Translation of the Original Operating Manual

Keiler 1

Generation 2
Edition 4

Software version: 21RK12010

Printed in Germany: 06/2021

ROPA

E901407GB

Imprint

All rights reserved

©Copyright by

ROPA Fahrzeug- und Maschinenbau GmbH

Sittelsdorf 24

D-84097 Herrngiersdorf

Phone: + 49 – 87 85 – 96 01 0

Fax: + 49 – 87 85 – 56 6

Internet *www.ropa-maschinenbau.de*

Email: Dennis.Kruse@ropa-maschinenbau.de

This operating manual may only be reprinted or otherwise reproduced – even in excerpts – with the express approval of ROPA GmbH. Any type of reproduction, distribution or storage on data medium in any form and of any type not authorized by ROPA GmbH forms a violation of current domestic and international copyright law and will be judicially prosecuted.

Publisher responsible for content:

ROPA Fahrzeug- und Maschinenbau GmbH

Contents

1 Preface 11

1.1 Name plate and important data 15
1.2 Serial numbers of pickups 17
1.3 Declaration of Conformity 18
1.4 Extended documentation 19
1.4.1 Supplier documentation and purchased parts operating manual 19

2 Safety 21

2.1 General 23
2.2 Obligations of the entrepreneur 23
2.3 General symbols and instructions 24
2.3.1 Safety signs 25
2.4 Proper use 26
2.4.1 Foreseeable misuse 26
2.5 Hazard zone 27
2.6 Safety stickers on the machine 29
2.7 Safety and health protection 32
2.8 Requirements for operating and maintenance personnel 33
2.9 Use of the boarding steps 33
2.10 In the event of accidents 33
2.11 Handling and process materials 34
2.12 Residual risks 34
2.13 Hazards caused by mechanical influences 34
2.14 Hazards caused by electromagnetic influences 34
2.15 Hazards caused by electricity 35
2.16 Hazards caused by process materials 36
2.17 Hazards caused by noise 36
2.18 Hazards caused by the hydraulic system 37
2.19 Hazards caused by pneumatic system 37
2.20 Hazards caused by hot substances/surfaces 37
2.21 Risks due to drive shafts 38
2.22 Stability with the side-driven harvester 38
2.23 Personal protective equipment 38
2.24 Leakage 39
2.25 Prohibition of unauthorised modifications and alterations 39
2.26 Safety and protective equipment 40
2.27 Immobiliser 41

3 General View and Specifications 43

3.1 General overview 45
3.2 Technical data 48
3.3 Tyre pressure 50
3.4 Transport draft for low-loader transport of the machine 51
3.5 Lashing eyes for transport by low-loader/ship 52

4 General Description 55

4.1 Function 57
4.2 Scope of delivery 58

5 Operating Components 59

5.1 Ladders 61
5.1.1 Left ladder 61

5.1.2 Right ladder.... 62
5.2 Overview of tractor operating components.... 64
5.2.1 Tractor terminal.... 65
5.2.2 Lifter operating component.... 66
5.2.3 Bunker operating component.... 68
5.3 Overview of machine controls.... 71
5.3.1 Control unit above picking conveyor.... 71
5.3.2 Operating components of the right sorting platform.... 72
5.3.3 Operating components of the left sorting platform.... 73
5.3.4 Double bunker operating component.... 74
5.3.5 Additional sorting platform emergency stop switch (optional).... 75

6 Operation.... 77

6.1 First startup.... 79
6.1.1 Adjusting the drawbar eye.... 80
6.1.1.1 Drawbar eye ball (optional).... 81
6.1.1.2 40 mm drawbar eye.... 82
6.1.1.3 Drawbar eye hitch (export).... 83
6.1.1.4 Drawbar eye Cuna.... 84
6.1.2 Adjustment of the cardan shaft.... 85
6.1.3 Adjustment of the hydraulic system.... 85
6.1.4 Number plate.... 86
6.1.5 Installing the electrics on the tractor.... 87
6.2 Safety regulations for operation of the machine.... 89
6.2.1 Working in the vicinity of overhead power lines.... 90
6.2.2 Behaviour during or after contact to the power lines.... 91
6.3 Operating concept with ISOBUS.... 92
6.3.1 Tractor terminal.... 92
6.3.1.1 Task Controller basic (option).... 93
6.3.1.2 Tractor terminal display areas.... 94
6.3.1.2.1 ESC key.... 96
6.3.1.2.2 Road mode.... 97
6.3.1.2.3 Field operation menu.... 98
6.3.1.2.4 Folding mode menu.... 100
6.3.1.2.5 Pickup menu.... 101
6.3.1.2.6 Sieving channel menu.... 105
6.3.1.2.7 Separation menu.... 108
6.3.1.2.8 Picking table menu.... 112
6.3.1.2.9 Manual conveyors menu.... 112
6.3.1.3 Main menu.... 114
6.3.1.3.1 Programmable keys menu (option).... 115
6.3.1.3.2 Menu Main settings.... 117
6.3.1.3.3 Menu Special functions.... 122
6.3.1.3.4 Menu Operating data.... 123
6.3.1.3.5 Menu Service.... 125
6.3.1.4 Readjusting thresholds.... 126
6.3.1.5 Warning and status indications on the tractor terminal.... 128
6.3.2 Machine terminal (optional).... 131
6.3.2.1 Machine terminal display areas.... 132
6.3.2.1.1 Sorting platform menu 1.... 133
6.3.2.1.2 Sorting platform menu 2.... 135
6.3.2.1.3 Sorting platform menu 3.... 136
6.4 Support foot.... 137
6.5 Coupling and uncoupling the machine.... 138
6.5.1 Coupling machine.... 138
6.5.2 Uncoupling machine.... 141
6.6 Road travel.... 142

6.6.1 General.... 142
6.7 Braking system.... 144
6.7.1 Air brake.... 144
6.7.2 Hydraulic service brake.... 147
6.7.3 Emergency brake.... 148
6.8 Steering.... 149
6.8.1 Steering in "Road" operating mode.... 149
6.8.2 Steering in "Field" operating mode.... 149
6.8.2.1 Drawbar steering.... 150
6.8.2.2 Axle steering.... 151
6.9 Chassis.... 154
6.9.1 Slope compensation (optional).... 154
6.9.2 Slope compensation display field on the tractor terminal.... 154
6.9.3 Hydraulic slope compensation including automatic function.... 155
6.10 Sunroof/weather protection roof (option).... 157
6.10.1 Canopy lighting (option).... 157
6.11 Lifting.... 158
6.11.1 Preparation for lifting.... 158
6.11.2 Lifting process.... 159
6.12 Pickup.... 160
6.12.1 Ridge pickup model.... 162
6.12.1.1 Ridge roller.... 162
6.12.1.2 Ridge centring.... 163
6.12.1.3 Shares.... 166
6.12.1.4 Lifting depth and ridge pressure regulation.... 168
6.12.1.4.1 Lifting depth.... 168
6.12.1.4.2 Ridge pressure regulation.... 171
6.12.1.5 Disc coulter.... 175
6.12.1.6 Leaf loading roller.... 179
6.12.1.7 Setting row distance.... 180
6.12.2 Swath pickup model with lifting shaft and cover belt.... 180
6.12.3 Swath pickup model with shares.... 183
6.12.4 Pickup model for carrots.... 184
6.12.5 Ridge pressure relief.... 185
6.12.6 Drawbar.... 188
6.13 cleaning.... 190
6.13.1 Sieving channel and leaf separation.... 190
6.13.1.1 Sieve conveyor 1.... 190
6.13.1.2 Sieve conveyor 1 cleaning roller (option).... 194
6.13.1.3 Shaker.... 195
6.13.1.4 Agitator (option).... 198
6.13.1.5 Sieve conveyor 2.... 201
6.13.1.6 Sieve conveyors synchronous adjustment.... 205
6.13.1.7 Sieve conveyors automatic function (option).... 208
6.13.1.8 Rubber paddle roller (option).... 213
6.13.1.9 Leaf chain.... 214
6.13.1.10 Leaf scraper.... 218
6.13.1.11 Pull-off rods in the leaf separation.... 220
6.13.2 Separation.... 221
6.13.2.1 Pintle belt 1.... 221
6.13.2.2 Deflector roller 1.... 226
6.13.2.2.1 Deflector roller 1 with spiral roller at the bottom (option).... 232
6.13.2.3 Pintle belt 2.... 232
6.13.2.4 Deflector roller 2.... 237
6.13.2.5 Rotating finger comb (UFK).... 238
6.13.2.6 Pintle belt 1/2 inclination.... 245
6.13.2.7 Pintle belts synchronous adjustment.... 250
6.13.3 Picking.... 254

6.13.3.1 Picking conveyor....255
6.13.3.2 Trash conveyor....259
6.13.3.3 Trash return (option)....260
6.13.3.4 Sorting container (option)....261
6.13.3.5 Collection box (option)....262
6.13.3.6 Potato crusher (option)....263
6.14 Bunker....265
6.14.1 Bunker folding section....266
6.14.2 Raising and lowering bunker....268
6.14.3 Bunker walking floor....269
6.14.4 Bunker filling conveyor....270
6.14.5 Bunker filling....271
6.14.6 Double bunker (option)....274
6.14.6.1 Double bunker walking floor....275
6.14.6.2 Bunker filling conveyor and double bunker sorting conveyor....276
6.14.6.3 Double bunker filling....278
6.15 Bunker unloading....281
6.15.1 Articulated bunker section (optional)....282
6.15.2 Tray filler (option)....283
6.15.3 Big Bag device (option)....284
6.15.4 Reset bunker floor....285
6.15.5 Double bunker unloading....286
6.15.5.1 Double bunker tray filler (option)....287
6.15.5.2 Reset large double bunker floor....288
6.16 Pump distributor gears....289
6.17 Hydraulic system....290
6.18 Compressed air system....293
6.18.1 Compressed air reservoir....293
6.19 Video system (optional)....294
6.20 Electrics....298
6.20.1 Voltage monitoring....298
6.20.2 Fuses....298
6.21 Shutdown....299

7 Maintenance and service....301

7.1 Pump distributor gears (PDG)....304
7.2 Hydraulic system....305
7.2.1 Hydraulic fluid tank for machine hydraulics....307
7.2.1.1 Changing hydraulic fluid....308
7.2.1.2 Replacing return filter element....310
7.2.2 Replacing tractor hydraulic system pressure filter element....312
7.3 Axle....314
7.4 Pneumatic system....315
7.5 Pickup....316
7.5.1 Ridge pickup model....316
7.5.1.1 Ridge roller....316
7.5.1.1.1 Ridge roller wiper....316
7.5.1.1.2 Adjusting ridge centring sensor....317
7.5.1.2 Shares....317
7.5.1.3 Disc coulter....318
7.5.1.4 Hydraulic disc coulter (optional)....319
7.5.1.5 Leaf loading roller....320
7.5.2 Swath pickup model....320
7.5.2.1 Setting cover belt tension and synchronism....321
7.5.2.2 Swath pickup gears....322
7.6 Sieving channel and leaf separation....323
7.6.1 Sieve conveyor 1....323

7.6.1.1 Tension....323
7.6.1.2 Setting synchronism....324
7.6.1.3 Replacing sieve conveyor 1....325
7.6.1.4 Sieve conveyor 1 wiper....326
7.6.2 Shaker....326
7.6.3 Agitator....327
7.6.4 Sieve conveyor 2....327
7.6.4.1 Tension....327
7.6.4.2 Setting synchronism....328
7.6.4.3 Replacing sieve conveyor 2....329
7.6.4.4 Sieve conveyor 2 wiper....330
7.6.5 Rubber paddle roller....330
7.6.6 Leaf chain....331
7.6.6.1 Tension....331
7.6.6.2 Setting synchronism....332
7.6.6.3 Replacing leaf chain....333
7.6.6.4 Leaf chain wiper....334
7.6.7 Leaf scraper....335
7.7 Separation....336
7.7.1 Pintle belt 1....336
7.7.1.1 Tension....336
7.7.1.2 Setting synchronism....337
7.7.2 Deflector roller 1....338
7.7.3 Pintle belt 2....339
7.7.3.1 Tension....339
7.7.3.2 Setting synchronism....340
7.7.4 Deflector roller 2....341
7.7.5 Pintle belt 1/2 inclination....341
7.7.6 Rotating finger comb (UFK)....342
7.7.6.1 Adjusting tension and synchronism....342
7.8 Picking conveyer....343
7.8.1 Adjusting tension and synchronism....343
7.9 Trash conveyer....344
7.9.1 Adjusting tension and synchronism....344
7.10 Trash return conveyor....345
7.10.1 Adjusting tension and synchronism....345
7.11 Sorting conveyor with double bunker....346
7.11.1 Adjusting tension and synchronism....346
7.12 Collection box....347
7.12.1 Adjusting tension and synchronism....347
7.13 Potato crusher....348
7.13.1 Distance adjustment....348
7.13.2 Tension adjustment....349
7.14 Locks....350
7.15 Bunker....351
7.15.1 Ultrasound sensor....351
7.15.2 Bunker walking floor standard....351
7.15.2.1 Tension of bunker walking floor chains....352
7.15.2.2 Drive chains....353
7.15.3 Double bunker walking floor....354
7.15.3.1 Tension of bunker walking floor chains....355
7.15.3.2 Double bunker drive chains....356
7.16 Shutdown for an extended period....357
7.17 Dismantling and disposal....357

8 Malfunction and remedies....359

8.1 Safety circuits....361

8.2 Electrics....362
8.2.1 Safety fuses....362
8.2.2 List of fuses (melting fuses)....363
8.2.3 Electronic fuses....363
8.2.4 Fuses list of self-resetting electronic fuses with LED....364
8.3 Relay list....365
8.4 Colour codes for electric wiring....366
8.5 Troubleshooting with the tractor terminal....367
8.5.1 Overview of diagnostic menus....368
8.5.1.1 Digital inputs....368
8.5.1.2 Analogue inputs....369
8.5.1.3 Rpm inputs....369
8.5.1.4 Pressure sensors....370
8.5.1.5 PWM + SW outputs....371
8.5.1.6 CAN-BUS....372
8.5.1.7 Error memory....372
8.5.1.8 Operating components....373
8.6 Welding on the machine....374
8.7 Jacking up of the vehicle....374
8.8 Releasing the brake manually....376
8.8.1 Pneumatic deactivation of brake....376
8.8.2 Hydraulic deactivation of brake....377
8.9 Hydraulic valves....379
8.10 Overview of the field settings....380
8.11 Checklist for optimising the lifting quality/storage quality....382

9 Lists/Tables/Plans/Diagrams/Maintenance Verification....383

9.1 Lubricating and operating supplies....385
9.2 Maintenance table....386
9.3 Lubricating plan (lubrication with grease gun)....389
9.4 Lubricant recoding table....391
9.5 Filter cartridges....392
9.6 Torque table for screws and nuts (Nm)....393
9.7 Maintenance verification....394
9.7.1 Maintenance verification oil change + filter exchange....394
9.7.2 Maintenance confirmation....395
9.7.3 Software updates....395
9.8 Confirmation about instructions given to the driver....396
9.9 Safety instructions....397
9.10 ROPA Handover confirmation....399
9.11 ROPA First Use Record....401

10 Index....403

1 Preface

We congratulate you on the purchase of your new ROPA machine. Please take the time and read thoroughly the operating manual. The operating manual is primarily intended for the machine operator. It contains all information required for safe operation of this machine, informs about safe handling and gives hints on practical use as well as for self-help and servicing. The respective safety information is based on the safety, work and health protection regulations applicable at the time of printing of this operating manual. In case of questions about the machine, on operation of the machine or on ordering of spare parts, please contact the dealer in your vicinity or the manufacturer directly:

ROPA Fahrzeug- und Maschinenbau GmbH

Sittelsdorf 24

D-84097 Herrngiersdorf

Phone Customer Service	+ 49 – 87 85 – 96 01 203
Spare parts telephone	+ 49 – 87 85 – 96 01 202
Fax	+ 49 – 87 85 – 566
Internet	*www.ropa-maschinenbau.de*
E-mail Customer Service	*Kundendienst@ropa-maschinenbau.de*
E-mail Spare Parts	*Bestellung@ropa-maschinenbau.de*

Important information

- Original ROPA spare parts have been especially developed for your machine. They conform to the high ROPA standards for safety and reliability. We would like to point out that parts and accessories not approved by ROPA may not be used on ROPA machines, otherwise the safety and operability of the machine may be impaired. We cannot assume any responsibility for such installations, additions or reconstructions. In case of unauthorized modifications to the machine, any warranty claim lapses! Furthermore, the Declaration of Conformity (CE Marking) or regulatory approvals can be declared ineffective. This also applies if seals or sealing wax applied by the factory are removed.

WARNING

In rare cases, massive interference of vehicle electronics or malfunctions of the machine may occur due to operation of improperly installed electronic appliances (e.g. radios or other appliances emitting electromagnetic radiation). In case of such interference, the complete machine may suddenly stop operating or execute unwanted functions.

- In such cases, immediately shut off the sources of interference and immediately shut down the machine.
- If needed, notify the company ROPA or the nearest authorised customer service of ROPA.

- We expressly reserve the right to make technical modifications for the purpose of improving our machines or increasing the safety standards – even without specific notification.
- All information about directions given in this operating manual (front, rear, right, left) are in relation to the driving direction forward. Please always state the chassis number of the machine for any orders for spare parts and technical inquiries. You will find the chassis number on the name plate and on the vehicle chassis above the name plate.
- Please have the machine serviced according to regulations. Comply with the information given in this operating manual and have parts subject to wear replaced in due time respectively ensure timely repairs. Have the machine respectively maintained or repaired according to regulations.
- Listen for suddenly occurring, unusual noises and have their cause remedied before the machine is operated further, since otherwise heavy damage or costly repairs to the machine may be caused.
- Generally comply with the respective applicable regulations for road traffic and the applicable regulations on occupational health and safety.
- A copy of this manual must be accessible to authorized personnel any time for the entire lifetime of the machine. Make sure that the manual is supplied with the machine, e.g. in the event of an onward sale.

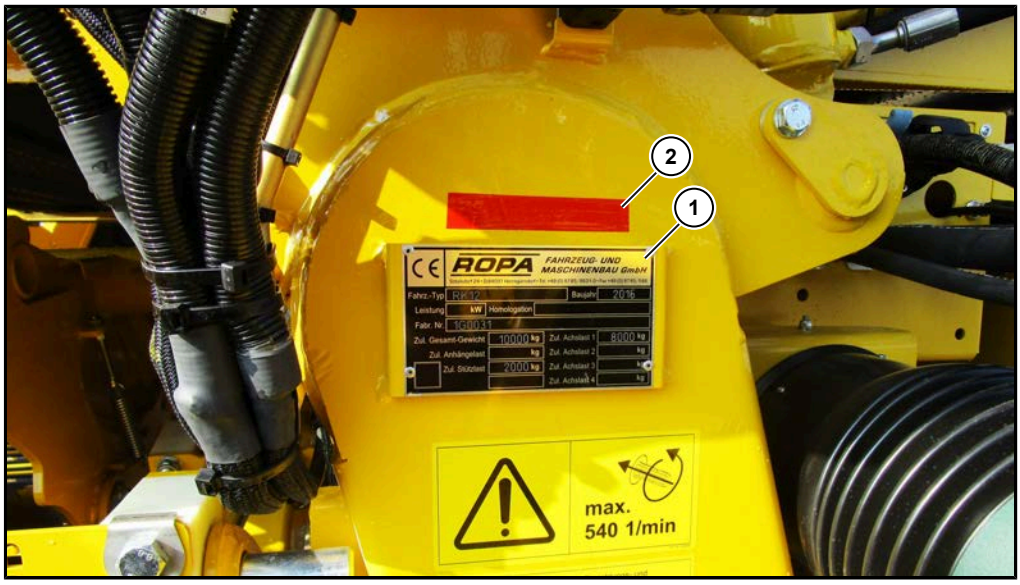
We expressly point out that any damage caused by the fact that this operating manual is not or not completely followed is not covered by the statutory warranty of ROPA. Even though this operating manual is comprehensive, in your own interest you should completely and carefully read it and slowly familiarize yourself with the machine using this operating manual.

ADVICE

This operating manual has been written in compliance with the EU Regulation 1322/2014 and the ISO Standard 3600:2015.

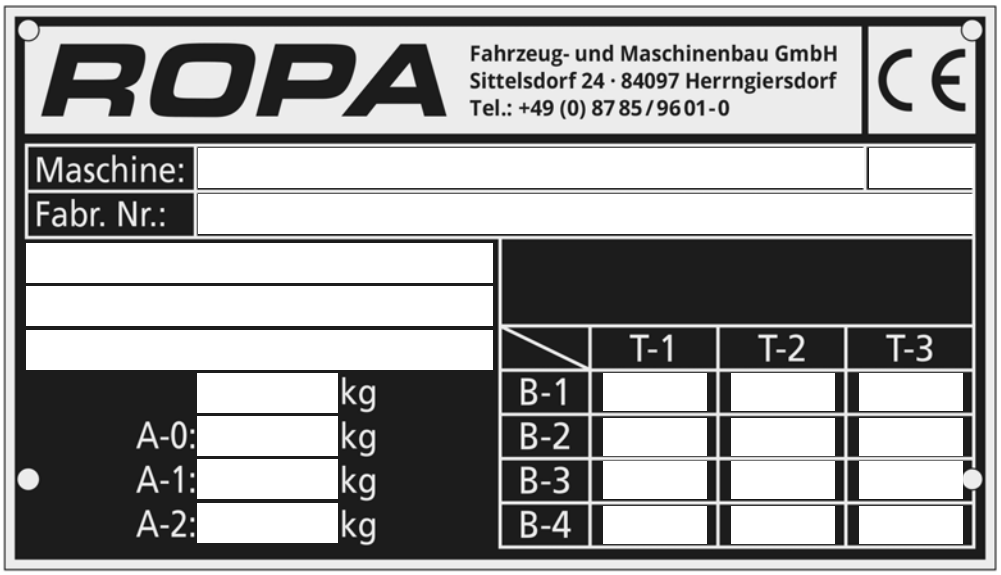
1.1 Name plate and important data

The name plate (**1**) of the machine is on the front bunker upright under the chassis number (**2**).

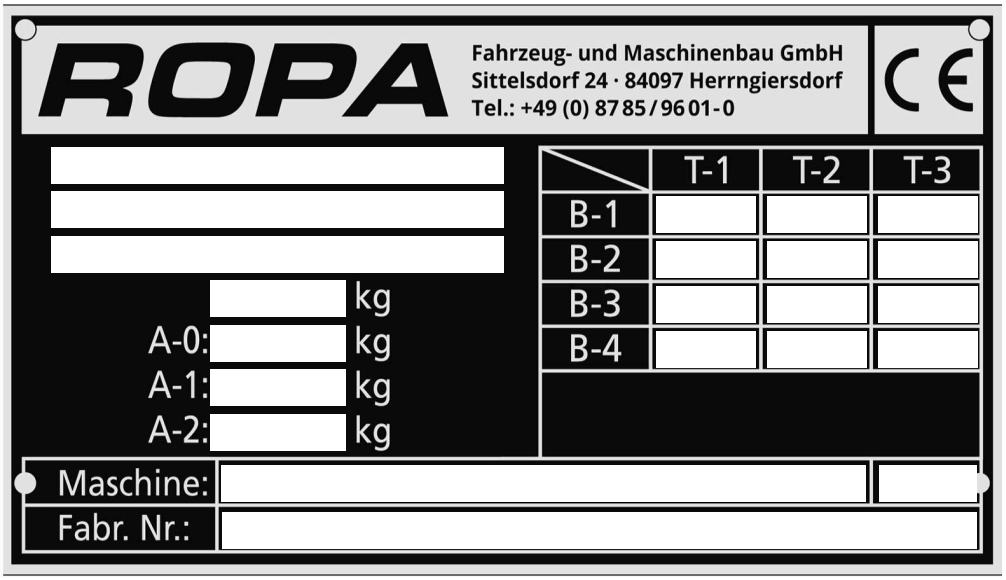


Please enter the data of your machine in the following image of the name plate. You will need this data for ordering spare parts.

Name plate up to 2020 year of constr.



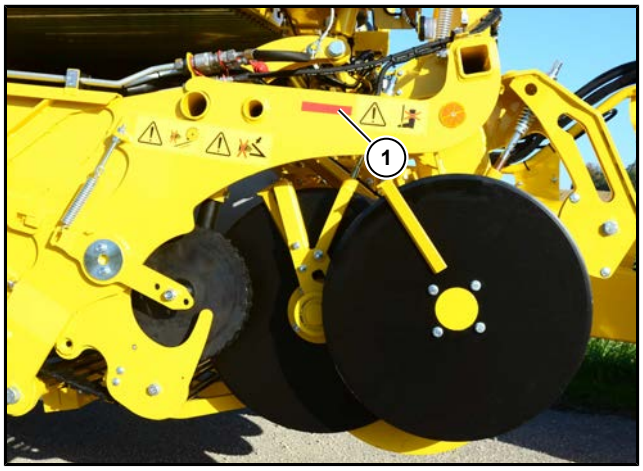
Name plate 2021 year of constr.



Name plate from 2022 year of constr.

1.2 Serial numbers of pickups

Starting from the model year 2019, the serial number (**1**) of all pickup versions is always located on the upper right (in the direction of travel) side contour of the pickup.



Example - ridge pickup on Keiler 2

1.3 Declaration of Conformity

The Declaration of Conformity belongs to separately provided documents and is handed over on the delivery of the machine.

The CE marking of the machine is a constituent part of the nameplate.

CE

ROPA

EG-Konformitätserklärung

im Sinne der EG-Maschinenrichtlinie 2006/42/EG, Anhang II, 1. A

Hersteller:

ROPA Fahrzeug- und Maschinenbau GmbH
Sittelsdorf 24
DE - 84097 Herrngiersdorf

In der Gemeinschaft ansässige Person, die bevollmächtigt ist, die relevanten technischen Unterlagen zusammenzustellen:

Alexander Daller
ROPA Fahrzeug- und Maschinenbau GmbH
Sittelsdorf 24
DE - 84097 Herrngiersdorf

Beschreibung und Identifizierung der Maschine:

Produkt:	gezogener Kartoffelroder
Typ:	RKA und RKB
Handelsbezeichnung:	Keiler 1, Keiler 2 und Keiler 2 Classic
Modell:	ROPA Keiler
Funktion:	Roden von Kartoffeln und ähnlichen Feldfrüchten. Entladen der gerodeten Feldfrüchte auf ein Abfuhrfahrzeug oder als Miete am Feld.

Es wird ausdrücklich erklärt, dass die Maschine allen einschlägigen Bestimmungen der folgenden EG-Richtlinien bzw. Verordnungen entspricht:

2006/42/EG	Richtlinie 2006/42/EG des Europäischen Parlaments und des Rates vom 17. Mai 2006 über Maschinen und zur Änderung der Richtlinie 95/16/EG (Neufassung) Veröffentlicht in L 157/24 vom 09.06.2006

Ort: Sittelsdorf

Datum: 25.03.2021

Unterschrift:

Name und Position im Unternehmen:

Hermann Paintner
Geschäftsführer

1.4 Extended documentation

Additional documents in addition to this operating manual also apply, e.g.

- Supplier documentation
- Wiring diagrams

1.4.1 Supplier documentation and purchased parts operating manual

The operating manuals for the purchased parts must be followed and they are attached to the technical documentation as separate sections. Optional components are also listed.

Supplier	Component	Description
Müller Elektronik	ROPA standard tractor terminal	BASIC terminal installation and operation manual
Müller Elektronik	ROPA tractor touch terminal	TOUCH800 installation and operation manual
Walterscheid	Cardan shafts	Cardan shaft operating manual

2 Safety

2.1 General

The machine has been manufactured according to the current state of technology and tested for safety.

The machine is CE compliant and therefore conforms to the respective European regulations for free movement of goods within the European Union respectively the European economic region.

Modifications to this machine may only be performed with the express approval of the manufacturer, since otherwise the manufacturer's warranty lapses. In addition, the road traffic registration may lapse and other registrations of the machine may become invalid. The operating manual supplied must be strictly observed. The manufacturer shall not be liable for damage caused by incorrect handling, inappropriate application or incorrect repairs respectively missing maintenance and service carried out by the customer. The machine may only be operated in a technically perfect condition, for its intended purpose and with due consideration of the risks involved.

2.2 Obligations of the entrepreneur

The entrepreneur employing the machine, respectively his agent, is obliged:

- to observe the applicable European and national work and safety regulations.
- to instruct the machine operators about their special obligation for safe driving of the machine. These instructions must be given anew before the start of each season. Records must be prepared about giving of these instructions, which must be signed by the entrepreneur and the instructed machine operator. These records must be kept for at least one year by the entrepreneur.
- before first use of the machine, to instruct the machine operators about operation respectively about safe handling of the machine.

Forms for these instructions may be found in Chapter 9 of this operating manual (documentation of instructions given to the driver). When needed, please copy these forms before completing them.

2.3 General symbols and instructions

The following symbols are used for safety instructions in this operating manual. They serve as a warning against possible personal injury or material damage, or provide help in facilitating work.

DANGER

This signal word warns of imminent danger of fatal accident or serious injury. This hazard may always occur if the operating or working instructions are not or only imprecisely observed.

WARNING

This signal word warns you of a possibly dangerous situation which may lead to serious injury or to death. This hazard may always occur if the operating or working instructions are not or only imprecisely observed.

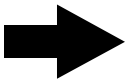
CAUTION

This signal word warns you of a possibly dangerous situation which may lead to serious injury or to death and damage to the machine or other serious property damage. Non-observance of these instructions may lead to loss of warranty. This hazard may always occur if the operating or working instructions are not or only imprecisely observed.

ATTENTION

This signal word warns you of a possible severe damage to the machine or other severe property damage. Non-observance of these instructions may lead to loss of warranty. This hazard may always occur if the operating or working instructions are not or only imprecisely observed.

ADVICE



This symbol draws your attention to some special aspects. This helps to facilitate work.

(**1**) **Item numbers**

The item numbers used in drawings are put in text in parentheses (**1**) and marked in bold.

- **Operational activities**

The defined sequence of operational activities facilitates the correct and safe use of the device.

2.3.1 Safety signs

The safety signs illustrate a danger source.

Warning of a general danger

This warning symbol stands for activities where several causes may lead to hazards.

Warning of dangerous electrical voltage

This warning symbol stands for activities during which the hazards of electrical shocks with possible deadly consequences exist.

Warning against open running belt

This warning symbol stands for activities during which the hazards of open running belt or chains with possible deadly consequences exist.

Warning against hot surfaces/hot liquids

This warning symbol stands for activities during which the hazards of hot surfaces/hot liquids with possible deadly consequences exist.

Warning against explosion hazard, battery area

This warning symbol stands for activities during which the hazards of corrosive liquid and gases exist.

Warning against falling hazard

This warning symbol stands for activities during which the hazards of falling with possible deadly consequences exist.

Warning of electromagnetic fields

This warning symbol stands for activities during which the hazards of electromagnetic fields respectively disorders exist.

Warning against crushing hazard

This warning symbol stands for activities during which the crush hazards with possible deadly consequences exist.

Warning against crushing hazard

This warning symbol stands for activities during which the crush hazards with possible deadly consequences exist.

2.4 Proper use

This machine is exclusively meant for:

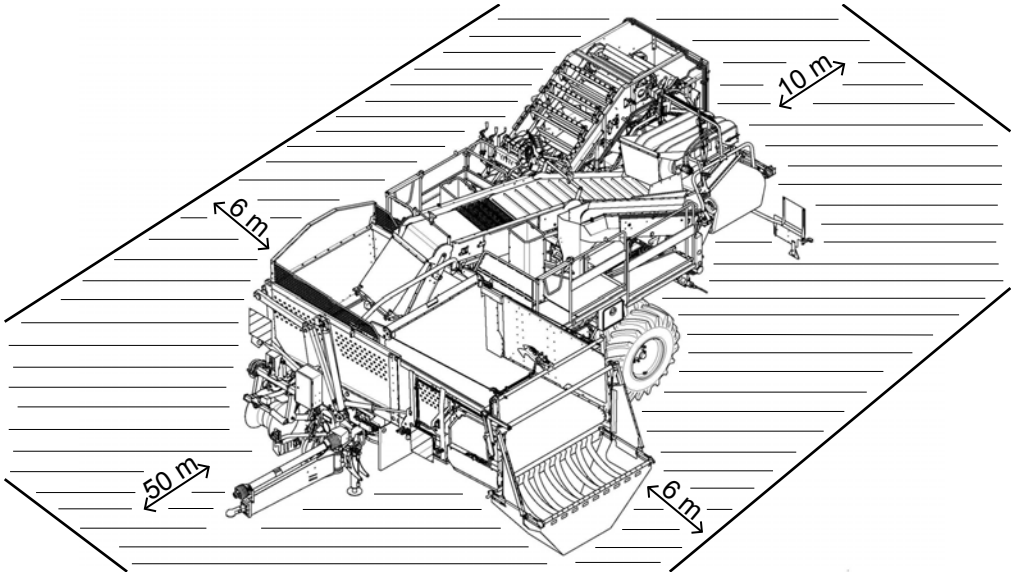
- lifting potatoes and similar crops.
- depositing the lifted crops in a pile on the edge of the field or for unloading lifted crops to a stationary vehicle alongside.

Included in proper use is that the machine is driven under compliance with the applicable road traffic regulations on public roads. This includes driving forward and backward. Any other use of the machine is deemed improper and is therefore prohibited.

2.4.1 Foreseeable misuse

We would like expressly to point out that this machine is not be used for transport of persons or for transport of any loads or any goods.

2.5 Hazard zone



Nobody may stay in the hazard zone during operation of the machine.. The operator must immediately shut down the machine in case of any threatening hazard and request the people concerned to leave the hazard zone immediately. He may only restart the machine when no people are located in the hazard zone anymore.

People wanting to approach the machine during operation must clearly communicate their intentions to the operator (e.g. by calling or by agreed hand signals) to avoid misunderstanding. During lifting, a strip with a width of six metres to the left and right of the machine, 50 metres in front of the machine and 10 metres behind the machine is deemed to be the hazard zone. As soon as a person enters this zone, the machine must be immediately shut down and the person concerned must be requested to leave the hazard zone immediately. The machine may only be restarted when no people are located in the hazard zone anymore.

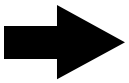
The persons assigned to sorting the crop must not leave the platform of the sorting stand while the tractor is running. If they wish to leave the machine during operation they must clearly communicate their intentions to the driver (e.g. by calling or by agreed hand signals) to avoid misunderstanding.

DANGER

There is a risk of serious or even fatal injuries for people in the hazard zone.

- The operator is obliged to immediately shut down the machine with the Emergency Stop Switch as soon as people or animals enter the hazard zone or reach into the hazard zone with objects.
- It is expressly prohibited to place crops that has not been lifted by the machine into the machine manually or using tools, as long as the machine is running.
- The tractor engine must be shut down and the ignition key must be removed before maintenance and repair work.
- In all cases, please read the operating manual and comply with the safety instructions.
- In the past, these activities have lead to severest accidents. Staying under lifted machine parts or within the swivelling perimeter of machine parts is hazardous and therefore prohibited.

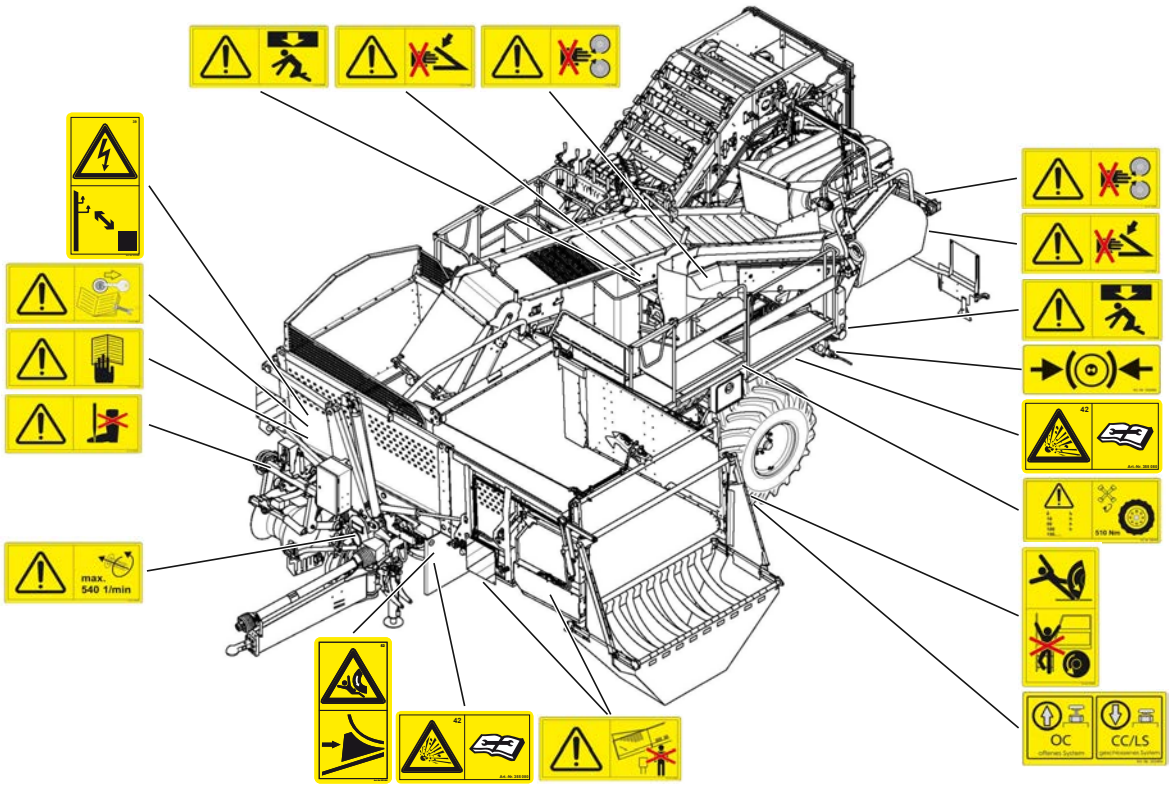
ADVICE

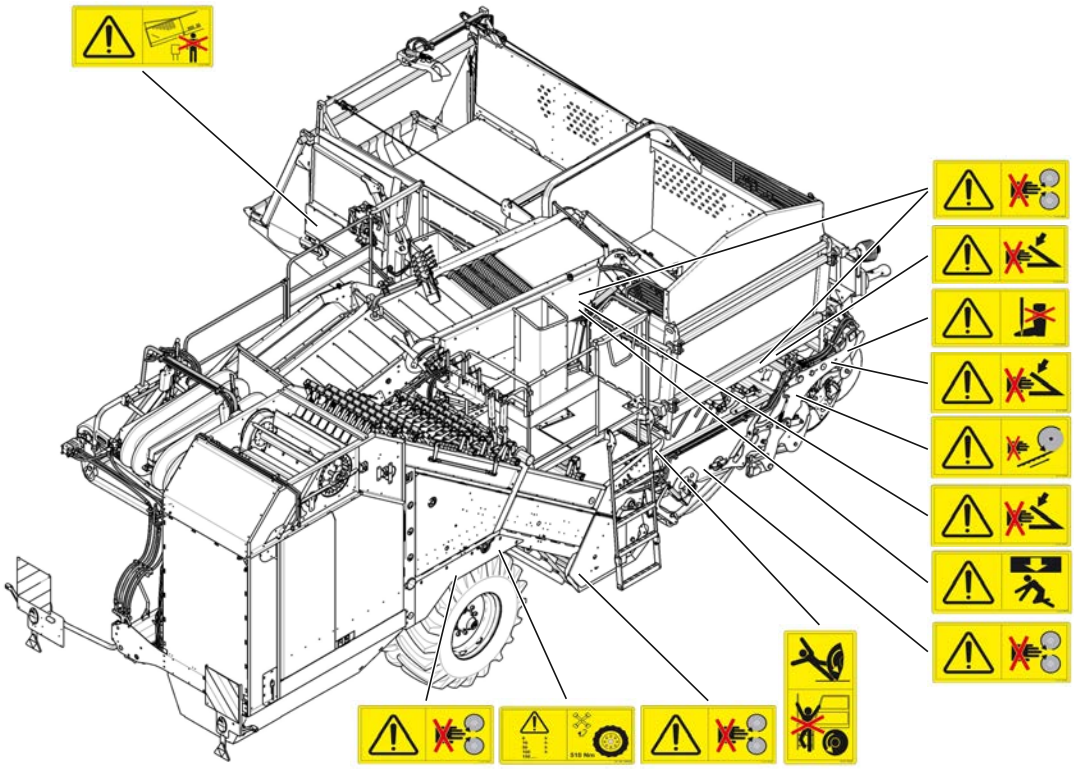


We recommend that the operator of the machine informs all people present during lifting about the possible hazards. You will find an information sheet for this purpose in the appendix. When needed, you should copy this sheet and hand it out to the people concerned. For your own safety and as protection against possible recourse (liability) claims, you should obtain written confirmation about receipt of this sheet in the space provided.

All parts of the machine which may cause specific hazards are additionally marked using warning labels (pictographs). These pictographs point out possible hazards. They form a part of this operating manual. They must always be kept in clean and well legible condition. Damaged or illegible safety stickers must be replaced immediately. The meaning of each individual pictograph is explained below. In addition, a six- or nine-figure number is given for each pictograph. This is the ROPA order number. Stating this number, you may reorder the respective pictograph from ROPA.

2.6 Safety stickers on the machine





355044900

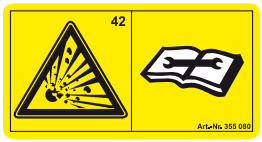
Tighten wheel studs as directed.

355045000

Before starting up, read the operating manual respectively the maintenance manual and observe all remarks on safety.

355045100

Shut down the engine before performing maintenance and repair work and pull out the ignition key. Read the operating manual and comply with remarks on safety.



355008000 (depending on the equipment model)

Explosion hazard. The pressure reservoir is under very high pressure. Perform removal and repair only following instructions from the manual.

355045300

Hazard from rotating parts. Never reach into operating chains and rollers. Hazard of clothing or body parts being pulled in. Do not open or remove protective equipment during operation.

355045400

Caution! Risk of cuts! Never step in front of or under the disc coulter.

355045600

Caution! Trash intake roller entrapment zone! Never reach into the trash intake roller while the machine is running. Hazard of clothing or body parts being pulled in.

355045900

Note the approved PTO shaft speed and direction of rotation of the PTO shaft!

355046000

Caution! Crushing hazard! Keep clear! Never stay under this part.

355046100

Caution! Crushing hazard! Keep clear! Never reach into the range of moving parts when the machine is running.

355046300

Caution! Do not stand under the bunker unloading conveyor! Hazard due to conveyor folding down. Never step into the hazard zone of raised and unsecured bunkers.

355046900

Set parking brake when parking the machine and release if before driving off.

355046400

Caution! Set adjusting screw on the 6x LVS block correctly! OC position Tractor connection to control unit, CC/LS position Tractor connection via LS.

355006800

Hazard due to electrical current! Observe a sufficiently safe distance to high-voltage power lines.

355045200

Entering or leaving the machine while it is moving is prohibited! Enter and leave the machine in the field only when it is stationary.

355006400

Hazard due to the machine inadvertently rolling away. Secure machine against inadvertently rolling away using a wheel chock before uncoupling or parking it.

2.7 Safety and health protection

The stipulations and regulations listed below must be rigorously observed in order to reduce the risk of personal injury and/or property damage. Furthermore, the regionally applicable regulations and instructions on safety at work and for safe handling of tractor-towed agricultural machines must be observed at all times. For safety reasons, anyone working with the machine must have read and understood the operating instructions. He must also be familiar with the applicable regulations on safety at work and health protection regulations.

For safe operation of the machine, the applicable health protection regulations, the relevant national work safety regulations or equivalently applicable national work safety and health protection regulations of other member states of the European Union or other states which have signed the agreement on the European Economic Area must be rigorously applied.

The operator is obliged to provide the applicable regulations in their current versions free of charge to the machine operator.

- The machine may only be used for its intended purpose and in compliance with these operating instructions.
- The machine must be used and operated in such a manner that its stability is guaranteed at any time.
- The machine may not be operated in enclosed rooms.
- The effectiveness of operating and adjusting components may not be impaired or overridden without approval.

2.8 Requirements for operating and maintenance personnel

The independent operation and maintenance of the machine is restricted exclusively to persons who are of age and:

- must have a required and valid driver's license (when driving on public roads), are physically and mentally suitable,
- are not under the influence of drugs, alcohol or medicine which may impair the reactions of the machine operator in any manner,
- have been instructed about operation and maintenance of the machine and have proven their ability to the entrepreneur,
- have been instructed by the entrepreneur about their specific obligation for safe driving of the machine,
- are familiar with the vicinity and it may be expected that they will reliably discharge the tasks assigned to them,
- are specifically authorised by the entrepreneur.

The operating personnel must thoroughly read and understand the operating instructions of the machine.

All maintenance work which is not specifically the responsibility of the operator may only be carried out by instructed or trained maintenance personnel. Some activities may only be performed by people expressly authorised by ROPA for these activities. In case of doubt, ask the manufacturer whether you may perform a specific activity yourself without any hazard.

ADVICE

Forms for instruction on safety given for operating and maintenance personnel are included in this operating manual. When needed, please copy these forms before completing them.

2.9 Use of the boarding steps

For safety reasons, always face the machine when ascending or descending the boarding steps. When ascending or descending, always use both hands to hold on to both handrails and remember to always grasp the handrails firmly when using the boarding steps.

The safety rail at the upper end of the boarding steps serves as a fall arrester (guardrail). Please bear in mind that this safety rail always closes automatically and cannot be blocked in any way. For safety reasons, this safety rail must not be permanently held open.

Never enter or leave the machine unless it is at standstill. Attention must be also paid to the condition of the underground.

2.10 In the event of accidents

In the event of accidents involving personal injury, the machine must be shut down immediately. To the extent required, immediately necessary first aid measures must be initiated, medical assistance called in and the next accessible supervisor should be informed.

2.11 Handling and process materials

- When handling process materials the appropriate protective clothing must always be worn to prevent or reduce skin contact with these materials.
- Defective, dismantled parts shall be sorted according to material type and routed to the proper recycling channel.
- Residues of oil, grease, solvents or cleaning agents must be reliably and environmentally compatible collected in suitable and prescribed containers and stored before being disposed of in an environmentally compatible manner in accordance with the local regulations.

2.12 Residual risks

Residual risks are special hazards involved in the use of the machine which cannot be fully eliminated despite a safety-conscious design. These residual risks are not readily recognizable and may result in injury or damage to health.

In the event such unforeseen residual risks become apparent, the machine must be shut down immediately and the responsible supervisor informed accordingly (if applicable). The supervisor then makes any further decisions and initiates the necessary measures for elimination of the hazard. If required, the machine manufacturer must be informed.

2.13 Hazards caused by mechanical influences

DANGER

During operation of the machine, there is life-threatening danger due to uncovered rotating machine parts (articulated shafts, rollers, conveyor chains and conveyor belts...) and overhanging parts.

Rotating machine parts and breaking attached parts may cause the serious injuries such as contusions, loss of body parts, broken bones. These injuries may be deadly in especially severe cases. During lifting, within range in front of the machine there is the greatest danger to life from stones or other objects possibly flung away (for instance, detaching metal parts).

– You can protect yourself against these hazards by keeping a sufficient safety distance, by constant attention and by wearing suitable protective clothing.

2.14 Hazards caused by electromagnetic influences

WARNING

During operation of the machine there is a danger of undesired movements of the machine which can be a subject of outside electromagnetic impacts.

– Keep the sources of interference, e.g. mobile phones or magnets, far away from the electronics of the machine.
– Never secure the control elements in the tractor cabin with magnets.
– Maintain the safety distances, e.g. to radio masts or to live power lines.

Terminals and control elements used by ROPA are tested for electromagnetic compatibility (EMC) according to DIN EN ISO 14982.

2.15 Hazards caused by electricity

DANGER

Danger of death due to electric voltage.

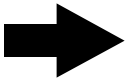
Cables and components are live, there is a danger of injury with deadly consequences. Clamping points are under voltage also after shut-off.

– All work on the electrical equipment of the machine must always be carried out by qualified electricians.
– Check electrical equipment on a regular basis: refasten loose connections and replace damaged lines and cables immediately.

There is an electrical hazard during work on the machine:

- During direct contact with live parts or parts that have become energized due to fault conditions.
- By electrostatically charged parts.
- During all work on live parts, lines or cables, a second person must be present at all times to disconnect the ISOBUS plug connector to the tractor in case of emergency.
- Never clean electrical equipment with water or similar liquids.
- Do not touch live parts inside and outside the machine.
- Before starting work on the machine, disconnect the ISOBUS plug connection to the tractor, check that there is no voltage and lock to prevent restart.
- Before opening cabinets and devices, discharge all parts that collect electrical charge, and make sure that all components are de-energized.

ADVICE



Safety of the electrical systems.

The safety of the electrical systems is complied with as per EU Regulation 2015/208 Annex XXIV.

2.16 Hazards caused by process materials

WARNING

Oil and grease can cause the following damage:

- poisoning by inhalation of fuel vapours.
- allergies due to skin contact with oil or grease.
- fire and explosion hazard due to smoking or the use of fire or naked flame when handling oil or grease.

Protective measures

– When handling oil, smoking or use of open fire or naked flame is strictly prohibited. Oil must be stored in suitable and approved containers only.
– Rags soaked with oil must be kept in suitable, approved containers and disposed of in an environmentally compatible manner.
– Always use a suitable funnel for filling oil.
– Avoid skin contact with oil or grease at all times! In case of need, wear suitable protective gloves.
– Only decant oil in the open air or in well ventilated rooms.

ADVICE

Environmental hazard due to pollution caused by leaking oil!
Hazard of pollution of ground or water bodies.

Prevention

– Always carefully close containers containing oil.
– Dispose of empty containers in accordance with regulations and in an environmentally compatible manner.
– Keep a supply of a suitable binding agent and use immediately as required.

2.17 Hazards caused by noise

WARNING

Noise

Noise can cause loss of hearing (deafness), hearing defects, health disorders such as loss of balance or consciousness disorders, as well as disorders of the heart and circulation. Noise may lead to reduction of the attention of people. In addition, noise may interfere with verbal communications among operating personnel as well as to the outside world. Perception of acoustic warning signals may be impaired or blocked.

Protection

– Wear ear protection (cotton wool, earplugs, capsules or helmets).
– Keep sufficient distance to operating machine.

Possible causes:

Pulse noise (< 0.2 s; > 90 dB(A))

Machine noise in excess of 90 dB (A)

2.18 Hazards caused by the hydraulic system

WARNING

Hydraulic fluid may cause irritation of the skin. Leaking hydraulic fluid may damage the environment. High pressure and partially high temperatures exist within hydraulic systems. Hydraulic fluid emitting at high pressure may enter the body through the skin and cause the most severe tissue damage and scalding. If work on the hydraulic system is carried out incorrectly, tools or machine parts may be flung away with great force and cause severe injuries.

Protection

– Regularly check all hydraulic hoses for their condition and immediately have damaged hoses exchanged by trained specialist personnel.
– The hydraulic hoses must be regularly checked following the recognized rules of technology and the regionally applicable safety regulations, and in case of need, replaced.
– Works on the hydraulic system have to be performed only by specially trained staff.
– When working on the hydraulic system, first make it pressureless! Avoid skin contact with hydraulic oil.

2.19 Hazards caused by pneumatic system

When working on the pneumatic system there is a risk that compressed air may escape suddenly and cause injuries.

– All work on the pneumatic equipment must always be carried out by qualified personnel.
– All pneumatic pressure lines and pressure vessels must be depressurised and vented before maintenance work.
– All equipment must be depressurised before starting repair work.

2.20 Hazards caused by hot substances/surfaces

Burning hazard/hazard of scalding due to

○ Hot surfaces (hot machine parts).
○ Hot hydraulic oil.

Counteractive measures

– Let machine and operating supplies cool down.
– Wear protective gloves.

2.21 Risks due to drive shafts

- Follow the operating manual of the shaft manufacturer.
- Only shafts that meet the specifications of the manufacturer may be used.
- Use the specified shaft covers appropriately in road and working settings.
- The PTO shaft guard, the funnel guard and the guard on the articulated shaft must be installed and must be in good condition.
- The articulated shaft must be removed and installed only with the tractor engine shut off, ignition key removed and the machine secured to prevent rolling.
- Make sure that the articulated shaft is correctly and installed and secured.
- Fasten the shaft guard to prevent movement with the shaft by attaching the safety chain or setting the torsion lock.
- When switching on the tractor PTO make sure that the direction of rotation is correct.
- Never exceed the approved maximum speed of the PTO shaft for the machine.
- Before switching on the tractor PTO shaft, make sure that no one is in the danger zone of the machine.

2.22 Stability with the side-driven harvester

Particular attention must be paid to the stability of the machine with a side-driven harvester. The gravity centre of the machine changes depending on the filling level of the bunker and the position of the drawbar. It is the sole responsibility of the driver to estimate the stability of the machine and adjust the driving behaviour accordingly.
If necessary, the following actions, among others, can shift the gravity centre. The filling level of the bunker can be set lower in the basic settings or the rear wall of the machine with overloading bunker can be folded in.

2.23 Personal protective equipment

Wear tight-fitting clothing to prevent accidents. Particularly, do not wear ties, scarves, rings or chains that may be caught by moving machine parts. Wear appropriate headgear for long hair.

Do not carry highly inflammable objects, e.g. matches and lighters in your pockets.

All persons staying within the area of effect of the machine are situationally obliged to wear the following protective equipment:

Always

- Safety shoes with slip-resistant soles.
- Tight-fitting working protective clothing.
- Dust mask if necessary.

Additionally for transport or assembly work

- Protective helmet.

Additionally for maintenance

- Cut-resistant gloves.
- Protective cream (make a skin protection plan).
- Protective goggles.
- Tight-fitting working protective clothing with long sleeves.
- Heat-resistant gloves.
- Oil-resistant protective gloves (when working on oil-containing systems).

Additionally if noise emissions exceed the limit value

- Ear protection.

Additionally on public roads

- Warning vest.

2.24 Leakage

The following measures shall be taken in case of leakage:

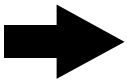
– Switch off the effective component and set it pressure-free if possible.
– Place a suitable container underneath.
– Exchange a component/sealing.
– Remove immediately and completely leaked substance.

2.25 Prohibition of unauthorised modifications and alterations

All unauthorised modifications and alterations are expressly prohibited.

Such actions require the express consent of the manufacturer. It is strictly prohibited to modify mechanical, electrical, pneumatic or hydraulic safety and control devices in order to bypass or put them out of operation.

ADVICE



Modifications and alterations of the machine must be approved by the manufacturer, as these may lead to the loss of the registration, permission or EU type approval.

2.26 Safety and protective equipment

Perform a documented function test after work on safety equipment. Perform a regular function check of safety equipment, keep maintenance intervals.

The safety equipment of the machine consists of:

- Emergency stop switch on lifter control unit.
- Emergency stop switch on sorting platform operating console.
- Emergency stop switch at the bunker filling conveyor (country-specific).
- Emergency stop switch at the picking conveyor cross tube (country-specific).
- Guards, protective cover.
- Safety circuits.
- Protection bars.

DANGER

Risk of inactive safety devices.

Defect or overridden protective devices can not prevent from severe injuries and hazards.

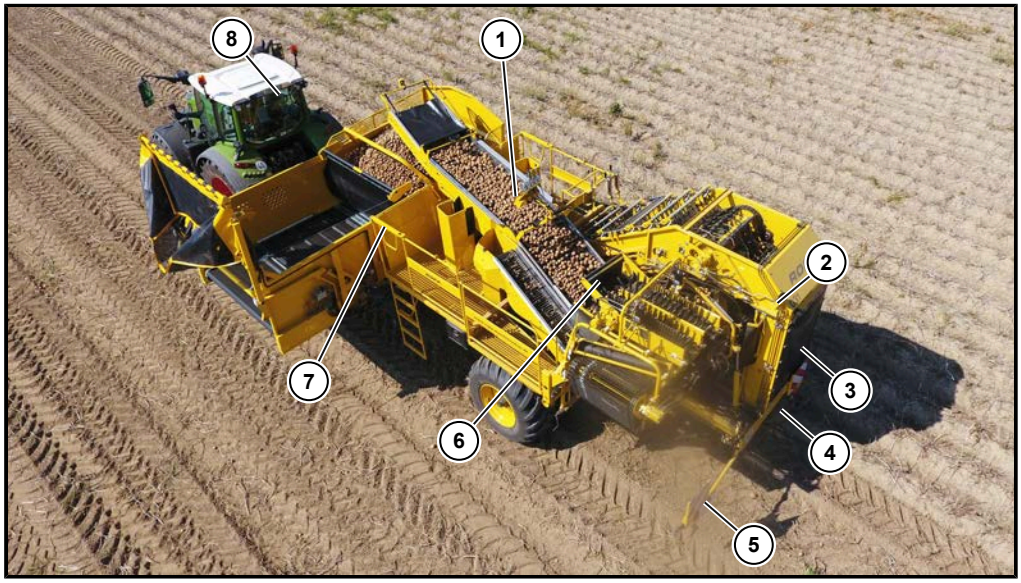
– After maintenance work and before the restart of the machine, make sure in any case that all protective devices are fully assembled and functional.

ADVICE

Separating and non-separating guards.

Separating and non-separating guards comply with the requirements of EU Regulation 167/2013 Art. 18.

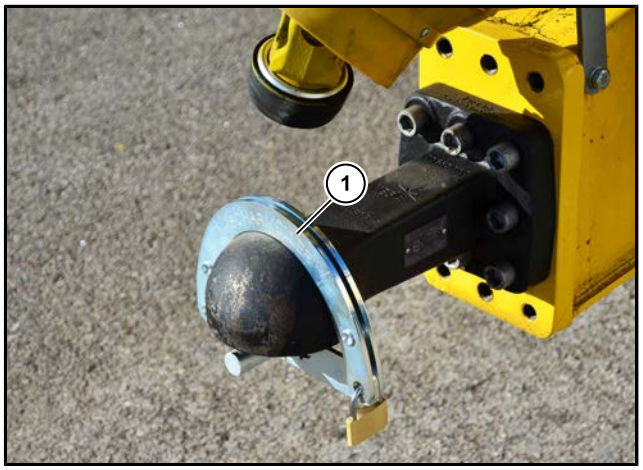
Overview



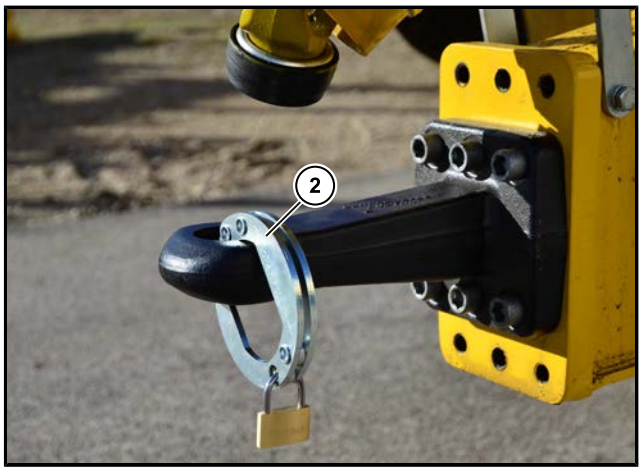
(1) Emergency stop switch on sorting platform operating console
(2) Rotating beacon (option)
(3) Rear tarpaulins
(4) Leaf chain tarpaulins
(5) Warning sign
(6) Rotating finger comb protective rubber
(7) Safety rail at the ladder
(8) Emergency stop switch on lifter control unit

2.27 Immobiliser

Mechanical guards are provided to prevent coupling with the tractor. These are locked by means of a padlock. If the lock together with the guard is removed, the machine can be coupled to the tractor.



(1) Immobiliser for drawbar eye ball

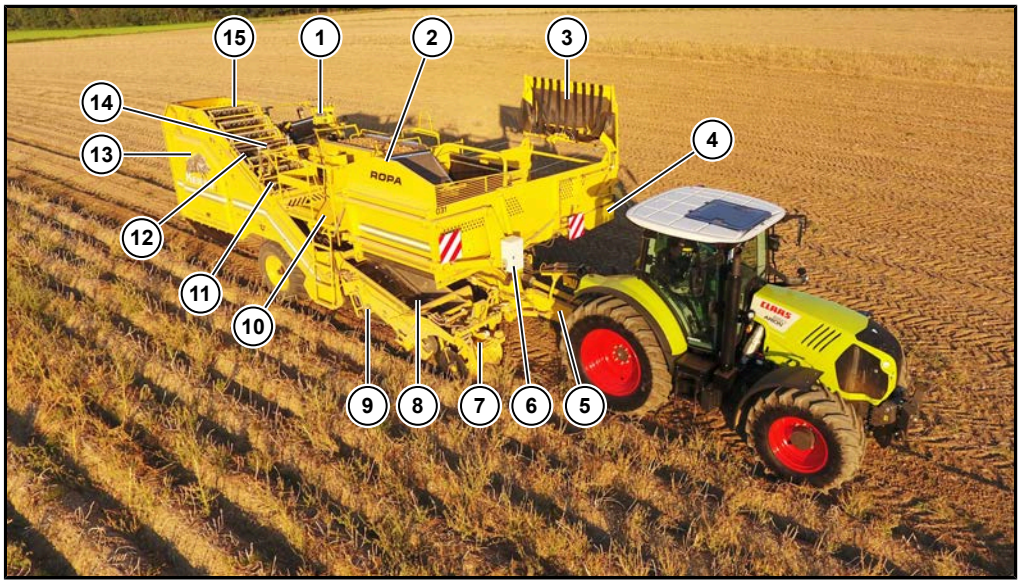


(2) Immobiliser for 40 mm drawbar eye, hitch and Cuna

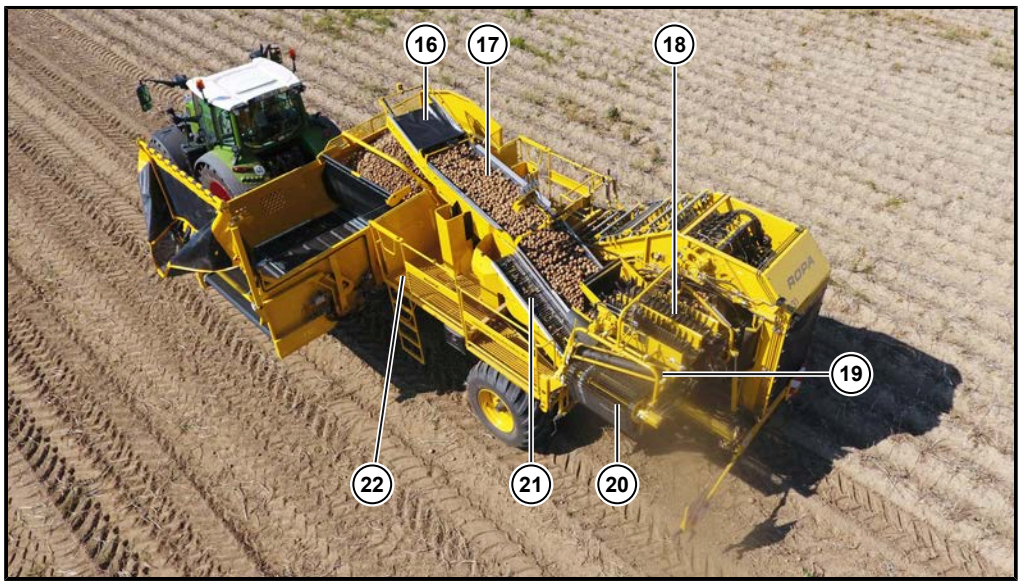
3 General View and Specifications

3.1 General overview

This overview is intended to familiarize you with the most important components of your machine.



(1) Control unit above picking conveyor
(2) Bunker
(3) Tray filler
(4) Articulated bunker section
(5) Drawbar
(6) Central electrics cabinet
(7) Pickup
(8) Sieve conveyor 1
(9) Shaker
(10) Sorting platform right with access ladder
(11) Front leaf-scraper
(12) Sieve conveyor 2 with leaf chain
(13) Pintle belt 1 with deflector roller 1
(14) Control unit above right sorting platform
(15) Rear leaf-scraper



(16) Bunker filling conveyor
(17) Picking conveyor
(18) Rotating finger comb
(19) Deflector roller 2
(20) Pintle belt 2
(21) Trash conveyor
(22) Sorting platform left with access ladder

Machine ready for driving on roads

ROPA
www.ropa-maschinenbau.de

ROPA
031

ROPA
031
HEIKER
40

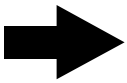
3.2 Technical data

Designation:	Standard bunker	Double bunker	
Maximum speed:	40 km/h and 25 km/h		
Two-line air brake system operating pressure:	5 - 8 bar		
Hydraulic brake system operating pressure (export):	100 - 150 bar		
Gross weight rating:	10,000 kg (till year of constr. 2017) 10,500 kg (from year of constr. 2018)	10,500 kg	
Permitted axle load:	8,000 kg		
Tyres:	500/60 x 26.5 (till year of constr. 2016) 600/55 x 26.5 600/55 R 26.5 (from year of constr. 2017) 710/50 R 26.5 (from year of constr. 2017)		
Lifter wheel left:	16.5/85 - 24 (from year of constr. 2017)		
Length (position driving on roads):	10 000 mm		
Width (position driving on roads):	3,000 mm		
Height (road position) with tray filler: with sunroof/weather protection roof:	3,700 mm 4,000 mm		
Height (truck loading position) with bunker fully lifted:	approx. 4,200 mm		
Bunker capacity:	approx. 6,000 kg	large: approx. 4,000 kg	small: approx. 2,000 kg
Maximum noise level for operators on the sorting platform in accordance with Directive 2006/42/EC; DIN EN ISO 11201	73 dBA		
Maximum vibration for operators on the sorting platform in accordance with Directive 2006/42/EC; DIN EN 1032	< 0.5 m/s²		

ADVICE

With the EU type approval, only one type of tyre per axle is permitted from the 2021 year of construction.

ADVICE



The EU type approval from the 2021 year of construction only applies to machines with 40 km/h and the pneumatic brake.
The EU type approval from the 2021 year of construction does not apply to machines with 25 km/h and the hydraulic brake.

Requirements for tractor

Designation:	Standard bunker	Double bunker
Approved support load:	minimum 2,000 kg (till year of constr. 2017) minimum 2,500 kg (from year of constr. 2018)	minimum 2,500 kg
Power:	from 66 kW (90 HP)	
PTO rotational speed:	max. 540 rpm	
System voltage:	12 V	
Control valves:	Optimal: Load Sensing System in tractor (max. 5 bar return pressure) Optional: single or double-acting control unit with pressure-free return flow (max. 5 bar return pressure)	
Hydraulic power:	minimum 40 l/min	
Operating pressure	180 - 210 bar	
Hydraulic support foot supply:	Double-acting control unit	

3.3 Tyre pressure

	Tyre type	Recommendation
		bar / psi
1	Axle	
	500/60 x 26.5	2.8 / 41
	600/55 x 26.5	2.4 / 35
	600/55 R 26.5	2.4 / 35
	710/50 R 26.5	2.0 / 29
	16.5/85 - 24	3.3 / 48
Others		**Recommendation**
2	Swath pickup	6.25 / 91

The tyre pressures of the axles are designed for a full bunker load.

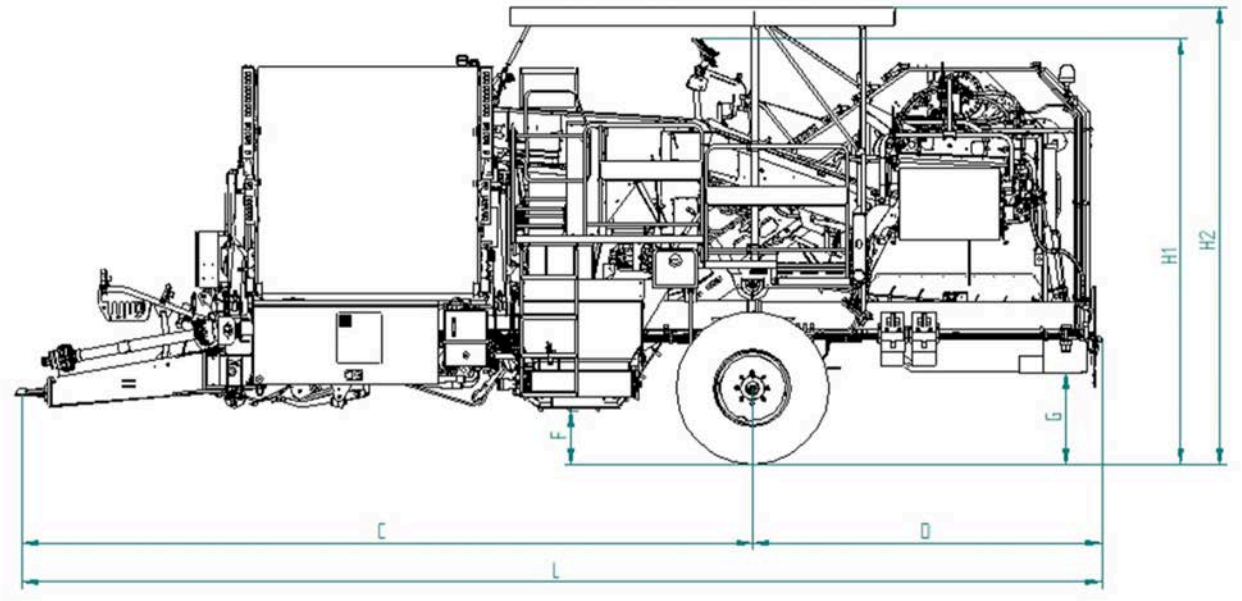
ADVICE

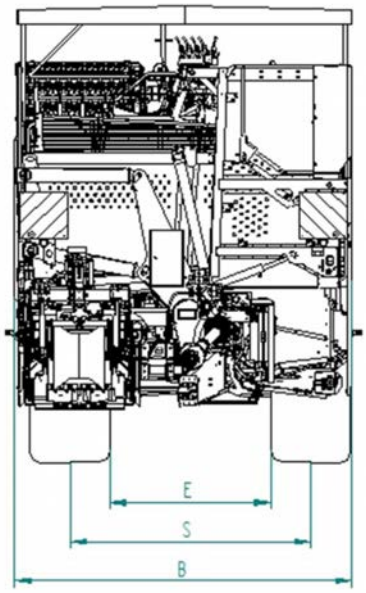
We expressly point out that tyre damage caused by insufficient tyre pressure is neither subject to warranty nor goodwill claims!

ADVICE

With the EU type approval, only one type of tyre per axle is permitted from the 2021 year of construction.

3.4 Transport draft for low-loader transport of the machine





All data in mm.

B	3,000	Maximum width of the machine.
C	6,600	Maximum length from coupling point to wheel centre.
D	3,100	Maximum length from wheel centre to rear.
E	1,430	Minimum distance (depending on tyre width).
F	400	The lowest point in front of the axle to the ground.
G	730	The lowest point behind the axle to the ground.
H1	3,700	Height without roof.
H2	4,000	Height with roof.
L	10,000	Maximum length of the machine.
S	2,140	Track width (depending on tyre width).

Tyre sizes:				
Right:	500/60 x 26.5	Left:	500/60 x 26.5	optional (till year of constr. 2016)
	600/55 x 26.5		600/55 x 26.5	Series
	600/55 R 26.5		600/55 R 26.5	optional (from year of constr. 2017)
	710/50 R 26.5		710/50 R 26.5	shown here optional (from 2017 YOM)
Lifter wheel left (can be combined with all tyres):			16.5/85 - 24	optional (from year of constr. 2017)

ADVICE

With the EU type approval, only one type of tyre per axle is permitted from the 2021 year of construction.

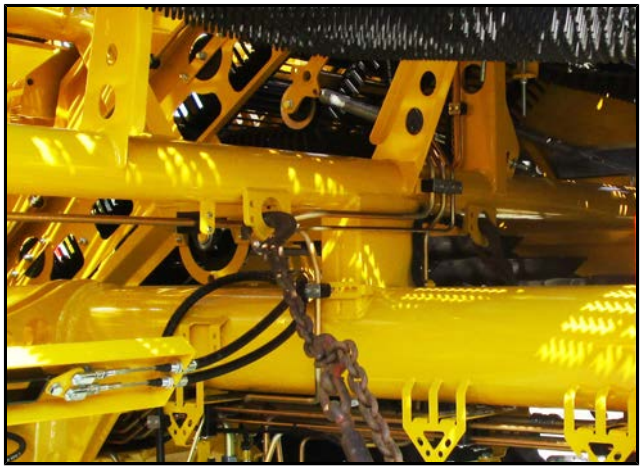
3.5 Lashing eyes for transport by low-loader/ship

The machine is fitted with eyelets at the support foot by which the machine can be tied down to the load platform. The eyelets, by which the machine can be tied down to the load platform, are also situated behind the axle on the main frame right and left. Clamping chains etc. must not be stretched over mechanical parts.

All other transport securing devices must be attached to the frame of the machine with belts to prevent damage to parts of the machine. The machine must be adequately secured.

Regular low loader for road transport with minimum transport height

Lashing points at the support foot



Lashing points behind the axle

The machine has no attachment points by which it can be lifted. For hoisting it into a ship for example, special, approved and TÜV-approved lifting devices are necessary.

4 General Description

4.1 Function

The machine is a towed working machine for lifting potatoes. The lifted potatoes are collected in the bunker. When the bunker is full, the potatoes may either be loaded onto an accompanying vehicle or deposited in a pile.

The machine is fitted with a quick-change system for pickup as standard equipment. The quick-change system enables a quick change between row pickup and the various methods of swath pickup.

Rows are picked up with row pickup. The row pickup system includes a guide control (ridge centring) that guides the machine along the centre of the ridge. This minimises the requirement for operator intervention. The adjustable lifting depth prevents potatoes from being cut by the pickup share. The disc coulters on the sides cut off overhanging haulm. The leaf loading rollers ensures clean transport to the sieving channel sides.

The swath pickup with lifter shaft and cover belt picks up deposited swaths (e.g. potato swath or onion swath). A pickup for special crops is also available.

The sieve conveyor 1 transports the crop into the machine with all the trash. The first separation takes place here. If the ridges are not broken, the shaker and the optional agitator can be actuated in stages to support the separation. Gentle treatment of the crop is important here.

The sieve conveyor 1 transfers the crop to sieve conveyor 2 via the leaf chain. An additional cleaning effect can be achieved with different speeds of the leaf chain and sieve conveyor 2. Gentle treatment of the crop is also important at this stage. At the same time there are up to 7 rows of leaf scrapers with single leaf springs and 3 pull-off rods above the leaf chain. They ensure that any potatoes still attached to the haulm are not lost.

The sieve conveyor 2 is followed by the pintle belt 1 with the deflector roller 1. The deflector roller 1 transfers the crop to the pintle belt 2. Above the pintle belt 2 there is a 4-row rotating finger comb (UFK) with each 2 rows driven separately, which sorts the crop and wipes it on the picking conveyor. Unsorted potatoes are fed with the deflector roller 2 to the trash conveyor.

In the sorting process incorrectly directed crop is removed from the trash conveyor and trash is removed from the sorting conveyor. The optional sorting system enables the stepless sorting of small crops too. Trash from the trach conveyor can be returned to the crop flow via an optional trash return. Trash, e.g. stones, can also be collected in an optional collection box.

The crop is fed into the bunker by the bunker filling conveyor and stored there temporarily. For unloading the bunker is raised to the required height and the crop is transferred to a stationary vehicle alongside or deposited as a pile by the walking floor of the bunker. An optional tray filler and articulated bunker are available for crop protection.

All computers are networked via ISOBUS and supply all information to the driver on the tractor terminal. Most functions of the machine are controlled and monitored by the tractor driver. Some functions can be controlled form the sorting platform. The machine can also be monitored from the tractor with the optional video system.

4.2 Scope of delivery

The scope of delivery of the machine includes:

- 1 ISOBUS standard tractor terminal with attachment fittings.
- 1 lifting control with integrated emergency stop switch with attachment fittings.
- 1 bunker control with attachment fittings.
- Various cables for connecting the operating components.
- 2 wheel chocks.
- 1 key for central electrics box.
- 1 Keiler 1 Original Operating Manual.
- 1 Keiler 1 Original Spare Parts List.
- 1 dirt catcher.
- 2 keys for side cover panels.
- 1 bunker support.
- 1 immobiliser.

Optional equipment for the machine includes:

- 1 ISOBUS touch screen tractor terminal with attachment fittings.
- 1 ISOBUS tractor retrofit set.
- Up to 2 video monitors for display of up to 8 cameras with attachment fittings.
- Various cables for connecting the tractor terminal and video monitors.
- 2 tool box keys.

5 Operating Components

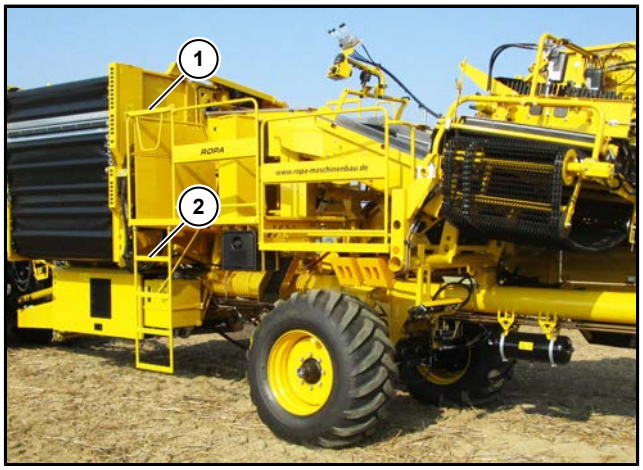
5.1 Ladders

DANGER

– Only persons appointed to sort the crop are permitted on the left and right platforms of the sorting platform during operation of the machine.
– Ascend ladders to the sorting platform only when the machine stands still.
– Maximally three persons are allowed on the left sorting platform and maximally two persons are allowed on the right sorting platform.
– Persons are not permitted on the sorting platform while travelling on public roads.

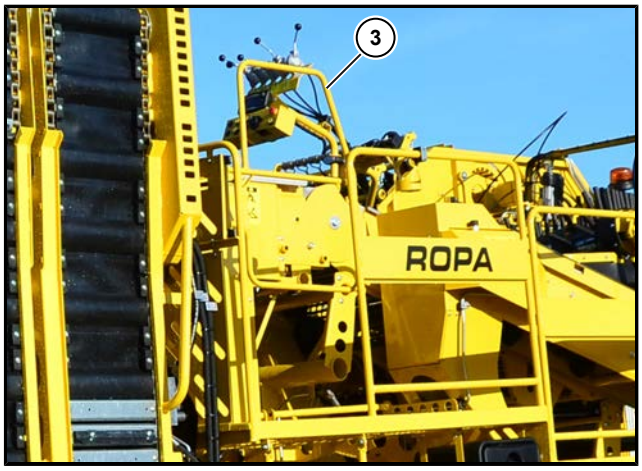
Use ladders. (*See Page 33*)

5.1.1 Left ladder



(1) Safety rail at the ladder left (till year of construction 2017)
(2) Left ladder

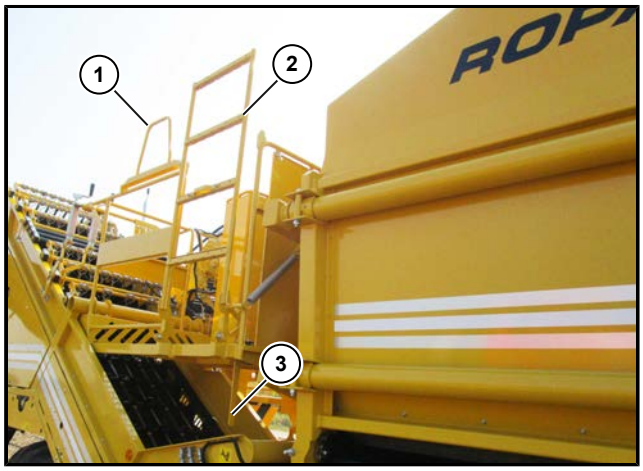
The access ladder of the left sorting platform (**2**) is fixed and cannot be adjusted. This ensures that the machine width is three metres for road travel. The safety rail at the ladder (**1**) must be closed after ascending or descending and kept closed.

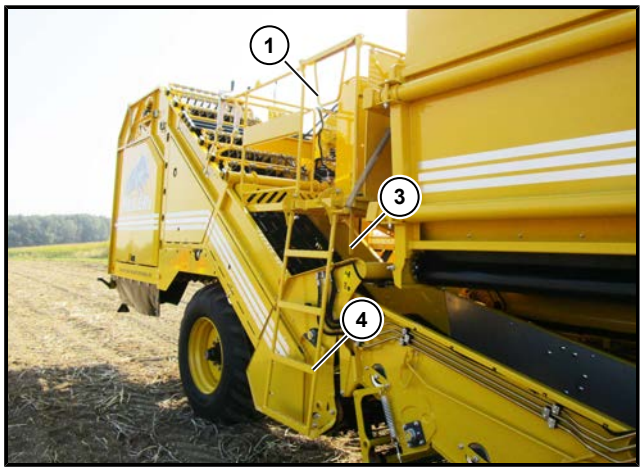


(3) Safety rail at the ladder left (from year of construction 2018)

The safety rail at the ladder (**3**) from year of construction 2018 locks itself by means of the built-in gas spring.

5.1.2 Right ladder





(1) Safety rail at the ladder right (till year of construction 2017)
(2) Right ladder in road position
(3) Release lever on right ladder
(4) Right access ladder in working position

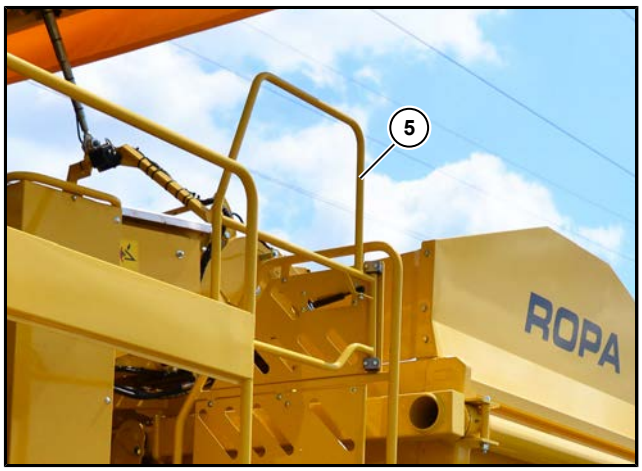
The right access ladder must be in the position (**2**) when driving on the road. This ensures that the machine width is three metres for road travel.

In the "Field" mode the right access ladder must be in the position (**4**). This makes it easy to work on the right sorting stand and enables easy access to or exit from the platform.

To unfold the right access ladder press the right access ladder release lever (**3**) and unfold the ladder. Close safety rail at the right ladder (**1**).

To close, open the safety rail (**1**) and fold in the ladder right with a swing, the ladder must latch.

The safety rail at the ladder (**1**) must be closed after ascending or descending and kept closed.



(5) Safety rail at the ladder right (from year of construction 2018)

The safety rail at the ladder (**5**) from year of construction 2018 locks itself by means of the built-in gas spring.

5.2 Overview of tractor operating components

Overview of Keiler 1 tractor operating components

(1) Video monitor
(2) Bunker operating component
(3) Lifter operating component with emergency stop switch
(4) Tractor touch screen terminal

For a detailed description see Chapter 6 "Operation" (*See Page 77*).

The hardware of the Keiler 1 and Keiler 2 operating components is identical. The tractor operating components for the Keiler 1 with the optional touch screen tractor terminal (**4**), bunker operating component (**2**), lifter operating component with emergency stop switch (**3**) and the optional video monitor (**1**) are shown here.

The lifter and bunker operating components are the most important machine control units. They combine the essential functions of the machine in two ergonomically designed operating components.

5.2.1 Tractor terminal

(1) ROPA ISOBUS standard tractor terminal
(2) ROPA ISOBUS tractor touch screen terminal

The standard terminal (**1**), which is optionally available from ROPA, can be used for a wide range of settings by pressing the soft keys and turning and pressing the rotary wheel.

ROPA also offers an optional touch screen terminal (**2**). Settings can be made by touching (tapping) the screen. Since it is a capacitive touch screen (PCAP), the screen also reacts to touches with stylus or gloves.

The optional ROPA standard tractor terminal (**1**) is described here. Because the machine controls operate on ISOBUS, other ISOBUS-compatible terminals can also be used.

5.2.2 Lifter operating component

WARNING

During operation of the machine there is a danger of undesired movements of the machine which can be a subject of outside electromagnetic impacts.

– Keep the sources of interference, e.g. mobile phones or magnets, far away from the electronics of the machine.
– Never secure the control elements in the tractor cabin with magnets.
– Maintain the safety distances, e.g. to radio masts or to live power lines.

Terminals and control elements used by ROPA are tested for electromagnetic compatibility (EMC) according to DIN EN ISO 14982.

The lifter operating component combines the most important functions for control of lifting.

(1) Automatic axle steering centring:

Sets the automatic axle steering centring to "Activated" status and vice versa. The automatic axle steering centring is active if the LED is on. (*See Page 151*)

(2) ridge centring:

Sets the ridge centring to "Activated" status and vice versa. Ridge centring is active when the LED is on. (*See Page 163*)

(3) automatic depth control:

Sets the preselected automatic depth control from "Preselected" status to "Activated" status and vice versa. Automatic depth control is active when the LED is on.

Ridge pressure regulation. (*See Page 171*)

Ridge pressure relief. (*See Page 185*)

(4) automatic slope compensation:

Sets the automatic slope compensation to "Activated" status and vice versa. Automatic slope compensation is active when the LED is on. (*See Page 155*)

(5) beginning of field:

When this key is pressed, the pickup is lowered, preselected automatic functions are activated. Chains and belts switch on in the specified sequence.

(6) end of field:

When this key is pressed, the pickup is raised, preselectable active automatic functions are reset to the "Preselected" status. Chains and belts switch off in the specified sequence. The drawbar automatically traverse to the bunker unloading position.

(7) lift bunker filling conveyor:

Press and hold the key to lift the bunker filling conveyor manually. When the bunker is folded it is lifted within the allowable range, e.g. for maintenance work. When the bunker is in working position and the bunker filling conveyor reaches the top end position, the walking floor starts until the end switches on the walking floor are tripped. (*See Page 270*)

(8) lower bunker filling conveyor:

Press and hold the key to lower the bunker filling conveyor manually. The bunker is lowered first when it is in working position. (*See Page 270*)

(9) automatic drawbar position:

When the key is briefly pressed the drawbar traverses to the specified position and the position can be reset by pressing and holding the key for more than 5 seconds. The automatic drawbar position is active when the LED is on. (*See Page 150*)

(10) STOP key:

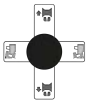
Key for software stop of the machine. After acknowledging the STOP key the machine can be restarted and normal operation can be continued.

(11) axle position correction:

Correct axle steering when axle steering centring is activated. (*See Page 151*)

(12) mini joystick left:

Top	=	Axle to right (*See Page 151*)		
Bottom	=	Axle to left		
Left	=	Drawbar to right	=	Machine to left (*See Page 150*)
Right	=	Drawbar to left	=	Machine to right



(13) mini joystick right:

Top	=	Raise pickup (*See Page 160*)
Bottom	=	Lower pickup
Left	=	Machine inclines to the left (*See Page 155*)
Right	=	Machine inclines to right

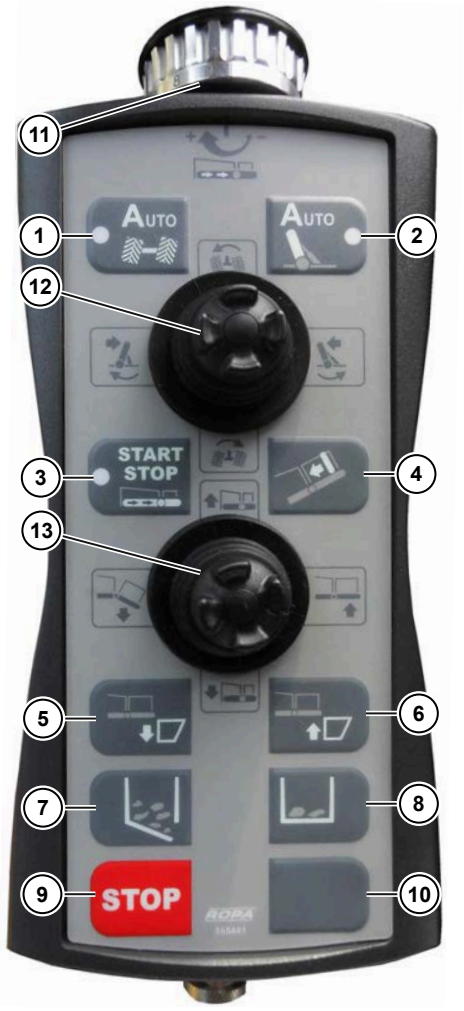
5.2.3 Bunker operating component

WARNING

During operation of the machine there is a danger of undesired movements of the machine which can be a subject of outside electromagnetic impacts.

– Keep the sources of interference, e.g. mobile phones or magnets, far away from the electronics of the machine.
– Never secure the control elements in the tractor cabin with magnets.
– Maintain the safety distances, e.g. to radio masts or to live power lines.

Terminals and control elements used by ROPA are tested for electromagnetic compatibility (EMC) according to DIN EN ISO 14982.



The bunker operating component combines the most important functions for control of the bunker.

(1) Automatic axle steering centring:

Sets the automatic axle steering centring to "Activated" status and vice versa. The automatic axle steering centring is active if the LED is on. (*See Page 151*)

(2) automatic drawbar position:

When the key is briefly pressed the drawbar traverses to the specified position and the position can be reset by pressing and holding the key for more than 3 seconds. The automatic drawbar position is active when the LED is on. (*See Page 150*)

(3) START/STOP bunker walking floor:

Activates the bunker walking floor / large bunker walking floor for manual operation with an initial key press (**START**) and deactivates it with a second key press (**STOP**). The bunker walking floor is active when the LED is on.

Bunker walking floor. (*See Page 269*)

Large bunker walking floor. (*See Page 275*)

Bunker unloading. (*See Page 281*)

(4) reset bunker floor:

Resets the bunker floor. (*See Page 285*)

(5) move tray filler forward:

Swivels the tray filler to working position. (*See Page 283*)

(6) move tray filler back:

Swivels the tray filler to transport position. (*See Page 283*)

(7) open collection box:

Opens collection box. (*See Page 262*)

(8) close collection box:

Closes collection box. (*See Page 262*)

(9) STOP key:

Key for software stop of the machine. After acknowledging the STOP key the machine can be restarted and normal operation can be continued.

(10) Empty key (not used).

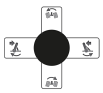
(11) speed of bunker walking floor:

Regulates the speed of the bunker walking floor / large bunker walking floor.

Bunker walking floor. (*See Page 269*)

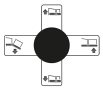
Large bunker walking floor. (*See Page 275*)

Bunker unloading. (*See Page 281*)



(12) mini joystick up:

Top	=	Axle to left (*See Page 151*)		
Bottom	=	Axle to right		
Left	=	Drawbar to right	=	Machine to left (*See Page 150*)
Right	=	Drawbar to left	=	Machine to right

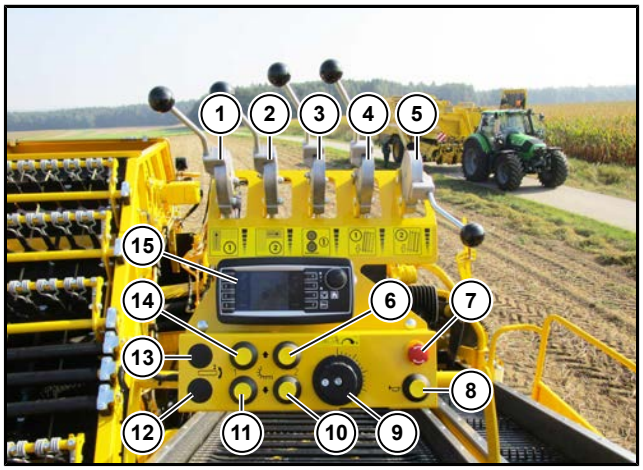


(13) mini joystick down:

Top	=	Lift bunker (*See Page 268*)
Bottom	=	Lower bunker
Left	=	Lower articulated bunker section (*See Page 282*)
Right	=	Lift articulated bunker section / small bunker walking floor speed (*See Page 275*)

5.3 Overview of machine controls

5.3.1 Control unit above picking conveyor



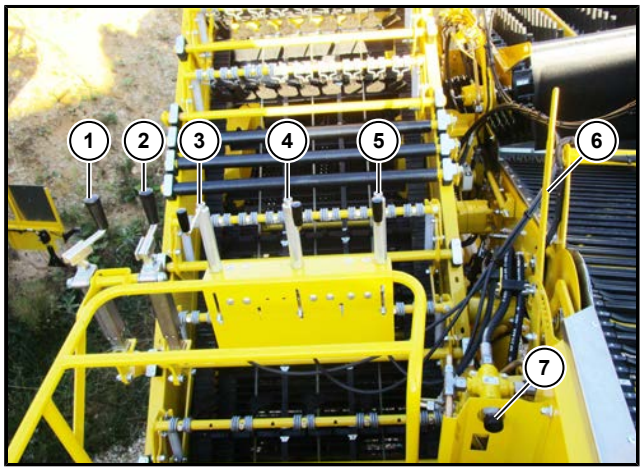
(1) Bowden cable for pintle belt 1 speed (*See Page 221*)
(2) Bowden cable for pintle belt 2 speed (*See Page 232*)
(3) Bowden cable for deflector roller 1 speed (*See Page 226*)
(4) Bowden cable for UFK 1 speed (*See Page 238*)
(5) Bowden cable for UFK 2 speed (*See Page 238*)
(6) Key raise UFK 2 (*See Page 238*)
(7) Emergency stop sorting platform switch
(8) Key tractor terminal horn
(9) Picking conveyor speed (*See Page 255*)
(10) Key lower UFK 2
(11) Key lower UFK 1
(12) Key lower pintle belt 1/2 inclination
(13) Key raise pintle belt 1/2 inclination (*See Page 245*)
(14) Key raise UFK 1 (*See Page 238*)
(15) Sorting platform terminal

Depending on the equipment of the machine, the individual operating components may differ.

ADVICE

The emergency stop switch shuts off the software and hardware of all computer outlets. This means that all electric actuators on the machine are no longer operational. The emergency stop switch never shuts off the tractor and the pump distributor gears. The machine can only be switched on again after acknowledgement via the standard switch-on sequence.

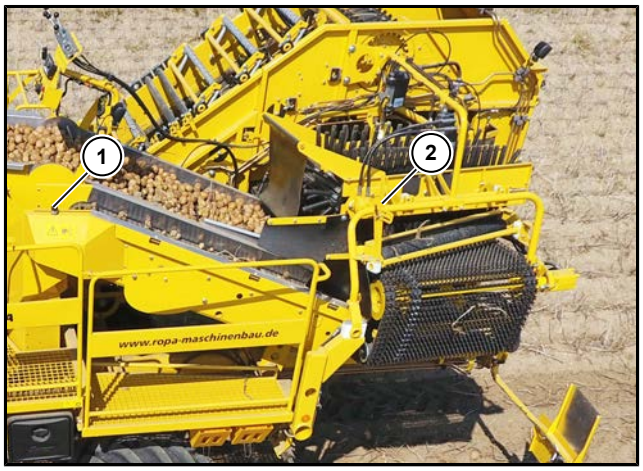
5.3.2 Operating components of the right sorting platform

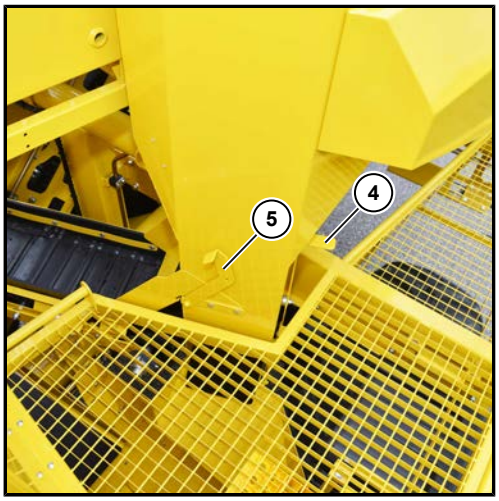


(1) Crank for rear leaf-scraper height (*See Page 218*)
(2) Crank for front leaf-scraper height (*See Page 218*)
(3) Crank for deflector roller 1 height (*See Page 226*)
(4) Crank for UFK 1 height (*See Page 238*)
(5) Crank for UFK 2 height (*See Page 238*)
(6) Lever for sorting distance (*See Page 255*)
(7) Rotary wheel for sorting speed (*See Page 255*)

Depending on the equipment of the machine, the individual operating components may differ.

5.3.3 Operating components of the left sorting platform

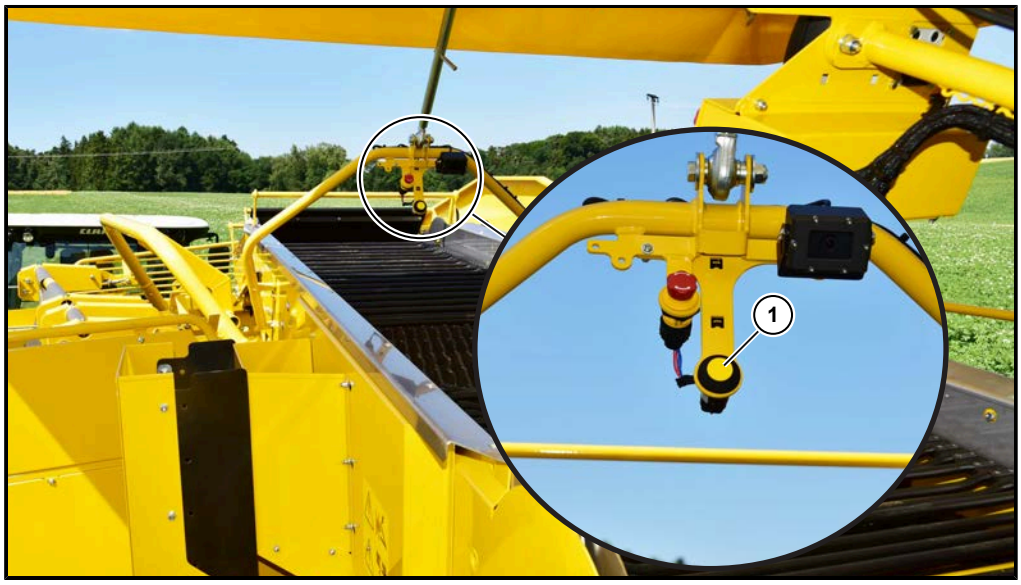




(1) Rotary wheel for trash conveyor speed (*See Page 259*)
(2) Adjusting lever for deflector roller 2 (*See Page 237*)
(3) Lever for sorting container flap (*See Page 261*)
(4) Lever for trash conveyor changeover flap (*See Page 259*)
(5) Lever for trash return switching flap (*See Page 260*)

Depending on the equipment of the machine, the individual operating components may differ.

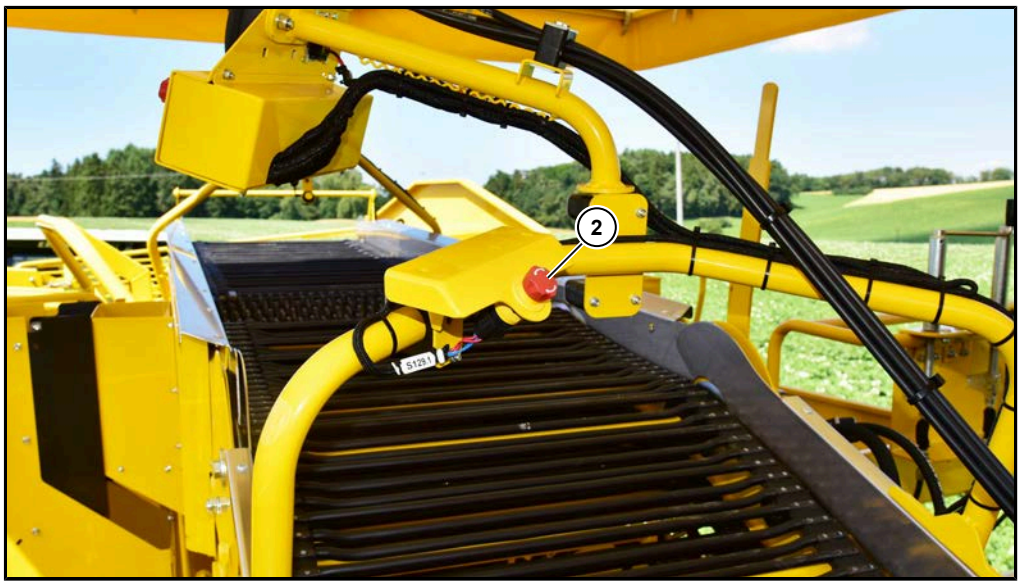
5.3.4 Double bunker operating component



(1) Key double bunker walking floor (*See Page 278*)

5.3.5 Additional sorting platform emergency stop switch (optional)

The optional additional emergency stop switch of the sorting platform is country-specific.



(1) Sorting platform emergency stop switch front
(2) Sorting platform emergency stop switch rear

ADVICE

If one of three emergency stop switches of the machine is pressed, the message "Sorting platform emergency stop switch is on!" appears on the tractor terminal..

6 Operation

This chapter provides all information for operation of the machine. For most work in an agricultural area, the mode of working and the work results are under the influence of many individual and different factors. The scope of this operating manual would be exceeded if we have considered all conceivable situations (ground condition, potato varieties, weather, individual growing conditions, etc.). This operating manual cannot be an instruction manual for lifting potatoes or nor can it replace driver training for driving on the road. Preconditions for operation of this machine and for optimum harvest results are, besides driver training offered by the manufacturer, solid basic agricultural knowledge and some experience with growing potatoes and the associated work processes. This chapter provides information about processes of operation and interactions during operation of the machine. You will find an exact description of adjusting work for the individual functional components in the respective chapters. The required maintenance work is described in chapter 7, "Maintenance and Services".

ADVICE

Obtain comprehensive information about the safety measures for operation of this machine before each operation of the machine. Should any people be present, who are not informed about the applicable hazard zones and safety distances, then inform these people about safety distances and hazard zones. Indispensably inform these people that you will immediately shut down the machine as soon as anyone unauthorized comes close to the hazard zones.

6.1 First startup

For safety reasons check all oil levels. Otherwise, all work and measures are required for first startup as they must be performed for daily startup.

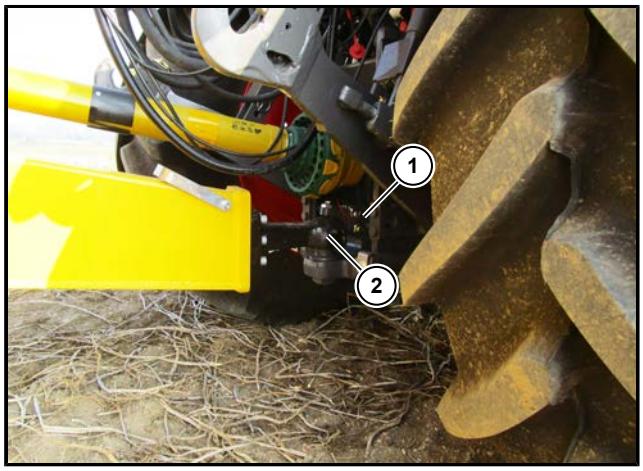
All bolted connections must be checked for tightness after the first 10 operating hours and retightened in case of need. In addition, the complete hydraulic system must be checked for leaks. Possibly existing leaks must be repaired immediately.

Stow the supplied accessories such as wheel chocks (**1**) and dirt catcher in compartments or brackets provided for them.

ADVICE

All hydraulic oil circuits on the machine (support foot, tractor hydraulics and machine hydraulics) are filled at the factory with **HVLP 46 hydraulic oil** (ISO-VG 46 in accordance with DIN 51524 Part 3)!

6.1.1 Adjusting the drawbar eye



(1) Train coupling
(2) Drawbar eye ball secured

When the machine is coupled, the main frame must always be horizontal to the ground or sloping slightly up to the tractor. The drawbar eye (**2**) can be screwed on the drawbar in three different positions to adjust the main frame to the tractor.

The machine has different drawbar eyes: the drawbar eye ball, 40 mm drawbar eye, and for export the hitch drawbar eye and the drawbar eye Cuna.

6.1.1.1 Drawbar eye ball (optional)

With the standard bunker, the ball coupling on the tractor must be approved for the support load of 2,000 kg (till year of constr. 2017) or 2,500 kg (from year of constr. 2018).

The ball coupling on the tractor with a double bunker must be approved for the support load of 2,500 kg.

Drawbar eye ball

Proceed as follows to adjust the height of the drawbar eye ball:

– Move the support foot until the machine stands horizontally, close the support foot stopcock.
– Loosen screws.
– Move the drawbar eye ball to the height of the tractor ball.
– Tighten the screws to a torque of 310 Nm.
– Specified screws: cheese head screw **M16*50 DIN912, steel 10.9 flZnnc.**

ADVICE

The drawbar eye ball used by ROPA (Ropa item no. 212009200) is permitted for a support load of 3,000 kg.

6.1.1.2 40 mm drawbar eye

With the standard bunker, the 40 mm train coupling on the tractor must be approved for the support load of 2,000 kg (till year of constr. 2017) or 2,500 kg (from year of constr. 2018).

The 40 mm train coupling on the tractor with a double bunker must be approved for the support load of 2,500 kg.

40 mm drawbar eye

Proceed as follows to adjust the height of the 40 mm drawbar eye:

– Move the support foot until the machine stands horizontally, close the support foot stopcock.
– Loosen screws.
– Move the 40 mm drawbar eye to the height of the tractor coupling.
– Tighten the screws to a torque of 310 Nm.
– Specified screws: cheese head screw **M16*50 DIN912, steel 10.9 flZnnc.**

ADVICE

The 40 mm drawbar eye used by ROPA (Ropa item no. 212006300) is permitted for a support load of 2,500 kg.

6.1.1.3 Drawbar eye hitch (export)

With the standard bunker, the hitch coupling on the tractor must be approved for the support load of 2,000 kg (till year of constr. 2017) or 2,500 kg (from year of constr. 2018).

The hitch coupling on the tractor with a double bunker must be approved for the support load of 2,500 kg.

Drawbar eye hitch

Proceed as follows to adjust the height of the drawbar eye hitch:

– Move the support foot until the machine stands horizontally, close the support foot stopcock.
– Loosen screws.
– Move the drawbar eye hitch to the height of the tractor coupling.
– Tighten the screws to a torque of 310 Nm.
– Specified screws: cheese head screw **M16*50 DIN912, steel 10.9 flZnnc.**

ADVICE

The drawbar eye hitch used by ROPA (Ropa item no. 212009300) is permitted for a support load of 3,000 kg.

6.1.1.4 Drawbar eye Cuna

With the standard bunker, the Cuna coupling on the tractor must be approved for the support load of 2,000 kg (till year of constr. 2017) or 2,500 kg (from year of constr. 2018).

With the double bunker, the Cuna coupling on the tractor must be approved for the support load of 2,500 kg.

Drawbar eye Cuna

Proceed as follows to adjust the height of the Cuna drawbar eye:

– Move the support foot until the machine stands horizontally, close the support foot stopcock.
– Loosen screws.
– Move the Cuna drawbar eye to the height of the tractor coupling.
– Tighten the screws to a torque of 610 Nm.
– Specified screws: cheese head screw **M20*70 DIN912, steel 10.9 ZN**.

ADVICE

The drawbar eye Cuna used by ROPA (Ropa item no. 212010900) is permitted for a support load of 2,500 kg.

6.1.2 Adjustment of the cardan shaft

The length of the cardan shaft between the tractor and the machine must be adjusted when first installed. When different tractors are used with the same machine the length of the cardan shaft must be checked. An operating manual of the cardan shaft manufacturer is delivered with the machine. Follow the instructions to adjust the length of the cardan shaft.

(1) Wide-angle cardan shaft protection secured

The shaft guard must always be locked to prevent it from rotating with the shaft. The torsion lock (**1**) must be engaged for this purpose.

6.1.3 Adjustment of the hydraulic system

WARNING

Risk of burns when working on the hot hydraulic system!

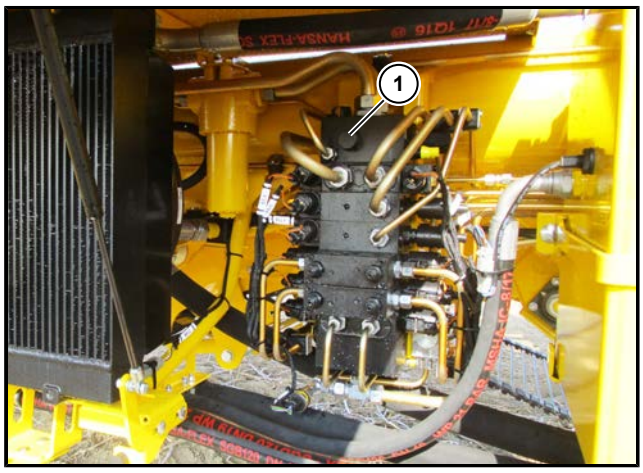
Allow the hydraulic system to cool before starting work on it. Wear gloves when working on the hydraulic system.

WARNING

The hydraulic system is under high pressure.

Hot hydraulic fluid may emit from leaks and cause severe injuries! The prestress of the pressure reservoirs is present even when the remaining hydraulic system is already pressureless. When dirt, even only in the smallest quantities, enters the hydraulic system, this may lead to serious damage to the complete hydraulic system.

- Work on pressure reservoirs of the machine may only be performed by trained personnel.
- When working on the pressure reservoirs, the machine must first be rendered completely pressureless.
- The pressure reservoirs themselves may in no case be damaged or opened, because substantial injuries to people can occur due to the constant prestress.
- During all work on the hydraulic system, ensure extreme cleanliness.



(1) Adjusting screw on the 6-part LVS block

The hydraulic system on the machine must be adjusted for the tractor hydraulic system. See the tractor manual for the required operating mode for the machine.

– Turn the adjusting screw (**1**) on the 6-part LVS block in to the stop to adjust the load sensing system for the machine. This is necessary if the machine is connected to the tractor via load sensing. Dynamic pressure must not build up when the machine is reversed.
– Turn the adjusting screw (**1**) on the 6-part LVS block out to the stop to adjust the machine for hydraulic system constant flow. This is necessary if the machine is connected to the tractor via a single-acting or double-acting control unit. Dynamic pressure must not build up when the machine is reversed.

ADVICE

We recommend operating the machine with a load sensing system. This will prevent unnecessary heating of the hydraulic oil.

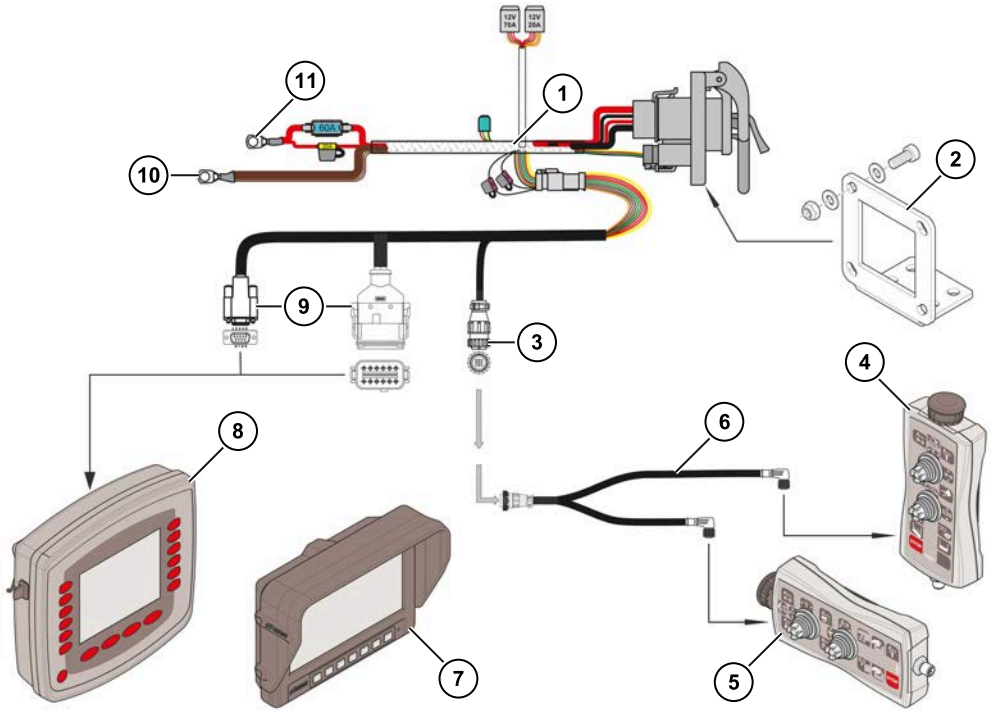
6.1.4 Number plate

In accordance with the regionally applicable regulations, a number plate must be attached to the rear of the machine below the number plate light.
The number plate may have a maximum size of 255 mm x 165 mm.

(1) Number plate 255 mm x 130 mm in Germany

6.1.5 Installing the electrics on the tractor

Tractor without ISOBUS:

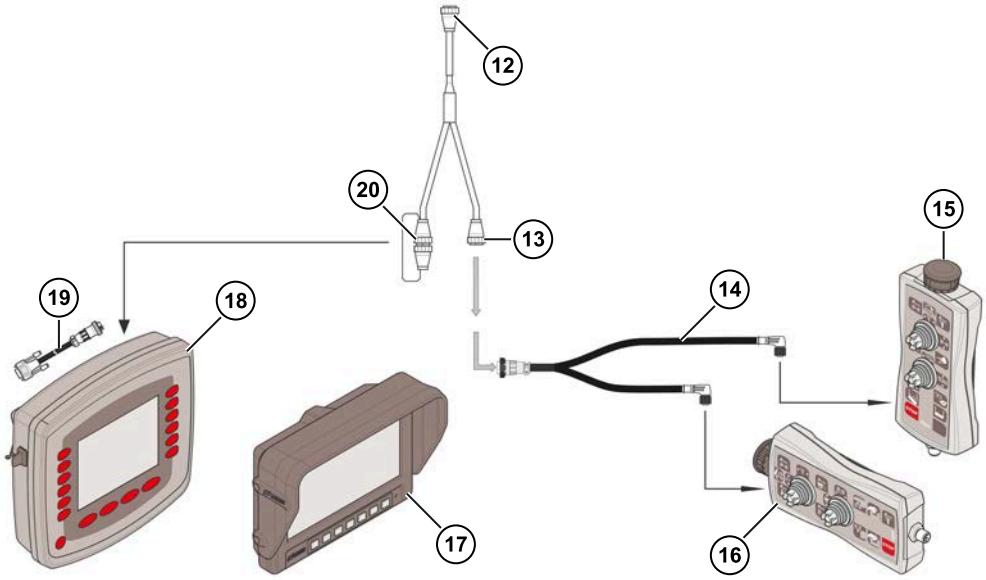


(1) ISOBUS retrofit set
(2) ISOBUS outlet holder
(3) InCab-connection
(4) ISOBUS control element bunker control
(5) ISOBUS control element lifting control
(6) InCab cable control elements
(7) Video monitor (option)
(8) Tractor terminal
(9) Tractor terminal connection
(10) Ground connection ISOBUS retrofit set
(11) Supply connection ISOBUS retrofit set

Proceed as follows:

– Install the ISOBUS retrofit kit (**1**) properly in the tractor with cable ties so that the InCab connection (**3**) and the tractor terminal connections (**9**) are located in the tractor cabin, the ISOBUS socket holder (**2**) at the rear of the tractor is screwed to the ISOBUS socket, the ground connection (**10**) is screwed tightly to the ground connection of the battery and the supply connection (**11**) is screwed tightly to the positive terminal of the 12 volt battery.
– Connect the optional video monitor (**7**) to the power supply cable of the video monitor. Mount the video monitor in the cabin.
– Connect the cable InCab control elements (**6**) to the InCab connection (**3**).
– Connect the control element ISOBUS lifting control (**5**) to the short end of the cable InCab control elements (**6**), mount the emergency stop switch bracket and the emergency stop switch to the control element and install the control element ISOBUS lifting control (**5**) in the tractor cabin.
– Connect the control element ISOBUS bunker control (**4**) to the long end of the cable InCab control elements (**6**) and install it in the tractor cabin.
– Attach the tractor terminal (**8**) to the appropriate tractor terminal connection (**9**) and install it in the cabin.

Tractor with pre-installed ISOBUS:



(12) Cable Y InCab connection tractor InCab
(13) Cable Y InCab connection InCab
(14) InCab cable control elements
(15) ISOBUS control element bunker control
(16) ISOBUS control element lifting control
(17) Video monitor (option)
(18) Tractor terminal
(19) Cable InCab tractor terminal
(20) Cable Y InCab terminal connection

Proceed as follows:

– Connect cable Y InCab connection tractor InCab (**12**) to the tractor InCab.
– Connect the optional video monitor (**17**) to the power supply cable of the video monitor. Mount the video monitor in the cabin.
– Connect the cable InCab control elements (**14**) to cable Y InCab connection InCab (**13**).
– Connect the control element ISOBUS lifting control (**16**) to the short end of the cable InCab control elements (**14**), mount the emergency stop switch bracket and the emergency stop switch to the control element and install the control element ISOBUS lifting control (**16**) in the tractor cabin.
– Connect the control element ISOBUS bunker control (**15**) to the long end of the cable InCab control elements (**14**) and install it in the tractor cabin.
– Connect the tractor terminal (**18**) with the cable InCab tractor terminal (**19**) to cable Y InCab terminal connection (**20**) and mount tractor terminal in the cabin.

6.2 Safety regulations for operation of the machine

- Before starting work, familiarize yourself with the machine and the operating components. In case of need, obtain instructions from a person already having sufficient experience in handling the machine.
- Before each startup, check the machine for driving and operating safety.
- Instruct all people staying in the vicinity of the machine about the hazard zones and the applicable safety regulations for handling of the machine. Strictly prohibit all people to enter the hazard zones while the machine is running. The appendix to this operating manual contains a drawing showing the hazard zones of the machine. In case of need, copy this sheet and possibly hand it out to all people present during operation of the machine. Obtain confirmation of receipt of this sheet from each person by their signature.
- Persons are not permitted to ride on the sorting platform when driving on roads. If a person is required to accompany the machine, this person must use the tractor emergency seat exclusively as soon as the tractor engine is started or while the machine is moving. If this regulation is deviated from for training purposes, then this is done at your own risk and under the responsibility of each of those participating.
- Only persons who have been trained and have reached the legal minimum age are permitted on the sorting platform in the field. Maximally two persons are allowed on the right sorting platform and maximally three persons are allowed on the left sorting platform in the field.
- The effectiveness of operating or adjusting components must not be impaired or bypassed in any way. Safety installations may neither be circumvented nor bridged or otherwise be rendered ineffective.
- When working with and on the machine, always wear tightly fitting and suitable protective clothing respectively approved personal protective equipment. Depending on the activities, the following personal protective equipment is required: warning vest, protective helmet, safety boots, hand protection, ear protection, face protection.
- The bunker and all other parts of the machine apart from the sorting platform must not be accessed while the tractor engine is running.
- Persons must not enter or leave the sorting platform unless the machine is stationary.
- Always give a short signal with the horn before starting the machine. This draws the attention of all people in the vicinity to the need of exiting the hazard zones. Convince yourself that no people are located in the hazard zones when the machine is started.
- Make sure of sufficient fire protection by keeping the machine free of dirt, grease residue and other combustible objects. Clean up spilt fuel or oils immediately using suitable binding agents.
- Do not run the machine in enclosed spaces. There is a risk of poisoning due to poisonous tractor engine exhaust gases. If the machine is to be operated in an enclosed area for maintenance or adjustment, then the exhaust gases of the tractor must be routed outside using suitable equipment (suction fan, exhaust hoses, exhaust pipe extensions etc.).
- When driving on public roads and paths, in your own interest, comply with the applicable laws and regulations.
- Safe operation of the machine requires the full concentration and attention of the driver. Do not wear headphones for listening to the radio or for monitoring radios, etc.
- While driving, do not use radios, mobile phones etc. Should it be necessary, for operational reasons, to use such devices while driving, then always use a suitable hands-free device for this purpose.
- Before starting the tractor, set the exterior rearview mirrors so that you can monitor and see the complete driving and working area of the machine.

- Before driving off, always check if there are people present in the immediate vicinity of the machine. Inform these people about your plans and instruct these people to keep a safe distance.
- The individual vehicle handling of the machine always depends on the road condition respectively the ground. Always adjust your driving to the current environmental and ground conditions.
- Never leave the driver's seat of the tractor with the engine running.
- When working in slopes and on hillsides, always make sure of sufficient stability of the machine.
- Be aware of the various fill levels of the bunker and the consequent weight distribution of the machine. This will change the behaviour of the machine during potential tipping, e.g. the machine is more likely to tip at the pickup if the bunker is half full.
- Do not lift the bunker until just before unloading it into a trailer. A raised bunker moves the centre of gravity of the machine significantly upwards. This increases the danger of tipping the machine. Drive at moderate speed with the bunker raised.
- Drive at moderate speed when turning the machine in the field. Always set the drawbar to the "straight-ahead position". This will reduce the danger of tipping the machine.

6.2.1 Working in the vicinity of overhead power lines

DANGER

Hazard to life due to electrical current!

Due to the dimensions of the machine, the landscape and the construction of power lines, the prescribed safety distance may be violated when working in the vicinity of or under power lines. This involves the risk of death by electrocution for the driver, sorting personnel and bystanders.

- When working in the vicinity of power lines, indispensably comply with the applicable minimum distances. These minimum distances between the outside edge of the machine and the power line may amount to up to 8.5m. The size of this minimum distance always depends on the voltage of the power line. The greater the voltage, the greater the prescribed minimum distance. Obtain information from the power company responsible about the technical situation in due time before starting harvesting work. In case of need, agree on temporary shutdown of the power line for the time, during which you are performing harvesting work.
- Strictly abide with the agreements made between the power company and you about possible shutdown of power. Only begin your work after you have ensured yourself that shutdown has actually happened, for instance by calling the power company and enquiring about this.
- Especially when performing work at night or in vision-impairing weather, inform yourself exactly about the routing of power lines. In case of need, have warning or safety marshals set up, which will warn you using suitable signalling equipment (visible or audible indications) about hazardous proximity to power lines.
- While lifting, make sure that you do not violate the prescribed minimum distances.
- When installing antennas or other auxiliary devices, always make sure that the total height of the machine in no case exceeds a dimension of 4m.

Well memorize the following behavioural rules when you are working in the vicinity of power lines. Exact compliance with these rules may save your life.

6.2.2 Behaviour during or after contact to the power lines

- Immediately try to interrupt contact to the power line by backing up.
- Try to lower the bunker if it is raised and comes into contact with the power line.
- Try to lift the pickup if it is lowered.
- Stay seated in the driver's seat of the tractor – no matter what happens around you!
- Do not walk around in the tractor cabin.
- In case of electrical shock or after contact to a power line, in no case leave the driver's cabin of the tractor. You are in danger of death outside the tractor cabin.
- Sorting personnel on he sorting platform should stand still and not move nor touch anything with their hands. Do not leave the sorting platform under any circumstances. Personnel are in danger of death if they leave the sorting platform.
- Wait until help arrives.
- In no case use a cell phone or a radio connected to an external antenna.
- Warn any people approaching the machine of the danger with hand signals and loud shouting.
- Only leave the driver's cabin of the tractor and the sorting platform after you have been instructed to do so by rescue personnel.

6.3 Operating concept with ISOBUS

The machine is always ISOBUS-compatible.

The tractor terminal is the information and command centre of the machine. This is where you monitor the overall machine, obtain information about operating status and performance data and make settings for parts of the machine.

Before starting work, you must familiarise yourself with operation using ISOBUS and with the various warning and status displays to ensure that you can operate the machine safely and efficiently.

The optional ROPA standard tractor terminal is described here. Because the machine operates with ISOBUS, different tractor terminals may vary from this description.

6.3.1 Tractor terminal

(1) Standard tractor terminal

The operation of the machine is divided into two basic sections, operation on the tractor and operation on the machine.

A user-friendly tractor terminal (**1**) with the ISOBUS operating concept is installed on the tractor. It has the lifter and bunker controls.

You navigate through the menus by turning and pressing the rotary wheel on the tractor terminal. The active selection is indicated by a black frame that shows the current selected function. You can also navigate through the menus by pressing the soft keys.

Lightly pressing the middle of the rotary wheel (enter function) confirms the current position of the cursor. The touch operation is not discussed in this manual, because it is similar to rotating/pushing the key and can only be directly selected here. Depending on the type of touch terminal you may need to press once or twice to select a function.

6.3.1.1 Task Controller basic (option)

The Task Controller records the total values. It records the area (ha), the distance (km) and the time (h) of the machine. Data are exchanged between the field file and the Task Controller in the ISO-XML data format. Orders can be conveniently imported into the Task Controller and the complete documentation can be exported on completion of the work.

See the terminal manufacturer's operating manual for setting up the Task Controller on your tractor terminal. To be able to use the Task Controller a release for the terminal must be purchased.

6.3.1.2 Tractor terminal display areas

(A) Warning indicator display area
(B) Working screen display area
(C) Automatic functions display area
(D) Display area soft key
(IN) Standard terminal display area
(F) On/Off switch

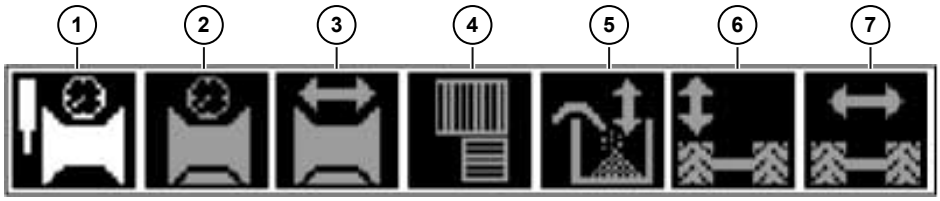
[A] Warning indicator display area (*See Page 128*)

DZ IN	B522 Sensor error Rpm sieve conveyor 2

[B] Working screen display area

The working screen display area shows all machine states and all electrically actuated valves can be adjusted in this area. The various working screens are accessed with soft keys.

[C] Automatic functions display area



(1) Ridge pressure relief (*See Page 185*)
(2) Ridge pressure regulation (*See Page 171*)
(3) Ridge centring (*See Page 163*)
(4) Pintle automatic function (*See Page 245*)
(5) Automatic filling (*See Page 271*)
(6) Slope compensation (*See Page 154*)
(7) Wheel steering (*See Page 151*)

The automatic functions display area shows all states of the automatic functions.
White = Deactivated.
Grey = Preselected.
Green = Activated.
The automatic functions are only displayed in the Field operation, Pickup, Sieving channel, Separation and Belt cleaning menus.

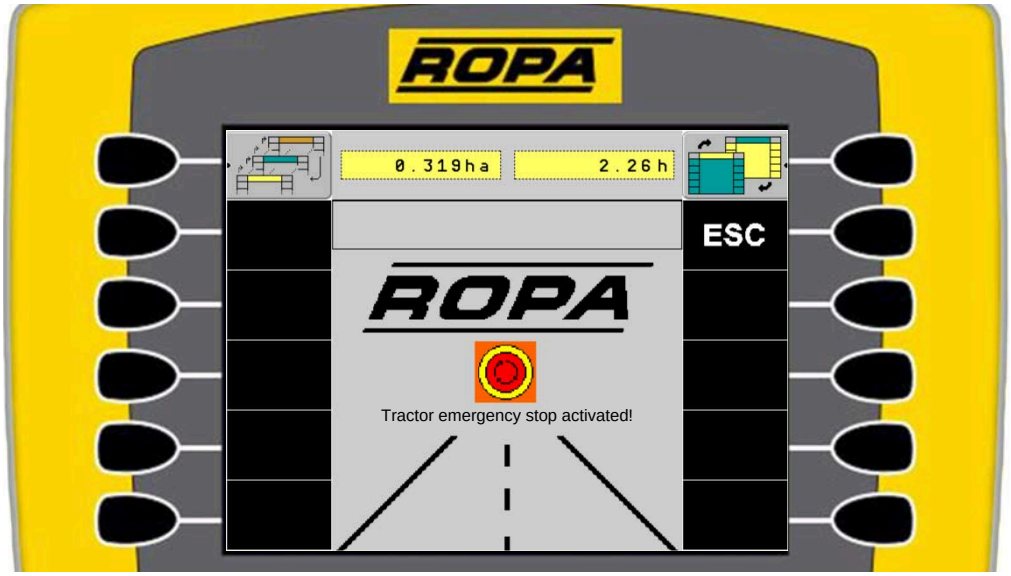
[D] Display area soft keys

The display of the soft keys on the tractor terminal depends on the model of the ISOBUS terminal. In this manual you can see the view of the left and right soft keys on the screens of the optional ROPA ten-key ISOBUS terminal. The option of more or fewer keys on other ISOBUS terminals may change the soft key positions of the various functions.

6.3.1.2.1 ESC key

The ESC key is available in almost all levels of the working screens and in the main menu with its submenus of the tractor terminal. By pressing shortly the ESC key, you can move step by step one level up in the working screens or in the main menu with its submenus. You can go directly to the main page by pressing the ESC key for a longer time.

6.3.1.2.2 Road mode



The machine must be in road mode only for travel on public roads (*See Page 142*). This is the only way to ensure that the machine is folded and that no computer outputs are under power. This makes unwanted steering movements impossible.

The operator can move from the road mode screen to the main working screen by selecting the ESC soft key.

ADVICE

If the machine is not in road mode, the emergency stop switch is not pressed and the bunker is folded in, the warning message "Press tractor emergency stop" is displayed at a speed above 8 km/h.

6.3.1.2.3 Field operation menu

(1) Dropdown menu soft key
(2) Pickup soft key
(3) Sieving channel soft key
(4) Separation soft key
(5) Picking table soft key
(6) Main menu soft key
(7) Machine manual On/Off soft key
(8) Sorting platform terminal soft key
(9) Sorting platform quick adjustment soft key
(10) Conveyors manual soft key

The folding mode menu (**1**) contains the functions (*See Page 100*) for moving the bunker from road position to working position and vice versa.

The pickup menu (**2**) contains the functions (*See Page 101*):

- Ridge pressure relief.
- Ridge pressure regulation.
- Lifting depth.
- Hydraulic disc coulter.
- Swath pickup.

The sieving channel menu (**3**) contains the functions (*See Page 105*):

- Conveyor pressure threshold adjustment.
- Sieve conveyors, leaf chain.
- Shaker.
- Agitator.

The separation menu (**4**) contains the functions (*See Page 108*):

- Conveyor pressure threshold adjustment.
- Pintle belt speeds.
- Pintle belt 1/2 inclination.
- Rotating finger comb.

The picking table menu (**5**) contains the functions (*See Page 112*):

- Picking conveyor speed.

Main menu (**6**) (*See Page 114*):

The machine manual On/Off soft key (**7**) switches the machine drive On or Off manually if the PTO is engaged and it displays the status of the machine:

- machine is shut off if the tractor PTO is disengaged.
- machine is switched on if the tractor PTO is engaged.
- machine is switched on with the tractor PTO disengaged (green/white flashing).

The soft key (**8**) releases or locks the sorting platform terminal for operation. If the sorting platform terminal is enabled the soft key is green.

The sorting platform quick adjustment soft key (**9**) releases and locks the electrical adjustment functions on the sorting platform:

- sorting platform quick adjustment locked.
- picking table speed adjustment on sorting platform enabled and locked at tractor terminal.
- rotating finger comb 1, rotating finger comb 2 and pintle belt 1/2inclination height adjustment enabled at the sorting platform and at the tractor terminal.
- sorting platform adjustments completely enabled, locked on tractor terminal and heights enabled.

The manual conveyors menu (**10**) contains the functions (*See Page 112*):

- Minimal actuation of chains and conveyors.
- Maximal actuation of chains and conveyors.
- Selecting which conveyors and chains are to be actuated.

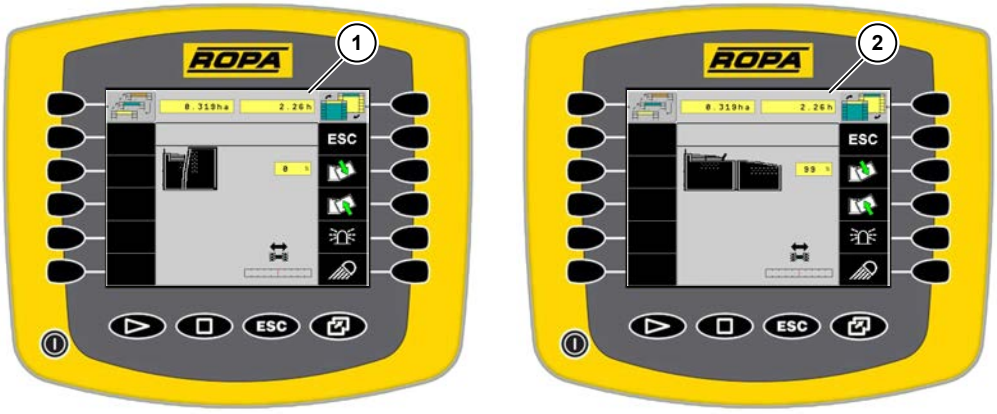
6.3.1.2.4 Folding mode menu

WARNING

Hazard of extremely severe injuries.

– Make sure that there are no persons in the danger zone.
– The sorting platforms may not be entered while the bunker is being folded.

The folding mode menu can be accessed from the field operation menu with the soft key . The field operation menu can be accessed from the folding mode menu with the soft key ESC.



(1) Dropdown menu road position
(2) Dropdown menu lifting position/bunker unloading position

The folding mode menu controls the adjustment of the bunker from road position to field operation for work (**2**) or from field operation to road position for road travel (**1**).

Press the soft key to move the bunker into working position. Press and hold the soft key for this operation.

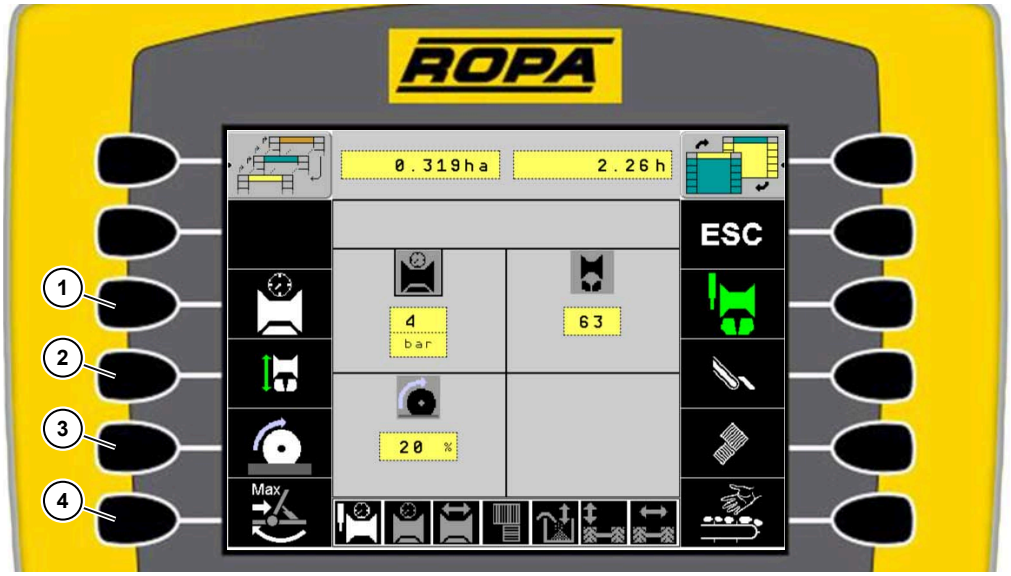
Press the soft key to move the bunker into road position. Press and hold the soft key for this operation.

Press the soft key to switch the optional rotating beacon on and off. The soft key is green when the rotating beacon is switched on.

Press the soft key to switch the optional LED working floodlights on and off. When the LED working floodlights are switched on the soft key is green.

Warning indicators in the display area notify the operator if conditions for folding the bunker have not been met. The actual position of the axles steering is also displayed.

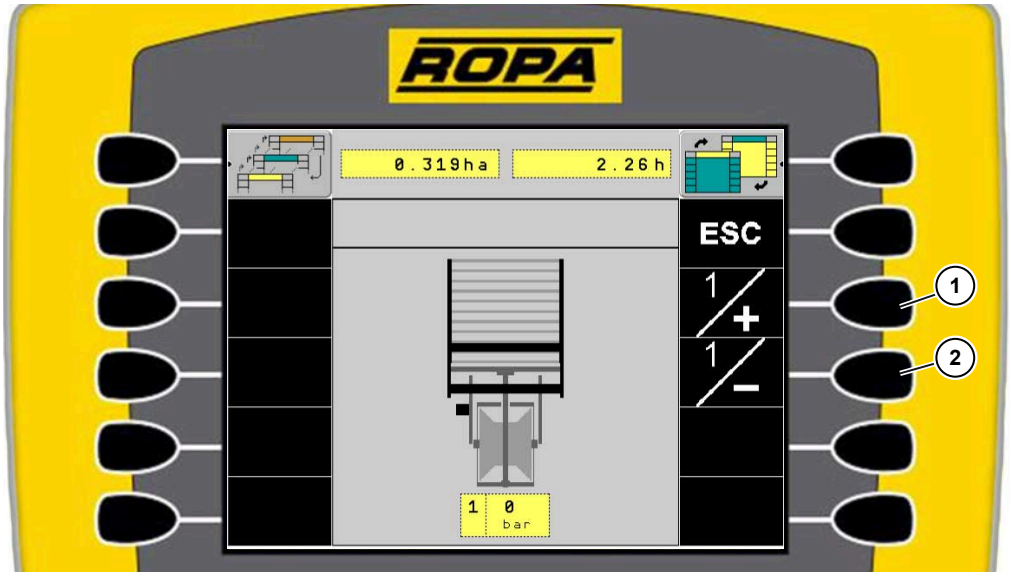
6.3.1.2.5 Pickup menu



(1) Soft key preselected or activated automatic depth control
(2) Lifting depth soft key
(3) Swath pickup soft key or hydraulic disc coulter
(4) Soft key optional drawbar

The pickup menu is opened when the soft key for the pickup is green. The pickup menu contains the settings for ridge pressure relief or ridge pressure regulation (depending on the preselected automatic function), lifting depth and the swath pickup or the hydraulic disc coulter (depending on the installed pickup variant). By selecting these submenus you can directly access the adjustment options.
Use the soft key to activate the drawbar.

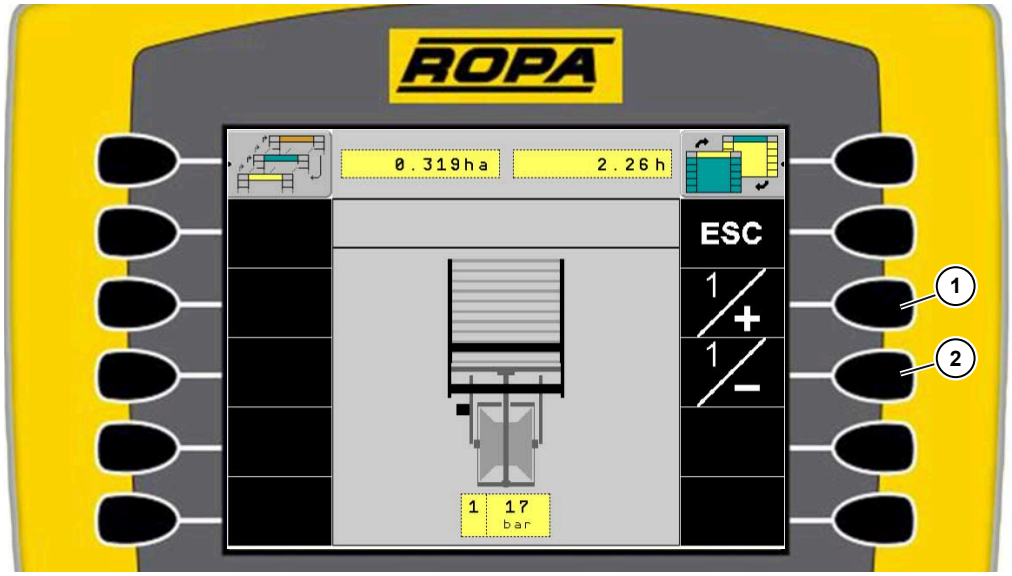
Ridge pressure relief (*See Page 185*)



(1) Soft key increase ridge pressure relief
(2) Soft key reduce ridge pressure relief

The pressure for the ridge pressure relief is opened with the soft key and each side of the pickup can be adjusted within a range of 0 bar to 70 bar. In this case 0 bar is floating position and 20 bar minimal relief pressure, e.g. for dry or sandy soil to enable easier pickup of the ridge. The maximum relief pressure is 70 bar, e.g. for wet conditions or heavy soil. The soft key "Increase ridge pressure relief" (**1**) increases the value, and the soft key "Reduce ridge pressure relief" (**2**) reduces the value.

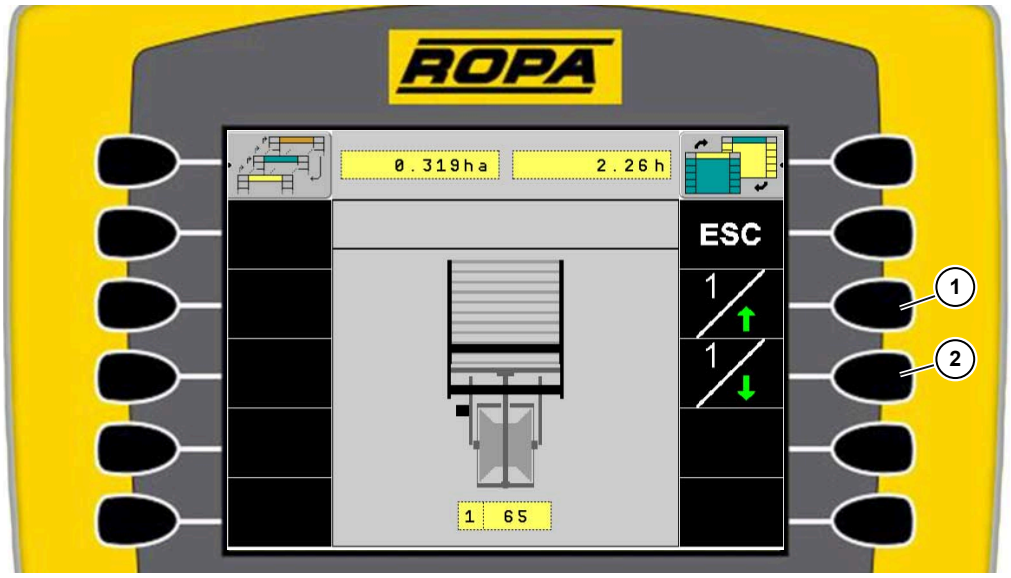
Ridge pressure regulation (*See Page 171*)



(1) Soft key increase ridge pressure regulation
(2) Soft key reduce ridge pressure regulation

The pressure for the ridge pressure regulation is opened with the soft key and each side of the pickup can be adjusted within a range of 5 bar to 35 bar. The pressure is minimal at 5 bar, e.g. for wet conditions or heavy soil. And at 35 bar the pressure is maximum, e.g. dry or sandy soil to allow the ridge to be picked up. The soft key "Increase ridge pressure regulation" (**1**) increases the value, and the soft key "Reduce ridge pressure regulation" (**2**) reduces the value.

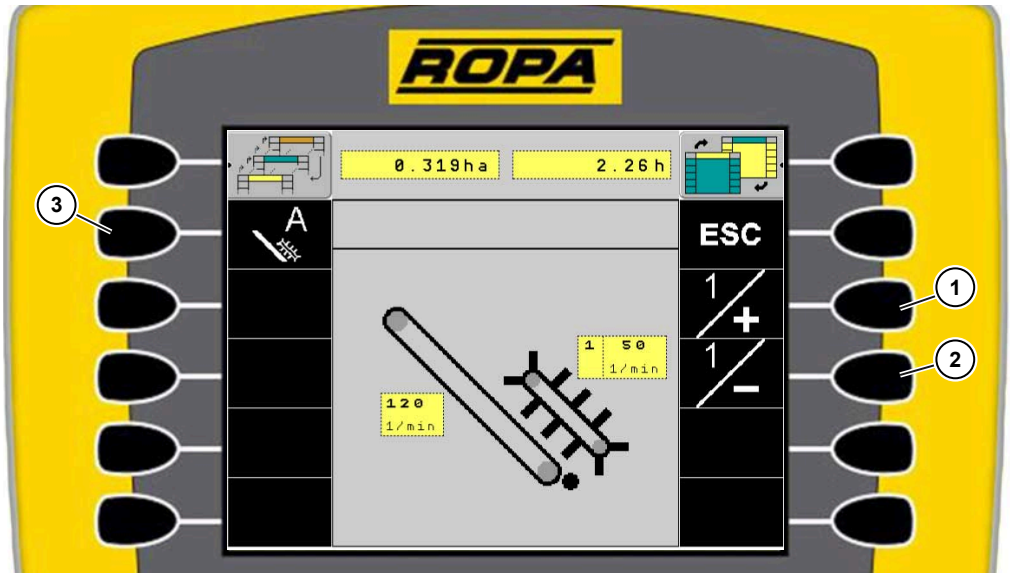
Lifting depth (*See Page 168*)



(1) Soft key lifting depth flatter
(2) Soft key lifting depth deeper

The lifting depth adjustment is opened with the soft key . The lifting depth is adjusted in a maximum of 100 stages, where 0 is a completely flat lifting depth and 99 is very deep lifting depth. Soft key lifting depth flatter (**1**) reduces the value. Soft key lifting depth deeper (**2**) increases the value.

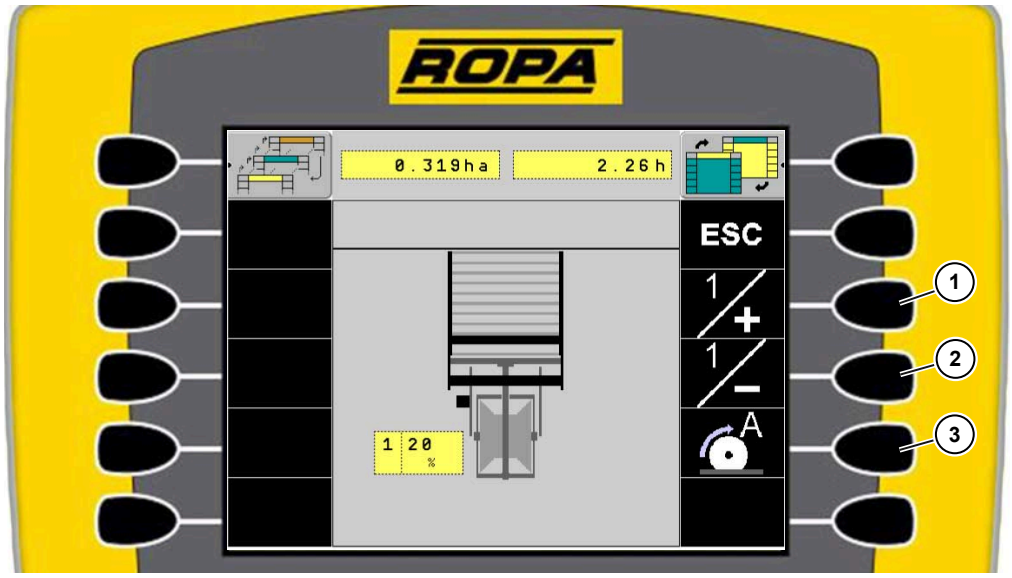
Swath pickup (*See Page 180*)



(1) Soft key increase swath pickup speed
(2) Soft key reduce swath pickup speed
(3) Soft key automatic swath pickup speed

The speed adjustment of the swath pickup is opened with the soft key . The speed of the swath pickup is infinitely adjustable. The soft key "Increase swath pickup speed" (**1**) increases the speed, the soft key "Reduce swath pickup speed" (**2**) reduces the speed. The automatic swath pickup speed soft key (**3**) can be used to select manual control of swath pickup rotating speed, soft key is white, and automatic rotating speed adjustment of sieve conveyor 1, soft key is green. The variation of the swath pickup speed in automatic mode to sieve conveyor 1 can be adjusted as a percentage.

Hydraulic disc coulter (*See Page 175*)



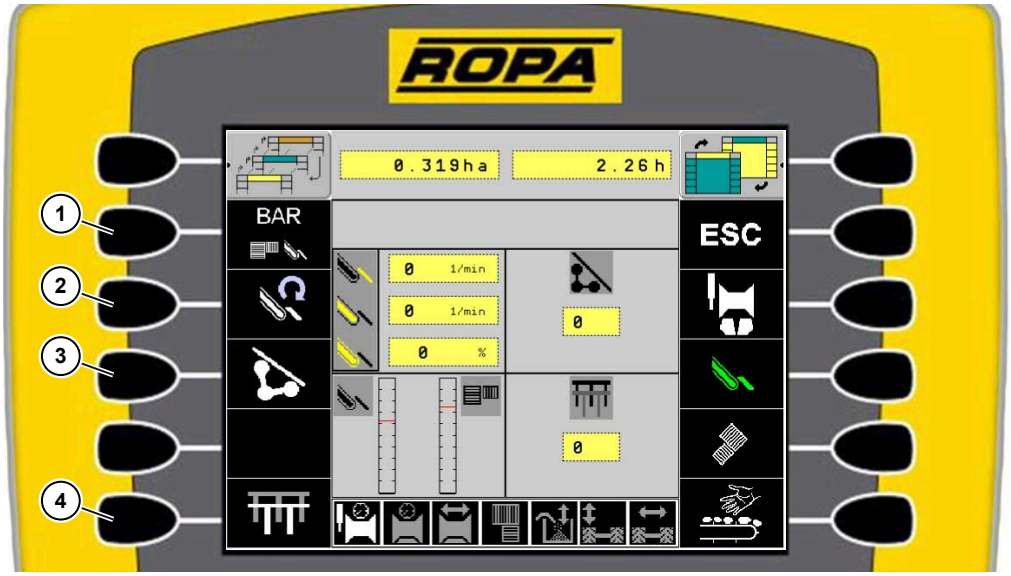
(1) Soft key increase disc coulter rpm
(2) Soft key reduce disc coulter rpm
(3) Soft key automatic disc coulter speed

The speed adjustment of the hydraulic disc coulter is opened with the soft key . The hydraulic disc coulter is adjusted steplessly. The soft key "Increase disc coulter speed" (**1**) increases the speed in percent, and the soft key "Reduce disc coulter speed" (**2**) reduces the speed in percent. The automatic disc coulter speed soft key (**3**) can be used to select manual control of disc coulter rotating speed, soft key is white , and automatic rotating speed adjustment of machine driving speed, soft key is green . The variation of the hydraulic disc coulter speed in automatic mode to driving speed can be adjusted in percent.

Drawbar (*See Page 188*)

If the soft key for optional drawbar is white, its function is deactivated. If the soft key for optional drawbar is green, its function is active and lifting in the lane is possible.

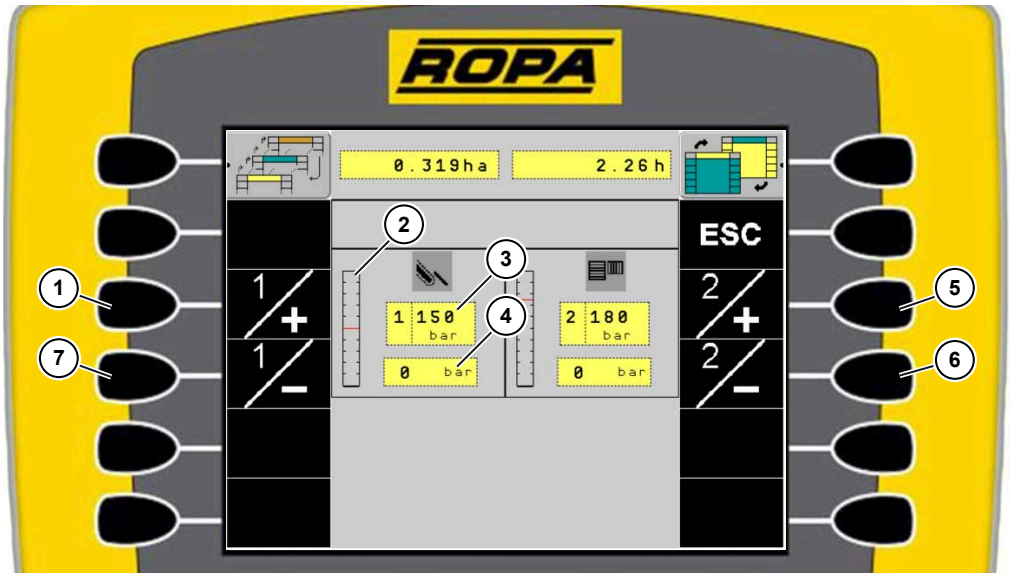
6.3.1.2.6 Sieving channel menu



(1) Conveyor pressure threshold adjustment soft key
(2) Sieving channel speed soft key
(3) Soft key shaker
(4) Soft key agitator

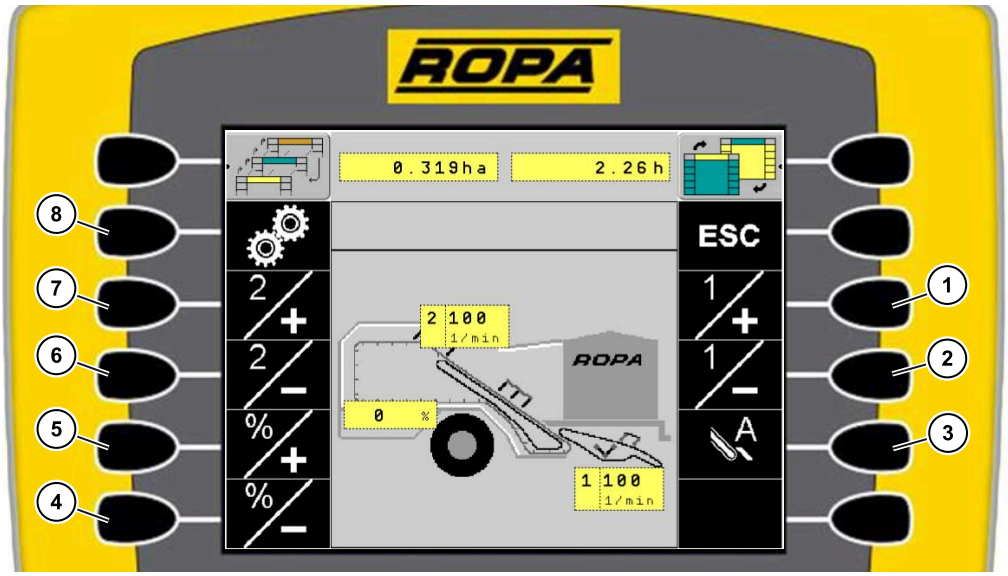
The sieving channel menu is opened when the soft key for the sieving channel is green. The settings for conveyor pressure threshold adjustment, sieving channel speed, shaker and agitator can be adjusted in the sieving channel menu. Selecting the submenus opens the adjustment options.

Conveyor pressure threshold adjustment (*See Page 126*)

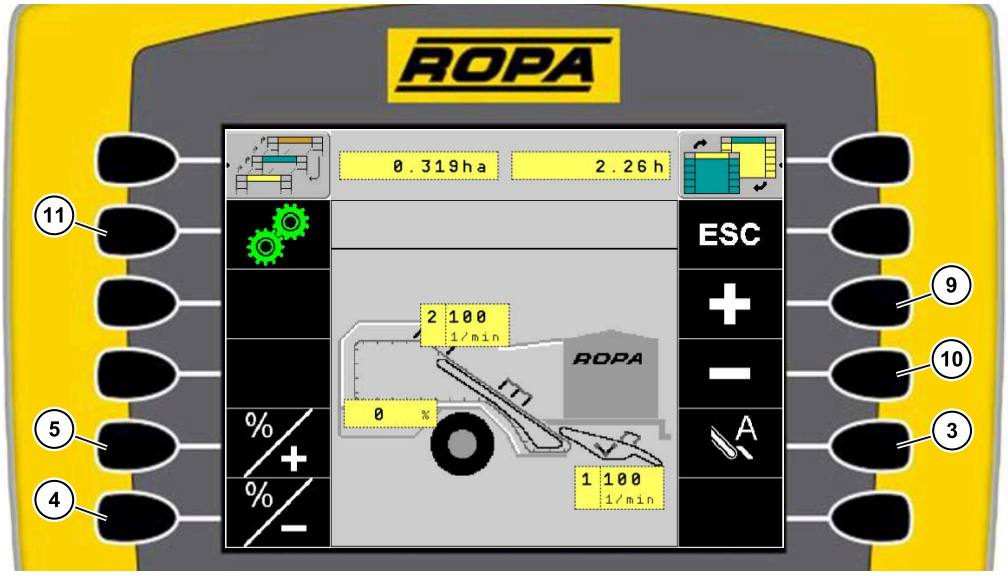


(1) Soft key increase sieving channel pressure threshold
(2) Actual pressure/threshold display
(3) Warning threshold
(4) Actual pressure
(5) Soft key increase pintle pressure threshold
(6) Soft key reduce pintle pressure threshold
(7) Soft key reduce sieving channel pressure threshold

Strainer chains, leaf chain rotating speed



Individual adjustment of strainer chains



Synchronous adjustment of sieve conveyors

(1) Soft key increase sieve conveyor 1 speed
(2) Soft key reduce sieve conveyor 1 speed
(3) Soft key automatic sieve conveyor speed
(4) Soft key reduce leaf chain speed
(5) Soft key increase leaf chain speed
(6) Soft key reduce sieve conveyor 2 speed
(7) Soft key increase sieve conveyor 2 speed
(8) Soft key synchronous speed of sieve conveyors deactivated
(9) Soft key increase sieve conveyor speed
(10) Soft key reduce sieve conveyor speed
(11) Soft key synchronous speed of sieve conveyors activated

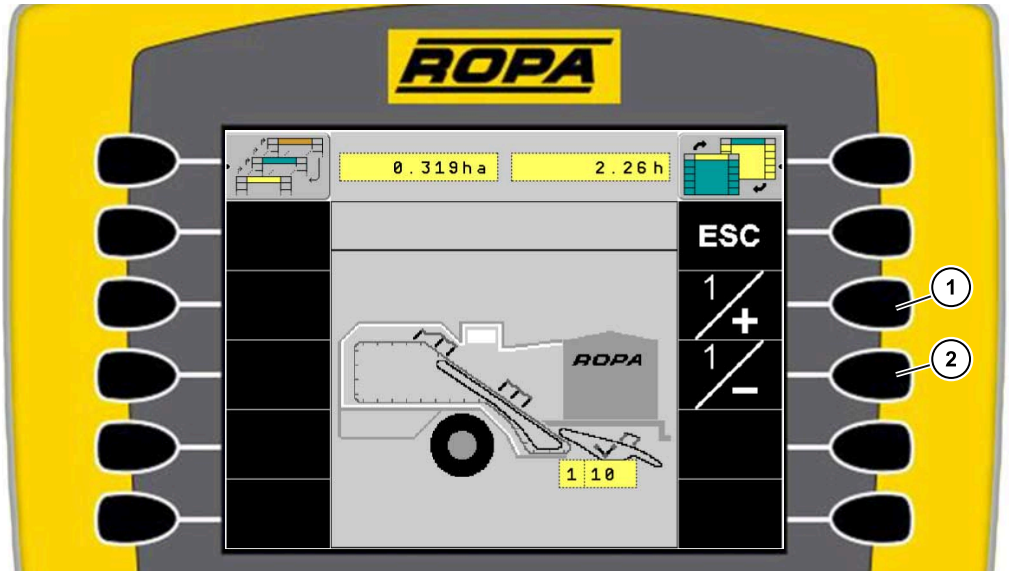
The speed of the sieve conveyors and leaf chain is opened with the soft key. The speeds of sieve conveyor 1 (*See Page 190*), sieve conveyor 2 (*See Page 201*) and the leaf chain (*See Page 214*) are adjusted here. The speed of the sieve conveyors is adjusted in rpm. The speed of the leaf chain can be braked in relation to the speed of sieve conveyor 2 in percent.

The speed of the sieve conveyors can be adjusted separately and also together (*See Page 205*) if the synchronous sieve conveyor speed soft key is activated (**11**), green in colour. When the speed of sieve conveyor 2 is adjusted, the speed of the leaf chain is adjusted simultaneously and the defined percentage difference remains the same.

The minimum speed of the sieve conveyors is 50 rpm, the maximum speed of the sieve conveyors is 200 rpm. The speed of the leaf chain can be braked in relation to sieve conveyor 2 in the range of 0% to -10%.

The automatic sieve conveyor speed soft key (**3**) is used to adjust the speeds of the sieve conveyors and the leaf chain automatically to the drive speed of the machine (*See Page 208*).

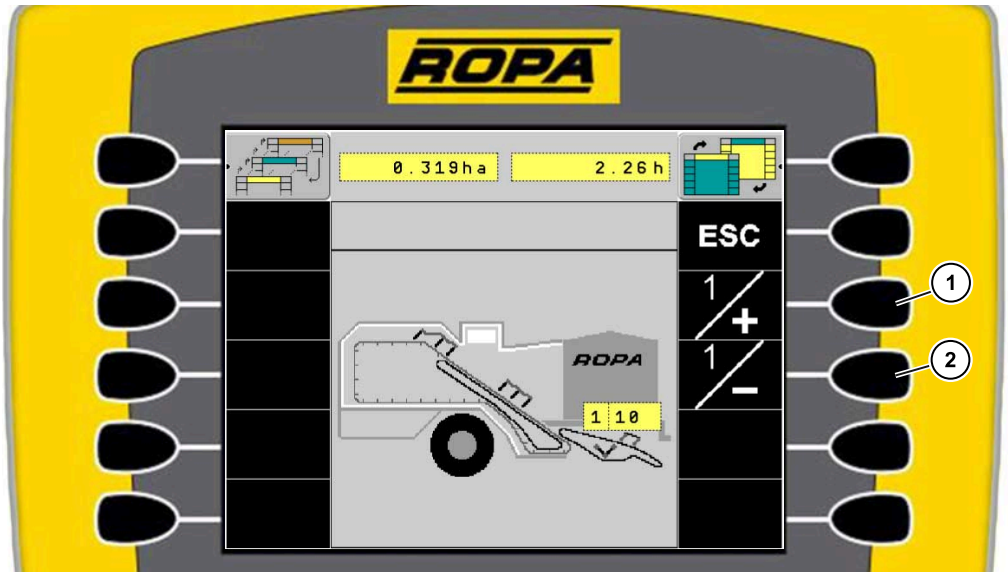
Shaker (*See Page 195*)



(1) Soft key increase shaker speed
(2) Soft key reduce shaker speed

The shaker is opened with the soft key. The speed of the shaker is adjusted in steps from 0 to 20, where 0 means that the shaker is shut off and 20 is the maximum speed of the shaker. The soft key "Increase shaker speed" (**1**) increases the value and the soft key "Reduce shaker speed" (**2**) reduce the value.

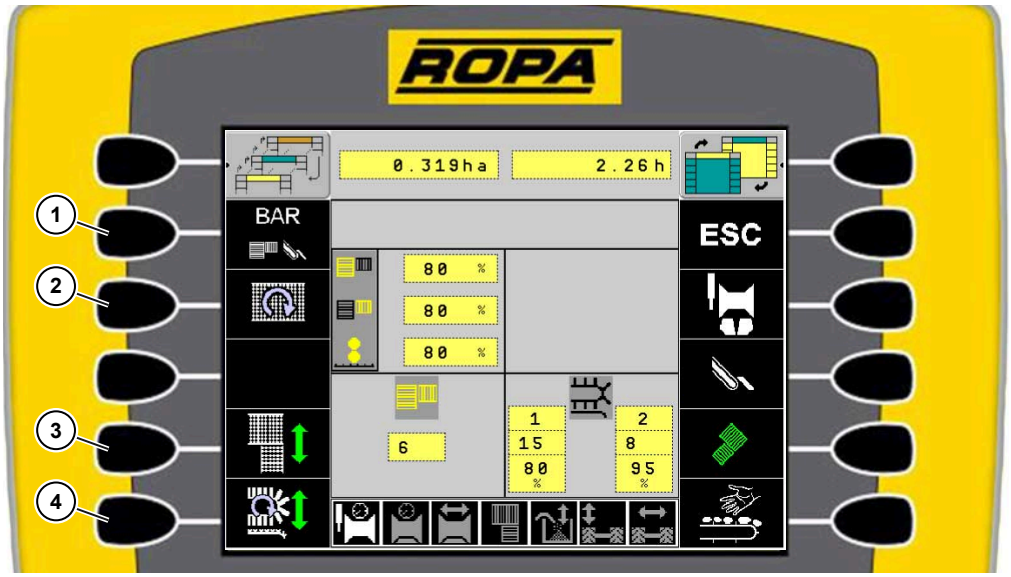
Agitator (option) (*See Page 198*)



(1) Soft key increase agitator speed
(2) Soft key reduce agitator speed

The optional agitator is opened with the soft key . The speed of the agitator is adjusted in steps from 0 to 20, where 0 means that the agitator is shut off and 20 is the maximum speed of the agitator. The soft key "Increase agitator speed" (**1**) increases the value and the soft key "Reduce agitator speed" (**2**) reduce the value.

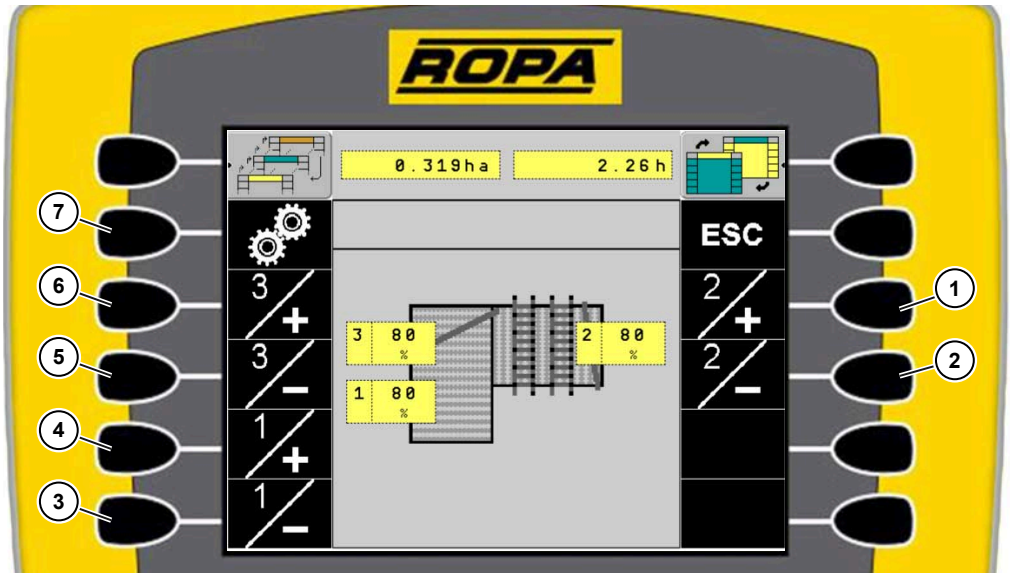
6.3.1.2.7 Separation menu



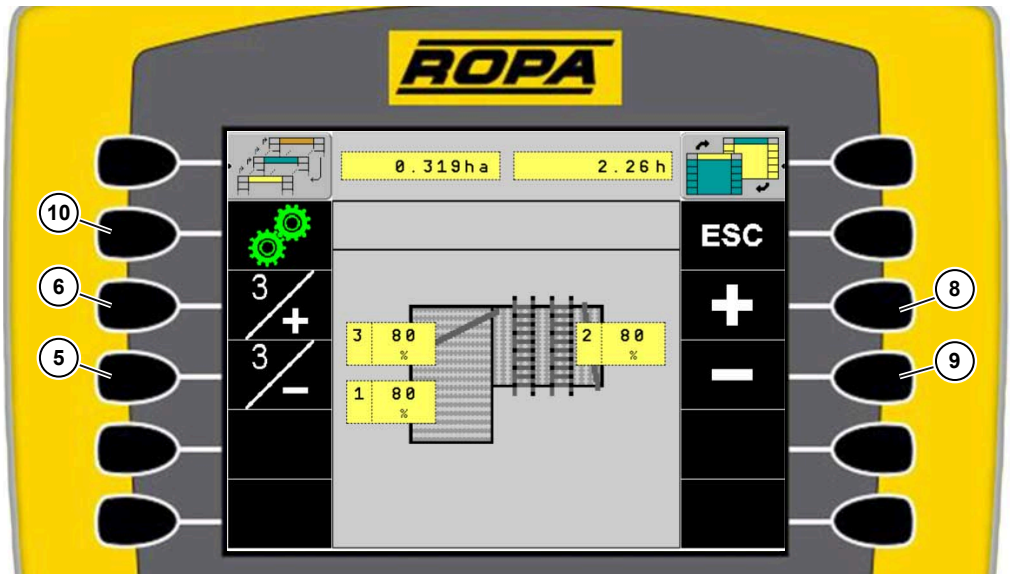
(1) Conveyor pressure threshold adjustment soft key (*See Page 126*)
(2) Soft key pintle belts speed
(3) Soft key pintle belt height
(4) Soft key rotating finger comb

The separation menu is opened when the separation soft key is shown in green. The settings for the pressure threshold adjustment of the conveyors , speed of pintle belts , height of pintle belts and rotating finger comb can be made in the separation menu. Selecting the submenus opens the adjustment options.

Speed of pintle belts (option)



Individual adjustment of pintle belts



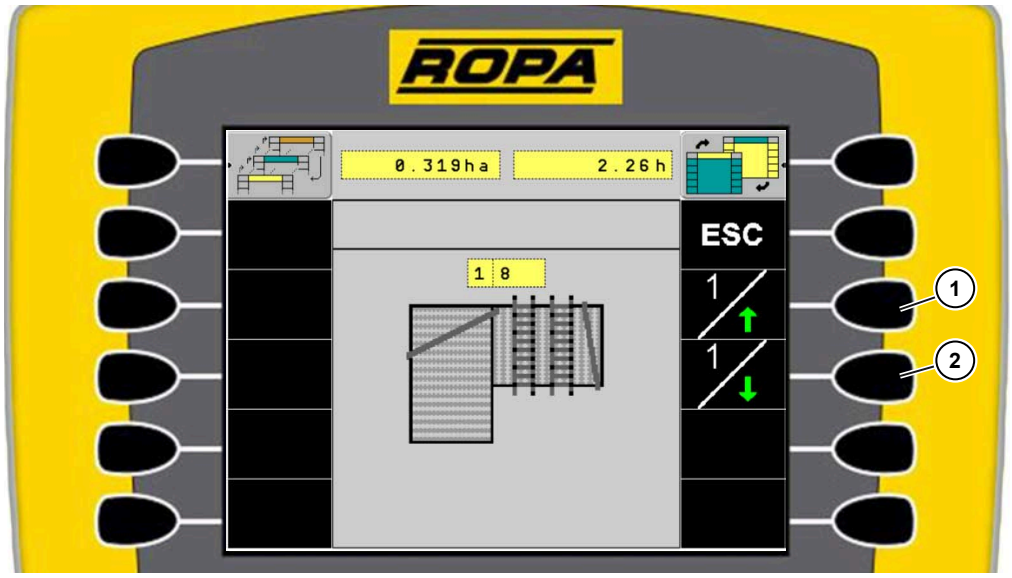
Synchronous adjustment of pintle belts

(1) Soft key increase pintle belt 2 speed
(2) Soft key reduce pintle belt 2 speed
(3) Soft key reduce pintle belt 1 speed
(4) Soft key increase pintle belt 1 speed
(5) Soft key reduce deflector roller 1 speed
(6) Soft key increase deflector roller 1 speed
(7) Soft key synchronous speed of pintle belts deactivated
(8) Soft key increase speed of pintle belts
(9) Soft key reduce speed of pintle belts
(10) Soft key synchronous pintle belt speed activated

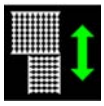
The speed of the pintle belts is opened with the soft key. The speed of the pintle belt 1 (*See Page 221*), pintle belt 2 (*See Page 232*) and the deflector roller 1 (*See Page 226*) can be adjusted here. The speeds are adjusted in the range from 30% to 100%.

The speeds of the pintle belts can be adjusted separately and also together if the synchronous speed of pintle belts soft key is activated (**10**), green in colour.

Pintle belt height (option)

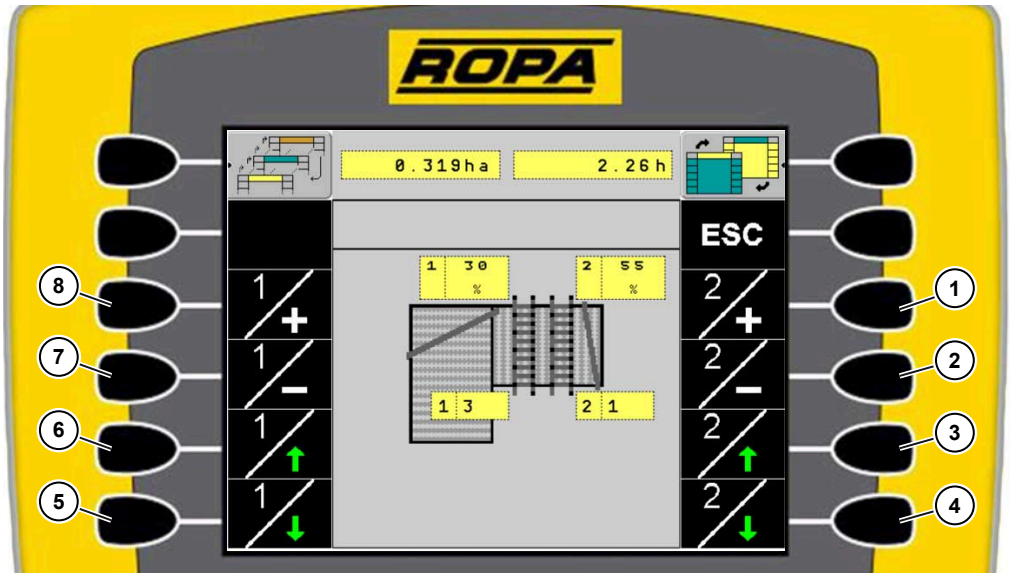


(1) Soft key pintle belt 1/2 higher
(2) Soft key pintle belt 1/2 lower



The pintle belt height is opened with the soft key . The inclination of the pintle belt 1/2 (*See Page 245*) can be optionally adjusted from stage 0 to 20. Stage 0 is the minimum inclination of the pintle belt and stage 20 is the maximum inclination of the pintle belt.

Rotating finger comb (UFK) (option)



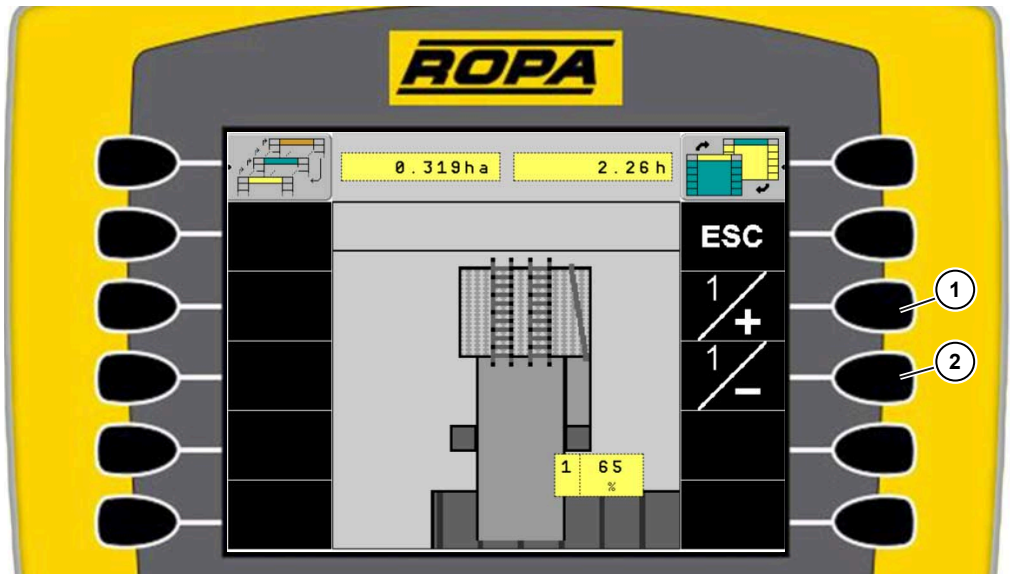
(1) Soft key increase UFK 2 speed
(2) Soft key reduce UFK 2 speed
(3) Soft key UFK 2 higher
(4) Soft key UFK 2 lower
(5) Soft key UFK 1 lower
(6) Soft key UFK 1 higher
(7) Soft key reduce UFK 1 speed
(8) Soft key increase UFK 1 speed

The rotating finger comb (*See Page 238*) is opened with the soft key. The speed of rotating finger comb 1 (UFK 1), the speed of rotating finger comb 2 (UFK 2), the height of UFK 1 and the height of UFK 2 are adjusted here.

The speeds are adjusted in the range from 20% to 100%. 20% is the minimum speed of the UFK and 100% is the maximum speed of the UFK.

The heights are adjusted from stage 0 to 20. Stage 0 is the minimum height of the UFK above pintle belt 2 and stage 20 is the maximum height of the UFK above pintle belt 2.

6.3.1.2.8 Picking table menu

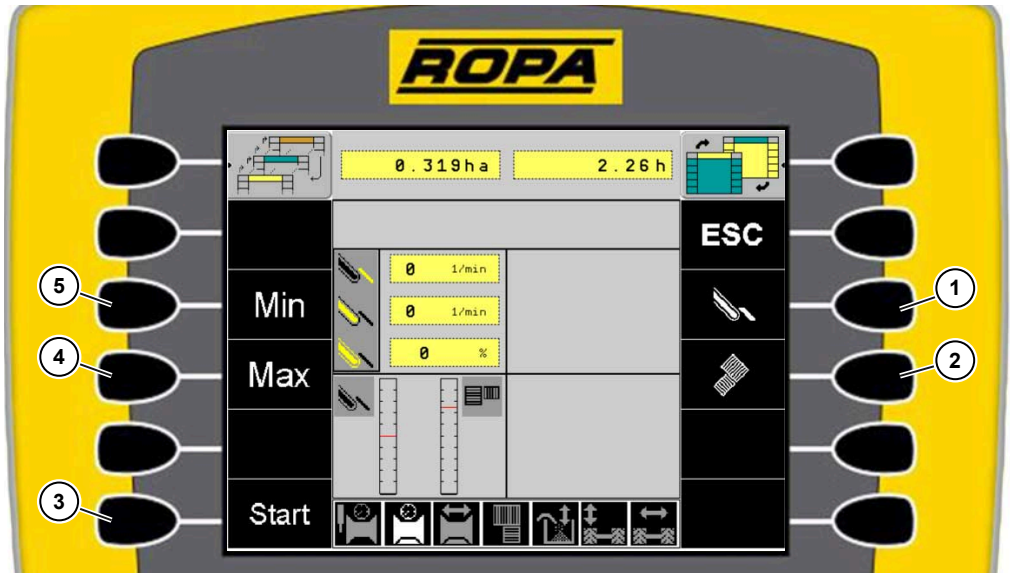


(1) Soft key increase picking conveyor speed
(2) Soft key reduce picking conveyor speed

The picking table menu is opened with the soft key. The speed of the picking conveyor (*See Page 255*) can be adjusted from 0% to 100%. The soft key "Increase picking conveyor speed" (**1**) increases the speed, the soft key "Reduce picking conveyor speed" (**2**) reduces the speed.

If the quick adjustment at the sorting platform is enabled, it is only possible to detect how fast the speed of the picking conveyor is set. The speed of the picking conveyor cannot be adjusted from the tractor. It can only be adjusted at the sorting platform.

6.3.1.2.9 Manual conveyors menu



(1) Sieving channel soft key
(2) Soft key pintle belts
(3) Start soft key
(4) Maximum speed soft key
(5) Minimum speed soft key

The manual conveyors menu is opened with the MANUAL soft key. In this menu all chains and conveyors can be individually manually actuated with the machine hydraulic system. Slow movement, e.g. to move a rod to an exact position for replacement, and fast movement for cleaning are both possible.

Press the soft key to preselect the sieving channel. After selection the soft key becomes green. The sieve conveyor 1, sieve conveyor 2 and the leaf chain are automatically actuated simultaneously at the set speeds.

Press the soft key to preselect the pintle belts 1,2. After selection the soft key becomes green. The deflector roller 1, deflector roller 2, rotating finger comb, picking conveyor and trash conveyor are automatically actuated simultaneously at the set speeds.

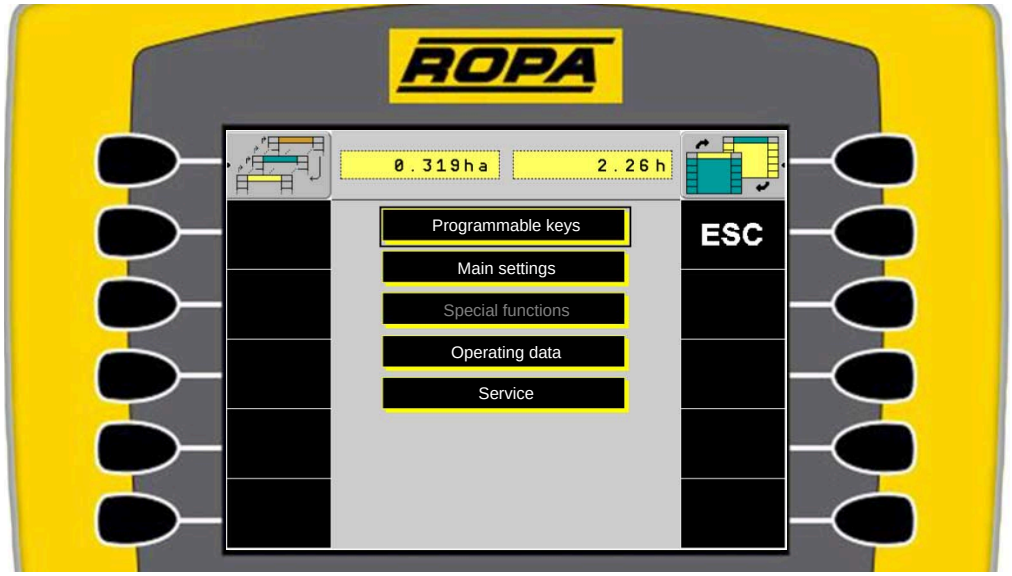
Depending on the equipment of the machine, the pintle belt 1 and the pintle belt 2 can be selected independently of each other.

Press the soft key Min to select the minimum conveyor speed for the preselected chains and conveyors. After selection the soft key Min becomes green. The soft keys Min and Max can never be selected simultaneously.

Press the soft key Max to select the maximum conveyor speed for the preselected chains and conveyors. After selection the soft key Max becomes green. The soft keys Min and Max can never be selected simultaneously.

While the Start is pressed and held the preselected chains and conveyors are actuated and run at the selected conveyor speed Min or Max. When the soft keys Start are released all chains and conveyors stop immediately.

6.3.1.3 Main menu



All submenus of the main menu can be selected with the rotary wheel on the tractor terminal. Greyed-out menu items cannot be selected.

ADVICE

The ESC key is almost always available on the soft keypad. Pressing the ESC key takes you back to the main screen step by step. On screens where the ESC key is not available a different cancellation procedure is available, e.g. when saving settings.

The reset soft key Reset resets the selected function in the main menu to the factory settings.

6.3.1.3.1 Programmable keys menu (option)

ADVICE

The described functions are available only in the operating mode "Field".

(1) Programmable key P1
(2) Programmable key P2
(3) Programmable key P3
(4) Programmable key P4
(5) Programmable key P5
(6) Programmable key P6

Pressing one of the six programmable keys enables you to activate one of six different machine settings. It enables you to call up the optimum settings for specific - recurrent - lifting conditions or ground types by pressing just one key.

After pressing the P1, P2, P3, P4, P5 or P6 programmable key and then confirming the selection the activated key is shown with a green background on the tractor terminal. This prevents an accidental activation.

When the pintle belt 1/2 automatic function is activated, the saved value for pintle belt 1/2 height is not called up.

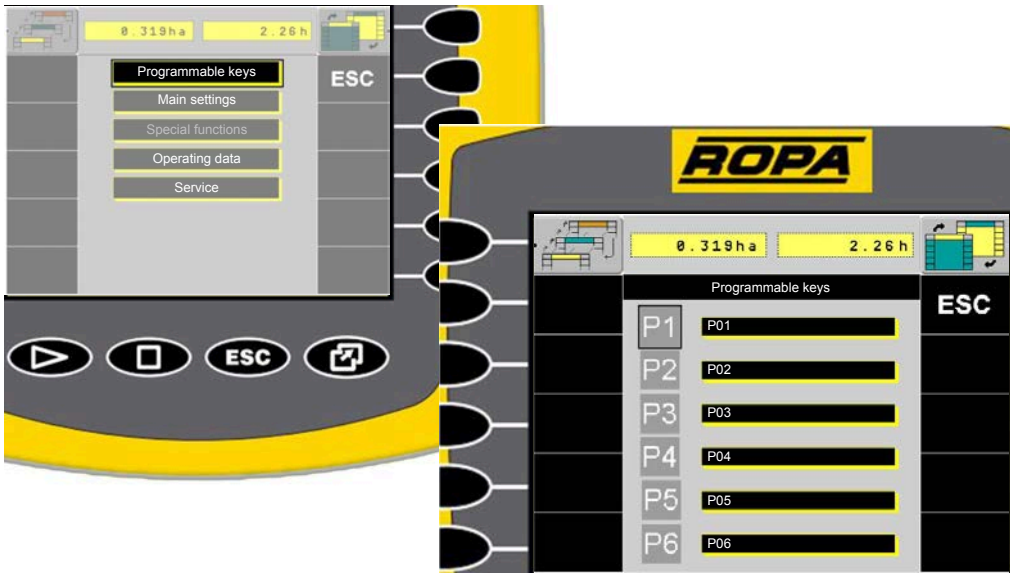
When quick adjustment of the picking conveyor speed is activated, the saved value is not called up.

As soon as you change a set value with the programmable key, for example the "P1", an icon on the tractor terminal will be highlighted white.

Save machine settings

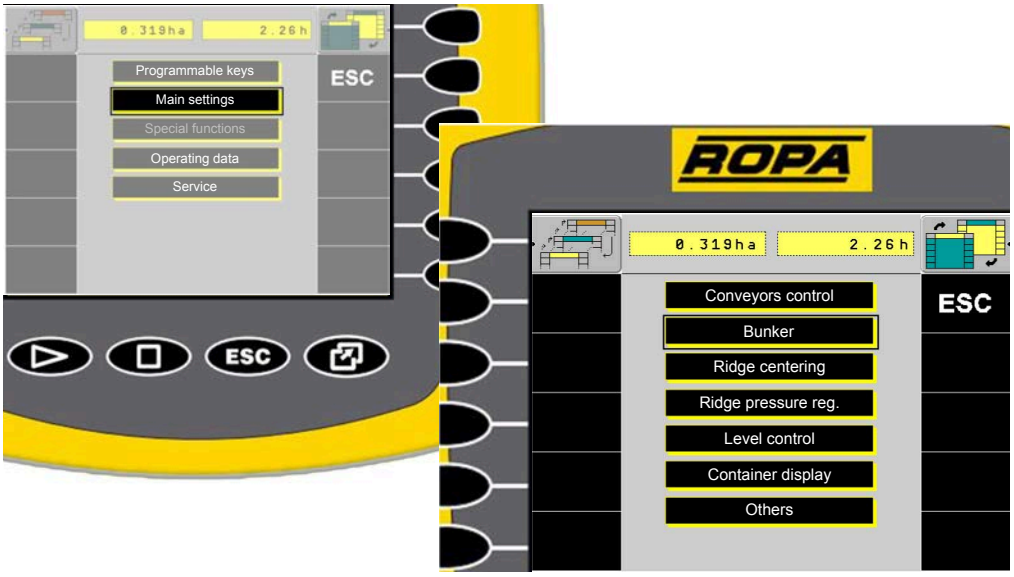
Press and hold the key for longer than 3 seconds to save a machine setting for each of the six programmable keys. The current thresholds, current speeds and current heights are automatically saved. A security prompt asks whether you really want to save the settings.

You are prompted to enter a name for the program when a setting for a programmable key is saved for the first time.

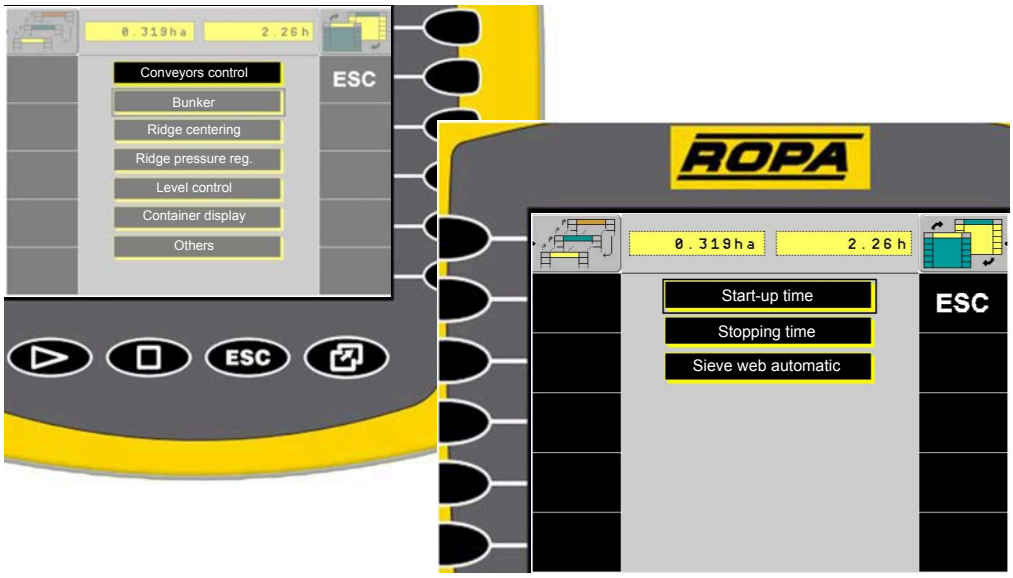


You can change the program name at any time. Select the program name and confirm the selection with the rotary wheel. An input form opens. Enter the new program name and save it or cancel it.

6.3.1.3.2 Menu Main settings



Conveyors control submenu



In the conveyors control submenu the start-up time and stopping time can be set for all electrically actuated chains and conveyors. The times must be set in the flow direction of the machine for shutdown and against the flow direction of the machine for start-up. This will prevent the machine from overrunning during start-up and shutdown.

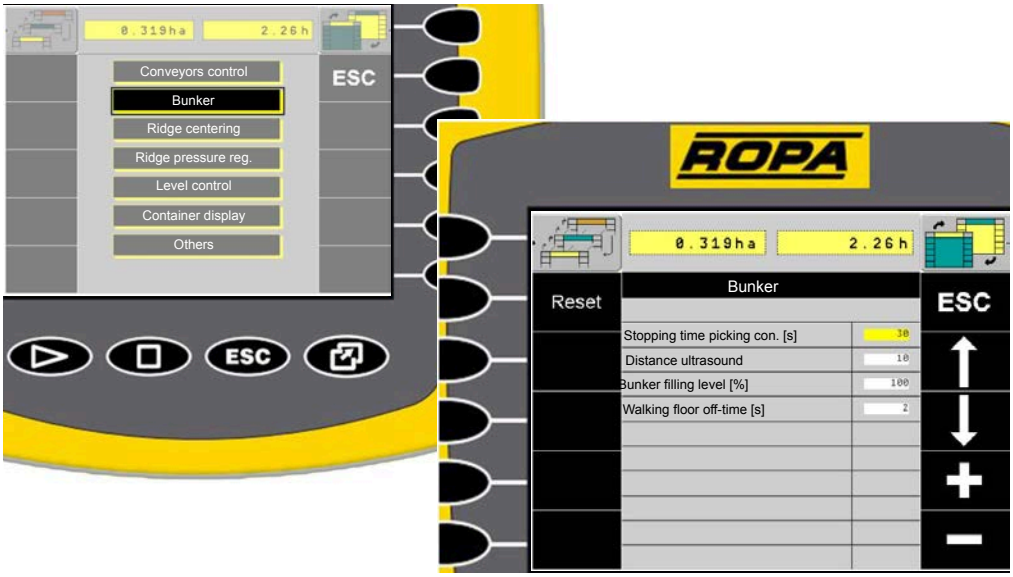
The minimum and maximum speeds of the sieve conveyors with activated optional sieve conveyor automatic control are also set here.

The start-up time and stopping time for conveyors control are set in seconds. The start-up time and stopping time for the disc coulter/swath pickup, sieving channel, shaker, LS shutdown, pintle belt 1, pintle belt 2, deflector roller, UFK 1/2 and the agitator can be adjusted. The timer for the start-up time is started when the pickup is lowered with the start of field key or the machine is started manually. The timer for the stopping time is started when the pickup is raised with the end of field key or the machine is shut down manually.

Depending on the equipment of the machine, the adjustable start-up and stopping times may differ.

The minimum and maximum speed for the automatic control are set in the automatic function of sieve conveyors.

Submenu Bunker



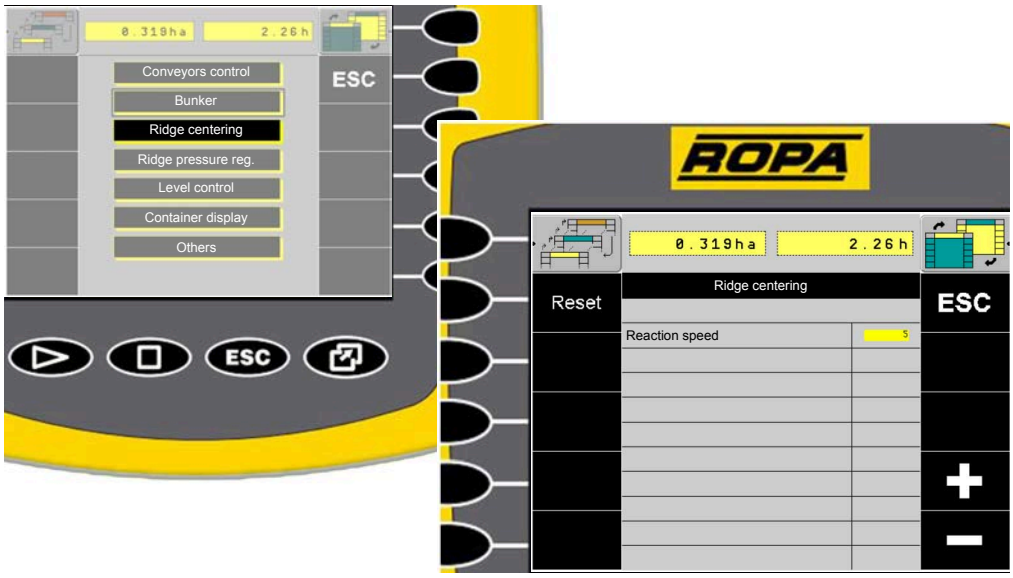
Stopping time picking conveyor. (*See Page 255*)

Distance ultrasound. (*See Page 271*)

Bunker filling level. (*See Page 271*)

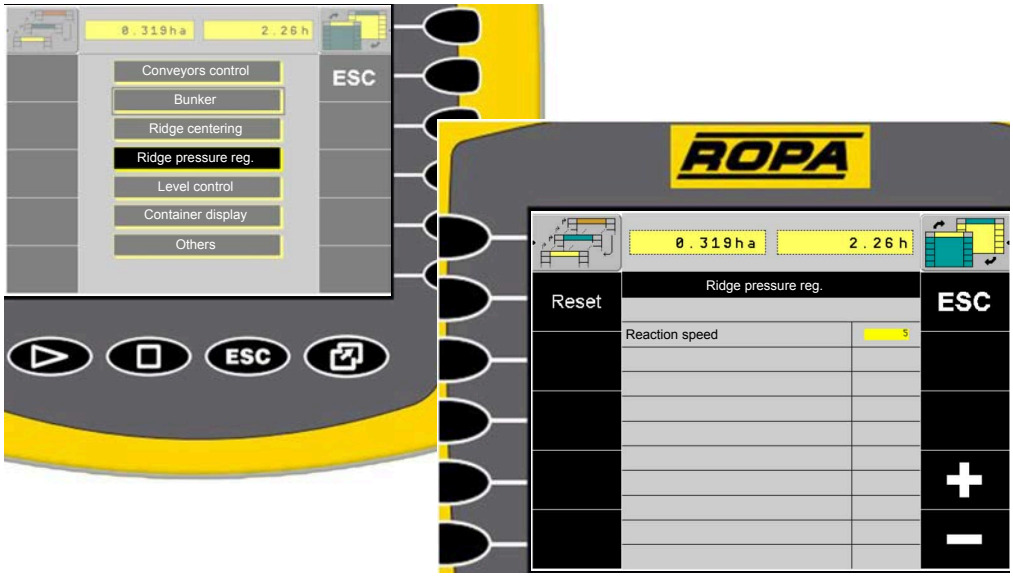
Walking floor off-time. (*See Page 271*)

Ridge centring submenu



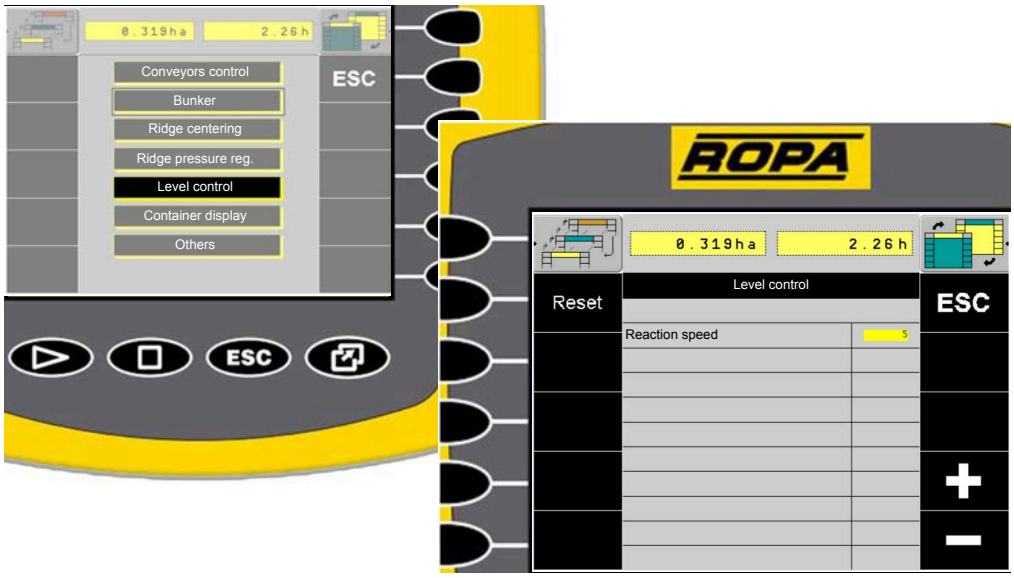
Ridge centring. (*See Page 163*)

Ridge pressure regulation submenu



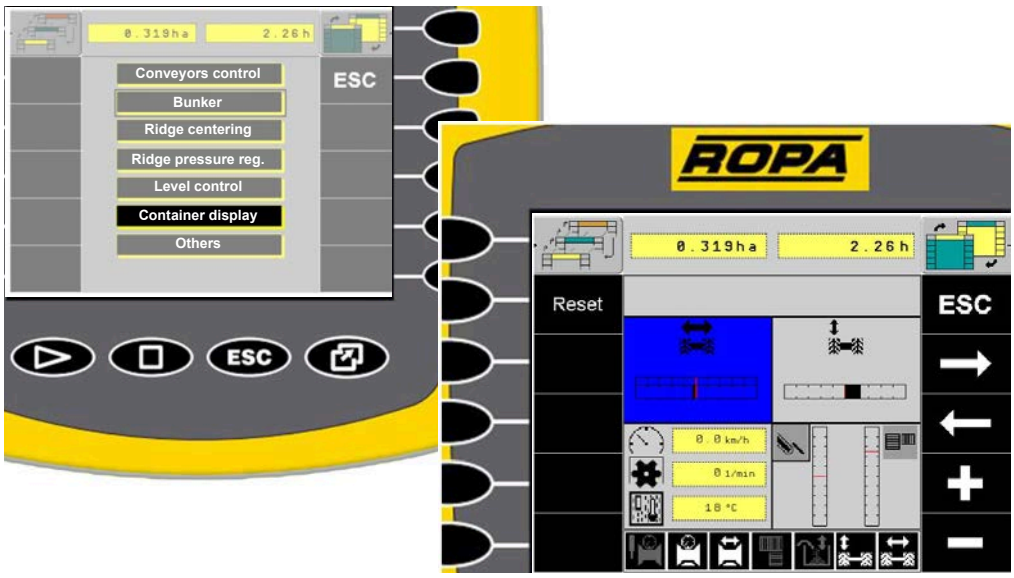
Ridge pressure regulation. (*See Page 171*)

Submenu Level control



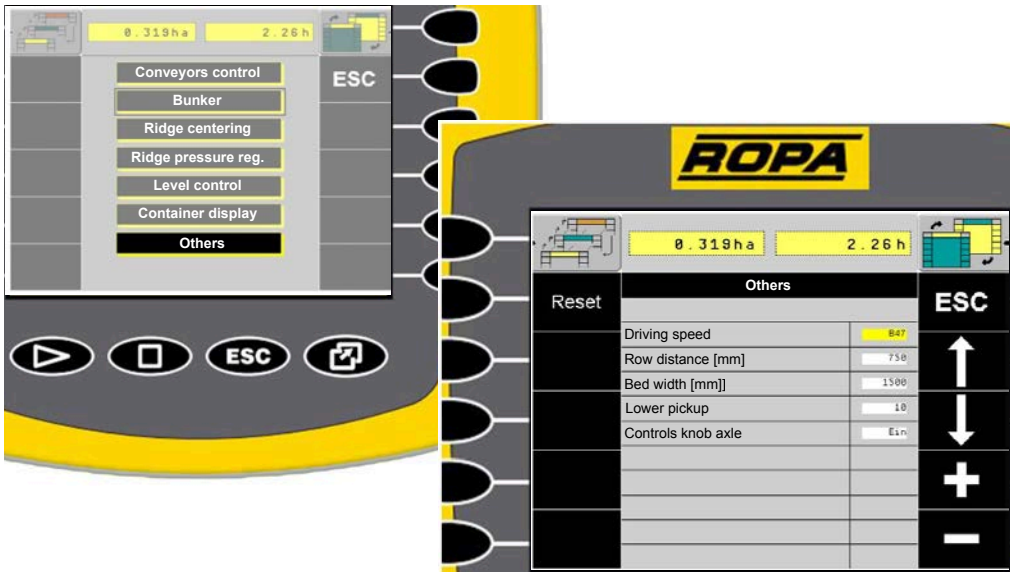
Level control. (*See Page 155*)

Container display submenu



In the container display submenu, 4 displayed containers can be defined in the field operation menu. Use the key Reset to return to the factory setting. Use the keys ← and → to select which container display is to be changed. Use the keys + and − to select what must be displayed. You can cancel or save with the key ESC.

Submenu Others



In the submenu Others you can define from where the machine receives the driving speed signal. In standard the setting is on the sensor B47 which is located on the left wheel of the machine.
On tractors equipped with ISOBUS the setting can be changed to TECU. Here the driving speed signal is taken from the tractor. If TECU signal is lost, the signal is automatically taken from the sensor B47.

Row distance [mm]. (*See Page 180*)

Bed width [mm]. (*See Page 180*), (*See Page 183*) and (*See Page 184*)

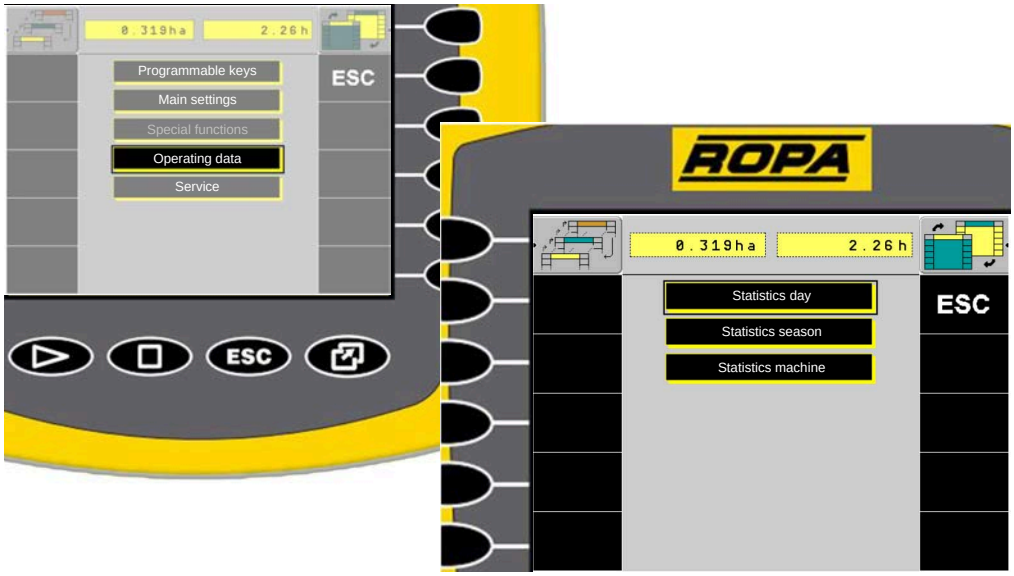
Lower pickup. (*See Page 160*)

On the right control element, you can activate and deactivate the rotary knob for axle trimming. If "On" is set for the Controls knob axle, the axle trimming is activated. If it is set to "Off", the axle trimming is deactivated.

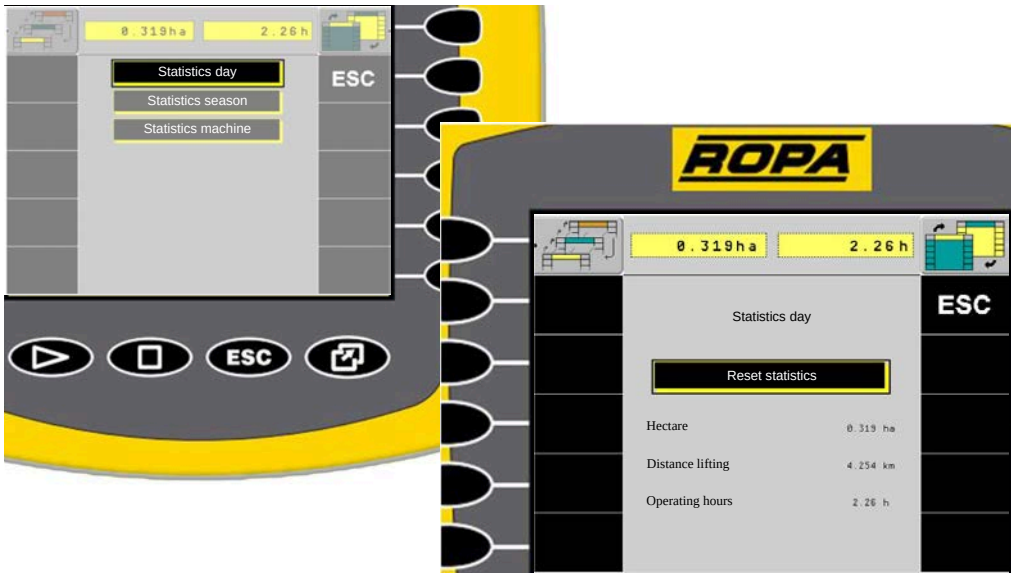
6.3.1.3.3 Menu Special functions

There are currently no functions in the special functions menu and this menu item is disabled.

6.3.1.3.4 Menu Operating data

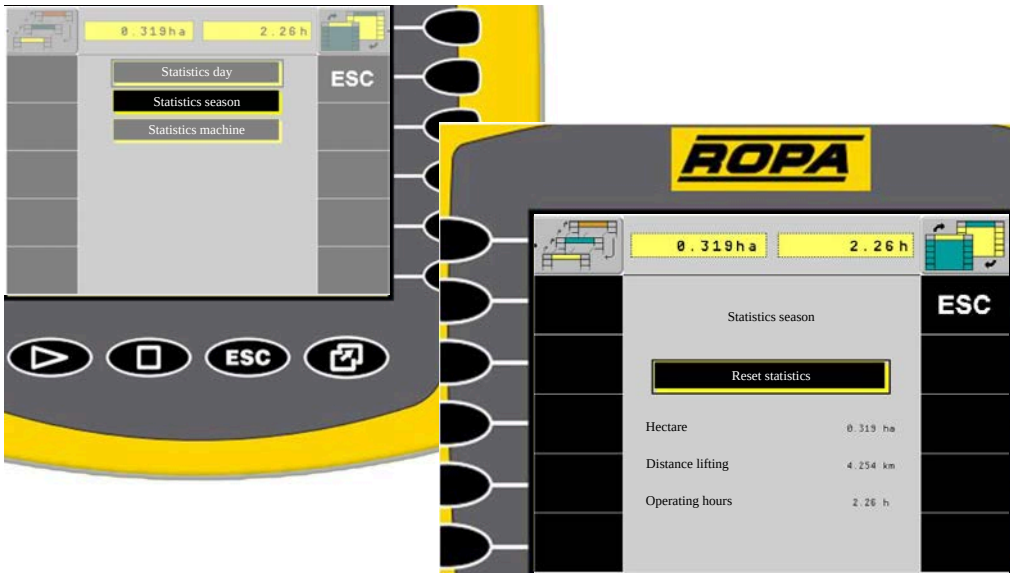


Statistics day submenu



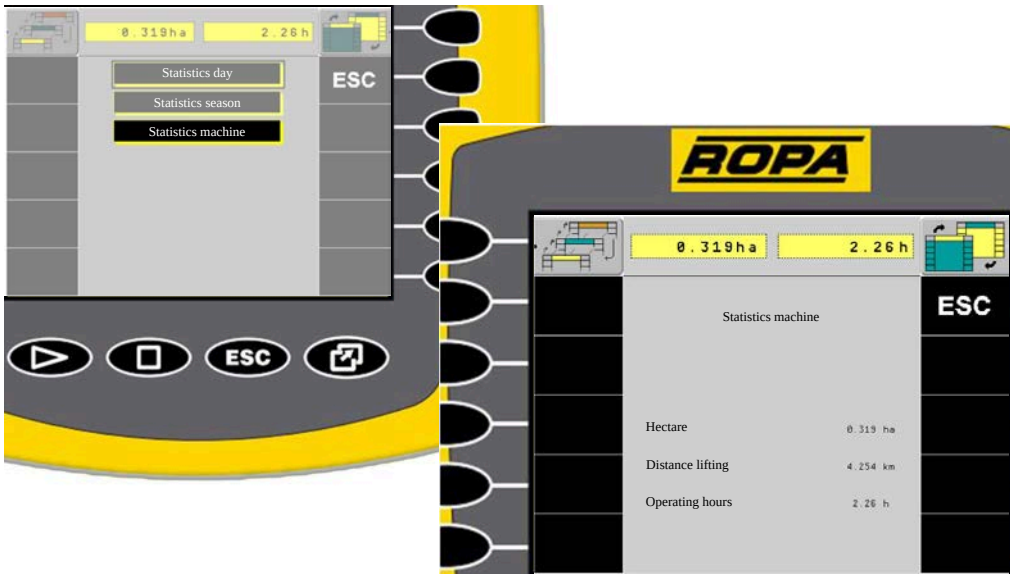
"Statistics day" can only be deleted by confirming the deletion again after pressing the delete key. This avoids inadvertent deleting.

Submenu Season statistics



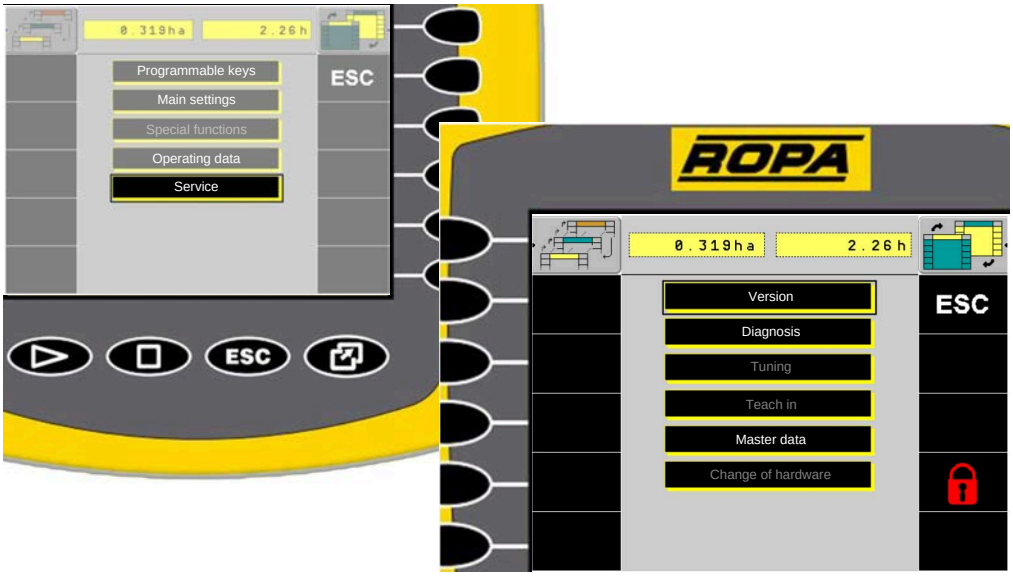
"Statistics season" can only be deleted by confirming the deletion again after pressing the delete key. This avoids inadvertent deleting.

Submenu Machine statistics



Data cannot be input, deleted or modified in the "Machine statistics".

6.3.1.3.5 Menu Service



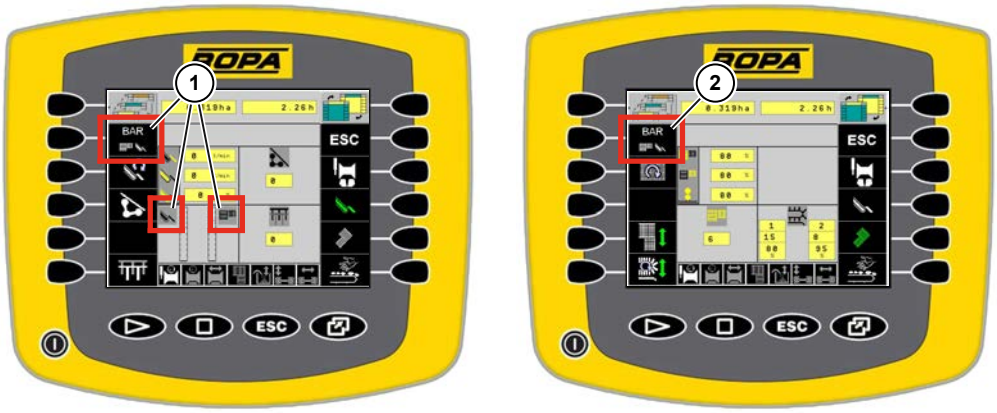
Submenu Version

For the operator, only the submenus "Version" and "Diagnostics" (see chapter "Malfunction and Remedies", *See Page 359*) are of importance in the service menu. The submenus: “Tuning” and “TeachIn” are only accessible after input of a service code.

DANGER

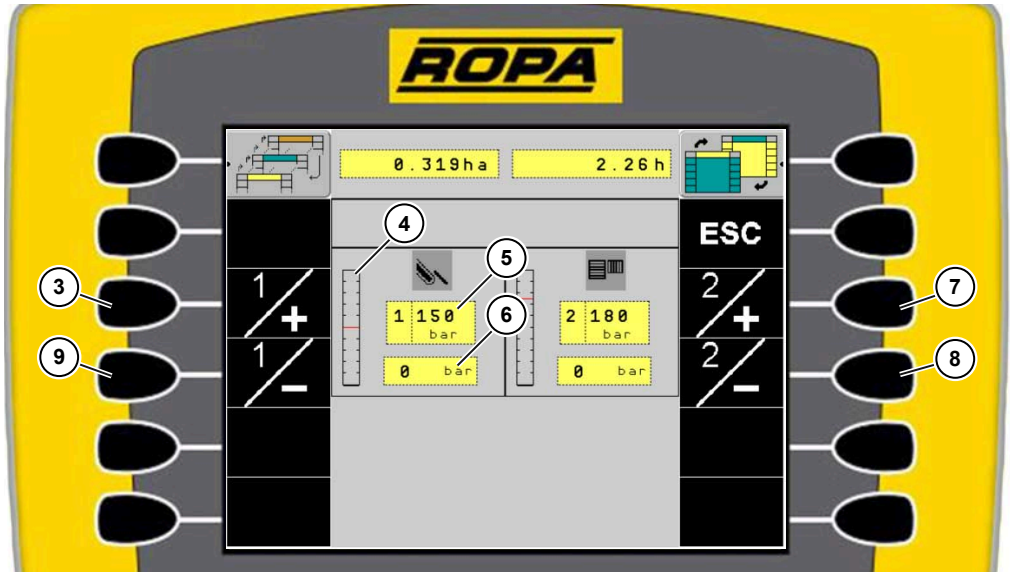
Access to these menus is locked by a specific code for safety reasons. If wrong settings are made in these menus or the applicable safety regulations are not or not sufficiently observed, then this may lead to extreme accidents with deadly injuries. In many cases, severe damage may be caused to the machine, with the consequence of expensive repairs or long periods of standstill. Access to these menus is therefore authorised only with direct contact to the manufacturer by telephone or to people expressly authorised for this purpose by the manufacturer.

6.3.1.4 Readjusting thresholds



(1) Sieving channel pressure threshold menu
(2) Separation pressure threshold menu

The pressure monitoring can be selected directly in the sieving channel menu (**1**) by selecting the grey button or the soft key or in the separation menu (**2**) by selecting the soft key in the tractor terminal.



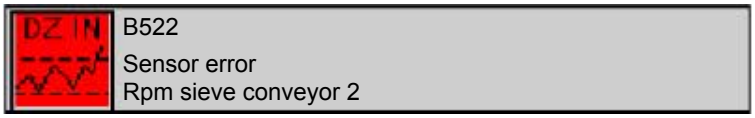
(3) Soft key increase sieving channel pressure threshold
(4) Actual pressure/threshold display
(5) Warning threshold
(6) Actual pressure
(7) Soft key increase pintle pressure threshold
(8) Soft key reduce pintle pressure threshold
(9) Soft key reduce sieving channel pressure threshold

The conveyors pressure threshold is opened with the soft key . The current actual pressure (**6**) in bar, the threshold that can be selected with soft keys (**5**) in bar and the combination of actual pressure and threshold (**4**) are displayed graphically.

The sieving conveyor increase threshold soft key (**3**) increases the threshold for the sieving channel. The sieving channel reduce threshold soft key (**9**) reduces the threshold for the sieving channel.

The pintle belt increase threshold soft key (**7**) increases the threshold for the pintle belt. The pintle belt reduce threshold soft key (**8**) reduces the threshold for the pintle belt.

6.3.1.5 Warning and status indications on the tractor terminal



The tractor terminal shows error messages in case of malfunctions. An entry is logged in the fault memory at the same time. If red warning notifications appear, the machine must be shut down immediately to avoid damage to the machine. The machine can be restarted at your own risk, e.g. to park the machine safely.

Red warning indicators

	Hydraulic oil level too low		Tractor battery voltage too low or too high (less than 12 V or over 16 V)
	Hydraulic fluid too hot		Emergency stop switch pressed
	Tractor return pressure too high	STOP	STOP key operating sections
max	PTO speed too high		Danger for person and machine

Red warning indicators of electronic problems

DZ IN	Rpm signal out of range	DATA ERROR	Error data backup
ANAIN	Analogue signal out of range	CONF ERROR	Incorrect machine configuration
	Line break or short circuit found	COM CPU	Communication problem with control device
EPROM	Internal EEPROM memory fault		Jackscrew drive error

Additional warning indications and notifications on operation

	Drawbar not for road drive Swing drawbar to right		Axle is not in central position Move axle to central position
	PTO speed too low Increase PRO speed		Emergency stop not activated Activate tractor emergency stop
	Sorting platform horn pressed		Bunker is to be folded in Lower filling web
	Adjust speed Drive more slowly		Bunker full
	Bunker is to be raised Swing drawbar to right		Bunker is to be raised Swing drawbar to left
	Threshold reached PS sieving channel		Blockage Sieve conveyor 1/2 rpm
	Threshold reached PS pintle		Linak zeroing active

Status indicators of automatic functions

	Ridge pressure relief Off		Ridge pressure relief On
	Ridge pressure relief preselected		
	Ridge pressure regulation Off		Ridge pressure regulation On
	Ridge pressure regulation preselected		
	Ridge centring Off		Ridge centring On
	Ridge centring preselected		
	Pintle belt 1/2 automatic function Off		Pintle belt 1/2 automatic function On
	Pintle belt 1/2 automatic function preselected		
	Automatic filling Off		Automatic filling On
	Automatic filling preselected		
	Slope compensation On		Slope compensation On
	Slope compensation preselected		
	Wheel steering Off		Wheel steering On
	Wheel steering preselected		

6.3.2 Machine terminal (optional)

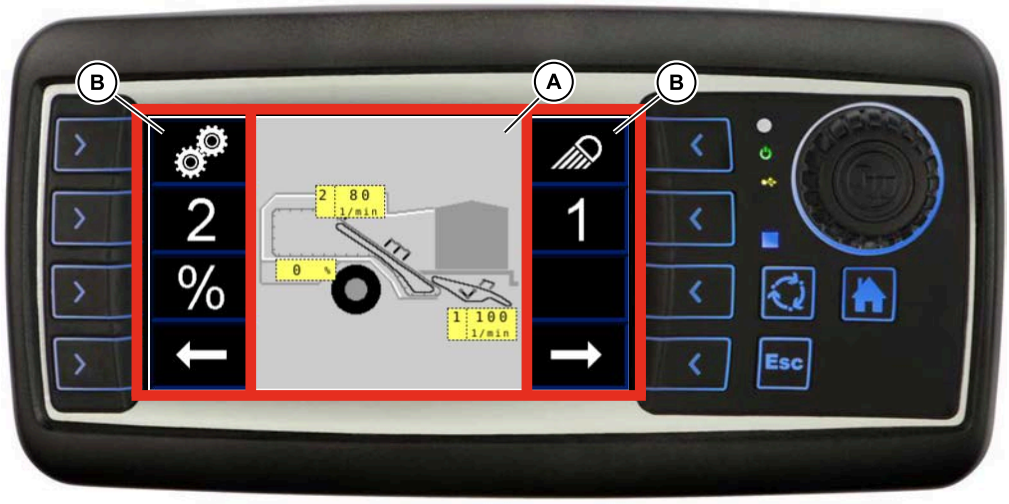
(1) Machine terminal

The operation of the machine is divided into two basic sections, operation on the tractor and operation on the machine.

A user-friendly machine terminal (**1**) with ISOBUS operation and additional electrical adjustment options with keys is installed on the machine.

Press the soft keys on the machine terminal to navigate through the menus.

6.3.2.1 Machine terminal display areas

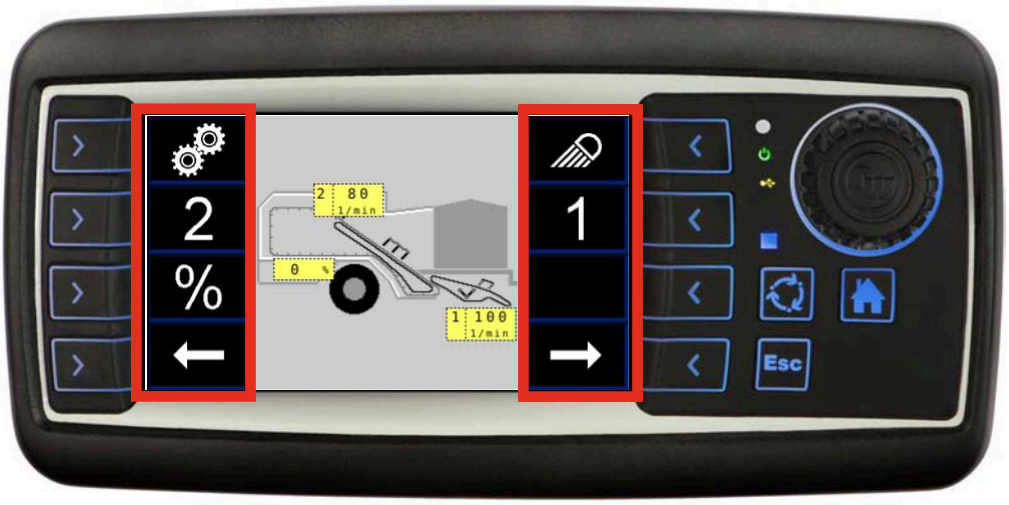


(A) Working screen display area
(B) Display area soft key

[A] Working screen display area

The working screen display area shows the machine states that can be adjusted from the sorting platform.

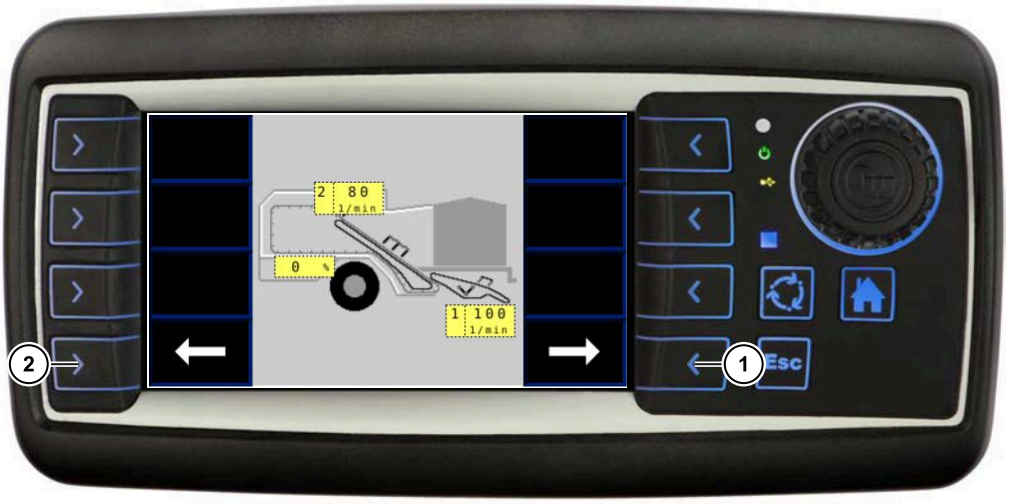
[B] Soft key display area



The soft keys are shown to the left and right of the working screen display area.

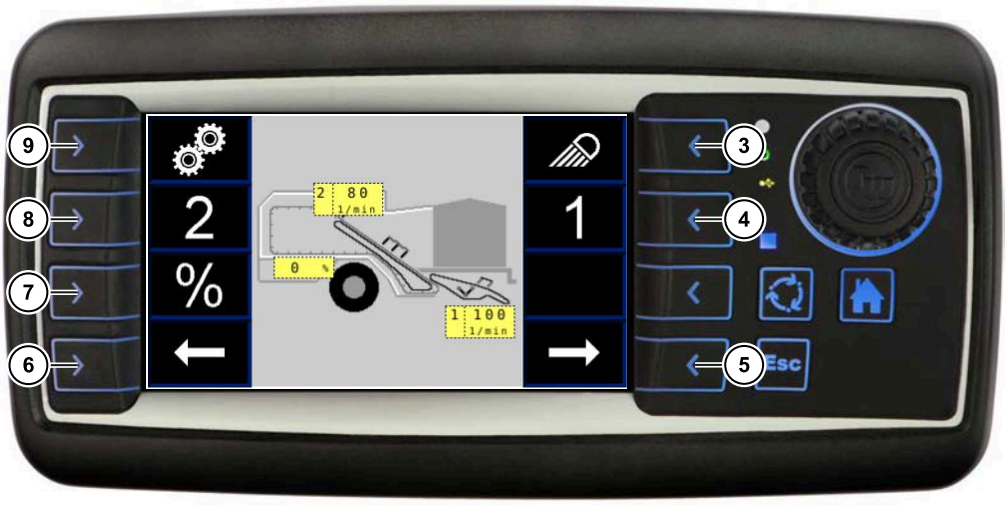
6.3.2.1.1 Sorting platform menu 1

Sorting platform menu 1 terminal locked



(1) Scroll screen right soft key
(2) Scroll screen left soft key

Sorting platform menu 1 terminal released



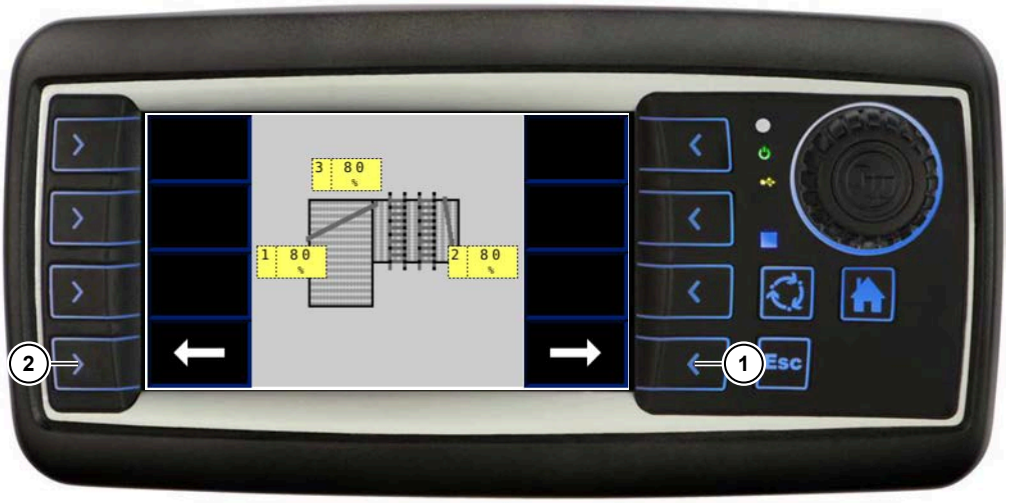
(3) Working floodlights soft key
(4) Soft key sieve conveyor 1 speed
(5) Scroll screen right soft key
(6) Scroll screen left soft key
(7) Soft key leaf chain speed
(8) Soft key sieve conveyor 2 speed
(9) Soft key synchronous sieve conveyors speed

The working floodlights (**3**) can be switched On and Off, as well as the speed of the sieve conveyor 1 (**4**) (*See Page 190*), sieve conveyor 2 (**8**) (*See Page 201*) and the leaf chain (*See Page 214*) (**7**) can be adjusted in the sorting platform menu 1 after release at the tractor terminal. The sieve conveyors can also be synchronously (**9**) (*See Page 205*) adjusted in this menu. The speed of the sieve conveyors is adjusted in rpm. The speed of the leaf chain can be braked in relation to the speed of sieve conveyor 2 in percent.

The minimum speed of the sieve conveyors is 50 rpm, the maximum speed of the sieve conveyors is 200 rpm. The speed of the leaf chain can be braked in relation to sieve conveyor 2 in the range of 0% to -10%.

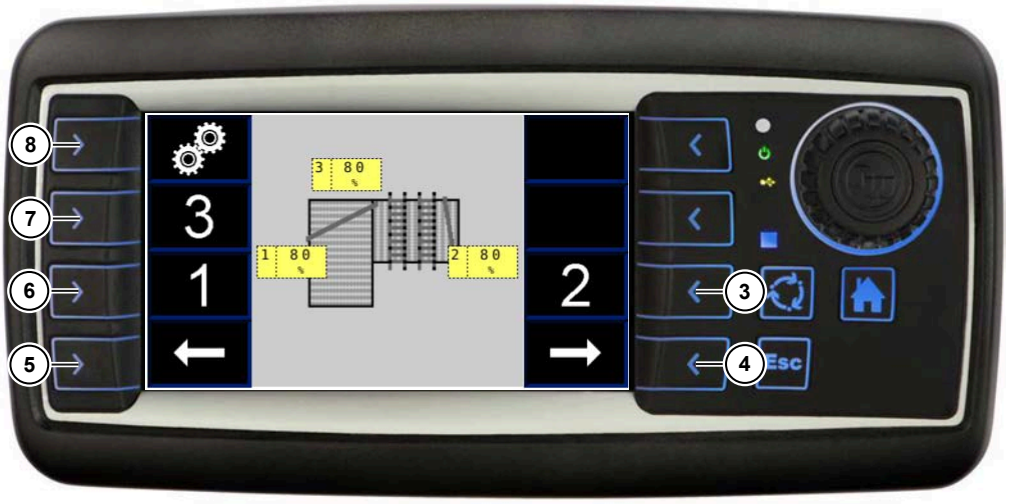
6.3.2.1.2 Sorting platform menu 2

Sorting platform menu 2 terminal locked



(1) Scroll screen right soft key
(2) Scroll screen left soft key

Sorting platform menu 2 terminal released



(3) Soft key pintle belt 2 speed
(4) Scroll screen right soft key
(5) Scroll screen left soft key
(6) Soft key pintle belt 1 speed
(7) Soft key increase speed of deflector roller 1
(8) Soft key synchronous speed of pintle belts

The speed of the pintle belt 1 (**6**) (*See Page 221*), pintle belt 2 (**3**) (*See Page 232*) and the deflector roller 1 (**7**) (*See Page 226*) can be adjusted in the sorting platform menu 2 after release at the tractor terminal. The pintle belts can also be synchronously (**8**) (*See Page 250*) adjusted in this menu. The speed of the pintle belts is adjusted in %.

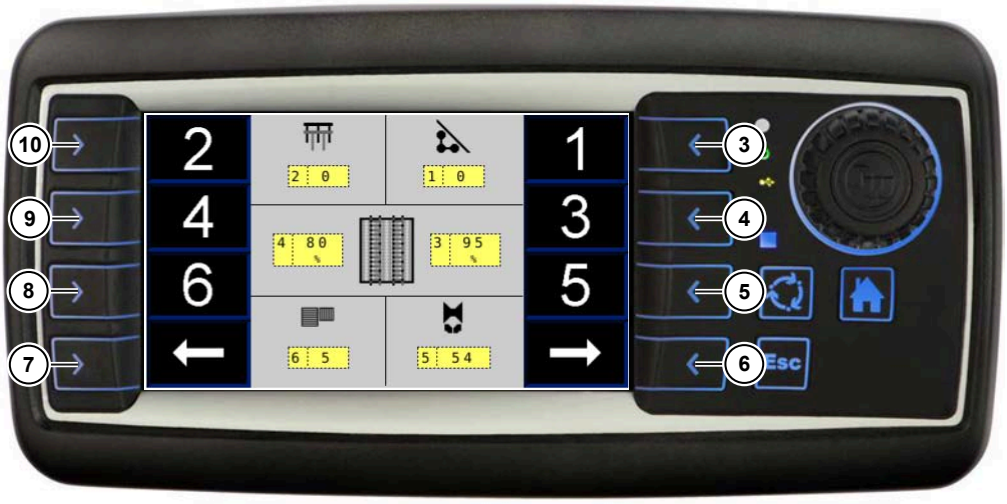
The minimum speed of the pintle belts and the deflector roller 1 is 30 %, the maximum speed of the pintle belts and the deflector roller 1 is 100%.

6.3.2.1.3 Sorting platform menu 3

Sorting platform menu 3 terminal locked

(1) Scroll screen right soft key
(2) Scroll screen left soft key

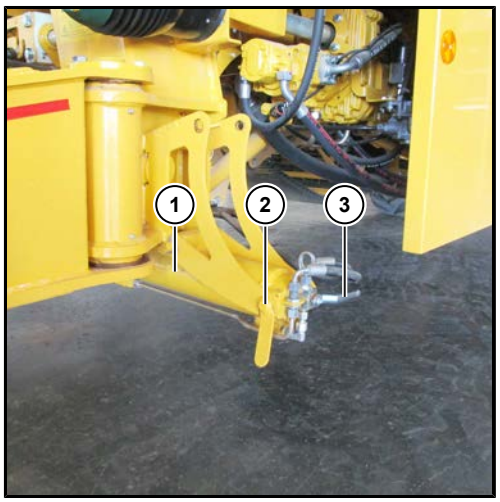
Sorting platform menu 3 terminal released

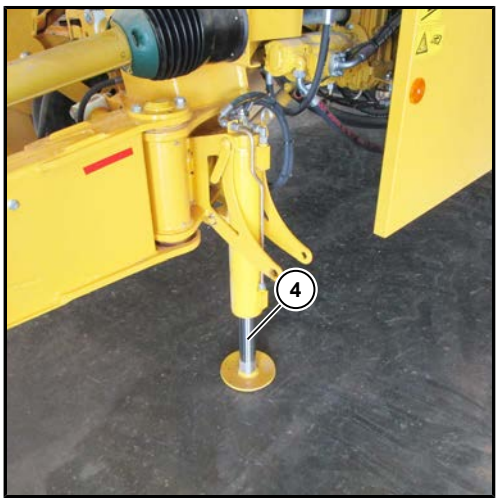


(3) Soft key shaker
(4) Soft key UFK 1 speed
(5) Lifting depth soft key
(6) Scroll screen right soft key
(7) Scroll screen left soft key
(8) Soft key pintle belt 1/2 inclination
(9) Soft key UFK 2 speed
(10) Soft key agitator

The intensity of the shaker (**3**) (*See Page 195*) and the agitator (**10**) (*See Page 198*), the height of lifting depth (**5**) (*See Page 168*) and the pintle belt 1/2 (**8**) (*See Page 245*) and the speed of UFK 1 (**4**) (*See Page 238*) and UFK 2 (**9**) (*See Page 238*) can be adjusted in the sorting platform menu 3 after release at the tractor terminal.

6.4 Support foot





(1) Machine support foot operating position
(2) Support foot safety bolt with circlip
(3) Support foot stopcock
(4) Machine support foot park position

The machine is fitted with a hydraulic support foot. It is designed for safe parking of the machine.

The stopcock (**3**) must be kept in the closed position at all times unless the support foot is to be moved. After closing the stopcock the double-acting tractor control unit must be released.

The support foot must be moved to the machine working position (**1**) immediately after coupling the machine to the tractor. Only in this position will this part of the machine have sufficient ground clearance. The support foot locking pin with circlip (**2**) must always be used.

The machine must not be parked on the support foot (**4**) until is has been secured to prevent movement.

ATTENTION

Danger of machine damage.

If the support foot is fully extended and exposed to the sun, the seals may be damaged due to expansion of the oil in the support foot.

– Never fully extend the support foot.
– If it is necessary to extend the support foot completely in order to couple the machine, retract it by 10 mm immediately after coupling.

6.5 Coupling and uncoupling the machine

6.5.1 Coupling machine

Proceed as follows to couple the machine to a suitable tractor:

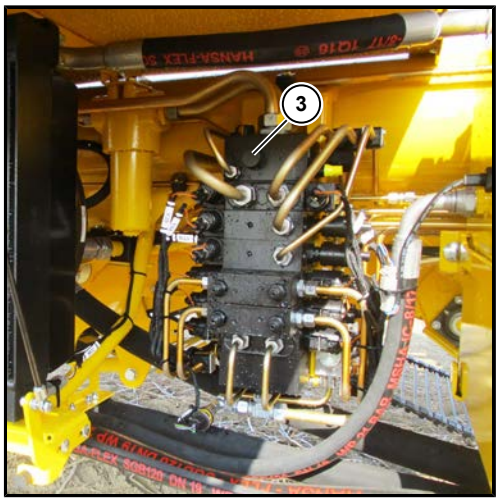
– Reverse the tractor to the coupling point of the machine and stop shortly before it.
– Dismantle the immobiliser from the drawbar eye and put it away.
– Connect the two hydraulic hoses of the support foot to a suitable tractor control unit. The control unit must not be set to floating position.

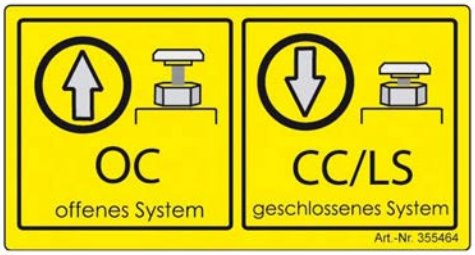
(1) Support foot stopcock closed

– Open the support foot stopcock and move the support foot to the correct height for coupling the machine.
– Reverse the tractor carefully until the couplings can be securely locked, then set the tractor parking brake.
– Retract the support foot completely, lock the stopcock and depressurize the hydraulic hoses.
– Switch off the tractor and lock the connection between the tractor and the machine.
– Fold up the support foot and lock it with the locking pin with circlip to ensure sufficient ground clearance.
– With the tractor shut off and secured to prevent movement connect the machine brake hoses to the tractor.

(2) Cardan shaft secured

– With the tractor shut off insert the wide-angle articulated shaft (**2**) until it locks and make sure that the torsion lock / chain lock on the shaft guard is installed.





(3) LS screw 6x LVS block

– Connect the tractor hydraulic hoses to the machine. When using the tractor LS screw the LS screw (**3**) on the 6-part LVS block fully in. If you are using a control unit on the tractor, screw the LS screw on the 6-part LVS block fully out.
– Connect the ISOBUS plug and the plug for the vehicle lights to the tractor.
– In the tractor cabin connect the emergency stop switch and the optional video monitor of the optional video system.
– Check the vehicle lights, remove the wheel chocks and release the machine parking brake.
– Do not start moving until the brake system has built up sufficient pressure.

ATTENTION

Hazard of damage to the hydraulic system!

If the LS screw is incorrectly adjusted at the input plate of the 6x LVS block, the hydraulic system of the machine may be seriously damaged. The LS screw must always be set to one of the two stops and must never be adjusted while the tractor is running.

– The LS screw at the input plate of the control block must be screwed in to the stop on tractors with the closed hydraulic system CC/LS (closed centre).
– The LS screw at the input plate of the control block must be screwed out to the stop on tractors with the open hydraulic system OC (open centre).

ATTENTION

Hazard of damage to the hydraulic system!

Incorrect or improper connection of hydraulic hoses to the tractor may cause severe damage to the machine's hydraulic system. Pay special attention to the correct position of the return hose. If this is not connected or not properly connected and pressure is applied to the machine's supply line, it will result in serious damage to the machine's hydraulic system!

– When connecting the hydraulic lines, ensure that the hydraulic couplings are properly engaged.
– Connect the hydraulic lines correctly to the tractor, e.g. supply line to supply line and return line to return line.
– Use a sufficiently large free return line on the tractor for the return line of the machine, so that no dynamic pressure can build up.

6.5.2 Uncoupling machine

Proceed as follows to uncouple the machine from a tractor:

- Park the machine on level ground.
- Switch off the tractor and secure it to prevent movement.
- Position the two wheel chocks under the wheels of the machine and set the machine parking brake.
- Unplug the machine electrical connections, ISOBUS plug and vehicle plug from the tractor outlets.
- Disconnect the wiring of the tractor emergency stop and the optional video system.
- Disconnect the cardan shaft of the machine from the tractor.
- Disconnect the hydraulic hoses from the machine, except for the two hydraulic hoses for the support foot.
- Couple the flow hose and the return hose of the tractor hydraulics together.
- Fold up the support foot and lock it with the locking pin with circlip.
- Open the support foot stopcock and then open the lock of the connection between the tractor and the machine.
- Start the tractor and extend the support foot to the height for uncoupling the machine, move the tractor forward slightly until the coupling position is completely free.
- If the support foot is fully extended, retract it by 10 mm.

(1) Support foot stopcock closed

- Close the support foot stopcock (**1**), depressurise the two hydraulic hoses of the support foot and disconnect the two support foot hydraulic hoses from the tractor.
- Mount the immobiliser to the drawbar eye of the machine (*See Page 41*).

ADVICE

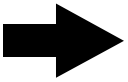
Always couple the flow hose and the return hose of the tractor hydraulics together after uncoupling the machine!
A check valve is installed in the return hose for safety reasons. Sunlight causes pressure accumulation in the return hose between the coupling and the check valve and coupling to the tractor becomes no longer possible. It can be prevented by coupling the return hose and the flow hose together.

6.6 Road travel

6.6.1 General

The machine is classified as a towed agricultural machine within the territory of the European Union. This type of vehicle is subject to very specific regulations and conditions which may differ between countries. Differences are also possible within a country in the individual conditions established by the respective competent road traffic authorities. In any case, the operator must make sure that the machine is furnished with the regionally required safety equipment and devices, e.g. warning triangle, warning lights on the tractor etc. and that these devices are always carried in functional condition.

ADVICE



ROPA expressly wants to point out that the driver and owner of the machine are always alone responsible for compliance with the respective regulations and conditions of the competent road traffic authorities.

Generally applicable for the Federal Republic of Germany:

Before driving on public roads:

- the bunker must be emptied.
- the bunker must be folded in transport position.

  To do this:

  - lower bunker completely.
  - lower bunker filling conveyor completely.
  - move optional tray filler back completely.
  - move optional articulated bunker back completely.
  - bring folding section of bunker to transport position.

- the pickup must be fully raised and secured.
- the sorting container and the collection box must be emptied and closed.
- the access ladder on the right sorting platform must be fully raised and locked.
- the machine must be coupled to a towing vehicle registered for travel on public roads.
- the support foot must be moved to working position, locked and the support foot stopcock must be closed.
- the rear wheel steering must be set to the 0° position.
- the drawbar must be moved completely in.
- check the operating and traffic safety of the machine.
- the machine must be sufficiently cleaned.
- the optional incline system of the machine must be set to the neutral position.
- pressure line P on the tractor must be disconnected.
- all working lights must be switched off.
- engage "Road" operating mode at the tractor terminal (press the emergency stop switch on the lifter operating element).

Further requirements for operating the machine:

Before driving on public roads and paths, the machine must be cleaned so far that:

- the gross weight rating is not exceeded,
- all warning signs are visible,
- all direction indicators and lighting fixtures are clean and functional,
- stones, earth, vegetation or crop residues cannot fall off the machine and affect other traffic.

As a towed agricultural machine with a maximum speed of 40 km/h or 25 km/h the machine must be registered and carry registration plates. Furthermore, the machine must be insured against damage from vehicle owners‘ third-party liability according to the locally applicable regulations.

The following conditions must always be fulfilled:

- A guide giving the directions required for safe driving of the vehicle to the driver must always be used, if otherwise safe driving of the vehicle (for instance at intersections and road junctions, when backing up, or in case of unfavourable weather conditions) cannot be ensured.
- Only persons familiar with the vicinity, experienced and reliable may be used as driver and accompanying personnel (guide).
- The vehicle may only be moved on public roads and paths by drivers having the required and valid driver's license. Besides the valid driver's licence, the driver must also carry originals of the general type approval of the machine and if available the existing and valid exemption permit.
- Safety vests, first aid kit and warning triangle must be be carried in the tractor.
- No persons are permitted to ride on the sorting platforms.
- The vehicle owner or his representative have to instruct each driver before beginning a working period about his special obligation for safe driving of the vehicle. The instructions given must be acknowledged by the drivers with their signature. The vehicle owner must keep these acknowledgements for at least one year. A form for these instructions is included in Chapter 9 (*See Page 396*). ROPA recommends copying this form before completing it.
- As already mentioned, the regionally competent road traffic authorities may establish additional conditions or conditions deviating from the regulations listed. It is the sole responsibility of the vehicle owner and the driver to gain knowledge of these regulations and to comply with them.
- If parts or functions of the vehicle whose condition or sequence has been prescribed are subsequently modified, then the "General type approval" lapses and a new "General type approval" must be applied for with the authorities in the country of operation.

6.7 Braking system

The braking system of the standard machine is a dual-circuit air brake system as the service brake. Machines exported to some countries are fitted with hydraulic brakes and a spindle emergency brake as the parking brake.

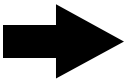
The service brake is actuated by the brake pedal on the cabin floor of the tractor. The parting brake on the machine is actuated by the spindle emergency brake.

DANGER

Hazard to life in case of faulty brakes.

- Before each drive, check functioning of the brakes!
- The braking systems must regularly be thoroughly checked!
- Setting and repair work on the brakes may only be performed by trained specialist personnel.

ADVICE



The EU type approval from the 2021 year of construction only applies to machines with 40 km/h and the pneumatic brake.
The EU type approval from the 2021 year of construction does not apply to machines with 25 km/h and the hydraulic brake.

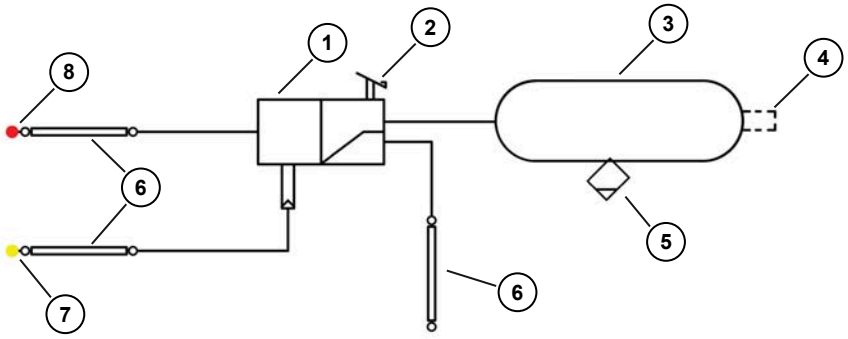
6.7.1 Air brake

The air brake is actuated by the brake pedal on the cabin floor of the tractor. It is applied on the tractor axles and the axle of the machine. It works on the machine only if there is sufficient pressure in the air brake system. If the service brake is not sufficiently functional (e.g. air pressure too low), the brake system must be checked without delay.

DANGER

If a warning icon is displayed on the tractor display indicating problems with the braking system or if problems with the braking system are found, then there is very serious danger of death for the driver and bystanders as well as other road users.

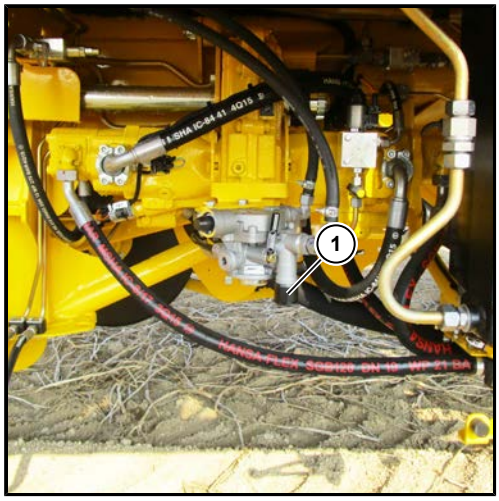
- Operation of the machine must be stopped immediately.
- The machine must be parked in such a manner that nobody is endangered or damaged.
- Additionally, the machine must be secured against rolling using wheel chocks and by engaging the parking brake.
- The machine must not be be moved again until the cause for the brake fault has been repaired by specialist personnel and the machine has been approved for operation by specialist personnel.



(1) Trailer brake valve
(2) Brake release valve
(3) Air reservoir
(4) Check valve
(5) Drainage valve
(6) Brake hose
(7) Yellow coupling head (line filter integrated)
(8) Red coupling head (line filter integrated)

The braking system is connected to the dual-circuit braking system of the towing vehicle by a supply line (red coupling head) and a brake line (yellow coupling head). The supply line sends compressed air to the reservoir on the machine (8 bar). The pressure in the brake line actuates the trailer brake valve and fills the membrane cylinder with compressed air from the reservoir.

The membrane cylinder transmits the braking force to the wheel brakes through the transmission equipment. The braking force is precisely and accurately controlled by the pressure in the brake line. An "advance" is set at the trailer brake valve, i.e. the machine brakes earlier and more strongly than the towing vehicle and the tension is maintained in the towing gear. If the brake line from the towing vehicle is cut, the machine automatically brakes (shear braking).



(1) Trailer brake valve with brake release valve
(2) Outlet valve/drainage valve

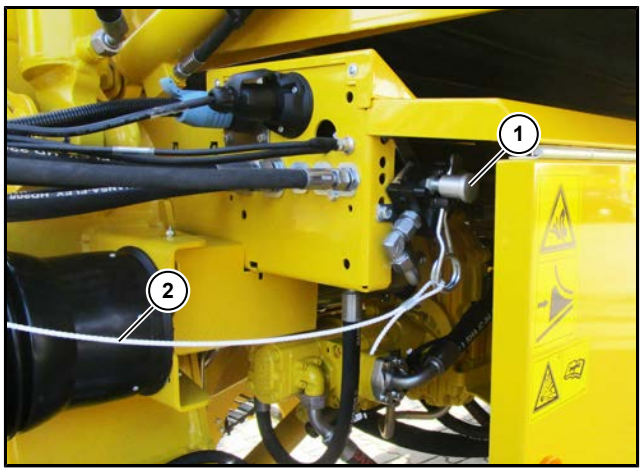
Clean the sealing rings of the coupling heads before connecting the braking system to the towing vehicle. After uncoupling, the coupling heads must be attached to the brackets on the drawbar.

Do not start driving until the pressure gauge in the towing vehicle shows a pressure of 5.0 bar.

After uncoupling the machine is automatically braked (trailer breakaway system). The brake can be released by pulling the brake release valve (**1**) when the machine is uncoupled. The pressure in the reservoir must still be at least 4.5 bar. If the pressure is lower, the brake can only be released by venting the reservoir through the drainage valve (**2**). The braking system cannot be used after this because the reservoir is empty.

6.7.2 Hydraulic service brake

The hydraulic service brake is actuated by the brake pedal on the cabin floor of the tractor. It is applied on the tractor axles and the axle of the machine. And it works only if enough pressure has built up in the hydraulic system. If the service brake is not sufficiently functional (e.g. air pressure too low), the brake system must be checked without delay.



(1) Trailer brake valve
(2) Breakaway line

DANGER

If a warning icon is displayed on the tractor display indicating a problem with the braking system, then there is very serious danger of death for the driver and bystanders as well as other road users.

– Operation of the machine must be stopped immediately.
– The machine must be parked in such a manner that nobody is endangered or damaged.
– Additionally, the machine must be secured against rolling using wheel chocks and by engaging the parking brake.
– It may only be moved again, after the cause for the brake fault has been repaired by specialist personnel and the machine has been released for operation by corresponding specialist personnel.

Clean the coupling head before connecting the braking system to the towing vehicle. After uncoupling, the coupling head must be attached to the brackets on the drawbar.

6.7.3 Emergency brake

(1) Spindle emergency brake

The emergency brake (**1**) is on the left side under the main frame of the machine behind the axle. It secures the harvester to prevent it from movement when parked.

Noe the following items for parking or coupling the machine when using the emergency brake.

When parking the machine:

– Always park the machine on level ground.
– Always set the brake on the towing vehicle. Switch off the engine and lock the towing vehicle to prevent accidental movement (remove ignition key) before leaving the driver's cabin to go under the machine to set the emergency brake.
– Turn the emergency brake crank (**1**) clockwise until the brake is fully set.
– Do not uncouple the tractor until the emergency brake on the machine has been set and chocks are placed under the wheels to prevent unwanted movement.

Coupling the machine:

– Couple the tractor.
– Always set the brake on the towing vehicle. Switch off the engine and lock the towing vehicle to prevent accidental movement (remove ignition key) before leaving the driver's cabin to go under the machine to release the emergency brake.
– Turn the emergency brake crank (**1**) anticlockwise until the brake is fully released.
– Do not start the tractor until the emergency brake on the machine has been fully released, the wheel chocks have been stored at the storage location of the machine, the service brake has been connected and tested for correct operation.

6.8 Steering

6.8.1 Steering in "Road" operating mode

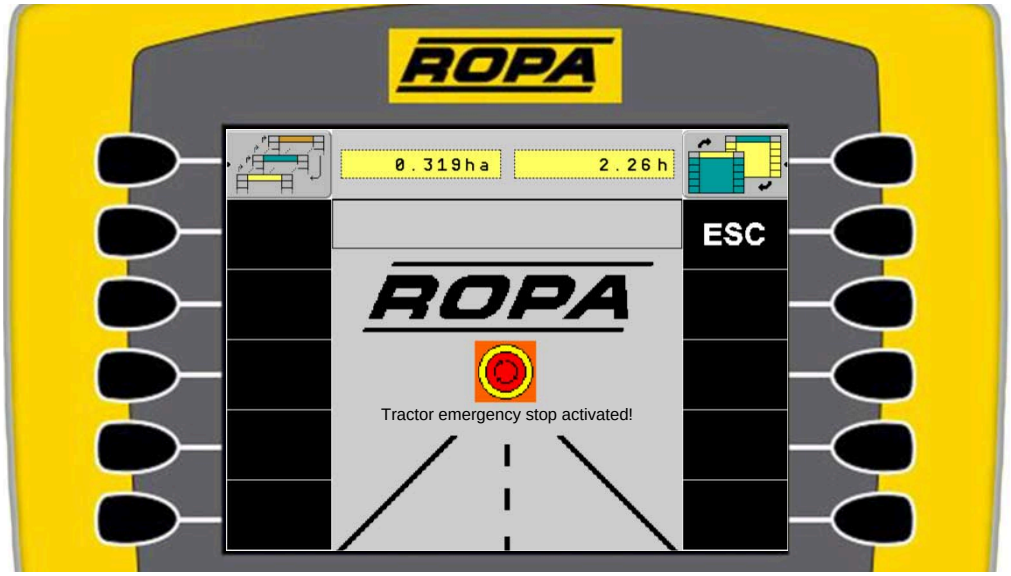
DANGER

Risk of fatal injuries if the "Road" operating mode is incorrectly used.

"Road" operating mode must always be engaged for travel on public roads. Otherwise unexpected steering movements of the machine may seriously endanger or cause fatal injuries in traffic.

– the machine must be prepared for road travel.
– engage "road" operating mode at the tractor terminal.

Before driving on public roads and tracks, the machine must be prepared, as described in the chapter on "Road traffic" (*See Page 142*).



The power at all outputs of all computers is shut off by software and hardware. "Road" operating mode is not engaged until the emergency stop switch on the tractor has been pressed. This ensures that the machine will not make any unexpected steering movements on public roads because the drawbar and axle steering are not enabled.

6.8.2 Steering in "Field" operating mode

I "Field" operating mode drawbar steering and axle steering are enabled on the machine as manual functions and also as automatic functions.

6.8.2.1 Drawbar steering

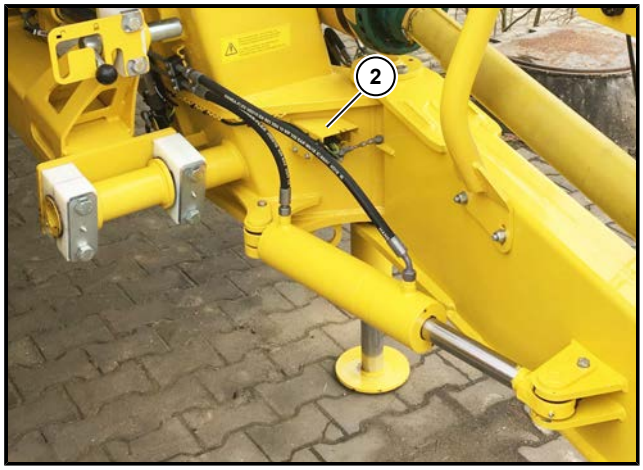
(1) Drawbar steering sensor standard drawbar road position

The position of the drawbar steering is monitored by a sensor (**1**). The steering of the standard drawbar has 3 basic positions.

In the road travel position the drawbar is fully swung in and cannot be moved when "Road" operating mode is engaged.

In the lifting position the drawbar is swung out far enough so the sieving channel can run beside the tractor to pick up the ridge or the swath. The drawbar position can be adjusted by the ridge centring function or manually.

In the bunker position the drawbar must be aligned in virtually a straight line with the main frame. This is required to raise and lower the bunker to ensure that the machine remains stable even if the bunker is in the fully raised position.



(2) Drawbar steering sensor optional drawbar road position

In addition to 3 basic positions of the standard drawbar, the position of the drawbar steering on the optional drawbar (**2**) has the additional fourth basic position.
When the optional drawbar is activated, the drawbar can swivel in completely and lifting of the right-hand ridge (in the direction of travel) within the lane is possible without driving over the other ridges (*See Page 188*).

The automatic drawbar function on the lifter operating component and the bunker operating component moves the drawbar to a previously saved position. The automatic drawbar function key must be pressed and held for 5 seconds to set this position again.

The drawbar can be moved manually with the left mini joystick on the lifter operating component and the top mini joystick on the bunker operating component. Moving mini joystick to the left steers the drawbar to the right and the machine to the left. Moving mini joystick to the right steers the drawbar to the left and the machine to the right.

6.8.2.2 Axle steering

(1) Axle position sensor

The position of the axle is monitored by a sensor (**1**). The axle steering has two basic positions.

In the road travel position the axle must be brought to the 0°-position. When "Road" mode is engaged at the tractor terminal the axle steering cannot be moved.

In the "Field" position the axle steering can be moved manually with the mini joysticks on the lifter operating component and the bunker operating component. When automatic wheel steering is activated, the axle steering is set to the preset value of the rotary wheel on the lifter operating component. The position or correction of the axle position can be adjusted with the rotary wheel.

Press the automatic axle centring key on the lifter control element or the bunker control element to activate automatic wheel steering. The automatic wheel steering can be activated from the deactivated status and from the preselected status. The automatic wheel steering is active when the LED is on. Manual steering or pressing the key again returns the automatic wheel steering to the status prior to activation.

Press the beginning of field key on the lifter operating component to activate the preselected automatic wheel steering. Manual steering or pressing the field end key returns the automatic wheel steering to the preselected status.

The axle position correction rotary wheel on the lifter operating component can be used to control the axle steering in the field with automatic wheel steering activated or to preset the target position of the axle steering. The axle centre of the automatic control is adjusted to the left or to the right. When the bunker is folded in the axle position rotary wheel is deactivated. The two LEDs, one above the icon and one below the icon indicate the direction in which the axle steering is being steered. In this direction the LED is on. In the centre position both LEDs are off.

The axle can be steered manually with the left mini joystick on the lifter operating component. The axle is steered to the right with the mini joystick up and steered to the left with the mini joystick down.

The axle can be steered manually with the top mini joystick on the bunker operating component. The axle is steered to the left with the mini joystick up and steered to the right with the mini joystick down.

Axle steering display field

(2) Axle position correction display
(3) Axle steering position indicator
(4) Automatic wheel steering

The current position of the axle steering (**3**) is displayed in the field operation menu. The axle position (**2**) with automatic wheel steering activated is corrected with the axle steering position indicator (**3**). The status of the automatic wheel steering (**4**) is displayed in the automatic functions field.

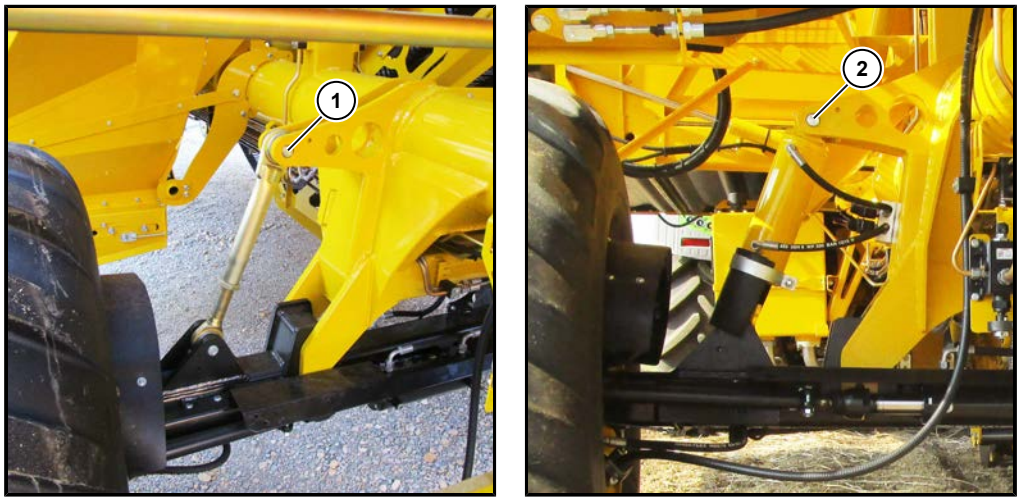
Automatic wheel steering is shut off. The machine can be steered manually with the mini joysticks on the lifter operating component and the bunker operating component.

Automatic wheel steering is preselected. Automatic wheel steering is activated with the start of field key on the lifter operating component.

Automatic wheel steering is switched on. Automatic wheel steering is reset to preselected with the end of field key on the lifter operating component. The automatic axle centring key on the lifter operating component or the bunker operating component resets the automatic wheel steering to its status before activation. If the machine is manually steered to the left or right, the automatic wheel steering is reset to the preselected status.

6.9 Chassis

6.9.1 Slope compensation (optional)



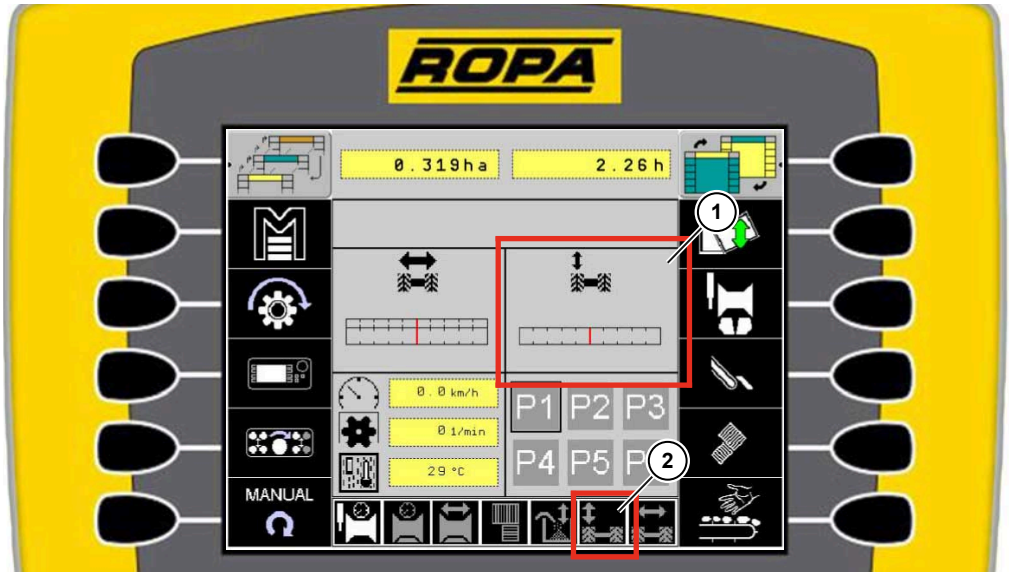
(1) Machine inclination upper arm
(2) Machine inclination cylinder

The standard machine is fitted with a machine inclination upper arm (**1**). The machine is aligned with the upper arm on a level surface vertically to the ground.

Optionally, the machine can be fitted with a machine inclination cylinder (**2**). The machine can be inclined with the cylinder against the ground towards the slope.

6.9.2 Slope compensation display field on the tractor terminal

The machine can only be inclined off public roads. The machine must always be vertically above the swing axle on public roads.



(1) Machine inclination display field
(2) Automatic slope compensation display field

Automatic slope compensation is shut off. The machine is above the swing axle and does not actively incline according to the ground profile. The machine can be manually inclined.

Automatic slope compensation is preselected. Automatic slope compensation is activated with the start of field key on the lifter operating component.

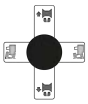
Automatic slope compensation is switched on. The machine automatically inclines on the swing axle to maintain a horizontal position regardless of the ground profile. If the machine is manually inclined to the left or right, the automatic function is reset to the preselected status. Automatic slope compensation is reset to preselected with the end of field key on the lifter operating component. Automatic slope compensation is reset to the status prior to activation with the automatic slope compensation key on the lifter operating component.

6.9.3 Hydraulic slope compensation including automatic function

DANGER

Hazard to life due to the machine tipping over!

The machine may only be brought into a horizontal position with the slope compensation, e.g. on slopes or in inclined positions. Extremely dangerous slopes and inclined positions of the machine must be avoided for safety reasons, otherwise the machine might tip over.



Manual slope compensation:

The machine can be manually inclined to the left and right with the right mini joystick on the lifter operating component. If it is inclined manually while automatic slope compensation is activated, automatic slope compensation is reset to the "preselected" status. It can be reactivated with the key on the lifter operating component to realign the machine to a horizontal position.

Automatic slope compensation Off/On

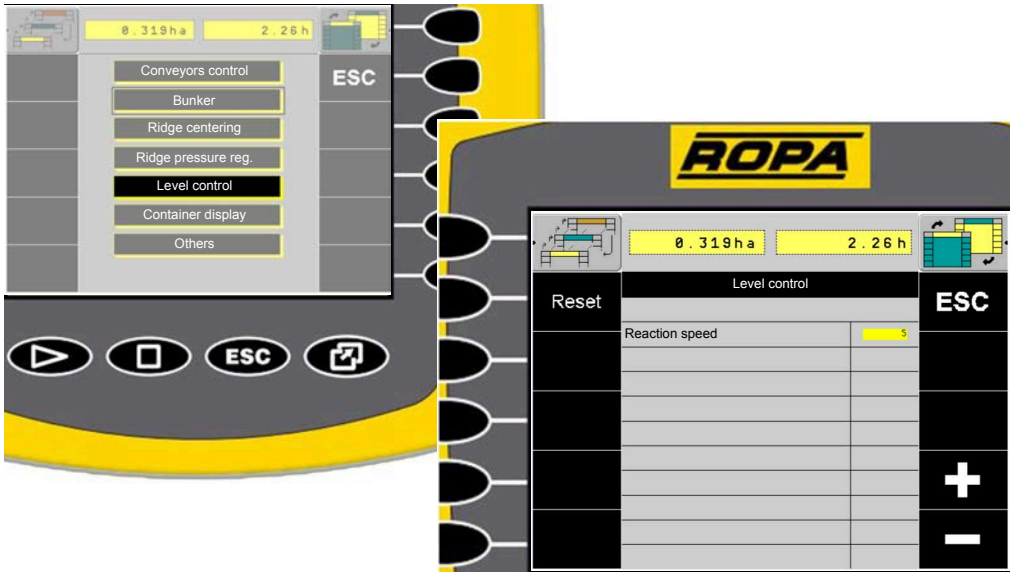
If this key on the lifter operating component is pressed in the "Field" operating mode, the automatic inclination system is set to ON (LED on). The machine automatically inclines to a horizontal position on the axle. If you press this key again, the automatic inclination system is OFF (LED off). It can be activated from the off status and the preselected status of the automatic slope compensation with the key. Automatic slope compensation is reset to the status prior to activation with the key.

The machine must be aligned vertically above the axle before selecting "Road" operating mode. The inclination system is automatically switched OFF when "Road" operating mode is selected.

Setting level control in the software

The reaction speed of the level control can be adjusted between 1 to 10 in the software, the default setting is 5. Where 1 = inert, for slow reaction speed at high lifting speed, and 10 = fast, for fast reaction speed at low lifting speed.

The reaction speed can be adjusted at the tractor terminal in the Main settings menu, Level control submenu.



6.10 Sunroof/weather protection roof (option)

(1) Sunroof

The sorting platform roof tarpaulin is available optionally as a sunroof (**1**) and a weather protection roof with side sections.

ADVICE

The roof tarpaulin and the side sections must be removed for transporting by low-loader. The frame for the sunroof/weather protection roof can remain mounted if the height is sufficient according to the exemption permit for low loader transport.

6.10.1 Canopy lighting (option)

Optional working floodlights can be installed on the sunroof or weather protection roof from year of construction 2018. They can be controlled directly with a switch.

6.11 Lifting

6.11.1 Preparation for lifting

Familiarise yourself with the local ground and landscape before starting to work.

Get an overview of the potato field that is to be lifted.

Instruct the people present before starting to work about the most important safety regulations, especially the required safety distances. In any case, instruct all people that you are obliged to immediately stop the machine and to immediately cease work if any one enters the hazard zones.

– Unfold bunker.
– Unfold the right sorting platform access ladder.
– Close safety rail at the right ladder.
– Close safety rail at the left ladder.
– Check the bunker floor to ensure that it is correctly positioned.
– Set drawbar in straight-ahead position and move it to lifting position shortly before starting a row.
– Check if the maximum set PTO speed of the tractor is 540 rpm.

6.11.2 Lifting process

- Drive into the field slowly and carefully so that the ridge roller is aligned with the lifted potato ridge after setting the drawbar to the lifting position.
- Switch on machine drive.
- Adjust the sieving channel lifting speed (sieve conveyor 1, sieve conveyor 2, leaf chain) and shaker intensity at the tractor terminal or the sorting platform terminal.
- Set the basic speed settings for the separation cleaning elements (pintle belt 1, deflector roller 1, pintle belt 2, rotating finger comb 1 (UFK 1), rotating finger comb 2 (UFK 2)) at the tractor terminal and operating components of the machine.
- Set all height adjustments (lifting depth, leaf scraper 1, leaf scraper 2, deflector roller 1, deflector roller 2, rotating finger comb 1 (UFK 1), rotating finger comb 2 (UFK 2), inclination pintle belt 1/2) at the tractor terminal and operating components of the machine.
- Adjust speed of picking conveyor and trash conveyor.
- Lower ridge pickup and drive into the crop.
- Immediately adjust lifting depth to the conditions. Make sure that the shares are not cutting the potatoes but are also not too deep in the ground.
- Check the lifting depth manually after a few metres by reversing the machine slightly, shutting it off and securing it to prevent movement, then dig into the area between the machine pickup and the untouched ridge to check whether lifting is deep enough, and repeat until the lifting depth is correct.
- Adjust sieving channel cleaning and separation, ideally some soil should be present up to the last pintle belt, then the potatoes are sorted clean through the rotating finger comb (UFK) onto the picking conveyor, with the potatoes treated gently on a cushion of soil.
- Check the pickup regularly to ensure that the ridge roller runs correctly along the ridge. If this is not the case, adjust the drawbar so that the ridge roller always moves along the centre of the ridge as far as possible; switch on ridge centring. Adjust the axle steering so that the tyre runs smoothly to the right (in the direction of travel) alongside the nearest ridge.

Normally, the headland is lifted first to establish space for transport equipment. Then the lanes are lifted through to establish enough space for manoeuvring. The exact procedure depends, as already mentioned several times, on the local conditions. In this case, the expert knowledge and skills of the driver alone influence the lifting results.

During lifting the potatoes are temporarily stored in the bunker. An ultrasonic sensor on the bunker filling conveyor registers the fill level of the bunker and lifts the conveyor as required. Once the bunker filling conveyor has reached its maximum height, the walking floor moves slowly forward to ensure that the bunker is filled as evenly as possible. When the bunker is full, the potatoes must be unloaded either onto a transport vehicle stationary alongside, or deposited in a suitable place in the form of a pile.

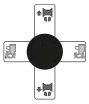
6.12 Pickup

DANGER

Injury hazard! Hazard to life due to moving parts!

When working on the raised pickup, there is a risk that the pickup may lower without warning. People in this area may be seriously injured as a result. Before starting work, the pickup must be completely raised and secured with safety bolt. If securing with the safety bolt is impossible, the pickup must be securely supported with material of sufficient load bearing capacity. Observe the applicable regulations on safety and health protection at work under raised loads.

The machine is fitted with a quick-change system for the various types of pickup as standard equipment. The machine is available in the various models: "Ridge pickup", "Swath pickup with lifting shaft and cover belt", "Swath pickup with shares" and "Pickup for carrot". The various models can also be combined in various ways. It takes less than 15 minutes to change a pickup.

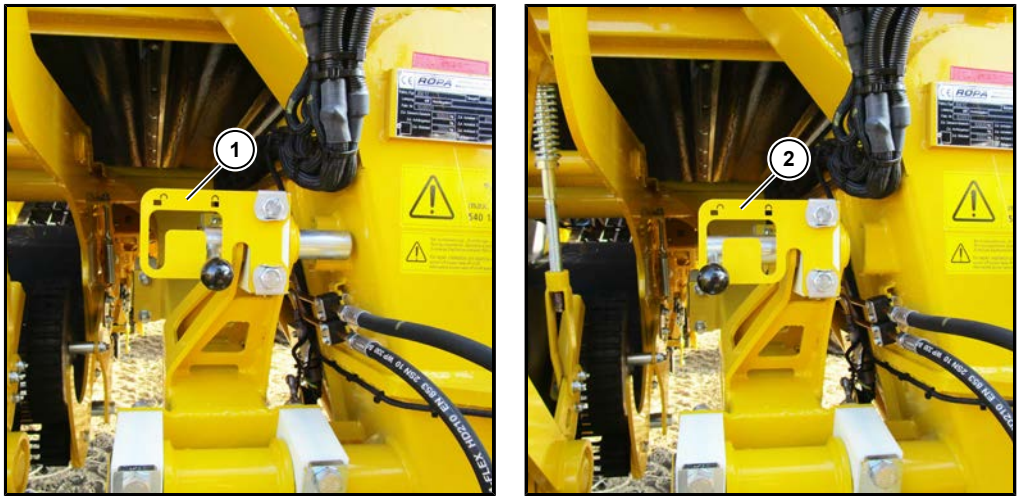


The pickup of the machine can be raised and lowered manually with the right mini joystick on the lifter operating component. The joystick up raises the pickup and the joystick down lowers it. The mini joystick must not be actuated unless the pickup is unlocked.

Pressing the start of field key on the lifter operating component automatically lowers the machine pickup at the press of the key. The start of field key must not be pressed unless the pickup is unlocked.

Pressing the end of field key on the lifter control automatically raises the machine pickup at the press of the key.

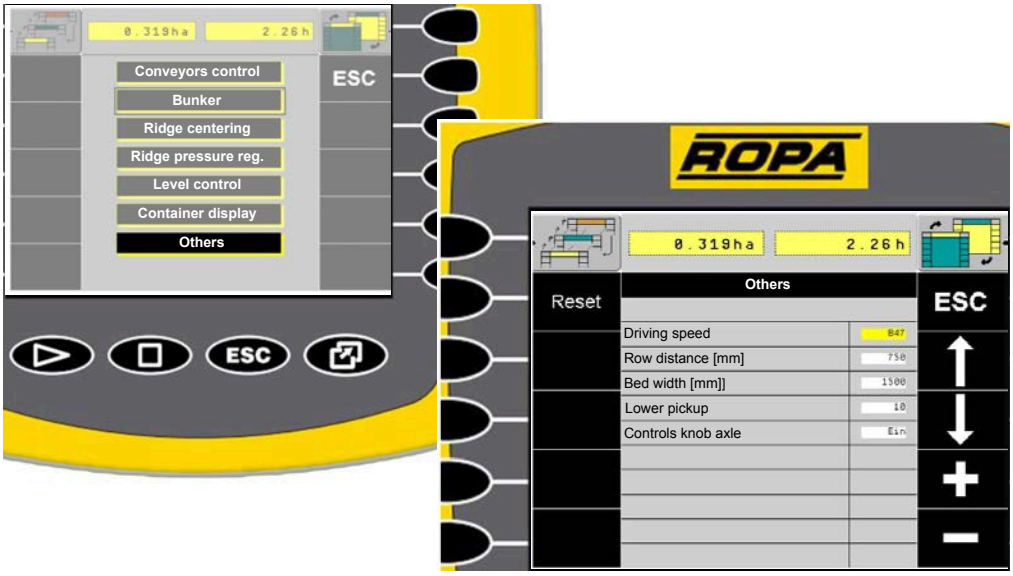
Pickup lock



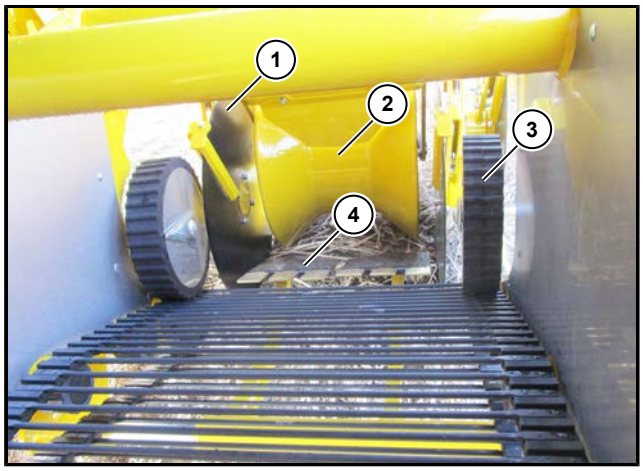
(1) Pickup locked
(2) Pickup unlocked

– Unlock the safety bolt before lowering the pickup (**2**).
– Lock the pickup with the safety bolt (**1**) before driving on public roads.
– Always lock pickup with the safety bolt (**1**) before working on the raised pickup.

The lowering speed of the pickup can be set on the tractor terminal in "Main settings", submenu "Others", line "Lower pickup".



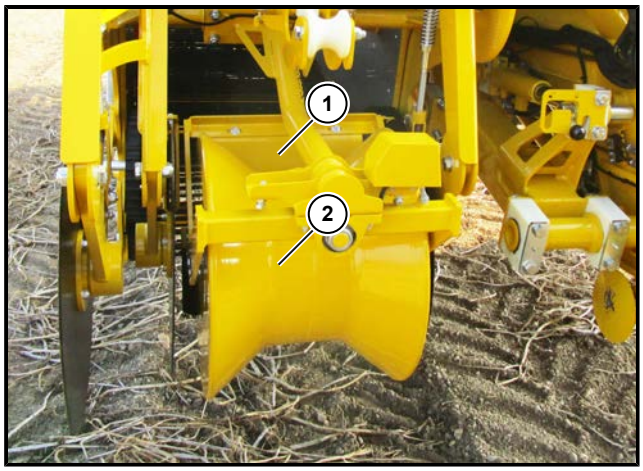
6.12.1 Ridge pickup model



(1) Disc coulter
(2) Ridge roller
(3) Leaf loading roller
(4) Share

When using the ridge pickup the potato ridges are guided via the shares (**4**) to sieve conveyor 1. The depth of the shares (**4**) is determined by the ridge roller (**2**). The disc coulters (**1**) cut off the haulm on the sides of the potato ridges. The leaf loading rollers (**3**) pick up the haulm on the sides.

6.12.1.1 Ridge roller

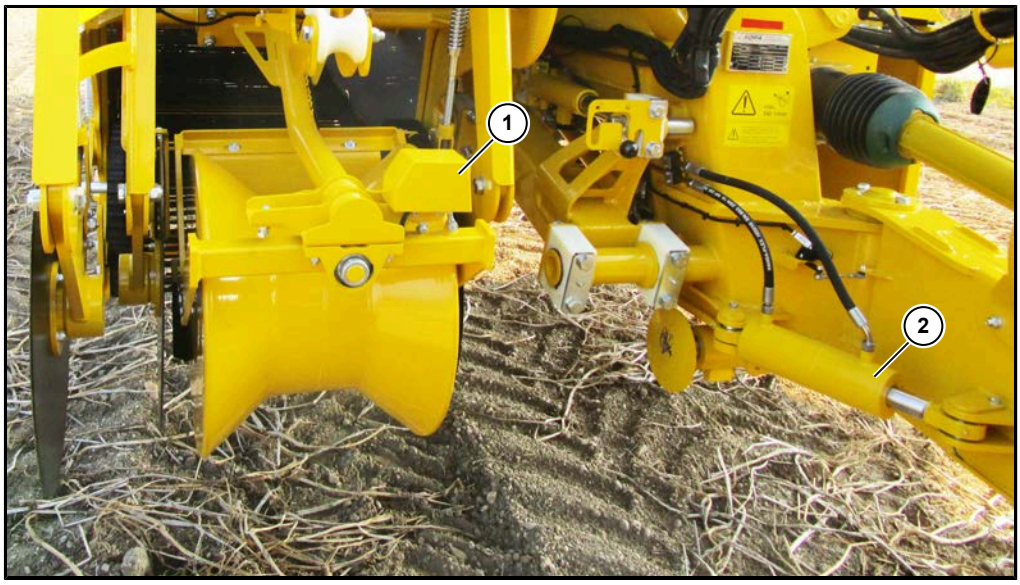


(1) Ridge roller wiper
(2) Ridge roller flat

Different types of ridge roller are available for different shapes of the potato ridge: the flat ridge roller (**2**) and the deep ridge roller.

The wiper (**1**) on the ridge roller prevents the ridge roller from being clogged with earth.

6.12.1.2 Ridge centring



(1) Sensor ridge centering
(2) Drawbar steering cylinder

The ridge centering controls the electromagnetic control valves of the drawbar cylinder (**2**) via the ridge centering sensor (**1**) on the ridge roller suspension and always keeps the sieving channel in the centre of the potato ridge.

The ridge centring can be preselected under automatic functions on the tractor terminal. If ridge centring is preselected, it is activated when the pickup is lowered. When the pickup is raised the ridge centring is deactivated and reset to preselected. Ridge centring is active within the range of the traverse path of the drawbar.

If the ridge roller falls from the potato ridge to the left, the machine steers right and the drawbar left. If the ridge roller falls from the potato ridge to the right, the machine steers left and the drawbar right.

(3) Automatic ridge centring

The current status of ridge centring (**3**) is displayed in the automatic functions display field.

Automatic ridge centring is deactivated.

Automatic ridge centring is preselected. Ridge centring is activated when the pickup is lowered with the start of field key on the lifter operating component.

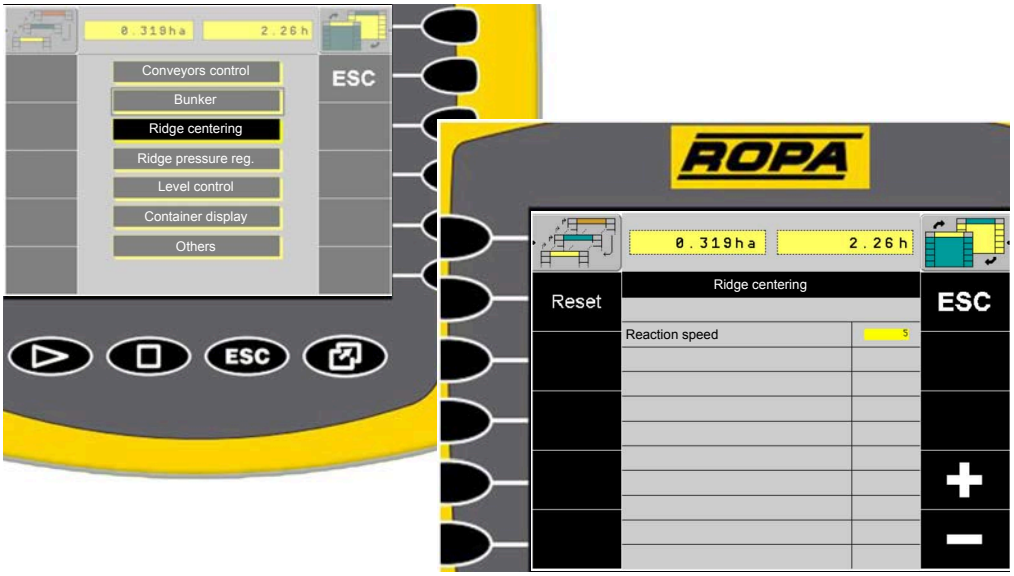
Automatic ridge centring is activated. Ridge centring is reset to preselected when the pickup is raised with the end of field key on the lifter operating component.

Press the ridge centring key on the lifter operating component to activate the automatic ridge centring. The automatic ridge centring can be activated from the deactivated status and from the preselected status. Ridge centring is active when the LED is on. Manual drawbar steering or pressing the key again returns ridge centring to the status prior to activation.

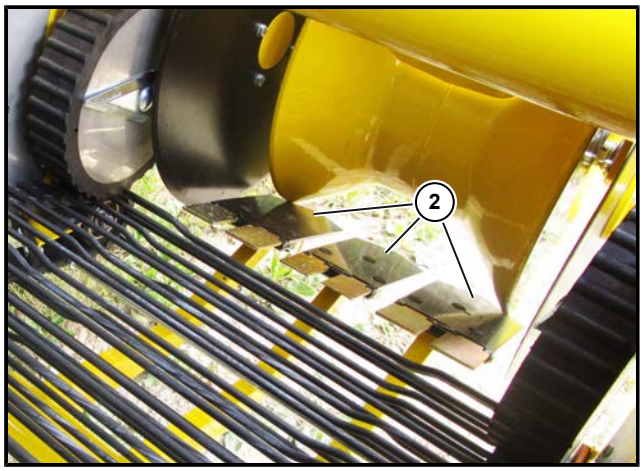
Press the beginning of field key on the lifter operating component to activate the preselected ridge centring. Ridge centring is activated when the pickup is lowered. Manual drawbar steering or pressing the end of field key again returns ridge centring to the preselected status.

Adjusting reaction speed

The reaction speed can be adjusted between 1 to 10 in the main settings menu, the ridge centering menu item, the basic setting is 5. Where 1 = slow and 10 = fast.



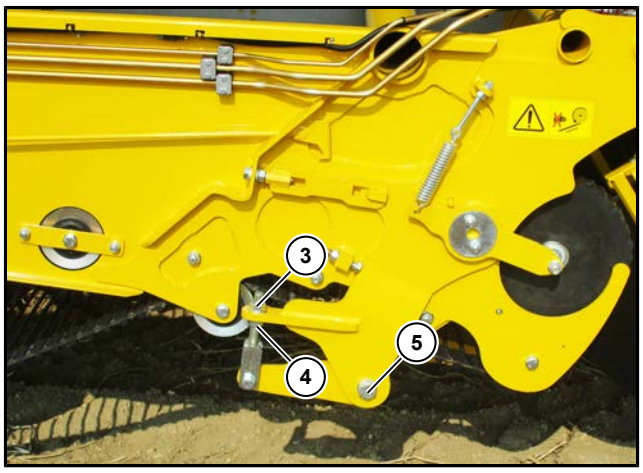
6.12.1.3 Shares



(1) Two-blade share
(2) Three-blade share

The share is available in following variants: single-blade share, two-blade share (**1**), wide two-blade share and three-blade share (**2**).

The share angle can be adjusted. In the basic setting the shares are at the same level as the sieve conveyors surface and form one line.



(3) Lock nut left
(4) Share inclination nut right
(5) Share safety screw right

– Loosen share safety screw (**5**).
– Loosen the lock nut (**3**).
– Adjust share inclination with nut (**4**).
– Tighten lock nut (**3**).
– Tighten share safety screw (**5**).

ATTENTION

Risk of destruction of pickup and sieve conveyor.

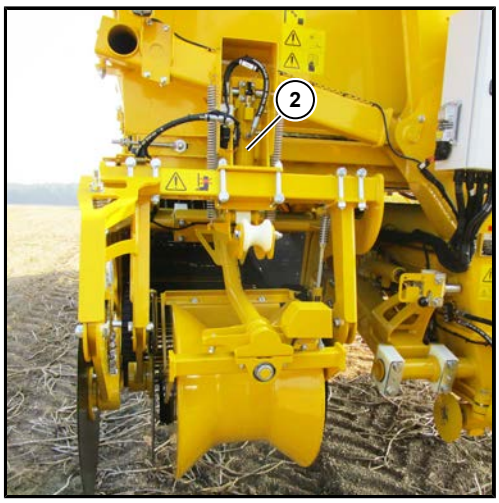
A larger share angle significantly increases the load on the share carrier. This increases the risk of damage to the crop, the pickup and the sieve conveyor.

– Use a measuring stick or similar item on the sieve conveyor and the share for the adjustment.
– The share must not be adjusted more than 10 mm below the level of the sieve conveyor.

6.12.1.4 Lifting depth and ridge pressure regulation

If the hydraulically adjustable lifting depth is integrated, ridge pressure regulation is also integrated and vice versa.

6.12.1.4.1 Lifting depth



(1) Lifting depth upper arm
(2) Lifting depth cylinder

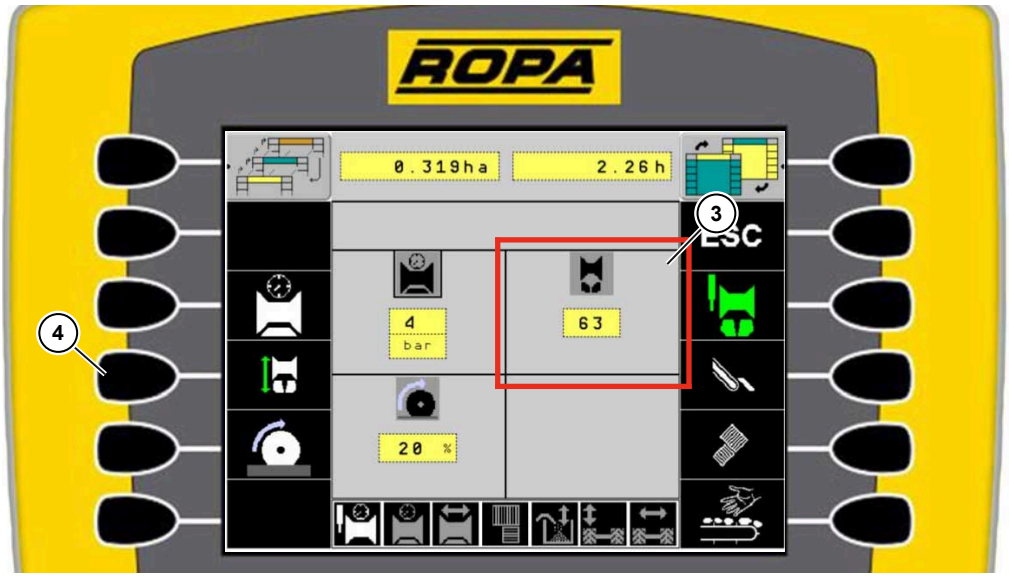
The lifting depth is the distance between the ridge roller and the share. In the standard version, the lifting depth is adjusted via an upper arm (**1**). Optionally, the lifting depth can be adjusted hydraulically via a cylinder (**2**). The hydraulic lifting depth can be adjusted at the tractor terminal and also at the sorting platform terminal if it has been released.

Adjustment of mechanical lifting depth

The mechanical lifting depth is adjusted steplessly with the crank above the lifting depth upper arm (**1**).

Adjustment of hydraulic lifting depth at the tractor terminal

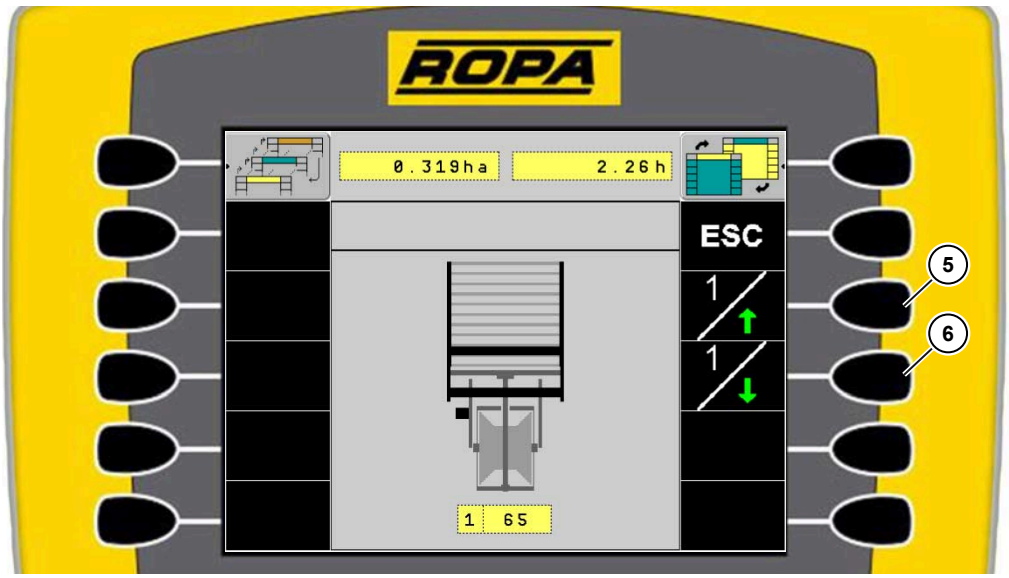
The lifting depth is adjusted in the pickup menu. Select the pickup soft key on the tractor terminal. After selection the soft key becomes green.



(3) Lifting depth display field
(4) Lifting depth soft key

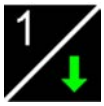
The lifting depth display field (**3**) indicates the actual setting of the lifting depth. Select the grey button on the lifting depth display field (**3**) to open the lifting depth submenu.

Select the lifting depth soft key to open the lifting depth submenu.



(5) Soft key lifting depth flatter
(6) Soft key lifting depth deeper

Press the key to flatten the lifting depth on the left. The lifting depth is adjusted in steps, where 0 is a completely flat lifting depth and 99 is a very deep lifting depth.



Press the key to lower the lifting depth on the left. The lifting depth is adjusted in steps, where 0 is a completely flat lifting depth and 99 is a very deep lifting depth.

Adjustment of hydraulic lifting depth at the sorting platform terminal

(7) Soft key shaker
(8) Soft key UFK 1 speed
(9) Lifting depth soft key
(10) Scroll screen right soft key
(11) Scroll screen left soft key
(12) Soft key pintle belt 1/2 inclination
(13) Soft key UFK 2 speed
(14) Soft key agitator

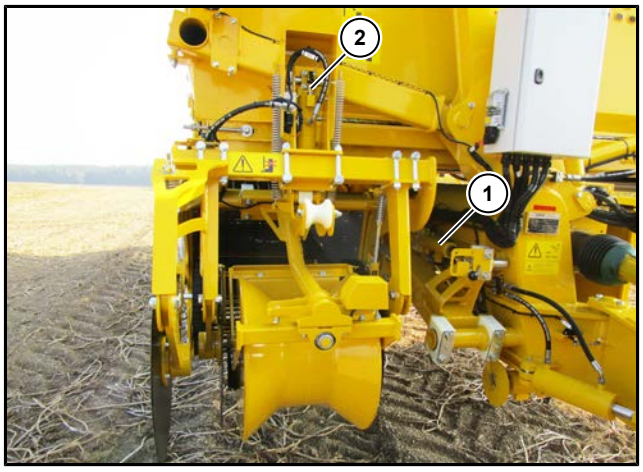
If the sorting platform terminal is released, scroll with the scroll screen right soft key or the scroll screen left soft key to open the screen for adjustment of the lifting depth. Select the lifting depth with the lifting depth soft key 5.

(15) Soft key lifting depth flatter
(16) Soft key lifting depth deeper

Press the key to flatten the lifting depth on the left. The lifting depth is adjusted in steps, where 0 is a completely flat lifting depth and 99 is a very deep lifting depth.

Press the key to lower the lifting depth on the left. The lifting depth is adjusted in steps, where 0 is a completely flat lifting depth and 99 is a very deep lifting depth.

6.12.1.4.2 Ridge pressure regulation



(1) Pickup cylinder
(2) Ridge pressure regulation sensor

With the ridge pressure regulation, the application pressure of the ridge roller is measured via the pressure sensor in the lifting depth cylinder (**2**).

The set application pressure is regulated by finely adjusted releasing and loading of the pickup cylinder (**1**).

The target application pressure can be adjusted at the tractor terminal in the range from 5 bar to 35 bar. The ridge pressure regulation must be adjusted so that the ridge roller rolls over the ridge without pushing or compressing the ridge.

The lifting depth must be checked after adjusting the ridge pressure regulation.

E.g.:

- Wet conditions or heavy soil.
  - **minimum application pressure 5 bar.**
- Under dry conditions to ensure proper harvesting and breakage of crusts.
  - **maximum application pressure 35 bar.**

(3) Automatic ridge pressure regulation

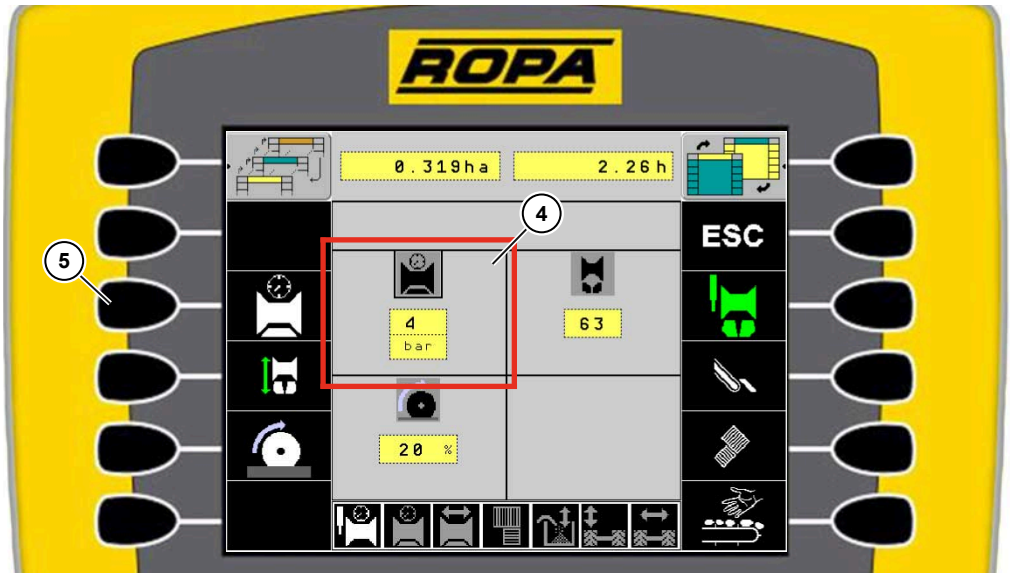
The current status of ridge pressure regulation (**3**) is displayed in the automatic functions display field.

The automatic ridge pressure regulation is deactivated.

The automatic ridge pressure regulation is preselected. Ridge pressure regulation is activated when the pickup is lowered with the start of field key on the lifter operating component.

The automatic ridge pressure regulation is activated. Ridge pressure regulation is reset to preselected when the pickup is raised with the end of field key on the lifter operating component.

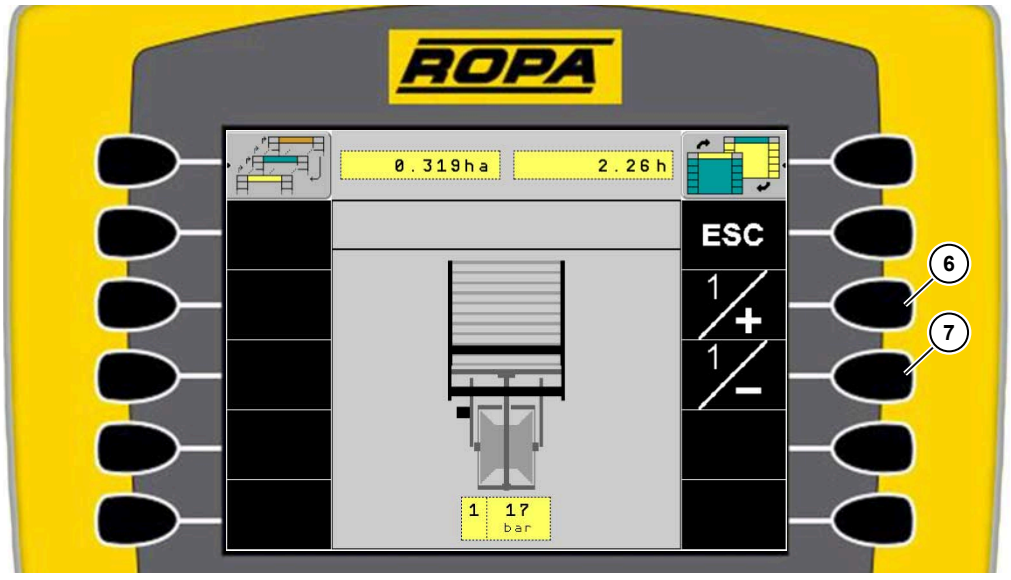
The pressure of the ridge pressure regulation can be adjusted in the pickup menu. Select the pickup soft key on the tractor terminal. After selection the soft key becomes green.



(4) Ridge pressure regulation display field
(5) Ridge pressure regulation soft key

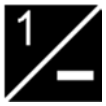
The ridge pressure display field (**4**) shows the current actual pressure of the ridge pressure regulation. Select the grey button to open the submenu for adjusting the ridge pressure regulation. The ridge pressure display field (**4**) shows the pressure of the ridge pressure regulation if the automatic ridge pressure regulation is preselected or activated.

The ridge pressure regulation soft key opens the ridge pressure regulation submenu. The ridge pressure regulation soft key can only be selected if under automatic functions the ridge pressure regulation on is preselected or activated .



(6) Soft key increase ridge pressure regulation
(7) Soft key reduce ridge pressure regulation

Press the key to increase pressure. The pressure is adjusted in steps in which 5 bar is the minimum load pressure and 35 bar is the maximum load pressure.

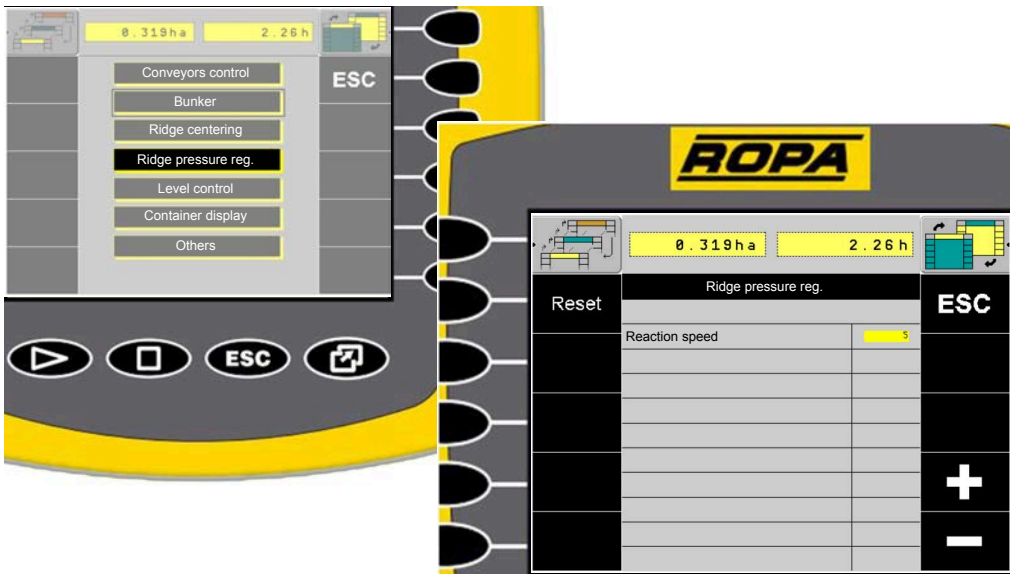


Press the key to reduce pressure. The pressure is adjusted in steps in which 5 bar is the minimum load pressure and 35 bar is the maximum load pressure.

Ridge pressure regulation is activated with the automatic depth control key on the lifter operating component. It can be activated with the pickup lowered from the preselected status. This is necessary if the pickup is not lowered with the start of field key. If the automatic depth control key on the lifter operating component is pressed with automatic ridge pressure regulation activated, the automatic function is reset to the preselected status.

Adjusting reaction speed

The reaction speed can be adjusted between 1 to 10 in the main settings menu, the ridge pressure regulation menu item, the basic setting is 5. Where 1 = slow and 10 = fast.



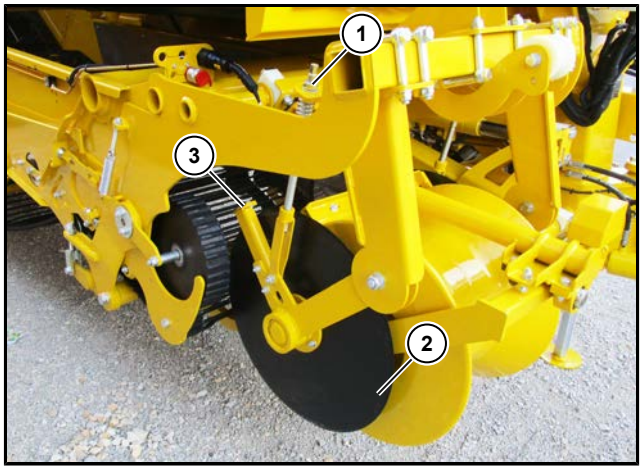
6.12.1.5 Disc coulter

ATTENTION

Hazard of damage to the disc coulters.

If you do not observe this note, the disc coulters, the pickup and the front area of the sieving channel may be destroyed.

– The drawbar must not be steered when the pickup is lowered and the tractor stands still or driving speed is minimal.
– The manual drawbar steering movement must be adjusted to the driving speed when the pickup is lowered. The lower the driving speed of the tractor is, the more carefully and slowly the drawbar must be steered.



(1) Disc coulter depth adjustment
(2) Disc coulter right
(3) Disc coulter right wiper

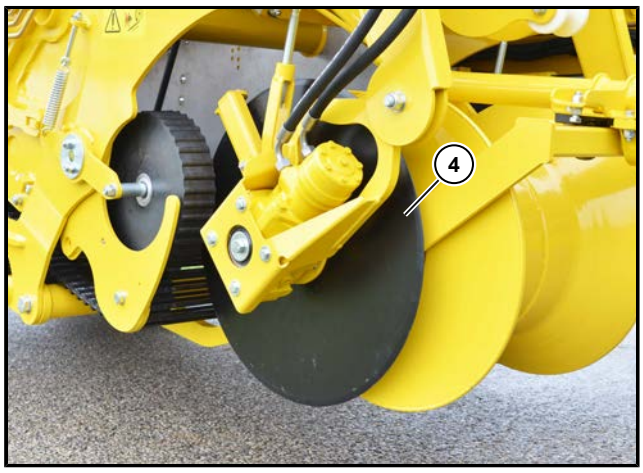
Two disc coulters are installed in the standard model of ridge pickup. Optionally, an additional disc coulter can be installed on the right side of the pickup.

On the ridge pickup with two disc coulters, disc coulters are located on the outside of the ridge roller each. Both disc coulters are identical and installed as mirror images of one another.

The working depth of the disc coulters can be adjusted independently of one another by turning the depth adjustment screw (**1**) to raise or lower the disc.

The wipers (**3**) are loosely installed above the disc coulters. They move more easily under wet and difficult conditions and keep the disc coulters clean.

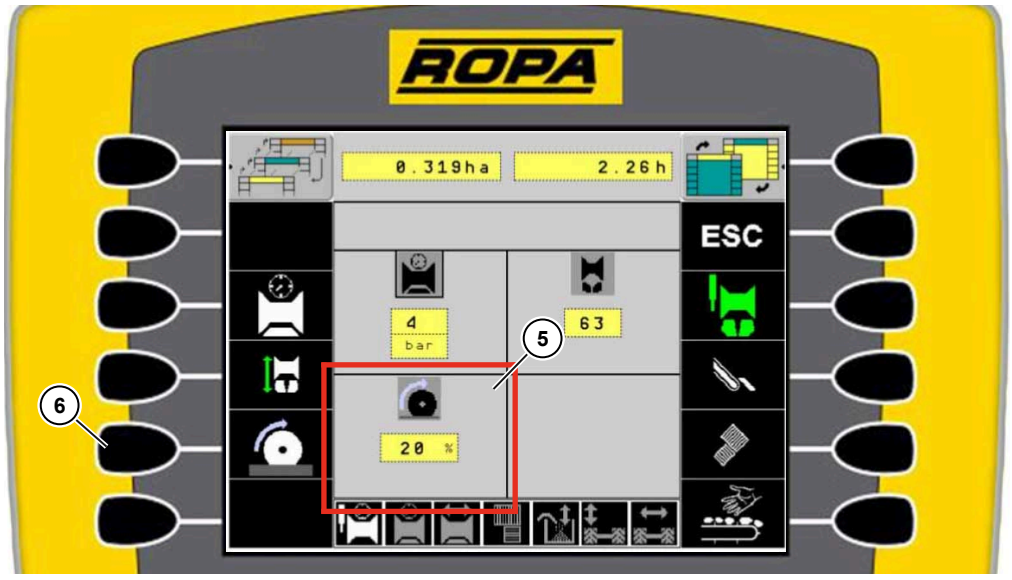
If the haulm is particularly tough, the disc edges can be sharpened to ensure that the haulm is cut cleanly.



(4) Ridge pickup with hydraulically driven disc coulter right

The right disc coulter (4) and the left disc coulter are optionally available as hydraulically driven disc coulters. Both disc coulters or only right disc coulter can be designed as hydraulically driven. The start of field key on the lifter control switches on the hydraulic disc coulter, the end of field key on the lifter control switches off the hydraulic disc coulter. The hydraulic disc coulter can be manually switched on and off together with the machine drive with the soft key.

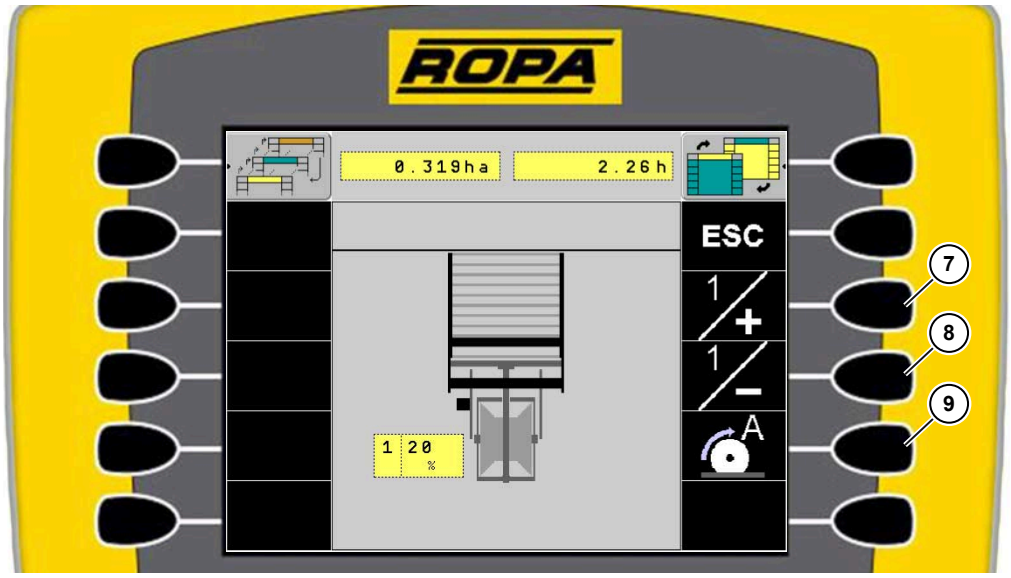
The hydraulic disc coulter can be adjusted in the pickup menu. Select the pickup soft key on the tractor terminal. After selection the soft key becomes green.



(5) Disc coulter display field
(6) Disc coulter soft key

The disc coulter display field (**5**) displays the current actual speed of the disc coulter. Select the grey button to open the disc coulter submenu and adjust the speed as a percentage.

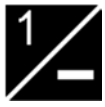
The disc coulter soft key opens the disc coulter submenu.



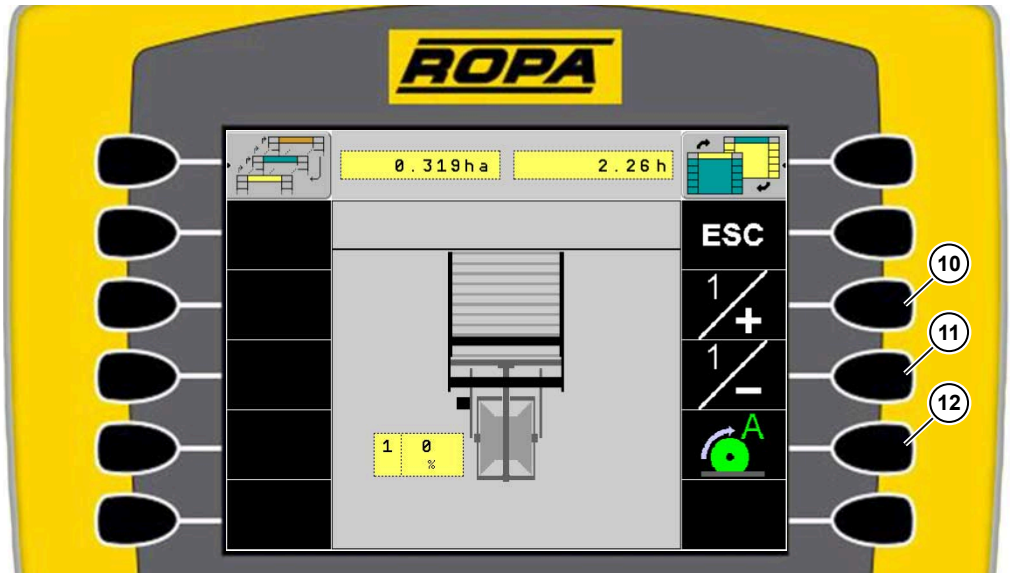
(7) Soft key increase disc coulter speed
(8) Soft key reduce disc coulter speed
(9) Soft key disc coulter automatic function deactivated

The automatic function of the disc coulters is deactivated. The speed of the disc coulters can be adjusted in the range from 20% to 100%.

Press the key 1/+ to increase the speed. The speed of the disc coulters can be adjusted in the range from 20% to 100%. The minimum speed of the hydraulic disc coulters is 20%, and 100% is the maximum speed of the hydraulic disc coulters.



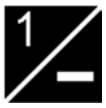
Press the key 1/− to reduce the speed. The speed of the disc coulters can be adjusted in the range from 20% to 100%. The minimum speed of the hydraulic disc coulters is 20%, and 100% is the maximum speed of the hydraulic disc coulters.



(10) Soft key increase disc coulter speed ratio
(11) Soft key reduce disc coulter speed ratio
(12) Soft key disc coulter automatic function activated

The automatic function of the disc coulters is activated. The speed of the disc coulters can be adjusted proportionally to the driving speed of the machine in the range from -25% to 25%.

Press the key to increase speed ratio of the disc coulters to the driving speed of the machine. The deviation of the disc coulter speed can be adjusted in the range from -25% to 25%. Here, -25% corresponds to the minimum speed of the hydraulic disc coulters to the driving speed, the disc coulters speed lags, and 25% corresponds to the maximum speed of the hydraulic disc coulters to the driving speed, the disc coulters speed leads.

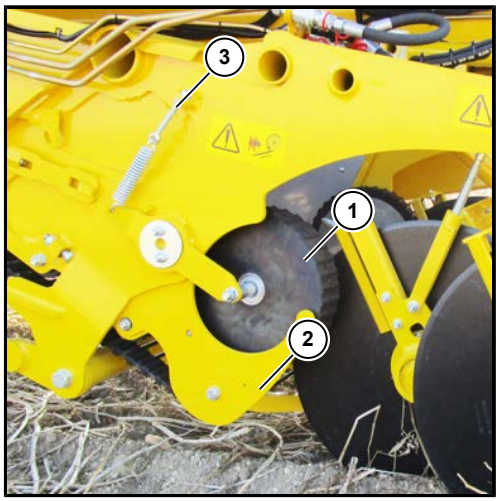


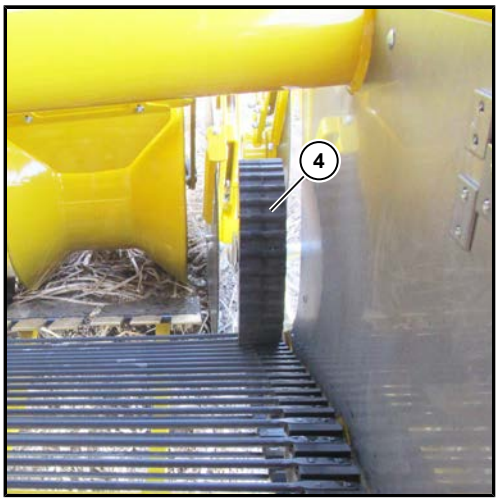
Press the key to reduce speed ratio of the disc coulters to the driving speed of the machine. The deviation of the disc coulter speed can be adjusted in the range from -25% to 25%. Here, -25% corresponds to the minimum speed of the hydraulic disc coulters to the driving speed, the disc coulters speed lags, and 25% corresponds to the maximum speed of the hydraulic disc coulters to the driving speed, the disc coulters speed leads.

(13) Additional disc coulter right

An additional disc coulter on the right (**13**) can be installed with a normal disc coulter. The depth settings are to be made as with the normal disc coulter.

6.12.1.6 Leaf loading roller





(1) Leaf loading roller right
(2) Leaf deflector skid right
(3) Leaf loading roller clamp right
(4) Installation position of leaf loading roller right

The right and left leaf loading rollers (**1**) are located on the ridge pickup between the two disc coulters and the side wall of the sieving channel. Both leaf loading rollers are identical and are installed as mirror images of one another.

The spring tensioner (**3**) must be adjusted so the leaf loading rollers are properly driven from sieve conveyor 1. If the haulm accumulates and if not sufficiently loaded, the spring tension can be increased to increase the pressure on the leaf loading rollers. Each side can be independently adjusted. Higher pressure on the leaf loading rollers also means higher wear.

The leaf deflector skid (**2**) prevents cut haulm and overhanging haulm from the next row from accumulating at the side wall of the sieving channel.

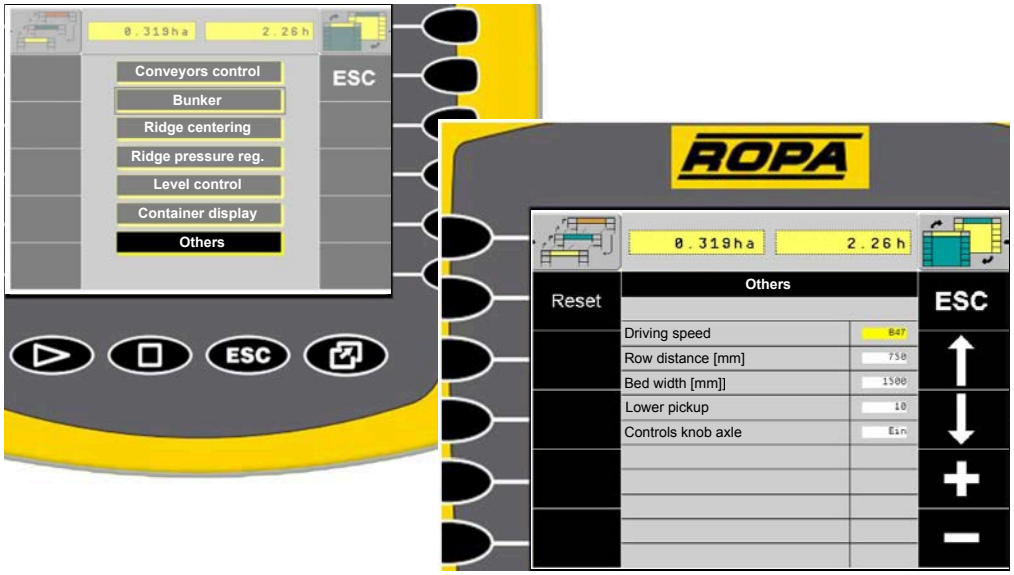
The internally mounted position of the leaf loading rollers (**4**) prevents the flow of the crop from accumulating on the side belts of sieve conveyor 1 where the crop flow cannot be sieved.

6.12.1.7 Setting row distance

Setting row distance in the software

In the software the row distance can adjusted infinitely from 750 mm to 1,800 mm; default setting 750 mm. The row distance is active when the ridge pickup is installed.

Set the row distance on the tractor terminal in the menu "Main settings", submenu "Others", otherwise the hectare counter will record incorrect values.

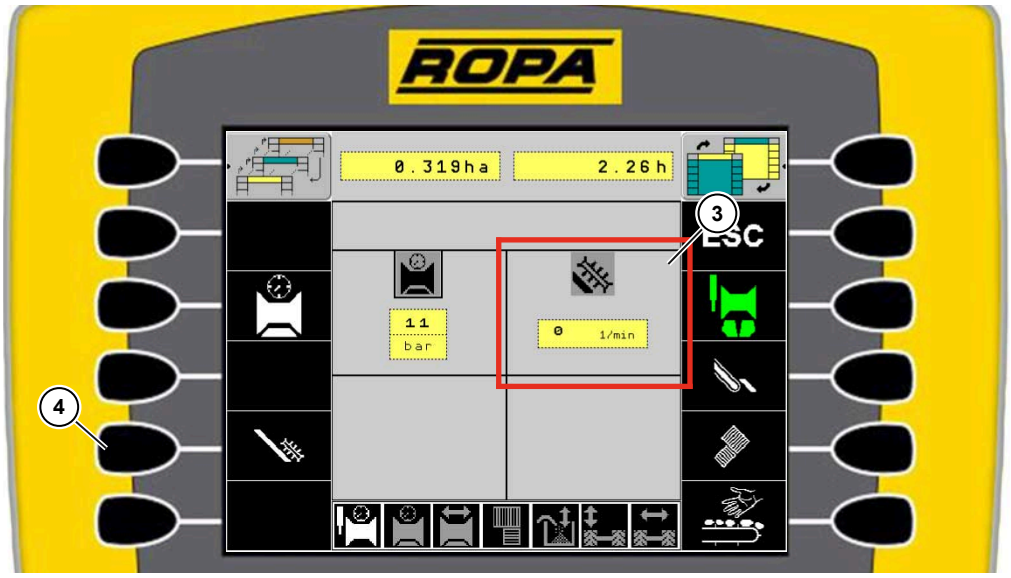


6.12.2 Swath pickup model with lifting shaft and cover belt

(1) Speed of cover belt swath pick-up
(2) Height adjustment of swath pickup

The speed of the swath pickup cover belt (**1**) is set at the tractor terminal for swath pickup with lifting shaft and cover belt. The working depth of the swath pickup can be adjusted mechanically via the two cranks (**2**) for the height adjustment sides independently of each other. The speed of the swath pickup cover belt can be adjusted manually. The speed of the swath pickup cover belt can be also adjusted automatically to the speed of sieve conveyor 1.

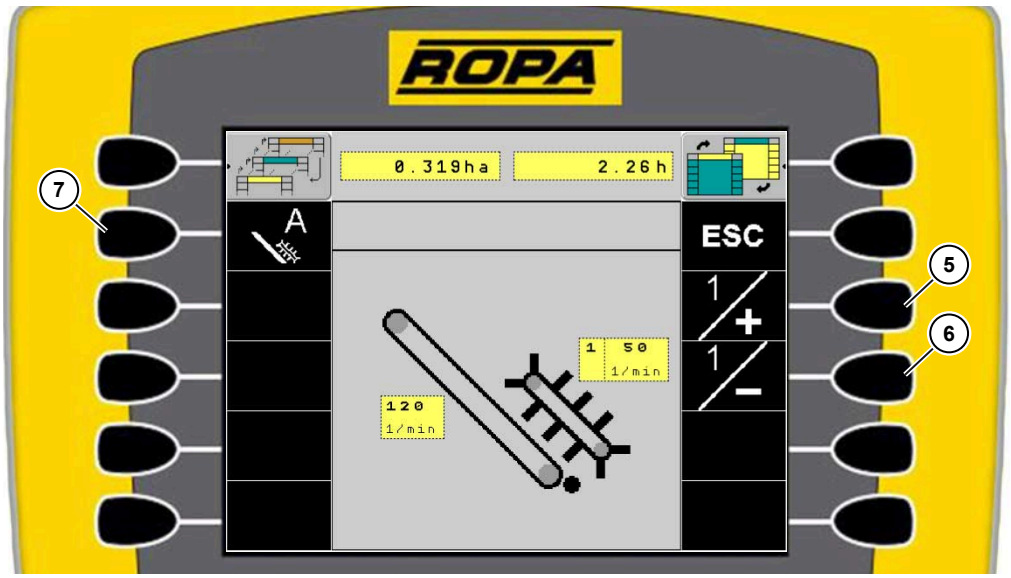
The swath pickup is adjusted in the pickup menu. Select the pickup soft key on the tractor terminal. After selection the soft key becomes green.



(3) Swath pickup display field
(4) Swath pickup soft key

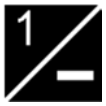
The swath pickup display field (**3**) displays the current actual speed of the swath pickup. Select the grey button to open the swath pickup submenu.

Select the swath pickup soft key to open the swath pickup submenu.



(5) Soft key increase swath pickup speed
(6) Soft key reduce swath pickup speed
(7) Soft key automatic swath pickup

Press the key to increase the speed. The speed of the swath pickup cover belt can be adjusted in the range from 50 rpm to 200 rpm.



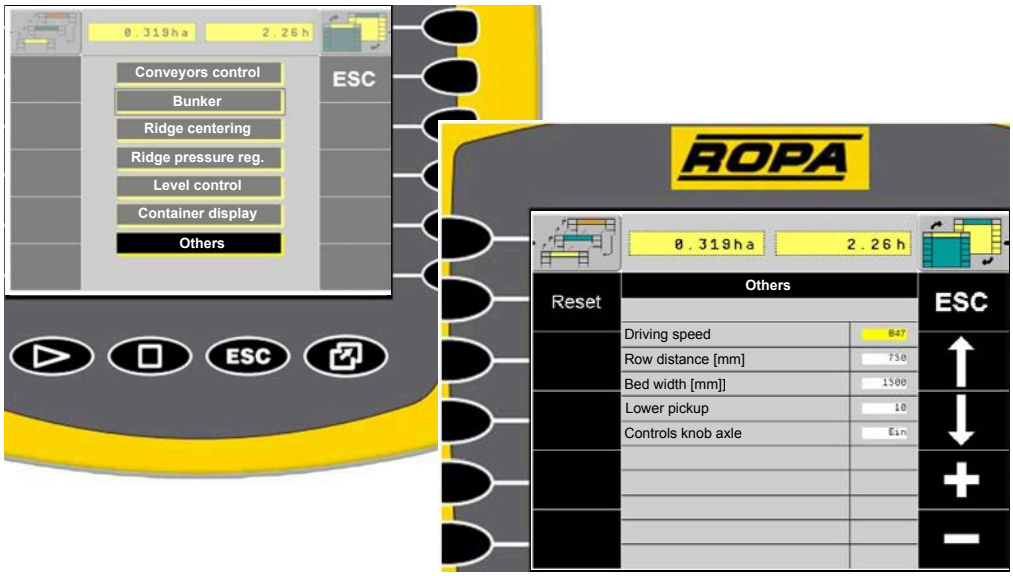
Press the key to reduce the speed. The speed of the swath pickup cover belt can be adjusted in the range from 50 rpm to 200 rpm.

The automatic swath pickup soft key switches the automatic function of the swath pickup on and off. If the soft key is white, the automatic function is deactivated. If the soft key is green, the automatic function is activated. The percentage deviation of the speed from the speed of sieve conveyor 1can be adjusted.

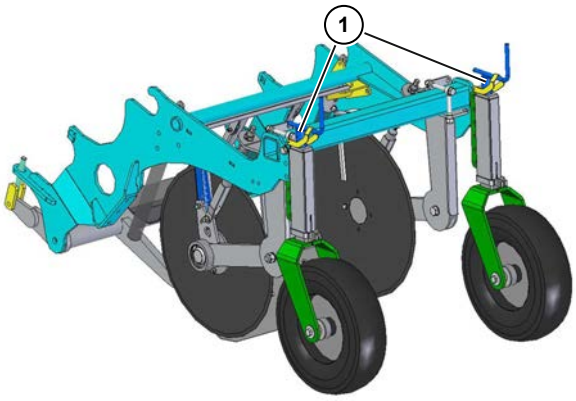
Setting bed width in the software

The bed width can be infinitely adjusted in the software from 750 mm to 2,250 mm; default setting 1,500 mm.

Set the bed width on the tractor terminal in the menu "Main settings", submenu "Others". The setting is necessary for correct area measurement.



6.12.3 Swath pickup model with shares



(1) Height adjustment of swath pickup with shares

The working depth of the swath pickup can be adjusted mechanically via the two cranks (**1**) for the height adjustment sides independently of each other.

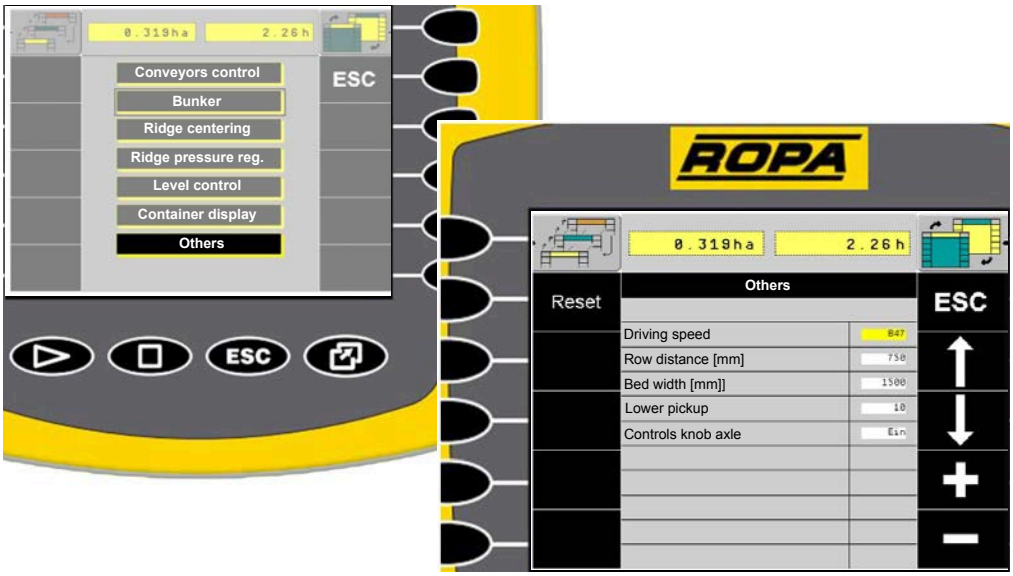
ADVICE

The pickup functions only with the ridge pressure relief. If the ridge pressure relief is activated, it must be set to float position (0 bar) or in the range from 8 bar to 20 bar.

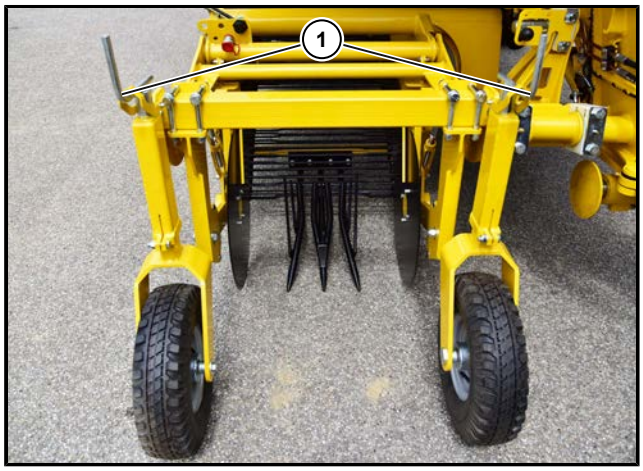
Setting bed width in the software

The bed width can be infinitely adjusted in the software from 750 mm to 2,250 mm; default setting 1,500 mm.

Set the bed width on the tractor terminal in the menu "Main settings", submenu "Others". The setting is necessary for correct area measurement.



6.12.4 Pickup model for carrots



(1) Height adjustment of the pickup with carrots

The working depth of the pickup can be adjusted mechanically via the two cranks (**1**) for the height adjustment sides independently of each other.

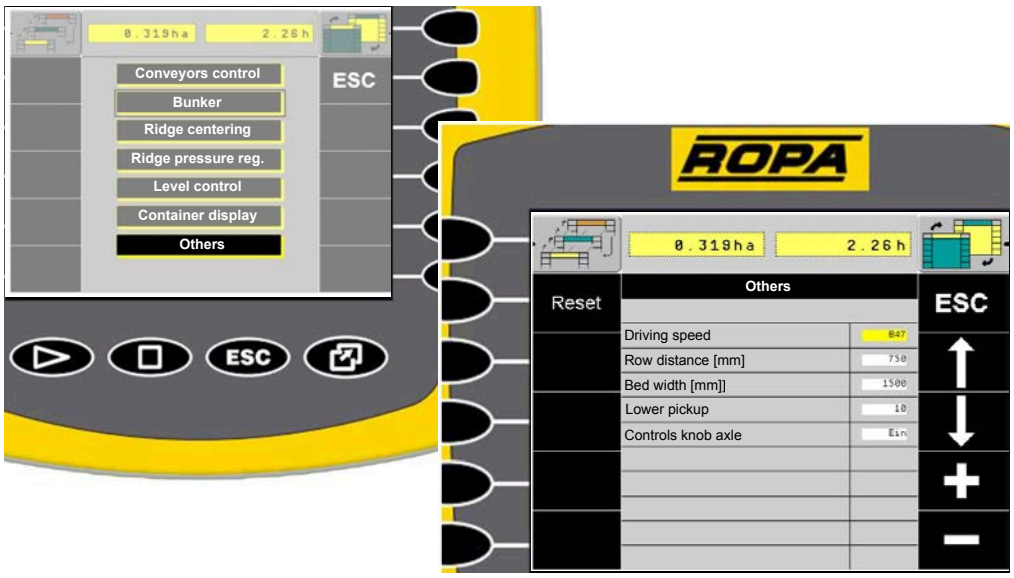
ADVICE

The pickup functions only with the ridge pressure relief. If the ridge pressure relief is activated, it must be set to float position (0 bar) or in the range from 8 bar to 20 bar.

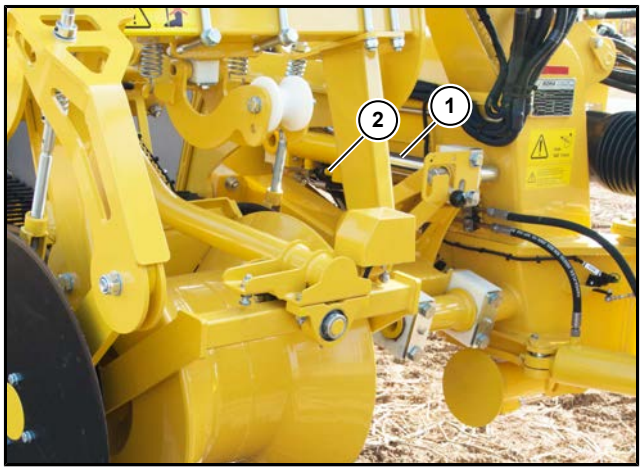
Setting bed width in the software

The bed width can be infinitely adjusted in the software from 750 mm to 2,250 mm; default setting 1,500 mm.

Set the bed width on the tractor terminal in the menu "Main settings", submenu "Others". The setting is necessary for correct area measurement.



6.12.5 Ridge pressure relief



(1) Pickup cylinder
(2) Ridge pressure relief sensor

With ridge pressure relief, the pickup and the associated reservoir can be hydraulically released using the cylinder. The relief pressure is displayed on the tractor terminal.

A part of the pickup weight is transferred to the main frame by the pickup cylinder (**1**). The pressure sensor of the ridge pressure relief (**2**) is located in the line to the pickup cylinder (**1**).

The relief pressure can be adjusted in the range from 0 bar to 70 bar at the tractor terminal. The ridge pressure relief must be adjusted so that the ridge roller rolls over the ridge without pushing or compressing the ridge.

The lifting depth must be checked after adjusting the ridge pressure relief.

E.g.:

- 0 bar is the floating position.
- Wet conditions or heavy soil.
  - **maximum relief pressure 70 bar.**
- Under dry conditions to ensure proper harvesting and breakage of crusts.
  - **minimum relief pressure 20 bar.**

ADVICE

Ridge pressure regulation or ridge pressure relief (*See Page 171*) can function better depending on the external conditions. The models of swath pickup and pickups for special crops function only with ridge pressure relief.

(3) Automatic ridge pressure relief

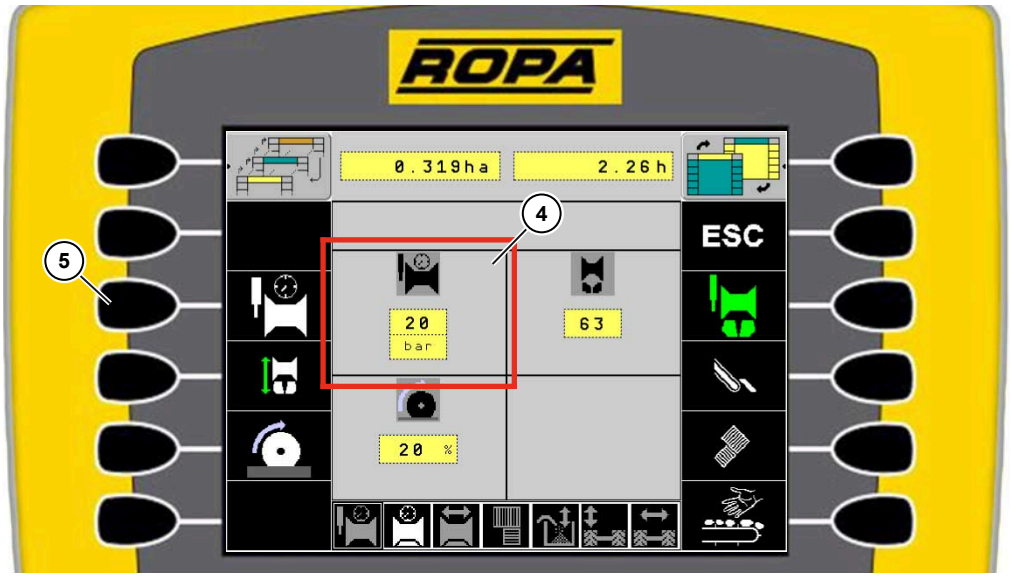
The current status of ridge pressure relief (**3**) is displayed in the automatic functions display field.

Automatic ridge pressure relief is deactivated.

Automatic ridge pressure relief is preselected. Ridge pressure relief is activated with a short activation period when the pickup is lowered with the start of field key on the lifter operating component.

Automatic ridge pressure relief is activated. Ridge pressure relief is reset to preselected status when the pickup is raised with the end of field key on the lifter operating component.

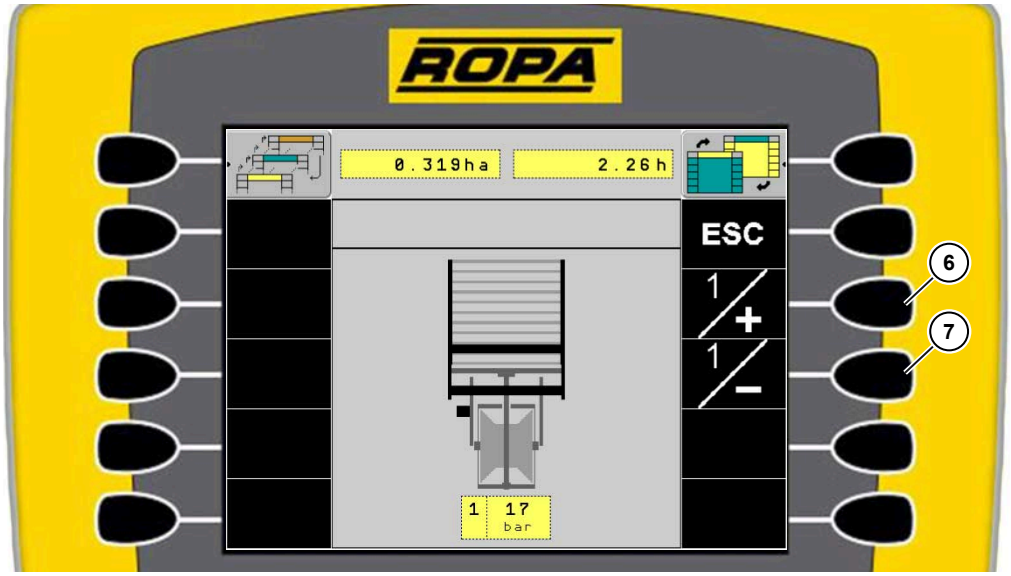
The pressure of the ridge pressure relief can be adjusted in the pickup menu. Select the pickup soft key on the tractor terminal. After selection the soft key becomes green.



(4) Ridge pressure display field
(5) Ridge pressure relief soft key

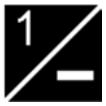
The ridge pressure display field (**4**) shows the current actual pressure of the activated automatic depth control, ridge pressure regulation and ridge pressure relief. Select the grey button to open the activated automatic depth control submenu where the set pressure can be adjusted.

The ridge pressure relief soft key opens the ridge pressure relief submenu. The ridge pressure relief soft key can only be selected if the ridge pressure relief is set to preselected or activated in the automatic functions.



(6) Soft key increase ridge pressure relief
(7) Soft key reduce ridge pressure relief

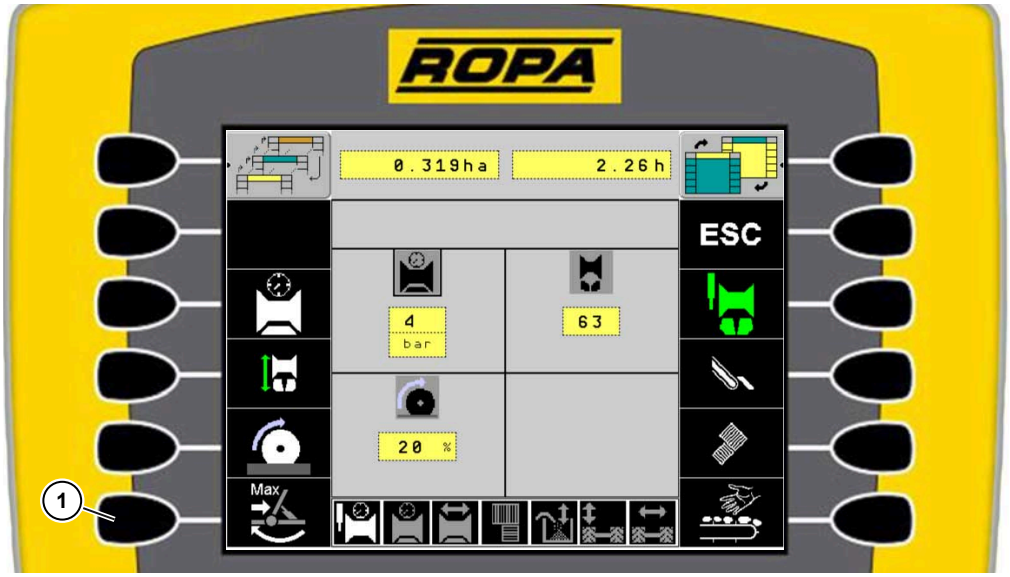
Press the key to increase pressure. The pressure is adjusted in steps in which 0 bar is floating position, 20 bar is the minimum relief pressure and 70 bar is the maximum relief pressure.

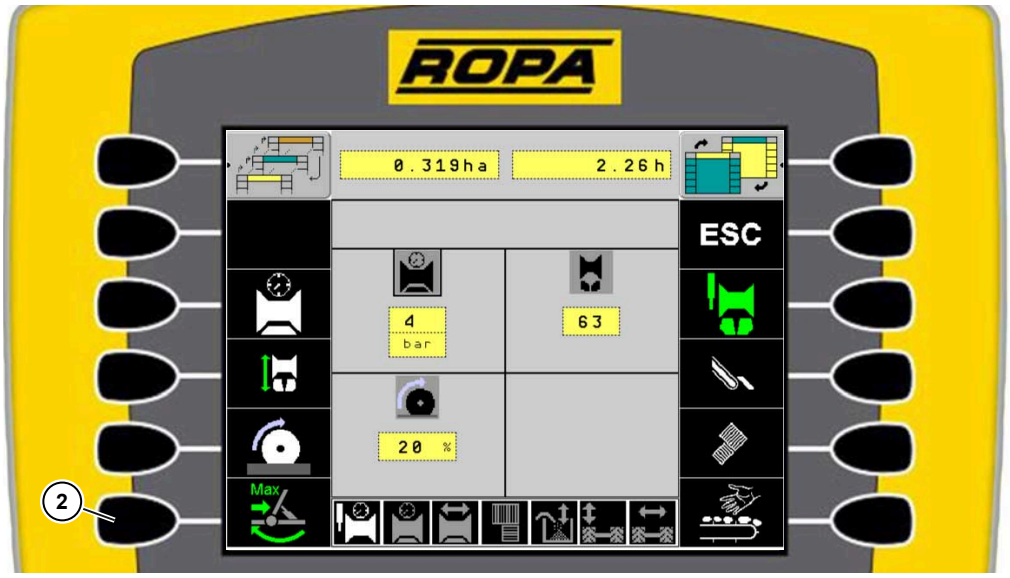


Press the key to reduce pressure. The pressure is adjusted in steps in which 0 bar is floating position, 20 bar is the minimum relief pressure and 70 bar is the maximum relief pressure.

Ridge pressure relief can be activated with the automatic depth control key on the lifter operating component. It can be activated with the pickup lowered from the automatic status preselected. This is necessary if the pickup is not lowered with the start of field key. If the automatic depth control key on the lifter operating component is pressed with ridge pressure relief activated, the automatic function is reset to the preselected status.

6.12.6 Drawbar





(1) Soft key optional drawbar deactivated
(2) Soft key optional drawbar activated

An additional soft key is displayed in the Pickup menu if a drawbar is installed.

If the soft key for the optional drawbar is white, the optional drawbar is deactivated and the drawbar can swivel in maximum to its road position.

If the soft key for the optional drawbar is green, the optional drawbar is active. Now move the drawbar completely in using the mini joystick . Switch the machine on and lower the pickup. Thus, the right ridge in the driving lane (in the direction of travel) can be harvested now. The automatic ridge centering can be activated. When the pickup is raised by pressing the End of field button , the function of the optional drawbar is reset to deactivated and is displayed in white.

6.13 cleaning

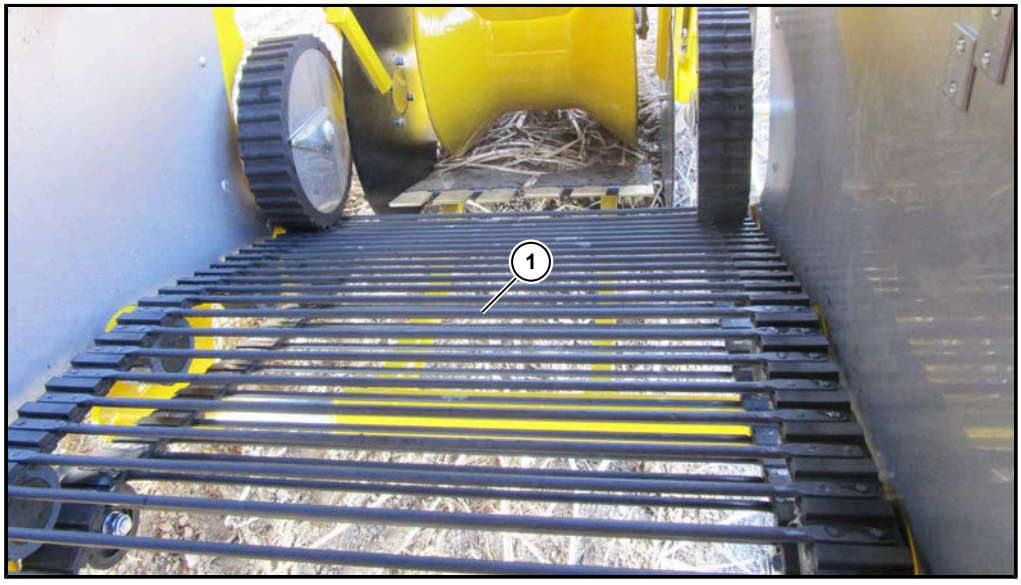
The cleaning consists of the sieving channel and leaf separation, separation and sorting.

6.13.1 Sieving channel and leaf separation

The sieving channel consists of the sieve conveyor 1 with an optional cleaning roller, the shaker, the optional agitator and the sieve conveyor 2, which are located together with the front section of the leaf chain in the transition from the sieving channel to the leaf separation.

Leaf separation includes the leaf chain, leaf scraper and pull-off rods.

6.13.1.1 Sieve conveyor 1



(1) Sieve conveyor 1

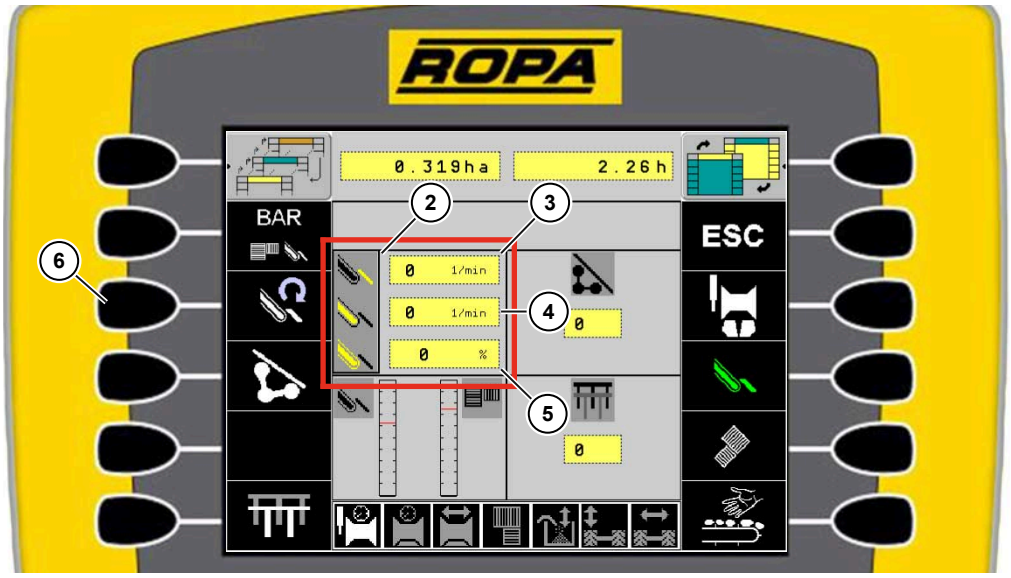
Sieve conveyor 1 is available in the following pitches: 32, 36, 40 and 45. The sieve conveyor 1 can be equipped with straight rods or a combination of straight and offset rods.

Sieve conveyor 1 is directly driven by an oil motor. The drive is always implemented as a rod drive, the speed of which can be infinitely adjusted.

The speed of sieve conveyor 1 is controlled at the tractor terminal or the sorting platform terminal if it is released. A speed sensor integrated in the oil motor sends feedback to the control.

Adjusting speed of sieve conveyor 1 at the tractor terminal

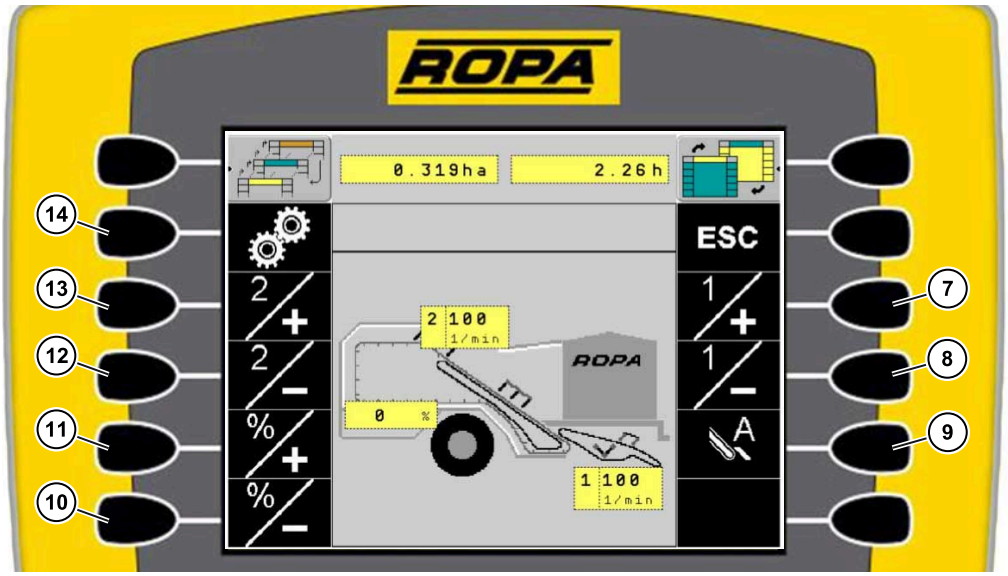
The speed of sieve conveyor 1 can be adjusted in the sieving channel menu. Select the sieving channel soft key on the tractor terminal. After selection the soft key becomes green.



(2) Sieving channel speed soft key
(3) Sieve conveyor 1 speed display
(4) Sieve conveyor 2 speed display
(5) Display of difference of leaf chain from sieve conveyor 2
(6) Sieving channel speed soft key

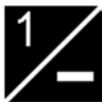
The sieving channel speed display field (**2**) shows the speed of sieve conveyor 1 (**3**), sieve conveyor 2 (**4**) and the percentage difference of the speed of leaf chain from sieve conveyor 2 (**5**). Select the grey button to open the sieving channel speed settings submenu.

The sieving channel speed soft key opens the sieving channel speed settings submenu.



(7) Soft key increase sieve conveyor 1 speed
(8) Soft key reduce sieve conveyor 1 speed
(9) Soft key sieve conveyors automatic function (optional)
(10) Soft key reduce leaf chain speed
(11) Soft key increase leaf chain speed
(12) Soft key reduce sieve conveyor 2 speed
(13) Soft key increase sieve conveyor 2 speed
(14) Soft key synchronous adjustment of sieve conveyor speed

Press the key 1/+ to increase the speed. The maximum speed of sieve conveyor 1 is 200 rpm.



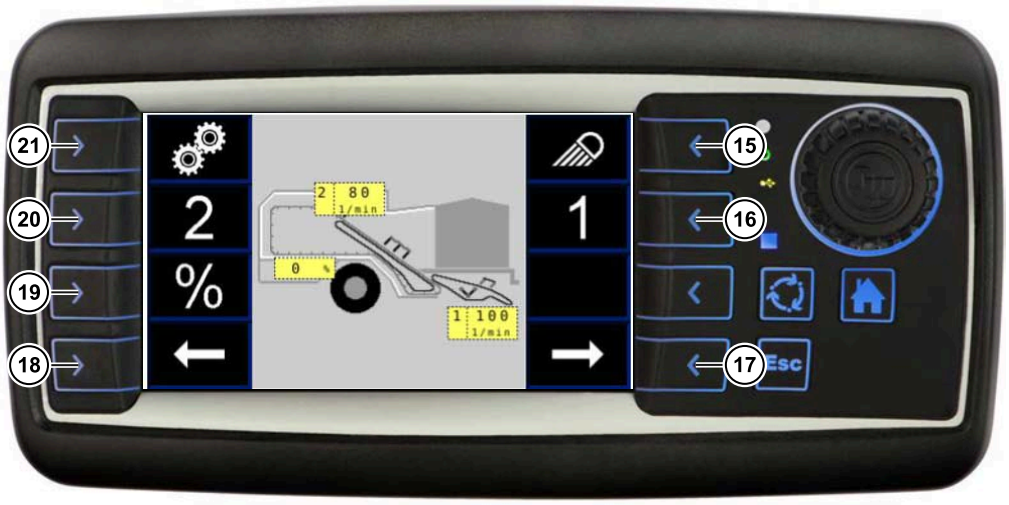
Press the key 1/− to reduce the speed. The minimum speed of sieve conveyor 1 is 50 rpm.

The sieve conveyor synchronous speed adjustment must be deactivated to adjust the speed of sieve conveyor 1. If the sieve conveyor synchronous speed adjustment soft key is white, the sieve conveyor synchronous speed adjustment is deactivated. If the sieve conveyor synchronous speed adjustment soft key is green, the sieve conveyor synchronous speed adjustment is activated.

The pressure in the hydraulic drive of sieve conveyor is continuously displayed and monitored by the pressure monitor on the tractor terminal. If the maximum pressure warning limit set by the driver is exceeded, the tractor terminal shows the warning and a warning sound is also generated.

If sieve conveyor is blocked by a foreign body, the tractor terminal shows the warning icon and a continuous warning sound is also generated. If it is blocked sieve conveyor shuts off automatically to prevent potential damage and subsequent damage. Work can be continued after clearing the blockage.

Adjusting speed of sieve conveyor 1 at the sorting platform terminal (option)

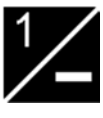


(15) Working floodlights soft key
(16) Soft key sieve conveyor 1
(17) Scroll screen right soft key
(18) Scroll screen left soft key
(19) Soft key leaf chain
(20) Soft key sieve conveyor 2
(21) Soft key synchronous adjustment of sieve conveyor speed

If the sorting platform terminal is released, scroll with the scroll screen right soft key → or the scroll screen left soft key ← to open the screen for adjusting the sieving channel speeds. Select sieve conveyor 1 with the sieve conveyor 1 1 soft key.

(22) Soft key increase sieve conveyor 1 speed
(23) Soft key reduce sieve conveyor 1 speed

Press the key 1/+ to increase the speed. The maximum speed of sieve conveyor 1 is 200 rpm.



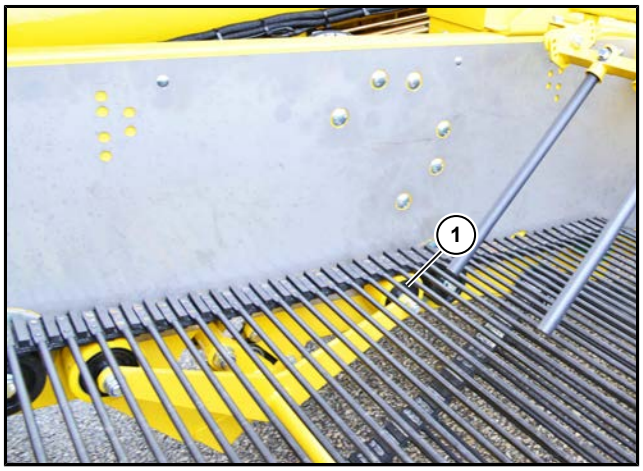
Press the key 1/− to reduce the speed. The minimum speed of sieve conveyor 1 is 50 rpm.

6.13.1.2 Sieve conveyor 1 cleaning roller (option)

(1) Sieve conveyor 1 cleaning roller

The cleaning roller is an optional equipment, which prevents accumulation of soil on sieve conveyor 1 in wet soil conditions. The cleaning roller is integrated in the sieve conveyor clamp and is independent of the pitch of sieve conveyor 1.

6.13.1.3 Shaker



(1) Shaker

The standard machine is fitted with a shaker (**1**). It is in the vicinity of sieve conveyor 1. The shaker makes rubber rollers on the belts of sieve conveyor 1 effective. It starts sieve conveyor 1 vibrating, which breaks up the soil and makes it easier to remove.

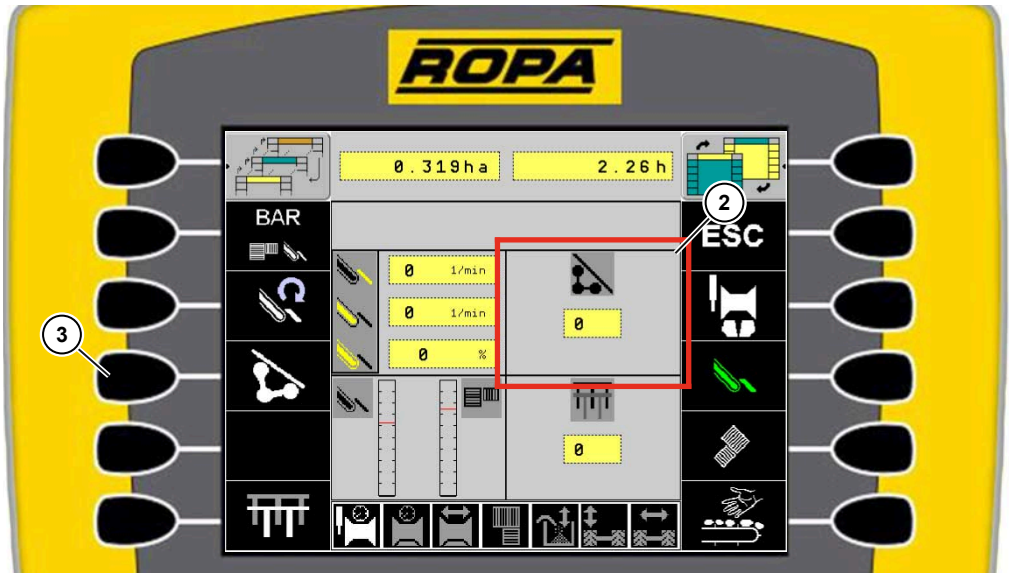
The shaker makes the process more efficient under difficult soil conditions. The shaker is adjusted in steps from 0 to 20. Step 0 = Off and Step 20 = maximum intensity.

ATTENTION

The shaker speed should be kept as low as possible to prevent damage to the tubers. If a greater sieving or cleaning efficiency is required, increase the shaker speed slightly and check the result. The higher the speed of the shaker, the greater the danger of damage to the tubers.

Adjusting shaker at the tractor terminal

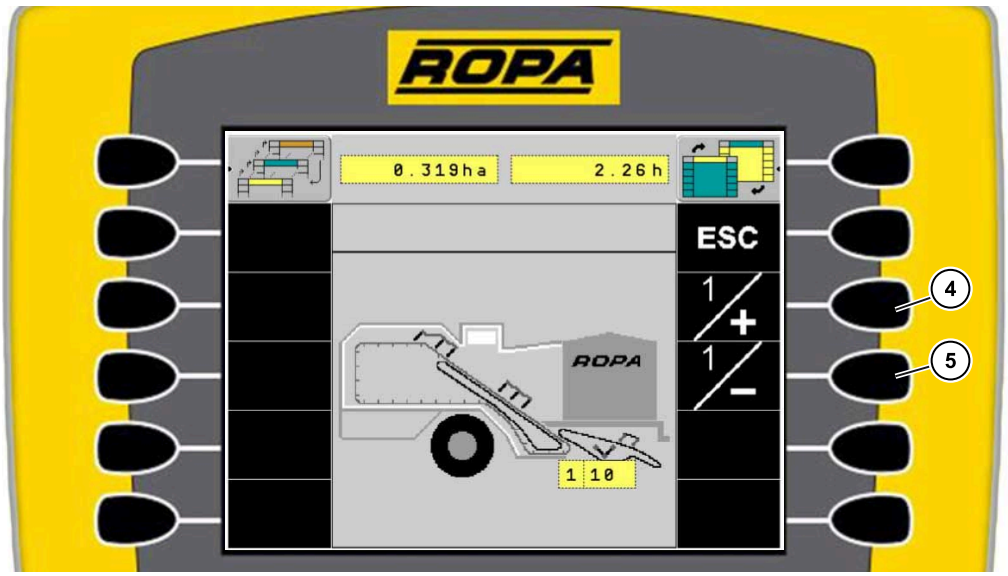
The intensity of the shaker can be adjusted in the sieving channel menu. Select the sieving channel soft key on the tractor terminal. After selection the soft key becomes green.



(2) Shaker display field
(3) Soft key shaker

The shaker display field shows the current setting of the shaker. Select the grey button on the shaker display field (**2**) to open the shaker submenu.

Select the soft key shaker to open the shaker submenu.



(4) Soft key increase shaker speed
(5) Soft key reduce shaker speed

Press the key to increase the intensity. The maximum intensity of the shaker is step 20.

Press the key to reduce the intensity. The minimum intensity of the shaker is step 1. Step 0 is off and the shaker does not move.

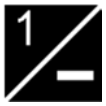
Adjusting shaker at the sorting platform terminal (option)

(6) Soft key shaker
(7) Lifting depth soft key
(8) Scroll screen right soft key
(9) Scroll screen left soft key
(10) Soft key pintle belt 1/2 inclination

If the sorting platform terminal is released, scroll with the scroll screen right soft key or the scroll screen left soft key to open the screen for adjusting the shaker. Select the shaker with the soft key shaker 1.

(11) Soft key increase shaker speed
(12) Soft key reduce shaker speed

Press the key to increase the intensity. The maximum intensity of the shaker is step 20.



Press the key to reduce the intensity. The minimum intensity of the shaker is step 1. Step 0 is off and the shaker does not move.

6.13.1.4 Agitator (option)

(1) Agitator
(2) Locking pin

Optionally, the machine can be equipped with an agitator (**1**). It is located above the sieve conveyor 1. The agitator helps to let the rubber fingers act in the unbroken ridge on the sieve conveyor 1. As a result, the ridge on the sieve conveyor 1 is pulled apart, which breaks up the soil and makes it easier to remove.

The agitator makes the process more efficient under difficult soil conditions. The agitator is adjusted in steps from 0 to 20. Step 0 = Off and Step 20 = maximum intensity.

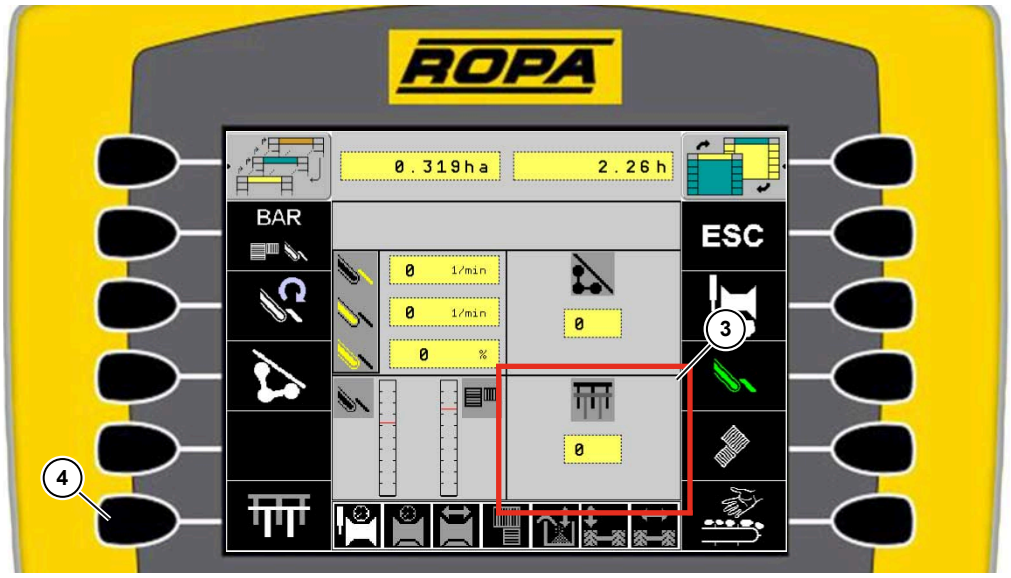
The two locking pins (**2**) allow both agitator arms to engage independently of each other in the crop flow or to be removed completely from the crop flow.

ATTENTION

The agitator speed should be kept as low as possible to prevent damage to the tubers. If a greater sieving or cleaning efficiency is required, increase the agitator speed slightly and check the result. The higher the speed of the agitator, the greater the risk of damage to the tubers.

Adjusting agitator at the tractor terminal

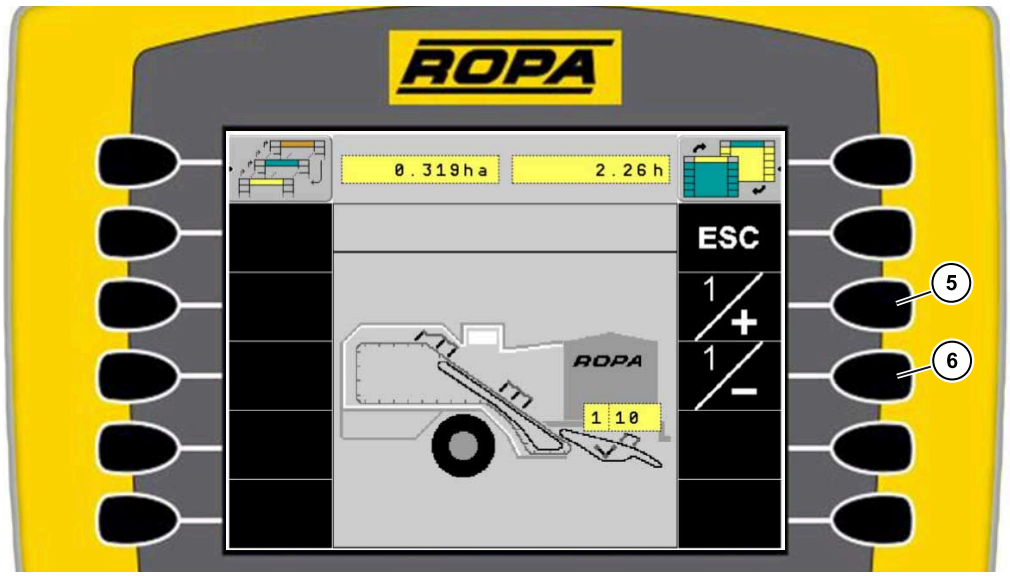
The intensity of the agitator can be adjusted in the sieving channel menu. Select the sieving channel soft key on the tractor terminal. After selection the soft key becomes green.



(3) Agitator display field
(4) Soft key agitator

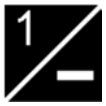
The agitator display field shows the current setting of the agitator. Select the grey button on the agitator display field (**3**) to open the agitator submenu.

Select the soft key agitator to open the agitator submenu.



(5) Soft key increase agitator speed
(6) Soft key reduce agitator speed

Press the key to increase the intensity. The maximum intensity of the agitator is step 20.



Press the key to reduce the intensity. The minimum intensity of the agitator is step 1. Step 0 is off and the agitator does not move.

Adjusting agitator at the sorting platform terminal (option)

(7) Soft key shaker
(8) Soft key UFK 1 speed
(9) Lifting depth soft key
(10) Scroll screen right soft key
(11) Scroll screen left soft key
(12) Soft key pintle belt 1/2 inclination
(13) Soft key UFK 2 speed
(14) Soft key agitator

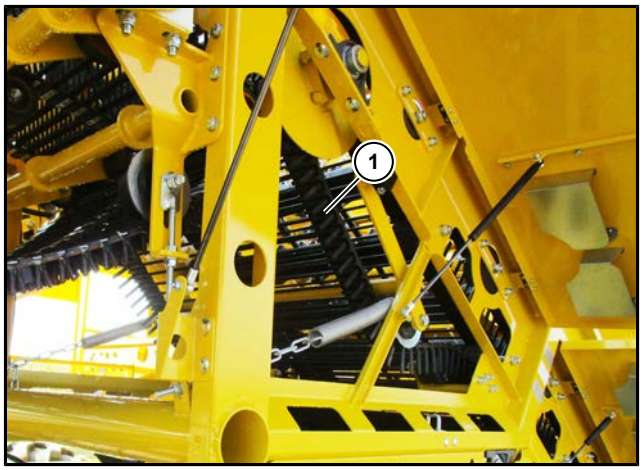
If the sorting platform terminal is released, scroll with the scroll screen right soft key → or the scroll screen left soft key ← to open the screen for agitator adjustment. Select the agitator with the soft key agitator 1.

(15) Soft key increase agitator speed
(16) Soft key reduce agitator speed

Press the key to increase the intensity. The maximum intensity of the agitator is step 20.

Press the key to reduce the intensity. The minimum intensity of the agitator is step 1. Step 0 is off and the agitator does not move.

6.13.1.5 Sieve conveyor 2



(1) Sieve conveyor 2

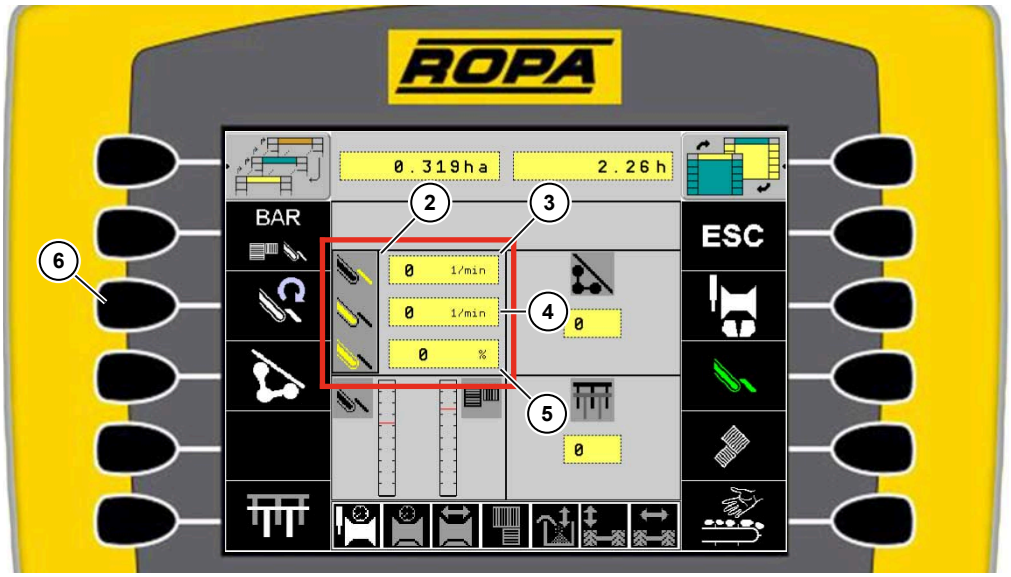
Sieve conveyor 2 is available in the following pitches: 28, 32, 36 and 40.

Sieve conveyor 2 is directly driven by an oil motor. The drive is always implemented as a rod drive, the speed of which can be infinitely adjusted.

The speed of sieve conveyor 2 is controlled at the tractor terminal or the sorting platform terminal if it is released. A speed sensor integrated in the oil motor sends feedback to the control.

Adjusting speed of sieve conveyor 2 at the tractor terminal

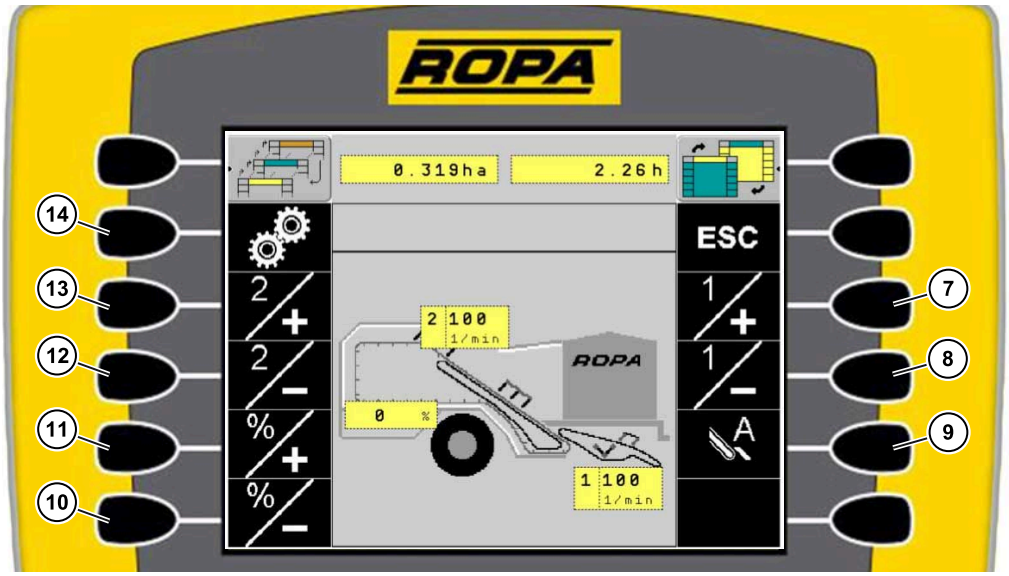
The speed of sieve conveyor 2 can be adjusted in the sieving channel menu. Select the sieving channel soft key on the tractor terminal. After selection the soft key becomes green.



(2) Sieving channel speed soft key
(3) Sieve conveyor 1 speed display
(4) Sieve conveyor 2 speed display
(5) Display of difference of leaf chain from sieve conveyor 2
(6) Sieving channel speed soft key

The sieving channel speed display field (**2**) shows the speed of sieve conveyor 1 (**3**), sieve conveyor 2 (**4**) and the percentage difference of the speed of leaf chain from sieve conveyor 2 (**5**). Select the grey button to open the sieving channel speed settings submenu.

The sieving channel speed soft key opens the sieving channel speed settings submenu.



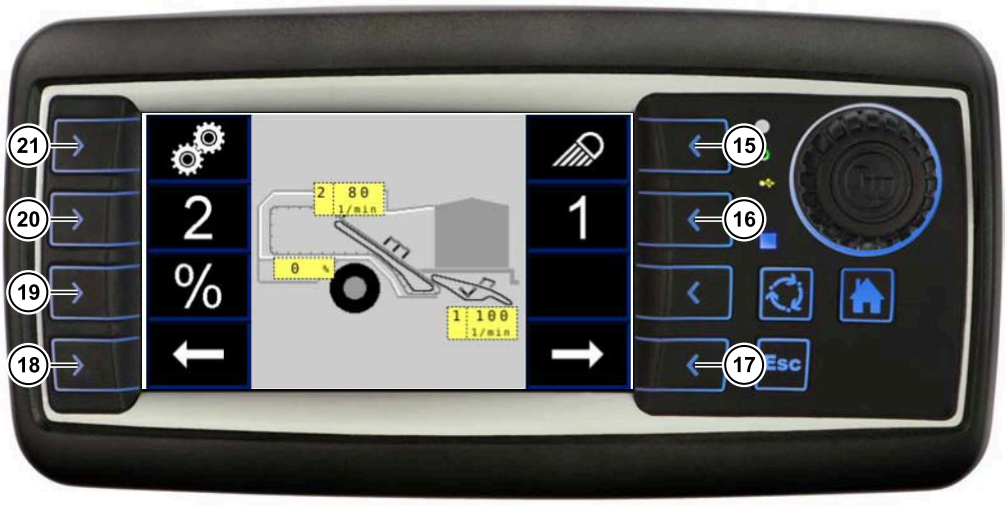
(7) Soft key increase sieve conveyor 1 speed
(8) Soft key reduce sieve conveyor 1 speed
(9) Soft key sieve conveyors automatic function (optional)
(10) Soft key reduce leaf chain speed
(11) Soft key increase leaf chain speed
(12) Soft key reduce sieve conveyor 2 speed
(13) Soft key increase sieve conveyor 2 speed
(14) Soft key synchronous adjustment of sieve conveyor speed

Press the key 2+ to increase the speed. The maximum speed of sieve conveyor 2 is 200 rpm.

Press the key 2− to reduce the speed. The minimum speed of sieve conveyor 2 is 50 rpm.

The sieve conveyor synchronous speed adjustment must be deactivated to adjust the speed of sieve conveyor 2. If the sieve conveyor synchronous speed adjustment soft key is white, the sieve conveyor synchronous speed adjustment is deactivated. If the sieve conveyor synchronous speed adjustment soft key is green, the sieve conveyor synchronous speed adjustment is activated.

Adjusting speed of sieve conveyor 2 at the sorting platform terminal (option)



(15) Working floodlights soft key
(16) Soft key sieve conveyor 1
(17) Scroll screen right soft key
(18) Scroll screen left soft key
(19) Soft key leaf chain
(20) Soft key sieve conveyor 2
(21) Soft key synchronous adjustment of sieve conveyor speed

If the sorting platform terminal is released, scroll with the scroll screen right soft key → or the scroll screen left soft key ← to open the screen for adjusting the sieving channel speeds. Select sieve conveyor 2 with the sieve conveyor 2 **2** soft key.

(22) Soft key increase sieve conveyor 2 speed
(23) Soft key reduce sieve conveyor 2 speed

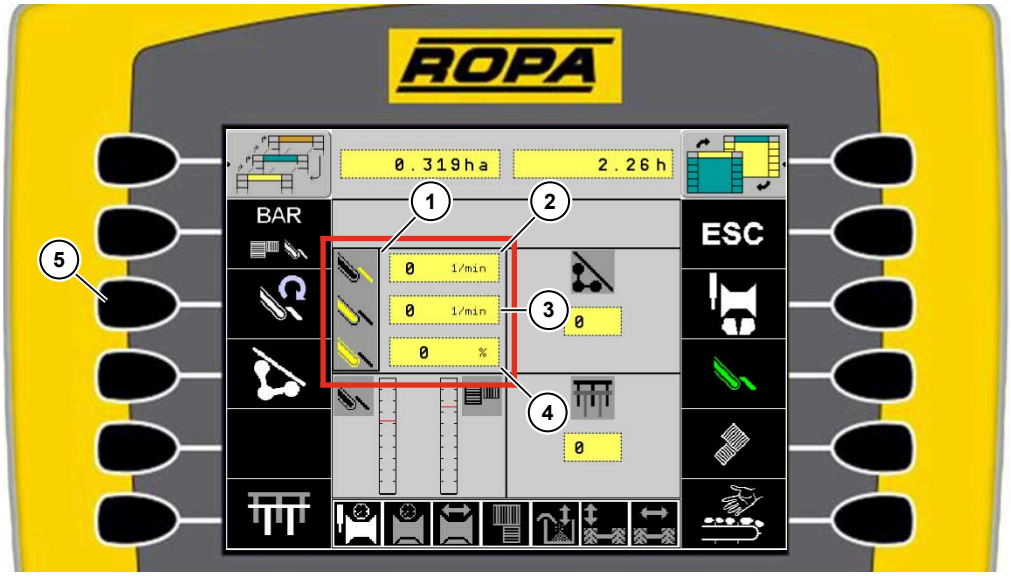
Press the key 2+ to increase the speed. The maximum speed of sieve conveyor 2 is 200 rpm.

Press the key 2− to reduce the speed. The minimum speed of sieve conveyor 2 is 50 rpm.

6.13.1.6 Sieve conveyors synchronous adjustment

Sieve conveyors synchronous adjustment at the tractor terminal

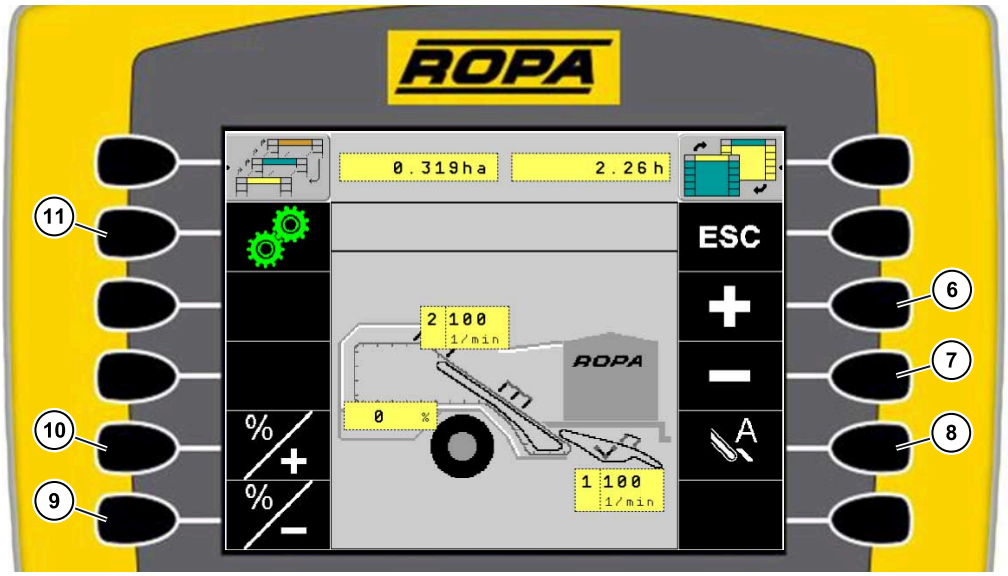
The speed is adjusted at the tractor terminal in synchronous mode. Select the sieving channel soft key on the tractor terminal. After selection the soft key becomes green.



(1) Sieving channel speed soft key
(2) Sieve conveyor 1 speed display
(3) Sieve conveyor 2 speed display
(4) Display of difference of leaf chain from sieve conveyor 2
(5) Sieving channel speed soft key

The sieving channel speed display field (**1**) shows the speed of sieve conveyor 1 (**2**), sieve conveyor 2 (**3**) and the percentage difference of the speed of the leaf chain from sieve conveyor 2 (**4**). Select the grey button to open the sieving channel speed settings submenu.

The sieving channel speed soft key opens the sieving channel speed settings submenu.



(6) Soft key increase sieve conveyor speed
(7) Soft key reduce sieve conveyor speed
(8) Soft key sieve conveyors automatic function
(9) Soft key reduce leaf chain speed
(10) Soft key increase leaf chain speed
(11) Soft key synchronous adjustment of sieve conveyor speed

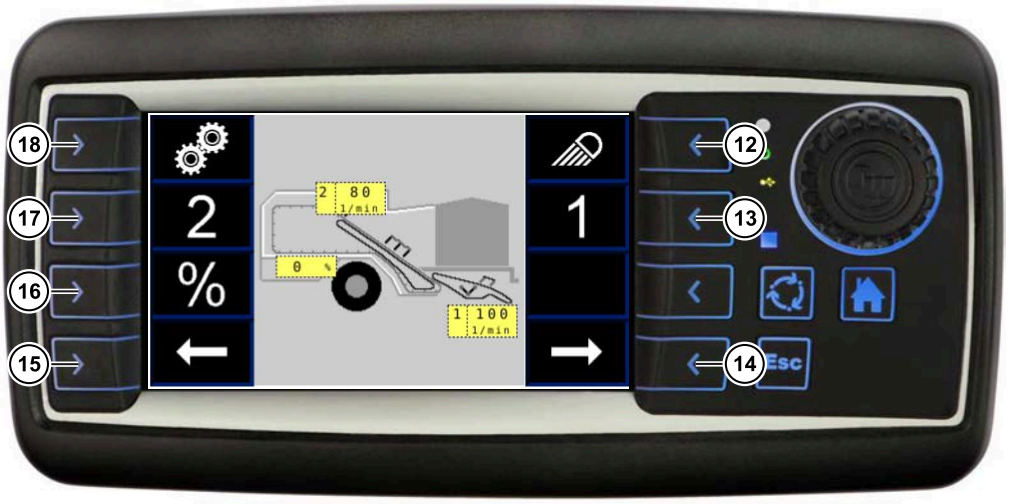
The speeds of sieve conveyor 1 and sieve conveyor 2 can be adjusted together in synchronous mode.

The sieve conveyor synchronous speed adjustment must be activated to adjust the speed of sieve conveyors synchronously. If the sieve conveyor synchronous speed adjustment soft key is white, the sieve conveyor synchronous speed adjustment is deactivated. If the sieve conveyor synchronous speed adjustment soft key is green, the sieve conveyor synchronous speed adjustment is activated.

Press the key to increase the speed synchronously. The maximum speed of the conveyors is 200 rpm. If one conveyor has reached this speed and is further increased, the speed of the other conveyor approaches this speed.

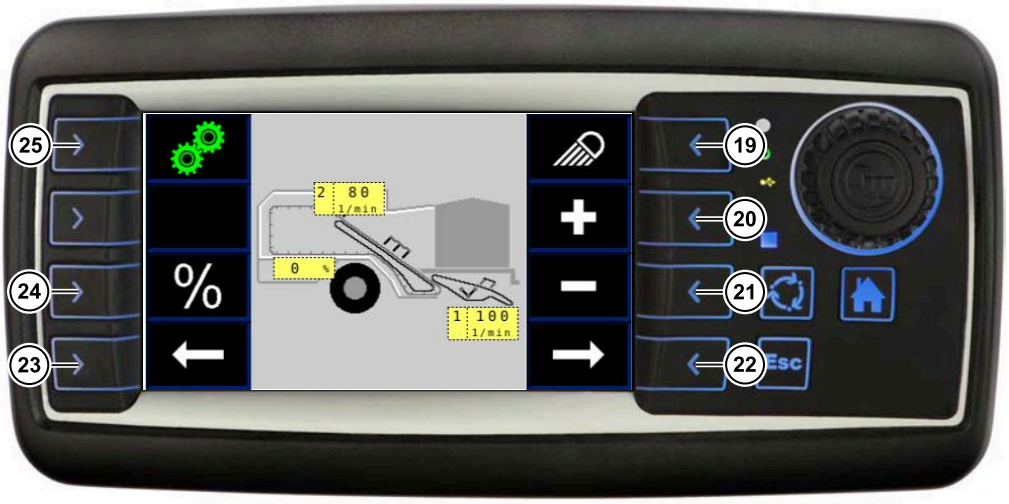
Press the key to reduce the speed synchronously. The minimum speed of the conveyors is 50 rpm. If one conveyor has reached this speed and it is further reduced, the speed of the other conveyor approaches this speed.

Synchronous adjustment of sieve conveyors at the sorting platform terminal (option)



(12) Working floodlights soft key
(13) Soft key sieve conveyor 1
(14) Scroll screen right soft key
(15) Scroll screen left soft key
(16) Soft key leaf chain
(17) Soft key sieve conveyor 2
(18) Soft key synchronous adjustment of sieve conveyor speed

If the sorting platform terminal is released, scroll with the scroll screen right soft key ➡ or the scroll screen left soft key ⬅ to open the screen for adjusting the sieving channel speeds. Select the sieve conveyor synchronous speed adjustment with the sieve conveyor synchronous speed adjustment soft key ⚙.



(19) Working floodlights soft key
(20) Soft key increase sieve conveyor speed
(21) Soft key reduce sieve conveyor speed
(22) Scroll screen right soft key
(23) Scroll screen left soft key
(24) Soft key leaf chain
(25) Soft key synchronous adjustment of sieve conveyor speed

The sieve conveyor synchronous speed adjustment must be activated to adjust the speed of sieve conveyors synchronously. If the sieve conveyor synchronous speed adjustment soft key is white, the sieve conveyor synchronous speed adjustment is deactivated. If the sieve conveyor synchronous speed adjustment soft key is green, the sieve conveyor synchronous speed adjustment is activated.

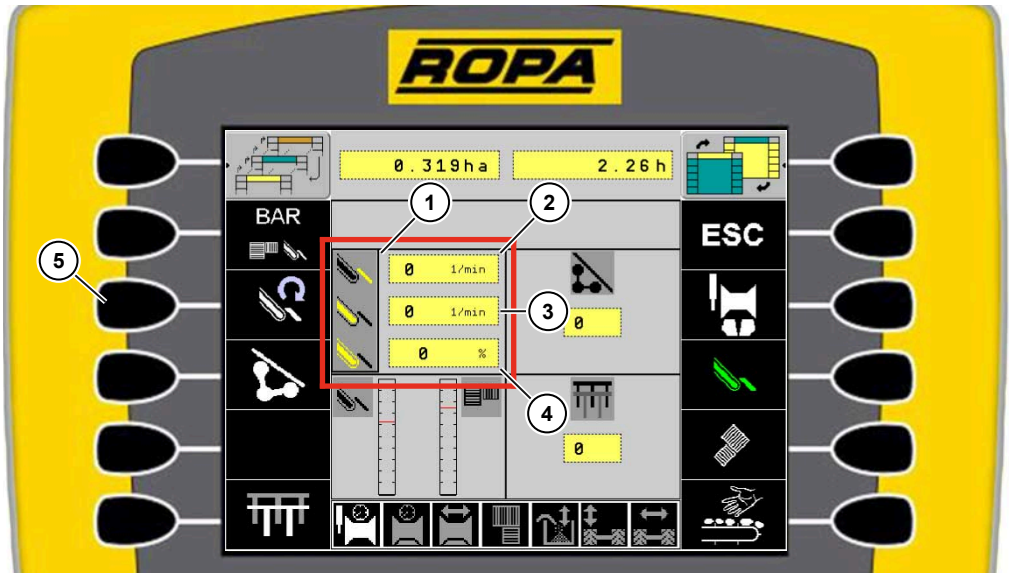
Press the key to increase the speed synchronously. The maximum speed of the conveyors is 200 rpm. If one conveyor has reached this speed and is further increased, the speed of the other conveyor approaches this speed.

Press the key to reduce the speed synchronously. The minimum speed of the conveyors is 50 rpm. If one conveyor has reached this speed and it is further reduced, the speed of the other conveyor approaches this speed.

6.13.1.7 Sieve conveyors automatic function (option)

Activate and adjust sieve conveyors automatic function at the tractor terminal

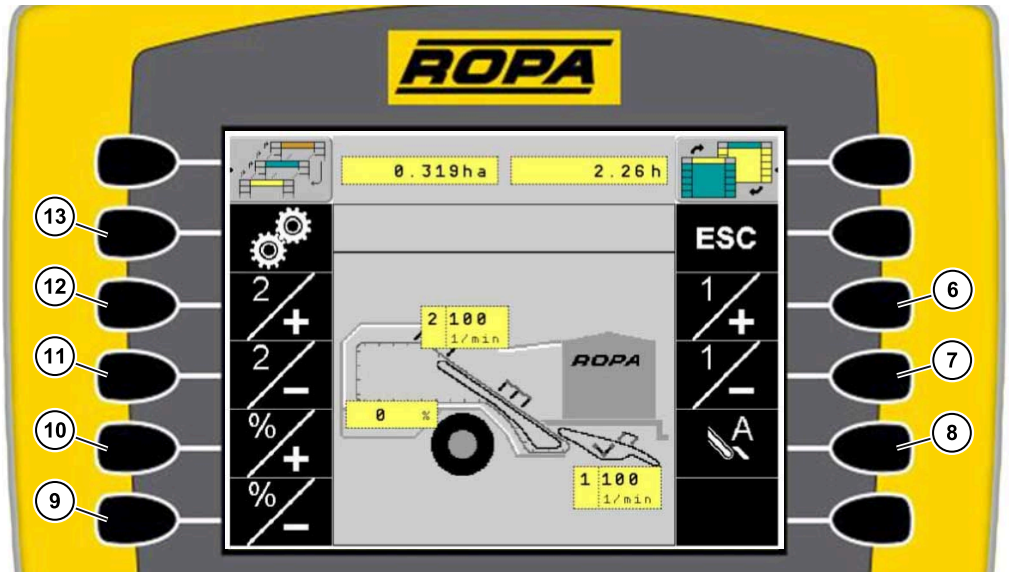
The optional sieve conveyors automatic function is activated and deactivated in the sieving channel menu at the sieving channel speeds menu item. Select the sieving channel soft key on the tractor terminal. After selection the soft key becomes green.



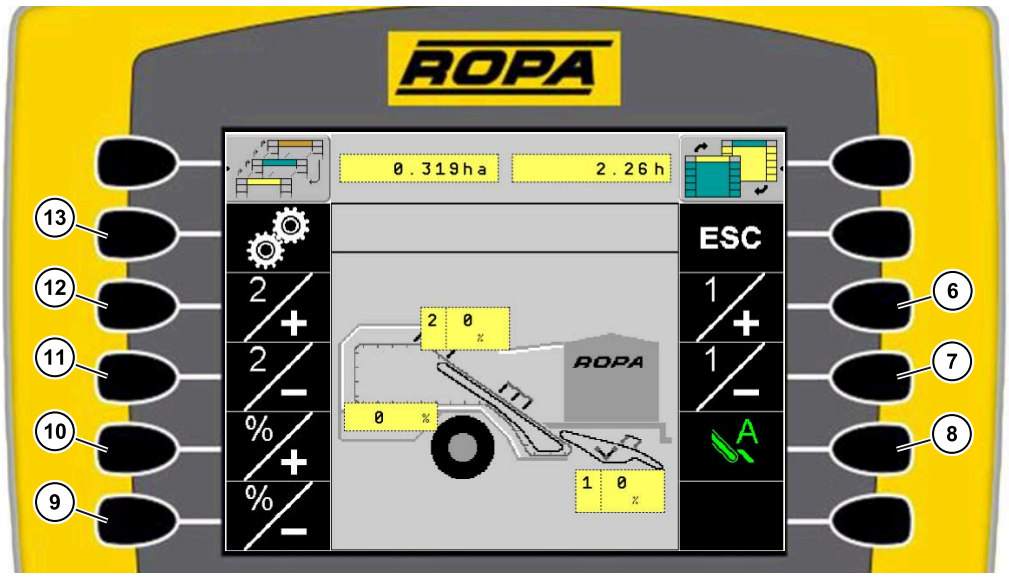
(1) Sieving channel speed soft key
(2) Sieve conveyor 1 speed display
(3) Sieve conveyor 2 speed display
(4) Display of difference of leaf chain from sieve conveyor 2
(5) Sieving channel speed soft key

The sieving channel speed display field (**1**) shows the speed of sieve conveyor 1 (**2**), sieve conveyor 2 (**3**) and the percentage difference of the speed of the leaf chain from sieve conveyor 2 (**4**). Select the grey button to open the sieving channel speed settings submenu.

The sieving channel speed soft key opens the sieving channel speed settings submenu.

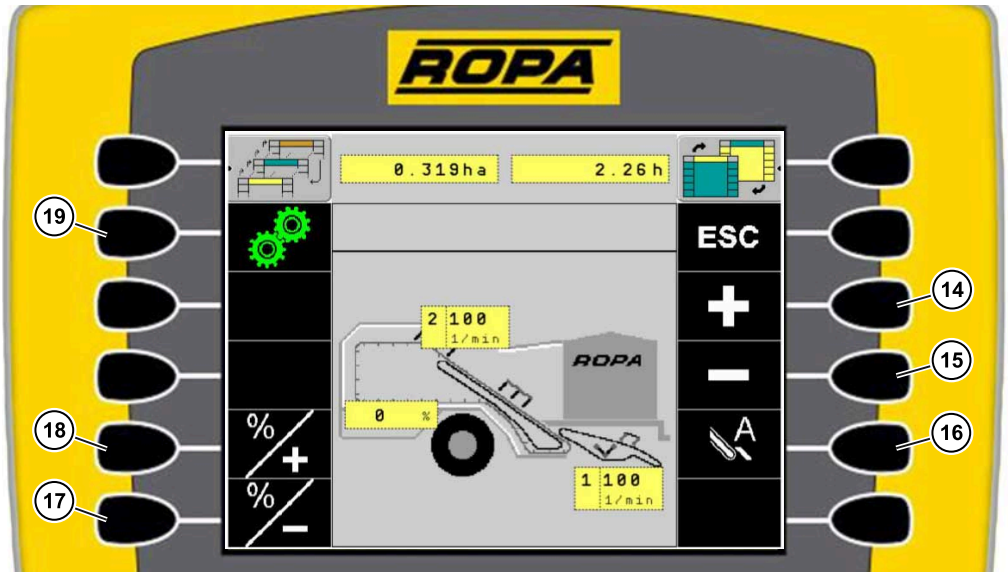


Sieve conveyors automatic function deactivated with individual adjustment

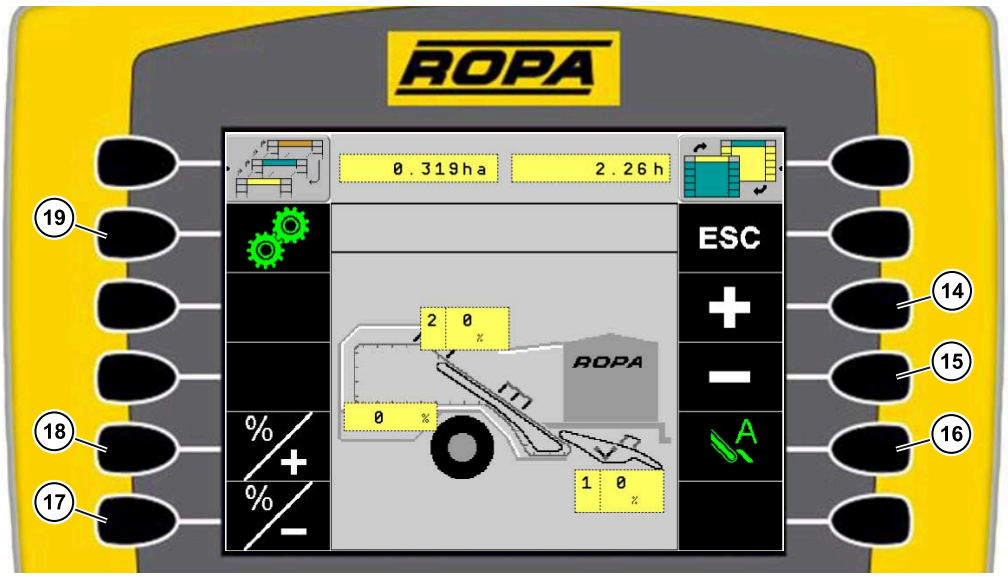


Sieve conveyors automatic function activated with individual adjustment

(6) Soft key increase sieve conveyor 1 speed
(7) Soft key reduce sieve conveyor 1 speed
(8) Soft key sieve conveyors automatic function
(9) Soft key reduce leaf chain speed
(10) Soft key increase leaf chain speed
(11) Soft key reduce sieve conveyor 2 speed
(12) Soft key increase sieve conveyor 2 speed
(13) Soft key synchronous adjustment of sieve conveyor speed



Sieve conveyors automatic function deactivated with synchronous adjustment

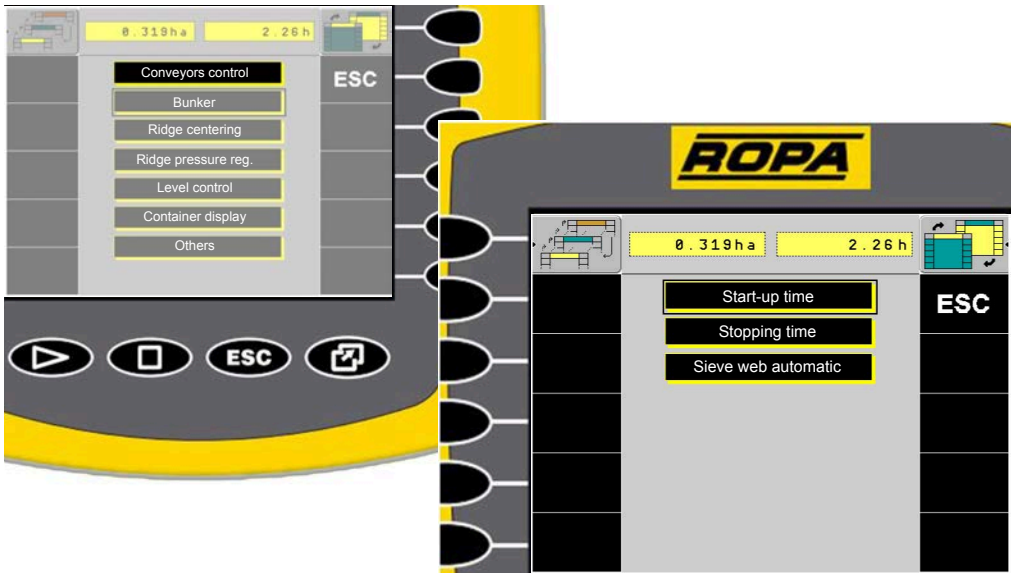


Sieve conveyors automatic function activated with synchronous adjustment

(14) Soft key increase sieve conveyor speed
(15) Soft key reduce sieve conveyor speed
(16) Soft key sieve conveyors automatic function
(17) Soft key reduce leaf chain speed
(18) Soft key increase leaf chain speed
(19) Soft key synchronous adjustment of sieve conveyor speed

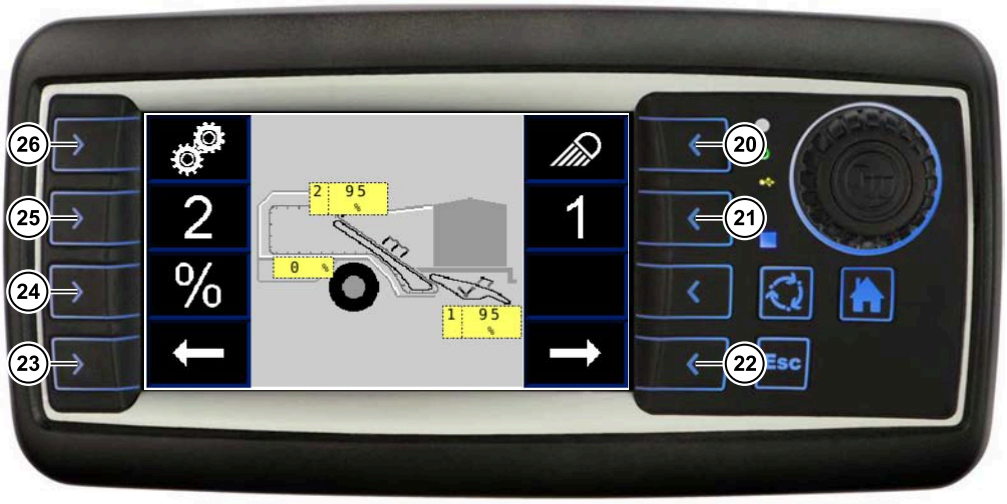
The soft key activates and deactivates the optional automatic sieve conveyor control in the individual adjustment and in the synchronous adjustment of the sieve conveyor speed. In activated status the soft key is green, in deactivated status the soft key is white.

If sieve conveyor automatic function is activated, the speed of the sieve conveyors is equivalent to the current driving speed. The speed of the sieve conveyors can be adjusted individually or synchronously as a percentage of the drive speed. Here, 0% deviation is synchronous to the current driving speed, - % sieve conveyors run slower than the driving speed and + % sieve conveyors run faster than the driving speed. The speed of the leaf chain can be braked in relation to sieve conveyor 2.

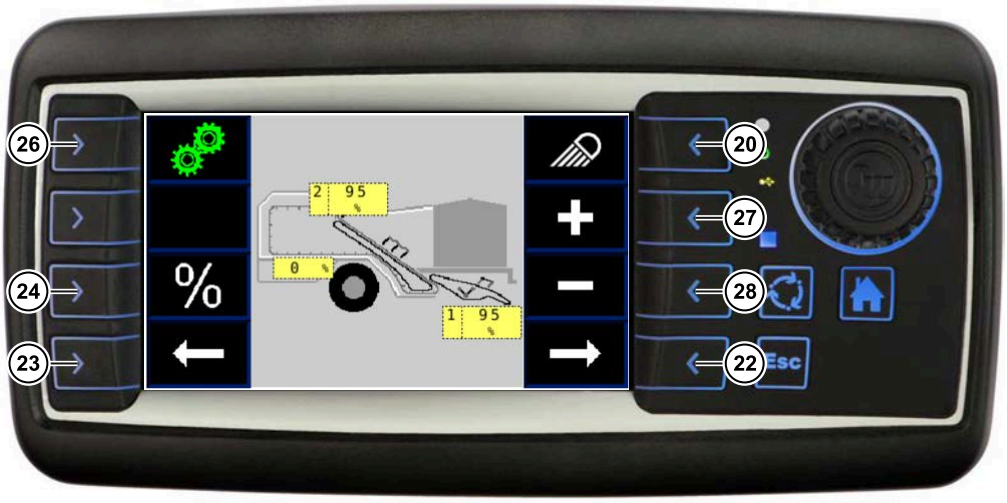


The minimum and maximum speed for the automatic control can be set in the main menu, in the main settings menu, conveyors control submenu under automatic function of sieve conveyors. During slow driving the speed of the sieve conveyors is not slower than the minimum set value. During fast driving the speed of the sieve conveyors is not faster than the maximum set value. The default settings are at minimum 50 rpm and at maximum 200 rpm.

Adjust sieve conveyors automatic function at the sorting platform terminal (option)



Individual adjustment of sieve conveyors automatic function at sorting platform

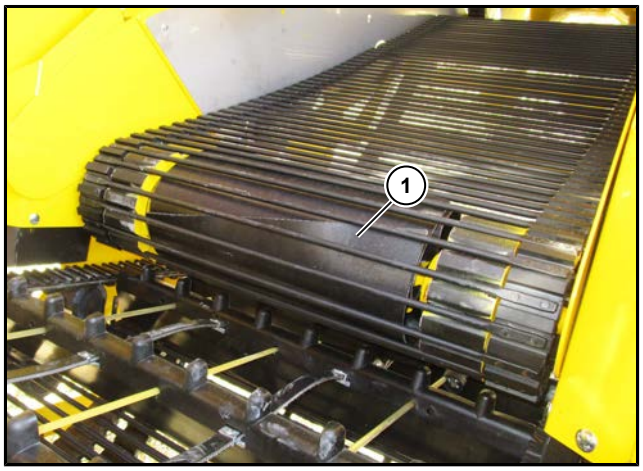


Synchronous adjustment of sieve conveyors automatic function at sorting platform

(20) Working floodlights soft key
(21) Soft key sieve conveyor 1
(22) Scroll screen right soft key
(23) Scroll screen left soft key
(24) Soft key leaf chain
(25) Soft key sieve conveyor 2
(26) Soft key synchronous adjustment of sieve conveyor speed
(27) Soft key increase sieve conveyor speed
(28) Soft key reduce sieve conveyor speed

If the sorting platform terminal is released, scroll with the scroll screen right soft key → or the scroll screen left soft key ← to open the screen for adjusting the sieving channel speeds. If the automatic function of sieve conveyors is activated at the tractor terminal, the speed of sieve conveyor 1 and sieve conveyor 2 can be adjusted individually and synchronously as a percentage of the drive speed.

6.13.1.8 Rubber paddle roller (option)

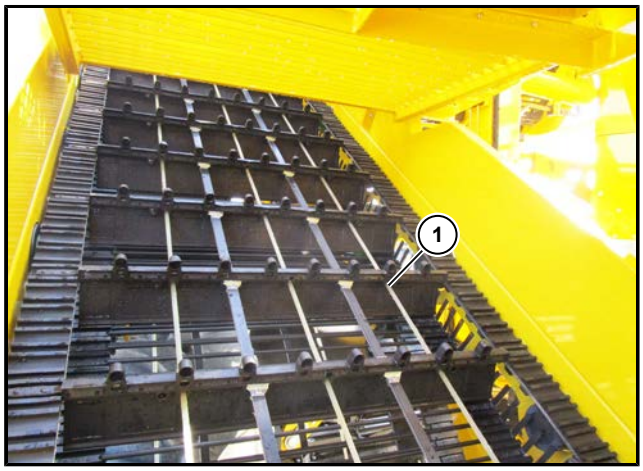


(1) Rubber paddle roller sieve conveyor 1

The rubber paddle roller is optional and can be mounted on the drive shaft of the sieve conveyor 1 (**1**) and on the drive shaft of the sieve conveyor 2.

The rubber paddle roller prevents sticky soil and haulm rolls from adhering to the drive shafts of sieve conveyor 1 and sieve conveyor 2.

6.13.1.9 Leaf chain



(1) Leaf chain with integrated leaf strings

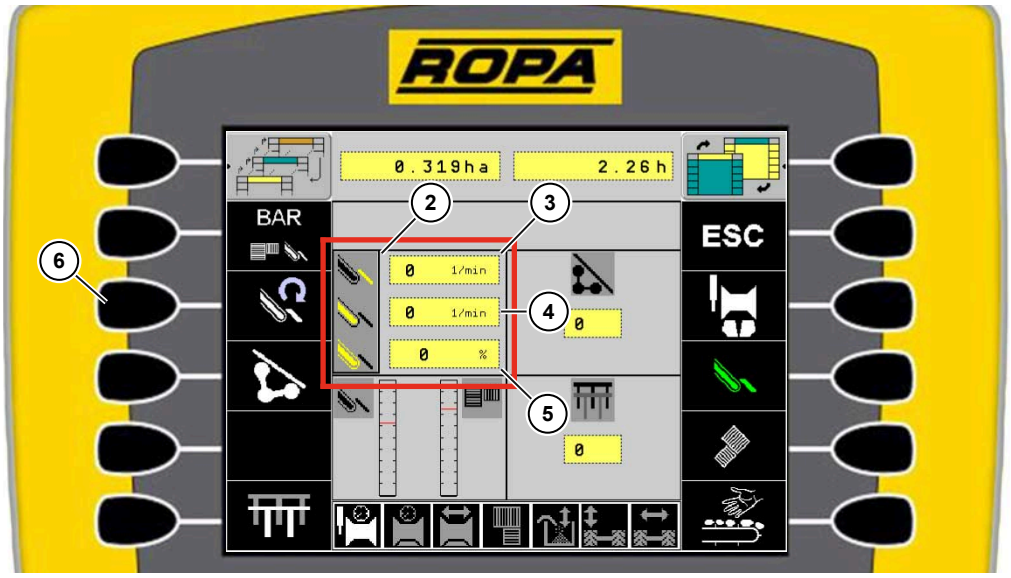
The leaf chain separates crop residues. The crop passes through the machine, during which stems and leaves are ejected through the mesh. The leaf chain consists of rubberised side belts, centre belts and carriers. The integrated leaf strings (**1**) reduce the mesh width and can if necessary be removed from inside to outside.

The speed of the leaf chain can be hydraulically braked depending on the speed of sieve conveyor 2. The feedback comes from the integrated speed sensor in the oil motor of the leaf chain and the integrated speed sensor in the oil motor of sieve conveyor 2. The maximum speed of the leaf chain cannot exceed that of sieve conveyor 2, and is also slower up to a specific deviation. This enables an additional cleaning effect under specific conditions.

The adjustment of the difference of the leaf chain to sieve conveyor 2 is controlled at the tractor terminal or the sorting platform terminal if it is released. A speed sensor integrated in the oil motor sends feedback of the percentage to the control. When the speed of sieve conveyor 2 is adjusted, the speed of the leaf chain automatically retains the defined percentage difference.

Adjusting speed of leaf chain at the tractor terminal

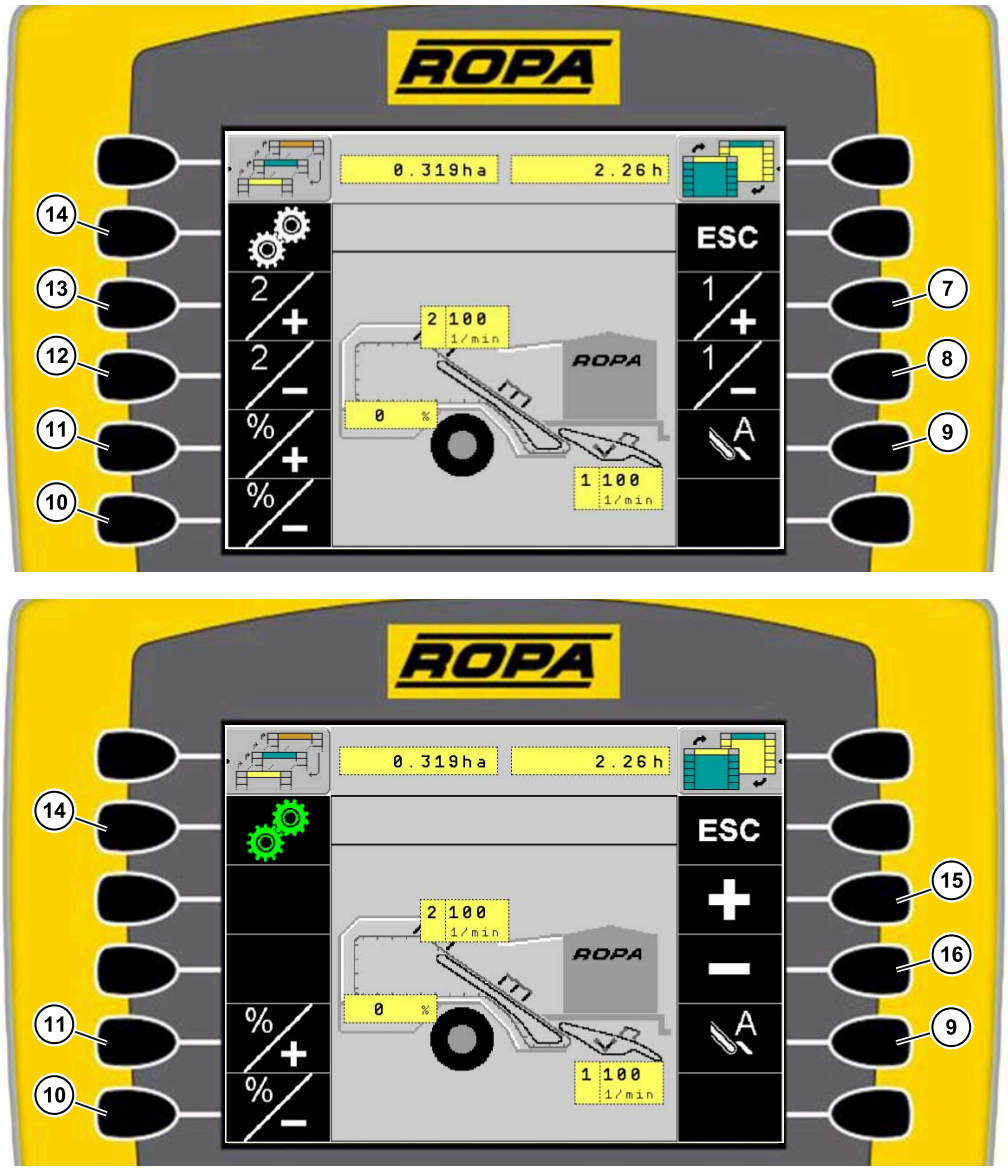
The percentage deviation of the speed of the leaf chain to sieve conveyor 2 can be adjusted in the sieving channel menu. Select the soft key on the tractor terminal. After selection the soft key becomes green.



(2) Sieving channel speed soft key
(3) Sieve conveyor 1 speed display
(4) Sieve conveyor 2 speed display
(5) Display of difference of leaf chain from sieve conveyor 2
(6) Sieving channel speed soft key

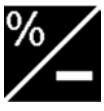
The sieving channel speed display field (**2**) shows the speed of sieve conveyor 1 (**3**), sieve conveyor 2 (**4**) and the percentage difference of the speed of leaf chain from sieve conveyor 2 (**5**). Select the grey button to open the sieving channel speed settings submenu.

The sieving channel speed soft key opens the sieving channel speed settings submenu.



(7) Soft key increase sieve conveyor 1 speed
(8) Soft key reduce sieve conveyor 1 speed
(9) Soft key sieve conveyors automatic function
(10) Soft key reduce leaf chain speed
(11) Soft key increase leaf chain speed
(12) Soft key reduce sieve conveyor 2 speed
(13) Soft key increase sieve conveyor 2 speed
(14) Soft key sieve conveyor speed synchronous adjustment
(15) Soft key increase sieve conveyor speed
(16) Soft key reduce sieve conveyor speed

Press the key % + to increase the speed. If the leaf chain is synchronised with sieve conveyor 2, the maximum speed of the leaf chain is reached and a deviation of 0% is displayed. When the speed of sieve conveyor 2 is adjusted, the defined percentage difference to the leaf chain remains the same.



Press the % − key to reduce the speed. At a deviation of -10% the minimum speed of the leaf chain compared to sieve conveyor 2 is reached. When the speed of sieve conveyor 2 is adjusted, the defined percentage difference to the leaf chain remains the same.

Adjusting speed of leaf chain at the sorting platform terminal (option)

(17) Working floodlights soft key
(18) Soft key sieve conveyor 1
(19) Scroll screen right soft key
(20) Scroll screen left soft key
(21) Soft key leaf chain
(22) Soft key sieve conveyor 2
(23) Soft key synchronous adjustment of sieve conveyor speed
(24) Soft key increase sieve conveyor speed
(25) Soft key reduce sieve conveyor speed

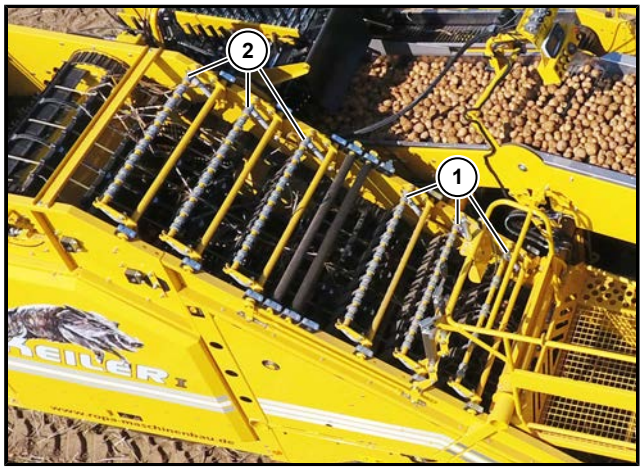
If the sorting platform terminal is released, scroll with the scroll screen right soft key → or the scroll screen left soft key ← to open the screen for adjusting the sieving channel speeds. Select the leaf chain with leaf chain soft key %.

(26) Soft key increase leaf chain speed
(27) Soft key reduce leaf chain speed

Press the key % + to increase the speed. If the leaf chain is synchronised with sieve conveyor 2, the maximum speed of the leaf chain is reached and a deviation of 0% is displayed. When the speed of sieve conveyor 2 is adjusted, the defined percentage difference to the leaf chain remains the same.

Press the % − key to reduce the speed. At a deviation of -10% the minimum speed of the leaf chain compared to sieve conveyor 2 is reached. When the speed of sieve conveyor 2 is adjusted, the defined percentage difference to the leaf chain remains the same.

6.13.1.10 Leaf scraper



(1) Front leaf-scraper
(2) Rear leaf-scraper

Above the leaf chain there are 6 rows of adjustable leaf scrapers with individual leaf springs to catch the potatoes hanging from or caught in the haulm. The potatoes fall through the leaf chain directly onto sieve conveyor 2 or on the slow-moving pintle belt 1.

The leaf scrapers are divided into two independently adjustable segments, 3 rows of front leaf scrapers (**1**) and 3 rows of rear leaf scrapers (**2**). Adjustment is made via the operating component on the right sorting platform of the machine.
Optionally, an additional row of leaf scrapers can be mounted before the front leaf scrapers. This additional row of leaf scrapers can be adjusted together with the front leaf scrapers.

If the haulm is young and green and the tubers are firmly attached to the haulm, the leaf scrapers should be set close to the leaf chain. If the haulm is dry and withered and the tubers are already detached, the leaf scrapers can be set further away from the leaf chain to have as little haulm residue in the mesh as possible.

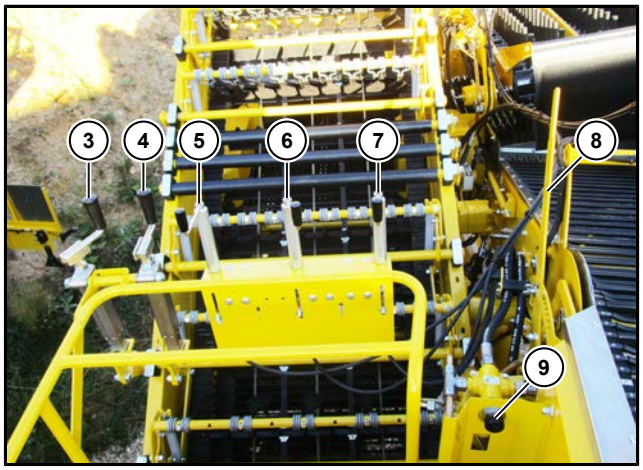
ATTENTION

Increased wear and crop damage.

Aggressively adjusted leaf scrapers that grip the leaf chain may increase wear on the leaf scrapers and the leaf chain. There will also be a risk of crop damage.

– Adjust leaf scrapers so they contact the leaf chain only as much as necessary and check the cleaning effect for subsequent adjustment if necessary.

Adjusting leaf scrapers at the operating component of the right sorting platform



(3) Crank for rear leaf-scraper height
(4) Crank for front leaf-scraper height
(5) Crank for deflector roller 1 height
(6) Crank for UFK 1 height
(7) Crank for UFK 2 height
(8) Lever for sorting distance
(9) Rotary wheel for sorting speed

The height of the front leaf scrapers can be adjusted with the crank for front leaf scrapers height (**4**).

The height of the rear leaf scrapers can be adjusted with the crank for rear leaf scrapers height (**3**).

6.13.1.11 Pull-off rods in the leaf separation

(1) Pull-off rods working positions
(2) Pull-off rods storage positions

If the potatoes do not come loose in spite of aggressively adjusted leaf scrapers, operational pull-off rods (**1**) can be installed in up to 3 positions. The potatoes are then caught between the pull-off rods, the leaf scrapers and the leaf chain, which will remove the haulm. If the pull-off rods are not required, they can be stored on the machine (**2**). The pull-off rods have a plastic tube to protect the potatoes.

ATTENTION

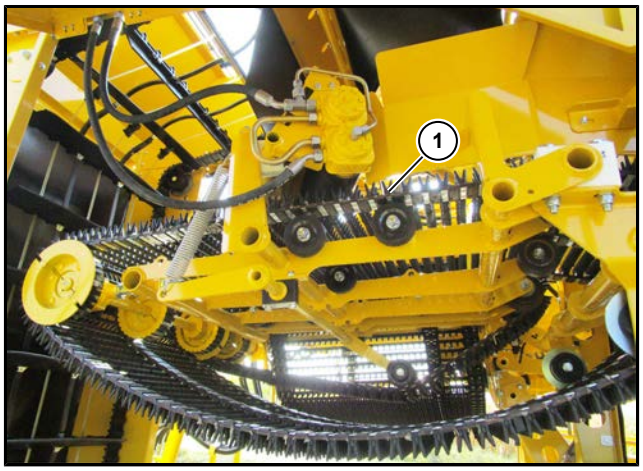
Increased wear and crop damage.

Using pull-off rods will increase wear of the leaf chain and the leaf scrapers. There will also be a risk of crop damage.

6.13.2 Separation

Separation consists of the pintle belt 1 with deflector roller 1, pintle belt 2 with deflector roller 2, rotating finger comb (UFK) and inclination of pintle belt 1/2.

6.13.2.1 Pintle belt 1

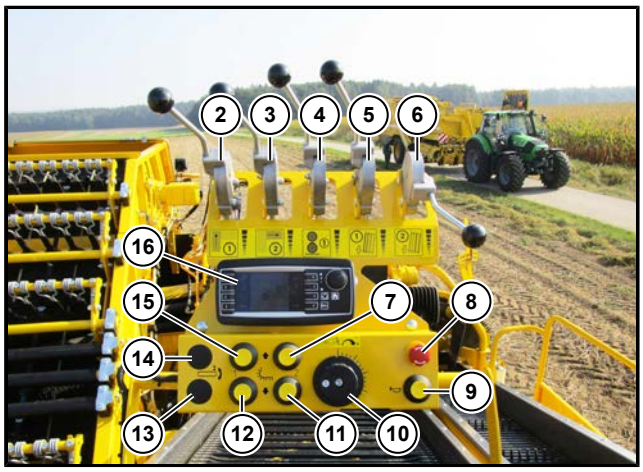


(1) Pintle belt 1

The pintle belt 1 (**1**) is a unit consisting of 2 separating chains, which is installed longitudinally to the machine. In the standard version, both separating chains are fitted with rubberised finger rods arranged in V-profile pattern. The deflector roller 1 is installed above. Small amounts of trash and haulm are passed through the rubber fingers and deflector roller 1 and separated.

In the standard version, speed of the pintle belt 1 is controlled with the Bowden cable on the sorting platform. Optionally, speed of the pintle belt 1 can be adjusted at the tractor terminal or at the sorting platform terminal if it has been released.

Adjustment of the pintle belt 1 speed via Bowden cable

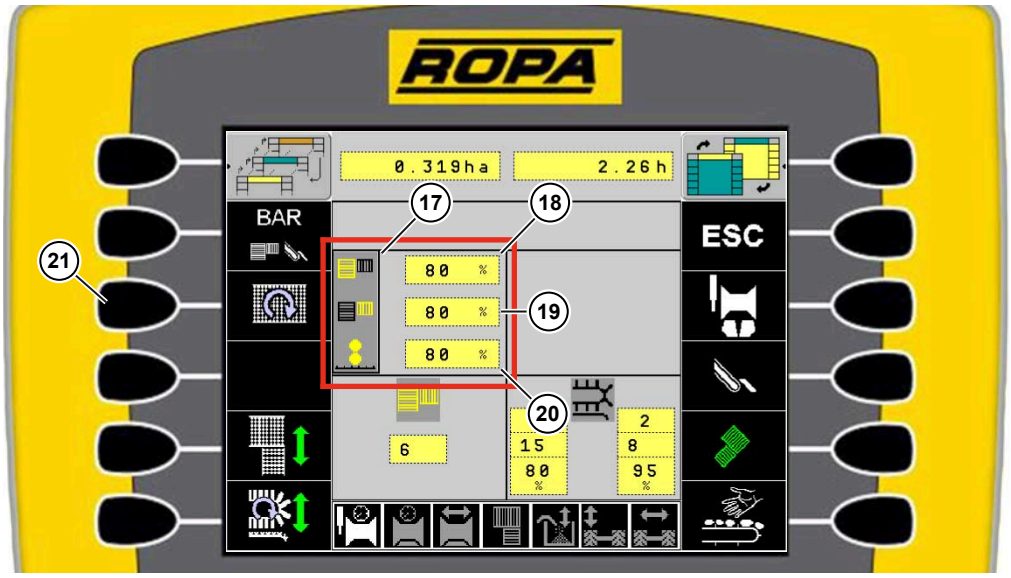


(2) Bowden cable for pintle belt 1 speed
(3) Bowden cable for pintle belt 2 speed
(4) Bowden cable for deflector roller 1 speed
(5) Bowden cable for UFK 1 speed
(6) Bowden cable for UFK 2 speed
(7) Key raise UFK 2
(8) Sorting platform emergency stop switch
(9) Key tractor terminal horn
(10) Picking conveyor speed
(11) Key lower UFK 2
(12) Key lower UFK 1
(13) Key lower pintle belt 1/2 inclination
(14) Key raise pintle belt 1/2 inclination
(15) Key raise UFK 1
(16) Sorting platform terminal

The speed of pintle belt 1 can be adjusted with the Bowden cable for pintle belt 1 speed (**2**). The pintle belt 1 stands still in the lowest position of Bowden cable, while pintle belt 1 runs at maximum rotational speed in its highest position.

Adjusting speed of pintle belt 1 at the tractor terminal (option)

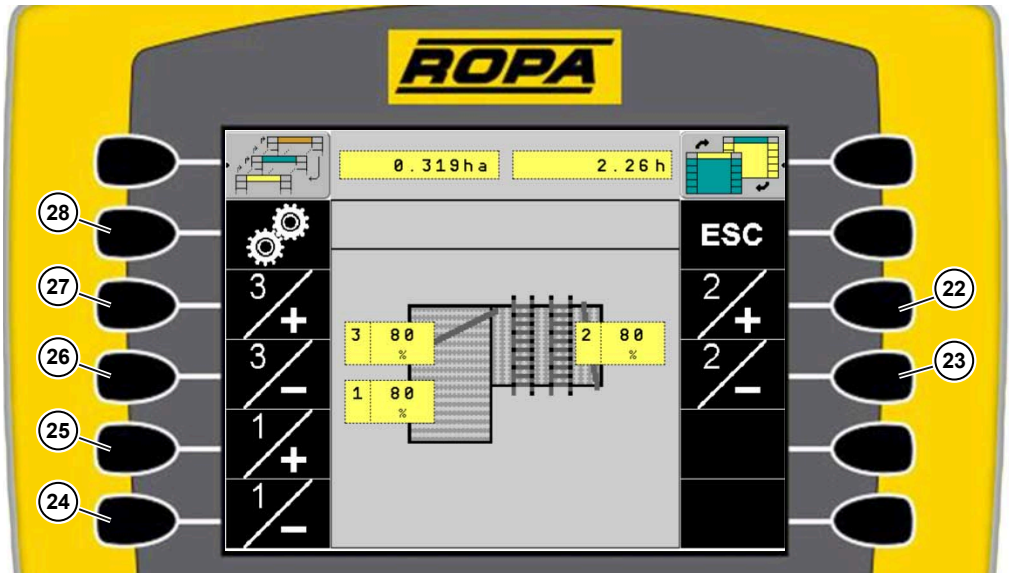
The speed of pintle belt 1 can be optionally adjusted in the separation menu. Select the separation soft key on the tractor terminal. After selection the soft key becomes green.



(17) Pintle belts speed display field
(18) Speed display for pintle belt 1
(19) Speed display for pintle belt 2
(20) Speed display for deflector roller 1
(21) Soft key speed of pintle belts

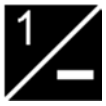
The pintle belts speed display field (**17**) shows the speed of pintle belt 1 (**18**), pintle belt 2 (**19**), and deflector roller 1 (**20**). Select the grey button for direct access to the pintle belt speed settings submenu.

The pintle belts speed soft key opens the pintle belt speed settings submenu.



(22) Soft key increase pintle belt 2 speed
(23) Soft key reduce pintle belt 2 speed
(24) Soft key reduce pintle belt 1 speed
(25) Soft key increase pintle belt 1 speed
(26) Soft key reduce speed of deflector roller 1
(27) Soft key increase speed of deflector roller 1
(28) Soft key synchronous adjustment of pintle belts speed

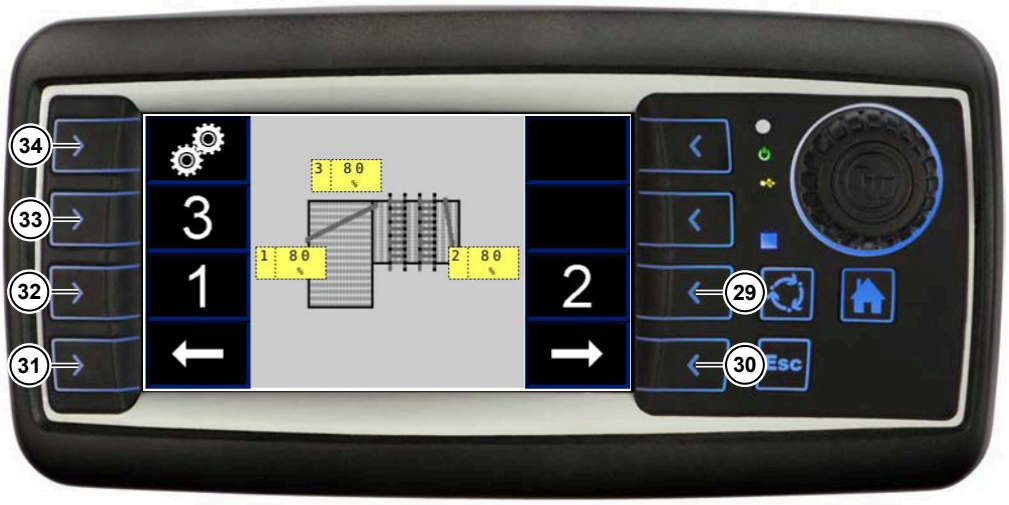
Press the key 1+ to increase the speed. The maximum speed of pintle belt 1 is 100 %.



Press the key 1− to reduce the speed. The minimum speed of pintle belt 1 is 30 %.

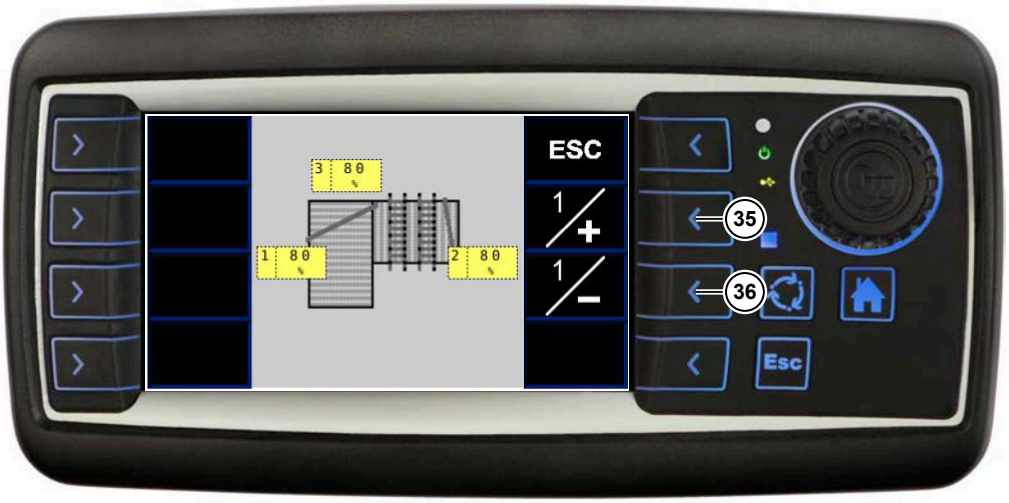
The pressure in the hydraulic drive of pintle belts is continuously displayed and monitored by the pressure monitor on the tractor terminal. If the maximum pressure warning limit set by the driver is exceeded, the tractor terminal shows the warning and a warning sound is also generated.

Adjusting speed of pintle belt 1 at the sorting platform terminal (option)



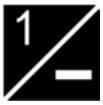
(29) Soft key pintle belt 2 speed
(30) Scroll screen right soft key
(31) Scroll screen left soft key
(32) Soft key pintle belt 1 speed
(33) Soft key increase speed of deflector roller 1
(34) Soft key pintle belts speed synchronous adjustment

If the sorting platform terminal is released, scroll with the scroll screen right soft key → or the scroll screen left soft key ← to open the screen for adjusting the speed of pintle belts. Select pintle belt 1 with the soft key 1.



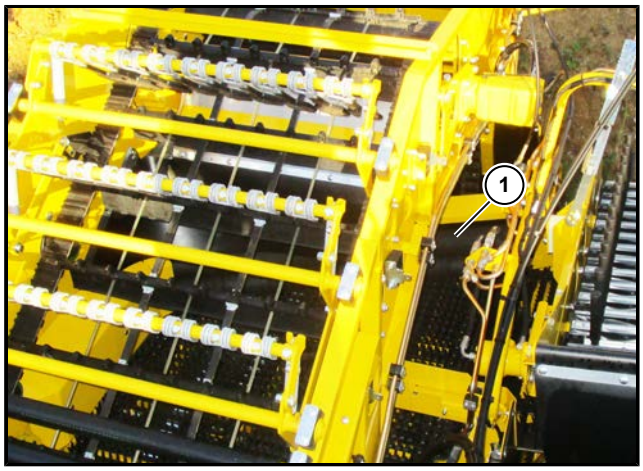
(35) Soft key increase pintle belt 1 speed
(36) Soft key reduce pintle belt 1 speed

Press the key 1 + to increase the speed. The maximum speed of pintle belt 1 is 100 %.



Press the key 1 − to reduce the speed. The minimum speed of pintle belt 1 is 30 %.

6.13.2.2 Deflector roller 1



(1) Deflector roller 1

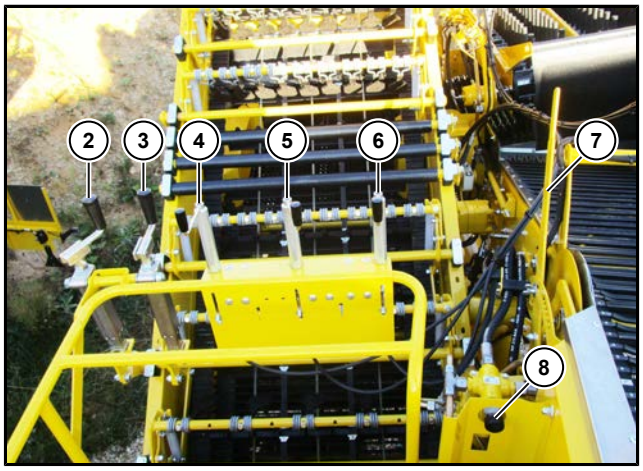
In the standard version, the speed of deflector roller 1 can be adjusted via Bowden cable and the its height via a crank. Optionally, speed of the deflector roller 1 can be adjusted at the tractor terminal or at the sorting platform terminal if it has been released and it is designed as a 2-part deflector roller.

ATTENTION

Danger of losses and machine damage.

The larger the set gap between the pintle belt 1 and the deflector roller 1, the greater the danger of crop losses. The narrower the set gap between the pintle belt 1 and the deflector roller 1, the greater the danger of increased wear, because soil may accumulate on the deflector roller 1 and the pintle belt 1.

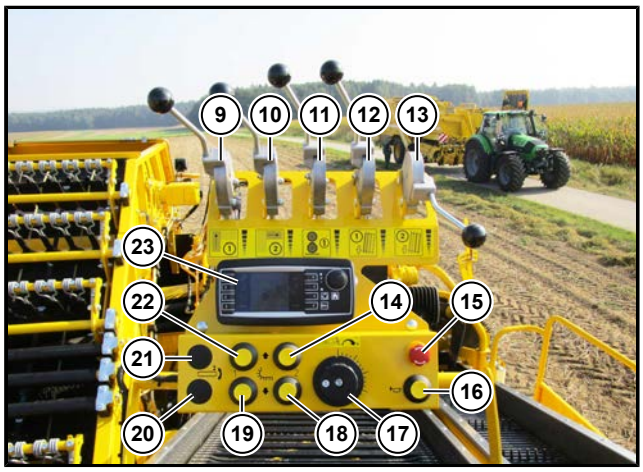
Adjusting height of the deflector roller 1 at the operating component of the right sorting platform



(2) Crank for rear leaf-scraper height
(3) Crank for front leaf-scraper height
(4) Crank for deflector roller 1 height
(5) Crank for UFK 1 height
(6) Crank for UFK 2 height
(7) Lever for sorting distance
(8) Rotary wheel for sorting speed

The height of deflector roller 1 over the pintle belt 1 can be adjusted using the crank for deflector roller 1 height (**4**).

Adjustment of the deflector roller 1 speed via Bowden cable

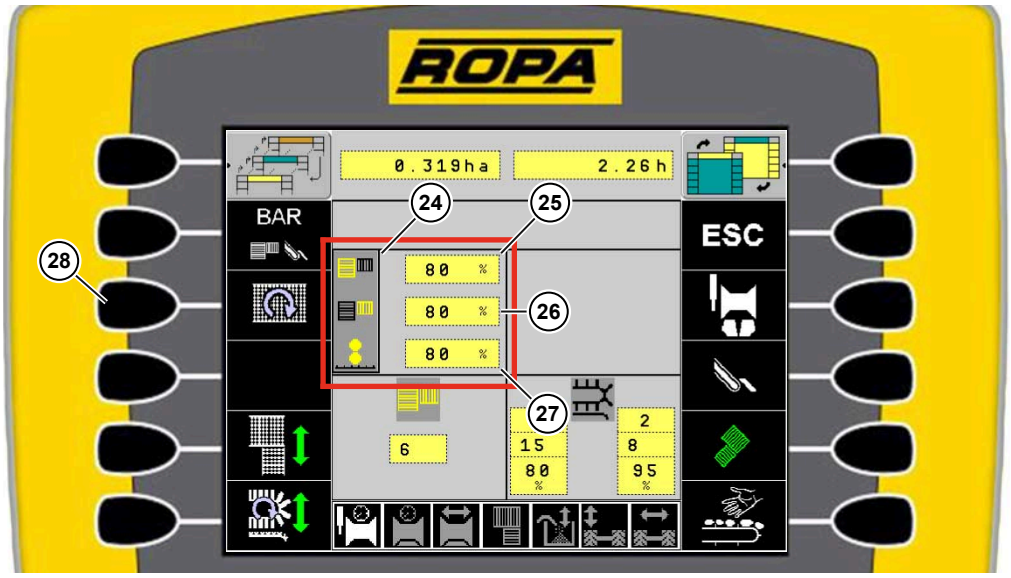


(9) Bowden cable for pintle belt 1 speed
(10) Bowden cable for pintle belt 2 speed
(11) Bowden cable for deflector roller 1 speed
(12) Bowden cable for UFK 1 speed
(13) Bowden cable for UFK 2 speed
(14) Key raise UFK 2
(15) Emergency stop sorting platform switch
(16) Key tractor terminal horn
(17) Picking conveyor speed
(18) Key lower UFK 2
(19) Key lower UFK 1
(20) Key lower pintle belt 1/2 inclination
(21) Key raise pintle belt 1/2 inclination
(22) Key raise UFK 1
(23) Sorting platform terminal

The speed of deflector roller 1 can be adjusted with Bowden cable for deflector roller 1 speed (**11**). The deflector roller 1 stands still in the lowest position of Bowden cable, while deflector roller 1 runs at maximum rotational speed in its highest position.

Adjusting speed of deflector roller 1 at the tractor terminal (option)

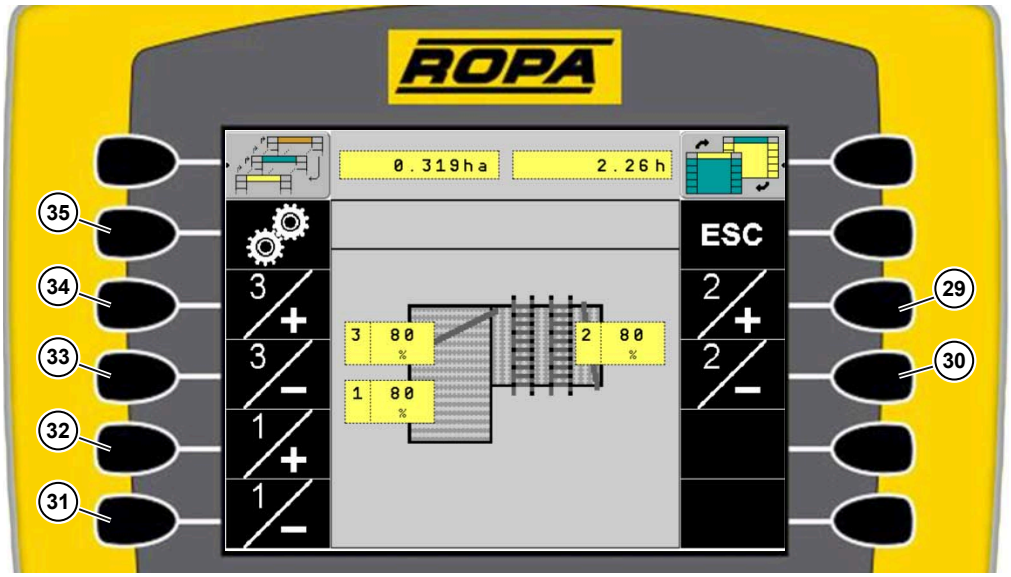
The speed of deflector roller 1 can be adjusted optionally in the separation menu. Select the separation soft key on the tractor terminal. After selection the soft key becomes green.



(24) Pintle belts speed display field
(25) Speed display for pintle belt 1
(26) Speed display for pintle belt 2
(27) Speed display for deflector roller 1
(28) Soft key speed of pintle belts

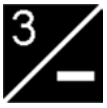
The pintle belt speeds display field (**24**) shows the speeds of pintle belt 1 (**25**), pintle belt 2 (**26**), and deflector roller 1 (**27**). Select the grey button for direct access to the pintle belt speed settings submenu.

The pintle belts speed soft key opens the pintle belt speed settings submenu.



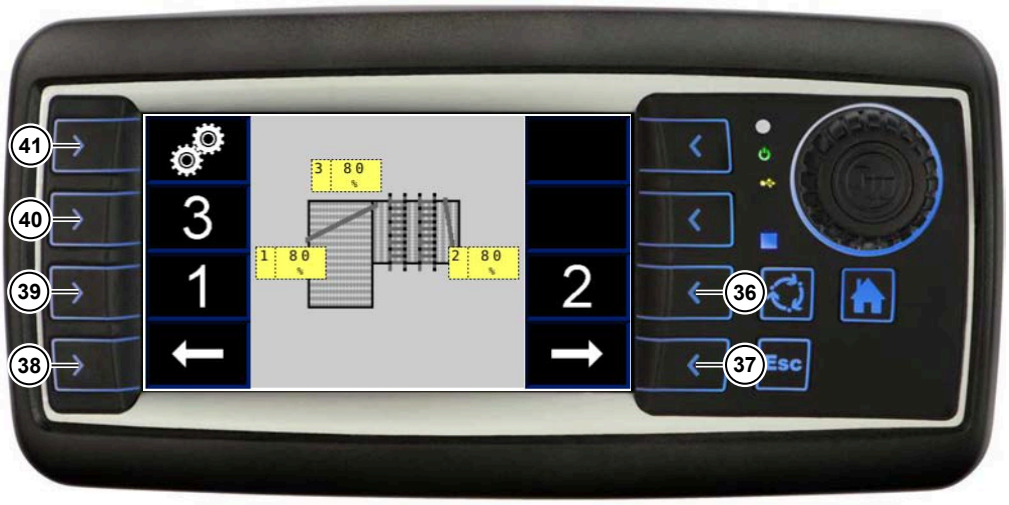
(29) Soft key increase pintle belt 2 speed
(30) Soft key reduce pintle belt 2 speed
(31) Soft key reduce pintle belt 1 speed
(32) Soft key increase pintle belt 1 speed
(33) Soft key reduce deflector roller 1 speed
(34) Soft key increase deflector roller 1 speed
(35) Soft key synchronous adjustment of pintle belts speed

Press the key 3+ to increase the speed. The maximum speed of the deflector roller 1 is 100%.



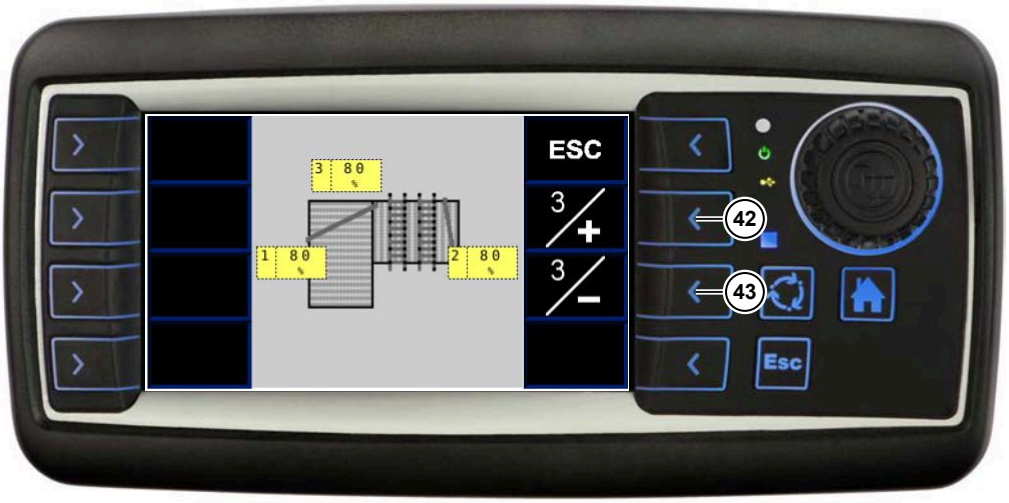
Press the key 3− to reduce the speed. The minimum speed of the deflector roller 1 is 30%.

Adjusting speed of deflector roller 1 at the machine terminal (option)



(36) Soft key pintle belt 2 speed
(37) Scroll screen right soft key
(38) Scroll screen left soft key
(39) Soft key pintle belt 1 speed
(40) Soft key increase speed of deflector roller 1
(41) Soft key pintle belts speed synchronous adjustment

If the sorting platform terminal is released, scroll with the scroll screen right soft key → or the scroll screen left soft key ← to open the screen for adjusting the speed of pintle belts. Select deflector roller 1 with the soft key 3.



(42) Soft key increase deflector roller 1 speed
(43) Soft key reduce deflector roller 1 speed

Press the key 3+ to increase the speed. The maximum speed of the deflector roller 1 is 100%.

Press the key 3− to reduce the speed. The minimum speed of the deflector roller 1 is 30%.

6.13.2.2.1 Deflector roller 1 with spiral roller at the bottom (option)

Optionally, the deflector roller 1 can be equipped with a spiral roller at the bottom.

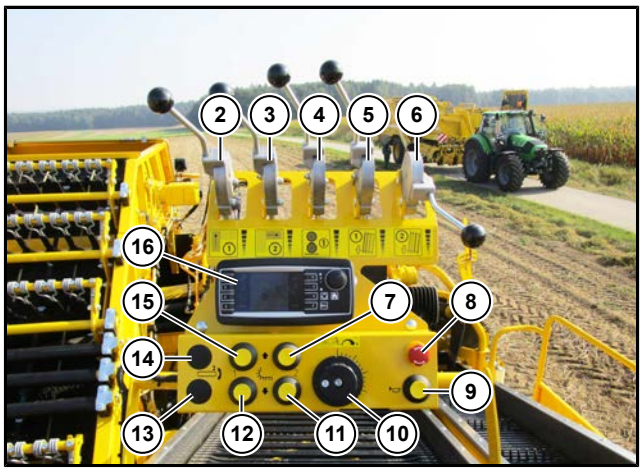
6.13.2.3 Pintle belt 2

(1) Pintle belt 2

The standard pintle belt 2 (**1**) is fitted with rubberised finger rods arranged in V-profile pattern. The rotating finger comb (UFK) is mounted above it. The crop is transported onto the picking conveyor by the UFK, the height and speed of which can be adjusted.

In the standard version, speed of the pintle belt 2 is controlled with the Bowden cable on the sorting platform. Optionally, speed of the pintle belt 2 can be adjusted at the tractor terminal or at the sorting platform terminal if it has been released.

Adjustment of the pintle belt 2 speed via Bowden cable

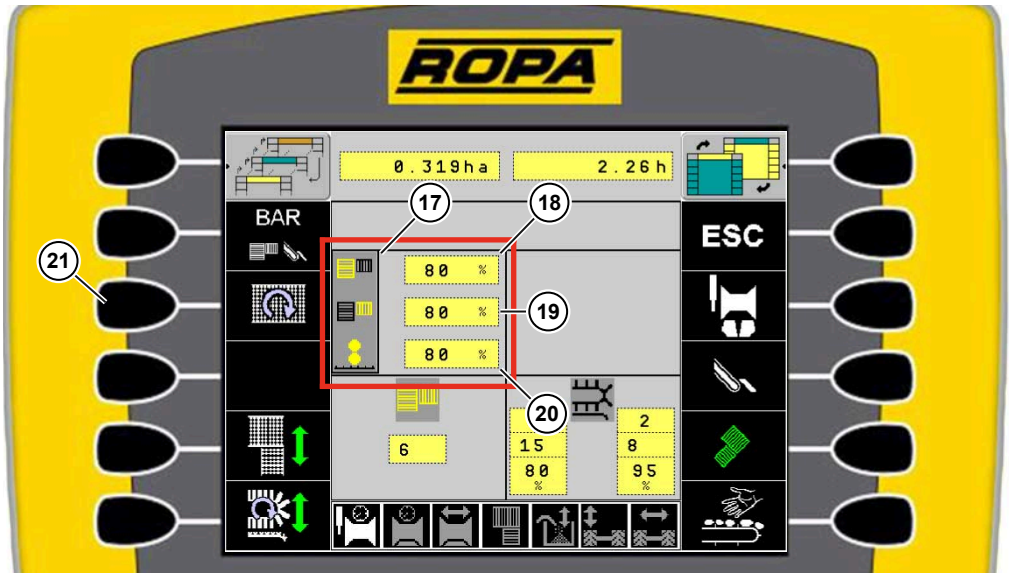


(2) Bowden cable for pintle belt 1 speed
(3) Bowden cable for pintle belt 2 speed
(4) Bowden cable for deflector roller 1 speed
(5) Bowden cable for UFK 1 speed
(6) Bowden cable for UFK 2 speed
(7) Key raise UFK 2
(8) Emergency stop sorting platform switch
(9) Key tractor terminal horn
(10) Picking conveyor speed
(11) Key lower UFK 2
(12) Key lower UFK 1
(13) Key lower pintle belt 1/2 inclination
(14) Key raise pintle belt 1/2 inclination
(15) Key raise UFK 1
(16) Sorting platform terminal

The speed of pintle belt 2 can be adjusted with the Bowden cable for pintle belt 2 speed (**3**). The pintle belt 2 stands still in the lowest position of Bowden cable, while pintle belt 2 runs at maximum rotational speed in its highest position.

Adjusting speed of pintle belt 2 at the tractor terminal (option)

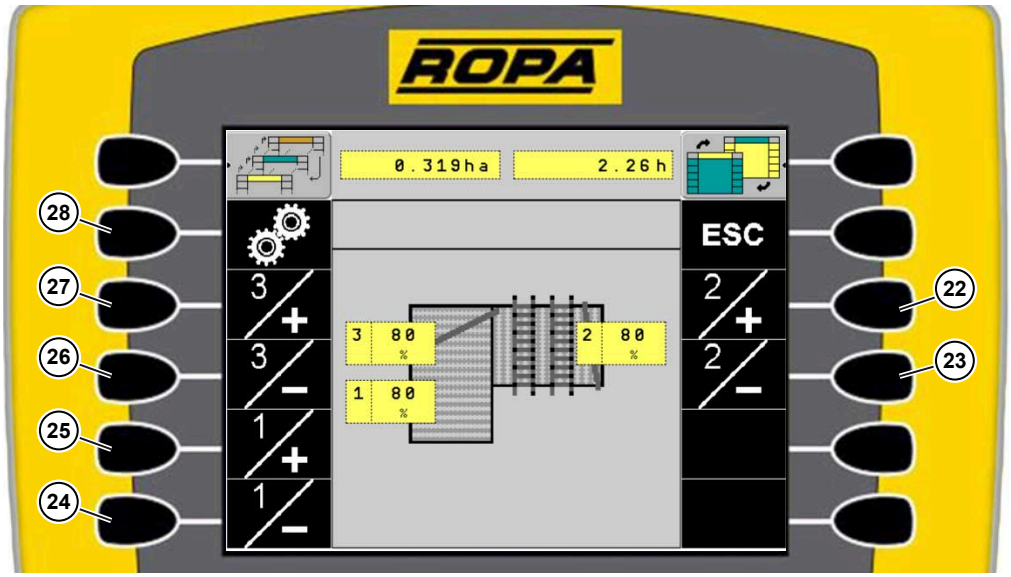
The speed of pintle belt 2 can be adjusted in the separation menu. Select the separation soft key on the tractor terminal. After selection the soft key becomes green.



(17) Pintle belts speed display field
(18) Speed display for pintle belt 1
(19) Speed display for pintle belt 2
(20) Speed display for deflector roller 1
(21) Soft key speed of pintle belts

The pintle belts speed display field (**17**) shows the speed of pintle belt 1 (**18**), pintle belt 2 (**19**), and deflector roller 1 (**20**). Select the grey button for direct access to the pintle belt speed settings submenu.

The pintle belts speed soft key opens the pintle belt speed settings submenu.

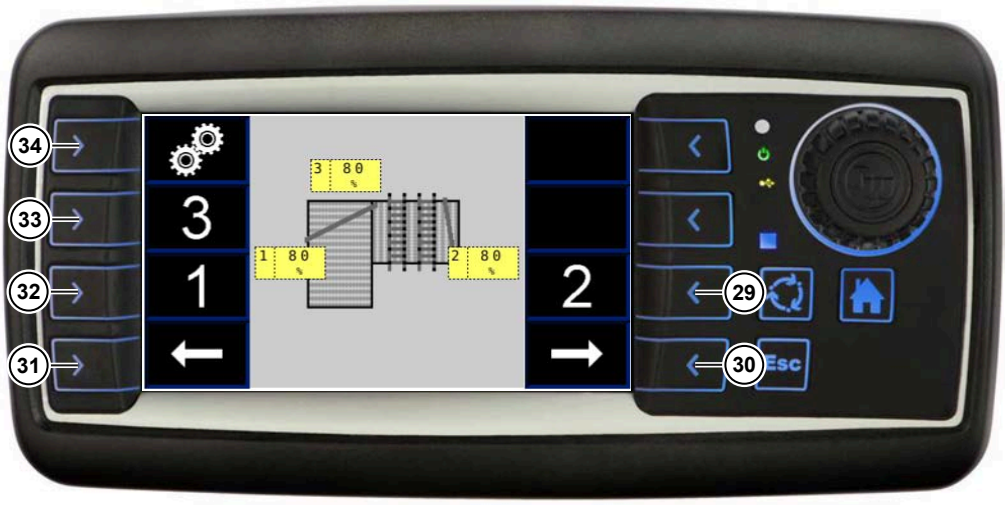


(22) Soft key increase pintle belt 2 speed
(23) Soft key reduce pintle belt 2 speed
(24) Soft key reduce pintle belt 1 speed
(25) Soft key increase pintle belt 1 speed
(26) Soft key reduce deflector roller 1 speed
(27) Soft key increase deflector roller 1 speed
(28) Soft key pintle belts speed synchronous adjustment

Press the key 2+ to increase the speed. The maximum speed of pintle belt 2 is 100 %.

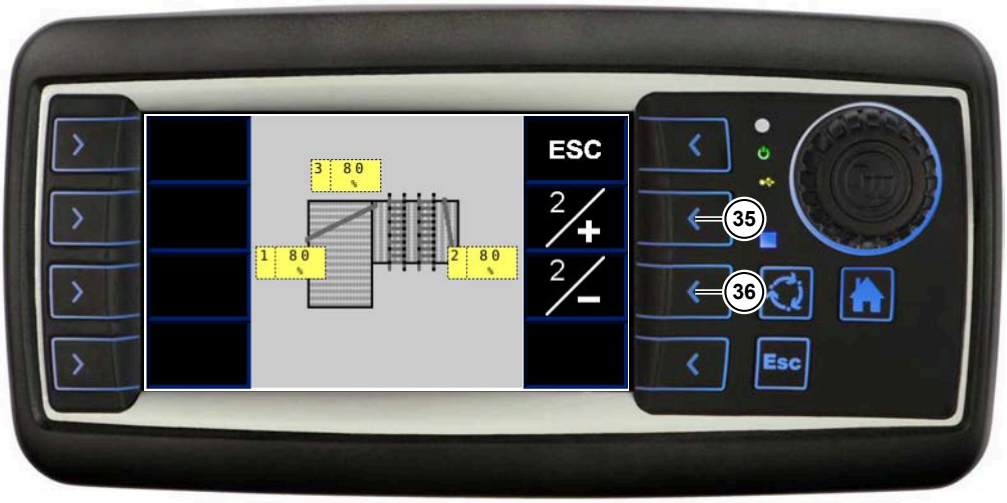
Press the key 2− to reduce the speed. The minimum speed of pintle belt 2 is 30 %.

Adjusting speed of pintle belt 2 at the sorting platform terminal



(29) Soft key pintle belt 2 speed
(30) Scroll screen right soft key
(31) Scroll screen left soft key
(32) Soft key pintle belt 1 speed
(33) Soft key increase speed of deflector roller 1
(34) Soft key pintle belts speed synchronous adjustment

If the sorting platform terminal is released, scroll with the scroll screen right soft key → or the scroll screen left soft key ← to open the screen for adjusting the speed of pintle belts. Select pintle belt 2 with the soft key 2.



(35) Soft key increase pintle belt 2 speed
(36) Soft key reduce pintle belt 2 speed

Press the key 2+ to increase the speed. The maximum speed of pintle belt 2 is 100 %.

Press the key 2− to reduce the speed. The minimum speed of pintle belt 2 is 30 %.

6.13.2.4 Deflector roller 2

(1) Adjusting lever for deflector roller 2
(2) Deflector roller 2

The deflector roller 2 (**2**) is driven hydraulically, depending on the speed of the pintle belt 2. If the speed of the pintle belt 2 is adjusted, this also adjusts the speed of the deflector roller 2. The deflector roller 2 can be adjusted in height with an adjusting lever for the deflector roller 2 (**1**) and is designed as a 1-part deflector roller.

ATTENTION

Danger of losses and machine damage.

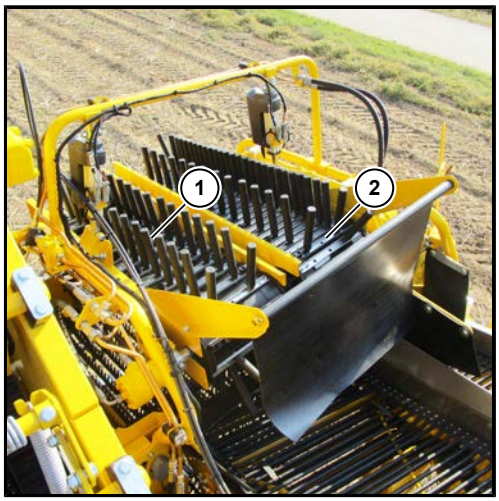
The larger the set gap between the pintle belt 2 and the deflector roller 2, the greater the danger of crop losses. The narrower the set gap between pintle belt 2 and deflector roller 2, the greater the danger of increased wear, because soil may accumulate on deflector roller 2 and pintle belt 2.

Adjusting height of the deflector roller 2 at the operating component of the left sorting platform

The deflector roller 2 (**2**) can be adjusted with the adjusting lever deflector roller 2 (**1**) at 12 different heights above the pintle belt 2. To do this, release the lock and engage the adjusting lever for the deflector roller 2 in the desired position. After that, secure the adjusting lever for deflector roller 2 (**1**).

6.13.2.5 Rotating finger comb (UFK)

Mechanical height adjustment of UFK



Electrical height adjustment of UFK

(1) Rotating finger comb 1 (UFK 1)
(2) Rotating finger comb 2 (UFK 2)

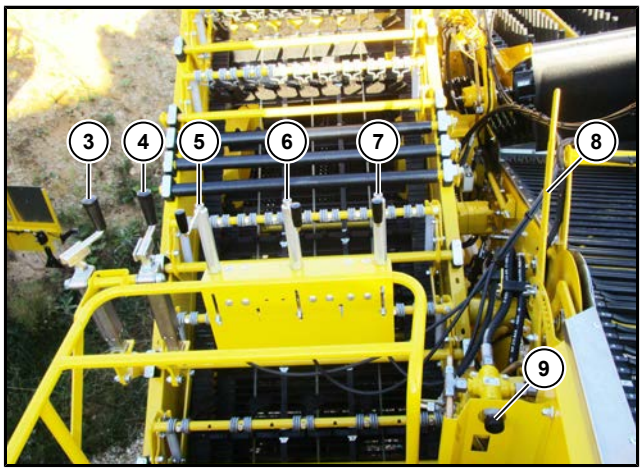
The standard machine is fitted with a rotating finger comb (UFK). The rotating finger comb (UFK) has 4 rows of fingers, with 2 rows each driven separately at an adjustable speed. The UFK 1 (**1**) and UFK 2 (**2**) identification goes in the direction of flow of the crop.

The UFK 2 (**2**) is driven hydraulically, depending on the speed of UFK 1 (**1**). If the speed of UFK 1 is adjusted, this also adjusts the speed of UFK 2.

In the standard version, the height of UFK can be mechanically adjusted via the pintle belt 2. Optionally, the height of UFK can be electrically adjusted via the pintle belt 2.

The UFK is located transverse to the transport direction of pintle belt 2. The 4 rows of fingers guide the potatoes to the picking conveyor while clumps are separated by the finger gaps and the gap to the pintle conveyor 2 and fed with the deflector roller 2 to the trash conveyor.

Mechanical adjustment of UFK height at the right sorting platform

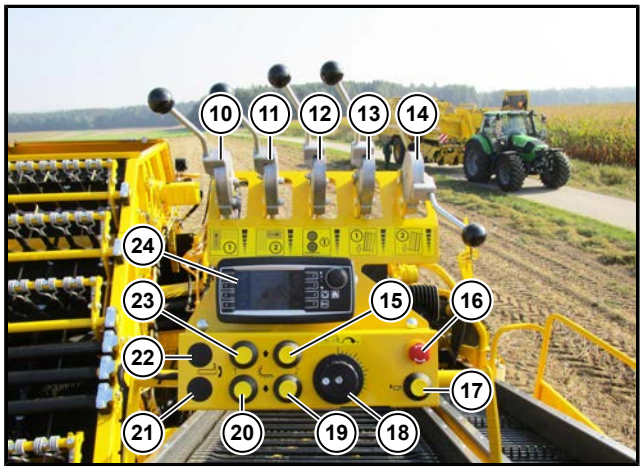


(3) Crank for rear leaf-scraper height
(4) Crank for front leaf-scraper height
(5) Crank for deflector roller 1 height
(6) Crank for UFK 1 height
(7) Crank for UFK 2 height
(8) Lever for sorting distance
(9) Rotary wheel for sorting speed

The height of UFK 1 can be adjusted using the crank for UFK 1 height (**6**).

The height of UFK 2 can be adjusted using the crank for UFK 2 height (**7**).

Mechanical adjustment of UFK height and electrical adjustment of UFK height via operating component above the sorting platform



(10) Bowden cable for pintle belt 1 speed
(11) Bowden cable for pintle belt 2 speed
(12) Bowden cable for deflector roller 1 speed
(13) Bowden cable for UFK 1 speed
(14) Bowden cable for UFK 2 speed
(15) Key raise UFK 2
(16) Emergency stop sorting platform switch
(17) Key tractor terminal horn
(18) Picking conveyor speed
(19) Key lower UFK 2
(20) Key lower UFK 1
(21) Key lower pintle belt 1/2 inclination
(22) Key raise pintle belt 1/2 inclination
(23) Key raise UFK 1
(24) Sorting platform terminal

The speed of UFK 1 can be adjusted with the Bowden cable for UFK 1 speed (**13**). The UFK 1 stands still in the lowest position of Bowden cable, while UFK 1 runs at maximum rotational speed in its highest position.

The speed of UFK 2 can be adjusted with the Bowden cable for UFK 2 speed (**14**). The UFK 2 stands still in the lowest position of Bowden cable, while UFK 2 runs at maximum rotational speed in its highest position.

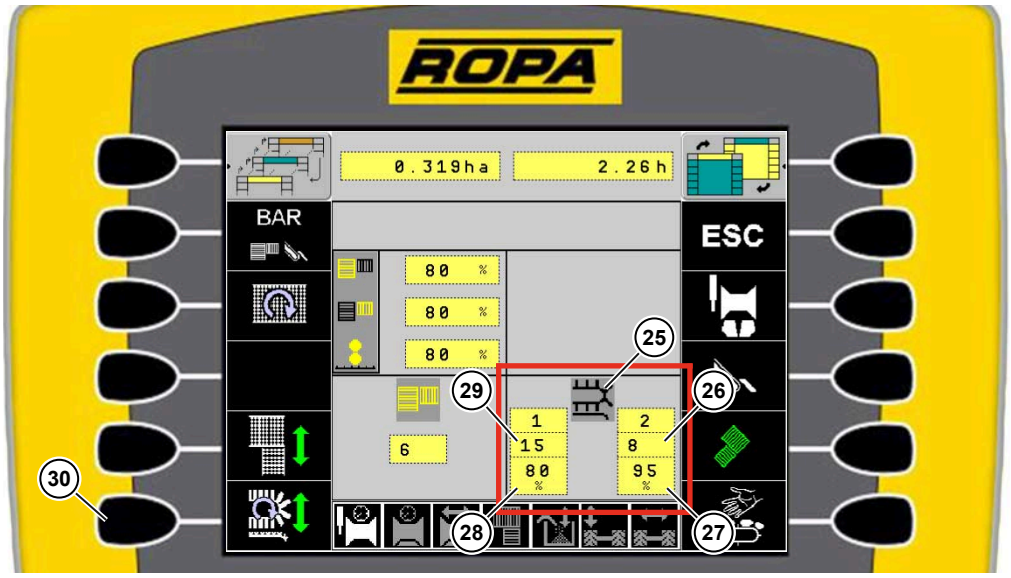
The UFK 1 with the installed electrical height adjustment can be raised using the key raise UFK 1 (**23**). The UFK 1 with the installed electrical height adjustment can be lowered using the key lower UFK 1 (**20**).

The UFK 2 with the installed electrical height adjustment can be raised using the key raise UFK 2 (**15**). The UFK 2 with the installed electrical height adjustment can be lowered using the key lower UFK 2 (**19**).

Adjusting the rotating finger comb (UFK) at the tractor terminal (option)

The speed and / or the height of the rotating finger comb (UFK) can be adjusted optionally at the tractor terminal, depending on the equipment model.

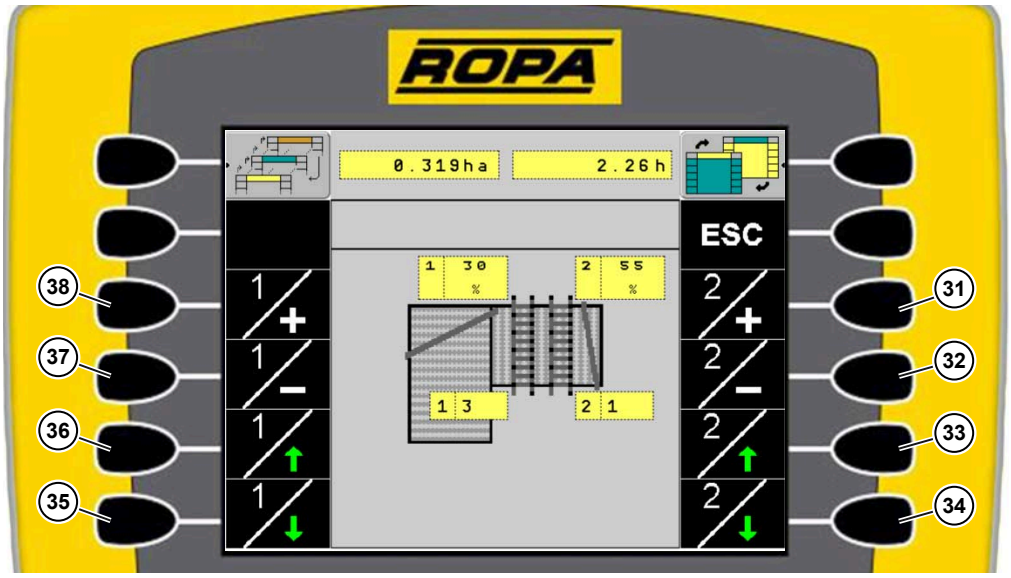
The speed and height of the rotating finger comb can be adjusted in the separation menu. Select the separation soft key on the tractor terminal. After selection the soft key becomes green.



(25) Speed and height display field for rotating finger comb (UFK)
(26) Height display for UFK 2
(27) Speed display for UFK 2
(28) Speed display for UFK 1
(29) Height display for UFK 1
(30) Soft key rotating finger comb

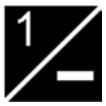
The speed of UFK 1 (**28**), UFK 2 (**27**) and the height of UFK 1 (**29**), UFK 2 (**26**) are shown in the speed and height display field for rotating finger comb (**25**). Select the grey button for direct access to the rotating finger comb submenu.

Select the soft key for adjustment of UFK to open the rotating finger comb (UFK) submenu.



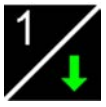
(31) Soft key increase UFK 2 speed
(32) Soft key reduce UFK 2 speed
(33) Soft key UFK 2 higher
(34) Soft key UFK 2 lower
(35) Soft key UFK 1 lower
(36) Soft key UFK 1 higher
(37) Soft key reduce UFK 1 speed
(38) Soft key increase UFK 1 speed

Press the 1+ key to increase the speed of UFK 1. The maximum speed of the UFK 1 is 100%.



Press the 1− key to reduce the speed of UFK 1. The minimum speed of UFK 1 is 20 %.

Press the 1↑ key to increase the height of UFK 1. The maximum distance between pintle belt 2 and UFK 1 is 20.



Press the 1↓ key to reduce the height of UFK 1. The minimum distance between pintle belt 2 and UFK 1 is 0.

Press the 2+ key to increase the speed of UFK 2. The maximum speed of the UFK 2 is 100%.

Press the 2− key to reduce the speed of UFK 2. The minimum speed of UFK 2 is 20 %.

Press the 2↑ key to increase the height of UFK 2. The maximum distance between pintle belt 2 and UFK 2 is 20.

Press the 2 key to reduce the height of UFK 2. The minimum distance between pintle belt 2 and UFK 2 is 0.

Adjusting the speed of the rotating finger comb (UFK) at the tractor terminal (option)

The speed and / or the height of the rotating finger comb (UFK) can be adjusted optionally at the sorting platform terminal, depending on the equipment model.

(39) Soft key shaker
(40) Soft key UFK 1 speed
(41) Lifting depth soft key
(42) Scroll screen right soft key
(43) Scroll screen left soft key
(44) Soft key pintle belt 1/2 inclination
(45) Soft key UFK 2 speed
(46) Soft key agitator

If the sorting platform terminal is released, scroll with the scroll screen right soft key → or the scroll screen left soft key ← to open the screen for adjusting the UFK speed. Select the UFK with the 3 soft key or with the 4 soft key.

(47) Soft key increase UFK 2 speed
(48) Soft key reduce UFK 2 speed
(49) Soft key reduce UFK 1 speed
(50) Soft key increase UFK 1 speed

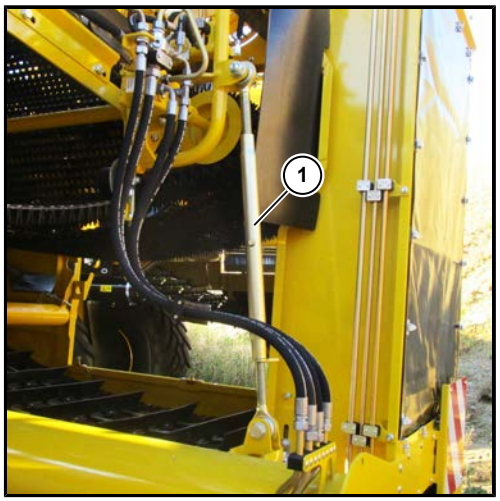
Press the 3+ key to increase the speed of UFK 2. The maximum speed of the UFK 2 is 100%.

Press the 3− key to reduce the speed of UFK 2. The minimum speed of UFK 2 is 20 %.

Press the 4+ key to increase the speed of UFK 1. The maximum speed of the UFK 1 is 100%.

Press the 4− key to reduce the speed of UFK 1. The minimum speed of UFK 1 is 20 %.

6.13.2.6 Pintle belt 1/2 inclination



(1) Upper arm pintle belt 1/2 inclination (standard)
(2) Hydraulic cylinder pintle belt 1/2 inclination (optional)

The standard version of pintle belt 1/2 is fitted with an upper arm (**1**) to adjust the inclination. The inclination of pintle belt 1/2 is manually adjusted by rotating the upper arm.

DANGER

Hazard to life due to moving machine parts!

Adjustment of the pintle belt 1/2 upper arm is permitted only if the machine drive is shut off and locked to prevent restart and the machine is secured to prevent movement. There is a danger of fatal injuries caused by tearing off parts of the body if the machine is running.

Pintle belt 1/2 can optionally be fitted with a hydraulic cylinder (**2**). The inclination of pintle belt 1/2 can be adjusted hydraulically while the machine is operating at the tractor terminal or depending on the installed option, at the sorting platform operating component or at the sorting platform terminal if it is released.

Adjusting inclination of the pintle belt 1/2 at the tractor terminal (optional)

(3) Pintle automatic function

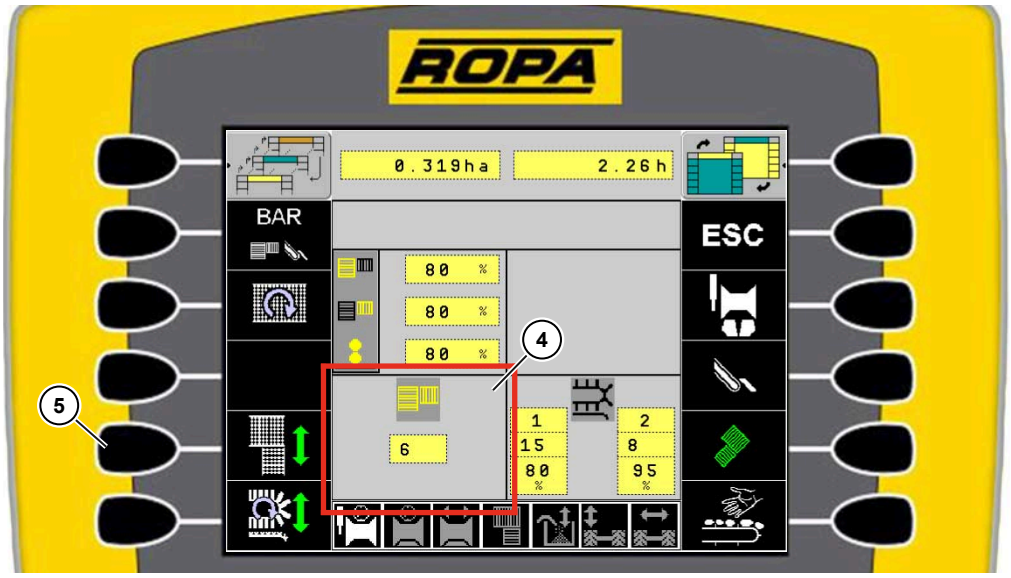
The current status of the pintle automatic function (**3**) is displayed in the automatic functions display field. If pintle automatic function is activated, the inclination of pintle belt 1/2 is always maintained at a constant angle to the ground within the range of the potential adjustment path of pintle belt 1/2 inclination.

The pintle automatic function is deactivated.

The pintle automatic function is preselected. Pintle automatic function is activated when the pickup is lowered with the start of field key on the lifter operating component.

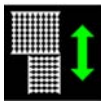
The pintle automatic function is activated. If the pintle belt 1/2 inclination is adjusted with activated automatic function, this setting will be taken as a new value. The pintle automatic function remains activated until the pintle automatic function is reset to preselected at the tractor terminal under automatic functions.

The inclination of pintle belt 1/2 can be adjusted in the separation menu. Select the soft key on the tractor terminal. After selection the soft key becomes green.

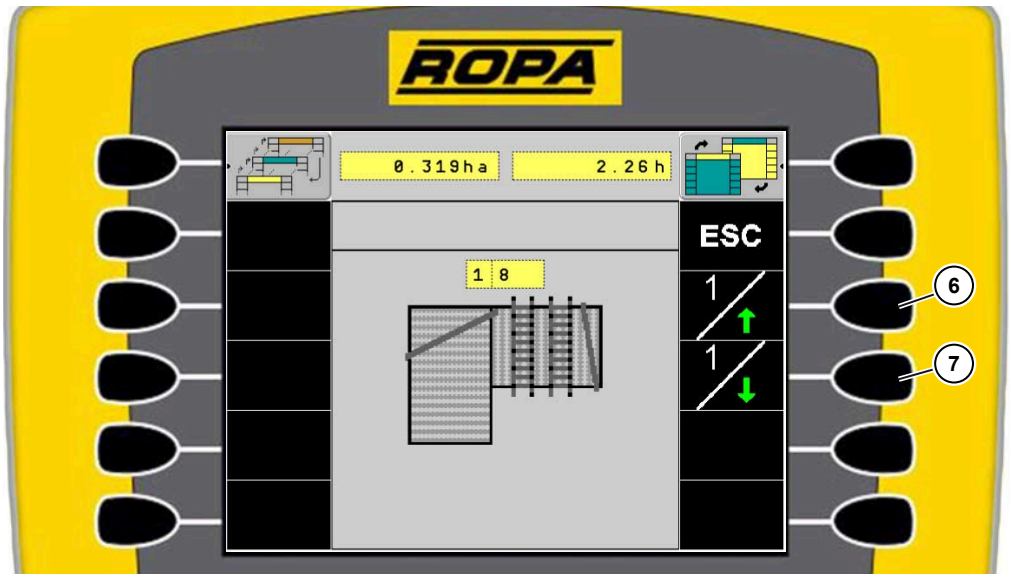


(4) Pintle belt height display field
(5) Soft key pintle belt height

The current height of the pintle belt 1/2 is displayed in the pintle belt height display field (**4**). Select the grey button for direct access to the pintle belt height submenu.

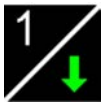


The pintle belt height soft key opens the pintle belt height submenu.



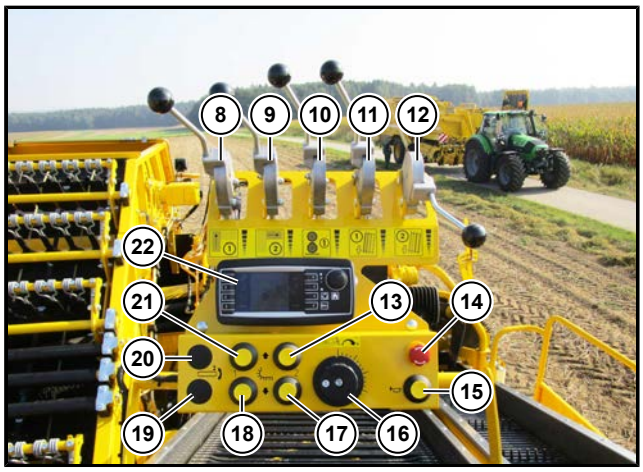
(6) Soft key pintle belt 1/2 higher
(7) Soft key pintle belt 1/2 lower

Press the key to raise pintle belt 1/2. The maximum height of pintle belt 1/2 is 20.



Press the key to lower pintle belt 1/2. The minimum height of pintle belt 1/2 is 0.

Adjusting inclination of the pintle belt 1/2 at the sorting platform operating component (optional)



(8) Bowden cable pintle belt 1
(9) Bowden cable pintle belt 2
(10) Bowden cable deflector roller 1
(11) Bowden cable for UFK 1 speed
(12) Bowden cable for UFK 2 speed
(13) Key raise UFK 2
(14) Emergency stop sorting platform switch
(15) Key tractor terminal horn
(16) Picking conveyor speed
(17) Key lower UFK 2
(18) Key lower UFK 1
(19) Key lower pintle belt 1/2 inclination
(20) Key raise pintle belt 1/2 inclination
(21) Key raise UFK 1
(22) Sorting platform terminal

The pintle belt 1/2 with installed hydraulic cylinder and without installed sorting platform terminal can be raised using the key raise pintle belt 1/2 inclination (**20**).

The pintle belt 1/2 with installed hydraulic cylinder and without installed sorting platform terminal can be lowered using the key lower pintle belt 1/2 inclination (**19**).

Adjusting inclination of pintle belt 1/2 at the sorting platform terminal (option)

(23) Soft key shaker
(24) Lifting depth soft key
(25) Scroll screen right soft key
(26) Scroll screen left soft key
(27) Soft key pintle belt 1/2 inclination

If the sorting platform terminal is released, scroll with the scroll screen right soft key → or the scroll screen left soft key ← to open the screen for adjusting the pintle belt height. Select pintle belt 1/2 height with the soft key 6.

(28) Soft key raise pintle belt 1/2
(29) Soft key lower pintle belt 1/2

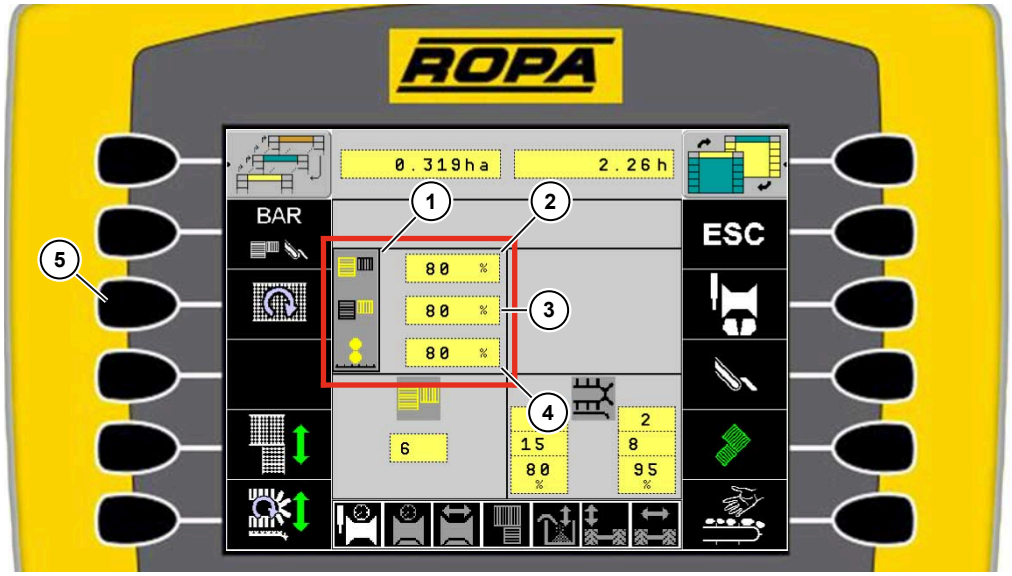
Press the 6↑ key to raise pintle belt 1/2. The maximum height of pintle belt 1/2 is 20.

Press the 6↓ key to lower pintle belt 1/2. The minimum height of pintle belt 1/2 is 0.

6.13.2.7 Pintle belts synchronous adjustment

Pintle belts synchronous adjustment at the tractor terminal

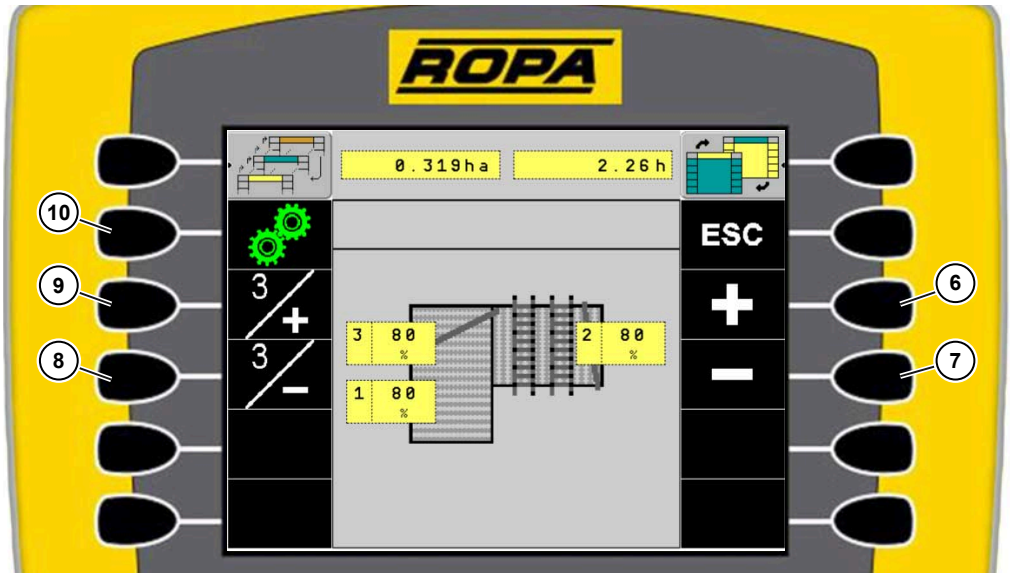
The speed is adjusted at the tractor terminal in the separation menu. Select the separation soft key on the tractor terminal. After selection the soft key becomes green.



(1) Pintle belts speed display field
(2) Speed display for pintle belt 1
(3) Speed display for pintle belt 2
(4) Speed display for deflector roller 1
(5) Soft key speed of pintle belts

The pintle belts speed display field (**1**) shows the speed of pintle belt 1 (**2**), pintle belt 2 (**3**), and deflector roller 1 (**4**). Select the grey button for direct access to the pintle belt speed settings submenu.

The pintle belts speed soft key opens the pintle belt speed settings submenu.



(6) Soft key increase speed of pintle belts
(7) Soft key reduce speed of pintle belts
(8) Soft key reduce deflector roller 1 speed
(9) Soft key increase deflector roller 1 speed
(10) Soft key pintle belts speed synchronous adjustment

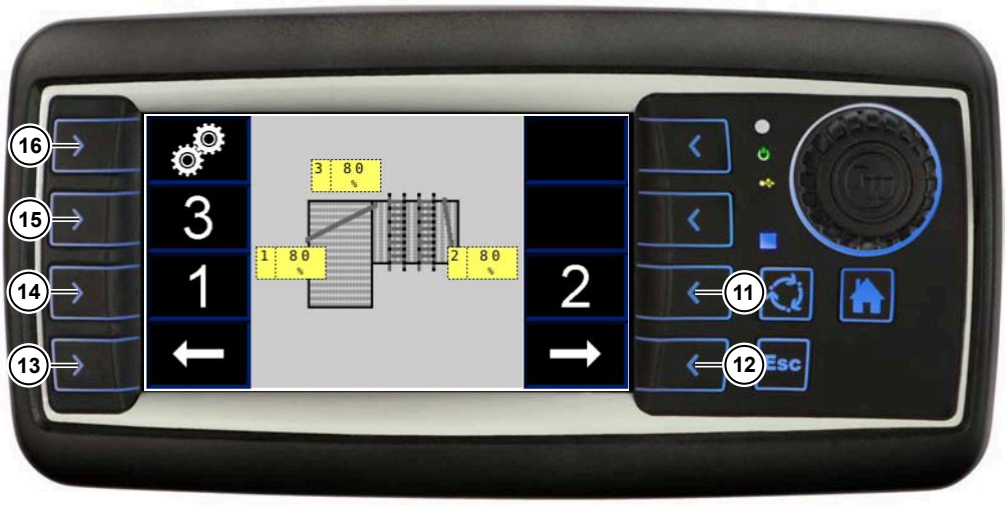
The speed of pintle belt 1, and pintle belt 2 can be adjusted simultaneously in synchronous mode.

Press the key + to increase the speed synchronously. The maximum speed of the pintle belts is 100%. If one pintle belt has reached this speed and it is further increased, the speed of the other pintle belt approaches this speed.

Press the key − to reduce the speed synchronously. The minimum speed of the pintle belts is 30 %. If one pintle belt has reached this speed and it is further reduced, the speed of the other pintle belt approaches this speed.

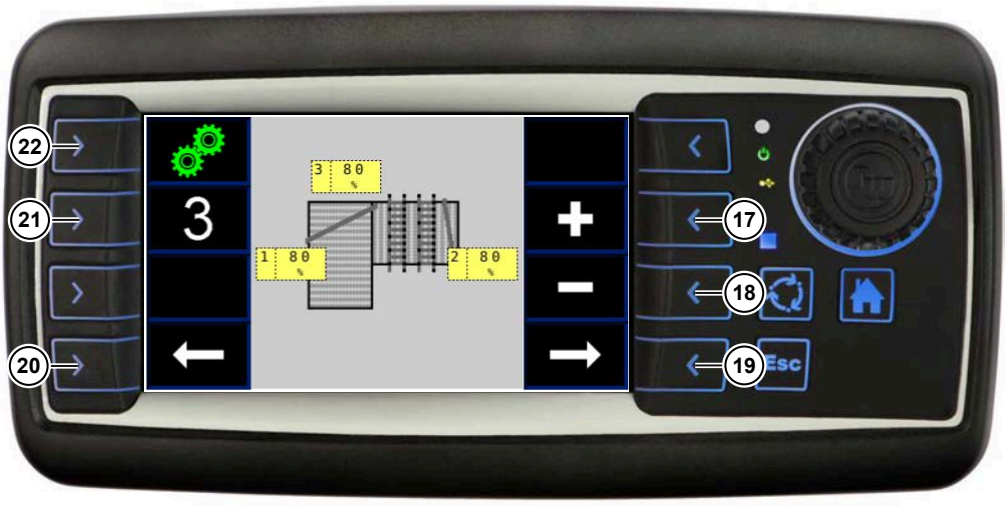
The pintle belts synchronous speed adjustment must be activated to adjust the speed of pintle belts synchronously. If the pintle belts synchronous speed adjustment soft key is white, the pintle belts synchronous speed adjustment is deactivated. If the pintle belts synchronous speed adjustment soft key is green, the pintle belts synchronous speed adjustment is activated.

Pintle belts synchronous adjustment at the sorting platform terminal



(11) Soft key pintle belt 2 speed
(12) Scroll screen right soft key
(13) Scroll screen left soft key
(14) Soft key pintle belt 1 speed
(15) Soft key increase speed of deflector roller 1
(16) Soft key pintle belts speed synchronous adjustment

If the sorting platform terminal is released, scroll with the scroll screen right soft key → or the scroll screen left soft key ← to open the screen for adjusting the speed of pintle belts. Select the pintle belts synchronous speed adjustment with the pintle belts synchronous speed adjustment soft key ⚙.



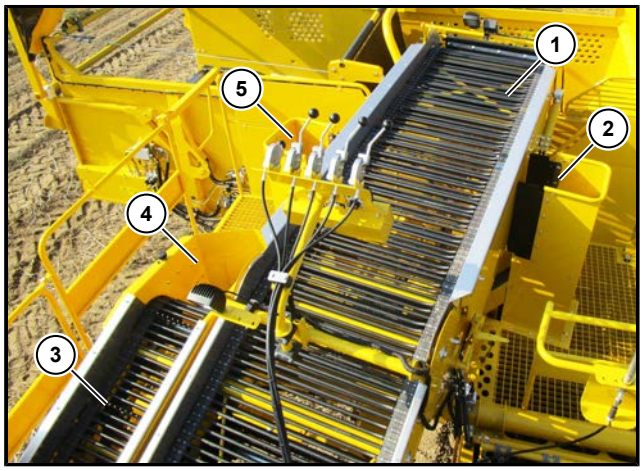
(17) Soft key increase speed of pintle belts
(18) Soft key reduce speed of pintle belts
(19) Scroll screen right soft key
(20) Scroll screen left soft key
(21) Soft key increase speed of deflector roller 1
(22) Soft key pintle belts speed synchronous adjustment

Press the key + to increase the speed synchronously. The maximum speed of the pintle belts is 100%. If one pintle belt has reached this speed and it is further increased, the speed of the other pintle belt approaches this speed.

Press the key to reduce the speed synchronously. The minimum speed of the pintle belts is 30 %. If one pintle belt has reached this speed and it is further reduced, the speed of the other pintle belt approaches this speed.

The pintle belts synchronous speed adjustment must be activated to adjust the speed of pintle belts synchronously. If the pintle belts synchronous speed adjustment soft key is white, the pintle belts synchronous speed adjustment is deactivated. If the pintle belts synchronous speed adjustment soft key is green, the pintle belts synchronous speed adjustment is activated.

6.13.3 Picking



(1) Picking conveyor
(2) Discharge chute right
(3) Trash conveyor
(4) Trash conveyor discharge chute
(5) Discharge chute left

The picking equipment consists of the picking conveyor (**1**) and the trash conveyor (**3**). The crop can be checked here and trash or incorrectly diverted crop can be sorted out.

One large discharge chute is installed on the right side of the picking conveyor, i.e. right discharge chute (**2**). Two large discharge chutes are installed on the left side of the picking conveyor, i.e. left discharge chute (**5**) and trash conveyor discharge chute (**4**). In this way, trash can be removed quickly.

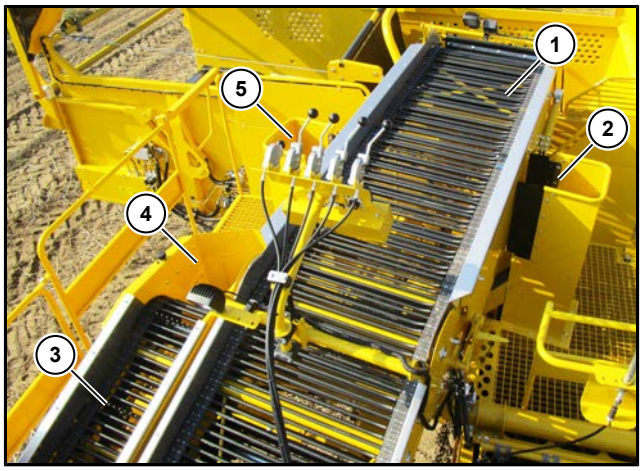
DANGER

Injury hazard! Hazard to life!

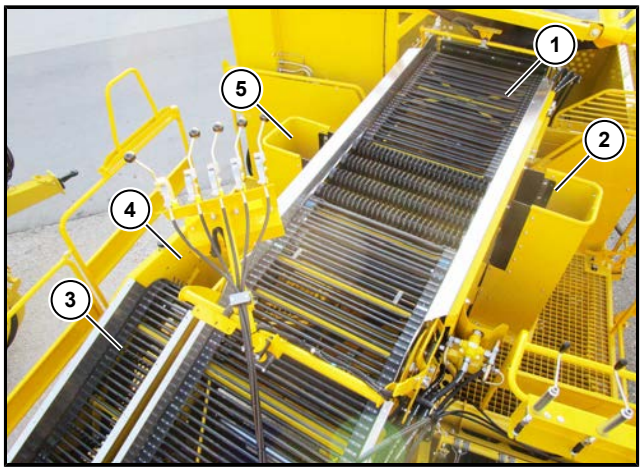
Never reach into the conveyors with your fingers. Entrapment may include injuries to hands up to and including loss of fingers and hands.

Always wear tight-fitting clothing. Clothing may be trapped in the conveyors and the wearer may be pulled in. This may cause very serious injury up and including fatal injuries!

6.13.3.1 Picking conveyor



Picking conveyor without sorting



Picking conveyor with sorting

(1) Picking conveyor
(2) Discharge chute right
(3) Trash conveyor
(4) Trash conveyor discharge chute
(5) Discharge chute left

The picking conveyor (**1**) is hydraulically driven and forms a single unit with the bunker filling conveyor. In standard version, the picking conveyor consists of a rod conveyor. Optionally, a sorting function can be integrated in the picking conveyor.

The speed of the picking conveyor can be adjusted from the tractor terminal or directly from the sorting platform. Simultaneous adjustment is not possible. The adjustment option at the sorting platform can be locked or released at the tractor terminal.

The picking conveyor starts immediately the pickup is lowered. After raising the pickup the picking conveyor continues to run from 0 to 99 seconds, default setting 30 seconds. The run-on time can be set in filling conveyor under main settings.

(6) Dropdown menu soft key
(7) Pickup soft key
(8) Sieving channel soft key
(9) Separation soft key
(10) Picking table soft key
(11) Main menu soft key
(12) Machine manual On/Off soft key
(13) Sorting platform terminal soft key
(14) Sorting platform quick adjustment soft key
(15) Conveyor cleaning soft key

All quick settings at the sorting platform are locked.

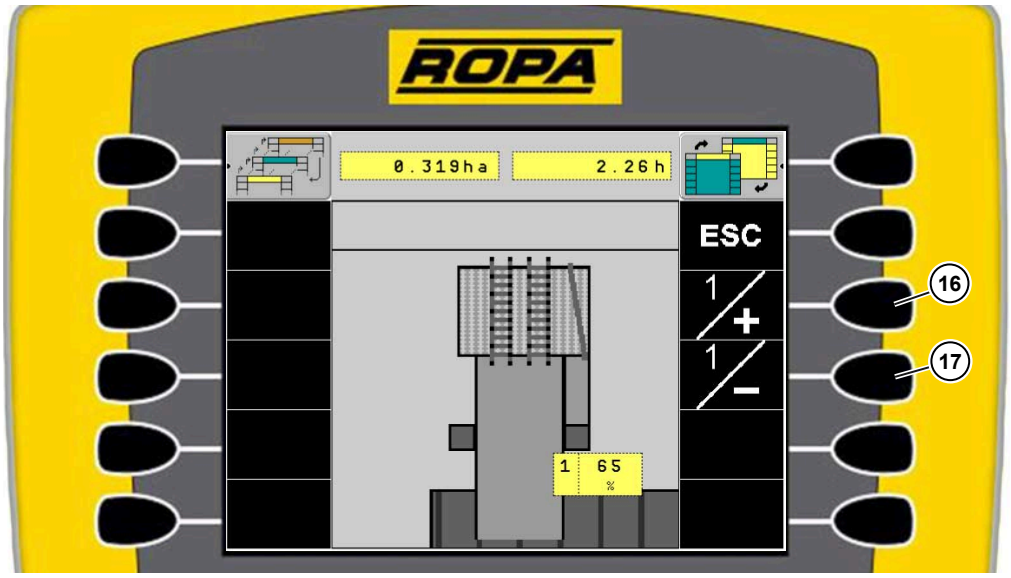
Quick adjustment of the heights of pintle belt 1/2, rotating finger comb 1 and rotating finger comb 2 is released at the sorting platform. The heights can be adjusted at the same time at the tractor terminal.
Quick adjustment of the picking conveyor speed is locked at the sorting platform.

Quick adjustment of heights is locked at the sorting platform.
Quick adjustment of the speed of the picking conveyor is released at the sorting platform. The speed cannot be adjusted at the same time at the tractor terminal.

Quick adjustment of the heights of pintle belt 1/2, rotating finger comb 1 and rotating finger comb 2 is released at the sorting platform. The heights can be adjusted at the same time at the tractor terminal.
Quick adjustment of the picking conveyor speed is locked at the sorting platform. The speed cannot be adjusted at the same time at the tractor terminal.

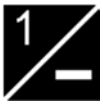
Adjusting picking conveyor at the tractor terminal

Press the picking table soft key to open the picking table submenu.



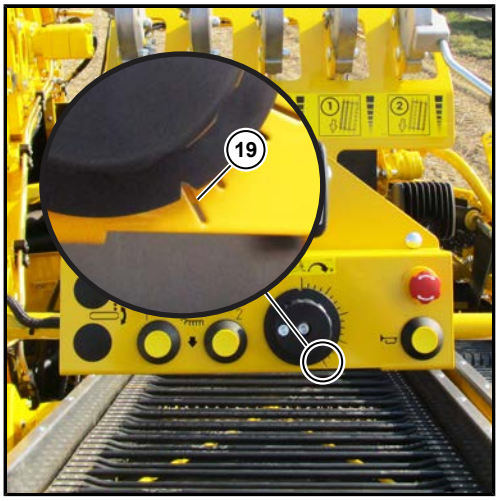
(16) Soft key increase picking conveyor speed
(17) Soft key reduce picking conveyor speed

Press the key 1/+ to increase the speed. The maximum speed of the picking conveyor is 100%.



Press the key 1/− to reduce the speed. The minimum speed of the picking conveyor is 1%. If the display shows 0% the conveyor is off and the picking conveyor is stopped.

Adjusting picking conveyor at the machine sorting platform

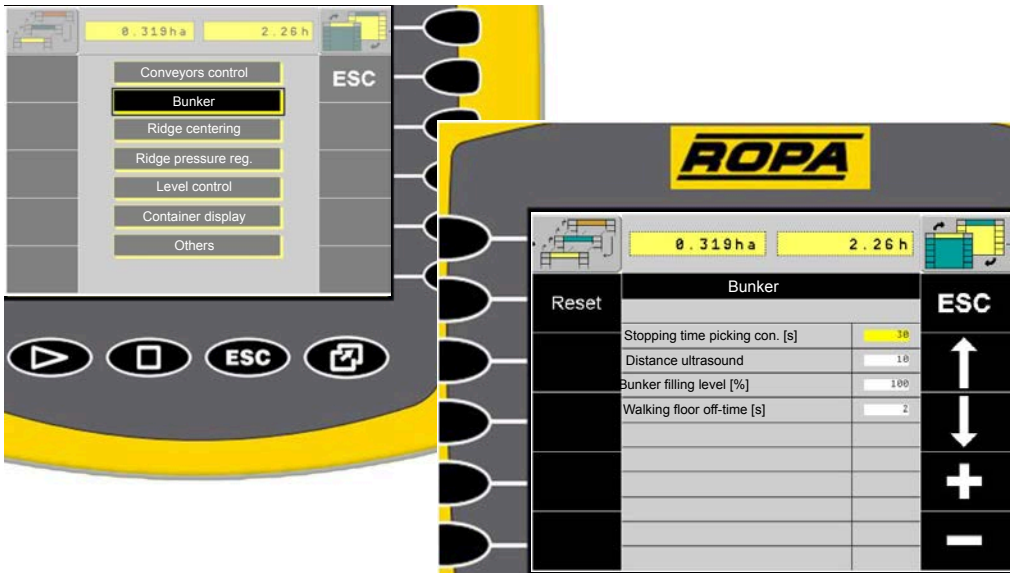


(18) Picking conveyor standstill
(19) Picking conveyor maximum speed

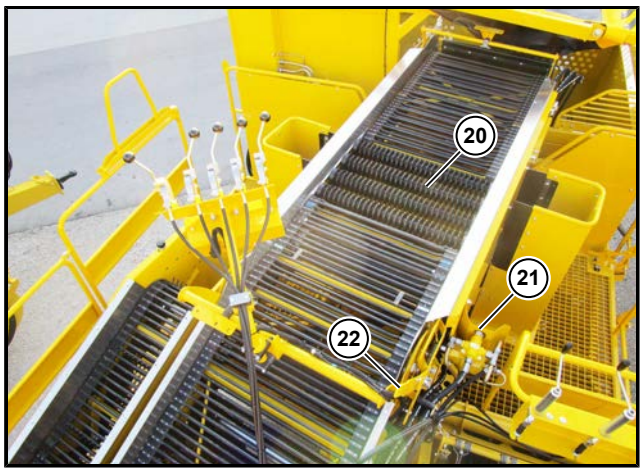
After release of the picking conveyor adjustment at the sorting platform, the previously set speed at the tractor terminal must be captured at the first adjustment. After that, the speed of the picking conveyor can be adjusted very precisely and also very quickly. The left stop (**18**) is picking conveyor Off and the right stop (**19**) is the maximum speed of the picking conveyor.

Setting picking conveyor stopping time

The stopping time of the picking conveyor can be set from 0 to 99 seconds at the tractor terminal in the main settings menus, filling conveyor submenu. The default setting is 30 seconds.



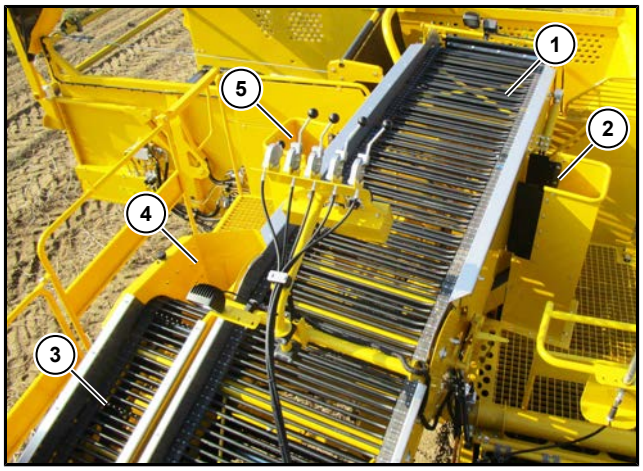
Grader rollers in picking conveyor (option)



(20) Grader rollers
(21) Rotary wheel for sorting speed
(22) Lever for sorting distance

Optionally, the picking conveyor can be equipped with the grader rollers (**20**). The distance of the grader rollers can be adjusted with the lever for sorting distance (**22**). The sorting rollers are positioned hydraulically in series to the picking conveyor. Speed of the grader rollers can be adjusted using the rotary wheel for sorting speed (**21**).

6.13.3.2 Trash conveyor

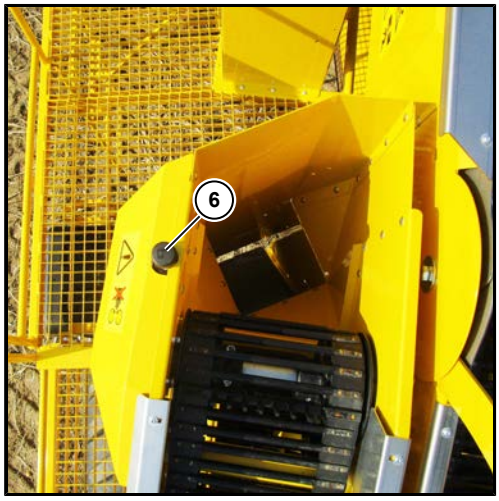


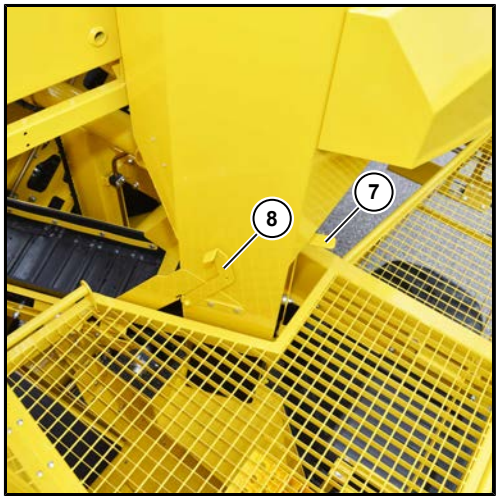
(1) Picking conveyor
(2) Discharge chute right
(3) Trash conveyor
(4) Trash conveyor discharge chute
(5) Discharge chute left

The trash conveyor (**3**) is hydraulically driven and runs hydraulically in series to the picking conveyor (**1**). The trash conveyor picks up the separated trash from pintle belt 2. Misdirected crop can be sorted out here. In the standard version, the remaining trash is fed back to the field via the trash conveyor discharge chute (**4**).

The trash conveyor starts immediately when the pickup is lowered. If the speed of the picking conveyor is reduced to zero, the trash conveyor also shuts off. After raising the pickup the trash conveyor continues to run as long as the picking conveyor.

Adjusting trash conveyor at the operating component of the left sorting platform



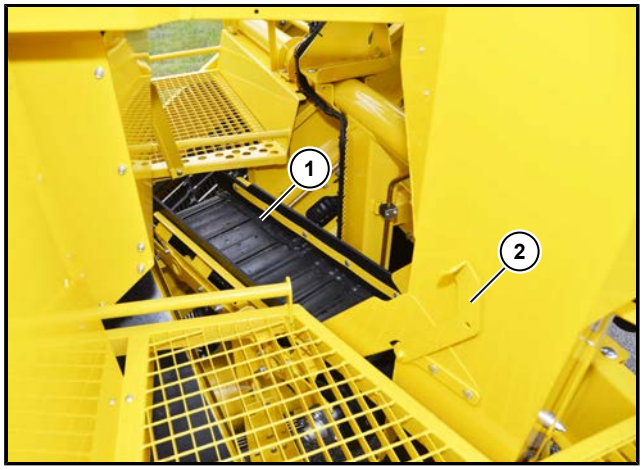


(6) Rotary wheel for trash conveyor speed
(7) Lever for trash conveyor switching flap (option)
(8) Lever for trash return switching flap (option)

The speed of the trash conveyor is adjusted with the rotary wheel for trash conveyor speed (**6**). Here the left stop is off and the right stop is the maximum speed of the trash conveyor.

Optionally, trash conveyor switching flaps can be mounted in the discharge chute, depending on the equipment version of the machine. Here, by means of lever for trash conveyor switching flap (**7**) separated trash can be fed to the field or gathered in the collection box.

6.13.3.3 Trash return (option)

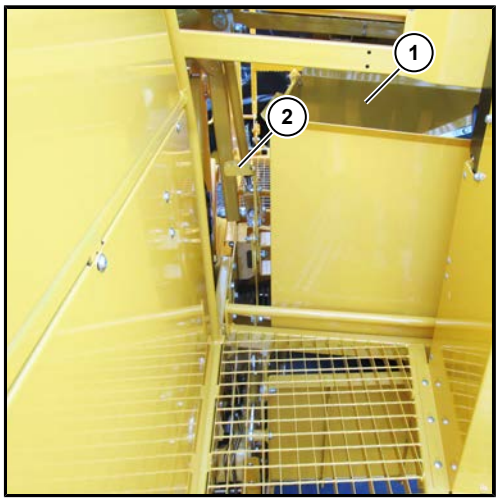


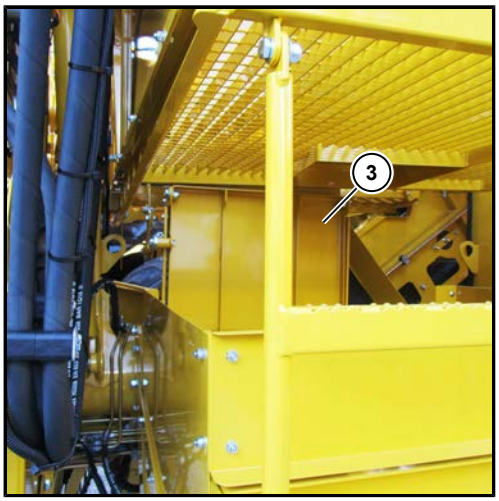
(1) Trash return conveyor
(2) Lever for trash return switching flap

The optional trash return conveyor (**1**) is hydraulically driven and runs hydraulically in series to the trash conveyor. If the speed of the trash conveyor is adjusted, this also adjusts the speed of the trash return conveyor.

Using the lever for trash return switching flap (**2**), trash can be guided from the trash conveyor to the trash return conveyor and fed back to the sieving channel or to the field.

6.13.3.4 Sorting container (option)

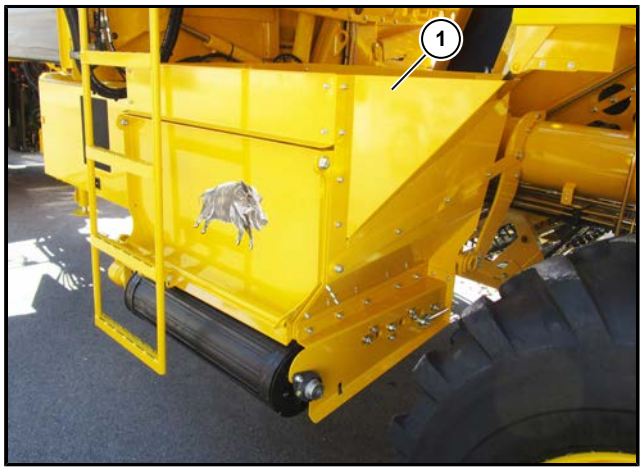




(1) Sorting container
(2) Lever for sorting container flap
(3) Sorting container flap

The optional sorting container (**1**) is located below the optional grader rollers. Sorted out by grader rollers trash and small potatoes can be temporarily stored here. The sorting container flap (**3**) can be opened and closed with the lever for sorting container flap (**2**). Depending on the equipment version, the emptying is carried out directly onto the field or into the collection box.

6.13.3.5 Collection box (option)



(1) Collection box

The optional collection box is located on the left side of the machine in front of the axle. Stones and trash can be collected here and unloaded at the edge of the field.

The collection box is opened with the key on the bunker control element. The collection box opens and the walking floor runs as long as the key is pressed. The position of the flap of the collection box is not monitored.

The collection box is closed with the key on the bunker control element. The collection box closes as long as the key is pressed. Emptying of the collection box is stopped. The position of the flap of the collection box is not monitored.

WARNING

Warning of injuries.

Ascending and descending ladders at the left sorting platform is forbidden during emptying of the collection box. The ladder at the left sorting platform also moves when the collection box is being opened and closed.

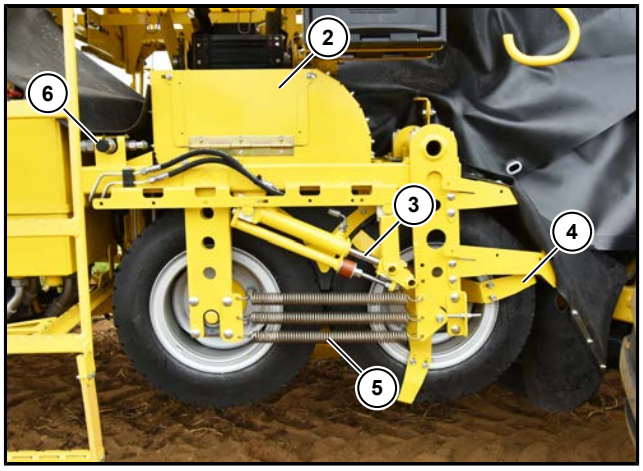
The hazard zone around the collection box must be strictly observed during emptying. Moving parts and moving trash, e.g. stones, may cause injuries.

6.13.3.6 Potato crusher (option)

Picture shows potato crusher on Keiler 2

(1) Potato crusher

The optional potato crusher is located on the left side of the machine in front of the axle.
Small potatoes are mostly sorted out by the trash conveyor. Similarly, rotten, green or misshapen tubers are sorted out by harvesting personnel via the discharge chute or the trash track. All of the tubers sorted out are conveyed to the potato crusher.
The potato crusher squeezes and shreds the tubers sorted out via the discharge chutes and trash track. Crushed potatoes have a significantly smaller volume with a much greater surface area, which significantly promotes the decomposition process and prevents germination in the following year.



Picture shows potato crusher Keiler 2 without protective cover

(2) Cleaning flap / maintenance hatch
(3) Cylinder for hydraulic spreading up
(4) Blade
(5) Mechanical stone and foreign object protection
(6) Volume regulator for speed adjustment

The potato crusher always works when the sieve conveyor 1 is switched on. Both tyres of the potato crusher rotate at different speeds and move in opposite directions to each other. The percentage difference in speed between the tyres of the potato crusher and the sieve conveyor 1 can be adjusted by means of the volume controller for speed adjustment (**6**).
The air pressure in the tyres can be variably adjusted according to the harvesting conditions and the crushing performance.

The cylinder (**3**) on the potato crusher can be spread hydraulically with the key on the bunker control element. The maximum free passage is 300 mm. This enables lifting without squeezing function and allows extremely large foreign objects to be removed.

The cylinder (**3**) on the potato crusher can be closed hydraulically with the key on the bunker control element.

6.14 Bunker

The bunker exclusively serves as intermediate storage of the lifted potatoes until they can be unloaded into a stationary transport vehicle. They can also be unloaded onto a pile at the edge of the field. It is in no case meant as a freight compartment or for transporting goods or objects.

DANGER

Never enter the bunker if the tractor engine is running. There is an extreme hazard to life if the bunker waking floor starts unexpectedly.

– When working in the bunker, shut off the tractor engine and secure it against inadvertent starting (e.g. by removing the ignition key and securely holding it, protected against access by third parties e.g. by holding it in your pants pocket).

The bunker filling conveyor is in the bunker. It is used to fill the bunker under manual control or using the automatic bunker filling function. The bunker filling conveyor can be raised and lowered. The bunker walking floor can be moved forward slowly to ensure optimum filling of the bunker. The standard bunker floor supports the bunker filling process. The optional bunker articulation must be swivelled up. It prevents the potatoes from falling out at the end of the bunker. A tray filler is optionally available for optimum loading in boxes.

For **road travel** the bunker filling conveyor is lowered, the tray filler is folded up, the bunker articulation is folded up and the bunker folding section is folded in.

In **working position** the bunker folding section is folded out and the bunker filling conveyor is adjusted so that the crop can slide into the bunker at the minimum drop level. The optional tray filler and optional bunker articulation are swivelled as required for unloading the bunker.

6.14.1 Bunker folding section

(1) Bunker in transport position
(2) Bunker in working position

The position of the bunker primarily determines whether the machine is in transport position (**1**) or working position (**2**). The bunker can only be folded in if the bunker and the bunker filling conveyor are completely lowered (bottom position).

ATTENTION

Danger of machine damage.

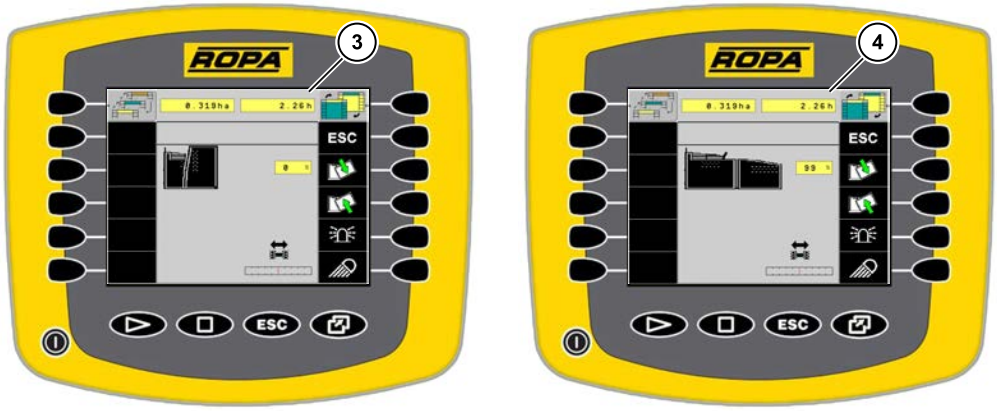
The bunker folding section may only be folded in if the bunker filling conveyor is fully lowered (*See Page 270*). If this is not complied with, then machine parts may collide and cause serious damage to the machine.

WARNING

Hazard of extremely severe injuries.

– Make sure that there are no persons in the danger zone.
– The sorting platforms may not be entered while the bunker is being folded.

The folding menu soft key opens the folding mode menu.



(3) Dropdown menu road position
(4) Dropdown menu lifting position/bunker unloading position

Press the key to move the folding bunker section to working position. If the display on the tractor terminal is 100% and the image has changed, the folding bunker section is in working position.

Before the bunker folding section can be moved to transport position, the bunker and the bunker filling conveyor must be at the bottom position (completely lowered).
Press the key to move the folding bunker section to transport position. If the display on the tractor terminal is 0% and the image has changed, the folding bunker section is in transport position.

6.14.2 Raising and lowering bunker

The bunker can be raised and lowered from the driver's seat with the bottom mini joystick on the bunker operating component. The bunker can only be raised and lowered in working position. The position of the bunker is monitored by a sensor. When the bunker is raised, the bunker filling conveyor automatically lifts to the top position first. The bunker can only be raised if the drawbar is in "straight-ahead position".

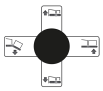
DANGER

Hazard to life! Danger of machine damage!

When the bunker is raised and lowered there are pinch and crush points on the bunker and the sorting platform. The centre of gravity of the machine is also significantly raised, involving an increased danger of tipping the machine. This involves extreme risk of injuries and even fatal injuries.

When raising and lowering the bunker make sure that the bunker does not collide with any objects, e.g. the trailer vehicle. There is a risk of serious damage to the machine.

– Keep clear of moving parts when raising and lowering the bunker.
– Keep away from the area under the raised bunker.
– Select an unloading area that is flat if possible.



The bunker can be raised and lowered with the bottom mini joystick on the bunker operating component. The speed of raising and lowering depends on how far the joystick is moved, minimum movement is slow and maximum movement is fast. The drawbar must be in the specified area to raise the bunker.

The bunker is lowered with the lower bunker filling conveyor key on the lifter operating component. The bunker filling conveyor does not lower until the bunker is fully lowered.

6.14.3 Bunker walking floor

The speed of the bunker walking floor can be infinitely adjusted from the driver's seat. The bunker walking floor unloads the bunker and is also actuated for optimum filling of the bunker. The standard version of the bunker walking floor is a cloth floor. This ensures gentle filling from the start.

Optionally, the bunker walking floor can be designed as a metal strips walking floor with a rubber cushion. After emptying the bunker, move the rubber cushion underneath the bunker filling conveyor. This ensures gentle filling from the start.

ATTENTION

Risk of damage to the bunker

The bunker walking floor must never be moved unless the bunker is in the working position. The bunker walking floor and the bunker itself may be damaged.

– Always move the bunker to working position and only then switch on the walking floor.

The bunker walking floor is switched on with the key on the bunker operating component. The red LED on the key indicates when the bunker walking floor is switched on.

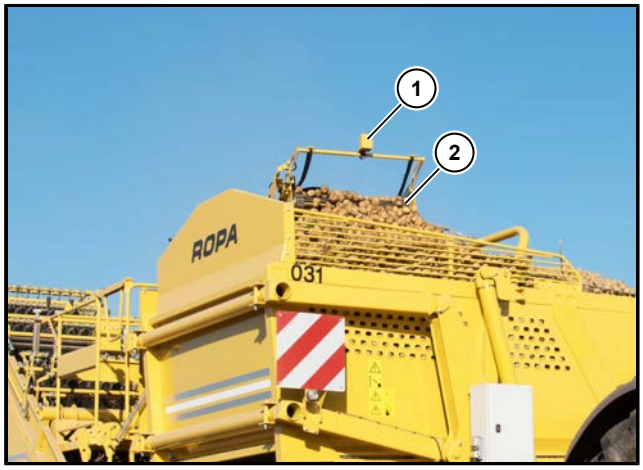
The speed of the bunker walking floor can be infinitely adjusted with the rotary wheel on the bunker operating component. If the rotary wheel is set to position 0 the bunker walking floor is off, position 5 is the highest torque and position 10 is the maximum speed. If the speed is set higher and the bunker is to be completely unloaded, the speed is automatically regulated with the integrated pressure sensor.

Pressing the raise bunker filling conveyor key on the lifter operating component actuates the bunker walking floor after the bunker filling conveyor has reached its top end position. When the end switch on the bunker floor is tripped the walking floor feed is automatically switched off.

ADVICE

When you press the start of field key , the bunker walking floor start/stop key is deactivated automatically.

6.14.4 Bunker filling conveyor



(1) Automatic filling ultrasound sensor
(2) Bunker filling conveyor

The bunker filling conveyor (**2**) can be raised and lowered manually from the driver's seat. The position of the bunker filling conveyor is monitored by a sensor. If automatic filling is activated (**1**) the bunker filling conveyor is automatically raised depending on the fill level of the bunker. This ensures optimum filling with maximum protection of the crop by a low drop height.

ATTENTION

Danger of machine damage!

The bunker filling conveyor must only be raised if the bunker folding section (*See Page 266*) is in the working position. If this is not complied with, machine parts may collide and cause serious damage to the machine.

The bunker filling conveyor is raised with the key on the lifter operating component. The bunker filling conveyor moves up while the key is pressed. If the bunker filling conveyor has reached the top end position, the bunker walking floor is actuated until the end switch on the bunker floor is tripped.

The bunker filling conveyor is lowered with the key on the lifter operating component. The bunker filling conveyor moves down while the key is pressed.

ADVICE

With the bunker raised press the key on the lifter operating component to lower first the bunker and then the bunker filling conveyor!

If automatic bunker filling is activated, accidentally pressing the key a second time on the lifter operating component after release will switch off the automatic filling of the bunker.

6.14.5 Bunker filling

(1) Automatic filling ultrasound sensor

The bunker filling can be performed manually or automatically.

Manual bunker filling

During manual bunker filling the fall height of the crop from the bunker filling conveyor into the bunker must be checked. It must be monitored, that the bunker filling conveyor is not covered with the crop. The bunker filling conveyor (*See Page 270*) is raised with the key and lowered with the key.

The bunker feed (*See Page 269*) must be actuated manually. This is done by pressing the raise bunker filling conveyor key on the lifter operating component. The bunker feed is activated when the top end position of the bunker filling conveyor is reached. If the end switches on the rear (**2**) or the front of the bunker floor (**3**) are tripped, the driver receives the signal "Bunker full!" on the tractor terminal and is informed that the maximum filling level has been reached.

Automatic bunker filling

For automatic bunker filling the automatic function (**4**) is preselected at the tractor terminal under automatic functions. Automatic bunker filling is activated with the start of field key . The automatic filling ultrasound sensor (**1**) automatically maintains the bunker filling conveyor at a low fall height above the filling cone. The bunker feed operates automatically when the bunker filling conveyor has reached the top position and the ultrasound sensor detects crop. If the end switches on the rear (**2**) or the front of the bunker floor (**3**) are tripped, the driver receives the signal "Bunker full!" on the tractor terminal and is informed that the maximum filling level has been reached. The automatic filling shuts off until bunker unloading.

(2) Rear bunker floor end switch
(3) Front bunker floor end switch

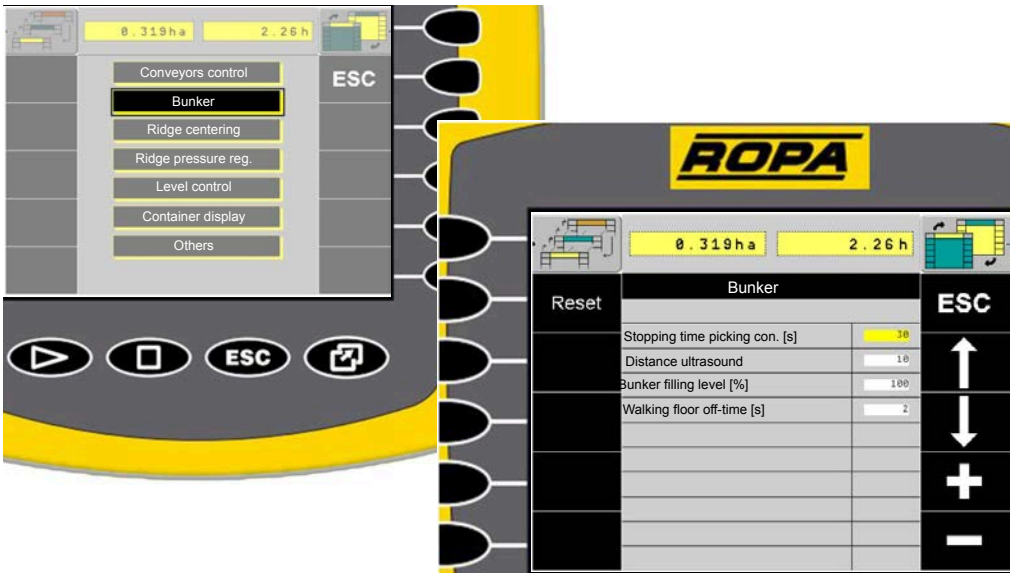
(4) Automatic bunker filling

The current status of automatic filling (**4**) is displayed in the automatic functions display field. Automatic bunker filling can be preselected, activated and deactivated with the rotary wheel on the tractor terminal.

The automatic bunker filling is deactivated.

The automatic bunker filling is preselected. Automatic bunker filling is activated when the pickup is lowered with the start of field key on the lifter operating component.

The automatic bunker filling is activated. Automatic filling is activated when the pickup is raised with the end of field key on the lifter operating component. Automatic filling can be deactivated again at the tractor terminal under automatic functions. When the end switches on the bunker floor are tripped the automatic bunker filling is switched off.



The sensitivity of automatic filling, the maximum bunker fill level and off-time of the bunker feed can be adjusted in the main menu , in the main settings menu, filling conveyor submenu.

The sensitivity of the ultrasound sensor can be adjusted between the values of 1 to 20, the default setting is 10.

The bunker fill level can be adjusted between the values of 50 to 100, the default setting is 100. The top end position of the bunker filling conveyor is limited here.

The off-time of the bunker feed can be set from 0 seconds to 5 seconds, with the default setting of 2 seconds. After reaching the top end position of the bunker filling conveyor this time counts down until the walking floor is released for automatic filling.

6.14.6 Double bunker (option)

(1) Double bunker

Optionally, the machine can be equipped with a double bunker. Here the crop is sorted by size on the sorting platform with the help of the grader rollers, then transported by the bunker filling conveyor to the front bunker and by the picking conveyor to the rear bunker.

6.14.6.1 Double bunker walking floor

(1) Large bunker walking floor
(2) Small bunker walking floor

At the double bunker the speed of the large bunker walking floor (**1**) and the small bunker walking floor (**2**) can be infinitely adjusted from the driver's seat independently of each other. The bunker walking floor unloads the bunker and is also actuated for optimum filling of the bunker. The double bunker walking floor is designed as a cloth floor. This ensures gentle filling from the start.

ATTENTION

Risk of damage to the bunker

The bunker walking floor must never be moved unless the bunker is in the working position. The bunker walking floor and the bunker itself may be damaged.

– Always move the bunker to working position and only then switch on the walking floor.

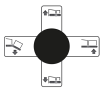
Large bunker walking floor

The large bunker walking floor is switched on with the START STOP key on the bunker operating component. The red LED on the key indicates when the large bunker walking floor is switched on.

The speed of the large bunker walking floor can be infinitely adjusted with the rotary wheel on the bunker operating component. If the rotary wheel is set to position 0 the large bunker walking floor is off and has its maximum speed at the position 10.

Pressing the raise bunker filling conveyor key on the lifter operating component actuates the large bunker walking floor after the bunker filling conveyor has reached its top end position. When the end switch on the bunker floor is tripped the bunker walking floor feed is automatically switched off.

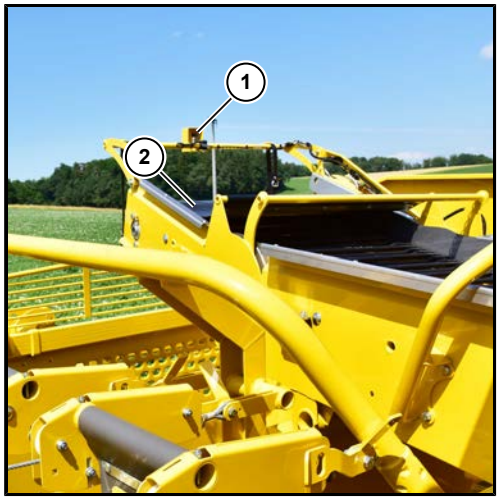
Small bunker walking floor

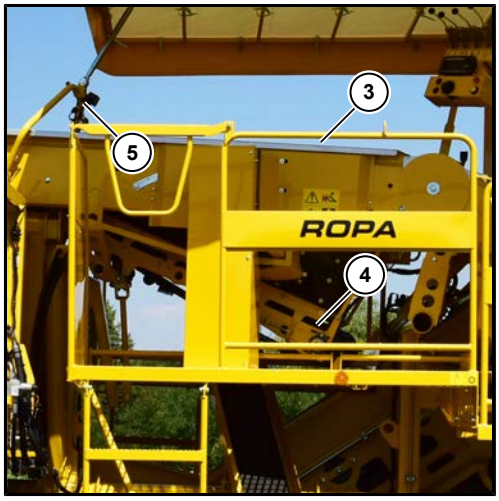


The small bunker walking floor is controlled with the bottom mini joystick on the bunker operating component. The small bunker walking floor stands still in the mini joystick zero position. The further the mini joystick is turned to the right, the higher the speed of the bunker walking floor is.

The small bunker walking floor is controlled with the key double bunker walking floor at the sorting platform. When the end switch on the bunker floor is tripped the bunker walking floor feed is automatically switched off.

6.14.6.2 Bunker filling conveyor and double bunker sorting conveyor





(1) Automatic filling ultrasound sensor
(2) Bunker filling conveyor
(3) Grader rollers
(4) Sorting conveyor
(5) Key double bunker walking floor

The bunker filling conveyor (**2**) can be raised and lowered manually from the driver's seat. The position of the bunker filling conveyor is monitored by a sensor. If automatic filling is activated (**1**) the bunker filling conveyor is automatically raised depending on the fill level of the bunker. This ensures optimum filling with maximum protection of the crop by a low drop height.

ATTENTION

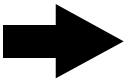
Danger of machine damage!

The bunker filling conveyor must only be raised if the bunker folding section (*See Page 266*) is in the working position. If this is not complied with, machine parts may collide and cause serious damage to the machine.

The bunker filling conveyor is raised with the key on the lifter operating component. The bunker filling conveyor moves up while the key is pressed. If the bunker filling conveyor has reached the top end position, the large bunker walking floor is actuated until the end switch on the bunker floor is tripped.

The bunker filling conveyor is lowered with the key on the lifter operating component. The bunker filling conveyor moves down while the key is pressed.

ADVICE

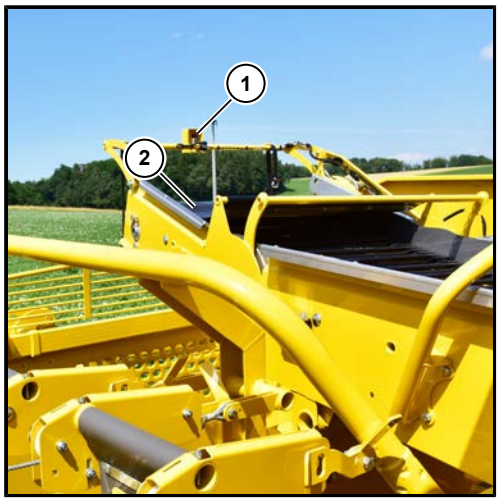


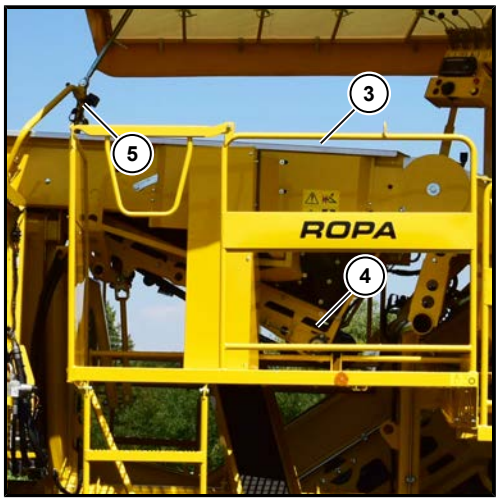
With the bunker raised press the key on the lifter operating component to lower first the bunker and then the bunker filling conveyor!

If automatic bunker filling is activated, accidentally pressing the key a second time on the lifter operating component after release will switch off the automatic filling of the bunker.

The sorting conveyor (**4**) is situated below the grader rollers (**3**) and the bunker filling conveyor (**2**). Here, the sorted crop is transported with the grader rollers (**3**) to the small double bunker.

6.14.6.3 Double bunker filling





1 Automatic filling ultrasound sensor
2 Bunker filling conveyor
3 Grader rollers
4 Sorting conveyor
5 Key double bunker walking floor

The bunker filling can be performed manually or automatically in the large double bunker.
In the small double bunker the bunker filling can be performed manually.

Manual bunker filling of large double bunker

During manual bunker filling the fall height of the crop from the bunker filling conveyor into the large double bunker must be checked. It must be monitored, that the bunker filling conveyor is not covered with the crop. The bunker filling conveyor (*See Page 276*) is raised with the key and lowered with the key .
The bunker feed (*See Page 275*) must be actuated manually. This is done by pressing the raise bunker filling conveyor key on the lifter operating component. The bunker feed is activated when the top end position of the bunker filling conveyor is reached. If the end switches on the rear (**6**) or the front of the bunker floor (**7**) are tripped, the driver receives the signal "Bunker full!" on the tractor terminal and is informed that the maximum filling level has been reached.

Manual bunker filling of small double bunker

Smaller crop, sorted by the grader rollers (**3**), is temporarily stored in the small double bunker. The sorting conveyor (**4**) for filling of small double bunker runs always with the same speed as the picking conveyor.
The bunker feed must be actuated manually. To do this press the key double bunker walking floor (**5**) at the sorting platform and the bunker feed will be activated. If the end switches on the rear (**6**) or the front of the bunker floor (**7**) are tripped, the driver receives the signal "Bunker full!" on the tractor terminal and is informed that the maximum filling level has been reached.

Automatic bunker filling of large double bunker

For automatic bunker filling the automatic function (**4**) is preselected at the tractor terminal under automatic functions. Automatic bunker filling is activated with the start of field key . The automatic filling ultrasound sensor (**1**) automatically maintains the bunker filling conveyor at a low fall height above the filling cone. The bunker feed operates automatically when the bunker filling conveyor has reached the top position and the ultrasound sensor detects crop. If the end switches on the rear (**6**) or the front of the bunker floor (**7**) are tripped, the driver receives the signal "Bunker full!" on the

tractor terminal and is informed that the maximum filling level has been reached. The automatic filling shuts off until bunker unloading.

(6) Rear bunker floor end switch
(7) Front bunker floor end switch

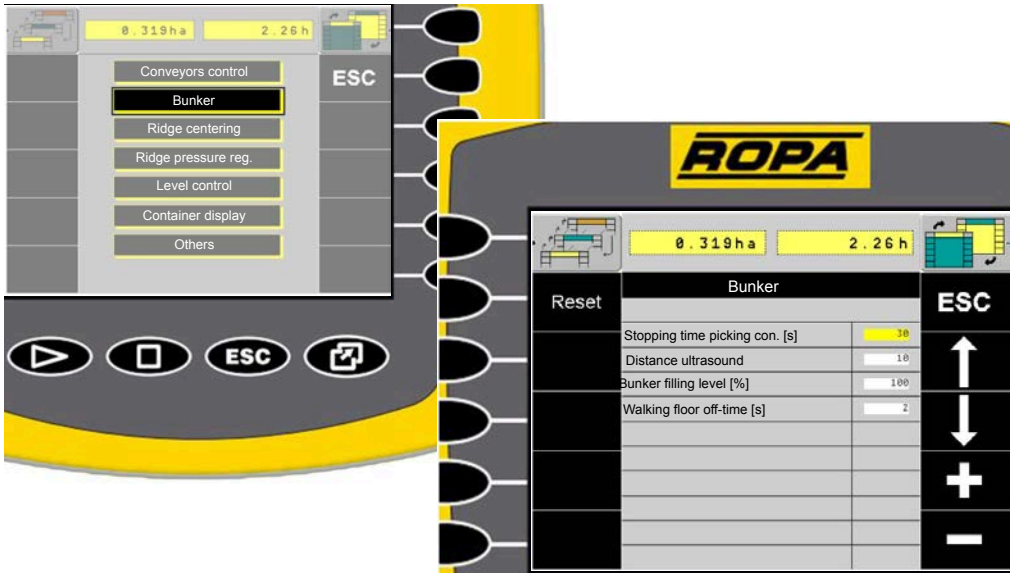
(4) Automatic bunker filling

The current status of automatic filling (**4**) is displayed in the automatic functions display field. Automatic bunker filling can be preselected, activated and deactivated with the rotary wheel on the tractor terminal.

The automatic bunker filling is deactivated.

The automatic bunker filling is preselected. Automatic bunker filling is activated when the pickup is lowered with the start of field key on the lifter operating component.

The automatic bunker filling is activated. Automatic filling is activated when the pickup is raised with the end of field key on the lifter operating component. Automatic filling can be deactivated again at the tractor terminal under automatic functions. When the end switches on the bunker floor are tripped the automatic bunker filling is switched off.



The sensitivity of automatic filling, the maximum bunker fill level and off-time of the bunker feed can be adjusted in the main menu , in the main settings menu, filling conveyor submenu.

The sensitivity of the ultrasound sensor can be adjusted between the values of 1 to 20, the default setting is 10.

The bunker fill level can be adjusted between the values of 50 to 100, the default setting is 100. The top end position of the bunker filling conveyor is limited here.

The off-time of the bunker feed can be set from 0 seconds to 5 seconds, with the default setting of 2 seconds. After reaching the top end position of the bunker filling conveyor this time counts down until the walking floor is released for automatic filling.

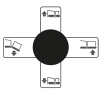
6.15 Bunker unloading

Procedure for bunker unloading

– Raise the pickup, disengage the tractor PTO shaft and align the drawbar in "straight-ahead position".
– Drive to the unloading site and do not raise the bunker until just before the trailer. Only raise the bunker as high as necessary.
– Unload the bunker into the trailer until the bunker is completely empty. Crop that is not emptied and is unfavourably positioned in the bunker will fall out when the bunker is filled again.
– After unloading the bunker raise it completely and reset the bunker floor with the key. The bunker floor can slide to working position and switch to working position.
– Lower the bunker completely when driving away from the trailer. Lifting is possible only with the bunker fully lowered in working position. Lower the bunker filling conveyor completely to minimise the fall height.

The speed of the bunker walking floor is activated and deactivated with the bunker walking floor "START - STOP" key on the bunker operating component. This allows the bunker walking floor to be stopped quickly, e.g. when filling corners in the trailer.

The speed of the bunker walking floor is infinitely adjusted with the bunker walking floor speed rotary wheel on the bunker operating component. When using the rotary wheel position 0 means that the bunker walking floor is stopped, at position 5 the bunker walking floor has the highest torque and at position 10 the bunker walking floor is at its maximum speed. During unloading the bunker walking floor automatically regulates the speed with a pressure sensor. If the speed set with the rotary wheel is too high the walking floor moves more slowly.

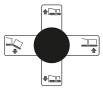


The bunker is raised and lowered with the bottom mini joystick on the bunker operating component. The joystick up raises the bunker and the joystick down lowers it. The extent of movement of the mini joystick is proportional to the speed of raising and lowering.

6.15.1 Articulated bunker section (optional)

(1) Articulated bunker section working position
(2) Articulated bunker section unloading position

The optional articulated bunker section can be adjusted from the driver's seat of the tractor. The position of the articulated bunker section is not monitored. The articulated bunker section ensures gentle loading of the crop into the trailer. It minimises the fall height into the trailer.



The articulated bunker section is adjusted with the bottom mini joystick on the bunker operating component. The articulated bunker part is lowered with the mini joystick moved to the left and raised with the mini joystick moved to the right. The driver must visually check the position of the articulated bunker part.

ATTENTION

Risk of damage to the crop and the machine!

If the crop is loaded on the trailer with the articulated bunker section, make sure that the lowered articulated bunker section does not come into contact with the trailer. It is also important to raise the bunker early so that the articulated bunker section is not buried under the crop. This may damage the crop and the articulated bunker section.

6.15.2 Tray filler (option)

(1) Tray filler forward
(2) Tray filler back

The optional tray filler can be moved forward (**1**) and back (**2**) from the driver's seat. The position of the tray filler is not monitored. The tray filler is intended for filling trays, but it can also be used as a fall brake for filling trailers. There are nine rubber flaps as a fall brake inside the tray filler.

When the tray filler is moved forward, select the speed of the bunker walking floor to prevent overflow. The speed of the bunker walking floor must be reduced in this case.

The tray filler is moved forward with the key on the bunker operating component. The hydraulic system will try to adjust the tray filler as long as the key is pressed. The driver must visually check that the tray filler is moved completely forward.

The tray filler is moved back with the key on the bunker operating component. The hydraulic system will try to adjust the tray filler as long as the key is pressed. The driver must visually check that the tray filler is moved completely back.

ATTENTION

Risk of damage to the crop and the machine!

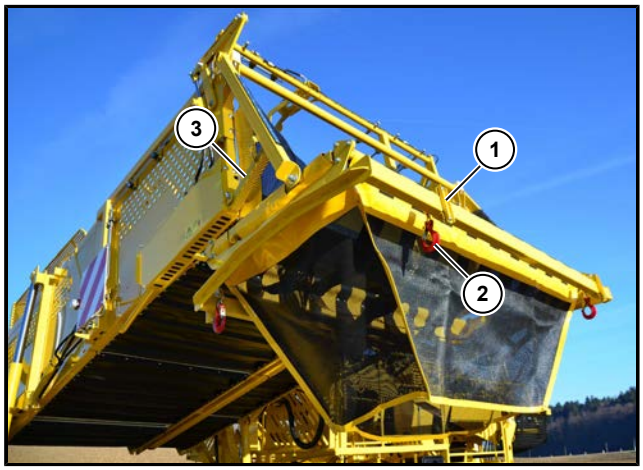
If the crop is being loaded with the tray filler, make sure that the tray filler does not overflow, bump into the trailer and is not overfilled with crop. This may damage the crop and the tray filler.

6.15.3 Big Bag device (option)

DANGER

Hazard to life due to the machine tipping over!

When filling the Big Bag, make sure that the attached Big Bag is always on the ground. The machine might tip over, if the Big Bag is raised! Risk of serious or even fatal injuries for personnel on the sorting platform and in the hazard zone!



Big Bag device with tray filler

(1) Big Bag hook adjustment
(2) Big Bag hook
(3) Front support

The optional Big Bag device is only available in combination with the optional tray filler.

When folding down the tray filler (*See Page 283*) with Big Bag device, make sure that the support at the front (**3**) and the support at the rear are also folded out and that the tray filler is positioned flush to the supports. The Big Bag must be hung onto 4 hooks (**2**). The hooks can be adjusted to different Big-Bag devices via the Big Bag hook adjustment (**1**).

ATTENTION

Risk of damage to the crop and the machine!

If the crop is being loaded with the tray filler, make sure that the Big Bag does not overflow and the tray filler is not overfilled with crop. This may damage the crop and the tray filler.

6.15.4 Reset bunker floor

(1) Reset bunker floor hook

The hook (**1**) for reset of the bunker floor is operated from the tractor driver's seat.

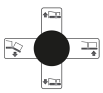
Pressing the reset bunker floor key on the bunker operating component trips the hook on the unloading side of the bunker. This ensures that the bunker floor slides smoothly back to the working position after unloading with the bunker fully raised. The hook is open as long as the key on the bunker operating component is pressed. When the key is released the hook is briefly energised in the close direction and closes.

6.15.5 Double bunker unloading

(1) Large double bunker
(2) Small double bunker

Procedure for bunker unloading

- Disengage the tractor PTO, raise the pickup and align the drawbar in "straight-ahead position".
- Drive to the unloading site and do not raise the bunker until just before the trailer. Only raise the bunker as high as necessary.
- Unload the first double bunker into the trailer until it is completely empty. Crop that is not emptied and is unfavourably positioned in the bunker will fall out when the bunker is filled again.
- Drive further to the second trailer. If the second trailer stands far away, lower the bunker and do not raise the bunker until just before the trailer. Only raise the bunker as high as necessary.
- Unload the second double bunker into the trailer until it is completely empty. Crop that is not emptied and is unfavourably positioned in the bunker will fall out when the bunker is filled again.
- After unloading the bunker raise it completely and reset the large double bunker floor with the key . The bunker floor can slide to working position and switch to working position.
- Lower the bunker completely when driving away from the trailer. Lifting is possible only with the bunker fully lowered in working position. Lower the bunker filling conveyor completely to minimise the fall height.
- Check the bunker floor of the small double bunker before switching on the machine again. If the bunker floor wasn't turned over to the working position, turn it over by hand.



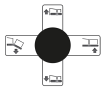
The bunker is raised and lowered with the bottom mini joystick on the bunker operating component. The joystick up raises the bunker and the joystick down lowers it. The extent of movement of the mini joystick is proportional to the speed of raising and lowering.

Steering of the large double bunker unloading

The speed of the large double bunker walking floor is activated and deactivated with the bunker walking floor "START - STOP" key on the bunker operating component. This allows the bunker walking floor to be stopped quickly, e.g. when filling corners in the trailer.

The speed of the large double bunker walking floor is infinitely adjusted with the bunker walking floor speed rotary wheel on the bunker operating component. If the rotary wheel is set to position 0 the large bunker walking floor is off and has its maximum speed at the position 10.

Steering of the small double bunker unloading



The small bunker walking floor is controlled with the bottom mini joystick on the bunker operating component. The small bunker walking floor stands still in the mini joystick zero position. The further the mini joystick is turned to the right, the higher the speed of the bunker walking floor is.

6.15.5.1 Double bunker tray filler (option)

(1) Tray filler forward
(2) Tray filler back

The optional tray filler is designed at the double bunker as a split tray filler. The tray filler can be swivelled forward (**1**) and back (**2**) from the driver's seat. The position of the tray filler is not monitored. The tray filler is intended for filling trays, but it can also be used as a fall brake for filling trailers. Rubber flaps are installed inside the tray filler and serve as a fall brake.

When the tray filler is moved forward, select the speed of the bunker walking floor to prevent overflow. The speed of the bunker walking floor must be reduced in this case.

The tray filler is moved forward with the key on the bunker operating component. The hydraulic system will try to adjust the tray filler as long as the key is pressed. The driver must visually check that the tray filler is moved completely forward.

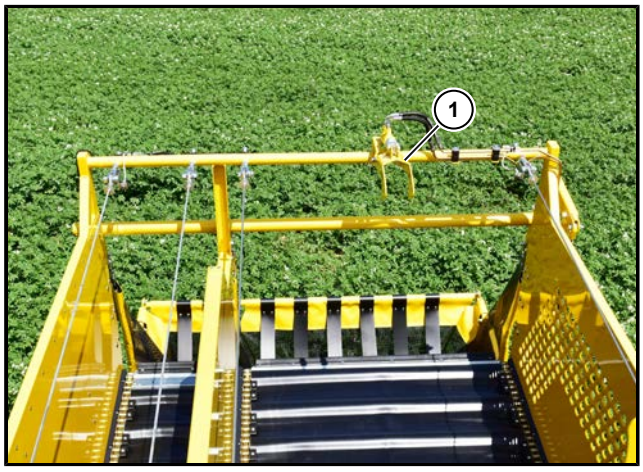
The tray filler is moved back with the key on the bunker operating component. The hydraulic system will try to adjust the tray filler as long as the key is pressed. The driver must visually check that the tray filler is moved completely back.

ATTENTION

Risk of damage to the crop and the machine!

If the crop is being loaded with the tray filler, make sure that the tray filler does not overflow, bump into the trailer and is not overfilled with crop. This may damage the crop and the tray filler.

6.15.5.2 Reset large double bunker floor

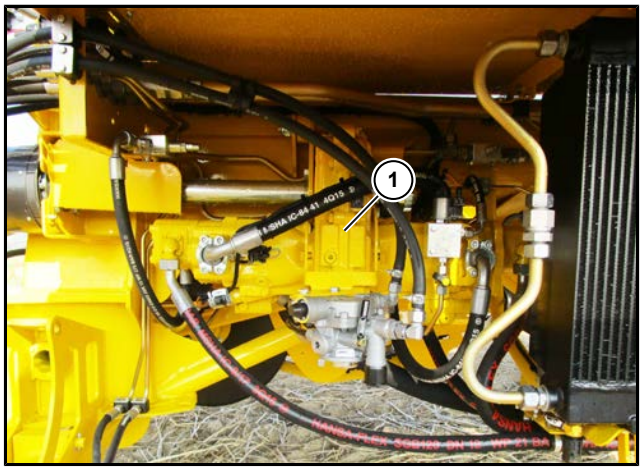


(1) Reset bunker floor hook

The hook (**1**) for reset of the bunker floor is operated from the tractor driver's seat.

Pressing the reset bunker floor key on the bunker operating component trips the hook on the unloading side of the bunker. This ensures that the bunker floor slides smoothly back to the working position after unloading with the bunker fully raised. The hook is open as long as the key on the bunker operating component is pressed. When the key is released the hook is briefly energised in the close direction and closes.

6.16 Pump distributor gears



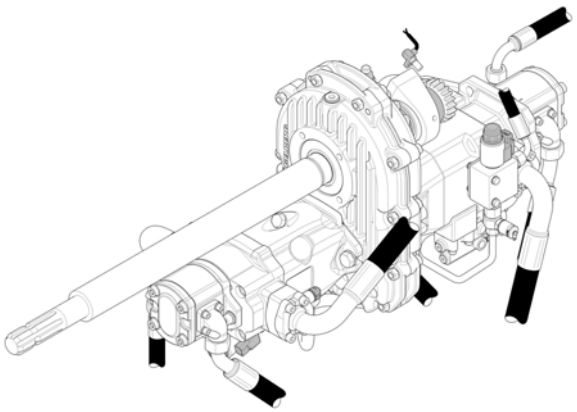
(1) Pump distributor gears

The pump distributor gear (**1**) is directly attached to the flange of the cardan shaft, which is connected to the tractor PTO and transfers the tractor engine power to the hydraulic pumps of the machine hydraulic system. The pump distributor gear (PDG) is front left under the machine cover panels.

ADVICE

The highest allowed PDG input speed to the drive for the hydraulic pumps must not be exceeded at any time – not even for a short time.

Maximum rotation speed: 540 rpm



6.17 Hydraulic system

WARNING

The hydraulic system is under high pressure.

Hot hydraulic fluid may emit from leaks and cause severe injuries! The prestress of the pressure reservoirs is present even when the remaining hydraulic system is already pressureless. When dirt, even only in the smallest quantities, enters the hydraulic system, this may lead to serious damage to the complete hydraulic system.

- Work on pressure reservoirs of the machine may only be performed by trained personnel.
- When working on the pressure reservoirs, the machine must first be rendered completely pressureless.
- The pressure reservoirs themselves may in no case be damaged or opened, because substantial injuries to people can occur due to the constant prestress.
- During all work on the hydraulic system, ensure extreme cleanliness.

The machine hydraulic system is subdivided into tractor hydraulic system, machine hydraulic system and the support foot, all independent of one another.

The **tractor hydraulic system** includes all hydraulic actuation functions as well as the drives for the bunker walking floor, the picking conveyor and the trash conveyor. This enables unloading if the tractor PTO is disengaged. The hydraulic oil is cooled via the tractor. The machine feed can be connected via a single-acting control unit, a double-acting control unit or the LS hydraulic system of the tractor. The 6-part LVS block on the machine must be adjusting by an adjusting screw depending on how the tractor hydraulic system is operated. Dynamic pressure must not build up when the machine is reversed.

ATTENTION

Risk of damage to the hydraulic system.

If the return pressure is too high at over 5 bar, the "Tractor return pressure too high" warning appears. Make sure that the return at the tractor is sufficiently high to prevent damage to the hydraulic system!

The **machine hydraulic system** includes the drives for the swath pickup with lifter shaft and cover belt, the hydraulic disc coulter, the sieve conveyor 1, the shaker, the agitator, the sieve conveyor 2, the leaf chain, the pintle belt 1, the deflector roller 1, the pintle belt 2, the deflector roller 2 and the rotating finger comb. The hydraulic oil is cooled via the integrated hydraulic oil cooler.

The **support foot** is connected to a double-acting control unit on the tractor. The support foot is required for parking the machine and only needs to be connected for coupling and uncoupling the machine. The stopcock on the support foot must be closed at all times and only opened briefly when required.

(1) Machine driving speed
(2) Rotational speed PDG input
(3) Temperature of hydraulic system

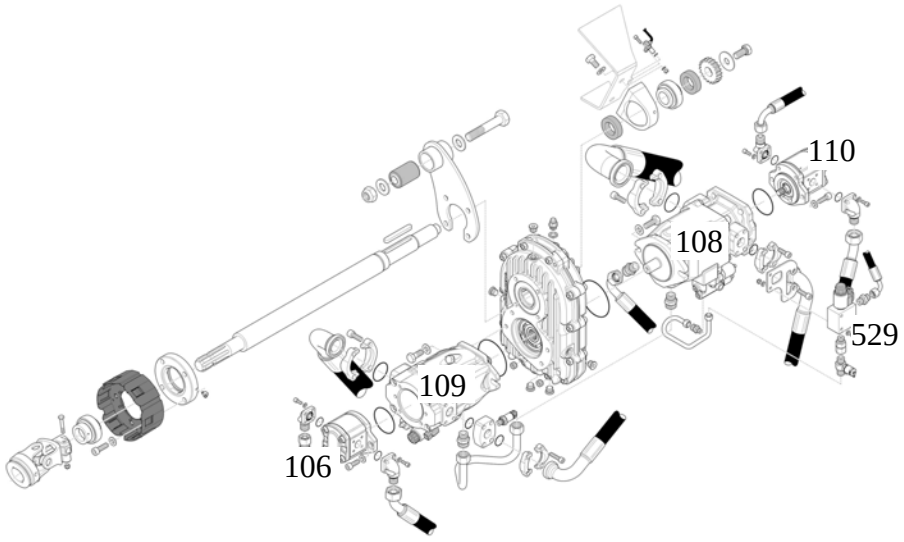
Regularly check the hoses of the hydraulic system for aging and damage! Immediately exchange damaged or aged hoses. Use only original ROPA hoses or hoses fully conforming to the technical specifications of the original hoses! Observe the regionally applying safety regulations on the service life of hydraulic hoses.

The hydraulic system is operational after the tractor engine has been started if the ISOBUS tractor terminal is completely operational.

The temperature of the hydraulic fluid (**3**) in the machine hydraulic system can be read at any time on the tractor terminal. If the temperature of the hydraulic fluid is 75° C or higher, or if the icon is displayed on the tractor terminal, immediately clean the hydraulic oil cooler.

The level in the hydraulic fluid tank with the machine in a horizontal position should in the medium to high range of the display in the inspection glass. The level must not be above the inspection glass. If the hydraulic fluid level is too low, then the tractor terminal displays the warning icon: hydraulic fluid level too low. Disengage the tractor PTO IMMEDIATELY! Refill hydraulic fluid and determine the cause for the lack of fluid. In case of a burst hydraulic hose, in the most unfavourable case, the complete hydraulic fluid tank becomes empty within 30 seconds.

Hydraulic pumps:

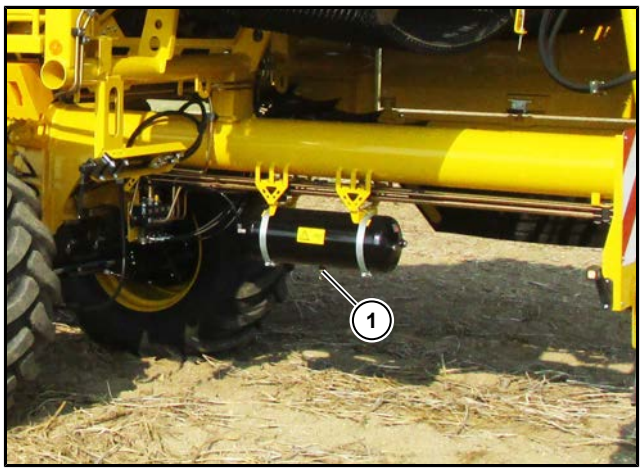


Pos.	Function
106	Optional: hydraulic disc coulter, swath pickup with lifer shaft and cover belt
108	Pintle belt 1, deflector roller 1, pintle belt 2, deflector roller 2, rotating finger comb (UFK)
109	Sieve conveyor 1, sieve conveyor 2; leaf chain
110	Shaker, optional agitator
529	LS pump shutdown valve

6.18 Compressed air system

The compressed air system of the machine is designed for the twin-circuit air brake system and is fed by the tractor twin-circuit air brake system.

6.18.1 Compressed air reservoir



(1) Compressed air reservoir with drain valve

The compressed air reservoir (**1**) is behind the axle bracket under the main frame. It acts as an air reservoir for the service brake, e.g. when the machine is parked. The compressed air reservoir is only installed if the machine is fitted with a compressed air brake system.

6.19 Video system (optional)

WARNING

The video system is solely for assistance and may show obstacles in a distorted perspective, incorrectly or not at all. It is not a substitute for your attention. The video system can not display all the objects situated to close and/or above the rear view camera. It does not warn you about collision, people or objects. You are responsible for the safety and must pay attention to your immediate surroundings. This applies not only to rear but also to the front and side areas around the machine. Otherwise you might not see people or objects, and continue driving, causing injures to people or damage to property and the machine.

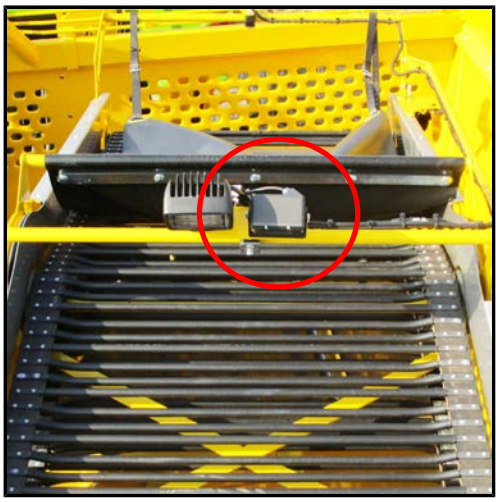
The video system could either fail or work incorrectly, when

- it rains heavily, snows or is foggy.
- the camera is exposed to very strong white light. White streaks may appear on the screen.
- the camera lens is dirty or covered.

The cameras are maintenance-free. When the image quality deteriorates, you should clean the lens cover using a soft, clean and lightly moistened cloth. During cleaning, make sure that you do not scratch the lens cover.

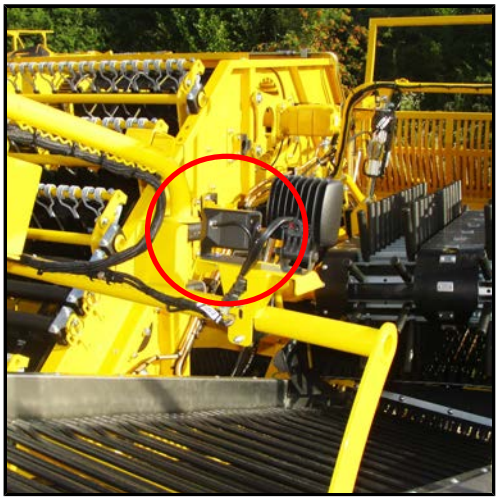
The machine can be fitted with up to two optional video monitors and up to eight video cameras. One video monitor can show up to four video cameras. Five camera positions are defined and three positions can be selected as desired. There is one camera on top at the rear of the machine, which acts as a reversing camera. There is a camera on the sorting platform to monitor the picking conveyor. The camera for monitoring the bunker discharge is mounted on the bunker. The camera for monitoring of the rotating finger comb (UFK) is mounted under the operating component at the picking conveyor. The camera for monitoring sieve conveyor 2 is mounted under the right sorting platform.

Rear view camera

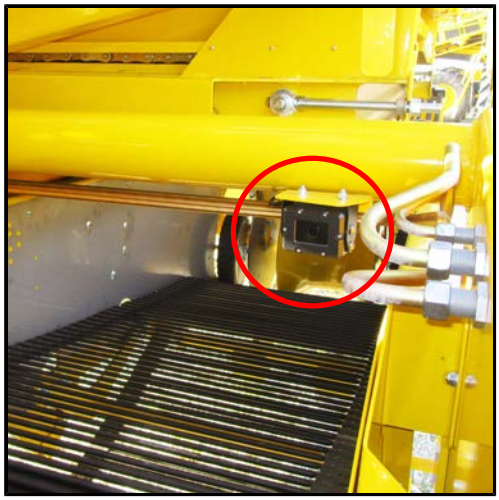


Picking conveyor video camera

Bunker discharge video camera



UFK video camera



Sieve conveyor 2 video camera

Video monitor

Monitor on/off

Open and switch the menus in this sequence:

Brightness	brightness - 0(MIN) ... 60(MAX)
Contrast	contrast - 0(MIN) ... 60(MAX)
Colour	colour saturation - 0(MIN) ... 60(MAX)
standard	Reset to factory settings
Language	Language - English, French, German, Spanish, Portuguese, Italian, Polish
Reflection	the camera image is reflected. Return to the main menu with the "Input" menu item. Close the menu with the "Exit" menu item.
Video	PAL, NTSC, Auto
Poc	OFF/ON. Monitor is started with ignition switched OFF monitor can be switched on and off at the monitor.
Timer on/off	automatically switches camera on and off
Timer setup	Sets the display period for every single camera in timer mode

"Plus" selection key

"Minus" selection key

Day/night switching

CAM Use this key to switch among camera 1, camera 2, camera 3 and camera 4 in single-image mode. In split-screen mode the operator can switch among cameras 1/2, 2/3, 3/4 and cameras 4/1. This key has no function in triple and quadruple image mode. Cameras can only be selected if a control line is not assigned.

MODE Pressing the mode key allows the operator to switch among the individual display modes (single image, split image and quadruple image).

6.20 Electrics

ATTENTION

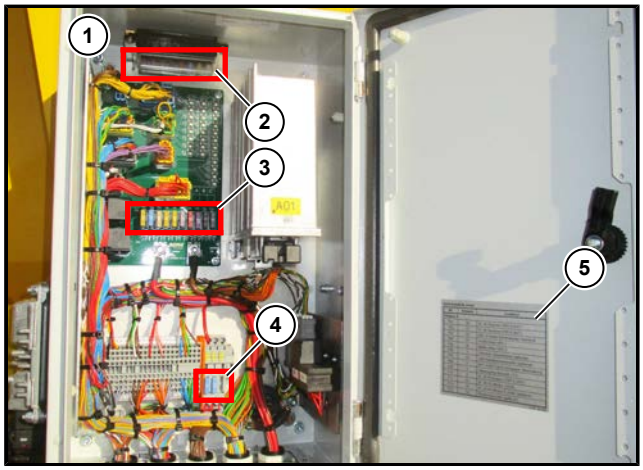
Hazard of damage to the electrical and electronic systems of the machine.

– The ISOBUS plug must not be disconnected while the machine is running.

6.20.1 Voltage monitoring

The battery voltage of the tractor is monitored by the system. If the voltage is too high or too low, then the warning icon is displayed on the tractor terminal. The battery voltage of the tractor must not exceed 16 V and must not fall below 12 V. If the battery voltage falls below 12 V, experience shows that the machine will not operate correctly.

6.20.2 Fuses



(1) Central electrical system
(2) Reserve fuses
(3) Safety fuses (F01 to F10) PCB in the central electrics
(4) Safety fuses (F11 to F14) Wago pins in the central electrics
(5) Safety fuses designation sticker

The fuses for the electrical system are located in the central electrical system box (**1**) at the front bunker upright.

Stickers on the inside of the metal cover (**5**) identify the fuses. In case of problems with the electric or electronic systems, please contact ROPA service.

6.21 Shutdown

Park the machine so that nobody is impeded or endangered. Also make sure of a sufficient safety distance to freely suspended power lines.

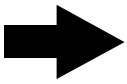
- Raise pickup completely and secure it.
- Empty bunker and lower it completely, lower bunker filling conveyor completely.
- Check position of articulated bunker section and tray filler.
- Fold the folding bunker section to road position.
- Close the collection box.
- Swivel drawbar completely in.
- Switch off tractor engine and secure it against inadvertent starting.
- Set the machine parking brake and position wheel chocks to prevent movement.
- Disconnect cardan shaft, all cables to the tractor and tractor hydraulic system from the machine, connect the support foot hydraulics if not yet connected and open the support foot stopcock.
- Couple the flow hose and the return hose of the tractor hydraulics together.
- Traverse support foot so the machine can be uncoupled from the tractor.
- If the support foot has to be extended completely for uncoupling, retract the support foot a bit after uncoupling.
- Close support foot stopcock, release hydraulic system and completely disconnect hydraulic system.
- Move tractor away from machine.
- Fold and lock right sorting platform access ladder.
- Secure the machine with immobiliser against unauthorised use.

ATTENTION

Risk of tipping machine.

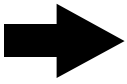
The machine must never be parked on the support foot with a full bunker. If the bunker is full, the machine must always be coupled to a tractor. The machine may tip over if it is parked on the support foot and the weight distribution of a full bunker is unfavourable. The support foot is designed for an empty machine!

ADVICE



Please, in case of need, consider additional protection for children.

ADVICE



Always couple the flow hose and the return hose of the tractor hydraulics together after uncoupling the machine!
A check valve is installed in the return hose for safety reasons. Sunlight causes pressure accumulation in the return hose between the coupling and the check valve and coupling to the tractor becomes no longer possible. It can be prevented by coupling the return hose and the flow hose together.

7 Maintenance and service

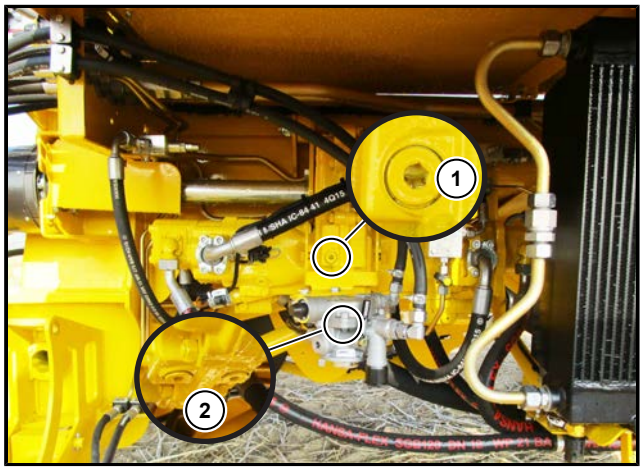
WARNING

During all maintenance work, there is the hazard of serious or fatal injury and the hazard of damage to the machine.

– Never climb over the sorting platform rails.
– During all maintenance work, make sure that nobody can inadvertently start the machine (remove the ignition key, lock the tractor cabin, always carry the tractor ignition key and if possible disconnect the ISOBUS plug connection to the tractor).
– Only perform maintenance work for which you have been trained and for which you have the required knowledge and tools.
– During all maintenance work, strictly comply with all regional regulations on safety, health protection and protection of the environment. Never forget: when you do not comply with the applicable regulations on safety, health protection or protection of the environment, you needless endanger yourself, other people and the environment. You may also lose your insurance cover.
– Always use approved and safe ladders and climbing aids.
– Do not walk on the open flaps of the sieve channel and the panels under the bunker.
– Always lower the pickup completely or secure it against unintentional lowering, if any maintenance work is required in the pickup area.
– Always secure bunker with the bunker support at the rear bunker cylinder, if any maintenance work is required in the area of the raised bunker.

7.1 Pump distributor gears (PDG)

The pump distributor gears unit is mounted on the left of the main frame in the front section of the panels under the bunker and transmits the PTO output of the tractor to the hydraulic pumps by a cardan shaft.



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

The pump distributor gears (PDG) must be inspected visually on a daily basis. Check for perspiration of the gears and oily areas on the gears. If you notice anything of mentioned above, immediately check the oil level of the PDG!

The first oil change is required after 50 operating hours, further oil changes must be performed annually.

Proceed as follows for changing the oil:

– Before changing the oil clean a wide area around the PDG.
– Change the oil only with gears warm after operation.
– Put an oil-resistant collecting vessel of sufficient size underneath.
– Open the oil drain screws (**2**), the gear oil flows out.
– Reinsert the oil drain screws (**2**).
– Open the oil filling screw (**1**) and add fresh oil into the filler opening until the oil level reaches the lower edge of the oil filling screw (**1**).
– Replace the oil filling screw (**1**).
– Conduct a test run and then check the oil level.

Prescribed oil variants:	**Gear oil API GL 5, SAE 90**
Filling volume:	approx. 1.4 litres

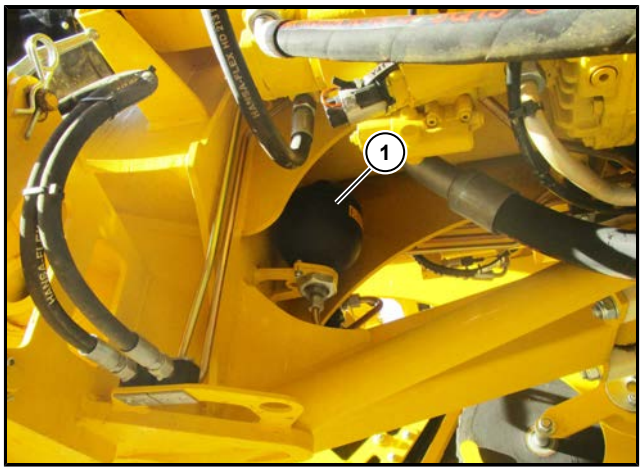
7.2 Hydraulic system

WARNING

Hazard from pressure accumulator!

The pressure reservoirs (**1**) of the hydraulic system are constantly under high internal pressure, even if the remaining hydraulic system is already rendered pressureless.

– Work on the pressure reservoirs may only be performed by especially trained people who are familiar with handling of pressure reservoirs.
– Render the system pressureless before all work on the hydraulic system or on the pressure reservoirs.
– Work on the hydraulic system may only be performed by people having been instructed about the special risks and hazards when working on hydraulic systems.

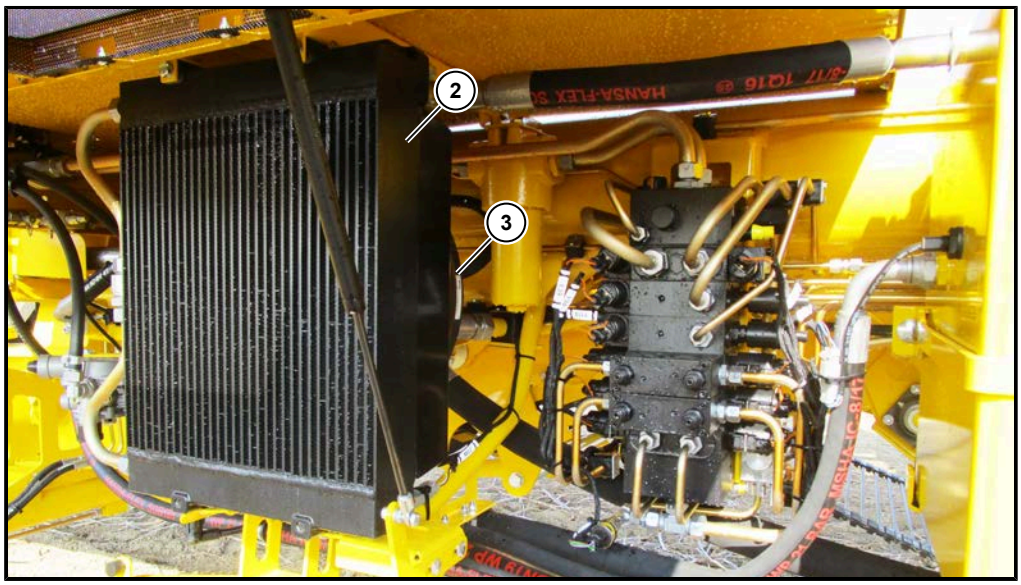


(1) Pressure accumulator

Regularly check the hoses of the hydraulic system for aging and damage!

Immediately exchange damaged or aged hoses. Only use hoses for replacements conforming to the specifications of the original hose!

For cost reasons we recommend ordering replacement hoses directly from ROPA, because original ROPA hydraulic hoses are generally significantly more economical than competitive products.



(2) Hydraulic oil cooler
(3) Electric fan

The machine hydraulic system is cooled with a hydraulic fluid cooler (**2**) in connection with an electric fan (**3**) and the tractor hydraulic system is cooled by the tractor. The electric fan does not work when the tractor PTO is stopped or when the oil temperature has not reached 60°C. When the oil temperature reaches 60°C and the PTO shaft of the tractor rotates, the electric fan of the hydraulic oil cooler switches on. If the PTO shaft of the tractor is switched off, the electric fan continues to run after it for 30 seconds. If the oil temperature falls below 55°C, the electric fan switches off.

The hydraulic fluid cooler (**2**) and the fan (**3**) must be regularly inspected for dirt and cleaned if required. Consider that a soiled cooler achieves a clearly reduced cooling performance. This will substantially reduce the load capacity of the machine. If the hydraulic oil is heated too much, the warning message appears at 75°C. Usually, the hydraulic oil cooler is soiled. If the electric fan doesn't rotate though the oil is overheated, check the fuse in the central electrical system.

WARNING

Burning hazard!

All coolers heat up during operation. Hazard of severe burnings!

- Wear protective gloves!
- Let the machine cool down sufficiently before starting any work on the cooling systems!

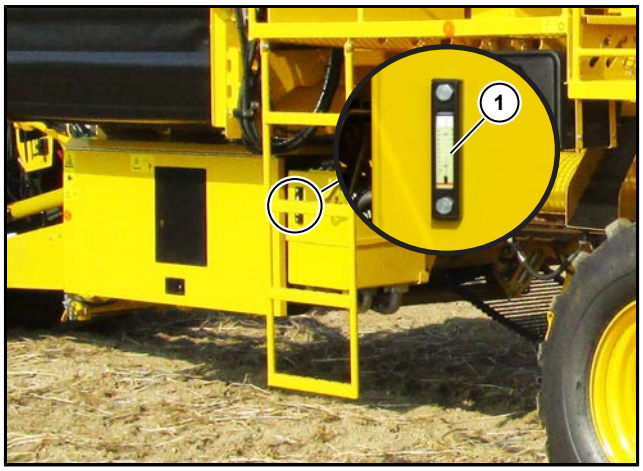
ATTENTION

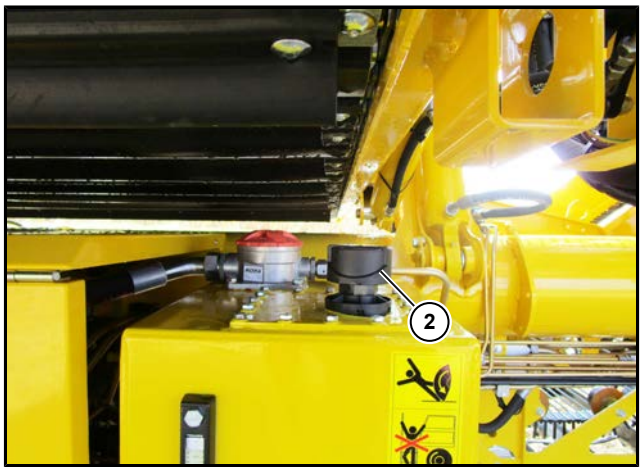
Danger of machine damage.

Clean the hydraulic fluid cooler carefully to avoid damage to the cooling fins. This may cause the machine to overheat and this may extensively damage it.

7.2.1 Hydraulic fluid tank for machine hydraulics

The tank for the hydraulic fluid is located at the left behind the panels at the access ladder. In addition to the display on the tractor terminal, the fluid level and temperature can also be read at the inspection glass (**1**) on the left side of the hydraulic fluid tank. The hydraulic fluid level should always remain in the range between the centre of the inspection glass and the upper edge of the inspection glass. Make sure that the oil level in the hydraulic oil tank is correct at all times. During all work on the hydraulic system, make sure of the utmost cleanliness!
Please observe that different types of hydraulic fluid may not be mixed.





(1) Inspection glass oil level + oil temperature
(2) Oil filling cap

Adding hydraulic fluid:

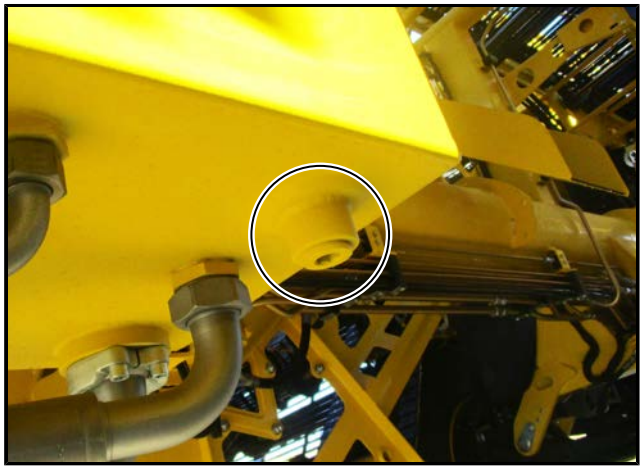
– Raise the bunker and secure it against unintentional lowering.
– For refilling hydraulic fluid, unscrew the black filling cap (bleeding head) (**2**) from the lid of the oil tank.
– When you open the filling lid for the hydraulic fluid, then it is possible that you hear a 'hissing' sound. This sound is normal.
  The filling lid (ROPA item no. 270070000) (**2**) is both a filler and vent filter. It maintains the required air balance as the fluid level varies (e.g. due to the fluid temperature).
  Replace it as soon as it become dirty, but no later than every 2 years.

ADVICE

When using a vacuum pump, do not set a vacuum on more than 0.2 bar.

7.2.1.1 Changing hydraulic fluid

The hydraulic fluid must be changed annually – best shortly before start of the season. For this purpose, provide a barrel of sufficient size. Unscrew the drain plug to change the hydraulic fluid. The drain plug is in the bottom of the hydraulic fluid tank. The old fluid is drained.



Oil drain screw

ADVICE

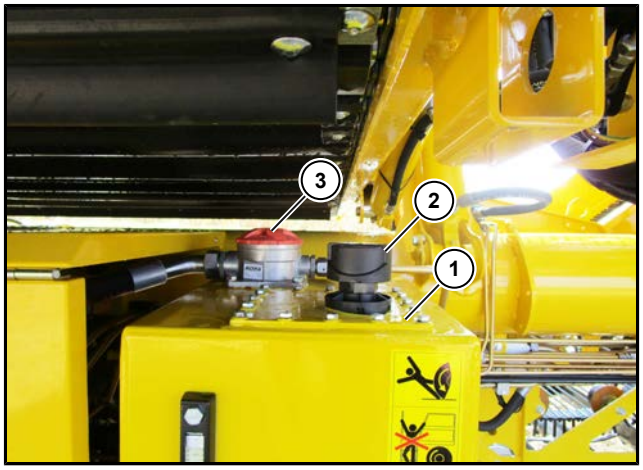
The entire machine contains more than twice as much hydraulic fluid as can be drained during a hydraulic fluid change. For this reason it is essential to adhere strictly to the prescribed intervals for changing the hydraulic fluid.

Prescribed oil variants:	**Hydraulic oilHVLP 46** (containing zinc)
	ISO-VG 46 as per DIN 51524 part 3
Filling volume:	approx. 70 litres

Cleaning intake sieves

The intake sieves inside of the hydraulic fluid tank must be checked for soiling every two years before filling up the fresh hydraulic fluid by optical inspection. If the sieves are soiled, they must be cleaned.

- For this purpose, the metal lid of the hydraulic fluid container must be taken off.
- Flush the intake sieves from inside to the outside using sufficient cleaning agent.
- Reinstall the intake sieves.
- Place the gasket and the metal lid onto them.
- Before installing them, coat the bolts for fastening the metal lid with sealing compound (ROPA item no. 017002600) and tighten the bolts.
- Before filling up with fresh hydraulic fluid, replace all filters in the hydraulic system. These filters are non-reusable products. They may not be cleaned. Cleaning destroys the filters. The hydraulic system might sustain heavy damage.
- Fill up the hydraulic system only using approved hydraulic fluid.

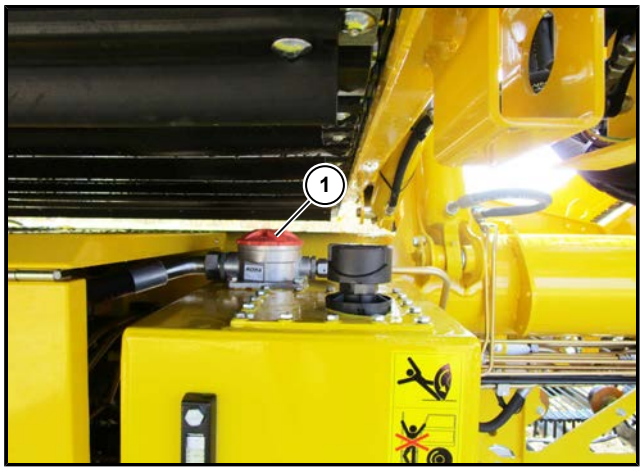


(1) Metal lid
(2) Oil filling cap with integrated bleeding and ventilation filter
(3) Return filter

7.2.1.2 Replacing return filter element

There is a return filter on the hydraulic tank (**1**). (Filter element ROPA item no. 270071500).

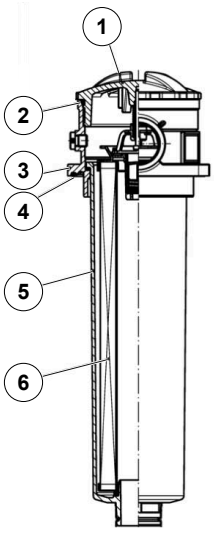
First exchange of all filter element is required after the first 50 operating hours, thereafter, annually.



(1) Return filter

ADVICE

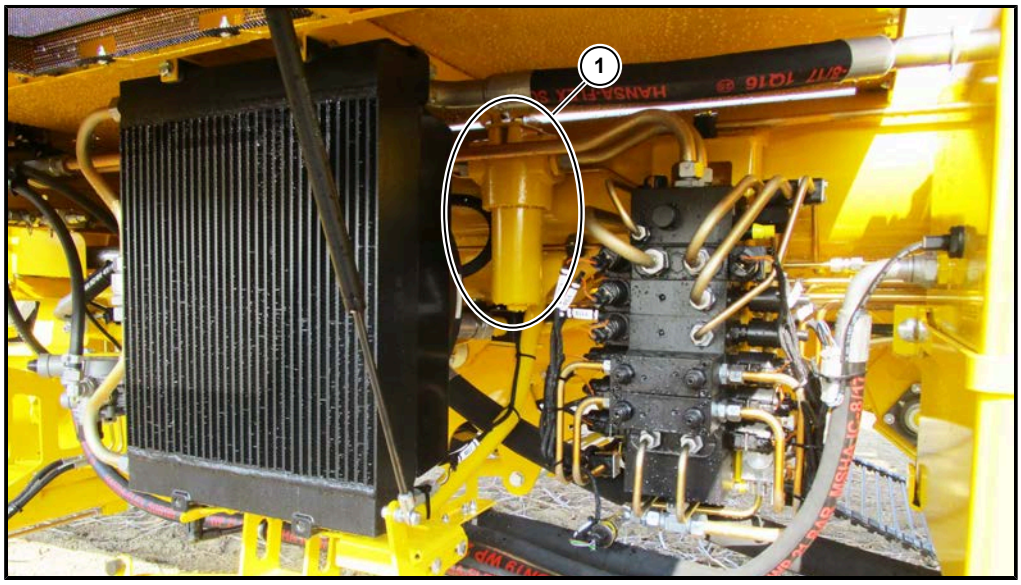
When exchanging the filter elements – as well as during all works on the hydraulic system – make sure of the utmost cleanliness. Make sure that the O-ring seals in the filter housing are not damaged or contaminated.



In order to replace the filter element in the return filter proceed as follows:

– Before opening the filter housing, make sure that the hydraulic system is absolutely pressureless and the oil filling cap is open.
– Unscrew the filter cover (**1**) with a tool, e.g. flat or round bar, while paying attention to the O-ring (**2**).
– Hold the filter element (**6**) and pull it out of the head section (**3**) while paying attention to the seal (**4**).
– Remove the old filter element (**6**) from the filter housing (**5**) by pulling and turning it and dispose of it responsibly.
– Dispose of the residual fluid from the filter housing (**5**) responsibly. Clean the housing and cover thoroughly.
– Check the filter on mechanical damages. Damaged parts may not be installed again (they must be immediately replaced).
– Check the O-rings and replace any damaged parts.
– Moisten sealing surfaces, thread and O-rings with fresh hydraulic fluid before installation.
– Always use a new filter element.
– When inserting the new filter element use the included O-ring.
– Insert new filter element (**6**) in the filter housing (**5**).
Note: use only original-ROPA filter elements (ROPA item no. 270071500).
– Insert filter housing (**5**) with filter element (**6**) in the head section (**1**) while paying attention to the sealing ring (**4**). Replace the sealing ring if it has visible damage.
– Screw in the filter cover (**1**) and tighten it with a tool. Tightening torque 20 Nm. Make sure that the O-ring (**2**) is positioned correctly.
– Test run the system and check for leaks. Retighten the cover if any leaks are found.

7.2.2 Replacing tractor hydraulic system pressure filter element



(1) Tractor hydraulic system pressure filter

Tractor hydraulic system pressure filter

The pressure filter for the tractor hydraulic system is on the left side of the machine under the bunker between the oil cooler and main frame. First exchange of all filter element is required after the first 50 operating hours, thereafter, annually. Besides a fluid-resistant and sufficiently large catchment barrel, you will need a ring wrench or fork wrench SW 32.

Filter exchange

- Switch off tractor engine, use chocks to prevent movement and lock it to prevent restart (remove ignition key).
- Unscrew the filter bowl. Catch the liquid in a suitable container and clean it respectively dispose of it in an environmentally compatible manner.
- Pull the filter element from the element holding pin. After having removed the filter element, check if there is a metal end cap at the top. If this is not the case, pull off the end cap separately from the element holding pin. Inspect the element surface for dirt residue and larger particles. These may point to damage to the components.
- Clean the bowl.
- Inspect the filter for mechanical damage; check sealing surfaces and threads in particular.
- Replace O-ring on the filter bowl. Dirt or incomplete pressure relief during disassembly may lead to seizing of the bowl screw thread.

Element installation

- Coat thread and sealing surfaces of the filter bowl and head as well as the O-ring of the bowl and element with clean hydraulic fluid.
- Install a new element (ROPA item no. 270043000).
- Carefully install the filter element on the element holding pin.
- Screw in the filter bowl to the stop.
- Unscrew the filter bowl by one sixth of a revolution.
- Start the tractor and e.g. raise the pickup to the stop (move against pressure), check filter for leaks.

ADVICE

Filter element must be disposed of in compliance with regional environmental protection regulations!

7.3 Axle

Check wheel nuts at regular intervals and tighten to 510 Nm with a torque spanner. Tighten for the first time after 10 operating hours, for the second time after 50 operating hours and after that every 50 operating hours.

7.4 Pneumatic system

The only maintenance work required for the pneumatic system is on the compressed air reservoir. The compressed air reservoir is under the main frame behind the axle.

The condensation water must be drained from the compressed air reservoir every 50 operating hours. If the machine is to be taken out of operation for a longer period (more than a week) the condensation water must also be drained from the compressed air tank. For this, press the drain valve slightly sideward or backward.

CAUTION

Injury hazard!

- Before draining water, stop the machine and switch off the tractor engine.
- The tractor must be locked to prevent accidental starting of the engine.
- All maintenance and repair work may only be performed by trained personnel.
- Always wear gloves, protective goggles and suitable protective clothing.

(1) Drain valve

7.5 Pickup

DANGER

Injury hazard! Hazard to life due to moving parts!

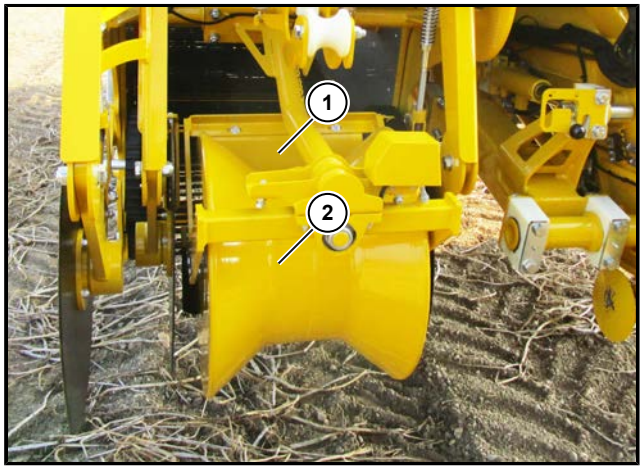
When working on the raised pickup, there is a risk that the pickup may lower without warning. People in this area may be seriously injured as a result. Before starting work, the pickup must be completely raised and secured with safety bolt. If securing with the safety bolt is impossible, the pickup must be securely supported with material of sufficient load bearing capacity. Observe the applicable regulations on safety and health protection at work under raised loads.

7.5.1 Ridge pickup model

The ridge pickup must be checked daily for operational function and damage. Clear jammed stones and other foreign bodies from the ridge pickup every day.

7.5.1.1 Ridge roller

7.5.1.1.1 Ridge roller wiper



(1) Ridge roller wiper
(2) Ridge roller

The wiper (**1**) on the ridge roller must be adjusted as required to prevent the ridge roller from becoming clogged under severe harvesting conditions.

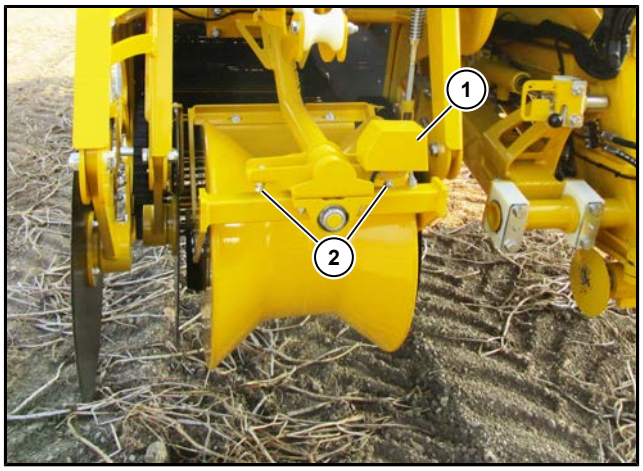
Proceed as follows to adjust the wiper on the ridge roller:

– Clean the ridge roller in the area of the wiper.
– Loosen the two self-locking nuts on the wiper with a SW 13 ring spanner or fork spanner.
– Push the wiper to 1.5 mm from the ridge roller.
– Tighten the two self-locking nuts on the adjusted wiper.

The wipers are different for the two different types of ridge rollers.

○ Wiper for ridge roller flat: ROPA item no. 520016904
○ Wiper for ridge roller deep: ROPA item no. 510100201

7.5.1.1.2 Adjusting ridge centring sensor



(1) Sensor ridge centering
(2) Ridge roller limit stop adjusting screws

The sensitivity of the ridge centring can be adjusted in the main menu under main settings / ridge centring from steps 1 to 10, default setting 5.
The higher the sensitivity the faster the reaction of the drawbar with the corresponding steering movement. The lower the value of the sensitivity the slower the reaction of the drawbar with the corresponding steering movement.

The adjusting screws for the ridge roller limit stops (**2**) must be set so that the ridge roller does not touch the disc coulters on the right and left if the ridge roller is tipped to one side of the ridge.

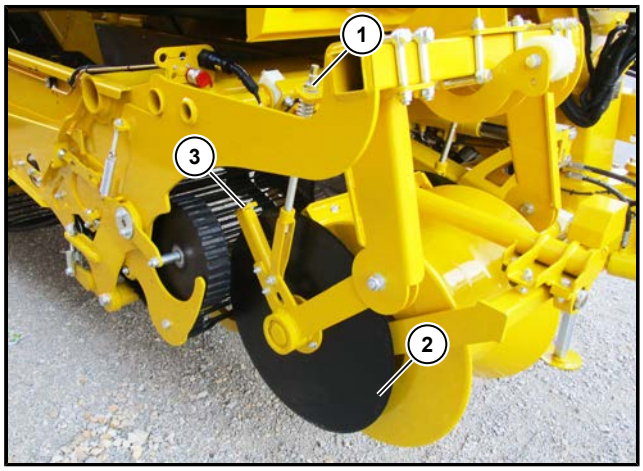
7.5.1.2 Shares

(1) Two-blade share

If the machine is out of service for an extended period, the shares must be coated with an environmentally friendly grease. Rusty shares will wear much faster and the machine will be much heavier to tow.

Worn shares must be promptly replaced to prevent damage to the crop and machine.

7.5.1.3 Disc coulter



(1) Disc coulter right depth adjustment
(2) Disc coulter right
(3) Disc coulter right wiper

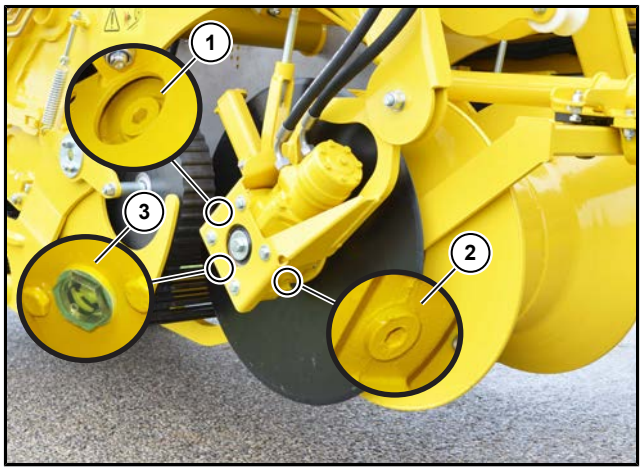
If the machine is out of service for an extended period, the disc coulters must be coated with an environmentally friendly grease. Rusty disc coulters will wear much faster.

Worn and bent disc coulters, e.g. damaged by stones, must be replaced promptly to prevent damage to the machine.

Check the wipers (**3**) on the disc coulters at regular intervals. They must be movable and must not be jammed. Jammed wipers will wear much faster.

Check that the depth adjustment of the disc coulters (**1**) moves easily at regular intervals. This will enable to react to external influences quickly in the field.

7.5.1.4 Hydraulic disc coulter (optional)



(1) Oil filling screw
(2) Oil drain screw
(3) Inspection glass

The mechanical settings on the hydraulic disc coulter are identical to those required for a standard disc coulter (*See Page 318*).

The fluid level in the hydraulic disc coulter gears must be checked every day. Check the fluid level before engaging the tractor PTO! The fluid level cannot be checked once the tractor PTO has been engaged and the machine hydraulics started.

To check the fluid level the angular gear of the hydraulic disc coulter must be in a horizontal position and the tractor PTO must have been disengaged for at least 5 minutes. When the oil level rises or falls without evident reason, always call in a customer service mechanic.

The oil level can be read in the inspection glass (**3**). It must be within the inspection glass range. The inspection glass is at the back of the angular gears of the hydraulic disc coulter.

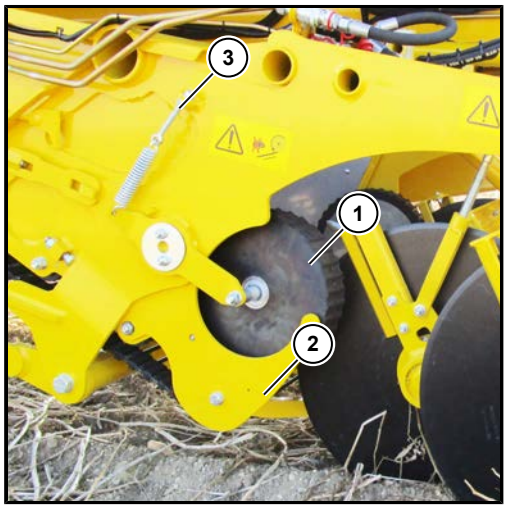
The first oil change is required after 50 operating hours, further oil changes must be performed annually.

Proceed as follows for changing the oil:

– Raise the pickup fully until the oil drain plug (**2**) is vertically above the ground and lock the pickup with suitable sturdy blocks.
– Before changing the oil clean a wide area around the hydraulic disc coulter gear.
– Change the oil only with gears warm after operation.
– Put an oil-resistant collecting vessel of sufficient size underneath.
– Open the oil drain plug (**2**) to allow the gear oil to flow out.
– Replace the oil drain plug (**2**).
– Open the oil filler plug (**1**) and add fresh oil into the filler opening until the oil level is in the upper range of the inspection glass (**3**).
– Replace the oil filling screw (**1**).

Prescribed oil variants:	**Gear oil API GL 5, SAE 90**
Filling volume:	approx. 0.6 litres

7.5.1.5 Leaf loading roller



(1) Leaf loading roller right
(2) Leaf deflector skid right
(3) Leaf loading roller clamp right

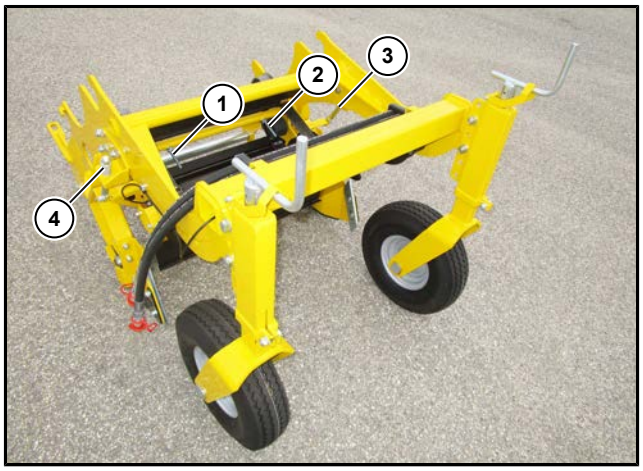
The spring tensioner must be adjusted on each side so the leaf loading rollers are properly driven from sieve conveyor 1. If the tension is incorrectly adjusted the leaf loading roller will be subjected to higher wear. The tension of the right leaf loading roller (**1**) is adjusted with the right leaf loading roller tensioner (**3**) and the tension of the left leaf loading roller is adjusted with left leaf loading roller tensioner.

The leaf loading rollers must be checked for wear at regular intervals and replaced promptly. Worn leaf loading rollers will e.g. become blocked with haulm more frequently on the sides of the pickup.

7.5.2 Swath pickup model

The swath pickup must be checked daily for operational function and damage. The swath pickup must also be cleaned daily of jammed stones and other foreign objects.

7.5.2.1 Setting cover belt tension and synchronism



(1) Cover belt swath pickup tensioner right
(2) Cover belt swath pickup tensioner left
(3) Height adjustment of right cover belt
(4) Height adjustment of left cover belt

The swath pickup is driven by an oil motor. To prevent the swath pickup cover belt from slipping on the drive wheels, the tension of the swath pickup cover belt is maintained by two adjustable rollers on one shaft.

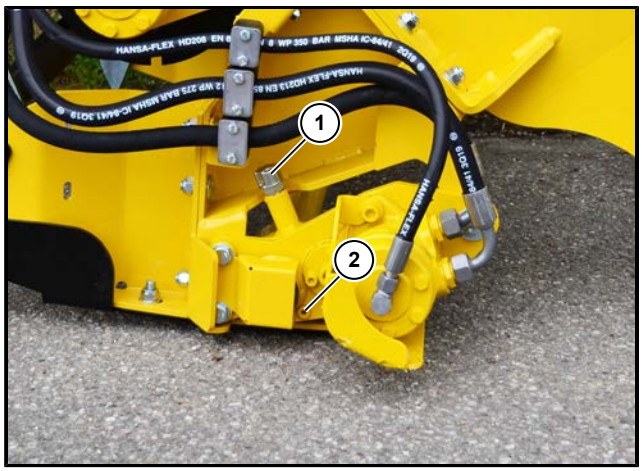
The two tensioners on the right (**1**) and left (**2**) must always be set at the same tension. To ensure that the swath pickup cover belt runs centred in the groove, the cover belt height adjustments must be adjusted on the right (**4**) and left (**3**). During the adjustment make sure that the swath pickup cover belt is only tensioned sufficiently to prevent the swath pickup cover belt from slipping on the drive wheels.

ADVICE

The tension of the swath pickup cover belt must be checked at intervals. The belts will stretch over time due to ageing and continuous operation. If the swath pickup cover belts are too loose, they will slip and may cause damage to the crop and to the machine.

7.5.2.2 Swath pickup gears

The gear unit of swath pickup is mounted on the left front side of the swath pickup and transfers power to the lifting shaft of the swath pickup.



(1) Oil filling screw with vent plug of swath pickup gears
(2) Oil drain screw of swath pickup gears

The swath pickup gears must be inspected visually on a daily basis. Check for perspiration of the gears and oily areas on the gears. If you notice anything of mentioned above, immediately check the oil level of the swath pickup gears!

The first oil change is required after 50 operating hours, further oil changes must be performed annually.

Proceed as follows for changing the oil:

– Raise the pickup fully and secure the pickup with locking ropes or material of sufficient load bearing capacity.
– Before changing oil clean a wide area around the swath pickup gears.
– Change oil only with gears warm after operation.
– Put an oil-resistant collecting vessel of sufficient size underneath.
– Open the oil drain plug (**2**) to allow the gear oil to flow out.
– Replace the oil drain plug (**2**).
– Open the oil filling screw (**1**) and add approx. 0.4 litre of fresh oil into the filler opening.
– Replace the oil filling screw (**1**).

Prescribed oil variants:	**Gear oil API GL 5, SAE 90**
Filling volume:	approx. 0.4 litres

7.6 Sieving channel and leaf separation

7.6.1 Sieve conveyor 1

ATTENTION

All rollers of sieve conveyor 1 must be checked daily for operational function and damage. Blocked or damaged rollers must be immediately exchanged for new rollers. Sieve conveyor 1 and rollers must also be cleaned daily of jammed stones and other foreign objects.

7.6.1.1 Tension

(1) Tensioner sieve conveyor 1

Sieve conveyor 1 is driven by an oil motor using a rod drive. To ensure that sieve conveyor 1 does not skip under heavy load, the tension of sieve conveyor 1 is maintained by a sieve conveyor tensioner (**1**).

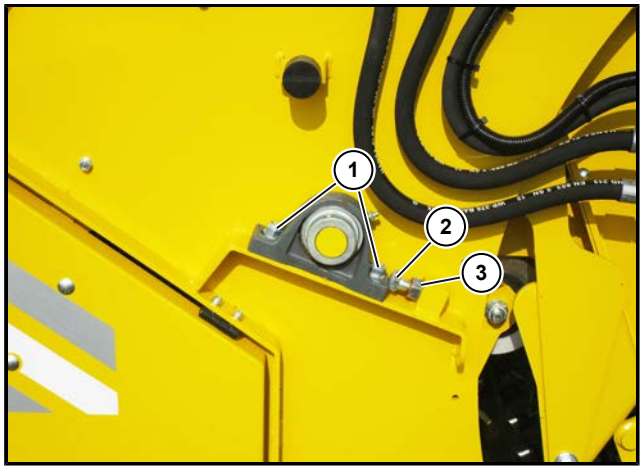
The sieve conveyor tensioner (**1**) must always be adjusted equally on each side of the sieve conveyor 1. During adjustment make sure that the tension of sieve conveyor 1 is just sufficient to prevent sieve conveyor 1 from jumping off the drive wheels.

7.6.1.2 Setting synchronism

If sieve conveyor 1 runs against the sieving channel wall on the left or right, it must be adjusted to equalise immediately, otherwise the wear on sieve conveyor 1 will be greatly increased.

Proceed as follows:

– Loosen the two screws (**1**).
– Loosen the lock nut (**3**) and then turn the adjusting screw (**2**), then lock the adjusting screw again.
– Tighten the two screws (**1**) again and allow sieve conveyor 1 to run for a few minutes. Check by visual inspection that sieve conveyor 1 runs straight. If this is not the case, then repeat the adjustment process until sieve conveyor 1 runs evenly in the centre.



(1) Shaft fastening screws
(2) Adjusting screw
(3) Lock nut

Setting note:

Conveyor runs to the right → turn adjusting screw counterclockwise.

Conveyor runs to the left → turn adjusting screw clockwise.

7.6.1.3 Replacing sieve conveyor 1

DANGER

Injury hazard!

To replace sieve conveyor 1 always have 2 persons, never try to replace sieve conveyor 1 alone. Parts of the machine will move while sieve conveyor 1 is being replaced. Every step must be discussed beforehand to prevent injury!

DANGER

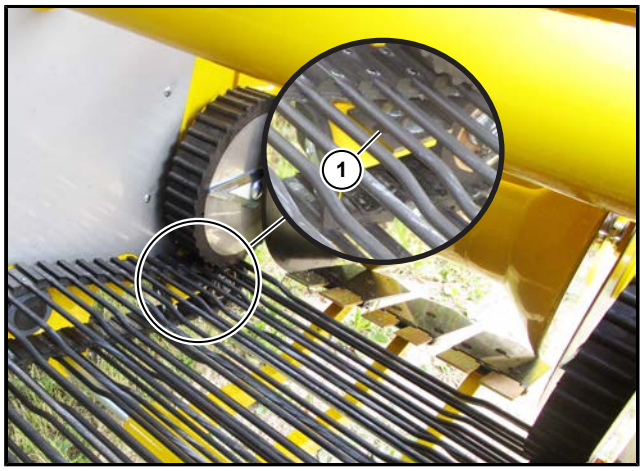
Injury hazard! Hazard to life due to moving parts!

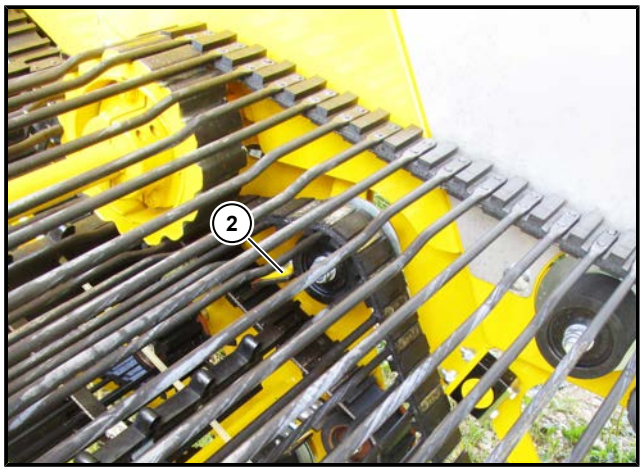
When working on the raised pickup, there is a risk that the pickup may lower without warning. People in this area may be seriously injured as a result. Before starting work, the pickup must be completely raised and secured with safety bolt. If securing with the safety bolt is impossible, the pickup must be securely supported with material of sufficient load bearing capacity. Observe the applicable regulations on safety and health protection at work under raised loads.

Proceed in the following sequence to replace sieve conveyor 1:

- Couple the machine to a suitable tractor and secure to prevent movement (tractor brake, set machine parking brake and use the two machine wheel chocks).
- Move sieve conveyor 1 with the conveyor cleaning menu on the tractor terminal "Min" actuation so the lock of sieve conveyor 1 is at a position at which the rod can be removed from the lock.
- Switch off tractor engine and lock it to prevent restart.
- Carefully loosen both sides of the sieve conveyor 1 tensioner.
- Pull the rod out of the sleeve lock while locking sieve conveyor 1 to the tensioner belt with the lock.
- Pull sieve conveyor 1 out.
- Replace drive wheels if they are worn or of a different pitch from the new sieve conveyor 1.
- Pull the sieve conveyor 1 in correctly, rods are on the outside of the belt and the female part pulls the male part.
- Insert the locking rod into the socket lock and fasten the sieve conveyor 1 with a tensioning belt, fix it in the recess of the rod using two bushings with grub screw.
- Tighten sieve conveyor tensioner evenly.
- Conduct a test run to check the movement of the sieve conveyor 1 and if necessary adjust as described in the chapter "Sieve conveyor 1 setting synchronism" (*See Page 324*).

7.6.1.4 Sieve conveyor 1 wiper





(1) Sieve conveyor 1 wiper front left
(2) Sieve conveyor 1 wiper rear left

The wipers are located on the left and right side on the rollers of the sieve conveyor 1. These wipers on the rollers must be checked daily, e.g. whether some stones are trapped between the wiper and the roller.

The wipers must be adjusted as closely to the rollers as possible. The wipers may not rub against the rollers.

ATTENTION

Wipers rubbing on the rollers lead to increased wear of the rollers and the wipers themselves. This may cause damage to the sieve conveyor.

7.6.2 Shaker

ATTENTION

The shaker must be checked daily for operational function and damage. Blocked or damaged rollers must be immediately exchanged for new rollers. The shaker and rollers must also be cleaned daily of jammed stones and other foreign objects.

7.6.3 Agitator

ATTENTION

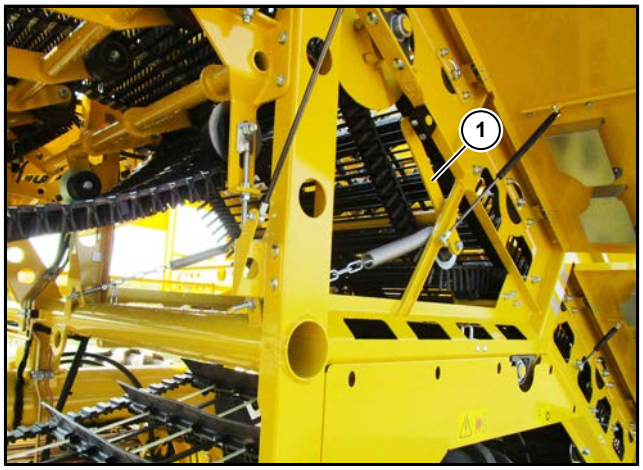
The agitator must be checked daily for operational function and damage. Blocked or damaged parts must be immediately exchanged for the new ones. The agitator must also be cleaned daily of jammed stones and other foreign objects.

7.6.4 Sieve conveyor 2

ATTENTION

All rollers of sieve conveyor 2 must be checked daily for operational function and damage. Blocked or damaged rollers must be immediately exchanged for new rollers. Sieve conveyor 2 and rollers must also be cleaned daily of jammed stones and other foreign objects.

7.6.4.1 Tension



(1) Sieve conveyor tensioner

Sieve conveyor 2 is driven by an oil motor using a rod drive. To ensure that sieve conveyor 2 does not skip under heavy load, the tension of sieve conveyor 2 is maintained by a sieve conveyor tensioner (**1**).

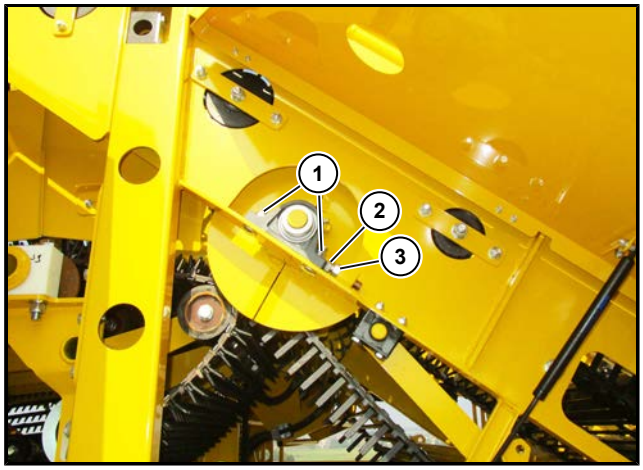
The sieve conveyor tensioner (**1**) must always be adjusted equally on each side of sieve conveyor 2. During adjustment make sure that the tension of sieve conveyor 2 is just sufficient to prevent sieve conveyor 2 from jumping off the drive wheels.

7.6.4.2 Setting synchronism

If sieve conveyor 2 moves onto the bar of the drive wheel more on the left or right side, then immediately set synchronism, because otherwise sieve conveyor 2 is subject to increased wear.

Proceed as follows:

– Loosen the two screws (**1**).
– Loosen the lock nut (**3**) and then turn the adjusting screw (**2**), then lock the adjusting screw again.
– Tighten the two screws (**1**) again and allow sieve conveyor 2 to run for a few minutes. Check by visual inspection that sieve conveyor 2 runs straight. If this is not the case, then repeat the adjustment process until sieve conveyor 2 runs evenly in the centre.



(1) Shaft fastening screws
(2) Adjusting screw
(3) Lock nut

Setting note:

Conveyor runs to the right → turn adjusting screw counterclockwise.

Conveyor runs to the left → turn adjusting screw clockwise.

7.6.4.3 Replacing sieve conveyor 2

DANGER

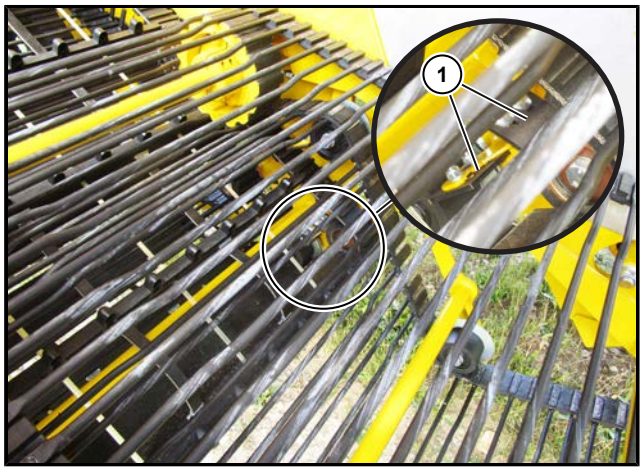
Injury hazard!

To replace sieve conveyor 2 always have 2 persons, never try to replace sieve conveyor 2 alone. Parts of the machine will move while sieve conveyor 2 is being replaced. Every step must be discussed beforehand to prevent injury!

The leaf chain must be removed first to replace sieve conveyor 2. To remove the leaf chain follow the instructions in "Replacing leaf chain" (*See Page 333*). Then proceed as follows:

- Traverse sieve conveyor 2 at the tractor terminal in the conveyor cleaning menu "Min" actuation until the overlaps of sieve conveyor 2 are at a position at which the overlaps can be easily opened.
- Switch off tractor engine and lock it to prevent restart.
- Carefully loosen both sides of the sieve conveyor 2 tensioner.
- Lock sieve conveyor 2 over the overlap with a tension belt.
- Open the two belts.
- Carefully release tension belts and pull sieve conveyor 2 out.
- Replace drive wheels if they are worn or of a different pitch from the new sieve conveyor 2.
- Pull sieve conveyor 2 in the right position.
- Lock sieve conveyor 2 over the overlap with a tension belt.
- Connect the ends of the belts and then tighten sieve conveyor tensioner evenly.
- Conduct a test run to check the movement of sieve conveyor 2 and if necessary adjust as described in the chapter "Sieve conveyor 2 setting synchronism" (*See Page 328*).

7.6.4.4 Sieve conveyor 2 wiper



(1) Sieve conveyor 2 wiper front left

The wipers are located on the left and right side on the rollers of the sieve conveyor 2. These wipers on the rollers must be checked daily, e.g. whether some stones are trapped between the wiper and the roller.

The wipers must be adjusted as closely to the rollers as possible. The wipers may not rub against the rollers.

ATTENTION

Wipers rubbing on the rollers lead to increased wear of the rollers and the wipers themselves. This may cause damage to the sieve conveyor.

7.6.5 Rubber paddle roller

ATTENTION

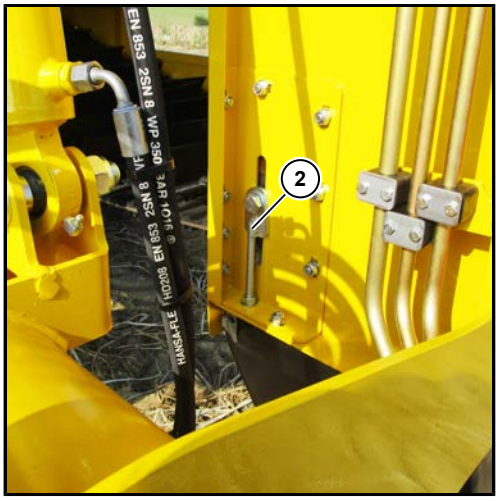
The rubber paddle roller must be checked daily for operational function and damage. Damaged parts must be immediately exchanged for the new ones. The rubber paddle roller must also be cleaned daily of jammed stones and other foreign objects.

7.6.6 Leaf chain

ATTENTION

All rollers of the leaf chain must be checked daily for operational function and damage. Blocked or damaged rollers must be immediately exchanged for new rollers. The leaf chain and rollers must also be cleaned daily of jammed stones and other foreign objects.

7.6.6.1 Tension



(1) Leaf chain tensioner right
(2) Leaf chain tensioner left

The leaf chain is driven by an oil motor. To prevent the leaf chain from slipping on the drive wheels, the tension of the leaf chain is maintained by two adjustable rollers, one on each side.

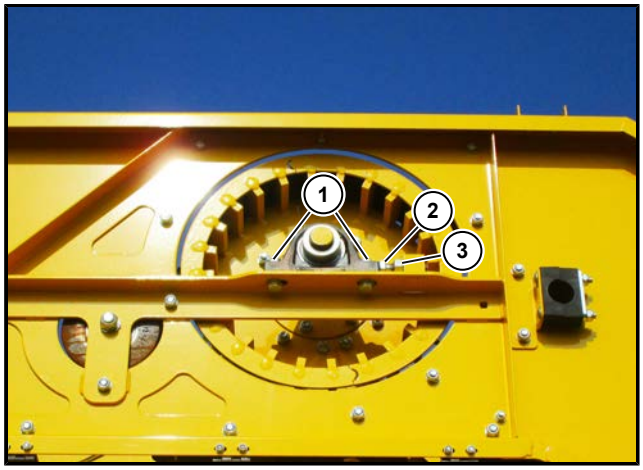
The right (**1**) and left leaf chain tensioner (**2**) must always be adjusted so the leaf chain is evenly tensioned. During the adjustment make sure that the leaf chain is only tensioned sufficiently to prevent the leaf chain from slipping on the drive wheels.

7.6.6.2 Setting synchronism

If leaf chain moves onto the bar of the drive wheel more on the left or right side, then immediately set synchronism, because otherwise the leaf chain is subject to increased wear.

Proceed as follows:

– Loosen the two screws (**1**).
– Loosen the lock nut (**3**) and then turn the adjusting screw (**2**), then lock the adjusting screw again.
– Tighten the two screws (**1**) again and allow the leaf chain to run for a few minutes. Check by visual inspection whether the leaf chain runs evenly straight. If this is not the case, then repeat the setting process for so long until the leaf chain runs evenly in the centre.



(1) Shaft fastening screws
(2) Adjusting screw
(3) Lock nut

Setting note:

Conveyor runs to the right → turn adjusting screw counterclockwise.

Conveyor runs to the left → turn adjusting screw clockwise.

7.6.6.3 Replacing leaf chain

DANGER

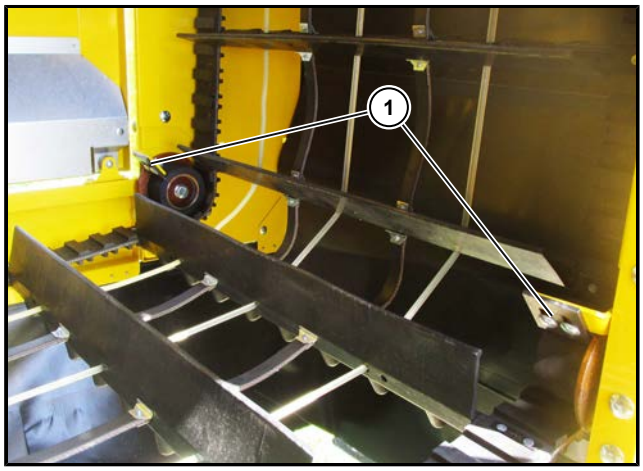
Injury hazard!

To replace the leaf chain always have 2 persons, never try to replace the leaf chain alone. Parts of the machine will move while the leaf chain is being replaced. Every step must be discussed beforehand to prevent injury!

Proceed in the following sequence to replace the leaf chain:

- Couple the machine to a suitable tractor and secure to prevent movement (tractor brake, set machine parking brake and use the two machine wheel chocks).
- Traverse the leaf chain at the tractor terminal in the conveyor cleaning menu "Min" actuation until the overlaps of the leaf chain are at a position at which the overlaps can be easily opened.
- Switch off tractor engine and lock it to prevent restart.
- Loosen both sides of the leaf chain tensioner rollers.
- Lock leaf chain over the overlap with a tension belt.
- Open the three leaf cords and the two small belts, and then open the two large belts.
- Carefully release tension belts and pull the leaf chain out.
- Replace drive wheels if they are worn.
- Pull leaf chain in correctly, the carriers are on the inside and indicate the direction of motion.
- Lock leaf chain over the overlap with a tension belt.
- Connect the two large belt ends, and then connect the two small belt ends and if necessary connect the leaf cords or pull the leaf cords out.
- Tighten leaf chain tensioner rollers.
- Conduct a test run to check the movement of the leaf chain and if necessary adjust as described in "Leaf chain setting synchronism" (*See Page 332*).

7.6.6.4 Leaf chain wiper



(1) Leaf chain wiper rear bottom

The wipers are located on the left and right side on the rollers of the leaf chain. These wipers on the rollers must be checked daily, e.g. whether some stones are trapped between the wiper and the roller.

The wipers must be adjusted as closely to the rollers as possible. The wipers may not rub against the rollers.

ATTENTION

Wipers rubbing on the rollers lead to increased wear of the rollers and the wipers themselves. This may cause damage to the leaf chain.

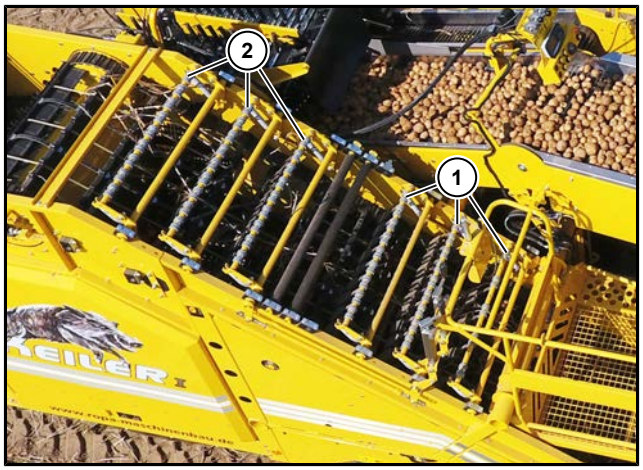
7.6.7 Leaf scraper

WARNING

Falling hazard!

Never walk over the accessible area of the sorting platform to other parts of the machine. Dirt, haulm and weather influences mean that it is not safe to stand on the machine apart from the sorting platform. There is a very serious risk of falling.

– Use a stable ladder and do not climb over the sorting platform railings.
– When work at heights near the edge of the machine use fall harness, e.g. a safety belt or scaffold and comply with the regional safety regulations.



(1) Front leaf-scraper
(2) Rear leaf-scraper

ATTENTION

If dirt and haulm accumulates on the leaf scrapers and the haulm is wrapped around the leaf scraper, it must be removed regularly, if necessary several times a shift. Switch off the machine and lock it to prevent restart (remove ignition key). This will prevent unnecessary damage to the crop and to the machine.

Use a stable ladder or stable scaffold to clean the leaf scrapers. Depending on how dirt and haulm have been caught, adjust the height of the leaf scrapers as described in the chapter "Cleaning / sieving channel and leaf separation / leaf scrapers" (*See Page 218*) for easier cleaning.

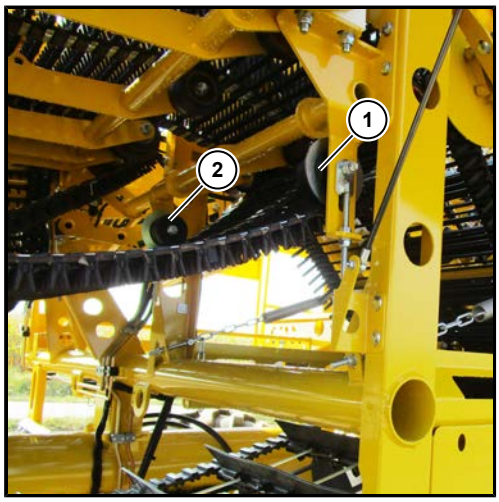
7.7 Separation

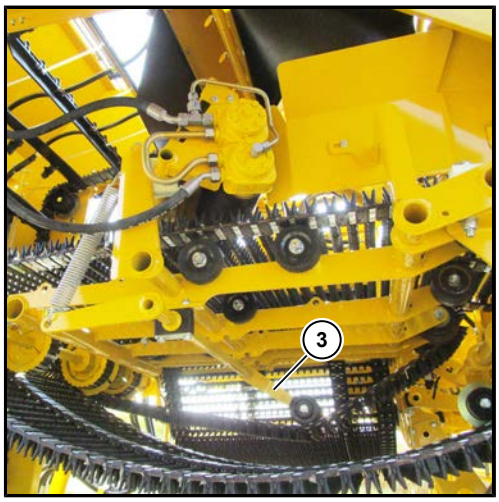
7.7.1 Pintle belt 1

ATTENTION

All rollers of pintle belt 1 must be checked daily for operational function and damage. Blocked or damaged rollers must be immediately exchanged for new rollers. Pintle belt 1 and rollers must also be cleaned daily of jammed stones and other foreign objects.

7.7.1.1 Tension





(1) Pintle belt 1 right tension roller of long separating chain
(2) Pintle belt 1 left tension roller of long separating chain
(3) Pintle belt 1 short separating chain tensioner

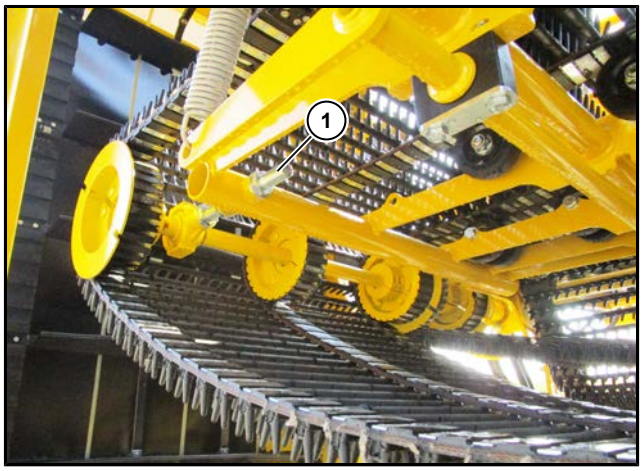
Pintle belt 1 is directly driven by an oil motor with rubber-coated friction wheels. To prevent pintle belt 1 from slipping on the rubber friction wheels the tension of the long separating chain of the pintle belt 1 is maintained by the right tension roller (**1**) and the left tension roller (**2**). The tension of the short separating chain of the pintle belt 1 is maintained by a tensioner (**3**).

The two tension rollers of the pintle belt 1 must always be adjusted equally for both sides. During adjustment make sure that the tension of the pintle belt 1 is just sufficient to prevent the pintle belt 1 from slipping on the drive wheels.

ADVICE

The tension of the pintle belt must be checked at intervals. The belts will stretch over time due to ageing and continuous operation. If the pintle belts are too loose, they will slip and may cause damage to the crop and to the machine.

7.7.1.2 Setting synchronism



(1) Adjusting synchronism of pintle belt 1

If the long separating chain of the pintle belt 1 runs unevenly on the left or right, the synchronism must be adjusted immediately, otherwise the pintle belt 1 becomes subject to increased wear.

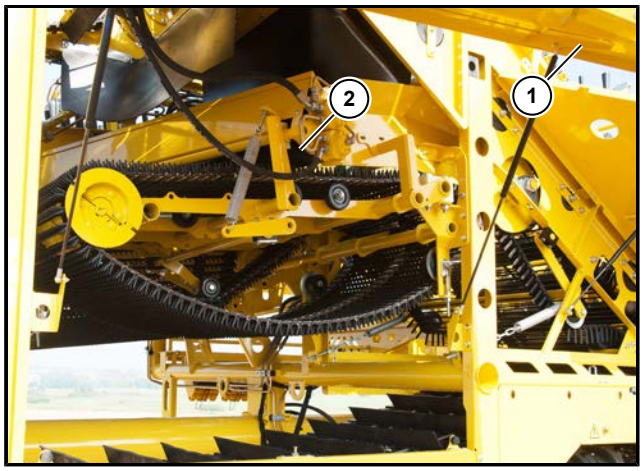
Proceed as follows:

– Loosen the nut in the direction in which the synchronism of pintle belt 1 is to be adjusted.
– Adjust the other nuts in the direction of the first nut.
– Tighten both nuts again and allow pintle belt 1 to run for a few minutes. Check by visual inspection whether pintle belt 1 runs evenly straight. If this is not the case, then repeat the adjustment process until pintle belt 1 runs evenly in the centre.

7.7.2 Deflector roller 1

ATTENTION

Under difficult lifting conditions dirt, earth and haulm will accumulate on deflector roller 1. The dirt must be removed regularly, if necessary several times a shift. Switch off the machine and lock it to prevent restart (remove ignition key). This will prevent unnecessary damage to the crop and to the machine.



(1) Side cover
(2) Deflector roller 1

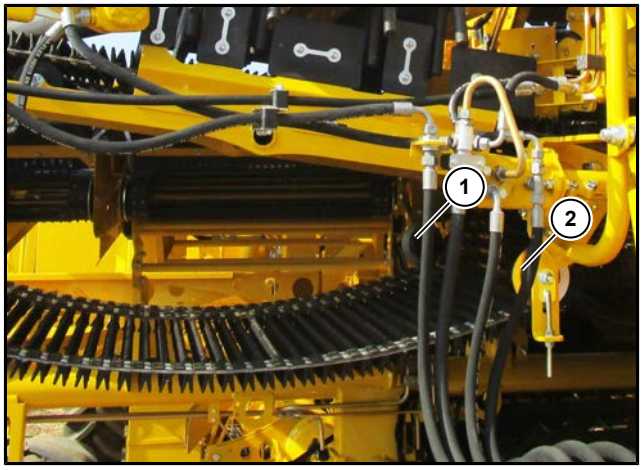
To clean deflector roller 1 open the side panel (**1**). Use a stable ladder to access deflector roller 1. Use the dirt hook to clean the deflector roller 1. After cleaning deflector roller 1 clean the side panel.

7.7.3 Pintle belt 2

ATTENTION

All rollers of pintle belt 2 must be checked daily for operational function and damage. Blocked or damaged rollers must be immediately exchanged for new rollers. Pintle belt 2 and rollers must also be cleaned daily of jammed stones and other foreign objects.

7.7.3.1 Tension



(1) Pintle belt 2 tension roller front
(2) Pintle belt 2 tension roller rear

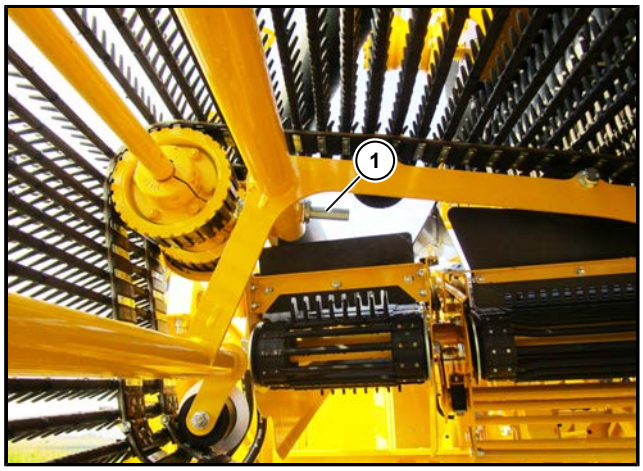
Pintle belt 2 is directly driven by an oil motor with rubber-coated friction wheels. To prevent the pintle belt 2 from slipping on the drive wheels, the tension of the pintle belt 2 is maintained by the front tension roller (**1**) and the rear tension roller (**2**).

The two tension rollers of the pintle belt 2 must always be adjusted equally for both sides. During adjustment make sure that the tension of the pintle belt 2 is just sufficient to prevent the pintle belt 2 from slipping on the drive wheels.

ADVICE

The tension of the pintle belt must be checked at intervals. The belts will stretch over time due to ageing and continuous operation. If the pintle belts are too loose, they will slip and may cause damage to the crop and to the machine.

7.7.3.2 Setting synchronism



(1) Adjusting synchronism of pintle belt 2

If pintle belt 2 runs unevenly on the left or right, the synchronism must be adjusted immediately, otherwise the ear on pintle belt 2 will be greatly increased.

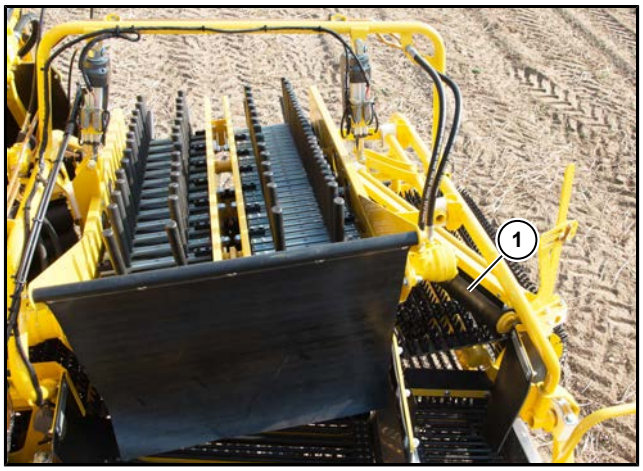
Proceed as follows:

– Loosen the nut in the direction in which the synchronism of pintle belt 2 is to be adjusted.
– Adjust the other nuts in the direction of the first nut.
– Tighten both nuts again and allow pintle belt 2 to run for a few minutes. Check by visual inspection whether pintle belt 2 runs evenly straight. If this is not the case, then repeat the adjustment process until pintle belt 2 runs evenly in the centre.

7.7.4 Deflector roller 2

ATTENTION

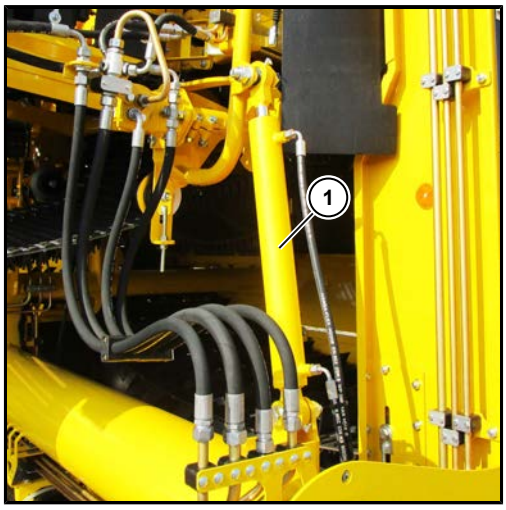
Under difficult lifting conditions dirt, earth and haulm will accumulate on deflector roller 2. The dirt must be removed regularly, if necessary several times a shift. Switch off the machine and lock it to prevent restart (remove ignition key). This will prevent unnecessary damage to the crop and to the machine.



(1) Deflector roller 2

Do not step on the machine to clean deflector roller 2. There is a risk of slipping on the machine due to the accumulation of soil and haulm. Use a stable ladder to access deflector roller 2. Use the dirt hook to clean deflector roller 2.

7.7.5 Pintle belt 1/2 inclination



(1) Cylinder pintle belt 1/2 inclination

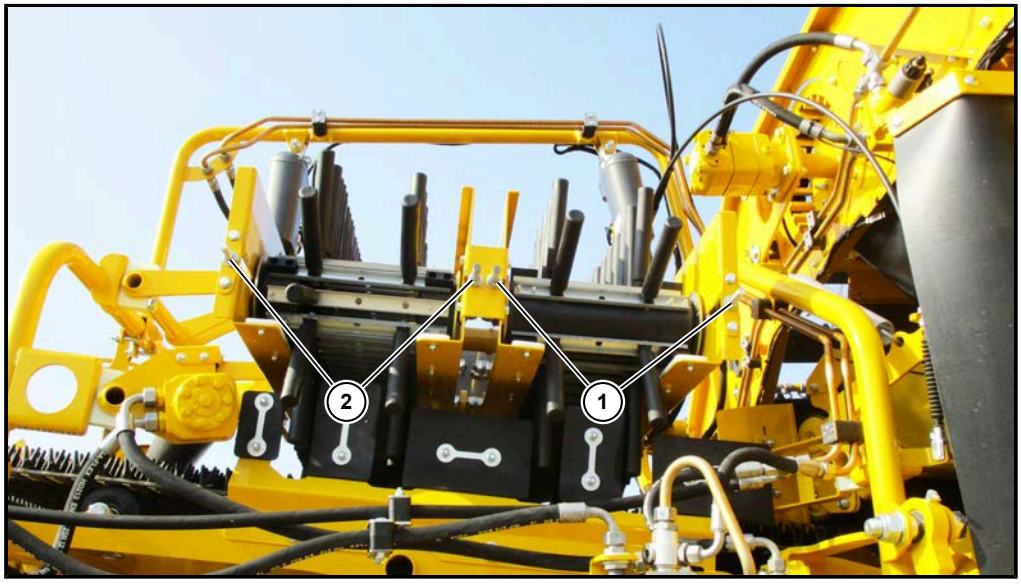
The inclination of pintle belt 1/2 is adjusted by an upper arm or optionally by a cylinder (**1**). Check at intervals that the adjustment mechanism operates smoothly.

7.7.6 Rotating finger comb (UFK)

ATTENTION

All rollers and fingers of the rotating finger comb (UFK) must be checked daily for operational function and damage. Blocked or damaged rollers must be immediately exchanged for new rollers. Damaged or broken UFK fingers must be replaced. UFK belts and rollers must also be cleaned daily of jammed stones and other foreign objects.

7.7.6.1 Adjusting tension and synchronism



(1) Rotating finger comb 1 tensioner
(2) Rotating finger comb 2 tensioner

The rotating finger comb (UFK) is subdivided into to independently adjustable units, rotating finger comb 1 (UFK 1) and rotating finger comb 2 (UFK 2). They are directly driven by an oil motor, with UFK 2 connected hydraulically in series to UFK 1.

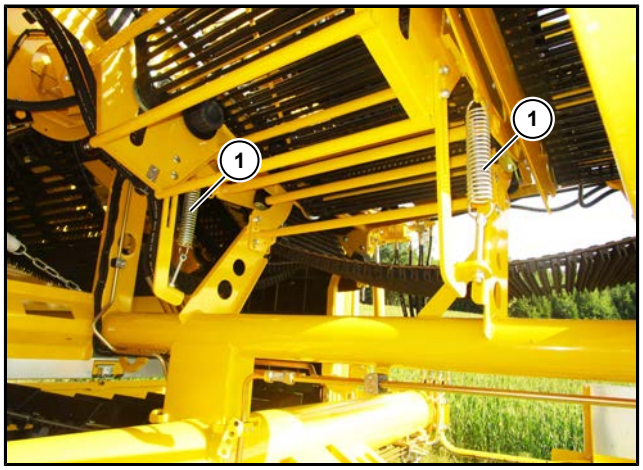
To prevent the friction wheels from slipping, UFK 1 (**1**) and UFK 2 (**2**) must be tensioned independently of each other. It is important to make sure that both UFKs are evenly tensioned on both sides. This ensures that the belts always run centrally. UFK 1 and UFK 2 must be tensioned to ensure that the friction wheel drives do not slip and that the belts do not sag. A sagging UFK belt wears faster.

7.8 Picking conveyer

ATTENTION

All rollers of the picking conveyor must be checked daily for operational function and damage. Blocked or damaged rollers must be immediately exchanged for new rollers. The picking conveyor and rollers must also be cleaned daily of jammed stones and other foreign objects.

7.8.1 Adjusting tension and synchronism



(1) Version of picking conveyor tensioner without sorting

The picking conveyor is directly driven by an oil motor with rubber-coated friction wheels. To prevent the picking conveyor from slipping on the drive wheels, the tension of the picking conveyor is maintained by a tensioner (**1**).

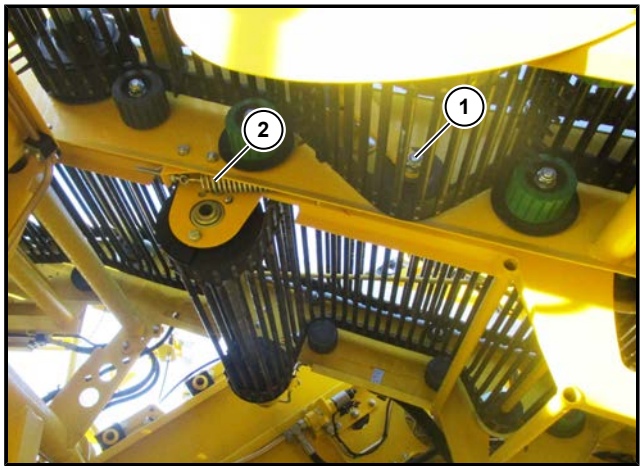
The tensioner of picking conveyor operates automatically by spring force and does not require adjustment. The tensioner of the picking conveyor is designed differently, depending on the equipment version of the machine, version of the picking conveyor with sorting or version of the picking conveyor without sorting.

7.9 Trash conveyer

ATTENTION

All rollers of the trash conveyor must be checked daily for operational function and damage. Blocked or damaged rollers must be immediately exchanged for new rollers. The trash conveyor and rollers must also be cleaned daily of jammed stones and other foreign objects.

7.9.1 Adjusting tension and synchronism



(1) Trash conveyor tensioner
(2) Trash conveyor tensioner spring

The trash conveyor is directly driven by an oil motor with rubber-coated friction wheels. To prevent the trash conveyor from slipping on the drive wheels, the tension of the trash conveyor is maintained by a tensioner (**1**).

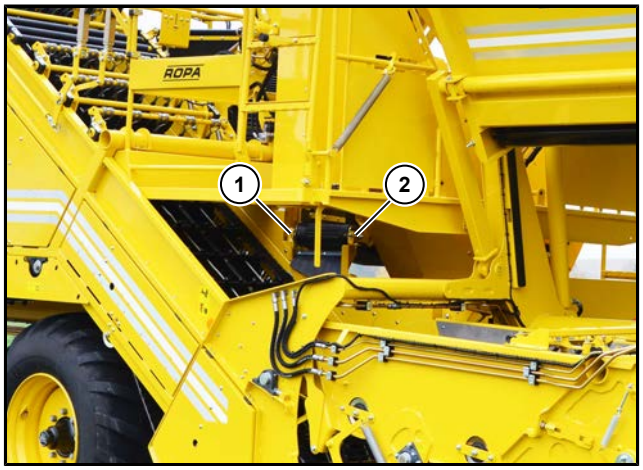
The tensioner of trash conveyor operates automatically by spring force and does not require adjustment.

7.10 Trash return conveyor

ATTENTION

All rollers of the trash return conveyor must be checked daily for operational function and damage. Blocked or damaged rollers must be immediately exchanged for new rollers. Trash return conveyor and rollers must also be cleaned daily of jammed stones and other foreign objects.

7.10.1 Adjusting tension and synchronism



(1) Trash return conveyor tensioner rear
(2) Trash return conveyor tensioner front

The trash return conveyor is directly driven by an oil motor with rubber-coated friction wheels. To prevent the trash return conveyor from slipping on the drive wheels, the trash return conveyor must be kept tensioned.

The tension and even running of the trash return conveyor are adjusted with a front tensioner (**2**) and a rear tensioner (**1**). The tensioners must be adjusted so that the trash return conveyor is evenly tensioned and runs centrally.

ADVICE

The tension of the trash return conveyor must be checked from time to time. The belts will stretch over time due to ageing and continuous operation. If the trash return conveyor is too loose, it will slip and may cause damage to the crop and to the machine.

7.11 Sorting conveyor with double bunker

ATTENTION

All rollers of the sorting conveyor must be checked daily for operational function and damage. Blocked or damaged rollers must be immediately exchanged for new rollers. Sorting conveyor and rollers must also be cleaned daily of jammed stones and other foreign objects.

7.11.1 Adjusting tension and synchronism

(1) Sorting conveyor tensioner left

The sorting conveyor is directly driven by an oil motor with rubber-coated friction wheels. To prevent the sorting conveyor from slipping on the drive wheels, the sorting conveyor must be kept tensioned.

The tension and even running of the sorting conveyor are adjusted with the left tensioner (**1**) and the right tensioner. The tensioners must be adjusted so that the sorting conveyor is evenly tensioned and runs centrally.

7.12 Collection box

ATTENTION

All rollers of the collection box must be checked daily for operational function and damage. Blocked or damaged rollers must be immediately exchanged for new rollers. Discharge conveyor of the collection box and rollers must also be cleaned daily of jammed stones and other foreign objects.

7.12.1 Adjusting tension and synchronism

(1) Collection box front tensioner
(2) Collection box rear tensioner

The walking floor of the collection box is directly driven by an oil motor with rubber-coated friction wheels. To prevent the walking floor of the collection box from slipping on the drive wheels, the walking floor of the collection box must be kept tensioned.

The tension and synchronous running of the walking floor of the collection box are adjusted with a front tensioner (**1**) and a rear tensioner (**2**). The tensioners must be adjusted so the walking floor is evenly tensioned and runs centrally.

ADVICE

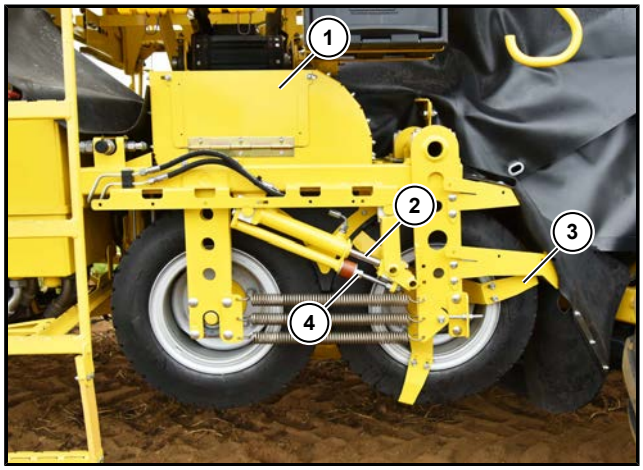
Check the tension of the walking floor of the collection box from time to time. The belts will stretch over time due to ageing and continuous operation. If the walking floor of the collection box is too loose, it will slip and may cause damage to the machine.

7.13 Potato crusher

ATTENTION

All moving parts of the potato crusher must be checked daily for operational function and damage. Blocked or damaged parts must be immediately exchanged for the new ones. The wheels of the potato crusher must also be cleaned daily of jammed stones and other foreign objects.

7.13.1 Distance adjustment

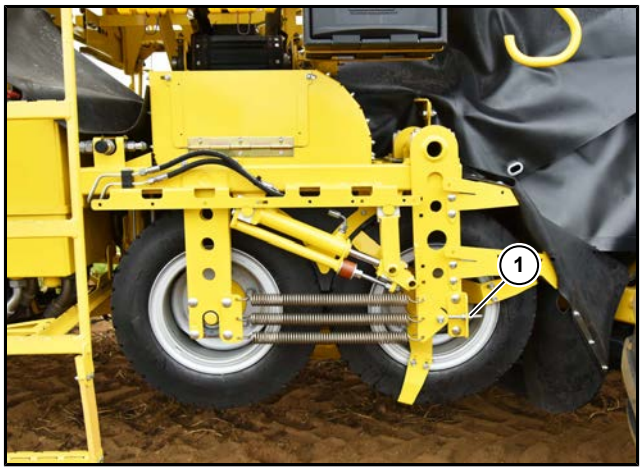


Picture shows potato crusher Keiler 2 without protective cover

(1) Cleaning flap / maintenance hatch
(2) Cylinder for hydraulic spreading up
(3) Blade
(4) Spindle for tyre distance adjustment

Adjust the distance between the blades (**3**) and the tyres so that the blades are placed on the rear tyre and do not touch the front tyre.
For this purpose, dismantle the protective device, but before doing it make sure that the machine is switched off, secured against being switched on again and against rolling away.
Now each blade (**3**) can be loosened and adjusted separately in such a way that the blades are placed on the rear tyre.
Set the spindle for adjusting the distance between the tyres (**4**) so that none of the blades touch the front tyre.
Once the adjustment and installation of the protective device have been completed, carry out a test run.

7.13.2 Tension adjustment

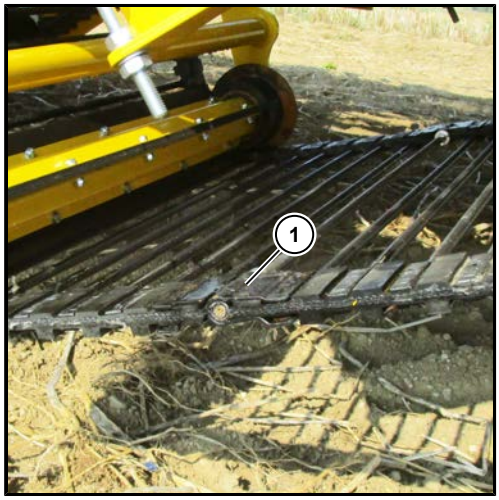


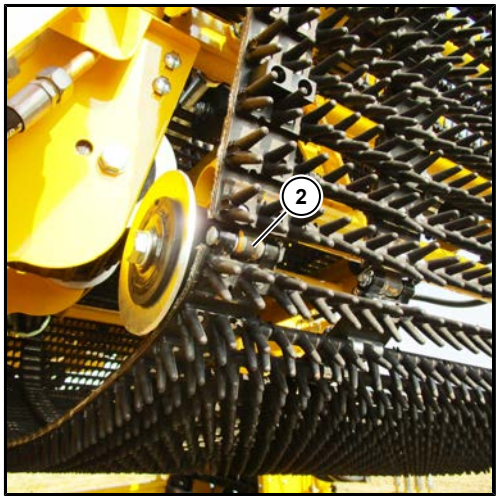
Picture shows potato crusher Keiler 2 without protective cover

(1) Adjustment of the spring tensioner outside

If the crushing quality is not sufficient, the pretension of 6 springs between the tyres is too low, the pretension can be increased by adjusting the spring tensioner.
For this purpose, dismantle the protective device, but before doing it make sure that the machine is switched off, secured against being switched on again and against rolling away.
Now adjust the pretension using the spring tension adjustment on the outside (**1**) and on the inside.
Once the adjustment and installation of the protective device have been completed, carry out a test run.

7.14 Locks





(1) Sieve conveyor 1 lock connection with connecting rod
(2) Pintle belt 2 lock connection with connecting bolt

In the standard model sieve conveyor 1 (**1**), pintle belt 1, pintle belt 2 (**2**), picking conveyor, trash conveyor, trash return conveyor, sorting conveyor at the double bunker and walking floor of the collection box are fitted with a lock. They make work easier for operators in many ways. Replacement of belts is made easier and maintenance and replacement of drives and rollers is simplified.

The locks consist of the riveted lock halves on the two ends of the belts and the inner and other lock bushings. The leading side is always the female part and the trailing side is always the male part. This forms a strong connection in combination with the recessed connecting rod or connecting bolt with locking ring, depending on the design.

ATTENTION

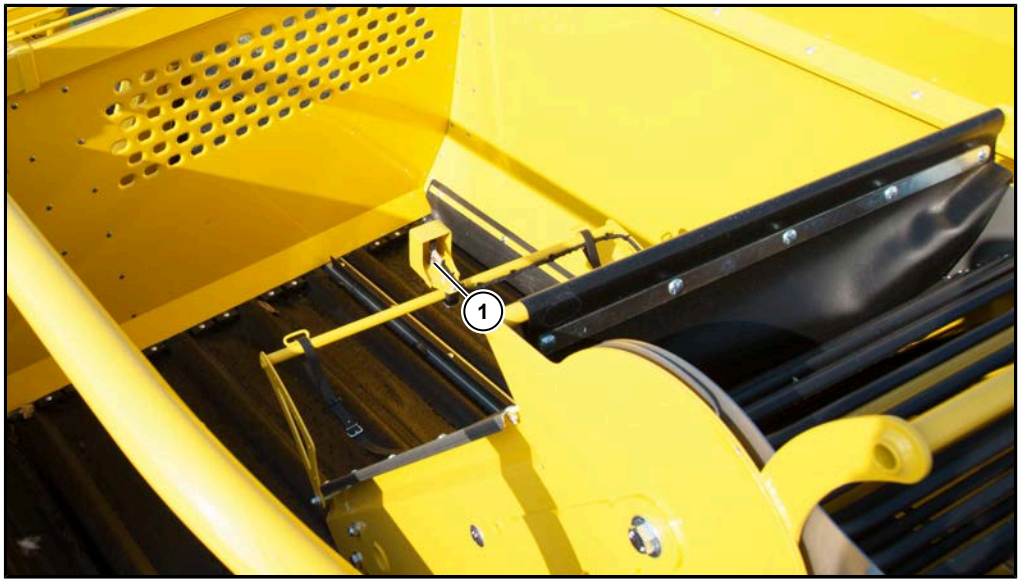
Risk of damage to belts and chains.

Bushings and rods must be checked for wear and replaced in good time. This will ensure that the lock will remain functional and costs will be reduced. If the replacement is too late the lock will be damaged and may also need replacement.

7.15 Bunker

The bunker (all steel plates and the walking floor) must be checked daily for accumulated dirt and must be cleaned as required. Accumulated soil reduces the capacity of the bunker and unnecessary increases the weight of the machine!

7.15.1 Ultrasound sensor

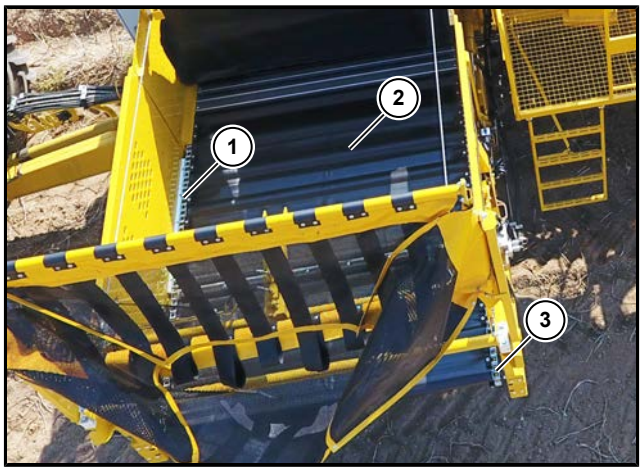


(1) Ultrasound sensor

The ultrasound sensor (**1**) must be cleaned with a moist cloth as required. The ultrasound sensor must be perfectly clean for optimum operation of the sensor.

Make sure that the ultrasound sensor (**1**) is always adjusted vertically to the bunker walking floor. If the bunker filling conveyor is raised or lowered, the ultrasound sensor (**1**) is always kept vertical to the bunker walking floor by the bunker filling conveyor rod. The rod must move easily and must not be bent.

7.15.2 Bunker walking floor standard



(1) Bunker walking floor chain front
(2) Bunker walking floor
(3) Bunker walking floor chain rear

The bunker walking floor (**2**) in the standard model consists of a cloth floor, which has 6 separate walking floor cloth segments. The walking floor cloth must not have any tears. If the walking floor cloth (**ROPA item no. 510008100**) is worn, the segments can be replaced separately.

ADVICE

The front (**1**) and rear bunker walking floor chain (**3**) must be oiled or greased as required.
We recommend a synthetic chain oil on ester basis according to FDA purity requirements of the guideline 21 CFR 178.3570, which is suitable for the occasional, technically unavoidable contact with food (**Ropa item no. 435015100**), for oiling the bunker walking floor chains.
The data sheet can be obtained upon request.

7.15.2.1 Tension of bunker walking floor chains

(1) Bunker chains tensioner front
(2) Bunker chains tensioner rear

ATTENTION

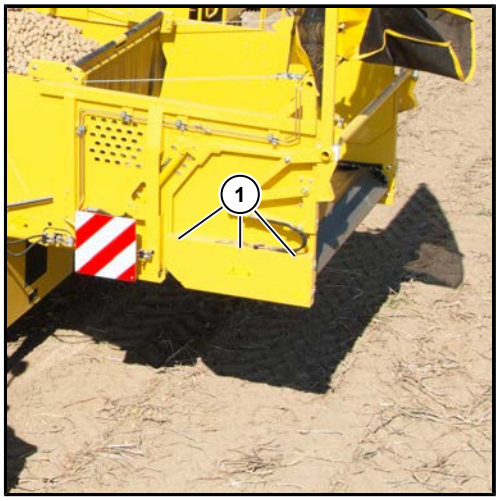
Check the tension of the bunker walking floor chains regularly. Incorrectly tensioned bunker walking floor chains may cause serious damage to the machine!

The tension of the chains of the bunker walking floor must be set so the chains will not break during folding and unfolding. The folding mechanism shortens the bunker walking floor chain slightly during folding and unfolding the bunker and is slightly longer at the end positions of the bunker, completely folded or unfolded.

If the chain tension is too loose, the bunker walking floor chains will grind and may skip. The bunker walking floor may run off track.

7.15.2.2 Drive chains

The two drive chains of the bunker walking floor drives must be oiled or greased and the tension must be checked after 100 operating hours.

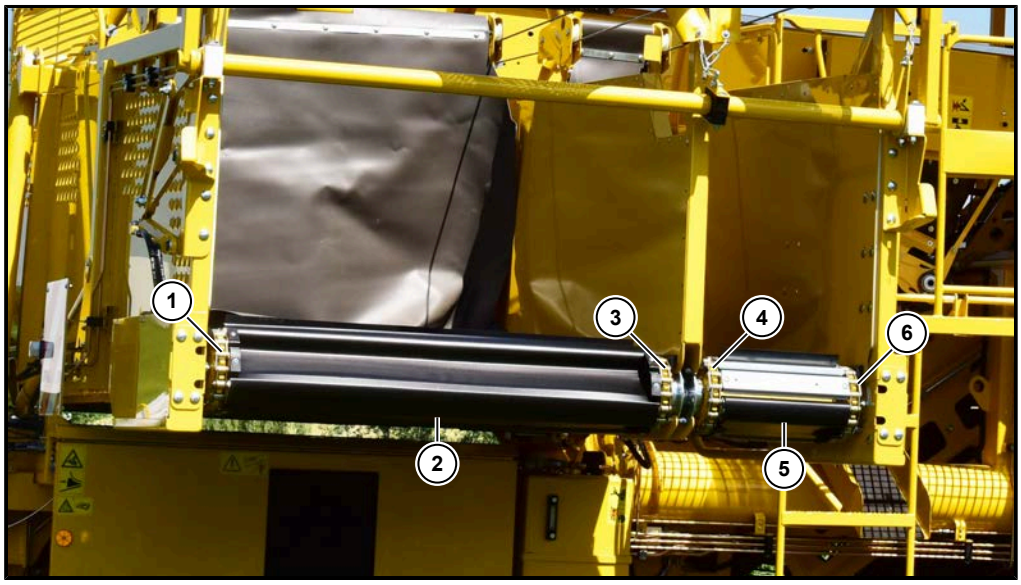


(1) Front drive chain guard cover screws
(2) Drive chain tensioning block front

Retensioning bunker walking floor drive chains

– Fold the bunker into working position, switch off the tractor engine, secure the tractor to prevent restart and set chocks to prevent movement of the machine.
– Loosen the screws on the front (**1**) and rear drive chain guard cover and remove the guards.
– Check the tension of the drive chains, adjust as necessary and grease the chains as required.
– To retighten the drive chains, loosen the fixing screw of the front and rear plastic tensioning block (**2**). Move the tensioning block so the drive chain is tightly tensioned once more. Retighten the fixing screw.
– Replace the guard covers on both sides and fasten them down with the screws.
– Conduct a test run of the bunker walking floor.

7.15.3 Double bunker walking floor



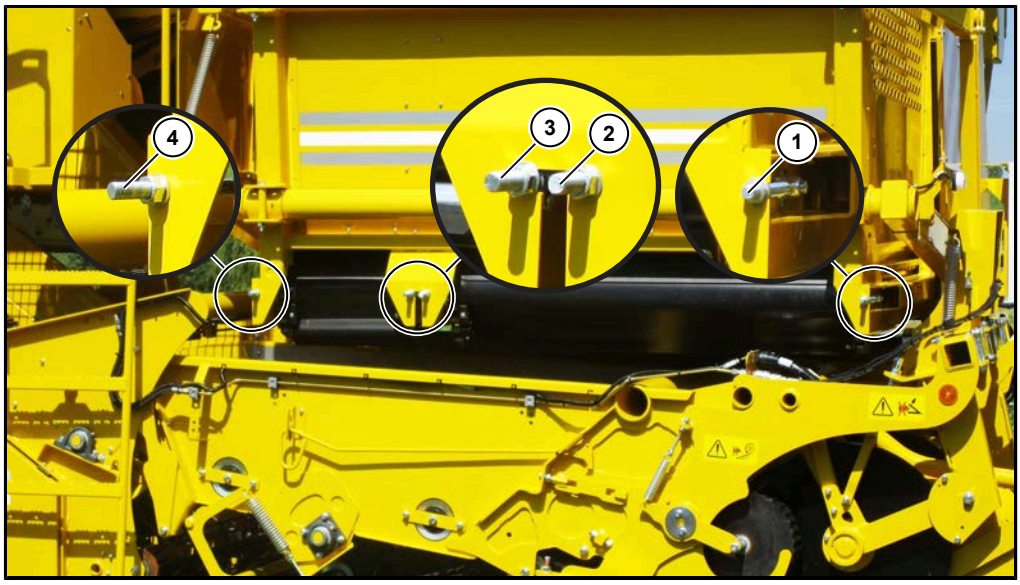
(1) Bunker walking floor chain of large bunker element front
(2) Bunker walking floor of large bunker element
(3) Bunker walking floor chain of large bunker element rear
(4) Bunker walking floor chain of small bunker element front
(5) Bunker walking floor of small bunker element
(6) Bunker walking floor chain of small bunker element rear

The bunker walking floors of double bunker consist of a cloth floor in the standard model, which has 6 separate walking floor cloth segments. The walking floor cloth must not have any tears. If the walking floor cloth of large bunker element (**ROPA item no. 510121800**) or walking floor cloth of small bunker element (**ROPA item no. 510121900**) is worn, the segments can be replaced separately.

ADVICE

All four bunker walking floor chains must be checked on a daily basis and oiled or greased if required.
We recommend a rapidly biodegradable hydraulic oil from renewable raw materials PLANTOSYN 3268 ECO according to ISO 15380, type HESS (**Ropa item no. 435004000**) to oil the bunker walking floor chains.

7.15.3.1 Tension of bunker walking floor chains



(1) Bunker chains tensioner of large bunker element front
(2) Bunker chains tensioner of large bunker element rear
(3) Bunker chains tensioner of small bunker element front
(4) Bunker chains tensioner of small bunker element rear

ATTENTION

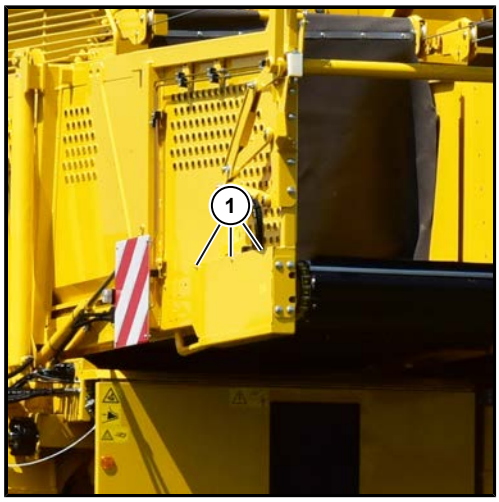
Check the tension of the bunker walking floor chains regularly. Incorrectly tensioned bunker walking floor chains may cause serious damage to the machine!

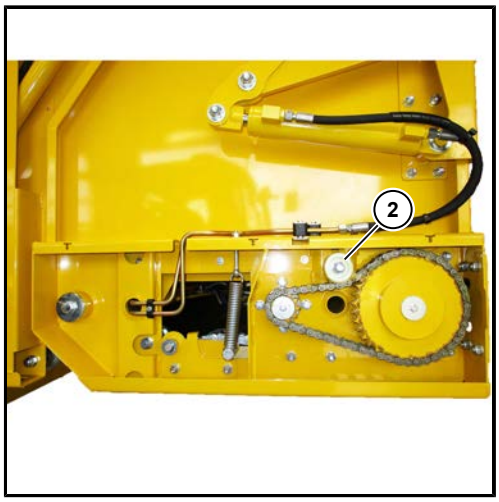
The tension of the chains of bunker walking floors must be set so the chains will not break during folding and unfolding. The folding mechanism shortens the bunker walking floor chain slightly during folding and unfolding the bunker and is slightly longer at the end positions of the bunker, completely folded or unfolded.

If the chain tension is too loose, the bunker walking floor chains will grind and may skip. As a result, the bunker walking floors may run at an angle.

7.15.3.2 Double bunker drive chains

Both drive chains of the bunker walking floor drives of large bunker element and small bunker element must be oiled or greased and checked for correct tension after each 100 operating hours.





(1) Front drive chain guard cover screws
(2) Drive chain tensioning block front

Retension bunker walking floors drive chains

- Fold the bunker into working position, switch off the tractor engine, secure the tractor to prevent restart and set chocks to prevent movement of the machine.
- Loosen the screws on the front (**1**) and rear drive chain guard cover and remove the guards.
- Check the tension of the drive chains, adjust as necessary and grease the chains as required.
- To retighten the drive chains, loosen the fixing screw of the front and rear plastic tensioning block (**2**). Move the tensioning block so the drive chain is tightly tensioned once more. Retighten the fixing screw.
- Replace the guard covers on both sides and fasten them down with the screws.
- Perform a test run of the both bunker walking floors.

7.16 Shutdown for an extended period

In case the machine has to be shut down for more than four weeks, then the following work must be performed:

– Wash the machine thoroughly. Avoid directly spraying the bearings and supporting rollers.
– Clean the pickup thoroughly from below and clean the shafts, e.g. drive shafts, thoroughly from all sides with the pressure cleaner.

ATTENTION

We would expressly like to point out that in case of damage to the machine caused by dried soil sticking to the strainer wheel drum, neither warranty coverage nor goodwill repairs will be performed.

– Drain condensing water at the compressed air reservoir.
– Lubricate all lubricating points of the machine.
– Spray the complete machine with corrosion-inhibiting oil. Make sure that no oil or grease touches the tires.
– Grease all piston shafts and the collars of the hydraulic cylinders.
– Park the machine in a dry and weather-protected place, if possible, in a hall.
– Secure the machine with immobiliser against unauthorised use.

7.17 Dismantling and disposal

If the machine is not disposed of properly at the end of its service life, it can lead to accidents and damages to environment.

Hazard may come from:

- Hydraulic oil
- Lubricants/process materials
- Media/pressure accumulator under pressure
- Residual energy
- Moving parts

– Now the machine can be disassembled and disposed of by an appropriate disposal company in accordance with applicable laws, directives and standards.
– Observe national safety regulations for disassembly of machines.
– Wear personal protective equipment.
– Render the system depressurised before all work on the hydraulic system or on the pressure reservoirs.

8 Malfunction and remedies

Your attention is visually drawn to malfunctions and hazardous situations by warning indications on the tractor terminal and acoustically by warning sounds. Some functions may be blocked in case of hazardous situations.

Malfunctions, causes and remedies are described in the tractor terminal, chapter 6.

8.1 Safety circuits

The machine provides the greatest possible safety to operator and materials. Because the machine depends on the tractor that tows it, when leaving the tractor always shut off the machine and lock it to prevent restart (remove ignition key). If a function cannot be performed from the tractor cabin or if switches are blocked, first check that the tractor emergency stop switch or the sorting platform emergency stop switch are not pressed.

If the malfunction cannot be remedied, then refer to the respective sections of this operating manual for the components or non-functional components. You will find hints on safety circuits and possible reasons for a malfunction there.

WARNING

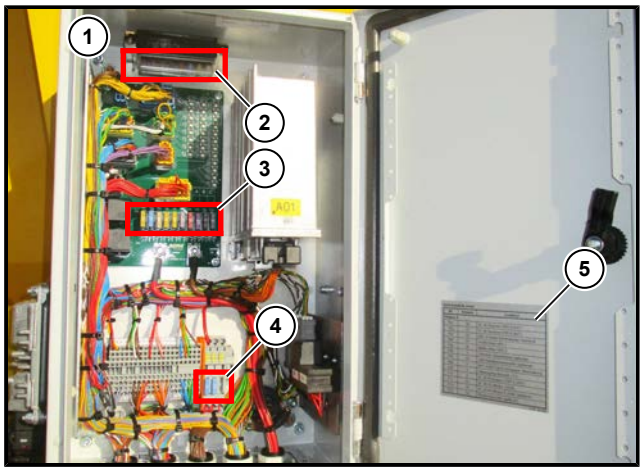
Hazard of extreme injuries or damage to the machine.

- Never defeat safety installations, safety locks or safety circuits. This may have the consequence of extreme injuries.
- Never perform functional tests, if you are not fully informed about the scope and consequences of such a test.
- Make sure that when searching for the cause of the malfunction or when remedying malfunctions, in case of need, a second, reliable person is present who is sufficiently familiar with the machine that he is able to shut down the machine immediately in case of emergency.
- In case of the slightest doubt, call in specialist personnel trained accordingly or enquire with service personnel from ROPA.
- Do not perform any repairs on the machine if you do not have the required specialist knowledge and experience.

If you are able to contact your dealer or the manufacturer by radio or cell phone, then more extensive fault diagnostics is possible using specific diagnostic menus on the tractor terminal. For safety reasons, individual menus are blocked for the operator. In case of improper handling, hazards to life may occur, or the machine may be heavily damaged, which would cause costly repairs.

8.2 Electrics

8.2.1 Safety fuses



(1) Central electrical system
(2) Reserve fuses
(3) Safety fuses PCB
(4) Safety fuses Wago pins
(5) Safety fuses designation sticker

The fuses for the electrical system are located in the central electrical system box (**1**) at the front bunker upright. Commercially available, flat plug-in fuses and self-resetting electronic fuses (safety fuses) are primarily used on the machine.

Imprints on the PCBs label the fuses. See the inside of the switch cabinet door for a sticker showing a general overview of the fuses.

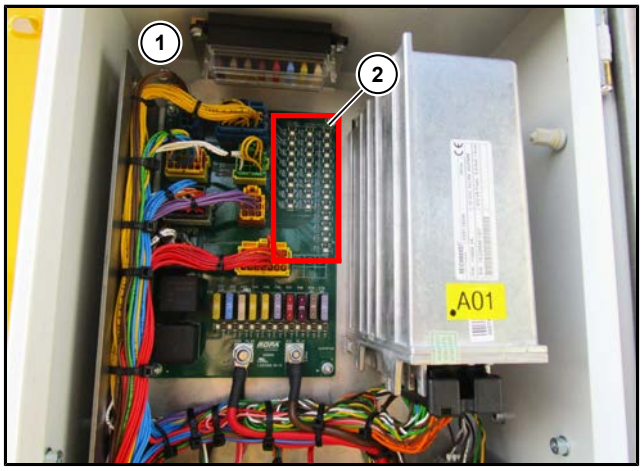
If the light emitting diode (LED) on a fuse lights, the fuse is faulty. Check the circuit and replace the faulty fuse with a new fuse of the same type.

8.2.2 List of fuses (melting fuses)

Central electrical system inside

No.	Ampere	Function
F01	20	Pin 30 computer ESR A (A01)
F02	15	Pin 30 computer ESR A (A01)
F03	25	K02.A Relay electric cooler hydraulics
F04	20	M559 Height rotating finger comb 1 (optional)
F05	20	M560 Height rotating finger comb 2 (optional)
F06	3	Terminal sorting platform (optional)
F07	15	LED working floodlights (optional)
F08	3	K01.A Machine emergency shutdown
F09	5	Feed sensors 12 V
F10	3	Pin 30 processor ESR A (A01)
F11	15	Pin 30 I/O module I (A34)
F12	15	Pin 30 I/O module II (A35) (optional)
F13	7.5	Rotating beacon (option)
F14	10	Lighting protective roof (option)
		ROPA item no. 3550578GB

8.2.3 Electronic fuses



(1) Central electrical system
(2) Self-resetting electronic fuses

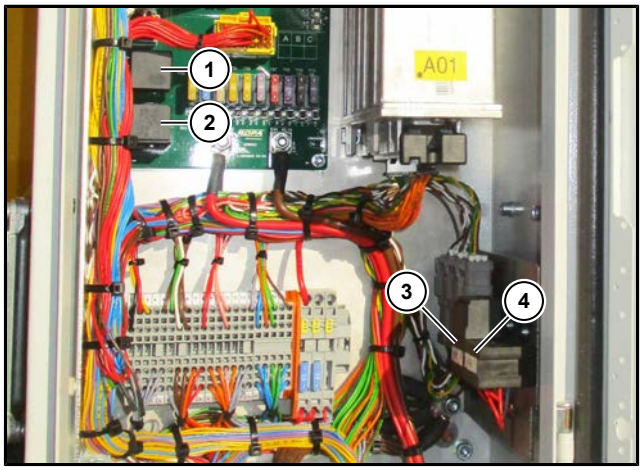
The fuses Fr01 - Fr28 are implemented as self-resetting electronic automatic cut-outs. If the light emitting diode (LED) of a self-resetting electronic fuse is lit, then the fuse is overloaded and power supply to the connected component interrupted.

8.2.4 Fuses list of self-resetting electronic fuses with LED

Central electrical system inside

No.	Ampere	Function	
Fr01	100 mA	B64 Lifting depth	8.5 V
Fr02	100 mA	B35 Fold bunker in/out	8.5 V
Fr03	100 mA	B570 Bunker filling conveyor position	8.5 V
Fr04	100 mA	B578 Picking conv. speed set value	8.5 V
Fr05	100 mA	B94 Pickup height	8.5 V
Fr06	100 mA	B04 Drawbar position	8.5 V
Fr07	100 mA	B05 Ridge centering	8.5 V
Fr08	100 mA	B02 Axle wheel angle	8.5 V
Fr09	100 mA	B34 Bunker height	8.5 V
Fr10	100 mA	B573 Axle swing angle	8.5 V
Fr11	100 mA	B561 Pintle belt 1/2 inclination	8.5 V
Fr12	100 mA	B15 PTO rotational speed PDG input	8.5 V
Fr13	100 mA	B521 Rpm sieve conveyor 1	8.5 V
Fr14	100 mA	B523 Rpm leaf chain	8.5 V
Fr15	100 mA	B522 Rpm sieve conveyor 2	8.5 V
Fr16	100 mA	B47 Driving speed	8.5 V
Fr17	100 mA	B531 Rpm swath pickup	8.5 V
Fr18	100 mA	Not used	8.5 V
Fr19	100 mA	Not used	8.5 V
Fr20	100 mA	Not used	8.5 V
Fr21	100 mA	B584 Return pressure sensor	12 V
Fr22	100 mA	B154/B155 Inclination sensor	12 V
Fr23	100 mA	B501 Pressure sensor sieve conveyor 1	12 V
Fr24	100 mA	B68 PS ridge pressure relief	12 V
Fr25	100 mA	B08 PS ridge pressure regulation	12 V
Fr26	100 mA	B502 Pressure sensor pintle belt 1	12 V
Fr27	100 mA	B58 Pressure sensor bunker unloading	12 V
Fr28	100 mA	B36 Bunker filling conveyor ultrasound	12 V
			ROPA item no. 3550734GB

8.3 Relay list



(1) Relay K02.A
(2) Relay K01.A
(3) Relay K15 (optional)
(4) Relay K19 (optional)

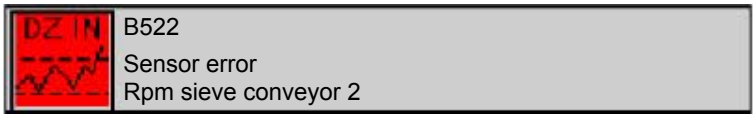
No.	Designation	Position in the machine	Comments	Item No.
K01.A	Relay emergency stop shutdown PCB A	Central electrical system on PCB bottom relay	Load relay, power 50 A, 12 V	320088200
K02.A	Relay ventilator drive hydraulic oil cooler	Central electrics on PCB top relay	Relay, power 40 A, 12 V	320033000
K15	Relay working floodlights (optional)	Central electrics right rear relay	Relay, power 20 A, 12 V	320017600
K19	Rotating beacon relay (optional)	Central electrics right front relay	Relay, power 20 A, 12 V	320017600

8.4 Colour codes for electric wiring

brown	Earth
red	Pin 30 (continuous current)
pink	Pin 15 (simulated ignition current)
yellow	8.5 Volt
violet	12 Volt
blue	Digital signal lines (ON/OFF)
green	Analogue signal lines (changing sensor values)
grey	All lamps “E” light bulbs and “H” warning devices (buzzer)
white	Electrical motors and internal wiring, miscellaneous
orange	Control lines for all valves and solenoids (all „Y“)

Feature: twisted cables
yellow (twisted) = I-CAN-high
green (twisted) = I-CAN-low
twisted together = I-CAN-BUS (ISOBUS) data line
white (twisted) = F-CAN-high
brown (twisted) = F-CAN-low
twisted together = F-CAN-BUS data line
white (twisted) = MA-CAN-high
brown (twisted) = MA-CAN-low
twisted together = MA-CAN-BUS data line

8.5 Troubleshooting with the tractor terminal



Some malfunctions are indicated on the tractor terminal by warning icons. In case of electrical or electronic problems, the components concerned are displayed including the designation of the component.

Example:

= Tractor emergency stop activated!

= Sorting platform emergency stop is on!

= Communication problem with control device.

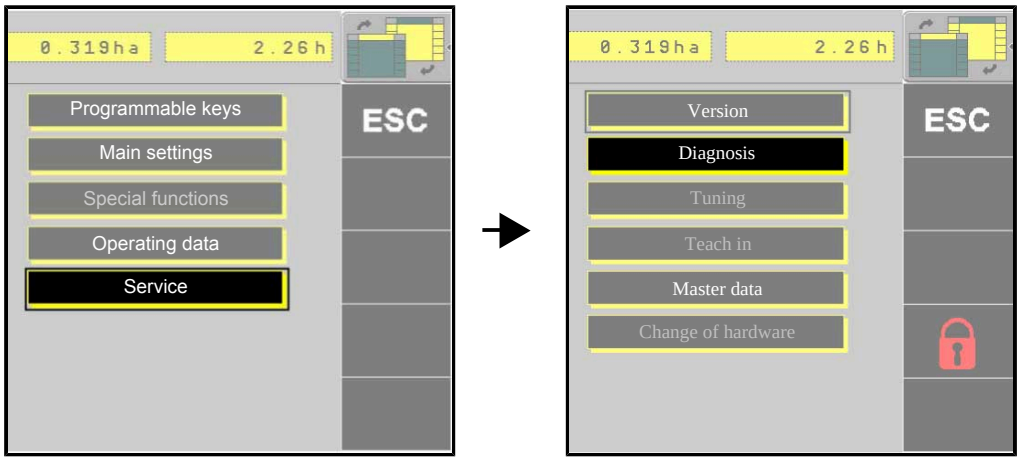
= Analogue signal out of range.

= Line break or short circuit found.

= Internal memory fault EEPROM.

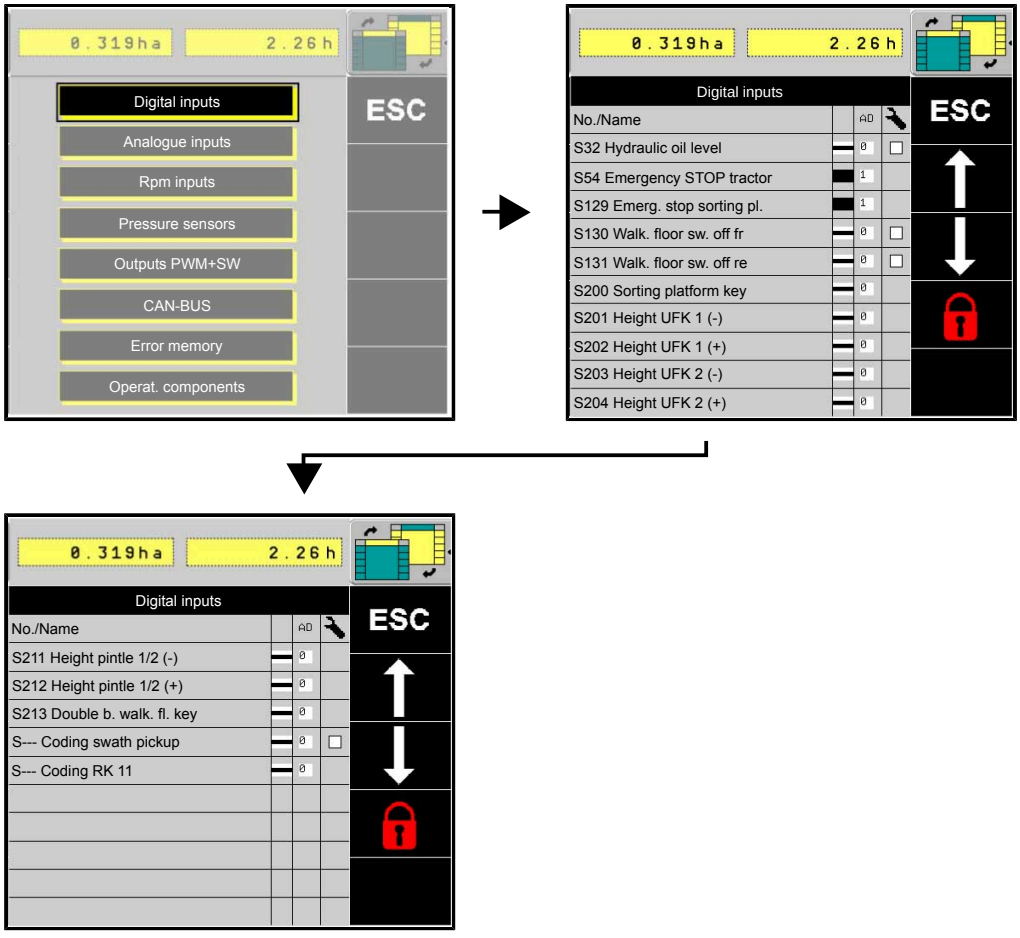
DIN	Part	Position in the machine	Comments	Item No.
A01	Computer ESR A	in the central electrics	Computer A	320078100
A07	Tractor terminal	in tractor on right	optional, standard or touch	320085000 or 320086400
A10	Lifter operating component	in tractor on right	functions for lifting	320085300
A12	Sorting platform terminal	sorting platform centre	optional, operation from sorting platform	320085100
A20	Bunker operating component	in tractor on left	functions for unloading	320085200
A34	I/O module I	right at central electrics cabinet	always installed	320082500
A35	I/O module II	left at central electrics cabinet	installed only with certain additional options	320082500

8.5.1 Overview of diagnostic menus

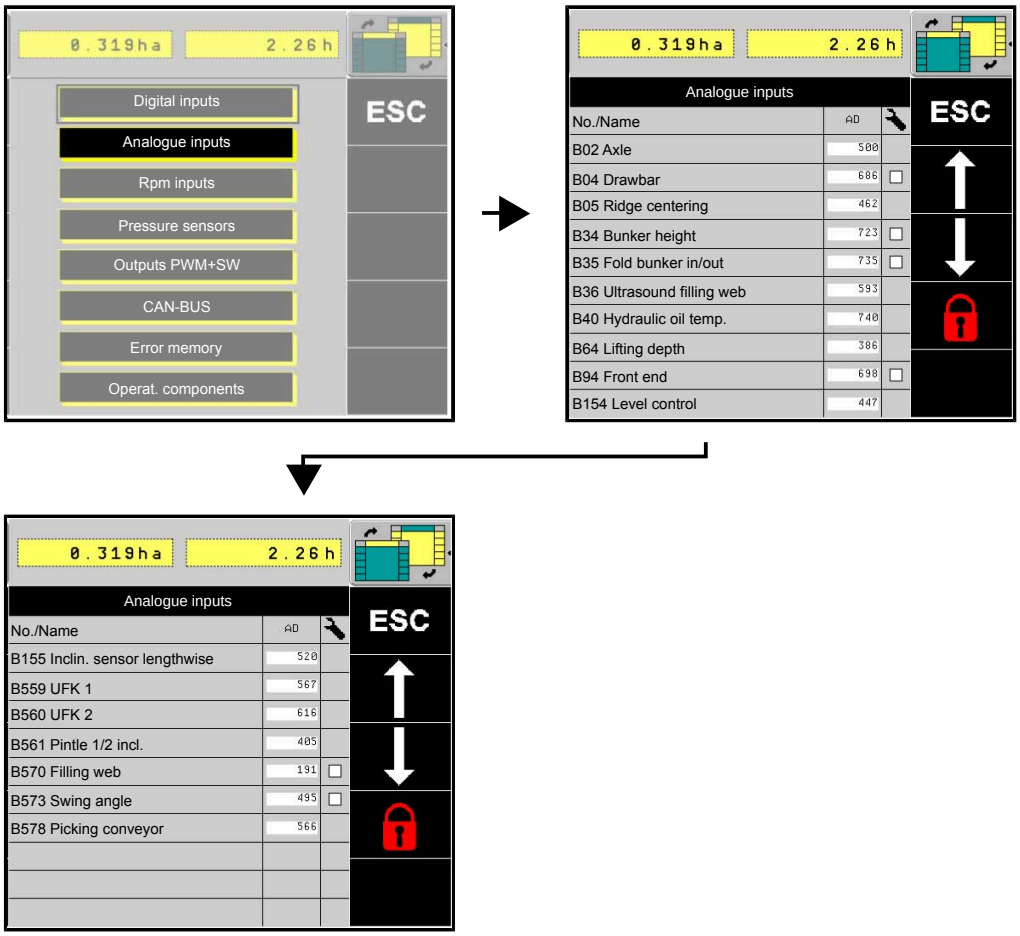


See below for illustrations of the available diagnostics menus on the tractor terminal. They facilitate malfunctions diagnostics for service personnel, if you call up the corresponding menu items after being requested by service personnel and notify the values or icons displayed to service personnel.

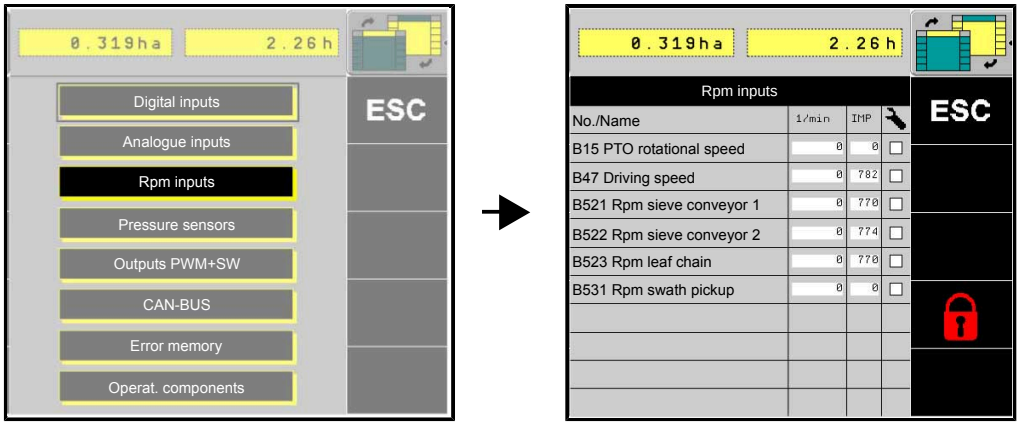
8.5.1.1 Digital inputs



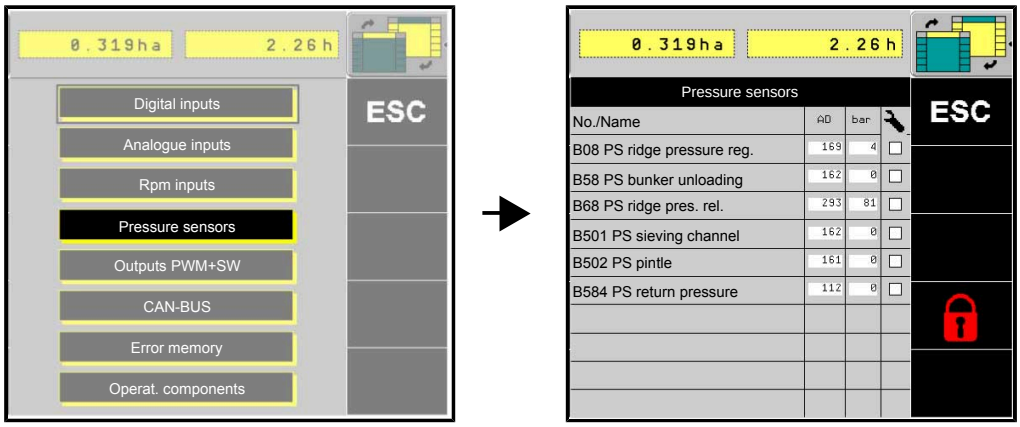
8.5.1.2 Analogue inputs



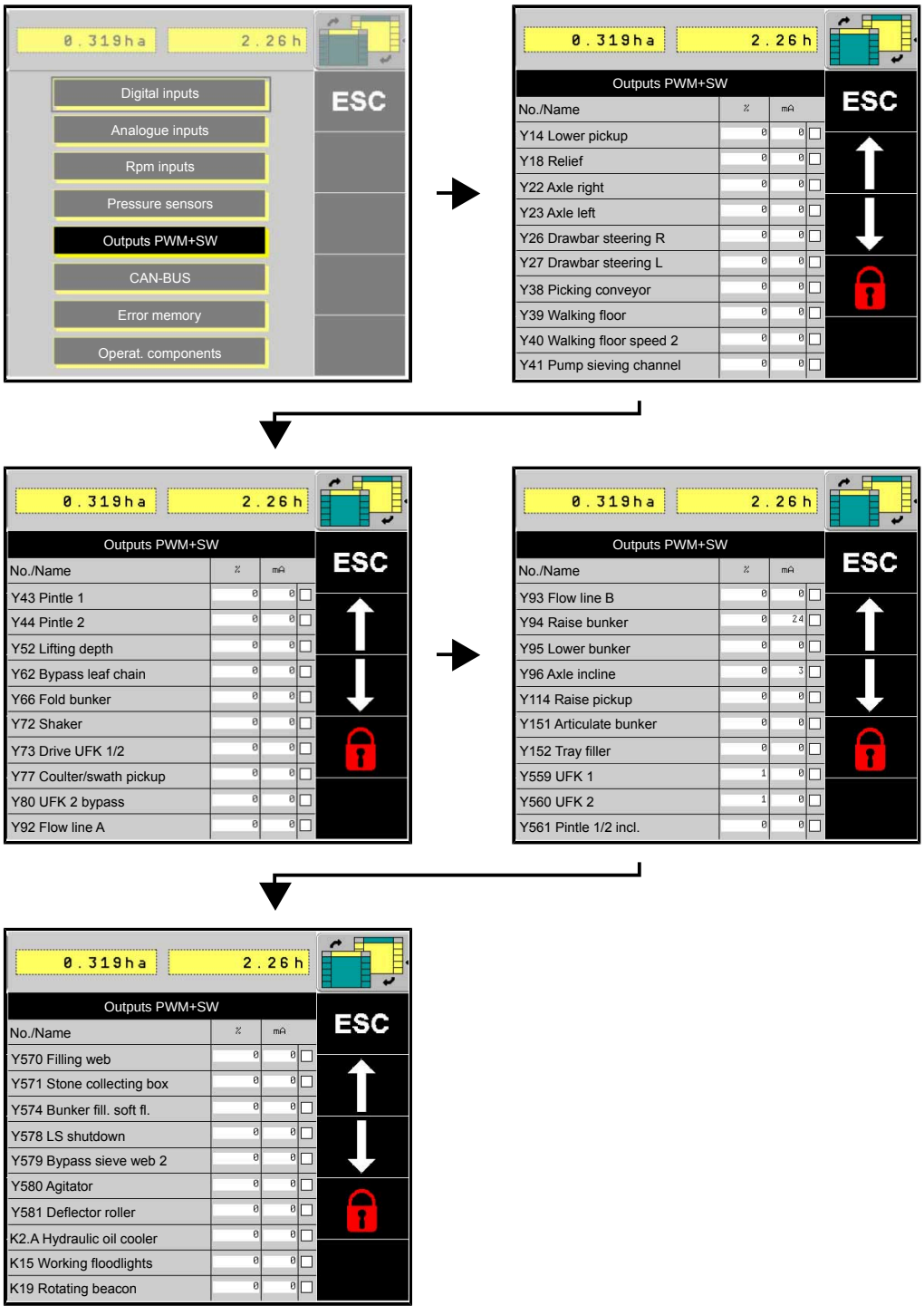
8.5.1.3 Rpm inputs



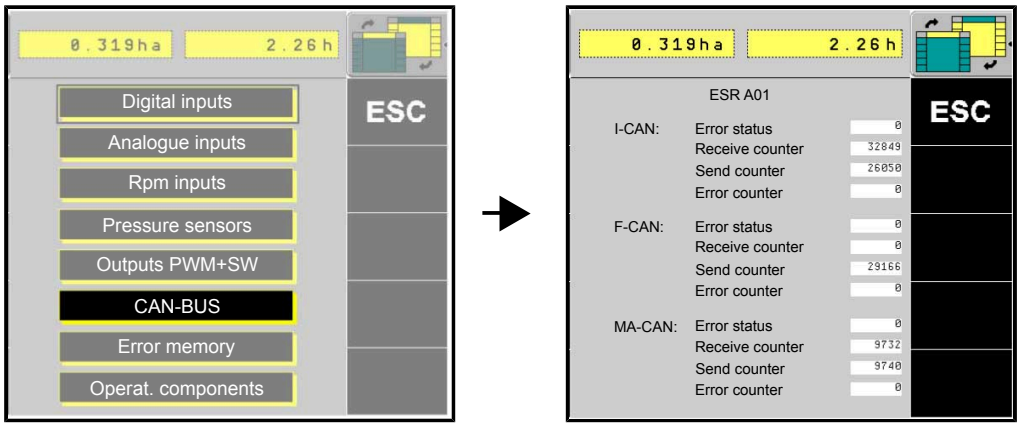
8.5.1.4 Pressure sensors



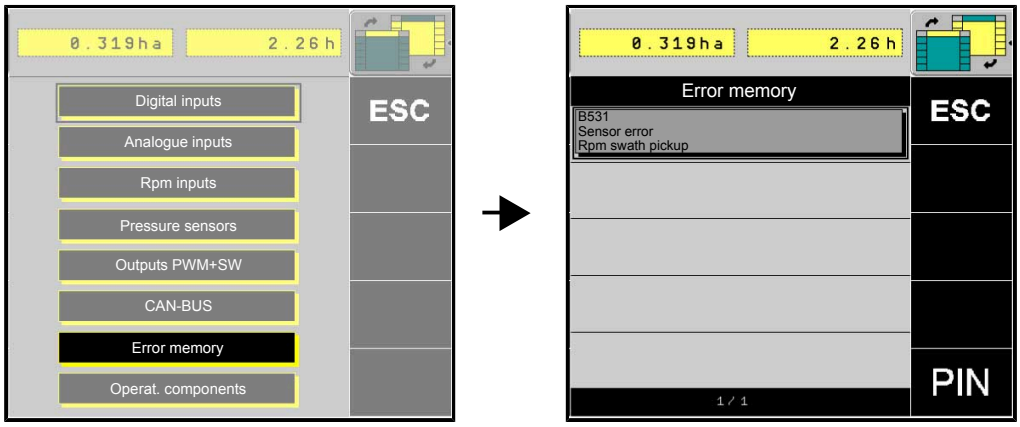
8.5.1.5 PWM + SW outputs



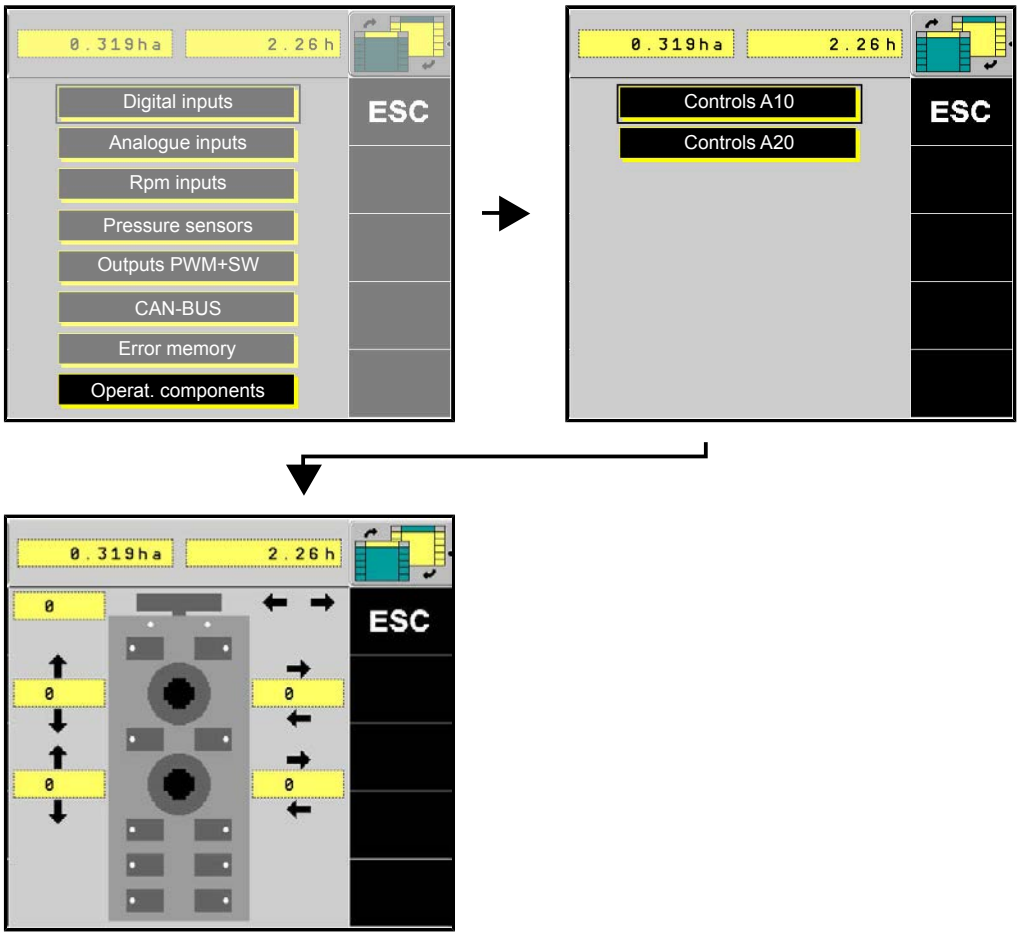
8.5.1.6 CAN-BUS



8.5.1.7 Error memory



8.5.1.8 Operating components



8.6 Welding on the machine

When welding on the machine the ISOBUS connection to the tractor must be disconnected (pull out ISOBUS plug). The ground cable of the welding transformer must be connected as close as possible to the welding position.

ATTENTION

Danger of machine damage.

Welding on the machine may only be performed by people sufficiently qualified for the respective work under the regional regulations. Welding on structural parts or parts with a safety function may only be performed after enquiry with ROPA, to the extent as it is admissible under the respective applicable regulations. All welding works may only be performed as per applicable standards and the recognized rules of engineering. Always observe the increased fire hazard when welding near combustible parts or liquids (fuel, oils, greases, tyres, etc.). We expressly point out that ROPA will not assume any warranty for damage to the machine caused by improper welding.

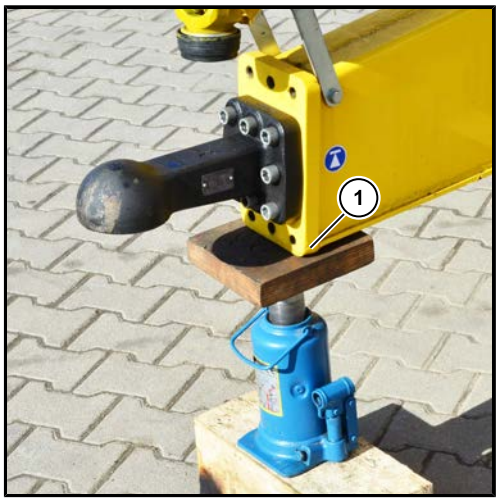
8.7 Jacking up of the vehicle

DANGER

Hazard of fatal injuries!

– For safety reasons, the vehicle must be always jacked up on one of the marked jacking points.
– In order to jack up the axle hitch the vehicle in the pulling jaw of the tractor and secure it. The vehicle may never be parked for jacking up of the axle on the support foot!

The vehicle can be jacked up at the marked points.



(1) Jacking point drawbar
(2) Jacking point axle left
(3) Jacking point axle right

ATTENTION

Danger of machine damage

When positioning the jack, make sure that no hydraulic lines or sensors in the area of the axle may be damaged.

- To jack up park the vehicle on even and sufficiently stable ground.
- Secure the vehicle against movement by setting the parking brake and placing wheel chocks. Place both wheel chocks under the wheel from front and rear on the side of the axle not to be jacked up.
- Use a jack with sufficient load capacity to lift the vehicle.
- To jack up the drawbar, position the jack under the drawbar (**1**).
- To jack up the left side of the axle, position the jack under the inner left side of the axle (**2**).
- To jack up the right side of the axle, position the jack under the inner right side of the axle (**3**).
- Once the vehicle is lifted, it has to be additionally secured with massive load bearing timbers or similar materials against crashes.

8.8 Releasing the brake manually

Working on the brake system is dangerous and may only be performed by people trained for this work and familiar with working on brake systems.

DANGER

Hazard to life due to the machine inadvertently rolling away.

– Before releasing the brake secure the machine against rolling away with both wheel chocks.
– Work on the vehicle brakes may only be performed by specialist personnel with corresponding training (e.g. motor vehicle mechanics, agricultural machinery mechanics, brake service, etc.) in compliance with the applicable safety regulations.

8.8.1 Pneumatic deactivation of brake

(1) Outlet valve/drainage valve

DANGER

– Never park the vehicle unsecured if the parking brake is released and the compressed air reservoir is drained.
– Secure the vehicle against rolling away using sufficiently large wheel chocks.
– Put in the driver's field of vision a distinctive sign with the inscription: "Danger! Machine has no functional brakes! Brakes are released.
– Keep the tractor ignition key in a secure place.

– Switch off tractor engine and secure it against inadvertent starting.
– Secure the vehicle against rolling away using the two wedges.
– Disconnect the air brake line from the tractor.
– Vent the compressed air reservoir by the drain valve or water drain valve (**1**) until the reservoir is completely depressurised.
– Check that the parking brake is completely released.
– The brake is released, the machine has no functional brakes.
– The machine may be towed to the next workshop or a secure parking place under compliance with the corresponding safety regulations.

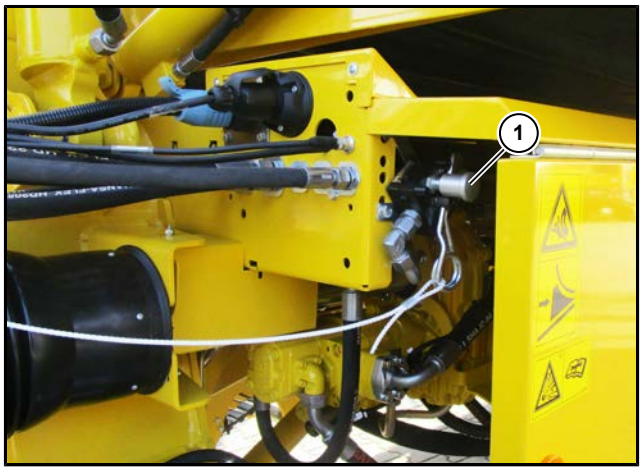
Once the repair work is completed, the brake must be activated as follows:

– Connect the air brake lines to the tractor.
– Start the tractor and wait until the brake pressure is at least 5 bar at the tractor.
– After completing all work, perform a brake test.

ADVICE

The basic setting of the brake is not affected by the emergency release process!

8.8.2 Hydraulic deactivation of brake



(1) Hydraulic brake hand pump

DANGER

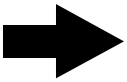
– Never park the vehicle unsecured if the parking brake is released and the pressure in the hydraulic brake line is without pressure.
– Secure the vehicle against rolling away using sufficiently large wheel chocks.
– Put in the driver's field of vision a distinctive sign with the inscription: "Danger! Machine has no functional brakes! Brakes are released.
– Keep the tractor ignition key in a secure place.

– Switch off tractor engine and secure it against inadvertent starting.
– Secure the vehicle against rolling away using the two wedges.
– Disconnect the hydraulic brake line from the tractor.
– Depressurise the brake line with hand pump (**1**) until the brakes are completely released.
– Check that the parking brake is completely released.
– The brake is released, the machine has no functional brakes.
– The machine may be towed to the next workshop or a secure parking place under compliance with the corresponding safety regulations.

Once the repair work is completed, the brake must be activated as follows:

– Connect the hydraulic brake line to the tractor.
– Start the tractor and wait until the hydraulic system on the tractor has started.
– After completing all work, perform a brake test.

ADVICE



The basic setting of the brake is not affected by the emergency release process!

8.9 Hydraulic valves

Most of the hydraulic valves are electrically controlled. Problems with solenoid valves may be detected using special test cables. These test cables may only be connected to the solenoid valves by trained and instructed specialist personnel.

Should an electrically controlled valve malfunction, then in any case, without exception, call in a specialist. Never try to shake the solenoid valve concerned to remedy possible contact problems or a possible line break. If the valve is suddenly opened during such tries, then the person concerned may suffer deadly injuries.

WARNING

Searching and remedying malfunctions on all components of the hydraulic system is exclusively the task of trained specialists. We expressly warn of tries to repair or self-performed tests on hydraulic valves under electro-magnetic control. If during such tests or tries to repair, parts of the hydraulic system are suddenly put under pressure, then this may trigger unwanted machine movement. This may pinch or even crush people or body parts.

8.10 Overview of the field settings

Sequence of operations						
Harvesting difficulty/problem		**1**	**2**	**3**	**4**
Mechanical damage		Adjust speed difference between leaf chain and sieve conveyor 2	Reduce shaker intensity	Reduce speed of sieve conveyors	Reduce height of deflector rollers and speed of pintle belt
Cut tubers	**smooth cut**	Adjust ridge centering		Disc coulter width setting	
	wavy cut	Increase lifting depth			
Loss of small tubers		Reduce height of deflector rollers	Reduce height of UFK	Reduce sieve conveyor pitch	Reduce pintle pitch
Loss of large tubers		Set leaf scraper steeper	Mount leaf removal rod	Find source of losses in the crop flow	
Loss of potatoes on trash conveyor		Reduce speed of UFK 2	Reduce speed of UFK 1	Increase speed of UFK 2	Increase speed of UFK 1
Clods/stones in crop		Reduce lifting depth	Increase height of deflector rollers and UFK	Increase speed of pintle belts with deflector roller	Reduce speed of UFK
Plant residues/leaves in the crop		Leaf scraper angle flatter	Increase height of UFK	Increase height of deflector rollers	Increase speed of pintle belts
Overload of the drive of sieve conveyors		Increase speed of sieve conveyors	Increase shaker intensity	Increase speed difference between leaf chain and sieve conveyor 2	Reduce lifting speed
Overload of the drive of pintle belts		Increase speed of sieve conveyors	Increase shaker intensity	Increase speed difference between leaf chain and sieve conveyor 2	Increase speed of pintle belts
No even soil flow in front of the ridge roller		Reduce ridge pressure	Increase depth of disc coulter		
No even soil flow on the share		Increase ridge pressure	Increase speed of sieve conveyor 1		
Crop with adhering soil		Increase speed of sieve conveyors	Increase speed difference between leaf chain and sieve conveyor 2	Increase speed of pintle belts	Reduce speed of UFK
Rolling of the crop on sieve conveyor 1		Reduce speed of sieve conveyor 1	Increase lifting speed	Increase lifting depth	

Sequence of operations				
Harvesting difficulty/problem		**5**	**6**	**Comments**
Mechanical damage		Increase lifting depth	Increase lifting speed	Try to harvest gently
				Speed of conveyors not too high
Cut tubers	**smooth cut**			Tubers are not in the middle of the ridge or grow out sideways
	wavy cut			
Loss of small tubers				If lost before pintle, reduce sieve conveyor pitch
Loss of large tubers				
Loss of potatoes on trash conveyor		Reduce speed of the last pintle		
Clods/stones in crop		Reduce ridge pressure under wet, sticky conditions		Increase the height of deflection rollers and UFK only so far that no losses occur
				Increase ridge pressure relief to reduce ridge pressure
Plant residues/leaves in the crop		Reduce speed of UFK	Increase speed of the last pintle	
Overload of the drive of sieve conveyors		Reduce lifting depth		
Overload of the drive of pintle belts		Reduce lifting speed	Reduce lifting depth	
No even soil flow in front of the ridge roller				Increase ridge pressure relief to reduce ridge pressure
				Significantly greater wear with the deeper disc coulter
No even soil flow on the share				Use of a hydraulically driven disc coulter might be reasonable
Crop with adhering soil		Increase shaker intensity		
Rolling of the crop on sieve conveyor 1				

8.11 Checklist for optimising the lifting quality/storage quality

- Tubers damaged during placement may contribute the spread of bacteria, fungal diseases and damage during unloading. This can be alleviated by heating the seed potatoes at at least 10°C and keeping the potatoes dry. At the same time safety can be increased by sorting the seed potatoes.
- The field should be clear of vegetation during harvest and the temperature of the tubers should not be below 10°C. The sensitivity of the variety must be considered. The divided harvesting process enable light potatoes with low damage and a longer storage life.
- The driving speed of the lifter should as high as sufficient for smooth operation of the separating equipment and to allow requirements for cleanliness to be maintained.
- The rotary speeds of the sieving and separating equipment should be as low as possible. The potatoes should be rolled with the trash as little as possible.
- The potatoes must never jump around on the sieve conveyors. Careful operation of the shaker equipment is very important, the more so the steeper the sieve conveyor, the more stones are present and less accuracy possible with the shaker equipment.
- The correct adjustment and presence of protective equipment should be checked frequently during lifting.
- The fall height should not exceed 25 cm wherever potatoes are transported singly or in small quantities. If the fall heights are greater, the potatoes must fall on padded material or other potatoes.
- Every variety of freshly lifted and cold potatoes may cause further damage and will affect storage capacity.
- External damage in the form of loose skins, cracks and flesh damage along with overventilation and uncontrolled movement of air will cause increased drying of tubers in storage. This will cause pressure points that may result in internal discoloration during preparation. Adequate heating may reduce this effect.
- All impact points must be padded to keep the fall stages and fall height as low as possible. The best case is potatoes falling on other potatoes.

9 Lists/Tables/Plans/ Diagrams/Maintenance Verification

9.1 Lubricating and operating supplies

Component	Lubricant type	Fill. volume in litres	Intervals
Hydraulic system	**Hydraulic fluid HVLP 46** (containing zinc) ISO-VG 46 as per DIN51524 part 3	approx. 70	annually
Pump distributor gears	**Gear oil** API GL 5, SAE 90	approx. 1.4	
Hydraulic disc coulter gears		approx. 0.6	
Swath pickup gears		approx. 0.4	
Bunker drive chains	Gear oil or grease		every 100 operat. hours
Bunker walking floor chains	**Chain oil** FDA guideline 21 CFR 178.3570		daily if required
Lubricating points	**Grease** as per DIN 51825, NLGI Class 2, Type: KP2K-20, at low outside temperatures KP2K-30		according to lubricating plan

The oil level control bolts and inspection glasses are decisive for the filling volumes!

Note the standards and approvals in our recoding table (*See Page 391*).

9.2 Maintenance table

Maintenance work	before starting harvest	daily	after the first 50oper. hrs.	Maintenance interval every 50 oper. hrs.	when needed	annually
Pump distributor gears						
Visual inspection of PDG for perspiration	X	X				
Change oil	X		X			X
Hydraulic disc coulter gears left and right						
Check oil level	X	X				
Change oil	X		X			X
Swath pickup gears						
Visual inspection of gear housing for perspiration	X	X				
Change oil	X					X
Hydraulic system						
Clean hydraulic fluid cooler	X	X			X	
Check oil level	X	X				
Change machine hydraulic fluid	X					X
Clean intake sieves inside the fluid tank	every 2 years					
Change return filter	X		X		X	X
Change tractor hydraulic system pressure filter element	X		X		X	X
Exchange filling cap hydraulic fluid tank (ventilation and bleeding filter)	every 2 years					
Check hydraulic lines for damage and chafe marks	X		X			X
Pneumatics						
Drain water from the air reservoir				X		
Sieve conveyor 1						
Check condition of drive rollers		X				
Check condition of rubber paddle roller		X				
Check condition of support rollers, deflector rollers and wipers		X				

Maintenance work	before starting harvest	daily	after the first 50oper. hrs.	Maintenance interval every 50 oper. hrs.	when needed	annually
Check condition of bushings and locks				X		
Retension sieve conveyor 1					X	
Sieve conveyor 2						
Check condition of drive rollers		X				
Check condition of rubber paddle roller		X				
Check condition of support rollers, deflector rollers and wipers		X				
Retension sieve conveyor 2					X	
Leaf chain						
Check condition of drive rollers		X				
Check condition of support rollers, deflector rollers and wipers		X				
Retension leaf chain					X	
Pintle belt 1 with deflector roller 1						
Check condition of drive rollers		X				
Check condition of support rollers and deflector rollers		X				
Check condition of bushings and locks				X		
Retension pintle belt 1					X	
Pintle belt 2 with UFK and deflector roller 2						
Check condition of drive rollers		X				
Check condition of support rollers and deflector rollers		X				
Check condition of bushings and locks				X		
Retension pintle belt 2 and UFK					X	
Picking conveyor, sorting, bunker filling conveyor, sorting conveyor, trash conveyor, trash return conveyor and collection box walking floor						
Check condition of drive rollers		X				
Check condition of support rollers and deflector rollers		X				

Maintenance work	before starting harvest	daily	after the first 50oper. hrs.	Maintenance interval every 50 oper. hrs.	when needed	annually
Check condition of bushings and locks				X		
Retension conveyors					X	
Oil/grease sorting drive chain	every 100 oper. hrs.					
Bunker walking floor						
Check tension walking floor chains, tighten if necessary	X			X		
Check tension of drive chains, tighten if necessary	every 100 oper. hrs.					
Oil/grease drive chains	every 100 oper. hrs.					
Check and oil/grease bunker walking floor chains		X			X	
Bunker walking floor, all chains/belts, rest of machine						
Remove soiling and sticking dirt		X			X	
Grease lubricating points	according to lubricating plan					
Retighten wheel bolts 510 Nm	after the first 10, then after the first 50 and then every 50 oper. hrs.					
Check tyre pressure	X			X		
Check brakes and readjust if necessary						X

9.3 Lubricating plan (lubrication with grease gun)

Lubricating point	Number of nipples	every oper. hours
Cardan shafts		
Tractor to machine	see attached manual of the cardan shaft manufacturer	
Drawbar		
Drawbar eye ball (optional)	1	8
Drawbar eye Cuna (option)	1	8
Drawbar cylinder	2	40
Drawbar pin	2	40
Axle		
Inclination cylinder (option)	2	40
Stub axle left/right	10	40
Pickup		
Lift arm front / rear	4	annually
Ridge roller bearing	2	annually
Swath pickup with lifting shaft and cover belt	2	40
Sieving channel/leaf separation		
Shaker bearing	2	100
Shaker drive	3	100
Drive shaft sieve conveyor 1	1	100
Drive shaft sieve conveyor 2	1	100
Drive shaft leaf chain	1	100
Transfer shaft leaf chain	2	100
Separation		
Pintle belts drive shafts	2	100
Rotating finger comb drive shafts	2	100
Drive shaft picking conveyor	1	100
Drive shaft bunker filling conveyor with sorting (option)	1	100
Drive shaft sorting conveyor (double bunker)	1	100
Drive shaft trash conveyor	1	100
Drive shaft trash return conveyor (option)	1	100
Collection box (option)	1	100
Potato crusher (option)	2	100
Cylinder(s) separation belt frame height pintle 1/2	2	40
Bunker		
Drive shaft walking floor (standard bunker)	2	100

Lubricating point	Number of nipples	every oper. hours
Drive shafts walking floor (double bunker)	4	100
Bunker coupling	8	annually
Cylinder lift bunker	4	annually
Cylinder fold bunker	4	annually
Cylinder bunker articulation (option)	4	annually

ADVICE

All lubricating points must also be lubricated after each washing of the machine.

Grease ROPA item no. 435006200

as per DIN 51825, NLGI-class 2, type: KP2K-20,

at low outdoor temperatures KP2K-30.

No lubricating greases containing solid lubricants may be employed. Biologically degradable greases are also admissible.

9.4 Lubricant recoding table

Status: **2019-02-20**	**Hydraulic oil HVLP 46** (containing zinc) ISO-VG 46 as per DIN 51524 part 3	**Gear oil** API GL 5, SAE 90	**Grease** as per DIN 51825, NLGI-class 2, type: KP2K-20, at low outdoor temperatures KP2K-30	**Chain oil** FDA directive 21 CFR 178.3570
ROPA marking **ROPA item no.:** Container size:	**ROPA hydroFluid HVLP 46** **435001210** = 20 l **435001230** = 208 l **435001240** = 1000 l	**ROPA gearOil GL5 90** **435002010** = 20 l **435002020** = 60 l **435002030** = 208 l	**435006200** = 18 kg **435002300** = 25 kg	**435015100** = 5 l
	Designation of manufacturer			
Aral	No approval for this manufacturer's products! No zinc-containing oils.	Hyp SAE 85W-90	Aralub HLP 2	
Agip/Eni	Agip ARNICA 46	Agip ROTRA MP	Agip GR-MU/EP	
Avia	AVIA FLUID HVI 46	AVIA HYPOID 90 EP	AVIALITH 2 EP	AVIAFOOD CHAIN E 150
BP	Energol SHF- HV 46	Energear Hypo90	Energrease LS-EP2	
Castrol	Hyspin AWH-M 46	Axle EPX 85W-90	Spheerol EPL 2	
Fuchs	Renolin B 46 HVI	TITAN GEAR HYP SAE 90	RENOLIT MP	
LIQUI MOLY	Hydraulic oil HVLP 46	Hypoid gear oil (GL 5) SAE 85W-90	Roller bearing grease KP2K-30	
Mobil	Univis N46	Mobilube HD-A 85W-90	Mobilux EP 2	
Shell	Tellus S2 VX 46	Spirax S3 AD 80W-90	Gadus S2 V220 2	
Total	Equivis ZS 46	EP-B 85W-90	Multis EP 2	
Rhenus			r. grea Norlith MZP 2	

9.5 Filter cartridges

Hydraulics	**ROPA item no.**
Return filter in oil tank	270071500
Tractor hydraulic system high-pressure filter element Including O-ring 79*3, ROPA item no. 412045500	270043000
Filling lid with integrated ventilation/bleeding filter	270070000
Suction filter in oil tank 1/2" AS 010-00	270000900
Suction filter in oil tank 1 1/4" AS 060-01	270007600
Suction filter in oil tank 1 1/2" AS 080-01	270054700

9.6 Torque table for screws and nuts (Nm)

Metric thread DIN 13				
Dimension	**6.9**	**8.8**	**10.9**	**12.9**
M4	2.4	3.0	4.4	5.1
M5	5.0	5.9	8.7	10
M6	8.5	10	15	18
M8	21	25	36	43
M10	41	49	72	84
M12	72	85	125	145
M14	115	135	200	235
M16	180	210	310	365
M18	245	300	430	500
M20	345	425	610	710
M22	465	580	820	960
M24	600	730	1050	1220
M27	890	1100	1550	1800
M30	1200	1450	2100	2450

Metric fine thread DIN 13				
Dimension	**6.9**	**8.8**	**10.9**	**12.9**
M8x1	23	27	39	46
M10x1	43	52	76	90
M12x1,5	76	89	130	155
M14x1,5	125	145	215	255
M16x1,5	190	225	330	390
M18x1,5	275	340	485	570
M20x1,5	385	475	680	790
M22x1,5	520	630	900	1050

Tightening torque wheel nuts

Wheels	510 Nm

9.7 Maintenance verification

9.7.1 Maintenance verification oil change + filter exchange

	Date:	**Date:**	**Date:**	**Date:**	**Date:**
	Oper.hrs.	**Oper.hrs.**	**Oper.hrs.**	**Oper.hrs.**	**Oper.hrs.**
	ok	**ok**	**ok**	**ok**	**ok**
Pump distributor gears					
Gear oil					
Hydraulic disc coulter gears					
Gear oil					
Swath pickup gears					
Gear oil					
Hydraulic oil					
Hydraulic oil					
Tractor hydraulic system pressure filter element					
Return filter element					
Intake sieves inside the oil tank cleaned					

9.7.2 Maintenance confirmation

Maintenance after **Plan 50 oper. hrs.**		**1st customer service ROPA machine**
May only be performed by ROPA Service Team be	**completely performed on:**	
	performed by:	
	Signature:	_____

9.7.3 Software updates

Version	Date	Name

9.8 Confirmation about instructions given to the driver

Mrs/Mr ..... date of birth .....

Last name and first name

Was instructed on .....

☐ about safe handling of the machine

☐ about maintenance of the machine

from ..... by.

Last name and first name

Has demonstrated the required knowledge

☐ for safe handling of the machine

☐ for maintenance of the machine

by presenting the following documents:

Certificate/testimonial of (date)

Certificate/testimonial of (date)

She/he was given instructions by (last name and first name) ..... on (date) .....

about the specific obligation of safe driving of the machine and the associated requirements. Subjects of these instructions were: The chapter driving on roads of the operating manual of the machine, the applicable safety regulations and the specific requirements of the road traffic authority, in whose jurisdiction the machine is to be moved.

I hereby confirm that I have given the above mentioned instructions to their full extent:

Signature

I hereby confirm that I have received the above mentioned instructions for their full extent and have understood them:

Signature of the operator

I have received, read and understood the operating instructions:

Place and date .....

Signature of the vehicle owner .....

Signature of the operator .....

9.9 Safety instructions

Even though all ROPA machines are engineered and manufactured with safety in mind, there are generally certain danger zones on all potato harvesters, where people are not permitted to be present under any circumstances during operation. The operator is strictly obliged to immediately cease operation of the machine as soon as people enter these hazard zones.

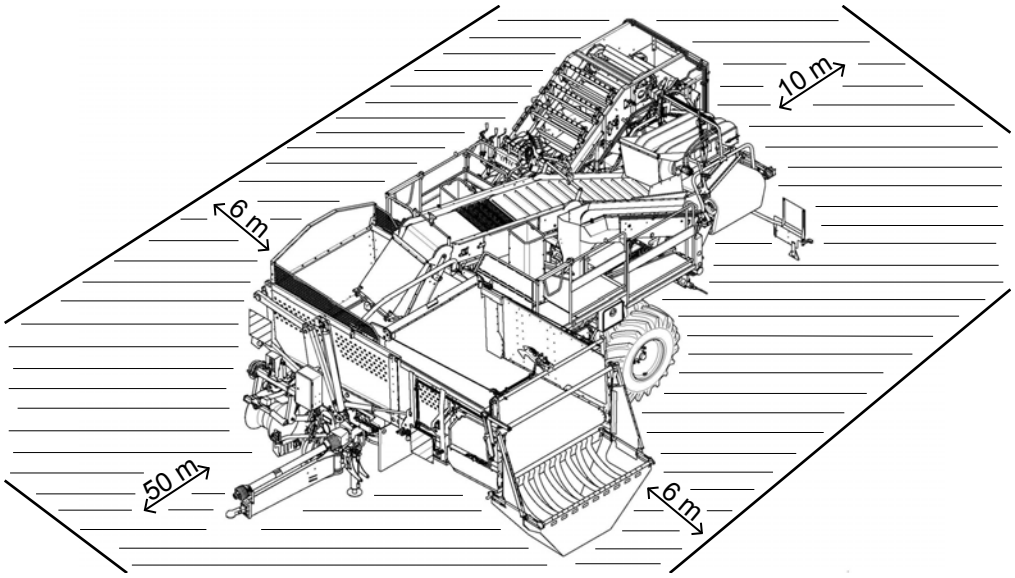
WARNING

When people enter the zones around the ROPA **Keiler 1**, that are designated as danger zones in the following illustration while the machine is lifting, they are at risk of very serious injury or or even fatal injury. The draft below shows these zones shaded.

- In any case, follow the instructions of the machine operator.
- Never enter the hazard zones!
- Should you have entered a hazard zone by mistake, then immediately and speedily leave this hazard zone, but without excessive haste.
- Keep minors and senior citizens away from the operating machine.

In detail, the following areas are deemed hazard zones:

- To the left and right up to a distance of **6 metres** from the outside edges of the machine.
- Behind the machine, **10 metres** from the rear edge of the machine.
- Front **50 metres** from the front of the tractor.



Please always make sure that during lifting there are no persons in front of the operating machine.

Statement

I (last name and first name) _____

have been informed by the owner about the danger zones and safety aspects of the Keiler during harvesting. I have completely received this information and understood it. I agree not to enter the hazard zones as long as the machine is running in lifting operation. I have been informed that I must immediately leave these hazard zones when I am directly requested to or by horn signals of the machine operator.

_____

Date/signature

Please copy this form before completing it!

9.10 ROPA Handover confirmation

ROPA Fahrzeug- und Maschinenbau GmbH, Sittelsdorf 24, D-84097 Herrngiersdorf

Support point address:	Chassis number:
	Type:
	Sub device no.:
	Type:
	Sub device no.:
	Type:
	Sub device no.:
	Type:
	Sub device no.:
	Type:
Client's address:	
	Owner:
	Email:
	Phone:
	Mobile phone:

Handover confirmation: First use date:

No deficiencies were found during the test run. The safe operation and maintenance were explained to me. I was informed about the chapter safety in the operating manual. The following items were handed to me together with the machine:

Document number: **Designation:** **Software:**

☒

Date/Signature of client or his representative

Support point or representative for machine delivery:

The machine has been handed over to the client in perfect condition. The handover has been executed correctly.

☒

Date / Signature of support point or representative for machine delivery

Voluntary data processing consent:

I agree that the above personal data as well as further information about me, which becomes known in connection with business relations, for purposes of customer service, customer survey and related to me as a customer (by phone, e-mail or via an Internet entry page), as well as for any other advertising, consulting and information purposes (written, by phone or e-mail) about products and services can be received by the ROPA support point and/or ROPA, or passed on to ROPA, as well as stored, processed and used. The non-granting of the consent does not effect on the delivery of the purchased item or services. You can, if desired, partially strike out this consent. Your consent can be revoked at any time in writing to the ROPA support point or the company ROPA.

Date/Signature of client or his representative

9.11 ROPA First Use Record

ROPA Fahrzeug- und Maschinenbau GmbH, Sittelsdorf 24, D-84097 Herrngiersdorf

ROPA partner:

Customer / site of operation:

Chassis No.:

Operating hours:

Machine type:

Lifting/loading hours:

Software version:

Harvested area:

Record:

Any customer complaints:

The safe operation and maintenance were explained to the customer.
The customer was informed about the chapter safety in the operating manual.

Date	Signature of mechanic	Signature of customer

10 Index

"

"Road" operating mode..... 149

A

Adding hydraulic fluid..... 308
Adjusting the drawbar eye..... 80
Adjustment of the cardan shaft..... 85
Adjustment of the hydraulic system..... 85
Agitator..... 198, 327
Air brake..... 144
Analogue inputs..... 369
Articulated bunker section..... 282
Axle steering..... 151

B

Big Bag device..... 284
Boarding steps..... 33
Braking system..... 144
Bunker..... 265, 351
Bunker filling..... 271
Bunker filling conveyor..... 270
Bunker filling conveyor and double bunker sorting conveyor..... 276
Bunker floor..... 285
Bunker folding section..... 266
Bunker operating component..... 68
Bunker unloading..... 281
Bunker walking floor..... 269, 351

C

CAN-BUS..... 372
CE compliant..... 23
Chassis..... 154
Collection box..... 262, 347
Compressed air reservoir..... 293
Compressed air system..... 293
Control unit above picking conveyor..... 71
Coupling machine..... 138

D

Declaration of Conformity..... 18
Deflector roller 1..... 226, 338
Deflector roller 2..... 237, 341
Diagnostic menu..... 368
Digital inputs..... 368
Disc coulter..... 175, 318
Dismantling..... 357
Double bunker..... 274
Double bunker filling..... 278
Double bunker tray filler..... 287
Double bunker unloading..... 286
Double bunker walking floor..... 275
Drawbar..... 188
Drawbar steering..... 150

E

Electrics..... 298, 362
Error memory..... 372
ESC key..... 114
Extended documentation..... 19

F

Field operating mode..... 149
Field operation menu..... 98
Filter list..... 392
first aid..... 33
First startup..... 79
First Use Record..... 401
Folding mode menu..... 100
Foreseeable misuse..... 26
Fuses..... 362, 363

G

General overview..... 45
General symbols and instructions..... 24

H

Handover confirmation..... 399
Hazards caused by electricity..... 35
Hazards caused by electromagnetic influences.... 34
Hazards caused by hot substances/surfaces..... 37
Hazards caused by mechanical influences..... 34
Hazards caused by noise..... 36
Hazards caused by pneumatic system..... 37
Hazards caused by process materials..... 36
Hazards caused by the hydraulic system..... 37
Hazard zone..... 27
Health protection..... 32
Hydraulic deactivation of brake..... 377
Hydraulic disc coulter..... 319
Hydraulic fluid tank..... 307
Hydraulic service brake..... 147
Hydraulic system..... 290, 305
Hydraulic valves..... 379

I

Immobiliser..... 41
Installing the electrics on the tractor..... 87
instructions given to the driver..... 396

J

Jacking up of the vehicle..... 374

L

Large double bunker floor..... 288
Leaf chain..... 214, 331
Leaf loading roller..... 179, 320
Leaf scraper..... 218, 335
Leakage..... 39
Left ladder..... 61
Lifter operating component..... 66
Lifting..... 158
Lifting depth..... 168
Locking pickup..... 161
Locks..... 350
Low-loader transport..... 52
Lubricant recoding table..... 391
Lubricating plan..... 389

M

Machine controls..... 71
Machine terminal..... 131
Machine terminal display areas..... 132
Main menu..... 114
Maintenance and service..... 300
Maintenance verification..... 394
Malfunction and remedies..... 358
Manual conveyors menu..... 112
Manufacturer..... 13
Modifications and alterations..... 39

N

Name plate and important data..... 15
Number plate..... 86

O

Obligations of the entrepreneur..... 23
old parts..... 34
Operating and maintenance personnel..... 33
Operating components..... 373
Operating components of the left sorting platform 73
Operating components of the right sorting platform..... 72
Operating concept with ISOBUS..... 92
Overhead power lines..... 90
Overview of the field settings..... 380

P

Parking brake..... 148, 376
Personal protective equipment..... 38
Phone Customer Service..... 13
Phone Spare Parts Service..... 13
Picking conveyor..... 255, 343
Picking table menu..... 112
Pickup menu..... 101
Pickup model for carrots..... 184
Pintle belt 1..... 221, 336
Pintle belt 1/2 inclination..... 245, 341
Pintle belt 2..... 232, 339
Pintle belts synchronous adjustment..... 250
Pneumatic deactivation of brake..... 376
Pneumatic system..... 315
Potato crusher..... 263, 348
Preface..... 13
Pressure sensors..... 370
Proper use..... 26
Protective equipment..... 40
Pull-off rods..... 220
Pump distributor gears..... 289, 304
PWM + SW outputs..... 371

R

Raising and lowering bunker..... 268
Readjusting thresholds..... 126
Relay list..... 365
Replacing pressure filter element..... 312
Replacing return filter element..... 310
Reset key..... 114
Residual risks..... 34
Ridge centring..... 163
Ridge pickup..... 162, 316
Ridge pressure regulation..... 171
Ridge pressure relief..... 185
Ridge roller..... 162, 316
Right ladder..... 62
Road travel..... 142
Rotating finger comb (UFK)..... 238, 342
Rpm inputs..... 369
Rubber paddle roller..... 213, 330

S

Safety..... 20
Safety circuits..... 361
Safety instructions..... 397
Safety regulations for operation of the machine... 89
Safety signs..... 25
Safety stickers..... 29
Scope of delivery..... 58
Separation menu..... 108
Setting row distance..... 180
Shaker..... 195, 326
Shares..... 166, 317
Ship transport..... 52
Shutdown..... 299
Shutdown for an extended period..... 357
Sieve conveyor 1..... 190, 323
Sieve conveyor 1 cleaning roller..... 194
Sieve conveyor 2..... 201, 327
Sieve conveyors automatic function..... 208
Sieve conveyors synchronous adjustment..... 205
Sieving channel menu..... 105
Slope compensation..... 154

Software updates..... 395
Sorting container..... 261
Sorting conveyor with double bunker..... 346
Spare parts..... 13
Stability with the side-driven harvester..... 38
Status indicators of automatic functions..... 130
Sunroof/weather protection roof..... 157
Support foot..... 137
Swath pickup..... 320
Swath pickup gears..... 322
Swath pickup model with lifting shaft and cover belt..... 180
Swath pickup with shares..... 183

T

Task Controller basic (option)..... 93
Technical data..... 48
Thresholds..... 128
Torque table for screws and nuts..... 393
Tractor terminal..... 65, 92
Tractor terminal display areas..... 94
Transport draft..... 51
Trash conveyor..... 259, 344
Trash return..... 260
Trash return conveyor..... 345
Tray filler..... 283
Troubleshooting with the tractor terminal..... 367
Tyre pressure..... 50

U

Ultrasound sensor..... 351
Uncoupling machine..... 141

V

Video system..... 294
Voltage monitoring..... 298

W

Welding on the machine..... 374
Wheel chocks..... 79