General
RINGFEDER Type 2050 AM, part no.: 14994532
RINGFEDER Type 2050 AP, part no.: 14994555

Range of application:
Type 2050 is approved to connect with drawbar eyes 50 according to DIN 74053 and drawbar eyes Class D 50 in accordance with EU directive 94/20 as well as drawbar eyes ISO 1102 and 50mm heavy duty drawbar eyes.

EEC type approval: e11 00 – 2833

Class of the automatic drawbar coupling 50 acc. to 94/20 EEC: C 50 - X

Approved values:
D-value: 190 kN 190 kN 190 kN 190 kN
Dc-value: 130 kN 130 kN 130 kN 170 kN

Maximum vertical load S:
1000 kg 2000 kg 2500 kg 1000 kg

V-value:
75 kN 63 kN 50 kN 60 kN

When fitting / replacing the trailer coupling please attend to the relevant statutory regulations and the particular information from the vehicle manufacturers.

The fitting of the trailer coupling onto the truck is to be done in accordance with the requirements of supplement VII of the EU directive 94/20 EC.

The coupling should be mounted to a drawbeam which fulfils the requirements of ISO 3584 cat. 3.

The coupling has a high-quality corrosion resistance through electrolytic treatment and a top-coat with high wear resistance. To maintain the high quality of the surface treatment, RINGFEDER recommend that no further paint is added to the coupling. If the coupling is over-painted, you run the risk of operational problems, a sticking signal/indicator pin or that important information is overpainted. Moving parts, plates and decals must all be thoroughly covered if the coupling is repainted.

Installation should be done in a proper and competent manner. Always follow the instructions.

All directives and instructions should be kept in the vehicle for future service and maintenance.

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Mounting instruction

Mounting the drawbar guide
- Mount the drawbar guide (a) with four screws as per the drawing. Flat washers with a minimum hardness of 200 HB must be under both bolt head and safety nut.
- Tightening torque M20 quality 8.8 (dry): 370-410 Nm.

Mounting the coupling
- Lubricate the thread of the drawbar (b) with grease. This prevents rust and makes future servicing easier.
- Fit the other mounting parts as per the drawing.
- Tightening torque castellated nut min 500 Nm.

- Lock the castellated nut with the split pin. It is very important that the split pin is completely within the gates of the castellated nut and is secured as per the picture.
- Mount the nut cover.
- When the coupling is reassembled after service, a new split pin must always be used.

Lubrication
Lubricate the coupling regularly with thin oil. For the maximum effect, the coupling must be open when it is being lubricated.
RINGFEDER do not recommend the use of central greasing systems.

- Lubrication points (see adjacent drawing).

Function check
Carry out the function check on page 6 and 7.
RINGFEDER Type 2050 AM

Mounting of the control box

- Mount the control box close to the coupling so that the operation of the coupling can be watched. The control box must be positioned so that it is well protected from vibration, impact, dirt and ice formation. Mount the control box as shown in Alt. A or B.

NOTE! Electrically controlled control boxes are not permitted. The control box has to be mounted rear of the vehicle on the co-driver’s side!

Warning!
Never put your fingers in the coupling mouth because of the danger of them being crushed.

Fitting the Pipes

- Turn the handle on the control box to service position according to “Service position control box” on page 8.
- Fit a plug in output 4 on the control box.
- Connect the supply line to the control box output (marked 1).
- Connect the other pipe to the control box output 2. Connect the pipe from output 2 to the coupling.
- Connect the supply line to the vehicle’s auxiliary air system. Working pressure 8 bar. Maximum pressure 10 bar.

Always follow the truck manufacturer’s body building instructions.

NOTE! Do not connect to the braking system.
RIGNFEDER Type 2050 AP
Mounting of the control box
- Mount the control box close to the coupling so that the operation of the coupling can be watched. The control box must be positioned so that it is well protected from vibration, impact, dirt and ice formation. Mount the control box as shown in Alt. A or B.

NOTE! Electrically controlled control boxes are not permitted. The control box has to be mounted rear of the vehicle on the co-driver’s side!

Fitting the Pipes
- Turn the handle on the control box to service position according to "Service position control box" on page 8.
- Connect the supply line to the control box output (marked 1).
- Connect the other 2 pipes to the control box outputs (2 and 4).
- Connect the pipe from output 4 on the control box to the front output of the actuator. The pipe from output 2 is connected to the rear output of the actuator.
- Connect the supply line to the vehicle’s auxiliary air system. Working pressure 8 bar. Maximum pressure 10 bar.
- Always follow the truck manufacturer’s body building instructions.

NOTE! Do not connect to the braking system.
Mounting of inductive sensor (if not already mounted)

- Open the coupling so that the indicator pin is out. Wind the inductive sensor in until it touches the indicator pin. Wind the inductive sensor back one turn (the distance between the indicator pin and the inductive sensor should now be approximately 1 mm).

  *Tighten the nuts (d), tightening torque max. 2 Nm.*

- Connect the inductive sensor to the vehicle’s electrical system (24 V) and to a green signal light in the driver’s cab (the signal light is not provided with the kit).

  See wiring diagram above. Follow the truck manufacturer’s instructions.

- Only when the coupling is closed and secured, the signal light in the driver’s cab must come on.

- When the coupling is open, the signal light must turn off. (If the light is on when the coupling is open, adjust the gap between the sensor and the indicator pin).
Safety check

Carry out the safety check once a week. If the check shows that any of the wear limits have been exceeded or that the coupling’s function is reduced, rectification must be carried out immediately.

NB! An open coupling is always a risk because of the powerful springs that is used to force the coupling to close.

- The coupling can be opened when the coupling mouth is in its normal position or at either fully articulates position, see drawing to the left.

Air leaks

- Check that there is no audible air leakage from the valve (b), pipes (d) or cylinder (c).
Operation check

- Turn the red handle (e) clockwise to "ON". Fold out the yellow handle (f). Simultaneously press on the mark "Press" on the handle and turn the handle anti-clockwise to "OPEN". Then turn it back to "CLOSE". The coupling pin should remain in the up/open position.

NB! An open coupling is always a risk because of the powerful springs that is used to force the coupling to close.

- Connect to the trailer according to the driver instructions on page 12-14.
- Open and close the coupling and check that it corresponds to the pictures below.

ALWAYS check that the coupling is closed and secure before driving. All the criteria for a closed coupling must be fulfilled before you start driving.

Open coupling
(a) The handle is raised approx. 90°
(b) The indicator pin is out
(c) The coupling bolt is up

Closed, secure coupling
(a) The handle is down
(b) The indicator pin is completely in
(c) The coupling bolt is down

Attachment
- Check that the coupling can be rotated in its mounting. The coupling must be closed when the rotation is carried out.
- Check it is possible to turn the coupling mouth.
Wear limits
A  Coupling pin  min 46.5 mm
B  Drawbar eye  max 51.5 mm
Vertical play
in the coupling pin  max 5.0 mm

More wear limits on page 9.

Lubrication
Lubricate the coupling regularly with thin oil. For the maximum effect, the coupling must be open when it is being lubricated.

- Lubrication points (see drawing on the left)

Torque check
- Check that the mechanism is tightened correctly. Tightening torque: 90 Nm.

Service position control box
Before any work or service is carried out on the coupling all air supply to the coupling must be cut off. Cut off the air supply by turning the control box' red handle (e) a quarter turn anti-clockwise to OFF.
Service - maintenance

- It is important to remember that a coupling is a safety critical item and should be treated as such. Proper preventive maintenance, inspection and lubrication are essential for a long, safe and trouble-free service life.
- The length of service intervals depends on the type of trailer, load, road- and weather conditions etc. Servicing can best be carried out when other work or inspection of the vehicle is done, for example every 60 000 or 90 000 km.
- At least once a year the coupling must be dismounted and inspected for wear, corrosion, cracks or deformation. Worn out or damaged parts must be replaced.
- If the daily overhaul or safety check shows that any of the wear limits have been exceeded or that the coupling’s function is reduced, repairs must be carried out immediately.
- The fact that one of the coupling’s wear limits have been exceeded indicates that other parts need service as well. Therefore, always remove the coupling from the drawbeam when changing the mechanism and guide bushes. Check the mounting parts and the drawbeam and replace worn out springs and bearing bushes.

Wear limits

<table>
<thead>
<tr>
<th>Part</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>A outer diameter</td>
<td>min 51.0 mm</td>
</tr>
<tr>
<td>B inner diameter</td>
<td>max 54.0 mm</td>
</tr>
<tr>
<td>C inner diameter</td>
<td>max 36.5 mm</td>
</tr>
<tr>
<td>D outer diameter</td>
<td>min 33.5 mm</td>
</tr>
<tr>
<td>E outer diameter</td>
<td>min 46.5 mm</td>
</tr>
<tr>
<td>Vertical play in the coupling pin</td>
<td>max 5.0 mm</td>
</tr>
</tbody>
</table>

Wear parts

- (f) Mechanism
- (g) Upper and lower guide bush
- (h) Drawbar eye bush
- (i) Rubber springs and bearing bushes
- (j) Wear plate

Changing the mechanism and guide bushes

*The coupling must be closed and the air supply to the control box must be cut off before work on the coupling is started.*

- Remove the mechanism by loosening the four screws and lift the mechanism from the drawbar.
- Remove the coupling mouth as per the picture.
Press out the old guide bushes from below and press in the new guide bushes from above as per the figure. The guide bushes must not be welded in.

Lubricate the bearing surfaces between the drawbar and the coupling mouth. Lubrication points.

Place the coupling mouth on the drawbar.

Put the new mechanism on the drawbar and insert the screws, but do not tighten completely.

Carry out the function check on page 7.

Tighten the screws.

Tightening torque M12 quality 8.8 (dry): 90 Nm.

Lubricate the coupling with thin oil. For the maximum effect, the coupling must be open when it is being lubricated.

Lubrication points (see drawing on left)
Changing the Indicator/locking pin

- Loosen the three bolts holding the cover.
- Remove the remaining parts.
- Clean the bearing surfaces of the locking pin (i) and lubricate with thin grease. Check that the centring pin (j) is correctly assembled.
- Replace the parts according to the drawing.

Tightening torque for the 3 screws for the cover: max 2 Nm.

Attachment check

- Remove the coupling head and clean the shaft of rust and rubber residue.
- Check that the drawbar is neither bent, nor has cracks.
- Check the wear limits as below:
  
  F max. Ø 67.2 mm (without bushings)
  G min. Ø 61.6 mm

- Check that there are no cracks forming or that there is no deformation on the drawbeam (h) and that the drawbar guide is properly attached.

Tightening torque M20 quality 8.8 (dry): 370–410 Nm.

Attachment check

- Check that there are no cracks forming or that there is no deformation on the drawbeam (h) and that the drawbar guide is properly attached.

Tightening torque M20 quality 8.8 (dry): 370–410 Nm.
Driver instructions
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Unlock and open the valve box door. Turn the red handle clockwise to "ON" and fold out the yellow handle. Simultaneously press on the yellow handle where it says "Press" and turn the handle anti-clockwise to "OPEN". Then turn it back to "CLOSE".

Uncouple the trailer. The coupling is closed when the trailer is disconnected.

Turn the red handle anti-clockwise to "OFF". Close and lock up the valve box door.

Warning!
*Never put your fingers into the coupling mouth because of the danger of them being crushed.*
Unlock and open the valve box door. Turn the red handle clockwise to "ON" and fold out the yellow handle. Simultaneously press on the yellow handle where it says "Press" and turn the handle anti-clockwise to "OPEN". Then turn it back to "CLOSE".

Couple to the trailer.

The coupling will close when the towing eye pushes up the coupling bolt and this releases the mechanism.

Check that the green lamp for the coupling in the cabin lights up.

Check that the indicator pin is completely in.

If the indicator pin is not completely in and the green light in the cabin for the coupling does not light up, the coupling procedure must be repeated. Only when the indicator pin is completely in and the green light in the cabin for the coupling lights up the coupling is closed and secured correctly.
When the trailer is coupled correctly turn back the red handle anti-clockwise into “OFF” then close and lock up the valve box door. (The valve box door can only be closed when both handles are in the closed position.)

Now the trailer is secured and driving may begin.
Mounting criteria for fitting or replacement of an automatic bolt coupling with EC type approval in accordance with the directive 94/20 EC

When fitting the trailer coupling please attend to the relevant statutory regulations. The trailer coupling may only be fitted on those vehicles being appropriate for the purpose. Always attend to the construction regulations/instructions from the vehicle manufacturers.

Fitting of the trailer coupling on the vehicle has to be made in accordance with the pertaining installation and operating instructions from the manufacturer and in compliance with the requirements laid down in appendix VII of the directive 94/20 EC.

Rear drawbeam must not show any incipient cracks or fissures (in particular when these are adjacent to bores). It has to be safeguarded that the trailer coupling is sufficiently designed for the towing vehicle and that restrictions, if any, are observed.

The EC type approval mark and the approved characteristic values for the trailer coupling as well as the application range are to be taken from the particulars on the manufacturers plate and from the pertaining installation and operating instructions.

The specifications of the towing vehicle necessary for dimensioning the trailer coupling may be taken from the vehicle manual.

Calculation of admissible trailer load of the coupling to be mounted

**Full trailer**

The permissible trailer load R of the trailer coupling for operation with full trailers (trailers where the drawbar is free to move in the vertical plane) is calculated by the formula for the D-value:

\[
D = \frac{(g \times T \times R)}{(T + R)} \text{ or by:} \\
R = \frac{(T \times D)}{((g \times T) - D)} \quad \text{(if D is less than } g \times T) \\
\text{where:} \\
R = \text{technically permissible maximum mass in tonnes of the full trailer (trailer cross weight)} \\
T = \text{technically permissible maximum mass in tonnes of the towing vehicle} \\
D = \text{theoretical reference force in kN for the horizontal force between towing vehicle and trailer} \\
g = 9.81 \text{ m/s}^2 \text{ (acceleration due to gravity)}
\]

**Rigid drawbar trailer/centre axle trailer**

The permissible trailer load of the coupling device for operation with rigid drawbar trailers/centre axle trailers (i.e. trailers equipped with a rigid drawbar which transmit vertical loads) is calculated by the formula for the Dc value:

\[
Dc = \frac{(g \times T \times C)}{(T + C)} \quad \text{or by} \\
C = \frac{(T \times Dc)}{((g \times T) - Dc)} \quad \text{(if Dc is less than } g \times T) \\
\text{where:} \\
C = \text{sum of the axle loads of the centre axle trailer carrying maximum permissible load} \\
\text{(permissible trailer load for rigid drawbar trailers/centre axle trailers) in tonnes} \\
T = \text{technically permissible maximum mass in tonnes of the towing vehicle} \\
Dc = \text{theoretical reference force in kN for the horizontal force between towing vehicle and rigid drawbar trailer/centre axle trailer} \\
g = 9.81 \text{ m/s}^2 \text{ (acceleration due to gravity)}
\]

and by:

\[
C = \frac{V}{a} \quad \text{(with S up to 1000 kg)} \\
\text{where:} \\
a = 1.8 \text{ m/s}^2 \text{ for towing vehicles with air suspension on the rear axle} \\
a = 2.4 \text{ m/s}^2 \text{ for towing vehicles with other suspension on the rear axle (e.g. leaf spring)} \\
V = \text{V-value of the trailer coupling to be mounted in kN} \\
S = \text{permissible static vertical load at the coupling point in kg}
\]

The lower value each for C resulting from both calculations is decisive as a value for the permissible trailer load of rigid drawbar trailers/centre axle trailers for the trailer coupling to be mounted.