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* if fitted; ** depending on model;
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** depending on seat model;
Preliminary remarks

Notes on these instructions

This repair manual includes information and instructions on how to perform repair work on the seat suspension MSG95A(L) of GRAMMER seats for the following models:

- Cable harness of seat suspension incl. U-profile and socket
- Cable harness for seat suspension with direct seat connection

The repair of the upper seat part is described in the respective repair manual for the upper seat part to which a reference is made, if required.

Example:
Remove the cable of the seat occupancy detection system at the upper seat part (see repair manual for upper seat part).

The seat suspension MSG95A(L) with U-profile and socket forms the basis for illustrations in this repair manual. In the case of technical deviations in work procedures (due to different seat suspension designs), refer to the current text or individual 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 the 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.
Preliminary remarks

For spare part orders, please use the numbers stated in the latest issue of the relevant spare parts catalogue.

The description of the work procedures refers to the removed seat suspension and the dismounted upper part of seat. Depending on the individual installation situation, some work may also be performed on the installed seat suspension and/or with upper seat part. For this reason, check the environment of the installed seat suspension for this possibility before starting work. The safety instructions of the specific vehicle manufacturer and those stated in Chapter 1 of this repair manual must be strictly observed.

This repair manual also includes some information on delivery options, if these require further explanation. Since the scope of delivery depends on the specific customer order, the actual seat suspension design 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 suspension regarded in the driving direction of the vehicle.

The document layout is suitable for later use of this repair manual via CD-ROM / INTERNET / INTRANET. A navigation line was entered below the heading for this. This navigation line includes the Chapter titles and it allows the user to jump directly to these Chapters after the corresponding hyperlinks have been set.
Basic information on the seat suspension

The seat suspension 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 multi-purpose lubricant.

In the description of the present repair manual, not all fastening parts might be mentioned. After repair, it might be necessary to check fastening parts regarding their factory-made laying, support and securing and to correct them respectively, if required.

Bowden pull wires, cables and air hoses may only be fastened with cable ties at the defined spots by hand (loose). Make sure that Bowden pull wires, cables and air hoses cannot be squeezed or distorted when the seat suspension is adjusted and the seat moved.

Replace all removed old parts with enclosed new ones. If there is no new part included, the old one is to be cleaned and checked for its suitability for re-use. Defective parts and worn parts must be replaced by new ones.

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

Qualified personnel

These 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.
Preliminary remarks

In order to avoid bodily injury, reduced operational safety of the seat suspension or damage to it resulting from improperly performed work, all information and instructions, in particular the safety instructions 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 the seat suspension 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 seat suspensions 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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www.grammer.com
1 Description

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1.1 Safety instructions
1.2 Rating plate

Note:
Please refer to the applicable seat operating instructions for further details.
1.1 Safety instructions

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 destruction of material and their prevention.

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

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

4. Prior to all repair work, the following work has to be carried out:
   - Disconnect the seat suspension from the power supply.
   - Move the seat suspension down to the end stops.

5. When using oil, grease and other chemical substances, the relevant safety regulations for the handling and use of these products must be observed.
The rating plate is located on the back of the seat suspension in the top left corner.

The rating plate shows the following information (example):

(A) **Country of manufacture**
    = MADE IN XXXXXXX

(B) **DESIGNATION** = MSG95A/722

(C) **INVENTORY NO.** = 11700851

(D) **Year / CW / Assembly** = 0831 042
   • Year of manufacture = 08 (2008)
   • Built in week = 31 (April)
   • Assembly = 042

(E) **ORDER NO.** = DE 72938970010
   • Country indicator = XX

**Note:**
When orders are placed, the correct inventory no. (C) on the rating plate is always to be quoted.
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  ● Level control with micro-switch (pages 1-3)
  ● Compressor and compressor cable with U-profile and socket – pin assignment of electrical connection (pages 4-6)
  ● Compressor and compressor cable with direct seat connection (4-pin plug) – pin assignment of electrical connection (pages 7-9)
  ● Compressor and compressor cable with direct seat connection (2-pin plug) – pin assignment of electrical connection (pages 10-12)
  ● Pneumatic connecting diagram (pages 13-14)
  ● Cable harness of seat suspension with U-profile and socket – pin assignment of electrical connection (pages 15-19)
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2 Inspection of the level control (pages 8-9)
3 Inspection of the micro-switch (pages 10-11)
4 Inspection of the pneumatic system (pages 12-13)
5 Inspection of the cable harness for seat suspension (pages 14-25)
5.1 Cable harness of seat suspension incl. U-profile and socket (pages 14-16)
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2.1 Overview of components

Level control with micro-switch

(1) Level control
(2) Belt retractor
(3) Webbing
(4) Air hose (black)
    hose from leveling valve to air distributor
(5) Air hose (black)
    hose from leveling valve to belt retractor
(6) Air hose (blue)
    Hose from the outlet valve to the air distributor
(7) Retracting spring
(8) Bowden pull wire lever
(9) Contact (K1) for plug (14)
(10) Contact (K2) for plug (15)
2.1 Overview of components

(11) Outlet valve
(12) Valve lever
(13) Cam disk
(14) Plug (blue cable)
(15) Plug (red cable)
(16) Micro-switch
(17) Cam switch
(18) Leveling valve
(19) Valve tappets

**WARNING** Risk of injury!
Due not operate the cam switch (17) at the micro-switch (16) manually, but operate it carefully by means of an appropriate tool.
2.1 Overview of components

Electrical plug and socket connections:

(A) Electrical connection (blue cable) between plug (14) and micro-switch (16)

(B) Electrical connection (red cable) between plug (15) and micro-switch (16)
2.1 Overview of components

Compressor and compressor cable incl. U-profile and socket – pin assignment of electrical connection

(1) Compressor
(2) Compressor cable (current path for compressor in the cable harness for seat suspension)
(3) Level control
(4) Plug of cable harness for seat suspension (12-pin)
(5) Right-angle plug (black cable)
(6) Right-angle plug (blue cable)
(7) Hose nozzle
(8) Compressed-air hose
(9) Plug (blue cable)
(10) Plug (red cable)
(11) Socket of cable harness for vehicle connection

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Compressor and compressor cable incl. U-profile and socket – pin assignment of electrical connection

(1) Compressor
(2) Compressor cable (current path for compressor in the cable harness for seat suspension)
(3) Level control
(4) Plug of cable harness for seat suspension (12-pin)
(5) Right-angle plug (black cable)
(6) Right-angle plug (blue cable)
(7) Hose nozzle
(8) Compressed-air hose
(9) Plug (blue cable)
(10) Plug (red cable)
(11) Socket of cable harness for vehicle connection
2.1 Overview of components

(12) Cable harness for vehicle connection
(13) Cable harness for seat suspension
(14) Pin assignment for compressor (1) at the plug of the cable harness for seat suspension (4)

**Pin:**
P1 (ground) and P2 (voltage)

**Electrical plug and socket connections:**
(A) Electrical connection (blue cable) between plug (9) and level control (3)
(B) Electrical connection (red cable) between plug (10) and level control (3)
(C) Electrical connection (black cable) between right-angle plug (5) and compressor (1)
2.1 Overview of components

(D) Electrical connection (blue cable) between right-angle plug (6) and compressor (1)

(E) Electrical connection (12-pin) between cable harness for vehicle connection (12) and cable harness for seat suspension (13)

Cable colors:
ro = red
sw = black
bl = blue
Compressor and compressor cable with direct seat connection (4-pin plug) – pin assignment of electrical connection

(1) Plug (cable harness of seat suspension) (6) (4-pin)
(2) Pin assignment for compressor (7) at the plug (1)
   **Pin:**
   - P1 (ground)
   - P2 (voltage)
(3) Plug at the micro-switch (red line)
(4) Plug at the micro-switch (blue line)
(5) Level control
(6) Cable harness for seat suspension
(7) Compressor
2.1 Overview of components

(8) Right-angle plug (blue line)
Voltage at the compressor

(9) Right-angle plug (black line)
Ground at the compressor

(10) Cable to compressor

Electrical plug and socket connections:

(A) Electrical connection between the plug (3) and the micro-switch of the level control (5).

(B) Electrical connection between the plug (4) and the micro-switch of the level control (5).

(C) Electrical connections between right-angle plug (9) and compressor (7)
2.1 Overview of components

(D) Electrical connections between right-angle plug (8) and compressor (7)

(E) Electrical connection (4-pin) between cable harness for vehicle connection and cable harness of seat suspension (2)

Cable colours:
bl = blue
ro = red
sw = black
2.1 Overview of components

Compressor and compressor cable with direct seat connection (2-pin plug) – pin assignment of electrical connection

(1) Plug (cable harness of seat suspension) (6) (2-pin)
(2) Pin assignment for compressor (7) at the plug (1)
   **Pin:**
   - P1 (voltage)
   - P2 (ground)
(3) Plug at the micro-switch (red line)
(4) Plug at the micro-switch (blue line)
(5) Level control
(6) Cable harness for seat suspension
(7) Compressor
2.1 Overview of components

(8) Right-angle plug (blue line)
Voltage at the compressor

(9) Right-angle plug (black line)
Ground at the compressor

(10) Cable to compressor

Electrical plug and socket connections:

(A) Electrical connection between the plug (3) and the micro-switch of the level control (5).

(B) Electrical connection between the plug (4) and the micro-switch of the level control (5).

(C) Electrical connections between right-angle plug (9) and compressor (7)
2.1 Overview of components

(D) Electrical connections between right-angle plug (8) and compressor (7)

(E) Electrical connection (2-pin) between cable harness for vehicle connection and cable harness of seat suspension (2)

Cable colours:
bl = blue
ro = red
sw = black
2.1 Overview of components

Pneumatic connecting diagram

(1) Air distributor

⚠️ ATTENTION Damage!
Please observe the notes stated in Chapter 3.17 and 3.19 when pulling off the air hoses (2, 3) and the air intake hose (10) at the connections of the air distributor (1).

(2) Air hose (blue)
Hose from the outlet valve to the air distributor

(3) Air hose (black)
hose from leveling valve to air distributor

(4) Air hose (black)
hose from leveling valve to belt retractor

(5) Level control
2.1 Overview of components

(6) Air spring
(7) Catch spring
(8) Coupling (compressed-air hose)
(9) Coupling (air intake hose)
(10) Air intake hose:
    Hose from the air spring (6) to the
    air distributor (1)
(11) Compressed-air hose:
    Hose from the air spring (6) to the
    compressor (13)
(12) Hose nozzle
(13) Compressor

⚠️ ATTENTION Damage!
Please observe the notes stated in
Chapter 3.13 when pulling off the
compressed-air hose (11) at the
connection of the compressor (13).
2.1 Overview of components

Cable harness of seat suspension incl. U-profile and socket – pin assignment of electrical connection

(1) Cable harness for seat suspension
(2) Plug for level control (blue cable)
(3) Plug for level control (red cable)
(4) U-shaped profile
(5) Plug of cable harness for seat suspension (12-pin)
(6) Socket of cable harness for vehicle connection
(7) Cable harness for vehicle connection
(8) Cable harness for upper seat part
(9) Socket of cable harness for upper seat part
(10) Plug of cable harness for seat suspension (8-pin)
2.1 Overview of components

(11) Holding plate

(12) Right-angle plug for compressor (blue cable)

(13) Right-angle plug for compressor (black cable)

(14) Pin assignment for compressor at the plug of the cable harness for seat suspension (5)
   **Pin:**
   - P1 (ground) and
   - P2 (voltage)

(15) Pin assignment for climate control system at the plug of the cable harness for seat suspension (5)
   **Pin:**
   - P3 (ground) and
   - P4 (voltage)

(16) Pin assignment for lumbar support at the plug of the cable harness for seat suspension (5)
   **Pin:**
   - P3 (ground) and
   - P5 (voltage)
2.1 Overview of components

(17) Pin assignment for heater at the plug of the cable harness for seat suspension (5)

**Pin:**
- P3 (ground) and
- P6 (voltage)

(18) Pin assignment for seat occupancy detection system/belt contact at the plug of the cable harness for the seat suspension (5)

**Pin:**
- P10, P11, P12 (signal A, C, B)

(19) Pin assignment for heater at the plug of the cable harness for seat suspension (10)

**Pin:**
- P6 (ground) and
- P8 (voltage)

(20) Pin assignment for lumbar support at the plug of the cable harness for seat suspension (10)

**Pin:**
- P6 (ground) and
- P7 (voltage)
2.1 Overview of components

(21) Pin assignment for climate control system at the plug of the cable harness for seat suspension (10)
Pin:
P6 (ground) and
P3 (voltage)

(22) Pin assignment for seat occupancy detection system/belt contact at the plug of the cable harness for the seat suspension (10)
Pin:
P1, P4, P5 (signal B, A, C)

Electrical plug and socket connections:
(A) Electrical connection (blue cable) between plug (2) and level control
(B) Electrical connection (red cable) between plug (3) and level control
2.1 Overview of components

(C) Electrical connection (black cable) between right-angle plug (13) and compressor

(D) Electrical connection (blue cable) between right-angle plug (12) and compressor

(E) Electrical connection (12-pin) between cable harness for vehicle connection (7) and cable harness for seat suspension (1)

(F) Electrical connection (8-pin) between cable harness for upper suspension part (8) and cable harness for seat suspension (1)

Cable colors:
ro = red
sw = black
bl = blue
2.1 Overview of components

Cable harness for seat suspension with direct seat connection (4-pin plug) – pin assignment of electrical connection

(1) Plug (cable harness of seat suspension) (4-pin)
(2) Cable harness for seat suspension
(3) Pin assignment for seat occupancy detection system (make contact) at the cable harness plug for seat suspension (1)
   **Pin:**
   - P3 (signal B)
   - P4 (signal A)
(4) Pin assignment for compressor at the plug (1)
   **Pin:**
   - P1 (ground) and P2 (voltage)
(5) Pin assignment for seat occupancy detection system (make contact) at the cable harness plug for seat suspension (6)
**Pin:**
P4 (signal A)
P5 (signal B)

(6) Plug (cable harness of seat suspension)
(8-pin)

(7) Pin assignment for lumbar support at the cable harness plug for seat suspension (6)
**Pin:**
P6 (ground) and P7 (voltage)

(8) Pin assignment for heater at the cable harness plug for seat suspension (6)
**Pin:**
P6 (ground) and P8 (voltage)
2.1 Overview of components

(9) Plug at the micro-switch of the level control (blue line)
(10) Plug at the micro-switch of the level control (red line)
(11) Holding plate
(12) Cable to compressor
(13) Right-angle plug (black line)
    Ground at the compressor
(14) Right-angle plug (blue line)
    Voltage at the compressor

**Electrical plug and socket connections:**

(E) Electrical connection (4-pin)
    between cable harness for vehicle connection and cable harness of seat suspension (2)
(F) Electrical connection (8-pin)
    between cable harness for seat suspension (2) and cable harness for upper seat part
2.1 Overview of components

Cable harness for seat suspension with direct seat connection (2 and 3-pin plug) – pin assignment of electrical connection

(1) Plug (cable harness of seat suspension) (2 and 3-pin)

(2) Cable harness for seat suspension

(3) Pin assignment for compressor at the 2-pin plug (1)
   **Pin:**
   - P1 (voltage) and P2 (ground)

(4) Pin assignment for seat occupancy detection system (make contact) at the cable harness plug for seat suspension (6)
   **Pin:**
   - P1 (signal C)
   - P2 (signal B)
   - P3 (signal A)
2.1 Overview of components

(5) Pin assignment for seat occupancy detection system (make contact, change-over contact, diagnosable) at the cable harness plug for seat suspension (6)

**Pin:**
- P1 (signal B)
- P4 (signal A)
- P5 (signal C)

(6) Plug (cable harness of seat suspension) (8-pin)

(7) Pin assignment for lumbar support at the cable harness plug for seat suspension (6)

**Pin:**
- P6 (ground) and
- P7 (voltage)

(8) Pin assignment for heater at the cable harness plug for seat suspension (6)

**Pin:**
- P6 (ground) and
- P8 (voltage)
2.1 Overview of components

(9) Plug at the micro-switch of the level control (blue line)

(10) Plug at the micro-switch of the level control (red line)

(11) Holding plate

(12) Cable to compressor

(13) Right-angle plug (black line)
   Ground at the compressor

(14) Right-angle plug (blue line)
   Voltage at the compressor

Electrical plug and socket connections:

(E) Electrical connection (2 and 3-pin) between cable harness for vehicle connection and cable harness of seat suspension (2)

(F) Electrical connection (8-pin) between cable harness for seat suspension (2) and cable harness for upper seat part
2.2 Functional test – Testing the specified status of functions

A functional test is used to circumscribe all possible malfunctions; it must be performed before and after repair work on the seat suspension at any rate.

Preconditions for inspection:
- Pull and push the weight and height adjustment handle at least five times to move the seat suspension over the entire range of spring as far as possible.
- The individual functions are activated in compliance with the instructions of the seat operating instructions.
- The electrical system of the vehicle has been inspected and found to be OK and in compliance with the vehicle operating instructions.
- The seat suspension must be vented completely.
- Battery voltage at the seat 12 V (24 V), ignition ON.
- Bowden pull wire adjustments have been inspected and found to be OK (see Chapter 3.24).

Note: The components mentioned above are illustrated in chapter 2.1, if not stated otherwise in this text. If there is a difference between the result/specified status and the actual status, please take the measures as described in the chapter "Notes, cause/remedial measures".

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Scope of inspection</th>
<th>Function to be operated</th>
<th>Result/specified status</th>
<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seat suspension</td>
<td>Apply load to the seat suspension and spring up and down several times.</td>
<td>No noise. High lateral stability in horizontal direction. No noticeable escape of air.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
</tbody>
</table>
### 2.2 Functional test – Testing the specified status of functions

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Scope of inspection</th>
<th>Function to be operated</th>
<th>Result/specified status</th>
<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Weight adjustment (level adjustment)</td>
<td>Ignition is ON.</td>
<td>Seat suspension remains in the lowest position.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Briefly lift the handle.</td>
<td>Seat suspension moves up to minimum height.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>3</td>
<td>Height adjustment upwards</td>
<td>Pull the handle upwards as far as possible and keep it in this position (max. 1 minute).</td>
<td>Seat suspension moves up to maximum height.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Release the handle.</td>
<td>After having reached the maximum height, the seat suspension must move down at least 30 mm.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>4</td>
<td>Height adjustment in downward direction</td>
<td>Press the handle down as far as possible and keep it in this position.</td>
<td>Seat suspension moves down to minimum height (as far as possible).</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Release the handle.</td>
<td>Seat suspension remains in the adjusted position.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Briefly lift the handle.</td>
<td>Seat suspension moves up to minimum height.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
</tbody>
</table>
### 2.2 Functional test – Testing the specified status of functions

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Scope of inspection</th>
<th>Function to be operated</th>
<th>Result/specified status</th>
<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Fore/aft isolator</td>
<td>Turn the handle for the fore/aft isolator (see chapter 3.11) backwards in order to unlock the fore/aft isolator.</td>
<td>The upper suspension part can be moved in longitudinal horizontal direction.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Turn the handle for the fore/aft isolator (see chapter 3.11) forwards in order to lock the fore/aft isolator. Move the upper suspension part back and forth until the fore/aft isolator locks into place with an audible click.</td>
<td>The upper suspension part cannot be moved in longitudinal horizontal direction.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
</tbody>
</table>
### 2.2 Functional test – Testing the specified status of functions

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Scope of inspection</th>
<th>Function to be operated</th>
<th>Result/specified status</th>
<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Vertical suspension</td>
<td>Turn the handle for vertical shock absorber adjustment to the left (see Chapter 3.5) to adjust a &quot;soft&quot; vertical cushioning.</td>
<td>The seat suspension can be moved easily in vertical direction.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Turn the handle for vertical shock absorber adjustment to the right (see Chapter 3.5) to adjust a &quot;hard&quot; vertical cushioning.</td>
<td>The seat suspension hardly can be moved in vertical direction.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
</tbody>
</table>
This chapter contains notes on possible faults of the seat suspension. 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 mentioned above are illustrated in chapter 2.1, if not stated otherwise in this text.

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat suspension does not respond when operating the handle for height adjustment in upward direction.</td>
<td>• Compressor is not running.</td>
<td>Check the compressor / compressor cable (Chapter 2.4, step no. 1.1).</td>
</tr>
<tr>
<td></td>
<td>• The height adjustment is not operated via the Bowden pull wire.</td>
<td>Replace (Chapter 3.22) or adjust (see Chapter 3.24) the Bowden pull wire.</td>
</tr>
<tr>
<td></td>
<td>• Level control is defective.</td>
<td>Check the level control (Chapter 2.4, inspection step 2.1).</td>
</tr>
<tr>
<td></td>
<td>• The plug at the micro-switch or compressor is not connected correctly.</td>
<td>Check the plug-in connectors and establish the connection, if necessary.</td>
</tr>
<tr>
<td></td>
<td>• Micro-switch is too far from the cam disk.</td>
<td>Adjust the micro-switch (see Chapter 3.15).</td>
</tr>
</tbody>
</table>

**WARNING** Risk of injury! Do not operate the cam switch manually, but use an appropriate tool.
### 2.3 Overview of faults – Pointing out possible faults that might occur

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The Bowden pull wire lever is not operated via the Bowden pull wire.</td>
<td>• Bowden pull wire is torn.</td>
<td>Adjust the Bowden pull wire (see Chapter 3.24).</td>
</tr>
<tr>
<td>• Bowden pull wire is torn.</td>
<td>• No voltage.</td>
<td>Replace the Bowden pull wire (Chapter 3.22).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the cable harness for seat suspension (Chapter 2.4, inspection step no. 5.1).</td>
</tr>
<tr>
<td>Seat suspension responds when the handle for height adjustment is pulled, but then returns to its original position.</td>
<td>• Level control is defective.</td>
<td>Check the level control (Chapter 2.4, inspection step 2.1).</td>
</tr>
<tr>
<td>Seat suspension does not respond when operating the handle for height adjustment in downward direction.</td>
<td>• Outlet valve does not respond (Bowden pull wire adjustment has been inspected).</td>
<td>Check the level control (Chapter 2.4, inspection step 2.1).</td>
</tr>
<tr>
<td></td>
<td>• Outlet valve / valve lever is too far from the cam disk.</td>
<td>Adjust the outlet valve (see Chapter 3.15).</td>
</tr>
<tr>
<td></td>
<td>• The height adjustment is not operated via the Bowden pull wire.</td>
<td>Replace (Chapter 3.23) or adjust (see Chapter 3.24) the Bowden pull wire.</td>
</tr>
<tr>
<td></td>
<td>• Level control is defective.</td>
<td>Replace the level control (Chapter 3.14).</td>
</tr>
<tr>
<td>Fault description</td>
<td>Possible cause</td>
<td>Troubleshooting</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>After the height adjustment, the seat suspension lowers for at least 30 mm, but continues to vent automatically after unloading the seat (driver gets off the seat).</td>
<td>• Level control does not uncouple.</td>
<td>Compress and expand the seat suspension once after getting off the seat.</td>
</tr>
<tr>
<td>Seat suspension responds after the height adjustment has been operated, but then returns to its original position.</td>
<td>• Handle has not been operated as far as possible.</td>
<td>Pull or push the handle as far as possible. Check the level control (Chapter 2.4, inspection step 2.3).</td>
</tr>
<tr>
<td>Seat suspension changes its position while driving, deflates and lowers down.</td>
<td>• Air hose connections are leaky.</td>
<td>Check all air hose connections for air leakage and, if necessary, seal leaky connections professionally. Replace the air hoses (Chapter 3.17).</td>
</tr>
<tr>
<td></td>
<td>• Air hoses are leaky.</td>
<td>Replace the air spring and the air distributor (Chapter 2.4, inspection step no. 4.2).</td>
</tr>
<tr>
<td></td>
<td>• Air spring and air distributor are leaky.</td>
<td>Adjust the outlet valve (see Chapter 3.15). Replace the level control (Chapter 3.14).</td>
</tr>
<tr>
<td></td>
<td>• Level control is leaky (air escapes from the outlet valve).</td>
<td>Replace the compressor (Chapter 3.13). Replace the compressor (Chapter 3.13).</td>
</tr>
</tbody>
</table>
### 2.3 Overview of faults – Pointing out possible faults that might occur

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| It is possible to set the seat suspension to the highest position, but it does not deflate any longer. | • Outlet valve is too far from the cam disc.  
• Level control is defective. | Adjust the outlet valve (see Chapter 3.15).  
Replace the level control (Chapter 3.14). |
| Seat suspension can be lowered, but does not pump up in the lowest position despite of the handle pulled upwards. | • Micro-switch is too far from the cam disk.  
• Level control is defective. | Adjust the micro-switch (see Chapter 3.15).  
Check the level control (Chapter 2.4, inspection step 2.1). |
| Height adjustment upwards: compressor runs, but seat suspension is not lifted.  | • Level control is leaky. | Replace the level control (Chapter 3.14). |
| Seat suspension moves up automatically (compressor does not switch off). | • Micro-switch is too near to the cam disk.  
• Micro-switch is defective. | Adjust the micro-switch (see Chapter 3.15).  
Replace the level control (Chapter 3.14). |
| Compressor starts running automatically. | • Wire break or short-circuit (e.g. caused by abrasion of the cable harness). | Replace the cable harness of the seat suspension (see Chapter 3.26). |
### 2.3 Overview of faults – Pointing out possible faults that might occur

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor is not running.</td>
<td>• No voltage.</td>
<td>Check the compressor (Chapter 2.4, step no. 1.1).</td>
</tr>
<tr>
<td></td>
<td>• Micro-switch is too far from the cam disk.</td>
<td>Adjust the micro-switch (see Chapter 3.15).</td>
</tr>
<tr>
<td></td>
<td>• Micro-switch is defective or cam switch is bent.</td>
<td>Check the micro-switch (Chapter 2.4, inspection step no. 3.1).</td>
</tr>
<tr>
<td></td>
<td>• Compressor is defective.</td>
<td>Replace the compressor (Chapter 3.13).</td>
</tr>
<tr>
<td></td>
<td>• Air hoses are leaky.</td>
<td>Check the air hoses (Chapter 2.4, step no. 4.1).</td>
</tr>
<tr>
<td></td>
<td>• Air spring is leaky.</td>
<td>Check the air spring (Chapter 2.4, step no. 4.2).</td>
</tr>
<tr>
<td></td>
<td>• Air distributor is leaky.</td>
<td>Check the air distributor (Chapter 2.4, step no. 4.3).</td>
</tr>
<tr>
<td></td>
<td>• Compressor is leaky or defective.</td>
<td>Replace the compressor (Chapter 3.13).</td>
</tr>
<tr>
<td>- No voltage at the compressor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Voltage is present at the compressor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Compressor is running, seat suspension does not move upwards or seat suspension lowers after a short time.</td>
<td>• The sealing ring of the level control is not tight.</td>
<td>Replace the level control (Chapter 3.14).</td>
</tr>
<tr>
<td>Seat suspension pumps up and remains in the middle position, while the compressor is running.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 2.3 Overview of faults – Pointing out possible faults that might occur

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>After having turned the handle for the fore/aft isolator backwards (in order to unlock the fore/aft isolator), the upper suspension part cannot be moved in longitudinal horizontal direction.</td>
<td>• Linkage rod is detached or broken.</td>
<td>Hang in or replace the linkage rod (see Chapter 3.12).</td>
</tr>
<tr>
<td>After having turned the handle for the fore/aft isolator forwards (in order to lock the fore/aft isolator), the upper suspension part can be moved in longitudinal horizontal direction.</td>
<td>• Linkage rod is detached or broken.</td>
<td>Hang in or replace the linkage rod (see Chapter 3.12).</td>
</tr>
<tr>
<td></td>
<td>• Tension spring is detached or broken.</td>
<td>Hang in or replace the tension spring (see Chapter 3.12).</td>
</tr>
<tr>
<td>There is no noticeable change in the vertical cushioning effect (hard or soft) after the handle for vertical shock absorber adjustment has been turned.</td>
<td>• Bowden pull wire for vertical shock absorber adjustment is detached or torn.</td>
<td>Hang in or replace the Bowden pull wire for vertical shock absorber - adjustment (see Chapter 3.6).</td>
</tr>
<tr>
<td></td>
<td>• Vertical shock absorber is defective.</td>
<td>Replace the vertical shock absorber (Chapter 3.7).</td>
</tr>
</tbody>
</table>
### 2.3 Overview of faults – Pointing out possible faults that might occur

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat suspension wobbles.</td>
<td>• Fixed bearings or rollers of the swinging structure are defective.</td>
<td>Replace the seat suspension (Chapter 3.1).</td>
</tr>
<tr>
<td></td>
<td>• Swinging structure is defective.</td>
<td>Replace the seat suspension (Chapter 3.1).</td>
</tr>
<tr>
<td>Seat suspension squeaks.</td>
<td>• Insufficient lubrication of the upper and/or lower rollers of the swinging structure.</td>
<td>Apply acid-free multi-purpose lubricant to the guiding rails of the upper suspension part and/or of the lower suspension part at the side surfaces of the rollers (see Chapter 3.27 and/or Chapter 3.28).</td>
</tr>
<tr>
<td></td>
<td>• Insufficient lubrication of the studs of the vertical shock absorber.</td>
<td>Apply acid-free multi-purpose lubricant to the stud of vertical shock absorber (see Chapter 3.7).</td>
</tr>
<tr>
<td></td>
<td>• Insufficient lubrication of the mounting surfaces of the longitudinal horizontal shock absorber.</td>
<td>Apply acid-free multi-purpose lubricant to mounting surfaces of the longitudinal horizontal shock absorber (see Chapter 3.9).</td>
</tr>
<tr>
<td></td>
<td>• Insufficient lubrication of the central bearing of the swinging structure.</td>
<td>Apply oil to the central bearing (see Chapter 3.29).</td>
</tr>
</tbody>
</table>

**Note:** For this purpose, swinging structure and central bearing do not have to be removed.
### 2.3 Overview of faults – Pointing out possible faults that might occur

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat suspension travels up and down and hits the upper and lower end stop.</td>
<td>• Vertical shock absorber is defective.</td>
<td>Replace the vertical shock absorber (Chapter 3.7).</td>
</tr>
<tr>
<td></td>
<td>• Air spring is leaky.</td>
<td>Check the air spring (see Chapter 2.4, step no. 4.2).</td>
</tr>
<tr>
<td></td>
<td>• Air distributor is leaky.</td>
<td>Check the air distributor (see Chapter 2.4, step no. 4.3).</td>
</tr>
<tr>
<td></td>
<td>• Air hose connections are leaky.</td>
<td>Check all air hose connections for air leakage and replace the component showing a defective air connection with a new one, if necessary.</td>
</tr>
<tr>
<td></td>
<td>• Air hoses are leaky.</td>
<td>Check the air hoses (see Chapter 2.4, step no. 4.1).</td>
</tr>
<tr>
<td></td>
<td>• Level control is defective.</td>
<td>Check the level control (Chapter 2.4, step no. 2.1).</td>
</tr>
<tr>
<td></td>
<td>• Compressor is defective.</td>
<td>Check the compressor (Chapter 2.4, step no. 1.1).</td>
</tr>
</tbody>
</table>
2.4 Troubleshooting – Locating the fault

1 Checking compressor and current path (compressor cable)

1.1 Compressor cable with U-profile and socket

Preconditions for fault diagnosis:

• The individual functions are activated in compliance with the instructions of the seat operating instructions.
• The electrical system of the vehicle has been inspected and found to be OK in compliance with the vehicle operating instructions.
• The micro-switch has been inspected and found to be OK.
• The pneumatic system has been inspected and found to be OK.
• Battery voltage at the seat 12 V (24 V), ignition ON.

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

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 1.1      | • Disconnect the electrical connection (E) between the cable harness of the vehicle connection and the cable harness of the seat suspension.  
• Pull up the handle for height adjustment.  
• Measure the resistance at the pins P1 and P2 in the plug of the cable harness of the seat suspension (12-pin) (assignment for compressor):  
  \[ P1 \ \Omega \ P2 \] | \[ 2.1 \ \Omega \ (\pm 10\%) \] (total resistance of compressor cable, micro-switch and compressor)  
\[ >> 2.1 \ \Omega \ (\rightarrow \infty) \] (interruption) or  
\[ << 2.1 \ \Omega \ (\rightarrow 0) \] (short-circuit) | Proceed with inspection step no. 1.3.  
Proceed with inspection step no. 1.2. |
## Troubleshooting – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 1.2     | • Disconnect electrical connection (C) and (D) between right-angle plug (blue cable) and compressor.  
          • Measure the resistance at the contacts of the compressor (2-pin):  
          Contact Ω contact                                                                                           | = 2.0 Ω (± 10%) (total resistance of compressor)  
          >> 2.0 Ω (→ ∞) (interruption) or  
          << 2.0 Ω (→ 0) (short-circuit)                                                                                           | Replace the cable harness of the upper seat part (Chapter 3.26). Replace the compressor (Chapter 3.13). |
| 1.3     | • Reconnect the electrical connections and pull the handle for height adjustment upwards.                                                                                                                 | Compressor is running and seat suspension moves upwards.  
          Compressor is running and seat suspension does not move upwards; compressor is leaky (return valve).  
          Compressor is not running.  
          Compressor is not active.                                                                                           | End of inspection. Replace the compressor (Chapter 3.13). Check the fuse and the plug-in connections and replace them, if necessary. Proceed with inspection step no. 1.4. |
## 2.4 Troubleshooting – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4</td>
<td>![WARNING] Risk of injury! Due not operate the cam switch at the micro-switch manually, but operate it carefully by means of an appropriate tool. Use a screwdriver to adjust or to readjust the micro-switch (see Chapter 3.15).</td>
<td>Compressor is not active. Compressor is running and seat suspension moves upwards.</td>
<td>Replace the compressor (Chapter 3.13). Proceed with inspection step no. 1.5.</td>
</tr>
<tr>
<td>1.5</td>
<td>Pull the handle for height adjustment upwards as far as possible.</td>
<td>The leveling valve (3.24 – pos. 21) is operated via the Bowden pull wire, but the seat suspension does not react. The leveling valve (3.24 – pos. 21) is not operated.</td>
<td>Replace the level control (Chapter 3.14). Adjust the Bowden pull wire (see Chapter 3.24) or replace the Bowden pull wire (see Chapter 3.22).</td>
</tr>
</tbody>
</table>
2.4 Troubleshooting – Locating the fault

1.2 Compressor cable with direct seat connection

Preconditions for fault diagnosis:
• The individual functions are activated in compliance with the instructions of the seat operating instructions.
• The electrical system of the vehicle has been inspected and found to be OK in compliance with the vehicle operating instructions.
• Electrical connection at the components produced according to instruction and locked, if possible.
• Cable harness for seat suspension has been inspected with regard to arcing spots and broken leads (kinks) and found to be OK.
• Ignition switched off (no voltage that might cause a current flow must be applied to the seat suspension).
• Micro-switch has been inspected and found to be OK.
• Pneumatic air system has been inspected and found to be OK.
• Bellows at the upper suspension part removed (see Chapter 3.3) and pressed down.

Notes:
• The components mentioned above are illustrated in Chapter 2.1, if not stated otherwise in this text.
• Descriptions of the work required during the diagnosis can be found in Chapter 3.
• Repeat the inspection after replacement of defective components.
• Assemble the seat after the end of the inspection or before repeating the inspection (e.g. reconnecting electrical connections (STVB)).
## Troubleshooting – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 1.1      | • Disconnect the electrical connection (E) between cable harness for vehicle connection and cable harness of seat suspension.  
• Connect the multimeter to pins P1 and P2 in the cable harness plug of the seat suspension (2 or 4-pin).  
• Pull up the handle for height adjustment and measure the resistance at the pins P1 and P2: | $P1 \, \Omega \, P2 = 1,5 \, \Omega (\pm 10\%)$ (total resistance of compressor cable, micro-switch and compressor)  
$>> 1,5 \, \Omega (R \to \infty)$ (break) or  
$<< 1,5 \, \Omega (R \to 0)$ (short-circuit) | Proceed with inspection step no. 1.4.  
Proceed with inspection step no. 1.2. |
### 2.4 Troubleshooting – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specifed status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 1.2      | • Disconnect the electrical connections (C and D) at the compressor.  
          • Pull up the handle for height adjustment and measure the resistance at the pins P1 and P2:  
          \[
          \begin{align*}
          P1 & \quad \Omega \quad P2 \\
          \end{align*}
          \]  
          \(= \infty \Omega\) (resistance of the line to the compressor)  
          \(<< \infty \Omega(R \rightarrow 0)\) (short-circuit) | Proceed with inspection step no. 1.3.  
Replace the cable harness of the seat suspension (see Chapter 3.26). |
## 2.4 Troubleshooting – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 1.3      | • Bridge contacts of the right-angle plugs.  
• Pull up the handle for height adjustment and measure the resistance at the pins P1 and P2:  
   
P1 \( \Omega \) P2 |  
   &lt; 1 \( \Omega \) (resistance of the line to the compressor)  
   &gt; 1 \( \Omega \) (\( R \rightarrow \infty \)) (break) |  
   Replace compressor (see Chapter 3.13).  
   Replace the cable harness of the seat suspension (see Chapter 3.26). |
| 1.4      | • Re-establish electrical connection (E), and (C and D) if necessary.  
• Switch the ignition on.  
• Pull up the handle for height adjustment. |  
   Compressor is running and seat suspension moves upwards.  
   Compressor is running and seat suspension does not move upwards; compressor is leaky (return valve). |  
   End of inspection.  
   Replace the compressor (see Chapter 3.13). |
2.4 Troubleshooting – Locating the fault

2 Inspection of the level control

Preconditions for fault diagnosis:
• The individual functions are activated in compliance with the instructions of the seat operating instructions.
• The electrical system of the vehicle has been inspected and found to be OK and in compliance with the vehicle operating instructions.
• The compressed-air hoses have been inspected with regard to kinks and tightness and found to be OK.
• The compressor has been inspected and found to be OK.
• The Bowden pull wires for height adjustment have been inspected and found to be OK.
• Battery voltage 12 V (24 V), ignition ON.

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

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Press the height adjustment handle down.</td>
<td>The leveling valve (3.18 – pos. 21) is operated via the Bowden pull wire; air escapes at the leveling valve. The leveling valve (3.24 – pos. 21) is operated via the Bowden pull wire; there is no air escaping at the leveling valve (valve tappets are stuck). The leveling valve (3.24 – pos. 21) is not operated.</td>
<td>Proceed with inspection step no. 2.2. Replace the level control (Chapter 3.14). Adjust Bowden pull wire (see Chapter 3.24) and check again.</td>
</tr>
</tbody>
</table>
# 2.4 Troubleshooting – Locating the fault

## Table of Troubleshooting Steps

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 2.2      | ![Warning Icon] **WARNING** Risk of injury! Due not operate the cam switch at the micro-switch manually, but operate it carefully by means of an appropriate tool. | - The seat suspension moves upwards.  
- The seat suspension does not move upwards. | - Proceed with inspection step no. 2.3.  
- Check the compressor (Chapter 2.4, step no. 1.1).  
- If the compressor is not defective, replace the level control (Chapter 3.14). |
| 2.3      | Pull the handle for height adjustment upwards as far as possible and release it. | - The seat suspension moves upwards and remains in the adjusted position.  
- The seat suspension moves upwards and does not remain in the adjusted position. | - End of inspection.  
- Replace the level control (Chapter 3.14). |
3 Inspection of the micro-switch

**Preconditions for fault diagnosis:**
- The electrical system of the vehicle has been inspected and found to be OK in compliance with the vehicle operating instructions.
- Level control is inspected and found OK.
- The Bowden pull wire for height adjustment (upwards) have been inspected and found to be OK.

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

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 3.1     | Disconnect electrical connection (A) and (B) between plug (blue and red cable) and micro-switch.  
         | • Measure the resistance at the contacts K1 and K2 of the micro-switch:  
         | K1 Ω K2                                    | >> 1 Ω (→ ∞) (interruption)               | Proceed with inspection step no. 3.2.  
         |                                                      | ≤ 1 Ω (→ 0) (short-circuit)               | Micro-switch is defective.  
         |                                                      |                                          | Replace the level control (Chapter 3.14). |
### Troubleshooting – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 3.2      | • Pull up the handle for height adjustment.  
          • Measure the resistance at the contacts K1 and K2 of the micro-switch:  
          \[ K1 \ \Omega \ \ K2 \] |  
          \[ = 0.2 \ \Omega \ (\pm 10\%) \text{ (total resistance of micro-switch)} \]  
          \[ \gg 0.2 \ \Omega \ (\rightarrow \infty) \text{ (interruption) or } \ll 0.2 \ \Omega \ (\rightarrow 0) \text{ (short-circuit)} \] |  
          End of inspection.  
          Micro-switch is defective.  
          Replace the level control (Chapter 3.14). |
4 Inspection of the pneumatic system

Preconditions for fault diagnosis:
- The compressor has been inspected and found to be OK.

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

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<th>Result/specified status</th>
<th>Troubleshooting</th>
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<tbody>
<tr>
<td>4.1</td>
<td>Apply load to seat suspension and air intake hose, inspect compressed-air hose and air hoses with regard to kinks and tightness.</td>
<td>Air hoses are tight.</td>
<td>Proceed with inspection step no. 4.2.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air hose is leaky.</td>
<td>Replace the air hose (see Chapter 3.17) or replace level control (Chapter 3.14).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air hose connection is leaky.</td>
<td>Professionally seal the connection or replace it (see Chapter 3.17).</td>
</tr>
<tr>
<td>4.2</td>
<td>Check the air spring for visible damage (e.g. abrasion) and tightness.</td>
<td>Air spring is tight.</td>
<td>Proceed with inspection step no. 4.3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air spring is leaky.</td>
<td>Replace the air spring (see Chapter 3.18).</td>
</tr>
</tbody>
</table>
## 2.4 Troubleshooting – Locating the fault

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<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.3</td>
<td>Apply load to seat suspension and inspect air distributor.</td>
<td>Air distributor is airtight. &lt;br&gt; Air escapes at the air distributor.</td>
<td>Proceed with inspection step no. 4.4. &lt;br&gt; Replace the air distributor (Chapter 3.19).</td>
</tr>
<tr>
<td>4.4</td>
<td>Apply load to seat suspension and inspect level control.</td>
<td>Air escapes at the level control. &lt;br&gt; The level control is tight.</td>
<td>Adjust the outlet valve (see Chapter 3.15). &lt;br&gt; Replace the level control (Chapter 3.14). &lt;br&gt; End of inspection.</td>
</tr>
</tbody>
</table>
## Troubleshooting – Locating the fault

### 5 Inspection of the cable harness for seat suspension

#### 5.1 Cable harness of seat suspension incl. U-profile and socket

**Preconditions for fault diagnosis:**
- The electrical system of the vehicle has been inspected and found to be OK and in compliance with the vehicle operating instructions.
- Compressor and current path has been inspected and found to be OK.

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

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 5.1      | • Disconnect the electrical connection (E) between the cable harness of the vehicle connection and the cable harness of the seat suspension.  
          • Disconnect the electrical connection (F) between the cable harness of the upper seat part and the cable harness of the upper suspension part.  
          • Bridge the pins P6 and P8 in the plug of the cable harness for the seat suspension (8-pin).  
          • Measure the resistance at the pins P3 and P6 in the plug of the cable harness for the seat suspension (12-pin) (pin assignment for the heater): P3, P6 | $<< 1 \, \Omega \, (R \rightarrow 0)$ (pass)  
$\geq 1 \, \Omega \, (R \rightarrow \infty)$ (interruption) | Proceed with inspection step no. 5.2.  
Replace the cable harness of the upper seat part (Chapter 3.26). |
## 2.4 Troubleshooting – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 5.2      | • Bridge the pins P6 and P7 in the plug of the cable harness for the seat suspension (8-pin).  
          • Measure the resistance at the pins P3 and P5 in the plug of the cable harness for the seat suspension (12-pin) (pin assignment for the lumbar support):  
          P3 Ω P5 | << 1 Ω (R→ 0) (pass)  
          ≥ 1 Ω (R→∞) (interruption) | Proceed with inspection step no. 5.3.  
          Replace the cable harness of the upper seat part (Chapter 3.26). |
| 5.3      | • Bridge the pins P6 and P3 in the plug of the cable harness for the seat suspension (8-pin).  
          • Measure the resistance at the pins P3 and P4 in the plug of the cable harness for the seat suspension (12-pin) (pin assignment for the climate control system):  
          P3 Ω P4 | << 1 Ω (R→ 0) (pass)  
          ≥ 1 Ω (R→∞) (interruption) | Proceed with inspection step no. 5.4.  
          Replace the cable harness of the upper seat part (Chapter 3.26). |
## 2.4 Troubleshooting – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 5.4      | • Measure the resistances between pins P1, P4 and P5 in the plug of the cable harness of the seat suspension (8-pin) and pins P12, P10 and P11 in the plug of the cable harness of the seat suspension (12-pin) (assignment for seat occupancy detection/belt contact): | \[\begin{align*}
P1 & \quad \text{Ω} & \quad P12 \\
P4 & \quad \text{Ω} & \quad P10 \\
P5 & \quad \text{Ω} & \quad P11
\end{align*}\] | \[\begin{align*}
\leq 1 \ \Omega (R\rightarrow 0) & \text{ (pass)} \\
\geq 1 \ \Omega (R\rightarrow \infty) & \text{ (interruption)}
\end{align*}\] |

End of inspection. Replace the cable harness of the upper seat part (Chapter 3.26).
2.4 Troubleshooting – Locating the fault

5.2 Cable harness for seat suspension with direct seat connection (4-pin)

Preconditions for fault diagnosis:
• The individual functions are activated in compliance with the instructions of the seat operating instructions.
• The electrical system of the vehicle has been inspected and found to be OK in compliance with the vehicle operating instructions.
• Electrical connection at the components produced according to instruction and locked, if possible.
• Cable harness for seat suspension has been inspected with regard to arcing spots and broken leads (kinks) and found to be OK.
• Ignition switched off (no voltage that might cause a current flow must be applied to the seat suspension).
• Micro-switch has been inspected and found to be OK.
• Pneumatic air system has been inspected and found to be OK.
• Bellows at the upper suspension part removed (see Chapter 3.3) and pressed down.

Notes:
• The components mentioned above are illustrated in Chapter 2.1, if not stated otherwise in this text.
• Descriptions of the work required during the diagnosis can be found in Chapter 3.
• Repeat the inspection after replacement of defective components.
• Assemble the seat after the end of the inspection or before repeating the inspection (e.g. reconnecting electrical connections (STVB)).
### 2.4 Troubleshooting – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 5.1      | • Disconnect the electrical connection (E) between the cable harness plug for seat suspension and the cable plug for vehicle connection.  
• Connect the multimeter to pins P1 and P2 in the cable harness plug of the seat suspension (4-pin).  
• Measure the resistance at the pins P1 and P2 in the cable harness plug of the seat suspension (4-pin):  
\[
P1 \quad \Omega \quad P2\]
  
\[
= \infty \Omega
\]
  
\[
<< \infty \Omega (R \rightarrow 0) \text{ (short-circuit)}
\]| Proceed with inspection step no. 5.2  
Replace the cable harness of the seat suspension (see Chapter 3.26). |
## 2.4 Troubleshooting – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
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</thead>
<tbody>
<tr>
<td>5.2</td>
<td>• Bridge the pins P6 and P8 in the plug of the cable harness for the seat suspension (8-pin) (pin assignment for the heater).&lt;br&gt;• Measure the resistance at the pins P1 and P2 in the cable harness plug of the seat suspension (4-pin):&lt;br&gt;  P1  Ω  P2</td>
<td>&lt; 1 Ω (R → 0) (pass)&lt;br&gt;  &gt; 1 Ω (R → ∞) (break)</td>
<td>Proceed with insp. step 5.3. Replace the cable harness of the seat suspension (see Chapter 3.26).</td>
</tr>
</tbody>
</table>
### 2.4 Troubleshooting – Locating the fault

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<th>Inspect/operate</th>
<th>Result/specified status</th>
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</tr>
</thead>
</table>
| 5.3      | • Bridge the pins P6 and P7 in the plug of the cable harness for the seat suspension (8-pin) (pin assignment for the lumbar support).<br>• Measure the resistance at the pins P1 and P2 in the cable harness plug of the seat suspension (4-pin):<br>\[
\begin{align*}
\text{P1} & \quad \Omega & \quad \text{P2}
\end{align*}
\]
|          | << 1 Ω (R → 0) (pass)                                                         | Proceed with inspection step no. 5.4. | Replace the cable harness of the seat suspension (see Chapter 3.26). |
|          | >> 1 Ω (R → ∞) (break)                                                        |                                |                                                                          |
### Troubleshooting – Locating the fault

<table>
<thead>
<tr>
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<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.4</td>
<td>• Measure resistance between the pins P4 and P3 in the cable harness plug for the seat suspension (4-pin) and the pins P4 and P5 in the cable harness plug for the seat suspension (8-pin) (pin assignment for seat occupancy detection system):</td>
<td></td>
<td>End of inspection.</td>
</tr>
<tr>
<td></td>
<td>Ω Ω</td>
<td>&lt;&lt; 1 Ω (R→0) (pass)</td>
<td>Replace the cable harness of the seat suspension (see Chapter 3.26).</td>
</tr>
</tbody>
</table>
5.3 Cable harness of seat suspension with direct seat connection (2 and 3-pin)

Preconditions for fault diagnosis:
- The individual functions are activated in compliance with the instructions of the seat operating instructions.
- The electrical system of the vehicle has been inspected and found to be OK in compliance with the vehicle operating instructions.
- Electrical connection at the components produced according to instruction and locked, if possible.
- Cable harness for seat suspension has been inspected with regard to arcing spots and broken leads (kinks) and found to be OK.
- Ignition switched off (no voltage that might cause a current flow must be applied to the seat suspension).
- Micro-switch has been inspected and found to be OK.
- Pneumatic air system has been inspected and found to be OK.
- Bellows at the upper suspension part removed (see Chapter 3.3) and pressed down.

Notes:
- The components mentioned above are illustrated in Chapter 2.1, if not stated otherwise in this text.
- Descriptions of the work required during the diagnosis can be found in Chapter 3.
- Repeat the inspection after replacement of defective components.
- Assemble the seat after the end of the inspection or before repeating the inspection (e.g. reconnecting electrical connections (STVB)).
## Troubleshooting – Locating the fault

### Step 5.1
- Disconnect the electrical connection (E) between the cable harness plug for seat suspension and the cable plug for vehicle connection.
- Connect the multimeter to pins P1 and P2 in the cable harness plug of the seat suspension (2-pin).
- Measure the resistance at the pins P1 and P2 in the cable harness plug of the seat suspension (2-pin):

  \[
  \begin{align*}
  &\text{P1} \quad \Omega \quad \text{P2} \\
  = &\infty \Omega \\
  \ll &\infty \Omega (R\to 0) \text{ (short-circuit)}
  \end{align*}
  \]

  Proceed with inspection step no. 5.2

Replace the cable harness of the seat suspension (see Chapter 3.26).
## 2.4 Troubleshooting – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 5.2      | • Bridge the pins P6 and P8 in the plug of the cable harness for the seat suspension (8-pin) (pin assignment for the heater).  
          • Measure the resistance at the pins P1 and P2 in the cable harness plug of the seat suspension (2-pin):  
          P1  Ω  P2                                                  | << 1 Ω (R→0) (pass)                 | Proceed with insp. step 5.3. Replace the cable harness of the seat suspension (see Chapter 3.26). |
|          |                                                                                | >> 1 Ω (R→∞) (break)              |                                                      |
| 5.3      | • Bridge the pins P6 and P7 in the plug of the cable harness for the seat suspension (8-pin) (pin assignment for the lumbar support).  
          • Measure the resistance at the pins P1 and P2 in the cable harness plug of the seat suspension (2-pin):  
          P1  Ω  P2                                                  | << 1 Ω (R→0) (pass)                 | Proceed with insp. step 5.4. Replace the cable harness of the seat suspension (see Chapter 3.26). |
|          |                                                                                | >> 1 Ω (R→∞) (break)              |                                                      |
### 2.4 Troubleshooting – Locating the fault

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</tr>
</thead>
<tbody>
<tr>
<td>5.4</td>
<td>• Measure the resistance between the pins P1, P2 and P3 in the cable harness plug of the seat suspension (3-pin) and the pins P1, P5 and P4 in the cable harness plug for the seat suspension (8-pin) (pin assignment for seat occupancy detection system):</td>
<td>&lt;&lt; $1 \ \Omega \ (R \rightarrow 0)$ (pass)</td>
<td>End of inspection.</td>
</tr>
<tr>
<td></td>
<td>P1 $\Omega$ P1</td>
<td></td>
<td>Replace the cable harness of the seat suspension (see Chapter 3.26).</td>
</tr>
<tr>
<td></td>
<td>P2 $\Omega$ P5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P3 $\Omega$ P4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$&lt;&lt; 1 \ \Omega \ (R \rightarrow 0)$ (pass)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$&gt;&gt; 1 \ \Omega \ (R \rightarrow \infty)$ (break)</td>
<td></td>
<td></td>
</tr>
</tbody>
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3.2 Front cover – removal and installation *  
3.3 Top cover – removal and installation  
3.4 Bellows – removal and installation  
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3.5.2 Handle for vertical shock absorber (Operating at the left side) – removal and installation  
3.6 Bowden pull wire for vertical shock absorber **  
3.6.1 Bowden pull wire for vertical shock absorber (Operating at the front side) – removal and installation  
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3.7 Vertical shock absorber – removal and installation  
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* if fitted; ** depending on model;
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</tr>
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3.27 Upper suspension part (Operating at the front side and the left side) ** – removal and installation
3.28 Lower suspension part – removal and installation
3.29 Swinging structure – disassembly and assembly
3.30 Worn parts – replacement
3.1 Seat suspension – removal and installation

REMOVAL / INSTALLATION

(1) Seat suspension
(2) Upper seat part
(3) Fore/aft adjustment
(4) Micro-encapsulated cap screw .............. replacement, 25 Nm
(5) Cable harness for upper seat part
(6) Cable tie
(7) Center cover
(8) Socket (cable harness for upper seat part)
(9) Plug (cable harness of seat suspension)
(10) Belt buckle cable (long)*
(11) Belt buckle cable (short)*

*) if fitted
Note:
For the removal of the seat suspension (1) on the vehicle, ask the vehicle manufacturer for the necessary assembly work to be carried out.

Removal and installation

1 Push the upper seat part (2) backwards over the fore/aft adjustment (3) as far as possible.

2 Mark the screw positioning diagram and unscrew two micro-encapsulated cap screws (4) at the front of the fore/aft adjustment (3).

Installation notes:
- Replace the micro-encapsulated cap screw (4), 25 Nm.
- Check the fore/aft adjustment (3) for correct locking in any position.
- Install the fore/aft adjustment (3) according to the marking.
3.1 Seat suspension – removal and installation

REMOVAL / INSTALLATION

3 If end stop (10) exists:
   Remove end stop (10).

4 Push the upper seat part (2) forwards over the fore/aft adjustment (3) as far as possible.

5 Mark the screw positioning diagram and unscrew two micro-encapsulated cap screws (4) at the rear of the fore/aft adjustment (3).
   **Installation notes:**
   • Replace the micro-encapsulated cap screw (4), 25 Nm.
   • Install the fore/aft adjustment (3) according to the marking.

6 If end stop (11) exists:
   Remove end stop (11).
3.1 Seat suspension – removal and installation

Lift off the upper seat part (2) at the seat suspension (1) and put it aside.

Note:
When laying down the seat suspension (1), make sure that the cable harness of the upper seat part (5) is not overstretched.

Installation note:
To prevent the cable harness of the upper seat part (5) from being squeezed and rubbed, the cable harness of the upper seat part (5) should be placed in a slackness loop (round arrow) between the seat suspension (1) and the upper seat part (2).
3.1 Seat suspension – removal and installation

8 Mark the point where the cable harness of the upper seat part (5) is fastened to the center cover (7) by means of a cable tie (6) and remove the cable tie (7).

9 Disconnect the electrical connection between the socket (8) and the plug (9).

10 Remove the seat suspension (1).

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

REMOVAL / INSTALLATION

1 Remove the upper seat part at the seat suspension and put it aside (see Chapter 3.1).

Notes:
- Cable ties at the cable harness of the upper seat part need not be removed and electrical connection need not be disconnected.
- Do not overstretched the cable harness of the upper seat part when putting it aside.

(1) Front cover
(2) Blind rivet
(3) Upper suspension part
(4) Bowden pull wire for height adjustment.
(5) Bowden pull wire for vertical shock absorber adjustment
3.2 Front cover – removal and installation

Removal and installation

2 Bore out the two rivet heads and drive out the blind rivets (2).

3 Remove the front cover (1) at the upper suspension part (3).
   **Note:** Bowden pull wire for height adjustment (4) and Bowden pull wire for vertical shock absorber adjustment (5) run right and left (arrows) under the front cover (1).

4 Re-install the components in the reverse order of their removal.
(1) Top cover
(2) Upper suspension part
(3) Bowden pull wire for vertical shock absorber adjustment
(4) Front cover *
(5) Bowden pull wire for height adjustment.
(6) Expanding rivet ............... to replace

* if fitted
3.3 Top cover – removal and installation

Removal and installation

1 Remove the seat suspension (Chapter 3.1).

2 Drive out the expanding rivet (6).

   **Note:**
   In order to make the expanding rivet (6) accessible for removal and installation which is partly covered by the front cover (4) *, carefully bend the front cover (4) upwards in the area of the expanding rivet (6).

   **Installation note:**
   Replace the expanding rivet (6).

* if fitted
3. Take off the Bowden pull wire for the vertical shock absorber adjustment (3) at the top cover (1) (arrow).

4. Pull out four lugs of the top cover (1) at the upper suspension part (2).

5. Remove the top cover (1).

**Installation note:**
Bowden pull wire for height adjustment (5) runs through the large opening (arrow) right in the top cover (1) inwards into the suspension.

6. Re-install the components in the reverse order of their removal.
3.4 Bellows – removal and installation

REMOVAL / INSTALLATION

(1) Bellows
(2) Lower suspension part
(3) Bellows pin
(4) Upper suspension part
(5) Handle for vertical shock absorber adjustment
(6) Wire insert
3.4 Bellows – removal and installation

Removal and installation

1. Pull out sixteen bellows pins (3) from the upper suspension part (4).

2. Pull out six bellows pins (3) at the lower suspension part (2).

3. Pull the bellows (1) over the handle for vertical shock absorber adjustment (5).

4. Pull the bellows (1) in downward direction over the lower suspension part (2) and remove it.
5 If the wire insert (6) is defective:
   Remove the wire insert (6) at the bellows (1).

Installation notes:
• Place the wire insert (6) in the middle fold of the bellows (1).
• The welding joint (arrow) of the wire insert (6) must be located in the front bellows (1).

6 Re-install the components in the reverse order of their removal.
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3.5.1 Handle for vertical shock absorber (Operating at the front side) – removal and installation
3.5.2 Handle for vertical shock absorber (Operating at the left side) – removal and installation
3.5.1 Handle for vertical shock absorber – removal and installation

REMOVAL / INSTALLATION

(1) Handle for vertical shock absorber adjustment
(2) Catch spring
(3) Bowden pull wire for vertical shock absorber adjustment
(4) L-bar (at the upper suspension part)
(5) Rounded head screw (inner race) ......................... 2.5 Nm
(6) Upper suspension part
3.5.1 Handle for vertical shock absorber – removal and installation

Removal and installation

1. Remove the bellows at the front at the upper suspension part (see Chapter 3.4) and press it down.

2. Turn the handle for vertical shock absorber adjustment (1) to the middle position.

3. Unscrew the rounded head screw (5) at the handle for vertical shock absorber adjustment (1).
   **Installation note:** Rounded head screw (5), 2.5 Nm.

4. Pull off the handle for vertical shock absorber adjustment (1) at the L-bar (4).
5 Take off the Bowden pull wire for the vertical shock absorber adjustment (3) at the handle for the vertical shock absorber adjustment (1).

**Installation note:**
Ensure that the wire of the Bowden pull wire (3) runs in the groove (arrow) of the handle for the vertical shock absorber setting (1).

6 Pull off the catch spring (2) at the L-bar (4).

7 Re-install the components in the reverse order of their removal.
3.5.2 Handle for vertical shock absorber – removal and installation

(1) Upper part of the suspension system
(2) Handle for vertical shock absorber adjustment
(3) Bowden pull wire
(4) Blind rivet
(5) Rounded head screw (inner race) .........................2.25 Nm
(6) Catch spring
(7) Guide element (Bowden pull wire)
3.5.2 Handle for vertical shock absorber – removal and installation

Removal and installation

1. Remove the bellows at the left side at the upper suspension part (see Chapter 3.4) and press it down.

2. Unscrew the rounded head screw (5)
   **Installation note:**
   Rounded head screw (5), 2.5 Nm.

3. Pull off the handle for vertical shock absorber adjustment (2) from the upper part of the suspension (1).

4. Take off the Bowden pull wire (3) at the handle for the vertical shock absorber adjustment (2).
   **Installation note:**
   Ensure that the wire of the Bowden pull wire (3) runs in the groove (arrow) of the handle for the vertical shock absorber setting (2).
3.5.2 Handle for vertical shock absorber – removal and installation

REMOVAL / INSTALLATION

5 Detach the Bowden pull wire (3) from the guide element (7).

6 Bore out the rivet head and drive out the blind rivet (4). Remove the guide element (7).

7 Pull off the catch spring (6) at the upper suspension part (1).

8 Re-install the components in the reverse order of their removal.
3.6 Bowden pull wire for vertical shock absorber – removal and installation

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3.6.1 Bowden pull wire for vertical shock absorber (Operating at the front side) – removal and installation
3.6.2 Bowden pull wire for vertical shock absorber (Operating at the left side) – removal and installation
3.6.1 Bowden pull wire for vertical shock absorber – removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Bowden pull wire for vertical shock absorber adjustment
(2) Handle for vertical shock absorber adjustment
(3) Upper suspension part
(4) Blind rivet
(5) Rounded head screw (inner race) ..................... 2.5 Nm
(6) L-bar ........................................ to grease
(7) Cable tie
(8) Support
(9) Bowden pull wire for height adjustment
(10) Catch spring
(11) Compression spring
(12) Fork
(13) Fixing
(14) Vertical shock absorber
(15) Bearing
(16) Hook
1 Remove the upper seat part (Chapter 3.1).

2 Remove the front cover (Chapter 3.2).

3 Remove the top cover (Chapter 3.3).

4 Remove the bellows at the front at the upper suspension part (see Chapter 3.4) and press it down.

**Removal and installation**

5 **WARNING** Risk of crushing!

Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.
6 Turn the handle for vertical shock absorber adjustment (2) to the middle position.

7 Unscrew the rounded head screw (5) at the handle for vertical shock absorber adjustment (2).
   **Installation note:**
   Rounded head screw (5), 2.5 Nm.

8 Pull off the handle for vertical shock absorber adjustment (2) at the L-bar (6).

9 Take off the Bowden pull wire for the vertical shock absorber adjustment (1) at the handle for the vertical shock absorber adjustment (2).
   **Installation note:**
   Ensure that the wire of the Bowden pull wire (1) runs in the groove (arrow) of the handle for the vertical shock absorber adjustment (2).
10 Take off the Bowden pull wire for vertical shock absorber adjustment (1) at the L-bar (6).

11 Remove the catch spring (10) at the L-bar (6).

12 Bore out the rivet head and drive out the blind rivet (4).

13 Remove the L-bar (6) from the upper part of the suspension (3).

**Installation note:**
Apply acid-free multi-purpose lubricant to the L-bar (6) in area of the rotary motion.
14 Mark the point where the Bowden pull wire for the vertical shock absorber adjustment (1) is fastened at the support (8) with cable tie (7), and remove the cable tie (7).

Note:
Depending on the version, can the Bowden pull wire for the vertical shock absorber adjustment (1) be attached only on the hook (16).

15 Pull off the fixing (13) at the adjusting lever of the vertical shock absorber (14).

16 Compress the compression spring (11) (arrow direction) and take off the hauling rope of the Bowden pull wire for vertical shock absorber adjustment (1) at the bearing (15).

17 Remove the fixing (13) at the fork (12).
18 Take off the Bowden pull wire for vertical shock absorber adjustment (1) at the fork (12) and remove the fork (12) and the compression spring (11).

19 Mark the installation position of the Bowden pull wire for vertical shock absorber adjustment (1) and remove the Bowden pull wire (1) from the seat suspension in upward direction. **Installation notes:**
- Install the Bowden pull wire (1) according to the marking.
- The Bowden pull wire (1) must be placed at the front at the upper suspension part (3), behind the Bowden pull wire for height adjustment (9) (arrow).

20 Re-install the components in the reverse order of their removal.
3.6.2 Bowden pull wire for vertical shock absorber – removal and installation

REMOVAL / INSTALLATION

(1) Bowden pull wire for vertical shock absorber adjustment
(2) Upper suspension part
(3) Handle for vertical shock absorber adjustment
(4) Bearing
(5) Compression spring
(6) Fork
(7) Fixing
(8) Vertical shock absorber
(9) Support
(10) Rounded head screw (inner race) ....................... 2.5 Nm
(11) L-bar (at the upper suspension part) ....................... to grease
(12) Catch spring
3.6.2 Bowden pull wire for vertical shock absorber – removal and installation

Removal and installation

1 Remove the upper seat part (Chapter 3.1).

2 Remove the top cover (Chapter 3.3).

3 Remove the bellows at the left side at the upper suspension part (see Chapter 3.4) and press it down.

4 **WARNING** Risk of crushing!

Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.
5 Unscrew the rounded head screw (10) from the handle for vertical shock absorber adjustment (3).

**Installation note:**
Rounded head screw (10), 2.5 Nm.

6 Pull off the handle for vertical shock absorber adjustment (3) at the L-bar (11).

**Installation note:**
Apply acid-free multi-purpose lubricant to the sliding surfaces (F) on the top and bottom side of the L-bar (11).

7 Detach the Bowden pull wire (1) at the handle for vertical shock absorber adjustment (3) and remove the handle for vertical shock absorber adjustment (3).

**Installation note:**
Ensure that the wire of the Bowden pull wire (1) runs in the groove (arrow) of the handle for the vertical shock absorber adjustment (2).
8 Push off the Bowden pull wire (1) at the support (9) in downward direction.

9 Remove the catch spring (12) at the L-bar (11).

10 Pull off the fixing (7) at the adjusting lever of the vertical shock absorber (8).

11 Compress the compression spring (5) (arrow direction) and take off the hauling rope of the Bowden pull wire (1) at the bearing (4).

12 Remove the fixing (7) at the fork (6).

13 Take off the Bowden pull wire (1) at the fork (6) and remove the fork (6) and the compression spring (5).
14 Mark the installation position of the Bowden pull wire (1) and remove the Bowden pull wire (1) from the seat suspension in upward direction.

**Installation notes:**
Install the Bowden pull wire (1) according to the marking.

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

REMOVAL / INSTALLATION

(1) Bowden pull wire for vertical shock absorber adjustment
(2) Swinging structure
(3) Vertical shock absorber
(4) Bearing
(5) Compression spring
(6) Fork
(7) Fixing
(8) Stud to grease
(9) Lock washer
(10) Stud to grease
(11) Lock washer
3.7 Vertical shock absorber – removal and installation

REMOVAL / INSTALLATION

1. Remove the seat suspension (Chapter 3.1).

2. Remove the top cover (Chapter 3.3).

3. Take off the bellows at the lower suspension part (see Chapter 3.4), push it upwards and fix it in this position.

Removal and installation

4. **WARNING** Risk of crushing!

   Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.
3.7 Vertical shock absorber – removal and installation

REMOVAL / INSTALLATION

5. Pull off the fixing (7) at the adjusting lever of the vertical shock absorber (3).

6. Compress the compression spring (5) (arrow direction) and take off the hauling rope of the Bowden pull wire for vertical shock absorber adjustment (1) at the bearing (4).

7. Remove the fixing (7) at the fork (6).

8. Take off the Bowden pull wire for vertical shock absorber adjustment (1) at the fork (6) and remove the fork (6) and the compression spring (5).

9. Loosen the lock washer (9) at the stud (8).
10 Pull out the stud (8) from the swinging structure (2), from the vertical shock absorber (3) and from the bearing (4).

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire surface (F) of the stud (8).

11 Loosen the lock washer (11) at the stud (10).

12 Pull out the stud (10) from the swinging structure (2) and from the vertical shock absorber (3).

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire surface (F) of the stud (10).
13 Remove the vertical shock absorber (3) in upward direction and remove the bearing (4).

**Installation note:**
When installing the vertical shock absorber (3), the marking must point upwards.

14 Re-install the components in the reverse order of their removal.
3.8 Adjustment device for vertical shock absorber – removal and installation

REMOVAL / INSTALLATION

(1) Bowden pull wire for vertical shock absorber adjustment
(2) Bearing
(3) Swinging structure
(4) Compression spring
(5) Fork
(6) Fixing
(7) Vertical shock absorber
(8) Stud................................. to grease
(9) Lock washer
3.8 Adjustment device for vertical shock absorber – removal and installation

1. Remove the seat suspension (Chapter 3.1).

2. Remove the top cover (Chapter 3.3).

**Removal and installation**

3. **WARNING** Risk of crushing!

   Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.

4. Pull off the fixing (6) at the adjusting lever of the vertical shock absorber (7).
5 Compress the compression spring (4) (arrow direction) and take off the hauling rope of the Bowden pull wire for vertical shock absorber adjustment (1) at the bearing (2).

6 Remove the fixing (6) at the fork (5).

7 Take off the Bowden pull wire for vertical shock absorber adjustment (1) at the fork (5) and remove the fork (5) and the compression spring (4).

8 Loosen the lock washer (9) at the stud (8).
9 Pull out the stud (8) from the swinging structure (3), from the vertical shock absorber (7) and from the bearing (2).

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire surface (F) of the stud (8).

10 Pull out the vertical shock absorber (7) and stud (2) from the swinging structure (3).

11 Pull off the Bowden pull wire (7) from the bearing (2).

12 Re-install the components in the reverse order of their removal.
3.9 Longitudinal horizontal shock absorber – removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Longitudinal horizontal shock absorber ......................... to grease
(2) Swinging structure
(3) Upper suspension part
(4) Clearance spacer
(5) Lock washer
1. Remove the seat suspension (Chapter 3.1).

2. Remove the top cover (Chapter 3.3).

3. Remove the bellows from the front upper suspension part (see Chapter 3.4).

**Removal and installation**

**WARNING** Risk of crushing!

Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.
5. Loosen the lock washer (5) from the axle of the upper part of suspension (3) and remove the clearance spacer (4).

6. Lift off the longitudinal horizontal shock absorber (1) at the tube of the swinging structure (2).

7. Pull down the longitudinal horizontal shock absorber (1) at the axle of the upper suspension part (3).

**Installation notes:**
- Press the longitudinal horizontal shock absorber (1) onto the tube of the swinging structure (2) without using driving or hammering tools.
- Apply acid-free multi-purpose lubricant to the mounting surfaces (F) of the longitudinal horizontal shock absorber (1).

8. Re-install the components in the reverse order of their removal.
3.10 Fore/aft isolator unit – removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Upper suspension part
(2) Swinging structure
(3) Collar screw (inner race) .......... to grease, 25 Nm
(4) Socket
(5) Clamp ..................................... to grease
(6) Tension spring
(7) Buffer
(8) Buffer
(9) Blind rivet
(10) Handle for fore/aft isolator
1. Remove the seat suspension (Chapter 3.1).

2. Remove the front cover * (Chapter 3.2).

3. Remove the top cover (Chapter 3.3).

4. Remove the bellows from the upper suspension part (see Chapter 3.4).

**Removal and installation**

5. **WARNING** Risk of crushing!

   Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.

* if fitted
6 Turn the handle for the fore/aft isolator (see chapter 10) backwards in order to unlock the locking mechanism of the fore/aft isolator.

7 If the longitudinal horizontal shock absorber is defective:
   Remove the longitudinal horizontal shock absorber (Chapter 3.9).

8 If the longitudinal horizontal shock absorber is not defective:
   Lift off the longitudinal horizontal shock absorber at the tube of the swinging structure (see Chapter 3.9).
3.10 Fore/aft isolator unit – removal and installation

REMOVAL / INSTALLATION

9 Unscrew two collar screws (3).
   **Installation notes:**
   • Collar screw (3), 25 Nm.
   • During installation, the tension spring (6) is screwed on under tension.
   • Apply acid-free multi-purpose lubricant to the entire surface (F) of the collar screw (3).

10 Lift the upper suspension part (1) at the front off the swinging structure (2) (see Chapter 3.27), push it backwards and lay it down.

11 Press off the clamp (5) at the swinging structure (2).
   **Installation note:**
   Apply acid-free multi-purpose lubricant to the clamp (5) at the running surface of the swinging structure (F).
3.10 Fore/aft isolator unit – removal and installation

REMOVAL / INSTALLATION

12 Remove two bushings (4) and the buffer (7) from the legs of the tension spring (6).

13 Remove the tension spring (6) from the clamp (5).

14 If the buffer (8) is defective:
Bore out the rivet head and drive out the blind rivet (9). Then, remove the buffer (8).

15 Re-install the components in the reverse order of their removal.
3.11 Handle for fore/aft isolator unit – removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Handle for fore/aft isolator
(2) Upper suspension part
(3) Rounded head screw .......... 2.5 Nm
(4) Clamping sleeve
(5) Linkage rod
(6) L-bar ......................... to grease
(7) Stop lever
(8) Tension spring
3.11 Handle for fore/aft isolator – removal and installation

Removal and installation

1 Turn the handle for the fore/aft isolator (1) forwards.

2 Unscrew the rounded head screw (3) at the handle for the fore/aft isolator (1).

   **Installation note:**
   Rounded head screw (3), 2.5 Nm.

3 Drive out the clamping sleeve (4) at the handle of the fore/aft isolator (1).

4 Carefully pull out the linkage rod (5) at the handle of the fore/aft isolator (1).

   **Note:**
   Make sure that the linkage rod (5) remains hung into the stop lever (7) and that the tension spring (8) remains hung into the linkage rod (5).
5 Remove the handle for the fore/aft isolator (1) at the L-bar (6) of the upper suspension part (2).

**Installation note:**
Apply acid-free multi-purpose lubricant to the L-bar (6) in the area of the rotary motion (F).

6 Re-install the components in the reverse order of their removal.
3.12 Locking mechanism for fore/aft isolator unit – removal and installation

REMOVAL / INSTALLATION

(1) Upper suspension part
(2) Handle for fore/aft isolator
(3) Rounded head screw ........ 2.5 Nm
(4) Clamping sleeve
(5) Linkage rod
(6) L-bar ..................... to grease
(7) Stop lever ..................... to grease
(8) Tension spring
(9) Tension spring
(10) Collar screw
    (inner race) ................. 2.25 Nm
(11) Washer
1 Remove the upper seat part at the seat suspension and put it aside (see Chapter 3.1).

**Notes:**
- Cable ties at the cable harness of the upper seat part need not be removed and electrical connection need not be disconnected.
- Do not overstretch the cable harness of the upper seat part when putting it aside.

2 Remove the front cover *(Chapter 3.2).*

3 Remove the bellows at the front and on the left at the upper suspension part (see Chapter 3.4) and press it down.

* if fitted
3.12 Locking mechanism for fore/aft isolator unit – removal and installation

Removal and installation

4 **WARNING** Risk of crushing!

Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.

5 Turn the handle for the fore/aft isolator (2) forwards.

6 Tilt the seat suspension to the right.

7 Unscrew the rounded head screw (3) at the handle for the fore/aft isolator (2).

**Installation note:**
Rounded head screw (3), 2.5 Nm.
8 Pull down the handle for the fore/aft isolator (2) at the L-bar (6) of the upper suspension part (1).

**Installation note:**
Apply acid-free multi-purpose lubricant to the L-bar (6) in the area of the rotary motion (F).

9 Mark the screw positioning diagram (arrow) for hanging in the tension springs (8, 9) and hang out the tension spring (9) at the upper suspension part (1) and at the linkage rod (5).

**Installation note:**
Hang in the tension spring (9) according to the marking.

10 Hang out the linkage rod (5) at the stop lever (7).
3.12 Locking mechanism for fore/aft isolator unit – removal and installation

11 Mark the drill hole for the clamping sleeve (4) in the handle of the fore/aft isolator (2) and knock out the clamping sleeve (4) at the handle of the fore/aft isolator (2). Remove the linkage rod (5) at the handle (2).

**Installation note:**
Install the clamping sleeve (4) according to the marking.

12 Mark the screw positioning diagram (arrow) for hanging in the tension spring (8) and hang out the tension spring (8) at the upper suspension part (1) and the stop lever (7).

**Installation note:**
Hang in the tension spring (8) according to the marking.
13 Remove the collar screw (10), washer (11) and stop lever (7).

**Installation notes:**
- Collar screw (10), 2.25 Nm.
- Apply acid-free multi-purpose lubricant to the side surfaces (F) of the stop lever (7).

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

REMOVAL / INSTALLATION

(1) Compressor
(2) Cable tie .............................. 360 N
(3) Lower suspension part
(4) Compressed-air hose *
(5) Hose nozzle
(6) Pad
(7) Compressor cable
(8) Right-angle plug
(9) Swinging structure
(10) Cable tie
(11) Air intake hose
(12) Air spring

*) Use a sharp knife for cutting into lengths.
ATTENTION Hydrostatic test!

The hydraulic test of the seat suspension should be performed upon installation of the compressor (1). To do this, apply 60 kg load to the suspension for 24 hours. The lowering within this time must not exceed 15 mm.

1. Take off the bellows at the lower suspension part (see Chapter 3.4), push it upwards and fix it in this position.
3.13 Compressor – removal and installation

Removal and installation

2  **WARNING** Risk of crushing!

Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.

3  **WARNING** The pressure in the pneumatic system might cause injury!

The pneumatic system is to be vented before removing the compressor (1).
3.13 Compressor – removal and installation

REMOVAL / INSTALLATION

4. Mark the point where the hose nozzle (5) and the intake hose (11) are fastened with cable tie (10) and remove the cable tie (10).

**Installation note:**
The locking head of the cable tie (10) must point away from the air spring (12).

5. Mark two right-angle plugs (8) and disconnect the electrical connection between the right-angle plug (8) and the compressor (1).

**Installation notes:**
- Reconnect the electrical connection between the right-angle plug (8) and the compressor (1) according to the marking.
- When connecting the electrical connection (1), the cable output of the compressor cable (7) at the right-angle plug (8) must point downwards.
6 Mark the places where the compressor (1) is attached to the lower suspension part (3) by means of two cable ties (2) and remove the cable ties (2).

**Installation note:**
Guide the cable tie (2) through the intended cut-outs at the lower suspension part (3) so that the locking head of the cable tie (2) points forwards.
Loosely close the cable tie (2) so that the compressor (1) still can be moved.
Align the compressor (1) so that a collision with the swinging structure (9) is prevented and then tighten the locking head of the cable tie (2) to 360 N by means of pliers in the direction shown (arrow).
3.13 Compressor – removal and installation

7 Pull off the hose nozzle (5) at the connection (arrow) of the compressor (1) and push it backwards at the compressed-air hose (4).

8 **ATTENTION** Take care not to damage the compressed-air hose (4)!

Do not lift off the compressed-air hose (4) at the connection (arrow) of the compressor (1) e.g. by means of a screwdriver or similar tools.

Cut off the compressed-air hose (4) in a clean and straight way directly behind the connection (arrow) of the compressor (1) by means of a sharp knife.
Notes:
- The compressed-air hose (4) can be cut off only once.
- After cutting off, mark the compressed-air hose (4) in order not to cut it several times.

Installation note:
Plug the compressed-air hose (4) completely onto the connection (arrow) of the compressor (1).

9 Pull off the hose nozzle (5) from compressed-air hose (4).

10 Remove the compressor (1) in forward direction.
11 Remove the pad (6) from the lower suspension part (3).

**Installation note:**
Place the pad (6) between the lower suspension part (3) and the compressor (1) so that the compressor (1) cannot come into contact with the lower suspension part (3).

12 Re-install the components in the reverse order of their removal.
3.14 Level control – removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Level control
(2) Bowden pull wire for height adjustment (downwards)
(3) Upper suspension part
(4) Lower suspension part
(5) Handle for height adjustment
(6) Bowden pull wire for height adjustment (upwards)
(7) Air hose (blue)
(8) Air hose (black)
(9) Plug (blue cable)
(10) Plug (red cable)
(11) Support (at the level control)
(12) Baffle for Bowden pull wire
(13) Micro-encapsulated hexagon nut ................. replacement, 25 Nm
(14) Plate
3.14 Level control – removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(15) Secondary belt
(16) Webbing
(17) Plastic clip
(18) Cable harness for seat suspension
(19) Air hose (black)
(20) Micro-encapsulated hexagon nut ................. replacement, 25 Nm
(21) Plate
(22) Plate (with threaded bolt)
(23) Air distributor
(24) Air intake hose
(25) Cable tie
**ATTENTION** Hydrostatic test!

The hydraulic test of the seat suspension should be performed upon installation of the level control (1). To do this, apply 60 kg load to the suspension for 24 hours. The lowering within this time must not exceed 15 mm.

1. Remove the seat suspension (Chapter 3.1).
2. Remove the top cover (Chapter 3.3).
3. Remove the bellows at the upper suspension part and at the back of the lower suspension part (see Chapter 3.4).
3.14 Level control – removal and installation

Removal and installation

4  **WARNING** Risk of crushing!

Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.

5  **WARNING** The pressure in the pneumatic system might cause injury!

The pneumatic system is to be vented before removing the level control (1).
6 **WARNING** Take care not to damage the connections (mandrel profiles) of the air distributor (23).

Mark the air hoses (7, 8) and pull off the air hoses (7, 8) at the connections (arrows) of the air distributor (23).

**Notes:**
- For easier removal, carefully slit the air hoses (7, 8) with a sharp knife.
- Do not use a screwdriver or similar tools to lift off the air hoses (7, 8) at the connections (arrows) of the air distributor (23).
- Cable ties (25), used to fasten the air hoses (7, 8 and 19) at the level control (1), need not be removed.
- Do not bend the air hoses (7, 8).
Installation notes:
• Re-install the air hoses (7, 8) according to the marking.
• Push the air hoses (7, 8) completely onto the respective connection (arrows) of the air distributor (23) by exerting pressure.
• Attach the label (7, 8) below the air intake hose (24).

7 Unscrew two micro-encapsulated hexagon nuts (20).

Installation notes:
• Replace the micro-encapsulated hexagon nut (20); 25 Nm.
• Make sure not to squeeze webbing (16) and secondary belt (15) when tightening the hexagon nuts (20).
8 Pull off the plate (21) at the threaded bolts of the plate (22).

**Note:**
The plate (21) remains hung into the secondary belt (15).

9 Pull out the plate (22) at the lower suspension part (4) while holding the webbing (16) in position and slowly guiding it upwards to the level control (1).

10 Pull the plate (22) out of the webbing (16).

**Installation note:**
The bend of the plate (22) must point inward.

11 Press the handle for height adjustment (5) down to release the Bowden pull wire (6) and detach the Bowden pull wire (6) at the level control (1).

**Note:**
Detach the Bowden pull wire (6) at the support (11) first.
12 Mark two plugs (9, 10) and disconnect the electrical connection between plugs (9, 10) and the level control (1).

**Installation note:**
Reconnect the electrical connection according to the marking.

13 Pull two plastic clips (17) out of the level control (1).

14 Thread the cable harness for seat suspension (18) in downward direction between the air hoses (8, 19) and the level control (1).
3.14 Level control – removal and installation

REMOVAL / INSTALLATION

15 Pull up the handle for height adjustment (5) to release the Bowden pull wire (2) and detach the Bowden pull wire (2) at the level control (1).

Note:
Detach the Bowden pull wire (2) at the baffle (12) first.

16 Pull the Bowden pull wire (2) out of the level control (1).

17 Unscrew two micro-encapsulated hexagon nuts (13).

Installation notes:
- Replace the micro-encapsulated hexagon nut (13); 25 Nm.
- Make sure not to squeeze the secondary belt (15) when tightening the hexagon nuts (13).
3.14 Level control – removal and installation

REMOVAL / INSTALLATION

18 Pull off the plate (14) at the threaded bolts of the level control (1) and remove the secondary belt (15) with plates (14, 21).

**Installation notes:**
- The bend of the plate (14, 21) must point outwards.
- The seam at the secondary belt (15) must be on the inside.

19 Pull out the level control (1) at the upper suspension part (3) and remove it from the seat suspension in downward direction.

20 Re-install the components in the reverse order of their removal.
3.15 Level control (micro-switch, outlet valve) adjustment

REMOVAL / INSTALLATION

1. Level control
2. Outlet valve
3. Micro-switch
4. Valve tappets
5. Cam switch
6. Valve lever
7. Cam disk
8. Round head screw (micro-switch)
9. Round head screw (outlet valve)
10. Compressor
3.15 Level control (micro-switch, outlet valve) adjustment

1. Remove the seat suspension (Chapter 3.1).

2. Remove the top cover (Chapter 3.3).

3. Remove the bellows from the upper suspension part (see Chapter 3.4).

4. **WARNING** Risk of crushing!

   Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.
5 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) = 0.8 – 1.2 mm.
• Turn the round head screw (8) to the left, the cam switch (5) is moving towards the cam disc (7). Thus, the pressure on the cam switch (5) increases and the compressor (10) will react earlier.
• Turn the round head screw (8) to the right, the cam switch (5) is moving away from the cam disc (7). Thus, the pressure on the cam switch (5) decreases and the compressor (10) will react later.
• When the cam switch (5) is placed on the cam disk (7) under pressure, the compressor (10) will react too early and start already during the compression and expansion of the seat suspension.
3.15 Level control (micro-switch, outlet valve) adjustment

**6 Adjusting the outlet valve (2):**

Adjust the clearance between valve lever (6) and cam disk (7) by turning the round head screw (9).

**Notes:**
- **Specified value:**
  
  Clearance (B) = 1.0 – 1.5 mm.
  
  Lay a feeler gauge with 1.0 – 1.5 mm between the valve lever (6) and the cam disk (7) (valve must let off air).
- Turn the round head screw (9) to the left; the valve lever (6) is moving towards the cam disk (7). Thus, the pressure on the valve tappet (4) increases and the outlet valve (2) will let off air earlier.
- Turn the round head screw (9) to the right; the valve lever (6) is moving away from the cam disk (7). Thus, the pressure on the valve tappet (4) decreases and the outlet valve (2) will let off air later.
3.15 Level control (micro-switch, outlet valve) adjustment

7 Install the bellows at the upper suspension part (see Chapter 3.4).

8 Install the top cover (Chapter 3.3).

9 Install the seat suspension (Chapter 3.1).
3.16 Secondary belt – removal and installation

REMOVAL / INSTALLATION

(1) Secondary belt
(2) Micro-encapsulated hexagon nut ................. to replace, 25 Nm
(3) Level control
(4) Plate
(5) Upper suspension part
(6) Cable harness for vehicle connection
(7) Webbing (level control)
(8) Plate (with threaded bolt)
(9) Micro-encapsulated hexagon nut ................. to replace, 25 Nm
(10) Plate
(11) Lower suspension part
3.16 Secondary belt – removal and installation

REMOVAL / INSTALLATION

1 Remove the bellows at the rear of the upper suspension part and the lower suspension part (see Chapter 3.4).

Removal and installation

2 Unscrew two micro-encapsulated hexagon nuts (9).

Installation notes:
- Replace the micro-encapsulated hexagon nut (9); 25 Nm.
- Make sure not to squeeze the secondary belt (1) when tightening the hexagon nuts (9).

3 Pull off the plate (10) at the threaded bolts of the plate (8).

Note: The plate (8) remains attached to the lower suspension part (11).
4 Pull the plate (10) out of the secondary belt (1).
   **Installation note:**
   The bend of the plate (10) must point to the outside.

5 Unscrew two micro-encapsulated hexagon nuts (2).
   **Installation notes:**
   • Replace the micro-encapsulated hexagon nut (2); 25 Nm.
   • Make sure not to squeeze the secondary belt (1) when tightening the hexagon nuts (2).
3.16 Secondary belt – removal and installation

6 Pull off the plate (4) at the threaded bolts of the level control (3) and remove it together with the secondary belt (1).

**Notes:**
- The secondary belt (1) must run between the upper suspension part (5) and the cable harness for vehicle connection (6).
- The level control (3) remains attached to the upper suspension part (5).

7 Pull the plate (4) out of the secondary belt (1).

**Installation notes:**
- The overlapping seams (arrow) at the secondary belt (1) must be located on top and point inwards.
- The bend of the plate (4) must point to the outside.

8 Re-install the components in the reverse order of their removal.
3.17 Air hoses – removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Air intake hose
(2) Compressed-air hose
(3) Swinging structure
(4) Compressor
(5) Hose nozzle
(6) Protective hose
(7) Catch spring
(8) Quick coupling (supply hose)
(9) Quick coupling (compressed-air hose)
(10) Air spring
(11) Cable clamp
(12) Hook
(13) Protective cap
(14) Cable tie
(15) Air distributor
(16) Air hose (blue)
(17) Air hose (black)
**ATTENTION** Hydrostatic test!

The hydraulic test of the seat suspension should be performed upon installation of the air hoses (1, 2). To do this, apply 60 kg load to the suspension for 24 hours. The lowering within this time must not exceed 15 mm.

1. Remove the bellows from the upper suspension part (see Chapter 3.4).
3.17 Air hoses – removal and installation

Removal and installation

2 **WARNING** Risk of crushing!

Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.

3 **WARNING** The pressure in the pneumatic system might cause injury!

The pneumatic system is to be vented before removing the air intake hose (1) and the compressed-air hose (2).
3.17 Air hoses – removal and installation

REMOVAL / INSTALLATION

4 Mark the point where the hose nozzle (5) and the air intake hose (1) are fastened with cable tie (14) and remove the cable tie (14).

**Installation note:**
The locking head of the cable tie (14) must point away from the air spring (10).

5 If the compressed-air hose (2) is defective:

5.1 Pull off the hose nozzle (5) at the connection of the compressor (4) and push it backwards at the compressed-air hose (2).
5.2 **ATTENTION** Take care not to damage the connection (mandrel profile) of the compressor (4).

Pull off the compressed-air hose (2) at the connection (arrow) of the compressor (4).

**Notes:**
- For easier removal, carefully slit the compressed-air hose (2) with a sharp knife.
- Do not use a screwdriver or similar tools to lift off the compressed-air hose (2) at the connection (arrow) of the compressor (4).

**Installation note:**
Push the compressed-air hose (2) completely onto the connection (arrow) of the compressor (4).
3.17 Air hoses – removal and installation

REMOVAL / INSTALLATION

5.3 Pull off the hose nozzle (5) from compressed-air hose (2).

5.4 Pull the catch spring (7) out of the air spring (10).

5.5 Pull the quick coupling (9) of the compressed-air hose (2) out of the air spring (10).

**Installation note:**
First, push the catch spring (7) into the air spring (10) and then plug the quick coupling (9) into the air spring (10) with a click.

5.6 Remove the compressed-air hose (2) and pull off the protective hose (6) at the compressed-air hose (2).
3.17 Air hoses – removal and installation

6 If the air intake hose (1) is defective:

6.1 **WARNING** Take care not to damage the connection (mandrel profile) of the air distributor (15).

Pull off the air intake hose (1) at the connection (arrow) of air distributor (15).

**Notes:**
- For easier removal, carefully slit the air intake hose (1) with a sharp knife.
- Do not use a screwdriver or similar tools to lift off the air intake hose (1) at the connection (arrow) of the air distributor (15).

**Installation notes:**
- Push the air intake hose (1) completely onto the connection (arrow) of the air distributor (15).
- The air intake hose (1) runs above the air hoses (16, 17).
3.17 Air hoses – removal and installation

6.2 Hang out the air intake hose (1) at the hook (12) of the swinging structure (3).

6.3 Pull off cable clamp (11) from the swinging structure (3).

6.4 Pull the catch spring (7) out of the air spring (10).

6.5 Pull the quick coupling (8) of the air intake hose (1) from the air spring (10).

**Installation note:**
First, push the catch spring (7) into the air spring (10) and then plug the quick coupling (8) into the air spring (10) with a click.
6.6 Mark the installation position of the air intake hose (1) and remove the air intake hose (1) from the seat suspension. **Installation note:** Install the air intake hose according to the marking.

7 **If the protective cap (13) is defective:**
   Unclip the protective cap (13) at the swinging structure (3).

8 Re-install the components in the reverse order of their removal.
3.18 Air spring – removal and installation

REMOVAL / INSTALLATION

(1) Lower suspension part
(2) Air spring
(3) Swinging structure
(4) Countersunk screw (inner race) ......................... 6 Nm
(5) Catch spring
(6) Quick coupling
(7) Air intake hose
(8) Compressed-air hose
3.18 Air spring – removal and installation

Removal and installation

1 Remove the bellows from the upper suspension part (see Chapter 3.4).

2 **WARNING** Risk of crushing!

Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.

3 **WARNING** The pressure in the pneumatic system might cause injury!

The pneumatic system is to be vented before removing the air spring (2).
4 Pull the catch spring (5) out of the air spring (2).

5 Pull the quick couplings (6) of the air hoses (7, 8) out of the air spring (2).

**Installation note:**
First, plug the catch spring (5) into the air spring (2) and then plug the quick couplings (6) into the air spring (2) with an audible click.

6 Unscrew the countersunk screw (4) from the air spring (2).

**Installation notes:**
- Countersunk screw (4), 6 Nm.
- The internal thread collar (arrow) at the bottom of the air spring (2) must lie flush in the drill hole (arrow) of the lower suspension part (1).
3.18 Air spring – removal and installation

**REMOVAL / INSTALLATION**

7 Turn the air spring (2) by 90° until the bayonet catch fits through the longitudinal hole in the swinging structure (3).

8 Press the air spring (2) down and pull out of the swinging structure (3).

9 Remove the air spring (2) from the seat suspension.

**Installation note:**
The step at the bottom of the air spring (2) must click into place in the cut-out (arrow) of the lower suspension part (1).

10 Re-install the components in the reverse order of their removal.
3.19 Air distributor – removal and installation

REMOVAL / INSTALLATION

(1) Air distributor
(2) Upper suspension part
(3) Support
(4) Rounded head screw (inner race) ....................... 2.5 Nm
(5) Blind rivet
(6) Air hose (black)
(7) Air hose (blue)
(8) Air intake hose
3.19 Air distributor – removal and installation

REMOVAL / INSTALLATION

ATTENTION Hydrostatic test!

The hydraulic test of the seat suspension should be performed upon installation of the air distributor (1). To do this, apply 60 kg load to the suspension for 24 hours. The lowering within this time must not exceed 15 mm.

1 Remove the bellows from the upper suspension part (see Chapter 3.4).
3.19 Air distributor – removal and installation

Removal and installation

2 ⚠️ WARNING Risk of crushing!

Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.

3 ⚠️ WARNING The pressure in the pneumatic system might cause injury!

The pneumatic system is to be vented before removing the air distributor (1).
4 **ATTENTION** Do not damage connections (mandrel profiles) of the air distributor (1) and the air hoses (6, 7, 8)!

Do not use a screwdriver or similar tools to lift off the air hoses (6, 7, 8) at the connections (arrows) of the air distributor (1).

Mark the air hoses (6, 7, 8) and cut off with a sharp knife in a clean and straight way directly behind the connections (arrows) of the air distributor (1).

**Notes:**
- The air hoses (6, 7, 8) can be cut off only once.
- After cutting, mark the air hoses (6, 7, 8) in order not to cut them several times.
Installation notes:
• Install the air hoses (6, 7, 8) according to the marking.
• Push the air hoses (6, 7, 8) completely onto the respective connections (arrows) of the air distributor (1).

5 Unscrew the rounded head screw (4) and take off and remove air distributor (1) at the support (3).
**Installation note:** Rounded head screw (4), 2.5 Nm.

6 Drill off the rivet head and knock out the blind rivet (5) from support (3) and upper suspension part (2).
3.19 Air distributor – removal and installation

7 Remove the support (3) at the upper part of the suspension (2).

*Installation note:*
The nose (arrow) at the top at the support (3) must snap into the longitudinal hole (arrow) of the upper suspension part (2).

8 Re-install the components in the reverse order of their removal.
3.20 Handle for height adjustment – removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Handle for height adjustment

(2) Lever

(3) Latching nose (at the lever)

(Representation and description of the operating lever at the front.
Description lever on the left and front are the same.)

1 Remove the bellows at the front and on the left at the upper suspension part (see Chapter 3.4) and press it down.
3.20 Handle for height adjustment – removal and installation

Removal and installation

2 Press the height adjustment handle (1) upwards.

3 **WARNING** Risk of breakage! The handle for height adjustment (1) is wedged in the lever (2) at the bottom of the lever (2) by means of two latching noses (3). Carefully separate the parts. When the handle for height adjustment (1) is deformed, replace it.

Insert the screwdriver at the bottom in the middle between handle (1) and lever (2). Use a screwdriver to bend open the handle (1) until the two latching noses (3) are released from the openings (arrows) in the handle for the height adjustment (1).
4 Pull off the handle (1) at the lever (2). **Installation note:** Push the handle (1) onto the lever (2), until the two latching noses (3) latch into the handle for height adjustment (1) with an audible click.

5 Re-install the components in the reverse order of their removal.
3.21 Holder for height adjustment – removal and installation

REMOVAL / INSTALLATION

(1) Upper suspension part
(2) Bowden pull wire for height adjustment (upwards)
(3) Bowden pull wire for height adjustment (downwards)
(4) Round head screw (inner race) ....................... 2.5 Nm
(5) Clamp (at support and lever)
(6) Support
(7) Lever
(8) Handle for height adjustment ..................... to replace, if necessary
(9) Holder for height adjustment
    = (6) + (7) + (8)

(Representation and description of the operating lever at the front.
Description lever on the left and front are the same.)
3.21 Holder for height adjustment – removal and installation

REMOVAL / INSTALLATION

1. Remove the seat suspension (Chapter 3.1).

2. Remove the front cover * (Chapter 3.2).

3. Remove the top cover (Chapter 3.3).

4. Remove the bellows at the front of the upper suspension part (see Chapter 3.4).

Removal and installation

4. **WARNING** Risk of crushing!

   Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.

* if fitted
6 Detach the Bowden pull wire for height adjustment at the level control in upward direction (see Chapter 3.14).

7 Detach the Bowden pull wire for height adjustment at the level control in downward direction (see Chapter 3.14).

8 Unscrew three round head screws (4). **Installation note:** Round head screw (4), 2.5 Nm.

9 For easier removal of the Bowden pull wires (2, 3), pull the support (6) together with the lever (7) out of the upper suspension part (1) in downward direction as far as possible.
3.21 Holder for height adjustment – removal and installation

10 Detach the Bowden pull wire for height adjustment (2) in upward direction at the respective clamp (5) of the support (6).

11 Detach the Bowden pull wire for height adjustment in downward direction (3) at the respective clamp (5) of the lever (7).

12 Pull the handle for height adjustment (8) upwards and detach the Bowden pull wire for height adjustment in upward direction (2) at the lever (7).

Note: After being detached, the Bowden pull wire for height adjustment in upward direction (2) is loose.

13 Detach the Bowden pull wire for height adjustment in downward direction (3) at the lever first (7) and then at the support (6), remove the handle for height adjustment (9).
3.21 Holder for height adjustment – removal and installation

14 If the handle for height adjustment (8) is defective: Remove the handle for height adjustment (8) (Chapter 3.20).

15 Re-install the components in the reverse order of their removal.
3.22 Bowden pull wire for height adjustment in upward direction – removal and installation

REMOVAL / INSTALLATION

(1) Bowden pull wire for height adjustment in upward direction

(2) Bowden pull wire for height adjustment in downward direction

(3) Upper suspension part

(4) Front plate (at upper suspension part)

(Representation and description of the operating lever at the front.
Description lever on the left and front are the same.)

1 Remove the seat suspension (Chapter 3.1).

2 Remove the front cover *(Chapter 3.2).

3 Remove the top cover (Chapter 3.3).

4 Remove the bellows at the front of the upper suspension part (see Chapter 3.4).

* if fitted
3.22 Bowden pull wire for height adjustment in upward direction – removal and installation

Removal and installation

5  **WARNING** Risk of crushing!

Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.

6  Detach the Bowden pull wire for height adjustment at the level control in upward direction (see Chapter 3.14).

7  Remove the handle for height adjustment at the upper suspension part (see Chapter 3.21).
3.22 Bowden pull wire for height adjustment in upward direction – removal and installation

REMOVAL / INSTALLATION

8 Detach the Bowden pull wire for height adjustment in upward direction at the handle for height adjustment (see Chapter 3.21).

9 Mark the installation position of the Bowden pull wire for height adjustment in upward direction (1) and pull out the Bowden pull wire (1) from the front plate (4) ** of the upper suspension part (3).

Installation notes:
• Re-install the Bowden pull wire (1) according to the marking.
• Adjust the new Bowden pull wire (1) to the length of the old one (1) (excess length of the wire).

10 Re-install the components in the reverse order of their removal.

** depending on model
3.23 Bowden pull wire for height adjustment in downward direction – removal and installation

REMOVAL / INSTALLATION

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(Representation and description of the operating lever at the front. Description lever on the left and front are the same.)

* if fitted
3.23 Bowden pull wire for height adjustment in downward direction – removal and installation

REMOVAL / INSTALLATION

1 Remove the seat suspension (Chapter 3.1).

2 Remove the front cover * (Chapter 3.2).

3 Remove the top cover (Chapter 3.3).

4 Remove the bellows from the upper suspension part (see Chapter 3.4).

Removal and installation

5 **WARNING** Risk of crushing!

Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.

* if fitted
6 Detach the Bowden pull wire for height adjustment at the level control in downward direction (see Chapter 3.14).

7 Remove the handle for height adjustment at the upper suspension part (see Chapter 3.21).

8 Detach the Bowden pull wire for height adjustment in downward direction at the handle for height adjustment (see Chapter 3.21).

9 Detach the Bowden pull wire for height adjustment in downward direction (1) at the respective clamp (4).*

* if fitted
10 Pull out the Bowden pull wire for height adjustment in downward direction (1) through the opening of the U-shaped rail (6) of the upper suspension part (3) towards the left.

11 Mark the installation position of the Bowden pull wire for height adjustment in downward direction (1) and pull out and remove the Bowden pull wire (1) between the upper suspension part (3) and the U-shaped profile (5).

**Installation notes:**
- Re-install the Bowden pull wire (1) according to the marking.
- The Bowden pull wire (1) must be placed within (arrow) the cable harness of the seat suspension (7).
- Adjust the new Bowden pull wire (1) to the length of the old one (1) (excess length of the wire).

12 Re-install the components in the reverse order of their removal.
3.24 Bowden pull wires for height adjustment – inspection and adjustment

CHECK/ADJUSTMENT

(1) Bowden pull wire for height adjustment in upward direction
(2) Bowden pull wire for height adjustment in downward direction
(3) Handle for height adjustment
(4) Level control
(5) Lock nut
(6) Counternut
(7) Clamp
(8) Regulating screw
(9) Regulating screw
(10) Clamp
(11) Counternut
(12) Lock nut
(13) Holder for Bowden wire end cap
(14) Bowden pull wire lever
3.24 Bowden pull wires for height adjustment – inspection and adjustment

CHECK/ADJUSTMENT

1. Remove the seat suspension (Chapter 3.1).
2. Remove the front cover *(Chapter 3.2).
3. Remove the top cover (Chapter 3.3).
4. Remove the bellows at the front of the upper suspension part (see Chapter 3.4).

* if fitted
3.24 Bowden pull wires for height adjustment – inspection and adjustment

**Inspection**

5 Pull up and press down the handle for height adjustment (3) several times as far as possible and check function and smooth operation (easy running) of the Bowden pull wires (1, 2).

6 Check the Bowden pull wire lever (14), valve lever (18) and valve tappets (17) at the outlet valve (16) and leveling valve (21) for smooth operation.

7 Check the neutral position of the handle for height adjustment (3) and the tensile force of the retracting spring (15) at the level control (4):
   - The retracting spring (15) must set the handle for height adjustment (3) in neutral position.
   - The retracting spring (15) must tighten the Bowden pull wires (1, 2) and hold the Bowden pull wire lever (14) in neutral position.
8 Check Bowden pull wire for height adjustment in upward direction (1):
Check the clearance between the Bowden pull wire lever (14) and the holder for the Bowden pull wire end cap (13).
**Specified value:**
Clearance (A) = 2 mm with the handle for height adjustment (3) pulled up.
**Note:**
When the specified value exceeds 2 mm, the suspension cannot be lifted above the middle position.

9 Check Bowden pull wire for height adjustment in downward direction (2):
**Specified value:**
The Bowden pull wire (2) must be slightly prestressed at the suspension device (20) at the leveling valve (21). The wire of the Bowden pull wire (2) may be arched within a maximum range of +/- 4 mm without the mechanical parts being moved.
Adjustment

1 Adjustment of Bowden pull wire for height adjustment in upward direction (1):

1.1 Detach the regulating screw (8) at the clamp (7).

1.2 Loosen the counternut (6) and adjust the clearance between the Bowden pull wire lever (14) and the holder for Bowden pull wire end cap (13) using the lock nut (5).

Notes:
• Specified value:
  Clearance (A) = 2 mm.
• Turn the lock nut (5) towards the regulating screw (8) to lengthen the Bowden pull wire (1) (clearance (A) increases).
• Turn the lock nut (5) away from the regulating screw (8) to shorten the Bowden pull wire (1) (clearance (A) decreases).
1.3 Secure the lock nut (5) with the counternut (6) and make sure not to distort the Bowden pull wire (1).

1.4 Hang in the regulating screw (8) at the clamp (7).

1.5 Operate the handle for height adjustment (3) several times and check the specified value; repeat the adjustment, if necessary.

2 Adjustment of Bowden pull wire for height adjustment in downward direction (2):

2.1 Detach the regulating screw (9) at the clamp (10).
2.2 Loosen the counternut (11) and adjust the tension of the Bowden pull wire (2) at the level control (4) using the lock nut (12).

**Notes:**
- Turn the lock nut (12) towards the regulating screw (9) to lengthen the Bowden pull wire (2).
- Turn the lock nut (12) away from the regulating screw (9) to shorten the Bowden pull wire (2).
- **Specified value:**
  The Bowden pull wire (2) must be slightly prestressed at the suspension device (20) at the leveling valve (21). The wire of the Bowden pull wire (2) may be arched within a maximum range of +/- 4 mm without the mechanical parts being moved.
2.3 Secure the lock nut (12) with the counternut (11) and make sure not to distort the Bowden pull wire (2).

2.4 Hang in the regulating screw (9) at the clamp (10).

2.5 Operate the handle for height adjustment (3) several times and check the tension; repeat the adjustment, if necessary.

3 Attach the bellows at the front of the upper suspension part (see Chapter 3.4).

4 Install the top cover (Chapter 3.3).

5 Install the front cover * (Chapter 3.2).

6 Install the seat suspension (Chapter 3.1).

* if fitted
(1) Cable harness for vehicle connection
(2) Upper suspension part
(3) Bellows
(4) Plug (cable harness of seat suspension)
(5) Socket (cable harness for vehicle connection)
(6) Clamp

1 Remove the bellows on the rear and left side of the upper suspension part (see Chapter 3.4). Press the bellows down where it is detached.
Removal and installation

2 Detach the cable harness for vehicle connection (1) at the clamp (6).

3 Disconnect the electrical connection between the plug (4) and the socket (5).

4 Remove the cable harness for vehicle connection (1).

**Installation note:**
The cable harness for vehicle connection (1) is guided out of the seat suspension at the back in the middle (arrow) between the bellows (3) and the upper suspension part (2).

5 Re-install the components in the reverse order of their removal.
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3.26.1 Cable harness of seat suspension (incl. U-profile and socket) – removal and installation
3.26.2 Cable harness of seat suspension (with direct seat connection) – removal and installation
3.26.1 Cable harness of seat suspension (incl. U-profile and socket) – removal and installation

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(1) Cable harness for seat suspension
(2) Upper suspension part
(3) Level control
(4) U-shaped profile
(5) Swinging structure
(6) Compressor
(7) Blind rivet
(8) Socket (cable harness for vehicle connection)
(9) Plastic clip
(10) Plug (cable harness of seat suspension)
(11) Blind rivet
(12) Push mount tie with wings
(13) Plastic clip
(14) Plug
3.26.1 Cable harness of seat suspension (incl. U-profile and socket) – removal and installation

(15) Angle plate
(16) Right-angle plug
(17) Plastic clip
(18) Cable tie
(19) Air hose
(20) Linkage rod
3.26.1 Cable harness of seat suspension (incl. U-profile and socket) – removal and installation

1 Remove the seat suspension (Chapter 3.1).

2 Remove the top cover (Chapter 3.3).

3 Remove the bellows from the upper suspension part (see Chapter 3.4).

Removal and installation

4 **WARNING** Risk of crushing!

Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.
3.26.1 Cable harness of seat suspension (incl. U-profile and socket) – removal and installation

REMOVAL / INSTALLATION

5 Mark the installation position of the cable harness of the seat suspension (1).

6 Disconnect the electrical connection between the plug (10) and the socket (8).

7 If the U-profile (4) is attached to the upper suspension part (2) by means of two blind rivets (7):
Remove the plug (10) at the U-profile (4).

   Note:
The U-profile (4) remains attached to the upper suspension part (2).

   Installation notes:
   • The U-profile (4) must be removed at the new cable harness for the seat suspension (1).
   • The new cable harness for the seat suspension (1) is installed at the remaining U-profile (4) of the upper suspension part (2).
3.26.1 Cable harness of seat suspension (incl. U-profile and socket) – removal and installation

8 If the U-profile (4) is attached to the upper suspension part (2) by means of a blind rivet (7):

8.1 Bore out the rivet head and drive out the blind rivet (7) at the U-profile (4) and at the upper suspension part (2).

8.2 Detach the U-profile (4) at the upper suspension part (2) and lay it down with the cable harness for the seat suspension (1).

9 Mark two plugs (14) and disconnect the electrical connection between the plugs (14) and the level control (3).

**Installation note:**
Reconnect the electrical connection according to the marking.
10 Pull out two plastic clips (13) at the level control (3).

11 Thread the cable harness for seat suspension (1) in downward direction between the air hoses (19) and the level control (3).

12 Mark the point where the cable harness of the seat suspension (1) is secured to the upper suspension part (2) with the cable tie (18) and remove the cable tie (18).

13 Pull out three plastic clips (9) of the upper suspension part (2).

14 Pull push mount ties with wings (12) out at the upper suspension part (2).
15 Bore out two rivet heads and drive out the blind rivet (11) at the angle plate (15) and upper suspension part (2).

16 Pull out the plastic clip (17) at the swinging structure (5).

17 Mark two right-angle plugs (16) and disconnect the electrical connection between the right-angle plug (16) and the compressor (6).

**Installation notes:**
- Reconnect the electrical connection according to the marking.
- When establishing the electrical connection, the cable output at the right-angle plug (16) must point downwards.
3.26.1 Cable harness of seat suspension (incl. U-profile and socket) – removal and installation

REMOVAL / INSTALLATION

18 Pull out and remove the cable harness of the seat suspension (1) between the linkage rod (20) and the upper suspension part (2).

**Installation note:**
Re-install the cable harness of the seat suspension (1) according to the marking.

19 Re-install the components in the reverse order of their removal.

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**Diagram:**

- Numbered parts 1 to 20 are shown in the diagram.

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3.26.2 Cable harness of seat suspension (with direct seat connection) – removal and installation

TABLE OF CONTENTS

(1) Plug (cable harness of seat suspension)
(2) Cable tie
(3) Cable harness for seat suspension
(4) Cable tie with bracket
(5) Corrugated pipe supports
(6) Cable clamp
(7) Plug (cable harness of seat suspension) (8-pin)
(8) Holding plate
(9) Rivet head
(10) Upper suspension part
(11) Swinging structure
(12) Lower suspension part
(13) Cable to compressor
1. Remove the upper seat part at the seat suspension (see Chapter 3.1).

2. Remove the top cover (Chapter 3.3).

3. Remove the bellows at the upper suspension part (see Chapter 3.4) and press it down.

Removal and installation

4. **WARNING** Risk of crushing!

   Move the seat suspension to the highest position and secure it between the swinging structure and the lower suspension part by means of suitable spacers.

5. Disconnect two electrical connections (C and D) at the compressor (see Chapter 3.13).
6 Disconnect the electrical connection (E) at the cable harness for vehicle connection.

7 Disconnect the electrical connections (A and B) at the level control (see Chapter 3.14).

8 Mark the points where the cable harness (3) is attached to the seat suspension.
   • 3 corrugated pipe supports (5)
   • 2 Cable clamps (6)
   • 5 cable ties with brackets (4)

9 Press cable clamps (6), corrugated pipe supports (5) and cable tie with clamp (4) off the upper suspension part (10), off the swinging structure (11) and off the lower suspension part (12).
3.26.2 Cable harness of seat suspension (with direct seat connection) – removal and installation

REMOVAL / INSTALLATION

10. Bore the two blind rivets (9) and lay down the plug (7) with the holding plate (8).

11. Mark the installation position of the cable harness (3) and remove the cable harness from the seat suspension.

**Installation note:**
Install the cable harness (3) according to the marking.

12. Re-install the components in the reverse order of their removal.
3.27 Upper suspension part – removal and installation

REMOVAL / INSTALLATION

(1) Upper suspension part
(2) Guiding rail (upper suspension part) t
(3) Roller (rear)
(4) Swinging structure
(5) Roller (front)

(Representation and description of the operating lever at the front. Description lever on the left and front are the same.)

Notes:
• The locking mechanism for the fore/aft isolator is preassembled at the upper suspension part (1) (see Chapter 3.12).
• Moreover, a buffer and two clamps are preassembled at the upper suspension part (1) (see Chapters 3.10, 3.23 and 3.25).
• Reuse or convert assemblies which are not included in the scope of delivery of the new upper suspension part (1).
3.27 Upper suspension part – removal and installation

REMOVAL / INSTALLATION

1. Remove the seat suspension (Chapter 3.1).

2. Remove the front cover * (Chapter 3.2).

3. Remove the top cover (Chapter 3.3).

4. Remove the bellows from the upper suspension part (see Chapter 3.4).

5. Remove the Bowden pull wire and the handle for vertical shock absorber adjustment at the upper suspension part (see Chapter 3.6).

**Note:**
The Bowden pull wire for the vertical shock absorber remains installed at the vertical shock absorber.

* if fitted

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* Diagram showing the upper suspension part with numbered parts indicating the locations of the components to be removed during installation.
6 Remove the longitudinal horizontal shock absorber (Chapter 3.9).

7 Remove the fore/aft isolator unit at the upper suspension part (see Chapter 3.10).
   **Note:**
   The clamp remains attached to the swinging structure.

8 **If the locking mechanism for the fore/aft isolator is preassembled:**
   The locking mechanism for the fore/aft isolator needs not be removed (see Chapter 3.12).

9 **If the locking mechanism for the fore/aft isolator is not preassembled:**
   Remove the locking mechanism for the fore/aft isolator (Chapter 3.12).
10 Remove the holder for height adjustment (Chapter 3.21).

11 Remove the Bowden pull wire for height adjustment in downward direction at the upper suspension part (Chapter 3.23).

**Notes:**
- Remove the Bowden pull wire for height adjustment in downward direction at the clamp * and pull inwards through the opening of the U-shaped rail.
- The Bowden pull wire for height adjustment in downward direction remains installed at the level control.

12 Remove the cable harness for vehicle connection (Chapter 3.25).

* if fitted
13 Remove the cable harness of the seat suspension with the U-profile at the upper suspension part (see Chapter 3.26) and lay down.

**Note:**
The cable harness of the seat suspension remains installed at the level control and at the compressor.

14 Remove the secondary belt from the upper suspension part (see Chapter 3.16).

15 Remove the level control at the upper suspension part (see Chapter 3.14) and lay it down.

**Notes:**
- The belt retractor of the level control is tensioned; hold the level control and carefully guide it down.
- The cable harness of the seat suspension remains installed at the level control.
16 Remove the air distributor at the upper suspension part (see Chapter 3.19) and lay it down.

**Note:**
The air hoses remain attached at the air distributor.

**Removal and installation**

17 **WARNING** Risk of crushing!

Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower suspension part by means of suitable spacers.
18 Push the upper suspension part (1) forwards (arrow A) until the cut-outs (arrows) on the left and right sides at the guiding rails (2) are located at the same height with the front rollers (5).

19 Lift out the upper suspension part (1) over the front rollers (5).

20 Laterally turn the upper suspension part (1) by approx. 45° (arrow B) and then lift it off at the rear rollers (3) in upward direction (arrow C).

**Installation note:**
Apply acid-free multi-purpose lubricant to the two guiding rails (2) at the side surfaces (F) of the rollers (3, 5).
21 Pull the two front rollers (5) and two rear rollers (3) off the axles of the swinging structure (4).

22 Re-install the components in the reverse order of their removal.
3.28 Lower suspension part – removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Lower suspension part
(2) Guiding rail (lower suspension part)
(3) End stop
(4) Buffer
(5) Fixed bearing
(6) Swinging structure
(7) Roller
(8) Upper suspension part
(9) Collar screw (inner race) ............................. 6 Nm
(10) Micro-encapsulated hexagon nut ...................... to replace, 25 Nm
(11) Countersunk screw

Note:
The end stops (3) with buffer (4) are premounted at the new lower suspension part (1).
3.28 Lower suspension part – removal and installation

1. Remove the bellows from the lower suspension part (see Chapter 3.4), push it upwards and fasten it to the upper suspension part.

2. Remove the compressor (Chapter 3.13).
   **Note:** Alternatively, the compressed-air hose may remain installed at the compressor. To be protected against shocks and impacts, the compressor must be fixed (e.g. by means of adhesive tape at the swinging structure).

3. Remove the webbing of the level control at the lower suspension part (see Chapter 3.14).

4. Remove the secondary belt from the lower suspension part (see Chapter 3.16).

5. Unscrew the countersunk screw a from the air spring at the lower suspension part (see Chapter 3.18).
3.28 Lower suspension part – removal and installation

Removal and installation

6 **WARNING** Risk of crushing!

Do not put your hands on the suspension or between the swinging structure.

7 Unscrew two micro-encapsulated hexagon nuts (10).

**Installation note:**
Replace the micro-encapsulated hexagon nut (10), 25 Nm.

8 Drive out two countersunk screws (11) from fixed bearing (5) and the lower suspension part (1).

**Installation note:**
The cam (arrow) at the head of the countersunk screw (11) must engage in the groove (arrow) of the lower suspension part (1).
3.28  Lower suspension part – removal and installation

REMOVAL / INSTALLATION

8 Push the swinging structure (6) backwards (arrow A) until the two fixed bearings (5) at the swinging structure (6) fit through the cut-out (arrows) of the left and right guiding rail (2) of the lower suspension part (1).

9 Lift the swinging structure (6) with the two fixed bearings (5) out of the guiding rails (2) of the lower suspension part (1) at the front.

10 Laterally turn the swinging structure (6) with the attached upper suspension part (8) by approx. 45° (arrow B) to pull the two rollers (7) out of the guiding rails (2) and then lift it off in upward direction (arrow C).
Note:
For turning the swinging structure (6) more easily, unscrew the two collar screws (9) and remove the end stops (3) with the buffer (4) from the guiding rails (2).

Installation note:
Collar screw (9), 6 Nm.

11 Remove the lower suspension part (1).

Installation note:
Apply acid-free multi-purpose lubricant to the side surfaces (F) of the two guiding rails (2) in the area where rollers are moved.

12 Re-install the components in the reverse order of their removal.
3.29 Swinging structure – disassembly and assembly

DISASSEMBLY / ASSEMBLY

TABLE OF CONTENTS

(1) Swinging structure
(2) Clearance spacer (if required)
   thickness 0.2 or 0.5 mm
(3) Roller  max. clearance 0.3 mm
(4) Buffer
(5) Tube section
(6) Fixed bearing
(7) Central bearing (of the swinging structure)

Installation note:
Apply acid-free multi-purpose lubricant (F) to the central bearing (7).

Note:
If the swinging structure (1) is defective, the entire seat suspension will be replaced (Chapter 3.1).
3.30 Worn parts – replacement

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Micro-encapsulated hexagon nut .................. to renew, 25 Nm
(see Chapter 3.14, Chapter 3.16 and Chapter 3.28)

(2) Buffer
(see Chapter 3.10)

(3) Fixed bearing
(see Chapter 3.28)

(4) Roller
(see Chapters 3.27 and Chapter 3.28)

(5) Clearance spacer
(see Chapter 3.9)

(6) Blind rivet (5 x 10)
(see Chapters 3.6, Chapter 3.19 and Chapter 3.26)

(7) Blind rivet (4.8 x 15.5)
(see Chapter 3.10)

(8) Buffer
(see Chapter 3.10)
3.30 Worn parts – replacement

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(9) Socket
(see Chapter 3.10)

(10) Countersunk screw (inner race) 6Nm
(see Chapter 3.18)

(11) Buffer
(see Chapter 3.29)

(12) Collar screw (inner race)........ 6 Nm
(see Chapter 3.28)

(13) Stopper
(see Chapter 3.28)

(14) Buffer
(see Chapter 3.28)

(15) Countersunk screw
(see Chapter 3.28)

(16) Blind rivet (3.6 x 200)
(see Chapter 3.1, Chapter 3.6, Chapter 3.13, Chapter 3.17 and Chapter 3.26)

(17) Cable tie (7.6 x 387)
(see Chapter 3.13)
3.30 Worn parts – replacement

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(18) Bellows pin  
(see Chapter 3.4)

(19) Micro-encapsulated cap screw  
(M8 x 12) ............ to replace, 25 Nm  
(see Chapter 3.1)

(20) Micro-encapsulated cap screw  
(M8 x 16) ............ to replace, 25 Nm  
(see Chapter 3.1)

(21) Expanding rivet  
(see Chapter 3.3)

(22) Clearance spacer (Ø8.5 x 0.2)  
(see Chapter 3.29)

(23) Compression spring  
(see Chapter 3.6, Chapter 3.7 and Chapter 3.8)