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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 MSG87 of GRAMMER seats.

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

Example:
Remove the seat heater cable of the upper seat part (see repair manual for upper seat part).

The seat suspension MSG87 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 the repair. These preparations are described in separate chapters and shall be carried out without the preparatory steps described there.

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 the 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.

Basic information on the seat suspension

For the removal and installation of the seat suspension, the removal and installation of the upper seat part is described in the repair manual of the upper seat part.

Note:
For the removal and installation of the seat suspension at the vehicle, ask the vehicle manufacturer for the necessary assembly work to be carried out.

The seat suspension is provided with a long-lasting lubrication (approx. 10 years). The lubricating points must only be re-lubricated with lubricant KFHC2N-50 DIN 51825 at the points marked with (F) indicated in the repair manual following repair work.

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.
Foreword

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

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

Qualified personnel

These instructions offer basic information on proper technical seat repair. The contents of the work procedures described are intended for professionally educated technicians with profound product knowledge. This level of knowledge is an imperative requirement when performing the work and procedures described in this document.

In order to avoid bodily injury, reduced operational safety of the seat suspension or damage to it resulting from improperly performed work, all information and instructions, in particular the safety instructions stated in Chapter 1, must be read carefully and strictly observed.

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

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

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

Change notification and copyright

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

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

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1.1 Safety instructions
1.2 Rating plate

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

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

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

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

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

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

**Note: ...**
introduces an additional explanation for better understanding 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 beginning any repair work, move the seat suspension to the highest position and secure it between the swinging structure and the lower suspension part by means of suitable spacers.

5 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 upper suspension part at the rear.

The rating plate shows the following information (example):

(A) **Manufacturer** = MADE BY GRAMMER

(B) **DESIGNATION** = MSG87

(C) **SERIES ART.CODE. =**
   012578351412

(D) **SERIAL NO. =** 002

(E) **ORDER =** 0320

Note:
When orders are placed, the correct SERIES ART.CODE (C) on the rating plate is always to be quoted.
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* Delivery option
2.1 Bellows – removal and installation

Removal and installation

1. Remove the seat.

2. Remove the indicator ribbon of the level indicator from the lower suspension part (5) (see Chapter 2.11).

**WARNING** Damage!
Take care not to tear off the mushroom-shaped nub (2) when pulling it out. Stretch the mushroom-shaped nub a little and lever it out at the thicker end with two screwdrivers (arrow).

**Installation notes:**
Insert mandrel (Ø approx. 3 mm) into the mushroom-shaped nub (2) through the corresponding opening at the outside of the bellows (1) and slightly pull the bellows (1) against the mandrel. Push the stretched mushroom-shaped nub (2) into the according drill hole.

3. Remove the bellows (1) from the upper suspension part (6):
   - Lever out 7 mushroom-shaped nubs (2)
   - Detach 6 keyhole nubs (3)

4. Remove the bellows (1) from the lower suspension part (5):
   - Lever out 5 mushroom-shaped nubs (2)
   - **Note:**
     The 6th mushroom-shaped nub was removed with the indicator ribbon.
   - Detach 4 keyhole nubs (3)
   - Push 2 locks (4) inwards

5. Pull the bellows (1) in downward direction over the lower suspension part (5) and remove it.

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

Removal and installation

⚠️ WARNING Risk of injury!

Always install the cover (1) as it provides protection against crushing at the seat fore/aft adjustment.

1. Remove the upper seat part at the seat suspension.

2. Bend the cover (1) upwards in the middle and remove from the upper suspension part (2).

   **Installation note:**
   Bend the four cover lugs along the arrow and push the cover (1) into the bracket of the upper suspension part (2).

3. Re-install the components in the reverse order of their removal.
2.3 Tension spring – removal and installation

Removal and installation

1 Remove the upper seat part at the seat suspension.

2 Remove the cover (Chapter 2.2).

3 **WARNING** Risk of crushing!

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

4 Unscrew the weight and height adjustment from the spring bracket (1) (see Chapter 2.10).

   **Note:**
   The weight and height adjustment does not have to be disassembled any further.

5 Detach the tension spring (2) at the spring bracket (1).

6 Turn tension spring (2) by approx. 90° and lift the tension spring eyelet over the tension spring suspension (3).

   **Installation notes:**
   • Push the tension spring eyelet into the circular nut (arrow) at the tension spring suspension (3).
   • Lubricate the spring bracket (1) at the marked points (F).

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

Removal and installation

1. Remove the upper seat part at the seat suspension.

2. Remove the cover (Chapter 2.2).

3. **WARNING** Risk of crushing!
   Move the seat suspension to the highest position and secure it between the swinging structure and the upper suspension part by means of suitable spacers.

4. Remove the bellows from the upper suspension part (see Chapter 2.1).

5. Push off the buffer (1) from the support (2) in downward direction.

6. Re-install the components in the reverse order of their removal.
2.5 End stop – removal and installation

Removal and installation

1. Remove the upper seat part at the seat suspension.

2. Remove the cover (Chapter 2.2).

3. Set seat suspension to lowest driver weight.

4. Remove the bellows from the upper suspension part (see Chapter 2.1).

5. Unscrew the collar screws (1) and remove the end stops (4) with the buffer (3) from the guiding rail (2).
   **Installation note:**
   Collar screw (1), 6 Nm.

6. **If buffer (3) is defective:**
   Push off the buffer (3) laterally from the end stop (4).

7. Re-install the components in the reverse order of their removal.
## 2.6 Top swinging structure bolt – removal and installation

### Removal and installation

1. Remove the upper seat part at the seat suspension.
2. Remove the cover (Chapter 2.2).
3. **WARNING** Risk of crushing!
   - Move the seat suspension to the highest position and secure it between the swinging structure and the upper suspension part by means of suitable spacers.
4. Remove the bellows from the upper suspension part (see Chapter 2.1).
5. Unscrew the weight and height adjustment from the spring bracket (see Chapter 2.10).
   - **Note:** The weight and height adjustment does not have to be disassembled any further.
6. Remove the tension springs (Chapter 2.3).
7. Remove the springs of the lock washer (5).
8. Remove the springs of the anti-rotation device (2) and push bolt (1) out of the upper suspension part (6) and the swinging structure (4).
9. Lift off the upper suspension part (6) and check sockets (3) for wear.
10. **If the sockets (3) are defective:** Push the sockets (3) from the swinging structure (4).
   - **Installation note:** Install sockets (3) with the slot aligned with the bottom of the swinging structure (A).
11. Re-install the components in the reverse order of their removal.
2.7 Tension spring suspension – removal and installation

Removal and installation

1. Remove the upper seat part at the seat suspension.

2. Remove the cover (Chapter 2.2).

3. **WARNING** Risk of crushing!
   Move the seat suspension to the highest position and secure it between the swinging structure and the upper suspension part by means of suitable spacers.

4. Remove the bellows from the upper suspension part (see Chapter 2.1).

5. Unscrew the weight and height adjustment from the spring bracket (see Chapter 2.10).
   **Note:** The weight and height adjustment does not have to be disassembled any further.

6. Remove the tension springs (Chapter 2.3).

7. Remove the top swinging structure bolt (Chapter 2.6).

8. Remove the shock absorber (Chapter 2.8).

9. Push the spacer sleeve (6) and socket (8) off the bolt (1).

10. Push the bolt (1) from the swinging structure (2) making sure to catch the tension spring suspensions (4) and two sockets (5).
    **Installation note:** Lubricate the bolt (1) at the marked point (F).

11. Re-install the components in the reverse order of their removal.
2.8 Shock absorber – removal and installation

Removal and installation

1. Remove the upper seat part at the seat suspension.
2. Remove the cover (Chapter 2.2).

3. **WARNING** Risk of crushing!

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

4. Remove the bellows from the upper suspension part (see Chapter 2.1).

5. Unscrew the weight and height adjustment from the spring bracket (see Chapter 2.10).

   **Note:**
   The weight and height adjustment does not have to be disassembled any further.

6. Remove the tension springs (Chapter 2.3).

7. Remove the top swinging structure bolt (Chapter 2.6).

8. Remove the axial locking ring (4) and push the bolt (3) out of the support at the swinging structure (2).

   **Installation note:**
   Lubricate the bolt (3) at the marked points (F).

9. Remove the springs of the lock washer (5).

10. Lift shock absorber (1) off the support and push it off the bolt (6) of the tension spring suspension.

    **Installation notes:**
    • Insert the shock absorber (1) with the round end down into the support of the swinging structure (2).
    • Lubricate the bolt (6) at the marked points (F).

11. Re-install the components in the reverse order of their removal.
2.9 Bottom swinging structure bolt – removal and installation

Removal and installation

1. Remove the upper seat part at the seat suspension.
2. Remove the cover (Chapter 2.2).
3. **WARNING** Risk of crushing!
   Move the seat suspension to the highest position and secure it between the swinging structure and the lower suspension part by means of suitable spacers.
4. Remove the bellows (Chapter 2.1).
5. Unscrew the weight and height adjustment from the spring bracket (see Chapter 2.10).
   **Note:**
   The weight and height adjustment does not have to be disassembled any further.
6. Remove the tension springs (Chapter 2.3).
7. Remove the springs of the lock washer (5).
8. Remove the springs of the anti-rotation device (7) and push the bolt (1) out of the lower suspension part (2) until the anti-rotation device (7) is loose.
9. Bring seat suspension into lowest position and push bolt (1) out of the swinging structure (3) and lower suspension part (2).
   **Installation note:**
   Lubricate the bolt (1) at the marked points (F).
10. Lift off the upper suspension part (4) and check two plastic bearings (6) for wear.
11. **If the plastic bearing (6) is defective:**
    Remove the plastic bearing (6) (see Chapter 2.12).
12. Re-install the components in the reverse order of their removal.
2.10 Weight and height adjustment – removal and installation

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2.10.1 Weight and height adjustment – removal and installation with ratchet *
2.10.2 Weight and height adjustment – removal and installation with toggle *

* Delivery option
2.10.1 Weight and height adjustment – removal and installation with ratchet (Delivery option)

Removal and installation

1. Remove the upper seat part at the seat suspension.

2. Remove the cover (Chapter 2.2).

3. **WARNING** Risk of crushing!

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

4. Unscrew the pan-head screw (4) and remove it from the adjusting spindle (7) together with the washer (7).
   **Installation note:**
   Pan-head screw (4), 25 Nm.

5. Unscrew the adjusting spindle (7) from the spring bracket (2) and completely pull out the weight and height adjustment (1) from the upper suspension part.
   **Installation note:**
   Lubricate the adjusting spindle (7) at the marked point (F).

6. Remove cover (11).

7. Unscrew the pan-head screw (10) and remove it from the adjusting spindle (7) together with the washer (9).
   **Installation note:**
   Pan-head screw (10), 25 Nm.

8. Pull ratchet (8) off the square of the adjusting spindle (7).

9. Push housing (5) and needle bearing (6) off the adjusting spindle (7).
   **Installation note:**
   Lubricate the needle bearing (6) at the marked points (F).

10. Re-install the components in the reverse order of their removal.
2.10.2 Weight and height adjustment – removal and installation with toggle (Delivery option)

Removal and installation

1. Remove the upper seat part at the seat suspension.
2. Remove the cover (Chapter 2.2).
3. **WARNING** Risk of crushing!
   
   Move the seat suspension to the highest position and secure it between the swinging structure and the upper suspension part by means of suitable spacers.
4. Unscrew the pan-head screw (4) and remove it from the adjusting spindle (7) together with the washer (7).
   **Installation note:**
   Pan-head screw (4), 25 Nm.
5. Unscrew the adjusting spindle (7) from the spring bracket (2) and completely pull out the weight and height adjustment (1) from the upper suspension part.
   **Installation note:**
   Lubricate the adjusting spindle (7) at the marked point (F).
6. Push grooved pin out of the toggle (8) and adjusting spindle (7) and remove toggle (8).
7. Push housing (5) and needle bearing (6) off the adjusting spindle (7).
   **Installation note:**
   Lubricate the needle bearing (6) at the marked points (F).
8. Re-install the components in the reverse order of their removal.
Removal and installation

1. Remove the upper seat part at the seat suspension.

2. Remove the cover (Chapter 2.2).

3. **WARNING** Risk of crushing!

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

4. Remove the bellows (1) from the upper suspension part (6) (see Chapter 2.1).

5. Unscrew the cap screw (5), remove the level control from the upper suspension part (6) and put it aside.
   
   **Note:** Indicator ribbon (3) is pulled inwards into the casing of the level indicator (5) by spring tension.

6. Lever out the mushroom-shaped nub (2) at the lower suspension part (7) (see Chapter 2.1) and pull the indicator ribbon (3) off the mushroom-shaped nub (2).
   
   **Installation note:**
   Turn back (arrow) the indicator ribbon (3) and push the mushroom-shaped nub (2) through drill hole (A) and (B).

7. Re-install the components in the reverse order of their removal.
2.12 Rollers and plastic bearings – removal and installation

Removal and installation

1. Remove the upper seat part at the seat suspension.

2. Remove the cover (Chapter 2.2).

3. **WARNING** Risk of crushing!

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

4. Remove the bellows from the upper suspension part (see Chapter 2.1).

5. Remove the end stops (Chapter 2.5).

6. Unscrew the weight and height adjustment from the spring bracket (see Chapter 2.10).

   **Note:**
   The weight and height adjustment does not have to be disassembled any further.

7. Remove the tension springs (Chapter 2.3).

8. Remove the top swinging structure bolt (Chapter 2.6).

9. Remove the shock absorber (Chapter 2.8).

10. Remove the bottom swinging structure bolt (Chapter 2.9).

11. Push the upper suspension part to the front and lift it off the front rollers (1).

12. Push the swinging structure (4) together (arrow B) and turn by approx. 45° (arrow A) until the guiding rails (5) release the bottom rollers (2) and plastic bearings (3).

13. Lift the swinging structure (4) off the lower suspension part (6).

   **Installation note:**
   Lubricate the guiding rails (5) at the side surfaces (F) in the area where rollers are moved.

14. Remove rollers (1, 2) and plastic bearings (3) from the axles of the swinging structure (4).

   **Installation note:**
   Lubricate the swinging structure axles (4) at the marked points (F).

15. Re-install the components in the reverse order of their removal.
2.13 Worn parts – replacement

Removal and installation

1. Perform preparatory work for the respective components (see Chapter for components).

2. Remove the buffer (1) (see Chapter 2.5).

3. Remove the end stop (2) (see Chapter 2.5).

4. Remove the collar screw (3) (see Chapter 2.5).

5. Remove the buffer (4) (see Chapter 2.4).

6. Remove the pan-head screw (5) (see Chapter 2.10).

7. Remove the lock washer (6) (see Chapters 2.8 and 2.9).

8. Remove the lock washer (7) (see Chapter 2.6).

9. Remove the washers (8) (see Chapter 2.10).

10. Remove the bolt (9) from the top swinging structure bearing (see Chapter 2.6).

11. Remove socket (10) (see Chapter 2.6).

12. Remove the bolt (11) from the bottom swinging structure bearing (see Chapter 2.9).

13. Remove the plastic bearing (12) (see Chapter 2.12).

14. Remove socket (13) (see Chapter 2.7).

15. Remove the tension spring suspension (14) (see Chapter 2.7).

16. Remove the roller (15) (see Chapter 2.12).

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

Note:
If the swinging structure, the upper or lower seat suspension is defective, the complete seat suspension has to be replaced.