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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 75 of the following seat models:

- Driver’s seat MSG 75/511 (narrow cushion and short back),
- Driver’s seat MSG 75/521 (wide seat cushion and short back),
- Driver’s seat MSG 75/522 (wide seat cushion and long back).

The driver’s seat of the MSG 75/521 type forms the basis for illustration. In the case of technical deviations in the work steps, (due to different seat models) refer to the current text or separate chapters of the manual.

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

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

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

The description of the work steps refers to the dismounted seat. Depending on the individual installation situation, some work may also be performed while the seat remains installed. For this reason, check the environment of the installed seat for this possibility before starting work. The safety instructions of the specific vehicle manufacturers and those stated in chapter 1.1 of this repair manual must be strictly observed.

This repair manual also includes some information on optional extras, in case further explanation is required. 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.

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

The document layout is suitable for later use of this repair manual via CD-ROM / INTERNET / INTRANET. 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

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

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

These installation instructions offer basic information on proper technical seat repair. The contents of the work procedures described are intended for professionally educated technicians with profound product knowledge, gained through regular training. 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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1 Description

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1.1 Safety Instructions
1.2 Rating Plate

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

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

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

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

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

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

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

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

4 Before starting repair work
   • disconnect the battery from power supply,
   • disconnect the seat switch from the vehicle supply network,
   • for seats with integrated seat heater, disconnect the heater switch from the vehicle supply network.

5 When using oil, grease and other chemical substances, the relevant safety regulations for the handling and use of these materials must be observed.
The rating plate is located at the front middle of the lower part of the suspension.

The rating plate shows the following information (example):

(A) BENENNUNG (DENOMINATION) = MSG 75/521

(B) SACH-NR. (INVENTORY NO.) = 141 206

(C) Year / CW / Assembly
   = 0428 061
   • Model = 04 (2004)
   • built in week = 28 (July)
   • Assembly = 061

(D) AUFTRAGS NR. (ORDER No.) = DE 42844300080

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

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2.1 Overview of Components
   • Controls and indicators
   • Pneumatic connecting diagram
   • Installation overview of the cable harness of the seat switch with switch mechanism
   • Seat switch and connector assignment with circuit diagram

2.2 Functional Test

2.3 Overview of Faults

2.4 Fault Diagnosis
   1 Checking the air spring / control
   2 Checking the compressor
   3 Checking the seat switch
# 2.1 Overview of Components

## Controls and indicators

1. Knob for lumbar support
2. Armrest
3. Knob for armrest angle adjustment
4. Belt roller
5. Handle for backrest adjustment

**Note:**
MSG 75/511 seat type (narrow cushion) is equipped with a loop for backrest adjustment.

6. Handle for level adjustment
7. Seat level indicator
8. Handle for fore/aft adjustment
9. Seat belt buckle
2.1 Overview of Components

Pneumatic connecting diagram

(1) Housing with control and seat level indicator
(2) Compressor
(3) Air hose
  Note: Insert length: A = 10 mm.
(4) Compressed-air hose
  Note: Insert length: A = 10 mm.
(5) Air spring
(6) Retaining ring of the quick coupling

⚠️ **WARNING** Damage! Please pay attention to the instructions given in chapter 3.22 when pulling the hoses out of the retaining rings of the quick coupling!
2.1 Overview of Components

Installation overview of the cable harness of the seat switch with switch mechanism

(1) Seat plate  
(2) Vehicle power connector  
(3) Cable ties with anchor ties  
(4) Blind rivet  
(5) Compression spring  
(6) Bushing  
(7) Switching bracket  
(8) Housing with control and seat level indicator  
(9) Cable tie  
(10) Switch plate  
(11) Cover  
(12) Blind rivet
2.1 Overview of Components

(13) Seat switch
(14) Cable harness of the seat switch
(15) Connector plug of the switch/control
(16) Connector plug of the seat heater
   (if fitted)
(17) Connector plug of the belt buckle switch (if fitted)
2.1 Overview of Components

Seat switch and connector assignment with circuit diagram

(1) Seat switch actuator
(2) Switch/Seat occupation detection system
(3) Vehicle power connector (depending on model)
(4) Connector plug of the seat heater (if fitted)
(5) Cable harness of the seat switch
(6) Connector plug of the switch/control
(7) Connector plug of the belt buckle switch (if fitted)
(8) Assignment as make contact (contacts: K1 and K3)
(9) Assignment as break contact (contacts: K1 and K2)
(10) Assignment for heater and control (if fitted)
(11) Assignment for belt buckle switch (if fitted)

Note:
Distance (A) between idle position and switching point of the push-rod switch (1) = 1.2 mm.
Example of switch/seat occupation detection system (2) switched as make contact (8):

(O) If no load is applied to the seat, the switch/seat occupation detection system (2) is open. The vehicle cannot be driven or is switched off.

(Z) If a load is applied to the seat, the switch/seat occupation detection system (2) is closed. The vehicle can be driven.
2.2 Functional Test

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 testing:
- 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 OK in compliance with the operating instructions.

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

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Scope of inspection</th>
<th>Function to be operated</th>
<th>Result/specified state</th>
<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Compressor</td>
<td>Pull the handle for level adjustment upwards.</td>
<td>Compressor is active and seat moves upwards.</td>
<td>See Overview of Faults (chapter 2.3).</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Release the handle for level adjustment.</td>
<td>Compressor stops.</td>
<td>See Overview of Faults (chapter 2.3).</td>
</tr>
<tr>
<td>3</td>
<td>Control</td>
<td>Press the handle for level adjustment down.</td>
<td>Seat lowers down.</td>
<td>See Overview of Faults (chapter 2.3).</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Release the handle for level adjustment.</td>
<td>Seat stops lowering down.</td>
<td>See Overview of Faults (chapter 2.3).</td>
</tr>
</tbody>
</table>
## 2.2 Functional Test

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Scope of inspection</th>
<th>Function to be operated</th>
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<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Weight adjustment and seat level indicator</td>
<td>Pull the handle for level adjustment upwards or press it downwards (while there is load on the driver’s seat) and let it go off.</td>
<td>The pointer of the seat level indicator moves to the right or left, respectively.</td>
<td>See Overview of Faults (chapter 2.3).</td>
</tr>
<tr>
<td>6</td>
<td>Suspension</td>
<td>Apply your body weight to the seat and adjust it to your individual weight. The pointer of the seat level indicator must be in the middle of the indicator window.</td>
<td>The suspension is within its maximum swinging range.</td>
<td>The loaded seat can spring without hitting the end stop within the range of 60 mm. See Overview of Faults (chapter 2.3).</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Apply load to the seat and spring up and down several times.</td>
<td>No noise.</td>
<td>See Overview of Faults (chapter 2.3).</td>
</tr>
<tr>
<td>8</td>
<td>Backrest angle</td>
<td>Pull the handle for backrest adjustment upwards.</td>
<td>The backrest folds forwards.</td>
<td>See Overview of Faults (chapter 2.3).</td>
</tr>
<tr>
<td>Step no.</td>
<td>Scope of inspection</td>
<td>Function to be operated</td>
<td>Result/specified state</td>
<td>Notes, cause/remedial measures</td>
</tr>
<tr>
<td>---------</td>
<td>------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>9</td>
<td>Backrest angle</td>
<td>Pull the handle for backrest adjustment upwards while loading and unloading the backrest, and then release the handle.</td>
<td>The backrest locks into place in the desired position. It should not be possible to move the backrest into another position when it is locked.</td>
<td>Adjustment angle of the backrest in 15 increments of 2.5° each. See Overview of Faults (chapter 2.3).</td>
</tr>
<tr>
<td>10</td>
<td>Seat fore/aft adjustment</td>
<td>Pull the handle for seat fore/aft adjustment upwards.</td>
<td>The seat moves forwards or backwards.</td>
<td>Maximum adjustment distance of 225 mm in lock-in positions of 15 mm each. See Overview of Faults (chapter 2.3).</td>
</tr>
<tr>
<td>11</td>
<td>Release the handle for fore/aft adjustment.</td>
<td></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>
</tbody>
</table>
## 2.2 Functional Test

<table>
<thead>
<tr>
<th>Step no.</th>
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<th>Result/specified state</th>
<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Lumbar support</td>
<td>Turn the knob for lumbar support up or down.</td>
<td>The backrest cushion arches outwards at the bottom or top.</td>
<td>See Overview of Faults (chapter 2.3).</td>
</tr>
<tr>
<td>13</td>
<td>Seat switch</td>
<td>Load and unload the seat cushion on the front left and right sides several times.</td>
<td>The seat switch contacts (audible switching sound). Switching function: • loaded = on • unloaded = off (for shutting down mechanical equipment when the driver leaves his/her seat)</td>
<td>See Overview of Faults (chapter 2.3).</td>
</tr>
<tr>
<td>14</td>
<td>Belt roller</td>
<td>Pull the safety belt out and let it go back.</td>
<td>The safety belt automatically retracts.</td>
<td>See Overview of Faults (chapter 2.3).</td>
</tr>
<tr>
<td>15</td>
<td>Seat belt buckle</td>
<td>Insert the belt latch (safety belt) into the belt buckle.</td>
<td>The belt buckle audibly clicks into place and cannot be easily withdrawn even by pulling it vigorously.</td>
<td>See Overview of Faults (chapter 2.3).</td>
</tr>
<tr>
<td>Step no.</td>
<td>Scope of inspection</td>
<td>Function to be operated</td>
<td>Result/specified state</td>
<td>Notes, cause/remedial measures</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------</td>
<td>------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------</td>
<td>------------------------------------------------</td>
</tr>
</tbody>
</table>
|         | Seat belt buckle switch     | Insert the belt latch (safety belt) into the belt buckle.        | Seat belt buckle switch contacts  
Switching function:  
• Insert the latch into the belt buckle = on  
• Take the latch out of the belt buckle = off | See overview of faults (Chap. 2.3). |
| 16      | Seat belt buckle            | Press the red release button of the belt buckle.                 | The belt buckle releases and the belt latch can be opened.                            | See Overview of Faults (chapter 2.3).           |
| 17      | Armrest                     | Turn the knob of the armrests inwards or outwards, respectively. | The armrests are lifted or lowered at the front.                                      | See Overview of Faults (chapter 2.3).           |
| 18      | Armrest                     | Tilt the armrests backwards.                                    | The armrests move continuously until the vertical end position is reached.            | See Overview of Faults (chapter 2.3).           |
|         | Headrest                    | Slowly pull out the backrest extension until the end stop is reached and then push it back again. | The backrest extension locks into place (audible) in any lock-in position.            | See Overview of Faults (chapter 2.3).           |
2.3 Overview of Faults

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 stated above are illustrated in chapter 2.1.

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspension travels up and down and hits the upper and lower end stop.</td>
<td>• Weight adjustment is not set to the individual weight of the driver.</td>
<td>Adjust the seat to the driver’s weight (refer to seat operating manual).</td>
</tr>
<tr>
<td></td>
<td>• Shock absorber is defective.</td>
<td>Replace the shock absorber (chapter 3.18).</td>
</tr>
<tr>
<td></td>
<td>• Compressed-air hose is untight.</td>
<td>Replace the compressed-air hose (see chapter 3.21).</td>
</tr>
<tr>
<td></td>
<td>• Air spring is untight.</td>
<td>Replace the air spring (chapter 3.22).</td>
</tr>
<tr>
<td></td>
<td>• Air hose is untight.</td>
<td>Replace the housing with control and seat level indicator (chapter 3.15).</td>
</tr>
<tr>
<td></td>
<td>• Compressor is defective.</td>
<td>Replace the compressor (chapter 3.21).</td>
</tr>
<tr>
<td></td>
<td>• Valve of the control is defective.</td>
<td>Replace the housing with control and seat level indicator (chapter 3.15).</td>
</tr>
</tbody>
</table>
### 2.3 Overview of Faults

<table>
<thead>
<tr>
<th>Fault description</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Seat wobbles.</td>
<td>• The bushings on the fixed bearing axles or roller axles of the swinging structure are defective.</td>
<td>Replace the bushings (see chapter 3.23).</td>
</tr>
</tbody>
</table>
| Seat does not respond when operating the handle for level adjustment in upward direction. | • Compressor is not active.  
• Air spring is untight.  
• Air escapes from the valve of the control.  
• Lever is broken. | Check the compressor (chapter 2.4, step no. 2.1).  
Check the air spring (chapter 2.4, step no. 1.1).  
Check the valve at the housing with control and seat level indicator (chapter 2.4, step no. 1.2).  
Replace the lever at the housing with control and seat level indicator (see chapter 3.15). |
| Seat does not respond when operating the handle for level adjustment in downward direction. | • Valve of the control is defective.  
• Lever is broken. | Replace the housing with control and seat level indicator (chapter 3.15).  
Replace the lever at the housing with control and seat level indicator (see chapter 3.15). |
### 2.3 Overview of Faults

<table>
<thead>
<tr>
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<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| Seat changes its position while driving, vents and lowers down. | - Air spring is untight.  
- Compressor is untight (return valve).  
- Air escapes from the valve of the control.  
- Compressed-air hose is untight.  
- Air hose is untight. | - Check the air spring (chapter 2.4, step no. 1.1).  
- Replace the compressor (see chapter 3.21).  
- Check the valve at the housing with control and seat level indicator (chapter 2.4, step no. 1.2).  
- Replace the compressed-air hose (see chapter 3.21).  
- Replace the housing with control and seat level indicator (see chapter 3.15). |
### 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 squeaks.</td>
<td>• Too little lubrication of the shock absorber axle of the swinging structure.</td>
<td>Apply acid-free multi-purpose lubricant to the shock absorber axle (see chapter 3.18).</td>
</tr>
<tr>
<td></td>
<td>• Too little lubrication of axles and rollers of the swinging structure.</td>
<td>Apply acid-free multi-purpose lubricant to the roller or fixed bushing axles of the swinging structure and the front of the plastic rollers (see chapter 3.23).</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong> You should dose lubrication so that the rollers can still rotate.</td>
</tr>
<tr>
<td>Seat level indicator does not work.</td>
<td>• Linkage rod of the pointer is detached from the lower part of the suspension.</td>
<td>Hang in the linkage rod of the pointer into the lower part of the suspension (see chapter 3.15).</td>
</tr>
<tr>
<td></td>
<td>• Linkage rod of the pointer is detached from the housing with control and seat level indicator.</td>
<td>Hang in the linkage rod of the pointer into the housing with control and seat level indicator (see chapter 3.15).</td>
</tr>
<tr>
<td></td>
<td>• Upper part of the linkage rod does not grip onto the longitudinal guide of the pointer.</td>
<td>Thread the upper end of the pointer linkage rod through the guide of the pointer (see chapter 3.15).</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 fore/aft adjustment does not work.</td>
<td>• Locking lever of the entire adjusting rail assembly is defective.</td>
<td>Replace the adjusting rail completely (see chapter 3.17).</td>
</tr>
<tr>
<td>Seat fore/aft adjustment does not securely lock into position or does not snap into place after being adjusted.</td>
<td>• Particles are between the adjusting and locking rails.</td>
<td>Remove/install the seat fore/aft adjustment completely (chapter 3.17).</td>
</tr>
<tr>
<td></td>
<td>• Locking lever of the entire adjusting rail assembly is defective.</td>
<td>Replace the adjusting rail completely (see chapter 3.17).</td>
</tr>
<tr>
<td></td>
<td>• Adjusting or locking rails are defective.</td>
<td>Replace the seat fore/aft adjustment (chapter 3.17).</td>
</tr>
<tr>
<td>Backrest does not fold forwards by itself after being unlocked.</td>
<td>• Retaining spring is loosened.</td>
<td>Hang in the retaining spring (see chapter 3.7).</td>
</tr>
<tr>
<td></td>
<td>• Retaining spring is defective.</td>
<td>Replace the retaining spring (see chapter 3.7).</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>Backrest frame cannot be unlocked.</td>
<td>• Actuator lever jams.</td>
<td>Remove/install the backrest lock completely (chapter 3.13).</td>
</tr>
<tr>
<td></td>
<td>• Control lug on the tooth-sheet of the backrest lock is broken.</td>
<td>Replace the tooth-sheet (see chapter 3.7).</td>
</tr>
<tr>
<td></td>
<td>• Backrest lock is defective.</td>
<td>Replace the backrest lock completely (chapter 3.13).</td>
</tr>
<tr>
<td>Angle of the backrest frame cannot be adjusted.</td>
<td>• Retaining spring is loosened.</td>
<td>Hang in the retaining spring (see chapter 3.7).</td>
</tr>
<tr>
<td></td>
<td>• Retaining spring is defective.</td>
<td>Replace the retaining spring (see chapter 3.7).</td>
</tr>
<tr>
<td></td>
<td>• Backrest lock is defective.</td>
<td>Replace the backrest lock completely (chapter 3.13).</td>
</tr>
<tr>
<td></td>
<td>• Backrest frame is defective.</td>
<td>Replace the backrest frame (see chapter 3.7).</td>
</tr>
<tr>
<td>No or insufficient curvature of the lumbar support in the seat cushion.</td>
<td>• Knob for lumbar support is defective.</td>
<td>Replace the knob for lumbar support (chapter 3.14).</td>
</tr>
<tr>
<td></td>
<td>• Lumbar support is defective.</td>
<td>Replace the backrest frame (see chapter 3.7).</td>
</tr>
</tbody>
</table>
### 2.3 Overview of Faults

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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Seat switch does not contact when the seat cushion is loaded.</td>
<td>• Switching bracket is detached from the seat plate.</td>
<td>Hang in the switching bracket into the seat plate (see chapter 3.16).</td>
</tr>
<tr>
<td></td>
<td>• Switching bracket does not seat properly on compression springs.</td>
<td>Place the switching bracket on the compression springs (see chapter 3.16).</td>
</tr>
<tr>
<td></td>
<td>• Compression springs are detached from the bushings.</td>
<td>Fasten the compression springs on the bushings (see chapter 3.16).</td>
</tr>
<tr>
<td></td>
<td>• Bellows is caught between seat cushion and seat plate.</td>
<td>Slide your hand between the bellows and the seat cushion to release the tension. Remove and install the seat cushion, if required (chapter 3.2).</td>
</tr>
<tr>
<td></td>
<td>• Switch push-rod is defective.</td>
<td>Replace the cable harness of the seat switch with switch mechanism (see chapter 3.16).</td>
</tr>
</tbody>
</table>
### Fault description

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat switch does not work.</td>
<td>• Vehicle power supply or electronics is defective.</td>
<td>Check the electrical system of the vehicle.</td>
</tr>
<tr>
<td></td>
<td>• Plug-in connection (vehicle power connector, seat - vehicle) is defective.</td>
<td>Check the plug connection, restore it, if necessary.</td>
</tr>
<tr>
<td></td>
<td>• Seat switch is defective.</td>
<td>Check the seat switch (chapter 2.4, step no. 3.1), replace the cable harness of the seat switch with switch mechanism, if required (see chapter 3.16).</td>
</tr>
<tr>
<td>Belt roller does not wind up automatically.</td>
<td>• Belt jams.</td>
<td>Briefly pull the belt and let it wind up.</td>
</tr>
<tr>
<td></td>
<td>• Belt roller is defective.</td>
<td>Replace the belt roller (chapter 3.9).</td>
</tr>
<tr>
<td>Belt latch does not lock into the belt buckle.</td>
<td>• Belt buckle is defective.</td>
<td>Replace the belt buckle (chapter 3.9).</td>
</tr>
<tr>
<td>Belt buckle does not release the belt latch after operating the red unlocking button.</td>
<td>• Belt buckle is defective.</td>
<td>Replace the belt buckle (chapter 3.9).</td>
</tr>
<tr>
<td>The belt buckle switch does not work.</td>
<td>• The belt buckle switch is defective.</td>
<td>Check the the belt buckle switch, replace the belt buckle, if required (Chap. 3.9).</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>Armrest does not lift or lower when turning the know outwards or inwards.</td>
<td>• Inclination of the armrest is defective.</td>
<td>Replace the armrest (see chapter 3.6).</td>
</tr>
<tr>
<td>Armrest does not hold when it is folded backwards. Armrest falls forwards.</td>
<td>• Armrest is defective.</td>
<td>Replace the armrest (see chapter 3.6).</td>
</tr>
<tr>
<td>Backrest extension does not hold in the locking position.</td>
<td>• Omega springs are broken. • Holder is damaged.</td>
<td>Replace the omega springs (see chapter 3.3). Replace the holder (see chapter 3.3).</td>
</tr>
</tbody>
</table>
1 Checking the air spring / control

Preconditions for fault diagnosis:
- The individual functions are activated in compliance with the instructions of the seat operating manual.
- The compressed-air hose and air hose have been inspected with regard to kinks and tightness.

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

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Checking/operating</th>
<th>Result/specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Check the air spring for abrasion.</td>
<td>Air spring is tight.</td>
<td>Proceed with step no. 1.2.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air spring is untight.</td>
<td>Replace the air spring (see chapter 3.22).</td>
</tr>
<tr>
<td>1.2</td>
<td>Apply load to the seat.</td>
<td>Air escapes from the valve of the control.</td>
<td>Replace the housing with control and seat level indicator (see chapter 3.15).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control is untight.</td>
<td>End of inspection.</td>
</tr>
</tbody>
</table>
2 Checking the compressor

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

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

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Checking/operating</th>
<th>Result/specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Pull the handle for seat height adjustment upwards.</td>
<td>Compressor is active.</td>
<td>End of inspection.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compressor is not active.</td>
<td>• Check and replace the fuse, cable and plug-in connectors, if necessary.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Proceed with step no. 2.2.</td>
</tr>
<tr>
<td>2.2</td>
<td>Pull the handle for seat height adjustment upwards.</td>
<td>Compressor is active.</td>
<td>End of inspection.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compressor is not active.</td>
<td>Replace the compressor (see chapter 3.21).</td>
</tr>
</tbody>
</table>
3 Checking the seat switch

Preconditions for fault diagnosis:
• Electrical system of the vehicle has been checked and is OK.

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

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Checking/operating</th>
<th>Result/specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>• Disconnect the plug-in connection (vehicle power connector, seat - vehicle).</td>
<td></td>
<td>Proceed with step no. 3.2. Replace the cable harness of the seat switch with switch mechanism (see chapter 3.16).</td>
</tr>
<tr>
<td></td>
<td>• Measure the resistance of the contacts 1 and 3 (make contact) of the seat power connector:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>white ........Ω ........yellow</td>
<td>&gt;&gt; 0.2 Ω (→∞)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>≤ 0.2 Ω</td>
<td></td>
</tr>
</tbody>
</table>
### 2.4 Fault Diagnosis

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Checking/operating</th>
<th>Result/specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2</td>
<td>• Apply load to the seat cushion with the current weight adjustment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Measure the resistance of the contacts 1 and 3 (make contact) of the seat power connector:</td>
<td>≤ 0.2 Ω</td>
<td>End of inspection.</td>
</tr>
<tr>
<td></td>
<td>white.........Ω ............yellow</td>
<td>&gt; 0.2 Ω</td>
<td>Replace the cable harness of the seat switch with switch mechanism (see chapter 3.16).</td>
</tr>
</tbody>
</table>
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3.2 Seat Cushion – Removal, Installation
3.3 Backrest Extension with Guide – Removal, Installation (Optional Extras)
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3.5 Storage Box – Removal, Installation (Optional Extras)
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3.16 Cable Harness of the Seat Switch with Switch Mechanism – Removal, Installation
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3.19 Webbings (Static Belt) – Removal, Installation
3.20 Seat Plate – Removal, Installation
3.21 Compressor – Removal, Installation
3.22 Air Spring – Removal, Installation
3.23 Swinging Structure with the Lower Part of the Suspension – Disassembly, Assembly
3.1 Backrest Cushion – Removal, Installation

REMOVAL/INSTALLATION

- (1) Backrest cushion
- (2) Headrest
- (3) Hook (backrest cushion)
- (4) Backrest frame
- (5) Torx screw .................. 2.5 Nm
- (6) Catcher (backrest cushion)
- (7) Handle for backrest adjustment
3.1 Backrest Cushion – Removal, Installation

Removal, installation

1. Pull out the backrest extension (2) to the end position.

2. Fold the backrest frame (4) completely forward and remove two torx screws (5).
   **Installation note:**
   Torx screw (5), 2.5 Nm.

3. Release the two catchers (6). Use a screwdriver to press on the catchers (6) from below.

4. Fold up the backrest frame (4) and pull the backrest cushion (1) out in forward direction.
5 Unhook the two hooks (3) on the backrest cushion (1) from the longitudinal hole (arrow) of the backrest frame (4) and take off the backrest cushion (1) in upward direction.

**WARNING** Take care with the backrest frame (4) - it may jerk forward and cause injury! When the backrest cushion (1) has been removed, the backrest frame (4) must be supported, for example held in place, before the handle for backrest adjustment (7) is operated.

6 Re-install the components in the reverse order of their removal.
3.2 Seat Cushion – Removal, Installation

REMOVAL    INSTALLATION

(1) Backrest frame
(2) Handle for backrest adjustment
(3) Seat plate
(4) Hook (seat plate)
(5) Bellows
(6) Seat cushion
(7) Holder (seat cushion)
(8) Locking hook (seat cushion)
(9) Catcher grip (seat cushion)

1 Remove the backrest cushion (chapter 3.1).
3.2 Seat Cushion – Removal, Installation

Removal

2 Lock the backrest frame (1) into place in the front position.

⚠️ **WARNING** Take care with the backrest frame (1) - it may jerk forward and cause injury! When the backrest cushion has been removed, the backrest frame (1) must be supported, for example held in place, before the handle for backrest adjustment (2) is operated.

3 Unhook the seat cushion (6) from the seat plate (3). First, pull the catcher grip (9) backwards and then upwards.

4 Grasp the seat cushion (6) on the front right and left side with both hands, press it downwards and pull it out in forward direction. Then, remove it.
Installation

1. Place the seat cushion (6) onto the seat plate (3). Both holders (7) at the bottom of the seat cushion (6) must be situated at the height of the hooks (4) on the seat plate (3).

   Notes:
   - When installing a new seat cushion (6), the two locking hooks (8) must first be broken at the perforation.
   - If the seat is equipped with a switch, make sure the springs and the switching bracket are in the correct position during the installation of the seat cushion (6) to guarantee the correct function of the seat switch (see chapter 3.16).

2. Press down the front part of the seat cushion (6) on the left and right sides, and then slide it backwards with the two holders (7) onto the two hooks (4).
3 Press onto the middle part of the seat cushion (6) at the back until you hear the catcher grip (9) locking.

**Notes:**
- Check the function of the seat switch: Press onto the front left and right sides of the seat cushion (6) several times and check whether you hear an audible snap of the switch (see chapter 3.16).
- Check the bellows (5) for being squeezed or distorted between seat cushion (6) and seat plate (3). Release it, if necessary.
3.3 Backrest Extension with Guide – Removal, Installation (Optional Extras)

REMOVAL/INSTALLATION

TABLE OF CONTENTS

(1) Backrest extension
(2) Washer
(3) Blind rivet
(4) Backrest frame
(5) Omega spring
..............................replace, if necessary.
(6) Fixture

1 Remove the backrest cushion (chapter 3.1).

2 Seat with storage box:
   Remove the storage box (chapter 3.5).
3.3 Backrest Extension with Guide – Removal, Installation (Optional Extras)

Removal, installation

3 Remove the backrest extension (1) by pulling it upwards over the end stop.

4 Bore out the four rivet heads, drive out the blind rivets (3) and remove the washers (2).

5 Pull the holder (6) out of the backrest frame (4) in downward direction and then remove it.

6 Replace the omega springs (5) – if any:
   Remove two omega springs (5) from the holder (6).

7 Re-install the components in the reverse order of their removal.
3.4 Cover, Right and Left – Removal, Installation

REMOVAL/INSTALLATION

TABLE OF CONTENTS

(1) Left backrest fixture (seat plate)
(2) Left cover
(3) Left cap cover
(4) Belt roller
(5) Seat belt buckle
(6) Right cover
(7) Right cap cover
(8) Catcher
(9) Hexagon nut
(10) Armrest
(11) Right backrest fixture (seat plate)
(12) Hexagon nut
3.4 Cover, Right and Left – Removal, Installation

Removal, installation

1 Seat with armrests (10):
   Use a screwdriver to lever out the left cap cover (3) from the hexagon nut (9) and the right one (7) from the hexagon nut (12) and then remove them.
   **Installation note:**
   When attaching the left cap cover (3) or the right one (7), make sure the cap cover (3 or 7) seats on the hexagon nut (9 or 12).

2 Release the four catchers (8) of the left cover (2) from the imprints (arrows) on the backrest fixture (1) on the left.

3 Pull out the belt of the belt roller (4) through the notch (D) of the left cover (2) and remove the cover on the left side (2).
4 Release the four catchers (8) of the right cover (6) from the imprints on the backrest fixture (11) on the right side.

5 Pull the right cover (6) over the belt buckle (5) and remove it.

6 Replace the left (2) or right (6) cover:
   When replacing the left (2) or right cover (6), break off the perforated predetermined breaking points (A, B, C, D) for the armrest (10), cap cover (3 or 7), belt buckle (5) and belt roller (4), if required.

7 Re-install the components in the reverse order of their removal.
3.5 Storage Box – Removal, Installation (Optional Extras)

REMOVAL/INSTALLATION

(1) Storage box
(2) Self-tapping screw .......... 1.6 Nm
(3) Backrest frame
(4) Hook
3.5 Storage Box – Removal, Installation (Optional Extras)

Removal, installation

1. Open the storage box (1).

2. **Model with hooks (4):**
   Remove the hooks (4) from the storage box (1).

3. Undo the three self-tapping screws (2) and remove the storage box (1) from the backrest frame (3).
   **Installation note:**
   Self-tapping screw, 1.6 Nm.

4. Re-install the components in the reverse order of their removal.
3.6 Armrests – Removal, Installation (Optional Extras)

REMOVAL/INSTALLATION

1. Remove the left and right covers (chapter 3.4).

TABLE OF CONTENTS

1. Left backrest fixture (seat plate)
2. Hexagon nut
3. Left armrest
4. Washer
5. Hexagon nut .......................... 25 Nm
6. Belt roller
7. Washer
8. Hexagon nut.......................... 25 Nm
9. Right armrest
10. Right backrest fixture (seat plate)
11. Hexagon nut
3.6 Armrests – Removal, Installation (Optional Extras)

Removal, installation

2 Loosen the belt roller (6) to remove the left armrest (3) (see chapter 3.9).
   **Note:**
   Loosen the belt roller (6) by turning the hexagon nut not more than twice, otherwise the seat cushion has to be removed to secure the hexagon bolt.
   **Installation note:**
   Tighten the belt roller (6) after the left armrest (3) has been replaced.

3 Undo the hexagon nut (5 or 8) and remove the washer (4 or 7).
   **Installation note:**
   Hexagon nut (5 or 8), 25 Nm.
4. Remove the left (3) or right armrest (9) from the hexagon nut (2 or 11) and put it to the side.

Note:
The hexagon nut (2 or 11) acts as anti-rotation device and guide for the left (3) or right armrest (9).

Installation note:
The two big punched triangles on the lower longitudinal hole of the left (3) or right armrest (9) mark the lock-in position for the middle screw position. When screwing, the marking should be located on the fixture of the backrest frame (1 or 10) at the height of the nose (arrow). Two further lock-in positions upwards and downwards are possible.

5. Re-install the components in the reverse order of their removal.
(1) Backrest frame
(2) Flange bolt .................. 25 Nm
(3) Bushing ......................... grease
(4) Left backrest fixture (seat plate)
(5) Hexagon nut
(6) Right backrest fixture (seat plate)
(7) Retaining spring ................. grease

1 Remove the backrest cushion (chapter 3.1).

2 Remove the seat cushion (chapter 3.2).

3 Remove the left and right covers (chapter 3.4).
3.7 Backrest Frame with Retaining Spring – Removal, Installation

4 Seat with armrests:
Remove the armrests (chapter 3.6).

Removal, installation

5 Fold the backrest frame (1) completely forwards to release the retaining spring (7).

6 Undo the two flange bolts (2) and take off the hexagon nuts (5).

Installation notes:
● Flange bolt (2), 25 Nm.
● The hexagon nut (5) acts as anti-rotation device and guide for the armrest (see chapter 3.6). When tightening the flange bolt (2), the hexagon nut (5) must be held so that two opposite outer surfaces of the hexagon nut (5) are located vertically.
7 Slightly press the backrest frame (1) against the right backrest fixture (6) and simultaneously lever it out from the left backrest fixture (4) in upward direction, and then remove it.

**Installation note:**
When hanging in the backrest frame (fig. A/1), make sure the cam (arrow) is located over the hook of the retaining spring (fig. A/7).

8 Remove the two bushings (3) from the left (4) and right backrest fixture (6).

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire surface (F) of the bushing (3).
9 Remove the retaining spring (7) from the right backrest fixture (6).

**Installation notes:**
- Apply acid-free multi-purpose lubricant to the entire outer surface (F) of the retaining spring (fig. B/7).
- Place the slightly tensioned retaining spring (fig. B/7) onto the three punched noses of the backrest fixture (fig. B/6), the hook of the retaining spring must show backwards (fig. B/7).

10 Re-install the components in the reverse order of their removal.
3.8 Bellows – Removal, Installation

REMOVAL/INSTALLATION

TABLE OF CONTENTS

(1) Backrest frame
(2) Bellows
(3) Hooks (lower part of the suspension)
(4) Lower part of the suspension
(5) Hook (seat plate)
(6) Seat plate
(7) Cable harness of the seat switch
(8) Anchor ties
(9) Keyhole pin
(10) Mushroom-shaped pin
(11) Bellows lug
(12) Handle for fore/aft adjustment
3.8 Bellows – Removal, Installation

REMOVAL/INSTALLATION

1 Remove the backrest cushion (chapter 3.1).

2 Remove the seat cushion (chapter 3.2).

3 Remove the left and right covers (chapter 3.4).

Removal, installation

4 Pull out the two anchor ties (8) from the seat plate (6) and the bellows (2).

Note:
Push the cable harness of the seat switch (7) forwards between the seat plate (6) and the backrest frame (1) and place it onto the seat plate (6) to protect the cable harness of the seat switch (7) against possible impacts.
5 Remove the two mushroom-shaped pins (10) from the seat plate (6).

**Installation note:**
Stick a mandrel (size 3) through the opening in the bellows (2) into the mushroom-shaped pin (10) to the end stop. For stretching the mushroom-shaped pin (10), pull the bellows (2) slightly towards the mandrel while sticking the mushroom-shaped pin (10) into the hole of the seat plate (6). Pull out the mandrel from the mushroom-shaped pin (10).

6 Take off two bellows lugs (11) from the seat plate (6).

7 Take off the six keyhole pins (9) from the seat plate (6) on the right, left and back sides.

8 Take off the bellows (2) on the front side from the six hooks (5).
9 Take off three keyhole pins (9) from the lower part of the suspension (4) at the front and two keyhole pins (9) from the lower part of the suspension (4) at the back.

10 Take off the bellows (2) from the eight hooks (3) on the left and right sides from the lower part of the suspension (4).

11 Pull the back part of the bellows (2) down over the lower part of the suspension (4).

12 Pull the front part of the bellows (2) over the lower part of the suspension (4) and the handle for fore/aft adjustment (12). Remove the bellows (2) in downward direction.

13 Re-install the components in the reverse order of their removal.
3.9 Belt Roller and Belt Buckle – Removal, Installation

REMOVAL/INSTALLATION

TABLE OF CONTENTS

(1) Left backrest fixture (seat plate)
(2) Hexagon bolt
(3) Belt roller
(4) Hexagon nut ......................... 50 Nm
(5) Hexagon nut ......................... 50 Nm
(6) Seat belt buckle
(7) Hexagon bolt

1. Remove the backrest cushion (chapter 3.1).
2. Remove the seat cushion (chapter 3.2).
3. Remove the left and right covers (chapter 3.4).
3.9 Belt Roller and Belt Buckle – Removal, Installation

Removal, installation

4. Unscrew the hexagon nut (4).
   **Installation note:**
   Hexagon nut (4), 50 Nm.

5. Pull out the hexagon bolt (2) and take off the belt roller (3).
   **Installation notes:**
   - The hole on the belt roller (3) must be pushed over the rivet (arrow) on the backrest fixture (1) on the left side.
   - When subsequently installing the belt roller (3), the respective predetermined breaking point of the left cover is to be broken (see chapter 3.4).

6. Unscrew the hexagon nut (5).
   **Installation note:**
   Hexagon nut (5), 50 Nm.
7 Pull out the hexagon bolt (7) and take off the belt buckle (6). **Installation notes:**
- Turn the belt buckle (6) to the correct position before tightening the hexagon nut (5) for the belt buckle (6) to pass through the cover hole (see chapter 3.4).
- When subsequently installing the belt buckle (6), the respective predetermined breaking point of the right cover is to be broken (see chapter 3.4).

8 Re-install the components in the reverse order of their removal.
3.10  Handle for Level Adjustment – Removal, Installation

REMOVAL/INSTALLATION

(1) Handle for level adjustment
(2) Lever (control)
3.10 Handle for Level Adjustment – Removal, Installation

Removal, installation

1. Press the handle for level adjustment (1) down.

2. **WARNING** Deformation!
   The handle for level adjustment (1) is wedged with the handle (2) into two latching noses (arrows) on the left and right side. Carefully separate the parts. If the handle for level adjustment (1) is deformed, replace it.
   Use a screwdriver to press on the catches through the lateral openings in the handle for level adjustment (1). Firmly grasp the handle for level adjustment (1) and pull it off the lever (2).

3. Re-install the components in the reverse order of their removal.
3.11 Handle for Fore/Aft Adjustment – Removal, Installation

REMOVAL/INSTALLATION

TABLE OF CONTENTS

(1) Entire adjusting rail assembly
(2) Locking lever
(3) Blind rivet
(4) Handle for fore/aft adjustment
3.11 Handle for Fore/Aft Adjustment – Removal, Installation

Removal, installation

1. Bore out the rivet head and drive out the blind rivet (3).

2. Pull off the handle for fore/aft adjustment (4) from the locking lever (2) of the entire adjusting rail (1).

3. Re-install the components in the reverse order of their removal.
(1) Handle for backrest adjustment  
...........................................replace

(2) Actuator lever

(3) Loop for backrest adjustment  
(special design: MSG 75/511 seat type)

(4) Actuator lever  
(special design: MSG 75/511 seat type)

1 Remove the backrest cushion (chapter 3.1).

2 Remove the seat cushion (chapter 3.2).
3.12 Handle for Backrest Adjustment – Removal, Installation

Removal, installation

3 Firmly grasp the handle for backrest adjustment (1) and pull it off the actuator lever (2).

Installation notes:
- The handle for backrest adjustment (1) is wedged on the actuator lever (2) and will be damaged while pulling it off. The handle for backrest adjustment (1) must always be replaced.
- The handle for backrest adjustment (1) must be slid on the actuator lever (2) until the end stop is reached (arrow).
4 Special design:
**MSG 75/511 seat type with narrow cushion**
Thread the loop for backrest adjustment (3) from the actuator lever (4).

5 Re-install the components in the reverse order of their removal.
3.13   Backrest Lock – Removal, Installation of the Entire Assembly

REMOVAL/INSTALLATION

TABLE OF CONTENTS

(1)   Left backrest fixture (seat plate)
(2)   Micro-encapsulated hexagon bolt ................................ replace, 25 Nm
(3)   Actuator lever
(4)   Handle for backrest adjustment
(5)   Backrest frame
(6)   Tooth-sheet ......................... grease
(7)   Hexagon nut

1  Remove the backrest cushion  
   (chapter 3.1).

2  Remove the seat cushion  
   (chapter 3.2).
3.13 Backrest Lock – Removal, Installation of the Entire Assembly

3 Remove the left cover (see chapter 3.4).

4 Remove the belt roller (see chapter 3.9).

Removal, installation

5 Unlock the backrest frame (5) by pulling the handle for backrest adjustment (4) and fold it completely forwards.

⚠️ WARNING Take care with the backrest frame (5) - it may jerk forward and cause injury! When the backrest cushion has been removed, the backrest frame (5) must be supported, for example held in place, before the handle for backrest adjustment (4) is operated.
6 Undo the micro-encapsulated bolt (2) and take off the hexagon nut (7).
Installation note: Replace the micro-encapsulated hexagon bolt (2), 25 Nm.

7 Remove the tooth-sheet (6).
Installation notes:
- Apply acid-free multi-purpose lubricant to the entire inner surface (F) of the tooth-sheet (6).
- The control lug (arrow) on the tooth-sheet (6) must show to the backrest fixture on the left (1).

8 Pull out the actuator lever (3) with the handle for backrest adjustment (4) from the left backrest fixture (1).
9 Replace the handle for backrest adjustment (4):
   Remove the handle for backrest adjustment (4) (chapter 3.12).

10 Re-install the components in the reverse order of their removal.
3.14 Knob for Lumbar Support – Removal, Installation

REMOVAL/INSTALLATION

(1) Fixture (backrest frame)
(2) Toothed wheel
(3) Knob for lumbar support
(4) Micro-encapsulated cap screw
.................................replace, 6 Nm
3.14 Knob for Lumbar Support – Removal, Installation

Removal, installation

1. Turn the knob for lumbar support (3) to the normal position (horizontal).

2. Undo the micro-encapsulated cap screw (4) and remove the knob for lumbar support (3) from the fixture (1).

**Installation note:**
Replace the micro-encapsulated cap screw (4), 6 Nm.
3.14 Knob for Lumbar Support – Removal, Installation

REMOVAL/INSTALLATION

3 Pull out the toothed wheel (2) from the knob for lumbar support (3).

Installation note:
When fitting the toothed wheel (2) in the knob for lumbar support (3), the two spaces with the missing tooth (arrow) must be positioned exactly on top of each other.

4 Re-install the components in the reverse order of their removal.
3.15 Housing with Control and Seat Level Indicator – Removal, Installation

REMOVAL/INSTALLATION

(1) Seat plate
(2) Lower part of the suspension
(3) Housing (control and seat level indicator)
(4) Linkage rod of the pointer
(5) Handle for weight adjustment
(6) Pointer
(7) Indicator window ........................................
 ........................................... replace, if necessary
(8) Switch plate
(9) Hook (housing)
(10) Torsion spring
(11) Lever
(12) Stud
(13) Cross-head screw
**WARNING** The pressure in the pneumatic system may cause injury! The pneumatic system is to be vented before removing the housing with control and seat level indicator.

1. Remove the backrest cushion (chapter 3.1).

2. Remove the seat cushion (chapter 3.2).

3. Remove the bellows from the seat plate (1) (see chapter 3.8) and lay it down.

4. Remove the seat switch from the housing (3) (see chapter 3.16).

   **Note:**
   The switch plate (8) on the seat plate (1) need not be removed.
3.15 Housing with Control and Seat Level Indicator – Removal, Installation

REMOVAL/INSTALLATION

5 Disconnect the plug-in connection between the cable harness of the control and the cable harness of the seat switch (see chapter 3.16).

6 Disconnect the right-angle plug and plug from the compressor (see chapter 3.21).

7 Remove the air hose from the air spring (see chapter 3.22).

8 Take off the air hose from the compressor holder (see chapter 3.21).

9 Take off the compressed-air hose from the housing (3) (see chapter 3.21).
3.15 Housing with Control and Seat Level Indicator – Removal, Installation

Removal, installation

10 Move the seat to the highest position and secure it there.

**WARNING** Risk of crushing!
Secure the suspension at the back between the lower part and the upper part of the suspension with suitable spacers.

11 Take off the linkage rod of the pointer (4) from the lower part of the suspension (2).

12 Take off the linkage rod of the pointer (4) from the housing (3) and then remove it.

Installation note:
When hanging it in, make sure the upper end of the linkage rod (4) engages into the longitudinal guide (arrow) of the pointer (6).
3.15 Housing with Control and Seat Level Indicator – Removal, Installation

REMOVAL/INSTALLATION

13 Knock out and remove the stud (12) from the seat plate (1) and housing (3).

14 Undo the two cross-head screws (13) from the housing (3).

15 Take off the hook (9) from the seat plate (1) and press it down.

16 Remove the housing (3) from the seat plate (1) diagonally in upward direction.

Installation note:
When installing the housing (3), slightly pull the switch plate (8) at the front in upward direction. When doing this, take care not to bend it.
17 Replace the lever (11):
Remove the lever (11) with the handle for weight adjustment (5) and torsion spring (10) from the housing (3).

18 Replace the indicator window (7):
Use a screwdriver to release the indicator window (7) by pressing on the catchers from below which is on the left or right side of the indicator window (7).

19 Re-install the components in the reverse order of their removal.
3.16 Cable Harness of the Seat Switch with Switch Mechanism – Removal, Installation

REMOVAL/INSTALLATION

- Bellows (1)
- Seat plate (2)
- Housing (control and seat level indicator) (3)
- Cover (4)
- Cable tie (5)
- Switch plate (6)
- Blind rivet (7)
- Cable harness (8)
- Bushing (9)
- Compression spring (10)
- Blind rivet (11)
- Switching bracket (12)
- Anchor tie (13)
- Seat switch (14)
- Connector plug of the switch/control (15)
- Connector plug of the control (16)
- Backrest frame (17)
3.16 Cable Harness of the Seat Switch with Switch Mechanism – Removal, Installation

REMOVAL/INSTALLATION

1. Remove the backrest cushion (chapter 3.1).

2. Remove the seat cushion (chapter 3.2).

3. Remove the cover on the right side (see chapter 3.4).

Removal, installation

4. Pull out the two anchor ties (13) from the seat plate (2) and bellows (1).

5. Detach the bellows (1) from the seat plate (2) alongside the cable harness (8) (see chapter 3.8) and lay it down.
6 Unhook the switching bracket (12) from the seat plate (2). Turn the switching bracket (12) up, then press it slightly to the right and simultaneously pull it out in upward direction on the left side of the seat plate (2). Then pull it out on the right side of the seat plate (2) and remove it.

**Installation note:**
The switching bracket (12) must seat on the two compression springs (10) to guarantee the correct switching function of the seat switch (14).

7 Pull off the two compression springs (10) from the bushings (9) in upward direction.

8 Bore out two rivet heads and drive out the blind rivets (11). Remove the two bushings (9).
9 Replace the switch plate (6):
Bore out the rivet head and drive out the blind rivet (7). Remove the switch plate (6).

10 Remove the cover (4) from the housing (3). To do this, press down the catchers (arrow) on the housing (3), push the cover (4) forwards over the catcher and remove it in upward direction.

11 Pull out the seat switch (14) from the housing (3) and lay it down on the seat plate (2).

12 Disconnect the plug-in connection between the connector plug of the switch/control (15) and the connector plug of the control (16).
13 Mark the places where the cable harness (8) is fixed to the seat plate (2) with four cable ties (5) and remove the cable ties (5).

**Installation note:**
The locking heads of the cable ties (5) must be tightened on the outside below the seat plate (2).

14 Push the connector plug of the switch/control (15) upwards through the opening of the seat plate (2).

15 Pull out the cable harness (8) in forward direction between the seat plate (2) and backrest frame (17) and then remove it.

16 Re-install the components in the reverse order of their removal.
3.17 Seat Fore/Aft Adjustment – Removal, Installation of the Entire Assembly

REMOVAL/INSTALLATION

1. Take off the bellows from the lower part of the suspension (2) (see chapter 3.8), push it upwards and fix it to the upper part of the suspension.

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<td>grease</td>
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3.17 Seat Fore/Aft Adjustment – Removal, Installation of the Entire Assembly

Removal, installation

2 Move the seat to the highest position and secure it there.

⚠️ **WARNING** Risk of crushing! Secure the suspension at the back between the lower part and the upper part of the suspension with suitable spacers.

3 Pull out two locking rails (6) off the adjusting rail (3) and the entire adjusting rail assembly (8).

**Note:**
To unlock the locking rail (6) from the entire adjusting rail assembly (8), pull the handle for fore/aft adjustment (7) in upward direction.

**Installation note:**
Apply acid-free multi-purpose lubricant to the rail surfaces (F) of the two locking rails (6).
3.17 Seat Fore/Aft Adjustment – Removal, Installation of the Entire Assembly

REMOVAL/INSTALLATION

4 Mark the mounting holes for the six micro-encapsulated cap screws (1), undo the micro-encapsulated cap screws (1) and remove the hexagon nuts (5) with the washers (4).

Installation notes:
- Replace the micro-encapsulated cap screw (1), 25 Nm.
- Screw tight the micro-encapsulated cap screws (1) in acc. with the respective screw positioning diagram.

5 Remove the adjusting rail (3) and the entire adjusting rail assembly (8).
6 Replace the handle for fore/aft adjustment (7):
Remove the handle for fore/aft adjustment (7) (chapter 3.11).

7 Re-install the components in the reverse order of their removal.
3.18 Shock Absorber – Removal, Installation

REMOVAL/INSTALLATION

TABLE OF CONTENTS

(1) Axle (swinging structure)
(2) Shock absorber
(3) Circlip

1. Remove the backrest cushion (chapter 3.1).

2. Remove the seat cushion (chapter 3.2).

3. Remove the bellows at the front and right side from the seat plate (see chapter 3.8) and press it down.
3.18 Shock Absorber – Removal, Installation

Removal, installation

4 Move the seat to the highest position and secure it there.

**WARNING** Risk of crushing!
Secure the suspension at the back between the lower part and the upper part of the suspension with suitable spacers.

5 Loosen the two circlips (3) on the axles (1) and then remove them.

6 Pull off the shock absorber (2) from the axles (1) and then remove it.

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire surface (F) of the axle (1).

7 Re-install the components in the reverse order of their removal.
3.19 Webbings (Static Belt) - Removal, Installation

REMOVAL/INSTALLATION

(1) Upper part of the suspension
(2) Micro-encapsulated cap screw ........................................replace, 25 Nm
(3) Upper strip
(4) Micro-encapsulated cap screw ........................................replace, 25 Nm
(5) Webbing (static belt)
(6) Lower strip
(7) Hexagon nut
(8) Lower part of the suspension
3.19 Webbings (Static Belt) - Removal, Installation

REMOVAL/INSTALLATION

1. Remove the backrest cushion (chapter 3.1).

2. Remove the seat cushion (chapter 3.2).

3. Remove the bellows on the back and side and pull it down over the lower part of the suspension (see chapter 3.8).

Removal, installation

4. Move the seat to the highest position and secure it there (the webbings (5) must not be under tension).

⚠️ WARNING Risk of crushing! Secure the suspension at the back between the lower part and the upper part of the suspension with suitable spacers.
5. Unscrew two micro-encapsulated cap screws (2) out of the upper part of the suspension (1).

**Installation note:**
Replace the micro-encapsulated cap screw (2), 25 Nm.

6. Pull out the upper strip (3) from the two webbings (5).

**Installation notes:**
- The depressions of the upper strip (3) must show upwards.
- The two webbings (5) must be situated in the depressions of the upper strip (3).

7. Unscrew the three micro-encapsulated cap screws (4) out of the lower part of the suspension (8) and take off the hexagon nuts (7).

**Installation note:**
Replace the micro-encapsulated cap screw (4), 25 Nm.
8 Remove the lower strip (6) and the two webbings (5).

**Installation notes:**

- **WARNING** Risk of accident!
The seat displacement is limited by the webbings. With different webbing variants, please make sure that the same webbing length is installed on the right and left side.
- The two webbings (5) must be situated in the depressions of the lower strip (6).

9 Re-install the components in the reverse order of their removal.
3.20 Seat Plate – Removal, Installation

REMOVAL/INSTALLATION

(1) Special torx screw ................ 25 Nm
(2) Seat plate
(3) Plastic roller
(4) Swinging structure
(5) Buffer
(6) Blind rivet
(7) Fixed bearing
(8) Guiding rail

⚠️ WARNING The pressure in the pneumatic system may cause injury! The pneumatic system is to be vented before removing the seat plate.
3.20 Seat Plate – Removal, Installation

REMOVAL/INSTALLATION

1. Remove the backrest cushion (chapter 3.1).
2. Remove the seat cushion (chapter 3.2).
3. Remove the left and right covers (chapter 3.4).
4. **Seat with armrests:**
   Remove the armrests (chapter 3.6).
5. Remove the backrest frame with the retaining spring (chapter 3.7).
6. Remove the bellows from the seat plate (2) (see chapter 3.8) and lay it down.
7. Replace the belt roller and the belt buckle (chapter 3.9).
8 Remove the entire backrest lock (chapter 3.13).

9 Remove the housing with control and seat level indicator (chapter 3.15).

10 Remove the cable harness of the seat switch with switch mechanism (chapter 3.16).

11 Remove the two webbings from the seat plate (2) (see chapter 3.19).

12 Remove the air spring from the swinging structure (see chapter 3.22).
Removal, installation

13 Move the seat to the highest position and secure it there.

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

14 Unscrew the two special torx screws (1) from the fixed bearing (7).
**Installation note:**
Special torx screw (1), 25 Nm.

15 Unhook the two fixed bearings (7) from the seat plate (2).
16 Push the seat plate (2) as far backwards as possible and remove the two guiding rails (8) at the bottom of the seat plate (2) from the two plastic rollers (3) by turning them sideways to the right.

17 Remove the seat plate (2) in upward direction.

18 Remove the compressor (chapter 3.21).

19 Remove the air spring from the seat plate (2) (see chapter 3.22).

20 Bore out the two rivet heads and drive out the blind rivets (6). Remove the two buffers (5).

21 Re-install the components in the reverse order of their removal.
3.21 Compressor – Removal, Installation

REMOVAL/INSTALLATION

(1) Seat plate
(2) Hook (compressor holder)
(3) Steal rivet
(4) Compressor
(5) Compressor holder
(6) Air hose
(7) Housing (control and seat level indicator)
(8) Compressed-air hose
(9) Right-angle plug
(10) Connector
(11) Backrest frame

**WARNING** The pressure in the pneumatic system may cause injury! The pneumatic system is to be vented before removing the compressor.
3.21 Compressor – Removal, Installation

1. Remove the backrest cushion (chapter 3.1).

2. Remove the seat cushion (chapter 3.2).

3. Remove the bellows from the seat plate (1) (see chapter 3.8) and lay it down.

4. Take off the linkage rod of the pointer from the lower part of the suspension (see chapter 3.15).

5. Remove the air spring from the swinging structure (see chapter 3.22).

6. Unscrew the special torx screws and take off the fixed bearings from the seat plate (1) (see chapter 3.20).
Removal, installation

7 Tilt the seat plate (1) with the backrest frame (11) backwards and lay it down on the backrest frame (11).

**Note:**
With short webbings, the upper or lower cross-head of the webbings has to be loosened before (see chapter 3.19).

8 Take off the compressed-air hose (8) from the housing (7).

9 Take off the compressed-air hose (8) from the compressor holder (5).

10 Remove the compressed-air hose (8) from the air spring (see chapter 3.22).

11 Take off the air hose (6) from the compressor holder (5).
12 Disconnect the right-angle plug (9) and plug (10) from the compressor (4).

13 Bore out the rivet head and drive out the steel rivet (3).

14 Take off the hook (2) from the seat plate (1) and press it down.

15 Remove the compressor holder (5) with the compressor (4) in forward direction.

16 Pull out the compressor (4) from the compressor holder (5).
3.21 Compressor – Removal, Installation

17 Pull off the compressed-air hose (8) from the compressor (4).

**WARNING** Damage!
- Do not use a screwdriver to lift the compressed-air hose (8) off the gudgeon of the compressor (4).
- Heat the compressed-air hose (8) at the head of compressor (4) (e.g. using a hot-air blower) and then, pull it off in one move.

18 Re-install the components in the reverse order of their removal.
3.22 Air Spring – Removal, Installation

REMOVAL/INSTALLATION

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* Use a special tool for cutting into lengths.

**WARNING** The pressure in the pneumatic system may cause injury! The pneumatic system is to be vented before removing the air spring.
3.22 Air Spring – Removal, Installation

REMOVAL/INSTALLATION

1. Remove the backrest cushion (chapter 3.1).
2. Remove the seat cushion (chapter 3.2).
3. Remove the bellows from the seat plate (1) (see chapter 3.8) and lay it down.
4. Take off the linkage rod of the pointer from the lower part of the suspension (see chapter 3.15).
5. Remove the compressor and pull off the compressed-air hose (6) from the compressor (chapter 3.21).
6. Unscrew the special torx screws and take off the fixed bearing (1) from the seat plate (see chapter 3.20).
Removal, installation

**WARNING** Damage!

- Before pulling the hoses (compressed-air hose (6) and air hose (7)) from the air spring (8), the retaining ring of the quick coupling (5) must first be pressed to the very back on both sides (e.g. using flat pliers) so as to avoid marks.
- Connect the hose not more than 1 to 2 times. Check the hose for damage before connecting it.
- Always replace a damaged hose (marks) by a new one. It is possible to cut off the defective part (about 8 mm) in a straight and clean way only once.
Removal, installation

7 Tilt the seat plate (1) with the backrest frame backwards and lay it down on the backrest frame.

**Note:**
With short webbings, the upper or lower cross-head of the webbings has to be loosened before (see chapter 3.19).

8 Undo the counter sunk screw (9) from the swinging structure (10).

**Installation note:**
Counter sunk screw (9), 6 Nm.

9 Pull out the compressed-air hose (6) and air hose (7) from the air spring (8).

**Installation note:**
The compressed-air hose (6) and air hose (7) are locked automatically after they have been connected.
10 Bore out the four rivet heads and drive out the blind rivets (4) from the seat plate (1).

11 Take off the plate (3) with the air spring (8).

12 Undo the counter sunk screw (2) from the plate (3) and remove the air spring (8).

**Installation notes:**
- Counter sunk screw (2), 6 Nm.
- The nose (arrow) on the top side of the air spring (8) must snap into the hole (3) of the plate.

13 Re-install the components in the reverse order of their removal.
3.23 Swinging Structure with the Lower Part of the Suspension – Disassembly, Assembly

DISASSEMBLY/ASSEMBLY

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(1) Swinging structure ............ grease
(2) Plastic roller, top ............ grease
(3) Plastic roller, bottom
(4) Bushing
(5) Fixed bearing
(6) Bushing
(7) Lower part of the suspension
(8) Swinging structure bolt ........ grease

1 Remove the backrest cushion (chapter 3.1).

2 Remove the seat cushion (chapter 3.2).

3 Remove the bellows (chapter 3.8).
3.23 Swinging Structure with the Lower Part of the Suspension – Disassembly, Assembly

**DISASSEMBLY/ASSEMBLY**

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4. **Take off the linkage rod of the pointer from the lower part of the suspension (7) (see chapter 3.15).**

5. **Remove the seat fore/aft adjustment completely (chapter 3.17).**

6. **Remove the shock absorber (chapter 3.18).**

7. **Remove the webbings (static belt) (chapter 3.19).**

8. **Remove the seat plate (chapter 3.20).**

**Note:**
The seat plate can be removed completely together with the backrest frame and all the components fixed to it. For this reason, you do not need to perform preparations that are expected to be carried out according to this chapter.

9. **Remove the air spring from the lower part of the suspension (7) (see chapter 3.22).**
3.23 Swinging Structure with the Lower Part of the Suspension – Disassembly, Assembly

Disassembly, assembly

10 Remove the two top plastic rollers (2) from the roller axles of the swinging structure (1).

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire surface of the roller axles (F) of the swinging structure (1) and the face (F) of the two top plastic rollers (2).

11 Remove the two fixed bearings (5) with bushings (4) from the fixed bearing axles of the swinging structure (1). Take off the bushings (4) from the fixed bearing (5).

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire surface of the fixed bearing axles (F) of the swinging structure (1).
12 Release the swinging structure bolt (8) and pull it out from the swinging structure (1) and the lower part of the suspension (7).

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire surface (F) of the swinging structure bolt (8) in the width of a brush.

13 Remove the two bushings (6) from the swinging structure (1).

14 Push the swinging structure (1) backwards and extend it until the swinging structure (1) with the left bottom plastic roller (3) can be taken out through the cut-out (arrow) of the running surface in the lower part of the suspension (7).
15 Lift the swinging structure (1) on the left side and slide it with the bottom plastic roller (3) through the cut-out (arrow) on the lower part of the suspension (7).

16 Remove the swinging structure (1) with the right bottom plastic roller (3) from the running surface of the lower part of the suspension (7), and take it off in upward direction.

17 Remove the two bottom plastic rollers (3) from the roller axles of the swinging structure (1).

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire surface of the roller axles (F) of the swinging structure (1).

18 Assemble the components in the reverse order of their disassembly.