RO*433
Vollautomatische Anhängekupplung
Automatic Trailer Coupling
Atelage de remorquage entièrement automatique
Series RO*430
Technical release 1

Suitable for:
- drawbar eyes 40 CH (f.e. ROE 57229)

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Official note
When fitting the trailer coupling the regulations for fitting mechanical fastening systems in accordance with appendix 7 ECE R 55-01 and the national regulations for commercial vehicles must be observed.

Subject to technical changes without prior notice

The coupling must be installed by authorised personnel!
Read these instructions carefully before fitting!
The safety instructions are summarised in a single chapter. In any situation where the user of the trailer coupling is at risk, the safety instructions are repeated in the individual sections and marked with the warning symbol shown here.

When handling hitches, prime movers and trailers the relevant safety regulations in the respective country must be observed (e.g. Berufsgenossenschaft in Germany). Any safety instructions in the operating manual of the tractor vehicle and the trailer remain valid and must be observed.

For operation, maintenance and assembly the safety instructions listed below must be observed. Further safety instructions are then given in the individual case which relate directly to the respective activity.

**Safety instructions for operation**

- The hitch may only be operated by authorised persons.
- The installation and operating instructions of the respective hitch retain their validity and must be observed.
- Only use the hitch and the towing eye of the trailer if they are in perfect technical condition.
- Only carry out hitching / unhitching operations on firm, level ground.
- During hitching, nobody may stand between the tractor vehicle and the trailer.
- After every hitching operation the correct locked status of the trailer coupling must be checked by means of the control pin or the remote indicator. Only drive the rig in the correctly locked status.
- The remote indicator does not exempt the driver from the obligation to check before driving (Regulations Authorising the Use of Vehicles for Road Traffic). Before driving off, among other things, the coupling status of the mechanical connection device for the tractor vehicle and the trailer must be checked.

**Safety instructions for maintenance**

- For maintenance work, only use the prescribed lubricants.
- Maintenance work may only be carried out by qualified personnel.

**Safety instructions for installation**

- Installation may only be carried out by authorised workshops.
- Installation must be carried out in compliance with the relevant accident prevention regulations and the technical regulations for mechanical equipment.
- Only original components may be used.
- Instructions and installation guidelines of the vehicle manufacturer must be observed, e.g. type of fastening, clearances etc.
- All screwed connections must be tightened with the prescribed tightening torque.
- Work may only be carried out on the trailer coupling when it is closed. **Risk of injuries!**

The installation of the hitch on the prime mover must be carried out in accordance with annex 7 of ECE R 55-01 and must be checked accordingly. As applicable, the relevant licensing regulations in the respective country must be observed.

The remote control and the remote indicator are equipment with safety components. This is why the installation must be documented.

The hitch, the remote control and the remote indicator are connection devices which require model approval and are subject to the highest safety requirements. Alterations of any kind shall cause the warranty to lapse and invalidate the type approval, which in turn invalidates the vehicle operation permit.
1. Fitting

RO*433

Fig. 1

1 hydraulic unit
2 spring housing
3 circlip 100x3
4 retaining ring
5 clamping bush
6 fastening segment (3 x)
7 clamping key (3 x)
8 thrust washer
9 rubber buffer
10 protective buffer cap

Installation position TOP

11 mounting plate
12 support plate
13 protective buffer cap
14 rubber buffer
15 body with drawbar
16 valve
17 pressure bar
18 raise lever
19 coupling pin
20 temporary bolts (3 x)
T crossmember
1. Fitting

1.1 Before installation (see fig. 1)

Note: Please comply with following when fitting coupling:
- applicable national regulations
- vehicle manufacturer’s specifications
- clearance for axial rotation of coupling head of 25°

The pre-assembled coupling must be dismantled before installation:
- Release transport screws from spring housing (2), mounting plate (11) and support plate (12) (screws no longer required).
- Remove hydraulic unit (1) with spring housing (2) completely.
- Remove circlip (3) with circlip pliers ZGA 4 DIN 5254 and retaining ring (4).
- Unscrew 3 temporary bolts (20) from spring housing (2) (width-across-flats 17 mm).
- Screw 3 temporary bolts (20) gradually into clamping bush (5) as far as stop (approx. 80 Nm) until the 3 clamping keys (7) can be easily removed.
- Unscrew 3 temporary bolts (20) again and withdraw clamping bush (5), remove 3 fastening keys (6).
- Withdraw thrust washer (8), rubber buffer (9), protective buffer cap (10) from jaw with drawbar (15).
- Withdraw mounting plate (11) with support plate (12) and protective buffer cap (13) from drawbar (15), while rubber buffer (14) remains on drawbar (15).

Fig. 2

1.2 Installation (see fig. 1)

- Attach mounting plate (11) preliminarily from inside to crossmember (T) and support plate (12) from outside to crossbar (T) using 2 of 4 mounting screws (please refer to p. 3 for size and grade).
- Fit protective buffer cap (13) onto mounting plate (11) with concave side towards rubber buffer (14).
- Slide jaw with drawbar (15) and rubber buffer (14) into mounting plate (11):
  Note: Do not remove special grease.
- Fit protective buffer cap (10) onto mounting plate (11) with concave side towards rubber buffer (9).
- Slide rubber buffer (9) onto drawbar (15).
- Slide on thrust washer (8) with concave side towards rubber buffer (9).
**1. Fitting**

**Fitting of fastening keys** (see fig. 2)

Recommendation: Use fitting tool part no. 57351 (see fig. 3) to facilitate mass installation

- **Note:** Locate fastening keys (6) in splines of drawbar (15):
  - The inscribed surface (R) in the direction of the hydraulic unit (2).
- Slide clamping bush (5) carefully over fastening keys (6) onto drawbar (15):
  - Observe the locking snugs in clamping bush (5) and verify that bores of clamping bush (5) and fastening keys (6) mate.
- Lightly grease end face and thread of 3 temporary bolts (20), screw them in by hand as far as stop and tighten alternately until slots in clamping bush (5) are free.
- Insert 3 clamping keys (7) into slots and hold in place.
- Slide retaining ring (4) over clamping bush (5).
- Fasten circlip (3) with circlip pliers ZGA 4 (see above).
- Unscrew 3 temporary bolts (20) from clamping bush (5) and fastening keys (6), generously grease and screw into spring housing (2) (required for later dismantling).
- Apply thorough coat of grease to retaining ring (4), clamping bush (5), fastening keys (6) and clamping keys (7) (to protect against corrosion).
- Unscrew 2 bolts from mounting plate (11).
- Slide on hydraulic unit (1) with spring housing (2):
  - **Caution:** Take care not to damage bellows and observe the correct installation location (see fig. 1)!
- Fasten with (not supplied):
  - 4 hexagon head cap screws to DIN 931, grade 8.8 or 10.9
  - 4 self-locking nuts to DIN 6925, grade 8 or 10

Please see table for details of nut and screw size, and fig. 4 for screw length.

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**Fig. 3**

**Fig. 4**

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**Table:**

<table>
<thead>
<tr>
<th>spring housing</th>
<th>support plate</th>
<th>mounting plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>grip</td>
<td>thickness of flange</td>
<td>length of bolts</td>
</tr>
<tr>
<td>49</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Please see fig. 1 for installation location.
1. Fitting

**Note:** Please comply with vehicle manufacturer’s specifications regarding nut and screw grade if these differ from above!

**Caution:** Screw heads should be on coupling head side (outer side of crossbar) to avoid impairing movability of coupling.

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**1. Fitting**

**Fig. 5**

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**1.3 Verification** (with compressed air)

- Coupling closed: pressure bar (17) protrudes 15 mm.
- Raise lever (18) slightly: compressed air can be heard to escape and relieves hydraulic unit, pressure bar (17) can be pressed back (use tool, danger of accident).
- Open coupling with hand lever (18).
- Close coupling, see para. 2.2: pressure bar (17) moves in direction of coupling pin.

**Note:** Before later painting, it is essential to close coupling and grease or cover coupling pin and head of pressure bar.

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**Tightening torques when attaching screws to mounting plate:**

<table>
<thead>
<tr>
<th>Coupling size</th>
<th>Screw size</th>
<th>Tightening torque (Nm)</th>
<th>Width across flats (mm)</th>
<th>ROCKINGER screw set part no. ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td>145</td>
<td>M 16</td>
<td>210 (Grade 8.8)*</td>
<td>24</td>
<td>70251*</td>
</tr>
<tr>
<td>150</td>
<td>M 20</td>
<td>410 (Grade 10.9)**</td>
<td>30</td>
<td>70252*</td>
</tr>
</tbody>
</table>

* Grade 8.8
** Tightening torque (friction efficient μ = 0.14) for screws use a torque meter to fix according to DIN ISO 6789, class A or B

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**Grip** (see fig. 4)

- central-axle trailer: 11 - 28 mm
- steerable-drawbar trailer: max. 28 mm

- Fit pneumatic connection (see fig. 5)
  - Remove plastic plugs.
  - Locate right-angle plug on valve. Connect right-angle plug to hose.
  - From valve (16) connection @ to hydraulic unit.
  - From valve (16) connection β to compressed air supply (secondary consumer – max. 10 bar, min. 5 bar).
2. Operation

2.1 Hitching (Fig.6)

Note: The relevant national regulations (i.e. safety-at-work) of the relevant must be observed when hitching and unhitching.

No one must stand between the vehicles!

Note: The tow hitch RO*433 is only allowed to be connected (used) with a Swiss drawbar eye (e.g. ROE 57229).

The possible drawbar angle is limited to max. ±12°.

- Push hand lever upwards (lever engages, residual air escapes via 16) push further until handlever engages in the upper position
- Check whether funnel is locked.
- Disengage brake on front axle of turntable drawbar trailer (see fig.6)
- Position drawbar trailer eye in centre of funnel
- Set drawbar eye to height of coupling point (centre of funnel)
- Slowly reverse prime mover

When engaging a central-axle-trailer (see fig.6) note following:

- Reverse prime mover slowly.
- The drawbar eye must be inserted into the middle of the funnel.

Otherwise the funnel, the drawbar eye or the drawbar landing legs might be damaged.
Check

After every hitching operation it is essential to check that the coupling is engaged as required by regulations.

The check pin must be flush with its guide bush after hitching (see fig. 7). If the check pin protrudes from its guide bush (this can also be established by touch if dark), this indicates that hitching has not been carried out correctly, and that you are at risk of an accident. The truck may not be driven with the trailer in this condition!

Remedy:
– Advance tractor unit approx. 1 m and then reverse again.
– Then check again.

In-cab status indicator upgrade kit available for retrofitting.

2.2 Closing coupling manually

(e.g. for tow-rope)

Raise coupling pin with suitable tool.

Warning: Don’t put your hands into the funnel/bolt area! Danger of injury!
3. Maintenance

3.1 Care

- Lubricate coupling pin, support ring and drawbar eye with heavy-duty grease (3EP f. e. ROE 96042) which is waterproof if possible before first use and after extended period in use.
- Low-maintenance automatic unit has a grease reservoir (regular regreasing unnecessary, please see below for repair information).
- Under harsh operating conditions or severe exposure to dirt or water regrease automatic unit (A) when coupling is open (see fig. 8):
  - use multi-purpose grease NLGI 2 (f. e. ROE 96035)
  - intervals: 6 months or 50,000 km
- Lubricate lower funnel bearing (F) and pressure bar on underside of coupling (K) with 3EP.
- Close coupling before cleaning with high-pressure washers (see para. 2.2).
- After cleaning, relubricate coupling pin and support ring.

Please note following when carrying out repairs on coupling (e.g. changing coupling pin):
- Remove old grease and relubricate thoroughly (see above).
3.2 Testing

Bearings:
- **Longitudinal play**
  - Grip coupling head (not jaw funnel) with both hands when uncoupled and move vigorously in longitudinal direction (see fig. 9):
    - **No longitudinal play is allowed.**

- **Vertical play**
  - Open coupling.
  - Move coupling head up and down with appropriate tool (see fig. 10):
    - Vertical play may not exceed 3 mm measured at coupling head (centre axis of coupling pin).

**Coupling pin:**
Check wear using ROCKINGER reference gauge (part no. 57026) (see fig. 11):
Coupling pin may be used until diameter of crowned section has worn to less than 36.5 mm, after which it must be replaced.

Vertical play in coupling pin (see fig. 12) may not exceed 2 mm.
3. Maintenance

**Lower bush:**
Check wear using ROCKINGER reference gauge (part no. 57290). Max. admissible internal diameter of lower bush is 31.5 mm. Passage below pin must be free (see fig. 12). Please consult repair leaflet (available on request) for details of replacing. The lower bush must under no circumstances be damaged in order to affect the closing function of the tow hitch.

**Hydraulic connection:**
No oil mist may escape from valve (16) when coupling is opened. In case a hydraulic unit (for installation position see fig. 1) has been turned over/aside during transportation or mounting, some oil drops may appear after actuation for 4 or 5 times. Such a state is harmless! Hydraulic unit contains no user-serviceable parts, do not open.

**Pressure bar:**
In event of pressure loss, check for wear:
- drawbar eye
- coupling pin (see above)
- pressure bar end face to max. 2 mm
Check lock of the funnel:

**Note:** The funnel must be locked in its central position when coupling is opened to be prepared for coupling on!

- Push the funnel sidewards
- Move handlever in locking direction (up)
- Release funnel
- The funnel must swing back in central position and be locked again
- If not, justify the central position by the lower unit as below.

**Adjustment:**

- Loosen screws (17) and bring the funnel into the central position:
- Open coupling: Funnel lock should be inserted
- Tighten screws (17) - **Tightening torque 30 Nm.**
- Both ends of torsion springs (R) must lie slack free (S) against the rib of the funnel. Between the spring holder (H) and the lay-on points of the torsion springs should also be no gap.
- In case there is a gap you can close it very easily by bending the spring holder with a screwdriver (M) (S = 0).
**Technical data**

**RO*433**

**Series RO*433**

for drawbar eyes 40 CH and ECE class S

<table>
<thead>
<tr>
<th>Size</th>
<th>a (mm)</th>
<th>b (mm)</th>
<th>c (mm)</th>
<th>d (mm)</th>
<th>e (mm)</th>
<th>f (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>145</td>
<td>140</td>
<td>80</td>
<td>180</td>
<td>120</td>
<td>17</td>
<td>84</td>
</tr>
<tr>
<td>150</td>
<td>160</td>
<td>100</td>
<td>200</td>
<td>140</td>
<td>21</td>
<td>94</td>
</tr>
</tbody>
</table>

Dimensions and tolerances in mm.

Flange size to ECE R 55-01
### Technical data

<table>
<thead>
<tr>
<th>part no.</th>
<th>hand lever upward</th>
<th>hand lever downward</th>
<th>size</th>
<th>hole pattern</th>
<th>C E N T R A L - A X L E</th>
<th>T R A I L E R</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(mm)</td>
<td>(kN)</td>
<td>maximum D-value*</td>
<td>maximum Dc-value*</td>
</tr>
<tr>
<td>433A45001</td>
<td>430B45001</td>
<td>145</td>
<td>140 x 80</td>
<td>100</td>
<td>91,5</td>
<td>1000</td>
</tr>
<tr>
<td>433A50001</td>
<td>430B50001</td>
<td>150</td>
<td>160 x 100</td>
<td>130</td>
<td>91,5</td>
<td>1000</td>
</tr>
</tbody>
</table>

* Calculation see catalogue or internet

** When using a central-axle trailer, the vertical load should amount to at least 4% of the trailer weight, in order to prevent increased wear caused by bouncing of the drawbar eye.

### Upgrade kits technical release 1

<table>
<thead>
<tr>
<th>Upgrade kits remote operation</th>
<th>part no.</th>
<th>Upgrade kits remote control</th>
<th>part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumatic remote operation RC-PC</td>
<td>ROE 71461</td>
<td>Electrical remote indicator RI-BC</td>
<td>ROE 71654</td>
</tr>
<tr>
<td><strong>power assisted opening and closing</strong></td>
<td></td>
<td>Electrical remote indicator RI-BR</td>
<td>ROE 71701</td>
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<tr>
<td></td>
<td></td>
<td>Electronic remote indicator RI-E</td>
<td>ROE 71671</td>
</tr>
</tbody>
</table>

**Repair instructions and parts list to be obtained upon request!**