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**Preliminary remarks**

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This repair manual includes information and instructions on how to perform repair work on the GRAMMER Seat MSG 65 of the following seat models:

- Driver's seat MSG 65/511 (slender seat cushion and short back),
- Driver's seat MSG 65/521 (wide seat cushion and short back),
- Driver's seat MSG 65/522 (wide seat cushion and long back).
- Boat seat AVENTO-Evolution
- Boat seat AVENTO-Premium

The driver's seat of the MSG 65/521 type forms the basis for illustration. In the case of technical deviations in the work steps, (due to different seat models) refer to the current text or separate chapters of the manual.

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

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

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

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

**Preliminary remarks**

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

This repair manual also includes some information on optional extras, in case further explanation is required. Since the scope of delivery depends on the specific customer order, the actual seat equipment may deviate from the descriptions and illustrations in this manual. These deviations may be described in separate assembly instructions included in the scope of delivery of the respective spare parts.

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

The document layout is suitable for later use of this repair manual via CD-ROM / INTERNET / INTRANET. For this reason a navigation line has been added beneath the title. This navigation line includes some chapter titles and it allows the user to jump directly to these chapters after the corresponding hyperlinks have been set.

**Basic information about the seat**

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

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

**Preliminary remarks**

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**GRAMMER****Qualified personnel**

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

In order to avoid bodily injury, reduced operational safety or damage to the seat resulting from improperly performed work, all information and instructions, in particular the safety notes stated in Chapter 1.1, must be read carefully and strictly observed.

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

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

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

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

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

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**1 Description**



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- 1.1 Safety notes
- 1.2 Rating plate

**Note:**

Please refer to the applicable seat operation manual for further details.

## 1.1 Safety notes

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- 1 All inspection, test and repair work must be performed exclusively by adequately trained personnel.
- 2 All work steps and procedures described are to be performed with consideration to the applicable directives and regulations stipulated by the relevant local authorities and in compliance with the provisions on health protection, prevention of accidents and environmental protection.
- 3 Special notes in this repair manual are highlighted as follows:



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



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

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

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

- 4 Before starting repair work
  - disconnect the battery from power supply,
  - disconnect the seat switch from the vehicle supply network
  - for seats with integrated seat heating, disconnect the heater switch from the vehicle supply network.
- 5 When using oil, grease and other chemical substances, the relevant safety regulations for the handling and use of these materials must be observed.

## 1.2 Rating plate

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The rating plate is located at the front middle or left of the lower part of the suspension system (delivery option: MSG65/511-522 or boat seats AVENTO).

The rating plate shows the following information (example):

(A) **BENENNUNG**  
(**DENOMINATION**) = MSG 65/521

(B) **SACHNUMMER**  
(**INVENTORY No.**) = 141 206

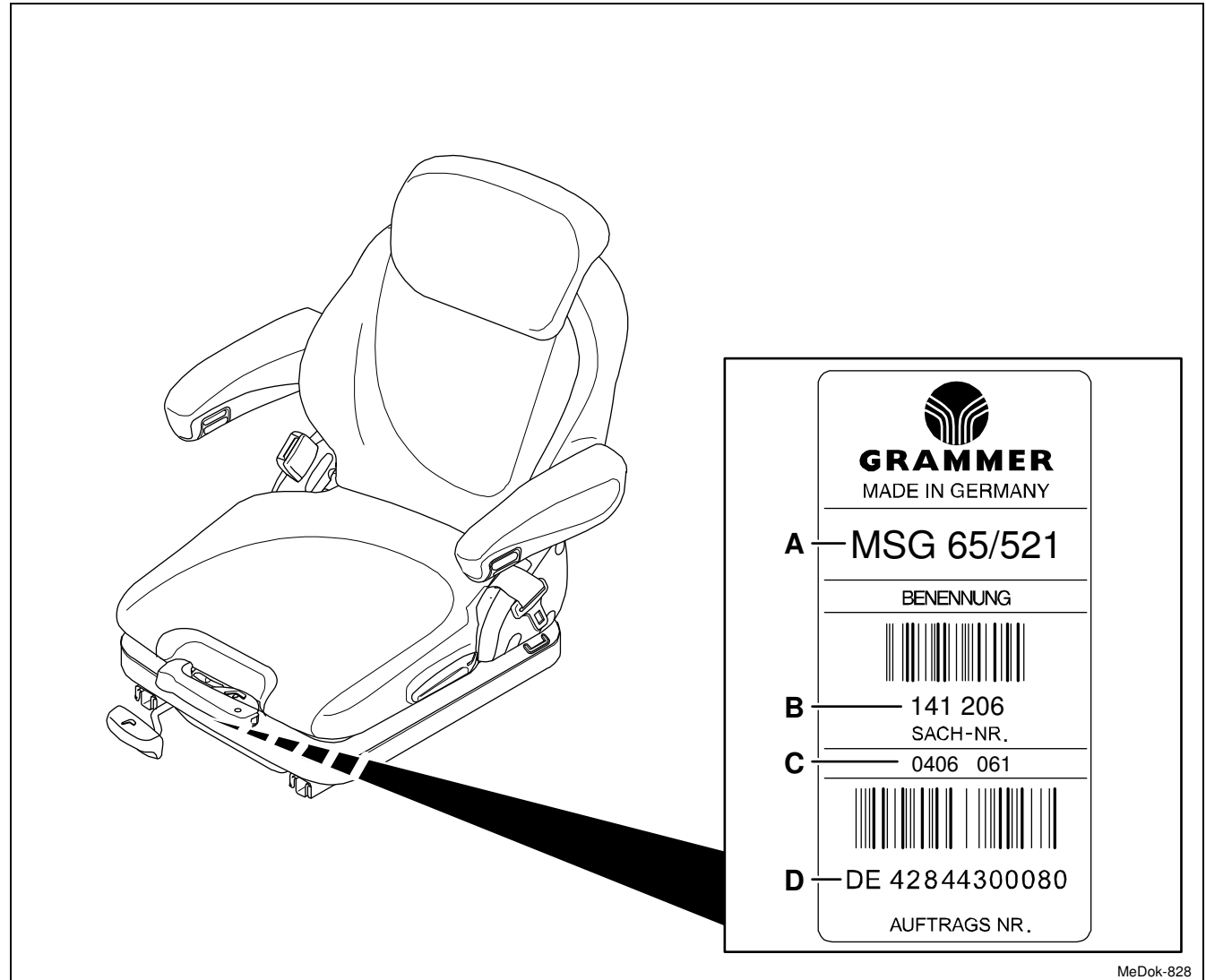
(C) **Year / KW / Assembly**  
= 0406 061

- Year of manufacture = 04 (2004)
- built in week = 06 (February)
- Assembly = 061

(D) **AUFTRAGS NR.**  
(**Order number**) = DE 42844300080

**Note:**

The inventory No. is always to be quoted when orders are placed.



MeDok-828

**2 Diagnosis**

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- 2.1 Overview of components
  - Controls and indicators
  - Installation overview of the seat switch
  - Seat switch and connector assignment with circuit diagram
- 2.2 Functional test
- 2.3 Overview of faults
- 2.4 Fault diagnosis
  - 1 Inspection of the seat switch

\* if fitted

## 2.1 Overview of components

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### Controls and indicators

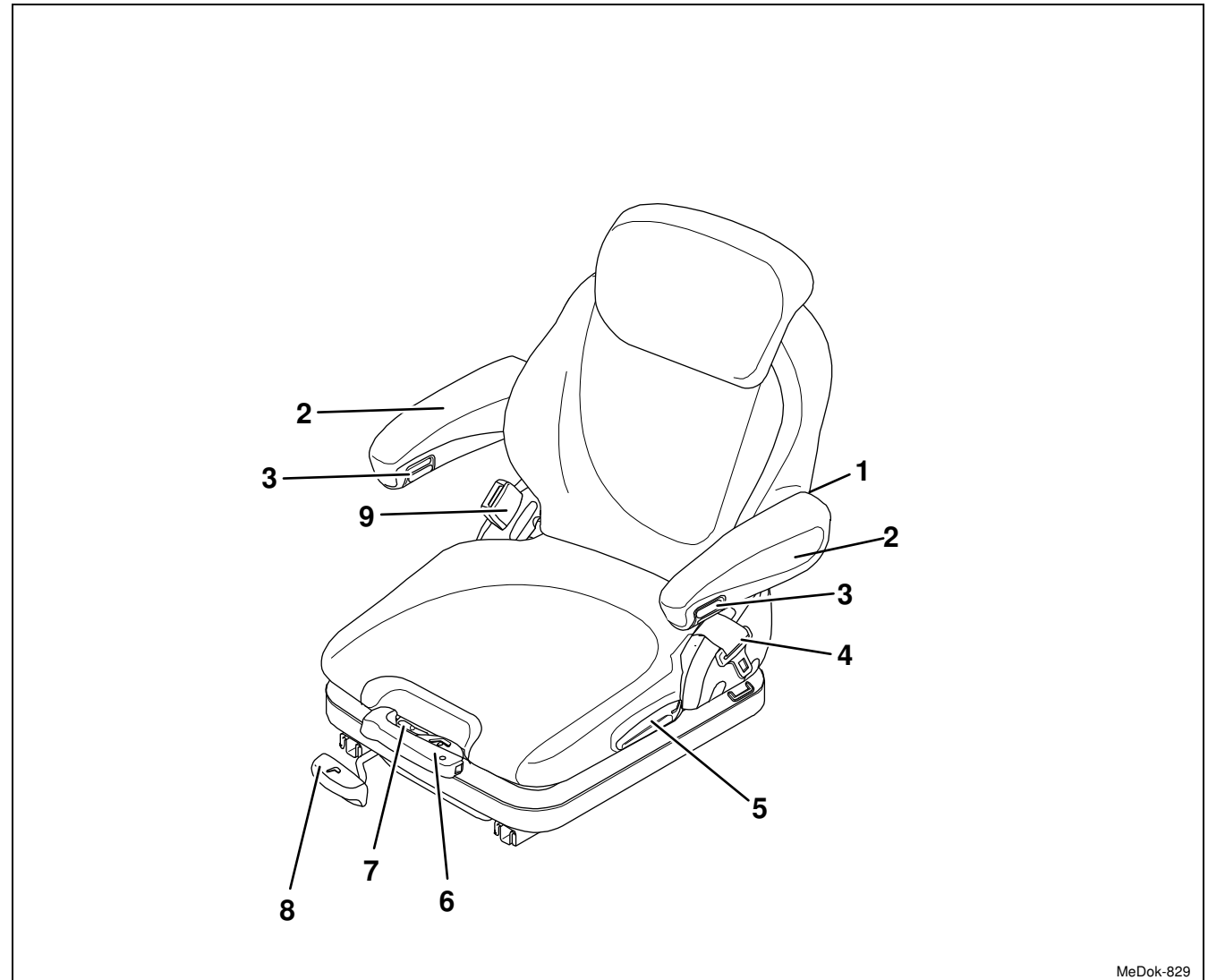
- (1) Handle for lumbar support
- (2) Armrest
- (3) Knob for armrest angle adjustment
- (4) Belt roller
- (5) Handle for backrest adjustment

**Note:**

MSG 65/511 seat type (slender seat cushion) and boat seat AVENTO-Evolution is equipped with a loop for backrest adjustment.

- (6) Handle for weight adjustment
- (7) Seat level indicator
- (8) Handle for fore/aft adjustment \*
- (9) Seat belt buckle \*

\* if fitted



MeDok-829

## 2.1 Overview of components

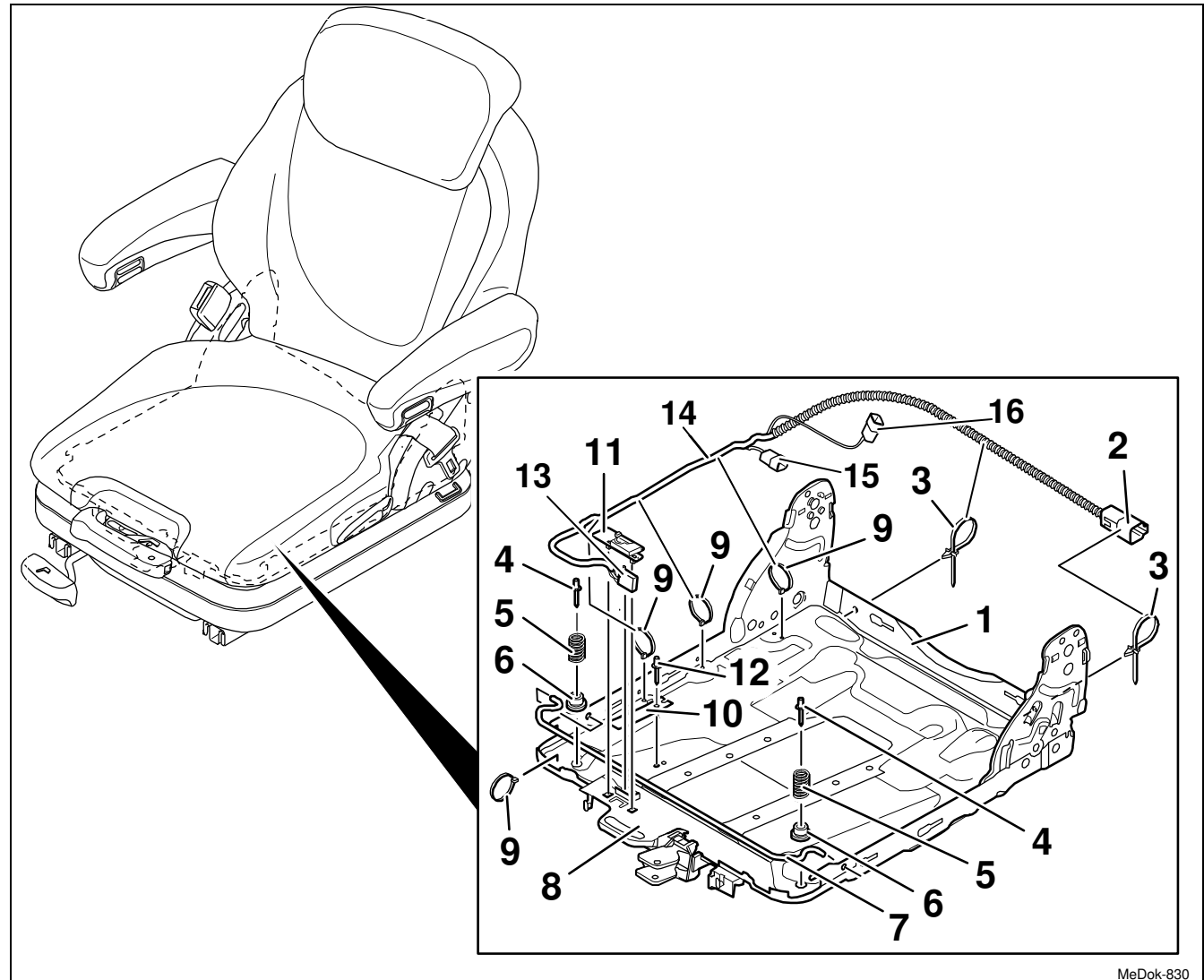
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### Installation overview Seat switch

- (1) Spring pack
- (2) Vehicle power connector
- (3) Cable ties with anchor ties
- (4) Blind rivet
- (5) Compression springs
- (6) Bushing
- (7) Switching bracket
- (8) Housing of seat level indicator
- (9) Cable ties
- (10) Switch plate
- (11) Cover
- (12) Blind rivet
- (13) Seat switch
- (14) Cable harness of the seat switch
- (15) Connector plug of the seat heater (if fitted)
- (16) Connector plug of the belt buckle switch (if fitted)



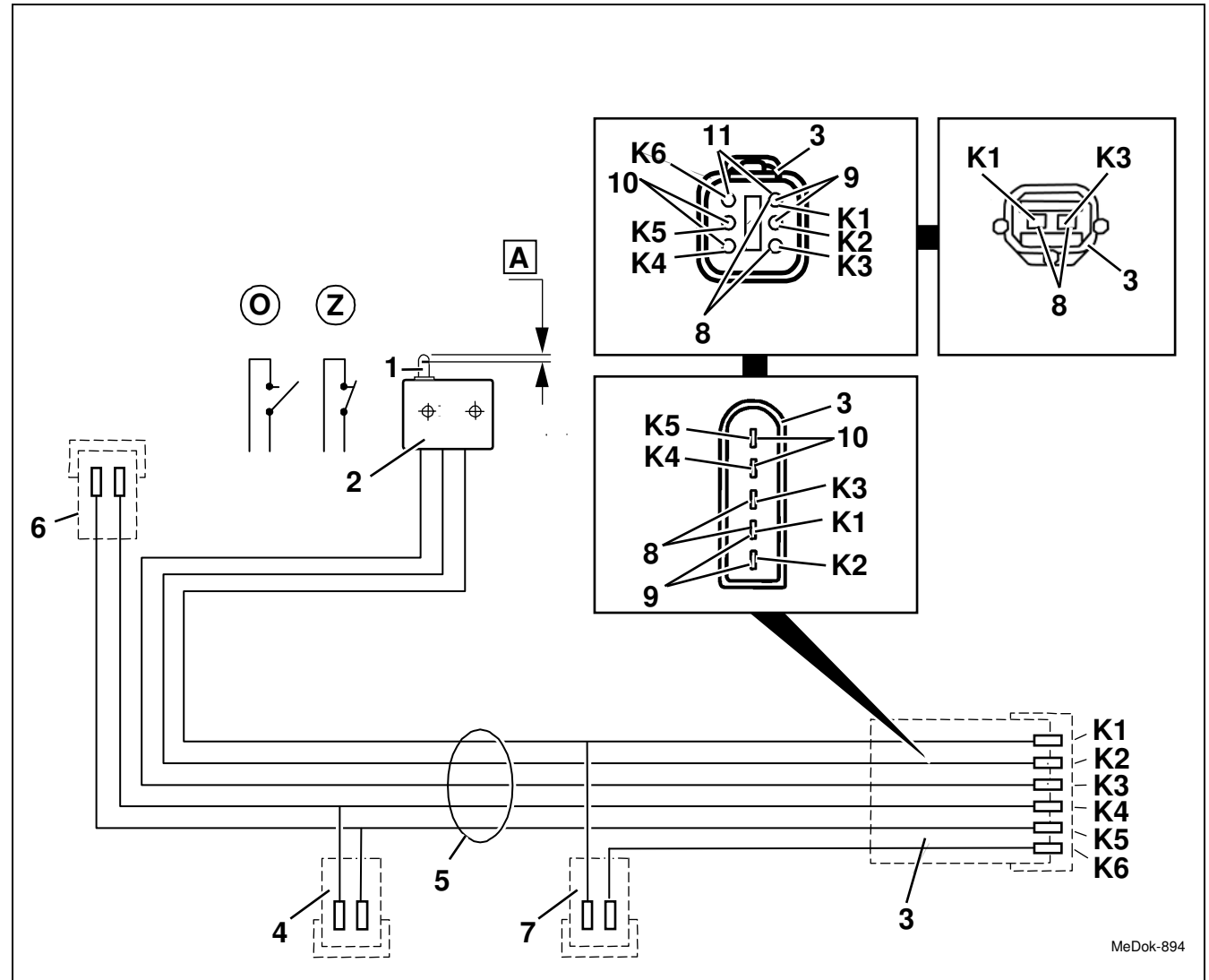
MeDok-830

## 2.1 Overview of components



### Seat switch and connector assignment with circuit diagram

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



MeDok-894

## 2.1 Overview of components

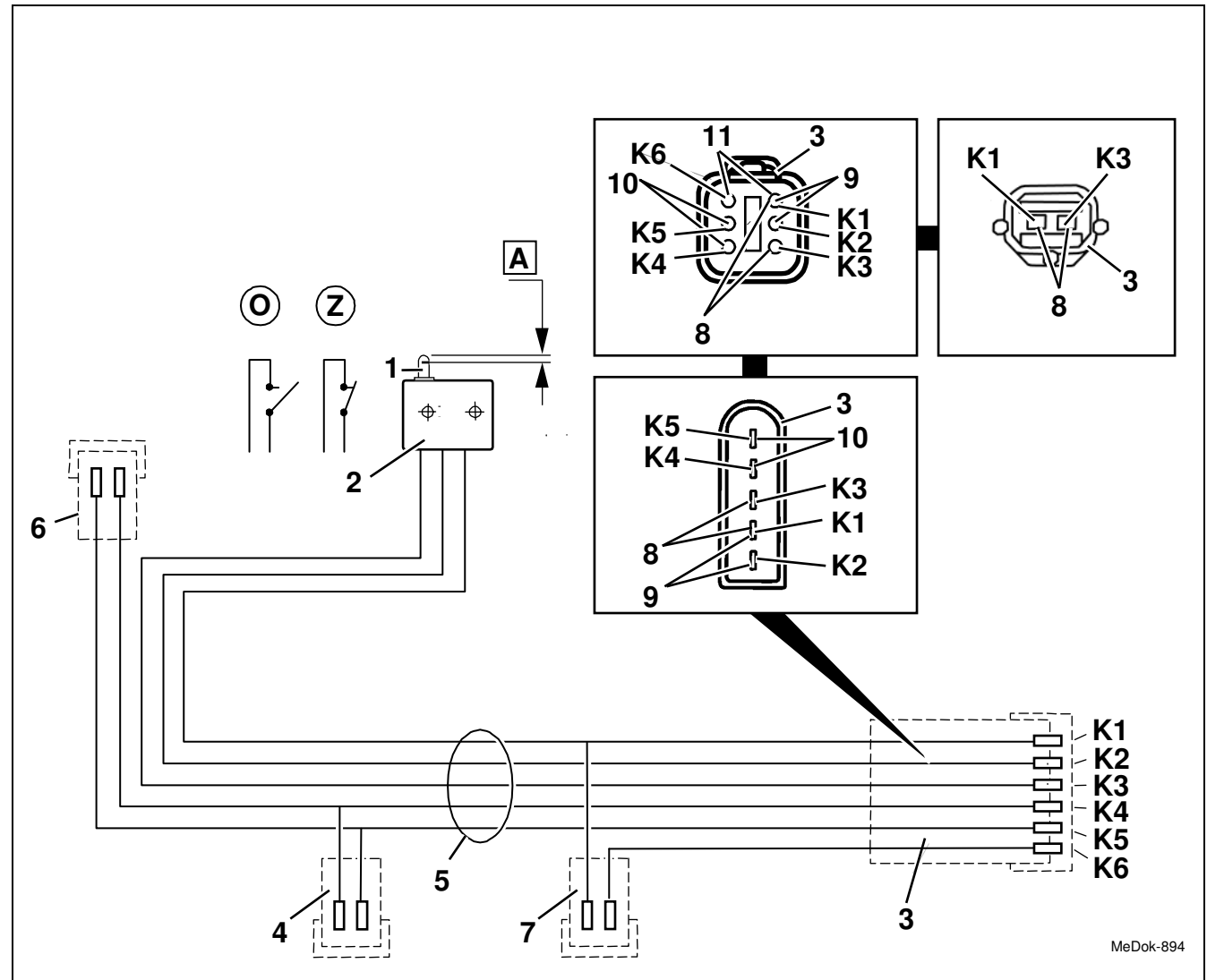


### Note:

Distance (A) between idle position and switching point of the push-rod switch (1) = 1.2 mm.

Example of seat switch (2) switched as make contact (8):

- (O) If no load is applied to the seat, the seat switch (2) is open. The vehicle cannot be driven or is switched off.
- (Z) If a load is applied to the seat, the seat switch (2) is closed. The vehicle can be driven.



MeDok-894



**2.2 Functional test**

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A functional test is used to circumscribe all possible malfunctions; it must be performed before and after repair work on the seat at any rate.

**Preconditions for testing:**

- The individual functions are activated in compliance with the instructions of the seat operating manual.
- The electrical system of the vehicle has been inspected and found OK in compliance with the operating instructions.

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

Step no.	Scope of inspection	Function to be operated	Result/specified state	Notes, cause/remedial measures
1	Weight adjustment and seat level indicator	Pull the handle for weight adjustment downwards or upwards (while there is load on the driver's seat) until it hits its end stop and then let it go off.	The pointer of the seat level indicator moves to the right or left, respectively.	See overview of faults (Chap. 2.3).
2	Suspension	Apply your body weight to the seat and adjust it to your individual weight. The pointer of the seat level indicator must be in the middle of the viewing window.	The suspension is within its maximum swinging range.	The loaded seat can spring without hitting the end stop within the range of 60 mm.  See overview of faults (Chap. 2.3).

**2.2 Functional test**

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Step no.	Scope of inspection	Function to be operated	Result/specified state	Notes, cause/remedial measures
3	Suspension	Apply load to the seat and spring up and down several times.	No noise. High lateral stability in horizontal direction.	See overview of faults (Chap. 2.3).
4	Backrest angle	Pull the handle for backrest adjustment upwards.	The backrest folds forwards.	See overview of faults (Chap. 2.3).
5		Pull the handle for backrest adjustment upwards while loading and unloading the backrest, and then release the handle.	The backrest locks into place in the desired position. It should not be possible to move the backrest to another position after it has been locked into place.	Adjustment angle of the backrest in 15 increments of 2.5° each. See overview of faults (Chap. 2.3).
6	Seat fore/aft adjustment	Pull the handle for seat fore/aft adjustment upwards.	The seat moves forwards or backwards.	The maximum adjustment distance of 225 mm in lock-in positions of 15 mm each. See overview of faults (Chap. 2.3).

**2.2 Functional test**

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Step no.	Scope of inspection	Function to be operated	Result/specified state	Notes, cause/remedial measures
7	Seat fore/aft adjustment	Release the handle for fore/aft adjustment.	The seat locks into place in the selected position. It should not be possible to move the seat to another position after it has been locked into place.	See overview of faults (Chap. 2.3).
8	Lumbar support	Turn the knob for lumbar support up or down.	The backrest cushion arches outward at the bottom or top.	See overview of faults (Chap. 2.3).
9	Seat switch	Load and unload the seat cushion in the front left and right sides several times.	The seat switch contacts (audible switching sound). Switching function: <ul style="list-style-type: none"> <li>• loaded = on</li> <li>• unloaded = off</li> </ul> (for shutting down mechanical equipment when the driver leaves his/her seat)	See overview of faults (Chap. 2.3).

**2.2 Functional test**

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Step no.	Scope of inspection	Function to be operated	Result/specified state	Notes, cause/remedial measures
10	Belt roller	Pull the safety belt out and let it go back.	The safety belt automatically retracts.	See overview of faults (Chap. 2.3).
11	Seat belt buckle	Insert the belt latch (safety belt) into the belt buckle.	The belt buckle audibly clicks into place and cannot be easily withdrawn even by pulling it vigorously.	See overview of faults (Chap. 2.3).
	Seat belt buckle switch	Insert the belt latch (safety belt) into the belt buckle.	Seat belt buckle switch contacts Switching function: <ul style="list-style-type: none"> <li>• Insert the latch into the belt buckle = on</li> <li>• Take the latch out of the belt buckle = off</li> </ul>	See overview of faults (Chap. 2.3).
12		Press the red release button of the belt buckle.	The belt buckle releases and the belt latch can be opened.	See overview of faults (Chap. 2.3).
13	Armrest	Turn the knob of the armrests inwards or outwards, respectively.	The armrests are lifted or lowered in the front.	See overview of faults (Chap. 2.3).

**2.2 Functional test**

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Step no.	Scope of inspection	Function to be operated	Result/specified state	Notes, cause/remedial measures
14	Armrest	Tilt the armrests backwards.	The armrests move continuously until the vertical end position is reached. Tilting the armrests too much backwards is not possible.	See overview of faults (Chap. 2.3).
15	Backrest extension	Slowly pull out the backrest extension until it resists and then push it back again.	The backrest extension locks into place (audible) in any lock-in position.	See overview of faults (Chap. 2.3).

**2.3 Overview of faults**

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This chapter contains notes on possible seat faults. The notes, combined with Chapter 2.4 "Fault diagnosis", are intended to ease troubleshooting of faults.

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

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

Fault description	Possible cause	Troubleshooting
The suspension travels up and down and hits the upper and lower end stop.	<ul style="list-style-type: none"> <li>• The weight adjustment is not set to the individual weight of the driver.</li> <li>• Shock absorber is defective.</li> <li>• The spring is worn or broken.</li> </ul>	Adjust the seat to the driver's weight (refer to seat operating manual).  Replace the shock absorber (Chap. 3.19).  Replace the entire spring pack (Chap. 3.18).
The seat wobbles.	<ul style="list-style-type: none"> <li>• The bushings on the fixed bearing axles or roller axles of the swinging structure are defective.</li> </ul>	Replace the bushings (see Chapter 3.21).

## 2.3 Overview of faults

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Fault description	Possible cause	Troubleshooting
The seat squeaks.	<ul style="list-style-type: none"> <li>• Too little lubrication of the shock absorber axle of the swinging structure.</li> <li>• Too little lubrication of axles and rollers of the swinging structure.</li> </ul>	<p>Apply acid-free multi-purpose lubricant to the shock absorber axle (see Chapter 3.19).</p> <p>Apply acid-free multi-purpose lubricant to the roller or fixed bushing axles of the swinging structure and the front of the plastic rollers (see Chapter 3.21).</p> <p><b>Note:</b> You should dose lubrication so that the rollers can still rotate.</p>
Seat level indicator does not work.	<ul style="list-style-type: none"> <li>• The linkage rod of the pointer is detached from the lower part of the suspension.</li> <li>• The linkage rod of the pointer is detached from the housing of the seat level indicator.</li> <li>• The upper part of the linkage rod does not grip onto the longitudinal guide of the pointer.</li> </ul>	<p>Hang in the linkage rod of the pointer on the lower part of the suspension (see Chapter 3.15).</p> <p>Hang in the linkage rod of the pointer on the housing of the seat level indicator (see Chapter 3.15).</p> <p>Thread the upper end of the pointer linkage rod through the guide of the pointer (see Chapter 3.15).</p>

**2.3 Overview of faults**

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Fault description	Possible cause	Troubleshooting
The weight adjustment is too tight or does not work.	<ul style="list-style-type: none"> <li>• The handle for weight adjustment is not fully folded out.</li> <li>• The weight adjustment is defective.</li> </ul>	<p>Fold out the handle for weight adjustment completely (refer to seat operating manual).</p> <p>Replace the entire spring pack (Chap. 3.18).</p>
Seat fore/aft adjustment does not work.	<ul style="list-style-type: none"> <li>• Locking lever of the entire adjusting rail assembly is defective.</li> </ul>	<p>Replace the entire adjusting rail (see Chap. 3.17).</p>
The seat fore/aft adjustment does not securely lock into position or does not snap into place after being adjusted.	<ul style="list-style-type: none"> <li>• Particles are between the adjusting and locking rails.</li> <li>• Locking lever of the entire adjusting rail assembly is defective.</li> <li>• Adjusting or locking rails are defective.</li> </ul>	<p>Remove/install the entire seat fore/aft adjustment (Chap. 3.17).</p> <p>Replace the entire adjusting rail (see Chapter 3.17).</p> <p>Replace the seat fore/aft adjustment (Chap. 3.17).</p>
The backrest does not fold forwards by itself after being unlocked.	<ul style="list-style-type: none"> <li>• The retaining spring is loosened.</li> <li>• The retaining spring is defective.</li> </ul>	<p>Hang in the retaining spring (see Chapter 3.7).</p> <p>Replace the retaining spring (see Chapter 3.7).</p>



**2.3 Overview of faults**

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<b>Fault description</b>	<b>Possible cause</b>	<b>Troubleshooting</b>
The backrest frame cannot be unlocked.	<ul style="list-style-type: none"> <li>• The operating lever jams.</li> <li>• The control lug on the tooth-sheet of the backrest lock is broken.</li> <li>• The backrest lock is defective.</li> </ul>	<p>Remove/install the entire backrest lock (Chap. 3.13).</p> <p>Replace the tooth-sheet (see Chapter 3.7).</p> <p>Replace the entire backrest lock (Chap. 3.13).</p>
The angle of the backrest frame cannot be adjusted.	<ul style="list-style-type: none"> <li>• The retaining spring is loosened.</li> <li>• The retaining spring is defective.</li> <li>• The backrest lock is defective.</li> <li>• The backrest frame is defective.</li> </ul>	<p>Hang in the retaining spring (see Chapter 3.7).</p> <p>Replace the retaining spring (see Chapter 3.7).</p> <p>Replace the entire backrest lock (Chap. 3.13).</p> <p>Replace the backrest frame (see Chapter 3.7).</p>

**2.3 Overview of faults**

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<b>Fault description</b>	<b>Possible cause</b>	<b>Troubleshooting</b>
No or insufficient curving of the lumbar support in the seat cushion.	<ul style="list-style-type: none"> <li>• Knob for lumbar support is defective.</li> <li>• Lumbar support is defective.</li> </ul>	<p>Replace the knob for lumbar support (Chap. 3.14).</p> <p>Replace the backrest frame (see Chapter 3.7).</p>
The seat switch does not contact when the seat cushion is loaded.	<ul style="list-style-type: none"> <li>• The switching bracket is detached from the spring pack.</li> <li>• The switching bracket does not seat properly on the compression springs.</li> <li>• Compression springs are detached from the bushings.</li> <li>• The bellows is caught between the seat cushion and spring pack.</li> <li>• The switch push-rod is defective.</li> </ul>	<p>Attach the switching bracket to the spring pack (see Chapter 3.16).</p> <p>Place the switching bracket on the compression springs (see Chapter 3.16).</p> <p>Fasten the compression springs on the bushings (see Chapter 3.16).</p> <p>Slide your hand between the bellows and the seat cushion to release the tension. Remove and install the seat cushion, if required (Chap. 3.2).</p> <p>Replace the seat switch and the cable (see Chapter 3.16).</p>

**2.3 Overview of faults**

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Fault description	Possible cause	Troubleshooting
The seat switch does not work.	<ul style="list-style-type: none"> <li>• The vehicle power supply or electronics is defective</li> <li>• Plug-in connection (Vehicle power connector Seat – Vehicle) is defective.</li> <li>• The seat switch is defective.</li> </ul>	<p>Check electrical system of the vehicle.</p> <p>Check the plug connection, restore it, if necessary.</p> <p>Check the seat switch (Chap. 2.4, Inspection step 1.1), replace the entire seat switch, if required (see Chapter 3.16).</p>
The belt roller does not wind up automatically.	<ul style="list-style-type: none"> <li>• The belt jams.</li> <li>• The belt roller is defective.</li> </ul>	<p>Briefly pull the belt and let it wind up again.</p> <p>Replace the belt roller (Chap. 3.9).</p>
The belt latch does not lock into the belt buckle.	<ul style="list-style-type: none"> <li>• The belt buckle is defective.</li> </ul>	<p>Replace the belt buckle (Chap. 3.9).</p>
The belt buckle does not release the belt latch after operating the red unlocking button.	<ul style="list-style-type: none"> <li>• The belt buckle is defective.</li> </ul>	<p>Replace the belt buckle (Chap. 3.9).</p>
The belt buckle switch does not work.	<ul style="list-style-type: none"> <li>• The belt buckle switch is defective.</li> </ul>	<p>Check the the belt buckle switch, replace the belt buckle, if required (Chap. 3.9).</p>

**2.3 Overview of faults**

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<b>Fault description</b>	<b>Possible cause</b>	<b>Troubleshooting</b>
The armrest does not lift or lower when turning the knob outwards or inwards.	<ul style="list-style-type: none"> <li>• The inclination of the armrest is defective.</li> </ul>	Replace the armrest (see Chapter 3.6).
The armrest does not hold in the backward folded position. The armrest falls forwards.	<ul style="list-style-type: none"> <li>• The armrest is defective.</li> </ul>	Replace the armrest (see Chapter 3.6).
The backrest extension does not hold in the locking position.	<ul style="list-style-type: none"> <li>• The omega springs are broken.</li> <li>• The holder is damaged.</li> </ul>	Replace the omega springs (see Chapter 3.3).  Replace the holder (see Chapter 3.3).

**2.4 Fault diagnosis**



**1 Check the seat switch**

Preconditions for fault diagnosis:

- Electrical system of the vehicle is checked and is OK.

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

Step no.	Checking/operating	Result/specified state	Troubleshooting
1.1	<ul style="list-style-type: none"> <li>• Disconnect the plug-in connection (Vehicle power connector Seat - Vehicle).</li> <li>• Measure the resistance at the contacts 1 and 3 (make contact) of the seat power connector: white .....Ω .....yellow</li> </ul>	<p>&gt;&gt; <b>0.1 Ω</b> (→ ∞)</p> <p>≤ <b>0.1 Ω</b></p>	<p>Proceed with inspection step 1.2.</p> <p>Replace the seat switch and the cable (see Chapter 3.16).</p>

**2.4 Fault diagnosis**

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Step no.	Checking/operating	Result/specified state	Troubleshooting
1.2	<ul style="list-style-type: none"> <li>• Apply load to the seat cushion with the current weight adjustment.</li> <li>• Measure the resistance at the contacts 1 and 3 (make contact) of the seat power connector:  white.....<math>\Omega</math> .....yellow</li> </ul>	$\leq 0.1 \Omega$  $> 0.1 \Omega$	<p>End of inspection.</p> <p>Replace the seat switch and the cable (see Chapter 3.16).</p>

**3 Repair Work**

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- 3.1 Backrest cushion – removal and installation
  - 3.1.1 Backrest cushion – removal and installation(MSG65/511-522 and boat seat AVENTO-Premium)
  - 3.1.2 Backrest cushion – removal and installation(Boat seat AVENTO-Evolution)
- 3.2 Seat cushion – removal and installation
  - 3.2.1 Seat cushion – removal and installation(MSG65/511-522 and boat seat AVENTO-Premium)
  - 3.2.2 Seat cushion – removal and installation(Boat seat AVENTO-Evolution)
- 3.3 Backrest extension with guide – removal, installation (MSG65/511-522 and boat seat AVENTO-Premium)
- 3.4 Cover, right and left – removal, installation
- 3.5 Storage box – removal, installation (optional extras)
- 3.6 Armrests – removal, installation (optional extras)
- 3.7 Backrest frame with retaining spring – removal, installation
- 3.8 Bellows– removal and installation
- 3.9 Belt roller and belt buckle – removal, installation
- 3.10 Handle for weight adjustment – removal, installation
- 3.11 Handle for fore/aft adjustment – removal, installation
- 3.12 Handle for backrest adjustment – removal, installation
- 3.13 Backrest lock – removal, installation of the entire assembly

**3 Repair Work**

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- 3.14 Knob for lumbar support – removal, installation
- 3.15 Seat level indicator – removal, installation of the entire assembly
- 3.16 Seat switch with cable and switch mechanism – removal, installation
- 3.17 Seat fore/aft adjustment – removal, installation of the entire assembly
- 3.18 Spring assembly – removal and installation
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- 3.19 Shock absorber – removal, installation
- 3.20 Webbing – removal, installation
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- 3.21 Swinging structure with the lower part of the suspension – disassemble, assemble
- 3.22 Backrest bearing with retaining spring – removal and installation
  - 3.22.1 Backrest bearing with retaining spring MSG65/511-522 and boat seat AVENTO-Premium – removal and installation (see Chapter 3.7)
  - 3.22.2 Backrest bearing with retaining spring Boat seat AVENTO-Evolution – removal and installation (see Chapter 3.1.2)
- 3.23 Suspension cover – removal and installation (Boat seat AVENTO-Evolution)
- 3.24 Seat cushion and backrest cushion cover – removal and installation (Boat seat AVENTO-Evolution)



## 3.1 Backrest cushion – removal, installation

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- 3.1.1 Backrest cushion – removal and installation (MSG65/511-522 and boat seat AVENTO-Premium)
- 3.1.2 Backrest cushion – removal and installation (Boat seat AVENTO-Evolution)

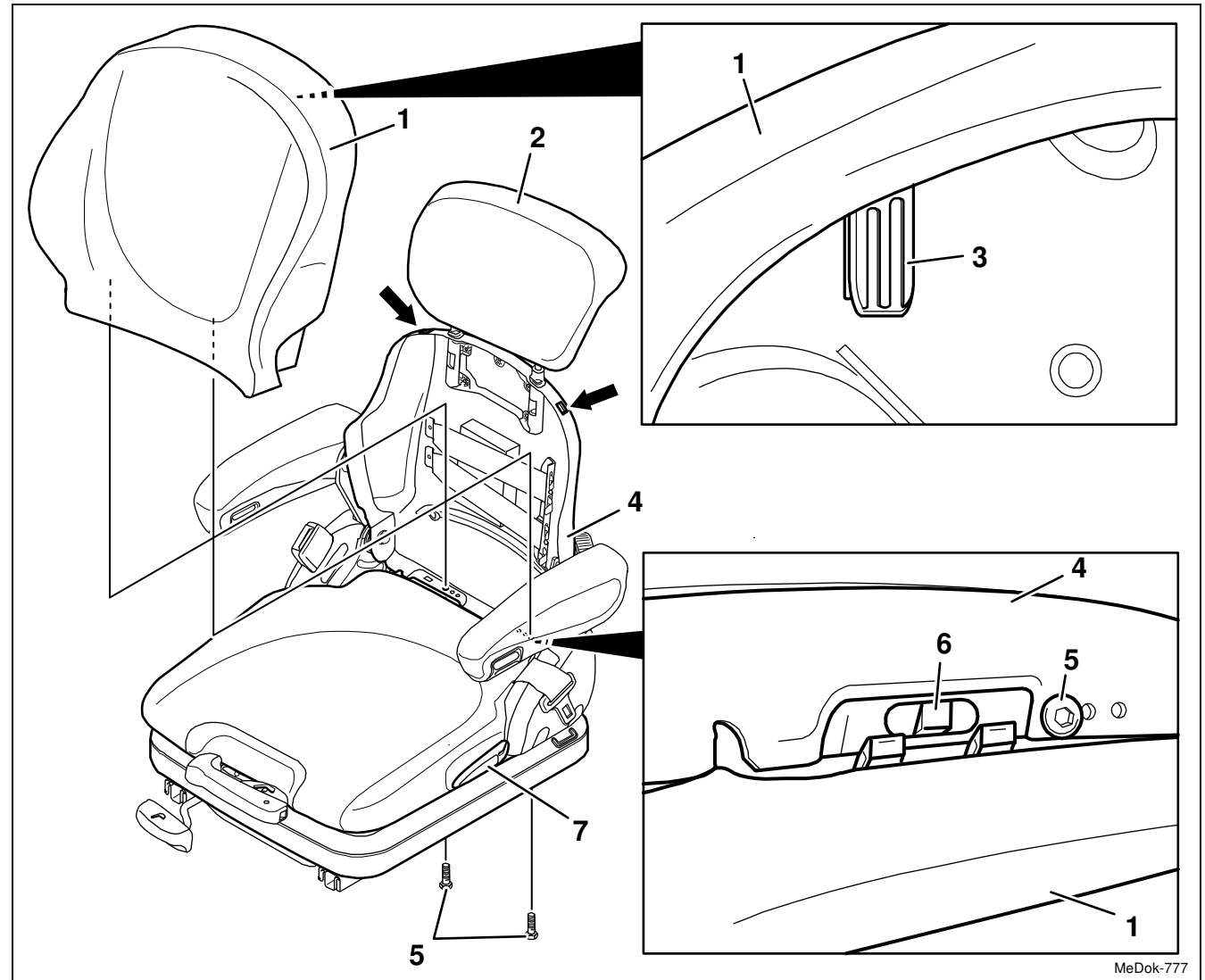
### 3.1.1 Backrest cushion – removal, installation (MSG65/511-522 and boat seat AVENTO-Premium)



REMOVAL/INSTALLATION

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- (1) Backrest cushion
- (2) Backrest extension
- (3) Hook (backrest cushion)
- (4) Backrest frame
- (5) Torx screw ..... 2.5 Nm
- (6) Catchers (backrest cushion)
- (7) Handle for backrest adjustment



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### 3.1.1 Backrest cushion – removal, installation (MSG65/511-522 and boat seat AVENTO-Premium)

REMOVAL/INSTALLATION

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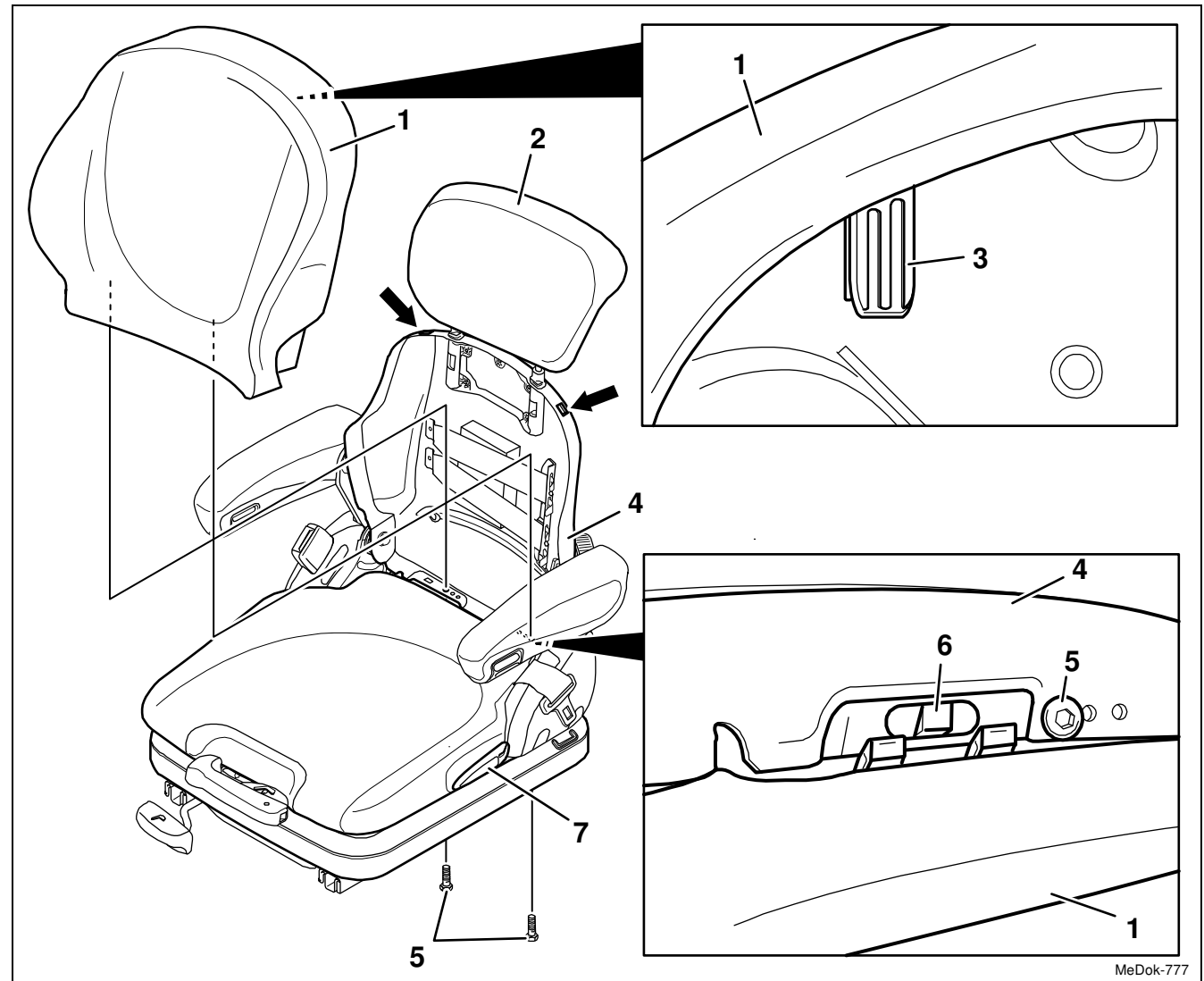
#### Removal, installation

- 1 Pull out the backrest extension (2) to the end position.
- 2 Fold the backrest frame (4) completely forwards, and remove the two torx screws (5).

**Installation note:**

Torx screw (5), 2.5 Nm.

- 3 Release the two catchers (6). Use a screwdriver to press on the catches (6) from below.
- 4 Fold up the backrest frame (4) and pull the backrest cushion (1) out in a forward direction.



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### 3.1.1 Backrest cushion – removal, installation (MSG65/511-522 and boat seat AVENTO-Premium)



#### REMOVAL/INSTALLATION

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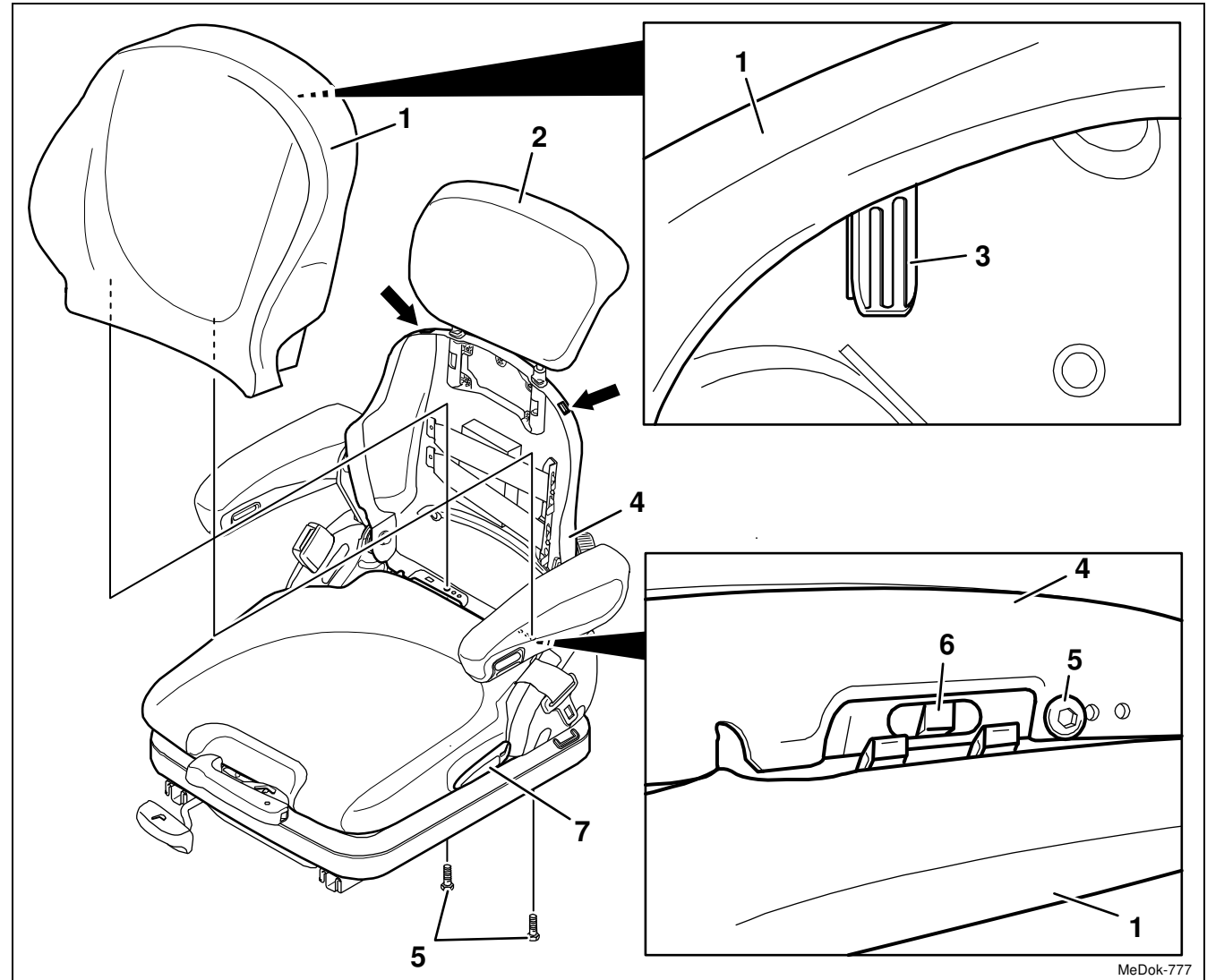
- 5 Unhook the two hooks (3) on the backrest cushion (1) from the longitudinal hole (arrow) of the backrest frame (4) and take off the backrest cushion (1) in an upward direction.



**WARNING:** take care with the backrest frame (4) – it may jerk forward and cause injury!

When the backrest cushion (1) has been removed, the backrest frame (4) must be supported, for example held in place, before the handle for backrest adjustment (7) is operated.

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



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### 3.1.2 Backrest cushion – removal and installation (Boat seat AVENTO-Evolution)

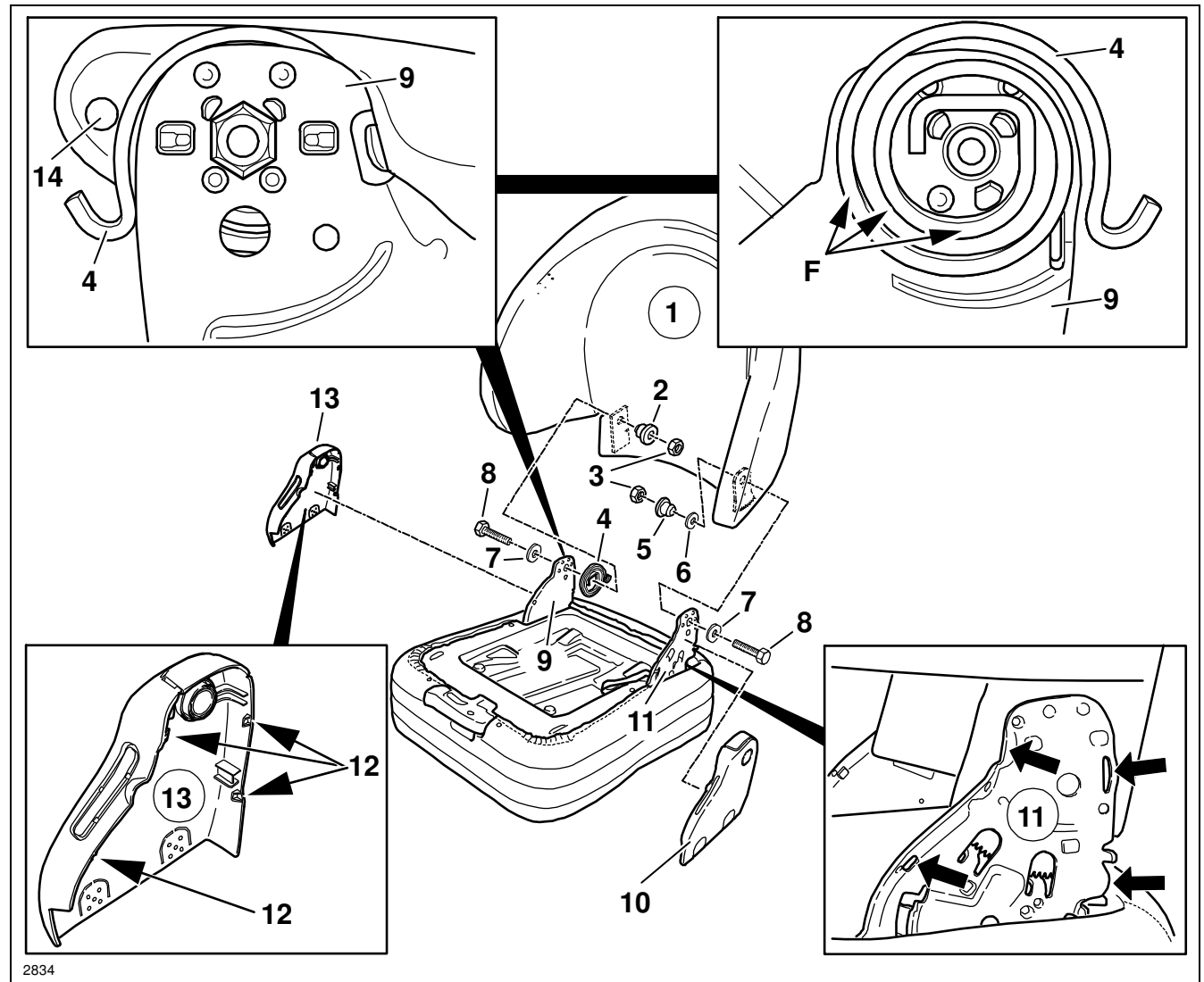


#### REMOVAL/INSTALLATION

#### TABLE OF CONTENTS

- (1) Backrest cushion
- (2) Right socket
- (3) Hexagon nut
- (4) Retaining spring
- (5) Left socket
- (6) Washer
- (7) Washer
- (8) Hexagon bolt..... 25 Nm
- (9) Right backrest support
- (10) Left cover
- (11) Left backrest support
- (12) Catchers
- (13) Right cover
- (14) Cam

1 Remove the seat cushion  
(Chap. 3.2.2).



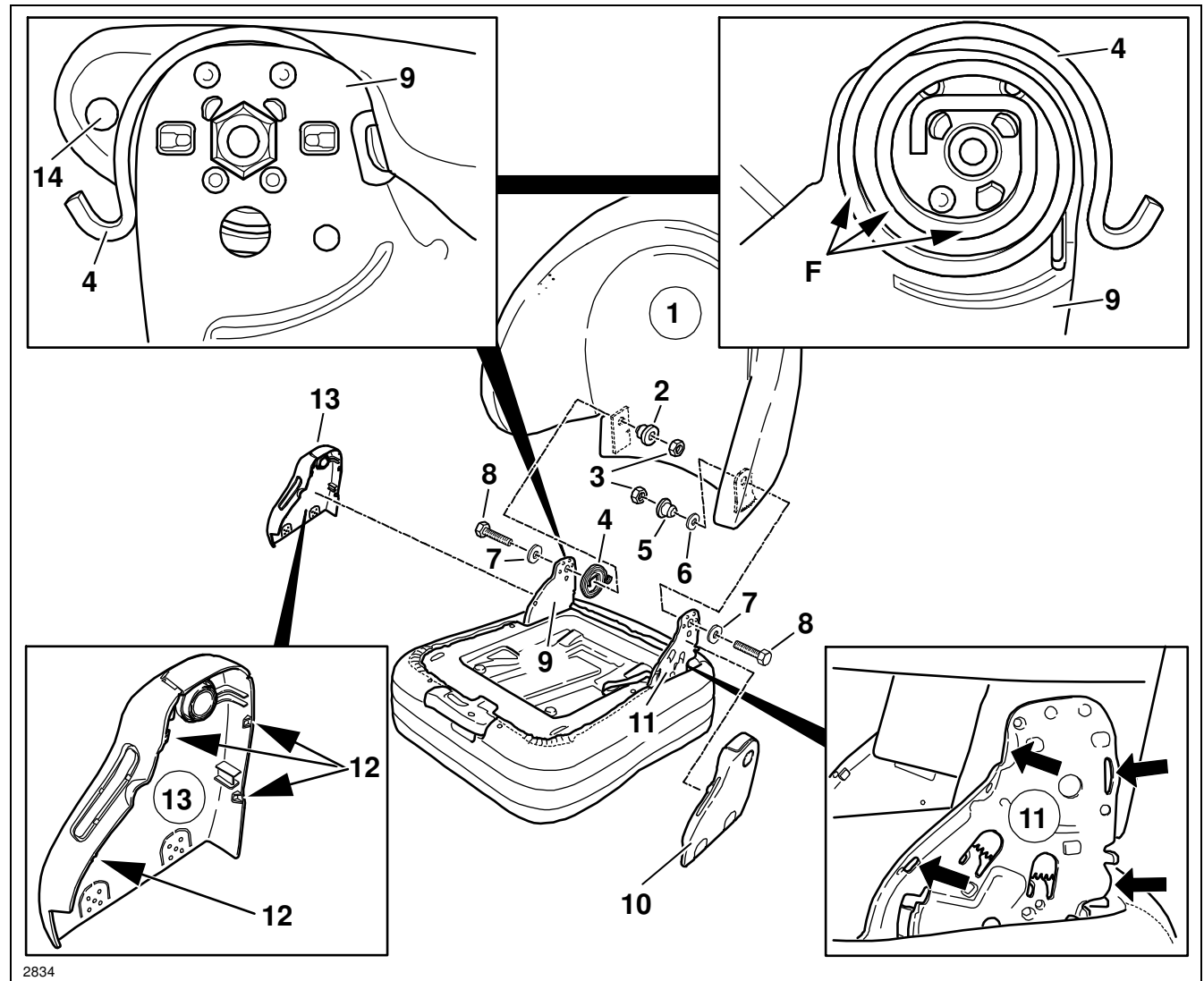
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### 3.1.2 Backrest cushion – removal and installation (Boat seat AVENTO-Evolution)

REMOVAL/INSTALLATION

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- 2 Release the four catchers (12) of the right cover (13) from the imprints (arrow) on the backrest support (9) on the right side and remove the right cover (13).
  - 3 Release the four catchers (12) of the left cover (10) from the imprints (arrow) on the backrest support (11) on the left side and remove the left cover (10).
  - 4 Fold the backrest cushion (1) completely forwards to release the retaining spring (4).
  - 5 Unscrew two hexagon bolts (8) and remove them together with the washers (7) and hexagon nuts.
- Installation note:**  
Hexagon bolt (8), 25 Nm.



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### 3.1.2 Backrest cushion – removal and installation (Boat seat AVENTO-Evolution)

#### REMOVAL/INSTALLATION

#### TABLE OF CONTENTS

- 6 Remove the left socket (5) with washer (6) and the right socket (2) from the backrest supports (9 and 11) at the backrest cushion (1).

**Installation note:**

Insert the sockets (5 and 2) with acid-free multi-purpose lubricant.

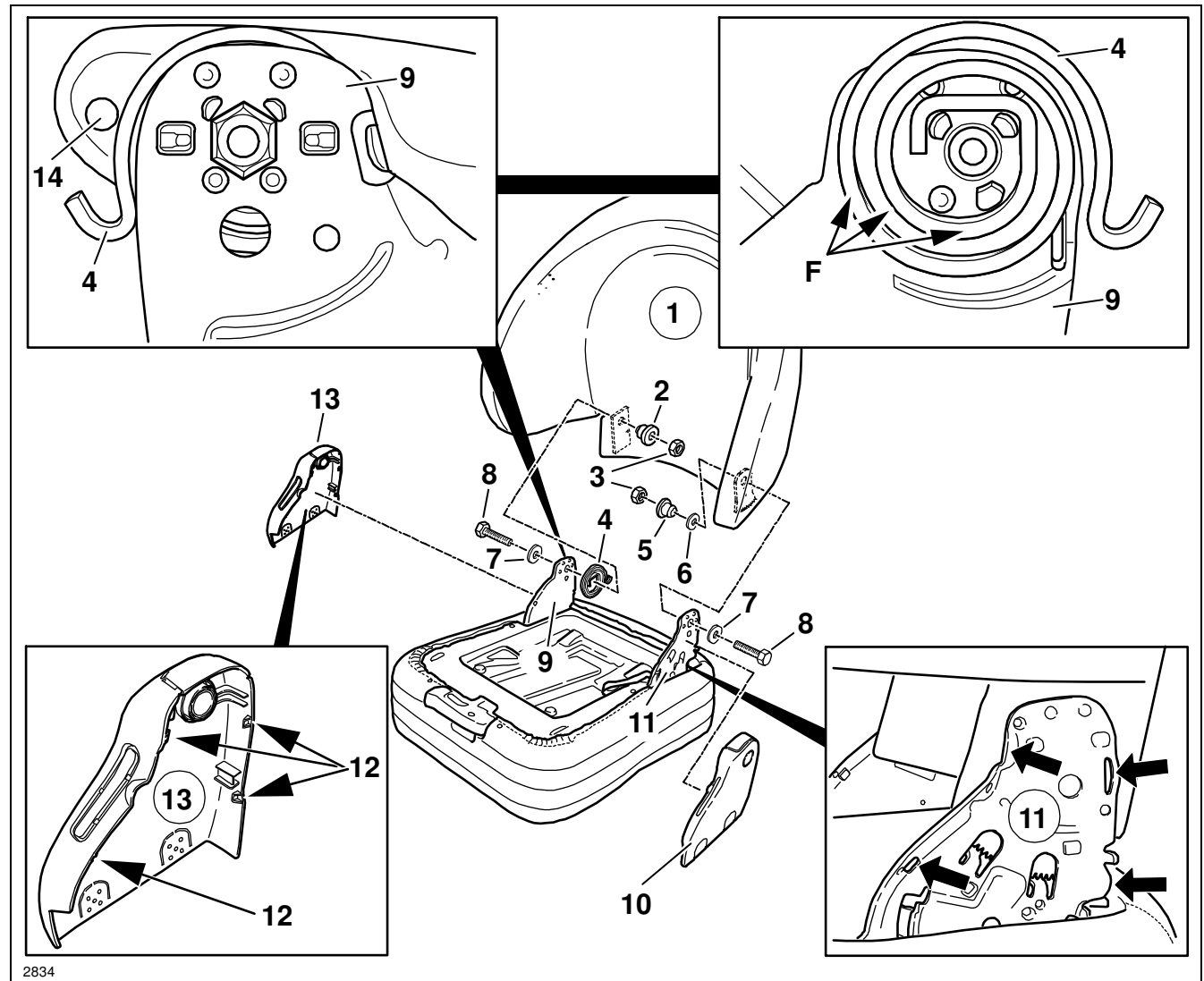
- 7 Slightly press the backrest cushion (1) against the right backrest support (9) and simultaneously lever it out from the left backrest support (11) in upward direction, and then remove it.

**Installation note:**

Apply acid-free multi-purpose lubricant to the entire surface (F) of the retaining spring (4).

When hanging in the backrest cushion, make sure the cam (14) is located over the hook of the retaining spring (4).

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



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## 3.2 Seat cushion – removal, installation

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- 3.2.1 Seat cushion – removal, installation (MSG65/511-522 and boat seat AVENTO-Premium)
- 3.2.2 Seat cushion – removal, installation (Boat seat AVENTO-Evolution)



### 3.2.1 Seat cushion – removal, installation (MSG65/511-522 and boat seat AVENTO-Premium)

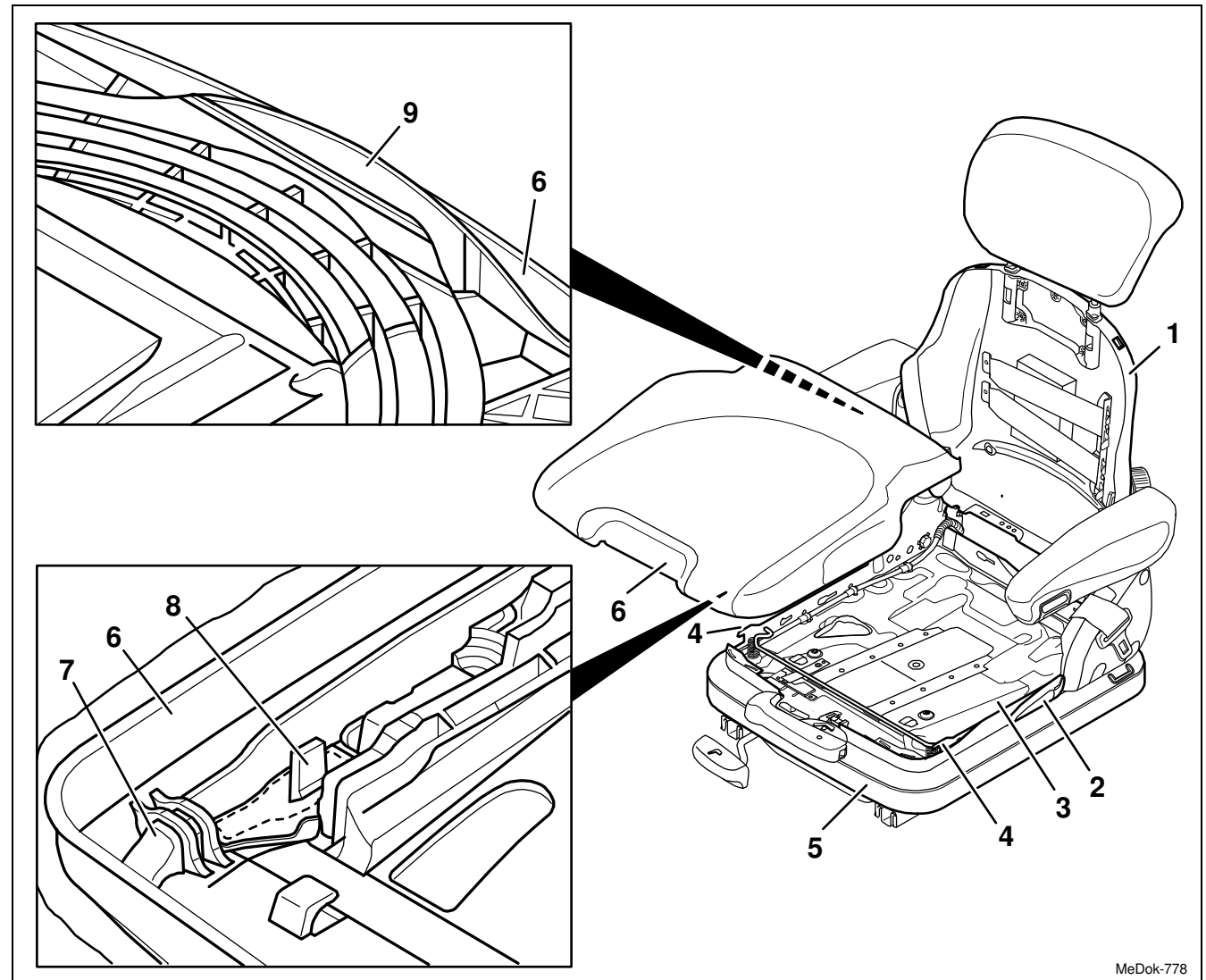


REMOVAL    INSTALLATION

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- (1) Backrest frame
- (2) Handle for backrest adjustment
- (3) Spring pack
- (4) Hooks (spring pack)
- (5) Bellows
- (6) Seat cushion
- (7) Holder (seat cushion)
- (8) Locking hook (seat cushion)
- (9) Catcher grip (seat cushion)

1 Remove the backrest cushion (Chap. 3.1).



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### 3.2.1 Seat cushion – removal, installation (MSG65/511-522 and boat seat AVENTO-Premium)

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REMOVAL    INSTALLATION

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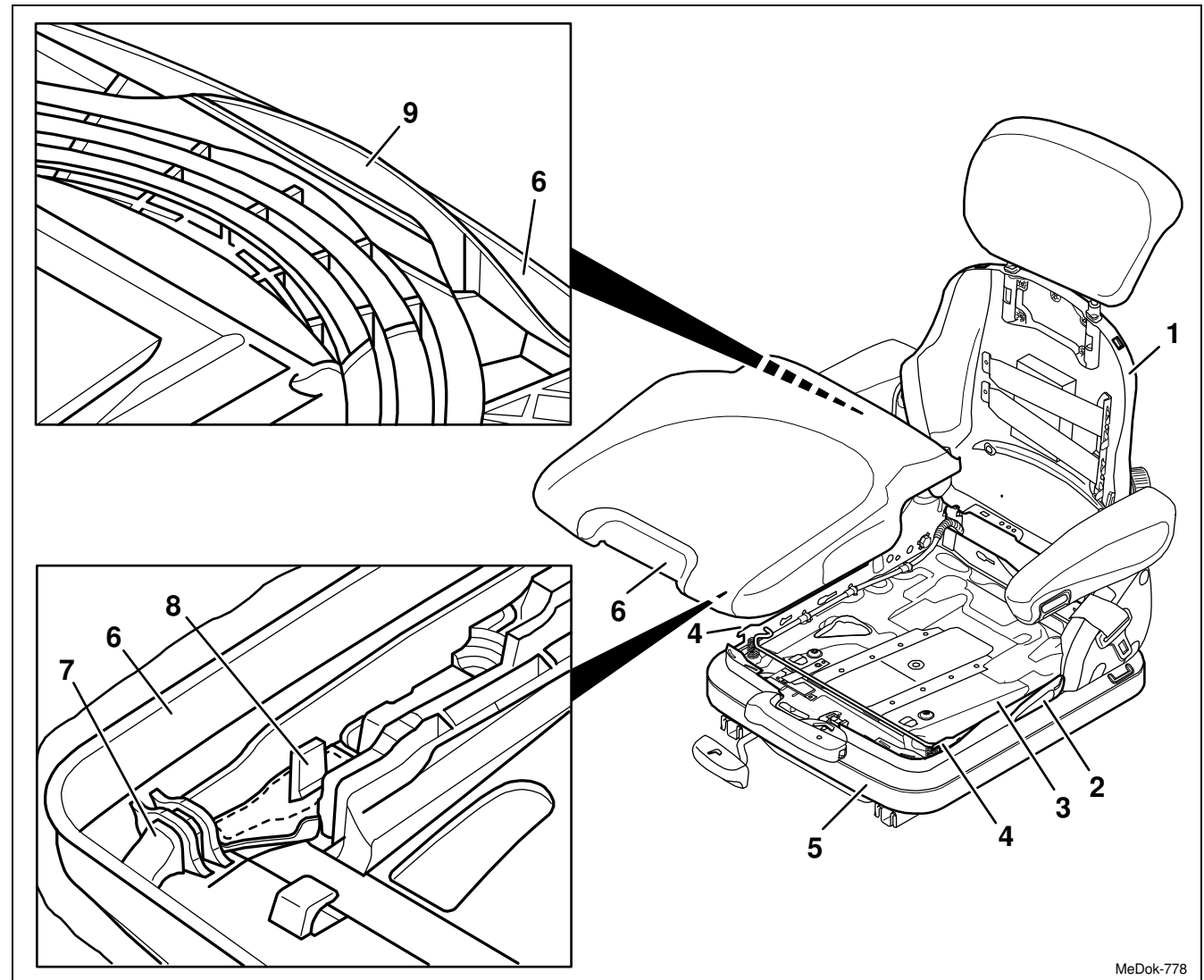
#### Removal

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



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

- 3 Take off the seat cushion (6) from the spring pack (3). First, pull the catcher grip (9) backwards and then upwards.
- 4 Take the seat cushion (6) at the front right and left side into both hands, press it downwards and pull it out in a forward direction, and remove it.



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### 3.2.1 Seat cushion – removal, installation (MSG65/511-522 and boat seat AVENTO-Premium)

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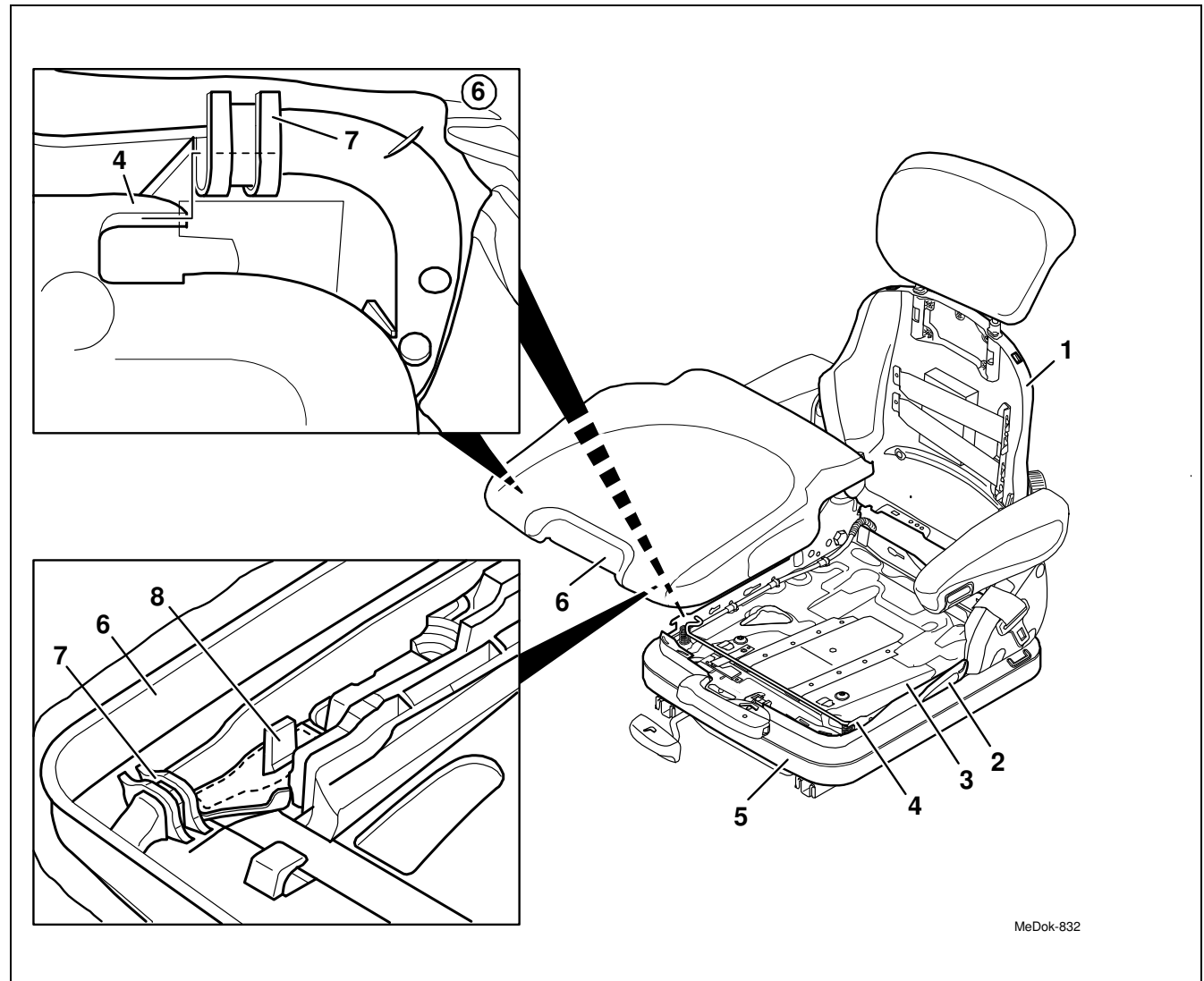
#### Installation

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

#### Notes:

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

- 2 Press down the front part of the seat cushion (6) on the left and right sides, and then slide it backwards with the two holders (7) onto the two hooks (4).



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### 3.2.1 Seat cushion – removal, installation (MSG65/511-522 and boat seat AVENTO-Premium)

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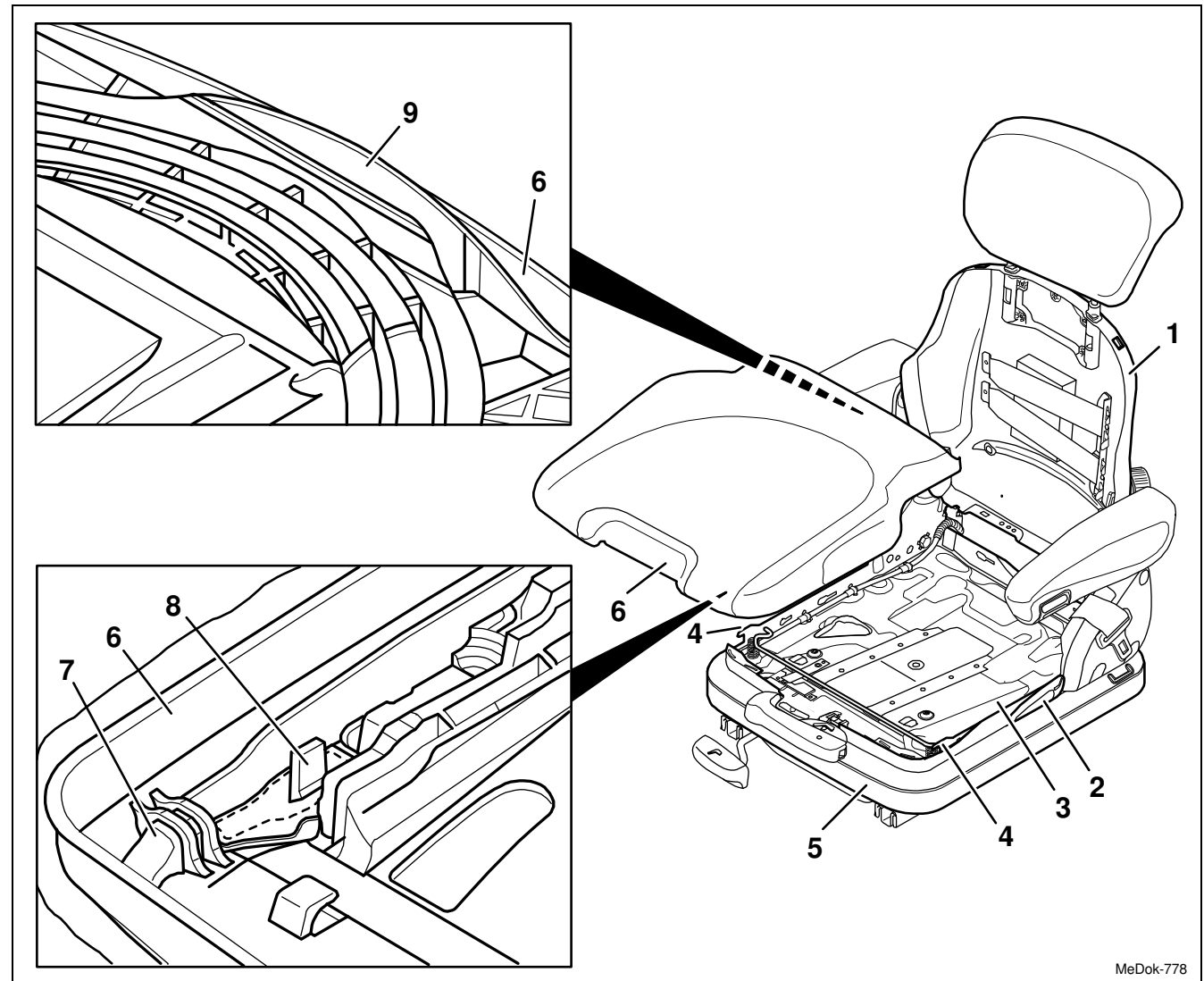
REMOVAL    INSTALLATION

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- 3 Press onto the seat cushion (6) at the back center until you hear the catcher grip (9) locking.

**Notes:**

- Check the function of the switch: Press onto the front left and right sides of the seat cushion (6) several times and check whether you hear the switch contacting (see Chapter 3.16).
- Check the bellows (5) for being squeezed or distorted between seat cushion (6) and spring pack (3). Release it if necessary.



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### 3.2.2 Seat cushion – removal, installation (Boat seat AVENTO-Evolution)



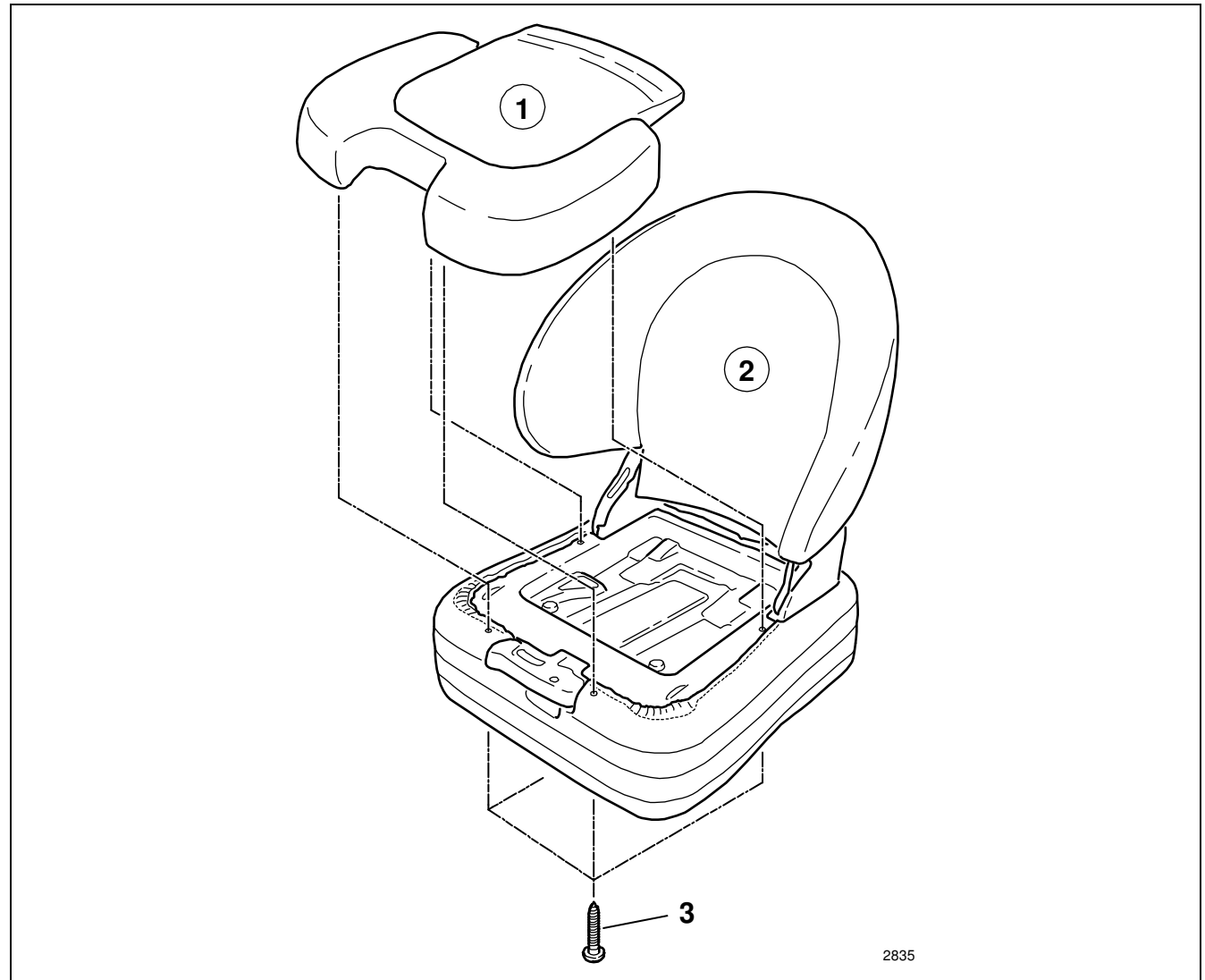
#### REMOVAL/INSTALLATION

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- (1) Seat cushion
- (2) Backrest cushion
- (3) Round head screw ..... 4 Nm

#### Removal and installation

- 1 Place the backrest cushion (2) in a vertical position.
  - 2 Unscrew four round head screws (3).
- Installation note:**  
Round head screws (3), 4 Nm.
- 3 Take the seat cushion (1) with both hands at the front left and right side, pull it out to the front and remove it.
  - 4 Re-install the components in the reverse order of their removal.



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### 3.3 Backrest extension with guide – removal, installation (MSG65/511-522 and boat seat AVENTO-Premium)

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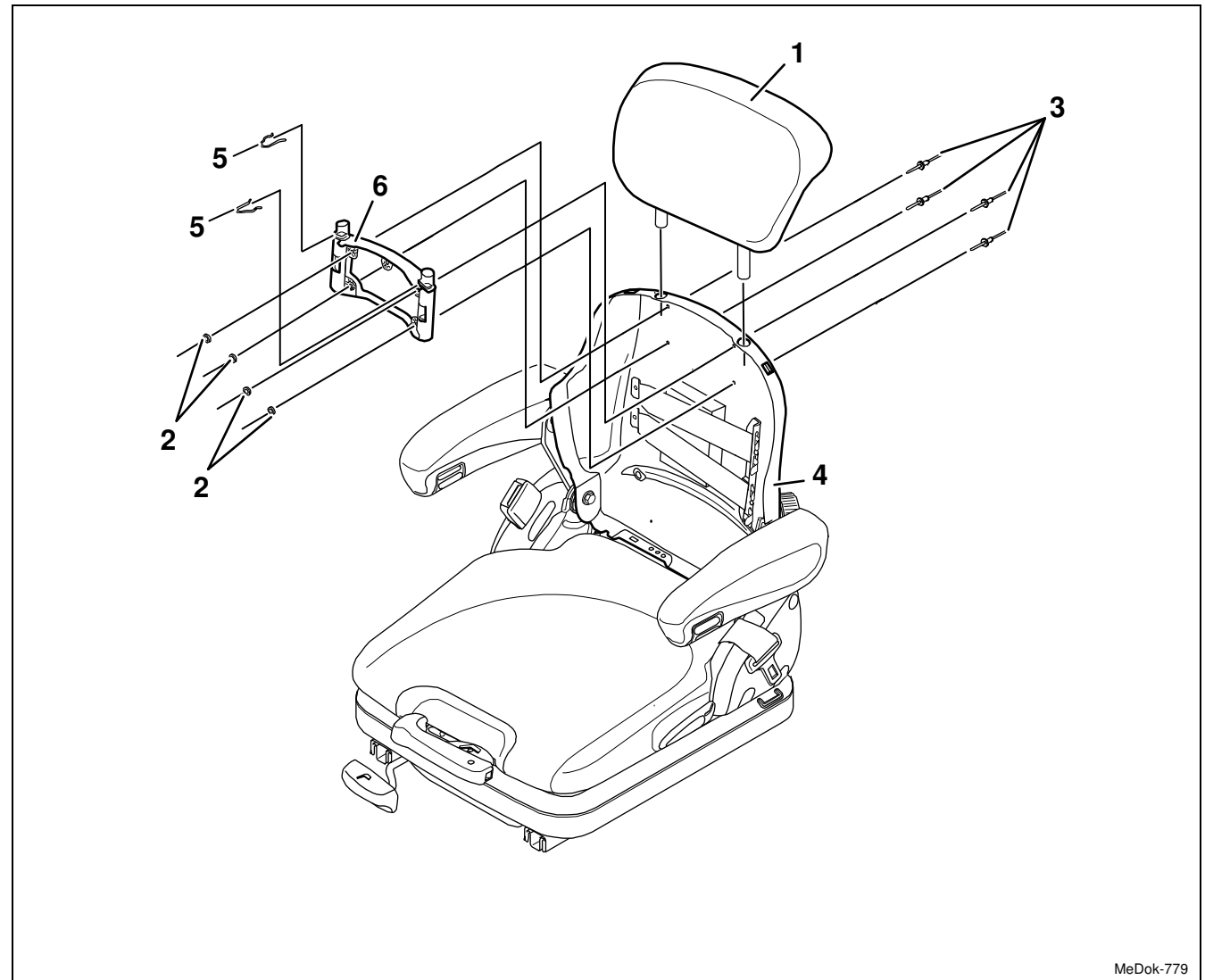
REMOVAL/INSTALLATION

TABLE OF CONTENTS

- (1) Backrest extension
- (2) Washer
- (3) Blind rivet
- (4) Backrest frame
- (5) Omega springs replace, if necessary
- (6) Holder

1 Remove the backrest cushion  
(Chap. 3.1).

2 **Seat with storage box:**  
Detach the storage box (Chap. 3.5).



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### 3.3 Backrest extension with guide – removal, installation (MSG65/511-522 and boat seat AVENTO-Premium)

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#### Removal, installation

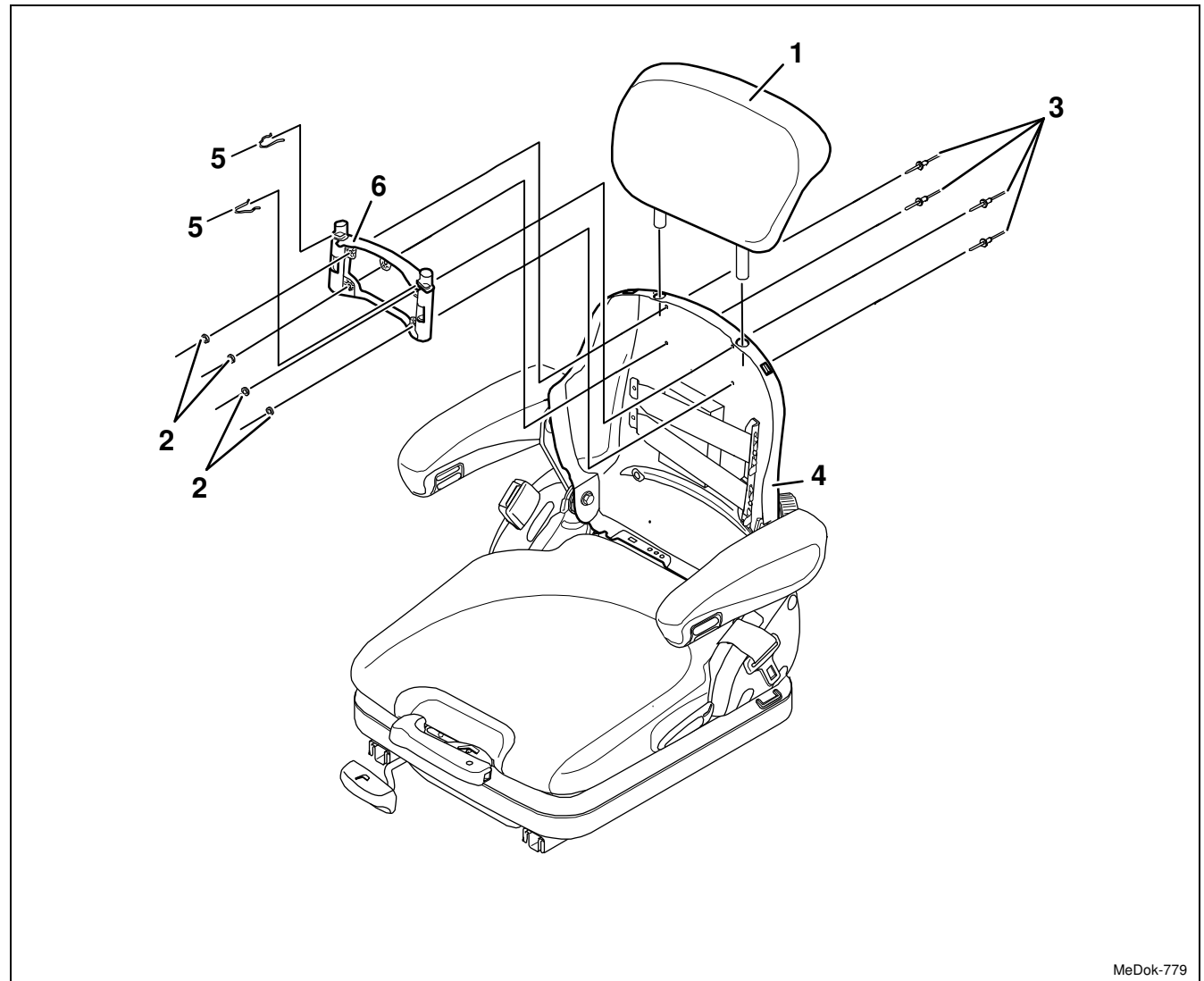
3 Remove the backrest extension (1), by pulling it upwards over the end stop in one move.

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

**Note:**

If the holder (6) of the boat seat AVENTO-Premium has to be replaced, the leather lining on the backrest frame (4) will be damaged.

5 Withdraw the holder (6) from the backrest frame (4) in a downward direction and then remove it.



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### 3.3 Backrest extension with guide – removal, installation (MSG65/511-522 and boat seat AVENTO-Premium)

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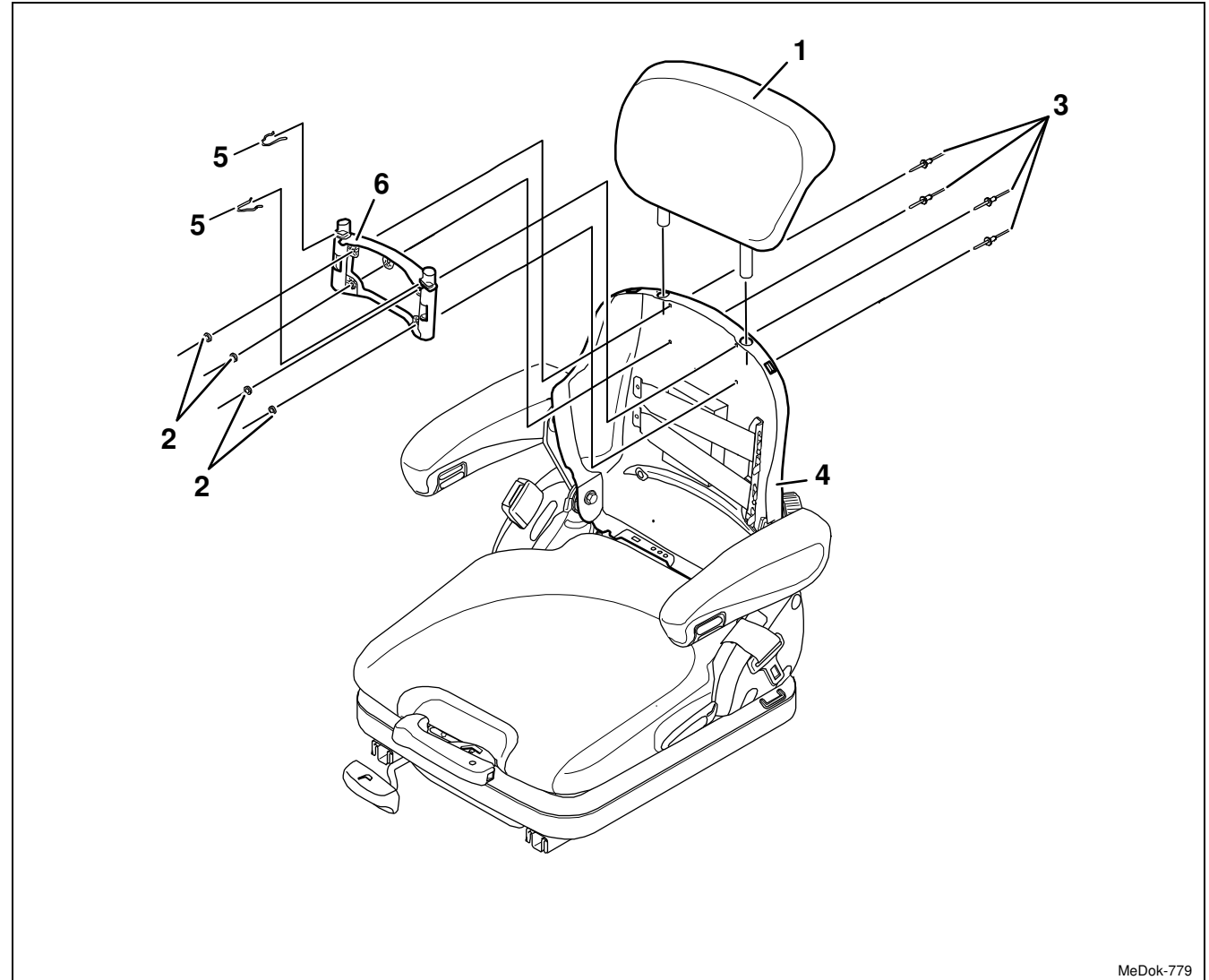
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#### 6 Replace the omega springs (5), if required:

Remove the two omega springs (5) from the holder (6).

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



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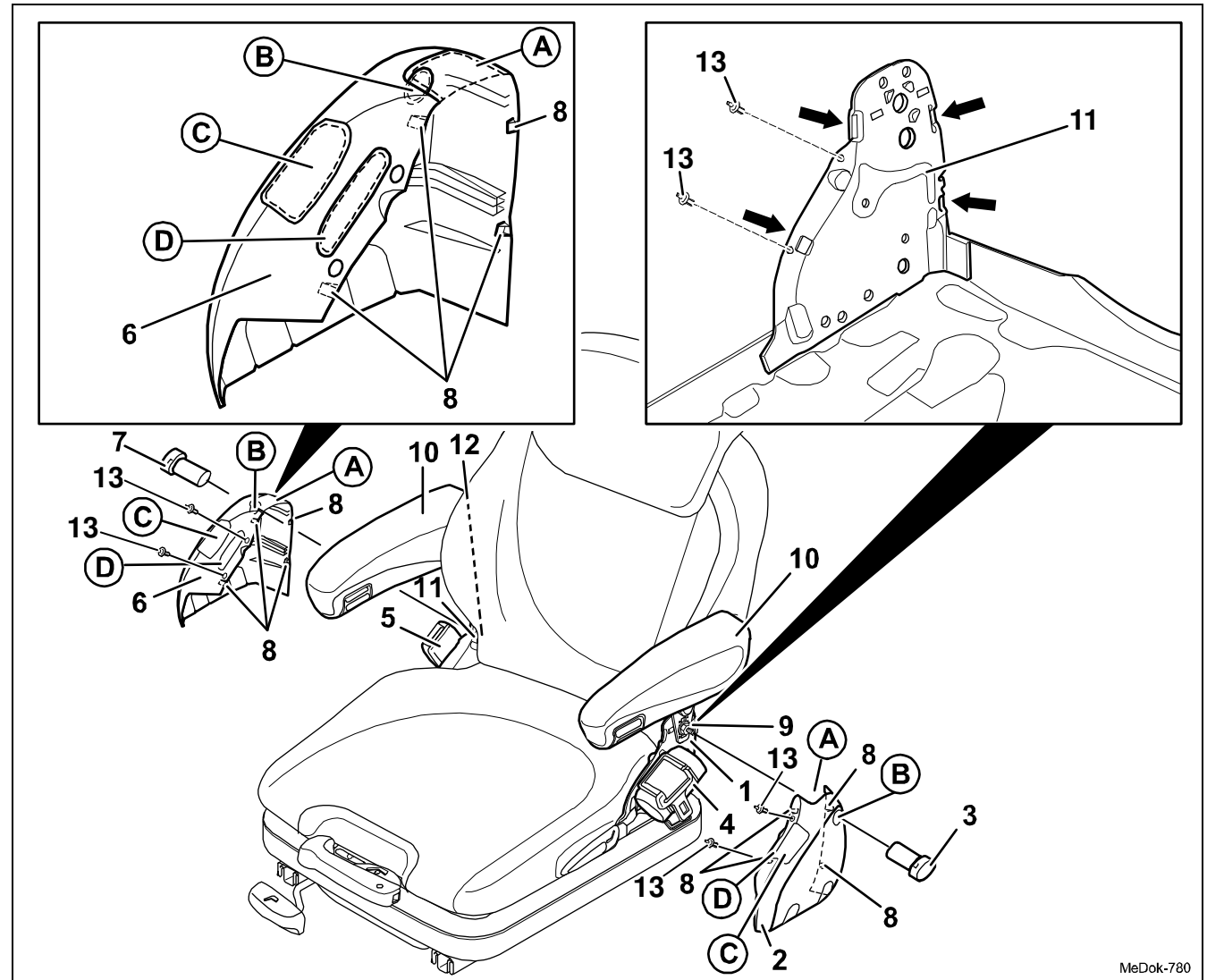
### 3.4 Cover, right and left – removal, installation

#### REMOVAL/INSTALLATION

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- (1) Left backrest fixture (spring pack)
- (2) Left cover
- (3) Left cap cover
- (4) Belt roller
- (5) Seat belt buckle
- (6) Right cover
- (7) Right cap cover
- (8) Catchers
- (9) Left hexagon nut
- (10) Armrest
- (11) Right backrest fixture (spring pack)
- (12) Right hexagon nut
- (13) Expanding rivet



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### 3.4 Cover, right and left – removal, installation

#### REMOVAL/INSTALLATION

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#### Removal, installation

##### 1 Seat with armrests (10):

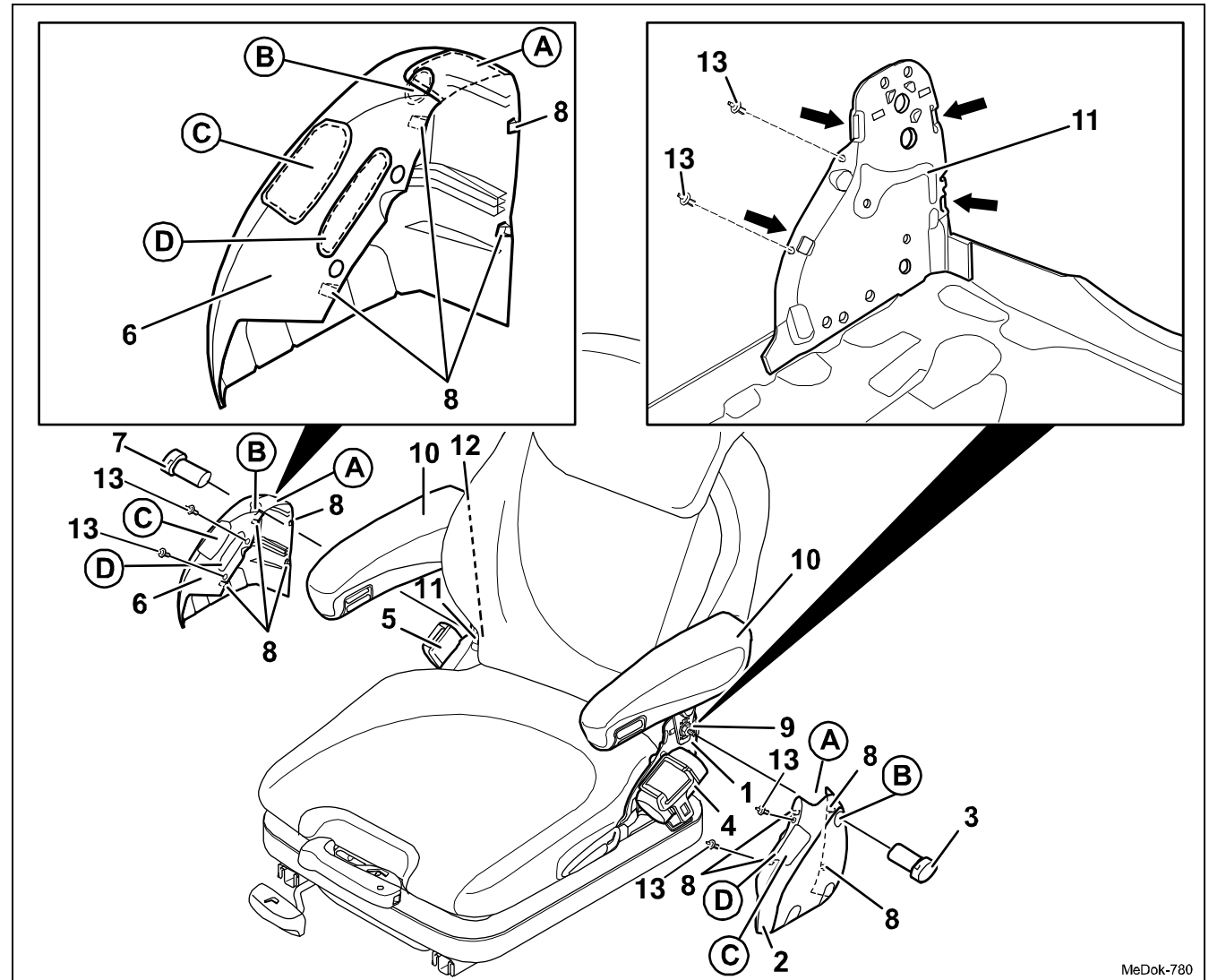
User a screw-driver to lever out the left cap cover (3) from the hexagon nut (9) and the right one (7) from the hexagon nut (12) and then remove them.

##### Installation note:

When attaching the left cap cover (3) or the right one (7), make sure the cap cover (3 or 7) is put on the hexagon nut (9 or 12).

2 Drive out four expanding rivets (13) on the covers at the left side (2) and at the right side (6)

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



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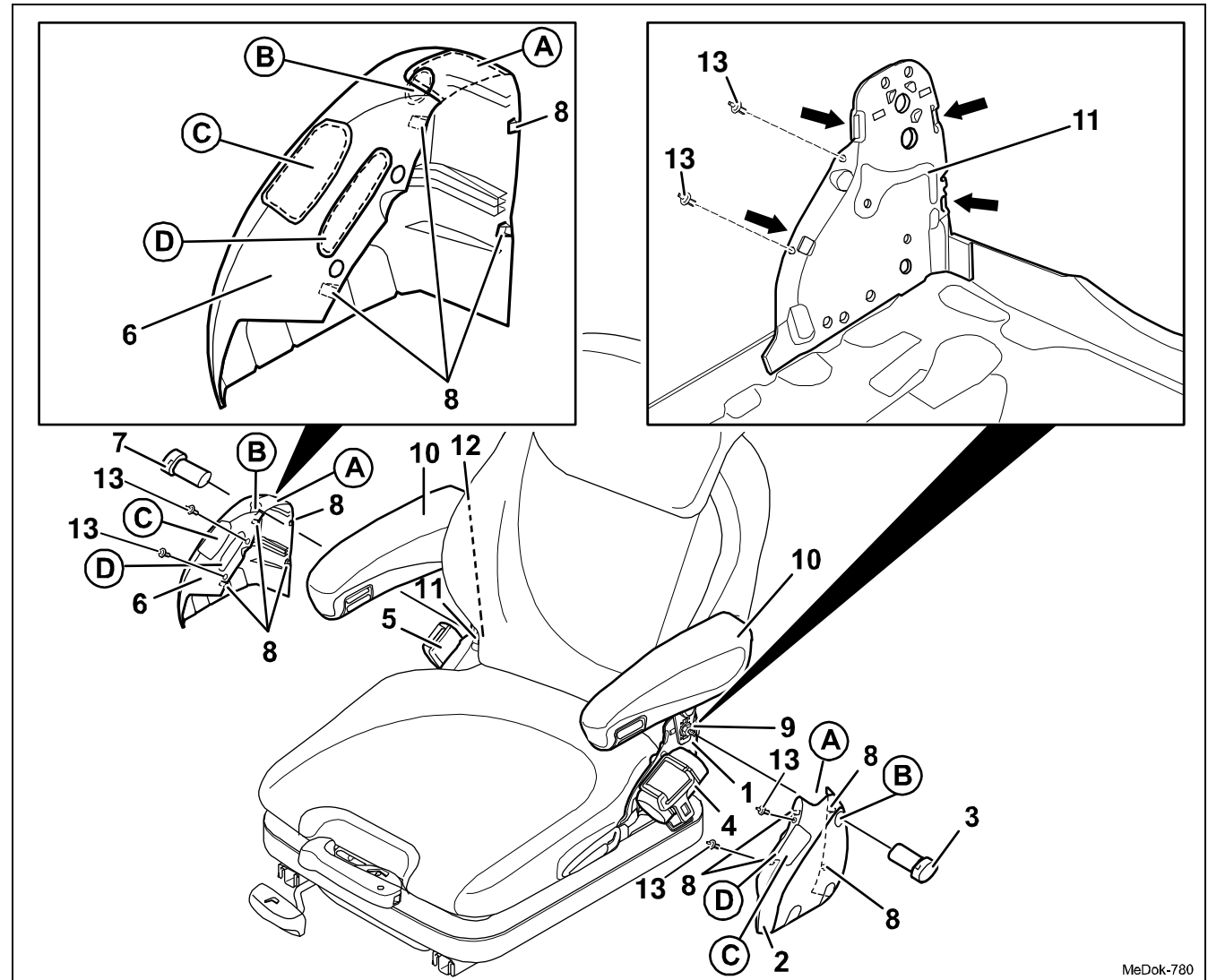
### 3.4 Cover, right and left – removal, installation

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- 4 Pull out the belt of the belt roller (4) through the notch (D) of the left cover (2) and remove the cover on the left (2).
- 5 Release the four catchers (8) of the right cover (6) from the imprints (arrow) on the backrest fixture (11) on the right.
- 6 Pull the right cover (6) over the belt buckle (5) and remove it.
- 7 Replacement of the left (2) or right (6) cover:**  
When replacing the left (2) or right cover (6), break off the predetermined breaking points (A, B, C, D) for armrest (10), cap cover (3 or 7), belt buckle (5) and belt roller (4), if required.
- 8 Re-install the components in the reverse order of their removal.



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### 3.5 Storage box – removal, installation (optional extras)

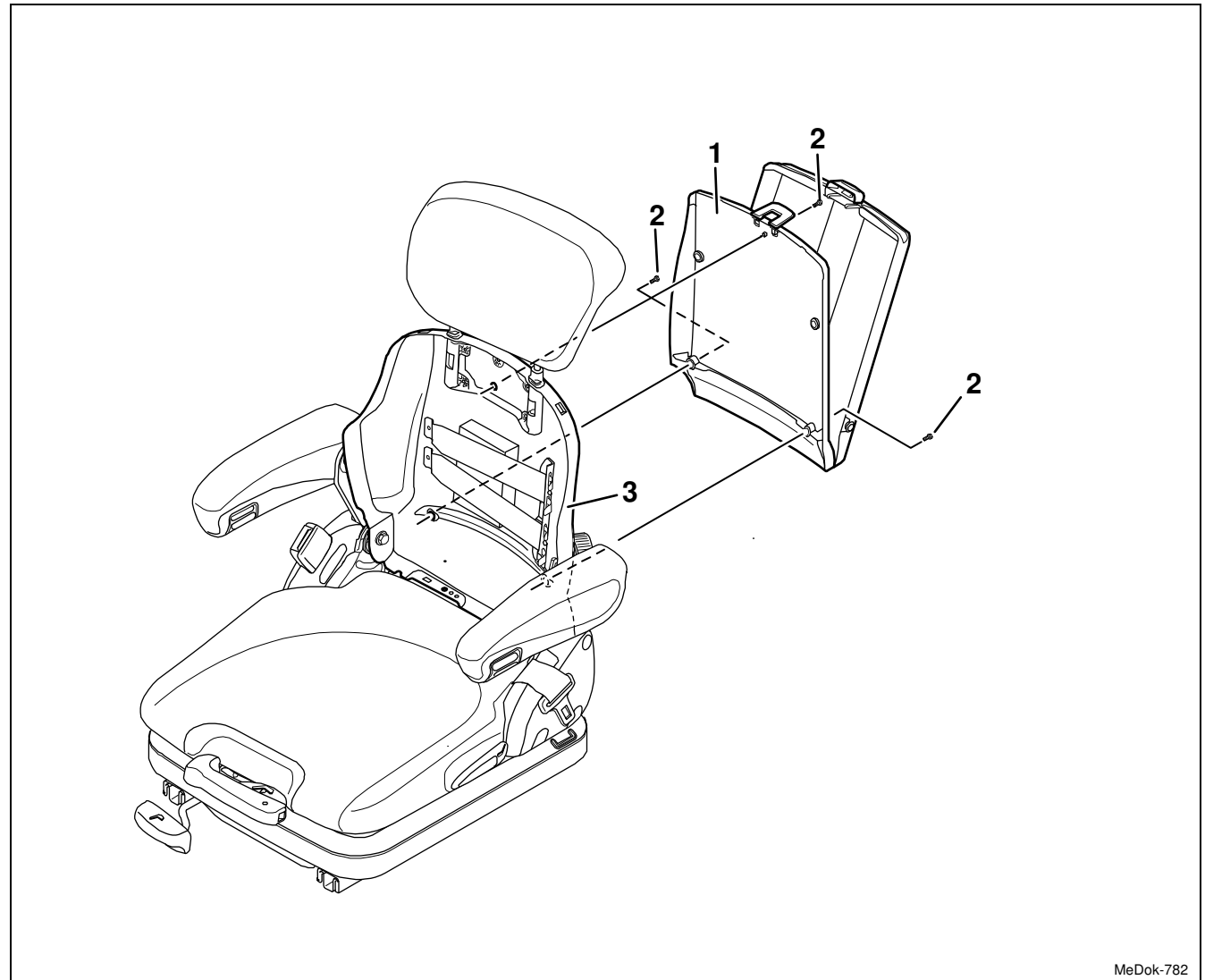
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- (1) Storage box
- (2) Self-tapping screw ..... 1.6 Nm
- (3) Backrest frame

1 Remove the backrest cushion  
(Chap. 3.1).



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### 3.5 Storage box – removal, installation (optional extras)

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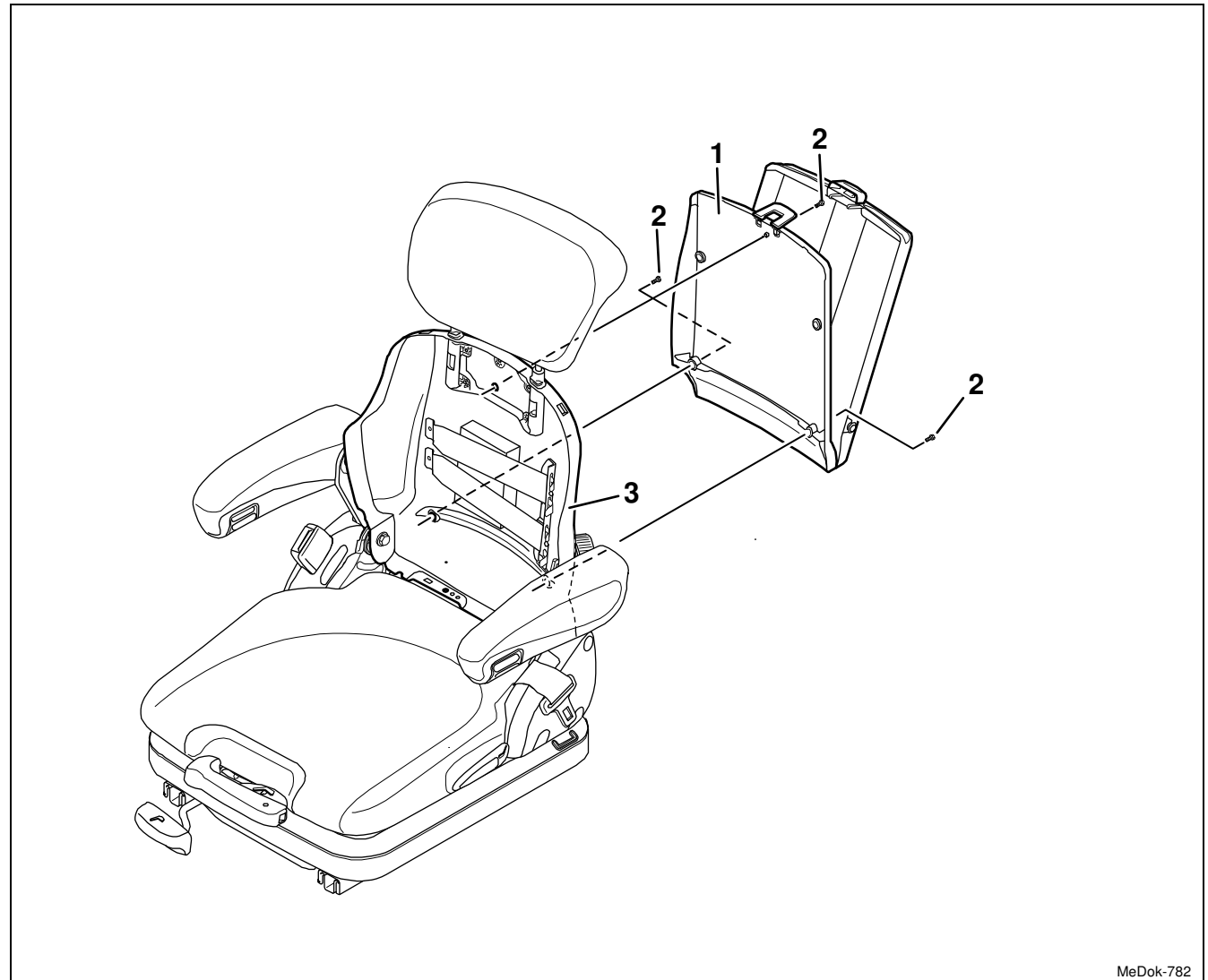
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#### Removal, installation

- 2 Open the storage box (1).
  - 3 Undo the three self-tapping screws (2) and remove the storage box (1) from the backrest frame (3).
- Installation note:**  
Self-tapping screw, 1.6 Nm.
- 4 Re-install the components in the reverse order of their removal.



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### 3.6 Armrests – removal, installation (optional extras)

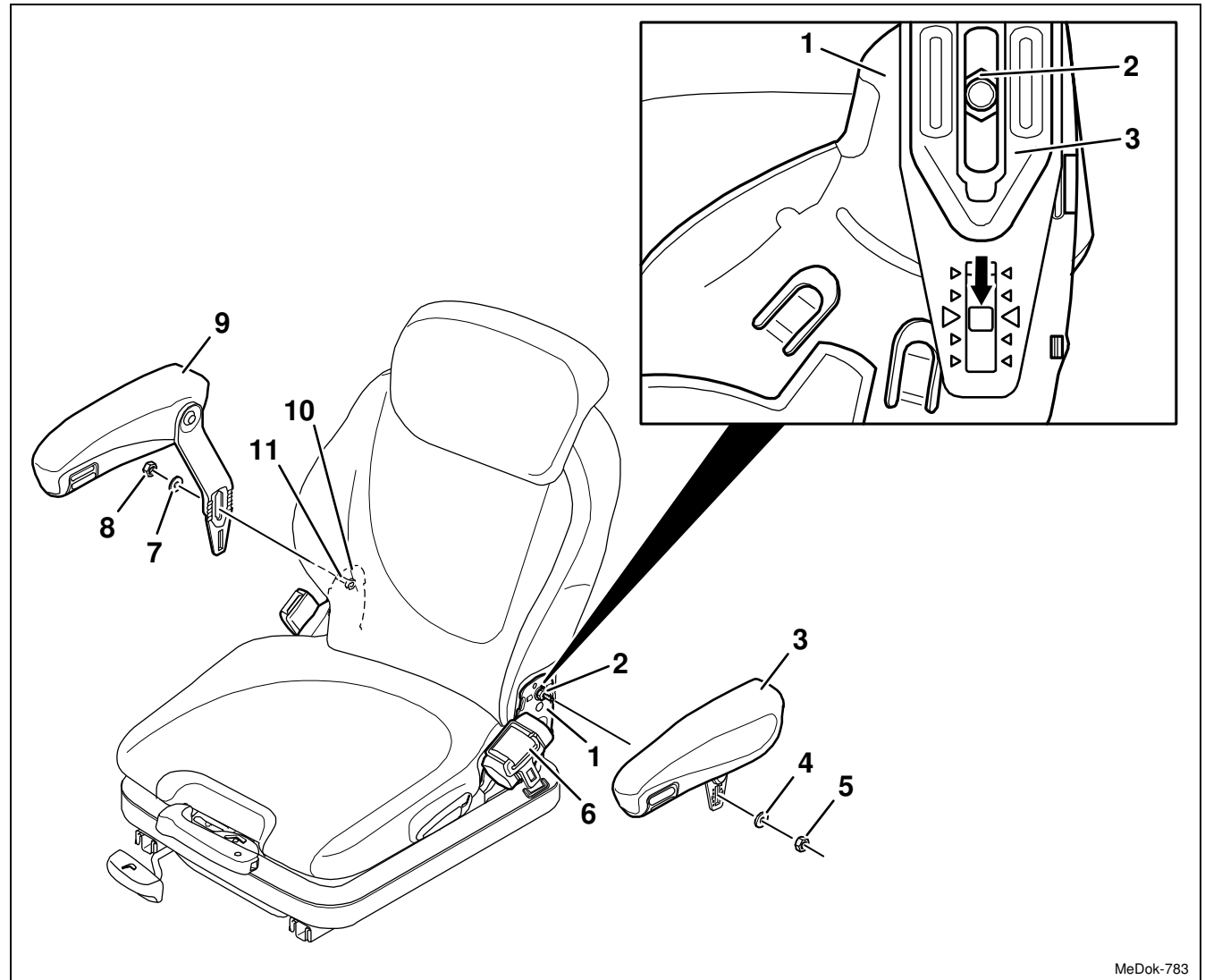
#### REMOVAL/INSTALLATION

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- (1) Left backrest fixture (spring pack)
- (2) Hexagon nut
- (3) Left armrest
- (4) Washer
- (5) Hexagon nut ..... 25 Nm
- (6) Belt roller
- (7) Washer
- (8) Hexagon nut ..... 25 Nm
- (9) Right armrest
- (10) Right backrest fixture (spring pack)
- (11) Hexagon nut

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



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### 3.6 Armrests – removal, installation (optional extras)

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#### Removal, installation

- 2 Loosen the belt roller (6) to remove the left armrest (3) (see Chapter 3.9).

**Note:**

Loosen the belt roller (6) by turning the hexagon nut not more than twice, otherwise the seat cushion has to be removed to secure the hexagon bolt.

**Installation note:**

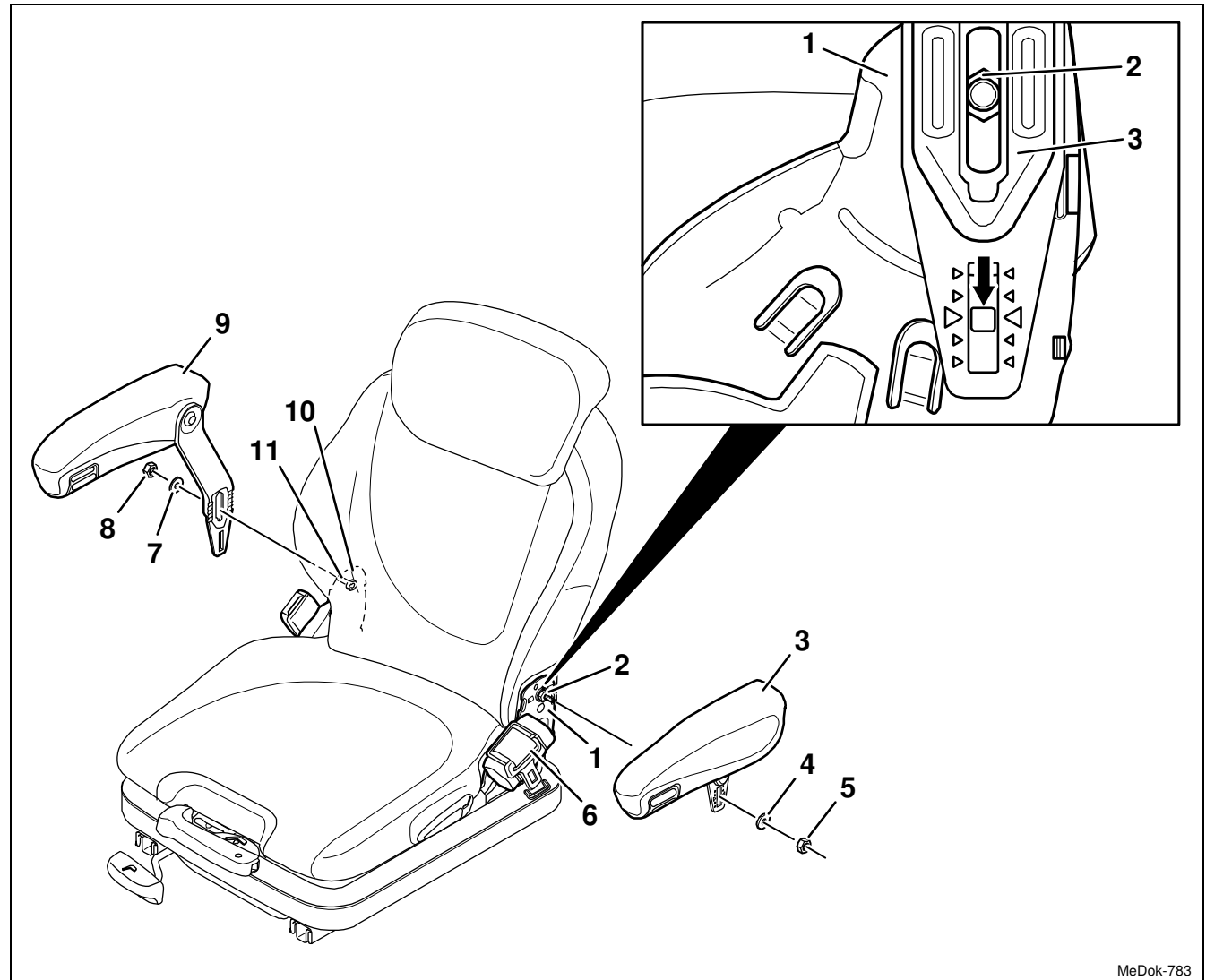
Tighten the belt roller (6) after the left armrest (3) has been replaced.

- 3 Undo the hexagon nut (5 or 8) and remove the washer (4 or 7).

**Installation note:**

Hexagon nut (5 or 8), 25 Nm.

- 4 Pull off the left (3) or right (9) armrest from the hexagon nut (2 or 11) and remove it to the side.



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### 3.6 Armrests – removal, installation (optional extras)

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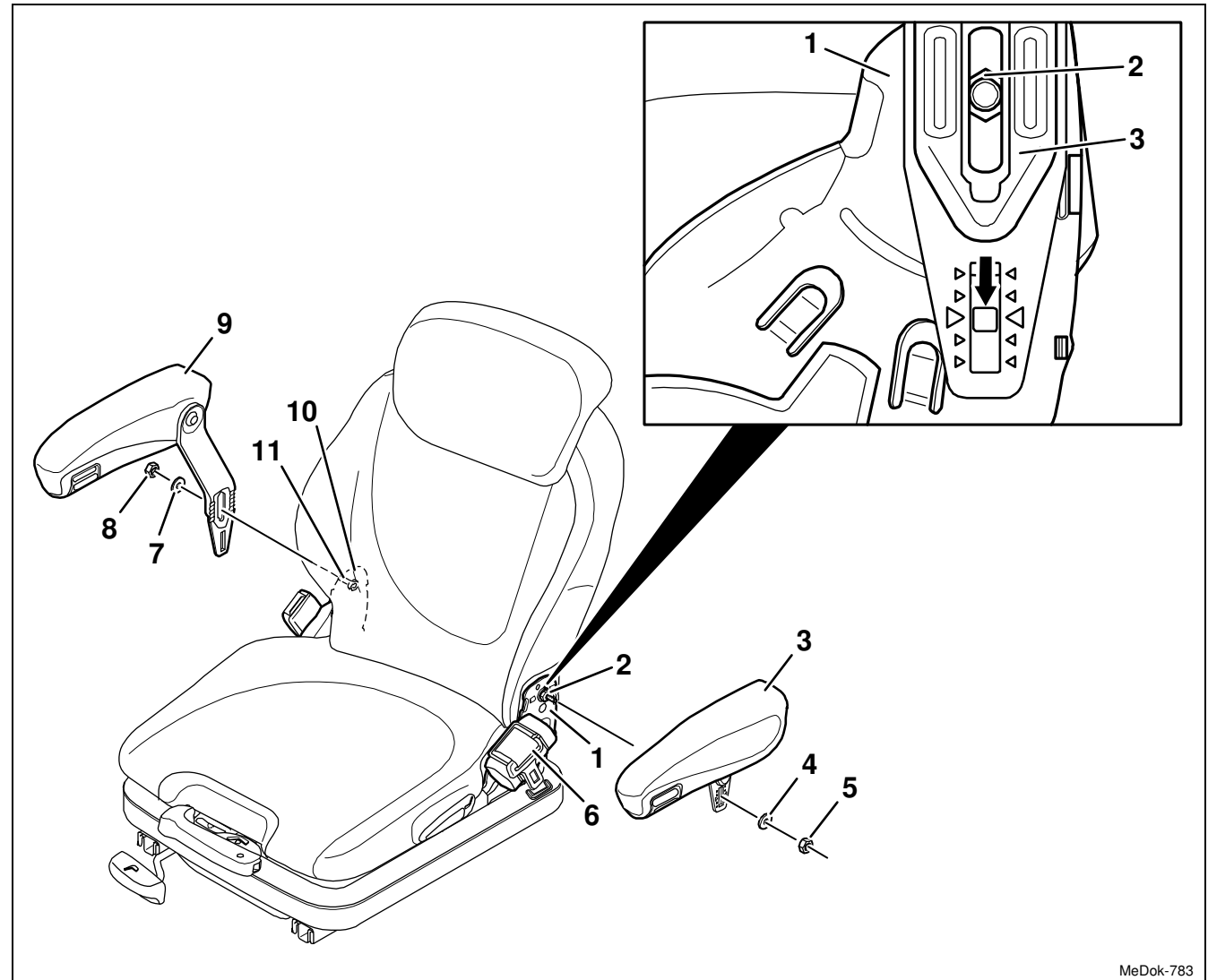
#### Note:

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

#### Installation note:

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

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



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### 3.7 Backrest frame with retaining spring – removal, installation

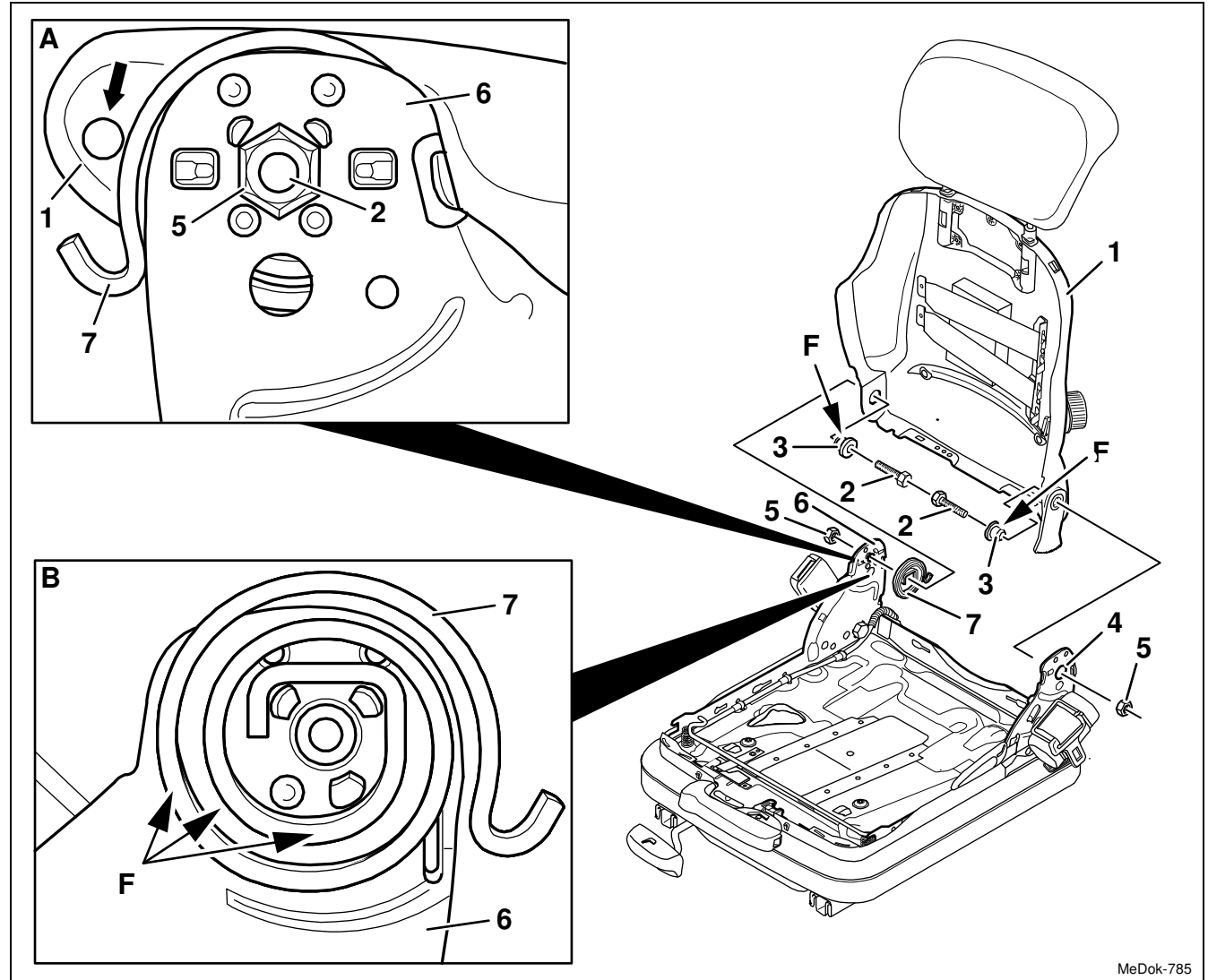
#### REMOVAL/INSTALLATION

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- (1) Backrest frame
- (2) Flange bolts ..... 25 Nm
- (3) Bushing ..... grease
- (4) Left backrest fixture (spring pack)
- (5) Hexagon nut
- (6) Right backrest fixture (spring pack)
- (7) Retaining spring ..... grease

- 1 Remove the backrest cushion (Chap. 3.1).
- 2 Remove the seat cushion (Chap. 3.2).
- 3 Remove the left and right covers (Chap. 3.4).



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### 3.7 Backrest frame with retaining spring – removal, installation

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#### 4 Seat with armrests:

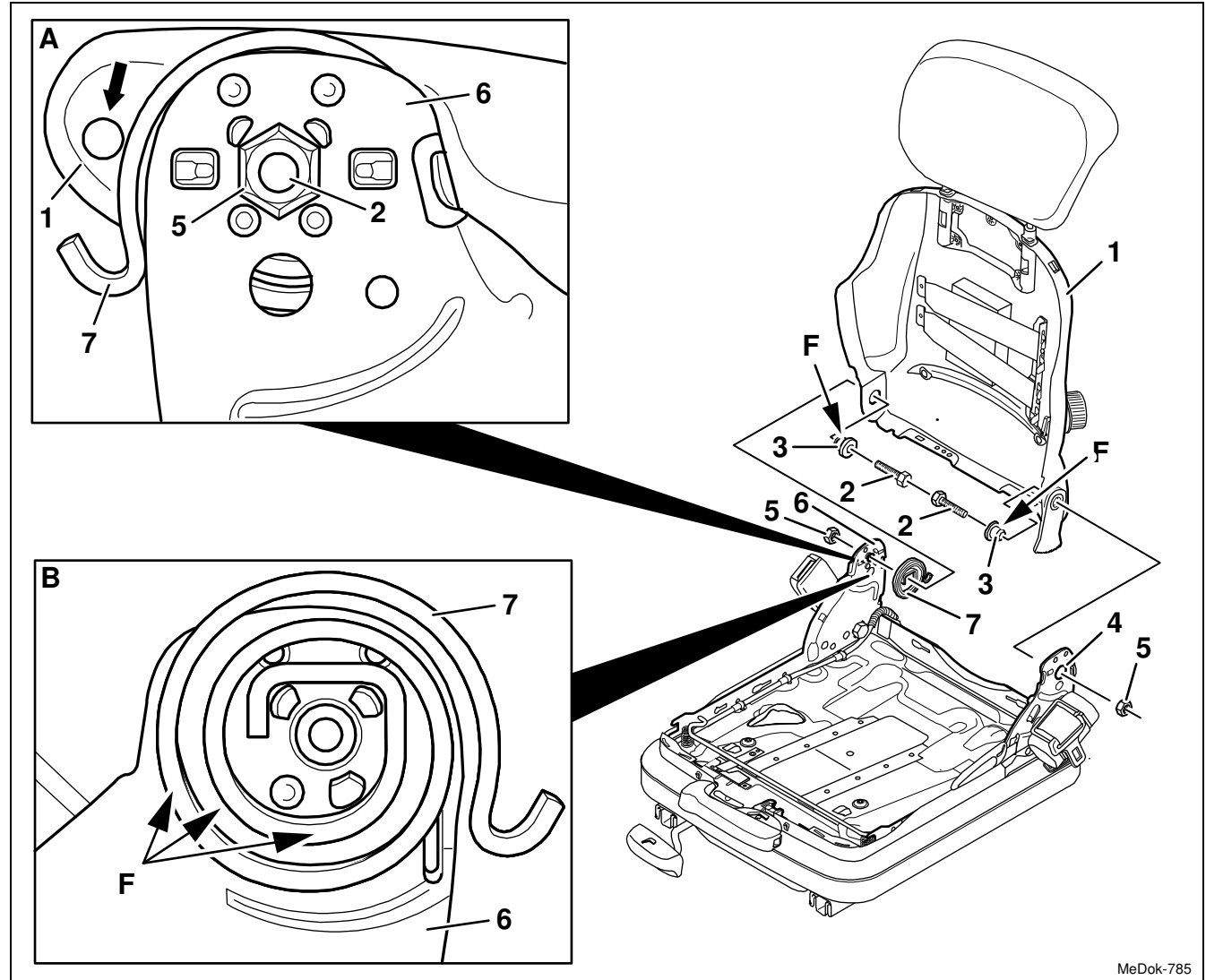
Remove the armrests (Chap. 3.6).

#### Removal, installation

- 5 To release the retaining spring (7), fold the backrest frame (1) completely forwards.
- 6 Undo the two flange bolts (2) and take off the hexagon nuts (5).

#### Installation notes:

- Flange bolt (2), 25 Nm.
- The hexagon nut (5) acts as anti-rotation device and guide for the armrest (see Chapter 3.6). When tightening the flange bolt (2), the hexagon nut (5) must be held so that the two opposite outer surfaces of the hexagon nut (5) are located vertically.



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### 3.7 Backrest frame with retaining spring – removal, installation

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- 7 Slightly press the backrest frame (1) against the right backrest fixture (6) and simultaneously lever it out from the left backrest fixture (4) in an upward direction, and then remove it.

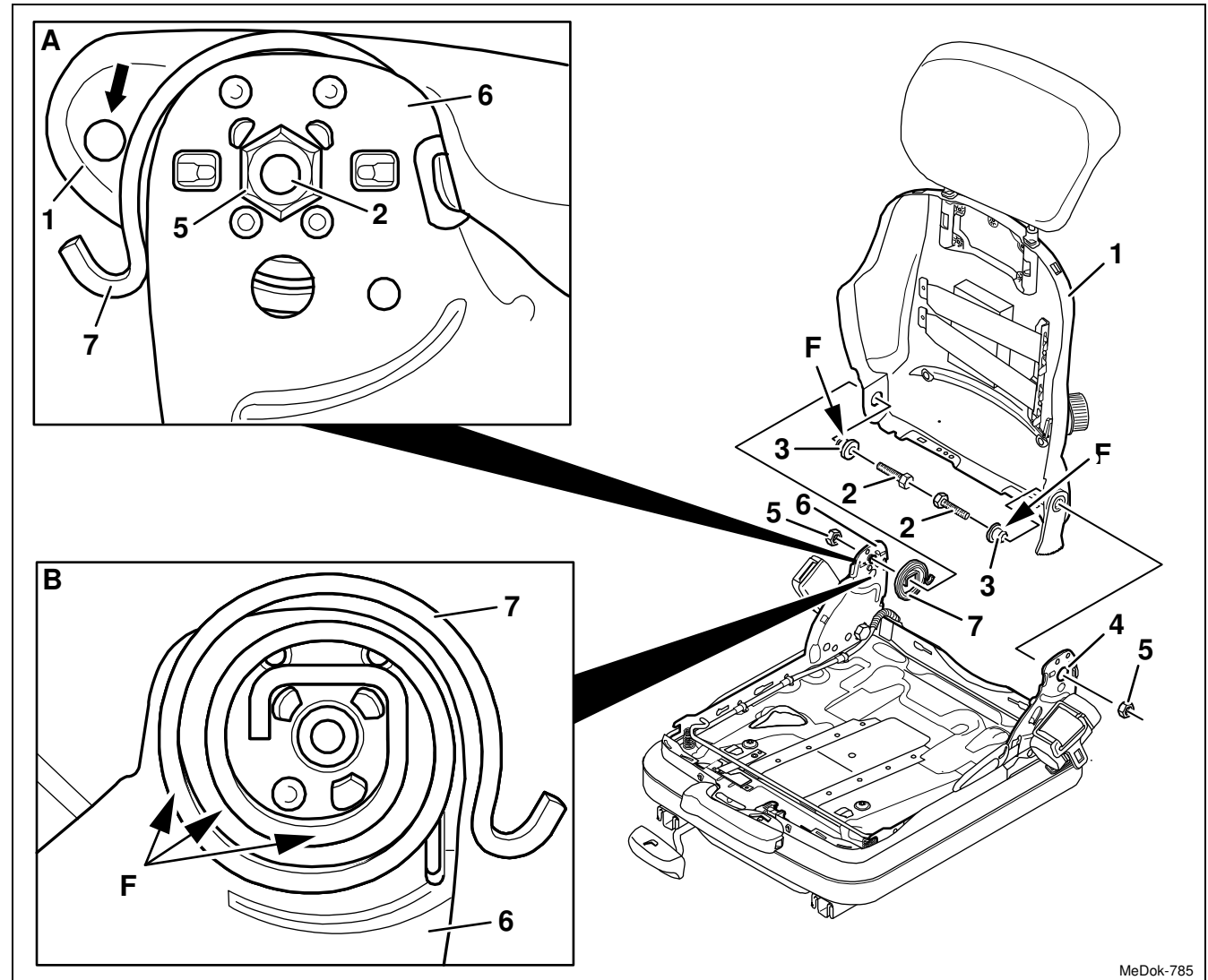
**Installation note:**

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

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

**Installation note:**

Apply acid-free multi-purpose lubricant to the entire surface (F) of the bushing (3).



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### 3.7 Backrest frame with retaining spring – removal, installation

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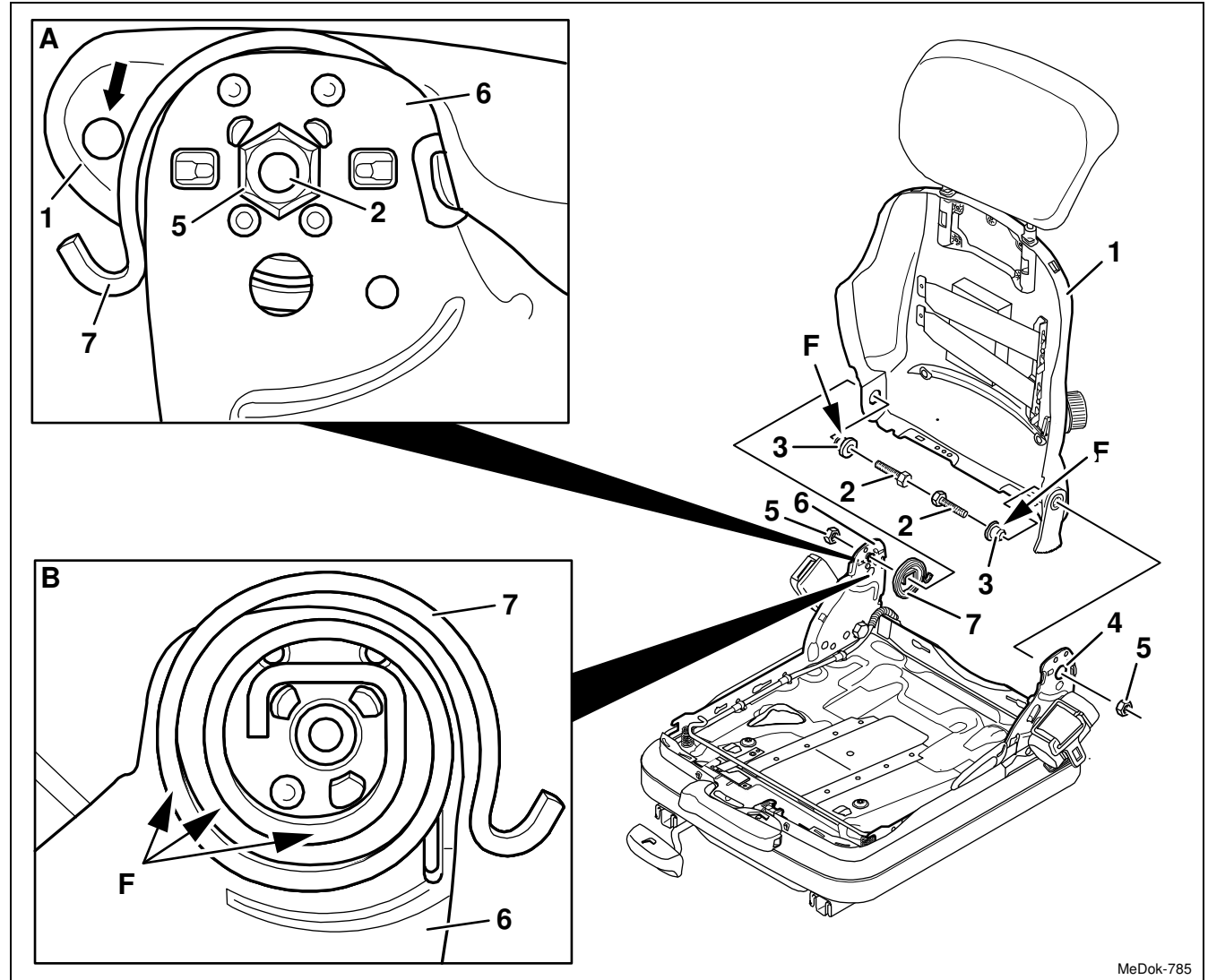


9 Take off the retaining spring (7) from the right backrest fixture (6).

**Installation notes:**

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

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



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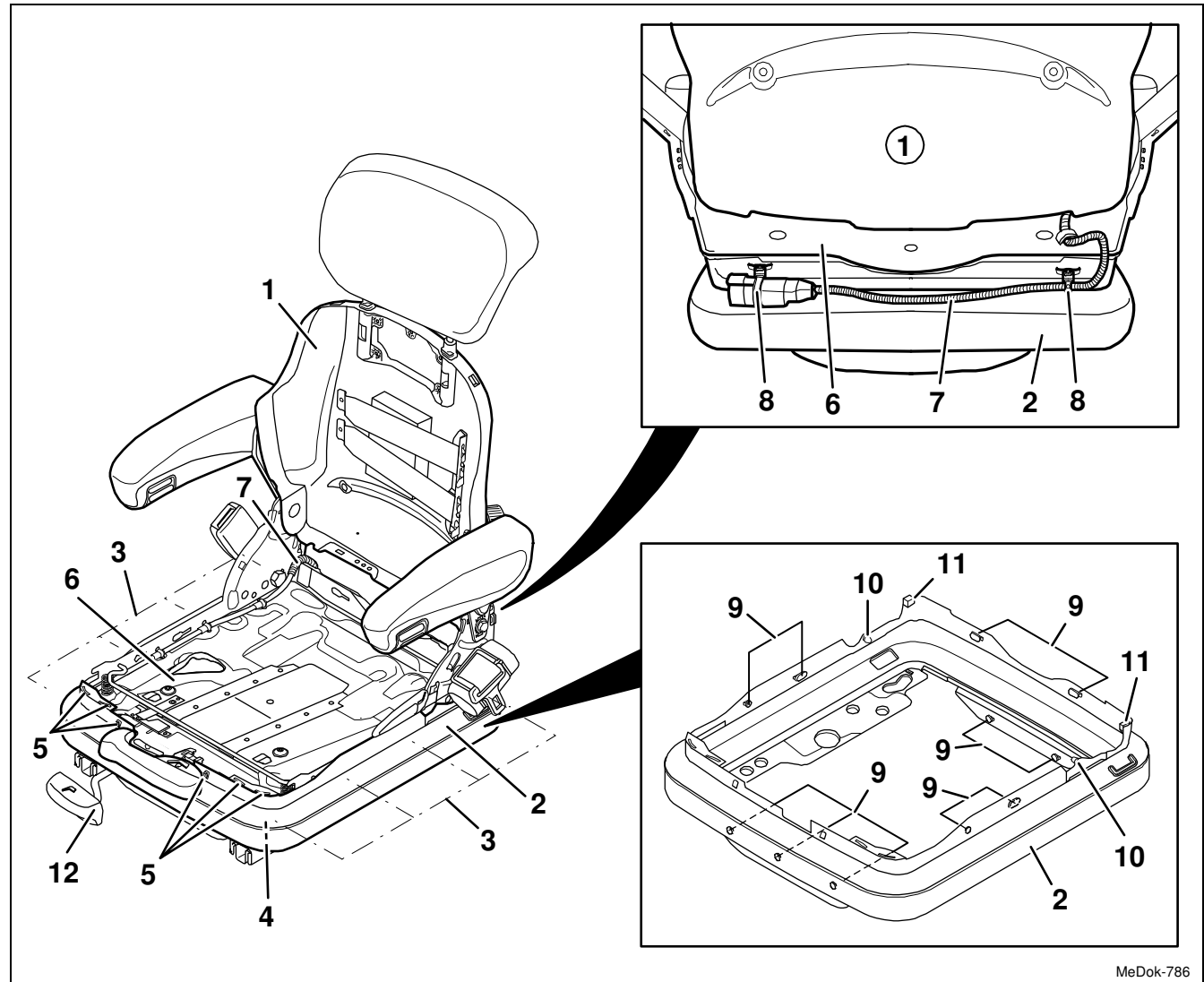
### 3.8 Bellows – removal and installation

#### REMOVAL/INSTALLATION

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- (1) Backrest frame
- (2) Bellows
- (3) Hooks (lower part of the suspension)
- (4) Lower part of the suspension
- (5) Hooks (spring pack)
- (6) Spring pack
- (7) Seat switch with cable
- (8) Cable ties with anchor ties
- (9) Keyhole knobs
- (10) Mushroom knobs
- (11) Bellows lug
- (12) Handle for fore/aft adjustment



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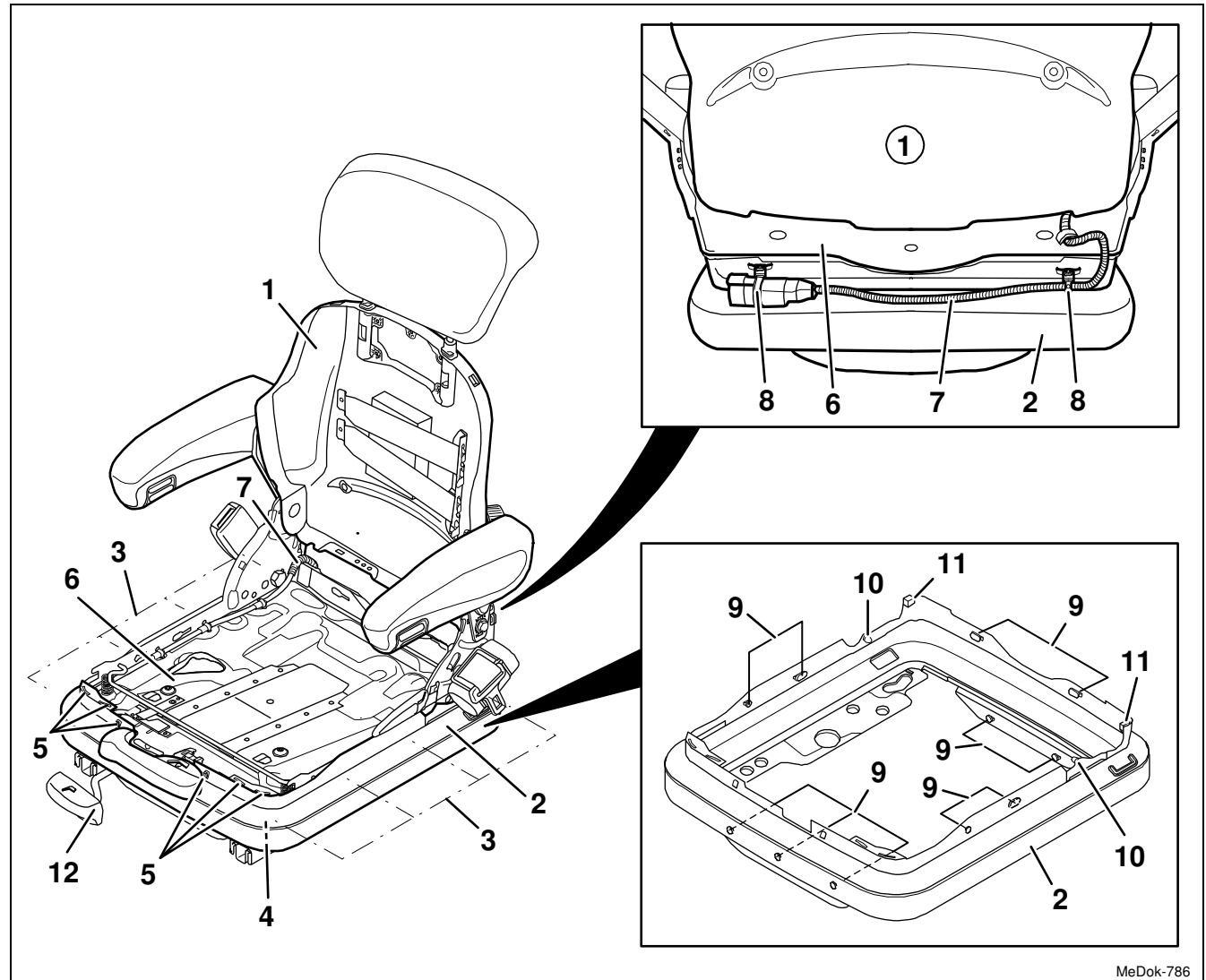
### 3.8 Bellows – removal and installation

#### REMOVAL/INSTALLATION

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- 1 Remove the backrest cushion (Chap. 3.1).
- 2 Remove the seat cushion (Chap. 3.2).
- 3 Remove the left and right covers (Chap. 3.4).
- 4 **Boat seat AVENTO-Evolution:**  
Suspension cover – removal, installation (Chapter 3.23).



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### 3.8 Bellows – removal and installation

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#### Removal, installation

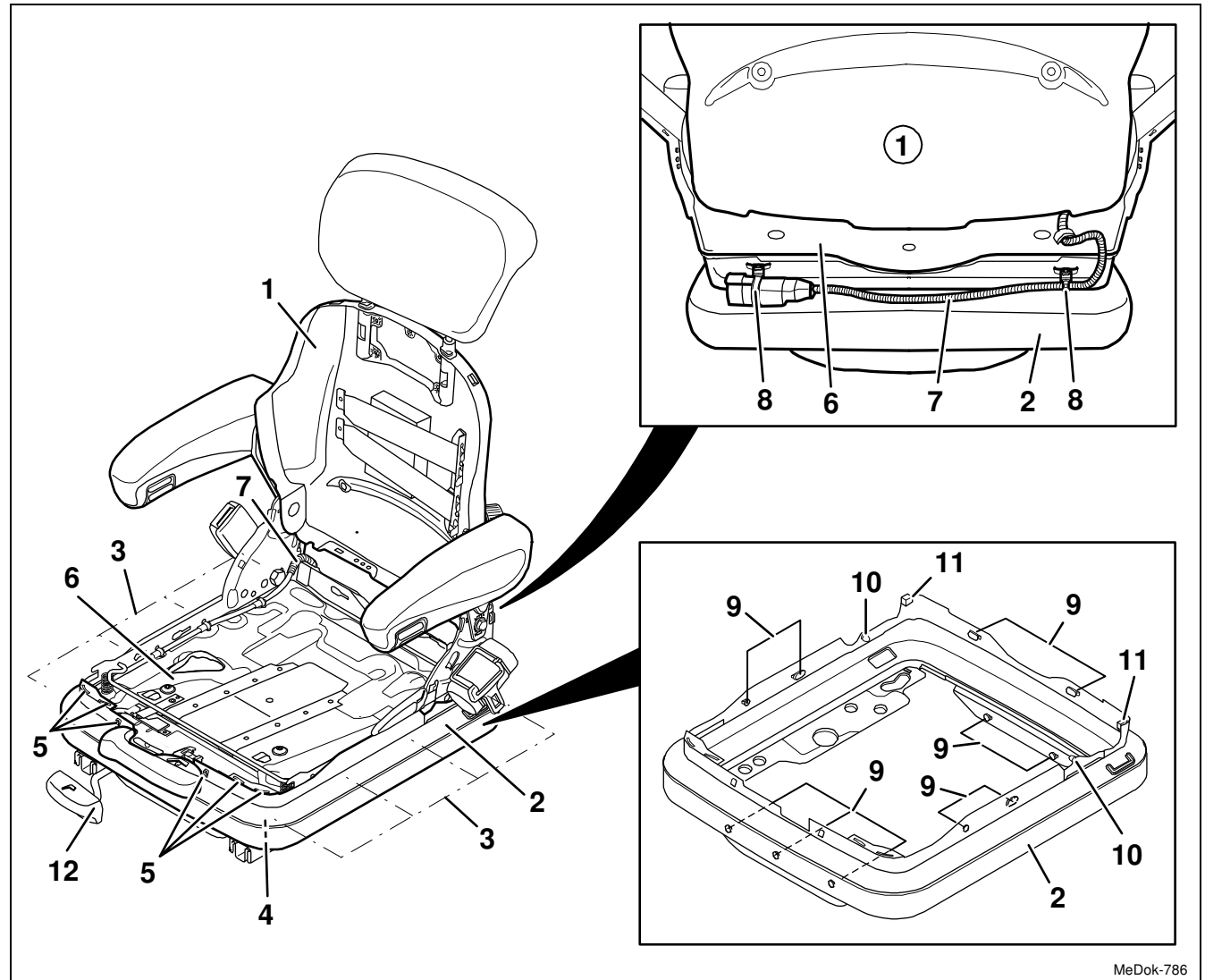
5 Pull out two cable ties with anchor ties (8) from the spring pack (6) and bellows (2).

**Note:**

To protect the seat switch with cable (7) against possible impacts, push the seat switch with cable (7) forward between the spring pack (6) and the backrest frame (1) and place it onto the spring pack (6).

**6 Delivery option for construction machines:**

Thread the left and right webbing from the bellows (2) (see Chapter 3.20.2).



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### 3.8 Bellows – removal and installation

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- 7 Remove the two mushroom knobs (10) from the spring pack (6).

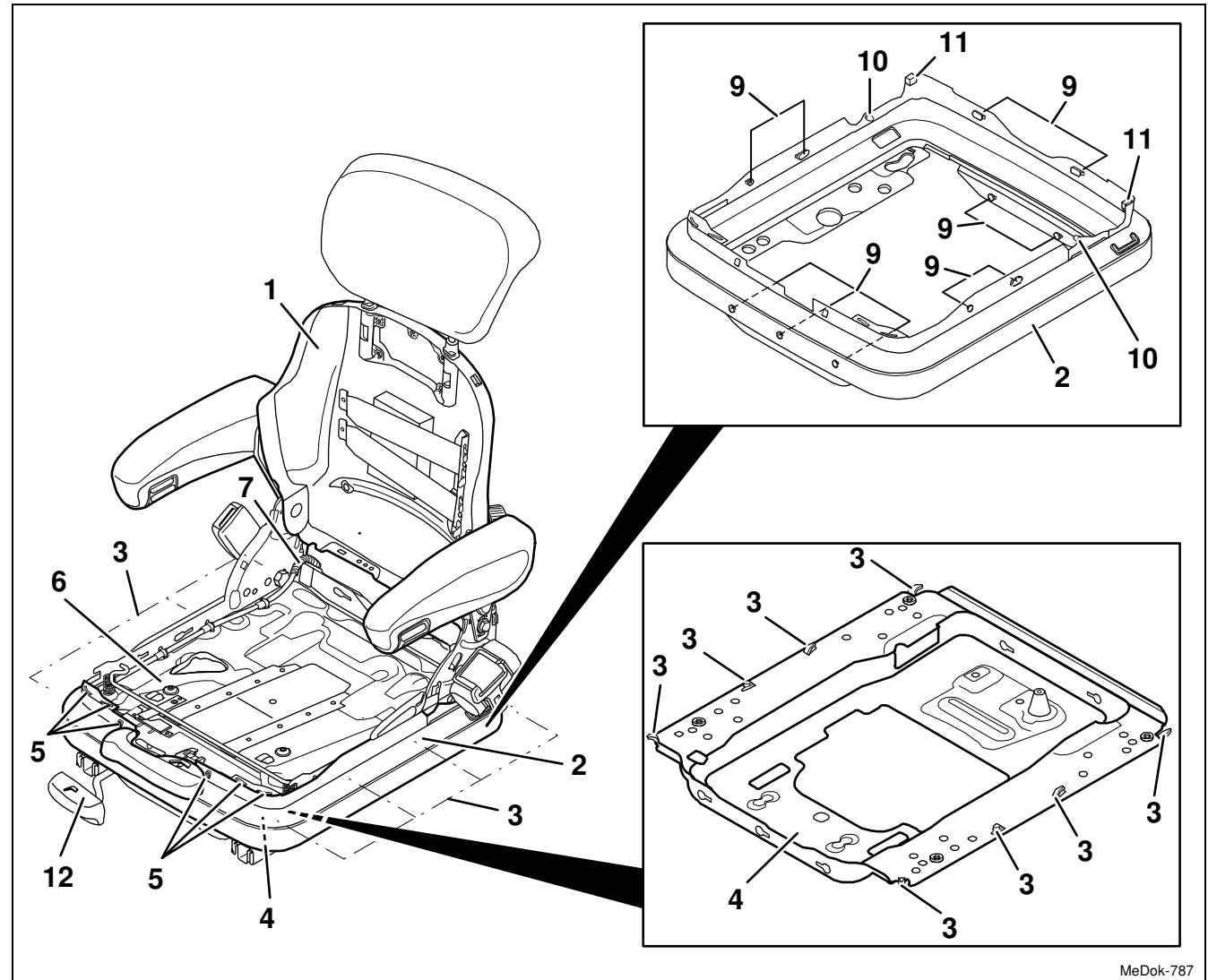
**Installation note:**

Stick a mandrel (size 3) through the opening in the bellows (2) in the mushroom knob (10) to the limit stop. For stretching the mushroom knob (10), pull the bellows (2) slightly towards the mandrel while sticking the mushroom knob (10) into the hole of the spring pack (6). Pull out the mandrel from the mushroom knob (10).

- 8 Take off the two bellows lugs (11) from the spring pack (6).

- 9 Take off six keyhole knobs (9) from the spring pack (6) on the right, left and back sides.

- 10 Remove the bellows (2) in the front from the six hooks (5).



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### 3.8 Bellows – removal and installation

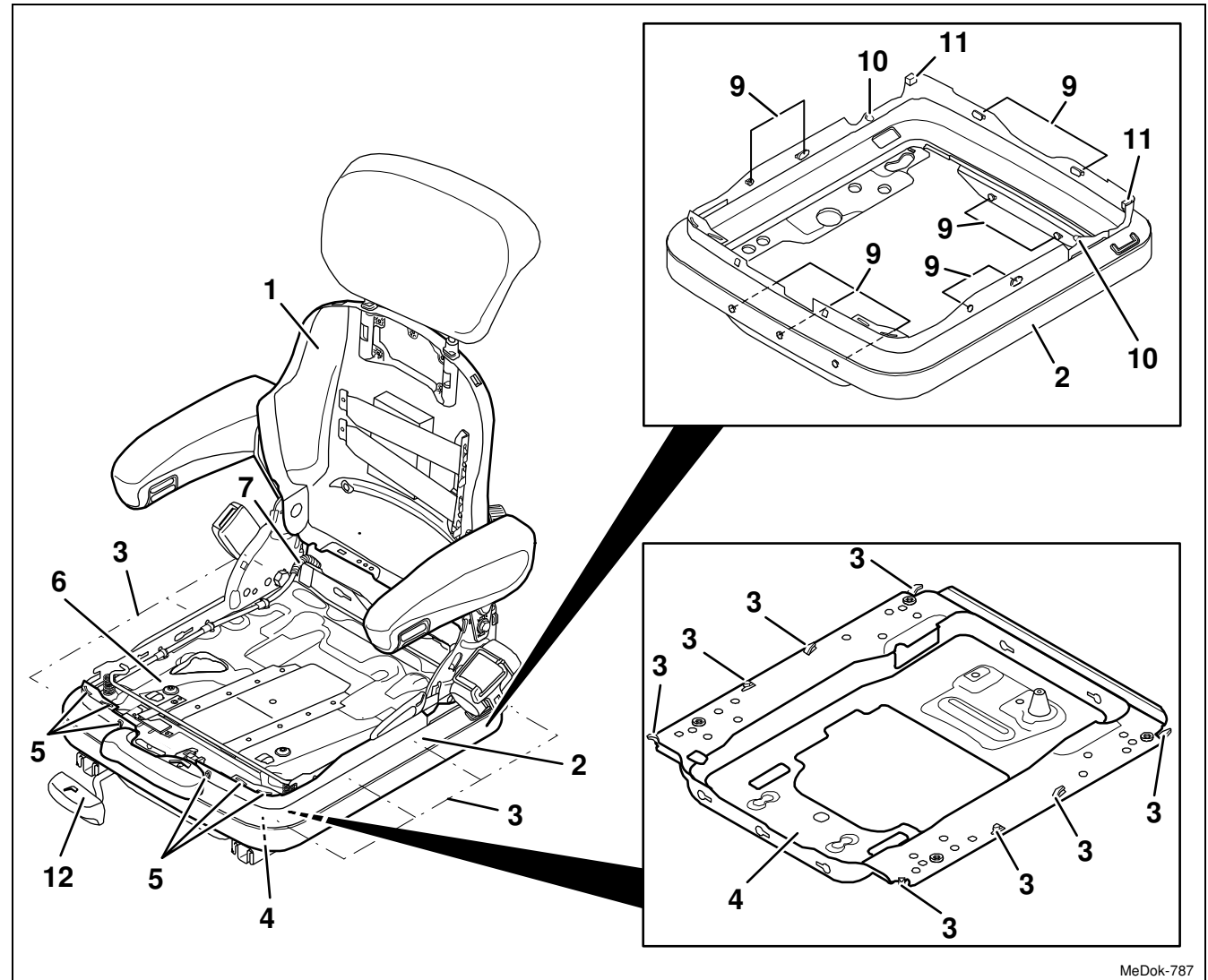
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- 11 Take off three keyhole knobs (9) from the upper part of the suspension in the front (4) and two keyhole knobs (9) from the upper part of the suspension (4) in the back.
- 12 Take off the bellows (2) from the eight hooks (3) on the left and right sides from the lower part of the suspension (4).
- 13 Pull down the back part of the bellows (2) over the lower part of the suspension (4).
- 14 Pull the front part of the bellows (2) over the lower part of the suspension (4) and handle for fore/aft adjustment (12). Remove the bellows (2) in a downward direction.
- 15 Re-install the components in the reverse order of their removal.



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### 3.9 Belt roller and belt buckle – removal, installation

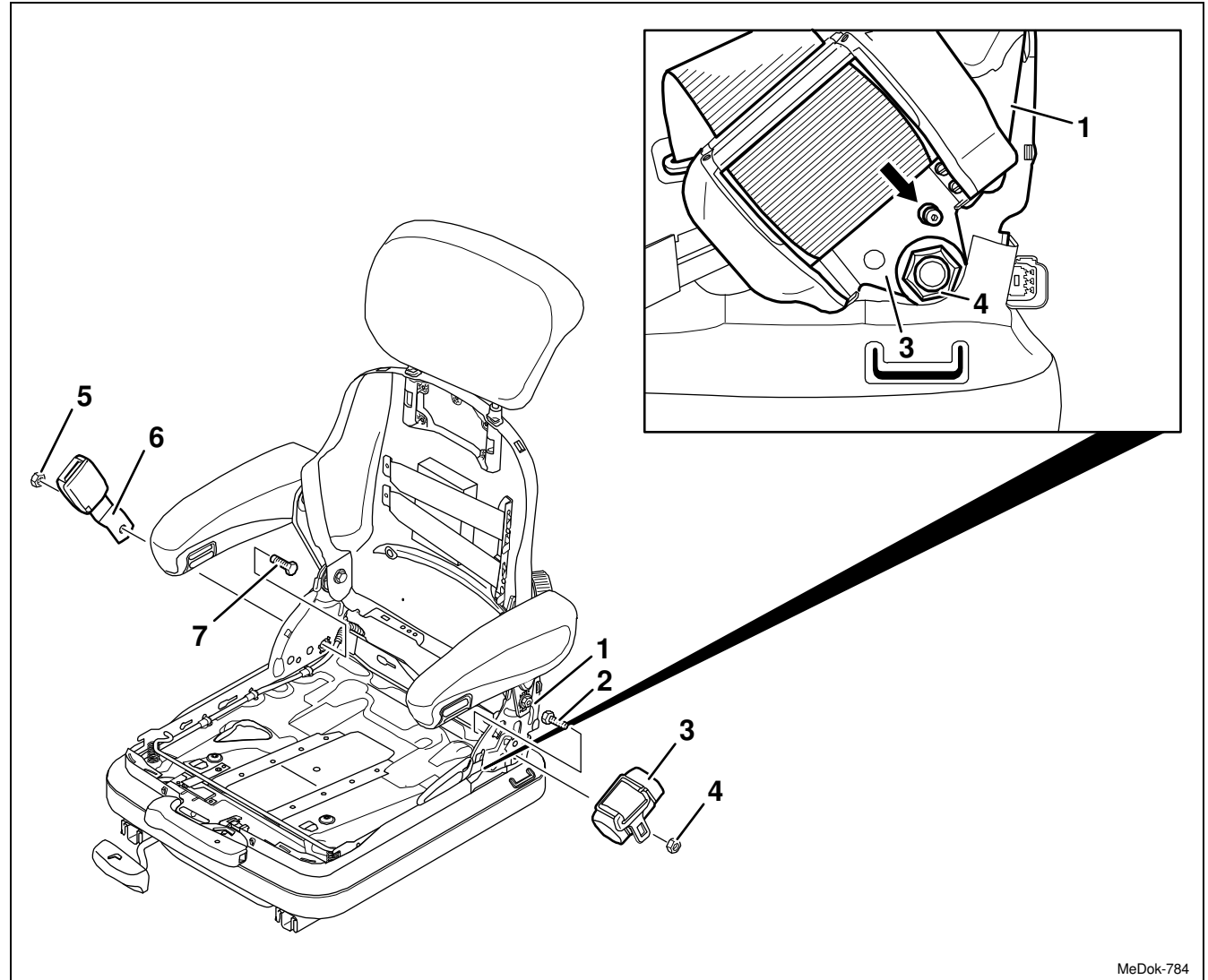


#### REMOVAL/INSTALLATION

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

- 1 Remove the backrest cushion (Chap. 3.1).
- 2 Remove the seat cushion (Chap. 3.2).
- 3 Remove the left and right covers (Chap. 3.4).



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### 3.9 Belt roller and belt buckle – removal, installation

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#### Removal, installation

- 4 Unscrew the hexagon nut (4).

**Installation note:**

Hexagon nut (4), 50 Nm.

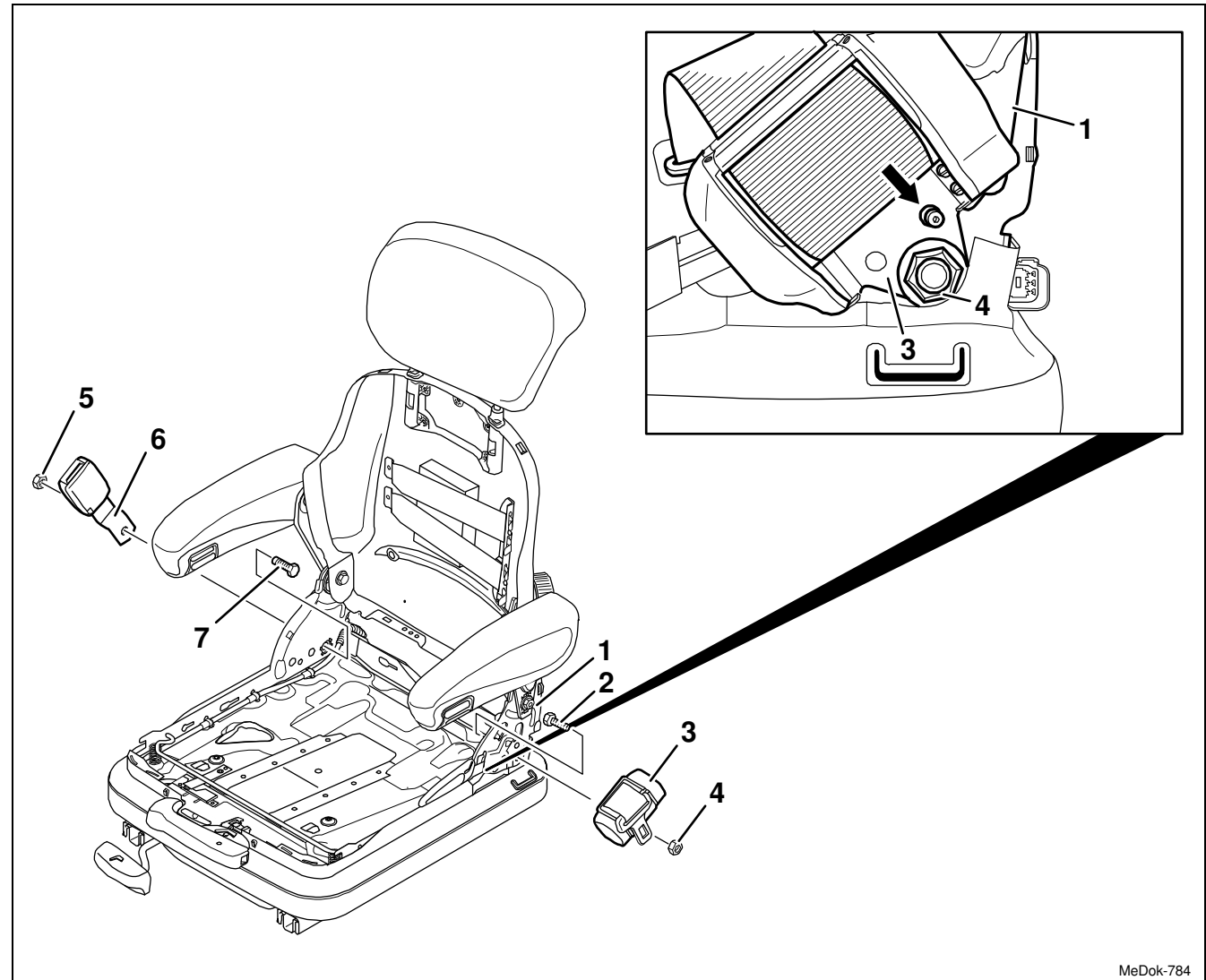
- 5 Pull out the hexagon bolt (2) and take off the belt roller (3).

**Installation notes:**

- The hole on the belt roller (3) must be pushed over the rivet (arrow) on the backrest fixture (1) to the left.
- When subsequently installing the belt roller (3), the respective predetermined breaking point of the left cover is to be broken (see Chapter 3.4).

#### 6 Delivery option for construction machines:

Hang out the webbing on the left and remove two washers (see Ch. 3.20.2).



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### 3.9 Belt roller and belt buckle – removal, installation

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7 Unscrew the hexagon nut (5).

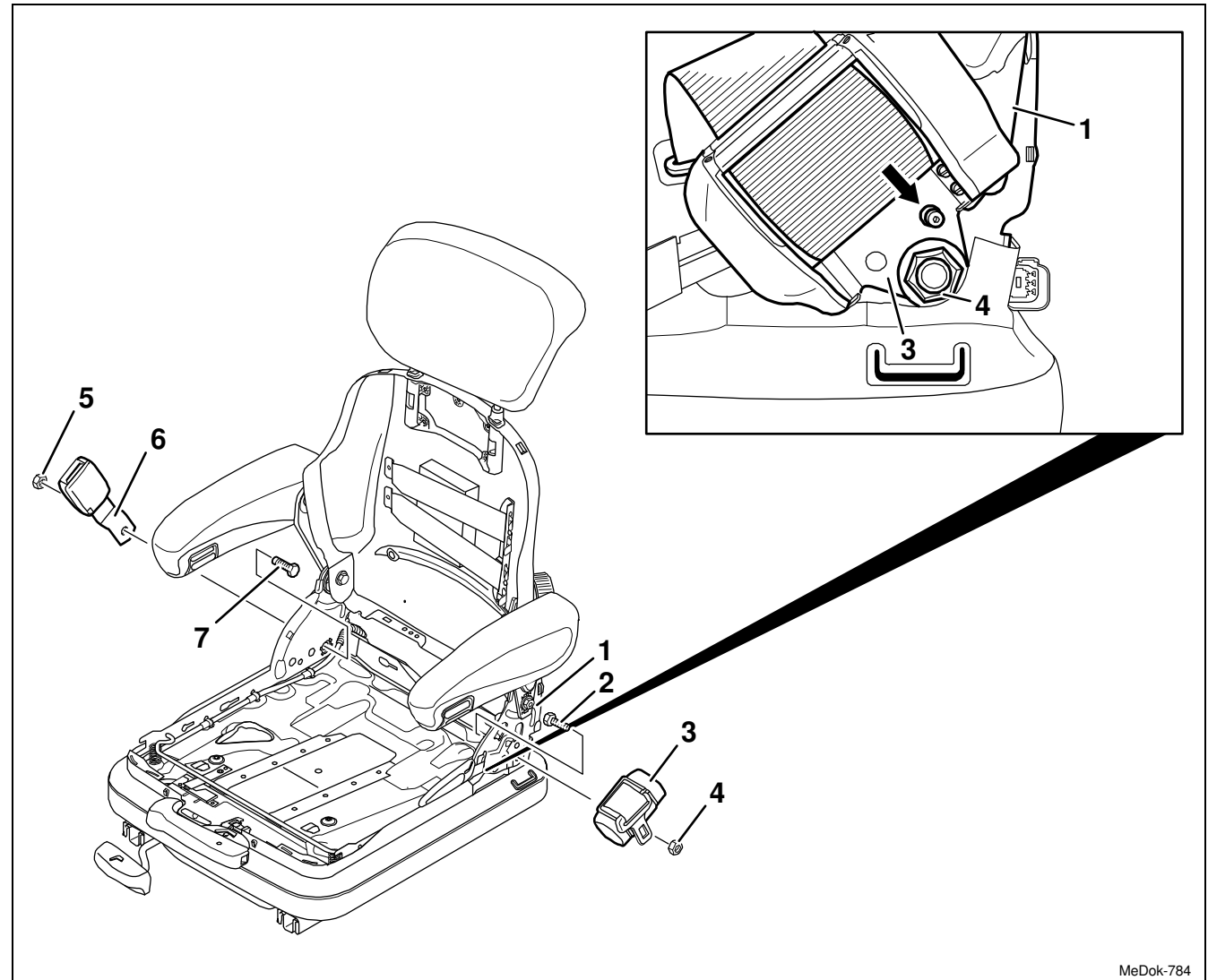
**Installation note:**

Hexagon nut (5), 50 Nm.

8 Pull out the hexagon bolt (7) and take off the belt buckle (6).

**Installation notes:**

- Turn the belt buckle (6) to the correct position before tightening the hexagon nut (5) in order the belt buckle (6) can pass through the hole in the hole (see Chapter 3.4).
- When subsequently installing the belt buckle (6), the respective predetermined breaking point of the right cover is to be broken (see Chapter 3.4).



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### 3.9 Belt roller and belt buckle – removal, installation

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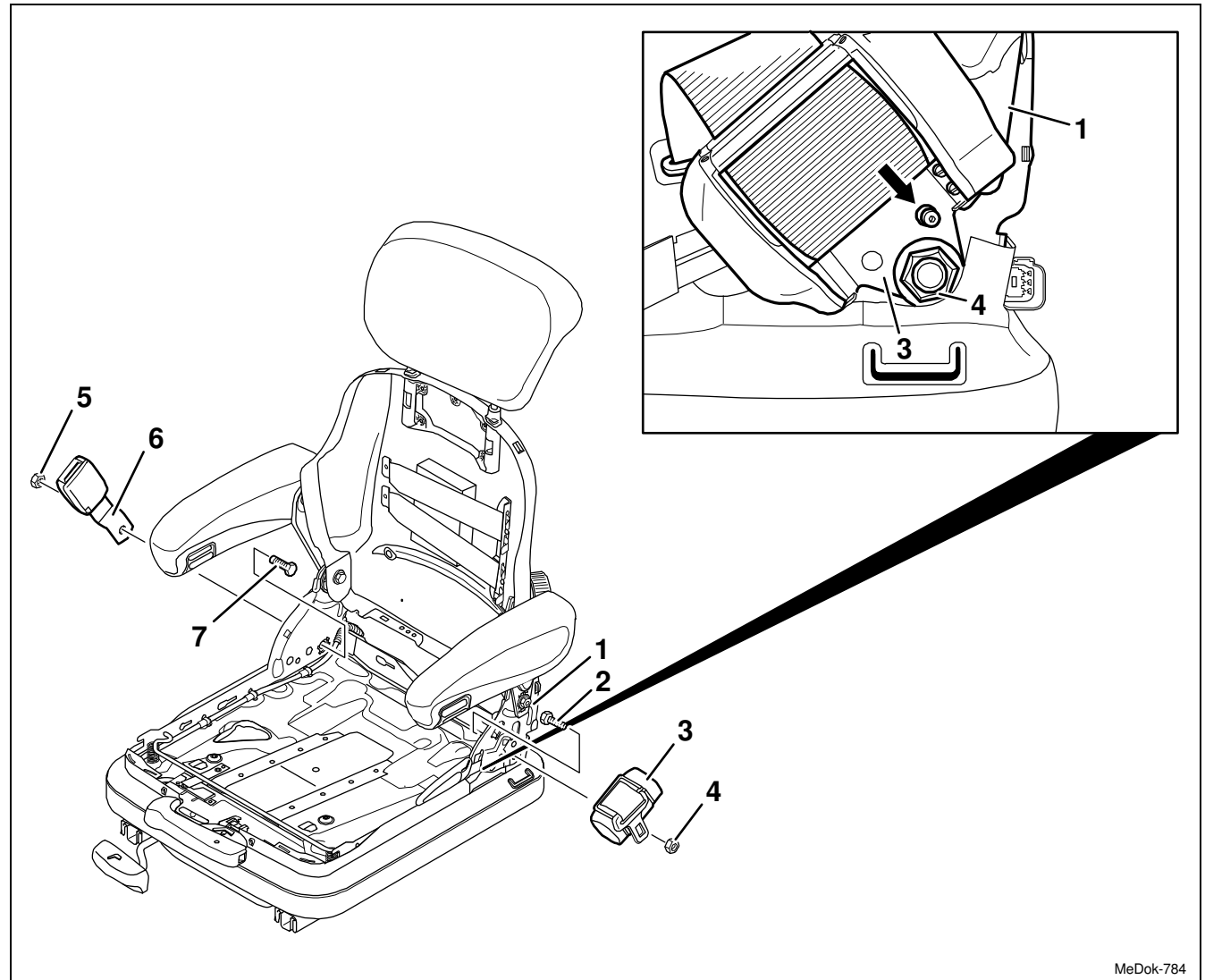
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#### 9 Delivery option for construction machines:

Hang out the webbing on the right and remove two washers (see Chapter 3.20.2).

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



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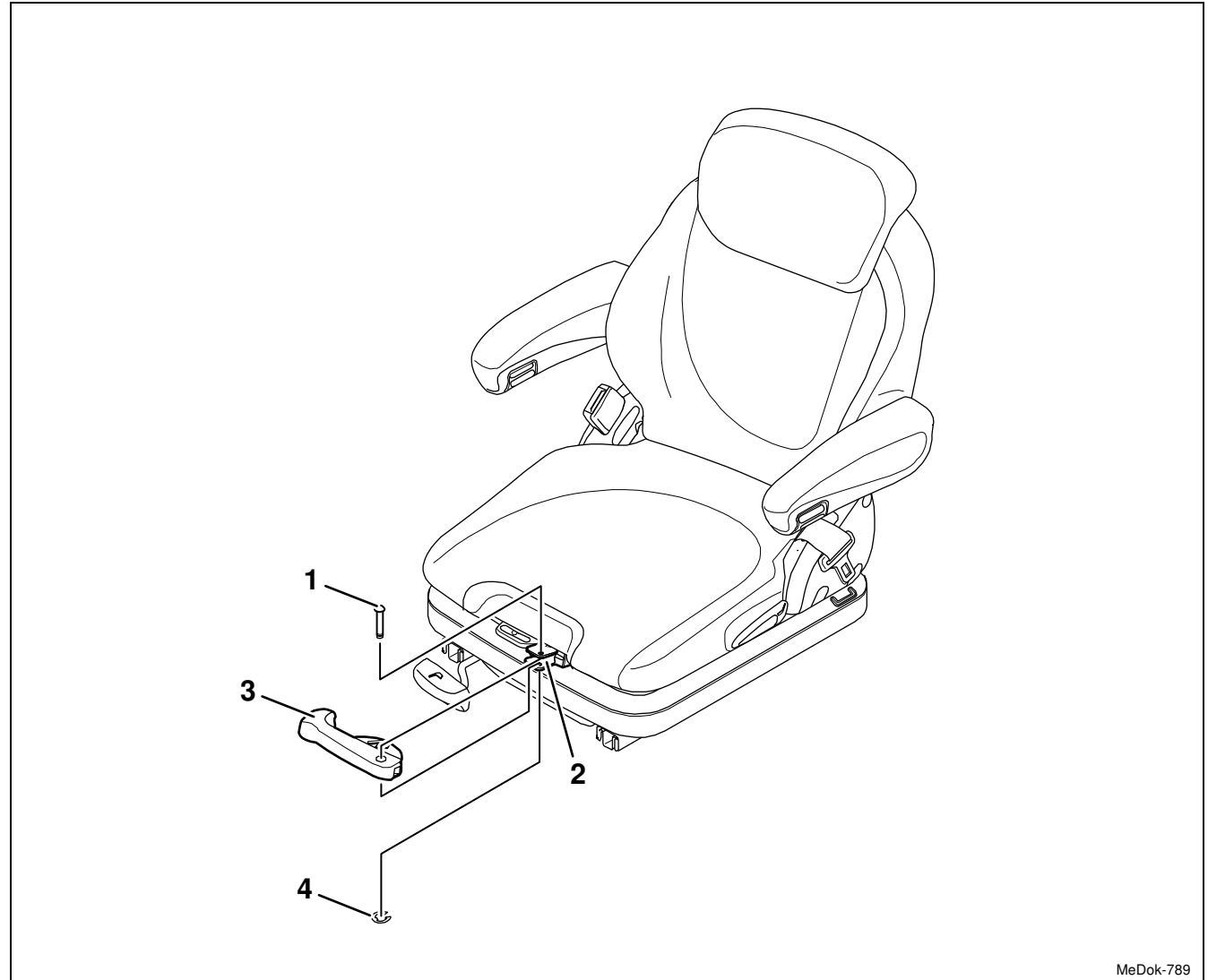
### 3.10 Handle for weight adjustment – removal, installation

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- (1) Half round head bolt
- (2) Handle holder (spring pack)
- (3) Handle for weight adjustment
- (4) Retaining ring ..... replace



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### 3.10 Handle for weight adjustment – removal, installation

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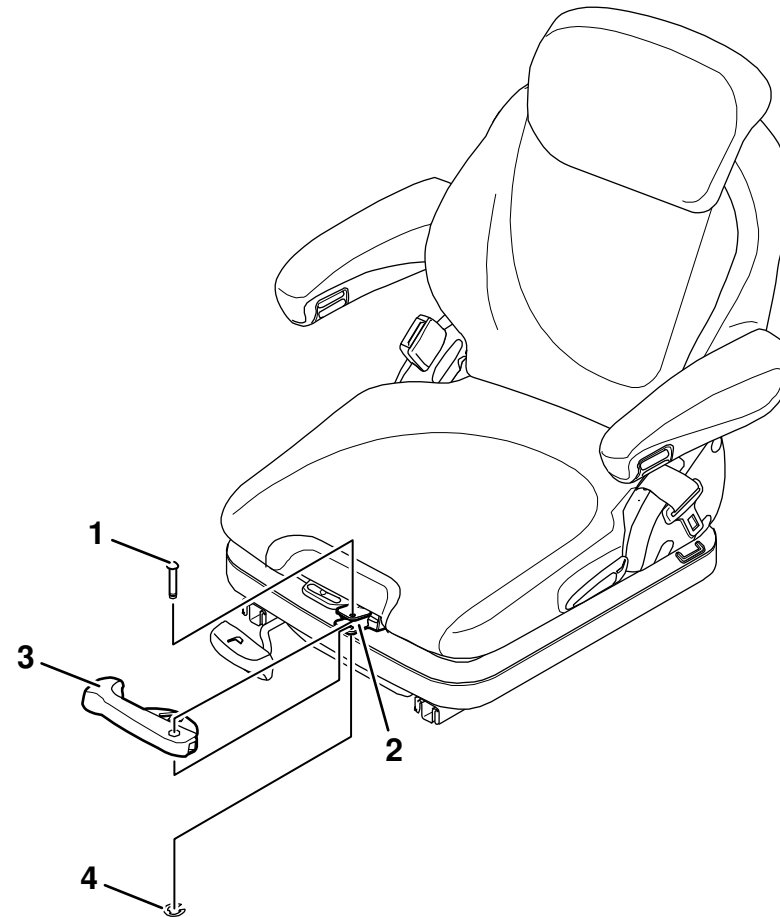
#### Removal, installation

- 1 Take off the retaining ring (4).

**Installation note:**

Replace the retaining ring (4).

- 2 Pull out the half round head bolt (1) from the handle for weight adjustment (3) and remove the holder (2).
- 3 Pull off the handle for weight adjustment (3) from the holder (2).
- 4 Re-install the components in the reverse order of their removal.



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### 3.11 Handle for fore/aft adjustment – removal, installation

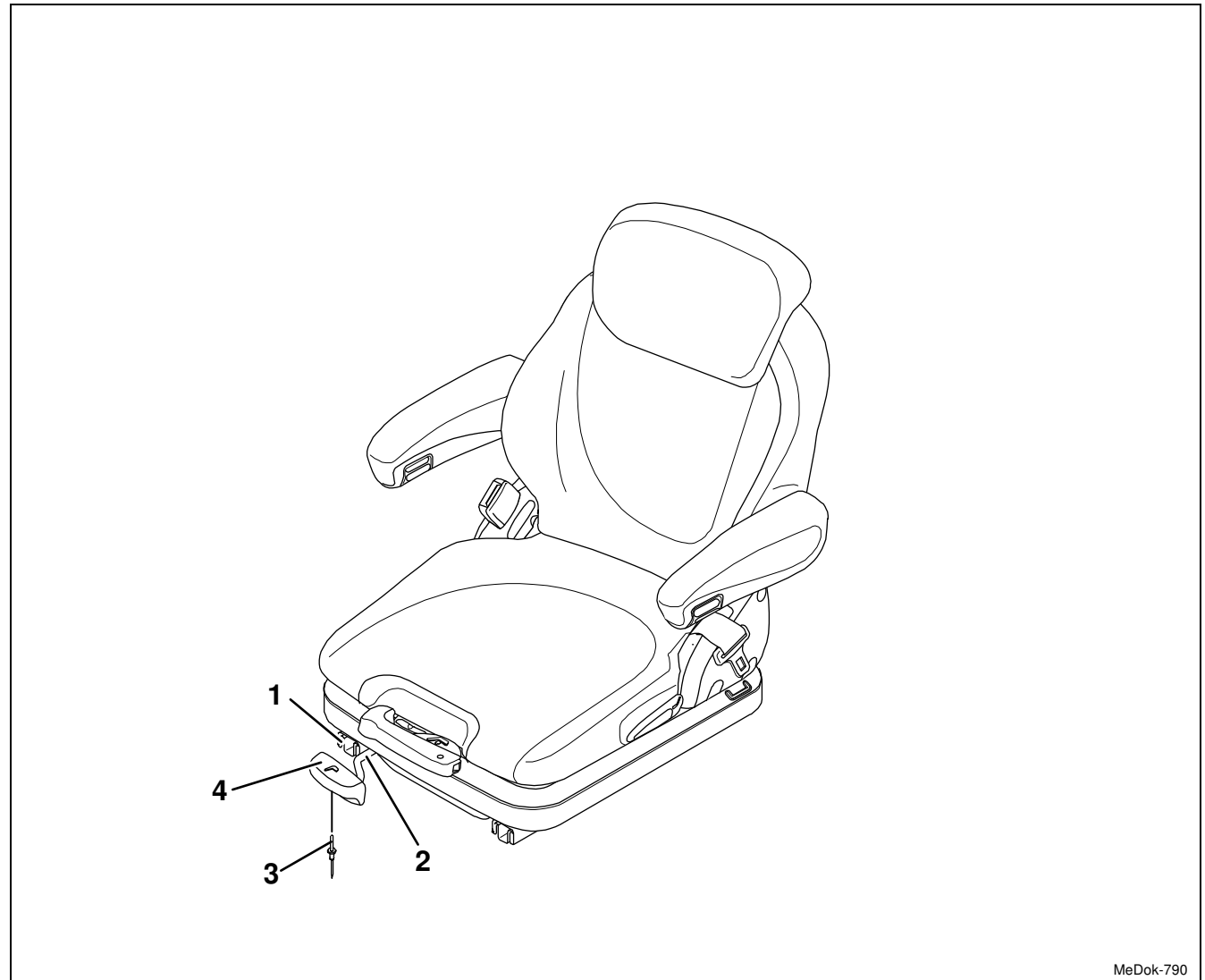
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- (1) The entire adjusting rail assembly
- (2) Locking lever
- (3) Blind rivet
- (4) Handle for fore/aft adjustment



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### 3.11 Handle for fore/aft adjustment – removal, installation

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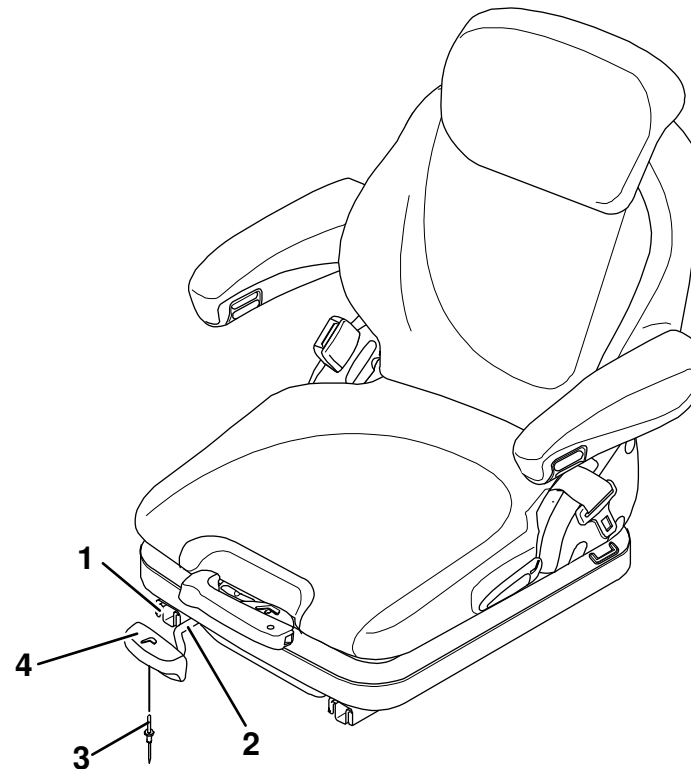
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#### Removal, installation

- 1 Bore out the rivet head of the blind rivet (3) and drive out the blind rivet (3).
- 2 Pull out the handle for fore/aft adjustment (4) from the locking lever (2) of the entire adjusting rail assembly (1).
- 3 Re-install the components in the reverse order of their removal.



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### 3.12 Handle for backrest adjustment – removal, installation

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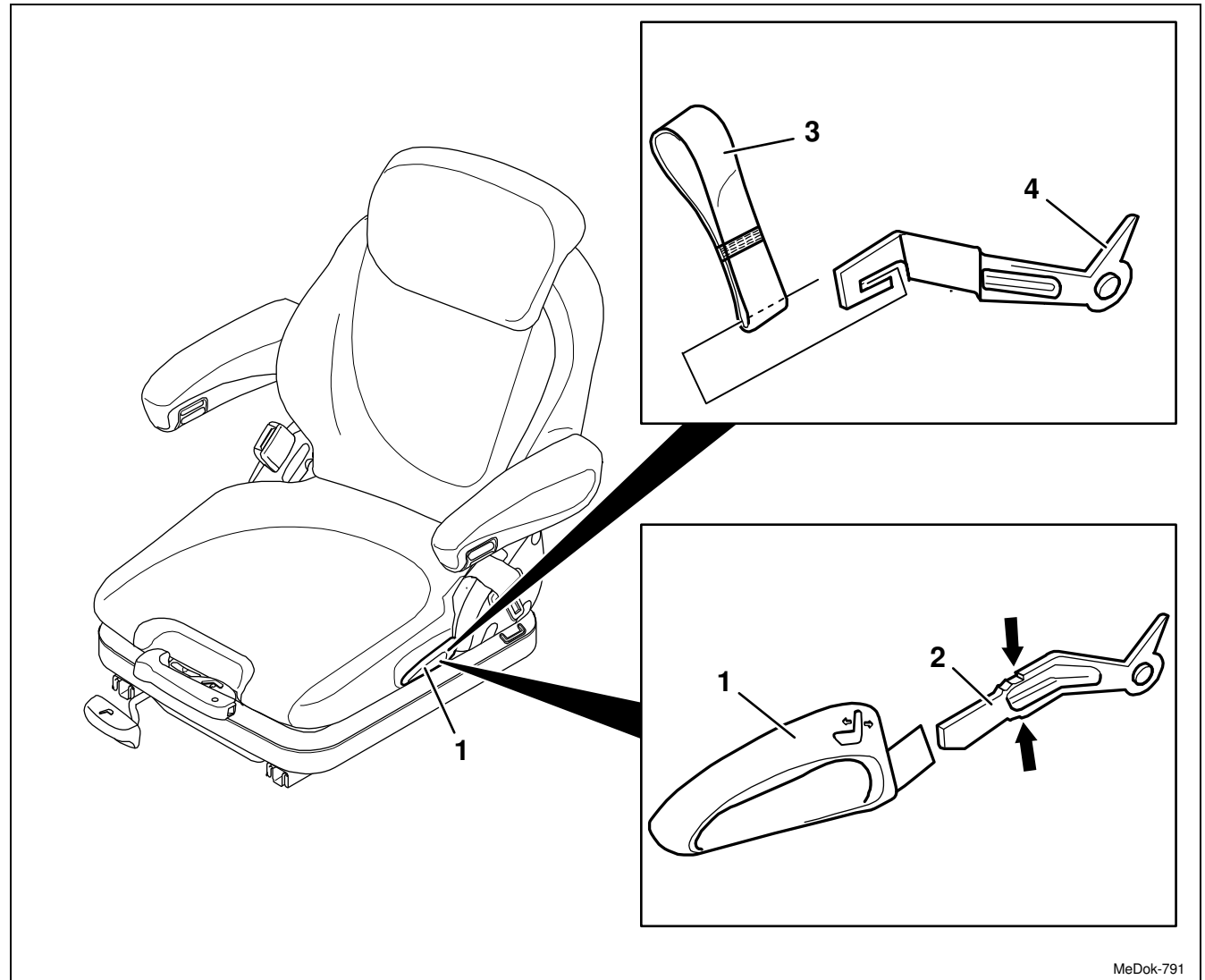
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- (1) Handle for backrest adjustment  
..... replace
- (2) Operating lever
- (3) Loop for backrest adjustment  
(Special design: seat MSG 65/511  
and boat seat AVENTO-Evolution)
- (4) Operating lever  
(Special design: seat MSG 65/511  
and boat seat AVENTO-Evolution)

1 Remove the backrest cushion  
(Chap. 3.1).

2 Remove the seat cushion (Chap. 3.2).



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## 3.12 Handle for backrest adjustment – removal, installation

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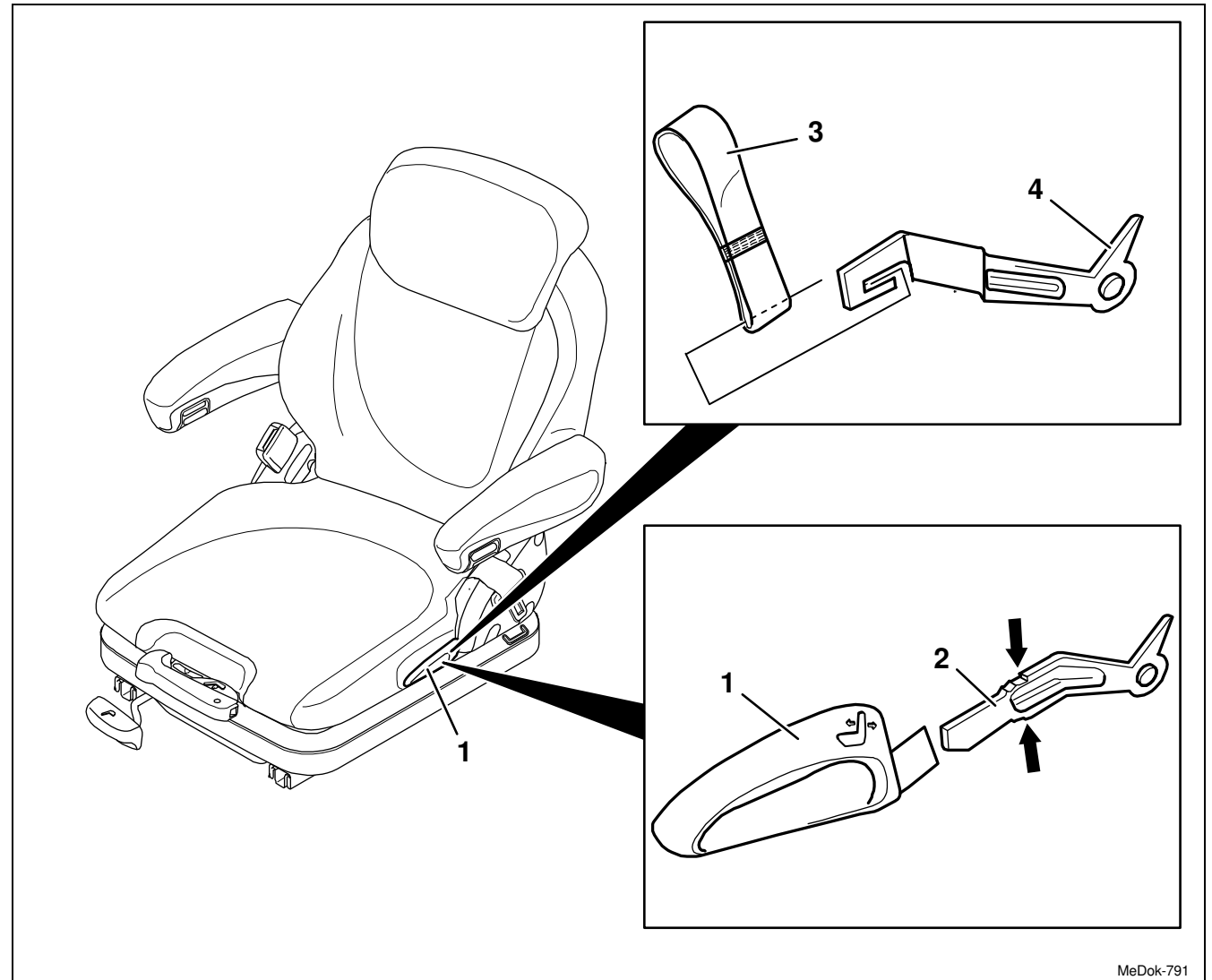


### Removal, installation

- 3 Clasp the handle for backrest adjustment (1) and pull it off from the operating lever (2).

#### Installation notes:

- The handle for backrest adjustment (1) is wedged in the operating lever (2) and will be damaged while pulling it off. The handle for backrest adjustment (1) must always be replaced.
- The handle for backrest adjustment (1) must be pushed over the operating lever (2) to the end stop (arrow).



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### 3.12 Handle for backrest adjustment – removal, installation

REMOVAL/INSTALLATION

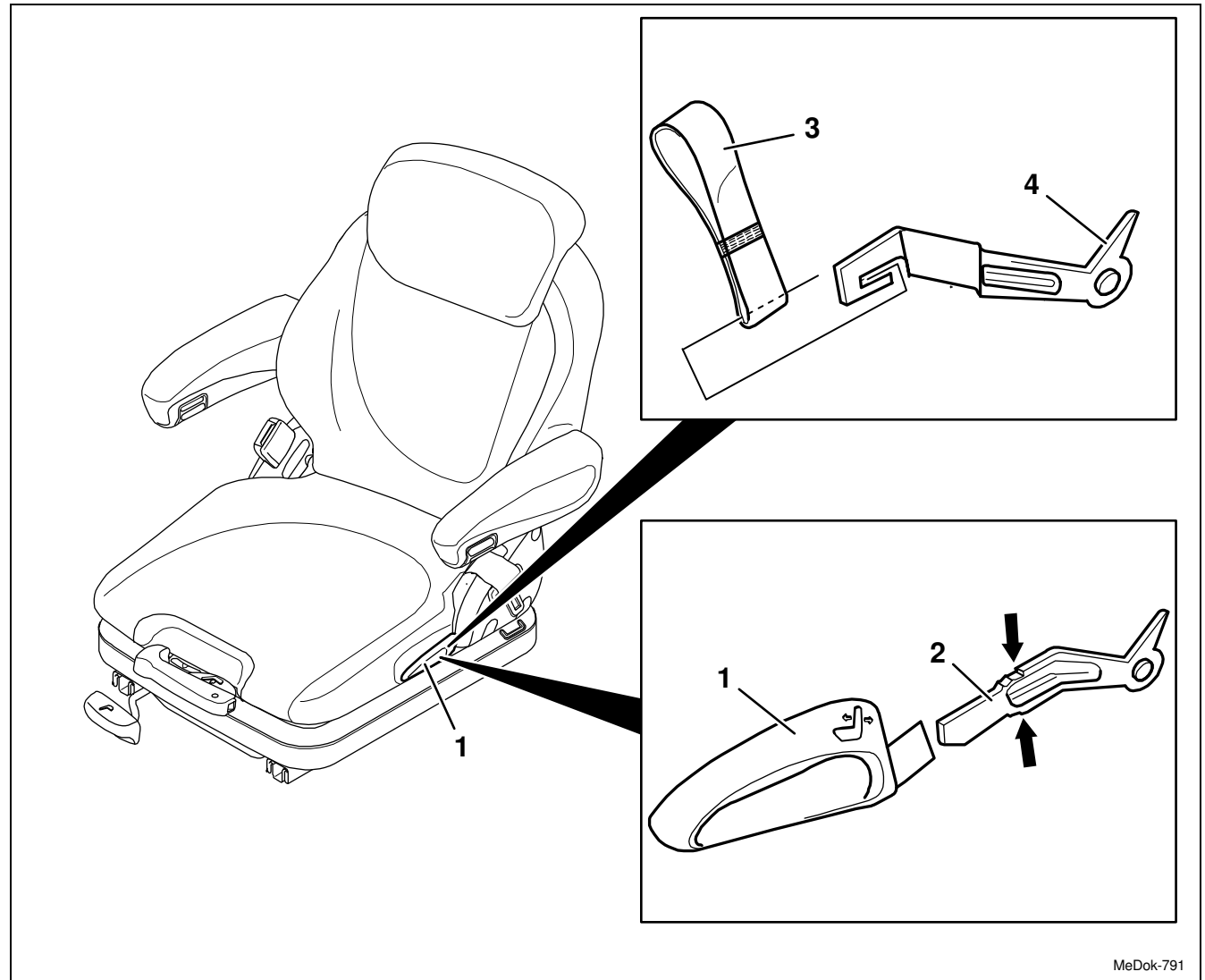
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#### 4 Seat type MSG 65/511 with slender seat cushion and boat seat AVENTO-Evolution:

Thread the loop for backrest adjustment (3) from the operating lever (4).

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



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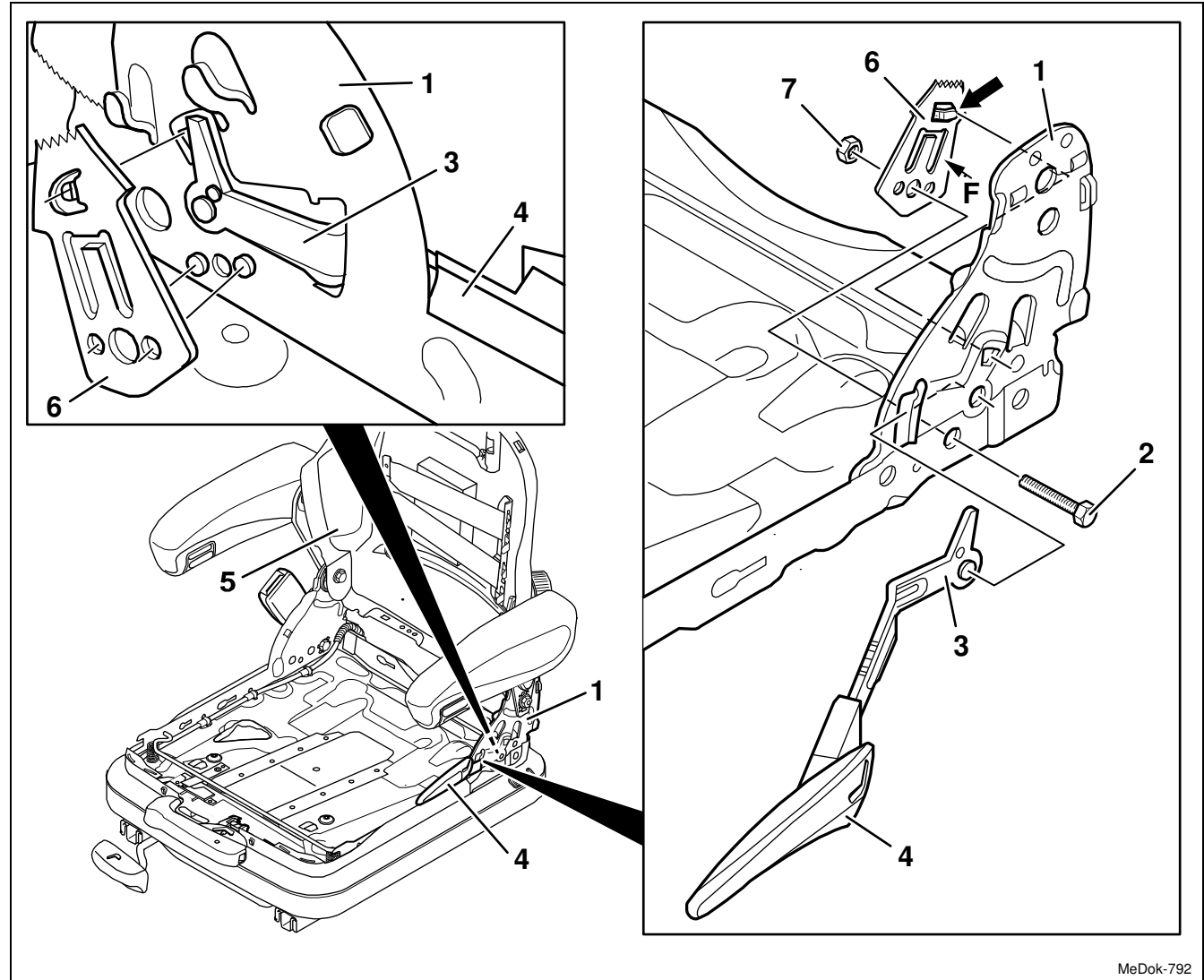
### 3.13 Backrest lock – removal, installation of the entire assembly



#### REMOVAL/INSTALLATION

#### TABLE OF CONTENTS

- (1) Left backrest fixture (spring pack)
- (2) Micro-encapsulated hexagon bolt  
..... replace, 25 Nm
- (3) Operating lever
- (4) Handle for backrest adjustment
- Note:**  
Seat MSG 65/511 (narrow seat cushion) and boat seat AVENTO-Evolution equipped with a loop for backrest adjustment.
- (5) Backrest frame
- (6) Tooth-sheet ..... grease
- (7) Hexagon nut



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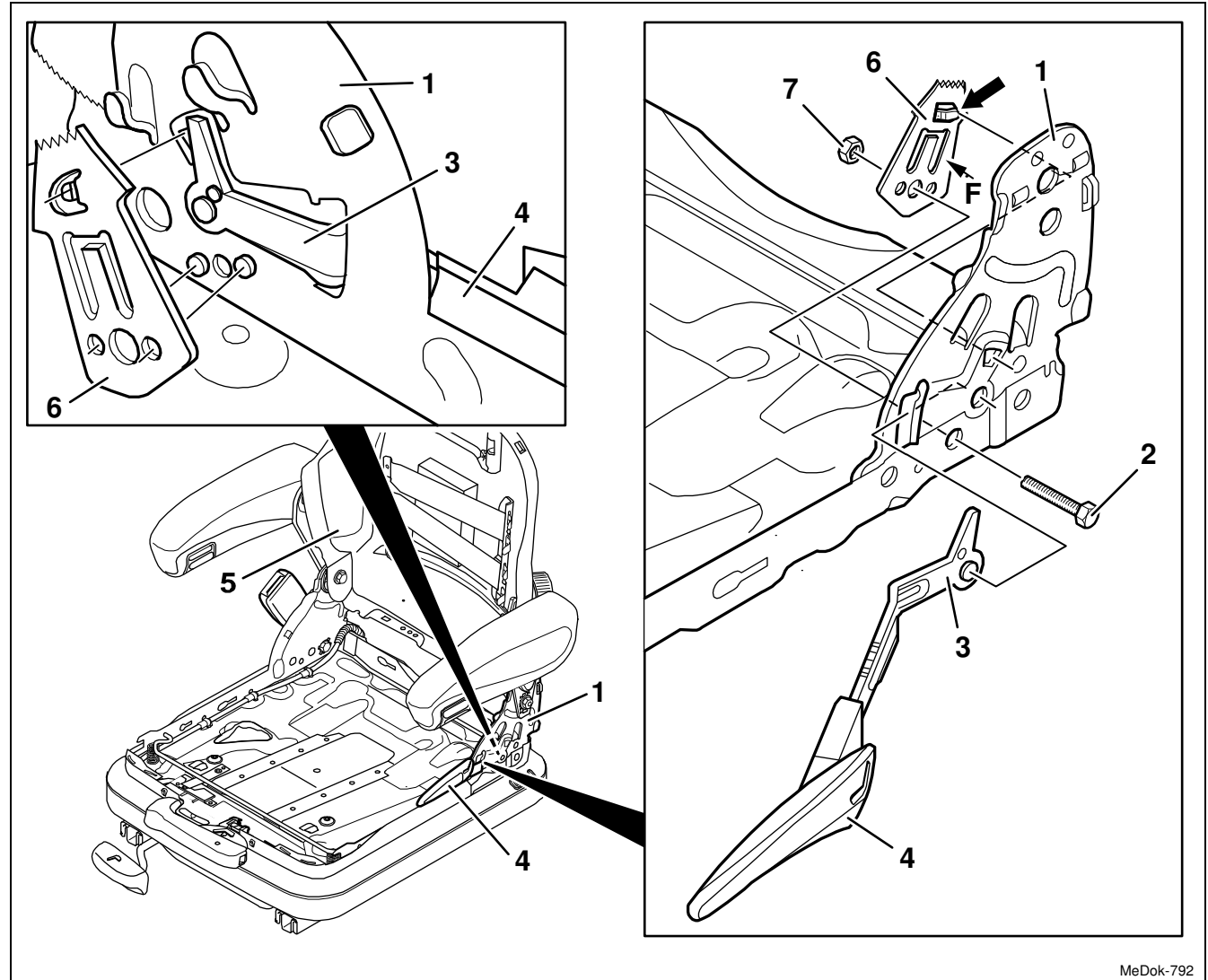
### 3.13 Backrest lock – removal, installation of the entire assembly

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- 1 Remove the backrest cushion (Chap. 3.1).
- 2 Remove the seat cushion (Chap. 3.2).
- 3 Remove the left cover (see Chapter 3.4).
- 4 Remove the belt roller (see Chapter 3.9).
- 5 Delivery option for construction machines:**  
Hang out the webbing on the left and remove two washers (see Chapter 3.20.2).
- 6 Boat seat AVENTO-Evolution:**  
Remove the suspension cover (Chap. 3.23).



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### 3.13 Backrest lock – removal, installation of the entire assembly

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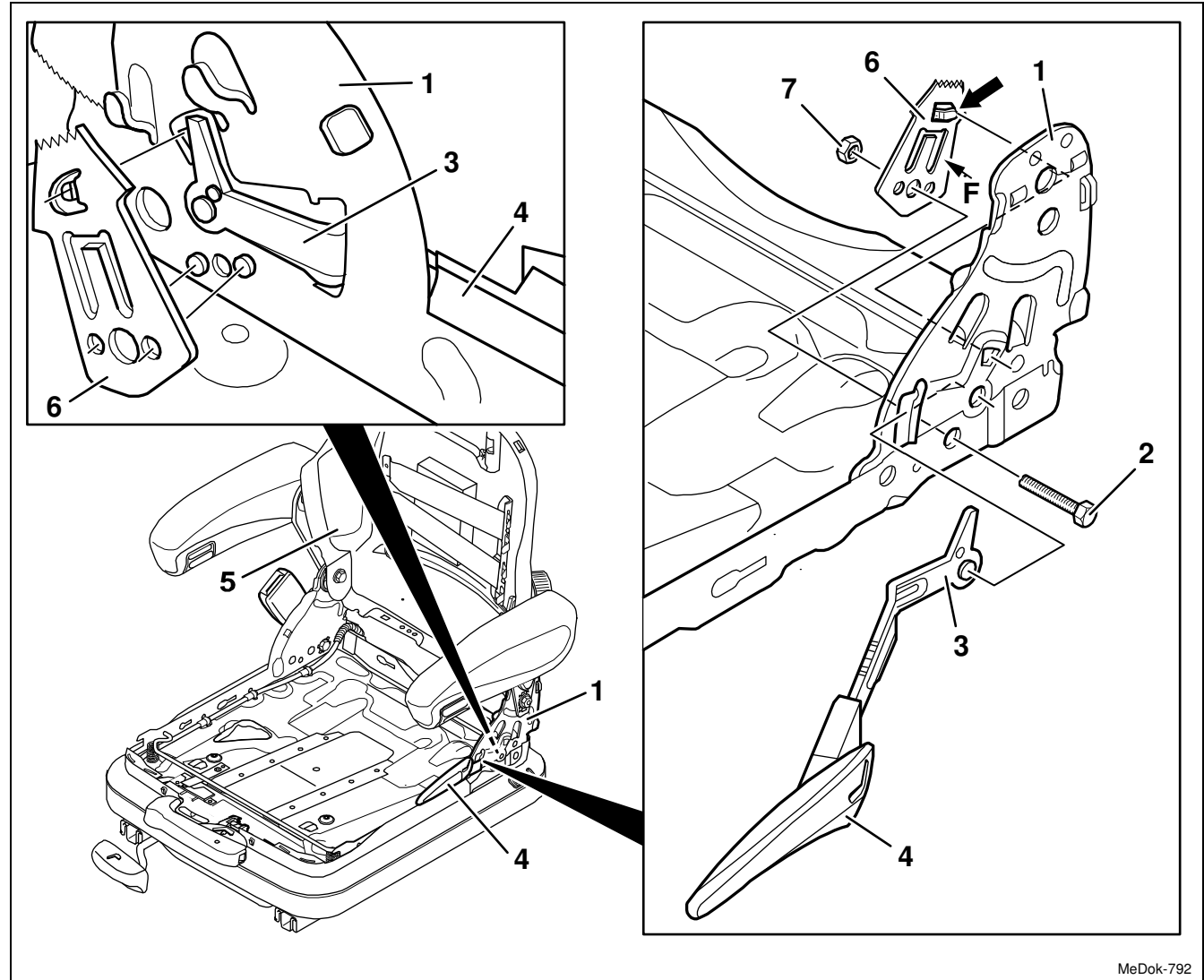


#### Removal, installation

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



**WARNING:** take care with the backrest frame (5) – it may jerk forward and cause injury!  
When the backrest cushion has been removed, the backrest frame (5) must be supported, for example held in place, before the handle for backrest adjustment (4) is operated.



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**3.13 Backrest lock – removal, installation of the entire assembly**

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- 8 Undo the micro-encapsulated bolt (2) and take off the hexagon nut (7).

**Installation note:**

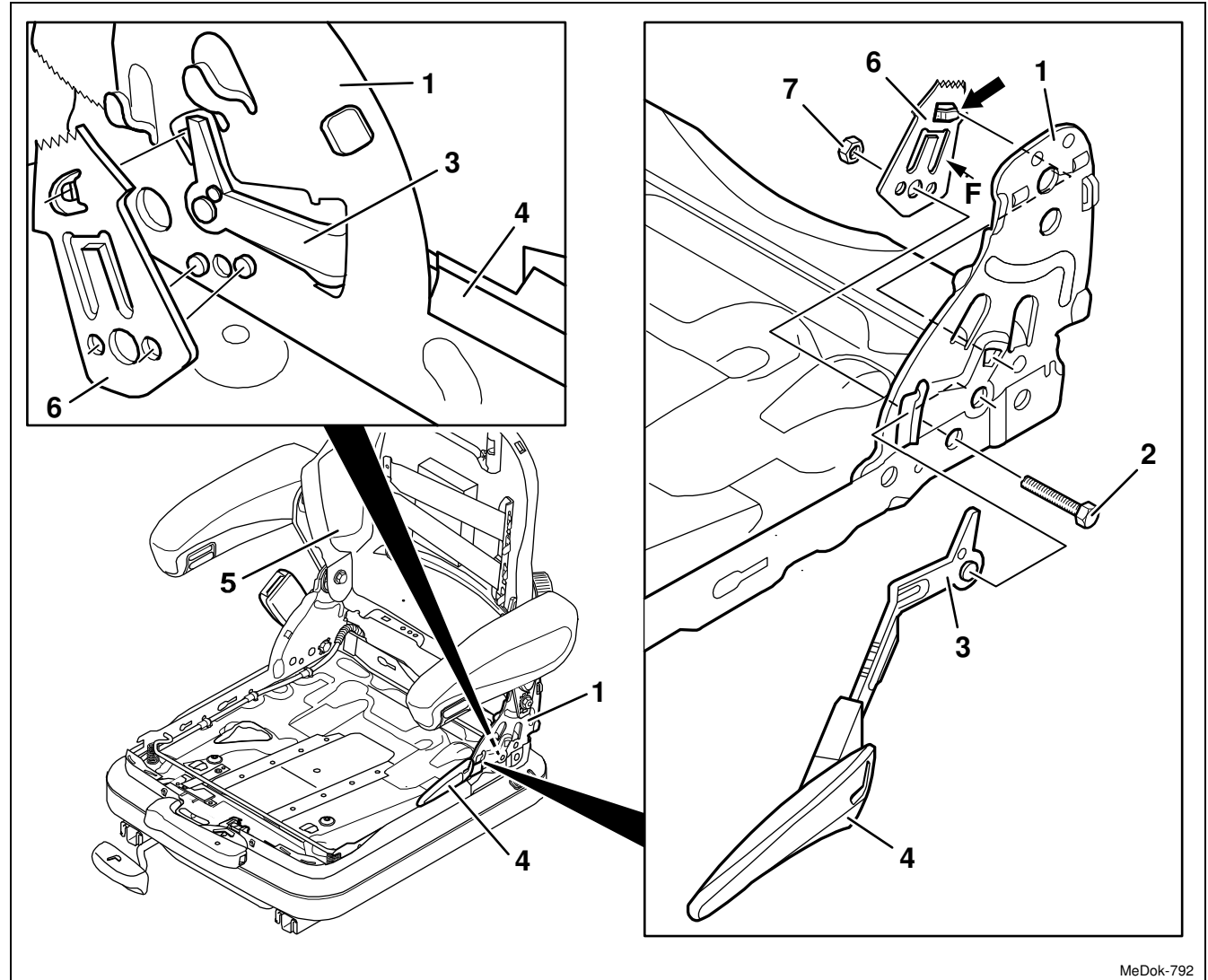
Replace the micro-encapsulated hexagon bolt (2), 25 Nm.

- 9 Remove the tooth-sheet (6).

**Installation notes:**

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

- 10 Pull out the operating lever (3) with the handle for backrest adjustment (4) from the left backrest fixture (1).



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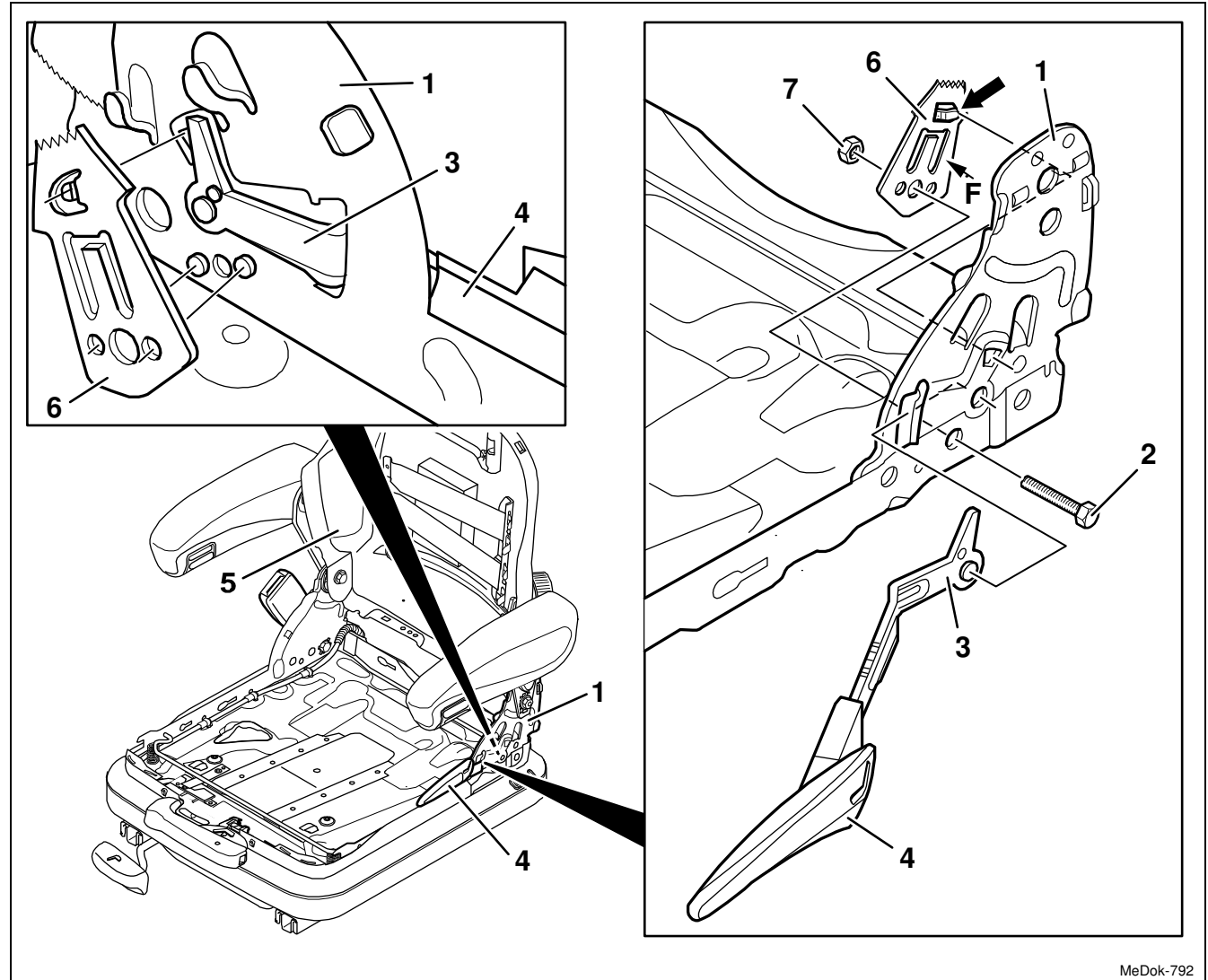
### 3.13 Backrest lock – removal, installation of the entire assembly

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- 11 **Replace the handle for backrest adjustment (4):**  
Remove the handle for backrest adjustment (4) (Chap. 3.12).
- 12 Re-install the components in the reverse order of their removal.



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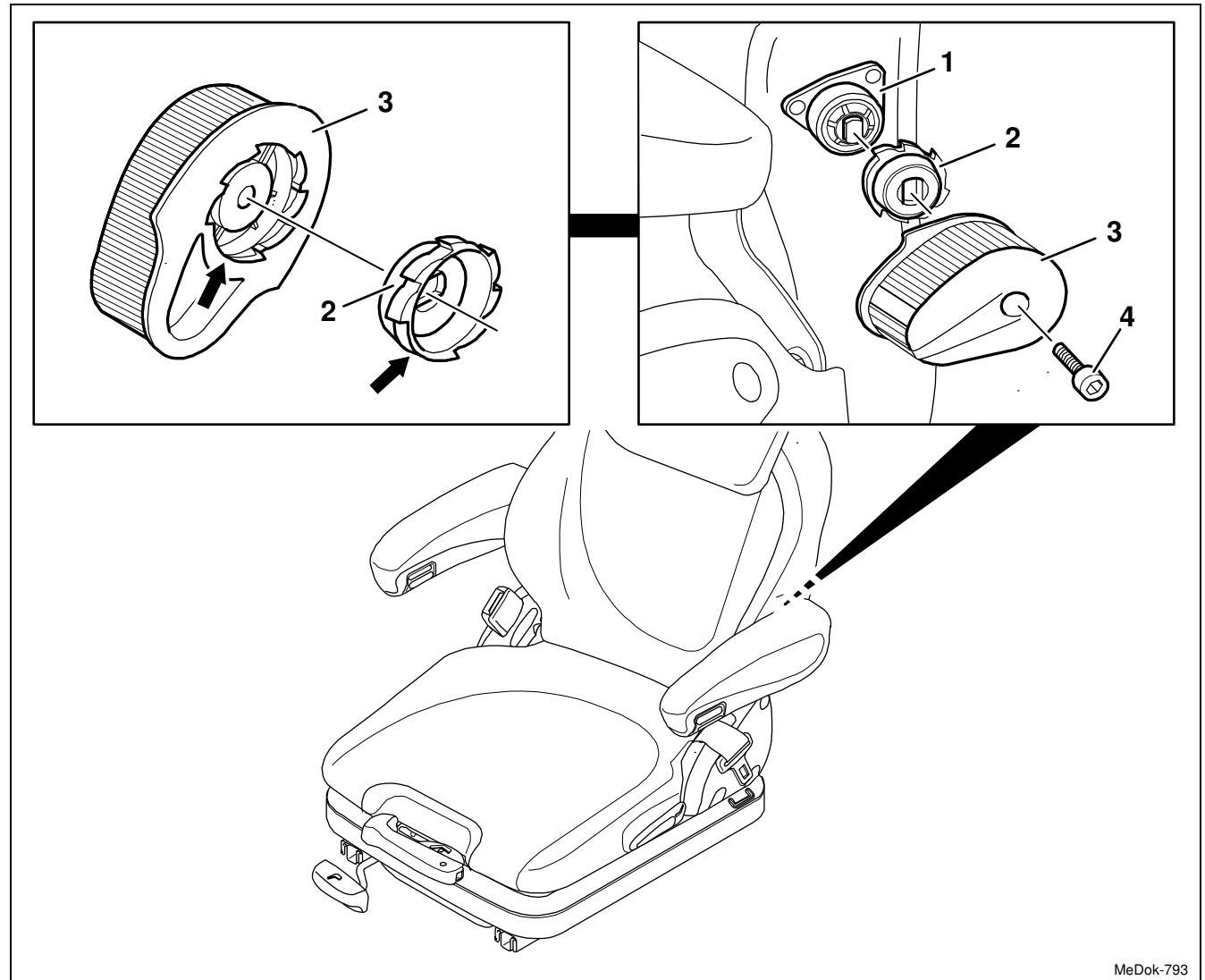
### 3.14 Knob for lumbar support – removal, installation

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



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### 3.14 Knob for lumbar support – removal, installation

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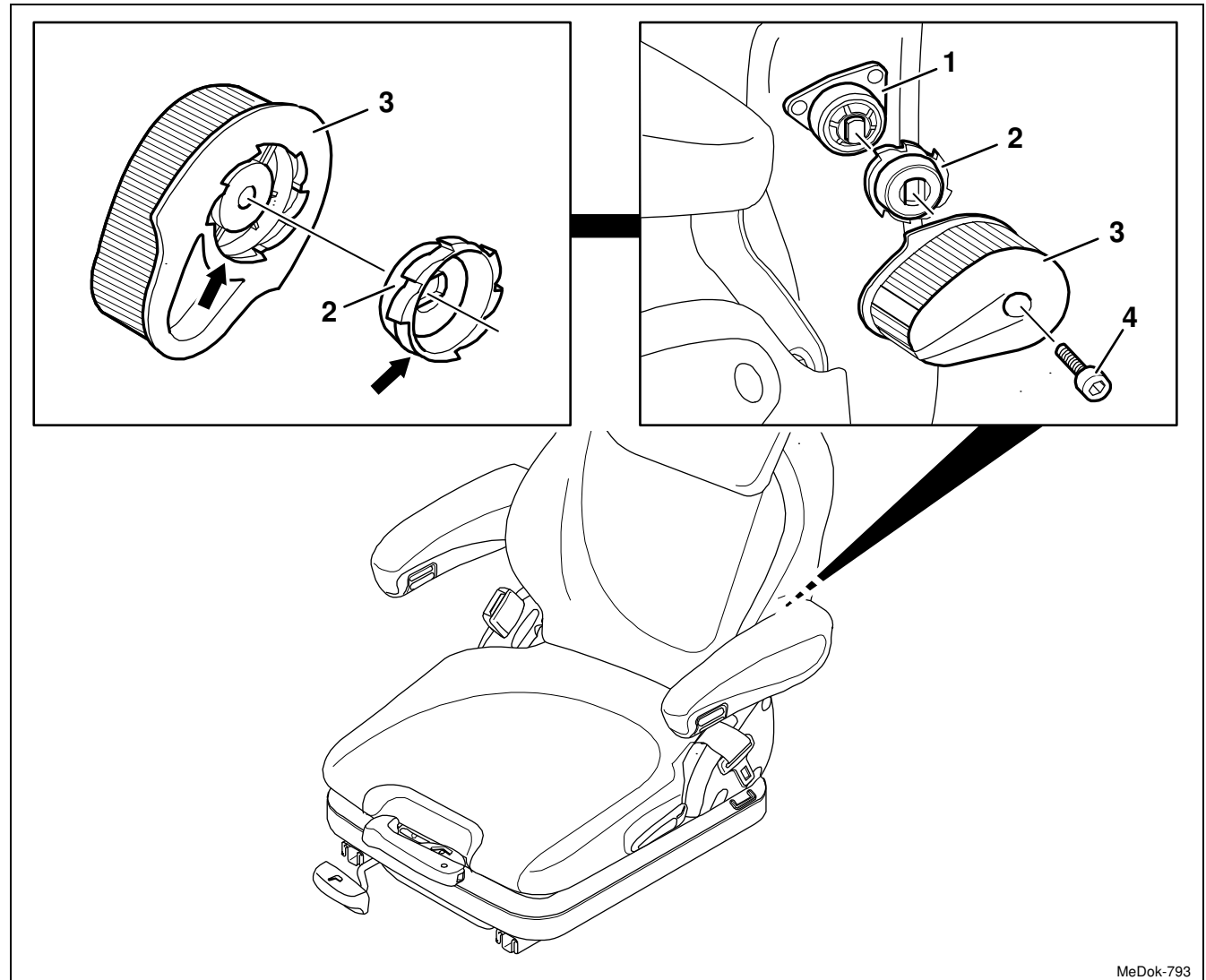


#### Removal, installation

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

**Installation note:**

Replace the micro-encapsulated cap screw (4), 6 Nm.



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### 3.14 Knob for lumbar support – removal, installation

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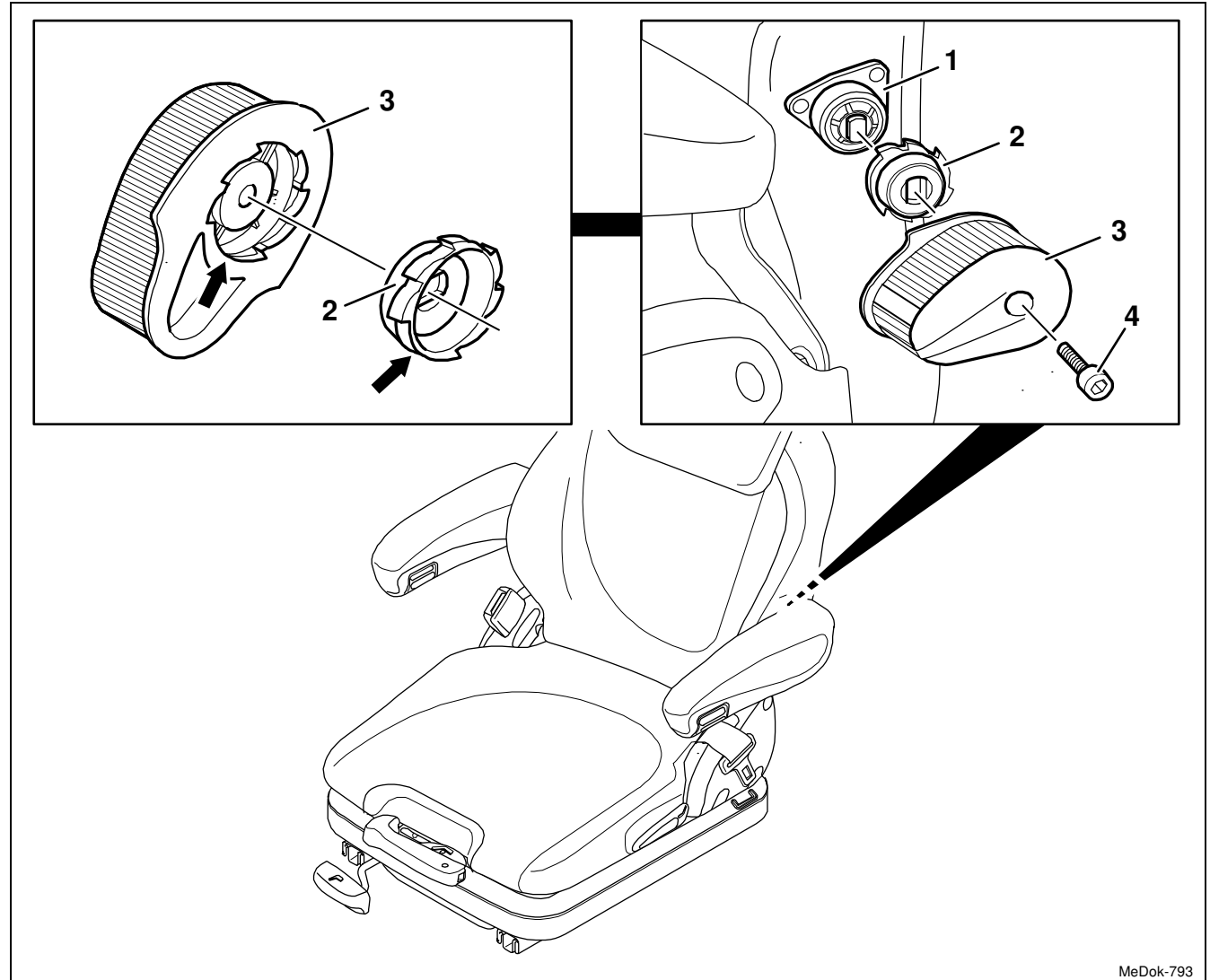


- 3 Pull out the toothed wheel (2) from the knob for lumbar support (3).

**Installation note:**

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

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



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### 3.15 Seat level indicator – removal, installation of the entire assembly

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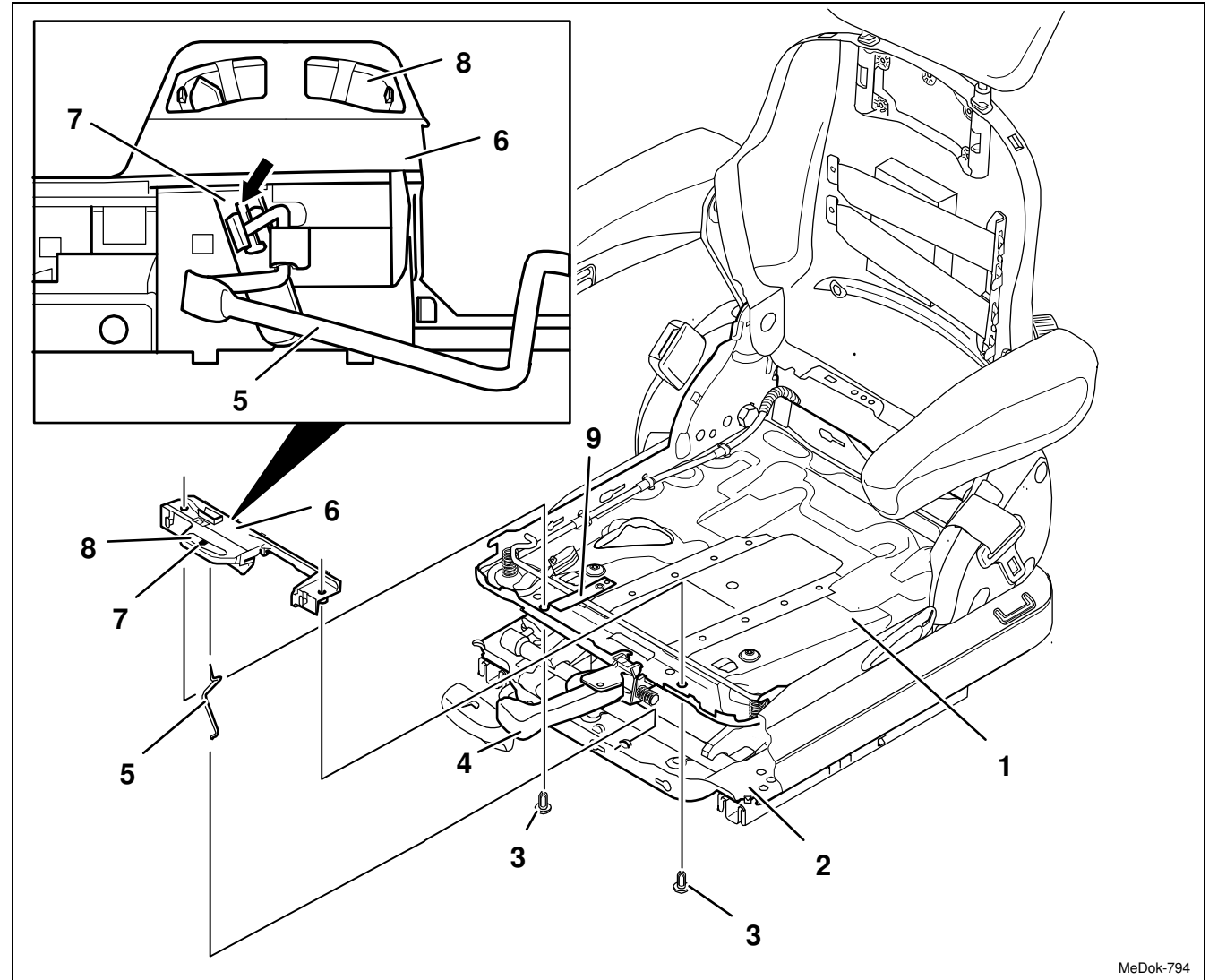
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- (1) Spring pack
- (2) Lower part of the suspension
- (3) Expanding rivet  
..... replace, if necessary
- (4) Handle for weight adjustment
- (5) Linkage rod of the pointer
- (6) Housing of the seat level indicator
- (7) Pointer
- (8) Viewing window  
..... replace, if necessary (9)
- (9) Switch plate

1 Remove the backrest cushion  
(Chap. 3.1).

2 Remove the seat cushion (Chap. 3.2).



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**3.15 Seat level indicator – removal, installation of the entire assembly**

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3 Take off the bellows from the spring pack (1) in the front (see Chapter 3.8), press it down and fix it on the lower part of the suspension (2).

4 Take off the seat switch from the housing of the seat level indicator (6) (see Chapter 3.16).

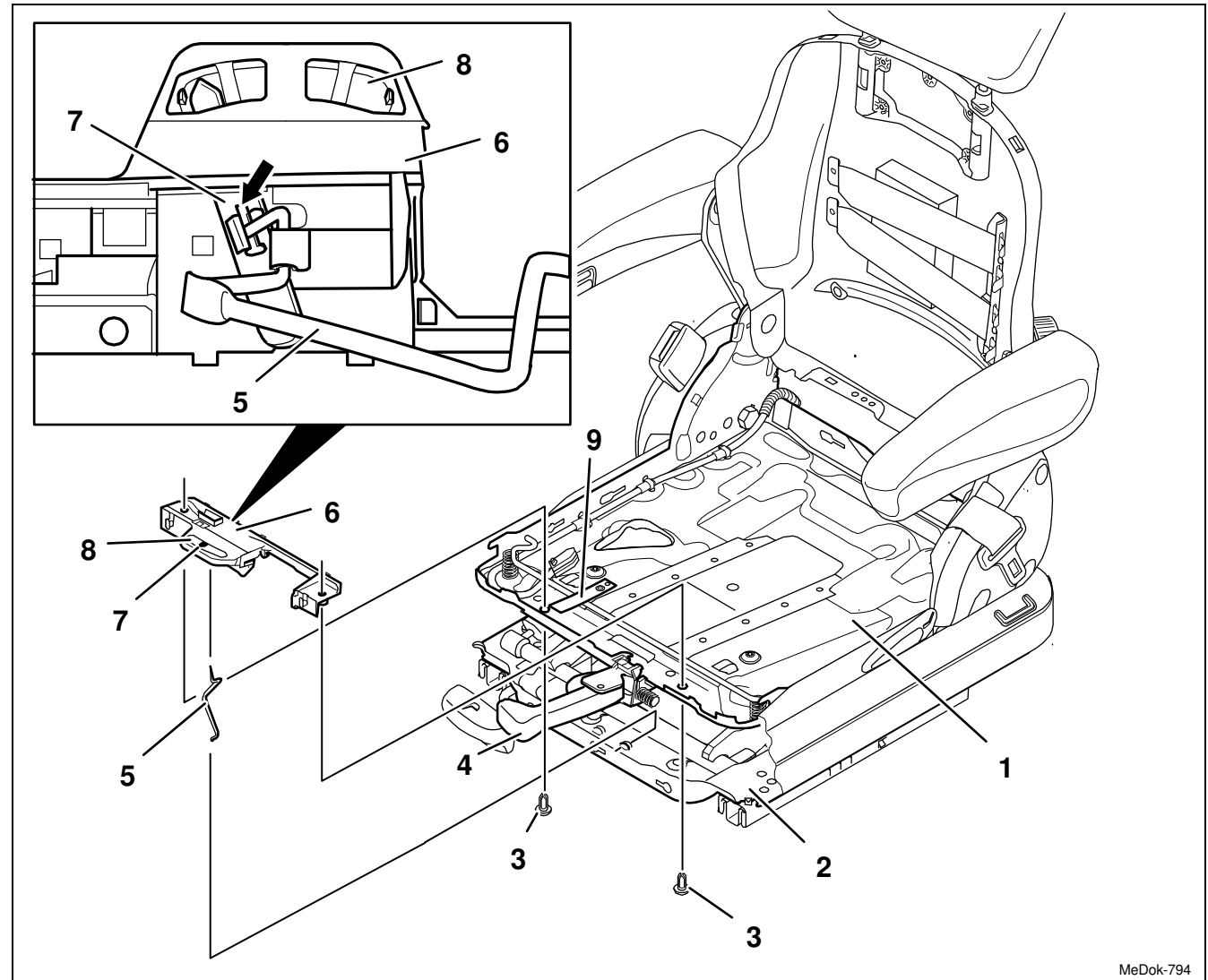
**Note:**

The switch plate (9) on the spring pack (1) must not be removed.

**Removal, installation**

5 Completely fold out the handle for weight adjustment (4).

6 Take off the linkage rod of the pointer (5) from the lower part of the suspension (2).



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**3.15 Seat level indicator – removal, installation of the entire assembly**

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- 7 Hang out the linkage rod of the pointer (5) from the housing of the seat level indicator (6) and then remove it.

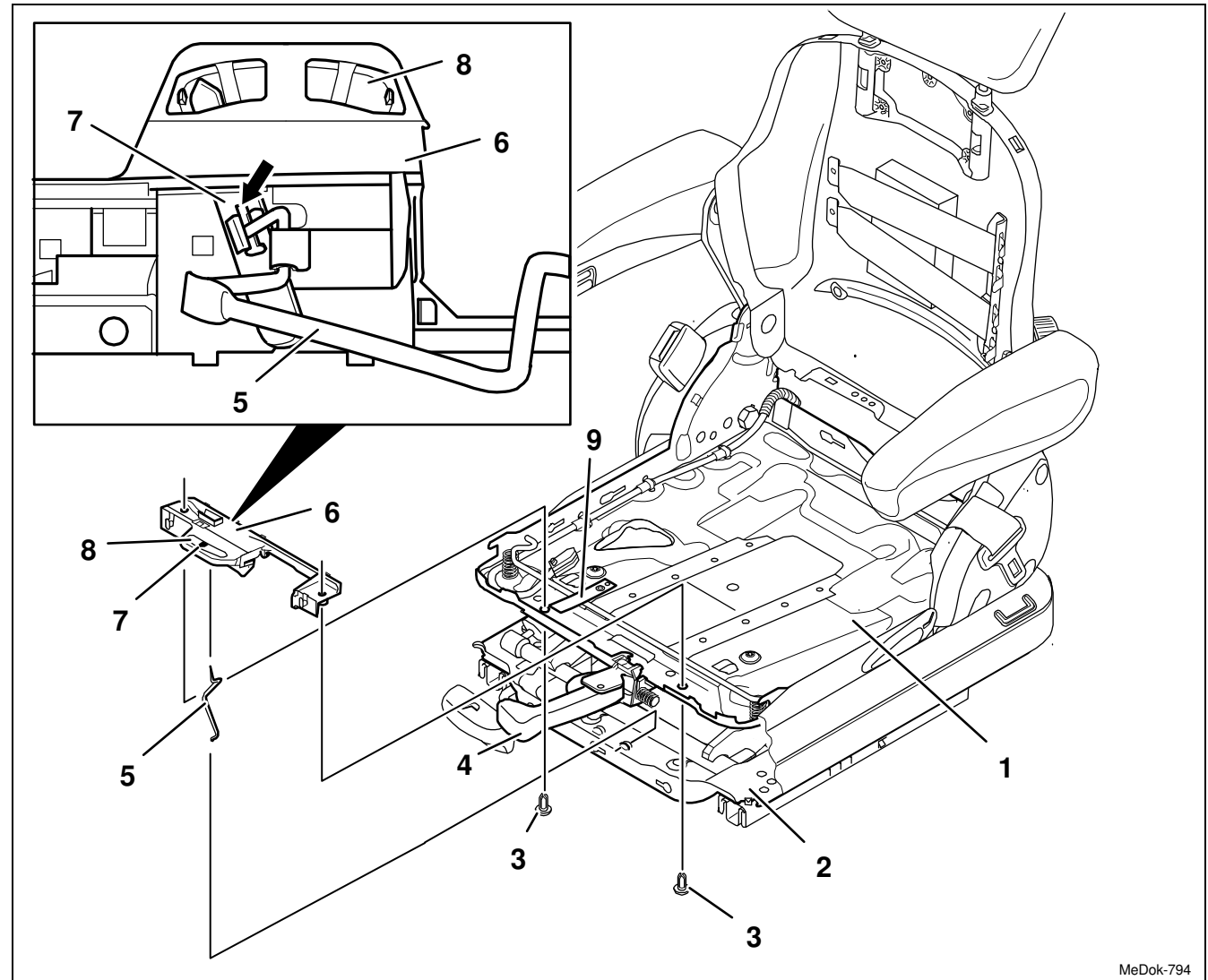
**Installation note:**

When hanging it in, make sure the upper end of the linkage rod (5) engages the longitudinal guide (arrow) of the pointer (7).

- 8 Use a suitable mandrel to drive out the two expanding rivets (3) from the housing of the seat level indicator (6) and from the spring pack (1).

**Installation note:**

Replace the expanding rivet (3) in case it has been deformed.



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**3.15 Seat level indicator – removal, installation of the entire assembly**

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- 9 Pull out the housing of the seat level indicator (6) from the spring pack (1) diagonally in an upward direction and then remove it.

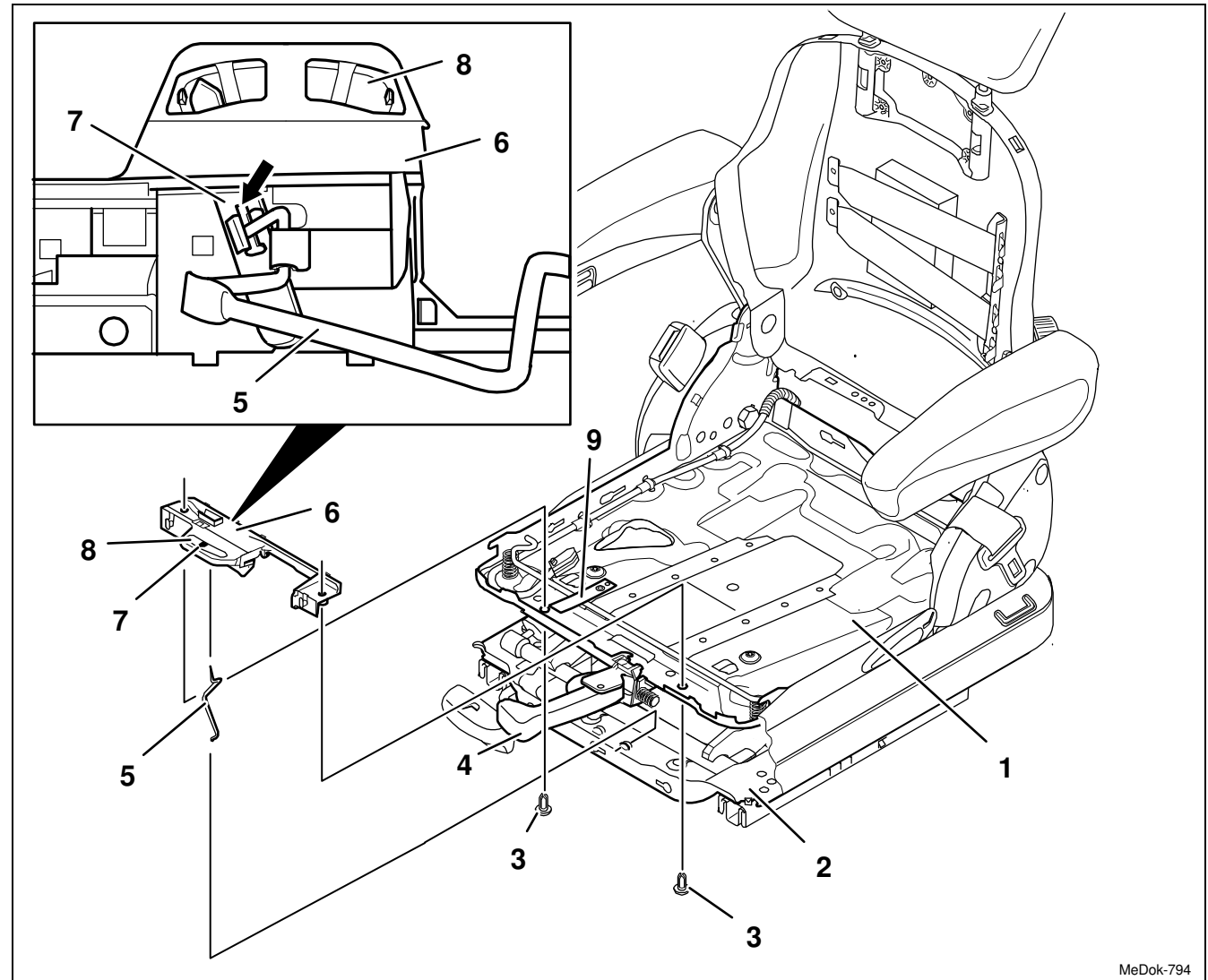
**Installation note:**

When installing the housing of the seat level indicator (6), slightly pull the switch plate (9) in the front in an upward direction. When doing this, take care not to bend it.

- 10 **Replace the viewing window (8):**

Use a screwdriver to release the viewing window (8), by pressing on the catches from below which are to the left and right side from the viewing window (8).

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



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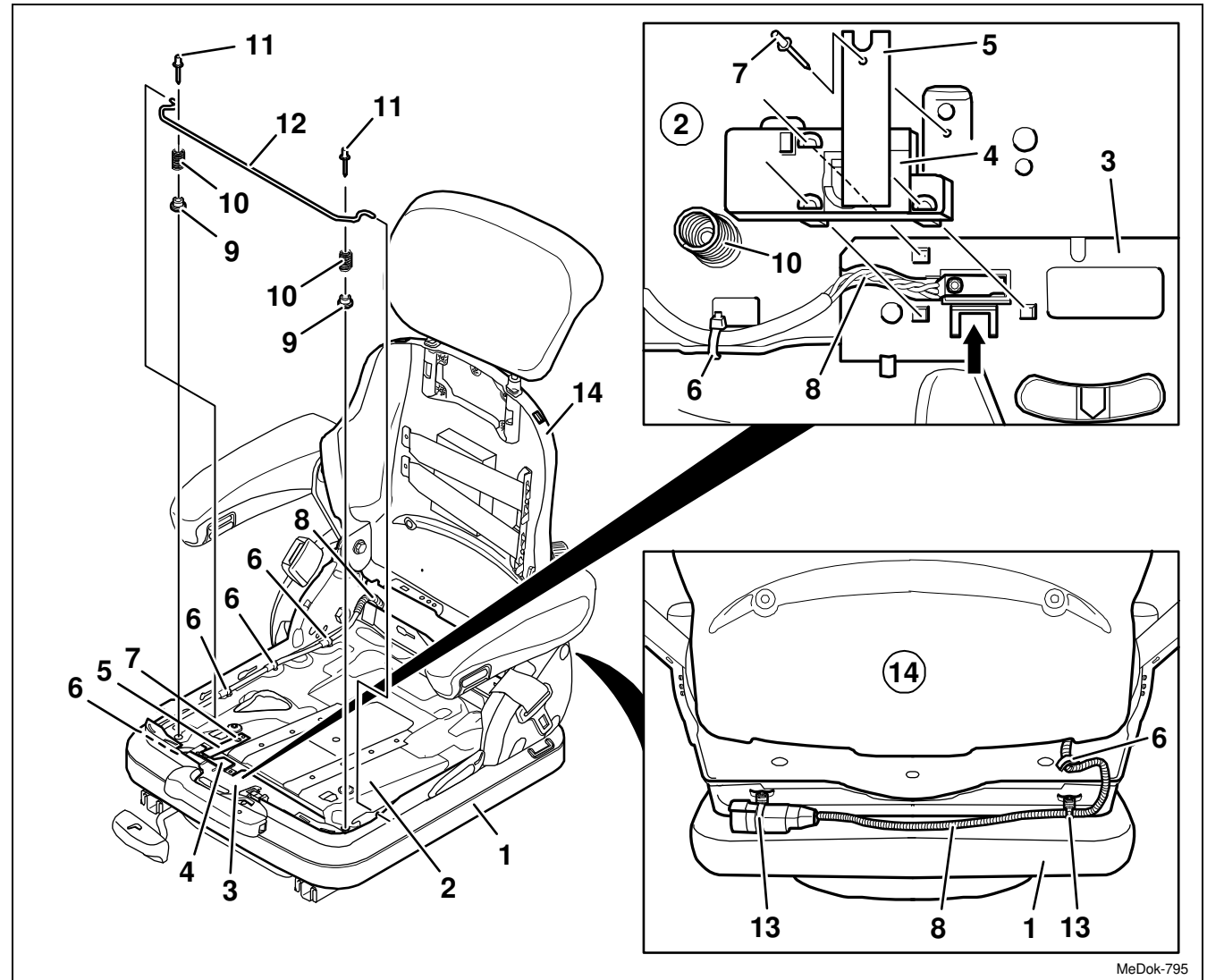
### 3.16 Seat switch with cable and switch mechanism – removal, installation

#### REMOVAL/INSTALLATION

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- (1) Bellows
- (2) Spring pack
- (3) Housing of the seat level indicator
- (4) Cover
- (5) Switch plate
- (6) Cable ties
- (7) Blind rivet
- (8) Seat switch with cable
- (9) Bushing
- (10) Compression springs
- (11) Blind rivet
- (12) Switching bracket
- (13) Cable ties with anchor ties
- (14) Backrest frame



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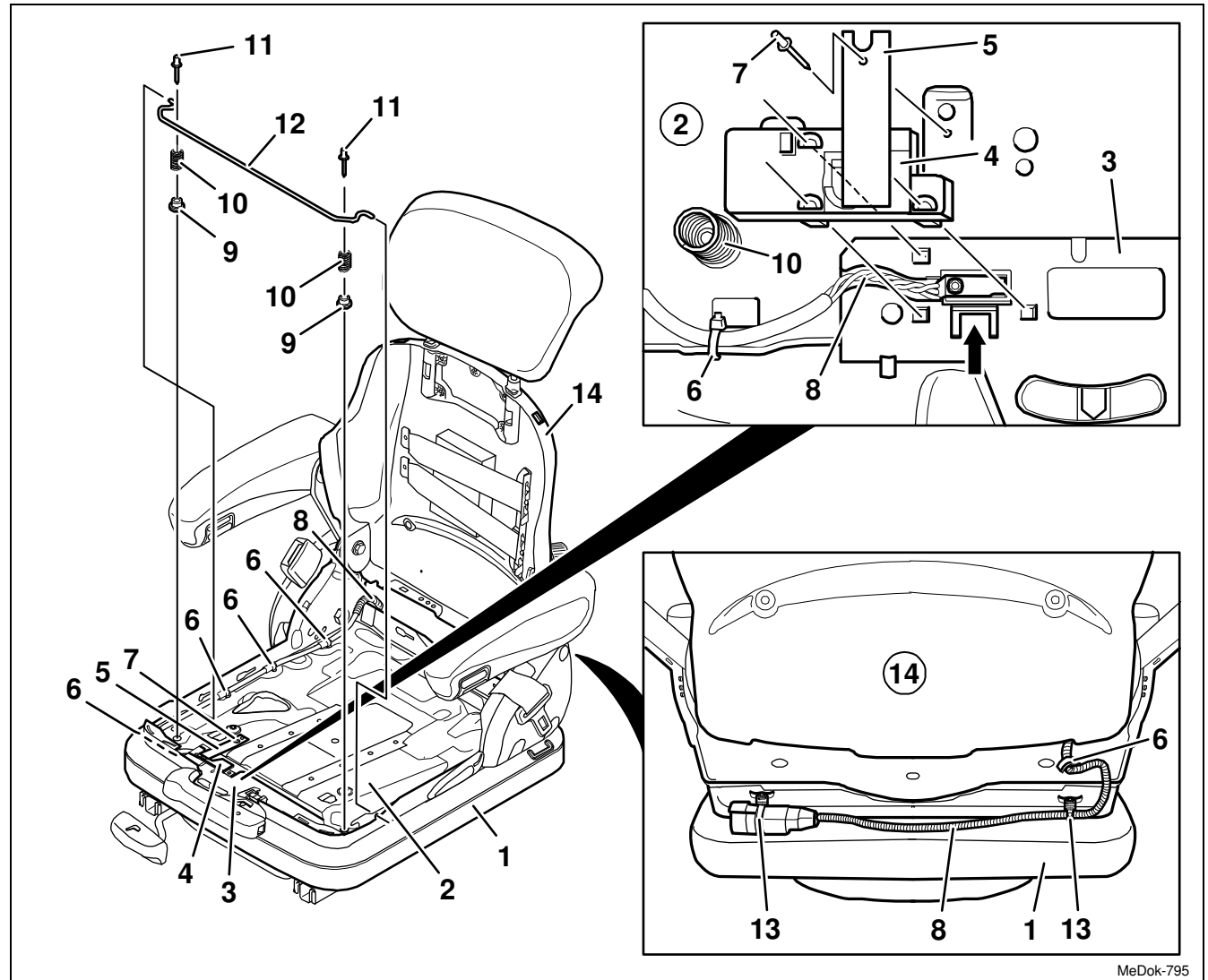
### 3.16 Seat switch with cable and switch mechanism – removal, installation

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- 1 Remove the backrest cushion (Chap. 3.1).
- 2 Remove the seat cushion (Chap. 3.2).
- 3 Remove the cover on the right side (see Chapter 3.4).
- 4 **Delivery option for construction machines:**  
Thread the webbing on the back right side from the bellows (1) (see Chapter 3.20.2).
- 5 Take off the bellows (1) from the spring pack (2) alongside the seat switch with cable (8) and lay it down (see Chapter 3.8).



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**3.16 Seat switch with cable and switch mechanism – removal, installation**

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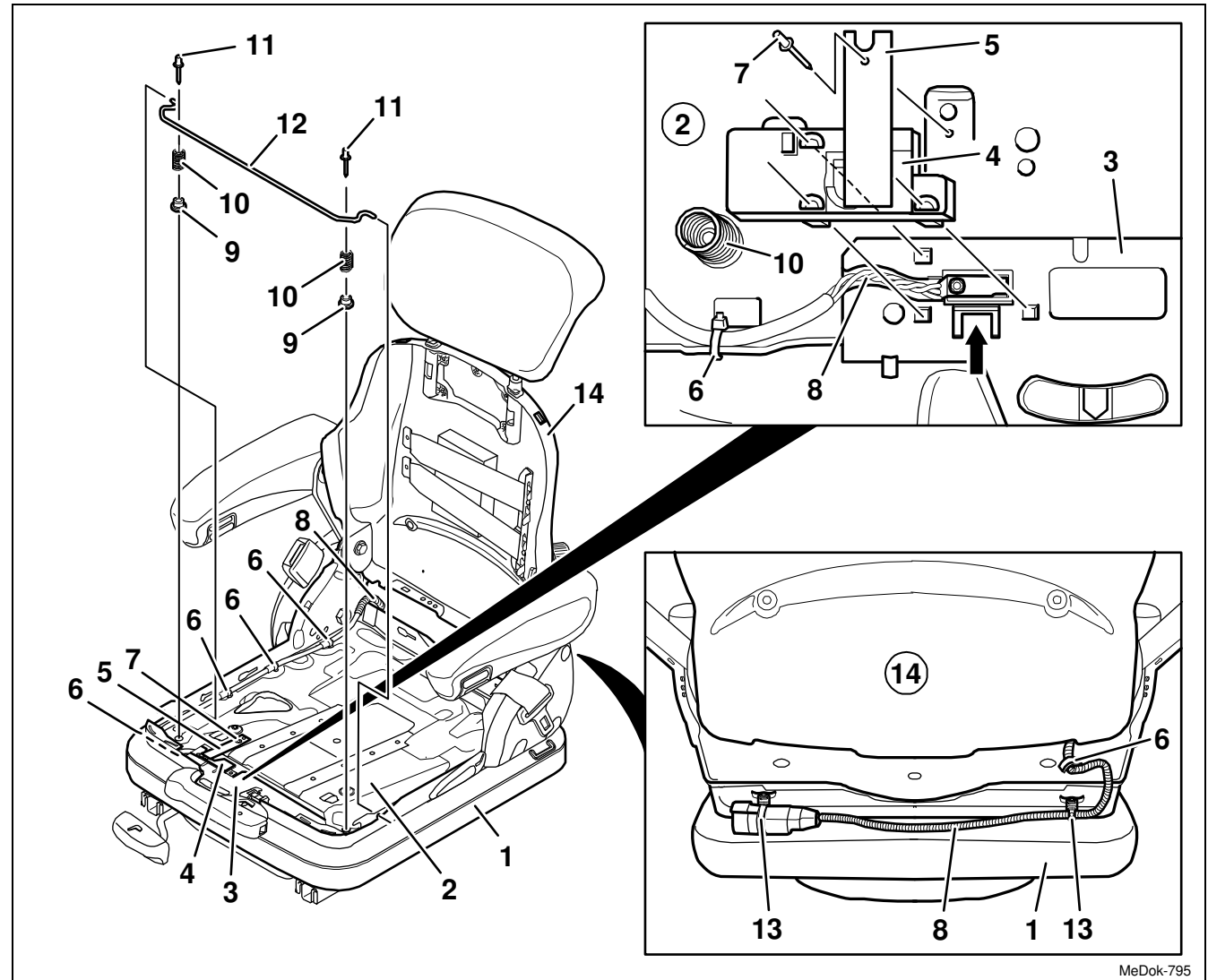
**Removal, installation**

- 6 Take off the switch bracket (12) from the spring pack (2). Press the switch bracket (12) slightly to the right, and then take it off from the spring pack (2) in an upward direction, by simultaneously pulling it out from the left and then from the right side. Subsequently, remove the switch bracket.

**Installation note:**

The switch bracket (12) must seat on the two compression springs (10), to guarantee the correct function of the seat switch with cable (8).

- 7 Pull off the two compression springs (10) from the two bushings (9) in an upward direction.
- 8 Bore out two rivet heads and drive out blind rivets (11). Remove the two bushings (9).



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### 3.16 Seat switch with cable and switch mechanism – removal, installation

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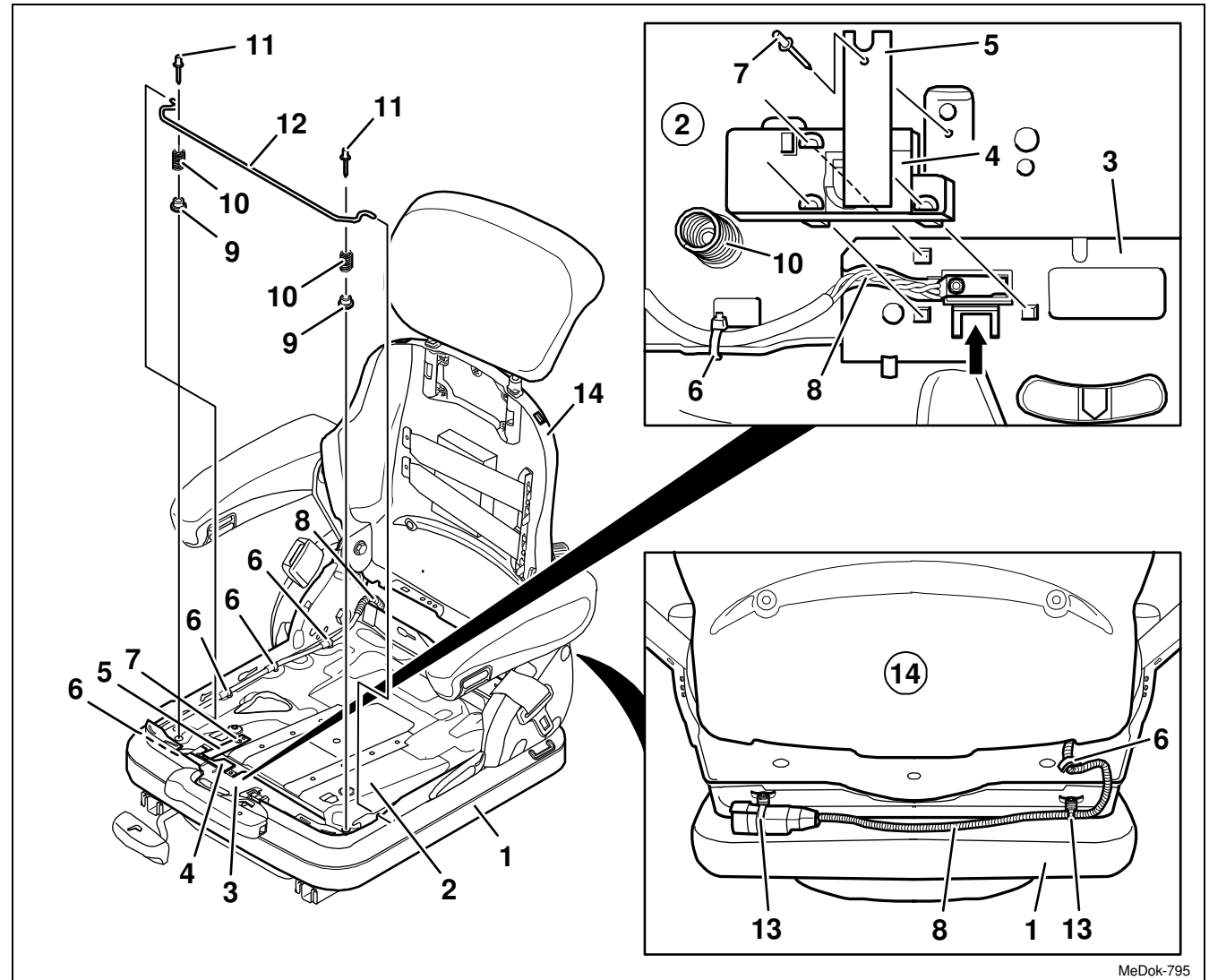


#### 9 Replace the switch plate (5):

Bore out the rivet head and drive out the blind rivet (7). Remove the switch plate (5).

10 Remove the cover (4) from the housing of the seat level indicator (3). To do this, press down the catchers (arrow) on the housing for seat level indicator (3), push the cover (4) forward over the catcher and remove it in an upward direction.

11 Pull out the seat switch cable (8) from the housing of the seat level indicator (3) and place it on the spring pack (2).



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**3.16 Seat switch with cable and switch mechanism – removal, installation**

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- 12 Mark places where the switch cable (8) is fastened on the spring pack (2) and remove the four cable ties (6).

**Installation note:**

The locking heads of the cable ties (6) must be fixed outside of the spring pack (2).

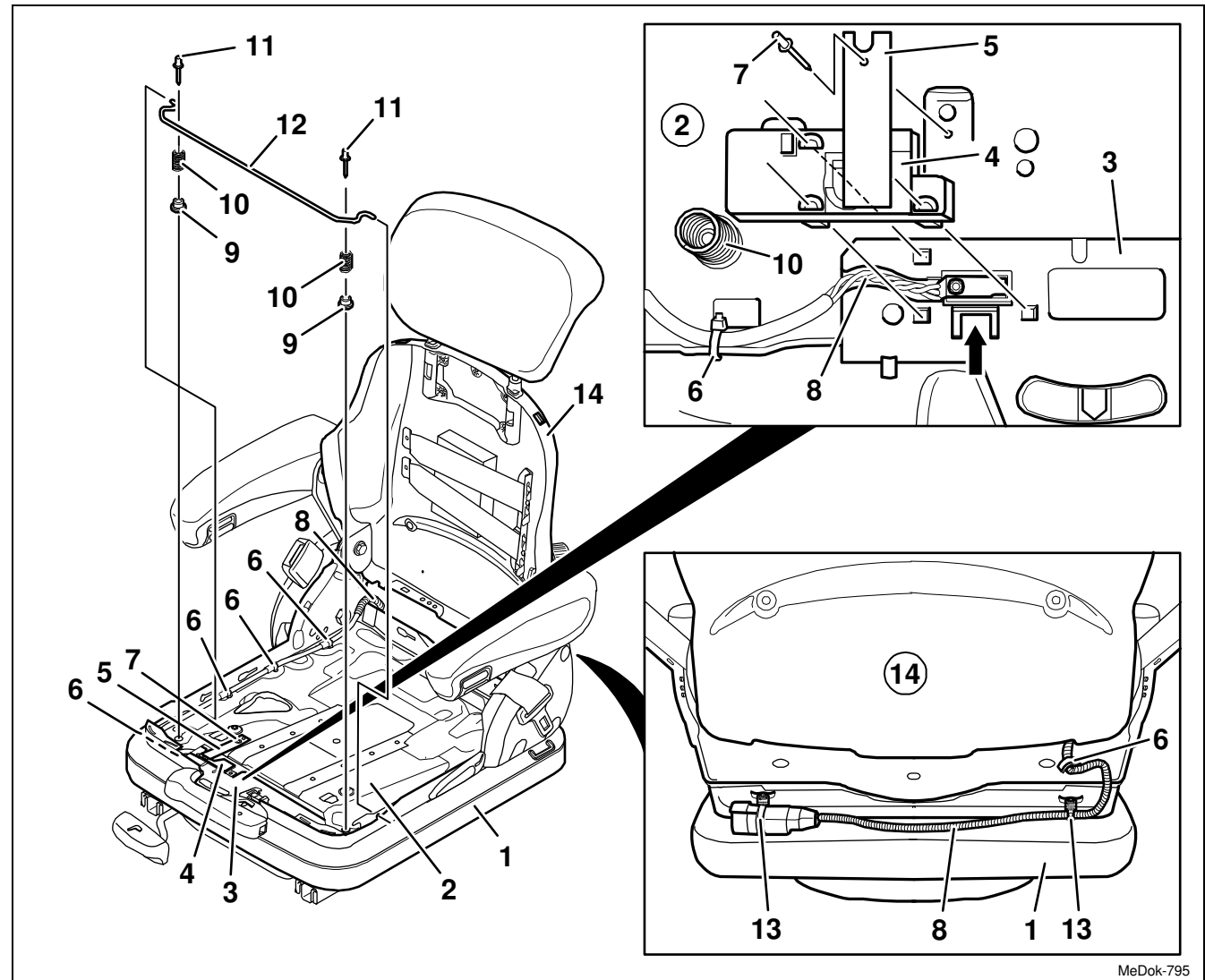
- 13 Pull out two cable ties with anchor ties (13) from the spring pack (2) and the bellows (3).

- 14 Pull out the switch with cable (8) forward between the spring pack (2) and backrest frame (14) and then remove it.

**Installation note:**

When installing the seat switch with cable (8), do not expose it to impacts.

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



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### 3.17 Seat fore/aft adjustment – removal, installation of the entire assembly

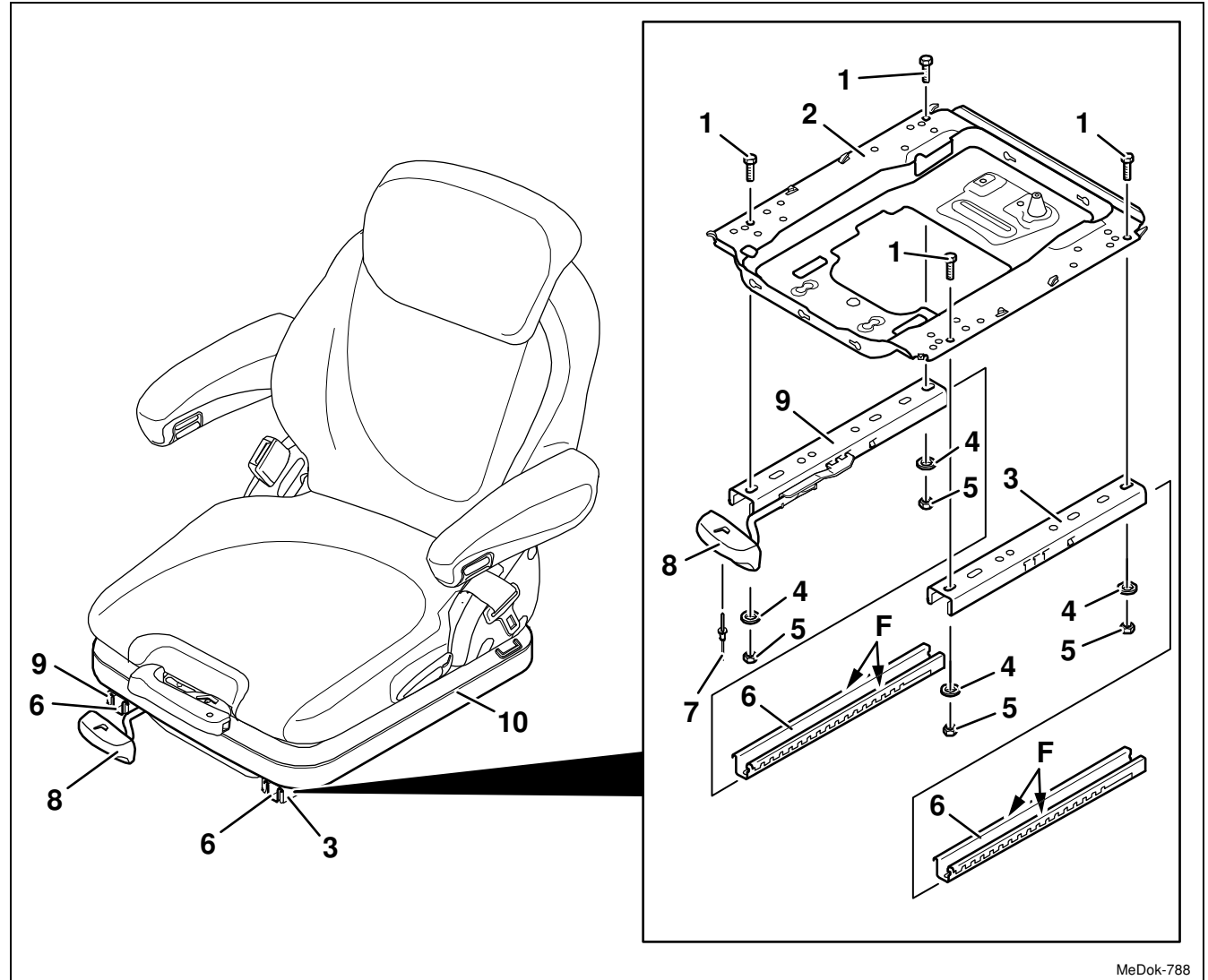


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- (1) Micro-encapsulated cap screw replac
- (2) Lower part of the suspension
- (3) Adjusting rail ..... grease
- (4) Washer
- (5) Hexagon nut
- (6) Locking rail
- (7) Blind rivet
- (8) Handle for fore/aft adjustment  
..... replace, if necessary
- (9) The entire adjusting rail..... grease
- (10) Bellows

1 Take off the bellows (10) from the lower part of the suspension (2), push it upward and then fix it (see Chapter 3.8).



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### 3.17 Seat fore/aft adjustment – removal, installation of the entire assembly

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#### Removal, installation

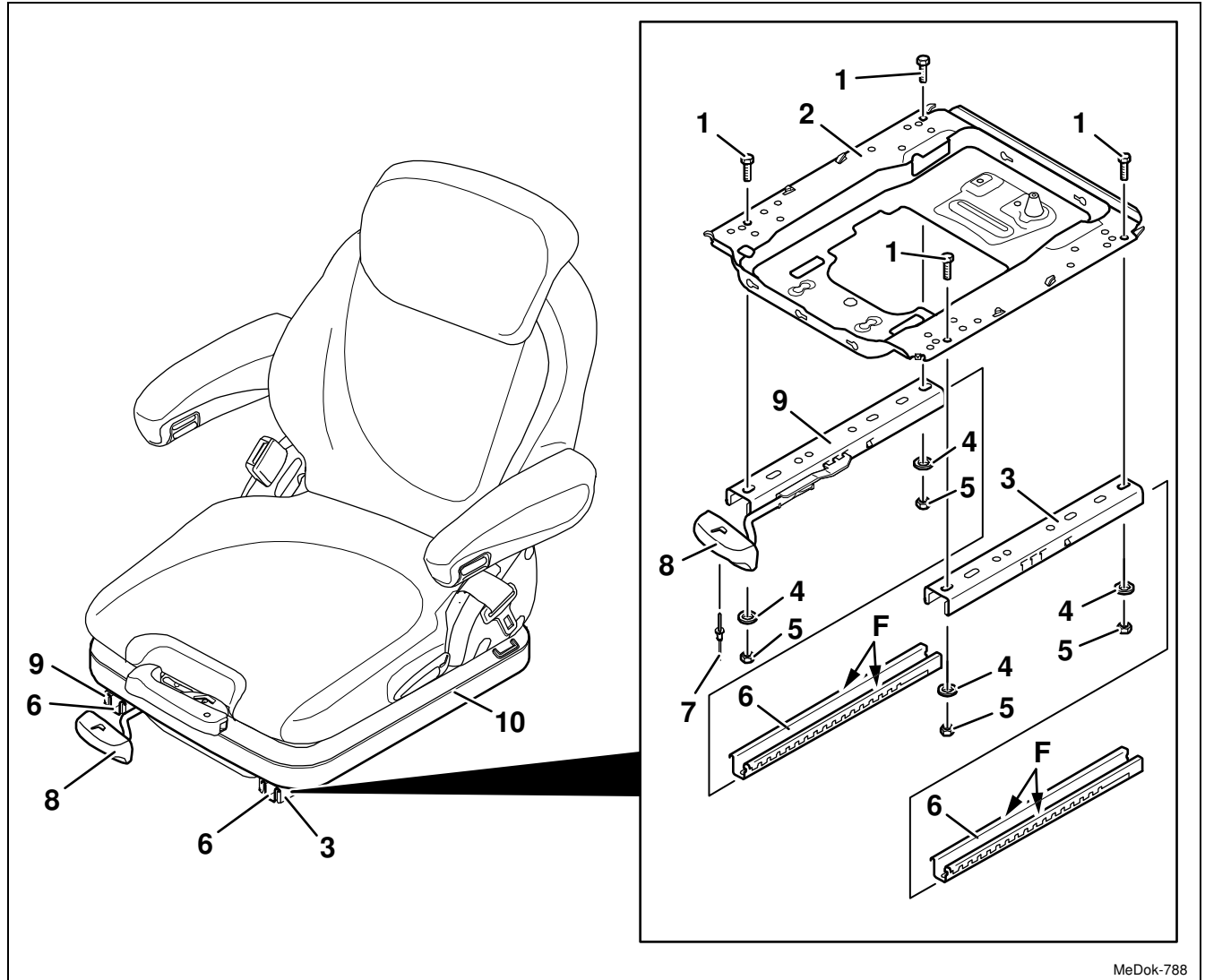
- 2 Pull out the two locking rails (6) from the adjusting rail (3) and the entire adjusting rail assembly (9).

**Note:**

To unlock the locking rail (6) from the entire adjusting rail assembly (9), pull the handle for fore/aft adjustment (8) in an upward direction.

**Installation note:**

Apply acid-free multi-purpose lubricant to the rail surfaces (F) of the two locking rails.



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**3.17 Seat fore/aft adjustment – removal, installation of the entire assembly**

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- 3 Undo the four micro-encapsulated cap screws (1) and remove the hexagon nuts (5) with the washers (6).

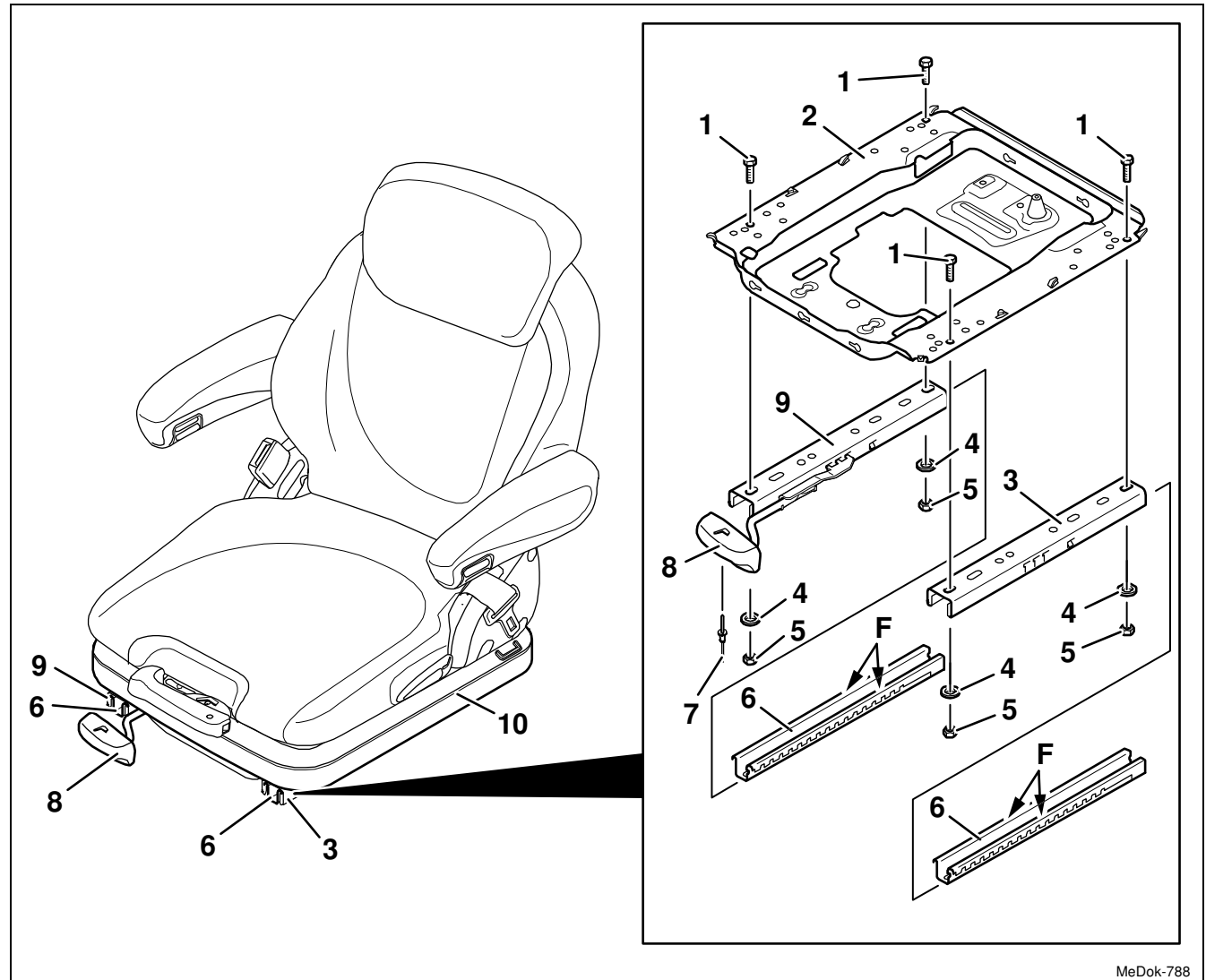
**Installation notes:**

- Replace the micro-encapsulated cap screw (1), 25 Nm.
- When removing the screws, mark the mounting holes for micro-encapsulated cap screws (1), and when reinstalling them again, use the screw positioning diagram that you created before.

- 4 Remove the adjusting rail (3) and the entire adjusting rail assembly (9).

**5 Delivery option for construction machines:**

Remove the two webbing fixation plates and the two adjusting washers (see Chapter 3.20.2).



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### 3.17 Seat fore/aft adjustment – removal, installation of the entire assembly

REMOVAL/INSTALLATION

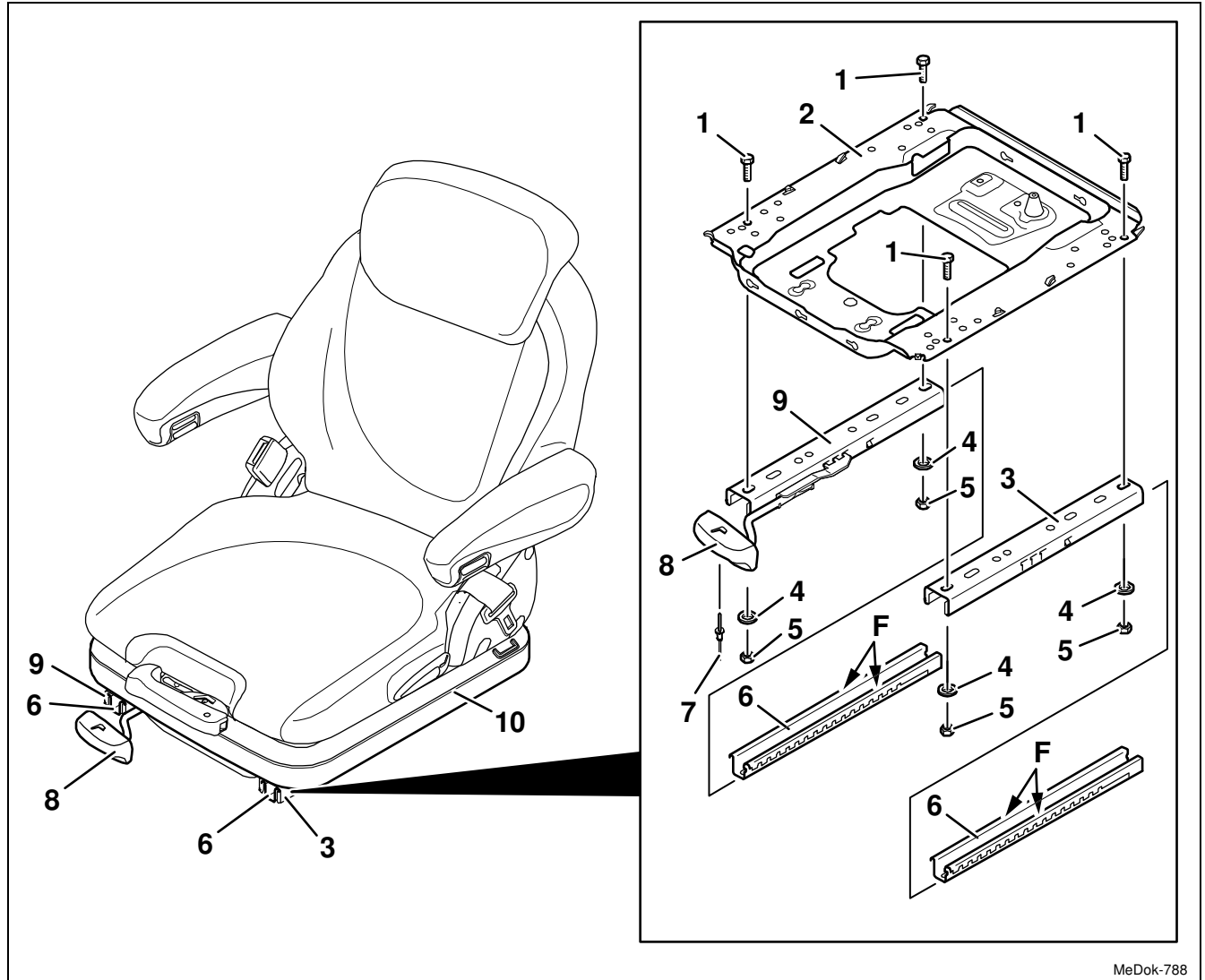
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#### 6 Replace the handle for fore/aft adjustment (8):

Remove the handle for fore/aft adjustment (8) (Chap. 3.11).

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



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**3.18 Spring pack – removal, installation of the entire assembly**

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- 3.18.1 Spring assembly – removal and installation (seat plate)
- 3.18.2 Spring assembly – removal and installation (upper suspension part)

### 3.18.1 Spring assembly – removal and installation of the entire assembly (seat plate)



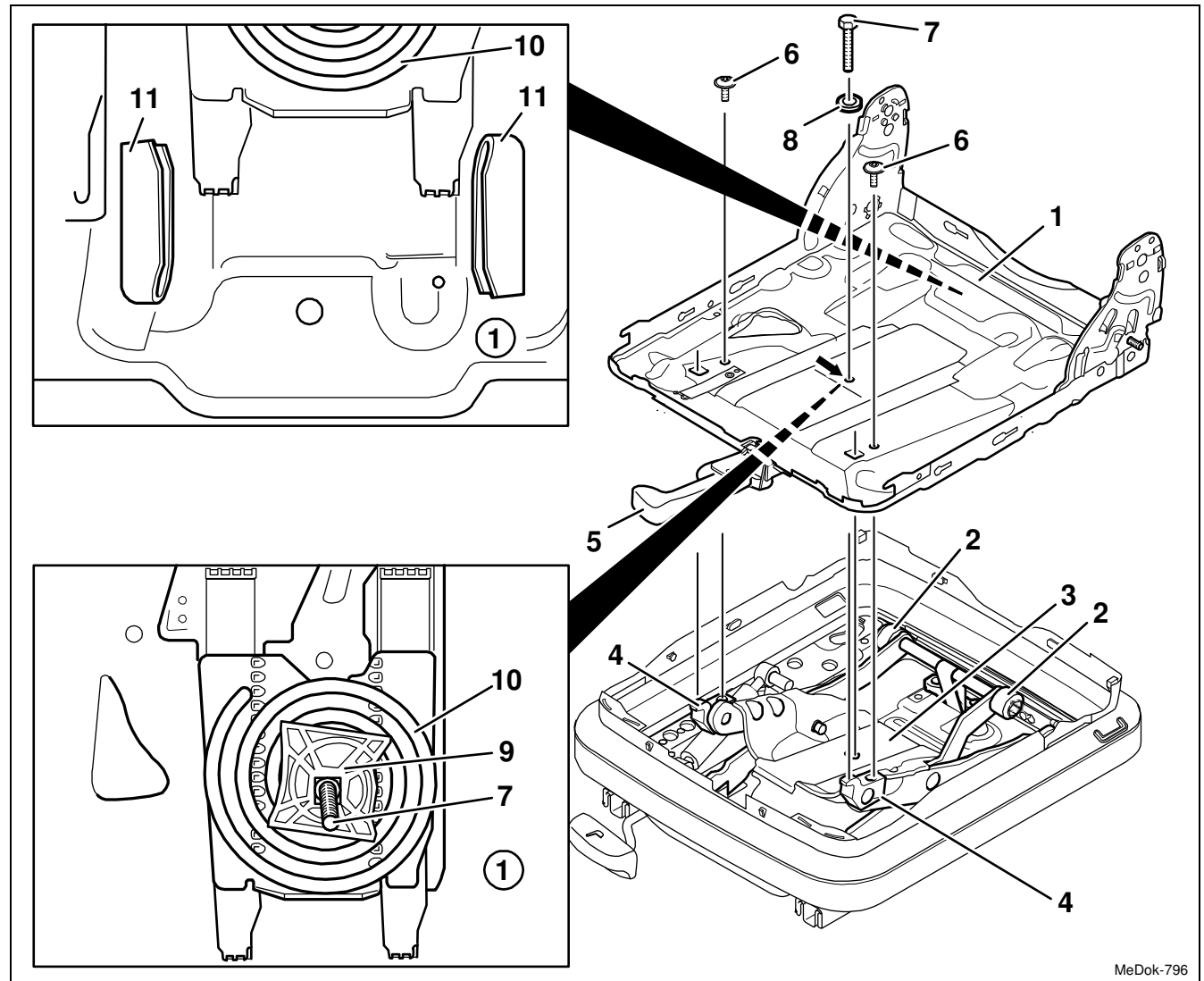
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- (1) Spring pack (seat plate)
- (2) Plastic roller
- (3) Swinging structure
- (4) Fixed bearing
- (5) Handle for weight adjustment
- (6) Special torx screw ..... 25 Nm
- (7) Retaining spindle
- (8) Washer (hardened)
- (9) Slider
- (10) Spring
- (11) Guiding rail

1 Remove the backrest cushion  
(Chap. 3.1).

2 Remove the seat cushion (Chap. 3.2).



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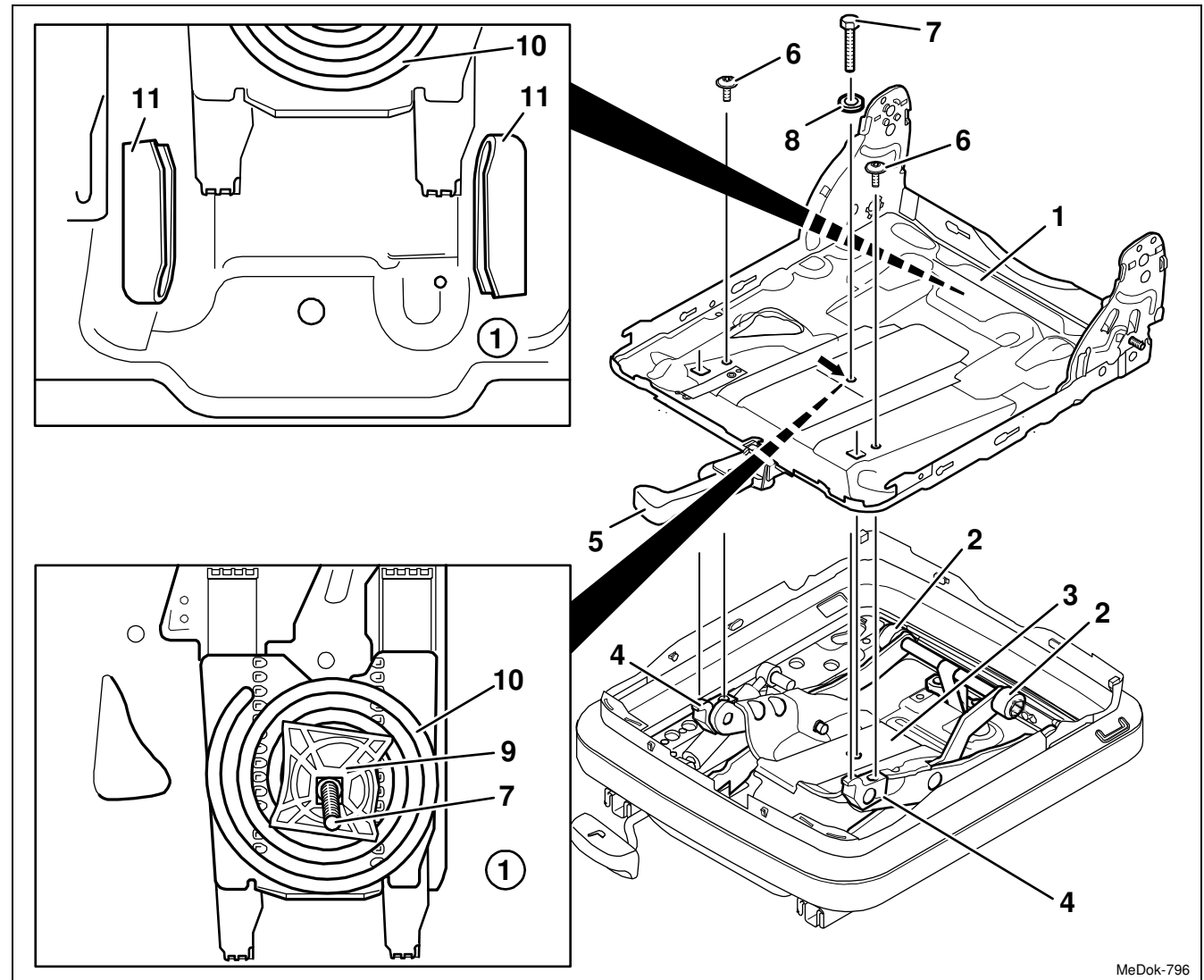
### 3.18.1 Spring assembly – removal and installation of the entire assembly (seat plate)



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- 3 Remove the left and right covers (Chap. 3.4).
- 4 **Seat with armrests:**  
Remove the armrests (Chap. 3.6).
- 5 Remove the backrest frame with the retaining spring (Chap. 3.7).
- 6 Remove the bellows from spring pack (1) (see Chapter 3.8) and lay it down.
- 7 **Delivery option for construction machines:**  
Take off the right and left webbing and remove the four washers (see Chapter 3.20.2).
- 8 Replace the belt roller and the belt buckle (Chap. 3.9).
- 9 Remove the entire backrest lock (Chap. 3.13).
- 10 Remove the entire seat level indicator (Chap. 3.15).



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### 3.18.1 Spring assembly – removal and installation of the entire assembly (seat plate)



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11 Remove the seat switch with cable and switch mechanism (Chap. 3.16).

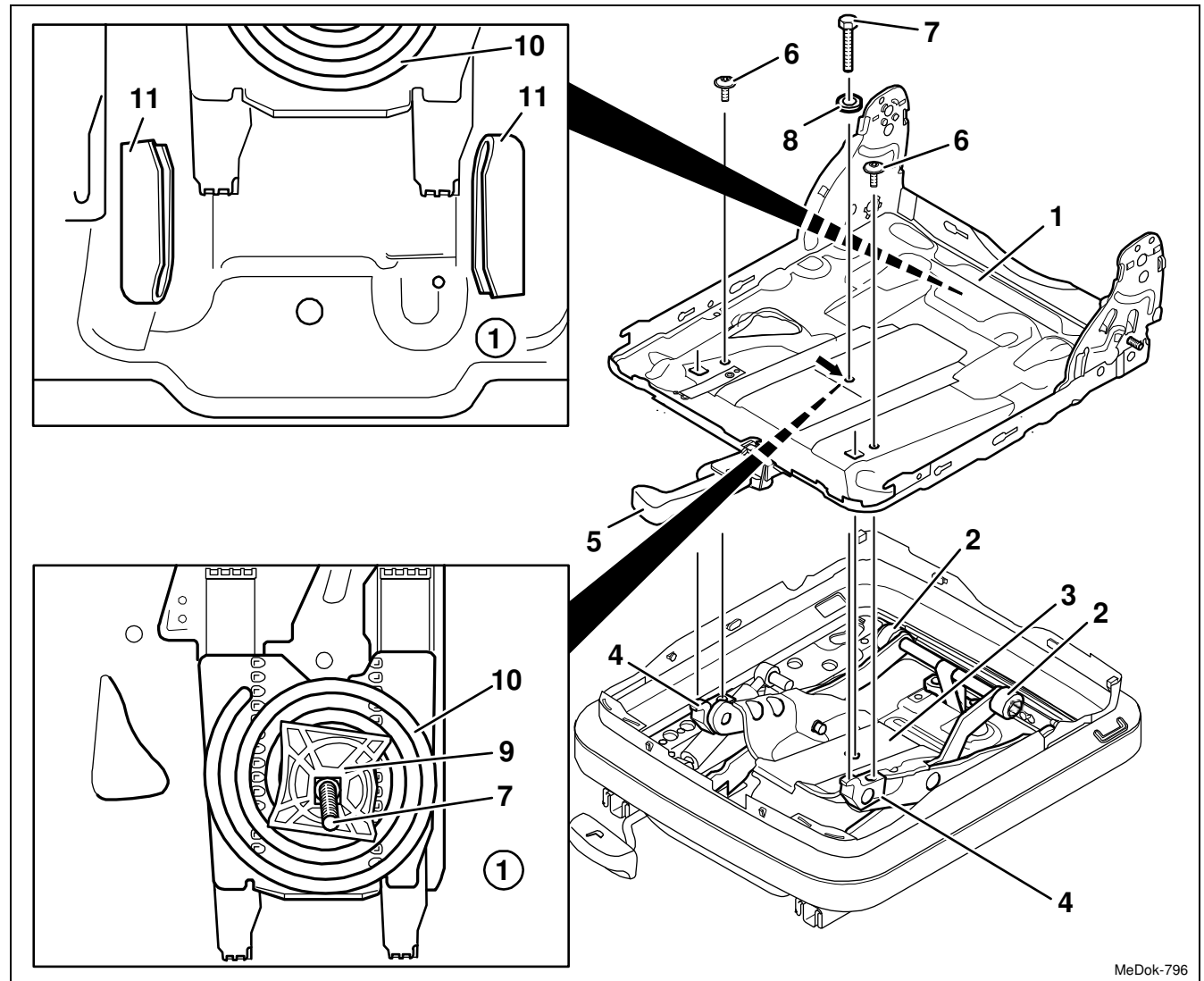
#### Removal, installation



**WARNING:** Take care with the spring (10) on the spring pack (1) - it may jerk forward and cause injury! Secure the spring (10) by tightening the screws before removing the spring pack (1).

12 Operate the handle for weight adjustment (5) upward or downward until the hole (arrow) on the spring pack (1) matches the mounting hole inside the spring pack (1).

13 Remove the handle for weight adjustment (5) (Chap. 3.10).



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### 3.18.1 Spring assembly – removal and installation of the entire assembly (seat plate)



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14 Screw the retaining spindle (7) for securing the springs (10) into the hole (arrow) on the spring pack (1) until the slider (9) lifts from the swinging structure (3).

**Notes:**

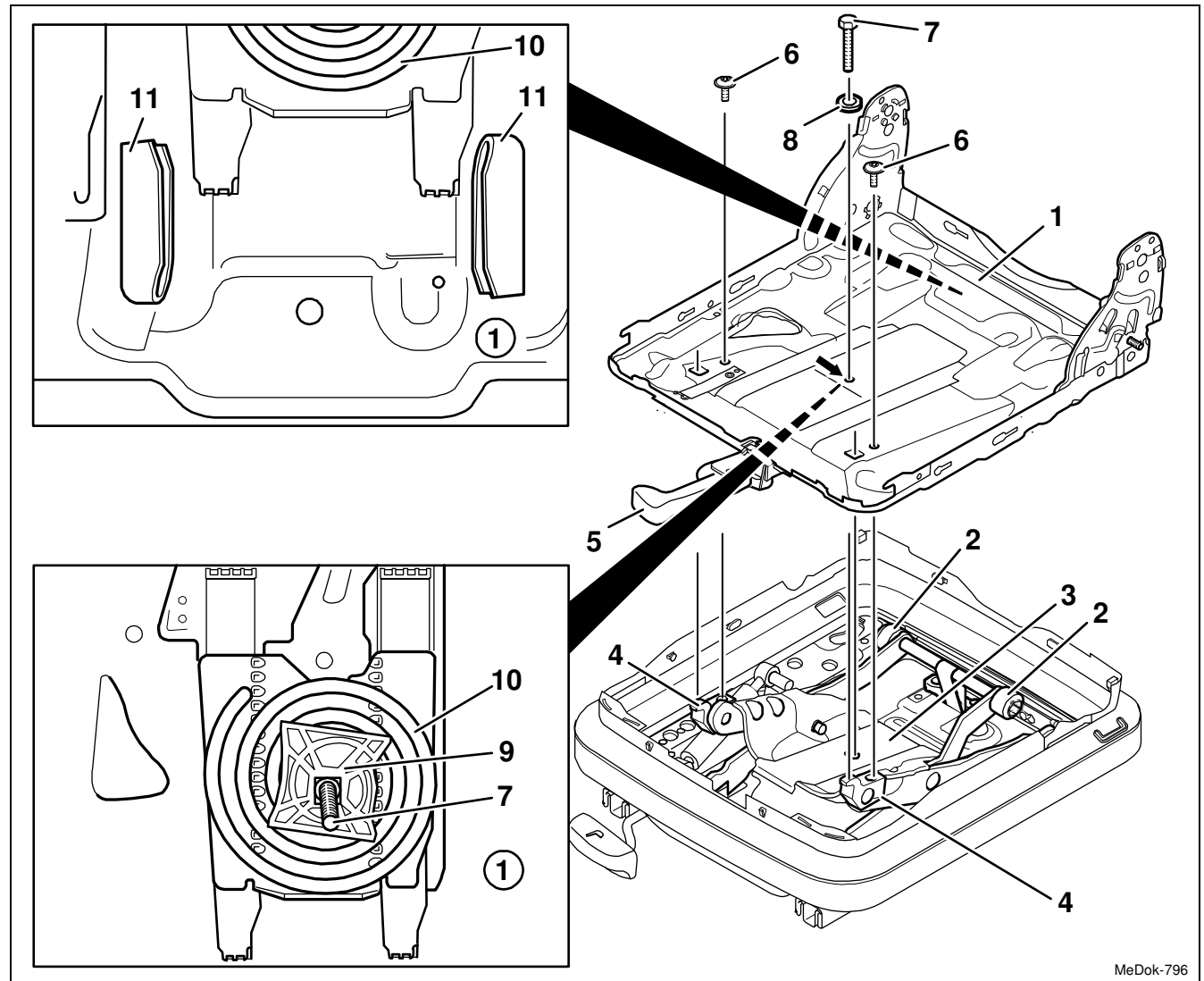
- In the service group, the washer (8) and retaining spindle (7) are provided with an exactly specified thread length.



**ATTENTION Malfunction!**

To avoid overextension of the springs (10) in the spring pack (1), the washer (8) and retaining spindle (7) that are supplied in the service group are to be used.

- Before you dispose of the replaced spring pack (1), unscrew the retaining spindle (7).



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### 3.18.1 Spring assembly – removal and installation of the entire assembly (seat plate)



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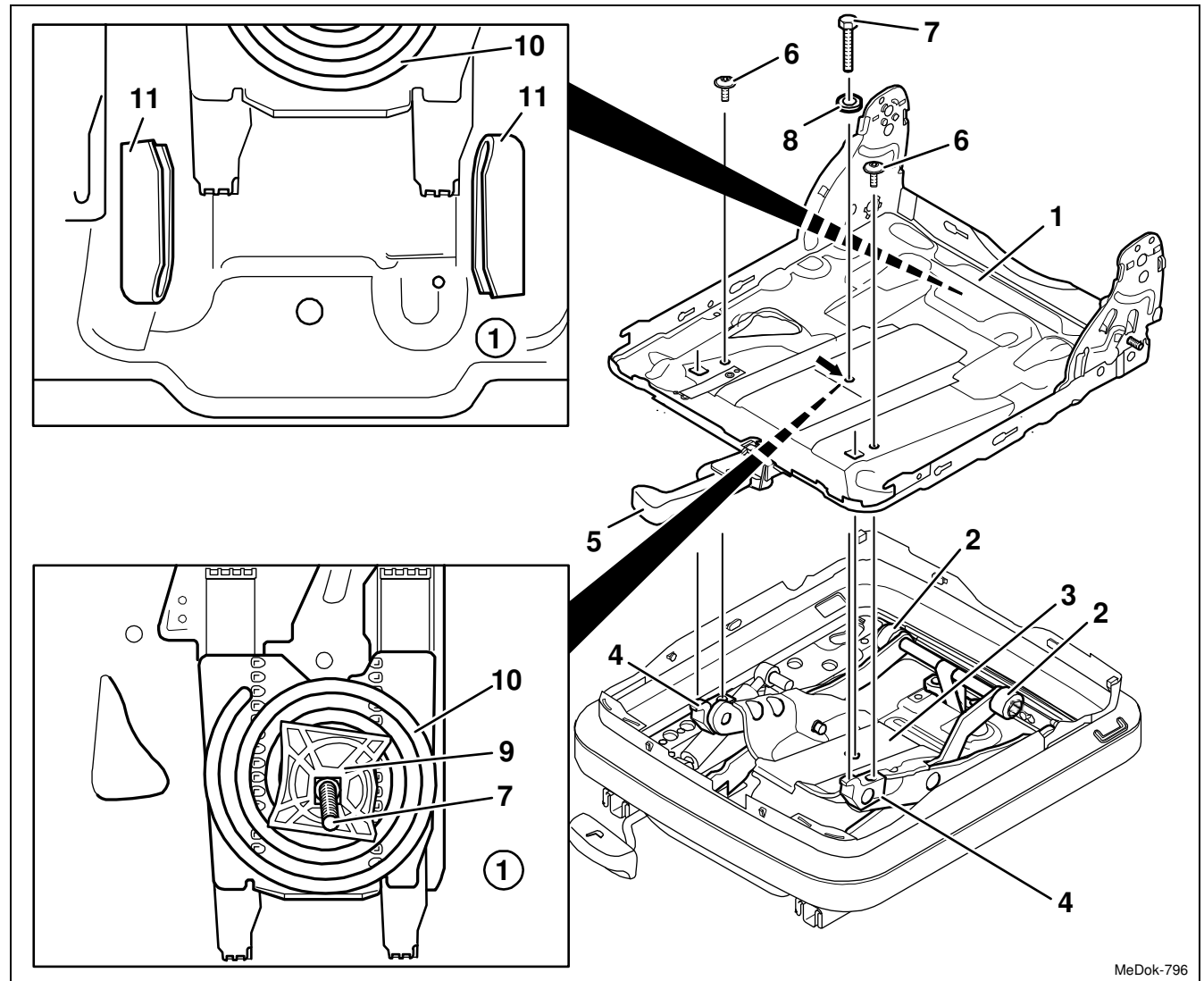
15 Unscrew the two special torx screws (6) from the fixed bearing (4).

**Installation notes:**

- Special torx screw (6), 25 Nm.
- When installing the spring pack (1), the both special torx screws (6) must be used.
- The retaining spindle (7) may be unscrewed and the washer (8) removed only after the two special torx screws (6) have been screwed into the fixed bearing (4) and tightened.

16 Take off the two fixed bearings (4) from the spring pack (1).

17 Lift the spring pack (1) in the front until the retaining spindle (7) is completely pulled out of the hole of the swinging structure (3).



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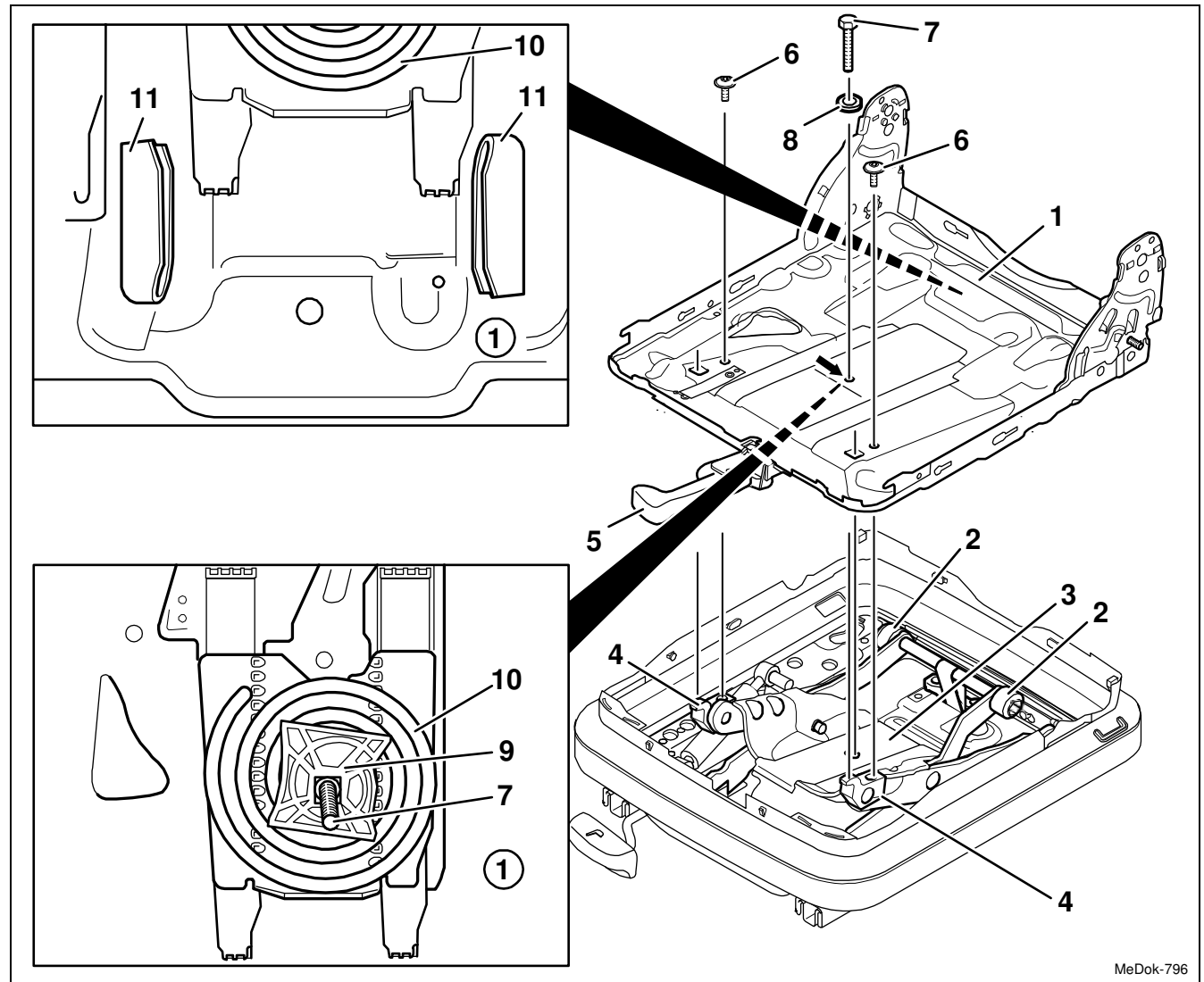
### 3.18.1 Spring assembly – removal and installation of the entire assembly (seat plate)



#### REMOVAL/INSTALLATION

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- 18 Push backwards the spring pack (1) as far as possible, and remove the two guiding rails (11) at the bottom of the spring pack (1) from the two plastic rollers (2) by turning them sideways to the right. Remove the spring pack (1) in an upward direction.
- 19 Re-install the components in the reverse order of their removal.



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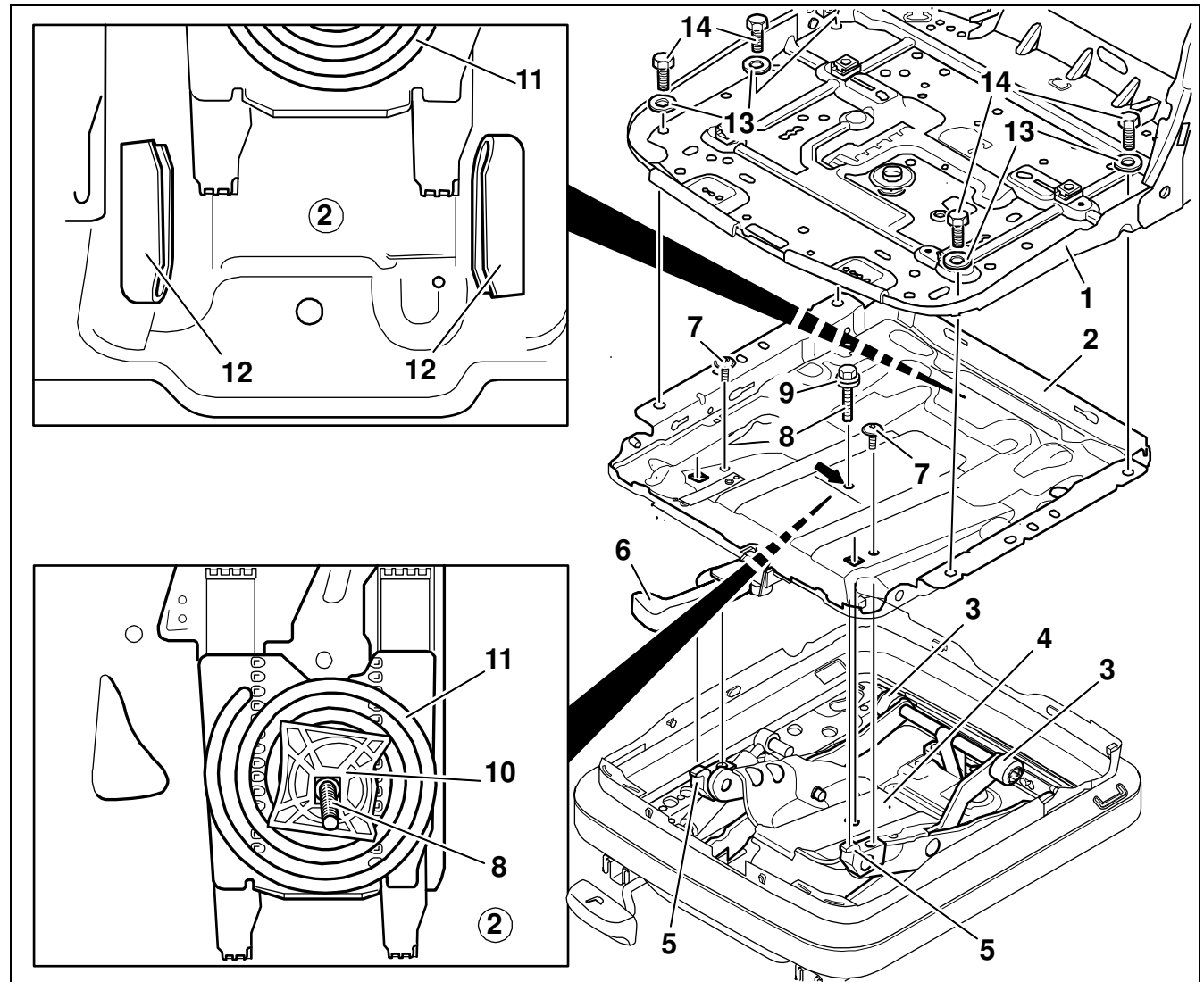
### 3.18.2 Spring assembly – removal and installation of the entire assembly (upper suspension part)



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- (1) Upper seat part
- (2) Spring assembly (upper suspension part)
- (3) Plastic roller
- (4) Swinging structure
- (5) Fixed bearing
- (6) Handle for weight adjustment
- (7) Special torx screw ..... 25 Nm
- (8) Retaining spindle
- (9) Washer (hardened)
- (10) Slider
- (11) Spring
- (12) Guiding rail
- (13) Washer
- (14) Hexagon bolt ..... 25 Nm



### 3.18.2 Spring assembly – removal and installation of the entire assembly (upper suspension part)

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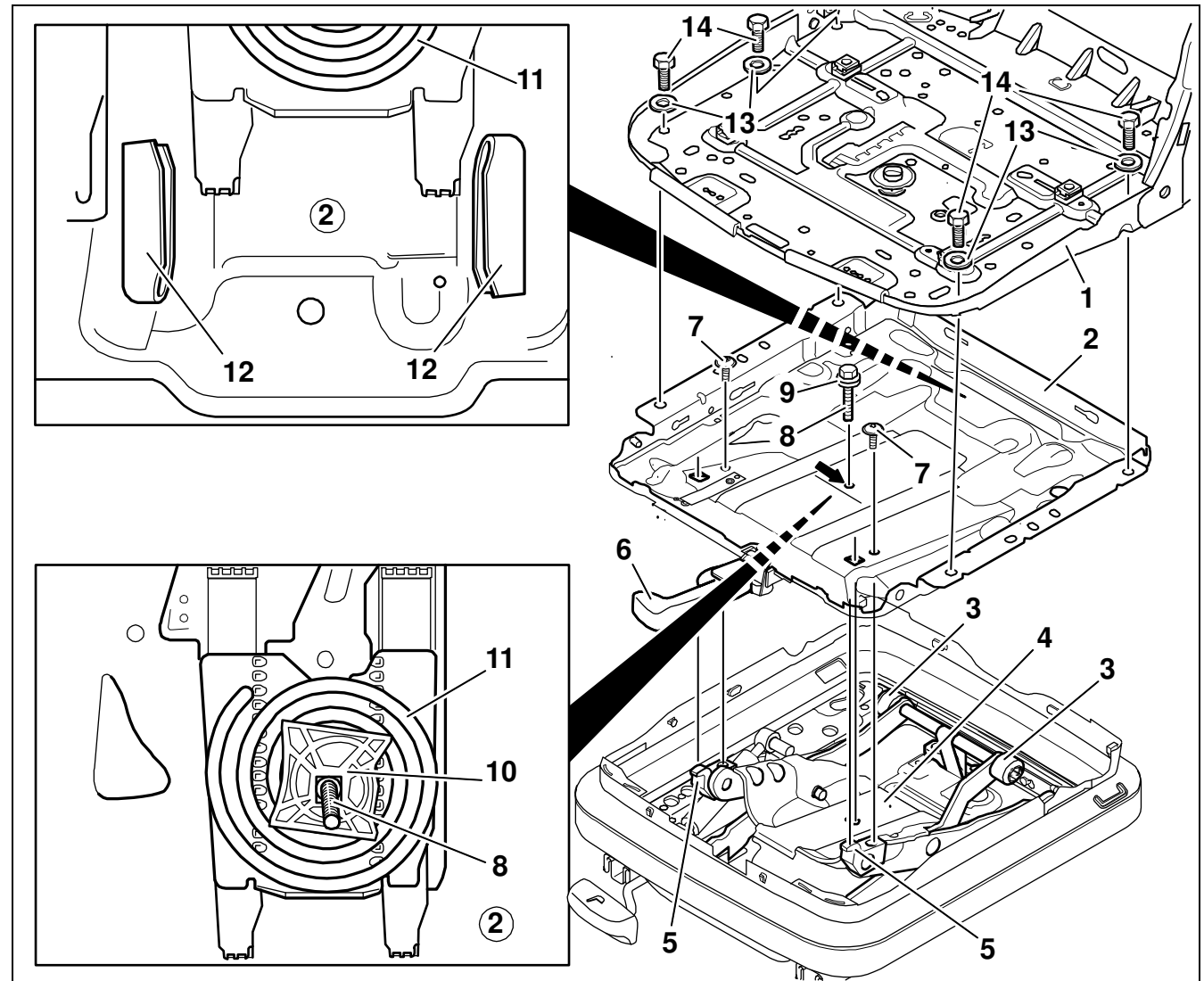
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- 1 Remove the seat cushion (see repair manual for the upper seat part).
  - 2 Remove the bellows from the spring assembly (2) (see Chapter 3.8) and lay it down.
  - 3 Unscrew four hexagon bolts (14) and remove them together with the washers (13).
- Installation note:**  
Hexagon bolts (14), 25 Nm.
- 4 Remove the upper seat part (1) from the spring assembly (2).

#### Removal, installation



**WARNING:** take care with the spring (11) on the spring pack (2) - it may jerk forward and cause injury! Secure the spring (11) by tightening the screws before removing the spring pack (2).



### 3.18.2 Spring assembly – removal and installation of the entire assembly (upper suspension part)

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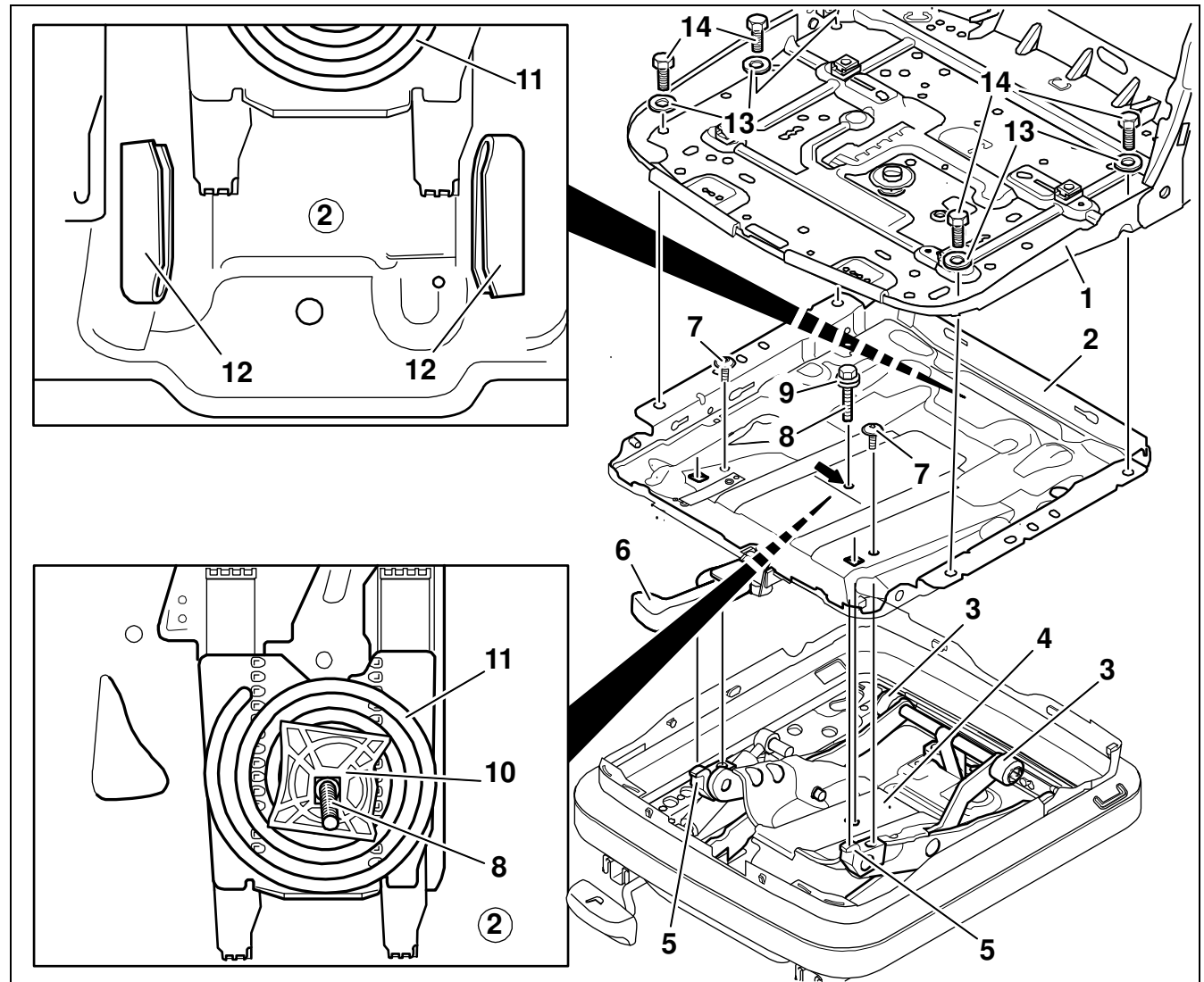
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- 5 Operate the handle for weight adjustment (6) upward or downward until the hole (arrow) on the spring pack (2) matches the mounting hole inside the spring pack (2).
- 6 Remove the handle for weight adjustment (6) (Chap. 3.10).
- 7 Screw the retaining spindle (8) for securing the springs (11) into the hole (arrow) on the spring pack (2) until the slider (10) lifts from the swinging structure (4).

#### Notes:

- In the service group, the washer (9) and retaining spindle (8) are provided with an exactly specified thread length.



### 3.18.2 Spring assembly – removal and installation of the entire assembly (upper suspension part)



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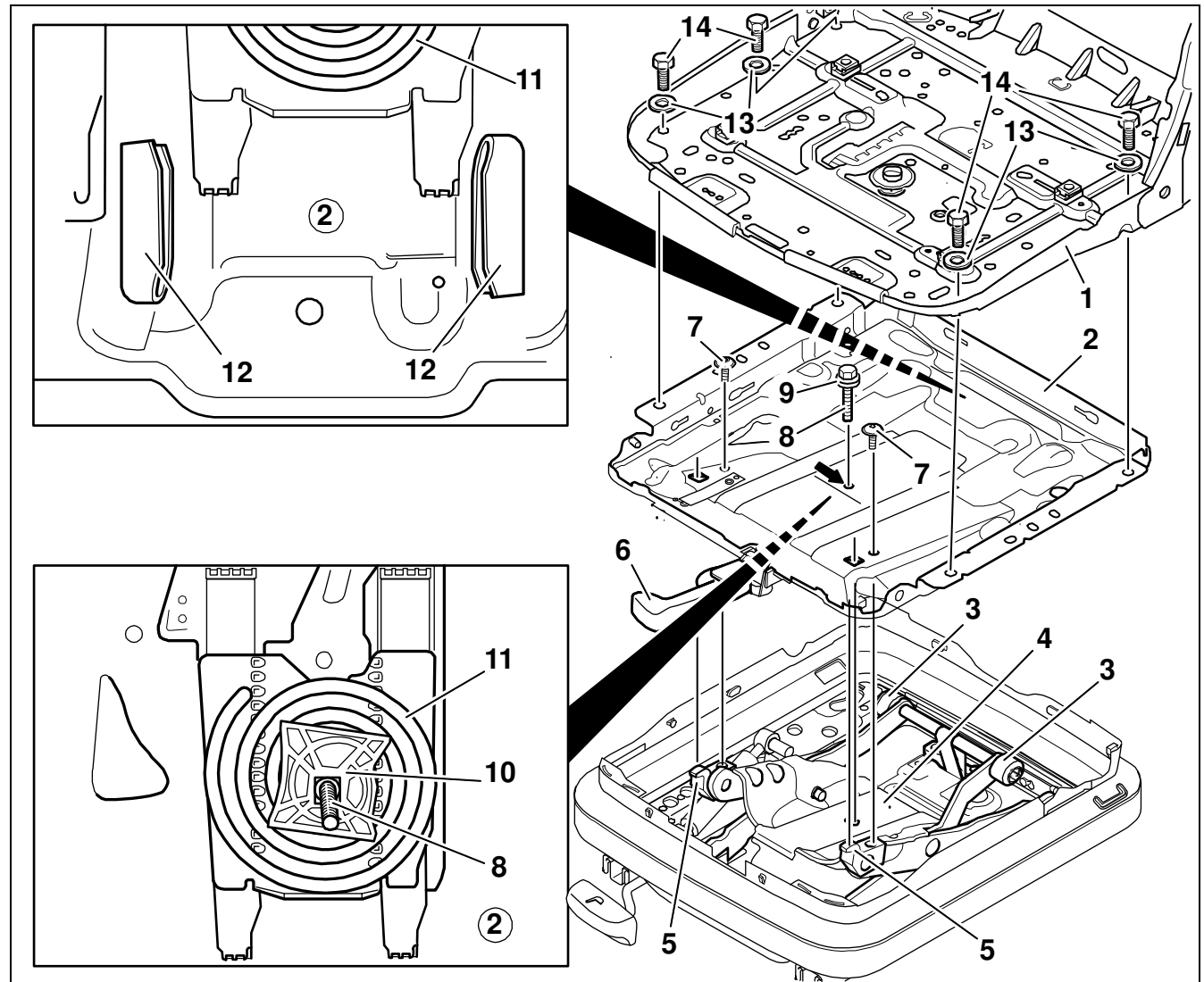
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#### ATTENTION Malfunction!

To avoid overextension of the springs (11) in the spring pack (2), the washer (9) and retaining spindle (8) that are supplied in the service group are to be used.

- Before you dispose of the replaced spring pack (2), unscrew the retaining spindle (8).



### 3.18.2 Spring assembly – removal and installation of the entire assembly (upper suspension part)

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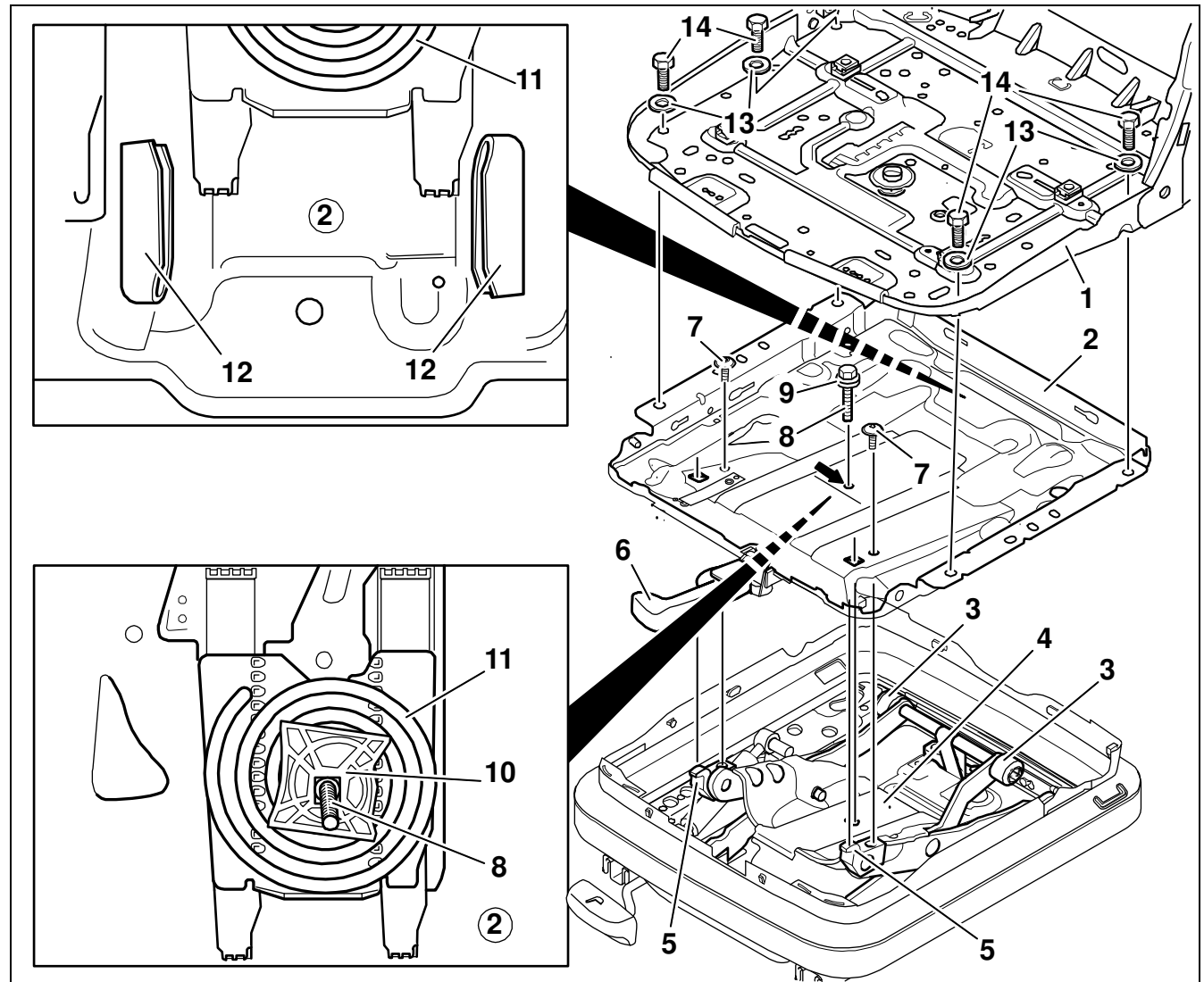
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- 8 Unscrew the two special torx screws (7) from the fixed bearing (5).

#### Installation notes:

- Special torx screw (7), 25 Nm.
  - When installing the spring pack (2), the both special torx screws (7) must be used.
  - The retaining spindle (8) may be unscrewed and the washer (9) removed only after the two special torx screws (7) have been screwed into the fixed bearing (5) and tightened.
- 9 Take off the two fixed bearings (5) from the spring pack (2).
- 10 Lift the spring pack (2) in the front until the retaining spindle (8) is completely pulled out of the hole of the swinging structure (4).

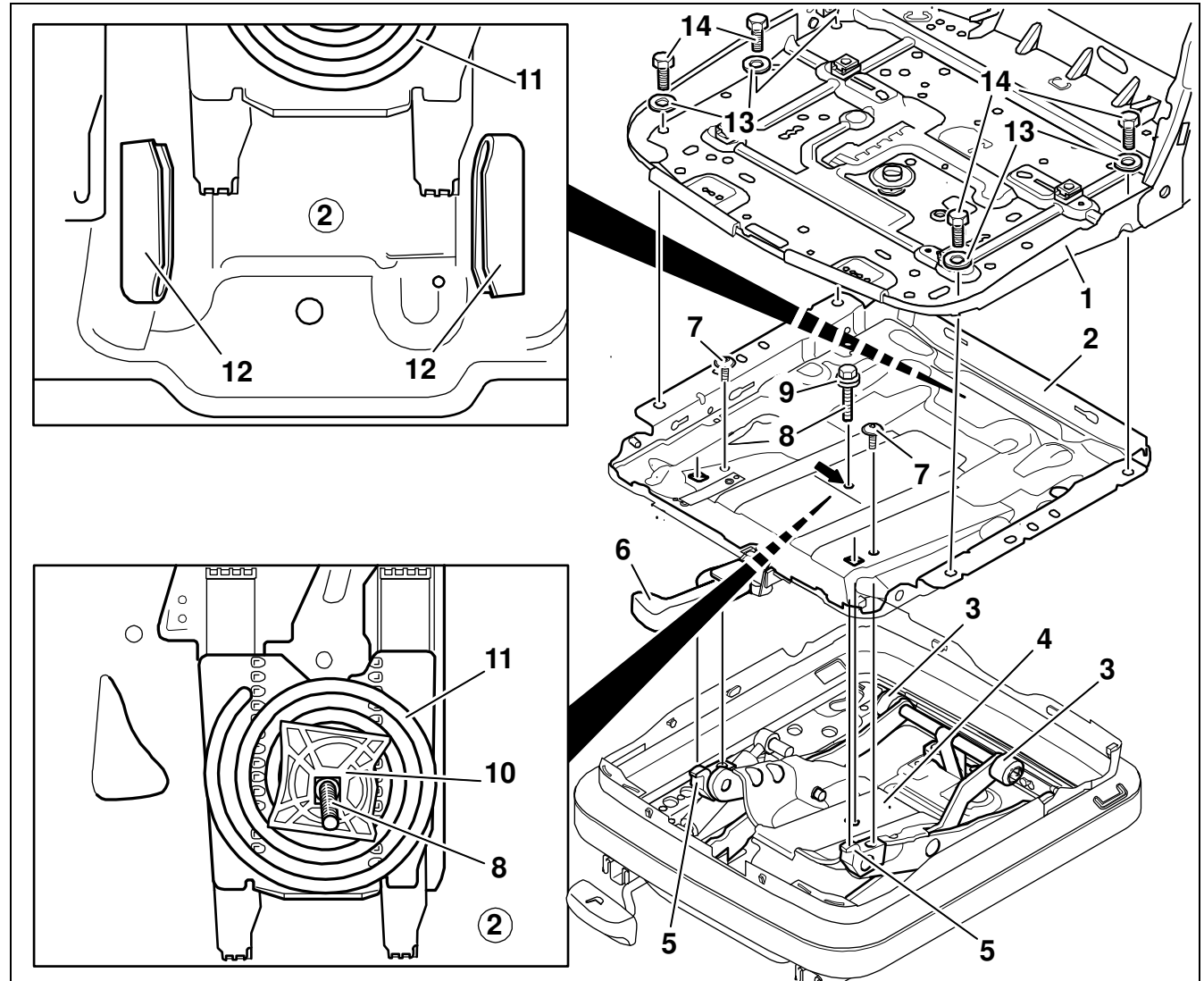


### 3.18.2 Spring assembly – removal and installation of the entire assembly (upper suspension part)

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- 11 Push backwards the spring pack (2) as far as possible, and remove the two guiding rails (12) at the bottom of the spring pack (2) from the two plastic rollers (3) by turning them sideways to the right. Remove the spring pack (2) in an upward direction.
- 12 Re-install the components in the reverse order of their removal.



### 3.19 Shock absorber – removal, installation

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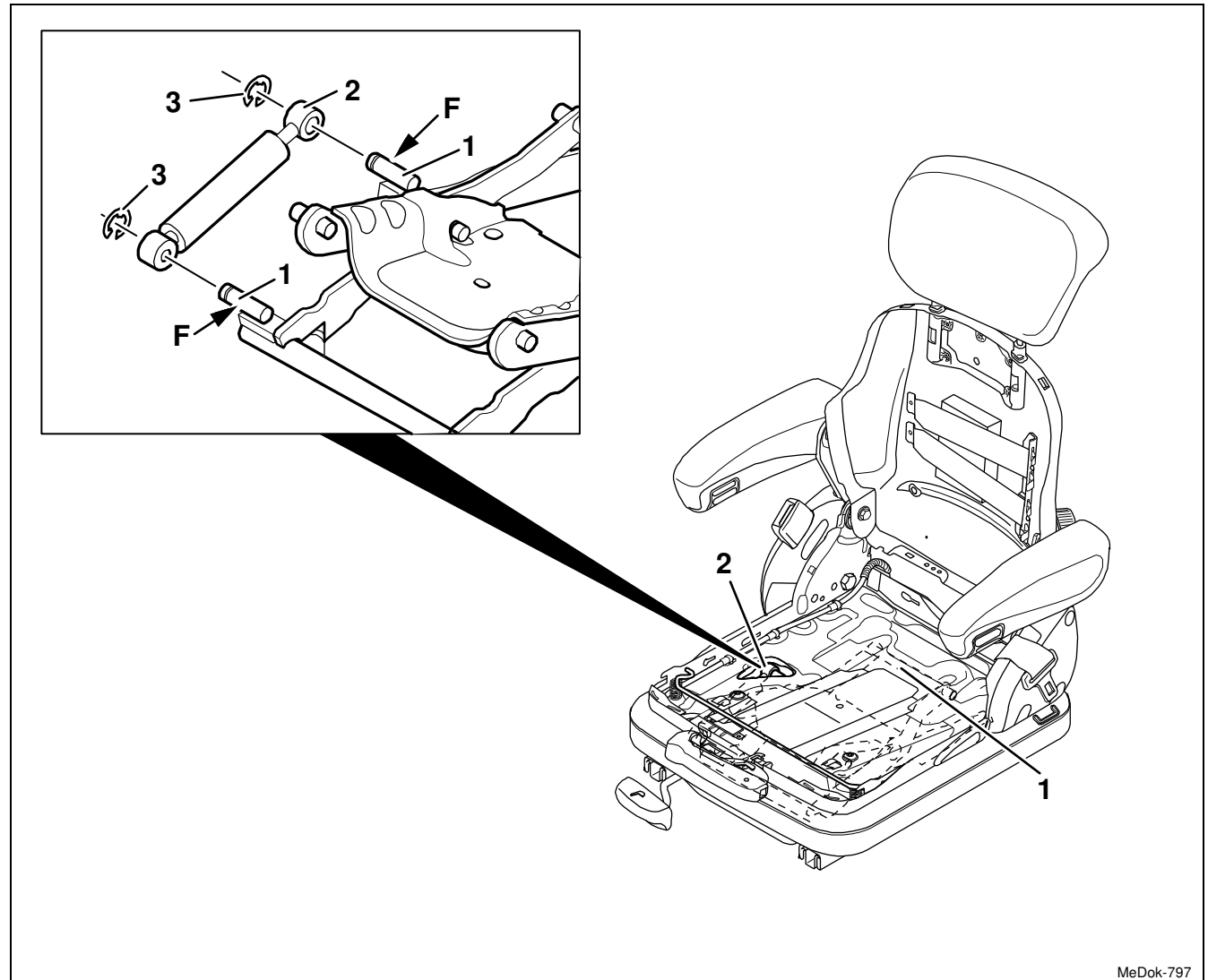


- (1) Axle (swinging structure)
- (2) Shock absorber
- (3) Retaining ring

1 Remove the backrest cushion (Chap. 3.1).

2 Remove the seat cushion (Chap. 3.2).

3 Remove the bellows in the front and to the right from the spring pack and lower part of the suspension. Pull the bellows in an upward direction over the handle for weight adjustment and spring pack and place it on the spring pack (see Chapter 3.8).



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### 3.19 Shock absorber – removal, installation

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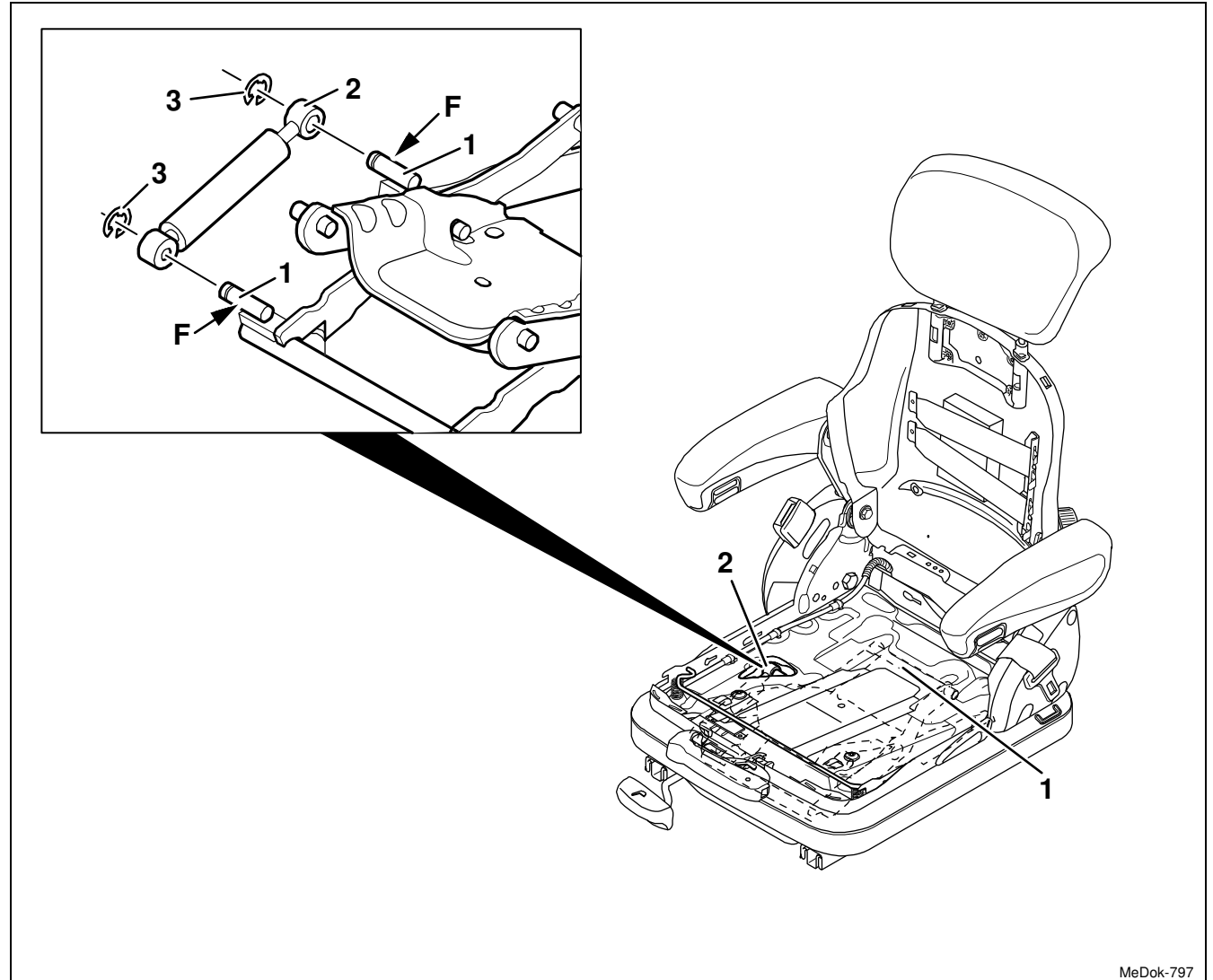
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#### Removal, installation

- 4 Loosen the two retaining rings (3) from the axles (1) and then remove them.
  - 5 Take off the shock absorber (2) from the axles (1) and then remove it.
- Installation note:**  
Apply acid-free multi-purpose lubricant to the entire surface (F) of the axle (1).
- 6 Re-install the components in the reverse order of their removal.



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## 3.20 Webbing – removal, installation

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3.20.1 Webbing (static belt) – removal, installation

3.20.2 Webbing (secondary belt) – removal, installation (delivery option: construction machines)

### 3.20.1 Webbing (static belt) – removal, installation

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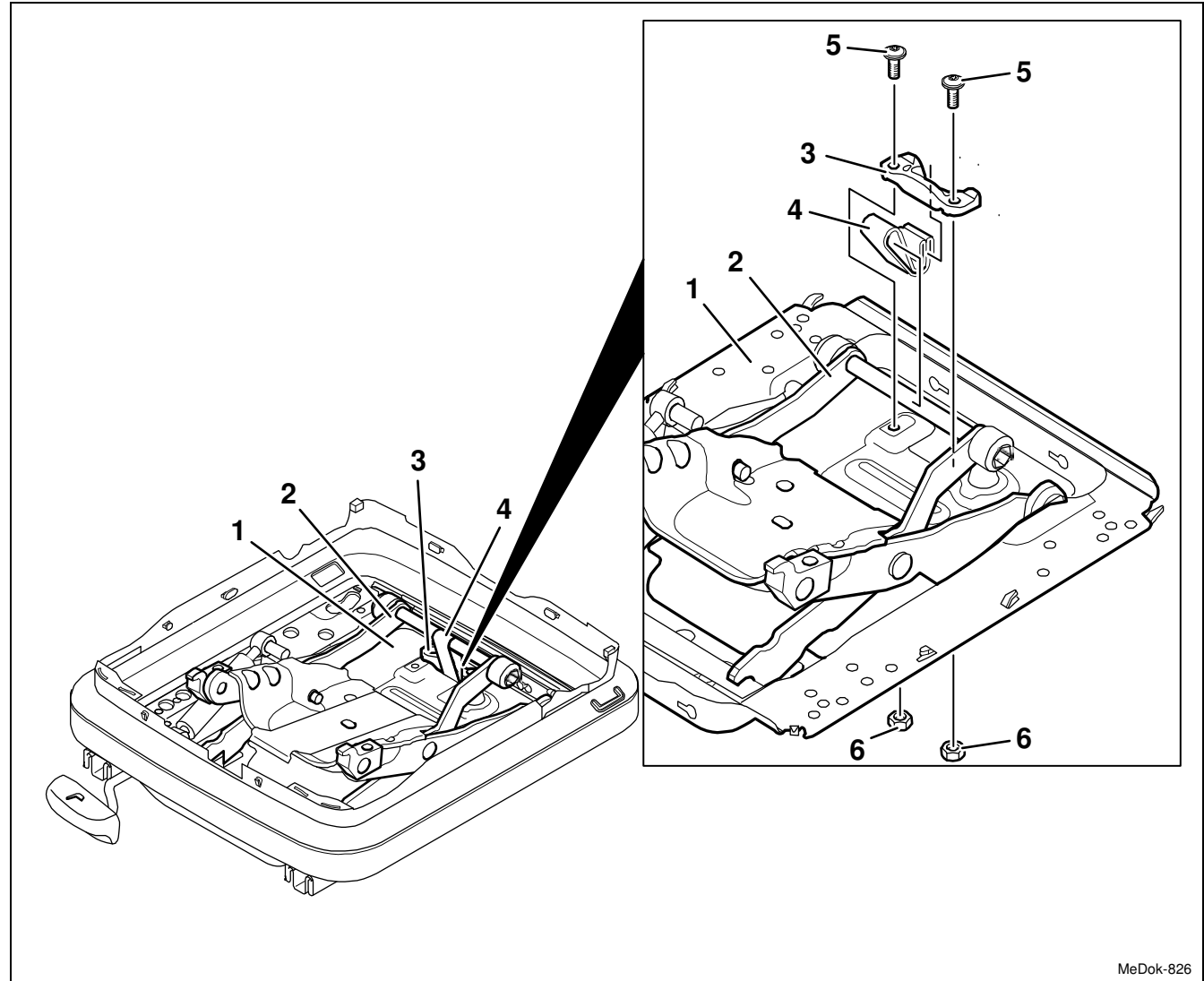


- (1) Lower part of the suspension
- (2) Swinging structure
- (3) Fixture
- (4) Webbing (static belt)
- (5) Special torx screw ..... 25 Nm
- (6) Hexagon nut

- 1 Remove the backrest cushion (Chap. 3.1).
- 2 Remove the seat cushion (Chap. 3.2).

#### 3 Delivery option for construction machines:

Take off the left and right webbing and remove the two washers (see Chapter 3.20.2).



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### 3.20.1 Webbing (static belt) – removal, installation

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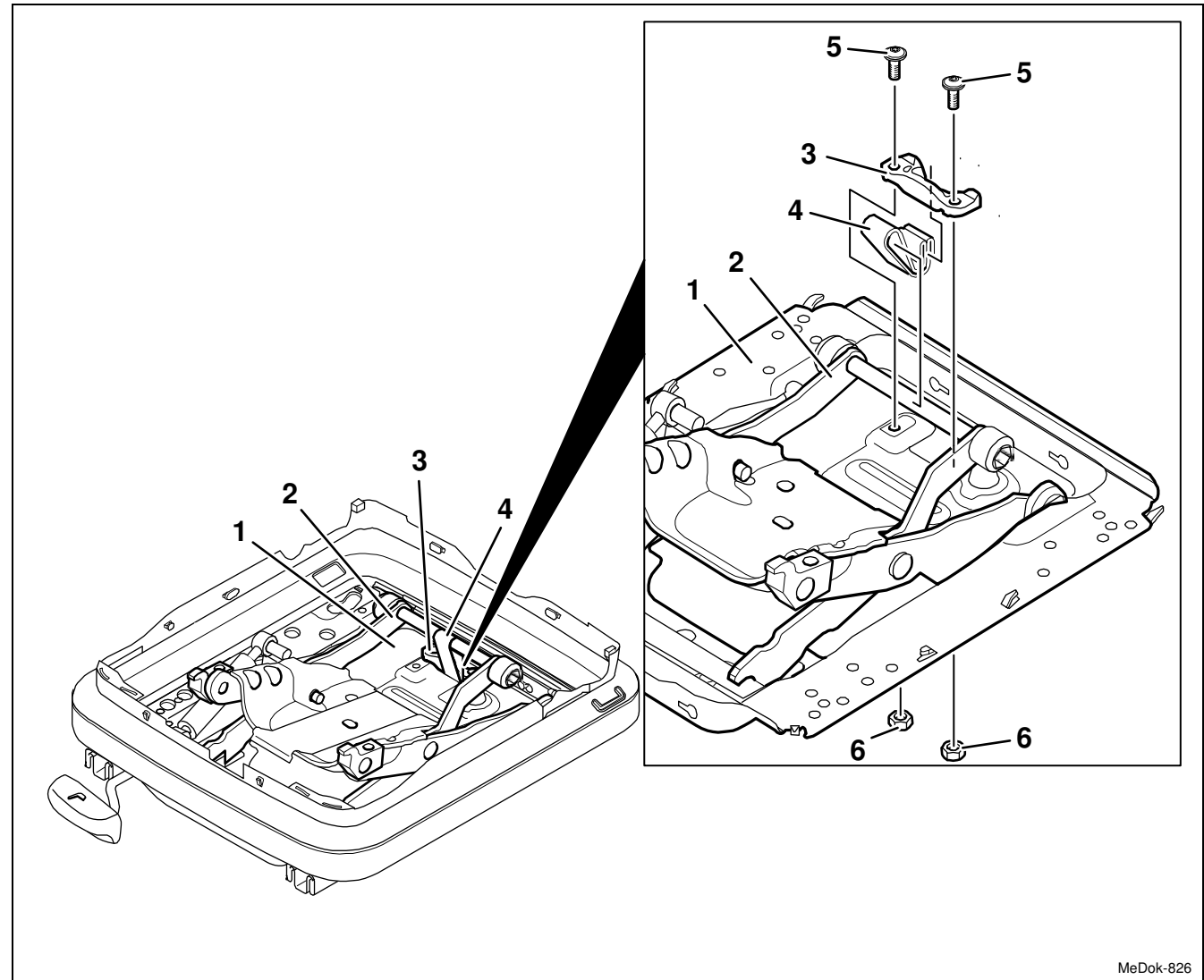
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- 4 Remove the bellows from the spring pack and lay it down (see Chapter 3.8).
- 5 Take off the linkage rod of the pointer from the lower part of the suspension (1) (see Chapter 3.15).
- 6 Remove the entire spring pack (Chap. 3.18).

**Note:**

For removing the webbing (4), you need neither to take off the spring pack from the backrest frame nor components fastened on the spring pack and backrest frame. For this reason, you do not need to perform preparations that are to be carried out according to this chapter.



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### 3.20.1 Webbing (static belt) – removal, installation

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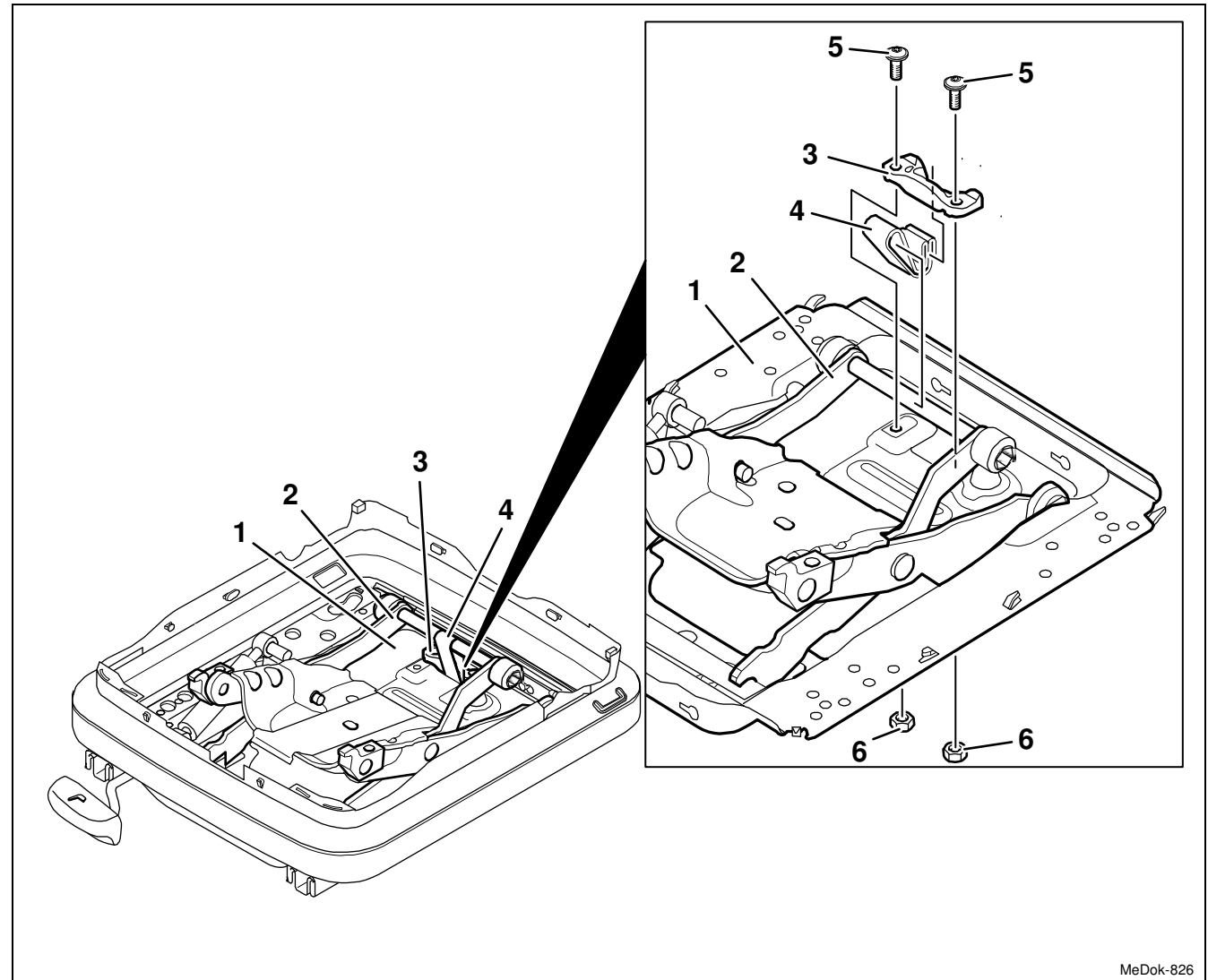
#### Removal, installation

- 7 Undo the two special torx screws (5) from the lower part of the suspension (1) and fixture (3), and then remove the hexagon nuts (6).

**Installation note:**

Special torx screw (5), 25 Nm.

- 8 Take off the fixture (3) and thread the webbing (4) from the fixture (3).
- 9 Pull the webbing (4) over the tube of the swinging structure (2) and take it off.
- 10 Re-install the components in the reverse order of their removal.



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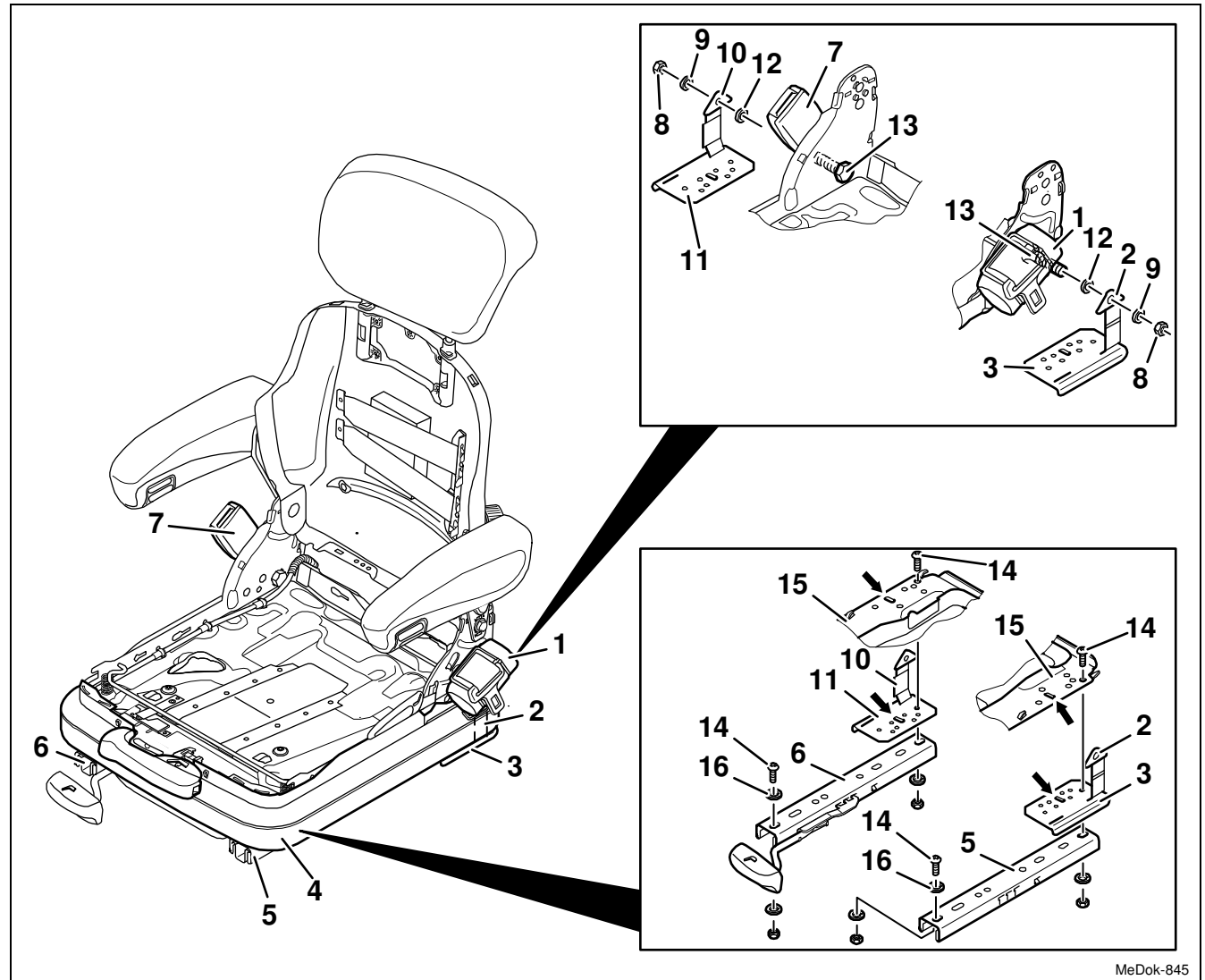
### 3.20.2 Webbing (secondary belt) – removal, installation (Delivery option: construction machines)



#### REMOVAL/INSTALLATION

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- (1) Belt roller
- (2) Webbing (left-hand)
- (3) Webbing fixation plate (left-hand)
- (4) Bellows
- (5) Adjusting rail
- (6) The entire adjusting rail assembly
- (7) Seat belt buckle
- (8) Hexagon nut ..... 50 Nm
- (9) Washer
- (10) Webbing (right-hand)
- (11) Webbing fixation plate (right-hand)
- (12) Washer
- (13) Hexagon bolt
- (14) Micro-encapsulated cap screw  
..... replace, 25 Nm
- (15) Lower part of the suspension
- (16) Adjustment washer



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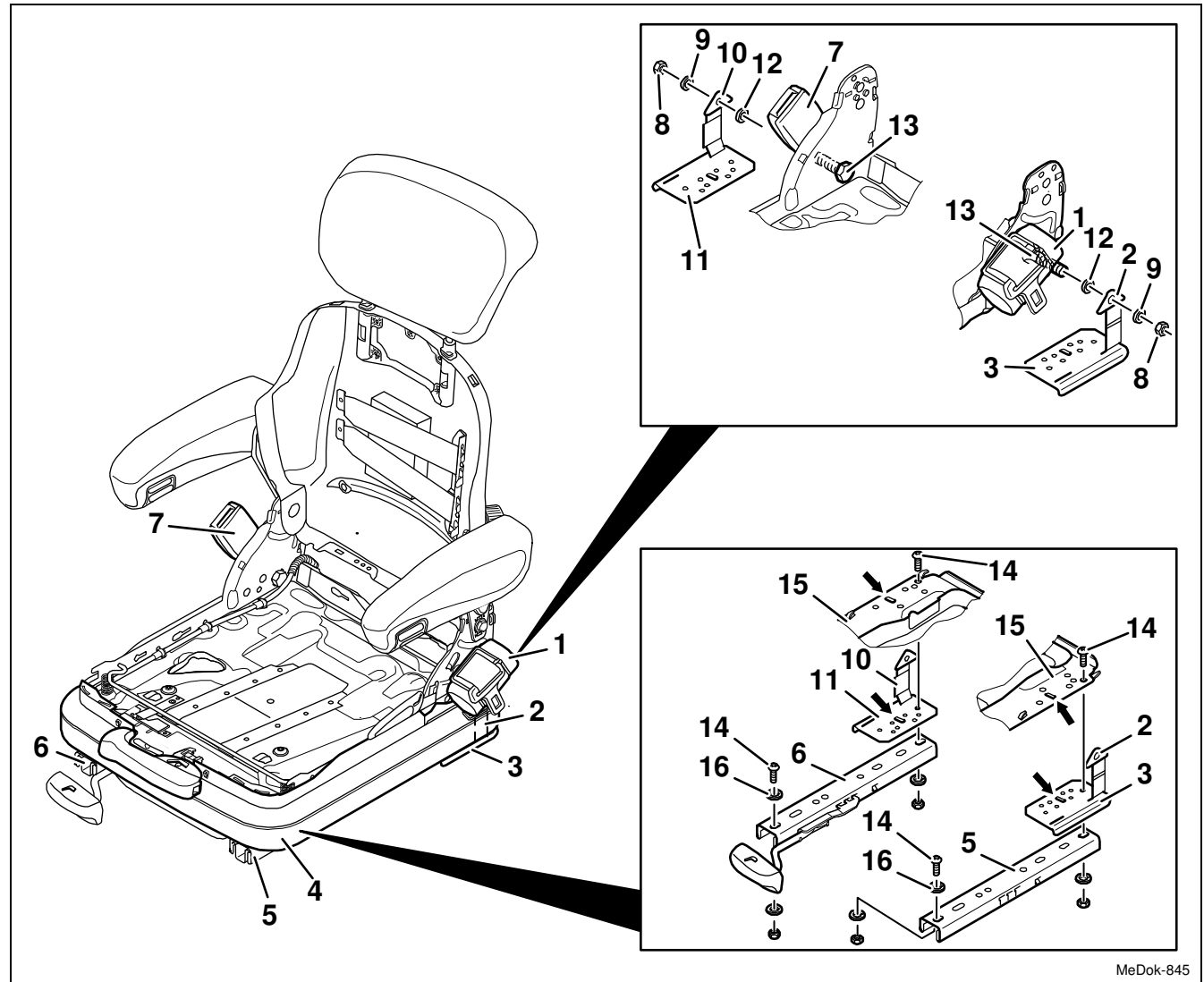
### 3.20.2 Webbing (secondary belt) – removal, installation (Delivery option: construction machines)



#### REMOVAL/INSTALLATION

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- 1 Remove the backrest cushion (Chap. 3.1).
- 2 Remove the seat cushion (Chap. 3.2).
- 3 Remove the left and right covers (Chap. 3.4).
- 4 Take off the bellows (10) from the lower part of the suspension (2), push it upward and then fix it (see Chapter 3.8).



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### 3.20.2 Webbing (secondary belt) – removal, installation (Delivery option: construction machines)



#### REMOVAL/INSTALLATION

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#### Removal, installation

5 Unscrew the two hexagon nuts (8).

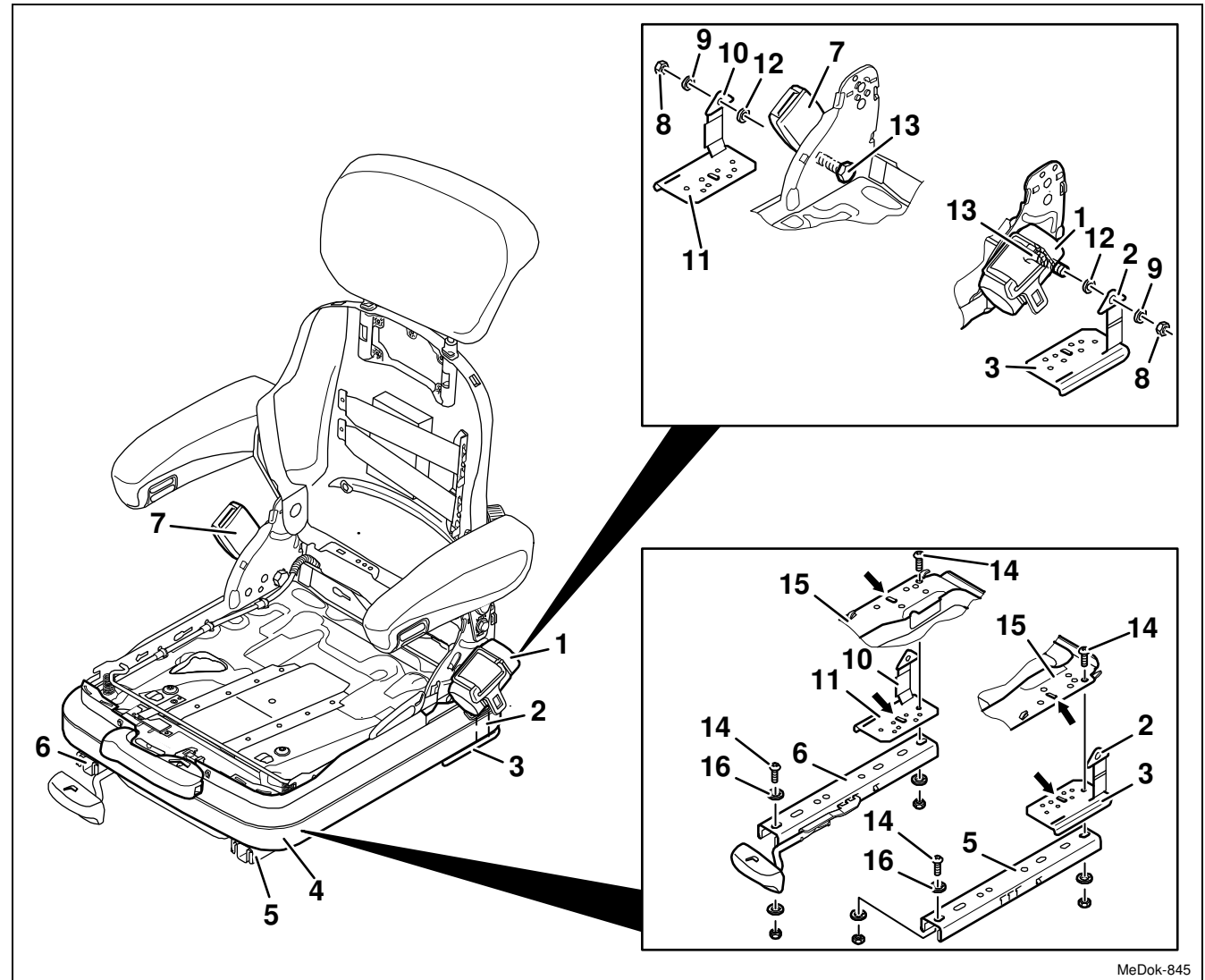
**Installation note:**

Hexagon nut (8), 50 Nm.

6 Remove the two washers (9) from the hexagon bolts (13), hang out the webbing (2 and 10) and remove the two further washers (12).

**Note:**

The belt roller (1), belt buckle (7) and hexagon bolts (13) must not be removed. Secure them by screwing in the hexagon nuts (8) until the webbing (2 and 10) are installed.



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### 3.20.2 Webbing (secondary belt) – removal, installation (Delivery option: construction machines)



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7 Take off the webbing (2 and 10) from the bellows (4).

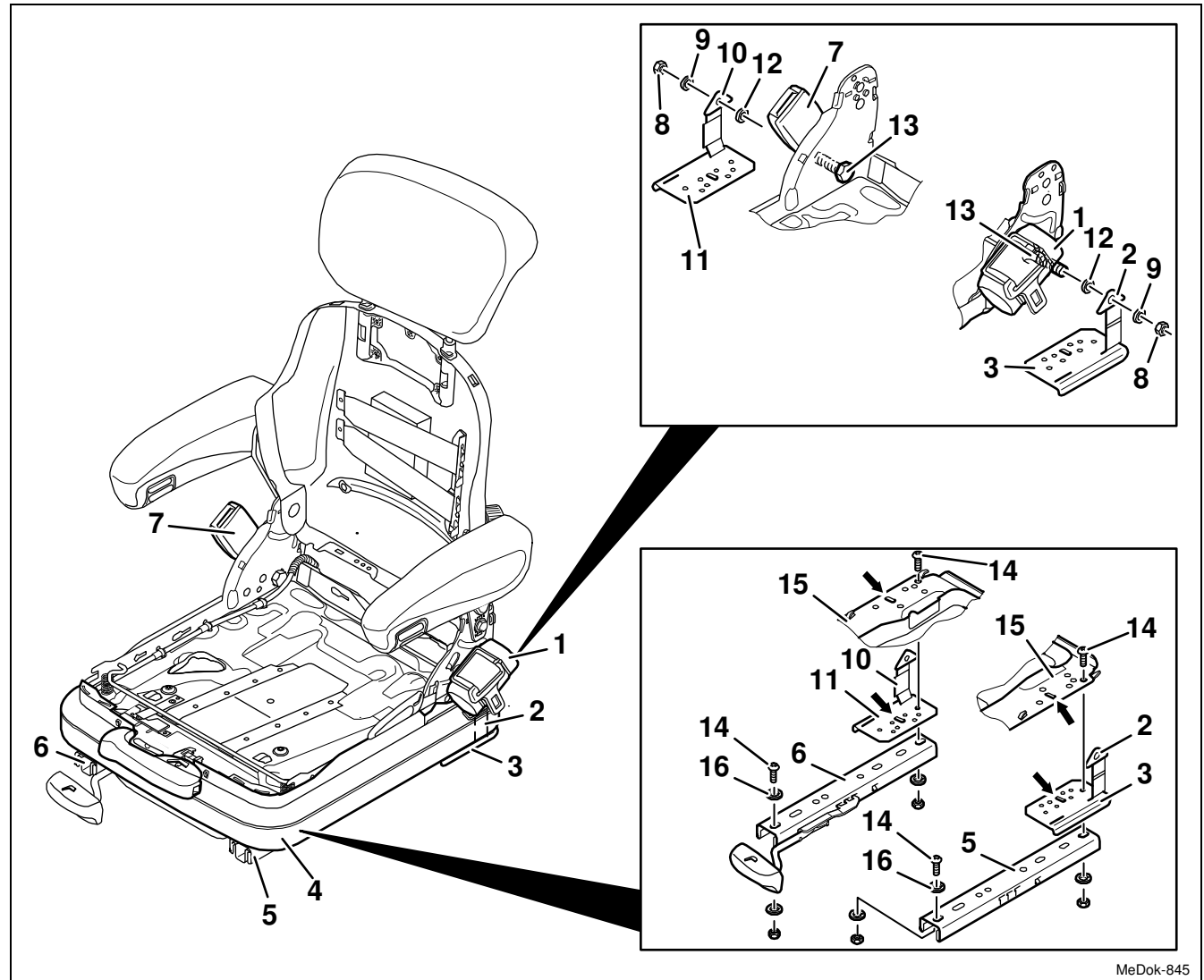
**Installation note:**

The lug of the webbing (2 and 10) may not be distorted. When tightening the hexagon nuts (8), make sure the lug is positioned vertically to the webbing (2 and 10).

8 Unscrew the four micro-encapsulated cap screws (14) and take off the seat fore/aft adjustment.

**Installation notes:**

- Replace the micro-encapsulated cap screw (14), 25 Nm.
- To retrofit for the construction machine option, use new micro-encapsulated cap screws (14) which are to be 3 mm longer than old ones.



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### 3.20.2 Webbing (secondary belt) – removal, installation (Delivery option: construction machines)



#### REMOVAL/INSTALLATION

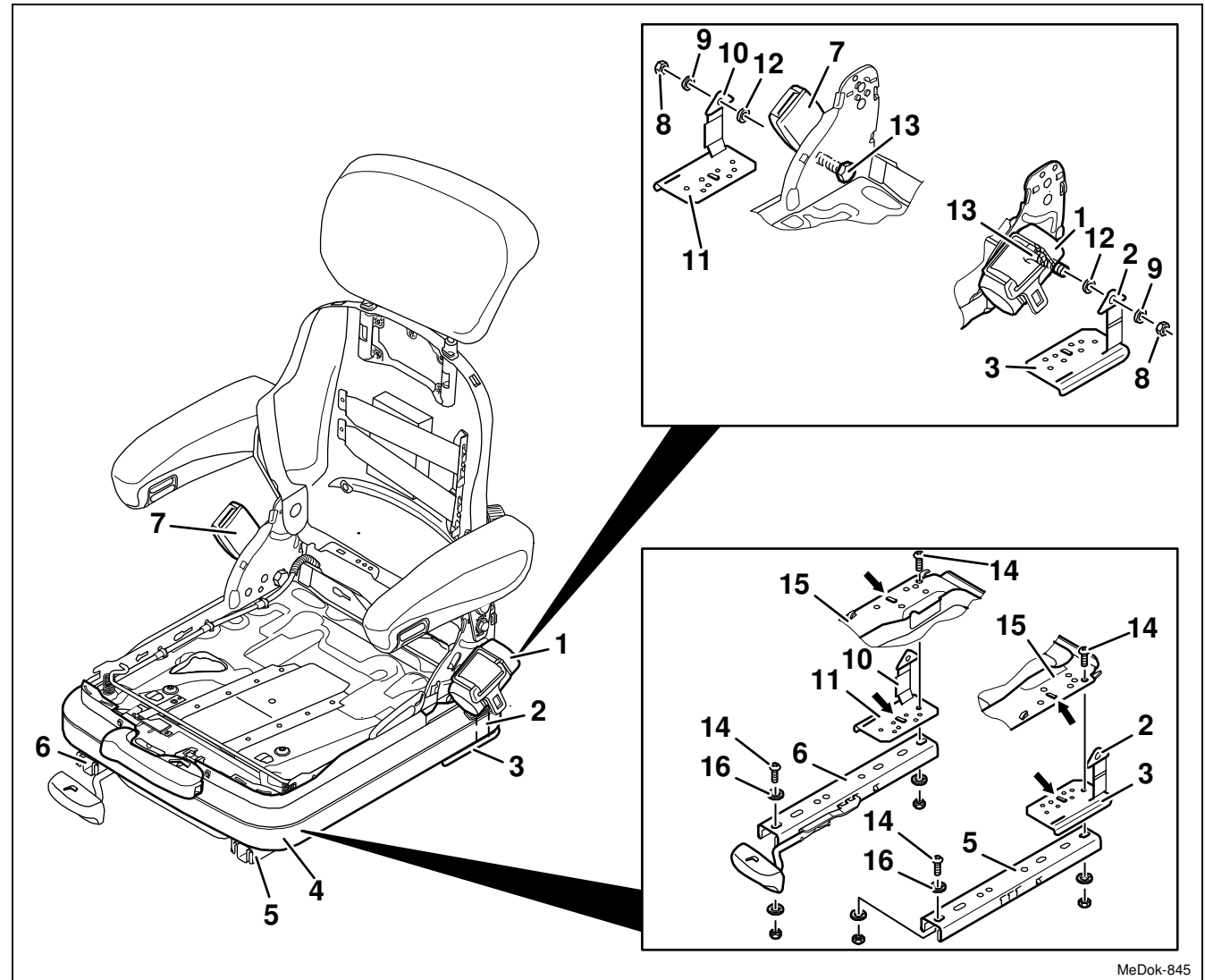
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- 9 Remove the belt fixation plates (3 and 11) and the two adjustment washers (16).

**Installation note:**

The embossment (arrow) on the belt fixation plates (3 and 11) acts as anti-rotation device and must engage the respective longitudinal hole (arrow) on the lower part of the suspension (15).

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



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**3.21 Swinging structure with the lower part of the suspension – disassemble, assemble**



DISASSEMBLE/ASSEMBLE

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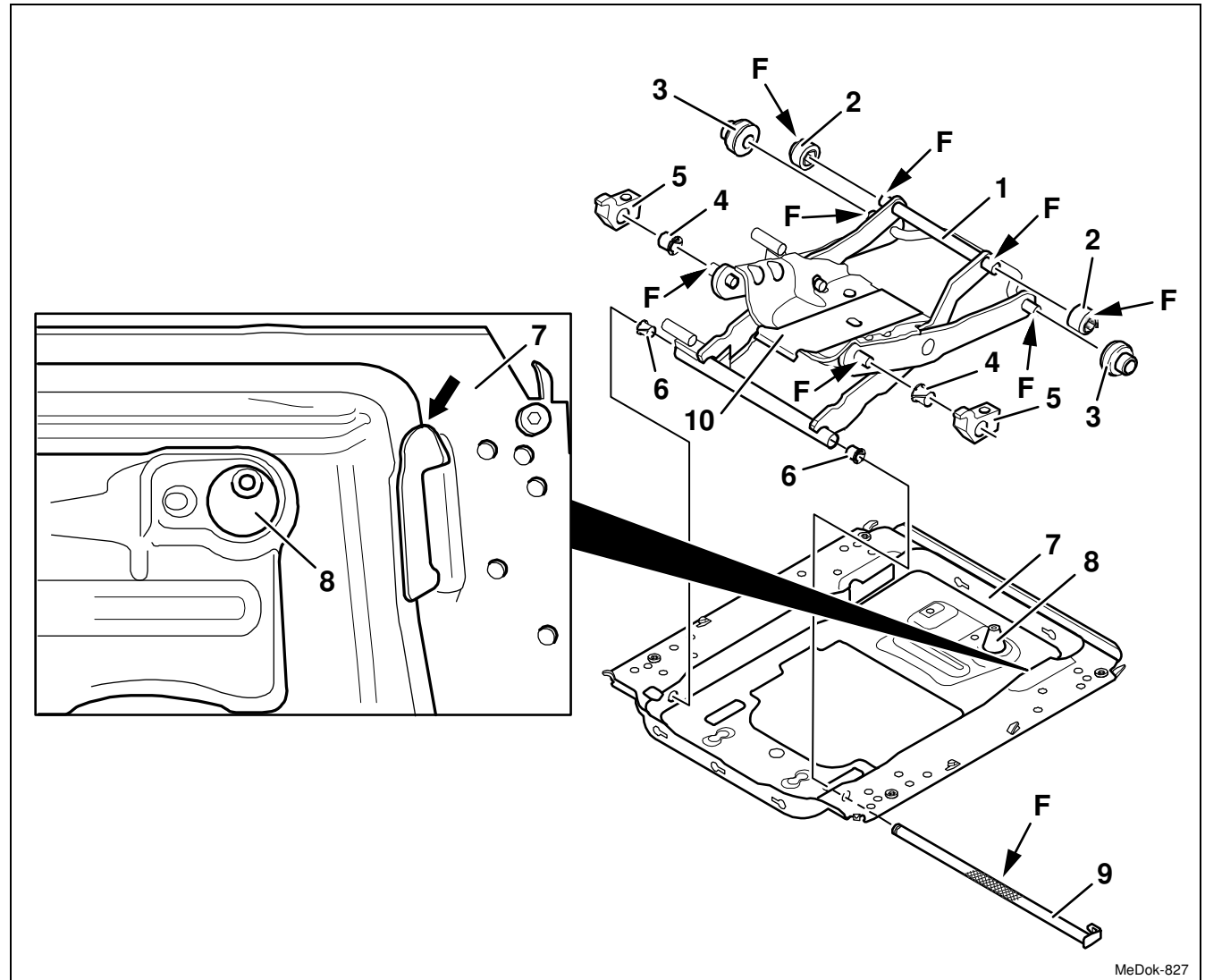
- (1) Swinging structure ..... grease
- (2) Plastic roller, at the top ..... grease
- (3) Plastic roller, at the bottom
- (4) Bushing
- (5) Fixed bearing
- (6) Bushing
- (7) Lower part of the suspension
- (8) Rubber buffer
- (9) Link bracket bolts ..... grease
- (10) Plate

1 Remove the backrest cushion  
(Chap. 3.1).

2 Remove the seat cushion (Chap. 3.2).

**3 Delivery option for construction machines:**

Remove the webbing (secondary belt)  
(Chapter 3.20.2).



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### 3.21 Swinging structure with the lower part of the suspension – disassemble, assemble

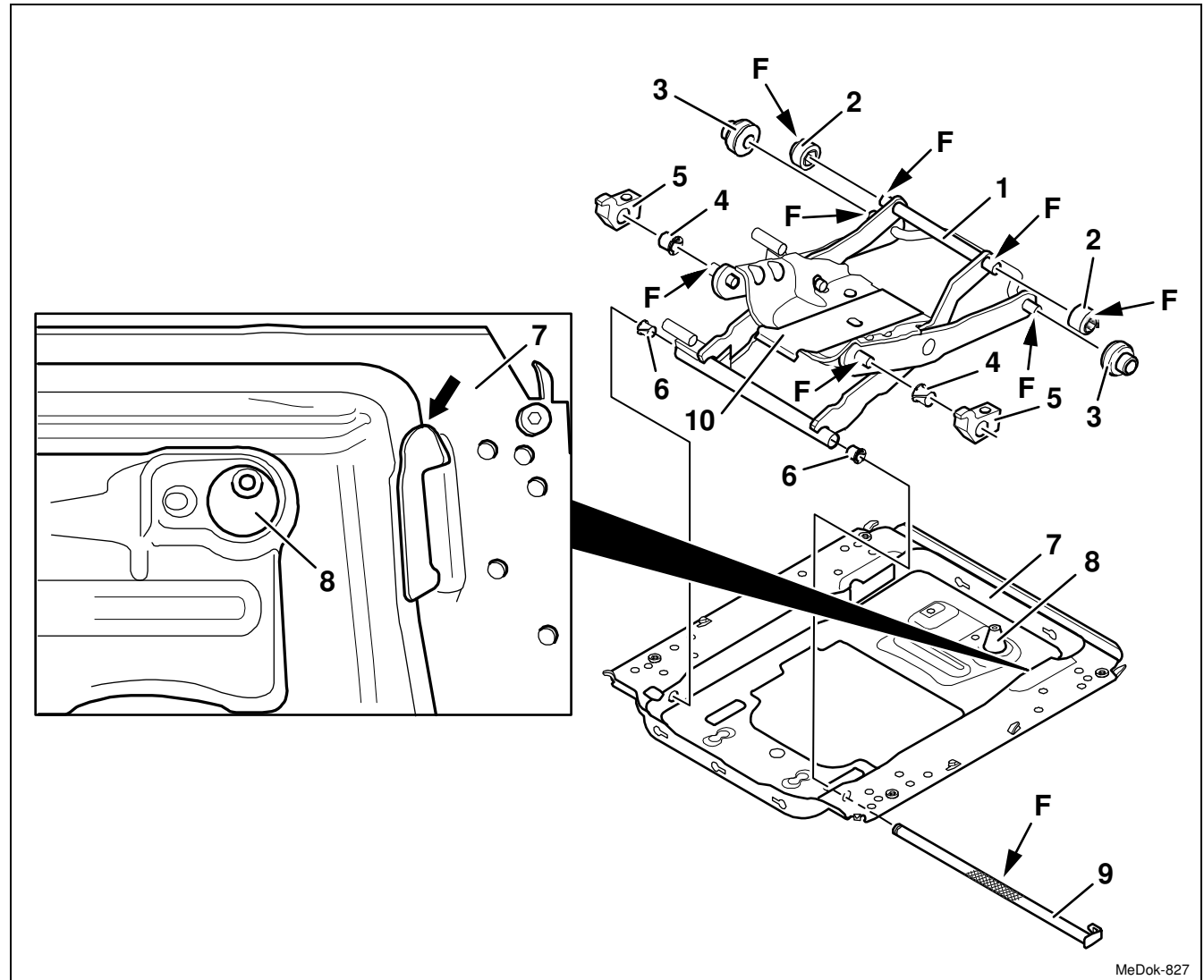
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DISASSEMBLE/ASSEMBLE

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- 4 Remove the bellows (Chap. 3.8).
- 5 Hang out the linkage rod of the pointer from the lower part of the suspension (7) (see Chapter 3.15).
- 6 Remove the entire seat fore/aft adjustment (Chap. 3.17).
- 7 Remove the entire spring pack (Chap. 3.18).  
**Note:**  
The spring pack and the backrest frame can be completely removed together with all the components fastened.  
For this reason, you do not need to perform preparations that are to be carried out according to this chapter.
- 8 Remove the shock absorber (Chap. 3.19).
- 9 Remove the webbing (static belt) (Chap. 3.20).



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### 3.21 Swinging structure with the lower part of the suspension – disassemble, assemble

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#### Disassemble, assemble

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

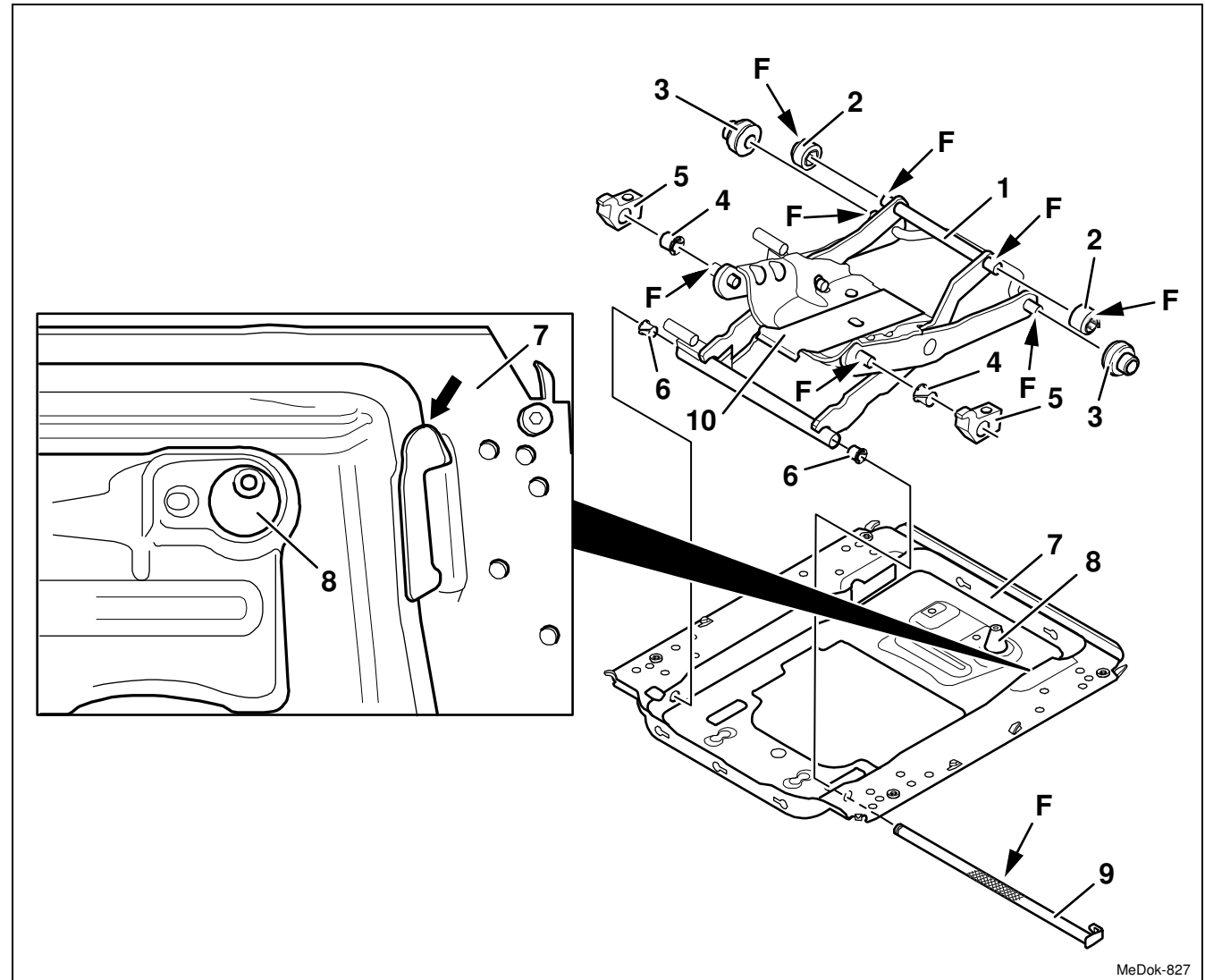
**Installation note:**

Apply acid-free multi-purpose lubricant to the entire surface (F) of the roller axle of the swinging structure (1) and the face (F) of the two plastic rollers at the top (2).

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

**Installation note:**

Apply acid-free multi-purpose lubricant to the entire surface (F) of the fixed bearing axle of the swinging structure (1).



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### 3.21 Swinging structure with the lower part of the suspension – disassemble, assemble

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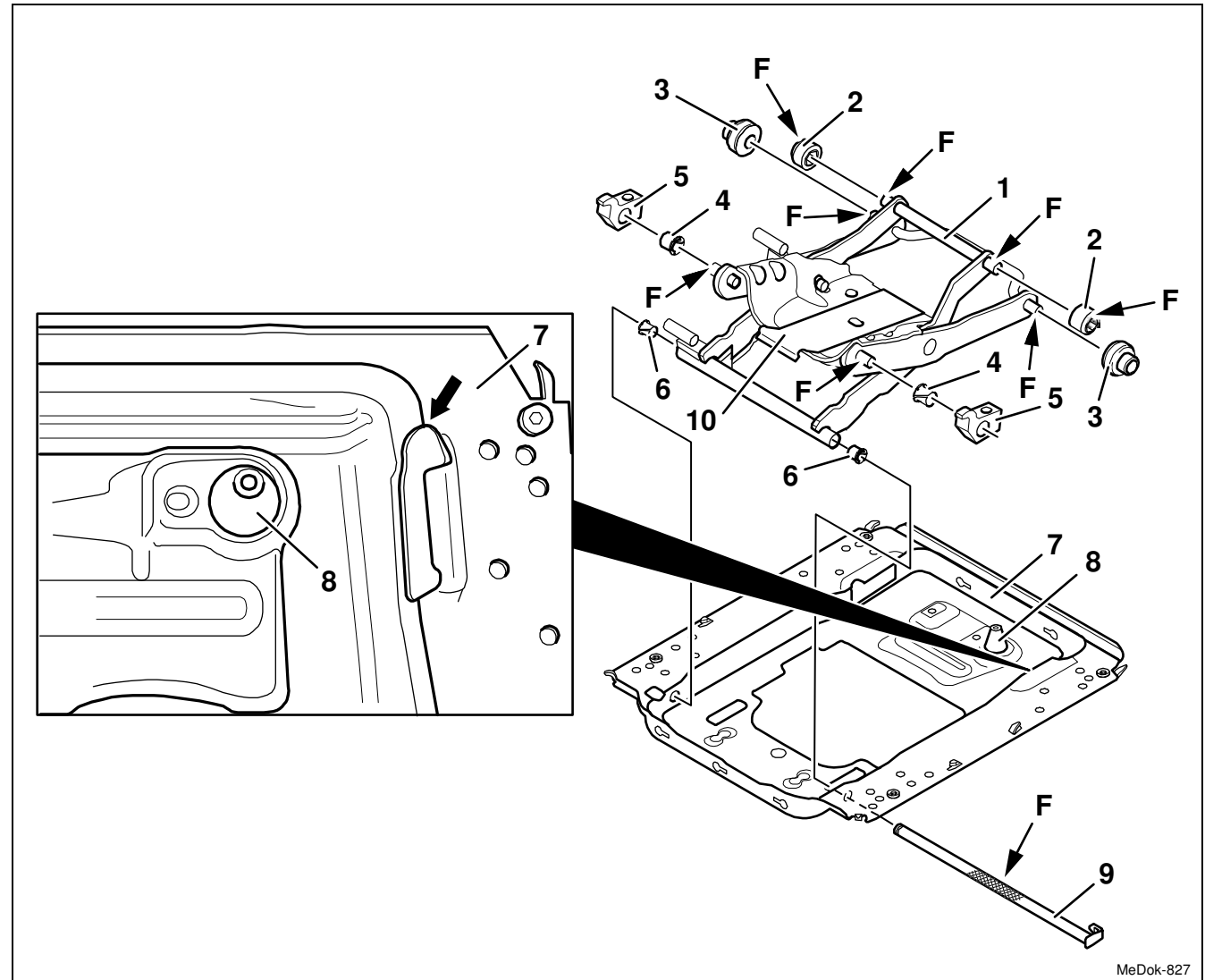


- 12 Disengage the link bracket bolt (9) and pull it out from the swinging structure (1) and lower part of the suspension (7).

**Installation note:**

Apply acid-free multi-purpose lubricant to the entire surface (F) of the link bracket bolt (9) in the width of a brush.

- 13 Remove the two bushings (6) from the swinging structure (1).
- 14 Push the swinging structure (1) backwards until the structure (1) with the left plastic roller at the bottom (3) can be taken out through the cut-out (arrow) in the lower part of the suspension (7).
- 15 Lift the swinging structure (1) on the left and slide it with the plastic roller (3) at the bottom through the cut-out (arrow) on the lower part of the suspension (7).



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### 3.21 Swinging structure with the lower part of the suspension – disassemble, assemble

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DISASSEMBLE/ASSEMBLE

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

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

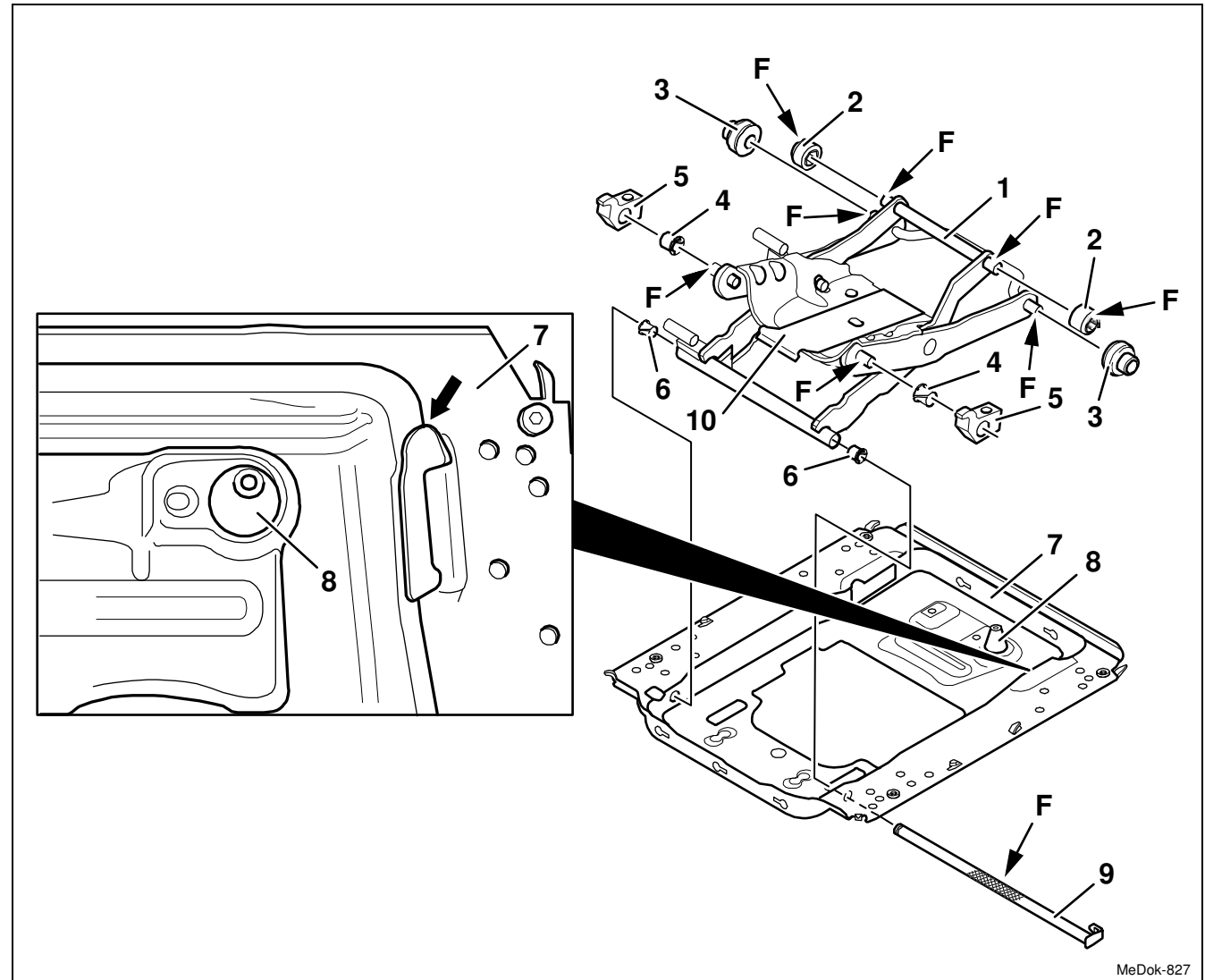
#### Installation note:

Apply acid-free multi-purpose lubricant to the entire surface (F) of the roller axle of the swinging structure (1).

18 **Replace the rubber buffer (8):**  
Dismount the rubber buffer (8) from the lower part of the suspension (7).

19 **Replace the plate (10):**  
Detach the plate (10) from the swinging structure (1).

20 Assemble the components in reverse order of their removal.



**3.22 Backrest bearing with retaining spring – removal and installation**

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- 3.22.1 Backrest bearing with retaining spring MSG65/511-522 and boat seat AVENTO-Premium – removal and installation (see Chapter 3.7)
- 3.22.2 Backrest bearing with retaining spring boat seat AVENTO-Evolution – removal and installation (see Chapter 3.1.2)

### 3.23 Suspension cover – removal and installation (Boat seat AVENTO-Evolution)

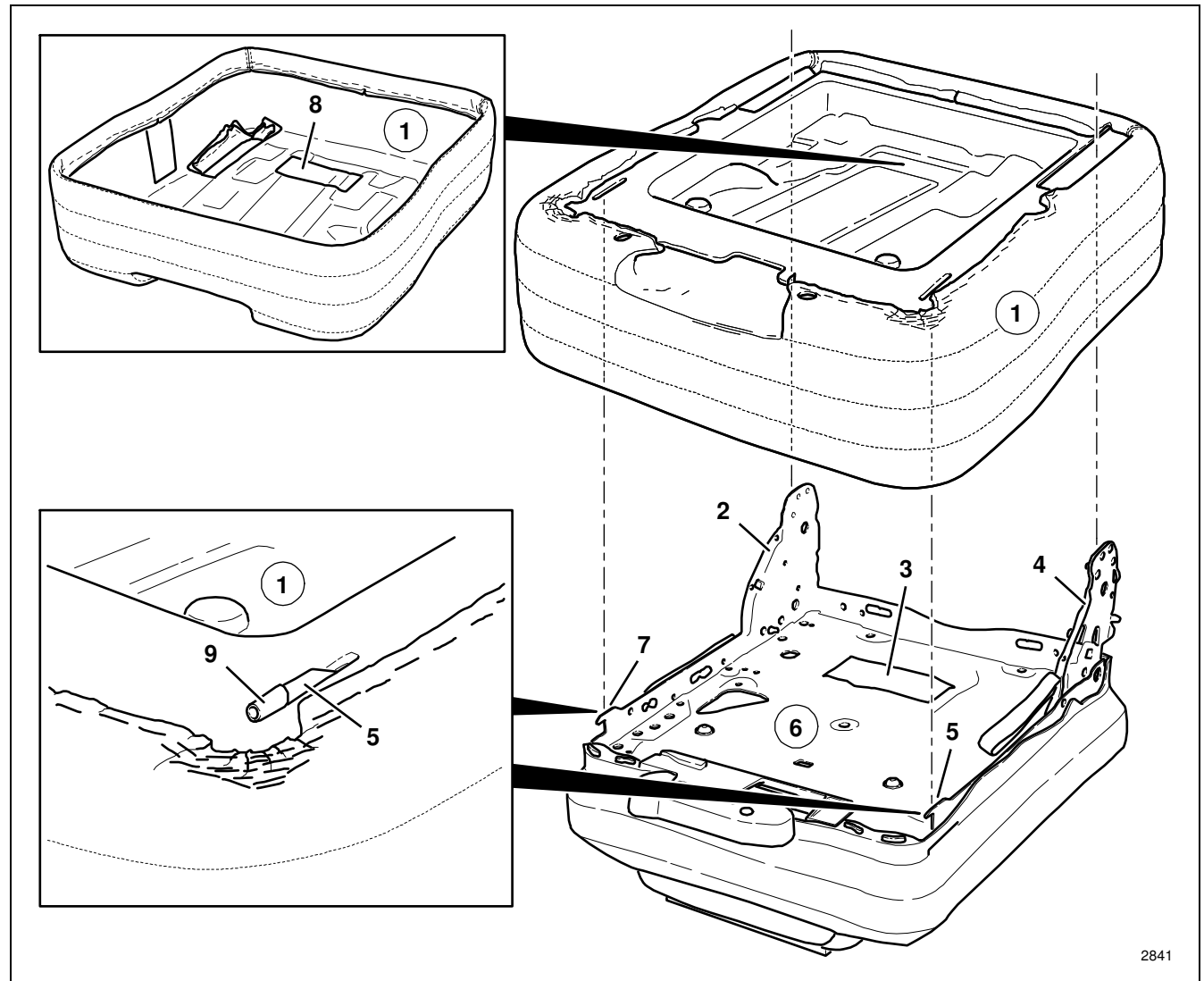
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- (1) Suspension cover
- (2) Right backrest support
- (3) Hook tape
- (4) Left backrest support
- (5) Left hooks
- (6) Seat plate
- (7) Right hook
- (8) Loop tape
- (9) Protective hose

1 Remove the seat cushion (Chap. 3.2.2).

2 Remove the backrest cushion (Chap. 3.1.2).



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### 3.23 Suspension cover – removal and installation (Boat seat AVENTO-Evolution)

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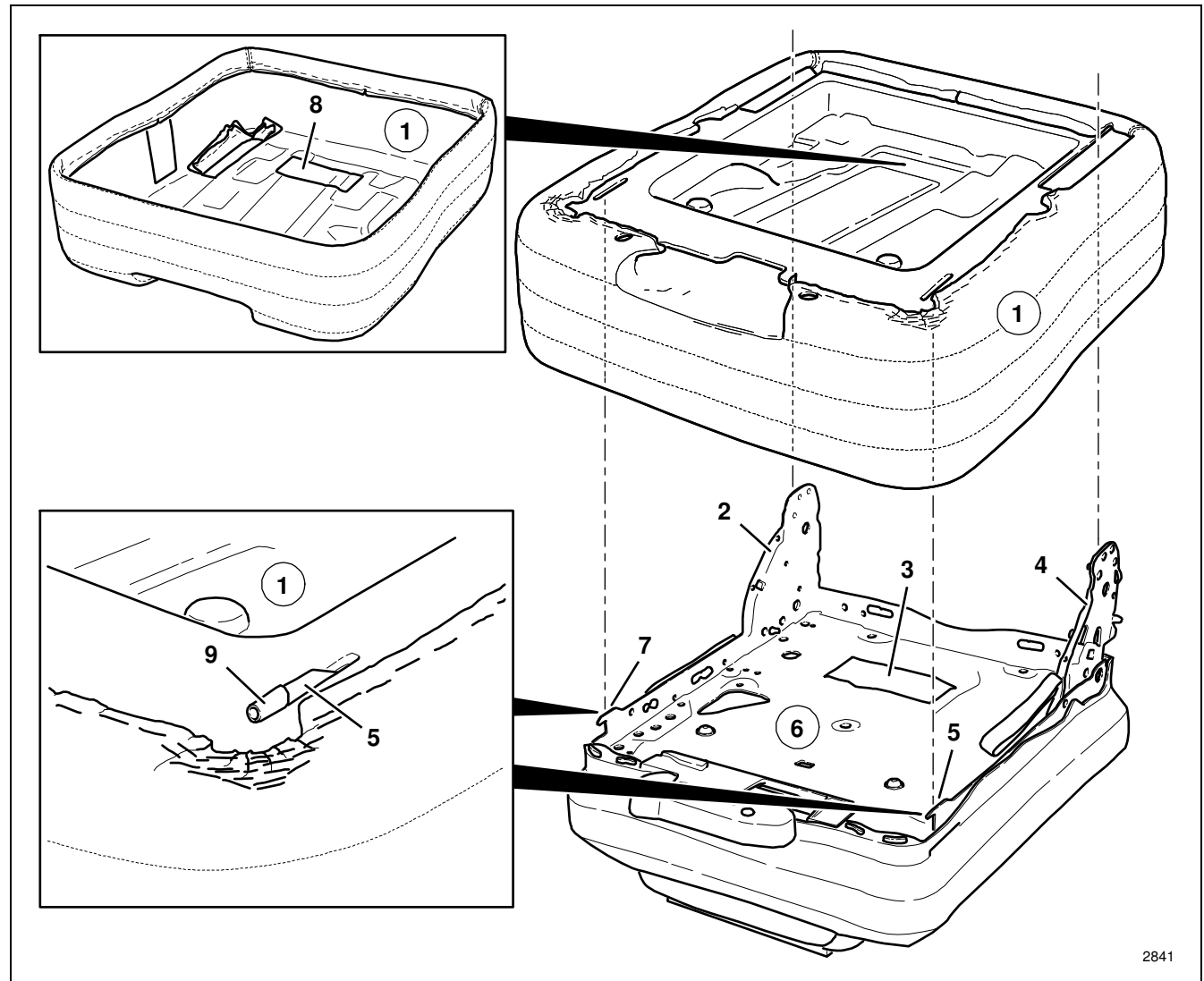


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#### Removal and installation

- 3 Remove the Protective hose (9) from the left hook (5) and right hook (7).
- 4 Pull up the suspension cover (1) at the back and separate the loop tape (8) from the hook tape (3).
- 5 Lift the suspension cover (1) over the backrest support (2 and 4) at the back and push it to the front.
- 6 Lift the suspension cover (1) off the hooks (5 and 7).
- 7 Re-install the components in the reverse order of their removal.



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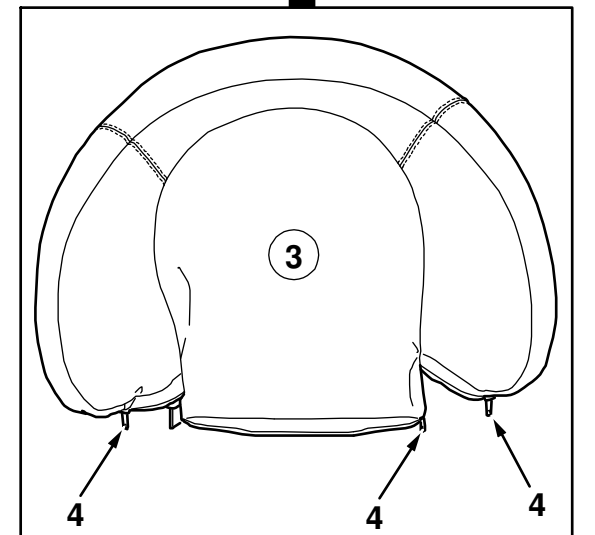
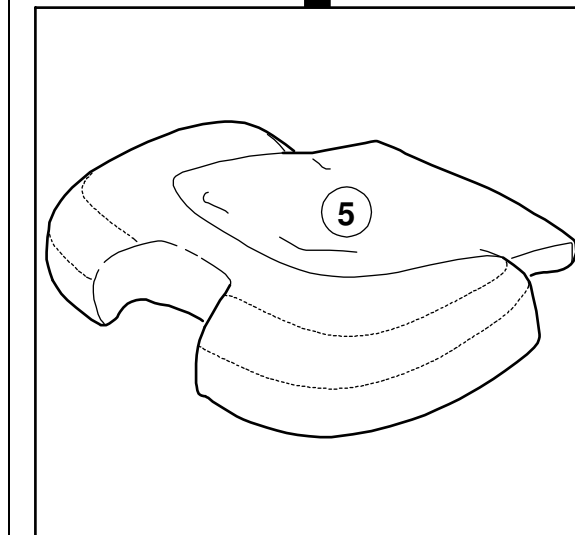
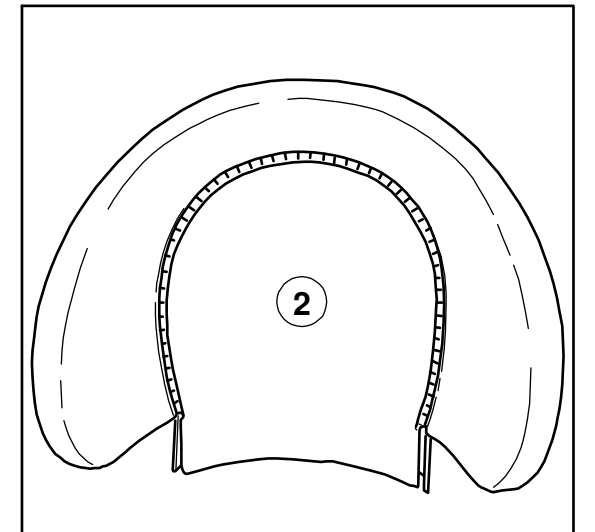
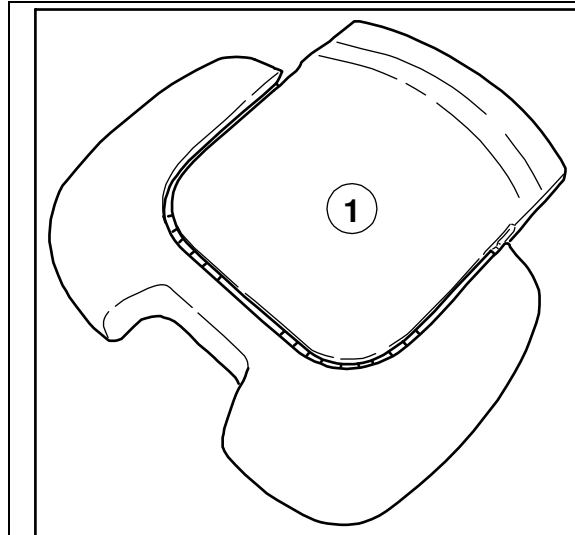
### 3.24 Seat and backrest cushion covers – removal and installation (Boat seat AVENTO-Evolution)



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- (1) Foam plastic part (seat cushion)
- (2) Foam plastic part (backrest cushion)
- (3) Backrest cushion cover
- (4) Zipper (at the backrest cushion cover)
- (5) seat cushion cover



#### Removal and installation

- 1 Remove the seat cushion (Chap. 3.2.2).
- 2 Remove the backrest cushion (Chap. 3.1.2).

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### 3.24 Seat and backrest cushion covers – removal and installation (Boat seat AVENTO-Evolution)

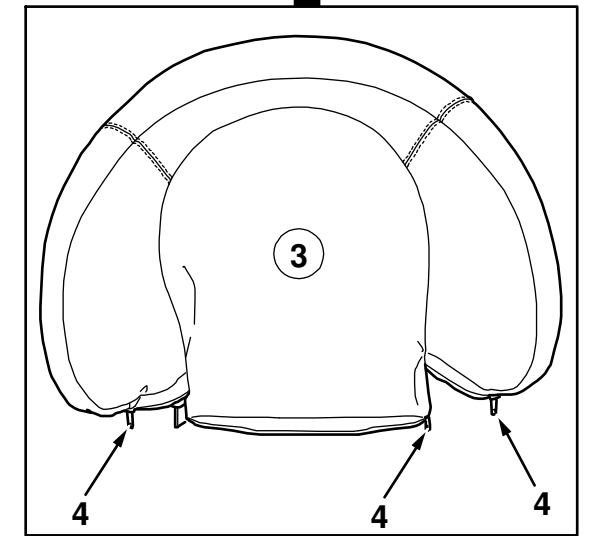
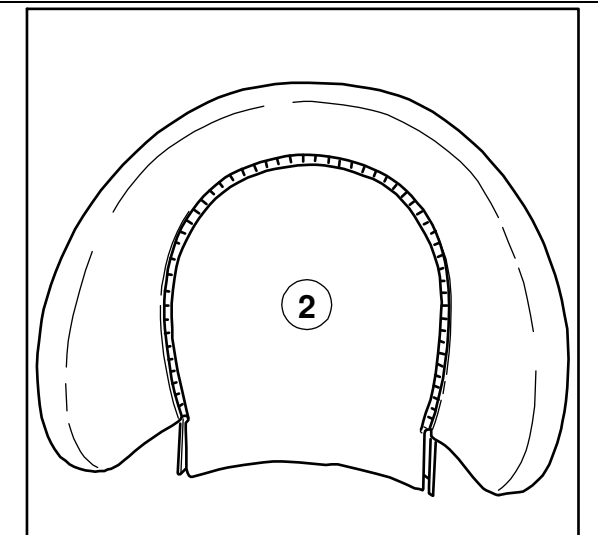
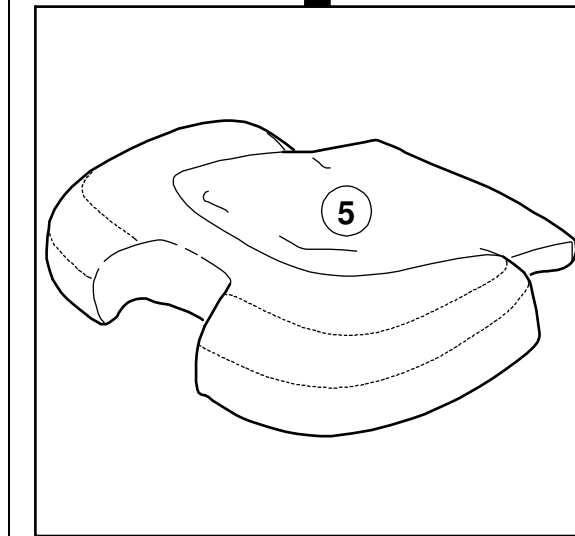
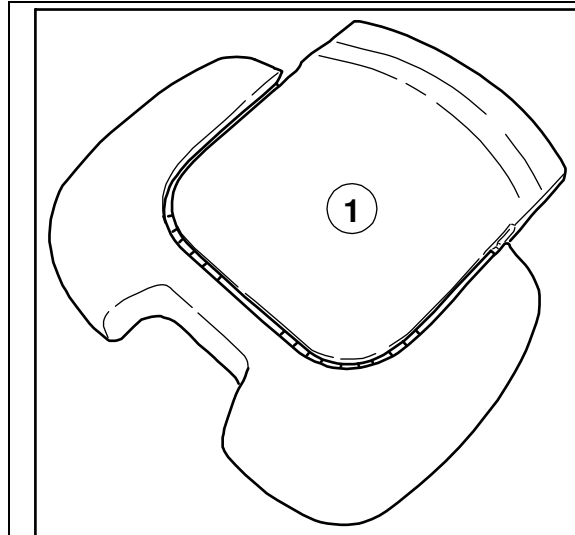
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- 3 Put the seat cushion on the seating area and pull all stainless steel staples out of the foam plastic part of the seat cushion (1).
- 4 Pull off the seat cushion cover (5) from the foam plastic part of the seat cushion (1).
- 5 Open three zippers (4) and pull the backrest cover (3) off the foam plastic part of the backrest cushion (2).



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### 3.24 Seat and backrest cushion covers – removal and installation (Boat seat AVENTO-Evolution)

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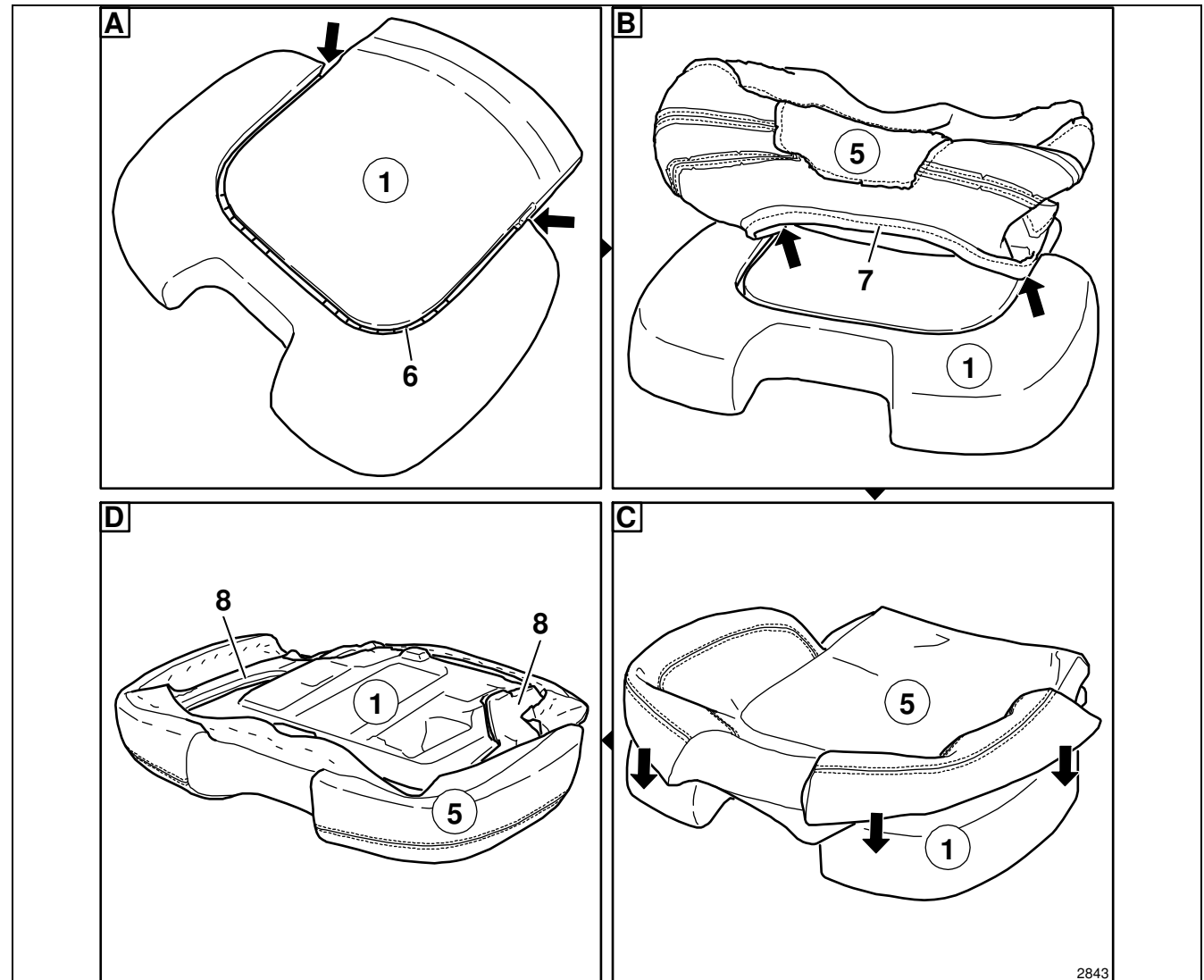


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#### 6 Fitting the seat cushion cover on the seat cushion foam part:

- 6.1 Turn the seat cushion cover (5) inside out and press the two back ends of the loop tape (7) in correct position into the back end of the seam groove (arrows in figure "A") onto the hook tape (6) (arrows in figure "B").
- 6.2 Press the entire loop tape (7) firmly into the seam groove onto the hook tape (6).
- 6.3 Pull the seat cushion cover (5) completely over the foam part (1) (arrows in figure "C") while aligning the seams with the edges of the foam part (1).



### 3.24 Seat and backrest cushion covers – removal and installation (Boat seat AVENTO-Evolution)

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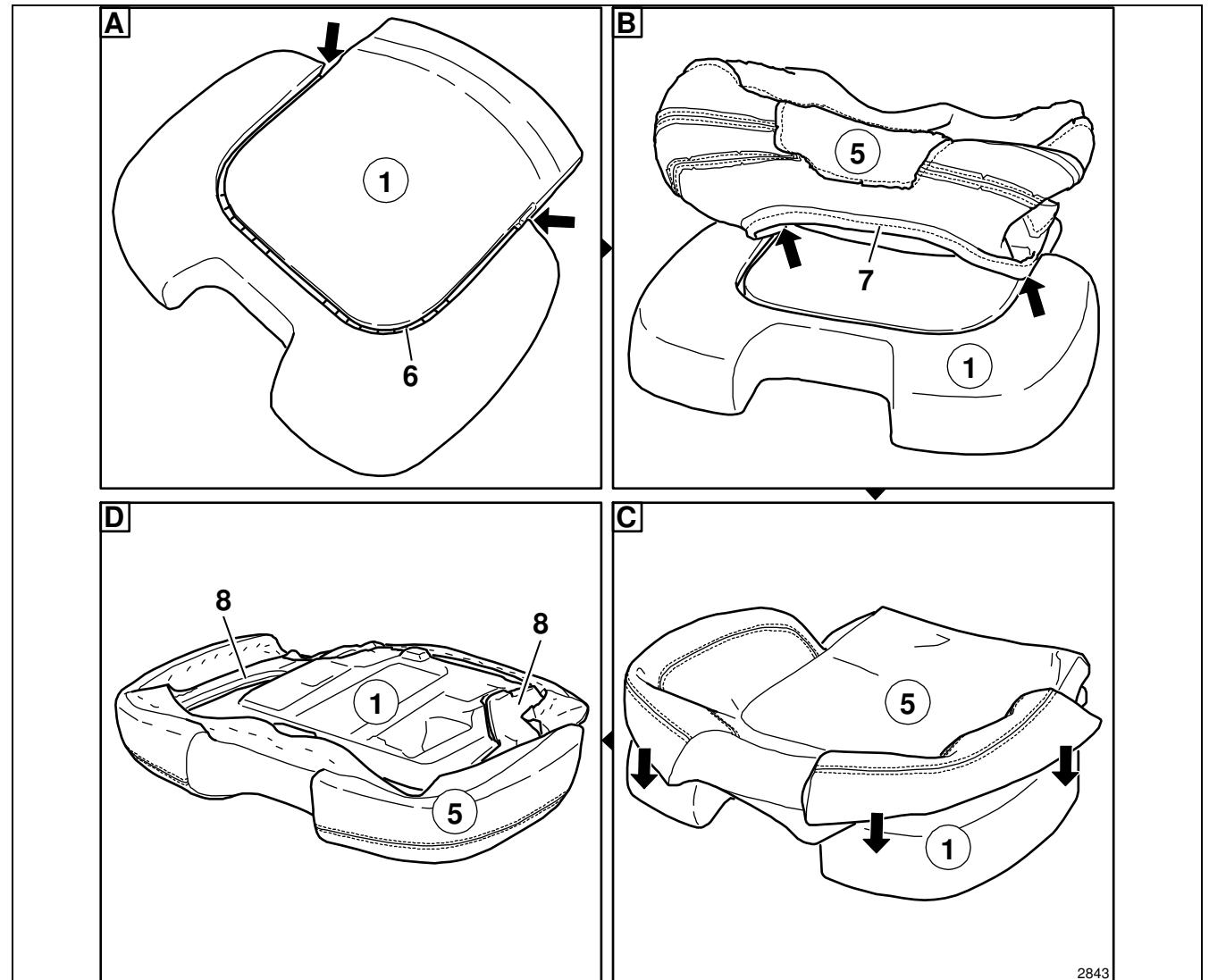
#### 6.4 Perform a visual inspection:

The seat cushion cover (5) must not pucker and must be pressed onto the foam part (1) with the Velcro fastener in the area of the seam groove (6). Rework the seat cushion cover, if necessary.

6.5 Mark the position of the two front holes for the rounded flange head screws on the seat cushion cover.

6.6 Turn the foam plastic part (1) with the seat cushion cover (5) around and staple the seat cushion cover to the plastic frame (8) all-round with stainless steel staples.

6.7 Cut the marked screw holes out of the seat cushion cover (5).



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## 3.24 Seat and backrest cushion covers – removal and installation (Boat seat AVENTO-Evolution)

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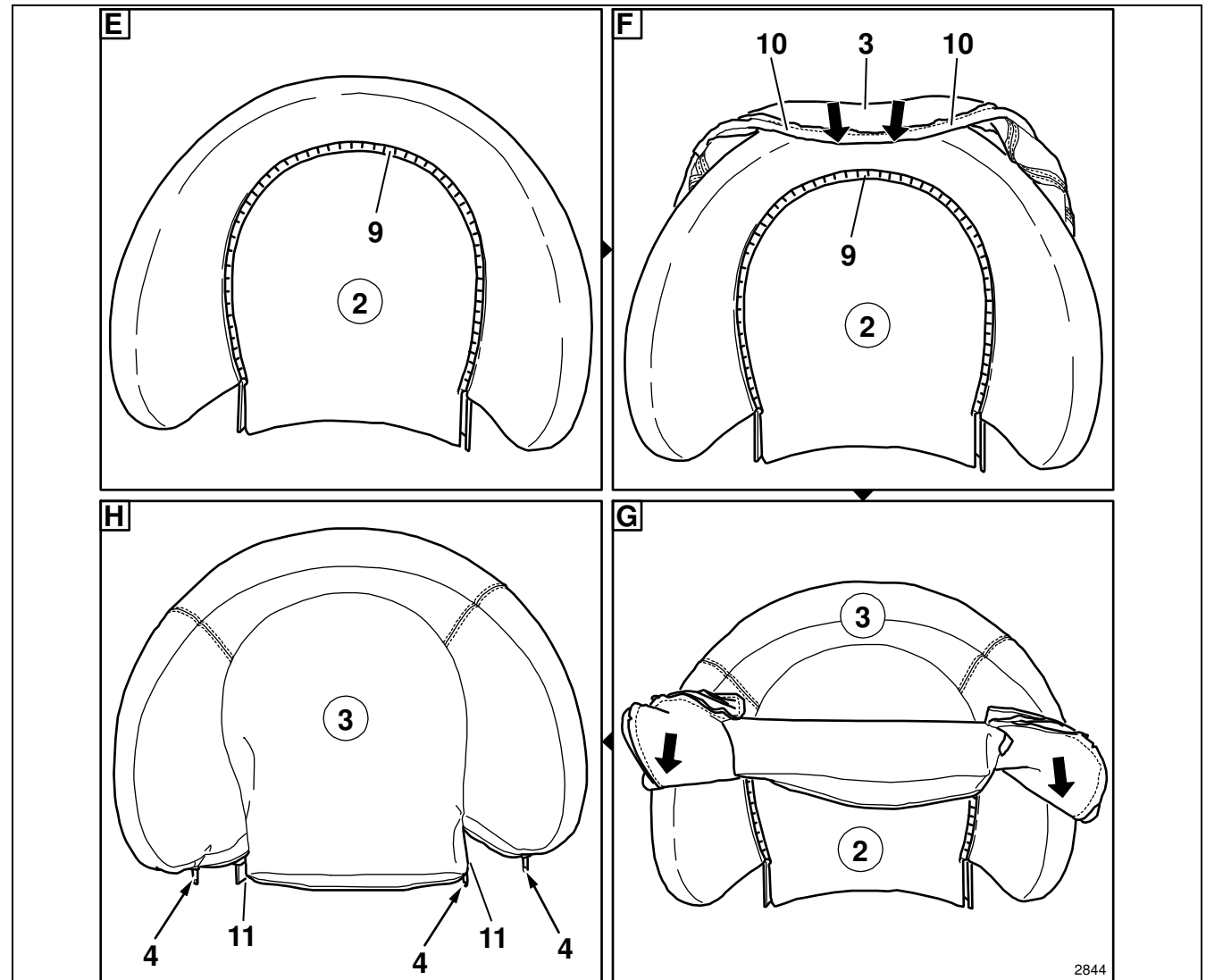


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### 7 Fitting the backrest cushion cover on the backrest cushion foam part

- 7.1 Open the three zip fasteners (4) on the backrest cushion cover (3) and turn the backrest cushion cover (G3) inside out.
- 7.2 Place the backrest cushion cover (3) in correct position in the middle of the foam part (2) and press approximately 10 cm of the loop tape (10) of the upper radius into the seam groove and onto the hook tape (9) (arrows in figure "F").
- 7.3 Pull the right and left side of the backrest cushion cover (3) over the foam part (2) (arrows in figure "G") and place the backrest cushion cover (3) in a centric position.



### 3.24 Seat and backrest cushion covers – removal and installation (Boat seat AVENTO-Evolution)

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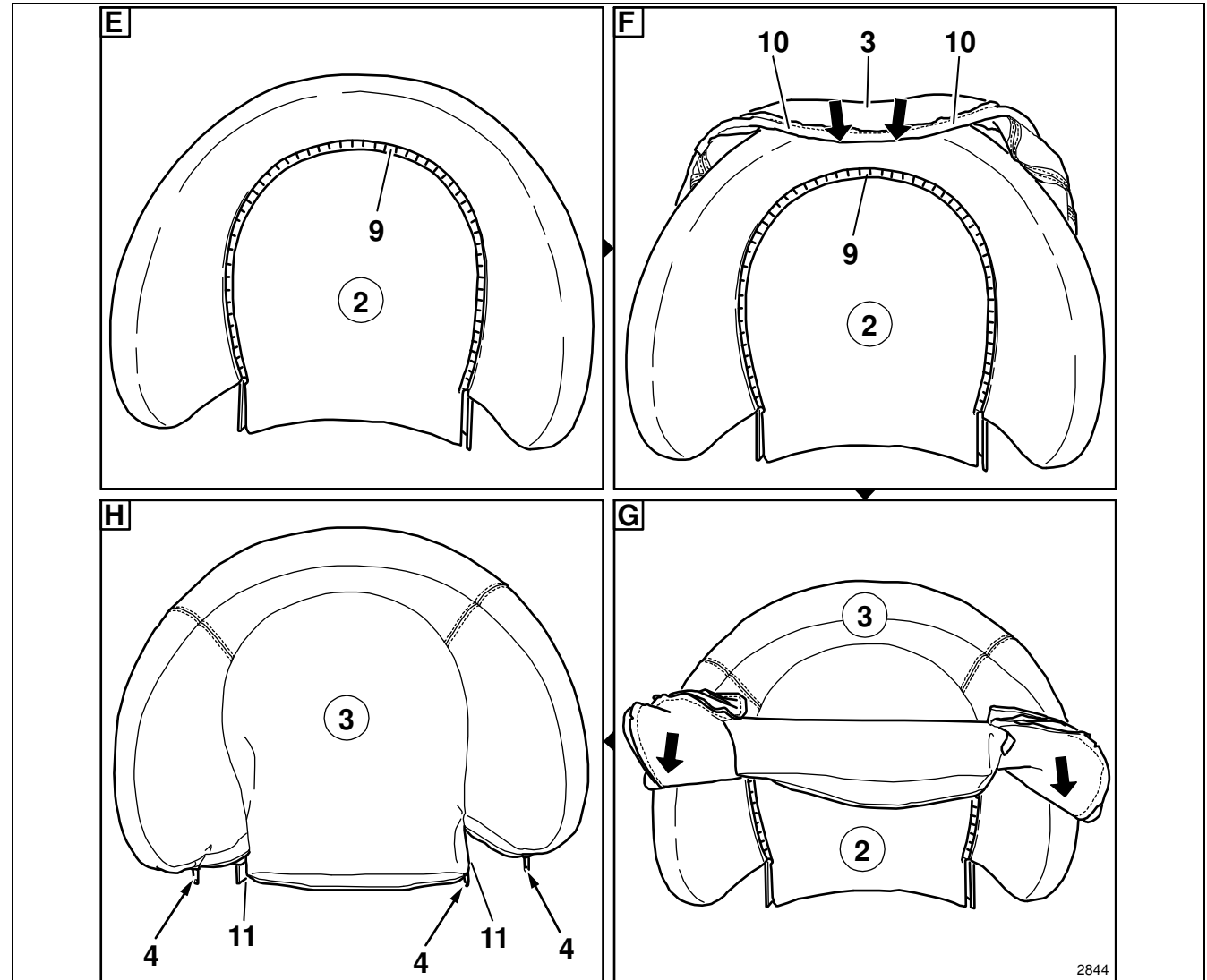
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7.4 Press the loop tape (10) of the backrest cushion cover (3) completely onto the hook tape (9) and into the seam groove from the inside and outside with one hand.

7.5 Justify the backrest cushion cover (3) at the bottom around the two backrest supports (11) and close the Velcro fastener.

7.6 Close three zip fasteners (4).

7.7 **Perform a visual inspection:**  
The backrest cushion cover (3) must not pucker and must be pressed onto the foam part (2) with the Velcro fastener in the area of the seam groove (1). Rework the backrest cushion cover (3), if necessary.



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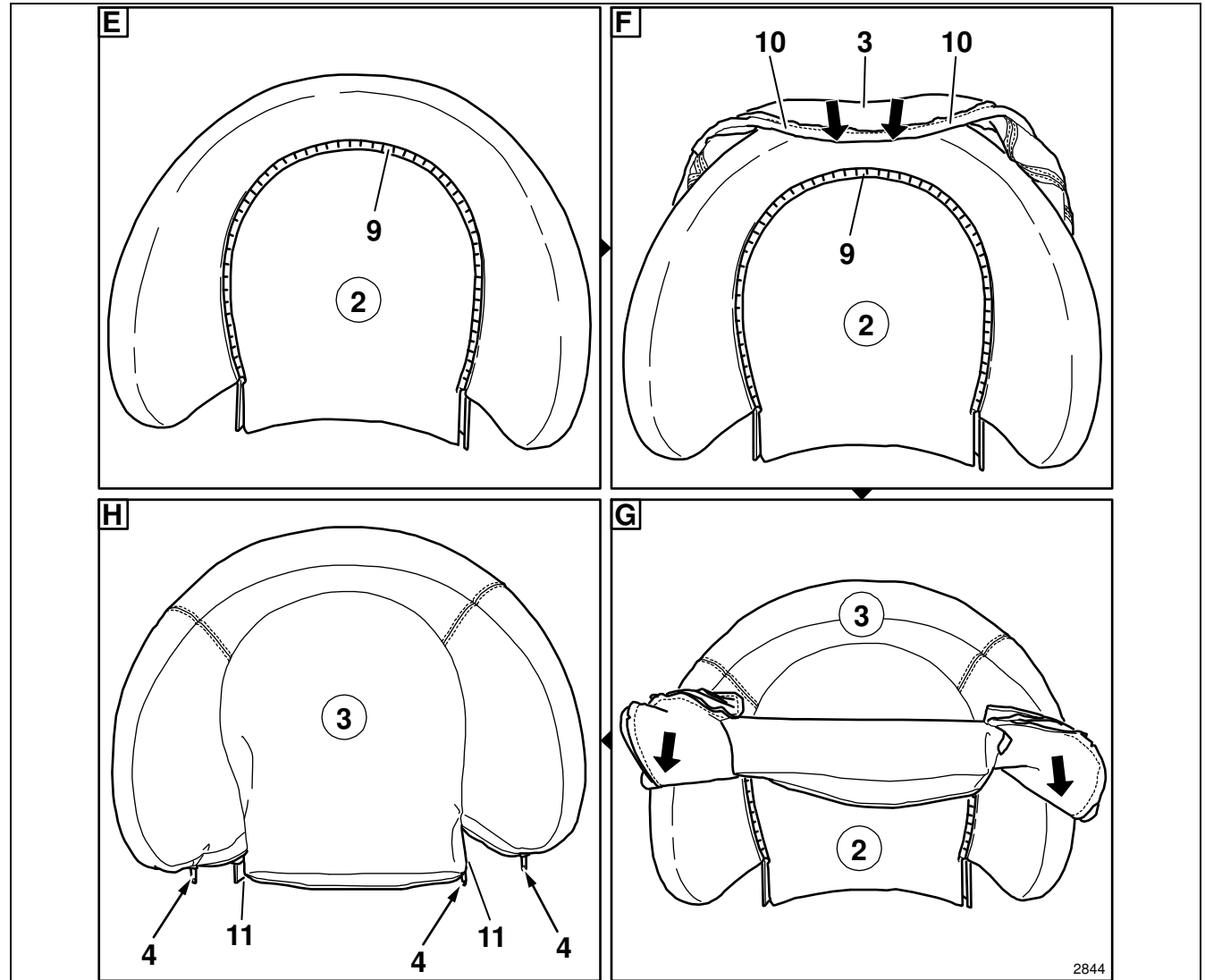
### 3.24 Seat and backrest cushion covers – removal and installation (Boat seat AVENTO-Evolution)



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- 7.8 Remove the pull tab at the slider of the zip fasteners (4).
- 8 Re-install the seat and backrest cushions including the cushion covers in reverse order of steps 1 and 2.



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