TABLE OF CONTENTS

Foreword

1 Description
  1.1 Safety information
  1.2 Nameplate

2 Repair work
  2.1 Removing/installing the bellows
  2.2 Removing/installing the cover
  2.3 Removing/installing the tension spring
  2.4 Removing/installing the buffer
  2.5 Removing/installing the stop
  2.6 Removing/fitting the upper bolts of the swing-arm bearing
  2.7 Removing/installing the tension spring suspension
  2.8 Removing/installing the shock absorber
  2.9 Removing/fitting the lower bolts of the swing-arm bearing *
  2.10 Removing/installing the weight and height adjustment
      2.10.1 Using a ratchet to remove/install the weight and height adjustment *
      2.10.2 Using a toggle to remove/install the weight and height adjustment *
  2.11 Removing/installing the spring unit of the fore/aft isolator *
  2.12 Removing/installing the locking mechanism for the fore/aft isolator *
  2.13 Removing/installing the handle for the fore/aft isolator *
  2.14 Removing/installing the buffer in the lower part of the suspension *
  2.15 Removing/installing the level indicator *
  2.16 Removing/installing the rollers and plastic bearing
  2.17 Repairing the wear parts

* Delivery options
Foreword

About this manual

This repair manual contains information and instructions on performing repair work on the GRAMMER MSG285 seat suspension.

The repair of the seat top is described in the corresponding seat-top repair manual, which is referred to as needed (see Seat Top repair manual).

Example:
Remove the seat heating cable from the seat top (see seat top repair manual).

Seat suspension MSG285 forms the basis of representation in the repair manual. Any differences resulting from technical deviations in the work steps (due to any seat-suspension design variations) are described in the text or in separate chapters.

All preparations to be made before starting work are listed at the beginning of each chapter. These tasks are described in their own chapters and are carried out without any of the preparations which may be listed there.

Solely the item numbers in the valid spare parts catalogues must be used for spare parts orders.

The work is described on the dismantled seat suspension with the seat top removed.

If the installed position allows, however, certain tasks can also be performed when the seat suspension is installed and/or with the seat top intact. For this reason, the surroundings of the installed seat suspension must first be investigated for this option before work is started. The safety specifications of the vehicle manufacturer and those in Chapter 1 of this repair manual must always be complied with.

Any delivery options requiring an explanation are also described in this repair manual. Since the scope of delivery is based on the customer order, the seat suspension equipment can differ in certain descriptions and illustrations.

The repair work on the seat suspension for left-hand drive is presented. The different tasks must be carried out in a mirror image for repairs on vehicle designs with right-hand drive.

If not otherwise indicated in the text, the directional information "front, back" and "right, left" refer to the installed seat suspension and the vehicle's direction of travel.

The layout was developed in a way that makes it suitable for later provision of the repair manual via CD-ROM / INTERNET / INTRANET.

General information on the seat suspension

For the removal and installation of the seat suspension, the removal and installation of the seat top is described in the seat-top repair manual.

Note:
Please contact the manufacturer about any assembly work required for the removal and installation of the seat suspension on the vehicle.

The seat suspension has long-term lubrication (around 10 years). The lubrication points may only be regreased with lubrication grease KFHC2N-50 DIN 51825 following repair work on the points marked by (F) in the repair manual.

It is possible that not all fasteners are mentioned in this repair manual. It may be necessary upon completion of the repair work that fasteners be inspected with regard to their factory installation and their hold and tightness, and corrected accordingly if needed.
Foreword

All removed used parts must be replaced by the enclosed new parts. If no corresponding new part is included in the spare parts scope of delivery for existing old parts, then they must be cleaned and inspected for further use. The defective parts and wear parts must be replaced.

GRAMMER AG will reject any warranty claims if damaged or worn parts and assemblies are not replaced by spare parts approved by GRAMMER.

Qualified personnel

The instructions represent the basis for proper and professional repair. The content of the described work steps builds on the training status of a technician with a completed vocational education and good knowledge of the product. This level of knowledge is essential for performing the work described.

All information and instructions, especially the safety information in Chapter 1, must be carefully read and followed completely to rule out bodily injuries and the impairment of the operational safety of the seat suspension or damage to the seat suspension as a result of improper work.

It is not possible for GRAMMER AG to ultimately evaluate all situations which could pose a risk of injury to the person involved. It is therefore urgently necessary that everyone performing repair work on the seat suspension apply their expert knowledge to ensure that their own safety is not jeopardised and that the seat suspension is not subjected to any negative impacts due to the type of repair work selected, especially those affecting safety. For these reasons, no liability can be assumed for such damages.

We also point out explicitly that all of the work steps described must only be carried out in compliance with all directives and requirements of the responsible authorities and of the health, accident and environmental protection regulations.

Right of modification and copyright

The seat suspension is under continuous development. Please understand that we must reserve the right to make changes to its form, equipment and technology. For these reasons, no claims can be derived from the content of this repair manual. Reprinting, translation and reproduction, even as excerpts without our written consent are prohibited.

GRAMMER AG - Postal box 14 54
D-92204 Amberg
Telephone +49 (0) 96 21 / 66-6822
www.grammer.com

Supplier and factory address:
GRAMMER AG
Köferring Str. 9-13
D-92245 Kümmerbruck
# TABLE OF CONTENTS

1.1 Safety Instructions
1.2 Nameplate

**Note:**
Please refer to the currently valid seat operating manual for additional descriptions.
1.1 Safety information

1 Inspection and repair work may only be performed by specially trained personnel.

2 All of the described work steps must only be carried out in compliance with all directives and requirements of the responsible authorities and of the health, accident and environmental protection regulations.

3 Special instructions in the repair manual are highlighted as follows:

⚠️ CAUTION ...
indicates a possible danger to persons and how to avoid it.

⚠️ ATTENTION ...
indicates possible material damage or destruction and how to avoid it.

Note: ...
indicates an additional explanation for understanding the work to be performed.

Installation note: ...
indicates an additional explanation for understanding the installation work to be performed.

4 Move the seat suspension to its highest position before starting any repair work and secure it with suitable spacers in the front between the swing arm and the lower suspension component.

5 Comply with the product safety requirements when handling oils, greases and other chemical substances.
1.2 Nameplate

The nameplate is mounted on the back of the upper suspension component.

The nameplate includes the following data:

(A) Manufacturer = MADE BY GRAMMER
(B) DESIGNATION = MSG285
(C) Part number - series = X XXX XXX
(D) CONSEC: NO. = 001
(E) ORDER = 1204

Note:
The correct part number series (C) on the nameplate must always be specified when placing orders.
# Repair work

## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Removing/installing the bellows</td>
</tr>
<tr>
<td>2.2</td>
<td>Removing/installing the cover</td>
</tr>
<tr>
<td>2.3</td>
<td>Removing/installing the tension spring</td>
</tr>
<tr>
<td>2.4</td>
<td>Removing/installing the buffer</td>
</tr>
<tr>
<td>2.5</td>
<td>Removing/installing the stop</td>
</tr>
<tr>
<td>2.6</td>
<td>Removing/fitting the upper bolts of the swing-arm bearing</td>
</tr>
<tr>
<td>2.7</td>
<td>Removing/installing the tension spring suspension</td>
</tr>
<tr>
<td>2.8</td>
<td>Removing/installing the shock absorber</td>
</tr>
<tr>
<td>2.9</td>
<td>Removing/fitting the lower bolts of the swing-arm bearing *</td>
</tr>
<tr>
<td>2.10</td>
<td>Removing/installing the weight and height adjustment *</td>
</tr>
<tr>
<td>2.10.1</td>
<td>Using a ratchet to remove/install the weight and height adjustment *</td>
</tr>
<tr>
<td>2.10.2</td>
<td>Using a toggle to remove/install the weight and height adjustment *</td>
</tr>
<tr>
<td>2.11</td>
<td>Removing/installing the spring unit of the fore/aft isolator *</td>
</tr>
<tr>
<td>2.12</td>
<td>Removing/installing the locking mechanism for the fore/aft isolator *</td>
</tr>
<tr>
<td>2.13</td>
<td>Removing/installing the handle for the fore/aft isolator *</td>
</tr>
<tr>
<td>2.14</td>
<td>Removing/installing the buffer in the lower part of the suspension *</td>
</tr>
<tr>
<td>2.15</td>
<td>Removing/installing the level indicator *</td>
</tr>
<tr>
<td>2.16</td>
<td>Removing/installing the rollers and plastic bearing</td>
</tr>
<tr>
<td>2.17</td>
<td>Repairing the wear parts</td>
</tr>
</tbody>
</table>

* Delivery options
2.1 Removing/installing the bellows

Removal, installation

1 Remove the seat top from the seat suspension.

2 Remove the display strip of the level indicator on the lower suspension part (5) (refer to Chapter 2.11).

**CAUTION** Damage!
Do not tear off the mushroom knobs (2) during removal.
Stretch the mushroom knobs somewhat lengthwise and use two screwdrivers to lift them out on the thicker end (arrow).

**Installation instructions:**
Insert the mandrel (Ø approx. 3 mm) into the mushroom knob (2) through the outside opening provided for this purpose (1) and carefully draw the bellows (1) against the mandrel.
Press the mushroom knob (2) stretched in this way into the corresponding hole.

3 Removing the bellows (1) from the upper suspension component (6):
   - Lever out 7 mushroom knobs (2)
   - Unhinge 4 keyhole knobs (3)

4 Removing the bellows (1) from the lower suspension component (5):
   - Lever out 7 mushroom knobs (2)
   - Unhinge 4 keyhole knobs (3)
   - Push 2 bars (4) toward the inside

5 Pull the bellows (1) down over the lower suspension component (5) and remove it.

6 The installation is carried out in reverse order.
2.2 Removing/installing the cover

Removal, installation

⚠️ CAUTION Risk of injury!

Always attach the cover (1) since it provides protection against crushing on the seat-length adjustment.

1. Remove the seat top from the seat suspension.

2. Bend the cover (1) up in the centre and remove it from the upper suspension component (2).
   **Installation note:**
   Bend the four tabs in the direction of the arrow and slide the cover (1) into the bracket of the upper suspension component (2).

3. The installation is carried out in reverse order.
2.3 Removing/installing the tension spring

Removal, installation

1. Remove the seat top from the seat suspension.

2. Remove the cover (Sec. 2.2).

3. **CAUTION** Risk of crushing!
   
   Move the seat suspension to its highest position and use suitable spacers to secure it between the swing arm and the upper suspension component.

4. Unscrew and remove the weight and height adjustment from the spring support (1) (refer to Section 2.10).
   
   **Note:**
   The weight and height adjustment must not be dismantled further.

5. Detach the tension spring (2) from the spring support (1).

6. Rotate the tension spring (2) approx. 90° and lift the tension spring lugs over the tension spring suspension (3).

   **Installation instructions:**
   - Slide the tension spring lug into the ring slot (arrow) on the tension spring suspension (3).
   - Grease the spring support (1) at the marked points (F).

7. The installation is carried out in reverse order.
2.4 Removing/installing the buffer

Removal, installation

1. Remove the seat top from the seat suspension.

2. Remove the cover (Sec. 2.2).

3. **CAUTION** Risk of crushing!
   
   Move the seat suspension to its highest position and use suitable spacers to secure it between the swing arm and the upper suspension component.

4. Remove the bellows from the upper suspension component (refer to Section 2.1).

5. Press the buffer (1) down and out of the bracket (2).

6. The installation is carried out in reverse order.
2.5 Removing/installing the stop

Removal, installation

1. Remove the seat top from the seat suspension.

2. Remove the cover (Sec. 2.2).

3. Set the seat suspension to the lowest driver weight.

4. Remove the bellows from the upper suspension component (refer to Section 2.1).

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

6. If buffer (3) is defective:
   Push the buffer (3) to the side away from the stop (4).

7. The installation is carried out in reverse order.
2.6 Removing/fitting the upper bolts of the swing-arm bearing

Removal, installation

1 Remove the seat top from the seat suspension.

2 Remove the cover (Sec. 2.2).

3 **CAUTION** Risk of crushing!

   Move the seat suspension to its highest position and use suitable spacers to secure it between the swing arm and the upper suspension component.

4 Remove the bellows from the upper suspension component (refer to Section 2.1).

5 Unscrew and remove the weight and height adjustment from the spring support (refer to Section 2.10).

   **Note:**
   The weight and height adjustment must not be dismantled further.

6 Remove the tension springs (Sec. 2.3).

7 Let the lock washer snap back (2).

8 Let the anti-rotation device (6) snap back and drive the bolt (5) out of the upper suspension component (1) and the swing arm (4).

9 Lift the upper suspension component (1) and check the bushings (3) for wear.

10 **If bushings (3) are defective:**

   Press the bushings (3) out of the swing arm (4).

   **Installation note:**
   Install the bushing (3) so that its slot aligns with the bottom of the swing arm (A)

11 The installation is carried out in reverse order.
2.7 Removing/installing the tension spring suspension

Removal, installation

1. Remove the seat top from the seat suspension.

2. Remove the cover (Sec. 2.2).

3. **CAUTION** Risk of crushing!
   Move the seat suspension to its highest position and use suitable spacers to secure it between the swing arm and the upper suspension component.

4. Remove the bellows from the upper suspension component (refer to Section 2.1).

5. Unscrew and remove the weight and height adjustment from the spring support (refer to Section 2.10).
   **Note:** The weight and height adjustment must not be dismantled further.

6. Remove the tension springs (Sec. 2.3).

7. Remove the upper bolt of the swing-arm bearing (Sec. 2.6).

8. Remove the shock absorber (Sec. 2.8).

9. Slide the bushing (3) off of the bolt (1).

10. Let the anti-rotation device (6) spring back and press the bolt (1) out of the swing arm (2), catching the two tension-spring suspensions (4) and two bushings (5) in the process.

   **Installation note:** Grease the bolt (1) at the marked point (F).

11. The installation is carried out in reverse order.
2.8 Removing/installing the shock absorber

Removal, installation

1 Remove the seat top from the seat suspension.

2 Remove the cover (Sec. 2.2).

3 **CAUTION** Risk of crushing!
   Move the seat suspension to its highest position and use suitable spacers to secure it between the swing arm and the upper suspension component.

4 Remove the bellows from the upper suspension component (refer to Section 2.1).

5 Unscrew and remove the weight and height adjustment from the spring support (refer to Section 2.10).
   **Note:**
   The weight and height adjustment must not be dismantled further.

6 Remove the tension springs (Sec. 2.3).

7 Remove the upper bolt of the swing-arm bearing (Sec. 2.6).

8 Remove the axial clamping ring (4) and press the bolt (3) out of the bracket on the swing arm (2).
   **Installation note:**
   Grease the bolt (3) at the marked points (F).

9 Let the lock washer snap back (5).

10 Lift the shock absorber (1) out of the bracket and slide it off of the bolt (6) of the tension-spring suspension.

   **Installation instructions:**
   - Insert the shock absorber (1) with its rounded end facing downwards into the bracket of the swing-arm (2).
   - Grease the bolt (6) at the marked points (F).

11 The installation is carried out in reverse order.
2.9 Removing/fitting the lower bolts of the swing-arm bearing (delivered version)

Removal, installation

1. Remove the seat top from the seat suspension.

2. Remove the cover (Sec. 2.2).

3. **CAUTION** Risk of crushing!

   Move the seat suspension to its highest position and use suitable spacers to secure it between the swing arm and the lower suspension component.

4. Remove the bellows (Sec. 2.1).

5. Let the lock washer snap back (5).

6. Let the anti-rotation device (7) snap back and press the bolt (1) out of the lower suspension component (2) until the anti-rotation device (7) is released.

7. Move the seat suspension to the lowermost position and push the bolt (1) out of the swing-arm (3) and the lower suspension component (2).

   **Installation note:**
   Grease the bolt (1) at the marked points (F).

8. Move the upper suspension component (4) up and down and check the two plastic bearings (6) for wear.

9. **If plastic bearings (6) are defective:**

   Remove the plastic bearings (6) (refer to Section 2.16).

10. The installation is carried out in reverse order.
2.10 Removing/installing the weight and height adjustment

TABLE OF CONTENTS

2.10.1 Using a ratchet to remove/install the weight and height adjustment *
2.10.2 Using a toggle to remove/install the weight and height adjustment *

* Delivery options
2.10.1 Using a ratchet to remove/install the weight and height adjustment (delivered version)

Removal, installation

1 Remove the seat top from the seat suspension.

2 Remove the cover (Sec. 2.2).

3 ☒ CAUTION Risk of crushing!
   Move the seat suspension to its highest position and use suitable spacers to secure it between the swing arm and the upper suspension component.

4 Unscrew the flat-head screw (4) and remove it together with the washer (3) from the adjusting spindle (7).
   Installation note:
   Flat-head screw (4), 25 Nm.

5 Unscrew and remove the adjusting spindle (7) from the spring support (2) and pull the complete weight and height adjustment (1) out of the upper suspension component.
   Installation note:
   Grease the adjusting spindle (7) at the marked point (F).

6 Remove the cover cap (11).

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

8 Remove the ratchet (8) from the square end of the adjusting spindle (7).

9 Slide the housing (5) and needle bearing (6) off of the adjusting spindle (7).
   Installation note:
   Grease the needle bearing (6) at the marked points (F).

10 The installation is carried out in reverse order.
2.10.2 Using a toggle to remove/install the weight and height adjustment (delivered version)

**Removal, installation**

1. Remove the seat top from the seat suspension.
2. Remove the cover (Sec. 2.2).
3. **CAUTION** Risk of crushing!
   
   Move the seat suspension to its highest position and use suitable spacers to secure it between the swing arm and the upper suspension component.
4. Unscrew the flat-head screw (4) and remove it together with the washer (3) from the adjusting spindle (7).
   **Installation note:**
   Flat-head screw (4), 25 Nm.
5. Unscrew and remove the adjusting spindle (7) from the spring support (2) and pull the complete weight and height adjustment (1) out of the upper suspension component.
   **Installation note:**
   Grease the adjusting spindle (7) at the marked point (F).
6. Press the grooved pin (9) out of the toggle (8) and the adjusting spindle (7) and remove the toggle (8).
7. Slide the housing (5) and needle bearing (6) off of the adjusting spindle (7).
   **Installation note:**
   Grease the needle bearing (6) at the marked points (F).
8. The installation is carried out in reverse order.
2.11 Removing/installing the spring unit of the fore/aft isolator (delivered version)

Removal, installation

1. Remove the seat top from the seat suspension.

2. Remove the cover (Sec. 2.2).

3. **CAUTION** Risk of crushing!

   Move the seat suspension to its highest position, slide the outer swing arm forwards against the buffer (11) and use suitable spacers to secure its front and back between the swing arm and the lower suspension component.

4. Remove the bellows (Sec. 2.1).

5. Let the lock washer (10) snap back and press the bolt (9) out of the bracket on the spring support (8).

   **Installation note:**
   Grease the bolt (9) at the marked point (F).

6. Unscrew and remove three oval head screws (5).

   **Installation note:**
   Oval head screw (5), 2.5 ± 0.5 Nm.

7. Rotate the spring unit (4) with the locking latch (6) and fork head (3) 90° around the swing arm axle (2) in the direction of the arrow.

8. Press the locking latch (6) and fork head (3) apart and remove them from the swing arm axle (2) together with the spring unit (4).

   **Installation note:**
   Grease the fork head (3) at the marked point (F).

9. Slide the spring unit (4) off of the bolt (7).

   **Installation note:**
   Grease the bolt (7) at the marked point (F).

10. The installation is carried out in reverse order.
2.12 Removing/installing the locking mechanism for the fore/aft isolator (delivered version)

Removal, installation

1. Remove the seat top from the seat suspension.

2. Remove the cover (Sec. 2.2).

3. **CAUTION** Risk of crushing!
   Move the seat suspension to its highest position and use suitable spacers to secure it between the swing arm and the lower suspension component.

4. Remove the bellows (Sec. 2.1).

5. Remove the spring unit of the fore/aft isolator (Sec. 2.11).

6. Remove the handle of the fore/aft isolator (Sec. 2.13).

7. Remove the axial clamping ring (3).

8. Let the rotary spring (6) spring back on the locking plate (5) and remove it from the bearing block (2).
   **Installation instructions:**
   - Grease the rotary spring (6) at the marked point (F).
   - Attach the rotary spring (6) in the upper slot of the locking plate (5).

9. Unhook the rod (4) from the locking plate (5) and pull it out of the recess (B) in the lower suspension component (1).
   **Installation instructions:**
   - Grease the rod (4) at the marked point (F).
   - Slide the rod (4) with the side (A) into the recess (B) before attaching it.
   - Attach the rod (4) in the lower slot of the locking plate (5).

10. Unscrew four countersunk screws (8) and remove the bearing block (2) from the locking plate (5) and lower suspension component (1).
    **Installation note:**
    Countersunk screw (8), 3 ± 0.25 Nm.

11. Remove the locking plate (5) from the lower suspension component (1) and inspect the bushing (7) for wear.

12. **If the bushing (7) is defective:**
    Press the bushing (7) out of the locking plate (5).

13. The installation is carried out in reverse order.
2.13 Removing/installing the handle for the fore/aft isolator (delivered version)

Removal, installation

1. Turn the handle (2) forward and lock the rod in place.

2. Remove the oval head screw (5) and slide the handle (2) off of the bracket (3).
   **Installation instructions:**
   - Align the handle (2) and the bracket (3) with line "B".
   - Oval head screw (5), 2.25 Nm.

3. Drive out the clamping sleeve (4) and detach the rod (6).
   **Installation note:**
   Align the handle (2) and eyelet on the rod (6) with line "A".

4. The installation is carried out in reverse order.
2.14 Removing/installing the buffer in the lower part of the suspension (delivered version)

Removal, installation

1 Remove the seat.

2 **CAUTION** Risk of crushing!

Move the seat suspension to its highest position and use suitable spacers to secure it between the swing arm and the upper suspension component.

3 Remove the bellows from the lower suspension component (refer to Section 2.1).

4 Unscrew the flange nut (2) and remove the threaded bolt (6) from below.

5 Slide the buffer and tube section (5) out of the guide rail (1) from the side and remove them from the lower suspension component (7).

6 Press the tube section (3) out of the buffer (4).

7 The installation is carried out in reverse order.
2.15 Removing/installing the level indicator (delivery variant)

Removal, installation

1. Remove the seat top from the seat suspension.

2. Remove the cover (Sec. 2.2).

3. **CAUTION** Risk of crushing!

   Move the seat suspension to its highest position and use suitable spacers to secure it between the swing arm and the upper suspension component.

4. Remove the bellows (1) from the upper suspension component (6) (refer to Section 2.1).

5. Unscrew and remove the cylinder screw (4), remove the level indicator (5) from the upper suspension component (6) and set it down on its side.

   **Note:** The spring force pulls the display strip (3) inwards into the level-indicator housing (5).

6. Lever out the mushroom knobs (2) on the lower suspension component (7) (refer to Section 2.1) and remove the display strip (3) from the mushroom knobs (2).

   **Installation note:**

   Turn over the display strip (3) (arrow) and slide the mushroom knobs (2) through holes (A) and (B).

7. The installation is carried out in reverse order.
2.16 Removing/installing the rollers and plastic bearing

Removal, installation

1 Remove the seat top from the seat suspension.

2 Remove the cover (Sec. 2.2).

3 **CAUTION** Risk of crushing!

   Move the seat suspension to its highest position and use suitable spacers to secure it between the swing arm and the upper suspension component.

4 Remove the bellows (Sec. 2.1).

5 Remove the stops (Sec. 2.5).

6 Unscrew and remove the weight and height adjustment from the spring support (refer to Section 2.10).

   **Note:**

   The weight and height adjustment must not be dismantled further.

7 Remove the tension springs (Sec. 2.3).

8 Remove the upper bolt of the swing-arm bearing (Sec. 2.6).

9 Remove the shock absorber (Sec. 2.8).

10 **Seat without fore/aft isolator:**

   Remove the swing-arm bearing bolts from below (Sec. 2.9).

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

   11.1 Remove the spring unit of the fore/aft isolator (Sec. 2.11).

   11.2 Remove the locking mechanism for the fore/aft isolator (refer to Section 2.12).

   **Note:**

   Do not remove the handle for the fore/aft isolator.

   11.3 Remove the buffer from the lower suspension component (Sec. 2.14).

12 Push the upper suspension component forward and lift it out of the front rollers (1).

   **Installation note:**

   Grease the guide rails in the upper suspension component in the area of the rollers (1).

13 Slide the swing arm (4) forwards and lift it out through the openings in the front of the guide rails (5).

   **Note:**

   Lift out the swing arm (4) first in the area of the inner swing arm with the rollers (2) and then in the area of the outer swing arm with the plastic bearings (3).

   **Installation note:**

   Grease the guide rails (5) on the lateral contact surfaces (F) in the area of roller motion.
2.16 Removing/installing the rollers and plastic bearing

14 Remove the rollers (1, 2) and plastic bearing (3) from the swing-arm axles (4).

**Installation note:**
Grease the swing-arm axles (4) at the marked points (F).

15 The installation is carried out in reverse order.
2.17 Repairing the wear parts

Removal, installation

1. Perform the preliminary work for the assemblies involved (refer to the sections for the assemblies).

2. Remove the buffer (1) (refer to Section 2.5).

3. Remove the stop (2) (refer to Section 2.5).

4. Remove the collar screw (3) (refer to Section 2.5).

5. Remove the buffer (4) (refer to Section 2.5).

6. Remove the flat-head screw (5) (refer to Section 2.10).

7. Remove the buffer (6) (refer to Sections 2.8 and 2.9).

8. Remove the lock washer (7) (refer to Section 2.6).

9. Remove the washer (8) (refer to Section 2.10).

10. Remove the bolt (9) from the top of the swing arm (refer to Section 2.6).

11. Remove the bushing (10) (refer to Section 2.6).

12. Remove the bolt (11) from the bottom of the swing arm (refer to Section 2.9).

13. Remove the plastic bearing (12) (refer to Section 2.16).

14. Remove the bushing (13) (refer to Section 2.7).

15. Remove the tension spring suspension (14) (refer to Section 2.7).

16. Remove the roller (15) (refer to Section 2.16).
2.17 Repairing the wear parts

17 Remove the rotary spring (16) (refer to Section 2.12).
18 Remove the rod (17) (refer to Section 2.12).
19 Remove the bearing block (18) (refer to Section 2.12).
20 Remove the locking plate (19) (refer to Section 2.12).
21 Remove the bushing (20) (refer to Section 2.12).
22 Remove the axial clamping ring (21) (refer to Section 2.8).
23 Remove the axial clamping ring (22) (refer to Section 2.12).
24 Remove the lock washer (23) (refer to Sections 2.7, 2.9 and 2.11).
25 Remove the bolt (24) (refer to Section 2.11).
26 Remove the oval flange-head screw (25) (refer to Section 2.11).
27 Remove the countersunk screw (26) (refer to Section 2.12).
28 Remove the clamping sleeve (27) (refer to Section 2.13).
29 Remove the oval head screw (28) (refer to Section 2.13).
30 Remove the bolt (29) (refer to Section 2.7).
31 Remove the buffer (30) (refer to Section 2.14).
32 Remove the threaded bolt (31) (refer to Section 2.14).
33 Remove the tube section (32) (refer to Section 2.14).
34 Remove the flange nut (33) (refer to Section 2.14).
35 The installation is carried out in reverse order.

**Note:**
The complete seat suspension must be replaced if the swing arm, upper suspension component or lower suspension component is defective.