Fully automatic towing hitch

RO Star 50 E
Contents

1 General
   Validity and binding character ... 3
   Copyright ................................ 4
   Emphasis in the text .................. 4
   Tools ......................................... 5
   Direction information ................. 5
   Function test ............................. 5
   Safety instructions ..................... 6
   Environmental protection .............. 6

2 Troubleshooting
   Faults in the towing hitch ........... 7
   Faults in the pneumatic remote control ................. 8

3 Preparation
   Releasing the system pressure .. 10

4 Repair work
   4.1 Automatic unit ............... 11
       Complete automatic unit, hitching pin, locking device ............. 11
       Hand lever ......................... 13
       Release pin ........................ 14

   4.2 Funnel .......................... 15
       Support ring ........................ 15
       Funnel reset and funnel .......... 16
       Checking the funnel centring and arrest ......................... 18

   4.3 Bushes ......................... 19
       Upper bush ......................... 19
       Lower bush ......................... 20

   4.4 Bearing ....................... 21
       Removing the towing hitch ...... 21
       Replacing the rubber springs and bearings ................... 22
       Installing the towing hitch ...... 24

   4.5 Pneumatic remote control (upgrade kit) .......... 26
       Actuator unit ........................ 26
       Complete control unit ............. 28
       Filter .................................. 29

   4.6 Function test .................... 30

5 Annex
   5.1 Spare parts .................. 31
       Towing hitch ......................... 31
       Pneumatic remote control upgrade kit ................. 32

   5.2 Tightening torques .................. 33
       Towing hitch ......................... 33
       Pneumatic remote control upgrade kit ................. 34

   5.3 Wear limits .................. 35
       Hitching pin and towing eye ..... 35
       Support ring and bushes ........ 36
       Bearing ............................. 37

   5.4 Lubrication instructions .... 38
       Towing hitch ......................... 38
Validity and application

Contents of these instructions

These repair instructions refer exclusively to the towing hitch RO·50 E. The instructions serve as the basis for the correct execution of all the main maintenance work.

- Repair work must be carried out in accordance with these instructions
- When replacing individual parts or assemblies, only use original spare parts from ROCKINGER

If lubricant is supplied with a spare part:
- Only use the supplied lubricant in accordance with these instructions
- If the original lubricant is lost, only use lubricants from the same manufacturer and of the same type

If fastening elements, e.g. bolts, are supplied with a spare part:
- Dispose of the old fastening elements
- Use the supplied fastening elements

Technical status

The information in these instructions is valid as of technical status 0.

For the technical status of the towing hitch, see the type plate [1]: The 9th digit of the article number designates the technical status (arrow).

ROCKINGER reserves the right:
- to make alterations to the design and the components and, instead of the stated components, to use other equivalent components in the interests of technical progress
- to alter information in these instructions

ROCKINGER is not obliged to extend these alterations to towing hitches supplied at an earlier date.
Liability

ROCKINGER assumes no guarantee for the completeness and correctness of the information. No claims can be derived from the contents of the instructions and, in particular, no liability is assumed for damages which result from incorrect repair or maintenance.

Copyright

All rights to these instructions and its annexes are held by ROCKINGER.

Emphasis in the text

Legend

In the interests of readability and clarity, different types of information are marked accordingly.

Sentences starting with an arrow contain instructions on how to proceed:

⇒ Always carry out the instructions successively in the order given

The following information is introduced by a dash:

– lists
– conditions for the subsequently described actions
– descriptions of preceding work steps
– descriptions of statuses

Warnings of hazards and risks

Important text passages which must always be observed are especially emphasised:

HAZARD!

 Warns against direct hazards which could lead to serious injury or death.
⇒ Provides instructions for the prevention or avoidance of hazards

WARNING!

Indicates risks which could lead to serious injury or death.
⇒ Requires safety measures to protect the persons concerned

CAUTION!

Indicates risks which could lead to material damage or personal injury (minor injuries).
⇒ Provides instructions for the prevention of damage

Pictures

As necessary, texts are illustrated with pictures. The reference to a picture is given by a picture number in [square brackets]. Capital letters after a picture number, e.g. [12A], refer to the corresponding item in the picture.

Binding instructions

LUBRICANTS:

– Lubricants for the previously described activity

TIGHTENING TORQUES:

– Tightening torques for the listed bolted connections

Additional information

The information symbol refers to instructions and recommendations as well as additional information.

TOOLS:

– List of the tools required for the subsequently described activities
Tools
For the work described in these instructions, the following tools are required:
- Allen key 6 mm
- Allen key M10
- Ring or open-end spanner SW 8
- Ring or open-end spanner SW 11
- Ring or open-end spanner SW 13
- Ring or open-end spanner SW 14
- Ring or open-end spanner SW 15
- Ring or open-end spanner SW 24
- 2 x spanners SW 27
- Socket spanner SW 15
- Socket spanner SW 70
- Small slotted screwdriver
- Long-nose pliers
- Wire cutter
- Socket 4.5 mm with extension
- Hammer
- Chisel
- Split pin driver
- Suitable tool for pressing bushes in and out
- Locking plate [2A] for indicator pin, Part no. ROE65632
- Installation aid [2B] for hand lever, Part no. ROE25614
- Assembly plug [2C] for lock, Part no. ROE84001

Direction information
Direction information is standardised throughout the text. To establish the directions, see Fig. [3].

Function test
After every repair, before starting up the towing hitch:
→ Carry out a function test; Section 4.6

[2] A Locking plate for indicator pin, Part no. ROE65632
     B Installation jig for hand lever, Part no. ROE25614
     C Assembly plug for lock, Part no. ROE84001

[3] Direction data
- X to the right
- Y to the back
- Z upwards
- -X to the left
- -Y to the front
- -Z downwards
Safety instructions

**WARNING!**
Incorrectly executed repair work can lead to serious accidents!

- Safe operation of the towing hitch is only possible if all repair work is carried out exclusively by qualified personnel
- Only carry out repairs to the towing hitch in accordance with these instructions
- All screwed connections must be tightened with the specified tightening torque. Where specified, use locking washers
- Only use original ROCKINGER spare parts
- Only use the towing hitch in a technically perfect condition
- Observe further documentation: Installation instructions for the towing hitch and the existing accessories, operating instructions for the traction vehicle and the trailer

**WARNING!**
Risk of accident due to incorrect modification! Towing hitches are vehicle parts subject to the highest possible safety requirements.

- ROCKINGER cannot assume any guarantee for the towing hitch if the customer has allowed unauthorised modifications or changes
- Unapproved modifications or changes will invalidate the type approval
- Only use original ROCKINGER accessories which are suitable for the respective towing hitch
- Never make any other modifications or changes to the towing hitch

**WARNING!**
Careless behaviour can lead to work accidents or work-related illnesses!

- Wear the appropriate protective clothing, e.g. work gloves when doing work which requires a high exertion of strength or handling articles with sharp edges
- When handling flammable materials, make sure to avoid naked flame and sparks. Do not smoke
- Observe all the relevant guidelines and regulations
  - E.g. Regulations for health and safety in vehicle maintenance, GUV 17.1 (in Germany)
  - Operating materials such as cleaning agents or lubricants can endanger health
- Always observe the instructions, work and safety regulations of the manufacturer

Environmental protection

- Only store operating materials and cleaning agents in suitable containers
- When disposing of old cleaning agents, operating materials and items which have come into contact with these (e.g. rags), always observe the statutory environmental protection regulations
- Bring old cleaning agents and operating materials to collection points. Do not release them into rivers or lakes, the public sewage system or the soil
- Dispose of replaced parts and packaging of spare parts in an environmentally friendly manner
## Faults in the towing hitch

For wear dimensions, see annex, Section 5.3 Wear limits

<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible causes</th>
<th>Remedy</th>
<th>see Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic hitch will not close</td>
<td>Lower bush dirty</td>
<td>➔ Remove dirt</td>
<td>4.3 Bushes – lower bush</td>
</tr>
<tr>
<td></td>
<td>Automatic unit overgreased</td>
<td>➔ Remove grease</td>
<td>4.1 Automatic unit, complete</td>
</tr>
<tr>
<td></td>
<td>Remote control is at position &quot;open&quot;</td>
<td>➔ Switch remote control to position &quot;close&quot;</td>
<td>Installation and operation instructions</td>
</tr>
<tr>
<td>Automatic hitch will not open</td>
<td>Automatic unit overgreased</td>
<td>➔ Remove grease</td>
<td>4.1 Automatic unit, complete</td>
</tr>
<tr>
<td></td>
<td>Pneumatic remote control has no pressure</td>
<td>➔ Check the air connections at the pneumatic remote control</td>
<td>4.5 Pneumatic remote control</td>
</tr>
<tr>
<td></td>
<td>Mechanical remote control not correctly adjusted</td>
<td>➔ Adjust mechanical remote control</td>
<td>Assembly and operating instructions - Mechanical remote control</td>
</tr>
<tr>
<td></td>
<td>Gas pressure spring defective</td>
<td>➔ Replace complete Bowden cable</td>
<td>Assembly and operating instructions - Mechanical remote control</td>
</tr>
<tr>
<td>Too much longitudinal clearance in the connection unit</td>
<td>Hitching pin worn</td>
<td>➔ Replace hitching pin</td>
<td>4.1 Automatic unit – Hitching pin</td>
</tr>
<tr>
<td></td>
<td>Towing eye worn</td>
<td>➔ Replace towing eye</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Rubber springs worn</td>
<td>➔ Replace rubber springs</td>
<td>4.4 Bearing – replacing the rubber springs</td>
</tr>
<tr>
<td>Too much vertical clearance at the hitching pin</td>
<td>Locking pin worn</td>
<td>➔ Replace locking pin</td>
<td>4.1 Automatic unit – Lock</td>
</tr>
<tr>
<td></td>
<td>Lifting lever worn</td>
<td>➔ Replace automatic unit</td>
<td>4.1 Automatic unit, complete</td>
</tr>
<tr>
<td></td>
<td>Locking plate worn at the inlet for the hitching pin</td>
<td>➔ Replace hitching pin and locking plate</td>
<td>4.1 Automatic unit – Hitching pin</td>
</tr>
<tr>
<td></td>
<td>Wear in the area of the locking pin and the locking plate</td>
<td>➔ Replace locking pin and hitching pin including locking plate</td>
<td>4.1 Automatic unit - Lock and - Hitching pin</td>
</tr>
</tbody>
</table>
## Faults in the pneumatic remote control

<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible causes</th>
<th>Remedy</th>
<th>see Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Towing hitch will not open</td>
<td>– No control pressure before the control unit</td>
<td>➔ Check the compressed air supply</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>– No control pressure after the control unit</td>
<td>➔ Check the input filter at the control unit. Replace a blocked filter</td>
<td>4.5 Pneumatic remote control – Filter</td>
</tr>
<tr>
<td></td>
<td>– Actuator has too little or no pressure from the control valve</td>
<td>➔ Check the compressed air lines between the control unit and the actuator</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>– Actuator blocked by ice</td>
<td>➔ Dismantle actuator, allow to thaw gently and dry.</td>
<td>4.5 Pneumatic remote control – Actuator unit</td>
</tr>
<tr>
<td></td>
<td>– Actuator blocked by ice</td>
<td>➔ Replace the dryer cartridge in the compressed air system of the vehicle</td>
<td></td>
</tr>
<tr>
<td>Towing hitch opens too slowly</td>
<td>– Control pressure too low</td>
<td>➔ Check the compressed air supply</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>– Piston gasket in the actuator worn</td>
<td>➔ Replace the actuator</td>
<td>4.5 Pneumatic remote control – Actuator unit</td>
</tr>
<tr>
<td>Closing operation is not supported by compressed air</td>
<td>– No control pressure after the control unit</td>
<td>➔ Check the input filter at the control unit. Replace a blocked filter</td>
<td>4.5 Pneumatic remote control – Filter</td>
</tr>
<tr>
<td></td>
<td>– Actuator has too little or no pressure from the control valve</td>
<td>➔ Check the compressed air lines between the control unit and the actuator</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>– Check valve in the control unit defective</td>
<td>➔ Replace the complete control unit</td>
<td>4.5 Pneumatic remote control – Complete control unit</td>
</tr>
<tr>
<td></td>
<td>– No pressure in the pressure reservoir</td>
<td>➔ Open the towing hitch briefly to fill the reservoir</td>
<td>Operating instructions</td>
</tr>
</tbody>
</table>
## Faults in the pneumatic remote control

<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible causes</th>
<th>Remedy</th>
<th>see Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Towing hitch does not remain open after opening and ventilation of the control unit</td>
<td>- Actuator incorrectly adjusted (installed slightly twisted)</td>
<td>➔ Open the hitch</td>
<td>4.5 Pneumatic remote control – Actuator unit</td>
</tr>
<tr>
<td></td>
<td>➔ Loosen the fastening bolts for the actuator at the holding plate</td>
<td>➔ Turn the actuator slightly anti-clockwise as far as the bolting allows</td>
<td></td>
</tr>
<tr>
<td></td>
<td>➔ Re-tighten the fastening bolts</td>
<td>➔ Replace automatic unit</td>
<td>4.1 Automatic unit – Complete automatic unit</td>
</tr>
<tr>
<td></td>
<td>➔ Replace hitching pin and locking plate</td>
<td>➔ Replace automatic unit</td>
<td>4.1 Automatic unit – Hitching pin</td>
</tr>
<tr>
<td></td>
<td>➔ Replace control unit</td>
<td>➔ Replace automatic unit</td>
<td></td>
</tr>
<tr>
<td>Towing hitch does not close fully (orange indicator pin is projecting out)</td>
<td>➔ Clean lower bush</td>
<td>➔ Replace control unit</td>
<td>4.5 Pneumatic remote control – Complete control unit</td>
</tr>
<tr>
<td></td>
<td>➔ Replace bush</td>
<td>➔ Replace automatic unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>➔ Replace bush</td>
<td>➔ Replace automatic unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>➔ Replace bush</td>
<td>➔ Replace automatic unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>➔ Replace control unit</td>
<td>➔ Replace automatic unit</td>
<td></td>
</tr>
</tbody>
</table>
Releasing the system pressure
Only for towing hitches with pneumatic remote control

**WARNING!**
Risk of injury! The pneumatic system is under high pressure!

- Release the pressure from the system before working on the towing hitch
- Release the pressure from the control unit
- Release the rapid-action coupling [4A]
- Protect compressed air lines from the penetration of dirt

![Diagram of the system](image_url)

[4] **A** Rapid-action coupling for connection of the compressed air feed line to the control unit
4.1 Automatic unit

Complete automatic unit, hitching pin, lock

Requirements
- Towing hitch closed

TOOLS:
- Allen key M10
- Hammer
- Plug
- Locking plate, Part no. ROE65632
- Assembly plug, Part no. ROE84001

Dismantling
► Press the hand lever [5A] slightly upwards and hold it there
► Draw the indicator pin [5B] out by hand and arrest it with the locking plate [5C]
► Remove the four bolts [6A]
► Lift out the automatic unit [6B]

Locking pin
► Remove the locking pin [7A] to the inside
► Clean the automatic unit inside in the area of the lock
► Press the indicator pin [7C] from the inside to the outside and hold it in this position
► Remove the locking plate [5C]
► Remove the O-ring [7D]
► Remove the indicator pin with spring [7E] to the inside
► Knock out the locking cap [7F]

NOTE
The locking cap [7F] is now necessarily destroyed. See Section 5.1, Spare parts
► Lift out the hitching pin [6C]
4.1 Automatic unit

Complete automatic unit, hitching pin, lock

Installation

➤ Thoroughly clean the automatic unit
  ➤ A complete new lock set is required for installation of the lock, see Section 5.1
  ➤ Insert the indicator pin [7C] through the spring [7E] and the locking cap [7F] and secure it in place with the O-ring [7D]
  ➤ Grease the assembled parts [7B] around the spring and slide it into the boring up to the stop
  ➤ Apply the assembly plug [8A] and hammer indicator pin [8B] in until it is flush with the edge of the housing [9]

NOTE

The locking cap must audibly engage

➤ Grease the locking pin [7A] and press it correctly aligned from the inside over the indicator pin and the spring
  ➤ Clean the mounting surfaces on the coupling [10A] and bushes [10B] thoroughly
  ➤ Check the bushes for wear if they are not new parts; Section 5.3
  ➤ Grease the bushes

Hitching pin

➤ Clean the hitching pin [10C] thoroughly and check for wear if it is not a new part; Section 5.3
  ➤ Grease the hitching pin and insert it from above in the correct position
  ➤ Fully assemble the automatic unit
  ➤ Observe tightening torques; Section 5.2
  ➤ When all parts are assembled: check the hitch for correct function; Section 4.6

LUBRICANT:

➤ Special grease ROE96040
  ➤ Only use the supplied special grease (risk of resin formation and loss of the lock)

TIGHTENING TORQUES:

➤ Automatic unit to hitch: . . . . . . 63 Nm

[7] A Locking pin
B Assembled parts
C Indicator pin
D O-ring
E Spring
F Locking cap

[8] A Assembly plug, Part no. ROE84001
B Indicator pin

[9] Indicator pin flush with housing edge

[10] A Mounting surfaces on the hitch
B Bushes
C Hitching pin
4.1 Automatic unit

Hand lever

Requirements

- Towing hitch closed

TOOLS:

- Wire cutter
- Socket 4.5 mm with extension
- Installation aid, Part no. ROE25614

Dismantling

- Remove the split pin [11A]
- Unhook the spring [11B] with the socket 4.5 mm from both spring caps [11C]

NOTE
Mark the position of the hand lever and the spring caps

- Remove the spring cap [11C]
- Use the installation aid [12A] (supplied with the spare parts set for the hand lever, Section 5.1) to slide out the hand lever [11B] in such a way that there is no distance between the ends. Otherwise parts inside the automatic unit can slip out of place!

- Remove the plastic bush [13A]

NOTE
Note the position of the spring

- Remove the spring [13B]. To do this, slide the installation aid [13C] as required without pulling it out completely

Installation

The installation is carried out in the reverse order. The following points must be observed in particular:

- Clean dirty parts thoroughly
- Grease the plastic bushes
- Make sure that the hand lever, spring caps, spring and plastic bushes are positioned correctly
- Replace the split pin
- Secure the split pin against falling out: bend the end of the split pin
- Check the towing hitch function; Section 4.6

LUBRICANT:

- Special grease ROE96042
4.1 Automatic unit

Release pin
Requirements
- Towing hitch closed

TOOLS:
- Ring or open-end spanner SW 24

Dismantling
- Note the inclined position of the release pin [14A]
- Release the union nut [14B]
- Remove the release pin completely

Installation
The installation is carried out in the reverse order. The following points must be observed in particular:
- Clean dirty parts thoroughly
- Replace the O-ring
- Check the correct position of the release pin. The ball end of the release pin must lie in the groove [16 arrow] of the control plate [16A]
- Check the function of the towing hitch; Section 4.6

TIGHTENING TORQUES:
- Union nut to the automatic unit housing: ... 45 -5 Nm

[14] A Release pin
   B Union nut

   D Union nut with O-ring

[16] A Control plate
4.2 Funnel

Support ring
Requirements
- Towing hitch closed

TOOLS:
- Hammer
- Chisel
- Split pin driver

Dismantling
- Knock out the support ring [17A], alternating from side to side with the chisel [18A]

NOTE
When the support ring is knocked out the notch pins [19A] are sheared off. The notch pins are supplied with the support ring spare parts set and preassembled; Section 5.1
- Open the towing hitch

WARNING!
Risk of injury, the hitching pin is under high spring tension. When the towing hitch is open, do not put your hand near the hitching pin!
- Remove the support ring using a suitable tool, e.g. screwdriver
- Close the towing hitch

Installation
- Thoroughly clean dirty mounting surfaces
- Open the towing hitch

WARNING!
Risk of injury. When the towing hitch is open, do not put your hand near the hitching pin!
- Fit the support ring [19B] in the correct position
- Close the towing hitch
- Drive in the notch pins [19A] to the stop
- Grease the support ring
- Check the function of the towing hitch; Section 4.6

LUBRICANT:
- Special grease ROE96017

[17] A Support ring

[18] A Chisel

[19] A Notch pins
  B Support ring
4.2 Funnel

Funnel reset and funnel

Requirements
- Towing hitch closed

TOOLS:
- Socket wrench SW 15

Dismantling

CAUTION!
The spring [20A] is under tension.
- Wear gloves
- Remove the bolts [20C]
- Remove the washer [20D], the spring retention plate [20E] and the spring [20A]

CAUTION!
Funnel is loose!
- Hold the funnel in place or secure it from falling out
- Open the towing hitch

WARNING!
Risk of injury, the hitching pin is under high spring tension. When the towing hitch is open, do not put your hand near the hitching pin!
- Remove the funnel carefully without actuating the release lever [20F]
- Close the towing hitch using the release pin [20I]

Installation
- Clean the contact surfaces and dirty parts thoroughly
- Grease the 2-party sliding ring [20G] and place it flush in the funnel boring [20H]
- Open the towing hitch

WARNING!
Risk of injury, the hitching pin is under high spring tension. When the towing hitch is open, do not put your hand near the hitching pin!
- Hang the funnel [20B] in carefully without actuating the release lever [20F]
- Close the towing hitch with the release pin [20I]
- Hang the spring [20A] into the spring retention plate [20E]
4.2 Funnel

- Place the spring ends in the correct position on the support ribs of the funnel [21]
- Insert the washer [20D] and hand-tighten it with the bolts [20C]
- Align the funnel edges parallel to the vehicle cross bar [22]
- Tighten the bolts
- Observe the tightening torques; Section 5.2
- Check the function of the funnel centring and arrest, page 18
- Check the function of the towing hitch; Section 4.6

LUBRICANT:
- Special grease ROE96017

TIGHTENING TORQUES:
- Funnel reset to lower bush: . . 85 Nm

[21] Position of the spring ends at the support ribs of the funnel

[22] Funnel alignment
4.2 Funnel

Checking the funnel centring and arrest

Procedure

→ Close the towing hitch
→ Press the funnel to the side
→ Release the funnel
→ Open the towing hitch

WARNING!
Risk of injury, the hitching pin is under high spring tension. When the towing hitch is open, do not put your hand near the hitching pin!
  - Now the funnel should be arrested in the centre position!
  - If not, the funnel reset must be readjusted; see below

NOTE
For hitching the funnel must be automatically arrested in the centre position!

Adjustment

→ Loosen the bolts [24A] slightly
→ Open the towing hitch, the funnel stop must engage
→ Tighten the bolts

NOTE
Both ends of the spring must rest on the support ribs of the funnel without clearance [24].
The spring retention plate must also have no clearance with respect to the spring at the contact points [25].
→ If it does, pull the ends of the spring retention plate slightly apart
→ Check the towing hitch for correct function; Section 4.6

TIGHTENING TORQUES:
  - Funnel centring to lower bush: 85 Nm
4.3 Bushes

Upper bush
Requirements
- Automatic unit removed; Section 4.1
- Funnel removed; Section 4.2
- Removal of towing hitch recommended; Section 4.4

TOOLS:
- A suitable tool for pressing in and out

Dismantling
- Note the position of the bush
- Press the worn bush [26A] slowly upwards and out

Installation
Take note of the following points in particular:
- Thoroughly clean the mounting surfaces before installation

CAUTION!
The bush can be damaged if it is kinked while pressing in.
- Make sure that the upper bush is in the correct position. The ground straight edge [26B] must be at a right angle to the coupling axis.
- Place the bush in an exact axial position
- Constantly check the centring of the bush for the first few millimetres when pressing it in
- Press the bush in to the collar [27B]
- Grease the contact surface of the bush when it is in place
- When all parts are assembled: Check the function of the towing hitch; Section 4.6

LUBRICANT:
- Special grease ROE96017
4.3 Bushes

Lower bush

Requirements
- Automatic unit removed; Section 4.1
- Funnel removed; Section 4.2
- Support ring removed; Section 4.2
- Removal of towing hitch recommended; Section 4.4

TOOLS:
- A suitable tool for pressing in and out

Dismantling
- Note the position of the bush
- Press the worn bush [28A] slowly upwards and out

Installation
Take note of the following points in particular:
- Thoroughly clean the mounting surfaces before installation

CAUTION!
The bush can be damaged if it is kinked while pressing in.
- Ensure that the lower bush is installed in the correct position. The borings [28B] must be perpendicular to the towing hitch axis. The ball [29A] must run in the groove of the old ball.
- Place the bush in an exact axial position
- Constantly check the centring of the bush for the first few millimetres when pressing it in
- Press the bush in to the collar [29B]
- Grease the contact surfaces of the lower bush when it is in place
- When all parts are assembled: Check the function of the towing hitch; Section 4.6

LUBRICANT:
- Special grease ROE96017
4.4 Bearing

Removing the towing hitch

Requirements
- Towing hitch closed

TOOLS:
- Allen key 6 mm
- Open-end spanner SW 13
- Socket spanner SW 70

Dismantling
- Remove the cap [30A]
- Remove the cylinder bolt [30B] with hex nut and distance bushes [30C]
- Remove the hex nut [30D]
- Remove the conical plate [30E]
- Remove the rubber spring [30F]
- Secure the rubber spring [31A] and spring cap [31B] from falling out
- Note the position of the spring cap [31B]
- Pull out the towing hitch
- Remove the spring cap [31B]
4.4 Bearing

Replacing the rubber springs and bearings

Requirements
- Towing hitch removed; p. 21

TOOLS:
- A suitable tool for pressing in and out

Replacing
- Remove the worn rubber springs [32A]
- Fit the new rubber springs taking care that they are installed in the correct order
- Note the position of the bearings [33A]
- Slowly press out the worn bearings
- Clean the contact surfaces thoroughly before fitting the new bearings

NOTE!
The notches [33, 34 arrows] at the edges of the bearings serve as a grease reservoir and must be positioned so that they face inwards.

CAUTION!
The bush can be damaged if it is kinked while pressing in.
- Place the bush in an exact axial position
- Constantly check the centring of the bush for the first few millimetres when pressing it in
- Press in the bushes one after the other until they are flush with the edges of the fastening bearing [34] section diagram
- Grease the bushes when they are in place
- Fit the towing hitch; p. 25 ff.
- Observe tightening torques; Section 5.2
- When all parts are assembled, check the function of the towing hitch; Section 4.6
4.4 Bearing

LUBRICANT:
- Copper paste ROE96039
- Special grease ROE96042

TIGHTENING TORQUES:
- Hex nut [37D] to towing bar [37C]: .............. 750 Nm
- Cylinder bolt [37E] to hex nut [37H]: .............. 32 Nm

[34] Section diagram
A Bearings
B Fastening bearing
4.4 Bearing

Installing the towing hitch

TOOLS:
- Allen key 6 mm
- Open-end spanner SW 13
- Socket spanner SW 70

Installation

➤ Check the bearings [35A] of the fastening bearing [35B] for wear; Section 5.3 or replace bearings; p. 24
➤ Clean the fastening bearing thoroughly and grease around the bearings
➤ Clean the towing hitch thoroughly around the towing bar [35C] and grease
➤ Slide the rubber spring [35D] onto the towing bar
➤ Fit the spring cap [35E, 36C] in the correct position on the fastening bearing [35B]
➤ Press the towing hitch up to the stop in the fastening bearing
4.4 Bearing

- Slide the rubber spring [37A] onto the towing bar
- Slide the conical plate [37B] in the correct position onto the towing bar
- Apply copper paste to the hex nut thread and the collar [37D]
- Fit the hex nut [37D] in the correct position with the collar in the direction of the conical plate taking account of the tightening torque
- Insert the cylinder bolt [37E] through the distance bush [37F], towing bar [37C] and distance bush [37G] and tighten the hex nut [37H], observing the tightening torque
- Fit the cap [37I]
- When all parts are assembled, check the function of the towing hitch; Section 4.6

LUBRICANT:
- Copper paste ROE96039
- Special grease ROE96042

TIGHTENING TORQUES:
- Hex nut [37D]
  - to towing bar [37C]: . . . . . . . . . 750 Nm
- Cylinder bolt [37E]
  - to hex nut [37H]: . . . . . . . . . . . 32 Nm
4.5 Pneumatic remote control (upgrade kit)

**Actuator unit**

**Requirements**
- System pressure released
- Towing hitch closed

**TOOLS:**
- Ring or open-end spanner SW 15
- Ring or open-end spanner SW 8

**Dismantling**

- Release the rapid-action coupling [38A] at the control unit
- Release the compressed air lines [38B and C] at the plug fittings of the actuator [38D]
- Protect the compressed air lines against the penetration of dirt
- Remove the 2 bolts [39A]
- Remove the holding plate [39B] with the actuator [39C]
- Remove the plug coupling [39D]
- Mark the position of the actuator unit
- Remove the 6 bolts [39E]
4.5 Pneumatic remote control (upgrade kit)

Actuator unit

Installation

The installation is carried out in the reverse order. The following points must be observed in particular:

Before installing the actuator:

- Close the towing hitch
- Clean mounting surfaces thoroughly
- Make sure that the actuator is correctly positioned at the holding plate [40]
- First plug the plug-in coupling [39E] onto the square shaft of the actuator, and then on to the hexagonal hand lever axle without tension along with the actuator and the holding plate
- Connect the rapid-action coupling [41A] to the control unit
- Observe tightening torques; Section 5.2
- Check all air-carrying parts for leaks. If necessary, use leak detection spray.
- Check the function of the remote control
- Check the function of the towing hitch; Section 4.6

TIGHTENING TORQUES:

- Actuator to holding plate: . . . . . . . . . . . . . . 11 Nm
- Holding plate to automatic unit: . . . . . . . . . . . . 85 Nm

[40] Position of the actuator on the holding plate

[41] A Rapid-action coupling
4.5 Pneumatic remote control (upgrade kit)

Complete control unit

Requirements

- System pressure released

TOOLS:

- Ring or open-end spanner SW 11
- Ring or open-end spanner SW 13
- Wrench for fastening bolts M8 (customer selection of the bolts)

Dismantling

- Release the rapid-action coupling [42A] at the control unit
- Screw off the compressed air lines [42B and C] in the control unit [42D]
- Protect the compressed air lines against the penetration of dirt
- Remove the four fastening bolts at the holding plate [42E] of the control unit

Installation

The installation is carried out in the reverse order. The following points must be observed in particular:

- Clean the mounting surfaces thoroughly before installation of the actuator
- Make sure there are no kinks in the compressed air lines
- Check all air-carrying parts for leaks. If necessary, use leak detection spray
- Check the function of the remote control

[42] A Rapid-action coupling
- B Compressed air line Ø 6 mm (red)
- C Compressed air line Ø 8 mm (black)
- D Control unit
- E Holding plate
4.5 Pneumatic remote control (upgrade kit)

Filter

Requirements
- System pressure released

TOOLS:
- Ring or open-end spanner SW 13
- Ring or open-end spanner SW 14
- Small slotted screwdriver
- Long-nose pliers

Dismantling

➔ Open the control unit
➔ Release the bolts [43A] and remove with the tube
➔ Secure the compressed air line against the penetration of dirt
➔ Release the lock nut [43B]
➔ Remove the angle bolts [39C]
➔ Take out the filter plate [43D]; if necessary use a small slotted screwdriver and long-nose pliers

Installation

The installation is carried out in the reverse order. The following points must be observed in particular:

➔ Clean the angle bolts and the sealing surfaces at the control unit
➔ Replace the gasket [43E]

CAUTION!
The new filter plate can be damaged when installing. Filter plates made from sinter material are pressure-sensitive. The filter plate may not flap during operation. Otherwise it will not filter.

➔ Carefully screw the angle bolts hand tight. The filter plate must not kink.
➔ Tighten the lock nut [43B]
➔ Tighten the threaded end of the tube [43A]
➔ Check all air-carrying parts for leaks. If necessary, use leak detection spray
➔ Check the function of the remote control
4.6 Function test

Function test

Procedure

To open the towing hitch:

➡ Press the hand lever [44A] upwards until it engages
  - The hitch is open. The indicator pin [44B] must now be clearly protruding (ca. 12 mm). The funnel must be arrested.

WARNING!
Risk of injury! The hitching pin and the hand lever are now under spring tension!
Do not put your hand anywhere near the hitching pin or the hand lever!

To close the hitch by hand:

➡ Press the hand lever [44A] upwards to the stop and hold it there while simultaneously pressing the release pin [44C] back
  - Move the hand lever to the lower position
  - The towing hitch is closed. The indicator pin [45A] must not be protruding. The funnel can be swivelled to the side.

WARNING!
If the indicator pin is still protruding when the towing hitch is closed [46], it is not permitted to drive with a trailer as there is a risk of accident. Possible remedies:

➡ Clean the lower bush [45B]
➡ Replace the lock; Section 4.1

![Diagram of towing hitch]

- A Hand lever
- B Indicator pin
- C Release pin

![Diagram of indicator pin with towing hitch closed]

- A Indicator pin
- B Lower bush

![Diagram of indicator pin wrong and O.K.]

- [46] Wrong
- [47] O.K.
Indicator pin with the towing hitch closed
## 5.1 Spare parts

### Towing hitch RO *50 E

![Towing hitch RO *50 E](image)

[48] * no spare part

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
<th>Article no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>complete automatic unit with hand lever upwards</td>
<td>71504 A</td>
</tr>
<tr>
<td>1</td>
<td>complete automatic unit with hand lever downwards</td>
<td>71504 B</td>
</tr>
<tr>
<td>2</td>
<td>complete hand lever upwards</td>
<td>71644</td>
</tr>
<tr>
<td>3</td>
<td>complete lock</td>
<td>27009</td>
</tr>
<tr>
<td>4</td>
<td>complete set of bolts M12</td>
<td>30417</td>
</tr>
<tr>
<td>5</td>
<td>hitching pin</td>
<td>47131</td>
</tr>
<tr>
<td>6</td>
<td>Protective flap for sensor boring</td>
<td>25558</td>
</tr>
<tr>
<td>7</td>
<td>upper bush</td>
<td>53606</td>
</tr>
<tr>
<td>8</td>
<td>complete lower bush</td>
<td>53605</td>
</tr>
<tr>
<td>9</td>
<td>support ring</td>
<td>59428</td>
</tr>
<tr>
<td>10</td>
<td>funnel</td>
<td>46148</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
<th>Article no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>complete funnel reset</td>
<td>71331</td>
</tr>
<tr>
<td>12</td>
<td>set of bolts M10</td>
<td>30486</td>
</tr>
<tr>
<td>13</td>
<td>complete bearing, including item 18</td>
<td>71801</td>
</tr>
<tr>
<td>14</td>
<td>cap</td>
<td>25347</td>
</tr>
<tr>
<td>15</td>
<td>hex nut M45, including item 18</td>
<td>71802</td>
</tr>
<tr>
<td>16</td>
<td>conical plate</td>
<td>59393</td>
</tr>
<tr>
<td>17</td>
<td>spring cap</td>
<td>44177</td>
</tr>
<tr>
<td>18</td>
<td>cylinder bolt M8, hex nut M8, distance bushes</td>
<td>30492</td>
</tr>
<tr>
<td>19</td>
<td>complete set of bolts</td>
<td>71122</td>
</tr>
<tr>
<td>20</td>
<td>complete release lever</td>
<td>71438</td>
</tr>
<tr>
<td></td>
<td>repair kit: items 3, 5, 7, 8, 13</td>
<td>71809</td>
</tr>
</tbody>
</table>
5.1 Spare parts

Pneumatic remote control upgrade kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
<th>Article no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>actuator</td>
<td>71653</td>
</tr>
<tr>
<td>2</td>
<td>holder for actuator</td>
<td>15746</td>
</tr>
<tr>
<td>3</td>
<td>deflector plate</td>
<td>15759</td>
</tr>
<tr>
<td>4</td>
<td>fastening bolts</td>
<td>30479</td>
</tr>
<tr>
<td>5</td>
<td>plug-in coupling</td>
<td>65770</td>
</tr>
<tr>
<td>6</td>
<td>fastening bolts including item 7</td>
<td>30426</td>
</tr>
<tr>
<td>7</td>
<td>distance washers</td>
<td>53599</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
<th>Article no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>complete control unit</td>
<td>71420</td>
</tr>
<tr>
<td>9</td>
<td>set of tubes</td>
<td>25514</td>
</tr>
<tr>
<td>10</td>
<td>pressure tank</td>
<td>90376</td>
</tr>
<tr>
<td>11</td>
<td>filter plate</td>
<td>90379</td>
</tr>
<tr>
<td>12</td>
<td>locking clip</td>
<td>65753</td>
</tr>
<tr>
<td>13</td>
<td>control unit lid</td>
<td>76002</td>
</tr>
<tr>
<td>14</td>
<td>bracket</td>
<td>65752</td>
</tr>
</tbody>
</table>
5.2 Tightening torques

Towing hitch RO *50 E

<table>
<thead>
<tr>
<th>Item</th>
<th>Bolt</th>
<th>Tightening torque (Nm)*</th>
<th>Tolerance</th>
<th>Special features</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>fastening bearing to the cross bar</td>
<td>580</td>
<td>Requiring documentation</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>automatic unit to the towing hitch body</td>
<td>63</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>funnel reset to the lower bush</td>
<td>85</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>bearing hex nut to the towing bar</td>
<td>750</td>
<td>Requiring documentation</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>cylinder bolt to the hex nut</td>
<td>32</td>
<td>Requiring documentation</td>
<td></td>
</tr>
</tbody>
</table>

* Setting value, bolts must be tightened using a torque wrench in accordance with DIN EN ISO 6789, Class A or B.
### 5.2 Tightening torques

**Pneumatic remote control upgrade kit**

![Diagram of a pneumatic remote control upgrade kit]

*51* Bolts with prescribed tightening torques

<table>
<thead>
<tr>
<th>Item</th>
<th>Bolt</th>
<th>Tightening torque (Nm)*</th>
<th>Tolerance</th>
<th>Special features</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>actuator to the holding plate</td>
<td>11</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>deflector plate with holding plate to the automatic unit</td>
<td>85</td>
<td>–</td>
<td></td>
</tr>
</tbody>
</table>

* Setting value, bolts must be tightened using a torque wrench in accordance with DIN EN ISO 6789, Class A or B.
5.3 Wear limits

Hitching pin and towing eye

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Gauge ROE part no.</th>
<th>Designation</th>
<th>Wear limit (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>57122</td>
<td>hitching pin</td>
<td>Ø 46.0</td>
</tr>
<tr>
<td>B</td>
<td>57122</td>
<td>bush inner diameter</td>
<td>Ø 52.5</td>
</tr>
<tr>
<td>C</td>
<td>57122</td>
<td>hitching pin vertical clearance</td>
<td>max. 2</td>
</tr>
<tr>
<td>D</td>
<td>–</td>
<td>towing eye height</td>
<td>min. 41.5</td>
</tr>
</tbody>
</table>

[52] Wear dimensions in the area of the hitching pin and towing eye
5.3 Wear limits

Support ring and bushes

[53] Wear dimensions in the area of the support ring and bushes

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Designation</th>
<th>Wear limit (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>upper bush</td>
<td>Ø max. 49.5</td>
</tr>
<tr>
<td>B</td>
<td>support ring</td>
<td>min. 12</td>
</tr>
<tr>
<td>C</td>
<td>lower bush</td>
<td>Ø max. 35.9</td>
</tr>
</tbody>
</table>
5.3 Wear limits

Bearing

[54] Wear dimensions in the area of the bearing

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Designation</th>
<th>Wear limit (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Longitudinal play</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>Vertical play</td>
<td>max. 3</td>
</tr>
</tbody>
</table>
5.4 Lubrication instructions

Towing hitch RO * 50 E

<table>
<thead>
<tr>
<th>Lubrication point</th>
<th>Designation</th>
<th>ROE part no.</th>
<th>Approx. quantity of grease</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Bearing with bushes, cone</td>
<td>96062</td>
<td>5 g</td>
</tr>
<tr>
<td>A2</td>
<td>Nut thread and front side</td>
<td>96039</td>
<td>10 g</td>
</tr>
<tr>
<td>B</td>
<td>Release lever guide</td>
<td>96040</td>
<td>10 g</td>
</tr>
<tr>
<td>C</td>
<td>Hitching pin and upper bush</td>
<td>96042</td>
<td>10 g</td>
</tr>
<tr>
<td>D</td>
<td>Hitching pin and lower bush</td>
<td>96062</td>
<td>5 g</td>
</tr>
<tr>
<td>E</td>
<td>Spring cap bearing</td>
<td>96062</td>
<td>5 g</td>
</tr>
<tr>
<td>F</td>
<td>Upper funnel bearing</td>
<td>96062</td>
<td>5 g</td>
</tr>
<tr>
<td>G</td>
<td>Lower funnel bearing</td>
<td>96062</td>
<td>5 g</td>
</tr>
<tr>
<td>H</td>
<td>Automatic unit housing inside</td>
<td>96017</td>
<td>100 g</td>
</tr>
<tr>
<td>I</td>
<td>Hex bushes bearing</td>
<td>96062</td>
<td>2 g</td>
</tr>
<tr>
<td>J</td>
<td>Locking pin in the automatic unit housing</td>
<td>96040</td>
<td>5 g</td>
</tr>
</tbody>
</table>