TABLE OF CONTENTS

Preliminary remarks

1 Description
1.1 Safety instructions
1.2 Rating plate

2 Repair Work
2.1 Adjusting rail set – removal and installation
2.2 Bellows – removal and installation
2.3 Seat height adjuster – removal and installation
2.4 Vertical shock absorber – removal and installation
2.5 Weight indicator – removal and installation
2.6 Weight adjuster – removal and installation
2.7 Lower part of the suspension – removal and installation
2.8 Upper part of the suspension – removal and installation
2.9 Swinging structure – disassembly and assembly
Notes on these instructions

This repair manual includes information and instructions on how to perform repair work on the seat suspension MSG 83 of GRAMMER seats.

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

Example: remove the upper seat part (see repair manual for the upper part of the seat).

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

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

With the help of these overview diagrams an experienced technician will gain a quick overview.

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

The description of the work steps refers to the removed seat suspension and the dismounted upper part of the seat. Depending on the individual installation situation, some work may also be performed on the installed seat suspension. For this reason, check the environment of the installed seat suspension for this possibility before starting work. The safety instructions of the specific vehicle manufacturers and those stated in chapter 1 of this repair manual must be strictly observed.
This repair manual also includes some information on special seat designs, if these require further explanation. Since the scope of delivery depends on the specific customer order, the actual suspension design may deviate from the descriptions and illustrations in this manual.

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

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

**Basic information on the suspension**

The 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.

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

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

Change notification and copyright

The 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.
TABLE OF CONTENTS

1.1 Safety instructions
1.2 Rating plate

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

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

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

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

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

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

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

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

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

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 fixed on the back at the top left corner of the suspension.

The rating plate shows the following information (example):

(A) BENENNUNG (DENOMINATION) = MSG85/520

(B) SACH-NR. (INVENTORY NO.) = 140 868

(C) Year / CW / Assembly
   • Model = 04 (2004)
   • Built in week = 40 (September)
   • Assembly = 092

(D) AUFTAGS NR. (Order number) = DE 46424300012

Note:
The inventory No. is always to be quoted when orders are placed.
TABLE OF CONTENTS

2 Repair Work
2.1 Adjusting rail set – removal and installation
2.2 Bellows – removal and installation
2.3 Seat height adjuster – removal and installation
2.4 Vertical shock absorber – removal and installation
2.5 Weight indicator – removal and installation
2.6 Weight adjuster – removal and installation
2.7 Lower part of the suspension – removal and installation
2.8 Upper part of the suspension – removal and installation
2.9 Swinging structure – disassembly and assembly
2.1 Adjusting rail set – removal and installation

REMOVAL/INSTALLATION

TABLE OF CONTENTS

(1) Micro-encapsulated cap screw,.................................................. replace, 25 Nm

(2) Washer

(3) Adjusting rail (delivery option) grease

(4) L-bar (delivery option)

(5) Upper part of the suspension

Note:
The adjusting rails can be unscrewed in different ways depending on the delivery option chosen. A description of the removal and installation is provided as an example for one of the most commonly used adjusting rail sets.
2.1 Adjusting rail set – removal and installation

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

Removal, installation

2. Prepare a screw positioning diagram for the four micro-encapsulated cap screws (1).

3. Undo the four micro-encapsulated cap screws (1) from the upper suspension part (5) and remove them with washers (2).

Installation notes:
- Replace the micro-encapsulated cap screw (1), 25 Nm.
- Tighten the micro-encapsulated cap screw (1) in acc. with the respective screw positioning diagram.
2.1 Adjusting rail set – removal and installation

4 Adjusting rail set with L-bar (4):
Remove the L-bar (4).

Note:
When screwing the L-bar (4) on, the washer (2) is no longer required.

5 Take off two adjusting rails (3).

Installation note:
Apply acid-free multi-purpose lubricant to the top and side running surface (F) of the adjusting rails (3).

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

REMOVAL/INSTALLATION

(1) Upper part of the suspension
(2) Bellows
(3) Lower part of the suspension
(4) Handle for height adjustment
(5) Wire insert
(6) Hooks (lower suspension part)

1 Remove the upper part of the seat
(see repair manual for the upper seat part).
2.2 Bellows – removal and installation

Removal, installation

2 Pull off the bellows (2) from the upper part of the suspension (1) and lay it down.

3 Take off the bellows (2) from the eight hooks (6) on the lower part of the suspension (3).

4 Pull the bellows (2) on the front side over the handle for height adjustment (4).

5 Pull the bellows (2) at the back over the upper part of the suspension (1) in upward direction and remove it from the suspension in forward direction.
6 Remove wire insert (5) from the bellows (2).

**Installation notes:**
- The welding joint of the wire insert (5) must be located in the front part of the bellows (2).
- Install wire insert (5) into the middle fold of the bellows (2).

7 Re-install the components in the reverse order of their removal.
2.3 Seat height adjuster – removal and installation

REMOVAL/INSTALLATION

TABLE OF CONTENTS

(1) Upper part of the suspension
(2) Circlip
(3) Spring steel plate .................grease
(4) Slide washer
(5) Height adjuster ....................grease
(6) Lower part of the suspension
(7) Handle for weight adjustment
(8) Shock absorber holder

Note:
It is not necessary to dismantle the upper seat part in order to remove the seat height adjuster (see repair manual for the upper seat part).
2.3 Seat height adjuster – removal and installation

REMOVAL/INSTALLATION

Removal, installation

1. Take off the bellows from the lower part of the suspension (6) (see chapter 2.2) and fasten it to the upper part of the suspension (1).

2. Turn the height adjuster (5) upwards to position "I".

3. Loosen up the circlip (2) from the height adjuster (5) and then remove it.

4. Set the minimum weight adjustment. For this purpose, turn the handle for weight adjustment (7) anti-clockwise until the end stop is reached.

Material-No. 138 065-a
5 Press down the upper suspension part (1) and pull out the height adjuster (5) with slide washer (4) from the shock absorber holder (8) in forward direction until the groove (see arrow) of the height adjuster (5) lies flat against the lower suspension part (6).

6 Remove the height adjuster (5) from the lower suspension part (6) in upward direction. **Installation note:** Apply acid-free multi-purpose lubricant to the entire surface of the axle (F) of the height adjuster (5).

7 Pull off the slide washer (4) from the axle of the height adjuster (5).
8 If the spring steel plate (3) is defective:
Take off the spring steel plate (3) from the lower suspension part (6) and then remove it.

**Installation note:**
Apply acid-free multi-purpose lubricant to the running surface (F) of the spring steel plate (3) for the height adjuster (5) and the contact surfaces (F) of the spring steel plate (3) on the lower suspension part (6).

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

REMOVAL/INSTALLATION

(1) Lower part of the suspension
(2) Circlip
(3) Stud .................................. grease
(4) Vertical shock absorber
(5) Hexagon nut
(6) Shock absorber holder ........ grease
(7) Micro-encapsulated hexagon bolt .................................. replace, 8 Nm
(8) Upper part of the suspension
(9) Spring support
2.4 Vertical shock absorber – removal and installation

REMOVAL/INSTALLATION

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

2. Remove the bellows (chapter 2.2).

3. Remove the height adjuster (chapter 2.3).

Removal, installation

4. Undo three micro-encapsulated hexagon bolts (7) at the bottom of the lower suspension part (1).

   **Installation note:**
   Replace the micro-encapsulated hexagon bolt (7), 8 Nm.
2.4 Vertical shock absorber – removal and installation

5 Press down the upper suspension part (8) and pull out the shock absorber holder (6) from the vertical shock absorber (4) and lower suspension part (1).

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire surface of the axle (F) of the shock absorber holder (6).

6 Remove three hexagon nuts (5) from the shock absorber holder (6).

7 Loosen up the circlip (2) from the stud (3) and then remove it.

8 Knock out the stud (3) from the spring support (9) and the vertical shock absorber (4).

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire surface of the stud (3).
2.4 Vertical shock absorber – removal and installation

REMOVAL/INSTALLATION

9 Remove the vertical shock absorber (4).

10 Re-install the components in the reverse order of their removal.
2.5 Weight indicator – removal and installation

REMOVAL/INSTALLATION

(1) Lower part of the suspension ............................................. grease
(2) Swinging structure
(3) Guide (display window)
(4) Weight indicator ribbon
(5) Roller
(6) Tension spring
(7) Upper part of the suspension

Note:
It is not necessary to dismantle the upper seat part in order to remove the weight indicator (see repair manual for the upper seat part).
1. Take off the bellows from the lower part of the suspension (1) (see chapter 2.2) and fasten it to the upper part of the suspension (7).

Removal, installation

2. Unhook the tension spring (6) from the weight indicator ribbon (4).

3. Unhook the tension spring (6) from the hole of the lower suspension part (1).

Installation notes:
- Fit the hook (facing outwards) of the tension spring (6) into the hole of the lower suspension part (1).
- Fit the hook of the tension spring (6) between the first and third spiral.
4 Remove the guide (3) from the lower suspension part (1).

**Installation note:**
Apply acid-free multi-purpose lubricant to the opening (F) for the guide (3) in the lower suspension part (1).

5 Remove the roller (5) from the weight indicator ribbon (4).

6 Open staples on the indicator ribbon (4) and remove the indicator ribbon (4) from the tube of the swinging structure (2).

**Installation note:**
Put narrow imprinted bars (see arrows) on the ribbon end of the indicator ribbon (4) on top of each other and attach two stables.

7 Re-install the components in the reverse order of their removal.
# 2.6 Weight adjuster – removal and installation

## REMOVAL/INSTALLATION

<table>
<thead>
<tr>
<th>(1)</th>
<th>Spring support .......... grease</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2)</td>
<td>Swinging structure</td>
</tr>
<tr>
<td>(3)</td>
<td>Tension spring</td>
</tr>
<tr>
<td>(4)</td>
<td>Spring bracket</td>
</tr>
<tr>
<td>(5)</td>
<td>Upper part of the suspension</td>
</tr>
<tr>
<td>(6)</td>
<td>Axial washer</td>
</tr>
<tr>
<td>(7)</td>
<td>Axial ball bearing</td>
</tr>
<tr>
<td>(8)</td>
<td>Dowel pin</td>
</tr>
<tr>
<td>(9)</td>
<td>Adjusting spindle ............. grease</td>
</tr>
<tr>
<td>(10)</td>
<td>Grooved pin</td>
</tr>
<tr>
<td>(11)</td>
<td>Toggle</td>
</tr>
<tr>
<td>(12)</td>
<td>Adjusting spindle with crank</td>
</tr>
</tbody>
</table>

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**Diagram and Table of Contents:**

| Material-No. 138 065-a |
1 Remove the upper part of the seat (see repair manual for the upper seat part).

2 Remove the bellows (chapter 2.2).

3 Dismount the vertical shock absorber from the spring support (1) (see chapter 2.4).

Removal, installation

4 Set the minimum weight adjustment. For this purpose, turn the toggle (11) anti-clockwise until the end stop is reached.
5 Move the suspension to the highest position and secure it there.

### WARNING
Risk of crushing!
Secure the suspension between the roller of the swinging structure and the roller guide of the lower suspension part with a suitable spacer.

6 Turn the suspension by 180 degrees and lay it down onto the upper suspension part (5).

7 Knock out the dowel pin (8) from the adjusting spindle (9) and then remove it.

**Installation note:**
Drive the dowel pin (8) in dead center of the adjusting spindle (9).
8 Screw out the adjusting spindle (9) with the toggle (11) from the spring bracket and remove it.

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire thread surface (F) of the adjusting spindle (9).

9 **If the toggle (11) is defective:**
Knock out the grooved pin (10) from the toggle (11) and remove the toggle (11) from the adjusting spindle (9).

**Installation note:**
Drive in the grooved pin (10) until the front surface is flush with the outer surface of the toggle (11).

**Delivery option:**
Adjusting spindle with crank (12) can only be replaced in total (not dismountable).
10 Pull out two axial washers (6) and axial ball bearing (7) from the adjusting spindle (9).

11 Take off four tension springs (3) from the spring bracket (4) and remove the spring bracket (4). **Installation note:** When fitting tension springs, the legs of tension springs (3) must show downwards.

12 Take off four tension springs (3) from the spring support (1) and then remove them.
13. Remove the spring support (1) from the U-profile of the swinging structure (2).

**Installation notes:**
- After the four tension springs (3) have been fitted into the hooks of the spring support (1), the outer front surface (see arrow) of the spring support (1) must lie completely flat against the inner side of the U-profile (see arrow) of the swinging structure (2).
- Apply acid-free multi-purpose lubricant to the four hooks of the spring support (1) at the fitting surface (F) of tension springs (3).

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

(1) Upper part of the suspension
(2) Swinging structure
(3) Rubber buffer
(4) Lower part of the suspension
(5) Stud ......................grease
(6) Roller guide ......................grease

**Note:**
It is not necessary to dismantle the upper seat part in order to remove the lower suspension part (see repair manual for the upper seat part).
2.7 Lower part of the suspension – removal and installation

REMOVAL/INSTALLATION

1. Take off the bellows from the lower part of the suspension (4) (see chapter 2.2) and fasten it to the upper part of the suspension (1).

2. Remove the height adjuster (chapter 2.3).

3. Remove vertical shock absorber from the lower suspension part (4) (see chapter 2.4).
   **Note:**
   The vertical shock absorber can remain fixed to the upper suspension part.

4. Take off the tension spring from the hole of the lower suspension part (4) (see chapter 2.5).

5. Dismantle the guide from the lower suspension part (4) and remove the roller from the weight indicator ribbon (see chapter 2.5).
2.7 Lower part of the suspension – removal and installation

Removal, installation

6 Unlock the stud (5) and position the locking hook of the stud (5) vertically until the stud (5) can be removed through the cut-out (see arrow) in the lower suspension part (4).

7 Pull out the stud (5) from the tube of the swinging structure (2) to the left and from the lower suspension part (1).

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire front surface (F) of the stud (5) in the width of a brush.
8 Turn the upper suspension part (1) with the swinging structure (2) sideways and remove it from the roller guides (6) of the lower suspension part (1).

**Note:**
The upper seat part can remain fixed to the upper suspension part (1).

9 Remove the lower suspension part (4).

**Installation note:**
Apply acid-free multi-purpose lubricant to the front surface (roller starting point) (F) of two roller guides (6).

10 Remove two rubber buffers (3) from the lower suspension part (4).

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

REMOVAL/INSTALLATION

(1) Stud ........................................... grease
(2) Upper part of the suspension
(3) Hexagon nut ........................................... replace, 25 Nm
(4) Swinging structure
(5) Roller
(6) Roller guide ........................................... grease
1. Remove the upper part of the seat (see repair manual for the upper seat part).

2. Remove the adjusting rail set (chapter 2.1).

3. Remove the bellows (chapter 2.2).

4. Dismount the vertical shock absorber from the spring support in the upper suspension part (2) (see chapter 2.4).  
   **Note:**  
   The vertical shock absorber can remain fixed to upper part of the suspension.

5. Remove the indicator ribbon from the tube of the swinging structure (see chapter 2.5).

6. Remove the weight adjuster (chapter 2.6).
Removal, installation

7 Move the suspension to the highest position and secure it there.

⚠️ **WARNING** Risk of crushing!
Secure the suspension between the roller of the swinging structure and the roller guide of the lower suspension part with a suitable spacer.

8 Unscrew two hexagon nuts (3).
**Installation note:** Replace the hexagon nut (3) by a new one, 25 Nm.

9 Knock out two studs (1) and then remove them.
**Installation note:** Apply acid-free multi-purpose lubricant to the entire surface of the stud (1) shoulder (F) and collar (F).
10 Slightly lift the upper suspension part (2) at the back and lift the roller guides (6) out of the front rollers (5) of the swinging structure (6) by turning sideways. Then, remove the upper suspension part (2).

**Installation note:**
Apply acid-free multi-purpose lubricant to the front surface (roller starting point) (F) of two roller guides (6).

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

DISASSEMBLY/ASSEMBLY

TABLE OF CONTENTS

(1) Swinging structure ................. grease
(2) Bushing ............................ grease
(3) Plastic roller ......................... grease

Installation note:
For the installation of a new swinging structure: convert assemblies that do not belong to the scope of delivery of the new swinging structure.
2.9 Swinging structure – disassembly and assembly

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

2. Remove the bellows (chapter 2.2).

3. Remove the height adjuster (chapter 2.3).

4. Dismount the vertical shock absorber from the spring support in the upper suspension part (chapter 2.4). **Note:** The vertical shock absorber can remain fixed to the lower part of the suspension.

5. Remove the indicator ribbon from the tube of the swinging structure (chapter 2.5).

6. Remove the weight adjuster (chapter 2.6).
2.9 Swinging structure – disassembly and assembly

7 Remove the lower suspension part (chapter 2.7).

8 Remove the upper suspension part (chapter 2.8).

Disassembly, assembly

9 Remove four plastic rollers (3) from the front, bottom and top roller axle of the swinging structure (1).

Installation notes:
• Apply acid-free multi-purpose lubricant to the front surface (F) of the plastic rollers (3).
• Apply acid-free multi-purpose lubricant to the entire surface (F) of the front, bottom and top roller axle of the swinging structure (1) (running surface of rollers).
10 Pull out four bushings (2) on the top and bottom back from the lug of the swinging structure (1).

**Installation note:**
Apply acid-free multi-purpose lubricant to the entire outer surface of the bushings (2).

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