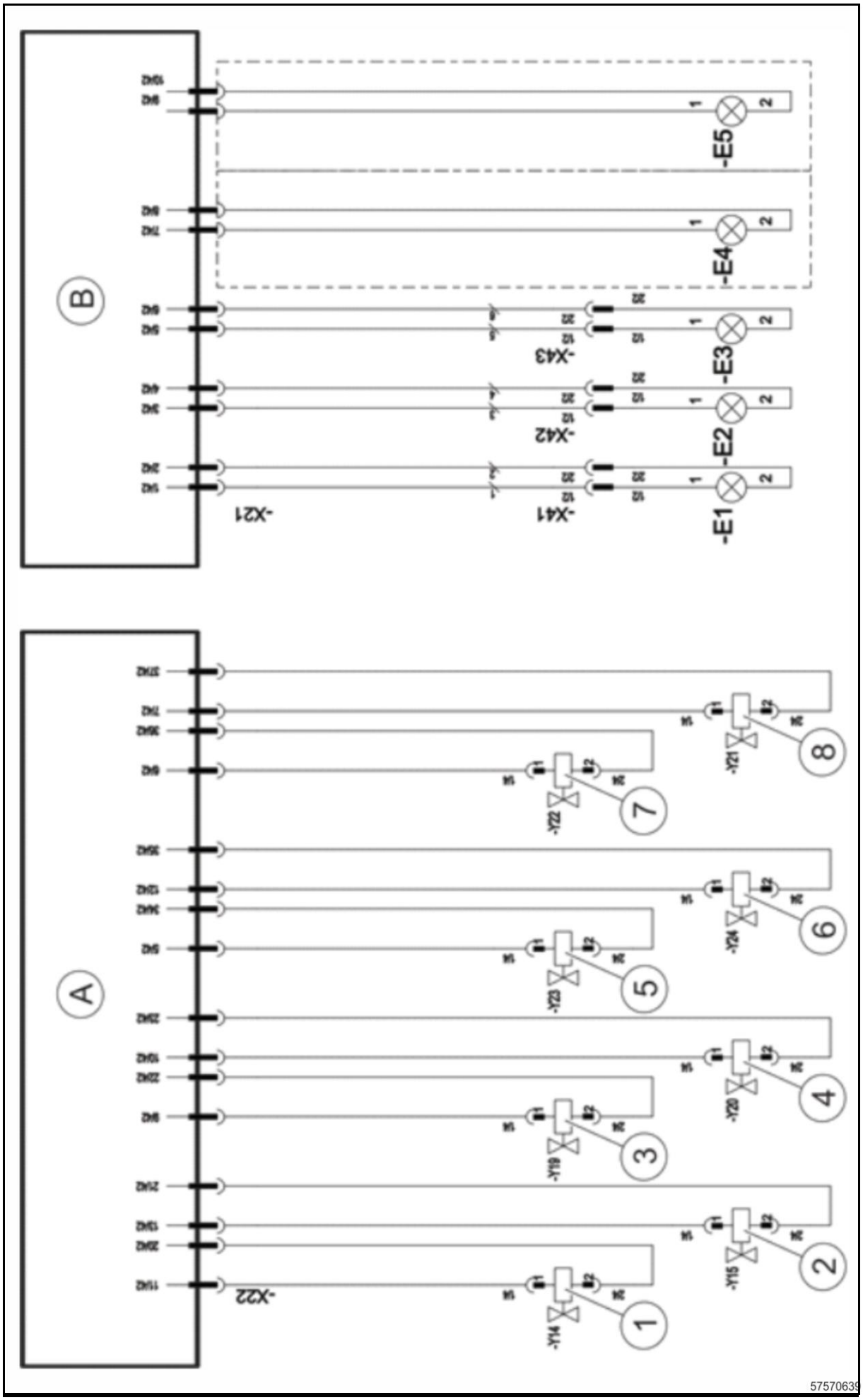
11.3 Electronic circuit diagram – ISOBUcontrol - Sensors


-S12
-X50
-X20
4/42
37/42
-S1
-X58
18/42
24/42
20/42
-S14
-X48
23/42
-S13
-X49
-S16
-X45
38/42
-S17
-X47
40/42
A
-S6
-X54
22/42
34/42
-S7
-X55
32/42
-S9
-X57
25/42
-S15
-X153
-X53
26/42
-S10
-X52
35/42
-S11
-X51
57570639

(A) Control unit
4/42 Supply, potentiometer, automatic charging system
18/42 12 V sensors 1
20/42 Ground, sensors 1
22/42 Signal "Tailgate lowered"
23/42 Signal, light barrier
24/42 Signal, cutting unit
25/42 Signal "Tailgate completely lifted"
26/42 Signal "Forage wagon full"
32/42 12 V sensors 2
34/42 Ground, sensors 2
35/42 Signal, beater speed
37/42 Signal, automatic charging system
38/42 Signal "Axle locked"
40/42 Signal "Axle unlocked" or in case of SES: Error in forced steering axle system

S01 Cutting unit
S06 Tailgate lowered, right-hand
S07 Tailgate lowered, left-hand
S09 Tailgate completely lifted
S10 Speed, beaters, left-hand
S11 Speed, beaters, right-hand
S12 Potentiometer, automatic charging system
S13 Knife protection system (transmitter)
S14 Knife protection system (receiver)
S15 Machine is full
S16 Pressure switch
S17 Axle unlocked

11.4 Electronic circuit diagram – ISOBUS control - Control unit


B
A
-X21
-X41
-X42
-X43
-E1
-E2
-E3
-E4
-E5
-X22
-Y14
-Y15
-Y19
-Y20
-Y23
-Y24
-Y22
-Y21
1
2
3
4
5
6
7
8
57570639

(A) Extension module, ISOBUS control

(B) LIN module, ISOBUS control

(1) Crossover conveyor, cw rotation

(2) Crossover conveyor, ccw rotation

(3) Front panel 1 (optional extra)

(4) Front panel 2 (optional extra)

(5) Axle suspension 1 (optional extra)

(6) Axle suspension 2 (optional extra)

(7) Lift axle (optional extra)

(8) Lower axle (optional extra)

E1 Work light, front panel

E2 Work light, rear, left-hand

E3 Work light, rear, right-hand

E4 Work lights (optional extra)

E5 Warning beacon (optional extra)

11.5 Connection, lighting

(1) Brake light: pink

(2) Rear light, left-hand: yellow

(3) Rear light, right-hand: yellow

(4) License plate: yellow

(5) Indicator, left-hand: blue

(6) Ground: black

(7) Indicator, right-hand: brown

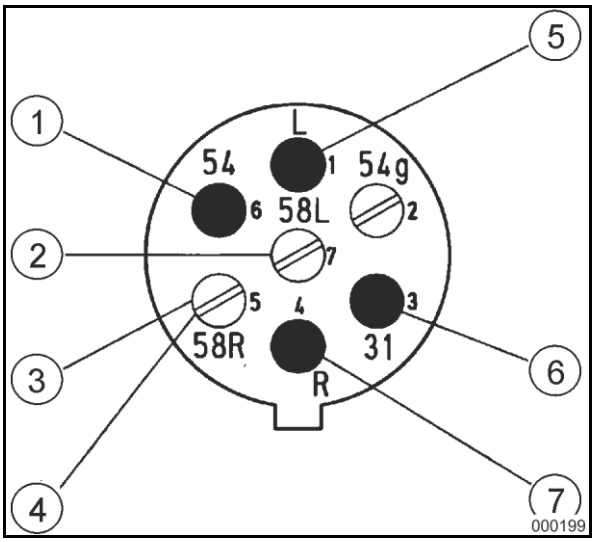


Fig. 175

Index

A

Access door 38, 234
Access to steering computer 207
Adjust length of propeller shaft to tractor 104
Adjust mounting height of folding drawbar . 105
Adjust travelling height..... 290, 291
ALB regulator, hydraulic 25
ALB regulator, mechanical..... 23
Angular gear of CFS unit 240
Angular gear of dosing unit..... 240
Automatic charging system..... 39, 142
Axle suspension..... 139
Axles 75

B

Ball-type coupling and shell..... 112, 122
Basic safety instructions 64
Beaters..... 43, 268
  Set sensor 263, 264
Bleed friction clutch of pick-up..... 242
Bottom linkage
  Folding drawbar 21
Brake pressure regulator
  ALB regulator, hydraulic..... 25
Brake regulator
  ALB regulator, mechanical..... 23
Brake system 22, 55, 75, 101, 274
  Braking axle 28
  Check and adjust standard slack adjuster 281
  Dual-line compressed-air brake system.... 23
  Hydraulic service brake system 27
Bulk densities of different loaded materials 217

C

Calibrate
  Automatic charging system (ISOBUS control)..... 159
Calibration..... 159
Cam-type cut-out clutch..... 244
Change gear lubricant oil..... 241
Charge
  Machines equipped with beaters 219, 220
  Machines without beaters 218, 219
Charge machine 215
Charge with ISOBUS control
  Field Operator 120 218
  Field Operator 130 219
Chassis 19
  Hydraulic chassis..... 283
Check / Top up gear lubricant oil 238
Check automatic slack adjuster 282
Check brake..... 281
Check brake linings..... 280
Check clearance of wheel hub bearing..... 280
Check/Retighten roller chain tension 268
Check/Top up hydraulic oil of dash pots 288
Check/Top up oil level..... 240
Circuit diagrams 304
Clean cutting unit 249
Cleaning by means of pressure washer / steam blaster 235
Cleaning work 235
Cleaning, service, maintenance and trouble-shooting 77
Combination options of coupling devices and drawgears..... 96
Commissioning..... 92
Compressed-air brake system..... 75
  Drain compressed-air reservoir 275
Connect brake system 115
Connect dual-line service brake system 116
Connect hydraulic brake system..... 116
Connect hydraulic hose pipes..... 114
Control
  Set parameters..... 155
Control block 34
Control devices 55
Correct use..... 56
Counter
  ISOBUS control 161
  Operating hours counter..... 161
  Service hours counter 161
  Transported loads counter 161
Couple..... 111
Couple and uncouple
  Combination options of coupling devices and drawgears 96
Couple drawgear..... 111
Couple forced steering axle 118
Couple propeller shaft..... 118

Coupling devices and draw gears
Combination options 96
Coupling devices and drawgears
Admissible towing capacity 98
DC value 97
Cover conveyor duct 132
Cutting knives
Grind 258
Remove and install 254
Set distance 258
Cutting unit 37, 248
Check strippers 260
External operation 248
Grind cutting knives 258
Remove and install cutting knives 254
Set sensors 262

D

DC value 97
Deactivate automatic charging system 41
without beaters 41
Delivery rate 53
Depressurise hydraulic system 271
Detection of travel direction 28
Discharge
with beaters 222, 226
without beaters 221, 225
Discharge machine 220
Discharge mode 140
Discharge mode A II 141
Discharge with ISOBUS control
Field Operator 120 221
Field Operator 130 225
Disconnect brake system 123
Disconnect dual-line service brake system 123
Disconnect hydraulic brake system 123
Disconnect hydraulic hose pipes 122
Displays 166
Drain condensate 286
Draw pin (Piton-Fix) and drawbar lug (hitch ring) 112, 122
Drawbar suspension 22, 139
Drawgear 21

E

Electrical system 53, 72
Electro-hydraulic control block 34
Electronic circuit diagram 308, 312, 316
Eliminate clogging at the pick-up and the feeder rotor 294
Elimination not from the tractor seat 294
Emergency brake valve
Connect 117
Disconnect 124
Emergency manual operation 299, 301
Enter cargo space 234
Error log
Forced steering axle system 212
Error messages
ISOBUS 297
Extend cutting unit 150
External operation for folding drawbar 127

F

Feed gearing of transport floor 238
Feeder rotor 37
Folding drawbar
Adjust mounting height 105
Bottom linkage 21
Forced steering axle system 29
Error log 212
Front panel 39
Front panel with incorporated automatic charging system
Automatic charging system 40
Functional diagram for emergency manual operation 300

G

Gearbox
Quantities when filled and change intervals 238
General data 47
General overview of the machine 18
General safety and accident prevention instructions 66

H

Hazardous area and dangerous spots 59
Hitch and unhitch machine 66
Hitch machine 110
Hitched machines 74
Hydraulic circuit diagram 305
Hydraulic system 30, 53, 71, 270
Control devices 55
Electro-hydraulic control block 34
Hydraulic oil 53
Hydraulic service brake system 27
Load-sensing hydraulic system 35
Marking of hose pipes 36, 271
Marking of supply lines 32

Operating pressure 53
Replace filter 272
Supply lines between tractor and machine 31

I

Inspection criteria for hydraulic hose pipes 272
Install cutting knives 257
Install cutting unit springs 253
Instruction signs 84
ISOBUS control
Calibrate automatic charging system 159
Counter menu 161
Field Operator 120 ..... 134, 163
Functions 137, 167
Reset daily counters 162
ISOBUS control of automatic charging system
Automatic charging system 40

L

Ladder 38
Lift folding drawbar 148
Lift mechanical supporting leg to transport position 103
Lift tailgate 147
Lift/Lower supporting leg 102
Lighting
Cargo space 146
Connection 319
Loading and unloading by means of a crane 90
Loading and unloading by means of a tractor 90
Loading and unloading of machine 89
Loading capacity 217
Load-sensing hydraulic system 35
Load-sensing mode 115
Lock forced steering axle 154
Lock steering axle 151
Lock tailgate 65
Lower folding drawbar 148
Lower mechanical supporting leg to support position 103
Lower tailgate 148
Lubricate
Roller chains of beaters 268
Lubricate automatic slack adjuster 279
Lubricate brake shaft bearing 278
Lubricate knuckle arm bearing 277
Lubricate locking cylinder heads at passive steering axle 277
Lubricate standard slack adjuster 278
Lubrication plan 237
Lubrication work 236

M

Main gearbox 239
Maintenance
Boogie chassis 282
Maintenance of axles 276
Maintenance of hydraulic chassis
Maintenance 283
Malfunctions
Electrical sysstem 296
Hydraulic system 295
ISOBUS 297
Working 297
Manoeuvre unhitched machine by means of a manoeuvring vehicle 126
Marking of hydraulic supply lines 32
Mount control set on the tractor 109
Mount extension sections, ropes and superstructure tarpaulin 127
Mount ISOBUS control set on the tractor ... 109

O

Open hydraulic system 114
Operating hours counter 161
Operating pressure 53
Operation 133
Cutting unit 248
Operation of steering computer 207
Operator's obligation 58
Organisational mesures 57

P

Parking brake 100
Pick-up 36, 107, 242
Check/Retighten tension of roller chain for pick-up 243
Power required 53
Preconditions for the operation of tractors with rigid-drawbar trailers 96
Product description 17
Product safety 59
Propeller shafts 73

Q

Qualification of staff 58

R

Remove cutting knives 255
Required tractor equipment 53
Retract cutting unit 149

Rewind superstructure tarpaulin.....131
Risk – Meaning.....15
Risks due to non-observance of safety instructions.....88
Risks due to residual energy.....77
Risks when handling the machine.....60
Road traffic regulations.....94
Road traffic regulations in Germany.....94
Road travel mode.....137
Rolling of machine
Secure machine.....99
Rotor gear.....239

S

Safety
Secure against starting and rolling.....99
Safety and protective devices.....60
Safety instructions.....56
Secure machine against rolling.....99
Secure tractor against accidental starting.....99
Sensor
Beater circuit.....264
Beaters.....263
Tailgate closed.....263
Tailgate open.....265
Sensors
Cutting unit.....262
Service and maintenance of machine.....229
Service and maintenance plan - Overview..230
Service hours counter.....161
SES system.....152, 153
Set additional guide wheels.....108
Set beater circuit.....246
Set circuit for CFS drum and pick-up.....247
Set cutting length.....109
Set machine parameters
FO120.....155
Set operating height.....107
Silage additive pump.....43
Spare and wearing parts, auxiliary materials 62
Starting, accidental
Secure tractor and machine.....99
Steering.....207
Steering axle.....28
Electro-hydraulic forced steering axle.....29
Passive steering axle.....28, 29
Steering computer
Operating and display elements.....208
Structural alterations.....62
Superstructure tarpaulin with rewinding and securing mechanism.....130
Supply lines of hydraulic system
Marking.....32
Suspension
Tandem/Tridem chassis.....20
Switch drawbar suspension off.....149
Switch drawbar suspension on.....149
Switch silage additive pump on/off.....155

T

Tailgate.....41, 42
Set sensor.....263, 265
Tandem chassis.....102
Tandem/Tridem chassis
hydraulic.....20
Suspension.....20
Technical data.....47
Tighten wheel nuts.....279
Tightening torques of wheel nuts.....280
Tow-hook (hitch hook) and drawbar lug (hitch ring).....111, 121
Tractor
Check compatibility.....95
Required equipment.....53
Traffic-related equipment.....45
Transport floor.....39, 266
Shorten and tighten chains.....266
Transport journeys.....70, 214
Transport journeys with partly discharged machine.....215
Transported loads counter.....161
Tridem chassis.....101
Type plate.....46
Tyre pressure.....50
Tyres.....76

U

Uncouple drawgear.....121
Uncouple propeller shaft.....125
Unhitch machine.....121
Unhook cutting unit springs.....250
Unlock steering axle.....152
Unwind superstructure tarpaulin.....130
Use of machine.....68, 213
User information.....14
User's obligation.....57

W

Warning and instruction signs.....78
Warning beacon.....139

Warning message 137
Warning signs 78
Warranty and liability 63
Work lights 139

Verfasser	Freigeber	Freigabedatum	Sprache
Alena Reddehase	Laura Bäumker	26.03.2018	englisch

Zuordnung	
PG	Short-cut forage wagon / Short-cut forage wagon with beaters
WG	Giga-Vitesse CFS 02
Modell	Giga-Vitesse CFS 3602 - 4402, Giga-Vitesse CFS 3602 DO - 4402 DO