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Notes on these instructions

This repair manual includes information and instructions on how to perform repair work on the seat suspension MSG95EL of GRAMMER seats.

The repair of the upper seat part is described in the repair manual for the upper seat part S721 - S742, to which a reference is made, if required.

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

The seat suspension MSG95EL forms the basis for illustrations in this repair manual. In the case of technical deviations in work procedures (due to different seat suspension designs), refer to the current text or individual chapters of the manual.

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

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

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

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

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

The illustrated repair steps refer to the seat suspension for left-hand drive. Different work steps are to be performed laterally reversed when repairing vehicle models with right-hand drive.

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

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

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

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

For proper functioning of the seat, it is important to carry out repair work of the pneumatic system by means of GRAMMER’s special tool kit Praticco. The individual work steps are described in the operating instructions which are enclosed with the kit.

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

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

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

**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 of the seat suspension or damage to it resulting from improperly performed work, all information and instructions, in particular the safety instructions stated in Chapter 1, must be read carefully and strictly observed.

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

For this reason, **GRAMMER** AG disclaims liability for any possible damage of this kind.

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

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Change notification and copyright

The seat suspensions are subject to continuous development. Please understand that we must reserve the right to make changes in shape, equipment and technical design. For this reason, the contents of this repair manual cannot be used to substantiate any possible claims. Reprint, translation and copies of this manual or parts thereof are admissible only after written approval.

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<table>
<thead>
<tr>
<th>1</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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1.1 Safety instructions
1.2 Rating plate

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

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

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

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

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

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

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

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

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

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

The rating plate is located on the back of the seat suspension in the top left corner.

The rating plate shows the following information (example):

(A) **BENENNUNG**
**DESIGNATION** = MSG 95EL

(B) **SACHNUMMER**
**INVENTORY NO.** = 1050365

(C) **Year/ CW / Assembly**
- Year of manufacture = 07 (2007)
- Built in week = 03 (January)
- Assembly = 031

(D) **AUFTRAGS NR.**
**ORDER NO.** = DE 42844300080

**Note:**
When orders are placed, the correct inventory no. (B) on the rating plate is always to be quoted.
2 Diagnosis

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2.1 Overview of components (page 1-18)
   - Level control – pin assignment of electrical connection (page 1-3)
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   - Pneumatic connecting diagram (page 6-7)
   - Cable harness for height adjustment / seat occupancy detection system and module for height adjustment – pin assignment of electrical connection (page 8-11)
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- Seat suspension does not respond when actuating the upper rocker switch (page 1)
- Seat suspension responds when the rocker switch is actuated, but then returns to its original position (page 2)
- Seat suspension does not respond when actuating the lower rocker switch (page 2)
- Seat suspension position changes during operation, deflates and lowers down (page 3)
- Seat suspension can be set to the highest position, but does not vent anymore (page 3)
- Seat suspension can be lowered, but does not pump up from the lowest position, while the compressor is running (page 3)
- Seat suspension pumps up and remains in the middle position, while the compressor is running (page 4)
- Seat suspension pumps up automatically (e.g. during seat compression and expansion), compressor starts running (page 4)
- After turning the handle for the fore/aft isolator backwards (in order to unlock the fore/aft isolator), the upper part of suspension cannot be moved in longitudinal horizontal direction (page 4)
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2.4 Fault diagnosis – Locating the fault (page 1-17)
   1 Checking the level control (page 1-3)
   2 Checking the compressor / compressor cable (page 4-5)
   3 Checking the air spring and the additional air supply (page 6)
   4 Checking the module for height adjustment (page 7-8)
   5 Checking the cable harness for height adjustment / seat occupancy detection system (page 9-13)
   6 Checking the entire cable harness (page 14-17)
2.1 Overview of components

Level control – pin assignment of electrical connection

(1) Level control
(2) Webbing
(3) Air hose:
   Hose from the solenoid valve for the retractor to the retractor
(4) Air hose:
   Hose from the solenoid valve to the additional air supply
(5) Air hose:
   Hose from the solenoid valve to the additional air supply
(6) Socket for entire cable harness
(7) Plug of level control (15-pin)
(8) Retractor (level control)
(9) Entire cable harness
2.1 Overview of components

(10) Pin assignment for control at the plug of the level control (7)
**Pin:**
P8 (ground) and P14 (voltage 12V / 24V)

(11) Pin assignment for seat occupancy detection system at the plug of the level control (7)
**Pin:**
P1 (signal) and P2 (ground)

(12) Pin assignment for height adjustment in upward direction at the plug of the level control (7)
**Pin:**
P4 (signal) and P5 (ground)

(13) Pin assignment for height adjustment in downward direction at the plug of the level control (7)
**Pin:**
P5 (ground) and P7 (signal)
2.1 Overview of components

(14) Pin assignment for the compressor at the plug of the level control (7)

**Pin:**
- P12 (voltage 12V / 24V)) and P15 (ground)

(15*) Pin assignment for climate control system:

**Contact:**
- P3 (voltage 12V)
- P2 (ground)

**Electrical plug and socket connection:**

(A) Electrical connection between level control (1) – entire cable harness (9)

* Pin assignment for variant 24V. At variant 12V no assignment of P3.
2.1 Overview of components

Compressor and compressor cable – pin assignment of electrical connection

(1) Level control
(2) Compressor
(3) Compressor cable (cable harness complete)
(4) Socket for entire cable harness
(5) Plug of level control (15-pin)
(6) Entire cable harness
(7) Right-angle plug
(8) Nozzle
(9) Compressed-air hose
(10) Pin assignment for compressor at the socket of the entire cable harness (4)

**Contact:**
K12 (voltage 12V / 24V) and K15 (ground)
2.1 Overview of components

Electrical plug and socket connections:

(A) Electrical connection between level control (1) – entire cable harness (6)

(B) Electrical connection between compressor cable (3) – compressor (2)

Cable colors:
gr = green
br = brown
2.1 Overview of components

Pneumatic connecting diagram

(1) Additional air supply
(2) Air hose:
   Hose from the solenoid valve to the additional air supply
(3) Air hose:
   Hose from the solenoid valve to the additional air supply
(4) Level control
(5) Air spring
(6) Catch spring
(7) Coupling (compressed-air hose)
(8) Coupling (air intake hose)
(9) Compressed-air hose:
   Hose from the air spring (5) to the compressor (13)
2.1 Overview of components

(10) Protective hose

(11) Air intake hose:
   Hose from the air spring (5) to the additional air supply (1)

(12) Nozzle

(13) Compressor
2.1 Overview of components

Cable harness of height adjustment / seat occupancy detection system and module for height adjustment – pin assignment of electrical connection

(1) Cable for height adjustment
(2) Cable for seat occupancy detection system
(3) Cable harness of height adjustment / seat occupancy detection system
   = (1) + (2)
(4) Socket for cable harness of height adjustment / seat occupancy detection system
(5) Socket for cable of height adjustment
(6) Plug of module for height adjustment
(7) Module for height adjustment
(8) Rocker switch
(9) Right plug of entire cable harness
(10) Entire cable harness
2.1 Overview of components

(11) Pin assignment for height adjustment in downward direction at the socket of the cable harness for height adjustment / seat occupancy detection system (4)
Contact: K5 (ground) and K6 (signal)

(12) Pin assignment for height adjustment in upward direction at the socket of the cable harness for height adjustment / seat occupancy detection system (4)
Contact: K4 (signal) and K5 (ground)

(13) Pin assignment for seat occupancy detection system at the socket of the cable harness for height adjustment / seat occupancy detection system (4)
Contact: K2 (ground) and K3 (signal)

(14) Pin assignment for height adjustment in upward direction at the plug of the module for height adjustment (6)
Pin: P1 (signal) and P2 (ground)
2.1 Overview of components

(15) Pin assignment for height adjustment in downward direction at the plug of the module for height adjustment (6)

Pin:
- P2 (ground) and P3 (signal)

(16) Pin assignment for seat occupancy detection system *

- blue (signal) and brown (ground)

(17) Socket of cable for seat occupancy detection system *

Electrical plug and socket connections:

(A) Electrical connection between cable for height adjustment (1) – module for height adjustment (7)

* if fitted or delivery option
2.1 Overview of components

(B) Electrical connection between cable harness of height adjustment / seat occupancy detection system (3) – entire cable harness (10)

(D) Electrical connection between cable harness of height adjustment (1) – seat occupancy detection system cable (2) *

Cable colors:
gr = green
br = brown
bl = blue
vi = purple

* if fitted or delivery option
2.1 Overview of components

Entire cable harness

(1) Entire cable harness
(2) Socket for entire cable harness
(3) Right plug of entire cable harness
(4) Left plug of entire cable harness
(5) Plug of entire cable harness
(6) Socket of fuse
(7) Fuse (Si = 15A at 12V/DC)
   (Si = 10A at 24V/DC)
(8) Right-angle plug
(9) Compressor cable
(10) U-type bracket
(11) Socket for cable harness of height adjustment / seat occupancy detection system
(12) Cable harness of height adjustment / seat occupancy detection system
2.1 Overview of components

(13) Socket of cable harness for vehicle connection
(14) Cable harness for vehicle connection
(15) Socket of cable harness for upper seat part
(16) Cable harness for upper seat part (additional load)

Electrical plug and socket connections:

(A) Electrical connection between entire cable harness (1) – cable harness of upper seat part (16)

(B) Electrical connection between entire cable harness (1) – cable harness of height adjustment / seat occupancy detection system (12)

(C) Electrical connection between entire cable harness (1) – cable harness for vehicle connection (14)
2.1 Overview of components

Entire cable harness – pin assignment of electrical connection

(1) Entire cable harness
(2) Socket for entire cable harness
(3) Right plug of entire cable harness
(4) Left plug of entire cable harness
(5) Plug of entire cable harness
(6) Socket of fuse
(7) Pin assignment for control at the plug of the entire cable harness (5)

**Pin:**
- P1 (ground) and
- P2 (voltage 12 V / 24V)

(8*) Pin assignment for climate control system at the plug of the entire cable harness (5)

**Pin:**
- P3 (ground) and
- P4 (voltage 12 V)

* Pin assignment for variant 12V. At variant 24V no assignment of P4.
2.1 Overview of components

(9) Pin assignment for the lumbar support at the plug of the entire cable harness (5)

**Pin:**
- P3 (ground) and P5 (voltage 12 V / 24V)

(10) Pin assignment for heater at the plug of the entire cable harness (5)

**Pin:**
- P3 (ground) and P6 (voltage 12 V / 24V)

(11) Pin assignment for height adjustment in downward direction at the right plug of the entire cable harness (3)

**Pin:**
- P5 (ground) and P6 (signal)

(12) Pin assignment for height adjustment in upward direction at the right plug of the entire cable harness (3)

**Pin:**
- P4 (signal) and P5 (ground)
2.1 Overview of components

(13) Pin assignment for seat occupancy detection system at the right plug of the entire cable harness (3)
**Pin:**
P2 (ground) and P3 (signal)

(14) Pin assignment for climate control system at the left plug of the entire cable harness (4)
**Pin:**
P3 (voltage 12 V) and P6 (ground)

(15) Pin assignment for the lumbar support at the left plug of the entire cable harness (4)
**Pin:**
P6 (ground) and P7 (voltage 12 V / 24V)

(16) Pin assignment for heater at the left plug of the entire cable harness (4)
**Pin:**
P6 (ground) and P8 (voltage 12 V / 24V)
(17) Pin assignment for control at the socket of the entire cable harness (2)
**Contact:**
K8 (ground) and K14 (voltage 12 V / 24V)

(18) Pin assignment for seat occupancy detection system at the socket of the entire cable harness (2)
**Contact:**
K1 (signal) and K2 (ground)

(19) Pin assignment for height adjustment in upward direction at the socket of the entire cable harness (2)
**Contact:**
K4 (signal) and K5 (ground)

(20) Pin assignment for height adjustment in downward direction at the socket of the entire cable harness (2)
**Contact:**
K5 (ground) and K7 (signal)
2.1 Overview of components

(21) Pin assignment for compressor at the socket of the entire cable harness (2)

Contact:
K12 (voltage 12 V / 24V) and K15 (ground)

(22**) Pin assignment for climate control system:

Contact:
K3 (voltage 12V) K2 (ground)

** Pin assignment for variant 24V. At variant 12V no assignment of K3.
2.2 Functional test – Testing the specified status of functions

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

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 and in compliance with the vehicle operating instructions.
- Battery voltage 12 V, ignition ON.
- At a battery voltage of 24 V, the power supply is running via a voltage transformer. The voltage transformer 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.
If there is a difference between the result/specified 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/specified state</th>
<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seat suspension</td>
<td>Apply load to the seat suspension and spring up and down several times.</td>
<td>No noise. High lateral stability in horizontal direction.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
</tbody>
</table>
### 2.2 Functional test – Testing the specified status of functions

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Scope of inspection</th>
<th>Function to be operated</th>
<th>Result/specified state</th>
<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Height adjustment</td>
<td>Press the upper part of the rocker switch and hold it down until the upper end stop is reached (max. 1 minute).</td>
<td>The seat suspension moves upwards and adjusts to the maximum height.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Release the rocker switch.</td>
<td>After having reached the maximum height, the seat suspension must move downwards by approx. 30 mm in order to ensure a minimum spring travel.</td>
<td>During operation, the seat might swing approx. 30 mm upwards without hitting the stopper. See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Press the lower part of the rocker switch and hold it down until the lower end stop is reached (max. 1 minute).</td>
<td>The seat suspension moves downwards and adjusts to the minimum height.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Release the rocker switch.</td>
<td>After having reached the minimum height, the seat suspension must move upwards by approx. 30 mm in order to ensure a minimum spring travel.</td>
<td>During operation, the seat might swing approx. 30 mm downwards without hitting the stopper. See Overview of faults (Chapter 2.3).</td>
</tr>
</tbody>
</table>
## 2.2 Functional test – Testing the specified status of functions

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Scope of inspection</th>
<th>Function to be operated</th>
<th>Result/specified state</th>
<th>Notes, cause/remedial measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td></td>
<td>Press the rocker switch and release it.</td>
<td>The seat suspension moves upwards, briefly deflates and adjusts to the end position.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>7</td>
<td>Fore/aft isolator</td>
<td>Turn the handle for the fore/aft isolator (see chapter 3.9) backwards in order to unlock the fore/aft isolator.</td>
<td>The upper part of suspension can be moved in longitudinal horizontal direction.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Turn the handle for the fore/aft isolator (see chapter 3.9) forwards in order to lock the fore/aft isolator. Move the upper part of suspension backwards until the fore/aft isolator locks into place with an audible click.</td>
<td>The upper part of suspension cannot be moved in longitudinal horizontal direction.</td>
<td>See Overview of faults (Chapter 2.3).</td>
</tr>
</tbody>
</table>
This chapter contains notes on possible faults of the seat suspension. The notes and information provided in Chapter 2.4 "Fault Diagnosis" are intended to ease troubleshooting of faults.

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

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

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat suspension does not respond when actuating the upper rocker switch.</td>
<td>• Compressor is not running.</td>
<td>Check the compressor / compressor cable (Chapter 2.4, step no. 2.1).</td>
</tr>
<tr>
<td></td>
<td>• Level control is defective.</td>
<td>Check the level control (Chapter 2.4, step no. 1.1).</td>
</tr>
<tr>
<td></td>
<td>• Module for height adjustment is defective.</td>
<td>Check the module for height adjustment (Chapter 2.4, step no. 4.1).</td>
</tr>
<tr>
<td></td>
<td>• Cable harness of height adjustment / seat occupancy detection system is</td>
<td>Check the cable harness for height adjustment / seat occupancy detection system (Chapter 2.4, step no. 5.1).</td>
</tr>
<tr>
<td></td>
<td>defective.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Entire cable harness is defective.</td>
<td>Check the entire cable harness (Chapter 2.4, step no. 6.1 to 6.4).</td>
</tr>
</tbody>
</table>
### 2.3 Overview of faults – Pointing out possible faults that might occur

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat suspension responds when the rocker switch is actuated, but then returns to</td>
<td>• Level control is defective.</td>
<td>Check the level control (Chapter 2.4, step no. 1.1).</td>
</tr>
<tr>
<td>its original position.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seat suspension does not respond when actuating the lower rocker switch.</td>
<td>• Level control is defective.</td>
<td>Check the level control (Chapter 2.4, step no. 1.1).</td>
</tr>
<tr>
<td></td>
<td>• Module for height adjustment is defective.</td>
<td>Check the module for height adjustment (Chapter 2.4, step no. 4.1).</td>
</tr>
<tr>
<td></td>
<td>• Cable harness of height adjustment / seat occupancy detection system is</td>
<td>Check the cable harness for height adjustment / seat occupancy detection system (</td>
</tr>
<tr>
<td></td>
<td>defective.</td>
<td>Chapter 2.4, step no. 5.1).</td>
</tr>
<tr>
<td></td>
<td>• Entire cable harness is defective.</td>
<td>Check the entire cable harness (Chapter 2.4, step no. 6.1 to 6.4).</td>
</tr>
</tbody>
</table>

TABLE OF CONTENTS
## 2.3 Overview of faults – Pointing out possible faults that might occur

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat suspension position changes during operation, deflates and lowers down.</td>
<td>• Air spring or additional air supply is leaky.</td>
<td>Check the air spring and the additional air supply (Chapter 2.4, step no. 3.1).</td>
</tr>
<tr>
<td></td>
<td>• Level control is leaky.</td>
<td>Check the level control (Chapter 2.4, step no. 1.1).</td>
</tr>
<tr>
<td></td>
<td>• Air connections are leaky.</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 hoses are leaky.</td>
<td>Check all air hoses for air leakage and replace a defective air hose, if necessary (see Chapter 3.14).</td>
</tr>
<tr>
<td></td>
<td>• Compressor is leaky (return valve).</td>
<td>Replace the compressor (see Chapter 3.11).</td>
</tr>
</tbody>
</table>
### 2.3 Overview of faults – Pointing out possible faults that might occur

<table>
<thead>
<tr>
<th>Fault Description</th>
<th>Possible Cause(s)</th>
<th>Action(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat suspension can be set to the highest position, but does not vent anymore.</td>
<td>• Level control is defective.</td>
<td>Check the level control (Chapter 2.4, step no. 1.2).</td>
</tr>
<tr>
<td>Seat suspension can be lowered, but does not pump up from the lowest position,</td>
<td>• Compressor is leaky (return valve).</td>
<td>Replace the compressor (see Chapter 3.11).</td>
</tr>
<tr>
<td>while the compressor is running.</td>
<td>• Secondary belt got caught in the level control.</td>
<td>Pull the secondary belt out of the level control (see Chapter 3.13).</td>
</tr>
<tr>
<td>Seat suspension pumps up and remains in the middle position, while the compressor</td>
<td>• The sealing ring of the level control is not tight.</td>
<td>Replace the level control (see Chapter 3.12).</td>
</tr>
<tr>
<td>is running.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seat suspension pumps up automatically (e.g. during seat compression and expansion); compressor starts running (page 4)</td>
<td>• Short-circuit at the compressor cable (e.g. caused by abrasion).</td>
<td>Check the compressor cable (Chapter 2.4, step no. 2.1).</td>
</tr>
<tr>
<td></td>
<td>• Level control is defective.</td>
<td>Check the level control (Chapter 2.4, step no. 1.2).</td>
</tr>
<tr>
<td>After turning the handle for the fore/aft isolator backwards (in order to unlock</td>
<td>• Linkage rod is detached or broken.</td>
<td>Hang in or replace the linkage rod (see Chapter 3.10).</td>
</tr>
<tr>
<td>the upper part of suspension cannot be moved in longitudinal horizontal direction.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 2.3 Overview of faults – Pointing out possible faults that might occur

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| After turning the handle for the fore/aft isolator forwards (in order to lock the fore/aft isolator), the upper part of suspension can be moved in longitudinal horizontal direction. | • Linkage rod is detached or broken.  
• Tension springs are detached.  
• Tension springs are broken. | Hang in or replace the linkage rod (see Chapter 3.10).  
Hang in the tension springs (see Chapter 3.10).  
Replace the locking mechanism for the fore/aft isolator (see Chapter 3.10). |
| Seat suspension wobbles.                                                           | • Fixed bearings or rollers of the swinging structure are defective.  
• Swinging structure is defective.                                              | Replace the seat suspension (see Chapter 3.22).  
Replace the seat suspension (see Chapter 3.22). |
### 2.3 Overview of faults – Pointing out possible faults that might occur

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat suspension squeaks.</td>
<td>• Insufficient lubrication of the upper and/or lower rollers of the swinging structure.</td>
<td>Apply acid-free multi-purpose lubricant to the guiding rails of the upper part of suspension and/or of the lower part of suspension at the side surfaces of the rollers (see Chapter 3.20 and/or Chapter 3.21).</td>
</tr>
<tr>
<td></td>
<td>• Insufficient lubrication of the studs of the vertical shock absorber.</td>
<td>Apply acid-free multi-purpose lubricant to the stud of vertical shock absorber (see Chapter 3.6).</td>
</tr>
<tr>
<td></td>
<td>• Insufficient lubrication of the mounting surfaces of the longitudinal horizontal shock absorber.</td>
<td>Apply acid-free multi-purpose lubricant to mounting surfaces of the longitudinal horizontal shock absorber (see Chapter 3.7).</td>
</tr>
<tr>
<td></td>
<td>• Insufficient lubrication of the central bearing of the swinging structure.</td>
<td>Apply oil to the central bearing. <strong>Note:</strong> For this purpose, the central bearing does not have to be removed.</td>
</tr>
</tbody>
</table>
### 2.3 Overview of faults – Pointing out possible faults that might occur

<table>
<thead>
<tr>
<th>Fault description</th>
<th>Possible cause</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat suspension compresses and extends too much and hits the upper and lower end stop.</td>
<td>• Vertical shock absorber is defective.</td>
<td>Replace the vertical shock absorber (see Chapter 3.6).</td>
</tr>
<tr>
<td></td>
<td>• Air spring is leaky.</td>
<td>Check the air spring (see Chapter 2.4, steps no. 3.1 to 3.2).</td>
</tr>
<tr>
<td></td>
<td>• Additional air supply is leaky.</td>
<td>Check the additional air supply (see Chapter 2.4, step no. 3.3).</td>
</tr>
<tr>
<td></td>
<td>• Air connections are leaky.</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 hoses are leaky.</td>
<td>Check all air hoses for air leakage and replace a defective air hose, if necessary (see Chapter 3.14).</td>
</tr>
<tr>
<td></td>
<td>• Level control is defective.</td>
<td>Check the level control (Chapter 2.4, step no. 1.1).</td>
</tr>
<tr>
<td></td>
<td>• Compressor is defective.</td>
<td>Check the compressor (Chapter 2.4, step no. 2.1).</td>
</tr>
</tbody>
</table>
2.4 Fault diagnosis – Locating the fault

1 Checking of the level control

Preconditions for fault diagnosis:
• The electrical system of the vehicle has been inspected and found to be OK and in compliance with the vehicle operating instructions.
• The seat suspension is disconnected (no voltage that might cause a current flow must be applied to the seat suspension).
• The air hoses have been inspected with regard to kinks and tightness and found to be OK.

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

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>• Apply load to the seat suspension.</td>
<td>Air escapes from the level control. The level control is tight.</td>
<td>Replace the level control (see Chapter 3.12). Proceed with inspection step no. 1.2.</td>
</tr>
<tr>
<td>1.2</td>
<td>• Disconnect the electrical connection between level control – entire cable harness. • Measure the resistance at the pins P8 and P14 in the plug of the level control (pin assignment for control): P8 Ω P14</td>
<td>= 2.86 kΩ (± 1%) [&gt;] 2.86 kΩ (→ ∞) (interruption) [&lt;] 2.86 kΩ (→ 0) (short-circuit)</td>
<td>Proceed with inspection step no. 1.3. Replace the level control (see Chapter 3.12).</td>
</tr>
</tbody>
</table>
### 2.4 Fault diagnosis – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3</td>
<td>• Measure the resistance at the pins P4 and P5 in the plug of the level control (pin assignment for height adjustment in upward direction): P4 Ω P5</td>
<td>= 3.41 kΩ (± 1%)</td>
<td>Proceed with inspection step no. 1.4. Replace the level control (see Chapter 3.12).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;&gt; 3.41 kΩ (∞) (interruption)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;&lt; 3.41 kΩ (0) (short-circuit)</td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td>• Measure the resistance at the pins P5 and P7 in the plug of the level control (pin assignment for height adjustment in downward direction): P5 Ω P7</td>
<td>= 3.41 kΩ (± 1%)</td>
<td>Proceed with inspection step no. 1.5. Replace the level control (see Chapter 3.12).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;&gt; 3.41 kΩ (∞) (interruption)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;&lt; 3.41 kΩ (0) (short-circuit)</td>
<td></td>
</tr>
</tbody>
</table>
### 2.4 Fault diagnosis – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>• Measure the resistance at the pins P1 and P2 in the plug of the level control (pin assignment for seat occupancy detection system): P1 Ω P2</td>
<td>= 3.41 kΩ (± 1%)</td>
<td>Proceed with inspection step no. 1.6. Replace the level control (see Chapter 3.12).</td>
</tr>
<tr>
<td>1.6</td>
<td>• Measure the resistance at the pins P12 and P15 in the plug of the level control (pin assignment for compressor): P12 Ω P15</td>
<td>= 17.36 kΩ (± 1%)</td>
<td>Proceed with inspection step no. 1.7. Replace the level control (see Chapter 3.12).</td>
</tr>
<tr>
<td>1.7</td>
<td>• Measure the resistance at the pins P2 and P3 in the plug of the level control (pin assignment for the climate control system for the seat variant 24V / DC): P2 Ω P3</td>
<td>= 92 kΩ (± 1%)</td>
<td>End of inspection. Replace the level control (see Chapter 3.12).</td>
</tr>
</tbody>
</table>
2 Checking the compressor / compressor cable

Preconditions for fault diagnosis:
- The electrical system of the vehicle has been inspected and found to be OK and in compliance with the vehicle operating instructions.
- The compressed-air hose has been inspected with regard to kinks and tightness and found to be OK.

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

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 2.1     | • Disconnect the electrical connection between level control – entire cable harness.  
          • Measure the resistance at the contacts K12 and K15 of the socket of the entire cable harness (pin assignment for compressor): K12 (green) Ω  K15 (brown) | = 0.8 Ω (± 10%) (total resistance of compressor cable and compressor)  
          >> 0.8 Ω (→ ∞) (interruption) or  
          <= 0.8 Ω (→ 0) (short-circuit) | End of inspection. Proceed with inspection step no. 2.2. |
### 2.4 Fault diagnosis – Locating the fault

#### Step 2.2

- Disconnect the electrical connection between the compressor cable – compressor.
- Measure the resistance at the contacts of the compressor (2-pin):

<table>
<thead>
<tr>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Disconnect the electrical connection</td>
<td>= 0.7 Ω (± 10%) (total resistance of compressor)</td>
<td>Replace the entire cable harness (see Chapter 3.18).</td>
</tr>
<tr>
<td>between the compressor cable – compressor.</td>
<td>&gt;&gt; 0.7 Ω (→ ∞) (interruption) or</td>
<td>Replace the compressor (see Chapter 3.11).</td>
</tr>
<tr>
<td>• Measure the resistance at the contacts of</td>
<td>&lt;= 0.7 Ω (→ 0) (short-circuit)</td>
<td></td>
</tr>
<tr>
<td>the compressor (2-pin):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>contact Ω contact</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 3 Checking the air spring and the additional air supply

**Preconditions for fault diagnosis:**
- Air intake hose, compressed-air hose and air hoses have been inspected with regard to kinks and tightness and found to be OK.

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

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>• Check the air spring for abrasion.</td>
<td>Visible abrasion, air spring untight.</td>
<td>Replace the air spring (see Chapter 3.15).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No abrasion.</td>
<td>Proceed with inspection step no. 3.2.</td>
</tr>
<tr>
<td>3.2</td>
<td>• Apply load to the seat suspension.</td>
<td>Compressed air escapes at the air spring.</td>
<td>Replace the air spring (see Chapter 3.15).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air spring is tight.</td>
<td>Proceed with inspection step no. 3.3.</td>
</tr>
<tr>
<td>3.3</td>
<td>• Apply load to the seat suspension.</td>
<td>Xompressed air escapes at the additional air supply.</td>
<td>Replace the additional air supply (see Chapter 3.16).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Additional air supply is tight.</td>
<td>End of inspection.</td>
</tr>
</tbody>
</table>
4 Checking the module for height adjustment

**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.

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 4.1      | • Disconnect the electrical connection between the cable for height adjustment – module for height adjustment.  
           • Measure the resistance at the pins P1 and P2 in the plug of the module for height adjustment (3-pin) (pin assignment for height adjustment in upward direction):  
           | P1 Ω P2                                                                         | = 510 Ω (± 1%)                         | Proceed with inspection step no. 4.2.  
           |                                                                                 | >> 510 Ω (→ ∞) (interruption)         | Replace the module for height adjustment (see Chapter 3.5).  
           |                                                                                 | << 510 Ω (→ 0) (short-circuit)        |                                              |
## 2.4 Fault diagnosis – Locating the fault

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<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 4.2      | • Measure the resistance at the pins P2 and P3 in the plug of the module for height adjustment (3-pin) (pin assignment for height adjustment in downward direction):  
  
  $\begin{array}{ccc}
  P2 & \Omega & P3 \\
  \end{array}$  
  
  $= 510 \ \Omega \ (\pm\ 1\%)$
  
  $\gg 510 \ \Omega \ (\rightarrow \infty) \ (\text{interruption})$
  
  $\ll 510 \ \Omega \ (\rightarrow \ 0) \ (\text{short-circuit})$
|                  | End of inspection.  
  
  Replace the module for height adjustment (see Chapter 3.5). |
5 Checking the cable harness of height adjustment / seat occupancy detection system

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.
• Module for height adjustment has been inspected and found to be OK.
• Seat switch in the upper seat part has been inspected and found to be OK.

Note: The components mentioned above are illustrated in Chapter 2.1 and in the repair manual of the upper seat part.

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>• Disconnect the electrical connection (B) between cable harness of height adjustment / seat occupancy detection system – entire cable harness.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 2.4 Fault diagnosis – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Measure the resistance at the contacts K2 and K3 of the socket of the cable harness for height adjustment / seat occupancy detection system (4) (pin assignment for seat occupancy detection system):</td>
<td>= 510 Ω (± 5%) (total resistance of seat switch and cable for seat occupancy detection system)</td>
<td>Proceed with inspection step no. 5.3.</td>
</tr>
<tr>
<td></td>
<td>K2 (brown) Ω K3 (blue)</td>
<td>&gt;&gt; 510 Ω (→ ∞) (interruption)</td>
<td>Cable harness with electrical connection (D):</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;&lt; 510 Ω (→ 0) (short-circuit)</td>
<td>Proceed with step 5.2.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cable harness without electrical connection (D) *:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>replace cable harness of height adjustment / seat occupancy detection (1) (see Chapter 3.19).</td>
</tr>
</tbody>
</table>

* if fitted or delivery option
### 2.4 Fault diagnosis – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 5.2      | • Disconnect electrical connection between cable harness of height adjustment (1) – seat occupancy detection system cable (2).  
          | • Measure the resistance at the contacts 1 and 2 of the socket of the seat occupancy detection system (pin assignment for height adjustment in upward direction):  
          | 1 (blue) Ω 2 (brown) | = 510 Ω (± 1%) (total resistance of seat switch and cable for height adjustment)  
          |                   | >> 510 Ω (→ ∞) (interruption)  
          |                   | << 510 Ω (→ 0) (short-circuit) | Replace cable harness of height adjustment / seat occupancy detection (1) (see Chapter 3.19).  
          |                   |                        | Replace cable harness of seat occupancy detection (2) (see Chapter 3.19). |

* if fitted or delivery option
### 2.4 Fault diagnosis – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.3</td>
<td>• Measure the resistance at the contacts K5 and K6 of the socket of the cable harness for height adjustment / seat occupancy detection system (4) (pin assignment for height adjustment in downward direction):</td>
<td>= <strong>510 Ω</strong> (± 1%) (total resistance of seat switch and cable for height adjustment)</td>
<td>Proceed with step 5.4.</td>
</tr>
<tr>
<td></td>
<td>K5 (brown) <strong>Ω</strong> K6 (purple)</td>
<td>&gt;&gt; <strong>510 Ω</strong> (→ ∞) (interruption)</td>
<td>Replace cable harness of height adjustment / seat occupancy detection (1) (see Chapter 3.19).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;&lt; <strong>510 Ω</strong> (→ 0) (short-circuit)</td>
<td></td>
</tr>
</tbody>
</table>
## 2.4 Fault diagnosis – Locating the fault

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<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.4</td>
<td>• Measure the resistance at the contacts K5 and K6 of the socket of the seat occupancy detection system (4) (pin assignment for height adjustment in downward direction): K5 (brown) Ω K6 (purple)</td>
<td>= 510 Ω (± 1%) (total resistance of module for height adjustment and height adjustment cable) &gt;&gt; 510 Ω (→ ∞) (interruption) &lt;&lt; 510 Ω (→ 0) (short-circuit)</td>
<td>End of inspection. Replace cable harness of height adjustment / seat occupancy detection (1) (see Chapter 3.19).</td>
</tr>
</tbody>
</table>
6 Checking the entire cable harness

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.
- Fuse (Si = 15 A) has been inspected and found to be OK.
- Level control has been inspected and found to be OK.
- Compressor cable has been inspected and found to be OK.

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

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 6.1      | • Close the electrical connection between level control – entire cable harness.  
           • Disconnect the electrical connection between the entire cable harness – cable harness for height adjustment / seat occupancy detection system. | | |
### 2.4 Fault diagnosis – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Measure the resistance at the pins P2 and P3 in the right plug of the entire</td>
<td>= 3.41 kΩ (± 10%)</td>
<td>Proceed with inspection step no. 6.2. Replace the cable harness (see Chapter 3.18).</td>
</tr>
<tr>
<td></td>
<td>cable harness (pin assignment for seat occupancy detection system):</td>
<td>&gt;&gt; 3.41 kΩ (→ ∞) (interruption)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;&lt; 3.41 kΩ (→ 0) (short-circuit)</td>
<td></td>
</tr>
<tr>
<td>6.2</td>
<td>• Measure the resistance at the pins P4 and P5 in the right plug of the entire</td>
<td>= 3.41 kΩ (± 10%)</td>
<td>Proceed with inspection step no. 6.3. Replace the cable harness (see Chapter 3.18).</td>
</tr>
<tr>
<td></td>
<td>cable harness (pin assignment for height adjustment in upward direction):</td>
<td>&gt;&gt; 3.41 kΩ (→ ∞) (interruption)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;&lt; 3.41 kΩ (→ 0) (short-circuit)</td>
<td></td>
</tr>
</tbody>
</table>
## 2.4 Fault diagnosis – Locating the fault

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<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.3</td>
<td>• Measure the resistance at the pins P5 and P6 in the right plug of the entire cable harness (pin assignment for height adjustment in downward direction): P5 Ω P6</td>
<td>= 3.41 kΩ (± 10%)</td>
<td>Proceed with inspection step no. 6.4. Replace the cable harness (see Chapter 3.18).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;&gt; 3.41 kΩ (→ ∞) (interruption)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;&lt; 3.41 kΩ (→ 0) (short-circuit)</td>
<td></td>
</tr>
</tbody>
</table>
## 2.4 Fault diagnosis – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 6.4      | • Disconnect the electrical connection between the entire cable harness – cable harness of vehicle connection.  
• Measure the resistance at the pins P1 and P2 in the plug of the entire cable harness (pin assignment for control): | = 2.86 kΩ (± 10%)  
>> 2.86 kΩ (→ ∞) (interruption)  
<< 2.86 kΩ (→ 0) (short-circuit) | Proceed with inspection step no. 6.5.  
Replace the cable harness (see Chapter 3.18). |
## 2.4 Fault diagnosis – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 6.5      | • Disconnect the electrical connection between the entire cable harness – cable harness of the upper seat part.  
           • Bridge the pins P3 and P6 in the left plug of the entire cable harness.  
           • Measure the resistance at the pins P3 and P4 in the plug of the entire cable harness (pin assignment for climate control system): P3 Ω P4 | << 1 Ω  
          ≥ 1 Ω (interruption) | Proceed with inspection step no. 6.6.  
Replace the cable harness (see Chapter 3.18). |
### 2.4 Fault diagnosis – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 6.6      | • Bridge the pins P6 and P7 in the left plug of the entire cable harness.  
          • Measure the resistance at the pins P3 and P5 in the plug of the entire cable harness (pin assignment for lumbar support):  
            P3 $\Omega$ P5 | $< 1 \Omega$  
            $\geq 1 \Omega$ (interruption) | Proceed with inspection step no. 6.7.  
                                     Replace the cable harness (see Chapter 3.18). |
| 6.7      | • Bridge the pins P6 and P8 in the left plug of the entire cable harness.  
          • Measure the resistance at the pins P3 and P6 in the plug of the entire cable harness (pin assignment for heater):  
            P3 $\Omega$ P6 | $< 1 \Omega$  
            $\geq 1 \Omega$ (interruption) | Proceed with inspection step no. 6.8.  
                                     Replace the cable harness (see Chapter 3.18). |
## 2.4 Fault diagnosis – Locating the fault

<table>
<thead>
<tr>
<th>Step no.</th>
<th>Inspect/Operate</th>
<th>Result/Specified state</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| 6.8      | • Measure the resistance at the pins P2 and P3 in the socket of the cable harness for seat suspension (13) (pin assignment for climate control system for the seat version 24V / DC):                                                                 | <= 1 Ω  
               ≥ 1 Ω (interruption)                                                                                                                    | End of inspection.  
               Replace the cable harness (see Chapter 3.18).                                                                                       |
3 Repair work

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3.1 Seat suspension – removal and installation (replacement of seat suspension)
3.2 Front cover – removal and installation
3.3 Top cover – removal and installation
3.4 Bellows – removal and installation
3.5 Height adjustment module – removal and installation
3.6 Vertical shock absorber – removal and installation
3.7 Longitudinal horizontal shock absorber – removal and installation
3.8 Fore/aft isolator unit – removal and installation
3.9 Handle for fore/aft isolator unit – removal and installation
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3.15 Air spring – removal and installation
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3.19 Cable harness of height adjustment / seat occupancy detection system – removal and installation
3.20 Upper part of suspension – removal and installation
3.21 Lower part of suspension – removal and installation
3.22 Swinging structure – disassembly and assembly
3.23 Worn parts – replacement
3.1 Seat suspension – removal and installation  
(replacement of seat suspension)

REMOVAL / INSTALLATION

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(1) Seat suspension
(2) Upper part of suspension
(3) Upper cover
(4) Stopper
(5) Cable harness for upper seat part (additional load)
(6) Cable harness of height adjustment / seat occupancy detection system
   = (7) + (8)
(7) Cable for height adjustment
(8) Cable for seat occupancy detection system
(9) Lower fore/aft adjustment
(10) Upper fore/aft adjustment
(11) Micro-encapsulated cap screw .................. to replace, 25 Nm
(12) Micro-encapsulated cap screw .................. to replace, 25 Nm
3.1 Seat suspension – removal and installation  
(replacement of seat suspension)

REMOVAL / INSTALLATION

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(13) Upper part of the seat
(14) Plug of cable for switching control
(15) Socket of cable harness for vehicle connection
(16) Cable harness for vehicle connection
(17) Supporting structure
(18) Cable ties
(19) Left plug of entire cable harness
(20) Socket of cable harness for upper seat part
(21) Right plug of entire cable harness
(22) Socket for cable harness of height adjustment / seat occupancy detection system
(23) Plug of module for height adjustment
3.1 Seat suspension – removal and installation (replacement of seat suspension)

REMOVAL / INSTALLATION

(24) Socket for cable of height adjustment
(25) Plastic clip
(26) Electrical connection between cable of height adjustment – seat occupancy detection system cable *

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

1 Cable harness without electrical connection (26):
Remove the bellows at the front and right side of the upper part of suspension (see Chapter 3.4).

* if fitted or delivery option
Removal and installation

2 Push the lower fore/aft adjustment (9) and the upper fore/aft adjustment (10) backwards as far as possible.

3 Mark the screw positioning diagram and unscrew two micro-encapsulated cap screws (11, 12) at the front of the lower fore/aft adjustment (9).

**Installation notes:**
- Replace the micro-encapsulated cap screws (11, 12) by new ones, 25 Nm.
- Check the lower fore/aft adjuster (9) for correct locking in any position.

4 Push the lower fore/aft adjustment (9) and the upper fore/aft adjustment (10) forwards as far as possible.
5 Remove the end stop (4) from the lower fore/aft adjustment (9).

6 Mark the screw positioning diagram and unscrew two micro-encapsulated cap screws (11) on the rear by means of a shortened hexagon socket head wrench at the lower fore/aft adjustment (9).

**Installation note:**
Replace the micro-encapsulated cap screw (11) by a new one, 25 Nm.

**Note:**
- In case of existing mounting holes (arrows), push the lower fore/aft adjustment (9) forwards until the micro-encapsulated cap screws (11) are accessible through the mounting holes (arrows). Then, unscrew the micro-encapsulated cap screws (11) through the mounting holes (arrows).
3.1 Seat suspension – removal and installation
(replacement of seat suspension)

7 Disconnect the electrical connection between the plug for the cable of the switching control (14) and the socket for the cable harness of the vehicle connection (15).

8 Detach the cable harness for the vehicle connection (16) from the supporting structure (17).

9 Lift off the upper seat part (13) at the seat suspension (1) and put it aside.

Note: When laying it down, make sure that the cable harness of the upper seat part (5) and the cable of the seat occupancy detection system (8) are not overstretched.

Installation note: To prevent the cables from being squeezed and rubbed, the cable harness of the upper seat part (5) and the cable of the seat occupancy detection system (8) should be placed in a slackness loop (round arrow) between the seat suspension (1) and the upper seat part (13).
3.1 Seat suspension – removal and installation
(replacement of seat suspension)

10 Mark the places where the cable of the seat occupancy detection system (8) and the cable harness of the upper seat part (5) are fastened to the upper cover (3) by means of two cable ties (18) and remove the cable ties (18).

11 Disconnect the electrical connection between the left plug of the entire cable harness (19) and the socket of the cable harness for the upper seat part (20).

12 Cable harness without electrical connection (26):
Disconnect the connector (26).
3.1 Seat suspension – removal and installation
(replacement of seat suspension)

REMOVAL / INSTALLATION

13 Cable harness without electrical connection(26):
13.1 Disconnect the electrical connection between the right plug of the entire cable harness (21) and the socket of the cable harness for the height adjustment / seat occupancy detection system (22).

13.2 Knock out the expanding rivet and remove the upper cover of the upper part of suspension (see Chapter 3.3).
3.1 Seat suspension – removal and installation (replacement of seat suspension)

13.3 Disconnect the electrical connection between the plug of the module for height adjustment (23) and the socket for the cable for height adjustment (24).

13.4 Pull out three plastic clips (25) of the upper part of suspension (2).

13.5 Remove the cable for height adjustment (7) from the seat suspension (1) in upward direction.

14 Remove the seat suspension (1).

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

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

1 Remove the upper seat part at the seat suspension, lift it off and put it aside (see Chapter 3.1).
Removal and installation

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

3 Remove the front cover (1) from the upper part of suspension (3).

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

REMOVAL / INSTALLATION

(1) Top cover
(2) Cable ties
(3) Cable harness for upper seat part (additional load)
(4) Cable for seat occupancy detection system
(5) Upper part of suspension
(6) Front cover
(7) Expanding rivet ............... to replace
3.3 Top cover – removal and installation

REMOVAL / INSTALLATION

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

Removal and installation

2. Drive out the expanding rivet (7).
   
   **Note:**
   In order to make the expanding rivet (7) accessible for removal and installation which is partly covered by the front cover (6), carefully bend the front cover (6) upwards in the area of the expanding rivet (7).

   **Installation note:**
   Replace the expanding rivet (7).
3.3 Top cover – removal and installation

3 Mark the places where the cable harness of the upper seta part (3) and the cable of the seat occupancy detection system (4) are fastened to the upper cover (1) by means of two cable ties (2) and remove the cable ties (2).

4 Pull out four lugs (arrows) of the top cover (1) at the upper part of suspension (5).

5 Remove the top cover (1).

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

REMOVAL / INSTALLATION

(1) Bellows
(2) Lower part of suspension
(3) Bellows pin
(4) Upper part of suspension
(5) Wire insert
3.4 Bellows – removal and installation

Removal and installation

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

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

3. Pull the bellows (1) in downward direction over the lower part of suspension (2) and remove it.

4. **If the wire insert (5) is defective:**
   - Remove the wire insert (5) at the bellows (1).

**Installation notes:**

- Place the wire insert (5) in the middle fold of the bellows (1).
- The welding joint (arrow) of the wire insert (5) must be located in the front bellows (1).

5. Re-install the components in the reverse order of their removal.
3.5 Height adjustment module – removal and installation

REMOVAL / INSTALLATION

(1) Module for height adjustment
(2) Upper part of suspension
(3) Rounded head screw .......... 2.5 Nm
(4) Plug of module for height adjustment
(5) Socket for cable of height adjustment
3.5 Height adjustment module – removal and installation

REMOVAL / INSTALLATION

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

2. Remove the front cover (Chapter 3.2).

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

Removal and installation

4. Disconnect the electrical connection between the plug of the module for height adjustment (4) and the socket for the cable for height adjustment (5).

5. Unscrew two rounded head screws (3).

**Installation note:**
Rounded head screw (3), 2.5 Nm.
3.5 Height adjustment module – removal and installation

6 Remove the module for height adjustment (1) at the upper part of suspension (2).

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

REMOVAL / INSTALLATION

(1) Swinging structure
(2) Vertical shock absorber
(3) Circlip
(4) Stud ......................... to grease
(5) Circlip
(6) Stud ......................... to grease
(7) Clearance spacer
3.6 Vertical shock absorber – removal and installation

Removal and installation

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

2 ! WARNING Risk of crushing!

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

3 Loosen the circlip (5) from the stud (4) and then remove it.
4. Pull out the stud (4) from the swinging structure (1) and from the vertical shock absorber (2).

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire external surface (F) of the stud (4).

5. Loosen the circlip (3) from the stud (6) and then remove it.

6. Pull out the stud (6) from the swinging structure (1) and from the vertical shock absorber (2) and remove two clearance spacers (7).

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire external surface (F) of the stud (6).
7 Remove the vertical shock absorber (2) from the seat suspension in backward direction.

**Installation note:**
When installing the vertical shock absorber (2), the marking must point upwards.

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

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Upper part of suspension
(2) Longitudinal horizontal shock absorber........................... to grease
(3) Swinging structure
(4) Clearance spacer
(5) Circlip
3.7 Longitudinal horizontal shock absorber – removal and installation

REMOVAL / INSTALLATION

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

2. Remove the top cover (Chapter 3.3).

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

Removal and installation

4. **WARNING** Risk of crushing!

   Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower part of suspension by means of suitable spacers.
5 Loosen the circlip (5) from the axle of the upper part of suspension (1) and remove the clearance spacer (4).

6 Lift off the longitudinal horizontal shock absorber (2) at the tube of the swinging structure (3).

7 Pull down the longitudinal horizontal shock absorber (2) at the axle of the upper part of suspension (1).

**Installation notes:**
- Press the longitudinal horizontal shock absorber (2) onto the tube of the swinging structure (3) without using driving or hammering tools.
- Apply acid-free multi-purpose lubricant to the mounting surfaces (F) of the longitudinal horizontal shock absorber (2).

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

REMOVAL / INSTALLATION

(1) Upper part of suspension
(2) Swinging structure
(3) Collar screw (inner race)........... to grease, 25 Nm
(4) Bushing
(5) Clamp ......................... to grease
(6) Tension spring
(7) Buffer
(8) Buffer
(9) Blind rivet
3.8 Fore/aft isolator unit – removal and installation

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

2. Remove the top cover (Chapter 3.3).

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

4. Unlock the locking mechanism of the fore/aft isolator (see Chapter 3.10).

**Removal and installation**

5. **WARNING** Risk of crushing!

Move the seat suspension to the highest position and secure it at the rear between the swinging structure and the lower part of suspension by means of suitable spacers.
6. Remove the longitudinal horizontal shock absorber (Chapter 3.7).

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

8. Lift the upper part of suspension (1) at the front off the swinging structure (2) (see Chapter 3.20), push it backwards and lay it down.
9 Press off the clamp (5) at the swinging structure (2).
**Installation note:**
Apply acid-free multi-purpose lubricant to the clamp (5) at the running surface of the swinging structure (F).

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

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

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

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

REMOVAL / INSTALLATION

(1) Handle for fore/aft isolator
(2) Upper part of suspension
(3) Raised countersunk head screw
(4) Clamping sleeve
(5) Linkage rod
(6) Stop lever
(7) Tension spring
3.9 Handle for fore/aft isolator unit – removal and installation

Removal and installation

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

2. Unscrew the raised countersunk head screw (3) at the handle of the fore/aft isolator (1).
   **Installation note:** After having tightened the raised countersunk head screw (3), slightly loosen it in order to ensure the rotary motion of the handle for the fore/aft isolator (1).

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

**Note:**
Make sure that the linkage rod (5) remains hung into the stop lever (6) and that the tension spring (7) remains hung into the linkage rod (5).

5 Remove the handle of the fore/aft isolator (1) at the L-bar of the upper part of suspension (2).

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

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Upper part of suspension  ......................................................... to grease
(2) Handle for fore/aft isolator
(3) Raised countersunk head screw
(4) Clamping sleeve
(5) Linkage rod
(6) Stop lever .............................. to grease
(7) Tension spring
(8) Tension spring
(9) Collar screw
    (inner race)........................ 2.25 Nm
(10) Washer
3.10 Locking mechanism for fore/aft isolator unit – removal and installation

Removal and installation

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

2. **WARNING** Risk of crushing!

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

3. Turn the handle of the fore/aft isolator (2) backwards to unlock the fore/aft isolator.

4. Tilt the seat suspension to the right.
5 Unscrew the raised countersunk head screw (3) at the handle of the fore/aft isolator (2).

**Installation note:**
After having tightened the raised countersunk head screw (3), slightly loosen it in order to ensure the rotary motion of the handle for the fore/aft isolator (2).

6 Pull the handle of the fore/aft isolator (2) down at the L-bar of the upper part of suspension (1).
3.10 Locking mechanism for fore/aft isolator unit – removal and installation

REMOVAL / INSTALLATION

7 Mark the screw positioning diagram (arrows) for hanging in the tension spring (8) and hang out the tension spring (8) at the upper part of suspension (1) and at the linkage rod (5).

**Installation note:**
Hang in the tension spring (8) according to the marking.

8 Hang out the linkage rod (5) at the stop lever (6).

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

**Installation note:**
Install the clamping sleeve (4) according to the marking.
3.10 Locking mechanism for fore/aft isolator unit – removal and installation

10 Mark the screw positioning diagram (arrows) for hanging in the tension spring (7) and hang out the tension spring (7) at the upper part of suspension (1).

11 Unscrew the collar screw (9) and remove it together with the washer (10).
   **Installation note:**
   Collar screw (9), 2.25 Nm.

12 Remove the stop lever (6) and hang out the tension spring (7) at the stop lever (6).
   **Installation note:**
   Apply acid-free multi-purpose lubricant to the side surfaces (F) of the stop lever (6).

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

REMOVAL / INSTALLATION

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Compressor</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Cable tie</td>
<td>190 N</td>
</tr>
<tr>
<td>3</td>
<td>Lower part of suspension</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Compressed-air hose *)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Nozzle</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Pad</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Compressor cable</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Right-angle plug</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Swinging structure</td>
<td></td>
</tr>
</tbody>
</table>

*) Use a sharp knife for cutting into lengths.
3.11 Compressor – removal and installation

**WARNING** Hydrostatic test!

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

1. Remove the bellows from the upper part of suspension (see Chapter 3.4).
3.11 Compressor – removal and installation

Removal and installation

2  WARNING  Risk of crushing!

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

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

The pneumatic system is to be vented before removing the compressor (1).
4 Mark two right-angle plugs (8) and disconnect the electrical connection between the right-angle plug (8) and the compressor (1).

**Installation notes:**

- Reconnect the electrical connection between the right-angle plug (8) and the compressor (1) according to the marking.
- When connecting the electrical connection (1), the cable output of the compressor cable (7) at the right-angle plug (8) must point downwards.

---

**Diagram:**

- **X**
- **Y**
5 Mark the places where the compressor (1) is attached to the lower part of suspension (3) by means of two cable ties (2) and remove the cable ties (2).

Installation note:
Guide the cable tie (2) through the intended cut-outs at the lower part of suspension (3) so that the locking head of the cable tie (2) points forwards.
Loosely close the cable tie (2) so that the compressor (1) and the Pad (6) still can be moved.
Align the compressor (1) so that a collision with the swinging structure (9) is prevented and then tighten the locking head of the cable tie (2) to 190 N by means of pliers in the direction shown (arrow).

6 Pull off the nozzle (5) at the connection of the compressor (1) and push it backwards on the compressed-air hose (4).
7 **WARNING** Damage!
Take care not to damage the connection (mandrel profile) of the compressor (1) and of the compressed-air hose (4). Do not lift off the compressed-air hose (4) at the connection of the compressor (1) by means of a screwdriver.

Cut off the compressed-air hose (4) in a clean and straight way directly behind the connection of the compressor (1) by means of a sharp knife.

**Installation note:**
Slightly heat the compressed-air hose (4) and then completely push it onto the connection of the compressor (1) by exerting pressure.
3.11 Compressor – removal and installation

Notes:
- The compressed-air hose (4) can be cut off only once.
- After cutting off, mark the compressed-air hose (4) in order not to cut it several times.
- Heat the rest of the compressed-air hose (4) at the connection of the compressor (1) by means of a soldering iron and remove it.

8 Pull off the nozzle (5) at the compressed-air hose (4).

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

Installation note:
- Place the pad (6) between the lower part of suspension (3) and the compressor (1) so that the compressor (1) cannot come into contact with the lower part of suspension (3).
- Place the pad (6) around the compressor (1) from back to front so that it lies flat against the compressor (1) after the cable ties (2) have been closed.

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

REMOVAL / INSTALLATION

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(1) Level control
(2) Upper part of suspension
(3) Lower part of suspension
(4) Air hose
(5) Air hose
(6) Micro-encapsulated hexagon nut....................... to replace, 25 Nm
(7) Plate
(8) Webbing
(9) Secondary belt
(10) Socket for entire cable harness
(11) Entire cable harness
(12) Plastic clip
(13) Additional air supply
3.12 Level control – removal and installation

(14) Cable tie
(15) Micro-encapsulated hexagon nut................. to replace, 25 Nm
(16) Plate
(17) Plate
(18) Plug of level control
WARNING Hydrostatic test!

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

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

2. Remove the top cover (Chapter 3.3).

3. Remove the bellows on the rear and right side of the upper part of suspension and on the rear of the lower part of suspension (see Chapter 3.4).
### 3.12 Level control – removal and installation

**Removal and installation**

4 **WARNING** Risk of crushing!

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

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

The pneumatic system is to be vented before removing the level control (1).
6 **WARNING** Damage!

Take care not to damage the connections (mandrel profiles) of the additional air supply (13). Do not lift off the two air hoses (4, 5) at the connections of the additional air supply (13) by means of a screwdriver.

Mark the connections of the air hoses (4, 5), heat the air hoses (4, 5) at the connections of the additional air supply (13) by means of a soldering iron and remove them.

**Installation notes:**
- Install the air hoses (4, 5) according to the marking.
- Slightly heat the air hoses (4, 5) and then push them onto the corresponding connections of the additional air supply (13) by exerting pressure.
3.12 Level control – removal and installation

REMOVAL / INSTALLATION

7 Pull two air hoses (4, 5) inwards to the level control (1).

**Note:**
The cable tie (14) by means of which the two air hoses (4, 5) are attached to the level control (1) does not have to be removed.

**Installation notes:**
- The air hoses (4, 5) have to be guided out (arrow) between the upper part of suspension (2) and the entire cable harness (11) towards the additional air supply (13).
- Do not bend the air hoses (4, 5).

8 Disconnect the electrical connection between the socket of the entire cable harness (10) and the plug of the level control (18).

9 Pull two plastic clips (12) out of the level control (1) on the left and right side.
3.12 Level control – removal and installation

REMOVAL / INSTALLATION

10 Unscrew two micro-encapsulated hexagon nuts (15).

**Installation notes:**
- Replace the micro-encapsulated hexagon nut (15), 25 Nm.
- Make sure not to squeeze the secondary belt (9) when tightening the hexagon nut (15).

11 Pull off the plate (16) at the threaded bolts of the plate (17).

12 Pull out the plate (17) at the lower part of suspension (3) while holding the webbing (8) in position and slowly guiding it upwards.

13 Pull out the plate (17) at the webbing (8).
3.12 Level control – removal and installation

14 Unscrew two micro-encapsulated hexagon nuts (6).

**Installation note:**
- Replace the micro-encapsulated hexagon nut (6), 25 Nm.
- Make sure not to squeeze the secondary belt (9) when tightening the hexagon nut (6).

15 Pull off the plate (7) at the threaded bolts of the level control (1) and lay it down with the secondary belt (9) and the plate (16).

**Installation note:**
The bend of the plates (7, 16) must point backwards.

16 Pull out the level control (1) at the upper part of suspension (2) and remove it from the seat suspension.

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

REMOVAL / INSTALLATION

(1) Secondary belt
(2) Micro-encapsulated hexagon nut....................... to replace, 25 Nm
(3) Level control
(4) Plate
(5) Upper part of suspension
(6) Connecting cable
(7) Webbing (level control)
(8) Plate
(9) Micro-encapsulated hexagon nut....................... to replace, 25 Nm
(10) Plate
(11) Lower part of suspension
3.13 Secondary belt – removal and installation

Removal and installation

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

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

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

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

   **Note:**
   The plate (8) remains attached to the lower part of suspension (11).
3.13 Secondary belt – removal and installation

REMOVAL / INSTALLATION

4 Pull the plate (10) out of the secondary belt (1).
**Installation note:**
The bend of the plate (10) must point to the outside.

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

REMOVAL / INSTALLATION

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

**Notes:**
- The secondary belt (1) must be placed between the upper part of suspension (5) and the connecting cable (6).
- The level control (3) remains attached to the upper part of suspension (5).

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

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

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

REMOVAL / INSTALLATION

- (1) Air intake hose
- (2) Compressed-air hose
- (3) Swinging structure
- (4) Compressor
- (5) Nozzle
- (6) Protective hose
- (7) Catch spring
- (8) Coupling (air intake hose)
- (9) Coupling (compressed-air hose)
- (10) Air spring
- (11) Additional air supply
- (12) Clip
- (13) Hook
- (14) Protective cap
3.14 Air hoses – removal and installation

WARNING Hydrostatic test!

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

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

Removal and installation

2 ⚠️ **WARNING** Risk of crushing!

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

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

The pneumatic system is to be vented before removing the air intake hose (1) and the compressed-air hose (2).
4 If the compressed-air hose (2) is defective:

4.1 Pull off the nozzle (5) at the connection of the compressor (4) and push it backwards at the compressed-air hose (2).

4.2 **WARNING** Damage!

Take care not to damage the connection (mandrel profile) of the compressor (4). Do not lift off the compressed-air hose (2) at the connection of the compressor (4) by means of a screwdriver.

Heat the compressed-air hose (2) at the connection of the compressor (4) by means of a soldering iron and pull it off.

**Installation note:**

Slightly heat the compressed-air hose (2) and then completely push it onto the connection of the compressor (4) by exerting pressure.
3.14 Air hoses – removal and installation

REMOVAL / INSTALLATION

4.3 Pull off the nozzle (5) at the compressed-air hose (2).

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

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

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

4.6 Remove the compressed-air hose (2) and pull off the protective hose (6) at the compressed-air hose (2).
5 If the air intake hose (1) is defective:

5.1 **WARNING** Damage!
Take care not to damage the connection (mandrel profile) of the additional air supply (11). Do not lift off the air intake hose (1) at the connection of the additional air supply (11) by means of a screwdriver. 

Heat the air intake hose (1) at the connection of the additional air supply (11) by means of a soldering iron and pull it off.

**Installation note:**
Slightly heat the air intake hose (1) and then completely push it onto the connection of the additional air supply (11) by exerting pressure.

5.2 Hang out the air intake hose (1) at the hook (13) of the swinging structure (3).
5.3 Pull the clip (12) out of the swinging structure (3) and hang it out at the air intake hose (1).

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

5.5 Pull the coupling (8) of the air intake hose (1) out of the air spring (10). **Installation note:** First, push the catch spring (7) into the air spring (10) and then plug the coupling (8) into the air spring (10) with a click.

5.6 Mark the installation position of the air intake hose (1) and remove the air intake hose (1) from the seat suspension. **Installation note:** Install the air intake hose according to the marking.
6 If the protective cap (14) is defective:
   Unclip the protective cap (14) at the swinging structure (3).

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

REMOVAL / INSTALLATION

(1) Lower part of suspension
(2) Air spring
(3) Swinging structure
(4) Countersunk screw (inner race)............... 6 Nm
1 Remove the bellows from the upper part of suspension (see Chapter 3.4).

Removal and installation

2 **WARNING** Risk of crushing!

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

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

The pneumatic system is to be vented before removing the air spring (2).
4 Remove the compressed-air hose from the air spring (see Chapter 3.14).

5 Remove the air intake hose from the air spring (see Chapter 3.14).

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

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

7 Turn the air spring (2) by 90° until the bayonet catch fits through the longitudinal hole in the swinging structure (3).
8 Press the air spring (2) down and pull it out of the swinging structure (3). **Installation note:** The step at the bottom of the air spring (2) must click into place in the cut-out (arrow) of the lower part of suspension (1).

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

10 Re-install the components in the reverse order of their removal.
3.16 Additional air supply – removal and installation

(1) Additional air supply
(2) Upper part of suspension
(3) Sealing ring
(4) Rounded head screw (inner race) ..................... 2.5 Nm
(5) Blind rivet
(6) Support
(7) Air hose (level control)
(8) Air hose (level control)
(9) Air intake hose
3.16 Additional air supply – removal and installation

**WARNING** Hydrostatic test!

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

1. Remove the bellows from the upper part of suspension (see Chapter 3.4).
3.16 Additional air supply – removal and installation

Removal and installation

2 **WARNING** Risk of crushing!

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

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

The pneumatic system is to be vented before removing the additional air supply (1).
4 **WARNING** Damage!

Take care not to damage the connections (mandrel profiles) of the additional air supply (1) and of the air hoses (7, 8, 9). Do not lift off the air hoses (7, 8, 9) at the connections of the additional air supply (1) by means of a screwdriver.

Mark the air hoses (7, 8, 9) and cut them off in a clean and straight way directly behind the connections of the additional air supply (1).

**Installation notes:**
- Install the air hoses (7, 8, 9) according to the marking.
- Slightly heat the air hoses (7, 8, 9) and then push them onto the corresponding connection of the additional air supply (1) by exerting pressure.
3.16 Additional air supply – removal and installation

Notes:
- The air hoses (7, 8, 9) can be cut off only once.
- After cutting, mark the air hoses (7, 8, 9) in order not to cut it several times.
- Heat the residual pieces of the air hoses (7, 8, 9) at the connection of the additional air supply by means of a soldering iron and remove them.

5 Bore out the rivet head and drive out the blind rivet (5).

6 Hang out the additional air supply (1) at the upper part of suspension (2) and remove it.

Installation note:
The nose (arrow) at the top part of the support (6) must click into place in the longitudinal hole (arrow) of the upper part of suspension (2).
3.16 Additional air supply – removal and installation

REMOVAL / INSTALLATION

7 Pull off the sealing ring (3) at the additional air supply (1).

8 Unscrew the rounded head screw (4) and remove the support (6) at the additional air supply (1).

**Installation note:**
Rounded head screw (4), 2.5 Nm.

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

REMOVAL / INSTALLATION

(1) Upper fore/aft adjustment
(2) Cable harness for vehicle connection
(3) Supporting structure
(4) Plug of cable for switching control
(5) Socket of cable harness for vehicle connection
(6) Clamp
(7) Socket of cable harness for vehicle connection
(8) Plug of entire cable harness
(9) Upper part of suspension
(10) Plastic clip
3.17 Cable harness of vehicle connection – removal and installation

REMOVAL / INSTALLATION

1 Remove the bellows on the rear and left side of the upper part of suspension (see Chapter 3.4). Press the bellows down in the dismantled area.

Removal and installation

2 Push the fore/aft adjustment (1) as far forward as possible.

3 Pull the plastic clip (10) out of the supporting structure (3).

4 Disconnect the electrical connection between the plug for the cable of the switching control (4) and the socket for the cable harness of the vehicle connection (5).

5 Detach the cable harness for the vehicle connection (2) from the supporting structure (3).
6. Hang out the cable harness for vehicle connection (2) from the clamps (6).

7. Disconnect the electrical connection between the plug of the entire cable harness (8) and the socket of the cable harness for vehicle connection (7).

   **Installation note:**
   The cable harness for vehicle connection (2) is guided out on the rear left (arrow) next to the left clamp (6) at the upper part of suspension (9).

8. Remove the cable harness for vehicle connection (2).

9. Re-install the components in the reverse order of their removal.
3.18 Entire cable harness (incl. U-profile) – removal and installation

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Entire cable harness
(2) Compressor
(3) Swinging structure
(4) Upper part of suspension
(5) U-shaped profile
(6) Plastic clip
(7) Socket for entire cable harness
(8) Plug of level control
(9) Level control
(10) Blind rivet
(11) Plastic clip
(12) Clamp
(13) Blind rivet
(14) Plastic clip
(15) Right-angle plug
3.18 Entire cable harness (incl. U-profile) – removal and installation

REMOVAL / INSTALLATION

(16) Socket of cable harness for vehicle connection
(17) Plug of entire cable harness
(18) Socket of fuse
(19) Support angle

1 Remove the upper seat part at the seat suspension (Chapter 3.1).

Note:
The cable for height adjustment does not have to be removed from the upper part of suspension.

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

3 Remove the top cover (Chapter 3.3).
Removal and installation

4 **WARNING** Risk of crushing!

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

5 Pull out two plastic clips (11) of the upper part of suspension (4).

6 Hang out the entire cable harness (1) at the clamp (12).

7 Pull out three plastic clips (14) at the upper part of suspension (4) and at the swinging structure (3).

8 Pull out two plastic clips (6) at the level control (9).
9 Disconnect the electrical connection between the socket of the entire cable harness (7) and the plug of the level control (8).

10 Mark two right-angle plugs (15) and disconnect the electrical connection between the right-angle plug (15) and the compressor (2).

**Installation notes:**
- Reconnect the electrical connection between the right-angle plug (15) and the compressor (2) according to the marking.
- When establishing the electrical connection, the cable output at the right-angle plug (15) must point downwards.
3.18 Entire cable harness (incl. U-profile) – removal and installation

11 Disconnect the electrical connection between the plug of the entire cable harness (17) and the socket of the cable harness for vehicle connection (16).

12 If the U-profile (5) is attached to the upper part of suspension (4) by means of two blind rivets (13):
Remove the plug of the entire cable harness (17) and the socket for the fuse (18) at the U-profile (5).
Note: The U-profile (5) remains attached to the upper part of suspension (4).
Installation note: The U-profile (5) must be removed from the new entire cable harness (1).
13 If the U-profile (5) is attached to the upper part of suspension (4) by means of a blind rivet (13):

13.1 Bore out the rivet head and knock out the blind rivet (13) at the U-profile (5) and the upper part of suspension (4).

13.2 Hang out the U-profile (5) at the upper part of suspension (4) and lay it down.

14 Bore out four rivet heads and knock out the blind rivets (10) at the support angle (19) and the upper part of suspension (4).
15 Mark the installation position for the entire cable harness (1) and carefully pull out and remove the entire cable harness (1) from the seat suspension. 

**Installation note:**
Install the entire cable harness (1) according to the marking.

16 Re-install the components in the reverse order of their removal.
3.19 Cable harness of height adjustment / seat occupancy detection system – removal and installation

(1) Seat suspension
(2) Upper seat part
(3) Cable for height adjustment
(4) Cable for seat occupancy detection system
(5) Cable harness of height adjustment / seat occupancy detection system
   = (3) + (4)
(6) Electrical connection between cable of height adjustment – seat occupancy detection system cable *

* if fitted or delivery option
Removal and installation

1 Cable harness without electrical connection (6):
1.1 Remove the bellows on the front and right of the upper suspension part (see Chapter 3.4).

1.2 Remove the seat suspension (Chap. 3.1).

Note: The electrical connection between the left plug of the entire cable harness and the socket of the cable harness for the upper seat part does not have to be disconnected.

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

1.4 Mark the points where the cable harness is secured with cable ties and remove cable ties.
3.19 Cable harness of height adjustment / seat occupancy detection system – removal and installation

1.5 Remove the cable harness for height adjustment / seat occupancy detection system (5).

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

2 Cable harness with electrical connection (6):
2.1 Remove the seat suspension (Chap. 3.1).

   Note:
The electrical connection between the left plug of the entire cable harness and the socket of the cable harness for the upper seat part does not have to be disconnected.

2.2 Disconnect the connector (6).
2.3 Remove the cable of the seat occupancy detection system at the upper seat part (see repair manual for upper seat part).

**Note:**
Not required if only the cable of the height adjustment (3) is to be removed.

**Remove the cable for height adjustment (3) (steps 2.4 to 2.7):**
Not required if only the cable of the seat occupancy detection system (4) is to be removed.

2.4 Remove the bellows on the front right of the upper suspension part (see Chapter 3.4).

2.5 Mark the points where the cable harness is secured with cable ties and remove cable ties.
3.19 Cable harness of height adjustment / seat occupancy detection system – removal and installation

REMOVAL / INSTALLATION

2.6 Remove the cable for height adjustment (3).

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

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Upper part of suspension
(2) Guiding rail (upper part of suspension) to grease
(3) Roller (rear)
(4) Swinging structure
(5) Roller (front)
3.20 Upper part of suspension – removal and installation

REMOVAL / INSTALLATION

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

2. Remove the seat suspension (Chapter 3.1).

3. Remove the front cover (Chapter 3.2).

4. Remove the top cover (Chapter 3.3).

5. Remove the module for height adjustment (Chapter 3.5).

6. Remove the longitudinal horizontal shock absorber (Chapter 3.7).

7. Remove the fore/aft isolator unit at the upper part of suspension (see Chapter 3.8).
3.20 Upper part of suspension – removal and installation

8 Remove the level control at the upper part of suspension (see Chapter 3.12) and lay it down.

Notes:
- The electrical connection between the entire cable harness and the plug of the level control does not have to be disconnected.
- The entire cable harness does not have to be removed from the level control.

9 Remove the secondary belt from the upper part of suspension (see Chapter 3.13).

10 Remove the additional air supply at the upper part of suspension (see Chapter 3.16) and lay it down.

Note: The air hoses do not have to be removed from the additional air supply.
3.20 Upper part of suspension – removal and installation

REMOVAL / INSTALLATION

11 Remove the cable harness for vehicle connection (Chapter 3.17).

12 Remove the entire cable harness from the upper part of suspension (see Chapter 3.18).

13 Remove the cable harness for height adjustment / seat occupancy detection system from the upper part of suspension (see Chapter 3.19).

Removal and installation

14 **WARNING** Risk of crushing!

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

REMOVAL / INSTALLATION

15 Push the upper part of suspension (1) forwards until the cut-outs (arrow) on the left and right sides at the guiding rails (2) are located at the same height with the front rollers (5).

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

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

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

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

REMOVAL / INSTALLATION

TABLE OF CONTENTS

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

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

2. Remove the compressor (Chapter 3.11).

3. Remove the webbing of the level control at the lower part of suspension (see Chapter 3.12).

4. Remove the secondary belt from the lower part of suspension (see Chapter 3.13).

5. Unscrew the countersunk screw a from the air spring at the lower part of suspension (see Chapter 3.15).
Removal and installation

6 **WARNING** Risk of crushing!

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

7 Unscrew two micro-encapsulated hexagon nuts (10) and pull out the countersunk screws (11) at the lower part of suspension (1).

**Installation notes:**
- Replace the micro-encapsulated hexagon nut (10), 25 Nm.
- The cam (arrow) at the head of the countersunk screw (11) must engage in the groove of the lower part of suspension (1).
3.21 Lower part of suspension – removal and installation

REMOVAL / INSTALLATION

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

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

10 Laterally turn the swinging structure (6) with the attached upper part of suspension (8) by approx. 45° (arrow A) to pull the two rollers (7) out of the guiding rails (2) and then lift it off in upward direction (arrow B).
3.21 Lower part of suspension – removal and installation

REMOVAL / INSTALLATION

Note:
For turning the swinging structure (6) more easily, unscrew the two collar screws (9) and remove the stopper (3) with the buffer (4) from the guiding rails (2).

Installation notes:
• Apply acid-free multi-purpose lubricant to the side surfaces (F) of the two guiding rails (2) where rollers are moved.
• Collar screw (9), 6 Nm.

11 Remove the lower part of suspension (1).

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

DISASSEMBLY / ASSEMBLY

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

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

REMOVAL / INSTALLATION

TABLE OF CONTENTS

(1) Micro-encapsulated hexagon nut....................... to replace, 25 Nm (see Chapters 3.12, 3.13 and 3.21)

(2) Buffer (see Chapter 3.8)

(3) Fixed bearing (see Chapter 3.21)

(4) Roller (see Chapters 3.20 and 3.21)

(5) Clearance spacer (see Chapter 3.7)

(6) Blind rivet (5 x 10) (see Chapters 3.16 and 3.18)

(7) Blind rivet (4.8 x 15.5) (see Chapter 3.8)

(8) Buffer (see Chapter 3.8)
3.23 Worn parts – replacement

REMOVAL / INSTALLATION

(9) Socket (see Chapter 3.8)

(10) Countersunk screw (inner race)................. 6 Nm (see Chapter 3.15)

(11) Buffer (see Chapter 3.22)

(12) Collar screw (inner race) ....... 6 Nm (see Chapter 3.21)

(13) Stopper (see Chapter 3.21)

(14) Buffer (see Chapter 3.21)

(15) Countersunk screw (see Chapter 3.21)

(16) Cable tie (3.6 x 200) (see Chapters 3.1 and 3.3)

(17) Cable tie (7.6 x 387) (see Chapter 3.11)
3.23 Worn parts – replacement

REMOVAL / INSTALLATION

(18) Bellows pin
(see Chapter 3.4)

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

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

(21) Expanding rivet
(see Chapter 3.3)