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Notes on these instructions

This repair manual includes information and instructions on how to perform repair work on the MSG 97A (L) suspension of the following seat models:
- Suspension with height and vertical shock absorber adjustment on the left side and
- Suspension with height adjustment on the front and vertical shock absorber adjustment on the right side.

The diagnosis of the entire seat assembly and repair of the upper part of the seat is described in the repair manual for the Upper seat part MSG 97A (L), to which a reference is made, if required. **Example:** remove the upper part of the seat (see repair manual for the upper seat part).

The suspension with height adjustment on the front and vertical shock absorber adjustment on the right side forms the basis for illustration in this repair manual. In the case of technical deviations in the work steps, refer to the current text or separate chapters of the manual.

Each chapter starts with a list of all preparatory work to be completed before starting repair. These preparations are described in separate chapters and shall be carried out without the preparatory steps described there.

At the beginning of each description for repair you will find an overview diagram. All parts included in these overview diagrams within one chapter are consecutively numbered starting with "1". Each component is referred to by the same number throughout the document.

With the help of these overview diagrams an experienced technician will gain a quick overview.
For spare part orders please use the numbers stated in the latest issue of the relevant spare parts catalogue.

The description of the work steps refers to the seat and upper seat part in a disassembled condition. Depending on the individual installation position, some work may also be performed while the seat remains installed. For this reason, check the environment of the installed seat for this possibility before starting work. The safety notes of the specific vehicle manufacturers and those stated in Chapter 1 of this repair manual must be strictly observed.

This repair manual also includes some information on special seat designs, if these require further explanation. Since the scope of delivery depends on the specific customer order, the actual seat equipment may deviate from the descriptions and illustrations in this manual.

If not stated otherwise, the directional indications "front, back" and "right, left" refer to the installed seat regarded in forward travel direction of the vehicle.

The document layout is suitable for later use of this repair manual via CD-ROM / INTERNET / INTRANET. For this reason a navigation line has been added beneath the title. This navigation line includes some chapter titles and it allows the user to jump directly to these chapters after the corresponding hyperlinks have been set.
Basic information about the seat

The seat is provided with a long-lasting lubrication (approx. 10 years). The lubricating points must be re-greased only after repair work, using an acid-free multiple-purpose lubricant.

Bowden pull wires must be fixed with cable ties to the defined spots only by hand (loose). Make sure that in the case of seat adjustment, the Bowden pull wires cannot be squeezed or distorted when the seat is moved.

After removal, all parts must be cleaned and checked for their suitability for re-use. Defective parts and worn parts must be replaced.

The company GRAMMER rejects any warranty claims, if damaged or worn parts and assemblies are not replaced by spare parts released by GRAMMER.

Qualified personnel

These installation instructions offer basic information on proper technical seat repair. The contents of the work procedures described are intended for professionally educated technicians with profound product knowledge. This level of knowledge is an imperative requirement when performing the work and procedures described in this document.
In order to avoid bodily injury, reduced operational safety or damage to the seat resulting from improperly performed work, all information and instructions, in particular the safety notes stated in Chapter 1, must be read carefully and strictly observed.

As an inevitable matter of fact, GRAMMER AG cannot evaluate all situations and consequences that may bear a risk of injury for the persons involved in the described work procedures. For this reason it is absolutely necessary that every person who carries out repair work at a seat uses his/her professional knowledge to make sure that his/her own safety will not be put at risk and that the selected type of repair will not cause any negative effects, in particular with regard to technical safety. For this reason Grammer AG disclaims liability for any possible damage of this kind.

We point out explicitly, that all work steps and procedures described are to be performed with consideration to the applicable directives and regulations stipulated by the relevant local authorities and in compliance with the provisions on health protection, prevention of accidents and environmental protection.

**Change Notification and Copyright**

The seats are subject to continuous development. Please understand that we must reserve the right to make changes in shape, equipment and technical design. For this reason, the contents of this repair manual cannot be used to substantiate any possible claims.

Reprint, translation and copies of this manual or parts thereof are admissible only after written approval.

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1.1 Safety notes
1.2 Rating plate

Note:
Please refer to the applicable seat operation manual for further details.
1.1 Safety notes

1 All inspection, test and repair work must be performed exclusively by adequately trained personnel.

2 All work steps and procedures described are to be performed with consideration to the applicable directives and regulations stipulated by the relevant local authorities and in compliance with the provisions on health protection, prevention of accidents and environmental protection.

3 Special notes in this repair manual are highlighted as follows:

⚠️WARNING ... indicates possible risks for persons and their prevention.

⚠️ATTENTION ... indicates possible damage or deterioration of material and their prevention.

Note: ... introduces an additional explanation for better understanding of the work to be carried out.

Installation note: ... introduces an additional explanation for better understanding of the installation work to be carried out.

4 Before starting any repair work
   • disconnect the battery from power supply and
   • move the seat down to the limit stop.

5 When using oil, grease and other chemical substances, the relevant safety regulations for the handling and use of these materials must be observed.
The rating plate is fixed on the back of the seat frame.

The rating plate shows the following information (example):

(A) **BENENNUNG (DENOMINATION)**  = MSG97A(L)/731

(B) **SACHNUMMER (INVENTORY No.)**  = 1 050 365

(C) **Year / CW / Assembly**
   - Year of manufacture  = 04 (2004)
   - Built in week  = 15 (April)
   - Assembly  = 031

(D) **AUFTRAGS NR. (Order number)**  = DE 42844300080

**Note:**
The inventory No. is always to be quoted when orders are placed.
2 Diagnosis

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2.1 Overview of components

- Compressor / height level control (page 1)
- Pneumatic connecting diagram (page 2)
- Vehicle power supply cable / connecting cable (page 4)

2.2 Functional test

2.3 Overview of faults

- Seat does not respond when operating the seat height adjustment in an upward direction (page 1)
- Seat responds when the seat height adjuster is operated, but returns then to its original position (page 2)
- Seat does not respond when operating the seat height adjustment in a downward direction (page 2)
- Seat changes its position whilst driving, vents and lowers down (page 2)
- Seat can be set to the highest position and does not vent anymore (page 3)
- Seat can be lowered, but does not pump up in the lowest position (page 3)
- Seat pumps up and remains in the middle position, while the compressor is running (page 4)
- Seat pumps up by itself (e.g. seat suspension); compressor starts (page 4)
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2.4 Fault diagnosis
   1 Checking the compressor (page 1)
   2 Checking the height level control (page 3)
   3 Checking the pneumatic spring (page 5)
   4 Checking the vehicle power connector / connector plug (page 6)
Compressor / Height level control:

(1) Height level control
(2) Compressor
(3) Compressor cable
(4) Flat plug
(5) Compressor power cable
(6) Power cable of the transparent right-angle plug (1-pin)
(7) Right-angle plug (transparent)
2.1 Overview of components

Pneumatic connecting diagram:

1. Air tank (additional air supply)
2. Pneumatic spring
3. Height level control
4. Air input hose
5. Air input hose
6. Retaining ring of the quick coupling

**WARNING** damage!

Please pay attention to the notes given in Chapter 3.10 when pulling the hoses out of the retaining rings of the quick coupling!

7. Air hose with angle

**Note:**
The blue marking indicates the length to be inserted into the air tank (1) and pneumatic spring (2).

**Insert length:** $A = 17$ mm.
2.1 Overview of components

(8) Compressed-air hose
(9) Compressor
2.1 Overview of components

Vehicle power supply cable / Connecting cable:

(1) Cable harness of the connector plug (seat heater, lumbar support)
(2) Compressor cable
(3) Cable harness of the vehicle power connector
(4) Power cable of the black right-angle plug (1-pin)
(5) Power cable of the connector plug
(6) Cable of the vehicle power connector – connector plug
(7) Power cable of the vehicle power connector
(8) Compressor power cable
(9) Cable of the transparent right-angle plug (1-pin)
2.1 Overview of components

(A) Connector plug
(B) Vehicle power connector (2-pin)
(C) Plug-in cable connection:
   Power cable of the vehicle power connector/Connector plug – Compressor power cable
(D) Right-angle plug (transparent)
   (compressor connecting cable for micro-switch)
(E) Right-angle plug (black)
   (current carrying cable for micro-switch)

Cable colors:
sw = black
we = white
ro = red
sw/we = black/white
A functional test is used to circumscribe all possible malfunctions; it must be performed before and after repair work on the seat suspension system at any rate.

** Preconditions for testing:**
- The individual functions are activated in compliance with the instructions of the seat operating manual.
- The electrical system of the vehicle has been inspected and found OK in compliance with the vehicle operating instructions.
- Battery voltage 12 V (24 V), ignition is on.

**Note:** The components stated above are illustrated in Chapter 2.1.
If there is a difference between the Result/actual status and the specified status, please take the measures as described in the chapter "Causes/remedial measures".

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Scope of inspection</th>
<th>Function to be operated</th>
<th>Result/specifed state</th>
<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Height adjustment</td>
<td>Pull the handle for height adjustment upwards and keep it in this position (max. 1 minute).</td>
<td>The seat moves upwards until the maximum height is reached.</td>
<td>See overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Release the handle.</td>
<td>The seat must move downwards by 30 mm after the maximum height is reached.</td>
<td>See overview of faults (Chapter 2.3).</td>
</tr>
</tbody>
</table>
## 2.2 Functional test

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Scope of inspection</th>
<th>Function to be operated</th>
<th>Result/specified state</th>
<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td>Press the handle for height adjustment downwards and keep it in this position.</td>
<td>The seat moves downwards until the minimum height is reached.</td>
<td>See overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>3</td>
<td>Release the handle for height adjustment.</td>
<td>The seat remains in the set position.</td>
<td>See overview of faults (Chapter 2.3).</td>
<td></td>
</tr>
</tbody>
</table>
### 2.3 Overview of faults

This chapter contains notes on possible faults of the seat suspension system. The notes and information provided in Chapter 2.4 "Fault diagnosis" are intended to ease troubleshooting of faults.

Faults, caused due to insufficient maintenance or improper repair, are not covered here.

**Note:** The components stated above are illustrated in Chapter 2.1.

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat does not respond when operating the handle for seat height adjustment in an</td>
<td>• The plug of the micro-switch is not properly inserted.</td>
<td>Check the current path and plug connections and, if necessary, connect the plug.</td>
</tr>
<tr>
<td>upward direction</td>
<td>• Compressor is not active.</td>
<td>Check the compressor (Chapter 2.4, inspection step 1.1).</td>
</tr>
<tr>
<td></td>
<td>• Compressor is not active, seat does not work as a result of a break of the seat heater / vehicle power connector</td>
<td>Check the connecting cable (Chapter 2.4, inspection step 4.1).</td>
</tr>
<tr>
<td></td>
<td>cable.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Micro-switch is too far from the cam disc.</td>
<td>Adjust the micro-switch (see Chapter 3.9.1).</td>
</tr>
<tr>
<td></td>
<td>• Valve for height adjustment is not operated via the Bowden pull wire.</td>
<td>Adjust the Bowden pull wire (see Chapter 3.11.1).</td>
</tr>
</tbody>
</table>
### 2.3 Overview of faults

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat responds when the handle for seat height adjustment is operated, but returns then to its original position.</td>
<td>• Height level control is defective.</td>
<td>Check the height level control (Chap. 2.4, inspection step 2.3).</td>
</tr>
<tr>
<td>Seat does not respond when operating the handle for seat height adjustment in a downward direction.</td>
<td>• Outlet valve is too far from the cam disc.</td>
<td>Adjust the outlet valve (see Chapter 3.9.1).</td>
</tr>
<tr>
<td></td>
<td>• Height level control is defective.</td>
<td>Check the height level control (Chap. 2.4, inspection step 2.1).</td>
</tr>
</tbody>
</table>
### 2.3 Overview of faults

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat changes its position whilst driving, vents and lowers down.</td>
<td>• Pneumatic spring is untight.</td>
<td>Check the pneumatic spring for abrasion and replace it if necessary (Chap. 3.12).</td>
</tr>
<tr>
<td></td>
<td>• Height level control is untight (compressed-air escapes from the outlet or height adjustment valve).</td>
<td>Replace the height level control (see Chapter 3.9).</td>
</tr>
<tr>
<td></td>
<td>• Air connections are untight.</td>
<td>Check all air connections for air leakage and, if necessary seal them up using loctite.</td>
</tr>
<tr>
<td></td>
<td>• Compressor is untight (return valve).</td>
<td>Replace compressed-air hoses (see Chapter 3.10).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replace the compressor (Chap. 3.8).</td>
</tr>
</tbody>
</table>
## 2.3 Overview of faults

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| Seat can be set to the highest position and does not vent anymore. | • Outlet valve is too far from the cam disc.  
• Height level control is defective. | Press the handle for seat height adjustment down.  
Adjust the outlet valve (see Chapter 3.9.1).  
Check the height level control (Chap. 2.4, inspection step 2.1). |
| Seat can be lowered, but does not pump up in the lowest position. | • Bowden pull wire is not correctly adjusted.  
• Bowden pull wire is broken.  
• Pneumatic system is untight.  
• Height level control is defective. | Check Bowden pull wire adjustment, adjust it, if necessary (Chapter 3.11).  
Replace Bowden pull wire (see Chapter 3.11).  
Check the entire pneumatic system for air leakage, replace defective components.  
Check the height level control (Chap. 2.4, inspection step 2.2). |
### 2.3 Overview of faults

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat pumps up and remains in the middle position, while the compressor is running.</td>
<td>• The sealing ring of the height level control is untight.</td>
<td>Replace the height level control (see Chapter 3.9.2).</td>
</tr>
<tr>
<td>Seat pumps up by itself (e.g. seat suspension); compressor starts.</td>
<td>• Short-circuit in the compressor cable (caused by abrasion on the edge of the swinging structure).</td>
<td>Remove the burr on the swinging structure and insulate the cable.</td>
</tr>
<tr>
<td></td>
<td>• Cable break</td>
<td>Replace the compressor (see Chapter 3.8).</td>
</tr>
</tbody>
</table>
2.4 Fault diagnosis

1 Checking the compressor

Preconditions for fault diagnosis:
- The individual functions are activated in compliance with the instructions of the seat operating manual.
- The electrical system of the vehicle has been inspected and found OK in compliance with the vehicle operating instructions.
- The compressed-air hoses have been inspected with regard to kinks and tightness.
- Battery voltage 12 V (24 V), ignition is on.

Note: The components stated above are illustrated in Chapter 2.1.

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Checking/operating</th>
<th>Result/specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Pull the handle for seat height adjustment upwards.</td>
<td>Compressor is active.</td>
<td>End of inspection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compressor is not active.</td>
<td>• Check and, if necessary, renew the fuse, current path and plug-in connections.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Proceed with inspection step 1.2.</td>
</tr>
</tbody>
</table>
## 2.4 Fault diagnosis

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Checking/operating</th>
<th>Result/specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td><strong>ATTENTION</strong> Damage! Do not operate the cam switch manually.</td>
<td>Compressor is active. Compressor is not active.</td>
<td>Proceed with inspection step 1.3. Replace the compressor (see Chapter 3.8).</td>
</tr>
<tr>
<td></td>
<td>Use a screwdriver to re-adjust the micro-switch (see Chapter 3.9.1).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>Pull the handle for seat height adjustment upwards.</td>
<td>The height level valve is operated via the Bowden pull wire. The height level valve is not operated.</td>
<td>Replace the height level control (see Chapter 3.9). Replace Bowden pull wire (see Chapter 3.11).</td>
</tr>
</tbody>
</table>
2 Checking the level control

Preconditions for fault diagnosis:
- The individual functions are activated in compliance with the instructions of the seat operating manual.
- The electrical system of the vehicle has been inspected and found OK in compliance with the vehicle operating instructions.
- The compressed-air hoses have been inspected with regard to kinks and tightness.
- Battery voltage 12 V(24 V), ignition is on.

Note: The components stated above are illustrated in Chapter 2.1.

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Checking/operating</th>
<th>Result/specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Press the handle for seat height adjustment down.</td>
<td>The height level valve is operated via the Bowden pull wire.</td>
<td>Proceed with inspection step 2.2.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The height level valve is not operated.</td>
<td>Adjust the Bowden pull wire (see Chapter 3.11).</td>
</tr>
<tr>
<td>2.2</td>
<td>Operate the electric switch manually.</td>
<td>Seat moves upwards.</td>
<td>Proceed with inspection step 2.3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seat doesn’t move upwards.</td>
<td>Replace the height level control (see Chapter 3.9).</td>
</tr>
</tbody>
</table>
## 2.4 Fault diagnosis

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Checking/operating</th>
<th>Result/specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3</td>
<td>Pull the handle for seat height adjustment upwards and then release it.</td>
<td>The seat remains in the set position.</td>
<td>End of inspection.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The seat does not remain in the set position.</td>
<td>Replace the height level control (see Chapter 3.9).</td>
</tr>
</tbody>
</table>
### 3 Checking the pneumatic spring

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Checking/operating</th>
<th>Result/specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 3.1      | Check the pneumatic spring for abrasion. | Pneumatic spring is tight.  
Pneumatic spring is untight. | Proceed with inspection step 3.2.  
Replace the pneumatic spring (see Chapter 3.12). |
| 3.2      | Apply load to the seat. | Compressed-air escapes from the height level control.  
The height level control is tight. | Adjust the outlet valve (see Chapter 3.9.1).  
Replace the height level control (see Chapter 3.9.2).  
Proceed with inspection step 3.3. |
| 3.3      | Apply load to the seat. | Compressed-air escapes from the air tank for the additional air supply.  
The air tank for the additional air supply is tight. | Replace the air tank for the additional air supply (see Chapter 3.13).  
End of inspection. |
## 4 Checking the cable of the vehicle power connector / connector plug

Preconditions for fault diagnosis:
- Electrical system of the vehicle is checked and is OK.
- Compressor is checked and is OK.

**Note:** The components stated above are illustrated in Chapter 2.1.

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Checking/operating</th>
<th>Result/specifed state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>• Disconnect the plug-in connection (Vehicle power connector Suspension - Vehicle).</td>
<td><strong>&gt; 15 Ω (→ ∞)</strong></td>
<td>Proceed with inspection step 4.2.</td>
</tr>
<tr>
<td></td>
<td>• Measure resistance on the contacts of the vehicle power connector of the suspension:</td>
<td>≤ 15 Ω</td>
<td>Replace cable harness (see Chapter 3.14).</td>
</tr>
<tr>
<td></td>
<td>red Ω black</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Fault diagnosis

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Checking/operating</th>
<th>Result/specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 4.2      | • Pull the handle for seat height adjustment upwards.  
          • Measure resistance on the contacts of the vehicle power connector of the suspension: red $\Omega$ black | $= 15 \, \Omega$  
$< 15 \, \Omega$ (short-circuit) or $>> 15 \, \Omega$ (break) | End of inspection.  
Replace cable harness (see Chapter 3.14). |
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3.1 Covers – removal and installation  
3.1.1 Top cover – removal and installation  
3.1.2 Front cover – removal and installation  
3.1.3 Side covers – removal and installation  

3.2 Bellows – removal and installation  
3.2.1 Bellows – removal and installation (seat with height adjustment on the front side)  
3.2.2 Bellows – removal and installation (seat with height adjustment on the left side)  

3.3 Bowden pull wire and handle for vertical shock absorber adjustment – removal and installation  
3.3.1 Bowden pull wire and handle for vertical shock absorber adjustment – removal and installation (seat with handle on the right side)  
3.3.2 Bowden pull wire and handle for vertical shock absorber adjustment – removal and installation (seat with handle on the left side)  

3.4 Vertical shock absorber – removal and installation  
3.5 Linkage rods, handle for horizontal suspension and locking device – removal and installation
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3.6 Horizontal shock absorber – removal and installation
3.7 Horizontal suspension unit – removal and installation
3.8 Compressor – removal and installation

3.9 Height level control with height limit control – removal and installation, complete
3.9.1 Height level control (micro-switch, outlet valve) adjustment
3.9.2 Height level control with height limit control – removal and installation, complete

3.10 Compressed-air hoses – removal and installation

3.11 Bowden pull wires and handle for height adjustment – removal and installation
3.11.1 Bowden pull wires for height adjustment - checking, adjusting
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3.11.3 Bowden pull wires and handle for height adjustment – removal and installation (seat with height adjustment on the left side)
3 Repair Work

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3.12 Pneumatic spring – removal and installation
3.13 Air tank for additional air supply – removal and installation
3.14 Cable harness – removal and installation
3.15 Upper part of the suspension system – removal and installation
3.16 Lower part of the suspension system – removal and installation
3.17 Swinging structure – repair
3.1 Covers – removal and installation

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3.1.1 Top cover – removal and installation
3.1.2 Front cover – removal and installation
3.1.3 Side covers – removal and installation
3.1.1 Top cover – removal and installation

REMOVAL/INSTALLATION

1. Remove the upper part of the seat (see repair manual for the upper seat part).

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(1) Bellows pins
(2) Upper cover
(3) Connecting cable
(4) Upper part of the suspension
Removal, installation

2 Pull the connecting cable (3) inwards through the upper cover (2).

3 Remove the two bellows pins (1) and take the upper cover (2) off.

**Installation note:**
Installation position of the upper cover (2):
With the smooth surface down.

4 Re-install the components in the reverse order of their removal.
3.1.2 Front cover – removal and installation

REMOVAL/INSTALLATION

(1) Blind rivet
(2) Front cover
(3) Upper part of the suspension (with height adjustment on the front)

1 Remove the upper part of the seat (see repair manual for the upper seat part).
3.1.2 Front cover – removal and installation

Removal, installation

2 Bore out the two rivet heads and drive out blind rivets (1), remove the front cover (2).

3 Re-install the components in the reverse order of their removal.
3.1.3 Side covers – removal and installation

REMOVAL/INSTALLATION

(1) Blind rivet
(2) Side cover
(3) Upper part of the suspension

1 Remove the upper part of the seat (see RM for the upper seat part).
3.1.3 Side covers – removal and installation

Removal, installation

2 Bore out the two rivet heads at each side and drive out blind rivets (1), remove the side covers (2).

**Installation notes:**
- Always attach the side covers as they provide protection against damage of the seat fore/aft adjustment.
- In the seat version with the height adjustment on the side, the Bowden pull wire is protected by the left side cover.

⚠️ **ATTENTION!**
Be careful not to squeeze the Bowden pull wire when installing the side cover (2).

3 Re-install the components in the reverse order of their removal.
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3.2.1 Bellows – removal and installation (seat with height adjustment on the front side)
3.2.2 Bellows – removal and installation (seat with height adjustment on the side)
3.2.1 Bellows – removal and installation (seat with height adjustment on the front side)

REMOVAL/INSTALLATION

(1) Upper part of the suspension
(2) Bellows
(3) Bellows pins
(4) Bellows pins
(5) Wire insert
(6) Lower part of the suspension
(7) Handle for fore/aft isolator
(8) Handle for height adjustment
(9) Handle for vertical shock absorber adjustment
(10) Cable tie

1. Remove the upper part of the seat (see repair manual for the upper seat part).

2. Remove the side cover (Chap. 3.1.3).
3.2.1 Bellows – removal and installation (seat with height adjustment on the front side)

Removal, installation

3 Remove the bellows (2) from the upper part of the suspension (1):
3.1 Remove six bellows pins (4) on the front.

3.2 Pull the bellows (2) on the left side over the handle for fore/aft isolator (7) and take two bellows pins (3) off.

Installation note:
When installing a new bellows, tear open the predetermined breaking point for the handle for fore/aft isolator (7) in the bellows (2), if not pre-cut.

3.3 Remove two bellows pins (4) on the back and take two bellows pins (3) off the upper part of the suspension system (1).
3.2.1 Bellows – removal and installation (seat with height adjustment on the front side)

3.4 Take three bellows pins (3) on the right side off the upper part of the suspension (1) and pull the bellows (2) over the handle for vertical shock absorber adjustment (9).

Installation note:
When installing a new bellows, tear open the predetermined breaking point for the handle for vertical shock absorber adjustment (9) in the bellows (2), if not pre-cut.

4 Remove the bellows (2) from the lower part of the suspension (6):

4.1 Take three bellows pins (3) on the front side off the lower part of the suspension (6).

4.2 Release two bellows pins (3) on the left side from the lower part of the suspension (6).

4.3 Release four bellows pins (3) on the back side from the lower part of the suspension (6).
3.2.1 Bellows – removal and installation (seat with height adjustment on the front side)

REMOVAL/INSTALLATION

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4.4 Remove a cable tie (10) on the right side from the connecting cable and take two bellows pins (3) off the lower part of the suspension (6).

5 Lift the bellows (2) over the lower part of the suspension (6) and remove the bellows (2) in a downward direction.

6 Remove the wire insert (5) from the bellows (2).

**Installation notes:**
- The welding joint (arrow) of the wire insert (5) must be inside the bellows (2) on the right side.
- Install the wire insert (5) in the middle fold of the bellows (2).

7 Re-install the components in the reverse order of their removal.
3.2.2 Bellows – removal and installation (seat with height adjustment on the side)

REMOVAL/INSTALLATION

1. Remove the upper part of the seat (see repair manual for the upper seat part).

2. Remove the side cover (Chap. 3.1.3).

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(1) Upper part of the suspension
(2) Bellows
(3) Bellows pins
(4) Wire insert
(5) Lower part of the suspension
(6) Handle for vertical shock absorber adjustment
(7) Handle for height adjustment
(8) Handle for fore/aft isolator
(9) Cable tie
3.2.2 Bellows – removal and installation (seat with height adjustment on the side)

Removal, installation

3 Remove the bellows (2) from the upper part of the suspension (1):
3.1 Remove four bellows pins (3) on the front side.

3.2 Take a bellows pin (3) off on the left side, and remove the bellows (2) from the handle for for/after isolator (8).

Installation note:
When installing a new bellows, tear open the predetermined breaking point for the handle for fore/aft isolator (8) in the bellows (2), if not pre-cut.

3.3 Take the bellows (2) on the left side off the handle for height adjustment (7).
3.2.2 Bellows – removal and installation (seat with height adjustment on the side)

REMOVAL/INSTALLATION

3.4 Remove the bellows (2) on the left side over the handle for vertical shock absorber adjustment (6).

**Installation note:**
When installing a new bellows, tear open the predetermined breaking point for the handle for vertical shock absorber adjustment (6) in the bellows (2), if not pre-cut.

3.5 Release four bellows pins (3) on the back side from the upper part of the suspension (1).

3.6 Release three bellows pins (3) on the right side from the upper part of the suspension (1).
3.2.2 Bellows – removal and installation (seat with height adjustment on the side)

REMOVAL/INSTALLATION

4 Remove the bellows (2) from the lower part of the suspension (5):
   4.1 Take three bellows pins (3) on the front side off the lower part of the suspension (5).
   4.2 Release two bellows pins (3) on the left side from the lower part of the suspension (5).
   4.3 Release four bellows pins (3) on the back side from the lower part of the suspension (5).
   4.4 Remove a cable tie (9) on the right side from the connecting cable and take two bellows pins (3) off the lower part of the suspension (5).
5 Lift the bellows (2) over the lower part of the suspension (5) and remove the bellows (2) in a downward direction.

6 Remove the wire insert (4) from the bellows (2).

**Installation notes:**
- The welding joint (arrow) of the wire insert (4) must be inside the bellows (2) on the right side.
- Install the wire insert (4) in the middle fold of the bellows (2).

7 Re-install the components in the reverse order of their removal.
3.3 Bowden pull wire and handle for vertical shock absorber adjustment - removal and installation

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3.3.1 Bowden pull wire and handle for vertical shock absorber adjustment – removal and installation (seat with handle on the right side)

3.3.2 Bowden pull wire and handle for vertical shock absorber adjustment – removal and installation (seat handle on the left side)
3.3.1 Bowden pull wire and handle for vertical shock absorber adjustment - removal and installation (seat with handle on the right side)

REMOVAL/INSTALLATION

TABLE OF CONTENTS

(1) Handle for vertical shock absorber adjustment
(2) Torx screw ................. 2.25 Nm
(3) Catch spring
(4) Upper part of the suspension
(5) Bowden pull wire
(6) Bearing for Bowden pull wire
(7) Blind rivet
(8) Cable tie
(9) Bearing (plastic)
(10) Compression springs
(11) Fork (plastic)
(12) Fixation (plastic)
(13) Vertical shock absorber
(14) Swinging structure
3.3.1 Bowden pull wire and handle for vertical shock absorber adjustment - removal and installation (seat with handle on the right side)

1 Remove the upper part of the seat (see repair manual for the upper seat part).

2 Remove the top and side covers (Chap. 3.1.1) and (Chap. 3.1.3).

3 Take the bellows off the upper part of the suspension (4) (see Chapter 3.2.1).

**Removal, installation**

4 Move the suspension system to the highest position.

**WARNING** Risk of crushing! Secure the suspension between the swinging structure and lower part of the suspension system with suitable spacers.
3.3.1 Bowden pull wire and handle for vertical shock absorber adjustment - removal and installation (seat with handle on the right side)

5 Screw out Torx screw (2). **Installation note:**
Torx screw (2), 2.25 Nm.

6 Pull the handle for vertical shock absorber adjustment (1) off the upper part of the suspension (4).

7 Remove the Bowden pull wire (5) from the handle for vertical shock absorber adjustment (1).

8 Push the Bowden pull wire (5) off the bearing for Bowden pull wire (6).

9 Bore out the rivet head and drive out the blind rivet (7). Remove the bearing for Bowden pull wire (6).

10 Mark the points where the Bowden pull wire (5) is fastened with the swinging structure (14) with the cable tie (8) and take the cable tie (8) off.
3.3.1 Bowden pull wire and handle for vertical shock absorber adjustment - removal and installation (seat with handle on the right side)

11 Pull the fixation (12) off the vertical shock absorber (13).

12 Take the Bowden pull wire (5) off the bearing (9).

13 Remove the fixation (12) from the fork (11).

14 Take the Bowden pull wire (5) off the fork (11), remove the fork (11) and compression spring (10).

15 Mark the location of the mounting hole for the Bowden pull wire (5) in the upper part of the suspension (4), pull the Bowden pull wire (5) out of the upper part of the suspension (4) and then remove it.

**Installation note:**
Install the Bowden pull wire according to the marking.

16 Re-install the components in the reverse order of their removal.
3.3.2 Bowden pull wire and handle for vertical shock absorber adjustment - removal and installation (seat with handle on the left side)

REMOVAL/INSTALLATION

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<td>(2) Torx screw .......................... 2.25 Nm</td>
</tr>
<tr>
<td>(3) Catch spring</td>
</tr>
<tr>
<td>(4) Upper part of the suspension</td>
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<tr>
<td>(5) Bowden pull wire</td>
</tr>
<tr>
<td>(6) Holder for Bowden pull wire</td>
</tr>
<tr>
<td>(7) Bearing (plastic)</td>
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<tr>
<td>(8) Compression springs</td>
</tr>
<tr>
<td>(9) Fork (plastic)</td>
</tr>
<tr>
<td>(10) Fixation (plastic)</td>
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<tr>
<td>(11) Vertical shock absorber</td>
</tr>
<tr>
<td>(12) Swinging structure</td>
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</table>
3.3.2 Bowden pull wire and handle for vertical shock absorber adjustment - removal and installation (seat with handle on the left side)

REMOVAL/INSTALLATION

1. Remove the upper part of the seat (see repair manual for the upper seat part).

2. Remove the top and side covers (Chap. 3.1.1) and (Chap. 3.1.3).

3. Take the bellows off the upper part of the suspension (see Chapter 3.2.2).

**Removal, installation**

4. Move the suspension system to the highest position.

⚠️ **WARNING** Risk of crushing! Secure the suspension between the swinging structure and lower part of the suspension system with suitable spacers.
3.3.2 Bowden pull wire and handle for vertical shock absorber adjustment - removal and installation (seat with handle on the left side)

**REMOVAL/INSTALLATION**

5. Screw out Torx screw (2).

**Installation note:**
Torx screw (2), 2.25 Nm.

6. Pull the handle for vertical shock absorber adjustment (1) off the upper part of the suspension (4).

7. Remove the Bowden pull wire (5) from the handle for vertical shock absorber adjustment (1).

8. Push the Bowden pull wire (5) off the holder for Bowden pull wire (6).

9. Pull the fixation (10) off the vertical shock absorber (11).

10. Take the Bowden pull wire (5) off the bearing (7).
3.3.2 Bowden pull wire and handle for vertical shock absorber adjustment - removal and installation (seat with handle on the left side)

11 Remove the fixation (10) from the fork (9).

12 Take the Bowden pull wire (5) off the fork (9), remove the fork (9) and compression spring (8).

13 Mark the installation position of the Bowden pull wire (5) on the upper part of the suspension (4), remove the Bowden pull wire (5) in an upward direction.

**Installation note:**
Install the Bowden pull wire according to the marking.

14 Re-install the components in the reverse order of their removal.
**3.4 Vertical shock absorber – removal and installation**

<table>
<thead>
<tr>
<th>(1) Bearing</th>
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<td>(2) Fixation</td>
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<td>(5) Circlips</td>
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<tr>
<td>(6) Stud .......... grease</td>
</tr>
<tr>
<td>(7) Swinging structure</td>
</tr>
<tr>
<td>(8) Circlips</td>
</tr>
</tbody>
</table>

1. Remove the upper part of the seat (see repair manual for the upper seat part).

2. Remove the top cover (Chap. 3.1.1).

3. Take the bellows off the lower part of the suspension (see Chapter 3.2), push it upward and fix.
3.4 Vertical shock absorber – removal and installation

Removal, installation

4 Move the suspension system to the highest position.

WARNING Risk of crushing! Secure the suspension between the swinging structure and lower part of the suspension system with suitable spacers.

5 Loosen up the circlip (8) from the stud (6) and then remove it.

6 Pull the stud (6) out of the swinging structure (7) and vertical shock absorber (4).

Installation note: Apply acid-free multi-purpose lubricant to the entire external surface (F) of the stud (6).
7 Take the fixation (2) and bearing (1) off the vertical shock absorber (4).

8 Loosen up the circlip (5) from the stud (3) and then remove it.

9 Pull the stud (3) out of the swinging structure (7) and vertical shock absorber (4).
   **Installation note:**
   Apply acid-free multi-purpose lubricant to the entire external surface (F) of the stud (3).

10 Remove the vertical shock absorber (4) in an upward direction.
   **Installation note:**
   When re-installing the vertical shock absorber (4), make sure the labelling is on top.

11 Re-install the components in the reverse order of their removal.
3.5 Linkage rods, handle for horizontal suspension and locking device – removal and installation

REMOVAL/INSTALLATION

TABLE OF CONTENTS

(1) Upper part of the suspension
(2) Handle
(3) Clamping sleeve
(4) Torx screw .................... 2.25 Nm
(5) Linkage rod
(6) Linkage rod
(7) Stop lever ......................... grease
(8) Washer
(9) Torx screw
(10) Tension spring
(11) Stop lever ......................... grease
(12) Blind rivet
(13) Buffer
(14) Washer
3.5 Linkage rods, handle for horizontal suspension and locking device – removal and installation

REMOVAL/INSTALLATION

<table>
<thead>
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<th>REMOVAL/INSTALLATION</th>
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<tbody>
<tr>
<td>1 Remove the upper part of the seat (see repair manual for the upper seat part).</td>
</tr>
<tr>
<td>2 Remove the top and side covers (Chap. 3.1.1) and (Chap. 3.1.3).</td>
</tr>
<tr>
<td>3 Take the bellows off the upper part of the suspension (1) (see Chapter 3.2).</td>
</tr>
</tbody>
</table>

Removal, installation

4 Move the suspension system to the highest position.

**WARNING** Risk of crushing!
Secure the suspension between the swinging structure and lower part of the suspension system with suitable spacers.

5 Turn the suspension by 90 degrees and put it down to the right side.
6 Screw out the Torx screw (4) from the handle (2).
   **Installation note:**
   Torx screw (4), 2.25 Nm.

7 Take the handle (2) off the upper part of the suspension (1).

8 Remove the linkage rod (5) from the stop lever (7) and the linkage rod (6) from the stop lever (11).

9 Knock out the clamping sleeve (3) from the handle (2), remove the linkage rod (5) and take it off the linkage rod (6).

10 Bore out the rivet head and drive out the blind rivet (12).

11 Remove the buffer (13) with the washer (14).
12 Take the two tension springs (10) off the upper part of the suspension (1).

13 Unscrew the two Torx screws (9) and remove them together with the washers (8).
   **Installation note:**
   Finger-tighten the Torx screw (9).

14 Remove the stop levers (7 and 11) and take the two tension springs (10) off.
   **Installation note:**
   Apply acid-free multi-purpose lubricant to the front surface (F) of the stop levers (7 and 11).

15 Re-install the components in the reverse order of their removal.
3.6 Horizontal shock absorber – removal and installation

REMOVAL/INSTALLATION

TABLE OF CONTENTS

1. Remove the upper part of the seat (see repair manual for the upper seat part).
2. Remove the top and side covers (Chap. 3.1.1) and (Chap. 3.1.3).
3. Take the bellows off the upper part of the suspension (1) (see Chapter 3.2).
Removal, installation

4 Mark the points where the connecting cable (2) and horizontal shock absorber (4) are fastened with the cable tie (5) and take the cable tie (5) off.

5 Loosen up the circlip (7) from the axle of the swinging structure (3) and remove the washer compensating for clearance (6).
6 Lever out the horizontal shock absorber (4) at the swinging tube (3) and push it off the axle of the swinging structure (3).

**Installation notes:**
- Press the horizontal shock absorber (4) onto the swinging tube (3) without using driving or hammering tools.
- Apply acid-free multi-purpose lubricant to the mounting surfaces (F) of the horizontal shock absorber (4).

7 Re-install the components in the reverse order of their removal.
3.7 **Horizontal suspension unit – removal and installation**

**REMOVAL/INSTALLATION**

1. Upper part of the suspension
2. Swinging structure
3. Hexagon bolt .......... grease, 25 Nm
4. Bushing
5. Clamp ......................... grease
6. Buffer
7. Tension spring
3.7 Horizontal suspension unit – removal and installation

REMOVAL/INSTALLATION

1. Remove the upper part of the seat (see repair manual for the upper seat part).

2. Remove the top and side covers (Chap. 3.1.1) and (Chap. 3.1.3).

3. Take the bellows off the upper part of the suspension (1) (see Chapter 3.2).

Removal, installation

4. Move the suspension system to the highest position.

**WARNING** Risk of crushing! Secure the suspension between the swinging structure and lower part of the suspension system with suitable spacers.
5 Unscrew the two hexagon bolts (3).

**Installation notes:**
- Hexagon bolt (3), 25 Nm.
- Apply acid-free multi-purpose lubricant to the entire surface (F) of the hexagon bolt (3).
- During the installation, the tension spring (7) is screwed on under tension.

First, tightly screw the leg of the tension spring (7) with buffer (6). Then, put the second hexagon bolt (3) through the bushing (4) and leg of the tension spring (7) and lever the hexagon bolt (3) in the guide of the threaded hole using a screwdriver (between tension spring (7) and bushing (4)). Now, pull the head of the hexagon bolt (3) as outwards as possible until the hexagon bolt (3) stands vertically and screw it in under pressure.
6 Remove the two stops from the upper part of the suspension (1) (see Chapter 3.15).

7 Lever out the horizontal shock absorber from the tube of the swinging structure (2) (see Chapter 3.6).

8 Lift the upper part of the suspension (1) on the front side off the swinging structure (see Chapter 3.15), push it backwards and put it down.

9 Press the clamp (5) off the swinging structure (2).

**Installation note:**
Apply acid-free multi-purpose lubricant to the surface (F) of the clamp (5) where it is connected with the swinging structure.
10 Remove the two bushings (4) and buffer (6) from the legs of the tension spring (7).

11 Remove the tension spring (7) from the clamp (5).

12 Re-install the components in the reverse order of their removal.
3.8 Compressor – removal and installation

TABLE OF CONTENTS

(1) Height level control
(2) Lower part of the suspension
(3) Compressor
(4) Cable tie (large) ................. 360 Nm
(5) Compressor cable
(6) Cable tie (small)
(7) Compressed-air hose
(8) Nozzle
(9) Support
(10) Right-angle plug (transparent)
(11) Flat plug
(12) Cable tie
3.8 Compressor – removal and installation

1. Remove the upper part of the seat (see repair manual for the upper seat part).

2. Remove the top and side covers (Chap. 3.1.1) and (Chap. 3.1.3).

3. Take the bellows off the upper part of the suspension (see Chapter 3.2).

Removal, installation

4. Move the suspension system to the highest position.

**WARNING** Risk of crushing! Secure the suspension between the swinging structure and lower part of the suspension system with suitable spacers.
5 Mark the points where the compressor cable (5) is fastened with the six cable ties (6) and remove the cable ties (6).  
**Installation note:**
Tie back any excess length of the compressor cable (5).

6 Disconnect the right-angle plug (10) from the height level control unit (1).

7 Disconnect the electric connector of the flat plug (11).

8 Mark the points where the compressed-air hose (7) is fastened with the cable tie (12) and remove the cable tie (12).
9 Mark the points where the compressor (3) is fastened with the two cable ties (4) and remove the cable ties (4).

**Installation note:**
Loosely apply the cable tie (4) until the locking head of the cable tie (4) is located slightly over the front curve of compressor (3) and while the compressor (3) can be still moved. Align the compressor (3) and use the pliers to tighten the locking head of the cable tie (4) to 360 Nm in the direction shown (arrow).

10 Pull the nozzle (8) out of the gudgeon of the compressor (3) and push it backwards off the compressed-air hose (7).
11 Pull the compressed-air hose (7) off the compressor (3).

**ATTENTION** damage!
- Do not use a screwdriver to lift the compressed-air hose (7) off the gudgeon of the compressor (3).
- Heat the compressed-air hose (7) at the head of compressor (3) (e.g. using a hot-air blower) and then, pull it off in one move.

12 Pull out the compressor cable (5) in a downward direction and remove compressor (3) to the front.

13 Remove the support (9) from the lower part of the suspension (2).

14 Re-install the components in the reverse order of their removal.
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3.9.1 Height level control (micro-switch, outlet valve) adjustment

3.9.2 Height level control with height limit control – removal and installation, complete
3.9.1 Height level control (micro-switch, outlet valve) adjustment

(1) Height level control
(2) Output valve
(3) Micro-switch
(4) Valve tappets
(5) Cam switch
(6) Valve lever
(7) Cam disk
(8) Round-head screw (micro-switch)
(9) Self-tapping screw
(10) Round-head screw (output valve)
(11) Compressor
3.9.1 Height level control (micro-switch, outlet valve) adjustment

ADJUSTMENT

1. Remove the upper part of the seat (see repair manual for the upper seat part).

2. Remove the top and side covers (Chap. 3.1.1) and (Chap. 3.1.3).

3. Take the bellows off the upper part of the suspension (see Chapter 3.2).

Adjustment

4. Move the suspension system to the highest position.

⚠️ **WARNING** Risk of crushing! Secure the suspension between the swinging structure and lower part of the suspension system with suitable spacers.
5 Loosen the self-tapping screw (9) a half turn.

6 **Adjusting the micro-switch (3):**
   Adjust the clearance between cam switch (5) and cam disk (7) by turning the round-head screw (8).

**Notes:**
- **Specified value:**
  Clearance (A) = 0.5 mm.
- Turn the round-head screw (8) to the left, the cam switch (5) is moving towards the cam disc (7).
- Turn the round-head screw (8) to the right, the cam switch (5) is moving away from the cam disc (7).
- When the cam switch (5) seats on the cam disk (7) under pressure, the compressor (11) turns too early and runs already during the compression and expansion of the seat suspension.
7 Adjusting the output level (2):
Adjust the clearance between valve lever (6) and cam disk (7) by turning the round-head screw (10).

Notes:
- **Specified value:** The valve lever (6) must seat on the cam disk without pressure (7).
- Turn the round-head screw (10) to the left, the valve lever (6) is moving towards the cam disc (7). This increases the pressure on the valve tappets (4) at the output valve (2) and the air escapes the output valve (2) earlier.
- Turn the round-head screw (10) to the right, the valve lever (6) is moving away from the cam disc (7). This decreases the pressure on the valve tappets (4) at the output valve (2) and the air escapes the output valve (2) later.
3.9.1 Height level control (micro-switch, outlet valve) adjustment

8 Tighten the self-tapping screw (9) after the adjustment has been completed.

9 Hang the bellows on the upper part of the suspension (see Chapter 3.2).

10 Install the top and side covers (Chap. 3.1.1) and (Chap. 3.1.3).

11 Install the upper part of the seat (see repair manual upper seat part).
3.9.2 Height level control with height limit control – removal and installation complete

REMOVAL/INSTALLATION

(1) Height level control
(2) Retainer for Bowden pull wire
(3) Bowden pull wire
(4) Hexagon nut
(5) Webbing
(6) Edge protection strip
(7) Plate
(8) Upper part of the suspension
(9) Torx screw
(10) Air input hose
(11) Air input hose
(12) Cable tie
(13) Right-angle plug (transparent)
(14) Right-angle plug (black)
(15) Lower part of the suspension
(16) Buffer
(17) Circlips
3.9.2 Height level control with height limit control – removal and installation complete

REMOVAL/INSTALLATION

1 Remove the upper part of the seat (see repair manual for the upper seat part).

2 Remove the top and side covers (Chap. 3.1.1) and (Chap. 3.1.3).

3 Take the bellows off the upper part of the suspension (8) (see Chapter 3.2).
3.9.2 Height level control with height limit control – removal and installation complete

Removal, installation

4 Move the suspension system to the highest position.

⚠️ **WARNING** Risk of crushing! Secure the suspension between the swinging structure and lower part of the suspension system with suitable spacers.

5 Loosen up the two circlips (17) from the stud (18) and then remove them.

6 Knock out the stud (18) from the lower part of the suspension (15) and then remove it. Firmly hold the webbing (5) and let it carefully roll back to the rewinder on the height level control (1).

7 Remove the two buffers (16) from the loop of the webbing (5).
8 Mark the points where the air input hose (10 and 11) is fastened with five cable ties (12) and remove the cable ties (12).

9 Pull the air input hose (10 and 11) off the pneumatic spring (see Chapter 3.10).

10 Mark the place where the cable is fastened with the right-angle plug (13 and 14) and the cable tie (20) and then remove the cable tie (20).

11 Mark the place where the Bowden pull wire (19) is fastened with the cable tie (21) and remove the cable tie (21).
3.9.2 Height level control with height limit control – removal and installation complete

12 Unhook the Bowden pull wire (3 and 19) from the height level control (1).

13 Mark and then disconnect the right-angle plug (13 and 14) from the height level control unit (1).

14 Unscrew the two hexagon nuts (4) and remove the plate (7) from the thread of the height level control (1).

15 Pull the plate (7) out of the loop of the webbing (5) and remove the edge protection strip (6).

16 Remove the height level control (1) from the upper part of the suspension (8).
17 Undo the Torx screw (9) and take the retainer for Bowden pull wire (2) off the height level valve (1). To do this, first release the two catchers on the backside of the retainer for Bowden pull wire (2) and take the retainer for Bowden pull wire (2) off the height level valve (1).

**Installation note:**
Finger-tighten the Torx screw (9).

18 Pull the Bowden pull wire (3) out of the retainer for Bowden pull wire (2).

19 Remove the height level valve in an upward direction.

20 Re-install the components in the reverse order of their removal.
3.10 Compressed-air hoses – removal and installation

REMOVAL/INSTALLATION

TABLE OF CONTENTS

(1) Height level control
(2) Cable tie
(3) Air input hose
(4) Air outlet hose
(5) Compressor
(6) Cable tie
(7) Cable tie
(8) Air hose with angle
(9) Pneumatic spring
(10) Air tank (additional air supply)
(11) Compressed-air hose
(12) Cable tie
(13) Retaining ring of the quick coupling
(14) Special tools
3.10 Compressed-air hoses – removal and installation

REMOVAL/INSTALLATION

1. Remove the upper part of the seat (see repair manual for the upper seat part).

2. Remove the top and side covers (Chap. 3.1.1) and (Chap. 3.1.3).

3. Remove the bellows (Chapter 3.2).

Removal, installation

**WARNING** hydrostatic test!
After the installation of a compressed-air hose, the hydraulic test of the suspension should be performed. To do this, apply 60 kg load to the suspension for 24 hours. The lowering within this time may not exceed 15 mm.

**Installation note:**
The compressed-air hoses are locked after they have been connected.
ATTENTION damage!

- When pulling the hoses out of the pneumatic spring (9) or air tank (10), the retaining ring of the quick coupling (13) must first be completely pressed back (e.g. using a flat pliers) to avoid marks.
- Connect the hose not more than 1 to 2 times. Check the hose for damage before connecting it.
- Always replace a damaged (marks) hose with a new one. It is possible to cut the damaged part off (about 12mm) using special tools (14) only once. After the cut off, the blue marking should be (arrow) set back by the length of the cut off piece.
4 Move the suspension system to the highest position.

**WARNING** Risk of crushing!
Secure the suspension between the swinging structure and lower part of the suspension system with suitable spacers.

5 **Removal of the compressed-air hose (11):**
5.1 Mark the points where the compressed-air hose (11) is fastened with the cable tie (12) and remove the cable tie (12).

5.2 Pull the compressed-air hose (11) off the pneumatic spring (9).

5.3 Pull the compressed-air hose (11) off the compressor (5) (see Chapter 3.8) and then remove it.
6 Remove the air hose with angle (8):
6.1 Mark the points where the compressed air hose with angle (8) is fastened with cable ties (6, 7 and 12) and remove the cable ties (6, 7 and 12).

**Installation note:**
Do not fix the cable tie (12) at the angle.

6.2 Pull the compressed-air hose with angle (8) off the pneumatic spring (9) and then off the air tank (10).

**Installation note:**
To avoid kinking, always install the compressed-air hose with angle (8) first on the pneumatic spring (9).

**Note:**
Apply pressure to insert the air hose with angle (8) into the pneumatic spring (9) and air tank (10) up to the blue marking.
6.3 Remove the air hose with angle (8).

7 Removal of the air input hose (3 and 4):

7.1 Mark the points where the air input hose (3 and 4) is fastened with the cable ties (2 and 6) and remove the cable ties (2 and 6).

7.2 Pull the air input hose (3 and 4) out of the pneumatic spring (9).
3.10 Compressed-air hoses – removal and installation

7.3 Remove the height level control (1) with air input hoses (3 and 4) (Chap. 3.9).

**Notes:**
- To ensure the tightness, the air input hoses (3 and 4) cannot be removed from the height level control (1).
- Cut the air input hose (3 or 4) off at the leaky area and connect the new air input hose (3 or 4) to an appropriate adapter. Subsequently, cut the excess length off.

8 Re-install the components in the reverse order of their removal.
3.11 Bowden pull wires and handle for height adjustment – removal and installation

TABLE OF CONTENTS

3.11.1 Bowden pull wires for height adjustment - checking, adjusting
3.11.2 Bowden pull wires and handle for height adjustment – removal and installation (seat with height adjustment on the front side)
3.11.3 Bowden pull wires and handle for height adjustment – removal and installation (seat with height adjustment on the left side)
3.11.1 Bowden pull wires for height adjustment - checking, adjusting

(1) Bowden pull wire
(2) Handle for height adjustment
(3) Bowden pull wire
(4) Level valve
(5) Lock nut
(6) Counternut
(7) Counternut
(8) Lock nut
(9) Holder for Bowden wire end cap
(10) Bowden wire lever
(11) Retracting spring
(12) Output valve
(13) Valve tappets
(14) Valve lever
(15) Cam disk
3.11.1 Bowden pull wires for height adjustment - checking, adjusting

CHECK/ADJUSTMENT

1. Remove the upper part of the seat (see repair manual for the upper seat part).

2. Remove the covers (Chapter 3.1).

Checking

3. Operate the handle for height adjustment (2) several times in both directions and check the following:
   - Bowden pull wire (1 and 3) for easy-running,
   - Bowden wire lever (10), valve lever (14) and valve tappets (13) at the output valve (12) for smoothness of running.
4 Check the neutral position of the handle for seat height adjustment (2) and the tensile force of the retracting spring (11) on the height level valve (4):
   - The retracting spring (11) must fix the handle for seat height adjustment (2) in neutral position.
   - The retracting spring (11) must tightly pull the Bowden pull wire (1 and 3) and keep the Bowden wire lever (10) in neutral position.

5 Check the clearance between the Bowden wire lever (10) and holder for Bowden wire end cap (9).
   **Specified value:** Distance (A) 2,0 mm with the handle for height adjustment (2) in the up position.
   **Note:** When the specified value exceeds 2,0 mm, the suspension cannot be lifted above the middle position.
3.11.1 Bowden pull wires for height adjustment - checking, adjusting

**Adjustment**

1. **Adjustment of the Bowden pull wire (3):**
   
   1.1 Loosen the counternut (6) and adjust the clearance between the Bowden wire lever (10) and holder for Bowden wire end cap (9) using the lock nut (5).
   
   **Notes:**
   - Turn the lock nut (5) inwards, the Bowden pull wire gets longer.
   - Turn the lock nut (5) outwards, the Bowden pull wire gets shorter.
   - **Specified value:** Clearance (A) 2,0 mm.

   1.2 Secure the lock nut (5) with the counternut (6) and make sure not to distort the Bowden pull wire (3).

   1.3 Operate the handle for seat height adjustment (2) several times and check the specified value, repeat the adjustment, if necessary.
2 Adjustment of the Bowden pull wire (1):

2.1 Loosen the counternut (7) and adjust the tension of the Bowden pull wire (1) on the height valve (4) using the lock nut (8).

Notes:
- Turn the lock nut (8) inwards, the Bowden pull wire (1) gets longer.
- Turn the lock nut (8) outwards, the Bowden pull wire (1) gets shorter.

Specified value: The Bowden wire (1) must be tightened, but not distorted on the suspension device on the height level valve (4).

2.2 Secure the lock nut (8) with the counternut (7) and make sure not to distort the Bowden pull wire (1).

2.3 Operate the handle for seat height adjustment (2) several times and check the specified value, repeat the adjustment, if necessary.
3 Install the covers (Chapter 3.1).

4 Install the upper part of the seat (see repair manual upper seat part).
3.11.2 Bowden pull wires and handle for height adjustment – removal and installation (seat with height adjustment on the front side)

REMOVAL/INSTALLATION

TABLE OF CONTENTS

(1) Bowden pull wire
(2) Upper part of the suspension
(3) Cable tie
(4) Holder for Bowden pull wire
(5) Handle .......... replace, if necessary
(6) Bowden pull wire
(7) Cross-head screw
(8) Cable tie

1 Remove the upper part of the seat (see repair manual for the upper seat part).

2 Remove the covers (Chapter 3.1).

3 Take the bellows off the upper part of the suspension (2) (see Chapter 3.2).
Removal, installation

4 Mark the points where the Bowden pull wire (1) is fastened with the two cable ties (3) and the Bowden pull wire (6) with the four cable ties (8), and then remove the cable ties (3 and 8).

Installation note:

⚠️ WARNING malfunction!
Loosely fix the Bowden pull wire (1 or 6) with the cable ties (3 or 8) at the marked points and make sure it is not distorted.

5 Take the Bowden pull wire (1) off the height level control and pull it out of the holder for Bowden pull wire (see Chapter 3.9.2).

Note:
To release the tension of the Bowden pull wire (1), press the handle for height adjustment (5) upwards.
3.11.2 Bowden pull wires and handle for height adjustment – removal and installation (seat with height adjustment on the front side)

6 Take the Bowden pull wire (6) off the height level control (see Chapter 3.9.2).

**Note:**
To release the tension of the Bowden pull wire (6), press the handle for height adjustment (5) upwards.

7 Undo the three cross-head screws (7).

8 Take the Bowden pull wire (1) off the holder for Bowden pull wire (4) and pull it out of the upper part of the suspension (2).

**Installation note:**
Adjust the new Bowden pull wire to the length of the old one (1) (excess length of the wire).

9 Take the Bowden wire (6) off the holder for Bowden wire (4) and remove it.

**Installation note:**
Adjust the new Bowden pull wire to the length of the old one (6) (excess length of the wire).
10 Remove the holder for Bowden pull wire (4).

11 Replace the handle (5), if required:

⚠️ **WARNING** risk of breakage!
The handle (5) and holder for Bowden pull wire (4) are wedged into the two latching noses (arrow) at the lower part of the holder for Bowden pull wire (4). Carefully separate the parts. When the handle (5) is deformed, replace it.

To remove the handle, use a screwdriver to bend open the handle (5) between the handle (5) and holder for Bowden pull wire (4) so that the two latching noses are released from the handle (5). Take the handle (5) off the holder for Bowden pull wire (4).

12 Re-install the components in the reverse order of their removal.
### 3.11.3 Bowden pull wires and handle for height adjustment – removal and installation (seat with height adjustment on the left side)

#### REMOVAL/INSTALLATION

<table>
<thead>
<tr>
<th>No.</th>
<th>Component</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bowden pull wire</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Upper part of the suspension</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Handle ..................................</td>
<td>replace, if necessary</td>
</tr>
<tr>
<td>4</td>
<td>Anchor ties</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Cable tie</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Bowden pull wire</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Cross-head screw</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Holder for Bowden pull wire</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Compression springs</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Washer</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Lever ..................................</td>
<td>grease</td>
</tr>
<tr>
<td>12</td>
<td>Blind rivet</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Bushing</td>
<td>grease</td>
</tr>
</tbody>
</table>

![Diagram of seat suspension components]
3.11.3 Bowden pull wires and handle for height adjustment – removal and installation (seat with height adjustment on the left side)

1. Remove the upper part of the seat (see repair manual for the upper seat part).

2. Remove the top and side covers (Chap. 3.1.1) and (Chap. 3.1.3).

3. Take the bellows off the upper part of the suspension (2) (see Chapter 3.2).

**Removal, installation**

4. Mark the points where the Bowden pull wire (6) is fastened with the two cable ties (5) on the upper part of the suspension (2) and remove the cable ties (5).

**Installation note:**

⚠️ **WARNING** malfunction!
Loosely fix the Bowden pull wire (6) with the cable ties (5) at the marked points and make sure it is not distorted.
5 Pull the anchor ties (4) out of the upper part of the suspension (2).

6 Take the Bowden pull wire (6) off the height level control (see Chapter 3.9.2).

7 Take the Bowden pull wire (1) off the height level control and pull it out of the holder for Bowden pull wire (see Chapter 3.9.2).

8 Lever the Bowden pull wire (1 and 6) off the holder for Bowden pull wire (8).

9 Push the Bowden pull wire for vertical shock absorber adjustment off the holder for Bowden pull wire (see chapter 3.3.2).
10 Bore out the rivet head and drive out the blind rivet (12).

11 Undo the two cross-head screws (7).

12 Take the Bowden pull wire (1 and 6) off the holder for Bowden pull wire (8) and lever (11).

13 Pull the Bowden pull wire (1 and 6) out of the upper part of the suspension (2) and then remove it.

**Installation note:** Adjust the new Bowden pull wire to the length of the old one (1) (excess length of the wire).
14 Knock out the bushing (13) from the holder for Bowden pull wire (8) and lever (11).
   **Installation note:**
   Apply acid-free multi-purpose lubricant to the entire surface (F) of the bushing (13).

15 Pull the holder for the Bowden pull wire (8) out of the lever (11) and remove two compression springs (9) and two washers (10).
   **Installation note:**
   Apply acid-free multi-purpose lubricant to the inner surfaces (F) of the lever (11).
16 Replace the handle (3), if required:

**WARNING** risk of breakage!
The handle (3) with the lever (11) is wedged into the two latching noses (arrows) at the lower part of the lever (11). Carefully separate the parts. When the handle (3) is deformed, replace it.
To remove the handle, use a screwdriver to bend open the handle (3) between the handle (3) and lever (11) so that the two latching noses are released from the handle (3). Pull the handle (3) off the lever (11).

17 Re-install the components in the reverse order of their removal.
3.12 Pneumatic spring – removal and installation

**REMOVAL/INSTALLATION**

**TABLE OF CONTENTS**

(1) Upper part of the suspension
(2) Lower part of the suspension
(3) Counter sunk screw .......... 6 Nm
(4) Washer
(5) Swinging structure
(6) Pneumatic spring
(7) Counter sunk screw .......... 6 Nm

1. Remove the upper part of the seat (see repair manual for the upper seat part).

2. Remove the top and side covers (Chap. 3.1.1) and (Chap. 3.1.3).

3. Take the bellows off the upper part of the suspension (1) (see Chapter 3.2).
3.12 Pneumatic spring – removal and installation

Removal, installation

4 Remove the two air input hoses, compressed-air hose and air input hose with angle from the pneumatic spring (6) (see Chapter 3.10).

5 Undo the counter sunk screw (3) from the pneumatic spring (6) and remove it together with the washer (4).

**Installation note:**
Counter sunk screw (3), 6 Nm.

6 Move the suspension system to the highest position.

**WARNING** Risk of crushing!
Secure the suspension between the swinging structure and lower part of the suspension system with suitable spacers.
3.12 Pneumatic spring – removal and installation

REMOVAL/INSTALLATION

7 Turn the spring system by 180 degrees and place it onto the upper part (1).

8 Undo the counter sunk screw (7) from the pneumatic spring (6).

**Installation notes:**
- Counter sunk screw (7), 6 Nm.
- The thread collar on the pneumatic spring (6) must seat flush in the hole of the swinging structure (5).

9 Slightly compress the pneumatic spring (6) and remove it from the swinging structure (5) and lower part of the suspension (2).

**Installation note:**
The step on the underside of the pneumatic spring (6) must fit into the cut-out (arrow) in the lower part of the suspension (2).

10 Re-install the components in the reverse order of their removal.
3.13 Air tank for additional air supply – removal and installation

REMOVAL/INSTALLATION

TABLE OF CONTENTS

(1) Swinging structure
(2) Upper bracket (swinging structure)
(3) Air tank
(4) Air hose with angle
(5) Clamp
(6) Lower bracket (swinging structure)

1 Remove the upper part of the seat (see repair manual for the upper seat part).

2 Remove the top and side covers (Chap. 3.1.1) and (Chap. 3.1.3).

3 Take the bellows off the upper part of the suspension (see Chapter 3.2).
Removal, installation

4 Move the suspension system to the highest position.

![WARNING](Risk of crushing!)

Secure the suspension between the swinging structure and lower part of the suspension system with suitable spacers.

5 Remove the air hose with angle (4) from the air tank (3) (see Chapter 3.10).

6 Press the air tank (3) down and take the bracket (2) off in an upward direction.

7 Pull the air tank (3) out of the clamp (5) in an upward direction and remove it.
8 Replace the clamp (5), if required:
Take the clamp (5) off the bracket (6) in a downward direction. To do this, use a screwdriver to press through the hole (arrow) in the bracket against the catchers (arrow) of the clamp (5) and pull the clamp (5) out in a downward direction.

9 Re-install the components in the reverse order of their removal.
3.14 Cable harness – removal and installation

REMOVAL/INSTALLATION

TABLE OF CONTENTS

(1) Height level control
(2) Cable harness of the connector plug
(3) Cable harness of the vehicle power connector
(4) Compressor cable
(5) Cable tie
(6) Right-angle plug (black)
(7) Lower part of the suspension
(8) Cable tie

1 Remove the upper part of the seat (see repair manual for the upper seat part).

2 Remove the top and side covers (Chap. 3.1.1) and (Chap. 3.1.3).

3 Remove the bellows (Chapter 3.2).
4. Remove the cable harness of the connector plug (2) from the horizontal shock absorber (see Chapter 3.6).

**Removal, installation**

5. Move the suspension system to the highest position.

**WARNING** Risk of crushing! Secure the suspension between the swinging structure and lower part of the suspension system with suitable spacers.

6. Mark the points where the cable of the vehicle power connector (3) is fastened with the cable tie (8) on the upper part of the suspension (7) and remove the cable tie (8).
7 Mark the places where the cable harness of the connector plug (2) and cable harness of the vehicle power connector (3) are fastened with the cable ties (5) and remove the cable ties (5).

**Installation note:**
Run the cable harness (2 and 3) and fix it with the cable ties (5) so that it is neither squeezed nor otherwise damaged.

8 Disconnect the electric connection (flat plug) of the compressor cable (4) to the cable harness of the connector plug (2) and cable harness of the vehicle power connector (3) (see Chapter 3.7).

9 Disconnect the right-angle plug (6) from the height level control unit (1).
3.14 Cable harness – removal and installation

10 Remove the cable harness of the connector plug (2) and cable harness of the vehicle power connector (3).

Note: Remove the cable harness of the connector plug (2) only for the upper seat part with seat heater (see repair manual for the upper seat part).

11 Re-install the components in the reverse order of their removal.
3.15 Upper part of the suspension system – removal and installation

REMOVAL/INSTALLATION

1 Remove the upper part of the seat (see repair manual for the upper seat part).

2 Remove the covers (Chapter 3.1).
3. Take the bellows off the upper part of the suspension (1) (see Chapter 3.2).

4. Take the Bowden pull wire and handle for vertical shock absorber adjustment off the upper part of the suspension (1) (see Chapter 3.3.1 or 3.3.2).
   **Note:**
   The Bowden pull wire does not need to be taken off the vertical shock absorber.

5. Remove linkage rods, handle for horizontal suspension and locking device (Chap. 3.5).

6. Remove the vertical shock absorber from the upper part of the suspension (1) (see Chapter 3.6).

7. Remove the horizontal suspension unit from the upper part of the suspension (1) (see Chapter 3.7).
3.15 Upper part of the suspension system – removal and installation

REMOVAL/INSTALLATION

8 Remove the height level control with the height limit control from the upper part of the suspension (1) (see Chapter 3.9.2).

Note:
Air input hoses do not need to be taken off the pneumatic spring.

9 Remove Bowden pull wires and handle for height adjustment (Chap. 3.11.2 or 3.11.3).

Removal, installation

10 Move the suspension system to the highest position.

⚠️ WARNING Risk of crushing!
Secure the suspension between the swinging structure and lower part of the suspension system with suitable spacers.
11 Bore out two rivet heads and drive out blind rivets (10), remove the stops (9).

12 Push the upper part of the suspension (1) forwards until the cut-outs (arrow) on the left and right sides at the guiding rails (2) are located at the same height with the front rollers (8) of the swinging structure (7).

13 Remove the upper part of the suspension (1) on the front side over the rollers (8) of the swinging structure (7) and remove it from the back rollers (6) of the swinging structure (7) by turning sideways.

**Installation note:**
Apply acid-free multi-purpose lubricant to the side surfaces (F) of the two guiding rails (2) of the rollers (6).
3.15 Upper part of the suspension system – removal and installation

14 Bore out two rivet heads and drive out blind rivets (5).

15 Remove the buffer (4) with the washer (3).

16 Re-install the components in the reverse order of their removal.
3.16 Lower part of the suspension system – removal and installation

REMOVAL/INSTALLATION

TABLE OF CONTENTS

(1) Upper part of the suspension
(2) Roller
(3) Swinging structure
(4) Fixed bearing
(5) Corrugated-head screw
(6) U-shaped profile
(7) Lower part of the suspension
(8) Guiding rail (lower part of the suspension) ......................... grease
(9) Counter sunk screw
(10) Washer
(11) Hexagon nut

1 Remove the upper part of the seat (see repair manual for the upper seat part).
2 Remove the top cover (Chap. 3.1.1).

3 Take the bellows off the lower part of the suspension (7) (see Chapter 3.2), push it upwards and fix it to the upper part of the suspension (1).

4 Remove compressor from the lower part of the suspension (7) (see Chapter 3.8). 
   **Note:**
   Compressor cable and compressed-air hose do not need to be removed. Protect the compressor against shocks (impacts) by fixing it on the swinging structure (3) with adhesive tape.

5 Remove the webbing from the lower part of the suspension (7) (see Chapter 3.9.2).

6 Undo the counter sunk screw (7) from the pneumatic spring (see Chapter 3.12).
3.16 Lower part of the suspension system – removal and installation

REMOVAL/INSTALLATION

7 Remove the two cable ties for the vehicle power connector cable on the lower part of suspension (7) (see Chapter 3.14).

Removal, installation

8 Unscrew the two hexagon nuts (11), remove washers (10) and counter sunk screws (9).

9 Undo the two corrugated-head screws (5) and take the U-shaped profile (6) off the guiding rail (8).

10 Push the upper part of suspension (1) with the swinging structure (3) backwards until the two fixed bearings (4) on the swinging structure (3) can be taken out through the cut-outs (arrows) of the guiding rails (8) on the upper part of suspension (1).
11 Lift the upper part of the suspension (1) with the swinging structure (3) out and pull it out together with the two rollers (2) from the guiding rails (8) by turning sideways. **Installation note:** Apply acid-free multi-purpose lubricant to the bearing surface at the side (F) of the two guiding rails (8) of the rollers (2).

12 Remove the upper part of the suspension (1) with the swinging structure (3) in an upward direction.

13 Re-install the components in the reverse order of their removal.
3.17 Swinging structure – disassemble, assemble

DISASSEMBLE/ASSEMBLE

TABLE OF CONTENTS

(1) Swinging structure
(2) Edge protection strip
(3) Washer compensating for clearance thickness ............... 0.2 or 0.5 mm
(4) Felt ring
(5) Roller .. Maximum clearance 0.3 mm
(6) Roller .. Maximum clearance 0.3 mm
(7) Buffer
(8) Tube section
(9) Fixed bearing
(10) Guiding rail (upper part of the suspension)
(11) Guiding rail (lower part of the suspension)
3.17 Swinging structure – disassemble, assemble

1. Remove the upper part of the seat (see repair manual for the upper seat part).

2. Remove the covers (Chapter 3.1).

3. Remove the bellows (Chapter 3.2).

4. Take the Bowden pull wire for vertical shock absorber adjustment off the vertical shock absorber (see Chapter 3.3).

5. Remove the vertical shock absorber (Chapter 3.4).

6. Take the vertical shock absorber off the swinging structure (see Chapter 3.6).

7. Remove the horizontal suspension unit (Chapter 3.7).
8 Remove the compressor (Chap. 3.8).

9 Take the webbing off the lower part of the suspension (see Chapter 3.9.2).

10 Remove the cable tie for the air input hoses of the height level control and pull the air input hoses off the pneumatic spring (see Chapter 3.10).

11 Take the Bowden pull wires for height level adjustment off the height level valve (see Chapter 3.11.2 or 3.11.3).

12 Remove the pneumatic spring (Chapter 3.12).

13 Remove the air tank for additional air supply (Chap. 3.13).

14 Remove the cable harness (Chapter 3.14).
3.17 Swinging structure – disassemble, assemble

**DISASSEMBLE/ASSEMBLE**

15 Take the upper part of the suspension off the swinging structure (see Chapter 3.15).

16 Take the lower part of the suspension off the swinging structure (see Chapter 3.16).

**Disassemble, assemble**

17 Take four rollers (5), two rollers (6), two fixed bearings (9) and four felt rings (4) off the swinging structure (1).

18 Pull the tube piece (8) out of the fixed bearing (9).

19 Remove the two buffers (7) from the swinging structure (1).

20 Remove the edge protection strip (2) from the swinging structure (1).
21 **Check:**
maximum clearance (A) or (B) between the rollers (5) and guiding rails of the lower part of the suspension (11) or upper part of the suspension (10) over the complete adjustment length.

22 **Readjustment:**
Place the washer compensating for clearance (2) between the roller (5 or 6) and axle of the swinging structure (1), if necessary.

**Note:**
Clearance spacers (with thickness of 0.2 and 0.5 mm) are included in the wear parts set.

23 **Assemble the components in reverse order of their removal.**