<table>
<thead>
<tr>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disclaimer</td>
</tr>
<tr>
<td>Safety checks</td>
</tr>
<tr>
<td>General information</td>
</tr>
<tr>
<td>1. Basic principles</td>
</tr>
<tr>
<td>2. Components</td>
</tr>
<tr>
<td>3. Removal of the spring brake actuator</td>
</tr>
<tr>
<td>4. Disassembling components</td>
</tr>
<tr>
<td>5. Assembling components</td>
</tr>
<tr>
<td>6. Testing</td>
</tr>
<tr>
<td>7. Refitting the spring brake actuator</td>
</tr>
</tbody>
</table>
Disclaimer

The information contained herein is intended for the exclusive use of trained persons within the commercial vehicle industry, and must not be passed on to any third party.

This information does not purport to be all-inclusive and no responsibility is assumed as a result of its use. We cannot accept any liability nor offer any guarantee regarding data accuracy, completeness or timeliness. The information does not represent any guarantee or ensured characteristics of the Products or Systems described.

No liability can be accepted based on the information, its use, recommendations or advice provided. In no event may we be held liable for any damage or loss except in the case of wilful intent or gross negligence on our part, or if any mandatory legal provisions apply.

Brand names mentioned in this information are not identified as such in all cases. We would emphasize however that they are nevertheless subject to the provisions of trademark legislation.

Any legal disputes arising from the use of this information shall be subject to German law.

Failure of any individual clause of this disclaimer to comply with current legal provisions does not affect the validity of the remaining clauses.

The information, either in part or whole, may not be copied, reproduced or transmitted in any form without the prior explicit permission of Knorr-Bremse Systeme für Nutzfahrzeuge GmbH. Any contravention will be liable for damages and prosecution. The contents of this document are also protected under EU regulation 6/2002 and equivalent local legislation. All rights reserved.
Important notice

Safety

Before working on or around air braking systems and devices, the following precautions should be observed:

Stop the engine before working under a vehicle.

Always chock the wheels because depleting vehicle air system pressure may cause the vehicle to roll. Keep hands away from actuator push rods and slack adjusters; they may apply as system pressure drops.

Never connect or disconnect a hose or line containing air pressure, it may whip as air escapes. Never remove a device or pipe plug unless you are sure that all system pressure has been depleted.

Never exceed recommended air pressure and always wear safety glasses when working with air pressure. Never look into air jets or direct them at anyone.

Never attempt to dismantle a device until you have read and understood recommended procedures. Some units contain powerful springs and injury can result if not properly dismantled. Use only correct tools and observe all precautions relative to the use of these tools.

Test preliminaries

Before you begin testing the air braking system, perform the following checks:
Examine all pipework for signs of kinks, dents, abrasion, drying out or overheating.
Check attachment of all pipework; it should be supported so that it cannot abrade or be subjected to excessive heat.
The VOSS plug connection system 230 permits the rapid fitting of nylon tubes; only a wrench is needed to undo the connector. It consists of four components: plug with fir-tree (2), male fitting (4), retaining clip (8) and spring element (9). The plug has a wide holding groove, in which the retaining clip (8) engages the assembly. Two other grooves accommodate O-rings. The first O-ring (5) seals the connector against the air pressure. The second O-ring (3) prevents the ingress of foreign matter. At the same time, its red colour serves as a visual check to indicate correct assembly.

The male fitting (4) is screwed tightly into the body of the device with the thread being sealed by O-ring (6).

The plastic retaining clip (8) is open on one side and is opened by the tapered tail of the plug during assembly. After insertion of the plug this clip engages the holding groove. The retaining clip is self-centering.

The rubber spring element (9) is inserted into an annular compartment at the base of the formed bore. The design of the spring element causes the plug to be placed under axial stress after the retaining clip (8) has engaged.

The nylon tube must be cut off square. A saw must not be used for this purpose as the unavoidable formation of burrs jeopardises the sealing capability of the connection. For cutting the nylon tube to length, the VOSS tube cutting pliers (VOSS Part No. 5 9 94 55 00 00) can be used so that the tube is cut cleanly and at right angles. Reworking the cut surface, such as deburring, is no longer necessary.

**Pressing the fir-tree into the nylon tube**

The following is to be observed:

- The pressing-in procedure is to be performed at room temperature
- The nylon tube must not be heated
- The fir-tree must not exhibit any damage otherwise the connection with the nylon tube will not be tight
- The fir-tree should be clean and free of grease
Protective cap
All plugs are supplied with a protective plastic cap to prevent damage to the plug. This protective cap must not be removed until immediately before final assembly.

Assembly using assembly mandrel
The male fitting (4) with greased O-ring (6), retaining clip (8) and spring element (9) are successively mounted onto the assembly mandrel. The assembly mandrel prepared in this way is screwed hand-tight into the connection bore. The mandrel is withdrawn, the individual components remain in their position. The male fitting (4) is then tightened fully to a torque of 10 + 1 Nm.

Assembly without using assembly mandrel
The spring element (9) is inserted into position under the thread root of the connection bore (a) and (b). The retaining clip (8) is introduced so that it rests flat on the thread root (b) and (c). The spring element (9) and retaining clip (8) are symmetrically positioned. The male fitting (4), pre-assembled with the pre-greased O-ring (6), is then screwed by hand into the tapped bore (c), then tightened fully to a torque of 10 + 1 Nm.

Grease
Use grease II14525 Fuchs “Renolit” HLT2.
General information

The service interval is the length of time from the vehicle first entering service, or from the last service, until the point in time - or distance travelled by the vehicle (whichever is the earlier) - when it is recommended that the specified braking system device is serviced using a genuine Knorr-Bremse service kit or replaced with a new part, or in the case of ABS subjected to a system functionality check.

This service interval is provided for preventative maintenance purposes so as to minimize the probability of a vehicle breakdown.

The service interval does not preclude the intermediate testing of the device on the vehicle to ensure that it is functioning in a correct manner, or the correct maintenance of other devices in the system that may influence the service interval.

The service interval can also be influenced by the positioning of the device on the vehicle, and the following service intervals are based on the assumption that each device is positioned such it cannot be inadvertently abused or that external rubber boots/seals are not exposed to abnormal influences.

In general, Knorr-Bremse service kits contain all of the components that can deteriorate with use, such as rubber parts (O-rings, special seals, bonded inlet/exhaust valves, exhaust flaps), plastic and metal parts (filter elements and springs), fasteners and the correct grease. The range of kits is designed to enable each device to be serviced in part or completely.

Knorr-Bremse service kits are only designed for use with genuine Knorr-Bremse assemblies and are only to be used in the manner detailed in these service instructions. After servicing, the assembly must also be checked in accordance with Knorr-Bremse service instructions to ensure correct operation before the vehicle is placed back in service.

### Service Intervals

<table>
<thead>
<tr>
<th>Component</th>
<th>Service interval</th>
<th>Service task</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring brake actuator</td>
<td>3 years or 300 000 km</td>
<td>Service the service portion</td>
<td>Incorrectly adjusted brakes (excessive stroke) and damage to the push rod boot will reduce the service interval</td>
</tr>
</tbody>
</table>

**Additional checks:**

In addition to the above, and any legally required periodic vehicle inspections, it is recommended that simple routine inspections of a general nature are carried out to maintain the braking system at a high level of functionality. These simple routine inspections should be (1) the weekly checking for excess water in the reservoirs by operation of the reservoir drain valves, and (2) the 6 monthly / (50,000 km) checking of the complete braking system for excessive air leakage during a maximum pressure foot brake application with the vehicle stationary and the parking brake released.
1. Basic principles

Functionality

<table>
<thead>
<tr>
<th>Application</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>The spring brake actuator is used for generating the input force required for the service brake and the parking brake.</td>
<td></td>
</tr>
</tbody>
</table>

Function

Driving

Chamber (d) is pressurised, power spring (21) is held compressed by the air pressure acting on spring portion piston (18). The spring portion is in the brakes released position.

Service chamber (a) is not pressurised. Push plate (52) and diaphragm (7) are held in the service brakes released position by the return spring (3).

Braking with foot brake valve (service brake)

When air pressure is introduced into service chamber (a) the diaphragm (7) moves the push plate (52) outwards with a force proportional to its effective area and the pressure applied. The push rod (1) transfers this force to the foundation brake via the slack adjuster. When the pressure is reduced or removed, the return spring (3) moves the push plate (52) and the diaphragm (7) back to the brakes released position.

Any water or other contamination is expelled through the vent hole (e). This also allows for equalization of any pressure between non pressure chamber (b) and atmosphere caused by air displaced by the diaphragm.

Legend

1 Push rod
3 Return spring
7 Diaphragm
16 Breather valve
18 Spring portion piston
19 Main seal
21 Power spring
26 Release bolt
52 Push plate

Connectors

11 Air supply
12 Air supply

<table>
<thead>
<tr>
<th>Number</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>a Service chamber</td>
</tr>
<tr>
<td>12</td>
<td>b Non pressure chamber</td>
</tr>
<tr>
<td>16</td>
<td>c Spring chamber</td>
</tr>
<tr>
<td>18</td>
<td>d Spring pressure chamber</td>
</tr>
<tr>
<td>19</td>
<td>e Vent hole</td>
</tr>
<tr>
<td>21</td>
<td>f Piston tube</td>
</tr>
</tbody>
</table>

DIN ISO 1219
1. Basic principles

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Braking with hand brake valve (parking brake)</td>
<td>When the pressure in spring pressure chamber (d) is released, the spring portion piston (18) is pushed forward by the power spring (21). The end of the spring portion piston (18) pushes diaphragm (7), push plate (52) and push rod (1) outwards. The force of the power spring (21) is transferred to the foundation brake via the slack adjuster. When pressure is reapplied to spring pressure chamber (d), spring portion piston (18) compresses power spring (21) and allows push plate (52) and diaphragm (7) to be returned to the brakes released position by return spring (3). The equalization of pressure in the spring chamber (c) is carried out via the breather valve (16) in the piston tube (f).</td>
</tr>
<tr>
<td>Breather valve</td>
<td>Pressure equalization is carried out between spring chamber (c) and atmosphere via port 11 and the upstream equipment (e.g. foot brake valve) in order to protect the spring chamber (c) from dirt and humidity deposits. Breather valve (16) is designed so that it remains open while the service brake is not applied. Only when actuating the service brake (pressure at port 11), breather valve (16) is closed in order to prevent pressure build-up in the spring chamber (c). Note: When the parking brake is applied and pressure is applied very slowly at port 11, it is possible that a venting noise becomes audible at the relay valve or at the hand-brake valve. This effect is not to be considered as leakage since it does not occur when the spring brake actuator section is charged or when the service brake is actuated in the normal way.</td>
</tr>
<tr>
<td>Leaking spring brake actuator piston</td>
<td>If main seal (19) is defective, air can leak from spring pressure chamber (d) to spring chamber (c). Pressure cannot build in spring chamber (c) since it will be vented via breather valve (16) and unintentional brake application of the spring-brake actuator is prevented (on condition that there is sufficient air supply at port 12). Pressure flow via the breather valve does not lead to a pressure build up on diaphragm (7) since this pressure will be vented via port 11 and the upstream equipment.</td>
</tr>
<tr>
<td>Mechanical release of the parking brake</td>
<td>The brake can be released mechanically in the event of a pressure failure in the spring brake actuator (port 12). Chock the wheels to make sure that the vehicle cannot start rolling and turn the release bolt (26) with the help of an open-ended spanner 24 mm AF in an anti-clockwise direction (torque max. 50 Nm) until the brake is released. CAUTION! When the repair has been carried out, screw the release bolt (26) fully into the actuator, ensuring that the seal in the inner face of the release bolt head seals against its adjacent sealing face and tighten to a torque of 30 + 10 Nm.</td>
</tr>
</tbody>
</table>
## 2. Components

### 2.2 Part identification

<table>
<thead>
<tr>
<th>Item</th>
<th>Spare</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Push rod</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>●</td>
<td>Return spring</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Front cover</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>●</td>
<td>Spring retainer</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Clamp ring</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>●</td>
<td>Diaphragm</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>●</td>
<td>Screw M8 x 50</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>●</td>
<td>Hexagon nut M8</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>Spring portion</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>●</td>
<td>Bellows</td>
<td>1</td>
</tr>
<tr>
<td>26</td>
<td></td>
<td>Release bolt</td>
<td>1</td>
</tr>
<tr>
<td>50</td>
<td>●</td>
<td>Split pin</td>
<td>1</td>
</tr>
<tr>
<td>51</td>
<td>●</td>
<td>Yoke pin</td>
<td>1</td>
</tr>
<tr>
<td>52</td>
<td></td>
<td>Push plate</td>
<td>1</td>
</tr>
<tr>
<td>53</td>
<td>●</td>
<td>Hexagon nut M16 x 1.5</td>
<td>2</td>
</tr>
<tr>
<td>54</td>
<td>●</td>
<td>Washer</td>
<td>2</td>
</tr>
</tbody>
</table>

● These components are part of the spare parts kit:

<table>
<thead>
<tr>
<th>Spring brake actuator</th>
<th>Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part No</td>
<td>Type No</td>
</tr>
<tr>
<td>K004797</td>
<td>BZ6554</td>
</tr>
<tr>
<td>K000568</td>
<td>BZ7578</td>
</tr>
<tr>
<td>K004796</td>
<td>BZ6553</td>
</tr>
<tr>
<td>K002896</td>
<td>BZ7579</td>
</tr>
</tbody>
</table>
3. Removal of the spring brake actuator

3.1 Removing the spring brake actuator from the vehicle

Servicing
## 3. Removal of the spring brake actuator

### 3.2 Removing the spring brake actuator from the vehicle

<table>
<thead>
<tr>
<th>Step</th>
<th>Service task</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Before starting work on the vehicle please refer to the safety instructions on page 5.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Apply pressure to port 12 via hand brake valve (brakes off position).</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Rotate the release bolt (26) in an anticlockwise direction (torque max. 50 Nm) such that the release bolt is fully wound out. Use a spanner 24 mm. Do not use an impact driver.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Vent port 12 via hand brake valve (brakes on position).</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Ensure that port 11 and 12 are free of pressure.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Disconnect the air lines after noting which port they are connected to for correct reinstallation.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Cover the ports to prevent entry of dirt.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Remove split pin (50) and yoke pin (51) from yoke assembly.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Remove the hexagon nuts (53), washers (54) and remove the spring brake actuator.</td>
<td></td>
</tr>
</tbody>
</table>
4. Disassembling components

4.1 Disassembly of the service portion

Servicing
## 4. Disassembling components

### 4.2 Disassembly of the service portion

<table>
<thead>
<tr>
<th>Step</th>
<th>Service task</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mark position of spring portion (17), front cover (4) and clamp ring (6) relative to each other. Ensure that the release bolt (26) is in the fully wound out position.</td>
<td>![Warning]</td>
</tr>
<tr>
<td>2</td>
<td>Care must be taken when loosening and removing the clamp ring (6) to ensure the force of return spring (3) is contained.</td>
<td>![Warning]</td>
</tr>
<tr>
<td>3</td>
<td>Loosen Screw (10) and hexagon nut (11). Use a spanner 13 mm AF and a hexagon key 6 mm.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Loosen and remove clamp ring (6).</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Remove complete service portion.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Remove diaphragm (7).</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Use appropriate cutter (e.g. sharp knife) to cut the bellows (20) away from the push rod (1) and front cover (4). Hold appropriately and wear gloves to protect your hands.</td>
<td>![Warning]</td>
</tr>
<tr>
<td>8</td>
<td>Place the flat surface of the push plate (52) on a hotplate and heat to 150°C - 200°C (this will break the “loctite” on the thread between push rod (1) and push plate (52). Do not heat using a flame. Take care when handling hot components.</td>
<td>![Warning]</td>
</tr>
<tr>
<td>9</td>
<td>Unscrew push rod (1) from push plate (52), taking care to contain the force of return spring (3).</td>
<td>![Warning]</td>
</tr>
<tr>
<td>10</td>
<td>Remove spring retainer (5) and return spring (3).</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Clean and inspect all parts that are to be reused for excessive wear, damage or corrosion. If in doubt replace the spring brake actuator.</td>
<td>![Warning]</td>
</tr>
<tr>
<td>12</td>
<td>Remove adhesive residue and grease on threads of push plate (52) and push rod (1). Use degreaser for any grease residue. The clean and dry threads should not be touched with bare hands for the assembling procedure.</td>
<td>![Warning]</td>
</tr>
</tbody>
</table>
5. Assembling components

5.1 Assembly of the service portion

Positioning of the clamp ring and diaphragm
5. Assembling components

5.2 Assembly of the service portion

<table>
<thead>
<tr>
<th>Step</th>
<th>Service task</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Put the bellows (20) on the push rod (1).</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Insert push rod (1) through the hole in front cover (4) and fix the bellows (20) to the inside of front cover.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Locate the return spring (3) on the bellows (20) outer diameter.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Place the spring retainer (5) on the return spring (3).</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Apply a continuous bead of adhesive “Loctite 638” around the entire circumference and covering at least the first four threads of the push rod (1). Screw push plate (52) and push rod (1) together. This should be done immediately after applying the adhesive.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Place diaphragm (7) into the spring portion (17). Ensure that it is in a central position; refer to the diagram “Positioning of the clamp ring and diaphragm”.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Place service portion, assembly (steps 1 - 5), in the diaphragm (7) and spring portion (17). Check that the position of spring portion (17), front cover (4) and clamp ring (6) are in line with the marks created in step 1 of “Dismantling service portion”.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Press the front cover (4) and the spring portion (17) together and fit clamp ring (6) ensuring correct alignment all around. Diaphragm (7) must be evenly located around the entire circumference with no dips or bulges; refer to the diagram “Positioning of the clamp ring and diaphragm”.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Tighten screw (10) and hexagon nut (11) to a torque of 15 ± 2 Nm.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Fully apply and release air to port 11 approximately 10 times (maximum 8.5 bar).</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Retighten screw (10) and hexagon nut (11) to a torque of 20 ± 2 Nm.</td>
<td></td>
</tr>
</tbody>
</table>
6. Testing

6.1 Functional and leakage test

Note for functional and leakage test:
If an 8.5 bar maximum air supply is not available, use the vehicle’s unloader cut-out pressure but only if this pressure is lower than 8.5 bar.

Service brake chamber
Apply maximum operating pressure of 8.5 bar at port 12 (spring portion).
Using a maximum pressure of 8.5 bar at port 11, operate the service brake twice. The push rod should move smoothly in and out and have a minimum stroke of 57 mm.

Spring brake chamber
Using a minimum pressure of 5.1 ± 0.3 bar at port 12, operate the spring portion twice. The push rod should move smoothly in and out and have a minimum stroke of 57 mm.
Note: A minimum pressure of 5.1 ± 0.3 bar is required at port 12 to hold the parking brake at its minimum stroke.

Leakage tests
Note: Refer to the “breather valve” explanation in the basic principles section before leak testing.

Service brake chamber
With a minimum application rate of 3 bar/sec. at port 11 and with the spring portion in the “brake on” position (port 12 vented to atmosphere), apply a maximum pressure of 8.5 bar at port 11. The maximum leakage allowed at the clamp ring and at port 12 is a 0.5” diameter bubble / 6 sec. (10 sccm).

Spring brake chamber
Apply a maximum pressure of 8.5 bar at port 12. The maximum leakage allowed at the clamp ring and at port 11 is a 0.5” diameter bubble /6 sec. (10 sccm).
7. Refitting the spring brake actuator

7.1 Refitting the spring brake actuator to the vehicle

![Diagram of spring brake actuator with labeled parts and vent hole.]

- Port 12
- Port 11
- Vent hole
- Numbers 50, 51, 53, 54, 6, 17, 26

Servicing
7. Refitting the spring brake actuator

### 7.2 Refitting the spring brake actuator to the vehicle

<table>
<thead>
<tr>
<th>Step</th>
<th>Service task</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Check that the mounting bracket surface is not cracked or damaged and is clean.</td>
<td>!</td>
</tr>
<tr>
<td>2</td>
<td>Make sure that release bolt (26) is in the fully wound out position.</td>
<td>!</td>
</tr>
<tr>
<td>3</td>
<td>Make sure that an open vent hole of the service portion is oriented towards the ground.</td>
<td>!</td>
</tr>
<tr>
<td>4</td>
<td>Assemble the spring brake actuator to the mounting bracket. New washers (54) must be fitted between the mounting nuts and the mounting bracket – never between the spring brake and the mounting bracket.</td>
<td>!</td>
</tr>
<tr>
<td>5</td>
<td>Tighten new M16 hexagon nuts (53) to a torque of 180 + 30 Nm.</td>
<td>!</td>
</tr>
<tr>
<td>6</td>
<td>Rotate the push rod (1) with the yoke assembly so that the yoke is correctly aligned with the slack adjuster.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Wind the slack adjuster to meet the yoke. This applies to manual and to automatic slack adjusters. Never pull the push rod (1) forward to meet the slack adjuster.</td>
<td>!</td>
</tr>
<tr>
<td>8</td>
<td>After applying grease to the yoke pin (51), yoke hole and slack adjuster hole, insert yoke pin into the yoke and fit the new split pin (50). Ensure the legs of the split pin are spread so that it cannot fall out.</td>
<td>!</td>
</tr>
<tr>
<td>9</td>
<td>Connect service brake hose to port 11 and parking brake hose to port 12. Tighten fittings to 40 + 5Nm.</td>
<td>!</td>
</tr>
<tr>
<td>10</td>
<td>Ensure that the brakes / slack adjuster are correctly adjusted to vehicle manufacturer's recommendations.</td>
<td>!</td>
</tr>
<tr>
<td>11</td>
<td>Apply pressure to port 11 via the foot brake valve and port 12 via the hand brake valve.</td>
<td>!</td>
</tr>
<tr>
<td>12</td>
<td>Ensure there is no leakage at the fittings.</td>
<td>!</td>
</tr>
<tr>
<td>13</td>
<td>Rotate release bolt (26) clockwise and lock it in the fully wound in position with a torque of 30 + 10 Nm ensuring that the seal in the inner face of the release bolt head seals against its adjacent sealing face. Do not use an impact driver.</td>
<td>!</td>
</tr>
<tr>
<td>14</td>
<td>Vent port 12 via hand brake valve (brakes on position) and check for correct function of the parking brake.</td>
<td>!</td>
</tr>
</tbody>
</table>
The figurative mark “K” and the trademarks KNORR, KNORR-BREMSE are registered in the name of Knorr-Bremse AG.

Subject to alteration without notice. For specific application requirements and details on the use of our products we recommend that you request individual consultation and documentation.

This document, either in part or whole, may not be copied, reproduced or transmitted in any form without the prior, explicit permission of Knorr-Bremse Systeme für Nutzfahrzeuge GmbH. Any contravention will be liable for damages and prosecution. The contents of this document are also protected under EU regulation 6/2002 and equivalent local legislation. All rights reserved. Printed in Germany - 2005

Knorr-Bremse

Knorr-Bremse Systems für Nutzfahrzeuge GmbH
Moosacher Straße 80
80809 Munich
Germany
Tel: +49 89 3547-0
Fax: +49 89 3547-2767

Knorr-Bremse Australia Pty. Ltd.
1/2D Factory Street
PO Box 180
Granville NSW 2142
Australia
Tel: +61 2 8863-6151
Fax: +61 2 8863-6149

Knorr-Bremse GmbH
Systeme für Nutzfahrzeuge
Beethovenstrasse 43-45
2340 Mödling
Austria
Tel: +43 2236 409-436
Fax: +43 2236 409-434

Knorr-Bremse Benelux B.V.B.A.
Impulsstraat 11
Industriepark zone D
2220 Heist-op-den-Berg
Belgium
Tel: +32 15 25-7900
Fax: +32 15 24-9240

Knorr-Bremse Sistemas para Veículos Comerciais Brasil Ltda.
Av. Engenheiro Eusebio Stevaux, 873
Jurubatuba
São Paulo - SP
Brazil
Tel: +55 11 5681-1104
Fax: +55 11 5686-3905

Knorr-Bremse Far East Ltd.
Truck Brake Systems Division
Suite 2901, 29/F., Central Plaza
18 Harbour Road
Wanchai
Hong Kong
China
Tel: +852 2861 2669
Fax: +852 2520 6259

Knorr-Bremse Brake Equipment (Shanghai) Co. Ltd.
Truck Brake Systems Division
Section B, Building 31
390 Aidu Road
 Waigaoqiao Free Trade Zone
Shanghai, 200131
China
Tel: +86 21 5046-0776
Fax: +86 21 5046-3427

Knorr-Bremse

Knorr-Bremse Systems pour Véhicules Utilitaires France S.A.
BP 34178
EN 13, La Briqueterie
Glos
France
Tel: +33 2 3132-1200
Fax: +33 2 3132-1303

Hesse & Wrede GmbH
George-Knorr-Straße 4
32661 Berlin
Germany
Tel: +49 50 392-3101
Fax: +49 50 392-3111

Knorr-Bremse Felekrendszer Kft.
Reckemeter
Szegedi út 49
6000
Hungary
Tel: +36 76 511 100
Fax: +36 76 481 100

Knorr-Bremse Systems for Commercial Vehicles India Private Ltd.
(A Joint Venture of Knorr-Bremse Far East and Tata Autocomp Systems Ltd)
Survey No 280 & 281
Village Mann
Taluka Mulshi
Pune 411 057
India
Tel: +91 20 2293 9141-47
Fax: +91 20 2293 9148

Knorr-Bremse Sistemi per Autoveicoli Commerciali S.p.A.
Via Alessandro Polini, 130
20043 Arcore
Italy
Tel: +39 039 6075-1
Fax: +39 039 6075-435

Knorr-Bremse Commercial Vehicle Systems Japan Ltd.
3-1-15, Michishiebaku
Toshima-ku
Tokyo 171 0021
Japan
Tel: +81 3 3971-8501
Fax: +81 3 3971-8579

Knorr-Bremse Koree Ltd.
Truck Brake Division
6 Fl., Bongwoon B/D, 31-7, 1-Ga
Jungchung-Dong, Jung-Gu
Seoul 100-395
Korea
Tel: +82 2 2273-1182
Fax: +82 2 2273-1184

Knorr-Bremse Benelux B.V.B.A.
Rendementsweg 49
3641 SK Mijdrecht
Netherlands
Tel: +31 297 223-330
Fax: +31 297 223-339

Knorr-Bremse RUS
Pamirskaja Str. 11
603029 Nischny Nowgorod
Russian Federation

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH
Representation Office Russia
1. Kazachstjch Pereulok 5/2
119017 Moscow
Russian Federation
Tel: +7 095 234-4995
Fax: +7 095 234-4996

Knorr-Bremse S.A. Pty. Ltd.
3 Derrick Road
(corner Chestnut Road)
1610 Kempton Park
South Africa
Tel: +27 11 961-7800
Fax: +27 11 975-6249

Boxt Ibérica, S.L.
Avda. Letxunborro 58
Apdo. 363
20303 Ilar
Spain
Tel: +34 943 614-063

Knorr-Bremse System for Tunga Fordon AB
P.O. Box 6029
200 11 Malmö
Sweden
Tel: +46 40 680 5800
Fax: +46 40 937490

Knorr-Bremse Systems for Nutzfahrzeuge GmbH
Office Switzerland
Zürichstrasse 46
8303 Busserdorf
Switzerland
Tel: +41 1 886 77-55
Fax: +41 1 886 77-50

Knorr-Bremse Systems for Nutzfahrzeuge GmbH
Liaison Office Istanbul
Medici Mebusan Cad. 139/A
Atlantic Han Kat. 3
00400 Fındıklı-Istanbul
Turkey
Tel: +90 212 293-4742
Fax: +90 212 293-4742

Knorr-Bremse Systems for Commercial Vehicles Ltd.
Century House, Folly Brook Road
Emerald Park, Emersons Green
Bristol
BS16 7FE
United Kingdom
Tel: +44 117 984-1000
Fax: +44 117 984-1001

Bendix Commercial Vehicle Systems LLC
901, Cleveland Street
Elyria, OH 44035
USA
Tel: +1 440 329-9100
Fax: +1 440 329-9105

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH
Representative Office China
28 F., International Trade Centre
500 Dongcheng Donglu
Beijing 100007
China
Tel: +86 10 6559-6666
Fax: +86 10 6559-6699

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH
Office Hongkong
P.O. Box 6029
200 11 Malmö
Sweden
Tel: +852 2861 2669
Fax: +852 2520 6259

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH
Office Singapore
488 Kitchener Road
Singapore 228231
Singapore
Tel: +65 6345 3700
Fax: +65 6345 3701

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH
Office South Africa
1610 Kempton Park
South Africa
Tel: +27 11 961-7800
Fax: +27 11 975-6249

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH
Office South Africa
Surgeon Drive
Emblem Park
Emblem Green
Bristol
BS16 7FE
United Kingdom
Tel: +44 117 984-1000
Fax: +44 117 984-1001

Knorr-Bremse

Knorr-Bremse Systeme für Nutzfahrzeuge GmbH
Office Switzerland
Zürichstrasse 46
8303 Busserdorf
Switzerland
Tel: +41 1 886 77-55
Fax: +41 1 886 77-50

Knorr-Bremse Systems for Nutzfahrzeuge GmbH
Liaison Office Istanbul
Medici Mebusan Cad. 139/A
Atlantic Han Kat. 3
00400 Fındıklı-Istanbul
Turkey
Tel: +90 212 293-4742
Fax: +90 212 293-4742

Knorr-Bremse Systems for Commercial Vehicles Ltd.
Century House, Folly Brook Road
Emerald Park, Emersons Green
Bristol
BS16 7FE
United Kingdom
Tel: +44 117 984-1000
Fax: +44 117 984-1001

Bendix Commercial Vehicle Systems LLC
901, Cleveland Street
Elyria, OH 44035
USA
Tel: +1 440 329-9100
Fax: +1 440 329-9105