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Notes on these instructions

This repair manual includes information and instructions on how to perform repair work on the GRAMMER Seat MSG 90.6 PG of the following seat models:
- Actros
- Atego, Axor
- Bus seat
- Seat with climate control system

The seat Actros forms the basis for illustrations in this repair manual. In general, the seat is illustrated with a mechanism for quick lowering of the seat, and not with a swivel.

In the case of technical deviations in work procedures (due to different seat models), refer to the current text or individual chapters of the manual.

The functions can either be on the left-hand or right-hand side of the seat. The only difference between the commercial vehicle type with a quick lowering mechanism and the bus seat is the missing swivel. For this reason, the repair work on the bus seat is identical to that on the vehicle of type Actros and is to be performed laterally reversed. The repair work concerning the swivel is described in a separate chapter.

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.
Preliminary remarks

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.

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

The description of the work steps refers to the dismounted seat. Depending on the individual installation situation, some work may also be performed on the installed seat. For this reason, check the environment of the installed seat for this possibility before starting work. The safety instructions of the specific vehicle manufacturer and those stated in Chapter 1.1 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 design may deviate from the descriptions and illustrations in this manual.

The illustrated repair steps refer to the driver's seat (left-hand drive). Different work steps are to be performed laterally reversed when repairing the passenger seat or in the case of vehicles with right-hand drive.

If not stated otherwise, the directional indications "front, back" and "right, left" refer to the installed seat 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 about the seat

The seat is provided with a long-lasting lubrication (approx. 10 years). The lubricating points must be re-greased only after repair work, using an acid-free 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 in the case of a vertical seat adjustment, they are not squeezed or distorted when the seat is 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.
In order to avoid bodily injury, reduced operational safety or damage to the seat resulting from improperly performed work, all information and instructions, in particular the safety instructions stated in Chapter 1.1, must be read carefully and strictly observed.

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

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

Change notification and copyright

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

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

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www.grammer.com
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1.1 Safety instructions
1.2 Seat types (example of seat models)
1.3 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 from the power supply.
   - Bleed air out of the compressed-air system.
   - Move the seat down to the end stops.
1.1 Safety instructions

5 The seat position for repair is "seat lowered (no pressure applied)". If it is necessary to bring the seat to a higher position for repair work, this position must be secured with suitable spacers (wooden block, fixation with screws or similar structure). Disregard of these safety measures bears the risk of an accident!

6 When using oil, grease and other chemical substances, the relevant safety regulations for the handling and use of these products must be observed.

7 **WARNING Be careful when removing/installing seats with pyrotechnic belt tensioners:**
   
   • Belt tensioners may only be removed /installed/ contacted when the battery is disconnected and the ignition key removed.
   
   • After an accident, the belt tensioner must be checked for external damage, defects and for being triggered. Defective or damaged components are immediately to be replaced with new ones. It is not allowed to repair defective or damaged components of the belt tensioner.

   • Install the belt tensioner immediately after it has been brought from the storage room. Not installed units may, in no case, be stored in the workshop without being supervised by an adequately trained person. If the installation work was interrupted, belt tensioners must be kept closed or brought back to the storage room.

   • Do avoid the contact of belt tensioners with grease, oil or cleaning supplies.

   • Always protect belt tensioners from flying sparks and naked flames. Do not expose them to temperatures above 100 °C, not even for a short time.
1.1 Safety instructions

- Belt tensioners, which have fallen down from a height of more than 0.5 m must be replaced and must by no means be installed in the vehicle.

- When replacing damaged components such as belt tensioners and lines, the inspection may only be performed using approved testing equipment and only when those components are installed. The use of unapproved measuring devices bears the risk of an undesired triggering.

- Attention must be paid to the following when an external power source or battery is connected for the first time:
  1. The ignition is on
  2. No personnel in the passenger compartment
  3. External power source or battery is connected

- In the Federal Republic of Germany, belt tensioners must be detonated prior to scrapping according to the respective regulations for the prevention of industrial accidents. This makes it impossible to remove pyrotechnic devices from the scrap yard for re-use or repair. These safety measures are necessary to prevent possible injuries resulting from improper activation of pyrotechnic devices. A significant risk is involved in the waste disposal site when not detonated components are flame cut, smelted or thrown into fire or smouldering fire.

  When detonating, make sure a safe distance of at least 10 m is maintained!

- To prevent costly additional work, we recommend you to order the scrapping work be done by a scrap dealer who is able to perform this work according to the required safety standards for pyrotechnic devices. When handing over those components, the scrap dealer must sign a declaration committing him to scrap pyrotechnic devices according to the respective regulations for the prevention of industrial accidents.
1.2 Seat types (example of seat models)

(A) Actros
(B) Atego, Axor
(C) Bus seat, right
   (function with swivel)
(D) Kingman (sales)
1.3 Rating plate

Actros type of seat

The rating plate from the manufacturing plant (A1) is located on the rear right of the seat frame.

The rating plate shows the following information (example):

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

(B) **Designation** = MSG 90.6 PG.LI

(C) **INVENTORY NO.** = 01133179

(D) **Year / CW / Assembly**
   = 0747 049
   • Year of manufacture = 07 (2007)
   • Built in week = 47 (November)
   • Assembly = 049

(E) **ORDER NO.** = XX 00000001234
   • Country indicator = XX
   • serial production number = 00000001234
The rating plate for delivery (A2) is located on the back of the supporting structure.

The rating plate shows the following information (example):

(F) **Number** = A9439105102 00005C38
- Actros seat type = A943
- Colour code = 5C38

(G) **Date of manufacture** = 27/11/07

(H) **Designation** = MSG 90.6 PG.LI
- Seat type = MSG 90.6 PG
- Left seat = LI

(I) **Inventory no. (GAG no.)** = 1051726

Notes:
- When orders are placed, the correct number (F) and GAG no. (I) on the rating plate always have to be quoted.
- In case of complaints, the delivery date is also to be quoted.
1.3 Rating plate

The rating plate (A3) of the level control is located on the upper right side.

The rating plate shows the following information (example):

(A) **Inventory no.** = 1126 814
    = SPC/050320

(B) **Working pressure** = \( p = 6.5 \ldots 10 \text{ bar} \)

(C) **SERIAL NO.** = 000 381

(D) **L6D** = Production code

**Note:**
When orders are placed, the correct inventory no. (A) on the rating plate is always to be quoted.
1.3 Rating plate

Atego, Axor seat types

The rating plate from the manufacturing plant (Atego, Axor = B1) is located on the rear right of the seat frame.

The rating plate shows the following information (example):

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

(B) **Designation** = MSG 90.6 PG.LI

(C) **INVENTORY NO.** = 01133179

(D) **Year / CW / Assembly**
   = 0747 049
   - Year of manufacture = 07 (2007)
   - Built in week = 47 (November)
   - Assembly = 049

(E) **ORDER NO.** = XX 00000001234
   - Country indicator = XX
   - Serial production number
     = 00000001234
1.3 Rating plate

The rating plate for delivery (Atego = B2) is located laterally on the supporting structure and (Axor = B3) is located on the rear of the supporting structure.

The rating plate shows the following information (example):

(F) **Number** = A9439105102 00005C38
- Atego seat type = A973
- Colour code = 5C38

(G) **Date of manufacture** = 27/11/07

(H) **Designation** = MSG 90.6 PG.LI
- Seat type = MSG 90.6 PG
- Left seat = LI

(I) **Inventory no. (GAG no.)** = 1051726

**Notes:**
- When orders are placed, the correct number (F) and GAG no. (I) on the rating plate always have to be quoted.
- In case of complaints, the delivery date is also to be quoted.
1.3 Rating plate

The rating plate (B4) of the level control is located on the upper right side.

The rating plate shows the following information (example):

(A) Inventory no. = 1 126 814
    = SPC/050320

(B) Working pressure = p = 6.5 .. 10 bar

(C) SERIAL NO. = 000 381

(D) L6D = Production code

Note:
When orders are placed, the correct inventory no. (A) on the rating plate is always to be quoted.
1.3 Rating plate

Bus seat type

The rating plate from the manufacturing plant (C1) is located on the front of the lower suspension part behind the bellows.

The rating plate shows the following information (example):

(A) Country of manufacture
   = MADE IN XXXXXXX

(B) Designation = MSG 90.6 PG.LI

(C) INVENTORY NO. = 01133179

(D) Year / CW / Assembly
   = 0747 049
   • Year of manufacture = 07 (2007)
   • Built in week = 47 (November)
   • Assembly = 049

(E) ORDER NO. = XX 00000001234
   • Country indicator = XX
   • Serial production number = 00000001234
The rating plate for delivery (C2) is located on the supporting structure.

The rating plate shows the following information (example):

(F) **Number** = A9539105102 00005C38
- Bus seat type = A953
- Colour code = 5C38

(G) **Date of manufacture** = 27/11/07

(H) **Designation** = MSG 90.6 PG.LI
- Seat type = MSG 90.6 PG
- Left seat = LI

(I) **Inventory no. (GAG no.)** = 1051726

**Notes:**
- When orders are placed, the correct number (F) and GAG no. (I) on the rating plate always have to be quoted.
- In case of complaints, the delivery date is also to be quoted.
1.3 **Rating plate**

The rating plate (C3) of the level control is located on the upper right side.

The rating plate shows the following information (example):

(A) **Inventory no.** = 1 126 814
    = SPC/050320

(B) **Working pressure** = \( p = 6.5 \ldots 10 \) bar

(C) **SERIAL NO.** = 000 381

(D) **L6D** = Production code

**Note:**
When orders are placed, the correct inventory no. (A) on the rating plate is always to be quoted.
1.3 Rating plate

Kingman (sales) seat type

The rating plate from the manufacturing plant (D1) is located on the front of the lower suspension part behind the bellows.

The rating plate shows the following information (example):

- **(A) Country of manufacture** = MADE IN XXXXXXX
- **(B) Designation** = MSG 90.6 PG.LI
- **(C) INVENTORY NO.** = 01133179
- **(D) Year / CW / Assembly** = 0747 049
  - Year of manufacture = 07 (2007)
  - Built in week = 47 (November)
  - Assembly = 049
- **(E) ORDER NO.** = XX 0000001234
  - Country indicator = XX
  - Serial production number = 0000001234
1.3 Rating plate

The rating plate (D2) of the level control is located on the upper right side.

The rating plate shows the following information (example):

(A) **Inventory no.** = 1 126 814
    = SPC/050320

(B) **Working pressure** = p = 6.5 .. 10 bar

(C) **SERIAL NO.** = 000 381

(D) **L6D** = Production code

**Note:**
When orders are placed, the correct inventory no. (A) on the rating plate is always to be quoted.
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Control elements

(1) Lever for seat depth adjustment  
(2) Lever for seat angle adjustment  
(3) Lever for locking mechanism of the fore/aft isolator (delivery option)  
(4) Lever for seat fore/aft adjustment  
(5a) Button for quick lowering of the seat (Actros, Atego, Axor)  
(5b) Button for swivel (bus seat)  
(6) Lever for vertical shock absorber - adjustment  
(7) Lever for seat height adjustment  
(8a) Switch for lower lumbar support  
(8b) Switch for upper lumbar support  
(9) Switch for lateral support adjustment  
(10) Switch for seat heater  
(11) Lever for backrest adjustment
2.1 Overview of components

Pneumatic connecting diagram

(1) Air hose (blue) for air spring (Z)
(2) Air hose (black) for air intake (P)
(3) Air hose (gray) for air exhaust (R)
(4) Air hose (black) for lumbar support and lateral support adjustment (A)
(5) Entire air hose set
   = (1) + (2) + (3) + (4)
   **Note:** The adhesive tapes are intended to bundle the air hose set (5) and to mark where the cable ties have to be fastened.
(6) Air spring
(7) Hose connector (T-piece)
(8) Hose nozzle
(9) Level control
(10) Right chamber of lateral support adjustment
(11) Left chamber of lateral support adjustment
(12) Lower chamber of lumbar support
(13) Upper chamber of lumbar support
(14) Hose connector
(15) Valve for upper chamber of lumbar support
(16) Valve for lower chamber of lumbar support
(17) Valve for lateral support adjustment
(18) Hose nozzle
2.1 Overview of components

Connections:

(Z) Connection for air hose (blue) to the air spring

(P) Connection for the air hose (black) for air intake

(R) Connection for the air hose (gray) for air exhaust

(A) Connection for the air hose for lumbar support and lateral support adjustment
2.1 Overview of components

Level control

(1) Level control
(2) Bowden pull wire for seat height adjustment
(3) Control disc for height adjustment
(4) Bowden pull wire for quick lowering of the seat
(5) Upper actuating cams for air intake valve (seat lifting)
(6) Lower actuating cams for air exhaust valve (seat lowering)
(7) Retracting spring of the valve lever for quick lowering of the seat
(8) Valve for quick lowering of the seat (venting)
(9) Valve lever for quick lowering of the seat
(10) Air intake valve (seat lifting)
(11) Air exhaust valve (seat lowering)
2.1 Overview of components

(12) Valve tappets for air intake
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(14) Valve tappets for quick lowering of the seat
(15) Air hose (blue) to the air spring (Z)
(16) Air hose (black) for air intake (P)
(17) Air hose (gray) for air exhaust (R)
(18) Bowden pull wire for vertical shock absorber adjustment

Connections:
(Z) Connection for air hose (blue) to the air spring
(P) Connection for the air hose (black) for air intake
(R) Connection for the air hose (gray) for air exhaust
Actros, Atego, Axor, bus seat:
heater cable, belt tensioner cable and
pin assignment with circuit diagram

(1) Cable for backrest heater
(2) Cable for seat cushion heater
(3) Cable for vehicle connection
(4) Cable for heater switch
(5) Belt tensioner cable
(- - - = cut it off, if not required)
(6) Thermostat in the backrest (safety thermostat)
(7) Heater mat in the backrest
(8) Thermostat in the seat cushion (for 2-level heater control)
(9) Heater mat in the seat cushion
(10) Plug of vehicle connection (6-pin)
(11) Plug of heater switch
2.1 Overview of components

(12) Plug of belt tensioner cable
(13) Plug of backrest heater (2-pin)
(14) Plug of seat cushion heater (3-pin)
(15) Socket of backrest heater (2-pin)
(16) Socket of seat cushion heater (3-pin)
(17) Heater cable
(18) Belt tensioner

Note:
Pin assignment seen from the back

(19) Pin assignment for heater at the plug for vehicle connection (10) contact 3 (K3) voltage 24 V (rt) contact 4 (K4) ground (sw)

(20) Pin assignment for belt tensioner at the plug for vehicle connection (10) contact 1 (K1) contact 2 (K2)
2.1 Overview of components

(21) Pin assignment for backrest cushion heater at the plug for backrest heater (13)
  contact 1 (K1)
  contact 2 (K2)

(22) Pin assignment for seat cushion heater (level 2 = low) at the plug for seat cushion heater (14)
  contact 1 (K1)
  contact 2 (K2)

(23) Pin assignment for seat cushion heater (level 1 = high) at the plug for seat cushion heater (14)
  contact 1 (K1)
  contact 3 (K3)

Cable colors:
- rt = red
- sw = black
- ge = yellow
- gr = green
- bl = blue
- br = brown
2.1 Overview of components

Electrical plug and socket connections:

(A) Electrical connection between the vehicle and the cable for vehicle connection (3)

(B) Electrical connection between the heater switch and the cable for heater switch (4)

(C) Electrical connection (3-pin) between the heater cable (17) and the cable for seat cushion heater (2)

(D) Electrical connection (2-pin) between the cable for seat cushion heater (2) and the cable for backrest heater (1)

(E) Electrical connection between the belt tensioner cable (5) and the belt tensioner (18)
2.1 Overview of components

Kingman: heater cable and pin assignment with circuit diagram

Note:
The overview of components for Kingman corresponds to that for Actros, Atego, Axor and bus seat:
• without belt tensioner cable (5)
• and 9-pin plug for vehicle connection (24)

Note:
Pin assignment seen from the back
(25) Pin assignment for heater at the plug for vehicle connection (24)
contact 9 (K9) voltage 24 V (rt)
contact 7 (K7) ground (sw)
2.1 Overview of components

Actros:
heater cable, belt buckle contact and pin assignment with circuit diagram

Note:
The overview of components for Actros with belt buckle contact corresponds to that for Actros, Atego, Axor and bus seat:
• without belt tensioner cable (12)
• with cable for belt buckle contact (26)
• with socket for belt buckle contact (27)
• with additional pin assignment (29) at the 6-pin plug for vehicle connection (10)
2.1 Overview of components

Note:
Pin assignment seen from the back

(19) Pin assignment for heater at the plug for vehicle connection (10)
contact 3 (K3) voltage 24 V (rt)
contact 4 (K4) ground (sw)

(29) Pin assignment for belt buckle contact at the plug for vehicle connection (10)
contact 4 (K4) ground (sw)
contact 5 (K5) belt warning buzzer (bl)

Electrical plug and socket connection:
(F) Electrical connection between the cable for belt buckle contact (26) and the belt buckle cable (28)
2.1 Overview of components

Belt buckle with belt buckle cable (if fitted)

(1) Belt buckle
(2) Belt buckle cable
(3) Plug for belt buckle cable
(4) Socket for belt buckle cable
(5) Cable for belt buckle contact
(6) Pin assignment for belt buckle contact at the plug of the belt buckle cable (3)

PIN
P1 (ground) and
P2 (voltage 24V)

Electrical plug and socket connection:

(F) Electrical connection between the belt buckle cable (2) and the cable for belt buckle contact (5)
2.1 Overview of components

Cable for electro-pneumatic gearshift (EPS cable) (if fitted)

(1) Cable for electro-pneumatic gearshift (EPS cable)
(2) Plug for EPS cable
(3) Socket for EPS cable
(4) EPS control element
(5) Pin (plug for EPS cable)
(6) Contact (socket for EPS cable)

Electrical plug and socket connection:

(G) Electrical connection between EPS cable (1) and EPS control element (4)
A functional test is used to circumscribe all possible malfunctions; it must be performed before and after repair work on the seat at any rate.

**Preconditions for inspection:**
- 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 operating instructions.
- Compressed-air reservoir pressure at least 7 bar and max. 10 bar.

**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/specif ied status and the actual status, please take the measures as described in the chapter "Causes/remedial measures".

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Scope of inspection</th>
<th>Function to be operated</th>
<th>Result/specif ied status</th>
<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seat</td>
<td>Apply load to the driver's seat and spring it up and down several times.</td>
<td>No noise. High lateral stability in horizontal direction.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>2</td>
<td>Quick lowering of the seat</td>
<td>Press down the button for quick lowering of the seat until it locks into place.</td>
<td>The seat moves down to its lowest position (mechanical end stop).</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Press down the button for quick lowering of the seat until it is released.</td>
<td>The seat moves back to its original position.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
</tbody>
</table>
### 2.2 Functional test

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Scope of inspection</th>
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</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Seat height adjustment</td>
<td>Pull the lever for seat height adjustment up and hold/release it.</td>
<td>The seat moves up by one step (approx. 12.5 mm).</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Pull the lever for seat height adjustment up again after each height adjustment (max. 8 times depending on the height step).</td>
<td>The seat moves up gradually until the highest position (maximum height) is reached.</td>
<td>The seat can oscillate about 40 mm upward without hitting the stopper while driving. See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Press the lever for seat height adjustment down and hold/release it.</td>
<td>The seat moves down by one step (approx. 12.5 mm).</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Press the lever for seat height adjustment down again after each height adjustment (max. 8 times depending on the height step).</td>
<td>The seat moves down gradually until the lowest position (minimum height) is reached.</td>
<td>The seat can oscillate about 35 mm downward without hitting the stopper while driving (lower residual spring displacement). See Overview of faults (Chapter 2.3).</td>
</tr>
</tbody>
</table>
### 2.2 Functional test

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Scope of inspection</th>
<th>Function to be operated</th>
<th>Result/specified status</th>
<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Backrest adjustment</td>
<td>Pull the handle for backrest adjustment up by supporting the backrest (e.g. holding it in place).</td>
<td>The backrest folds forwards.</td>
<td>Folding angle: approx. 60 degrees</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Pull the backrest adjustment handle up while loading and unloading the backrest, and then release the handle.</td>
<td>The backrest latches into the desired position. It should not be possible to move the backrest into another position after it has been locked.</td>
<td>The backrest can be adjusted within a range of -12 to +38 degrees.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>10</td>
<td>Vertical shock absorber adjustment</td>
<td>Turn the lever for vertical shock absorber adjustment forwards.</td>
<td>Vertical shock absorption is harder.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Turn the lever for vertical shock absorber adjustment backwards.</td>
<td>Vertical shock absorption is softer.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
</tbody>
</table>
## 2.2 Functional test

<table>
<thead>
<tr>
<th>Step no.</th>
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<th>Result/specified status</th>
<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Seat fore/aft adjustment</td>
<td>Pull up the lever for seat fore/aft adjustment.</td>
<td>The seat can be pushed forwards or backwards.</td>
<td>The maximum adjustment travel of 180 mm in increments of 10 mm each. See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>Release the lever for seat fore/aft adjustment.</td>
<td>The seat locks into place in the selected position. It should not be possible to move the seat into another position when it is locked.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>14</td>
<td>Swivel (if fitted)</td>
<td>Press the button for swivel down until it locks into place.</td>
<td>The rotary motion is released.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>Press the button for swivel down until it is released.</td>
<td>The rotary motion is locked.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
</tbody>
</table>
## 2.2 Functional test

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Scope of inspection</th>
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<th>Result/specified status</th>
<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Resting position adjustment (if fitted)</td>
<td>Press the lever for resting position adjustment down and simultaneously pull up the lever for the seat fore/aft adjustment. While doing so, push the seat backwards.</td>
<td>The seat is pushed backwards beyond the end stop of the seat fore/aft adjustment.</td>
<td>The maximum adjustment travel is 100 mm for left-hand drive and 150 mm for right-hand drive in increments of 10 mm each. See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>Release the lever for resting position adjustment and seat fore/aft adjustment.</td>
<td>The seat locks into place in the selected position. It should not be possible to move the seat into another position when it is locked.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>18</td>
<td>Fore/aft isolator (if fitted)</td>
<td>Turn the lever for the fore/aft isolator downwards 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>
</tbody>
</table>
### 2.2 Functional test

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Scope of inspection</th>
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<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Fore/aft isolator (if fitted)</td>
<td>Turn the handle for the fore/aft isolator upwards to lock the fore/aft isolator. Move the upper suspension part backwards 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>
<tr>
<td>20</td>
<td>Lumbar support / lateral support adjustment</td>
<td>Press the switch for lumbar support and lateral support adjustment to &quot;+&quot; or &quot;-&quot;.</td>
<td>The curvature in the backrest cushion increases or decreases.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>21</td>
<td>Seat heater</td>
<td>Switch on the switch for seat heater (level I and II).</td>
<td>The seat cushion heater and backrest heater warm up.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
</tbody>
</table>

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**TABLE OF CONTENTS**

---

Material no. 1153450_c
This chapter contains notes on possible seat faults. 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 moves up too slowly.</td>
<td>• Too low reserve air pressure.</td>
<td>Check the compressed air system of the vehicle.</td>
</tr>
<tr>
<td></td>
<td>• Bowden pull wire for seat height adjustment is not correctly adjusted.</td>
<td>Check the Bowden pull wire for seat height adjustment and adjust it, if necessary (see Chapter 3.8).</td>
</tr>
<tr>
<td></td>
<td>• Level control is defective.</td>
<td>Check leveling valve and level control (Chapter 2.4, inspection steps 1.1 and 2.1).</td>
</tr>
<tr>
<td></td>
<td>• Air leaks at the valve tappet.</td>
<td>Replace the level control (Chapter 3.38).</td>
</tr>
<tr>
<td></td>
<td>• Air connections are leaky (air leaks at the connections of the air hoses).</td>
<td>Check all air connections for air leakage and replace the component with a defective air connection with a new one if necessary.</td>
</tr>
<tr>
<td></td>
<td>• Air exhaust hose or air intake hose is bent.</td>
<td>Replace the air hose set (see Chapter 3.22).</td>
</tr>
</tbody>
</table>
## 2.3 Overview of faults

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat moves up too slowly.</td>
<td>• Air hoses are leaky.</td>
<td>Check all air hoses for air leakage and replace a defective air hose (air hose set), if necessary (see Chapter 3.22).</td>
</tr>
<tr>
<td></td>
<td>• Air spring is untight.</td>
<td>Check the air spring (Chapter 2.4, step no. 3.1).</td>
</tr>
<tr>
<td>Seat does not move up (seat does not respond when pulling the lever for seat height adjustment).</td>
<td>• Bowden pull wire for seat height adjustment is not correctly adjusted.</td>
<td>Check the Bowden pull wire for seat height adjustment and adjust it, if necessary (see Chapter 3.8).</td>
</tr>
<tr>
<td></td>
<td>• Bowden pull wire for seat height adjustment is torn.</td>
<td>Replace the Bowden pull wire for seat height adjustment (see Chapter 3.9).</td>
</tr>
<tr>
<td></td>
<td>• Air leaks at the valve tappet.</td>
<td>Replace the level control (Chapter 3.38).</td>
</tr>
<tr>
<td></td>
<td>• Air connections or air hoses are leaky.</td>
<td>Check all air connections and air hoses for air leakage and replace the component with a defective air connection or the defective air hose with a new one, if necessary.</td>
</tr>
</tbody>
</table>
## 2.3 Overview of faults

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat does not move up (seat does not respond when pulling the lever for seat height adjustment).</td>
<td>• Level control is defective.</td>
<td>Check leveling valve and level control (Chapter 2.4, inspection steps 1.1 and 2.1).</td>
</tr>
<tr>
<td></td>
<td>• Handle support for seat height adjustment is defective.</td>
<td>Replace the handle support for seat height adjustment (see Chapter 3.9).</td>
</tr>
<tr>
<td></td>
<td>• Air spring is leaky.</td>
<td>Check the air spring (Chapter 2.4, step no. 3.1).</td>
</tr>
<tr>
<td></td>
<td>• Button for quick lowering of the seat is engaged.</td>
<td>Press down the button for quick lowering of the seat until it is released.</td>
</tr>
<tr>
<td>Seat does not move down (seat does not respond when pushing the lever for seat height adjustment).</td>
<td>• Exhaust air cannot escape (e.g. air exhaust hose is squeezed).</td>
<td>Replace the air hose set (see Chapter 3.22).</td>
</tr>
<tr>
<td></td>
<td>• Bowden pull wire for seat height adjustment is not correctly adjusted.</td>
<td>Check the Bowden pull wire for seat height adjustment and adjust it, if necessary (see Chapter 3.8).</td>
</tr>
<tr>
<td></td>
<td>• Bowden pull wire for seat height adjustment is torn.</td>
<td>Replace the Bowden pull wire for seat height adjustment (see Chapter 3.9).</td>
</tr>
<tr>
<td></td>
<td>• Level control is defective.</td>
<td>Check leveling valve and level control (Chapter 2.4, inspection steps 1.1 and 2.1).</td>
</tr>
</tbody>
</table>
## 2.3 Overview of faults

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| Seat does not move down (seat does not respond when pushing the handle for seat height adjustment). | • Bowden pull wire for seat height adjustment is torn / seat height adjustment does not operate.  
• Handle support for seat height adjustment is defective. | Replace the Bowden pull wire for seat height adjustment (see Chapter 3.9).  
Replace the handle support for seat height adjustment (see Chapter 3.9). |
| The seat changes its position during operation:  
• Seat lowers down  
• Seat moves up by itself  
• Seat oscillates | • Bowden pull wire for seat height adjustment is not correctly adjusted.  
• Bowden pull wire for seat height adjustment is torn.  
• Level control is defective.  
• Air connections are leaky (air leaks at the connections of the air hoses).  
• Air hoses are leaky. | Check the Bowden pull wire for seat height adjustment and adjust it, if necessary (see Chapter 3.8).  
Replace the Bowden pull wire for seat height adjustment (see Chapter 3.9).  
Check leveling valve and level control (Chapter 2.4, inspection steps 1.1 and 2.1).  
Check all air connections for air leakage and replace the component with a defective air connection with a new one if necessary.  
Check all air hoses for air leakage and replace a defective air hose (air hose set), if necessary (see Chapter 3.22). |
### 2.3 Overview of faults

<table>
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<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>The seat changes its position during operation:</td>
<td>• Air spring is leaky.</td>
<td>Check the air spring (Chapter 2.4, step no. 3.1).</td>
</tr>
<tr>
<td>• Seat lowers down</td>
<td>• Air leaks at the valve tappet.</td>
<td>Replace the level control (Chapter 3.38).</td>
</tr>
<tr>
<td>• Seat moves up by itself</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Seat oscillates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seat moves up or down, but it automatically returns to its</td>
<td>• Level control is defective.</td>
<td>Check leveling valve and level control (Chapter 2.4, inspection steps 1.1 and 2.1).</td>
</tr>
<tr>
<td>original position.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seat does not respond when pressing the button for quick</td>
<td>• Bowden pull wire for quick lowering of the seat is torn (quick lowering of the</td>
<td>Replace the Bowden pull wire for the quick lowering of the seat (see Chapter 3.7).</td>
</tr>
<tr>
<td>lowering of the seat.</td>
<td>seat does not operate).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Button for quick lowering of the seat is defective.</td>
<td>Replace the button for the quick lowering of the seat (see Chapter 3.7).</td>
</tr>
<tr>
<td></td>
<td>• Level control is defective.</td>
<td>Check leveling valve and level control (Chapter 2.4, inspection steps 1.1 and 2.1).</td>
</tr>
</tbody>
</table>
## 2.3 Overview of faults

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<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backrest cushion does not respond when operating the valves for lumbar support / lateral support adjustment.</td>
<td>• Too low reserve air pressure.</td>
<td>Check the compressed-air system of the vehicle.</td>
</tr>
<tr>
<td></td>
<td>• Respective valve is defective.</td>
<td>Replace the valves for lumbar support and lateral support adjustment (Chapter 3.23).</td>
</tr>
<tr>
<td></td>
<td>• Air hoses are leaky.</td>
<td>Check all air hoses for air leakage and replace a defective air hose (air hose set), if necessary (see Chapter 3.22).</td>
</tr>
<tr>
<td></td>
<td>• Chamber for lumbar support or lateral support adjustment is leaky.</td>
<td>Replace the lumbar support or lateral support adjustment (Chapter 3.33 or 3.34).</td>
</tr>
</tbody>
</table>
### 2.3 Overview of faults

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<tr>
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<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat cushion heater or backrest heater does not operate.</td>
<td>• Power supply of the vehicle is defective.</td>
<td>Check electrical system of the vehicle.</td>
</tr>
<tr>
<td></td>
<td>• Plug connection to the vehicle is defective.</td>
<td>Check the plug and socket connection, restore it, if necessary.</td>
</tr>
<tr>
<td></td>
<td>• Heater cable is squeezed or chafed.</td>
<td>Check the seat heater (Chapter 2.4, inspection step 4.1).</td>
</tr>
<tr>
<td></td>
<td>• Seat heater is defective.</td>
<td>Check the seat heater (Chapter 2.4, inspection step 4.1).</td>
</tr>
<tr>
<td>Seat has too much clearance in the transverse direction (seat wobbles).</td>
<td>• Side clearance of rollers in the lower or upper suspension part is too large.</td>
<td>Replace the seat suspension (see Chapter 3.44).</td>
</tr>
<tr>
<td></td>
<td>• Fixed bearings or rollers of the swinging structure are defective.</td>
<td>Replace the seat suspension (see Chapter 3.44).</td>
</tr>
<tr>
<td></td>
<td>• Swinging structure is defective.</td>
<td>Replace the seat suspension (see Chapter 3.44).</td>
</tr>
</tbody>
</table>
## 2.3 Overview of faults

<table>
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<tr>
<th>Fault description</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Seat suspension squeaks.</td>
<td>• Side clearance of rollers in the upper or lower suspension part is too large or insufficient lubrication of the rollers.</td>
<td>Replace the seat suspension (see Chapter 3.44).</td>
</tr>
<tr>
<td></td>
<td>• Insufficient lubrication of the axles of the swinging structure for the fixed bearings.</td>
<td>Apply penetrating oil to the fixed bearing (through the hole in the lower or upper suspension part).</td>
</tr>
<tr>
<td></td>
<td>• Insufficient lubrication of the central bearing of the swinging structure.</td>
<td>Apply penetrating oil to the central bearing of the swinging structure (see Chapter 3.45).</td>
</tr>
<tr>
<td></td>
<td>• Insufficient lubrication of the collar screw and/or of the axle of the swinging structure for the fastening of the vertical shock absorber.</td>
<td><strong>Note:</strong> For this purpose, the swinging structure does not have to be removed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apply acid-free multi-purpose lubricant to the collar screw and/or to the axle of the swinging structure (see Chapter 3.35).</td>
</tr>
</tbody>
</table>
### 2.3 Overview of faults

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<tr>
<th>Fault description</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Seat does not respond when the swivel button is pressed (if fitted).</td>
<td>• Linkage rod is jammed or detached.</td>
<td>Assure smooth running of the linkage rod or hang it up (see Chapter 3.47.1).</td>
</tr>
<tr>
<td></td>
<td>• Cylinder for swivel is defective.</td>
<td>Replace the cylinder for swivel (see Chapter 3.47.2).</td>
</tr>
<tr>
<td></td>
<td>• Valve for swivel is defective.</td>
<td>Replace the valve for swivel (see Chapter 3.47.3).</td>
</tr>
<tr>
<td></td>
<td>• Air hose for swivel is leaky.</td>
<td>Check the air hoses for leakage and replace them, if necessary (see Chapter 3.47.4).</td>
</tr>
<tr>
<td>Vertical shock absorption does not become harder or softer when the lever for</td>
<td>• Bowden pull wire for vertical shock absorber adjustment is not correctly</td>
<td>Check the Bowden pull wire for vertical shock absorber adjustment and adjust it, if necessary (see Chapter 3.10).</td>
</tr>
<tr>
<td>vertical shock absorber adjustment is turned forwards or backwards.</td>
<td>adjusted.</td>
<td>Replace the Bowden pull wire for vertical shock absorber adjustment (see Chapter 3.11).</td>
</tr>
<tr>
<td></td>
<td>• Bowden pull wire of vertical shock absorber adjustment is torn.</td>
<td></td>
</tr>
</tbody>
</table>
## 2.3 Overview of faults

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| Backrest does not fold forwards by itself after being unlocked. | • Torsion spring is detached.  
• Tension spring is broken. | Hang in the torsion spring (see Chapter 3.30).  
Replace the torsion spring (see Chapter 3.30). |
| Backrest cannot be unlocked. | • Lever for backrest adjustment is defective.  
• Bowden pull wire for backrest adjustment is not correctly adjusted.  
• Bowden pull wire for backrest adjustment is torn.  
• Backrest locking mechanism is defective. | Replace the lever for backrest adjustment (see Chapter 3.13).  
Check the Bowden pull wire for backrest adjustment and adjust it, if necessary (see Chapter 3.12).  
Replace the Bowden pull wire for backrest adjustment (see Chapter 3.13).  
Replace the bearing support with backrest locking mechanism (Chapter 3.32). |
| Seat fore/aft adjustment does not operate after pulling or pushing the lever for seat fore/aft adjustment. | • Particles are between the adjusting and locking rails. | Clean the seat fore/aft adjustment. |
### 2.3 Overview of faults

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat fore/aft adjustment does not operate after pulling or pushing the lever for seat fore/aft adjustment.</td>
<td>• Lever for seat fore/aft adjustment is defective. • Seat fore/aft adjustment is defective.</td>
<td>Replace the lever for seat fore/aft adjustment (see Chapter 3.40). Replace the seat fore/aft adjustment (see Chapter 3.40).</td>
</tr>
<tr>
<td>Backrest too much play or Backrest rattles in unloaded condition.</td>
<td>Play in backrest locking/lock too big.</td>
<td>Bowden pull wire for backrest adjustment – inspection and adjustment (Chapter 3.12). Play in the backrest locking mechanism – inspection and adjustment (Chapter 3.56).</td>
</tr>
</tbody>
</table>
## 1 Inspection of the leveling valves

**Preconditions for fault diagnosis:**
- Compressed-air reservoir pressure at least 7 bar.
- Seat cushion is lifted off in position for repair (Chapter 3.1).
- The air hoses have been inspected with regard to kinks and tightness and found to be OK.
- The connections of the air hoses have been inspected with regard to tightness and found to be OK.
- The air spring has been inspected with regard to tightness and found to be OK.

**Notes:**
- Perform the inspection with the seat being loaded (e.g. by pressing it down).
- The components mentioned above are illustrated in Chapter 2.1, if not stated otherwise in this text.

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>![WARNING] Risk of crushing! During inspection, do not touch the seat suspension and the swinging structure with your hands. Apply load to the seat.</td>
<td>Air escapes at the valves of the level control. The level control is tight.</td>
<td>Replace the level control (Chapter 3.38). Proceed with inspection step no. 1.2.</td>
</tr>
</tbody>
</table>
## 2.4 Fault diagnosis

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>Manually press back the valve lever for quick lowering of the seat at the level control against the retracting spring.</td>
<td>The seat moves down (mechanical end stop). Compressed air leaks at the valve for quick lowering of the seat (venting). The seat does not move down.</td>
<td>Proceed with inspection step no. 1.3. Replace the level control (Chapter 3.38).</td>
</tr>
<tr>
<td>1.3</td>
<td>Release the valve lever for quick lowering of the seat.</td>
<td>The seat moves back to its original position. The seat remains moved down. The seat does not move back to its original position.</td>
<td>Proceed with inspection step no. 1.4. Check the level control for fixed valve tappet of the quick lowering of the seat. Check the level control (see inspection step 2.1).</td>
</tr>
</tbody>
</table>
### 2.4 Fault diagnosis

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 1.4      | ![WARNING](image) **WARNING** Risk of crushing! The level control immediately pushes the control disc for seat height adjustment forwards and the seat moves up. Hang out the Bowden pull wire for seat height adjustment at the control disc for seat height adjustment. | - The seat moves up until the maximum height is reached.  
- The seat remains in its original position.  
- The seat does not move up. | - Proceed with inspection step no. 1.5.  
- Check the level control for fixed valve tappets of the air intake and air exhaust.  
- Replace the level control (Chapter 3.38). |
| 1.5      | Hang in the Bowden pull wire for seat height adjustment at the control disc for height adjustment. | - The seat moves back to its original position.  
- The seat does not move back to its original position. | - Proceed with inspection step no. 1.6.  
- Check the level control (see inspection step 2.1). |
## Fault diagnosis

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.6</td>
<td>Briefly press the upper actuating cam for the air intake valve against the valve tappet of the air intake with your hand.</td>
<td>The seat moves up.</td>
<td>Proceed with inspection step no. 1.7.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The seat does not move up.</td>
<td>Replace the level control (Chapter 3.38).</td>
</tr>
<tr>
<td>1.7</td>
<td>Briefly press the lower actuating cam for the air exhaust valve against the valve tappet of the air exhaust with your hand.</td>
<td>The seat moves down.</td>
<td>End of inspection.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The seat does not move down.</td>
<td>Replace the level control (Chapter 3.38).</td>
</tr>
</tbody>
</table>
2.4 Fault diagnosis

2 Inspection of the level control

Preconditions for fault diagnosis:
- Compressed-air reservoir pressure at least 7 bar.
- Seat cushion is lifted off in position for repair (Chapter 3.1).
- The air hoses as well as the connections of the air hoses have been inspected with regard to kinks and tightness and found to be OK.
- Bowden pull wires, lever for seat height adjustment and button for quick lowering of the seat have been inspected and found to be OK.
- The air spring has been inspected with regard to tightness and found to be OK.

Notes: • Perform the inspection with the seat being loaded (e.g. by pressing it down).
  • The components mentioned above are illustrated in Chapter 2.1, if not stated otherwise in this text.

<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>![WARNING] Risk of crushing! During inspection, do not touch the seat suspension and the swinging structure with your hands. Gradually move up the seat until the highest position (maximum height) is reached.</td>
<td>The seat moves up to the maximum height (seat might oscillate about 40 mm upwards without hitting the stopper). The seat does not move up to the maximum height.</td>
<td>Proceed with inspection step no. 2.2. Replace the level control (Chapter 3.38).</td>
</tr>
</tbody>
</table>
## 2.4 Fault diagnosis

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2</td>
<td>Gradually move down the seat until the lowest position (minimum height) is reached.</td>
<td>The seat moves down to the minimum height (seat might oscillate about 35 mm downwards without hitting the stopper).</td>
<td>Proceed with inspection step no. 2.3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The seat does not move down to the minimum height.</td>
<td>Replace the level control (Chapter 3.38).</td>
</tr>
<tr>
<td>2.3</td>
<td>Press and lock the button for quick lowering of the seat.</td>
<td>The seat moves down to the lowest position as far as possible.</td>
<td>Proceed with inspection step no. 2.4.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The seat does not move down to the lowest position.</td>
<td>Replace the level control (Chapter 3.38).</td>
</tr>
<tr>
<td>2.4</td>
<td>Press and unlock the button for quick lowering of the seat.</td>
<td>Seat moves up by about 35 mm until the minimum height level is reached.</td>
<td>Proceed with inspection step no. 2.5.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seat does not move to the minimum height.</td>
<td>Replace the level control (Chapter 3.38).</td>
</tr>
</tbody>
</table>
### 2.4 Fault diagnosis

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>Move the seat to the middle position and apply load to the seat.</td>
<td>The level control moves the seat to the original position (up). The level control does not move the seat up to the original position.</td>
<td>Proceed with inspection step no. 2.6. Replace the level control (Chapter 3.38).</td>
</tr>
<tr>
<td>2.6</td>
<td>Unload the seat.</td>
<td>The level control moves the seat down to the original position. The level control does not move the seat down to the original position.</td>
<td>End of inspection. Replace the level control (Chapter 3.38).</td>
</tr>
</tbody>
</table>
### 3 Checking the air spring

**Preconditions for fault diagnosis:**
- Compressed-air reservoir pressure at least 7 bar.
- Seat cushion is lifted off in position for repair (Chapter 3.1).
- Bellows at the lower suspension part is removed (see Chapter 3.6).
- The compressed-air hoses have been inspected with regard to kinks and tightness and found to be OK.
- The connections of the air hoses have been inspected with regard to tightness and found to be OK.
- Level control has been inspected and found to be OK.

**Note:** The components mentioned above are illustrated in Chapter 2.1, if not stated otherwise in this text.

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td><img src="icon" alt="WARNING" /> Risk of crushing! During inspection, do not touch the seat suspension and the swinging structure with your hands. Move the seat to the highest position. Check the air spring for abrasion.</td>
<td>Visible abrasion, air spring untight. No abrasion.</td>
<td>Replace the air spring (Chapter 3.36). Proceed with inspection step no. 3.2.</td>
</tr>
<tr>
<td>3.2</td>
<td>Apply load to the seat suspension.</td>
<td>Air escapes at the air spring. Air spring is tight.</td>
<td>Replace the air spring (Chapter 3.36). End of inspection.</td>
</tr>
</tbody>
</table>
4 Inspection of the seat heater (Actros, Atego, Axor, bus seat, Kingman)

Preconditions for fault diagnosis:
- Electrical system of the vehicle has been inspected and found to be OK in compliance with the vehicle operating instructions.
- Seat cushion is lifted off in position for repair without disconnecting the electrical connections (C) and (D) (Chapter 3.1).

Note: The components mentioned above are illustrated in Chapter 2.1, if not stated otherwise in this text.

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 4.1a     | • Disconnect the electrical connection (A) between the seat (Actros, Atego, Axor, bus seat) and the vehicle.  
• Turn the heater switch to heating level 2 (high).  
ATTENTION Malfunction! The heater can only be checked at heating level 1 below 20 °C.  
• Measure the resistance at the contacts in the plug for vehicle connection (pin assignment for Actros, Atego, Axor, bus seat):  
  K3 (red) Ω K4 (black) | = 5.32 Ω (±10 %) (total resistance of the heater mats at approx. 20 °C)  
< 4.78 Ω or  
>> 5.85 Ω | End of inspection. Proceed with inspection step 4.2. |
### 2.4 Fault diagnosis

#### 4.1b • Disconnect the electrical connection (A) between the Kingman seat and the vehicle.

- Turn the heater switch to heating level 2 (high).

⚠️ **ATTENTION** Malfunction!
The heater can only be checked at heating level 1 below 20 °C.

- Measure the resistance at the contacts in the plug for vehicle connection (pin assignment for Kingman):

<table>
<thead>
<tr>
<th>K9 (red)</th>
<th>Ω</th>
<th>K7 (black)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[ R = 5.32 \, \Omega (±10\%) \] (total resistance of the heater mats at approx. 20 °C)

- \( < 4.78 \, \Omega \) or
- \( \gg 5.85 \, \Omega \)

**Troubleshooting**

End of inspection.

Proceed with inspection step 4.2.
## 2.4 Fault diagnosis

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<th>Result/specifed status</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2</td>
<td>• Disconnect the electrical connection (C) between the heater cable and the cable for seat cushion heater as well as the electrical connection (D) between the cable for seat cushion heater and the cable for backrest heater. &lt;br/&gt;• Measure the resistance at the contacts in the plug of backrest heater (2-pin):  &lt;br/&gt;  K1 (yellow) Ω K2 (black)</td>
<td>2.14 Ω (±10 %) (at approx. 20 °C) &lt;br/&gt;  &lt;br/&gt;  &lt;br/&gt;&lt; 1.93 Ω or  &gt; 2.35 Ω</td>
<td>Proceed with inspection step no. 4.3.  &lt;br/&gt;  Replace the backrest (Chapter 3.30).</td>
</tr>
<tr>
<td>4.3</td>
<td>• Short-circuit the socket for the backrest heater (2-pin).  &lt;br/&gt;• Measure the resistance at the contacts in the plug of the seat cushion heater (3-pin):  &lt;br/&gt;  K1 (black) Ω K2 (red)  &lt;br/&gt;  K1 (black) Ω K3 (yellow)</td>
<td>3.18 Ω (±10 %) (at approx. 20 °C) &lt;br/&gt;  &lt;br/&gt;&lt; 2.86 Ω or  &gt; 3.5 Ω</td>
<td>Replace the heater cable (see Chapter 3.20).  &lt;br/&gt;  Replace the seat cushion (see Chapter 3.2).</td>
</tr>
</tbody>
</table>
5 Inspection of the belt tensioner cable

**Preconditions for fault diagnosis:**
- Electrical system of the vehicle has been inspected and found to be OK in compliance with the vehicle operating instructions.
- Seat heater has been inspected and found to be OK.

**Note:** The components mentioned above are illustrated in Chapter 2.1, if not stated otherwise in this text.

<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 belt tensioner and the belt tensioner cable and short-circuit the plug of the belt tensioner cable.  
• Measure the resistance at the contacts in the plug for vehicle connection (pin assignment for Actros, Atego, Axor, bus seat):
  
  K1 (brown) Ω K2 (blue) | << 1 Ω (R→ 0) (pass)  
  ≥ 1 Ω (R→ ∞) (interruption) | End of inspection. Replace the belt tensioner cable (see Chapter 3.20). |
## 6 Inspection of the belt buckle contact

** Preconditions for fault diagnosis:**
- Electrical system of the vehicle has been inspected and found to be OK in compliance with the vehicle operating instructions.
- Seat heater has been inspected and found to be OK.
- Belt buckle with belt buckle cable has been inspected and found to be OK.

**Note:** The components mentioned above are illustrated in Chapter 2.1, if not stated otherwise in this text.

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>• Switch off the heater (switch for seat heater to position &quot;0&quot;).</td>
<td>≥ 1 Ω (R→ ∞) (interruption)</td>
<td>Proceed with inspection step no. 6.2.</td>
</tr>
<tr>
<td></td>
<td>• Snap the belt latch into the belt buckle (no buzzing).</td>
<td>&lt;&lt; 1 Ω (R→ 0) (short-circuit)</td>
<td>Replace the belt buckle contact (see Chapter 3.28).</td>
</tr>
<tr>
<td></td>
<td>• Measure the resistance at the contacts in the plug for vehicle connection</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(pin assignment for Actros):</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>K4 (black) Ω K5 (blue)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 2.4 Fault diagnosis

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.2</td>
<td>• Release the belt latch at the belt buckle (buzzing).</td>
<td></td>
<td>End of inspection.</td>
</tr>
<tr>
<td></td>
<td>• Measure the resistance at the contacts in the plug for vehicle connection</td>
<td></td>
<td>Replace the belt buckle contact (see Chapter 3.28).</td>
</tr>
<tr>
<td></td>
<td>(pin assignment for Actros):</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>K4 (black)  Ω  K5 (blue)</td>
<td>&lt;&lt; 1 Ω (R→ 0) (short-circuit)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>≥ 1 Ω (R→ ∞) (interruption)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7 Inspection of the belt buckle with belt buckle cable

**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.
- The belt buckle is open (belt latch is not locked into the belt buckle).

**Note:** The components mentioned above are illustrated in Chapter 2.1, if not stated otherwise in this text.

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 7.1      | • Disconnect the electrical connection (F) between the belt buckle cable and the cable of the belt buckle contact.  
         | • Measure the resistance at the pins P1 and P2 in the plug of the belt buckle cable. | = $0.2 \, \Omega \ (\pm 10\%)$  
         | | $>> 0.2 \, \Omega \ (\rightarrow \infty)$ (interruption)  
         | | $<< 0.2 \, \Omega \ (\rightarrow 0)$ (short-circuit) | End of inspection.  
         | | Replace the belt buckle and the belt buckle cable (Chapter 3.28). |
### 8 Inspection of the cable for electro-pneumatic gearshift (EPS cable)

#### 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.

**Note:** The components mentioned above are illustrated in Chapter 2.1, if not stated otherwise in this text.

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/operate</th>
<th>Result/specified status</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 8.1      | • Disconnect the electrical connection between the EPS cable and the vehicle.  
          • Disconnect the electrical connection (G) between the EPS cable and the EPS control element.  
          • Short-circuit the contacts at the socket of the EPS cable and measure the resistance at the corresponding pins P1 to P9 at the plug of the EPS cable:  
          P1  \( \Omega \)  P2 to P9 | \(< 1 \, \Omega \, (R \rightarrow 0) \) (pass)  
\( \geq 1 \, \Omega \, (R \rightarrow \infty) \) (interruption) | End of inspection.  
Replace the EPS cable (see Chapter 3.21). |
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3.50 Cable harness heater switch – removal and installation (seat with climate control system)
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3.52 Radial fan for backrest – removal and installation (seat with climate control system)
3.53 Control module for climate control system – removal and installation (seat with climate control system)
3.54 Cable harness for microphone – removal and installation (seat with climate control system)
3.55 Microphone support – removal and installation (seat with climate control system)
3.56 Play in the backrest locking mechanism – inspection and adjustment
3.1 Seat cushion in position for repair – lifting off and attachment

(1) Seat cushion
(2) Velcro fastener (at the cover of the backrest (4) and the seat cushion (1)).
(3) Bowden pull wire for seat angle adjustment
(4) Backrest
(5) Slider
(6) Lever for seat depth adjustment
(7) Spring
(8) Cable tie
(9) Cable seat cushion heater
(10) Seat frame
3.1 Seat cushion in position for repair – lifting off and attachment

RAISE/ATTACH

Raise, attach

1. Push the seat cushion (1) as far forward as possible.

2. Horizontally push the screwdriver through the third drill hole from the front (arrows) at the left in the seat cushion (1) under the spring (7) and unlock the seat cushion (1) by lifting the springs (7). Simultaneously pull the handle for seat depth adjustment (6) in upward direction and push the seat cushion (1) forwards.

3. Lift off the seat cushion (1) in upward direction over the sliders (5).

**Installation note:**
Place the seat cushion (1) in the right position on the sliders (5) and press it down until it can be pushed backwards and locks into place.
3.1 Seat cushion in position for repair – lifting off and attachment

RAISE/ATTACH

4 Mark the point where the Bowden pull wire for the seat angle adjustment (3) is fastened at the seat cushion (1) with cable tie (8), and remove the cable tie (8).

5 Undo the Velcro fastener (2) between the backrest (4) and the seat cushion (1).

Notes:
- For easy disconnection and reconnection of the electrical connections, detach the covering on the left in position for repair (Chapter 3.4) and remove covering at the rear (see Chapter 3.5).
- For seats with climate control system, the cable for the backrest cushion heater is guided out of the backrest at the bottom right (see Chapter 3.49).
3.1 Seat cushion in position for repair – lifting off and attachment

6 Mark the point where the cable of the seat cushion heater (9) is fastened at the seat support (10) with cable tie (11) and remove the cable tie (11).

7 Mark the points where the electrical connections (C, D) are bundled with a cable tie (12) and remove the cable tie (12).

**Installation note:**
The cable tie (12) must be lead through the cable tie (13) affixed to the seat frame (10) to fix the electrical connections (C, D) to the seat frame (10).

8 Disconnecting electrical connections (C, D) between cable for seat cushion heater (9) and cable for vehicle connection (14) and between cable cushion heater (9) and cable for backrest cushion heater (15).
3.1 Seat cushion in position for repair – lifting off and attachment

9 Seat with climate control system:
Disconnect the electrical connection between the cable harness for backrest and seat fan cable (see Chapter 2.12.).

10 ATTENTION Damage!

Place the seat cushion (1) on the right side of the seat without distorting or kinking the Bowden pull wire for seat angle adjustment (3).

11 Mount the components in reverse order of their removal.
3.2 Seat cushion and lever for seat angle and seat depth adjustment – removal and installation

REMOVAL / INSTALLATION

(1) Round head screw ............... 2.5 Nm
(2) Locking plate
(3) Seat cushion
(4) Seat plate
(5) Housing
(6) Lever for seat depth adjustment
(7) Lever for seat angle adjustment
(8) Hauling rope
(9) Lock washer
(10) Holding plate
(11) Bowden pull wire for seat angle adjustment

1 Lift off the seat cushion in position for repair (Chapter 3.1).
3.2 Seat cushion and lever for seat angle and seat depth adjustment – removal and installation

Removal and installation

2 Operate the lever for seat angle adjustment (7) and position the latches (13) between two cutouts in the seat frame (12).

3 Unscrew two round head screws (1).
   **Installation note:**
   Round head screw (1), 2.5 Nm.

4 Loosen the lock washer (9) at the Bowden pull wire for seat angle adjustment (11).

5 Remove the Bowden pull wire for seat angle adjustment (11) at the seat plate (4) and remove the holding plate (10).
3.2 Seat cushion and lever for seat angle and seat depth adjustment – removal and installation

REMOVAL / INSTALLATION

6 Pull out the housing (5) at the seat cushion (3) until the hauling rope (8) is accessible.

**Installation notes:**
- When inserting the housing (5), press the locking plate (2) towards the seat plate(4) so that the hook (arrow) at the lever for seat depth adjustment (6) can be pushed under the locking plate (2).
- Apply acid-free multi-purpose lubricant to the bearing area (F) of the locking plate (2).

7 Remove the hauling rope (8) at the lever for seat angle adjustment (7).
3.2 Seat cushion and lever for seat angle and seat depth adjustment –
removal and installation

REMOVAL / INSTALLATION

8 Pull out the housing (5) with the lever for seat angle adjustment (7) and seat
depth adjustment (6) out of the seat cushion (3).

9 Remove the seat cushion (3).

10 Re-install the components in the reverse order of their removal.
3.3 Seat cushion cover – removal and installation

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3.3.1 Seat cushion cover – removal and installation
3.3.2 Seat cushion cover – removal and installation (seat with climate control system)
3.3.1 Seat cushion cover – removal and installation

REMOVAL INSTALLATION

TABLE OF CONTENTS

1. Lift off the seat cushion in position for repair (Chapter 3.1).

2. Remove the seat cushion and lever for seat angle and seat depth adjustment (Chapter 3.2).

Note:
No claims for warranty can be accepted if you install the seat cushion covers of other manufacturers than GRAMMER AG.

(1) Seat cushion cover (2) Foam plastic part (3) Cable seat cushion heater (4) Velcro (5) Seat plate (6) Clamp ................. 16 each, replace
3.3.1 Seat cushion cover – removal and installation

Removal

3 Mark the location of clamps (6) – 16 pcs. – and remove the seat cushion cover (1) from the clamps (6) using a stopping knife.

4 **ATTENTION** Damage!

The seat cushion cover (1) is secured in the seat pan area with two Velcro fasteners (4). When separating the Velcro fasteners, make sure the Velcros (4) are not torn out of the foam plastic part (2).

Pull off the seat cushion cover (1) from the foam part (2) and remove the seat cushion heater cable (3) by guiding it through the seat plate (5).
3.3.1 Seat cushion cover – removal and installation

**Installation**

1. Push new clamps (6) – 16 pcs. – at the marked locations onto the seat plate (5).

2. Guide the seat cushion heater cable (3) into the seat plate (5) and evenly install the seat cushion cover (1) onto the foam part (2) starting from the back to the front.

3. Turn back the edge of the seat cushion cover (1) along the slinging strap and evenly push it into the clamps (6) from the back to the front (A – A) using a stopping knife. While doing so, compress the foam plastic part (2) to release the tension in the seat cushion cover (1).

4. Install the seat cushion and lever for seat angle and seat depth adjustment (Chapter 3.2).

5. Install the seat cushion (Chapter 3.1).
### 3.3.2 Seat cushion cover – removal and installation

(seat with climate control system)

**REMOVAL**

<table>
<thead>
<tr>
<th>Material no. 1153450_c</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Seat cushion cover</td>
</tr>
<tr>
<td>(2) Foam plastic part</td>
</tr>
<tr>
<td>(3) Ventilation cushion (fabric inlay)</td>
</tr>
<tr>
<td>(4) Seat plate</td>
</tr>
<tr>
<td>(5) Clamp ............... 16 each, replace</td>
</tr>
<tr>
<td>(6) Tie strap</td>
</tr>
<tr>
<td>(7) Lug</td>
</tr>
<tr>
<td>(8) Cable seat cushion heater</td>
</tr>
<tr>
<td>(9) Cable for seat fan</td>
</tr>
<tr>
<td>(10) Cable tie</td>
</tr>
<tr>
<td>(11) Slinging strap</td>
</tr>
<tr>
<td>(12) Clamping plate (at seat plate)</td>
</tr>
</tbody>
</table>

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**INSTALLATION**

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**Note:**

No claims for warranty can be accepted if you install the seat cushion covers of other manufacturers than GRAMMER AG.
3.3.2 Seat cushion cover – removal and installation
(seat with climate control system)

**REMOVAL**

1. Lift off the seat cushion in position for repair (Chapter 3.1).

2. Remove the seat cushion and lever for seat angle and seat depth adjustment (Chapter 3.2).

**Removal**

3. Mark the installation position of the 16 clamps (5) at the seat plate (4) and seat cushion cover (1).

4. Lever out the first clamp (5) at the front with suitable means, such as screwdriver for example, from the revolving groove of the seat plate (4).

5. Remove all further clamps (5) one by one at the seat plate (4).

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**INSTALLATION**

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3.3.2 Seat cushion cover – removal and installation
(seat with climate control system)

REMOVAL     INSTALLATION

6 Carefully remove clamps (5) at the seat cushion cover (1).

7 Mark the point where the cable for the seat cushion heater (8) and the seat fan cable (9) are bundled with a cable tie (10) and remove the cable tie (10).

8 Slightly bend open the clamping plate (12) and remove the seat heater cable (8) and the seat fan cable (9) through the opening (arrow) of the seat plate (4) in upward direction, remove the seat plate (4).
### 3.3.2 Seat cushion cover – removal and installation
(seat with climate control system)

#### ATTENTION Damage!

The seat cushion cover (1) is kept under tension with two lugs (7) at tie straps (6) in the seat pan area at the back. When removing the seat cushion cover (1), make sure that the tie straps (6) do not tear.

Pull off the seat cushion cover (1) at the foam plastic part (2).

#### Place the two lugs (7) vertical and pull out in upward direction through the slits in the foam plastic part (2).

#### Remove the seat cushion cover (1) at the foam plastic part (2).

**Installation note:**

Ensure that the ventilation cushion (3) has been placed correctly in the foam plastic part (2).
3.3.2 Seat cushion cover – removal and installation  
(seat with climate control system)

Installation

1. Push 16 new clamps (5) onto the seat plate (4) at the marked locations.

2. Guide the two lugs (7) at the tie straps (6) out through the slits in the foam plastic part (2) in downward direction, then turn until they lie evenly under tension at the foam part (2).

3. Evenly install the seat upholstery (1) over the foam plastic part (2) starting from the back to the front.

4. Lead out the seat heater cable (8) and seat fan cable (9) downward through the opening (arrow) of the seat plate (4) and fasten with the clamping plate (12).
3.3.2 Seat cushion cover – removal and installation
(seat with climate control system)

REMOVAL INSTALLATION

TABLE OF CONTENTS

5 Fasten the cable for the seat cushion heater (8) and the seat fan cable (9) with cable tie (10) at the marked location.

6 Turn back the edge of the seat upholstery (1) along the slinging strap (11) and push it evenly on both sides into the clamps (5) from the back to the front (A – A) using suitable means such as a stopping knife, for example. While doing so, compress the foam plastic part (2) to release the tension in the seat upholstery (1).

7 Install the seat cushion and lever for seat angle and seat depth adjustment (Chapter 3.2).

8 Install the seat cushion (Chapter 3.1).
3.4 Left covering in position for repair – removal and attachment

REMOVAL/ATTACHMENT

(1) Left covering
(2) Lever for seat height adjustment
(3) Raised countersunk head screw .......................... 3 Nm
(4) Support
(5) Round head screw ............. 1.7 Nm
(6) Seat frame
(7) Upper snap-in hook
(8) Lower snap-in hook
(9) Rear snap-in hook
(10) Front snap-in hook
(11) Central snap-in hook
(12) Rear covering
(13) Front covering
(14) Handle support

1 Lift off the seat cushion in position for repair (Chapter 3.1).
3.4 Left covering in position for repair – removal and attachment

Removal, attachment

2 Unscrew the raised countersunk head screw (3) and pull off the lever for seat height adjustment (2) at the handle support (14).

**Installation note:**
Raised countersunk head screw (3), 3 Nm.

3 Unscrew the round head screw (5).

**Installation note:**
Round head screw (5), 1.7 Nm.

⚠️ **ATTENTION** Risk of breakage!
The left covering (1) is held by nine snap-in hooks and is wedged in the plastic. Use suitable screwdrivers to carefully unhook the parts.

4 Carefully detach the upper snap-in hooks (7) on the left covering (1) from the supports (4).
5 Detach the left covering (1) at the bottom of the supports (4). To do this, carefully pull the lower snap-in hooks (8) at the height of the supports (4) first in downward and then in outward direction.

6 Carefully pull the central snap-in hook (11) at the left covering (1) out of the seat frame (6).

7 Carefully detach the front snap-in hook (10) at the left covering (1) from the front covering (13).

8 Carefully detach the rear snap-in hook (9) at the left covering (1) from the rear covering (12).

9 Carefully pull off the left covering (1) over the operator levers and put it on the left side of the seat.

10 Mount the components in reverse order of their removal.
### 3.5 Entire covering – removal and attachment

#### REMOVAL / INSTALLATION

<table>
<thead>
<tr>
<th>No.</th>
<th>Component</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Covering, right-hand</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Rear covering</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Backrest</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Seat frame</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Round head screw</td>
<td>1.7 Nm</td>
</tr>
<tr>
<td>6</td>
<td>Left covering</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Plug (for cable for heater switch)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Air hose for lateral support</td>
<td></td>
</tr>
<tr>
<td></td>
<td>adjustment</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Air hose of the upper lumbar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>support</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Air hose of the bottom lumbar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>support</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Hose nozzle</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Air hose for lumbar support</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and lateral support adjustment</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Valve (for lumbar support and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>lateral support adjustment</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Support</td>
<td></td>
</tr>
</tbody>
</table>
3.5 Entire covering – removal and attachment

REMOVAL / INSTALLATION

(15) Belt buckle
(16) Covering, front
(17) Lower snap in hook
(18) Upper snap in hook
(19) Cover (delivery option)
(20) Cross-head screw
   (delivery option) ....................... 3 Nm
(21) Lever for fore/aft isolator (delivery option)
(22) Hose nozzle
(23) Heater switch
(24) Holder (pin) at the center
(25) Support at the rear
(26) Bracket at the front
(27) Eccentric
(28) Heater switch
(29) Plug (cable harness for heater switch)
3.5 Entire covering – removal and attachment

1. Lift off the seat cushion in position for repair (Chapter 3.1).

2. Remove the left covering in position for repair (Chapter 3.4).

3. **Seat with operator console and armrest for electro-pneumatic gearshift:**
   3.1 Remove the supporting structure for electro-pneumatic gearshift (see Chapter 3.25).

   3.2 Unthread the cable for electro-pneumatic gearshift (EPS) (see Chapter 3.21).
3.5 Entire covering – removal and attachment

REMOVAL / INSTALLATION

Removal and installation

4 Seat without climate control system:
Disconnect the electrical connection (B) between the connector (7) and heater switch (23).

5 Seat with climate control system:
Mark two electrical connections (N) (note the color of the cables) and disconnect the electrical connections (N) between the six connectors (29) and the heater switch (28).

Installation note:
Re-establish the electrical connections (N) according to the markings.
3.5 Entire covering – removal and attachment

REMOVAL / INSTALLATION

ATTENTION Hydrostatic test!
The hydraulic test of the seat should be performed after connecting the air hoses (8, 9, 10, 12).

6 Remove three hose clamps (11) at the air hoses (8, 9, 10) and one hose clamp (22) at the air hose (12) and push towards the back.

ATTENTION Damage!

7 Do not damage air hoses (8, 9, 10, 12) and connections (arrows) of the valve (13). Do not use a screwdriver, for example, or a similar tool to lift off the air hoses (8, 9, 10, 12) at the connections (arrows) of the valve (13).
3.5 Entire covering – removal and attachment

Mark the air hoses (8, 9, 10, 12) and cut off with a sharp knife in a clean and straight way directly behind the connections (arrows) of the valve (13).

**Installation notes:**
- Install the air hoses (8, 9, 10, 12) according to the marking.
- Push the air hoses (8, 9, 10, 12) completely to the connections (arrows) of the valve (13).
- When attaching the new left covering (6), the valves (13) and the heater switch (23) should be adapted.

**Notes:**
- For easier removal, carefully slit the air hose ends at the connections (arrows) of the valve (13) with a sharp knife.
- The air hoses (8, 9, 10, 12) can be cut off only once.
- After cutting, mark the air hoses (8, 9, 10, 12) in order not to cut them several times.
8 Unscrew the round head screw (5).

**Installation note:**
Round head screw (5), 1.7 Nm.

⚠️ **ATTENTION,** risk of breakage!
The right covering (1) is held by snap in hooks and is wedged into the plastic. Use suitable screwdrivers to carefully lever the hooks out.

9 Carefully detach the snap-in hooks at the back (25) on the right-hand covering (1) from the covering at the back (2) and remove the covering at the back (2).

10 Carefully detach the upper snap-in hooks (18) on the right-hand covering (1) from the supports (14).
3.5 Entire covering – removal and attachment

REMOVAL / INSTALLATION

11 Detach the right covering (1) at the bottom from the supports (14). First carefully press the bottom snap-on hook (17) upwards at the level of the supports (14) and then pull it in outward direction.

12 Carefully pull out the middle snap-in hook (24) from the seat support (4) at the right-hand covering (1).

13 Seat with fore/aft isolator:
13.1 Lever out the cover (19) at the lever for the fore/aft isolator (21).

13.2 Unscrew the cross-head screw (20).
   
   *Installation note:*
   Cross-head screw (20), 3 Nm.

13.3 Pull off the lever for the fore/aft isolator (21) at the eccentric (27).
3.5 Entire covering – removal and attachment

14 Carefully detach the front snap-in hook (26) at the right-hand covering (1) from the support at the front (16).

15 Remove the front covering (16).

16 Carefully pull the right-hand covering (1) over the belt buckle (15) and remove.

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

REMOVAL / INSTALLATION

(1) Bellows
(2) Lever for seat fore/aft adjustment
(3) Seat frame
(4) Lower suspension part
(5) Seat fore/aft adjustment
(6) Supporting structure (Actros, bus seat)
(7) Bellows pin
(8) Cable tie
(9) Bowden pull wire for backrest adjustment
(10) Cable tie
(11) Cable tie
(12) Bowden pull wire for fore/aft isolator
(13) Support
(14) Handle rail
3.6 Bellows – removal and installation

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Seat with operator console and armrest for electro-pneumatic gearshift:

2.1 Remove the cable for the electro-pneumatic gearshift (EPS cable) (see Chapter 3.21).

Note:
The EPS cable does not need to be removed at the swinging structure and at the pin contact strip.

2.2 Remove the operator console for the electro-pneumatic gearshift (see Chapter 3.25).

3 Remove the left covering in position for repair (Chapter 3.4).
3.6 Bellows – removal and installation

REMOVAL / INSTALLATION

4 Remove the entire covering (Chapter 3.5).

**Note:**
The rear and front covering do not need to be removed at the right covering.

Removal and installation

5 Remove ten bellows pins (7) at the lower suspension part (5).

6 Mark the point where the Bowden pull wire for backrest adjustment (9) is fastened to the rear of the bellows (1) by means of cable ties (8) and remove the cable ties (8).

**Installation note:**

⚠️ **ATTENTION** Malfunction!
Loosely fix the Bowden pull wire (9) by means of the cable tie (8) at the marked point and make sure it is not distorted.
### 7 Seat with fore/aft isolator:
Mark the point where the Bowden pull wire for the fore/aft isolator (12) is fastened to the front of the bellows (1) by means of cable ties (11) and remove the cable ties (11).

**Installation note:**

⚠️ **ATTENTION** Malfunction!
Loosely fix the Bowden pull wire (12) by means of the cable tie (11) at the marked point and make sure it is not distorted.

### 8 Mark the points where the bellows (1) is fastened to the right side of the seat frame (3) and to the left side of the handle rail (14) by means of two cable ties (10) and remove the cable ties (10).

### 9 Detach the bellows (1) at the supports (13).
3.6 Bellows – removal and installation

REMOVAL / INSTALLATION

10 Remove five bellows pins (7) at the seat frame (3).

11 Push the seat backwards over the seat fore/aft adjustment (5) as far as possible.

12 Pull the rear part of the bellows (1) downwards over the lower suspension part (4) and the locking rail of the seat fore/aft adjustment (5).

13 Push the seat forwards over the seat fore/aft adjustment (5) as far as possible.

14 Lift the front part of the bellows (1) over the lever for seat fore/aft adjustment (2) and remove it in downward direction.

15 Re-install the components in the reverse order of their removal.
3.7 Bowden pull wire and button for quick lowering of the seat – removal and installation

REMOVAL / INSTALLATION

(1) Bowden pull wire for quick lowering of the seat
(2) Rounded head screw (inner race) ......................... 3 Nm
(3) Handle rail
(4) Lever (for quick lowering of the seat)
(5) Holder (for quick lowering of the seat)
(6) Button (for quick lowering of the seat)
(7) Support (handle rail)
(8) Retracting spring
(9) Valve lever
(10) Lock washer
(11) Retainer (level control)
(12) Grooved pin ......................... to grease
(13) Lock washer
(14) Snap-in element
(15) Rounded head screw (inner race) ......................... 3 Nm
(16) Seat frame
3.7 Bowden pull wire and button for quick lowering of the seat – removal and installation

REMOVAL / INSTALLATION

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the left covering in position for repair (Chapter 3.4).

3 Remove the bellows at the rear left of the seat frame (see Chapter 3.6).

Removal and installation

4 **ATTENTION** Risk of crushing!

Bring the seat into the highest position and secure the swinging structure to the front plastic rollers of the lower suspension part by means of appropriate spacers.
5 Mark the installation position of the Bowden pull wire for quick lowering of the seat (1) prior to removal.

**Installation note:**
Place the Bowden pull wire for quick lowering of the seat (1) according to the marking.

6 Loosen the lock washer (10) at the Bowden pull wire (1).

7 Detach the Bowden pull wire (1) at the retainer (11).

8 Remove the Bowden pull wire (1) from the valve lever (9).

**Note:**
For easier removal of the Bowden pull wire (1), press the retracting spring (8) against the Bowden pull wire (1) (strain relief).
3.7 Bowden pull wire and button for quick lowering of the seat – removal and installation

REMOVAL / INSTALLATION

9 Pull the Bowden pull wire (1) out of the seat suspension in backward direction.

10 Pull out the clip (17) at the seat frame (16).

11 Remove the Bowden pull wire (1) from the clip (17).

12 Unscrew two rounded head screws (2) and lay the handle rail (3) down. **Installation note:** Rounded head screw (2), 3 Nm.

13 Detach the Bowden pull wire (1) at the support (7). **Installation note:** Hang the Bowden pull wire (1) into the first upper clamp of the support (7).
3.7 Bowden pull wire and button for quick lowering of the seat – removal and installation

REMOVAL / INSTALLATION

14 Loosen the lock washer (13) at the Bowden pull wire (1).

15 Remove the Bowden pull wire (1) from the holder (5).

16 Detach the Bowden pull wire (1) at the lever (4) and remove it.
   **Installation note:**
   Hand the Bowden pull wire (1) into the front drill hole of the lever (4).

17 If the button for quick lowering of the seat (6) is defective:
   17.1 Pull out the grooved pin (12) at of the lever (4) and at the holder (5) in forward direction and remove the lever (4).
   **Installation note:**
   Apply acid-free multi-purpose lubricant to the entire external surface (F) of the grooved pin (12).
3.7 Bowden pull wire and button for quick lowering of the seat – removal and installation

REMOVAL / INSTALLATION

17.2 Unscrew two rounded head screws (15) and remove the button for quick lowering of the seat (6).

**Installation note:**
Rounded head screw (15), 3 Nm.

18 If the snap-in element (14) is defective:
Remove the snap-in element (14) from the holder (5).

19 Re-install the components in the reverse order of their removal.
3.8 Bowden pull wire for seat height adjustment – inspection and adjustment

**INSPECTION**

1. Bowden pull wire for seat height adjustment
2. Handle for seat height adjustment
3. Button for quick lowering of the seat
4. Level control
5. Regulating screw
6. Counternut
7. Nut
8. Nipple
9. Suspension head

1. Lift off the seat cushion in position for repair (Chapter 3.1).

2. Press and unlock the button for quick lowering of the seat (3).
3.8 Bowden pull wire for seat height adjustment – inspection and adjustment

Inspection

Note:
Check the Bowden pull wire for seat height adjustment (1) for correct functioning upon installation.

3 Operate the handle for seat height adjustment (2) in both directions as far as possible (pulling it upwards / pushing it downwards) and check it for correct functioning:
• locking in each step for a maximum of nine locking steps (eight actuations)
• easy running of the Bowden pull wire for seat height adjustment (1)
• smooth operation of the handle for seat height adjustment (2)
• tight suspension of the Bowden pull wire for seat height adjustment (1) at the level control (4) (regarding tensional force).
3.8 Bowden pull wire for seat height adjustment – inspection and adjustment

Adjustment

Notes:
• No different adjustable dimensions of the Bowden pull wires for seat height adjustment (1) with regard to seat models with left-hand or right-hand drive.
• The new Bowden pull wire for seat height adjustment (1) must be preadjusted outside the seat.

1 With the Bowden pull wire for seat height adjustment (1) being installed:
1.1 Remove the left covering in position for repair (Chapter 3.4).

1.2 Remove the bellows at the rear left of the handle rail (see Chapter 3.6).

1.3 Detach the Bowden pull wire for seat height adjustment (1) at both ends (see Chapter 3.9).
3.8 Bowden pull wire for seat height adjustment – inspection and adjustment

**INSPECTION**  **ADJUSTMENT**

2 Pull the Bowden pull wire for seat height adjustment (1) as far as possible (arrow) and use a slide gauge to check the adjustable dimension (A) between the nipple (8) and the suspension head (9) (excess length of the wire).

**Adjustable dimension:** \( A = 217 \text{ mm} \)

3 Loosen the counternut (6) and adjust the required adjustable dimension (A) by means of the regulating screw (5).

4 Turn the regulating screw (5) away from the nut (7) in order to shorten the adjustable dimension (A) or turn the regulating screw (5) towards the nut (7) in order to extend the adjustable dimension (A).
5 Hold the nut (7) in position and secure the adjustment with the counternut (6).

**Note:**
Make sure not to distort the Bowden pull wire for seat height adjustment (1).

6 If the Bowden pull wire for seat height adjustment (1) has been removed:
Hang in the Bowden pull wire for seat height adjustment (1) at both ends (see Chapter 3.9).

7 Install the Bowden pull wire for seat height adjustment (1) (see Chapter 3.9).

8 Operate the handle for seat height adjustment (2) several times in both directions, check it for correct functioning and readjust it, if necessary.
3.8 Bowden pull wire for seat height adjustment – inspection and adjustment

9 Install the bellows at the rear left of the handle rail (see Chapter 3.6).

10 Attach the left covering (Chapter 3.4).

11 Press and unlock the button for quick lowering of the seat (3).

12 Install the seat cushion (Chapter 3.1).
### 3.9 Bowden pull wire and handle support for seat height adjustment – removal and installation

**REMOVAL / INSTALLATION**

<table>
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<tr>
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<td>3 Nm</td>
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<tr>
<td>3</td>
<td>Handle rail</td>
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<td>4</td>
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<td>6</td>
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<td>13</td>
<td>Bowden pull wire for quick lowering of the seat</td>
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</table>
3.9 Bowden pull wire and handle support for seat height adjustment – removal and installation

REMOVAL / INSTALLATION

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the left covering (Chapter 3.4).

3 Remove the bellows at the rear left of the seat frame (see Chapter 3.6).

Removal and installation

4 WARNING Risk of crushing!

Bring the seat into the highest position and secure the swinging structure to the front plastic rollers of the lower suspension part by means of appropriate spacers.

5 Mark the installation position of the Bowden pull wire for seat height adjustment (1) prior to removal.
6 Remove the Bowden pull wire (1) from the control disc (7).

**Note:**
For easier removal of the Bowden pull wire (1), press the control disc (7) against the Bowden pull wire (1) (strain relief).

7 Loosen the lock washer (9) at the Bowden pull wire (1).

8 Remove the Bowden pull wire (1) from the holder (8).

9 Pull the Bowden pull wire (1) out of the seat suspension in backward direction.

10 Pull out the clip (14) at the rear lower left of the seat frame (12).

11 Remove the Bowden pull wire (1) from the clip (14).
3.9 Bowden pull wire and handle support for seat height adjustment – removal and installation

REMOVAL / INSTALLATION

12 Unscrew two rounded head screws (2) and lay the handle rail (3) down. **Installation note:** Rounded head screw (2), 3 Nm.

13 Loosen the lock washer (10) at the Bowden pull wire (1).

14 Detach the Bowden pull wire (1) at the holder for seat height adjustment (6).

15 Remove the Bowden pull wire (1) from the drum (11).
3.9 Bowden pull wire and handle support for seat height adjustment – removal and installation

16 Unthread the Bowden pull wire (1) between the drum (11) and the handle support for seat height adjustment (6) and remove it.

**Installation notes:**
- The Bowden pull wire (1) has to be hung into the guide (arrow) of the handle support for seat height adjustment (6).
- The Bowden pull wire (1) has to be placed around the drum (11).

17 If the handle support for seat height adjustment (6) is defective:

17.1 Drive the grooved pin (4) out of the handle rail (3).
17.2 Pull the handle support for seat height adjustment (6) out of the handle rail (3).

**Note:**
To pull the handle support for seat height adjustment (6) out more easily, detach the Bowden pull wire for quick lowering of the seat (13) at the support (5) (see Chapter 3.7).

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

**Installation notes:**
- Preadjust the new Bowden pull wire (1) to the correct length (see Chapter 3.8).
- Lay the Bowden pull wire for set height adjustment (1) according to the marking.
- Check the Bowden pull wire upon installation (see Chapter 3.8).
3.10 Bowden pull wire for vertical shock absorber adjustment —
inspection and adjustment

INSPECTION       ADJUSTMENT

(1) Bowden pull wire for vertical shock absorber adjustment
(2) Lever for vertical shock absorber adjustment
(3) Vertical shock absorber
(4) Adjusting lever
(5) Compression spring
(6) Regulating screw
(7) Counternut
(8) Nut
(9) Hauling rope

1 Lift off the seat cushion in position for repair (Chapter 3.1).
3.10 Bowden pull wire for vertical shock absorber adjustment – inspection and adjustment

**Inspection**

2 Operate the lever for vertical shock absorber adjustment (2) several times in both directions and check the following:
- Check the Bowden pull wire for vertical shock absorber adjustment (1) for easy running.
- Check the lever for vertical shock absorber adjustment (2) for wear.
- Check the adjusting lever (4) for contamination.

3 Turn the lever for vertical shock absorber adjustment (2) to the middle position.
3.10 Bowden pull wire for vertical shock absorber adjustment – inspection and adjustment

INSPECTION     ADJUSTMENT

4 Check the adjustment of the vertical shock absorber (3):
   • The adjusting lever (4) must be set to the middle position (line "A") in relation to the vertical shock absorber (3).
   • The compression spring (5) must tighten the Bowden pull wire for vertical shock absorber adjustment (1).

Adjustment

Note:
The adjustment of the Bowden pull wire for vertical shock absorber adjustment (1) is the same for seat models with left-hand and with right-hand drive.

1 Remove the left covering in position for repair (Chapter 3.4).

2 Remove the bellows at the rear left of the handle rail (see Chapter 3.6).
3.10 Bowden pull wire for vertical shock absorber adjustment –
inspection and adjustment

3 Turn the lever for vertical shock absorber adjustment (2) to the middle position.

4 Loosen the counternut (7) and bring the adjusting lever (4) to the middle position in relation to the vertical shock absorber (3) (line "A") by means of the regulating screw (6).

5 Turn the regulating screw (6) away from the nut (8) in order to shorten the excess length of the hauling rope (9) or turn the regulating screw (6) towards the nut (8) in order to extend the excess length of the hauling rope (9).
3.10 Bowden pull wire for vertical shock absorber adjustment –
inspection and adjustment

6 Hold the nut (8) in position and secure the adjustment with the counternut (7).

**Note:**
Make sure not to distort the Bowden pull wire for vertical shock absorber adjustment (1).

7 Operate the lever for vertical shock absorber adjustment (2) several times in both directions, check it for correct functioning and readjust it, if necessary.

8 Install the bellows at the rear left of the handle rail (see Chapter 3.6).

9 Attach the left covering (Chapter 3.4).

10 Install the seat cushion (Chapter 3.1).
3.11 Bowden pull wire and lever for vertical shock absorber adjustment – removal and installation

REMOVAL / INSTALLATION

(1) Bowden pull wire for vertical shock absorber adjustment
(2) Support
(3) Lever for vertical shock absorber adjustment
(4) Adjusting lever
(5) Fork
(6) Compression spring
(7) Vertical shock absorber
(8) Bearing
(9) Lock washer
(10) Axle (swinging structure)
(11) Support
(12) Seat frame
(13) Clip
3.11 Bowden pull wire and lever for vertical shock absorber adjustment – removal and installation

**REMOVAL / INSTALLATION**

| (14) Axial locking ring | replace |
| (15) Compression spring |
| (16) Holder (lever for vertical shock absorber) |
| (17) Lock washer |
| (18) Holder (Bowden pull wire) |

1. Lift off the seat cushion in position for repair (Chapter 3.1).

2. Remove the left covering in position for repair (Chapter 3.4).
3.11 Bowden pull wire and lever for vertical shock absorber adjustment – removal and installation

Removal and installation

3  **WARNING** Risk of crushing!

Bring the seat into the highest position and secure the swinging structure to the front plastic rollers of the lower suspension part by means of appropriate spacers.

4 Turn the lever for vertical shock absorber adjustment (3) forwards to release tension from the Bowden pull wire (1).

5 Detach the fork (5) at the adjusting lever (4).

6 Compress the compression spring (6) (arrow) and take off the hauling rope of the Bowden pull wire (1) at the bearing (8).
3.11 Bowden pull wire and lever for vertical shock absorber adjustment – removal and installation

7 Take off the Bowden pull wire (1) at the fork (5) and remove the compression spring (6).

8 If the bearing (8) is defective:
8.1 Pull off the adjusting lever (4) at the pin of the vertical shock absorber (7).
8.2 Loosen the lock washer (9) at the axle (10).
8.3 Pull off the bearing (8) at the axle (10).

9 Mark the fixing position of the Bowden pull wire (1) at the holder (11) and detach the Bowden pull wire (1) at the holder (11).

Installation note:
Hang the Bowden pull wire (1) into the holder (11) according to the marking.
3.11 Bowden pull wire and lever for vertical shock absorber adjustment – removal and installation

10 Pull the Bowden pull wire (1) out of the seat suspension in backward direction.

11 Pull out the clip (13) at the seat frame (12).

12 Remove the Bowden pull wire (1) from the clip (13).

13 Remove the Bowden pull wire (1) from the support (2).

**Installation note:**
Hang the Bowden pull wire (1) into the lower clamp of the support (2).

14 Loosen the lock washer (17) at the Bowden pull wire (1).
3.11 Bowden pull wire and lever for vertical shock absorber adjustment –
removal and installation

REMOVAL / INSTALLATION

15 Remove the Bowden pull wire (1) at
the holder (18).

16 Hang out the Bowden pull wire (1) at
the lever for vertical shock absorber
adjustment (3) and remove it.

**Installation notes:**
- Hang the Bowden pull wire (1) into
  the front hole of the lever for vertical
  shock absorber adjustment (3).
- Adjust the new Bowden pull wire
  (1) to the length of the old one (1)
  (excess length of the wire).
- Check the Bowden pull wire upon
  installation (see Chapter 3.10).
3.11 Bowden pull wire and lever for vertical shock absorber adjustment – removal and installation

If the lever for vertical shock absorber adjustment (3) is defective:

17.1 Detach two axial locking rings (14) at the holder (16).

**Installation notes:**
- Replace the axial locking ring (14).
- The axial locking rings (14) must lie flat against the web (arrow) of the holder (16).

17.2 Pull off the spring (15) and the lever for vertical shock absorber adjustment (3) at the holder (16).

18 Re-install the components in the reverse order of their removal.
3.12 Bowden pull wire for backrest adjustment – inspection and adjustment

(1) Bowden pull wire for backrest adjustment (left)

(2) Bowden pull wire for backrest adjustment (right)

(3) Lock

(4) Tooth sheet

(5) Retaining spring

(6) Bracket for backrest hook-in function

(7) Torsion spring

(8) Backrest

(9) Regulating screw

(10) Counternut

(11) Nut

(12) Lever for backrest adjustment

(13) Holder
3.12 Bowden pull wire for backrest adjustment – inspection and adjustment

**Inspection**

1. Lift off the seat cushion in position for repair (Chapter 3.1).

2. Apply load to the backrest (8) and lock/unlock it several times using the lever for backrest adjustment (12) and check the following:
   - easy running of the Bowden pull wires (1, 2)
   - contamination of the lock (3)
   - synchronous locking of the left and right side without jamming

3. Check the backrest clearance at the upper edge of the backrest (8).
   **Specified value:** no clearance or only minimal clearance "A".
3.12 Bowden pull wire for backrest adjustment – inspection and adjustment

**INSPECTION**

4 Carefully pivot the backrest (8) forwards against the stop.

5 Check the adjustment of the left and right lock (3):
   - The lever for backrest adjustment (12) must lie flat against the holder (13).
   - The gear segment of the lock (3) must fully engage with the tooth sheet (4) (no clearance).
   - The lock (3) must protrude by at least 1 mm at the gear segment.
   - The retaining spring (5) must tighten the Bowden pull wire (1, 2).

**ADJUSTMENT**

Adjustment

1 Remove the left covering in position for repair (Chapter 3.4).

2 Carefully detach the rear covering at the right covering (see Chapter 3.5).
3.12 Bowden pull wire for backrest adjustment –
inspection and adjustment

3 Adjust the regulating screw (9) at
the left (1) and right Bowden pull
wire (2):

3.1 Loosen the counternut (10) and
adjust the gear segment of the lock
(3) by means of the regulating screw
(9) so that there is no clearance
between the lock (3) and the tooth
sheet (4).

Note:
When releasing the lock (3), the
tooth sheet (4) must freely move
along the lock (3) (without rattling).

3.2 Hold the nut (11) in position and
secure the adjustment of the
regulating screw (9) by means of the
counternut (10).

Note:
Make sure not to distort the Bowden
pull wire (1, 2).
3.12 Bowden pull wire for backrest adjustment – inspection and adjustment

4 Lock/unlock the backrest (8) several times and check the adjustment on both sides, readjust if necessary.

5 Install the rear covering (see Chapter 3.5).

6 Install the left covering (13) (Chapter 3.4).

7 Install the seat cushion (Chapter 3.1).
3.13 Bowden pull wire and lever for backrest adjustment – removal and installation

REMOVAL / INSTALLATION

(1) Bowden pull wire for backrest adjustment (left)
(2) Bowden pull wire for backrest adjustment (right)
(3) Backrest
(4) Stud
(5) Holder
(6) Axial locking ring............... replace
(7) Lever for backrest adjustment
(8) Lock washer
(9) Lock washer
(10) Lock
(11) Catch element
(12) Bracket for backrest hook-in function
3.13 Bowden pull wire and lever for backrest adjustment – removal and installation

(13) Torsion spring
(14) Cable tie
(15) Clamp
(16) Bellows
(17) Z-section

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the left covering in position for repair (Chapter 3.4).

3 Carefully detach the rear covering at the right covering (see Chapter 3.5).
3.13 Bowden pull wire and lever for backrest adjustment – removal and installation

Removal and installation

4 Mark the point where the right Bowden pull wire (2) is fastened to the bellows (16) by means of cable tie (14) and remove the cable tie (14).

**Installation notes:**

⚠️ **ATTENTION** Malfunction!
- Loosely fix the right Bowden pull wire (2) by means of cable tie (14) and make sure it is not distorted.
- Check the Bowden pull wire adjustment, readjust if necessary (Chapter 3.12).

5 Detach the left Bowden pull wire (1) at the clamp (15).
6 Fold the backrest (3) forward until the lock (10) is free.

7 Detach the left Bowden pull wire (1) at the catch element (11) of the left lock (10) and detach the right Bowden pull wire (2) at the catch element (11) of the right lock (10).

**Note:**
The hook (arrow) of the respective Bowden pull wire (1, 2) must point to the outside.

8 Loosen the lock washer (9) at the left Bowden pull wire (1) and the lock washer (9) at the right Bowden pull wire (2).

9 Detach the left Bowden pull wire (1) and the right Bowden pull wire (2) at the Z-section (17).
3.13 Bowden pull wire and lever for backrest adjustment –
removal and installation

REMOVAL / INSTALLATION

10 Remove two axial locking rings (6) at the stud (4).

**Installation notes:**
- Replace the axial locking ring (6).
- Press the axial locking ring (6) onto the stud (4) with the curve pointing to the lever for backrest adjustment (7).

11 Pull off the lever for backrest adjustment (7) at the stud (4).

12 Detach the left and right Bowden pull wires (1, 2) at the lever for backrest adjustment (7).

**Note:**
The left Bowden pull wire (1) must be hung into the left drill hole and the right Bowden pull wire (2) must be hung into the right drill hole at the lever for backrest adjustment (7).
3.13 Bowden pull wire and lever for backrest adjustment –
removal and installation

13 Loosen the lock washers (8) at the left Bowden pull wire (1) and at the right Bowden pull wire (2).

14 Detach the left and right Bowden pull wires (1, 2) at the holder (5).

**Installation note:**
Adjust the new Bowden pull wires (1, 2) to the lengths of the old Bowden pull wires (1, 2) (excess length of the wire).

15 Re-install the components in the reverse order of their removal.
3.14 Bowden pull wire for locking mechanism of the fore/aft isolator – inspection and adjustment (delivery option)

(1) Lever for fore/aft isolator
(2) Support
(3) Eccentric
(4) Bowden pull wire for locking mechanism of the fore/aft isolator
(5) Lock
(6) Longitudinal hole
(7) Stop lever
(8) Retracting spring
(9) Upper suspension part
(10) Clamp
(11) Rubber spring
(12) Nut
(13) Counternut
(14) Regulating screw
(15) Hauling rope
3.14 Bowden pull wire for locking mechanism of the fore/aft isolator – inspection and adjustment (delivery option)

**Inspection**

1. Lift off the seat cushion in position for repair (Chapter 3.1).

2. Turn the lever for the fore/aft isolator (1) downwards as far as possible (unlocked).
   It should be possible to move the upper suspension part (9) horizontally without getting stuck.

**Checking the locking function of the fore/aft isolator (A):**

3.1 Lift the eccentric (3) with the lever for the fore/aft isolator (1) (arrow direction "a") until the lock (5) is released from the longitudinal hole (6) and the eccentric (3) turns in arrow direction "b".
3.2 The retracting spring (8) must lock the stop lever (7) into the clamp (10) (arrow direction "e"). If necessary, slightly move the upper suspension part (9).

3.3 The upper part of suspension (9) should not horizontally move after being engaged.

4 Checking the unlocking function of the fore/aft isolator (B):

4.1 Turn the lever for fore/aft isolator (1) to arrow direction "c" (unlocked) until the lock (5) locks down the eccentric (3) in the longitudinal hole.
3.14 Bowden pull wire for locking mechanism of the fore/aft isolator – inspection and adjustment (delivery option)

INSPECTION  ADJUSTMENT

4.2 The Bowden pull wire (4) must unlock the stop lever (7) from the clamp (10) against the retracting spring (8) and pull it back until the stop lever forms a line (d) with the cutout in the upper suspension part (9).

4.3 The retracting spring (8) must hold the eccentric (3) down in the locked position via the Bowden pull wire (4).

Adjustment

1 Loosen the counternut (13) and use the regulating screw (14) to bring the stop lever (7) to an overlapping position with the cutout in the upper suspension part (9) – line (d) – (basic setting).
3.14 Bowden pull wire for locking mechanism of the fore/aft isolator – inspection and adjustment (delivery option)

2 Turn the regulating screw (14) away from the nut (12) in order to shorten the excess length of the hauling rope (15) or turn the regulating screw (14) towards the nut (12) in order to extend the excess length of the hauling rope (15).

Note:
Make sure not to distort the Bowden pull wire (4).

3 Hold the nut (12) in position and secure the adjustment with the counternut (13).

4 Check the lever for the fore/aft isolator (1) for proper functioning by operating it several times in both directions and readjust it, if necessary.

5 Install the seat cushion (Chapter 3.1).
3.15 Bowden pull wire for locking mechanism of the fore/aft isolator –
removal and installation (delivery option)

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the left covering in position for repair (Chapter 3.4).
3.15 Bowden pull wire for locking mechanism of the fore/aft isolator –
removal and installation (delivery option)

REMOVAL / INSTALLATION

3 Seat with operator console and
armrest for electro-pneumatic
gearshift:
Remove the operator console for the
electro-pneumatic gearshift (see
Chapter 3.25).

4 Remove the entire covering
(Chapter 3.5).

Removal and installation

5 **WARNING** Risk of crushing!

Bring the seat into the highest position
and secure the swinging structure to
the front plastic rollers of the lower
suspension part by means of
appropriate spacers.
3.15 Bowden pull wire for locking mechanism of the fore/aft isolator – removal and installation (delivery option)

REMOVAL / INSTALLATION

6 Temporarily reinstall the lever for the fore/aft isolator (9) and turn it upwards as far as possible to release the Bowden pull wire (1).

7 Mark the point where the Bowden pull wire (1) is fastened to the bellows (11) by means of cable ties (10) and remove the cable ties (10).

Installation note:

**ATTENTION** Malfunction!
Loosely fix the Bowden pull wire (1) by means of the cable tie (10) and make sure it is not distorted.

8 Press the stop lever (6) against the force of the retracting spring (7) in direction of the Bowden pull wire (1) and detach the Bowden pull wire (1) at the locking lever (6).
3.15 Bowden pull wire for locking mechanism of the fore/aft isolator – removal and installation (delivery option)

9 Loosen the lock washer (2) at the Bowden pull wire (1).

10 Detach the Bowden pull wire (1) at the upper suspension part (3).

11 Pull the Bowden pull wire (1) out of the drill holes (arrows) in the seat frame (8).

12 Remove the Bowden pull wire (1) from the holder (4).

13 Detach the Bowden pull wire (1) at the eccentric (5).

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

14 Re-install the components in the reverse order of their removal.
3.16 Bowden pull wire for seat angle adjustment – inspection and adjustment

INSPECTION  ADJUSTMENT

(1) Lever for seat angle adjustment
(2) Seat cushion
(3) Bowden pull wire for seat angle adjustment
(4) Right latch
(5) Left latch
(6) Regulating screw
(7) Counternut
(8) Nut
(9) Seat frame

1 Lift off the seat cushion in position for repair (Chapter 3.1).
3.16 Bowden pull wire for seat angle adjustment – inspection and adjustment

Inspection

2. Apply load to the seat frame (9) and lock/unlock the lever for seat angle adjustment (1) several times. Then, check the following:
   • easy running of the Bowden pull wire (3)
   • wear of the lever for seat angle adjustment (1)
   • contamination of the right (4) and left latch (5)
   • synchronous locking of the latches (4, 5) with the seat frame (9).
3.16  Bowden pull wire for seat angle adjustment – inspection and adjustment

3 Check the adjustment of the right (4) and left latch (5) in the 8 locking positions:
- The locked latches (4, 5) must protrude at least 1 mm from the cutouts (arrows) in the seat frame (9).
- The unlocked latches (4, 5) must not contact the cutouts in the seat frame (9) over the entire adjustable range (rattling).
3.16 Bowden pull wire for seat angle adjustment — inspection and adjustment

Adjustment

1. Adjust the seat to the middle adjustment of the seat angle and lock it in this position.

2. Loosen the counternut (7) and use the regulating screw (6) to position the latches (4, 5) so that they protrude at least 1 mm from the cutouts (arrows) in the seat frame (9) (basic setting).

3. Hold the nut (8) in position and secure it by means of the counternut (7).

   **Note:**
   Make sure not to distort the Bowden pull wire (3).

4. Lock/unlock the seat frame (9) several times using the lever for seat angle adjustment (1), check it for proper functioning and readjust it, if necessary.

5. Install the seat cushion (Chapter 3.1).
3.17 Bowden pull wire for seat angle adjustment with locking mechanism – removal and installation

REMOVAL

(1) Locking mechanism (complete)
(2) Compression spring
(3) Housing....................... to grease
(4) Catch element................. to grease
(5) Bowden pull wire for seat angle adjustment
(6) Latch......................... to grease
(7) Latch guide.................... to grease
(8) Compression spring.......... to grease
(9) Cover
(10) Seat frame
(11) Upper suspension part
3.17 Bowden pull wire for seat angle adjustment with locking mechanism – removal and installation

**REMOVAL**

1. Lift off the seat cushion in position for repair (Chapter 3.1).

2. Remove the left covering in position for repair (Chapter 3.4).

3. Remove the front covering (see Chapter 3.5).

**4 Seat with fore/aft isolator:**

Remove the cable tie by means of which the Bowden pull wire for the fore/aft isolator is fastened to the front of the bellows (see Chapter 3.6).

5. Remove two bellows pins at the front of the seat frame and detach the bellows at the two supports (see Chapter 3.6). Press the bellows down and fix it.

**INSTALLATION**
### Removal

#### 6 **WARNING** Risk of crushing!

Bring the seat into the highest position and secure the swinging structure to the front plastic rollers of the lower suspension part by means of appropriate spacers.

7 Operate the seat angle adjustment and move the seat to the highest position.

8 Remove the seat cushion and the lever for seat angle and seat depth adjustment (Chapter 3.2).

9 Press one latch (6) inward (arrow) and pull out the entire locking mechanism (1) with the Bowden pull wire (5) and the compression spring (2) forward on the unlocked side.
3.17 Bowden pull wire for seat angle adjustment with locking mechanism – removal and installation

10 Remove the cover (9) at the housing (3).

11 Remove two latches (6) with mit compression springs (8) from the housing (3).

12 Pull the catch element (4) out of the housing (3) and take off the Bowden pull wire (5) at the catch element (4).

13 Take off the Bowden pull wire (5) from the housing (3).
3.17 Bowden pull wire for seat angle adjustment with locking mechanism – removal and installation

**Installation**

1. Adjust the new Bowden pull wire (5) to the length of the old one (excess length of the wire).

2. Apply acid-free multi-purpose lubricant (F) to the housing (3) and to the catch element (4).

3. Hang the Bowden pull wire (5) into the hole (marked with "L") of the catch element (4) and insert the catch element (4) into the housing (3).

4. Apply acid-free multi-purpose lubricant (F) to the latches (6).

5. Turn the catch element (4) in the housing (3) as far as possible and insert latches (6) into the housing (3).
3.17 Bowden pull wire for seat angle adjustment with locking mechanism – removal and installation

6 Apply acid-free multi-purpose lubricant (F) to the compression springs (8).

7 Hang in compression springs (8) into the latches (6) and press them into the pockets (12) of the housing (3).

8 Checking the installation position: The compression springs (8) must press the latches (6) to the outside while the nose (arrow) of the latch (6) must embrace the respective pin (13) of the catch element (4).

9 Press the cover (9) onto the latches (6) and compression springs (8) and lock it together with the housing (3).
3.17 Bowden pull wire for seat angle adjustment with locking mechanism – removal and installation

10 Turn the complete locking mechanism (1) around and position the Bowden pull wire (5) in the housing (3).

11 Guide the Bowden pull wire (5) through the cutout (14) in the upper suspension part (11).

12 Place the right latch (16) in front of the groove (15) in the upper suspension part (11) and press it in.

**Installation notes:**
- Check the latch guides (7) in the upper suspension part (11) for tight fit before inserting the latches (16, 17) (pressed in).
- Apply acid-free multi-purpose lubricant to the recess (F) of the latch guides (7).
3.17 Bowden pull wire for seat angle adjustment with locking mechanism – removal and installation

13 Press in the left latch (17) by hand while pressing the cover (9) onto the housing (3) (secure!) and push the entire locking mechanism (1) into the upper suspension part (11) until both latches (16, 17) are engaged.

14 Engage the seat frame (10) in the latches (16, 17) by pressing the seat frame (10) down.

15 Install the seat cushion and the lever for seat angle and seat depth adjustment (Chapter 3.2).
3.17 Bowden pull wire for seat angle adjustment with locking mechanism – removal and installation

16 Install the compression spring (2) under the bearing pins of the catch element (4).

17 Adjust the seat angle to the lowest position.

18 Install the bellows at the front of the seat frame and hang it in at the two supports (see Chapter 3.6).

19 Install the front covering (see Chapter 3.5).

20 Check the Bowden pull wire for seat angle adjustment and adjust it, if necessary (Chapter 3.16).

21 Install the left covering (Chapter 3.4).

22 Install the seat cushion (Chapter 3.1).
3.18 Handle rail – removal and installation

REMOVAL / INSTALLATION

(1) Handle rail
(2) Rounded head screw ............ 3 Nm
(3) Bowden pull wire for seat height adjustment
(4) Bowden pull wire for quick lowering of the seat
(5) Bowden pull wire for vertical shock absorber adjustment

1 Lift off the seat cushion in position for repair (Chapter 3.1).
2 Remove the left covering in position for repair (Chapter 3.4).
3.18 Handle rail – removal and installation

**Removal and installation**

3 **WARNING** Risk of crushing!

Bring the seat into the highest position and secure the swinging structure to the front plastic rollers of the lower suspension part by means of appropriate spacers.

4 Unscrew two rounded head screws (2) and lay the handle rail (1) down.

**Installation note:**
Rounded head screw (2), 3 Nm.

**Note:**
The Bowden pull wires for seat height adjustment (3), quick lowering of the seat (4) and vertical shock absorber adjustment (5) must only be replaced, if the respective Bowden pull wire (3, 4, 5) is defective.
5 If the Bowden pull wire for quick lowering of the seat (4) is defective:
Remove the Bowden pull wire for quick lowering of the seat (see Chapter 3.7).

6 If the Bowden pull wire for quick lowering of the seat (4) is not defective:
Remove the Bowden pull wire for quick lowering of the seat at the handle rail (see Chapter 3.7).

7 If the Bowden pull wire for seat height adjustment (3) is defective:
Remove the Bowden pull wire for seat height adjustment (see Chapter 3.9).

8 If the Bowden pull wire for seat height adjustment (3) is not defective:
Remove the Bowden pull wire for seat height adjustment at the handle rail (see Chapter 3.9).
3.18 Handle rail – removal and installation

9 If the Bowden pull wire for vertical shock absorber adjustment (5) is defective:
Remove the Bowden pull wire for vertical shock absorber adjustment (see Chapter 3.11).

10 If the Bowden pull wire for vertical shock absorber adjustment (5) is not defective:
Remove the Bowden pull wire for vertical shock absorber adjustment at the handle rail (see Chapter 3.11).

11 Detach the handle rail (1).

12 Re-install the components in the reverse order of their removal.
3.19 Heater switch – removal and installation

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3.19.1 Heater switch – removal and installation
3.19.2 Heater switch – removal and installation (seat with climate control system)
3.19.1 Heater switch – removal and installation

RAISE/ATTACH

(1) Heater switch
(2) Left covering
(3) Plug (for cable for heater switch)

1. Lift off the seat cushion in position for repair (Chapter 3.1).

2. Remove the left covering in position for repair (Chapter 3.4).
3.19.1 Heater switch – removal and installation

**Removal and installation**

3 Disconnect the electrical connection (B) between the connector (3) and heater switch (1).

4 Compress the springs (arrows) at the heater switch (1) and pull out heater switch (1) from the left-hand covering (2).

5 Re-install the components in the reverse order of their removal.
3.19.2 Heater switch - removal and installation
(seat with climate control system)

(1) Heater switch
(2) Left covering
(3) Plug (cable harness for heater switch)

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the left covering in position for repair (Chapter 3.4).
3.19.2 Heater switch - removal and installation
(seat with climate control system)

Removal and installation

3 Mark two electrical connections (N) (note the color of the cables) and disconnect the electrical connections (N) between the six connectors (3) and the heater switch (1).

**Installation note:**
Re-establish the electrical connections (N) according to the markings.

4 Compress the springs (arrows) at the heater switch (1) and pull out heater switch (1) from the left-hand covering (2).

5 Re-install the components in the reverse order of their removal.
3.20 Heater cable and belt tensioner cable (delivery option) – removal and installation

REMOVAL / INSTALLATION

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(1) Cable for backrest heater
(2) Cable for seat cushion heater
(3) Cable for heater switch
(4) Cable for vehicle connection
(5) Belt tensioner cable
(6) Heater cable = (3) + (4)
(7) Belt tensioner
(8) Cable tie
(9) Seat frame
(10) Cable tie
(11) Secondary belt
(12) Cable tie
(13) Cable tie
(14) Clip
3.20 Heater cable and belt tensioner cable (delivery option) – removal and installation

Electrical plug and socket connections:

(A) Electrical connection between the vehicle and the cable for vehicle connection (4)

(B) Electrical connection between the heater switch and the cable for heater switch (3)

(C) Electrical connection (3-pin) between the heater cable (6) and the cable for seat cushion heater (2)

(D) Electrical connection (2-pin) between the cable for seat cushion heater (2) and the cable for backrest heater (1)

(E) Electrical connection between the belt tensioner cable (5) and the belt tensioner (7)
3.20 Heater cable and belt tensioner cable (delivery option) – removal and installation

REMOVAL / INSTALLATION

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the left covering in position for repair (Chapter 3.4).

3 Remove the rear covering (see Chapter 3.5).

4 Remove the bellows at the rear left of the seat frame (see Chapter 3.6).

Removal and installation

5 ! WARNING Risk of crushing!

Bring the seat into the highest position and secure the swinging structure to the front plastic rollers of the lower suspension part by means of appropriate spacers.
6 Seat with belt tensioner (7):
6.1 Mark the point where the belt tensioner cable (5) is fastened to the belt roller support (7) by means of cable tie (8) and remove the cable tie (8).

6.2 **ATTENTION** Damage!
When removing or installing the belt tensioner cable (5), do not expose it to impacts.

Disconnect the electrical connection (E).
### 3.20 Heater cable and belt tensioner cable (delivery option) – removal and installation

#### REMOVAL / INSTALLATION

7 Mark the point where the cable of the seat cushion heater (2) and the belt tensioner cable (5) are fastened by means of cable ties (10) and remove the cable ties (10).

**Note:**
The belt tensioner cable (5) is only fitted for seats with belt tensioner (7).

8 Mark the points where the two electrical connections (C, D) are bundled by means of cable ties (13) and remove the cable ties (13).

**Installation note:**
The cable tie (13) must be guided through the cable tie (12) fastened to the seat frame (9) in order to fasten the electrical connections (C, D) to the seat frame (9) at the same time.
3.20 Heater cable and belt tensioner cable (delivery option) – removal and installation

**REMOVAL / INSTALLATION**

9 Disconnect the electrical connections (C, D).

10 **Seat with belt tensioner (7):**
   Pull out the belt tensioner cable (5) to the left at the secondary belt (11) and put it aside.
   **Installation note:**
   The belt tensioner cable (5) has to be laid in the top seam (arrow) of the cross member of the seat frame (9).

11 Disconnect the electrical connection (B).

12 Pull out the clip (14) at the seat frame (9) and detach the cable for vehicle connection (4) and the belt tensioner cable (5) at the clip (14).
   **Note:**
   The belt tensioner cable (5) is only fitted for seats with belt tensioner (7).
3.20 Heater cable and belt tensioner cable (delivery option) – removal and installation

REMOVAL / INSTALLATION TABLE OF CONTENTS

13 Pull out the clip (14) at the Z-section (15) and detach the cable of the heater switch (3) at the clip (14).

14 Mark the point where the cable for vehicle connection (4) is attached to the level control (16) by means of cable ties (17) and remove the cable ties (17).

15 **For seat models Atego, Axor:**
Mark the point where the cable for vehicle connection (4) at the air intake hose (20) and at the air exhaust hose (19) is bundled by means of cable tie (18) and remove the cable tie (18).

**Note:**
For seat models with EPS cable, the EPS cable is fastened by means of cable ties as well (see Chapter 3.21).
3.20 Heater cable and belt tensioner cable (delivery option) – removal and installation

16 Disconnect the electrical connection (A).
   **For seat model Actros:** (see Chapter 3.39).
   **For seat models Atego, Axor:** (see Chapter 3.40).

17 Mark the installation position for the cable for vehicle connection (4), pull the cable for vehicle connection (4) out of the suspension in backward direction and remove it with the cable of the heater switch (3) and the belt tensioner cable (5).
   **Installation note:**
   
   **WARNING** Malfunction!
   Lay the cable for vehicle connection (4) according to the markings in such a way that they cannot be squeezed when the seat is moved vertically.

18 Re-install the components in the reverse order of their removal.
3.21 Cable for electro-pneumatic gearshift (EPS) – removal and installation

REMOVAL / INSTALLATION

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(1) Cable for electro-pneumatic gearshift (EPS cable)
(2) Right covering
(3) Seat frame
(4) Cable tie
(5) Cable tie
(6) Spring clip
(7) Blind rivet
(8) Clip
(9) Seat fore/aft adjustment
3.21 Cable for electro-pneumatic gearshift (EPS) – removal and installation

REMOVAL / INSTALLATION

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the left covering in position for repair (Chapter 3.4).

3 Remove the operator console for the electro-pneumatic gearshift (EPS) (see Chapter 3.25).

Removal and installation

4 **WARNING** Risk of crushing!

Bring the seat into the highest position and secure the swinging structure to the front plastic rollers of the lower suspension part by means of appropriate spacers.
5 Thread the EPS cable (1) through the right covering (2).

6 Remove the entire covering (Chapter 3.5).

7 Detach the EPS cable (1) at the two spring clips (6).

8 Mark the point where the EPS cable (1) is fastened to the seat frame (3) by means of cable ties (4) and remove the cable ties (4).

9 Bore out the rivet head and drive out the blind rivet (7).

**Note:**
The rivet head must not be knocked off.
10 Mark the position of the clip (8) at the EPS cable (1) and pull off the clip (8) at the EPS cable (1).

**Installation notes:**

⚠️ **WARNING** Malfunction!

- Attach the clip (8) at the new EPS cable (1) according to the marking and fasten it by means of a blind rivet (7) in such a way that the EPS cable cannot be squeezed, kinked or distorted when the seat is moved vertically or horizontally.
- Mount the clip (8) in such a way that the EPS cable (1) can be guided inwards parallel to the seat fore/aft adjustment (9).
3.21 Cable for electro-pneumatic gearshift (EPS) – removal and installation

REMOVAL / INSTALLATION

11 For seat model Actros:
11.1 Remove the plug of the EPS cable at the pin contact strip (see Chapter 3.39).

11.2 Mark the point where the EPS cable (1) is fastened to the swinging structure (10) by means of cable tie (5) and remove the cable tie (5).

Installation note:
For easier fastening of the cable tie (5), remove the operator console at the fore/aft adjustment (see Chapter 3.39).
3.21 Cable for electro-pneumatic gearshift (EPS) – removal and installation

REMOVAL / INSTALLATION

For seat models Atego, Axor:

12.1 Remove the plug of the EPS cable at the pin contact strip (see Chapter 3.40).

12.2 Mark the points where the EPS cable (1) is fastened or bundled by means of three cable tie (11) and remove the cable tie (11).

13 Pull the EPS cable (1) out of the seat suspension in backward direction and remove it.

14 Re-install the components in the reverse order of their removal.
3.22 Air hose set – removal and installation

REMOVAL / INSTALLATION

- (1) Air hose (blue) for air spring (Z)
- (2) Air hose (black) for air intake (P)
- (3) Air hose (gray) for air exhaust (R)
- (4) Air hose (black) for lumbar support and lateral support adjustment (A)
- (5) Entire air hose set
  \[= (1) + (2) + (3) + (4)\]

Note:
The adhesive tapes are intended to bundle the air hose set (5) and to mark where the cable ties (11, 13) have to be fastened.

- (6) Air spring
- (7) Air hose set for vehicle connection
- (8) Level control
- (9) Hose nozzle
- (10) Retainer (level control)
- (11) Cable tie
3.22 Air hose set – removal and installation

(12) Cable for vehicle connection
(13) Cable tie
(14) Hose connector (T-piece)
(15) Lower suspension part
(16) Air spring support (swinging structure)
(17) Z-section
(18) Clip
(19) Bellows
### General instructions for air hose (2, 3, 4) installation in bus seats:

- Make sure that sufficient length of the air hoses (2, 3, 4) is provided. Move the seats to the maximum forward and backward stop of the seat fore/aft adjustment. The air hoses (2, 3, 4) must not be squeezed!
- Fasten the cable ties so as to ensure sufficient movement space for the air hoses (2, 3, 4) when the seat is moved (sufficient hose length should be provided).
**ATTENTION** Malfunction!

- It is not allowed to replace individual air hoses (2, 3, 4) due to risk of crushing (when improperly installed).
- If an individual air hose (2, 3, 4) is defective, the air hose set for vehicle connection (7) of the seat has to be removed and replaced.

**Note:**
The air hose (1) to the air spring (6) must only be replaced, if the air hose (1) is defective.

- The air hoses (1, 2, 3, 4) differ in length and colour.
- The provided illustrations show how to run the hoses in an assembled seat. The instructions on how to run hoses to individual assemblies and the respective attachment points of the cable ties for the air hose set (7) are to be observed!
ATTENTION Hydrostatic test!

The hydraulic test of the seat should be performed upon installation of the air hoses (1, 2, 3, 4). To do this, apply 60 kg load to the seat for 24 hours. The lowering within this time must not exceed 15 mm.

1. Lift off the seat cushion in position for repair (Chapter 3.1).

2. Remove the left covering in position for repair (Chapter 3.4).
3 Take off the rear covering at the right covering (see Chapter 3.5).

4 Remove the bellows at the rear of the lower suspension part (see Chapter 3.6).

5 **Seat with compressed-air quick coupling:**
   Remove the quick coupling and the air hose for the compressed-air quick coupling at the supporting structure (see Chapter 3.42).
3.22 Air hose set – removal and installation

Removal and installation

6  "WARNING" Risk of crushing!

Bring the seat into the highest position and secure the swinging structure to the front plastic rollers of the lower suspension part by means of appropriate spacers.

7  "WARNING" The pressure in the pneumatic system might cause injury!

The pneumatic system is to be vented before removing the air hoses (1, 2, 3, 4) (e.g. by means of the quick lowering).

8 If the air hose (1) to the air spring (6) is defective:

8.1 Pull off the hose nozzle (9) and push it backwards at the air hose (1).
8.2 **ATTENTION** Damage!
Take care not to damage the connection (mandrel profile) of the level control (8).

Pull off the air hose (1) at the connection (arrow) of the level control (8).

**Notes:**
- For easier removal, carefully slit the air hose (1) with a sharp knife.
- Do not use screwdrivers or similar tools to lift off the air hose (1) at the connections (arrow) of the level control (8).

**Installation note:**
Push the air hose (1) completely onto the connection (arrow) of the level control (8) by exerting pressure.
8.3 Pull off the hose nozzle (9) at the air hose (1).

8.4 Lay the seat on the side to allow access to the bottom side.

8.5 Remove the air hose (blue) at the air spring (see Chapter 3.36).

8.6 Pull out the air hose (1) at the air spring support (16) and remove it.

9. Remove the air hose for lumbar support and lateral support adjustment at the valve for lumbar support and lateral support adjustment (see Chapter 3.23).
3.22 Air hose set – removal and installation

10 Pull out the clip (18) at the Z-section (17) and detach the air hose (4) at the clip (18).

11 Mark the installation position of the air hose (4) and guide the air hose (4) inwards at the cut-out (arrow) in the bellows (19).
   **Installation note:**
   Lay the air hose (4) according to the marking.

12 Detach the air hose (4) at the retainer (10) of the level control (8).

13 Pull off the hose nozzle (9) and push it backwards at the air hose (2).
ATTENTION Damage!
Take care not to damage the connections (mandrel profiles) of the level control (8).

Pull off the air hoses (2, 3) at the connections (arrows) of the level control (8).

Notes:
• For easier removal, carefully slit the air hoses (2, 3) with a sharp knife.
• Do not use a screwdriver or similar tools to lift off the air hoses (2, 3) at the connections (arrows) of the level control (8).

Installation notes:
• Push the air hoses (2, 3) completely onto the connections (arrows) of the level control (8) by exerting pressure.
• The air hose (3) has to be installed at the level control (8) without hose nozzle (9).
15 Pull off the hose nozzle (9) at the air hose (2).

16 Lay the seat on the side to allow access to the bottom side.

17 Mark the installation position of the air hose set for vehicle connection (2, 3, 4) prior to removal.
   • For seat model Actros: The air hoses (2, 3) are placed in a loop of 180° to the connection at the pin contact strip.
   • For seat models Atego/Axor: The air hoses (2, 3) are placed in a loop of 360° to the connection at the pin contact strip.
3.22 Air hose set – removal and installation

18 For seat model Actros:

18.1 Remove the air hoses at the pin contact strip (see Chapter 3.39).

18.2 Mark the points where the air hoses (2, 3, 4) are fastened to the air spring support (16) by means of four cable ties (13) and remove the cable ties (13).

Note:
If an EPS cable is fitted, take into consideration the fastening of the EPS cable at the air hoses (2, 3, 4) by means of additional cable ties (see Chapter 3.21).

Installation note:
The air hose (3) must run over the connection piece (14).

18.3 Mark the point where the air hoses (2, 3) are fastened to the lower suspension part (15) by means of cable ties (11) and remove the cable ties (11).
3.22 Air hose set – removal and installation

REMOVAL / INSTALLATION

19 For seat models Atego/Axor:

19.1 Remove the air hoses at the pin contact strip (see Chapter 3.40).

19.2 Mark the points where the air hoses (2, 3, 4) are fastened to the air spring support (16) by means of four cable ties (20) and remove the cable ties (20).

19.3 Mark the points where the air hoses (2, 3) are fastened to the lower suspension part (15) and to the supporting structure (23) by means of cable ties (21) and remove the cable ties (21).
19.4 Mark the point where the air hoses (2, 3) and the cable for vehicle connection (12) are bundled by means of cable ties (22) and remove the cable ties (22).

**Note:**
If an EPS cable is fitted, take into consideration the fastening of the EPS cable at the air hoses (2, 3) by means of the cable ties (21, 22) and additional cable ties (see Chapter 3.21).

20 Pull the air hose set for vehicle connection (7) out of the seat in downward direction and remove it.

**Installation note:**
Lay the air hose set for vehicle connection (7) according to the marked installation position.

21 Re-install the components in the reverse order of their removal.
### 3.23 Valves for lumbar support and lateral support adjustment – removal and installation

**REMOVAL / INSTALLATION**

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<tbody>
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<td>(2)</td>
<td>Air hose for lumbar support, upper chamber</td>
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<td>(3)</td>
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<td>Valve for lateral support adjustment</td>
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<td>Valve for lumbar support, upper chamber</td>
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<td>(9)</td>
<td>Valve for lumbar support, lower chamber</td>
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<tr>
<td>(10)</td>
<td>Valve unit (entire valve) = (7) + (8) + (9)</td>
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<td>(11)</td>
<td>Hose nozzle</td>
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3.23 Valves for lumbar support and lateral support adjustment – removal and installation

REMOVAL / INSTALLATION

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the left covering in position for repair (Chapter 3.4).

ATTENTION Hydrostatic test!
The hydraulic test of the suspension should be performed upon installation of the valve unit (10).

Removal and installation

3 Pull off three hose nozzles (5) at the air hoses (1, 2, 3) and one hose nozzle (11) at the air hose for air intake (4) and push them backwards.
4 ATTENTION Damage!

Take care not to damage the air hoses (1, 2, 3, 4). Do not use a screwdriver or similar tools to lift off the air hoses (1, 2, 3, 4) at the connections (arrows) of the valves (7, 8, 9).

Mark the air hoses (1, 2, 3, 4) and cut them off in a clean and straight way directly behind the connections (arrows) of the valves (7, 8, 9) by means of a sharp knife.

Installation notes:
- Install the air hoses (1, 2, 3, 4) according to the marking.
- Push the air hoses (1, 2, 3, 4) completely onto the connections (arrows) of the valves (7, 8, 9) by exerting pressure.
3.23 Valves for lumbar support and lateral support adjustment – removal and installation

Notes:
- The air hoses (1, 2, 3, 4) can be cut off only once.
- After cutting, mark the air hoses (1, 2, 3, 4) in order not to cut them several times.

5 Press the springs (arrows) on the top and bottom of the valves (7, 8, 9) and pull the valve unit (10) out of the left covering (6).

6 Re-install the components in the reverse order of their removal.
3.24 Armrests – removal and installation (delivery option)

REMOVAL / INSTALLATION

(1) Backrest
(2) Backrest cover
(3) Rounded head screw (inner race) ......................... 4 Nm
(4) Armrest on the left
(5) Micro-encapsulated cap screw ..................... to replace, 25 Nm
(6) Armrest on the right
(7) Micro-encapsulated cap screw ..................... to replace, 25 Nm
Removal and installation

1. Unscrew two rounded head screws (3).
   **Installation note:**
   Rounded head screw (3), 4 Nm.

2. Unscrew two micro-encapsulated cap screws on the left (5) or right (7) and remove the left armrest (4) or right armrest (6) from the backrest (1).
   **Note:**
   Slightly lift the backrest cover (2) so that the micro-encapsulated cap screws (5) or (7) are accessible.
   **Installation note:**
   Replace the micro-encapsulated cap screw (5) or (7), 25 Nm.

3. Re-install the components in the reverse order of their removal.
3.25 Operator console and armrest for electro-pneumatic gearshift (EPS) – removal and installation (delivery option)

REMOVAL / INSTALLATION

(1) Support for EPS console
(2) Stud
(3) EPS control element
(4) Operator console for electro-pneumatic gearshift = EPS console
(5) Cover (EPS console)
(6) Plug (EPS cable)
(7) Cable tie
(8) Micro-encapsulated cap screw, M8 ........... to replace, 25 Nm
(9) Micro-encapsulated cap screw, M8 ........... to replace, 25 Nm
(10) Micro-encapsulated cap screw, M6 ........... to replace, 12 Nm
(11) Rounded head screw (inner race) ............. to hand-tighten
3.25 Operator console and armrest for electro-pneumatic gearshift (EPS) – removal and installation (delivery option)

REMOVAL / INSTALLATION

(12) Left armrest, bottom
(13) Right armrest, top
(14) Catch element
(15) Washer
(16) Rounded head screw (inner race) ...................... 12 Nm
(17) Pin
(18) Clamping sleeve
(19) Washer
(20) EPS cable
(21) Right covering
(22) Countersunk screw
3.25 Operator console and armrest for electro-pneumatic gearshift (EPS) –
removal and installation (delivery option)

Removal and installation

1 Disconnect the electrical connection between the plug of the EPS cable (6) and the EPS control element (3).

2 Unscrew three countersunk screws (22) and remove the control element (3) from the EPS console (4). 
   **Installation note:**
   Hand-tighten the countersunk screw (22).

3 Lift off the cover (5) at the EPS console (4).

4 Mark the point where the EPS cable (20) is fastened to the EPS console (4) by means of cable tie (7) and remove the cable tie (7).

5 Pull the EPS cable (20) out of the EPS console (4) in backward direction.
6 Unscrew the micro-encapsulated cap screws (8, 9, 10) at the support for the EPS console (1) and remove the EPS console (4) as well as the washer (19).

**Installation note:**
- Replace the micro-encapsulated cap screws (8, 9) by new ones, 25 Nm.
- Replace the micro-encapsulated cap screw (10) by a new one, 12 Nm.

7 **Remove the catch element (14):**

7.1 Unscrew two rounded head screws (16) and remove two washers (15).

**Installation note:**
Rounded head screw (16), 12 Nm.

7.2 Mark the installation position of the catch element (14) and remove the catch element (14).
3.25 Operator console and armrest for electro-pneumatic gearshift (EPS) – removal and installation (delivery option)

REMOVAL / INSTALLATION

8 Remove the right armrest (12, 13):

8.1 Unscrew four rounded head screws (11) and remove the top of the armrest (13).

**Installation note:**
Hand-tighten the rounded head screw (11).

8.2 Drive out the pin (17) at the bottom of the armrest (12).

8.3 Drive out the clamping sleeve (18) at the EPS console (4).

8.4 Remove the bottom of the armrest (12) at the EPS console (4).

9 Remove the support for the EPS console at the seat frame (see Chapter 3.30).

10 Re-install the components in the reverse order of their removal.
3.26 Backrest cover and seat belt – removal and installation

REMOVAL / INSTALLATION

(1) Hexagon bolt ........................ 45 Nm
(2) Belt buckle
(3) Spacer
(4) Spring washer
(5) Adjustment washer (plastic)
(6) Safety belt
(7) Hexagon bolt ........................ 45 Nm
(8) Spring washer
(9) Belt roller

⚠️ CAUTION Pay attention to the safety notes in Chapter 1.1 on belt rollers with belt tensioners!

(10) Hexagon bolt ........................ 45 Nm
(11) Rounded head screw (inner race) ......................... 4 Nm
(12) Backrest cover
(13) Support
(14) Lock
3.26 Backrest cover and seat belt – removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(15) Belt guide
(16) Rounded head screw (inner race) ......................... 2 Nm
(17) Belt bracket
(18) Serrated washer head screw .............................. to replace, 25 Nm
(19) Hexagon bolt ............................. 45 Nm
(20) Spacer sleeve
(21) Belt guide
(22) Spring washer
(23) Backrest
(24) Microphone support
3.26 Backrest cover and seat belt – removal and installation

1. Lift off the seat cushion in position for repair (Chapter 3.1).

2. Seat with operator console and armrest for electro-pneumatic gearshift:
   Remove the supporting structure for electro-pneumatic gearshift (EPS) (see Chapter 3.25).

3. Remove the left covering in position for repair (Chapter 3.4).

4. Remove the covering completely (Chapter 3.5).

   **Note:**
   For seat models with fore/aft isolator remove only the left and right covering. Do not remove the covering at the front.
3.26 Backrest cover and seat belt – removal and installation

Removal and installation

5 Unscrew the five rounded head screws (11) and remove the backrest cover (12).
   **Installation note:**
   Rounded head screw (11), 4 Nm.

6 Unscrew the hexagon bolt (7) and remove the two adjustment washers (5) and the spring washer (4).
   **Installation notes:**
   • For a new safety belt (6) the items hexagon bolt (7), adjustment washer (5) and spring washer (4) are preassembled at the safety belt (6).
   • Hexagon bolt (7), 45 Nm.
3.26 Backrest cover and seat belt – removal and installation

REMOVAL / INSTALLATION

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7 Belt roller (9) with belt tensioner (25):

**WARNING** Risk of injury!
Pay attention to the safety notes in Chapter 1.1 on belt roller (9) with belt tensioners (25)!

7.1 Mark the point where the belt tensioner cable (28) is fastened with the cable tie (26) and remove the cable tie (26).

7.2 Disconnect the electrical connection between the plug (27) and the belt tensioner (25).
8 Unscrew the hexagon bolt (10) at the support (13) and remove the spring washer (8).

**Installation notes:**
- Hexagon bolt (10), 45 Nm.
- For a new safety belt (6), the items hexagon bolt (10) and spring washer (8) are preassembled on the belt roller (9).

9 Carefully place the belt roller down (9).

**Installation note:**
Hang in the lock (14) at the belt roller (9) behind the support (13) in the installation position (arrow).
3.26 Backrest cover and seat belt – removal and installation

10 Unscrew the serrated washer head screw (18), and put aside the belt bracket (17) with the belt guide (21).

Note:
For seats with climate control system the microphone support (24) must be removed.

Installation notes:
• Replace the serrated washer head screw (18), 25 Nm.
• The hook (arrow) at the belt bracket (17) must engage into the square hole at the backrest (23).
• For seats with climate control system the belt bracket (17) must be screwed on together with the microphone support (24).

11 Unscrew the three rounded head screws (16) at the belt guide (15).

Installation note:
Rounded head screw (16), 2 Nm.
3.26 Backrest cover and seat belt – removal and installation

REMOVAL / INSTALLATION

12 Pull out the belt guide (15) forwards towards the backrest (23).

13 Hang out the safety belt (6) and the belt guide (15) and guide it out of the backrest (23) towards the back.

14 Unscrew the hexagon bolt (19) and remove the belt guide (21) with safety belt (6), spacer sleeve (20) and spring washer (22) from the belt bracket (17).

Installation notes:
- For a new safety belt (6) the items hexagon bolt (19), spacer sleeve (20) and spring washer (22) are preassembled at the belt guide (21).
- Hexagon bolt (19), 45 Nm.
3.26 Backrest cover and seat belt – removal and installation

REMOVAL / INSTALLATION

15 Belt buckle with belt buckle cable:
   Remove the belt buckle with belt buckle cable (Chapter 3.28).

16 Belt buckle without belt buckle cable:
   Unscrew the hexagon bolt (1) and remove the belt buckle (2) and the spacer (3).
   **Installation notes:**
   - Hexagon bolt (1), 45 Nm.
   - The nose (arrow) at the bottom of the spacer (3) must snap into the hole of the seat frame (24).

17 Re-install the components in the reverse order of their removal.
3.27 Lap belt – removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Hexagon bolt ......................... 45 Nm
(2) Belt buckle
(3) Spacer
(4) Seat frame
(5) Socket
(6) Support (for belt roller)
(7) Hexagon bolt ......................... 12 Nm
(8) Belt roller
(9) Hexagon bolt ......................... 45 Nm
(10) Hexagon nut
(11) Groove screw ......................... 12 Nm
3.27 Lap belt – removal and installation

REMOVAL / INSTALLATION

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Seat with operator console and armrest for electro-pneumatic gearshift:
   Remove the operator console for the electro-pneumatic gearshift (EPS) (see Chapter 3.25).

3 Remove the left covering in position for repair (Chapter 3.4).

4 Remove the entire covering (Chapter 3.5).
   **Note:**
   For seat models with fore/aft isolator, remove only the left and right covering. Do not remove the front covering.
3.27 Lap belt – removal and installation

Removal and installation

5 Belt buckle with belt buckle cable:
Remove the belt buckle with belt buckle cable (Chapter 3.28).

6 Belt buckle without belt buckle cable:
Unscrew the hexagon bolt (1) from the seat frame (4) and remove the belt buckle (2) and the spacer (3).

Installation notes:
• Hexagon bolt (1), 45 Nm.
• The nose (arrow) on the bottom side of the spacer (3) must snap into the drill hole of the seat frame (4).
7 Unscrew the groove screw (11) from the support (6).
   **Note:**
   The groove screw (11) protects the belt roller (8) against distortion.
   **Installation note:**
   Groove screw (11), 12 Nm.

8 Unscrew the hexagon bolt (9) and remove the belt roller (8) and the hexagon nut (10).
   **Installation note:**
   Hexagon bolt (9), 45 Nm.

9 Unscrew the hexagon bolt (7) from the seat frame (4) and remove the support (6) and the socket (5).
   **Installation note:**
   Hexagon bolt (7), 45 Nm.

10 Re-install the components in the reverse order of their removal.
3.28  Belt buckle with belt buckle cable (delivery option) –
removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Belt buckle (with belt buckle cable)
(2) Belt buckle cable (short)
(3) Hexagon bolt ...................... 45 Nm
(4) Spacer
(5) Cable tie
(6) Bowden pull wire for backrest adjustment
(7) Plug (short belt buckle cable)
(8) Clip
(9) Socket (long belt buckle cable)
(10) Seat frame
3.28 Belt buckle with belt buckle cable (delivery option) – removal and installation

REMOVAL / INSTALLATION

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the left covering in position for repair (Chapter 3.4).

3 Remove the entire covering (Chapter 3.5).
   **Note:** For seat models with fore/aft isolator, remove only the left and right covering. Do not remove the front covering.

**Removal and installation**

4 Mark the point where the belt buckle cable (2) is fastened to the seat frame (10) by means of a cable tie (5) and remove the cable tie (5).

5 Disconnect the electrical connection between the plug (7) and the socket (9).
3.28 Belt buckle with belt buckle cable (delivery option) – removal and installation

## REMOVAL / INSTALLATION

### REMOVAL

6 Pull out the clip (8) at the seat frame (10).

7 Remove the belt buckle cable (2) from the clip (8).

8 Unscrew the hexagon bolt (3) and remove the belt buckle (1) with the belt buckle cable (2) and the spacer (4).

**Installation notes:**
- Hexagon bolt (3), 45 Nm.
- The nose (arrow) on the bottom side of the spacer (4) must snap into the drill hole of the seat frame (10).
- The belt buckle cable (2) must run in front of the Bowden pull wire for backrest adjustment (6).

9 Re-install the components in the reverse order of their removal.
3.29 Secondary belt – removal and installation

REMOVAL / INSTALLATION

(1) Webbing (secondary belt)
(2) Seat frame
(3) Protective profile
(4) Micro-encapsulated cap screw .................. to replace, 25 Nm
(5) Webbing retaining plate
(6) Lower suspension part

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3.29 Secondary belt – removal and installation

REMOVAL / INSTALLATION

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Seat with operator console and armrest for electro-pneumatic gearshift:
Remove the clip for the EPS cable at the lower suspension part (see Chapter 3.21).

3 Remove the bellows at the rear of the lower suspension part (see Chapter 3.6).

Removal and installation

4 Unscrew the micro-encapsulated cap screw (4).
Installation note:
Replace the micro-encapsulated cap screw (4), 25 Nm.
5 Detach the webbing retaining plate (5) at the lower suspension part (6).

6 Pull out the webbing retaining plate (5) at the webbing (1) and remove the webbing (1).

**Installation notes:**
- Both loops of the webbing (1) have to be hung in the webbing retaining plate (5) on the left next to the micro-encapsulated cap screw (4).
- The webbing (1) must be placed over the protective profile (3) inserted into the seat frame (2).

7 Re-install the components in the reverse order of their removal.
3.30 Backrest – removal and installation

REMOVAL

- (1) Renew micro-encapsulated hexagon bolt (right), to replace, grease, 47 Nm
- (2) Bearing support (right-hand)
- (3) Micro-encapsulated cap screw to replace, 25 Nm
- (4) Hexagon nut (welded for end stop)
- (5) Torsion spring (right)
- (6) Leaf (tooth sheet) (right) to grease
- (7) Backrest
- (8) Leaf (tooth sheet) (left) to grease
- (9) Torsion spring (left)
- (10) Renew micro-encapsulated hexagon bolt (left), to replace, grease, 47 Nm

INSTALLATION

- (11) Bearing support (left)
- (12) Support for EPS console
**Note:**
If the scope of delivery of spare parts contain bolts which are not micro-encapsulated, a suitable threadlocking compound (e.g. LOCTITE) should be used.

1. Lift off the seat cushion in position for repair (Chapter 3.1).

2. **Seat with operator console and armrest for electro-pneumatic gearshift:**
   Remove the supporting structure for electro-pneumatic gearshift (EPS) (see Chapter 3.25).

3. **Seat with armrests:**
   Remove the armrests (Chapter 3.24).
3.30 Backrest – removal and installation

REMOVAL  INSTALLATION

4. Remove the left covering in position for repair (Chapter 3.4).

5. Remove the covering completely (Chapter 3.5).
   **Note:**
   For seat models with fore/aft isolator remove only the left and right covering. Do not remove the covering at the front.

6. Pull off the lever for backrest adjustment at the bolt (see Chapter 3.13).
   **Note:**
   Left and right Bowden pull wires need not be taken off at the lever for backrest adjustment.
3.30 Backrest – removal and installation

REMOVAL     INSTALLATION

7 Remove the backrest cover and the safety belt (see Chapter 3.26).

Note:
Remove the safety belt only at the backrest. Do not remove the belt roller and the belt buckle.

8 Remove air hoses for lumbar support and lateral support adjustment at the valve unit (see Chapter 3.23).

9 Seat with climate control system:
9.1 Remove covering clamps and insertion rod at the backrest cover and pull the backrest cover over the foam plastic part in upwards direction (see Chapter 3.31).
3.30 Backrest – removal and installation

REMOVAL  INSTALLATION

9.2 Remove the cable harness for the brackets (see Chapter 3.49).

**Note:**
Electrical connections between cable harness for backrest and cable harness for vehicle connection, and between cable harness for backrest and cable harness for heater switch need not be disconnected.

9.3 Remove radial fan for backrest (Chapter 3.52).

9.4 Remove the control module for climate control system (Chapter 3.53).

9.5 Remove the cable for the microphone (Chapter 3.54).

9.6 Remove the microphone support (Chapter 3.55).
Removal

10 Unscrew two micro-encapsulated cap screws (3) from the right and left hexagon nut (4).

**Installation note:**
Replace the micro-encapsulated cap screw (3), 25 Nm.

11 Temporarily reinstall the lever for backrest adjustment to unlock the backrest (7) (see Chapter 3.13).

12 Fold the backrest (7) forward and secure it in this position.
13 Unscrew two hexagon bolts (1, 10) and remove the backrest (7) with the torsion springs (5, 9) at the bearing supports (2, 11).

Notes:
• Hexagon bolts (1, 10) have different widths across flats depending on the seat's special equipment (e.g. console for electro-pneumatic gearshift).
• If a console for electro-pneumatic gearshift exists, the support for the EPS console (12) must also be removed or installed.
3.30 Backrest – removal and installation

Installation

1. Put the backrest (7) in forward inclined horizontal position on the bearing supports (2, 11).

**Installation note:**
Apply acid-free multi-purpose lubricant to the teeth (F) of the leaf (6, 8).

**Note:**
Perform installation consecutively first on the right (2) and then on the left bearing support (11).

2. Installation on the right bearing support (2):

2.1. Lift the backrest (7) and put the torsion spring (5) to the right bearing support (2).
- The straight leg (a) points downwards.
- The angular leg (b) points towards the leaf (6) of the backrest (7).
2.2 Hang in the angular leg (b) of the torsion spring (5) in the drill hole (c) on the leaf (6) of the backrest (7).

2.3 Push the leaf (6) with the engaged torsion spring (5) down in front the bearing support (2) and temporarily fasten it with a micro-encapsulated hexagon bolt (1).

3 Installation on the left bearing support (11):
3.1 Lift the backrest (7) at the left and put the torsion spring (9) to the left bearing support (11):
   • The straight leg (d) points downwards.
   • The angular leg (e) points towards the leaf (8) of the backrest (7).
3.30 Backrest – removal and installation

REMOVAL

3.2 Hang in the angular leg (e) of the torsion spring (9) in the drill hole (f) on the leaf (8) of the backrest (7).

3.3 Push the leaf (8) with the engaged torsion spring (9) down in front the bearing support (11) and temporarily fasten it with a micro-encapsulated hexagon bolt (10).

INSTALLATION

4. Tighten the micro-encapsulated hexagon bolt (1, 10).

Installation notes:

- Renew micro-encapsulated hexagon bolt (1, 10), 47 Nm.
- Apply acid-free multi-purpose lubricant to collar (F) of the micro-encapsulated hexagon bolts (1, 10).
- The thread of the micro-encapsulated hexagon bolts (1, 10) and the inside thread of the backrest (7) must be free of grease.
3.30 Backrest – removal and installation

REMOVAL    INSTALLATION    TABLE OF CONTENTS

5 Set the backrest (7) upright.

6 Tighten the micro-encapsulated cap screws (3) at the right and left hexagon nut (4).
   **Installation note:**
   Replace the micro-encapsulated cap screw (3), 25 Nm.

7 Install air hoses for lumbar support and lateral support adjustment at the valve unit (see Chapter 3.23).

8 **Seat with climate control system:**
   8.1 Remove the microphone support (Chapter 3.55).

8.2 Install the cable for the microphone (Chapter 3.54).
3.30 Backrest – removal and installation

REMOVAL       INSTALLATION

8.3 Install the control module for climate control system (Chapter 3.53).

8.4 Install radial fan for backrest (Chapter 3.52).

8.5 Install the cable harness for the brackets (see Chapter 3.49).

8.6 Pull the backrest cover downward over the foam plastic part and install with insertion rod and covering clamps (see Chapter 3.31).

9 Install the backrest cover and the safety belt (see Chapter 3.26).

10 Attach the lever for backrest adjustment (see Chapter 3.13).
3.30 Backrest – removal and installation

11 Install the complete covering (Chapter 3.5).

12 Attach the left covering (Chapter 3.4).

13 **Seat with armrests:**
   For the installation of a new backrest, the armrests of the old backrest are installed onto the new backrest (see Chapter 3.24).

14 **Seat with operator console and armrest for electro-pneumatic gearshift:**
   Install the supporting structure for electro-pneumatic gearshift (see Chapter 3.25).

15 Install the seat cushion (Chapter 3.1).
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3.31.1 Backrest cover – removal and installation  
3.31.2 Backrest cover – removal and installation (seat with climate control system)
3.31.1 Backrest cover – removal and installation

REMOVAL / INSTALLATION

(1) Backrest cover
(2) Foam plastic part
(3) Velcro
(4) Zipper
(5) Insertion rod
(6) Covering clamps replace
(7) Safety belt

Note:
No claims for warranty can be accepted if you install the backrest cushion covers of other manufacturers than GRAMMER AG.
3.31.1 Backrest cover – removal and installation

REMOVAL / INSTALLATION

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the left covering in position for repair (Chapter 3.4).

3 Remove the covering at the back (see Chapter 3.5).

4 **Seat with armrests:**
   Remove the armrests (Chapter 3.24).

5 Pull off the lever for backrest adjustment at the bolt (see Chapter 3.13).

**Note:**
Left and right Bowden pull wires need not be taken off at the lever for backrest adjustment.
3.31.1 Backrest cover – removal and installation

REMOVAL / INSTALLATION

6 Remove the backrest cover and the safety belt (see Chapter 3.26).

**Note:**
Remove the safety belt only at the backrest. Do not remove the belt roller and the belt buckle.

Removal and installation

7 Bend open the five covering clamps (6), turn off from the backrest (1) and remove.

**Installation notes:**

- **ATTENTION** Damage!
  Attach the new covering clamps (6) with the sharp side to the foam part (2). Do not install any covering clamps (6) in the safety belt area (7) (arrows).
- Replace the covering clamps (6).
3.31.1 Backrest cover – removal and installation

8 Open fully the zip fastener (4) of backrest cushioning (1).

9 Remove the lower and upper insertion rod (5) from the backrest cover (1).

10 **ATTENTION** Damage!
The backrest cover (1) is secured in the backrest area with two Velcros (3). When separating the Velcro fasteneners, make sure the Velcros (3) are not torn out of the foam plastic part (2).

Pull off the backrest cover (1) from the foam plastic part (2) in upward direction.
3.31.1 Backrest cover – removal and installation

REMOVAL / INSTALLATION

Installation notes:

• When installing a new backrest cover (1), cut in the holes for the belt guide and belt bracket mounting.
• Put the backrest cover (1) to top of the headrest and evenly pull it onto the foam plastic part (2) from top to bottom.
• When pulling the backrest cover (1), release the tension by compressing the foam plastic part (2).

11 Re-install the components in the reverse order of their removal.
3.31.2 Backrest cover – removal and installation
(seat with climate control system)

REMOVAL / INSTALLATION

(1) Backrest cover
(2) Foam plastic part
(3) Clamp
(4) Ventilation cushion (fabric inlay)
(5) Strip
(6) Tie strap
(7) Zipper
(8) Safety belt
(9) Covering clamps................. replace
(10) Insertion rod
(11) Cable tie
(12) Cable for backrest heater
(13) Cable harness for backrest
(14) Cable for microphone
(15) Backrest frame
3.31.2 Backrest cover – removal and installation  
(seat with climate control system)

**Note:**
No claims for warranty can be accepted if you install the backrest cushion covers of other manufacturers than GRAMMER AG.

1. Lift off the seat cushion in position for repair (Chapter 3.1).

2. Remove the left covering in position for repair (Chapter 3.4).

3. Remove the covering at the back (see Chapter 3.5).

4. **Seat with armrests:**
   Remove the armrests (Chapter 3.24).
5 Remove the backrest cover and the safety belt (see Chapter 3.26).
   **Note:** Remove the safety belt only at the backrest. Do not remove the belt roller and the belt buckle.

6 Pull off the lever for backrest adjustment at the bolt (see Chapter 3.13).
   **Note:** Left and right Bowden pull wires need not be taken off at the lever for backrest adjustment.

7 Remove the microphone cable at the microphone support and pull out through the backrest cover towards the inside (see Chapter 3.54).
3.31.2 Backrest cover – removal and installation
(seat with climate control system)

Removal and installation

8 Bend open the three covering clamps (9), turn off from the backrest (1) and remove.

Installation notes:

- **ATTENTION** Damage!

  Attach the new covering clamps (9) with the sharp side to the foam part (2). Do not install any covering clamps (9) in the safety belt area (8) (arrows).

  Replace the covering clamps (9).

9 Mark the points where the cable for the backrest heater (12) is attached to the cable harness for the backrest (13) and to the microphone cable (14) by means of two cable ties (11) and remove the cable ties (11).

10 Open fully the zip fastener (7) of backrest cushioning (1).
3.31.2 Backrest cover – removal and installation
(seat with climate control system)

11 Remove the lower and upper insertion rod (10) from the backrest cover (1).

12 Pull the cable for the backrest heater (12) out of the backrest frame (14) in downward direction.

ATTENTION Damage!
The backrest cushion cover (1) is kept under tension with a strip (5) at the tie strap (6) in the upper backrest area. When removing the backrest cover (1), make sure that the tie strap (6) does not tear.

Pull the backrest cover (1) up to the strip (5) in upward direction over the plastic foam part (2) and hang out the strip (5) from the three clamps (3).
3.31.2 Backrest cover – removal and installation  
(seat with climate control system)

REMOVAL / INSTALLATION

14 Pull off the backrest cover (1) over the foam plastic part (2) in upward direction.  
**Installation notes:**  
• When installing a new backrest cover (1), cut in the holes for the belt guide and belt bracket mounting.  
• Put the backrest cover (1) to the top of the headrest and evenly pull it down onto the foam plastic part (2).  
• When pulling the backrest cover (1), release the tension by compressing the foam plastic part (2).  
• Ensure that the ventilation cushion (4) has been placed correctly in the foam plastic part (2).

15 Re-install the components in the reverse order of their removal.
3.32 Bearing support with backrest locking mechanism and hook-in function – removal and installation

REMOVAL

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<tbody>
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<td>(1)</td>
<td>Bearing support (right)</td>
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<td>(2)</td>
<td>Bearing support (left)</td>
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<td>(3)</td>
<td>Seat frame (right)</td>
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<tr>
<td>(4)</td>
<td>Rounded head screw .......... 6 Nm</td>
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<td>(5)</td>
<td>Blind rivet</td>
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<td>(6)</td>
<td>Hexagon bolt</td>
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<td>(7)</td>
<td>Retaining spring (right)</td>
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<td>Retaining spring (left)</td>
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<td>Seat frame (left)</td>
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<td>(10)</td>
<td>Backrest</td>
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<td>(11)</td>
<td>Rounded head screw .......... 6 Nm</td>
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<td>(12)</td>
<td>Blind rivet</td>
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<td>(13)</td>
<td>Lock ......................... to grease</td>
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<td>(14)</td>
<td>Spacer ......................... to grease</td>
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<td>Catch element ................ to grease</td>
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<td>Torsion spring</td>
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</tbody>
</table>
3.32 Bearing support with backrest locking mechanism and hook-in function – removal and installation

REMOVAL        INSTALLATION

(17) Bracket for backrest hook-in function (right)
(18) Bracket for backrest hook-in function (left)
(19) Leaf (tooth sheet)

Delivery option pos. 20 - 24 for seat with operator console and armrest for electro-pneumatic gearshift (EPS console):

(20) Support for EPS console
(21) Micro-encapsulated cap screw, M8 ...................... to replace, 25 Nm
(22) Micro-encapsulated cap screw, M8 ...................... to replace, 25 Nm
(23) Micro-encapsulated cap screw, M6 ...................... to replace, 12 Nm
(24) Washer
3.32 Bearing support with backrest locking mechanism and hook-in function – removal and installation

REMOVAL     INSTALLATION

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Note:
If screws are included in the scope of delivery of spare parts which are not micro-encapsulated, an appropriate threadlocking compound (e.g. LOCTITE) has to be used.

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Seat with operator console and armrest for electro-pneumatic gearshift:
Remove the operator console for the electro-pneumatic gearshift (see Chapter 3.25).

3 Remove the left covering in position for repair (Chapter 3.4).
3.32 Bearing support with backrest locking mechanism and hook-in function – removal and installation

**REMOVAL**

4 Remove the entire covering (Chapter 3.5).

**Note:**
For seat models with fore/aft isolator, remove only the left and right covering. Do not remove the front covering.

5 Remove the backrest (see Chapter 3.30).

**Notes:**
- The seat belt remains installed and the backrest is put down to the back.
- The electrical connections do not have to be disconnected and the air hoses do not have to be removed.
6 Pull off the lever for backrest adjustment at the stud (see Chapter 3.13).

**Note:**
The left and right Bowden pull wires for backrest adjustment do not have to be detached at the lever for backrest adjustment.

7 Detach the Bowden pull wires for backrest adjustment at the left and right catch elements (see Chapter 3.13).
3.32 Bearing support with backrest locking mechanism and hook-in function – removal and installation

**Removal**

8 Drill off two rivet heads and drive out blind rivets (5) at the right bearing support (1).

9 Unscrew the rounded head screw (4) and remove the right bearing support (1) on the right seat frame (3) with the parts attached to it (7, 13, 14, 15, 16, 17).

10 Bore out the rivet head and drive out the blind rivet (12) at the left bearing support (2).

11 Unscrew the rounded head screw (11) and remove the left bearing support (2) on the left seat frame (9) with the parts attached to it (8, 13, 14, 15, 16, 18).
Installation

Note:
Reuse or convert parts which are not included in the scope of delivery of the backrest locking mechanism.

1 Assembly of the right bearing support (1):

1.1 Insert two spacers (A/14) with their round side into the right and left milling hole of the bearing support (A/1).

Notes:
- The groove (arrows) of the spacer (A/14) must stay in alignment with the groove (A/arrow) of the bearing support (A/1).
- Apply acid-free multi-purpose lubricant to the side surfaces (F) of the spacers (A/14).
- The milling holes on the left and right of the bearing support (A/1) prevent moving of the spacers (A/14).
3.32 Bearing support with backrest locking mechanism and hook-in function – removal and installation

**REMOVAL**

1.2 Insert the lock (B/13) into the bearing support (B/1).

**Notes:**
- The flat side of the lock (B/13) must point towards the bearing support (B/1).
- The even and flat side of the lock (B/13) must lie on the bottom of the bearing support (B/1).
- The groove (B/arrow) of the lock (B/13) must stay in alignment with the groove (B/arrows) of the spacer (B/14) and of the bearing support (B/1).
- Apply acid-free multi-purpose lubricant to the entire external surface (F) of the lock (B/13).
1.3 Push the catch element (C/15) from the right through the bearing support (C/1) as far as possible.

**Notes:**
- Before pushing it through, place (turn) the catch element (C/15) in such a way that the nose (C/arrow) at the catch element (C/15) can be guided through the groove (C/arrow) in the bearing support (C/1).
- Apply acid-free multi-purpose lubricant to the entire front surface (F) of the catch element (C/15).
- Move the catch element (C/15) up and down several times to check it for easy running.
3.32 Bearing support with backrest locking mechanism and hook-in function – removal and installation

REMOVAL INSTALLATION

1.4 Hang the transversal bracket of the torsion spring (D/16) into the hinge of the bearing support (D/1).

Note:
The bend at the transversal bracket of the torsion spring (D/16) must point towards the bearing support (D/1).

1.5 Insert the bracket (D/17) into the hinge of the bearing support (D/1) and hang in the legs of the torsion spring (D/16) into the lateral hook of the bracket (D/17).

The torsion spring (16) presses the bracket (17) onto the bearing support (1).

Note:
The nose (D/arrow) on the side of the bracket (D/17) must point towards the bearing support (D/1) and must be located on the inserting side of the catch element (D/15).
1.6 Insert the short leg of the retaining spring (E/7) into the catch element (E/15).

Notes:
• The long leg of the retaining spring (E/7) must point towards the bearing support (E/1) and to the back.
• When it is installed, the retaining spring (7) must press upwards the engaging surface (arrow) of the lock (13).

2 Assembly of the left bearing support (2):
Assemble the left bearing support (F/2) according to steps 1.1 to 1.6 with the retaining spring (F/8) and the components (F/13, F/14, F/15, F/16 and F/18) laterally reversed.
3.32 Bearing support with backrest locking mechanism and hook-in function – removal and installation

REMOVAL     INSTALLATION

3 Insert the right and left bearing supports (1, 2) into the right and left side of the seat frame (3, 9) and fasten them by means of hexagon bolts (6) in installation position for adjustment.

**Note:**
The retaining springs (7, 8) must lie flat against the right and left side of the seat frame (3, 9) with initial tension.

4 Loosely screw the right and left bearing support (1, 2) with rounded head screws (4, 11).

5 Fasten the right bearing support (1) with two blind rivets (5) on the right of the seat frame (3) (fixed bearing).
3.32 Bearing support with backrest locking mechanism and hook-in function – removal and installation

REMOVAL INSTALLATION

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6 Tighten the rounded head screw (4) at the right bearing support (3) and pull the hexagon bolt (6) out again. **Installation note:** Rounded head screw (4), 6 Nm.

7 Install the backrest (see Chapter 3.30).

8 Hang in the Bowden pull wires for backrest adjustment at the left and right catch elements and install the lever for backrest adjustment (see Chapter 3.13).

9 To align the backrest locking mechanism, fold the backrest (10) forwards and backwards several times until the notching between the lock (13) and the leaf (19) stays in alignment.
3.32 Bearing support with backrest locking mechanism and hook-in function – removal and installation

REMOVAL     INSTALLATION

10 Tighten the rounded head screw (11) of the left bearing support (2).

Installation note:
Rounded head screw (11), 6 Nm.

11 Fasten the left bearing support (2) with a blind rivet (12) on the left of the seat frame (9).

12 Install the complete covering (Chapter 3.5).

13 Install the left covering (Chapter 3.4).

14 Seat with operator console and armrest for electro-pneumatic gearshift:
Install the operator console for the electro-pneumatic gearshift (see Chapter 3.25).

15 Install the seat cushion (Chapter 3.1).
3.33 Lumbar support – removal and installation

REMOVAL / INSTALLATION

(1) Backrest
(2) Safety belt
(3) Backrest cover
(4) Foam plastic part
(5) Lumbar support
(6) Lattice frame
(7) Air hose for upper chamber
(8) Air hose for lower chamber
(9) Hose connector
(10) Zipper
(11) Covering clamps ................. replace
3.33 Lumbar support – removal and installation

REMOVAL / INSTALLATION

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the left covering in position for repair (Chapter 3.4).

3 Carefully detach the rear covering at the right covering (see Chapter 3.5).

4 Remove the backrest cover at the backrest (see Chapter 3.26).

**Note:**
The seat belt does not have to be removed.
3.33 Lumbar support – removal and installation

Removal and installation

5 Hang in the seat belt (2) at the left curvature of the backrest (1).

6 Bend open the covering clamps (11) in the zipper area (10) and remove them.

Installation notes

- **ATTENTION** Damage!
  Attach the new covering clamps (11) with the pointed side pointing towards the foam plastic part (4). Do not attach any covering clamps (11) in the safety belt area (2) (arrow).
  - Replace the covering clamps (11).

7 Completely open the zipper (10).
3.33 Lumbar support – removal and installation

ATTENTION Hydrostatic test!

The hydraulic test of the lumbar support (5) and of the air hoses for the upper and lower chamber (7, 8) should be performed upon installation of the lumbar support (5).

WARNING Damage!

Take care not to damage the air hoses for the upper and lower chamber (7, 8).

Pull off the air hoses for the upper and lower chamber (7, 8) at the corresponding hose connector (9).

Installation note:
Push the air hoses for the upper and lower chamber (7, 8) completely onto the corresponding hose connector (9) by exerting pressure.
9 Detach the lumbar support (5) at the lattice frame (6).

10 Pull out the lumbar support (5) through the lattice frame (6) in backward direction.

**Installation note:**
Before hanging it into the lattice frame (6), exactly align the lumbar support (5) between the foam plastic part (4) and the lattice frame (6).

11 Re-install the components in the reverse order of their removal.
3.34 Lateral support adjustment – removal and installation

REMOVAL / INSTALLATION

(1) Lateral support adjustment, left
(2) Backrest frame
(3) Foam plastic part ..... to glue with (2)
(4) Hose connector (T-piece)
(5) Air hose, left chamber
(6) Lateral support adjustment, right
(7) Air hose, right chamber
(8) Hose connector
(9) Cable tie
(10) Blind rivet
(11) Washer
(12) Air hose for lateral support adjustment
3.34 Lateral support adjustment – removal and installation

1. Lift off the seat cushion in position for repair (Chapter 3.1).

2. **Seat with armrests:**
   Remove the armrests (Chapter 3.24).

3. **Seat with operator console and armrest for electro-pneumatic gearshift:**
   Remove the operator console for the electro-pneumatic gearshift (EPS) (see Chapter 3.25).

4. Remove the left covering in position for repair (Chapter 3.4).

5. Remove the entire covering (Chapter 3.5).

**Note:**
For seat models with fore/aft isolator, remove only the left and right covering. Do not remove the front covering.
6 Remove the backrest cover and the seat belt (see Chapter 3.26).

Note: Remove the seat belt at the backrest only. Do not remove the belt roller and the belt buckle.

7 Remove the backrest cover (Chapter 3.31).

Removal and installation

⚠️ ATTENTION Hydrostatic test!

The hydraulic test of the left and right lateral support adjustment (1, 6) and of the air hoses for the left and right chamber (5, 7) should be performed upon installation of the lateral support adjustment.
8 Mark the point where the air hose for the right chamber (7) is fastened to the backrest frame (2) by means of cable ties (9) and remove the cable ties (9).

9 **Lateral support adjustment, left (1):**
9.1 Carefully pull off the foam plastic part (3) in the area of the left lateral support adjustment (1) at the backrest frame (2).

**Installation note:**
Glue together the foam plastic part (3) and the backrest frame (2) at the provided bonding surfaces by means of appropriate adhesive (e.g. Dunlop upholstery glue).

9.2 Drill off two rivet heads, drive out the blind rivets (10) and remove the washer (11).
### 3.34 Lateral support adjustment – removal and installation

#### REMOVAL / INSTALLATION

**9.3 **\(\textbf{ATTENTION} \) Damage!
Take care not to damage the air hose for the left chamber (5).

Pull off the air hose for the left chamber (5) at the hose connector (4).

**Installation note:**
Push the air hose for the left chamber (5) completely onto the hose connector (4) by exerting pressure.

**9.4** Remove the left lateral support adjustment (1) at the backrest frame (2).
10 Lateral support adjustment, right (6):

10.1 Carefully pull off the foam plastic part (3) in the area of the left lateral support adjustment (6) at the backrest frame (2).

Installation note:
Glue together the foam plastic part (3) and the backrest frame (2) at the provided bonding surfaces by means of appropriate adhesive (e.g. Dunlop upholstery glue).

10.2 Drill off two rivet heads, drive out the blind rivets (10) and remove the washer (11).
3.34 Lateral support adjustment – removal and installation

REMOVAL / INSTALLATION

10.3 **ATTENTION** Damage!
Take care not to damage the air hose for the right chamber (7).

Pull off the air hose for the right chamber (7) at the hose connector (8).

**Installation note:**
Push the air hose for the right chamber (7) completely onto the hose connector (8) by exerting pressure.

10.4 Remove the right lateral support adjustment (6) at the backrest frame (2).

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

**REMOVAL / INSTALLATION**

| (1) | Vertical shock absorber |
| (2) | Collar screw.... to replace, to grease |
| (3) | Hexagon nut ......................... 25 Nm |
| (4) | Bracket (swinging structure) |
| (5) | Washer ............................... replace |
| (6) | Axle (swinging structure). to grease |

1. Lift off the seat cushion in position for repair (Chapter 3.1).

2. Remove the Bowden pull wire and the bearing at the vertical shock absorber (see Chapter 3.11).
3  **WARNING** Risk of crushing!

Bring the seat into the highest position and secure the swinging structure to the front plastic rollers of the lower suspension part by means of appropriate spacers.

4  Unscrew the hexagon nut (3) at the collar screw (2).

**Installation note:**
Hexagon nut (3), 25 Nm.

5  Pull out the collar screw (2) at the bracket (4) and at the vertical shock absorber (1) and remove two washers (5).
Installation notes:
- Replace the collar screw (2).
- Apply acid-free multi-purpose lubricant to the entire collar (F) of the collar screw (2).
- Replace the washer (5).

6 Move the seat to the middle position in order to be able to pull off the vertical shock absorber (1) at the axle (6).

7 Pull off the vertical shock absorber (1) at the axle (6) and remove it. **Installation notes:**
- Install the vertical shock absorber (1) with the labelling at the top.
- Apply acid-free multi-purpose lubricant to the entire surface (F) of the axle (6).

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

REMOVAL / INSTALLATION

(1) Air spring
(2) Collar screw (inner race) ........ 5 Nm
(3) Upper air spring support (swinging structure)
(4) Lower air spring support (swinging structure)
(5) Thread collar (air spring)
(6) Air hose (blue) to the air spring (Z)
(7) Retaining ring of quick coupling
(8) Pin (air spring)
(9) Collar screw (inner race) ........ 5 Nm
(10) Upper suspension part
(11) Level control
ATTENTION Damage!

- Before pulling out the air hose (6) at the air spring (1), the retaining ring of the quick coupling (7) must be pressed to the very back (e.g. using flat pliers), in order to avoid scoring of the air hose (6).
- Connect the air hose (6) not more than 1 to 2 times. Always check the air hose (6) for scoring prior to connection.
- It is possible to cut off the defective part in a straight and clean way (about 12 mm) with a sharp knife only once.
- After cutting off, mark the air hose (6) in order not to cut it several times.
ATTENTION Hydrostatic test!

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

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Detach the Bowden pull wire for quick lowering of the seat at the level control (retainer and valve lever) (see Chapter 3.7).
3.36 Air spring – removal and installation

REMOVAL / INSTALLATION

3 Hang out the Bowden pull wire for seat height adjustment at the level control (control disc) (see Chapter 3.9).

4 Remove the cable for vehicle connection at the level control (see Chapter 3.20).

5 Remove the air hose for lumbar support and lateral support adjustment at the retainer of the level control (see Chapter 3.22).

6 Remove the level control at the swinging structure and lift off the level control in upward direction as far as possible (see Chapter 3.28).

**Note:**
The air hoses at the level control do not need to be removed.
3.36 Air spring – removal and installation

**REMOVAL / INSTALLATION**

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**For seat model Actros:**

Remove the pin contact strip at the supporting structure (see Chapter 3.39).

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**WARNING** Risk of crushing!

Bring the seat into the highest position and secure the swinging structure to the front plastic rollers of the lower suspension part by means of appropriate spacers.

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

The pneumatic system is to be vented before removing the air hose (1) (e.g. by means of the quick lowering).

10 Unscrew the collar screw (2) through the mounting hole (arrow) in the upper suspension part (10).

**Installation notes:**
- Collar screw (2), 5 Nm.
- The thread collar (5) of the air spring (1) must lie flush in the hole of the upper air spring support (3).
3.36 Air spring – removal and installation

11 Unscrew the collar screw (9).
   **Installation note:**
   Collar screw (9), 5 Nm.

12 Press the retaining ring of the quick coupling (7) against the air spring (1) and pull the air hose (6) out of the air spring (1).
   **Installation notes:**
   • Insert the air hose (6) into the retaining ring of the quick coupling (7) as far as possible.
   • The air hose (6) is automatically locked after it has been connected.
3.36 Air spring – removal and installation

REMOVAL / INSTALLATION

13 Pull out the air spring (1) between the upper and lower air spring support (3, 4) and remove it from the seat in downward direction.

**Note:**
Press the removed level control (11) aside when removing the air spring (1).

**Installation note:**
Insert the air spring (1) at the lower air spring support (4) so that the pin (8) at the bottom of the air spring (1) engages in the drill hole (arrow) of the air spring support (4).

14 Re-install the components in the reverse order of their removal.
3.37 Fore/aft isolator – removal and installation (delivery option)

REMOVAL / INSTALLATION

<table>
<thead>
<tr>
<th>No.</th>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stopper</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Rounded flange head screw</td>
<td>(inner race)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Nm</td>
</tr>
<tr>
<td>3</td>
<td>Upper suspension part</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Clamp</td>
<td>to grease</td>
</tr>
<tr>
<td>5</td>
<td>Rubber spring</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Swinging structure</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Tube section</td>
<td>to grease</td>
</tr>
<tr>
<td>8</td>
<td>Washer</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Hexagon bolt</td>
<td>25 Nm</td>
</tr>
<tr>
<td>10</td>
<td>Stop lever</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Running surface (U-shaped rail)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Stud</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Lever for fore/aft isolator</td>
<td></td>
</tr>
</tbody>
</table>
1. Lift off the seat cushion in position for repair (Chapter 3.1).

**Removal and installation**

2. To unlock the fore/aft isolator, turn the lever for the fore/aft isolator (13) upwards.

3. Move the seat to a high position and secure it.

⚠️ **WARNING** Risk of crushing!
Secure the obtained height position by means of appropriate spacers between the upper suspension part and the lower suspension part.

**Note:**
The swinging structure (6) has to remain movable in the entire running surface area (11).
4 Unscrew two rounded flange head screws (2).
   **Installation note:**
   Rounded flange head screw (2), 5 Nm.

5 Pull off two stoppers(1) at the studs (12) and remove them from the running surfaces (11) of the upper suspension part (3).

6 Unscrew two hexagon bolts (9) and remove the washers (8).
   **Installation note:**
   Hexagon bolt (9), 25 Nm.
7 Release the clamp (4) and the stop lever (10) and push the upper suspension part (3) backwards against the pivot point (arrow) of the stop lever (10).

8 **ATTENTION** Deformation!
The clamp (4) is mounted between the swinging structure (6) and the upper suspension part (3).

To remove the clamp (4), push a screwdriver from the front horizontally between the upper suspension part (3) and the right side of the clamp (4) and carefully lift the upper suspension part (3) by means of the screwdriver at the pivot point (arrow) of the stop lever (10).

9 Push the clamp (4) forwards under the stop lever (10) until it can be pressed off at the swinging structure (6).
3.37 Fore/aft isolator – removal and installation (delivery option)

REMOVAL / INSTALLATION

10 Press off the clamp (4) at the swinging structure (6).

**Installation notes:**
- The groove (14) of the clamp (4) must engage in the guide (13) at the upper suspension part (3).
- Apply acid-free multi-purpose lubricant to the entire groove (F) and running surface (F) of the clamp (4).

11 Pull the rubber spring (5) out of the clamp (4).

12 Pull two tube pieces (7) out of the rubber spring (5).

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire external surface (F) of the tube pieces (7).

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

REMOVAL / INSTALLATION

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(1) Level control
(2) Swinging structure
(3) Lock washer
(4) Centre axle (swinging structure)
(5) Front axle, bottom (swinging structure)
(6) Clamp, right (level control)
(7) Clamp, left (level control)
(8) Bracket (level control)
(9) Air hose (blue) to the air spring (Z)
(10) Air hose (black) for air intake (P)
(11) Air hose (gray) for air exhaust (R)
(12) Air spring
3.38 Level control – removal and installation

WARNING Hydrostatic test!

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

Notes:
- When replacing the level control (1), the air hose (9) to the air spring (12) is replaced as well.
- To prevent any damages of the air hoses (9, 10, 11) and connections (Z, P, R) of the level control (1), all necessary notes including the safety and installation notes in Chapter 3.22 are to read and to be observed.
3.38 Level control – removal and installation

REMOVAL / INSTALLATION

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the left covering in position for repair (Chapter 3.4).

3 Detach the front covering at the right covering (see Chapter 3.5).

4 Remove the bellows at the front of the upper suspension part (see Chapter 3.6) and press it down.

5 Detach the Bowden pull wire for quick lowering of the seat at the level control (retainer and valve lever) (see Chapter 3.7).

6 Hang out the Bowden pull wire for seat height adjustment at the level control (control disc) (see Chapter 3.9).
3.38 Level control – removal and installation

REMOVAL / INSTALLATION

7 Remove the cable for vehicle connection at the level control (see Chapter 3.20).

8 Remove the air hose for lumbar support and lateral support adjustment at the retainer of the level control (see Chapter 3.22).

9 Pull the air hose out of the air spring (see Chapter 3.36).

10 Pull out the air hose at the air spring support (see Chapter 3.22).

11 Remove the air hoses for the air spring, air intake and air exhaust at the level control (see Chapter 3.22).
Removal and installation

12 **WARNING** Risk of crushing!

Bring the seat into the highest position and secure the swinging structure to the front plastic rollers of the lower suspension part by means of appropriate spacers.

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

The pneumatic system is to be disconnected from the air supply before removing the level control (1).

14 Loosen the lock washer (3) at the centre axle (4) of the swinging structure (2).
15 Detach the level control first with the right clamp (6) and then with the left clamp (7) at the centre axle (4) of the swinging structure (2).

**Installation note:**
During installation, make sure that the bracket (8) is hung into the lower front axle (5) of the swinging structure (2).

16 Remove the level control (1) from the seat in upward direction.

**Installation note:**
If the new air hose to the air spring (9) is not yet preassembled at the new level control (1), the air hose (9) has to be mounted at the level control (1) prior to installation (see Chapter 3.22).

17 Re-install the components in the reverse order of their removal.
3.39 Supporting structure – removal and installation

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3.39 Supporting structure – removal and installation
3.39.1 Supporting structure and pin contact strip – removal and installation (Actros)
3.39.2 Supporting structure – removal and installation (Atego, Axor)
3.39.3 Supporting structure – removal and installation (bus seat)
3.39.1 Supporting structure and pin contact strip – removal and installation (Actros)

REMOVAL / INSTALLATION

(1) Supporting structure
(2) Pin contact strip
(3) Rounded head screw (inner race) ......................... 5 Nm
(4) Micro-encapsulated cap screw .................. to replace, 25 Nm
(5) Plug of the cable for vehicle connection
(6) Connection for air intake
(7) Connection for air exhaust
(8) Plug of EPS-cable (delivery option)
(9) Air hose for air exhaust
(10) Air hose for air intake

Note:
For removal and installation of other supporting structures, please refer to the installation instructions on "Linea & Tourea" (material no.: 1 089 979).
3.39.1 Supporting structure and pin contact strip – removal and installation (Actros)

Removal and installation

1. Unscrew two rounded head screws (3) and lay the pin contact strip (2) down. 
   **Installation note:** Rounded head screw (3), 5 Nm.

2. Push the seat backwards as far as possible and unscrew two micro-encapsulated cap screws (4) at the front. 
   **Installation note:** Replace the micro-encapsulated cap screw (4), 25 Nm.

3. Push the seat forwards as far as possible and unscrew four micro-encapsulated cap screws (4) at the rear. 
   **Installation note:** Replace the micro-encapsulated cap screw (4), 25 Nm.
3.39.1 Supporting structure and pin contact strip – removal and installation (Actros)

**REMOVAL / INSTALLATION**

4 Lift off the seat from the supporting structure (1) and remove the supporting structure (1).

**5 Removal of the pin contact strip (2):**
5.1 Disconnect the electrical connection between the pin contact strip (2) and the plug of the cable for vehicle connection (5).

5.2 Pull off the air hose for air intake (10) and air exhaust (9) at the connection for air intake (6) and air exhaust (7).

5.3 **Seat with operator console and armrest for electro-pneumatic gearshift (EPS):**
   Disconnect the electrical connection between the pin contact strip (2) and the plug of the EPS cable (8).

5.4 Remove the pin contact strip (2).

6 Re-install the components in the reverse order of their removal.
3.39.2 Supporting structure – removal and installation (Atego, Axor)

REMOVAL / INSTALLATION

(1) Supporting structure
(2) Micro-encapsulated cap screw .................. to replace, 25 Nm
(3) Lower suspension part

1 Remove the seat fore/aft adjustment at the supporting structure (see Chapter 3.40).

**Note:**
The pin contact strip does not need to be removed from the supporting structure.
3.39.2 Supporting structure – removal and installation (Atego, Axor)

Removal and installation

2 Unscrew four micro-encapsulated cap screws (2).

**Installation note:**
Replace the micro-encapsulated cap screw (2), 25 Nm.

3 Remove the supporting structure (1) from the lower suspension part (3).

4 Re-install the components in the reverse order of their removal.
3.39.3 Supporting structure – removal and installation (bus seat)

(1) Supporting structure

**Note:**
Size and shape of the supporting structure (1) might differ depending on the design or model of the seat.

(2) Swivel

(3) Lever for seat fore/aft adjustment

(4) Seat fore/aft adjustment

(5) Plate with mounting holes

(6) Micro-encapsulated cap screw .................. to replace, 25 Nm

(7) Hexagon nut

(8) Washer

(9) Micro-encapsulated cap screw .................. to replace, 25 Nm

(10) Locking rail
3.39.3 Supporting structure – removal and installation (bus seat)

Removal and installation

1. Push the seat backwards as far as possible.

2. Unscrew two micro-encapsulated cap screws (6) at the front and remove the washers (8) and hexagon nuts (7).
   **Installation note:**
   Replace the micro-encapsulated cap screw (6), 25 Nm.

3. Push the seat forwards as far as possible.

4. Unscrew two micro-encapsulated cap screws (9) and remove the washers (8) and hexagon nuts (7).
   **Installation note:**
   Replace the micro-encapsulated cap screw (9), 25 Nm.
5 Unscrew four micro-encapsulated cap screws (6) at the rear and remove hexagon nuts (7), washers (8) and the plates with mounting holes (5).

6 Remove the supporting structure (1) at the locking rail (10) of the seat fore/aft adjustment (4).

7 Re-install the components in the reverse order of their removal.
3.40 Seat fore/aft adjustment – removal and installation

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3.40.1 Seat fore/aft adjustment – removal and installation (Actros)
3.40.2 Seat fore/aft adjustment and pin contact strip – removal and installation (Atego, Axor)
3.40.3 Seat fore/aft adjustment – removal and installation (bus seat)
3.40.1 Seat fore/aft adjustment – removal and installation (Actros)

REMOVAL / INSTALLATION

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(1) Lever for seat fore/aft adjustment
(2) Locking rail ...................... to grease
(3) Adjusting rail
(4) Seat fore/aft adjustment 
   = (2) + (3)
(5) Micro-encapsulated cap screw ........................ to replace, 25 Nm
(6) Plate with mounting holes
(7) Micro-encapsulated cap screw ........................ to replace, 25 Nm
(8) Lower suspension part
3.40.1 Seat fore/aft adjustment – removal and installation (Actros)

REMOVAL / INSTALLATION

1 Remove the supporting structure (see Chapter 3.39).

**Note:**
The pin contact strip does not need to be removed from the supporting structure.

**Removal and installation**

2 Push the seat forwards as far as possible.

3 Unscrew two micro-encapsulated cap screws (5) at the front.

**Installation note:**
Replace the micro-encapsulated cap screw (5), 25 Nm.

4 Push the seat backwards as far as possible.
5 Unscrew four micro-encapsulated cap screws (7) at the rear and remove two plates with mounting holes (6) from the adjusting rails (3).
   **Installation note:**
   Replace the micro-encapsulated cap screw (7), 25 Nm.

6 Remove the seat fore/aft adjustment (4) with the lever for fore/aft adjustment (1) at the lower suspension part (8).
   **Installation note:**
   Apply acid-free multi-purpose lubricant to the notching (F) of the locking rails (2).

7 Pull the lever for seat fore/aft adjustment (1) out of the retainers for the adjusting rails (3).

8 Re-install the components in the reverse order of their removal.
3.40.2 Seat fore/aft adjustment and pin contact strip – removal and installation (Atego, Axor)

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Seat fore/aft adjustment (complete)
   = (2) + (3) + (4) + (5)
(2) Lever for seat fore/aft adjustment
(3) Locking rail ...................... to grease
(4) Adjusting rail
(5) Base plate
(6) Pin contact strip
(7) Supporting structure
(8) Micro-encapsulated cap screw .................. to replace, 25 Nm
(9) Micro-encapsulated cap screw .................. to replace, 25 Nm
(10) Plate with mounting holes
(11) Micro-encapsulated cap screw .................. to replace, 25 Nm
(12) Screw-on plate
3.40.2 Seat fore/aft adjustment and pin contact strip – removal and installation (Atego, Axor)

(13) Rounded head screw (inner race) ......................... 2.6 Nm

(14) Plug of the cable for vehicle connection

(15) Connection for air exhaust

(16) Connection for air intake

(17) Plug of EPS cable (delivery option)

(18) Air hose for air exhaust

(19) Air hose for air intake

(20) Micro-encapsulated cap screw .................. to replace, 25 Nm

(21) Stopper
3.40.2 Seat fore/aft adjustment and pin contact strip – removal and installation (Atego, Axor)

Removal and installation

1 Unscrew the rounded head screw (13).
   **Installation note:**
   Rounded head screw (13), 2.6 Nm.

2 Push the pin contact strip (6) to the right to unhook the two noses (arrows) at the base plate (5).

3 Remove the pin contact strip (6) at the base plate (5) and put it aside.
   **Note:**
   In left-hand drive vehicles, the pin contact strip (6) is installed on the right side of the base plate (5) (tunnel side). For right-hand drive vehicles, the pin contact strip (6) has to be mounted to the left side of the base plate (5).
3.40.2 Seat fore/aft adjustment and pin contact strip – removal and installation (Atego, Axor)

REMOVAL / INSTALLATION

4 Push the seat forwards as far as possible.

5 Seat without operator console and armrest for electro-pneumatic gearshift:
Unscrew two micro-encapsulated cap screws (8) at the front.
Installation note:
Replace the micro-encapsulated cap screw (8), 25 Nm.

6 Seat with operator console and armrest for electro-pneumatic gearshift:
Unscrew two micro-encapsulated cap screws (20) at the front and remove the stoppers (21).
Installation note:
Replace the micro-encapsulated cap screw (20), 25 Nm.
3.40.2 Seat fore/aft adjustment and pin contact strip – removal and installation (Atego, Axor)

7 Move the seat by means of the seat fore/aft adjustment (1) so that the micro-encapsulated cap screws (9, 11) are accessible via the mounting holes (arrows) at the bottom in the base plate (5).

8 Unscrew two micro-encapsulated cap screws (9).

**Installation note:**
Replace the micro-encapsulated cap screw (9), 25 Nm.

9 Unscrew four micro-encapsulated cap screws (11) and remove two plates with mounting holes (10) and two screw-on plates (12).

**Installation note:**
Replace the micro-encapsulated cap screw (11), 25 Nm.

10 Remove the seat fore/aft adjustment (1) at the supporting structure (7).
11 Removal of the pin contact strip (6):
11.1 Disconnect the electrical connection between the pin contact strip (6) and the plug of the cable for vehicle connection (14).

11.2 Pull off the air hose for air intake (19) and air exhaust (18) at the connection for air intake (16) and air exhaust (15).

11.3 Seat with operator console and armrest for electro-pneumatic gearshift:
   Disconnect the electrical connection between the pin contact strip (6) and the plug of the EPS cable (17).

11.4 Remove the pin contact strip (6).

12 Re-install the components in the reverse order of their removal.
3.40.3 Seat fore/aft adjustment – removal and installation (bus seat)

REMOVAL / INSTALLATION

(1) Lever for seat fore/aft adjustment
(2) Locking rail ................. to grease
(3) Adjusting rail
(4) Seat fore/aft adjustment
   = (2) + (3)
(5) Micro-encapsulated cap screw ............... to replace, 25 Nm
(6) Hexagon nut
(7) Rotary table
(8) Swivel, upper part
(9) Swivel
   = (7) + (8)

1 Remove the supporting structure (Chapter 3.39).
3.40.3 Seat fore/aft adjustment – removal and installation (bus seat)

Removal and installation

2 Turn the swivel (7) by approx. 45 degrees.

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

4 Unscrew two micro-encapsulated cap screws (5) at the front and remove two hexagon nuts (6).
   **Installation note:**
   Replace the micro-encapsulated cap screw (5), 25 Nm.

5 Move the seat by means of the seat fore/aft adjustment (4) so that the two micro-encapsulated cap screws (5) are accessible via the mounting hole (arrow) at the bottom left and right in the adjusting rail (5).
3.40.3 Seat fore/aft adjustment – removal and installation (bus seat)

6 Unscrew two micro-encapsulated cap screws (5) at the rear and remove two hexagon nuts (6).

**Installation note:**
Replace the micro-encapsulated cap screw (5), 25 Nm.

7 Remove the seat fore/aft adjustment (4) with the lever for fore/aft adjustment (1) at the swivel (8).

**Installation note:**
Apply acid-free multi-purpose lubricant to the notching (F) of the locking rails (2).

8 Pull the lever for seat fore/aft adjustment (1) out of the retainers for the adjusting rails (3).

9 Re-install the components in the reverse order of their removal.
3.41 Guides – removal and installation

REMOVAL / INSTALLATION

(1) Guide............................... to grease
(2) Blind rivet
(3) Seat frame

1 Lift off the seat cushion in position for repair (Chapter 3.1).
Removal and installation

2 Bore off four rivet heads at the guides (1) and drive out the blind rivets (2).

3 Remove four guides (1) at the seat frame (3).

**Installation note:**
Apply acid-free multi-purpose lubricant to the bearing surfaces of the seat cushion (F) for the guides (1).

4 Re-install the components in the reverse order of their removal.
3.42 Air hose for compressed-air quick coupling – removal and installation (delivery option)

REMOVAL / INSTALLATION

(1) Air hose (for compressed-air quick coupling)
(2) Compressed-air quick coupling
(3) Supporting structure
(4) Retaining ring
(5) Hose nozzle
(6) Hose connector (T-piece)
(7) Cable tie

WARNING

Hydrostatic test!

The hydraulic test of the seat should be performed upon installation of the new air hose for compressed-air quick coupling (1). To do this, apply 60 kg load to the seat for 24 hours. The lowering within this time must not exceed 15 mm.
3.42 Air hose for compressed-air quick coupling – removal and installation (delivery option)

Removal and installation

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

The pneumatic system is to be vented before removing the air hose (1) (e.g. by means of the quick lowering).

2 Mark the point where the air hose (1) is fastened to the supporting structure (3) by means of cable ties (7) and remove the cable ties (7).

3 Push the hose nozzle (5) backwards at the air hose (1).

4 Pull off the air hose (1) at the hose connector (6).
5 Pull off the hose nozzle (5) at the air hose (1).

6 Push the retaining ring (4) of the compressed-air quick coupling (2) completely backwards (arrow direction) and pull the air hose (1) out of the compressed-air quick coupling (2).

**Installation notes:**
- Insert the air hose (1) into the compressed-air quick coupling (2) as far as possible.
- The air hose (1) is automatically locked with the retaining ring (4) after it has been inserted.

7 Re-install the components in the reverse order of their removal.
3.43 Seat frame – removal and installation

REMOVAL / INSTALLATION

(1) Seat frame
(2) Stud.......................... to grease
(3) Blind rivet
(4) Support
(5) Blind rivet
(6) Rounded head screw
(inner race)........................... 3 Nm
(7) Protective profile
(8) Clip (for cable and Bowden pull wire)
(9) Z-section
(10) Blind rivet
(11) Guide.............................. to grease
(12) Upper suspension part
(13) Clearance spacer
(14) Slider
3.43 Seat frame – removal and installation

REMOVAL / INSTALLATION

(15) Support
(16) Eccentric
(17) Blind rivet
(18) Support (Bowden pull wire)
(19) Blind rivet
(20) Clamp (Bowden pull wire)
(21) Clamp (EPS cable)
(22) Handle rail

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the left covering in position for repair (Chapter 3.4).
3 Seat with operator console and armrest for electro-pneumatic gearshift:
Remove the operator console for the electro-pneumatic gearshift (EPS) (see Chapter 3.25).

4 Remove the covering completely (Chapter 3.5).

5 Remove the bellows at the upper suspension part and at the supports (see Chapter 3.6) and press it down.

6 Remove the Bowden pull wire and the lever for backrest adjustment (Chapter 3.13).

7 Remove the Bowden pull wire for seat angle adjustment with the locking mechanism (see Chapter 3.17).
   **Note:**
   Remove the entire locking mechanism, do not disassemble it.
8 Remove the seat belt at the seat frame (see Chapter 3.26).

9 **Seat with lap belt:**
Remove the lap belt (Chapter 3.27).

10 Remove the belt buckle with the belt buckle cable (Chapter 3.28).

11 Remove the secondary belt (Chapter 3.29).

12 Remove the backrest (Chapter 3.30).

13 Remove the bearing support with backrest locking mechanism and hook-in function (see Chapter 3.32).

**Note:**
Remove the entire bearing support, do not disassemble it.
### 3.43 Seat frame – removal and installation

#### REMOVAL / INSTALLATION

**Removal and installation**

14 **WARNING** Risk of crushing!

Bring the seat into the highest position and secure the swinging structure to the front plastic rollers of the lower suspension part by means of appropriate spacers.

15 Unscrew two rounded head screws (6) and lay the handle rail (22) down. **Installation note:** Rounded head screw (6), 3 Nm.

16 Pull out three clips (8) at the upper suspension part (1) and at the Z-section (9). **Note:** The Bowden pull wires and cables do not need to be detached at the clips (8).
17 Bore off two rivet heads and drive out the blind rivets (5) at the seat frame (1).

18 Pull out two studs (2).
**Installation note:**
Apply acid-free multi-purpose lubricant to the entire surface (F) of the studs (2).

19 Remove the seat frame (1) in upward direction.
**Installation notes:**
- For installation of a new seat frame (1): Convert assembles that do not belong to the scope of delivery of the new seat frame (1).
- If necessary, adjust the clearance between the seat frame (1) and the upper suspension part (12) by means of clearance spacers (13).
3.43 Seat frame – removal and installation

REMOVAL / INSTALLATION

**Apply acid-free multi-purpose lubricant to the contact surfaces of the seat cushion (F) of the four guides (11).**

**Place the seat frame (1) horizontally and in the right position onto the upper suspension part (12).**

**20 Removal of further assemblies:**

20.1 Bore off four rivet heads, drive out the blind rivets (3) at the seat frame (1) and remove two supports (4).

20.2 Pull off the clamp (20) at the seat frame (1).

20.3 Seat with operator console and armrest for electro-pneumatic gearshift:
Pull off two clamps (21) at the seat frame (1).
3.43 Seat frame – removal and installation

REMOVAL / INSTALLATION

20.4 Bore off four rivet heads, drive out the blind rivets (10) at the seat frame (1) and remove two Z-sections (9).

20.5 Bore off four rivet heads, drive out the blind rivets (17) at the seat frame (1) and remove the support (15) with the eccentric (16).

20.6 Bore off the rivet head, drive out the blind rivet (19) at the seat frame (1) and remove the support (18).

20.7 Remove two sliders (14).

20.8 Pull off the protective profile (7) at the seat frame (1).

21 Re-install the components in the reverse order of their removal.
3.44 Seat suspension – removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Seat suspension
(2) Seat frame
(3) Stud ......................... to grease
(4) Blind rivet
(5) Clearance spacer
(6) Backrest
(7) Countersunk screw
    (inner race) ....................... 25 Nm
(8) Support (belt roller)
(9) Holder (Bowden pull wire)
(10) Rounded head screw
    (inner race) ....................... 2.7 Nm
(11) Air hose for lumbar support and
    lateral support adjustment
(12) Cable for vehicle connection
3.44 Seat suspension – removal and installation

REMOVAL / INSTALLATION

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the seat cushion and the lever for seat angle and seat depth adjustment (Chapter 3.2).

3 Remove the left covering in position for repair (Chapter 3.4).

4 Seat with operator console and armrest for electro-pneumatic gearshift:
   Remove the operator console for the electro-pneumatic gearshift (EPS) (see Chapter 3.25).

5 Remove the covering completely (Chapter 3.5).

6 Remove the bellows (Chapter 3.6).
7 Hang out the Bowden pull wire for quick lowering of the seat at the level control (valve lever and retainer) (see Chapter 3.7) and pull it out in backward direction.

8 Remove the Bowden pull wire for seat height adjustment at the level control (control disc) and at the holder (see Chapter 3.9) and pull it out in backward direction.

9 Remove the Bowden pull wire for vertical shock absorber adjustment at the vertical shock absorber and at the holder (see Chapter 3.11) and pull it out in backward direction.
3.44 Seat suspension – removal and installation

REMOVAL / INSTALLATION

10 Seat with fore/aft isolator:
10.1 Remove the Bowden pull wire for the locking mechanism of the fore/aft isolator (Chapter 3.15).

10.2 Remove the fore/aft isolator (Chapter 3.37).

11 Remove the Bowden pull wire for seat angle adjustment with the locking mechanism (Chapter 3.17).

Note: Remove the entire locking mechanism, do not disassemble it.

12 Seat with belt buckle and belt buckle cable:
Disconnect the electrical connection between the plug and the socket of the belt buckle cable (see Chapter 3.28).
13 Detach the belt roller at the support (upper suspension part) (see Chapter 3.26), lead it upwards at the webbing and secure it.

14 Remove the air hose for lumbar support and lateral support adjustment at the valve unit (see Chapter 3.23).

15 Detach the cable of the heater switch at the clip (see Chapter 3.20).

16 Detach the air hose for lumbar support and lateral support adjustment at the clip (see Chapter 3.22).
3.44 Seat suspension – removal and installation

REMOVAL / INSTALLATION

17 Detach the cable for vehicle connection and the belt tensioner cable at the clip (see Chapter 3.20).

18 Remove the secondary belt (Chapter 3.29).

19 Remove the supporting structure (Chapter 3.39).

20 Remove the seat fore/aft adjustment (Chapter 3.40).

Removal and installation

⚠️ WARNING Risk of crushing! The seat frame is not locked anymore.

21 Unscrew two countersunk screws (7) and remove the holder (8).

Installation note: Countersunk screw (7), 25 Nm.
3.44 Seat suspension – removal and installation

REMOVAL / INSTALLATION

22 Unscrew the rounded head screw (10) and remove the support (9) at the seat suspension (1).
   **Installation note:**
   Rounded head screw (10), 2.7 Nm.

23 Bore off two rivet heads and drive out the blind rivets (4) at the seat frame (2).

24 Pull two studs (3) out of the seat suspension (1) and the seat frame (2).
   **Installation note:**
   Apply acid-free multi-purpose lubricant to the entire surface (F) of the stud (3).
25 Lift off the seat frame (2) with the attached backrest (6) in upward direction. 

**Installation notes:**
- If necessary, adjust the clearance between the seat frame (2) and the seat suspension (1) by means of clearance washers (5).
- Place the seat frame (2) horizontally in the right position onto the seat suspension (1).

26 Remove the seat suspension (1). 

**Installation note:**
For installation of a new seat suspension (1):
Convert assemblies that do not belong to the scope of delivery of the new seat suspension (1).

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

DISASSEMBLY / ASSEMBLY

TABLE OF CONTENTS

(1) Lower suspension part, guiding rail ................ face side to be greased
(2) Swinging structure .................................. axles to be greased
(3) Upper suspension part, guiding rail ................ face side to be greased
(4) Buffer
(5) Collar screw (inner race)........... 7 Nm
(6) Stopper
(7) Buffer
(8) Hexagon nut
(9) Buffer (spacer)
(10) Micro-encapsulated cap screw ..................... to replace, 25 Nm
(11) Clearance spacer, thickness..................... 0.2 and 0.5 mm
(12) Plastic roller

Note:
Max. clearance between the roller and the upper suspension part or the lower suspension part: 0.25 mm.
3.45 Swinging structure – disassembly and assembly

DISASSEMBLY / ASSEMBLY

(13) Sleeve (tube piece)
(14) Fixed bearing
(15) Hexagon nut ....................... 25 Nm
(16) Threaded bolt
(17) Rounded flange head screw (inner race) ....................... 5 Nm
(18) Stopper
(19) Rounded head screw (inner race) ....................... 2.7 Nm
(20) Holder (Bowden pull wire)
(21) Centre bearing .......... to grease

Note:
If the swinging structure (2) is defective, the entire seat suspension has to be replaced (Chapter 3.44).
### 3.46 Worn parts – removal and installation

#### REMOVAL / INSTALLATION

1. Fork (1x)  
   (see Chapter 3.11)
2. Compression spring (1x)  
   (see Chapter 3.11)
3. Fixing (1x)  
   (see Chapter 3.11)
4. Collar screw (1x)  
   (see Chapter 3.35)  
   **25 Nm**
5. Hexagon nut (1x)  
   (see Chapter 3.35)  
   Hexagon nut (4x)  
   (see Chapter 3.45)
6. Washer (2x)  
   (see Chapter 3.35)
7. Bellows pin (16x)  
   (see Chapter 3.6)
8. Collar screw (2x)  
   (inner race)  
   **7 Nm**  
   (see Chapter 3.45)
9. Stopper (2x)  
   (see Chapter 3.45)
## Worn parts – removal and installation

**REMOVAL / INSTALLATION**

1. **Buffer (2x)**  
   (see Chapter 3.45)
2. **Fixed bearing (4x)**  
   (see Chapter 3.45)
3. **Sleeve (tube piece) (4x)**  
   (see Chapter 3.45)
4. **Buffer (2x)**  
   (see Chapter 3.45)
5. **Clearance spacer (8x)**  
   (see Chapter 3.45)
6. **Buffer (spacer) (2x)**  
   (see Chapter 3.45)
7. **Plastic roller (4x)**  
   (see Chapter 3.45)
8. **Micro-encapsulated cap screw (2x)**  
   25 Nm  
   (see Chapter 3.45)
9. **Threaded bolt (2x)**  
   (see Chapter 3.45)
10. **Slider (2x)**  
    (see Chapter 3.43)
3.47 Entire swivel – removal and installation  
(driver's seat with swivel, e.g. bus seat)

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3.47.1 Swivel and linkage rod – removal and installation
3.47.2 Cylinder for swivel – removal and installation
3.47.3 Button and valve for swivel – removal and installation
3.47.4 Air hose set for swivel – removal and installation
3.47.1 Swivel and linkage rod – removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Swivel (complete)
(2) Micro-encapsulated cap screw ..................  to replace, 25 Nm
(3) Supporting structure for swivel
(4) Lower suspension part
(5) Micro-encapsulated cap screw ..................  to replace, 25 Nm
(6) Cylinder
(7) Air hose to the cylinder
(8) Air hose for air intake
(9) Air hose for air exhaust
(10) Cable for vehicle connection
(11) Rounded head screw (inner race) ............. to hand-tighten
(12) Wire bracket
1 Position the backrest vertically and put the seat onto the backrest.

2 Remove the supporting structure (Chapter 3.39).

3 Remove the seat fore/aft adjustment (Chapter 3.40).
3.47.1 Swivel and linkage rod – removal and installation

Removal and installation

4 **ATTENTION** Damage!

When lifting off the swivel (1), do not overstretch the air hose to the cylinder (7) and take care not to damage the hose connection to the cylinder (6).

Unscrew six micro-encapsulated cap screws (2) and remove the swivel (1) at the supporting structure for the swivel (3).

**Installation note:**

Replace the micro-encapsulated cap screw (1), 25 Nm.

5 Thread the air hoses for air intake and air exhaust (8, 9) and the cable for vehicle connection (10) through the swivel (1) to the lower suspension part (4).
6 Unscrew the rounded head screw (11) at the cylinder (6).

**Installation note:**
Hand-tighten the rounded head screw (11).

7 Detach the wire bracket (12) at the cylinder (6) and remove the swivel (1).

8 **Removal of the supporting structure for the swivel (3):**
Unscrew six micro-encapsulated cap screws (5) and remove the supporting structure for the swivel (3) at the lower suspension part (4).

**Installation note:**
Replace the micro-encapsulated cap screw (5), 25 Nm.

9 Re-install the components in the reverse order of their removal.
3.47.2 Cylinder for swivel – removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Air hose (to the cylinder)
(2) Cylinder for the swivel
(3) Rounded head screw (inner race) ............ to hand-tighten
(4) Wire bracket
(5) Hose nozzle
(6) Connection (fixed throttle)

ATTENTION Hydrostatic test!

The hydraulic test of the seat should be performed upon installation of the cylinder (2). To do this, apply 60 kg load to the seat for 24 hours. The lowering within this time must not exceed 15 mm.
1 Position the backrest vertically and put the seat onto the backrest.

2 Remove the supporting structure (Chapter 3.39).

3 Remove the swivel (see Chapter 3.47).

Note: Do not remove the fore/aft adjustment at the swivel.

Removal and installation

4 WARNING The pressure in the pneumatic system might cause injury!

The pneumatic system is to be vented before removing the cylinder for the swivel (2).

5 Pull off the hose nozzle (5) and push it backwards over the air hose (1).
6 **ATTENTION** Damage!
Take care not to damage the connection (6) of the cylinder (2). Do not use a screwdriver or similar tools to lift off the air hose (1) at the connection (6) of the cylinder (2).

Cut off the air hose (1) in a clean and straight way directly behind the connection (6) of the cylinder (2) by means of a sharp knife.

**Installation note:**
Push the air hose (1) completely onto the connection (6) of the cylinder (2) by exerting pressure.

**Notes:**
- The air hose (1) can be cut off only once.
- After cutting off, mark the air hose (1) in order not to cut it several times.
3.47.2 Cylinder for swivel – removal and installation

REMOVAL / INSTALLATION

7 Pull off the hose nozzle (5) at the air hose (1).

8 Unscrew the rounded head screw (3).  
   **Installation note:**  
   Hand-tighten the rounded head screw (3), 2.6 Nm.

9 Detach the wire bracket (4) at the cylinder (2) and remove the cylinder (2).

10 **Removal of the connection (6):**  
    Unscrew the connection (6) at the cylinder (2).

11 Re-install the components in the reverse order of their removal.
3.47.3 Button and valve for swivel – removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Button for swivel
(2) Handle rail
(3) Holder (for button of swivel)
(4) Grooved pin ................... to grease
(5) Rounded head screw
   (inner race) ......................... 3 Nm
(6) Lever (of button for swivel)
(7) Valve support
(8) Valve for swivel
(9) Hose nozzle
(10) Air hose (to the cylinder)
(11) Air hose (short)
(12) Rounded head screw
     (inner race) ......................... 3 Nm
3.47.3 Button and valve for swivel – removal and installation

REMOVAL / INSTALLATION

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the right covering in position for repair (Chapter 3.4).

Removal and installation

3 Drive out the grooved pin (4) at the lever (6) and at the holder (3) in backward direction and remove the lever (6) with the button for the swivel (1).

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire external surface (F) of the grooved pin (4).

4 If the button for the swivel (1) is defective:
Unscrew two rounded head screws (12) and remove the button for the swivel (1).

**Installation note:**
Rounded head screw (12), 3 Nm.
3.47.3 Button and valve for swivel – removal and installation

REMOVAL / INSTALLATION

5 Unscrew the rounded head screw (5) and pull out the valve for the swivel (8) with the valve support (7) at the holder (3).

**Installation note:**
Rounded head screw (5), 3 Nm.

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

The pneumatic system is to be vented before removing the valve for the swivel (8).

7 Pull off two hose nozzles (9) and push them backwards over the air hoses (10, 11).
8 **WARNING** Damage!
Take care not to damage the air hoses (10, 11). Do not use a screwdriver or similar tools to lift off the air hoses (10, 11) at the connections (arrows) of the valve (8).

Mark the air hoses (10, 11) ad cut them off in a clean and straight way directly behind the connections (arrows) of the valve (8) by means of a sharp knife.

**Installation notes:**
- Install the air hoses (10, 11) according to the marking.
- Push the air hoses (10, 11) completely onto the connections (arrows) of the valve (8) by exerting pressure.
Notes:
- The air hoses (10, 11) can be cut off only once.
- After cutting, mark the air hoses (10, 11) in order not to cut them several times.

9 Remove the valve for the swivel (8) with the valve support (7).

10 Re-install the components in the reverse order of their removal.
3.47.4 Air hose set for swivel – removal and installation

REMOVAL / INSTALLATION

- Valve (for swivel)
- Hose nozzle
- Cable tie
- Hose connector (reducer)
- Hose nozzle
- Air hose (short)
- Air hose (long)
- Air hose (to the cylinder)
- Air hose (for lumbar support, lateral support adjustment and swivel)
- Air hose (for lumbar support and lateral support adjustment)
- Hose connector
- Bowden pull wire for vertical shock absorber adjustment
- Z-section
- Clip
3.47.4 Air hose set for swivel – removal and installation

REMOVAL / INSTALLATION

(15) Retainer
(16) Level control
(17) Cable tie
(18) Bellows
(19) Cable tie
(20) Air spring support

**WARNING** Hydrostatic test!

The hydraulic test of the seat should be performed upon installation of the air hoses (6, 7, 8, 9, 10). To do this, apply 60 kg load to the seat for 24 hours. The lowering within this time must not exceed 15 mm.
3.47.4 Air hose set for swivel – removal and installation

REMOVAL / INSTALLATION

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the right covering in position for repair (Chapter 3.4).

3 Carefully detach the rear covering at the left covering (see Chapter 3.5).

4 Detach the bellows at the supports (see Chapter 3.6).

5 Remove the swivel (see Chapter 3.47.1).

**Note:**
Do not remove the supporting structure and the fore/aft adjustment at the swivel.

6 Remove the air hose to the cylinder at the cylinder (see Chapter 3.47.2).
7 Remove the air hose for lumbar support and lateral support adjustment at the valve for lateral support adjustment (see Chapter 3.23).

Removal and installation

8 **WARNING** Risk of crushing!

Bring the seat into the highest position and secure the swinging structure to the front plastic rollers of the lower suspension part by means of appropriate spacers.

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

The pneumatic system is to be vented before removing the air hoses (6, 7, 8, 9, 10).
10 Mark the point where the air hose (8) and the connection piece (4) are fastened to the Bowden pull wire (12) for vertical shock absorber adjustment by means of cable tie (3) and remove the cable tie (3).

11 Pull off the hose nozzles (2, 5) and push them backwards over the air hoses (6, 7, 8, 9, 10).

12 **WARNING** Damage! Take care not to damage the connections (mandrel profiles) at the valve (1) and the connection pieces (4, 11).

Pull off the air hoses (6, 7, 8, 9, 10) at the connections (arrows) and connection pieces (4, 11).
3.47.4 Air hose set for swivel – removal and installation

REMOVAL / INSTALLATION

Notes:
- For easier removal, carefully slit the air hoses (6, 7, 8, 9, 10) by means of a sharp knife.
- Do not use a screwdriver or similar tools to lift off the air hoses (6, 7, 8, 9, 10) at the connections (arrows) and connection pieces (4, 11).

Installation note:
Push the air hoses (6, 7, 8, 9, 10) completely onto the connections (arrows) and connection pieces (4, 11) by exerting pressure.

13 Remove the air hoses (6, 7, 10).

14 Pull off the hose nozzles (2, 5) at the air hoses (6, 7, 8, 9, 10).

15 Pull out the clip (14) at the Z-section (13) and detach the air hoses (8, 9) at the clip (14).
16 Mark the point where the air hoses (8, 9) are bundled by means of cable ties (17) and remove the cable ties (17).

17 Detach the air hoses (8, 9) at the retainer (15) of the level control (16).

18 Mark the points where the air hoses (8, 9) are fastened to the air spring support (20) by means of cable ties (19) and remove the cable ties (19).

19 Pull off the hose nozzle (5) and push it backwards over the air hose (9).

20 Pull off the air hose (9) at the connection piece (11).

**Note:**
Please observe the notes and safety notes listed under step 12.
3.47.4 Air hose set for swivel – removal and installation

REMOVAL / INSTALLATION

21 Pull off the hose nozzle (5) at the air hose (9).

22 Pull out the air hoses (8, 9) in upward direction through the seat suspension and then in backward direction (arrow) at the bellows (18) and remove them.

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

**Installation note:**
Cut the required air hoses (6, 7, 8, 9, 10) to the length of the removed air hoses (6, 7, 8, 9, 10) using piece goods.
3.48 Bowden pull wire and bearing for optional backrest adjustment – removal and installation (delivery option)

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Bowden pull wire for optional backrest adjustment
(2) Baffle
(3) Lever for backrest adjustment
(4) Seat frame (left)
(5) Backrest
(6) Countersunk screw (hexagon socket screw) ........12 Nm
(7) Cable tie
(8) Bowden pull wire for left backrest adjustment
(9) Bowden pull wire for right backrest adjustment
(10) Bearing
(11) Leaf spring
(12) Blind rivet
(13) Blind rivet
3.48 Bowden pull wire and bearing for optional backrest adjustment – removal and installation (delivery option)

REMOVAL / INSTALLATION

(14) Angle plate
(15) Handle for optional backrest adjustment
(16) Holder (for Bowden pull wire)
(17) Blind rivet
(18) Blind rivet
(19) Lock washer
(20) Backrest cover
(21) Lock washer
(22) Stopper
(23) Lever
(24) Zipper
3.48 Bowden pull wire and bearing for optional backrest adjustment – removal and installation (delivery option)

**ATTENTION** Noise!

When driving out the blind rivets, make sure that the residues of the blind rivets do not fall into the seat.

1. Remove the backrest cover (see Chapter 3.26).

2. Lift off the seat cushion in position for repair (Chapter 3.1).

3. Remove the left covering in position for repair (Chapter 3.4).

4. Carefully detach the rear covering at the right covering (see Chapter 3.5).
5 Remove the lever for backrest adjustment at the stud (see Chapter 3.13).

6 Detach the left and right Bowden pull wire for backrest adjustment at the lever for backrest adjustment (see Chapter 3.13).

**Removal and installation**

7 Mark the point where the Bowden pull wire for optional backrest adjustment (1) is fastened to the Bowden pull wire for the left backrest adjustment (8) by means of cable ties (7) and remove the cable ties (7).
3.48 Bowden pull wire and bearing for optional backrest adjustment – removal and installation (delivery option)

REMOVAL / INSTALLATION

8 Unscrew the countersunk screw (6) at the left side of the seat frame (4).
   **Installation note:**
   Countersunk screw (6); 12 Nm.

9 Detach the Bowden pull wire for optional backrest adjustment (1) at the baffle (2) and remove the baffle (2).
   **Installation note:**
   The nose (arrow) of the baffle (2) acts as an anti-rotation device and must engage into the provided drill hole on the left side of the seat frame (4).

10 Detach the Bowden pull wire for optional backrest adjustment (1) at the lever for backrest adjustment (3).
3.48 **Bowden pull wire and bearing for optional backrest adjustment –
removal and installation (delivery option)**

**REMOVAL / INSTALLATION**

11 Loosen the lock washer (21) at the Bowden pull wire for optional backrest adjustment (1).

12 Detach the Bowden pull wire for optional backrest adjustment (1) at the bearing (10).

13 Bore off the rivet head and drive out the blind rivet (18) at the holder (16).

14 Detach the Bowden pull wire for optional backrest adjustment (1) at the holder (16) and remove the holder (16).
3.48 Bowden pull wire and bearing for optional backrest adjustment – removal and installation (delivery option)

**REMOVAL / INSTALLATION**

15 Completely open the zip fastener (24) of the backrest upholstery (20).

16 Pull the Bowden pull wire for optional backrest adjustment (1) out of the backrest cover (20) in downward direction and remove it.

**Installation note:**
The Bowden pull wire for optional backrest adjustment (1) runs below the backrest cover (20).

17 Loosen the lock washer (19) at the axle of the bearing (10).

18 Bore off two rivet heads and drive the blind rivets (13) out of angle plate (14), bearing (10) and backrest (5).
3.48 Bowden pull wire and bearing for optional backrest adjustment – removal and installation (delivery option)

REMOVAL / INSTALLATION

19 Pull off the lever for backrest adjustment (23) at the axle of the bearing (10) and remove it together with the angle plate (14).

20 Pull off the handle for optional backrest adjustment (15) at the lever (23).

21 Pull the lever (23) out of the angle plate (14).

22 Bore off the rivet head, drive the blind rivet (17) out of the bearing (10) and backrest (5) and remove the bearing (10).

23 If the leaf spring (11) is defective:
Bore off the rivet head, drive the blind rivet (12) out of the leaf spring (11) and bearing (10) and remove the leaf spring (11).

24 Re-install the components in the reverse order of their removal.
3.49 Cable harness for backrest – removal and installation
(seat with climate control system)

REMOVAL / INSTALLATION

(1) Cable harness for backrest
(2) Cable for microphone
(3) Cable for backrest heater
(4) Cable tie
(5) Cable tie
(6) Cable tie
(7) Cable for seat fan
(8) Cable seat cushion heater
(9) Seat frame
(10) Cable tie
(11) Cable tie
(12) Cable tie
(13) Cable harness for vehicle connection
3.49  Cable harness for backrest – removal and installation (seat with climate control system)

REMOVAL / INSTALLATION

(14) Air hose
(15) Cable harness for heater switch
(16) Backrest frame
(17) Cable tie
(18) Cable tie
(19) Cable of backrest fan
(20) Control module for the climate system
3.49 Cable harness for backrest – removal and installation
(seat with climate control system)

**Electrical plug and socket connections:**

(H) Electrical connection between cable harness for backrest (1) and seat cushion heater (8)

(I) Electrical connection between seat cushion heater (8) and backrest heater cable (3)

(J) Electrical connection between cable harness for backrest (1) and seat fan cable (7)

(K) Electrical connection between cable harness for backrest (1) and cable harness for the heater switch (15)

(L) Electrical connection between cable harness for backrest (1) and cable harness for the vehicle connection (13)

(M) Electrical connection between cable harness for backrest (1) and backrest fan cable (19)
3.49 Cable harness for backrest – removal and installation  
(seat with climate control system)

REMOVAL / INSTALLATION

1. Lift off the seat cushion in position for repair (Chapter 3.1).

2. Remove the left covering in position for repair (Chapter 3.4).

3. Remove the covering at the back (see Chapter 3.5).

4. Remove the backrest cover (see Chapter 3.26).

5. Remove the covering clamps and upper insertion rods at the backrest cover (see Chapter 3.31).

6. Open the zip fastener of the backrest cover completely and pull the backrest cover on the right side upwards over the foam plastic part (see Chapter 3.31).
7 Disconnect the electrical connection between the cable harness for backrest and control module for climate control system (see Chapter 3.53).

**Removal and installation**

8 Mark the points where the cable harness for the backrest (1) is attached to the backrest heater cable (3) and to the microphone cable (2) by means of two cable ties (4) and remove the cable ties (4).

9 Mark the points where the cable harness for the backrest (1) is fastened to the air hoses (14) with two cable ties (12) and remove the cable ties (12).
10 Mark the points where the electrical connections (H, I, J) are bundled with a cable tie (6) and remove the cable tie (6).

**Installation note:**
The cable tie (6) must be guided through the cable tie (5) fastened at the seat support (9).

11 Mark the points where the electrical connections (K, L) are bundled with a cable tie (10) and remove the cable tie (10).

**Installation note:**
The cable tie (10) must be guided through the cable tie (11) fastened at the seat support (9).

12 Disconnect electrical connections (H, I, J, K, L).
3.49 Cable harness for backrest – removal and installation 
(seat with climate control system)

REMOVAL / INSTALLATION

13 Mark the points where the cable harness for the backrest (1) and the microphone cable (2) are fastened to the backrest frame (16) with cable ties (17) and remove the cable ties (17).

14 Mark the points where the cable harness for the backrest (1), the microphone cable (2) and the electrical connection (M) are fastened to the backrest frame (16) with cable ties (18) and remove the cable ties (18).

**Installation note:**
The excess length of the backrest fan cable (19) is tied back in loops with the cable tie (18).
15 Disconnect the electrical connection (M) between cable harness for backrest (1) and backrest fan cable (19).

16 Pull the cable harness for the backrest (1) out of the backrest frame (16) in backward direction and remove it.

17 Re-install the components in the reverse order of their removal.
3.50 Cable harness heater switch – removal and installation
(seat with climate control system)

REMOVAL / INSTALLATION

(1) Cable harness for heater switch
(2) Plug (cable harness for heater switch)
(3) Heater switch
(4) Air hose (for lumbar support and lateral support adjustment)
(5) Seat frame
(6) Cable tie
(7) Cable harness for backrest
(8) Cable tie
(9) Cable harness for vehicle connection
(10) Cable tie
(11) Bowden pull wire for backrest adjustment on the left
(12) Bowden pull wire for backrest adjustment on the right
3.50 Cable harness heater switch – removal and installation
(seat with climate control system)

1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the left covering in position for repair (Chapter 3.4).

3 Remove the covering at the back (see Chapter 3.5).

Removal and installation

4 Mark the installation position of the cable harness for the heater switch (1).
5 Mark two electrical connections (N) (note the color of the cables) and disconnect the electrical connections (N) between the six connectors (2) and the heater switch (3).

**Installation notes:**
- Re-establish the electrical connections (N) according to the markings.
- Lay the cable harness of the heater switch (1) within (arrow) the air hose (4).

6 Mark the point where the cable harness of the heater switch (1) is fastened to the Bowden pull wires for the backrest adjustment (11, 12) with cable tie (10), and remove the cable tie (10).
7 Mark the points where the electrical connections (K, L) are bundled with a cable tie (8) and remove the cable tie (8).

**Installation note:**
The cable tie (8) must be guided through the cable tie (6) fastened at the seat support (5).

8 Disconnect the electrical connection (K) between cable harness of the heater switch (1) and the cable harness for the backrest (7).

9 Remove the cable harness for the heater switch (1).

**Installation note:**
Install the cable harness of the heater switch (1) according to the marking.

10 Re-install the components in the reverse order of their removal.
3.51 Cable harness for vehicle connection – removal and installation
(seat with climate control system)

REMOVAL / INSTALLATION

<table>
<thead>
<tr>
<th>No.</th>
<th>Component Description</th>
</tr>
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<tbody>
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<tr>
<td>2</td>
<td>Cable harness for backrest</td>
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<td>3</td>
<td>Cable harness for heater switch</td>
</tr>
<tr>
<td>4</td>
<td>Microphone contact cable (in cable harness for vehicle connection)</td>
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<tr>
<td>5</td>
<td>Belt buckle contact cable (in cable harness for vehicle connection)</td>
</tr>
<tr>
<td>6</td>
<td>Belt buckle cable</td>
</tr>
<tr>
<td>7</td>
<td>Cable for microphone</td>
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<tr>
<td>8</td>
<td>Bellows</td>
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<td>9</td>
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<td>10</td>
<td>Cable clamp</td>
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<td>11</td>
<td>Cable tie</td>
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<tr>
<td>12</td>
<td>Cable tie</td>
</tr>
<tr>
<td>13</td>
<td>Seat frame</td>
</tr>
</tbody>
</table>

Material no. 1153450_c
3.51 Cable harness for vehicle connection – removal and installation
(seat with climate control system)

REMOVAL / INSTALLATION

(14) Cable clamp
(15) Cable tie
(16) Plug (belt buckle cable)
(17) Cable for signal
(18) Cable tie
(19) Level control
3.51 Cable harness for vehicle connection – removal and installation  
(seat with climate control system)

**Electrical plug and socket connections:**

(A) Electrical connection between vehicle and cable harness for vehicle connection (1)

(F) Electrical connection between belt buckle contact cable (5) and belt buckle cable (5)

(K) Electrical connection between cable harness for backrest (2) and cable harness for the heater switch (3)

(L) Electrical connection between cable harness for backrest (2) and cable harness for the vehicle connection (1)

(O) Electrical connection between microphone cable (7) and microphone contact cable (4)
1 Lift off the seat cushion in position for repair (Chapter 3.1).

2 Remove the left covering in position for repair (Chapter 3.4).

3 Remove the covering at the back (see Chapter 3.5).

**Removal and installation**

4 **WARNING** Risk of crushing! Bring the seat into the highest position and secure the swinging structure to the front plastic rollers of the lower suspension part by means of appropriate spacers.
5 Disconnect electrical connection (A).
   **Note:**
   Follow the installation instructions of the vehicle manufacturer.

6 Mark the points where the electrical connections (K, L) are bundled with a cable tie (11) and remove the cable tie (11).
   **Installation note:**
   The cable tie (11) must be guided through the cable tie (12) fastened at the seat support (13).

7 Disconnect electrical connection (L).
   **Note:**
   Electrical connection (K) needs not be disconnected.
8 Mark the points where the bellows (8) is fastened to the seat frame (13) by means of three cable ties (12) and remove the cable ties (12).

**Installation note:**
The microphone contact cable (4) and the signal cable (17) are also fastened with the two left cable ties (12).

9 Pull out cable clamp (10) at the seat support (13) and hang out the cable harness for the vehicle connection (1) at the cable clamp (10).

10 Disconnect electrical connection (F).

11 Pull out cable clamp (14) at the seat support (13) and hang out the plug (16) at the cable clamp (14).
12 Mark the points where the cable for the belt buckle contact (5) is fastened to the seat support (13) with two cable ties (15) and remove the cable ties (15).

**Installation note:**
The cable for the belt buckle contact (5) is placed in the bottom seam (arrow) of the seat support (13).

13 Disconnect electrical connection (O).

14 Mark the point where the cable harness of the vehicle connection (1) is fastened to the level control (19) with the cable tie (18) and remove the cable tie (18).
15 Mark the installation position of the cable harness for the vehicle connection (1) and pull out the cable harness for the vehicle connection (1) from the large opening of the swivel (9) and the seat suspension towards the top.

16 Pull out the cable harness for vehicle connection (1) from the opening (arrow) in the bellows (8) towards the back and remove.

**Installation note:**

⚠️ **WARNING** Malfunction! Lay the cable harness for the vehicle connection (1) according to the mark so that it cannot be squeezed when the seat is moved vertically.

17 Re-install the components in the reverse order of their removal.
3.52 Radial fan for backrest – removal and installation
(seat with climate control system)

REMOVAL / INSTALLATION

(1) Radial fan for backrest
(2) Support (in foam part for backrest)
(3) Cable for microphone
(4) Flat head screw
   (inner race) ......................... 6 Nm
(5) Backrest frame
(6) Cable of backrest fan
(7) Cable harness for backrest
(8) Cable tie
1 Remove the backrest cover (see Chapter 3.26).

2 Completely open the zipper of the backrest cover (see Chapter 3.31) and pull apart in the range of the radial fan (1) in order to make the radial fan (1) and the electrical connection (M) accessible.

**Removal and installation**

3 Mark the points where the cable harness for the backrest (7), the microphone cable (3) and the electrical connection (M) are fastened to the backrest frame (5) with cable ties (8) and remove the cable ties (8).

**Installation note:**
The excess length of the backrest fan cable (6) is tied back in loops with the cable tie (8).
4 Disconnect the electrical connection (M) between cable harness for backrest (7) and backrest fan cable (6).

5 Unscrew the two flat head screws (4) at the support (2) and remove radial fan (1).
   **Installation note:**
   Flat head screw (3), 6 Nm.

6 Re-install the components in the reverse order of their removal.
3.53 Control module for climate control system – removal and installation
(seat with climate control system)

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Control module for the climate system
(2) Backrest frame
(3) Blind rivet
(4) Cable harness for backrest
(5) Bracket (at the connector)
(6) Catcher (at the connector)
(7) Connector
1 Remove the backrest cover (see Chapter 3.26).

2 Remove the covering clamp and upper insertion rods at the backrest cover (see Chapter 3.31).

3 Open the zip fastener of the backrest cover completely and pull the backrest cover on the right side upwards over the foam plastic part (see Chapter 3.31).
3.53 Control module for climate control system – removal and installation (seat with climate control system)

Removal and installation

4 Unlock the bracket (5) at the catcher (6) of the connector (7) and disconnect the electrical connection (P) between the cable harness for the backrest (4) and the control module for the climate control system (1).

Note:
To unlock, press down the catcher (6) at the connector (7) and turn the bracket (5) as far as possible (arrow) via the catcher (6).

5 Bore off two rivet heads and drive out the blind rivets (3) at the backrest frame (2).

6 Remove the control module for the climate control system (1).

7 Re-install the components in the reverse order of their removal.
3.54 Cable harness for microphone – removal and installation

(seat with climate control system)

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Cable for microphone
(2) Microphone support
(3) Backrest
(4) Serrated washer head screw
               ....................... to replace, 25 Nm
(5) Cable tie
(6) Belt bracket
(7) Backrest cover
(8) Cable tie
(9) Backrest frame
(10) Cable harness for backrest
(11) Cable tie
(12) Cable of backrest fan
(13) Cable tie
(14) Cable for backrest heater
(15) Cable for microphone contact
3.54 Cable harness for microphone – removal and installation
(seat with climate control system)

REMOVAL / INSTALLATION

1. Lift off the seat cushion in position for repair (Chapter 3.1).
2. Remove the left covering in position for repair (Chapter 3.4).
3. Remove the covering at the back (see Chapter 3.5).
4. Remove the backrest cover (see Chapter 3.26).
5. Open the zipper of the backrest cover completely (see Chapter 3.31).
3.54 Cable harness for microphone – removal and installation
(seat with climate control system)

**Removal and installation**

6 Disconnect the electrical connection (O) between microphone cable (1) and microphone contact cable (15).

7 Mark the points where the microphone cable (1) is attached to the backrest heater (14) and to the cable harness for the backrest (10) by means of two cable ties (13) and remove the cable ties (13).

8 Mark the points where the microphone cable (1), the cable harness for the backrest (10) and the electrical connection (M) are fastened to the backrest frame (9) with cable ties (11) and remove the cable ties (11).

**Installation note:**
The excess length of the backrest fan cable (12) is tied back in loops with the cable tie (11).
3.54 Cable harness for microphone – removal and installation
(seat with climate control system)

REMOVAL / INSTALLATION

9 Mark the points where the microphone cable (1) and the cable harness for the backrest (10) are fastened to the backrest frame (9) with cable ties (8) and remove the cable ties (8).

10 Fold the backrest (3) forwards.

11 Unscrew the serrated washer head screw (4), and put aside the microphone support (2) on the backrest (3).

Note:
After unscrewing the serrated washer head screw (4) the belt bracket (6) is loose.

Installation notes:
• Replace the serrated washer head screw (4), 25 Nm.
• The hook (arrow) at the belt bracket (6) must engage into the square hole at the backrest (3).
12 Mark the point where the microphone cable (1) is fastened at the microphone support (2) with cable tie (5) and remove the cable tie (5).

**Installation note:**
The locking head of the cable tie (5) must be located inside between microphone support (2) and backrest (3).

13 Pull the microphone cable (1) out of the backrest cover (7) remove it.

14 Re-install the components in the reverse order of their removal.
3.55 Microphone support – removal and installation
(seat with climate control system)

REMOVAL / INSTALLATION

(1) Microphone support
(2) Cable for microphone
(3) Backrest
(4) Serrated washer head screw
............................... to replace, 25 Nm
(5) Cable tie
(6) Belt bracket
(7) Adapter plate (for microphone)
(8) Rounded head screw
(inner race) .........................6 Nm

1 Remove the backrest cover (see Chapter 3.26).

2 Open the zipper of the backrest cover completely (see Chapter 3.31).
3.55 Microphone support – removal and installation  
(seat with climate control system)

**Removal and installation**

3  Fold the backrest (3) forwards.

4  Unscrew the serrated washer head screw (4), and put aside the microphone support (1) on the backrest (3).

**Note:**
After unscrewing the serrated washer head screw (4) the belt bracket (6) is loose.

**Installation notes:**
- Replace the serrated washer head screw (4), 25 Nm.
- The hook (arrow) at the belt bracket (6) must engage into the square hole at the backrest (3).
5 Mark the point where the microphone cable (2) is fastened at the microphone support (1) with cable tie (5) and remove the cable tie (5).

**Installation note:**
The locking head of the cable tie (5) must be located inside between microphone support (1) and backrest (3).

6 Remove the microphone cable (1).

7 **Microphone support (1) with adapter plate (7):**
Unscrew the three rounded head screws (8) and remove the adapter plate (7).

**Installation note:**
Rounded head screw (8), 6 Nm.

8 Re-install the components in the reverse order of their removal.
3.56 Play in the backrest locking mechanism – inspection and adjustment

**INSPECTION**

(1) Backrest
(2) Bearing support, right-hand
(3) Catch element
(4) Lock
(5) Washer
(6) Spacer at the bearing support opposite the lever (white) *
(7) Spacer at the bearing support lever-side (black) *
(8) Bearing support, left-hand

1. Lift off the seat cushion in position for repair (Chap. 3.1).
2. Remove the left covering in position for repair (Chapter 3.4).

* Delivery option
3.56 Play in the backrest locking mechanism – inspection and adjustment

INSPECTION

3 Remove the covering at the back (see Chapter 3.5).

4 Fold the backrest forwards.

Inspection of play
5 Determine clearance between bearing support (2, 8) and lock (4) with a feeler gauge with no load on the backrest (1).
   • Play 0 to 0.15 mm: No adjustment necessary
   • Play > 0.15 to 0.25 mm: Take up play with a 0.1 mm thick washer (5).
   • Play > 0.25 to 0.35 mm: Take up play with a 0.2 mm thick washer (5).
   • Play > 0.35: Replace the spacer * (6, 7) (see Chap. 3.32).

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**Adjusting play**

6 Remove the catch element (3) and lock (4) (see Chapter 3.29).

7 Push washer (5) between lock (4) and spacer * (6, 7) based on the result of the inspection.

8 Assemble the seat (see Chap. 3.29) and check play in backrest locking mechanism again.

* Delivery option