

**Special Tools  
Require**

■ Torx-bit with centrall guide boring	4931 599 085
■ Forcing discs	4931 599 018
■ Torx TX20 bit	4931 599 008
■ Screwdriver TX20	4931 599 005


**Important!**

- Before beginning the maintenance work, perform an initial check with a high voltage test according to VDE (see chapter Electrical and Mechanical Test Instructions).
- Before all repair work, pull the power plug from the socket!

**Disassembly****Removing the  
QUIK-LOK cable**

**1** Pull off the QUIK-LOK cable from the machine.

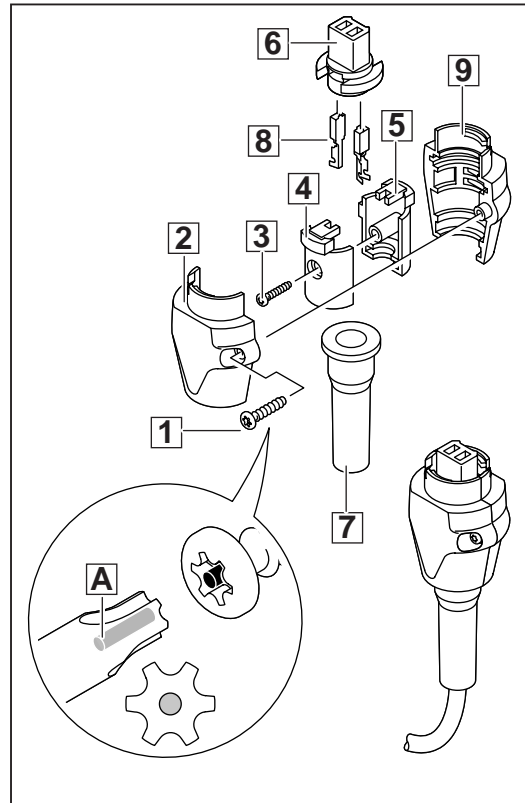
**2** Loosen the screw (1) and take apart the plug into two parts (2) and (9).

 The screw (1) has a central pin (see enlargement). It can only be removed with a respective Torx screwdriver with a cantrical boring (A)! This Torx screwdriver is part of the service tool kit. It can also be ordered with order number 4931 599 085.

**3** Pull down the cable entry sleeve (7) slightly.

**4** Loosen the screw (3) and disassemble the inner plug into three parts (4), (5), and (6).

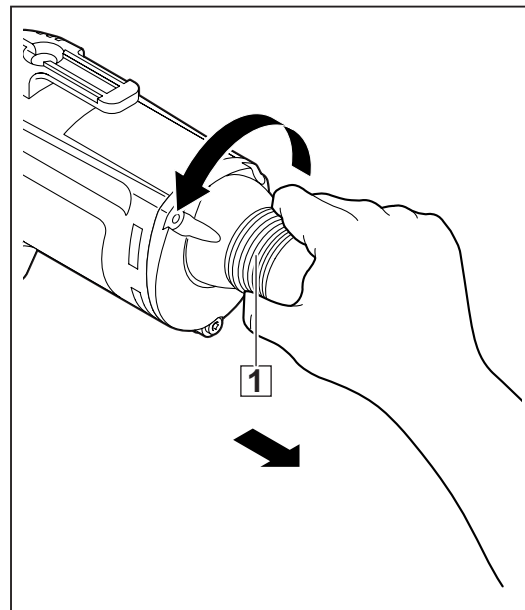
**5** Remove the contacts (8) with cables.



1

**Removing the  
retension sleeve  
with the bit stop  
cylinder**

**1** Remove the retension sleeve together with the bit stop cylinder (1) from the machine, by turning counter-clockwise.

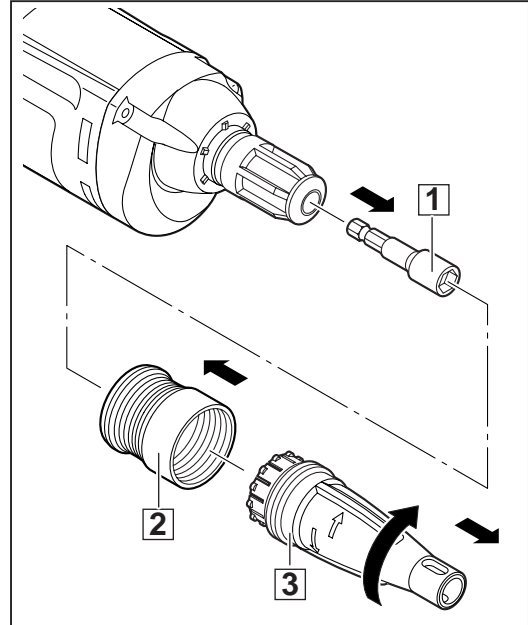


2

### Machines with reducing gear unit:

#### Removing the bit stop cylinder

- 1 Unscrew the bit stop cylinder (3) from the the retention sleeve (2), turning clock-wise.
- 2 Pull the magnetic bit holder (1) from the front part of the gear case.

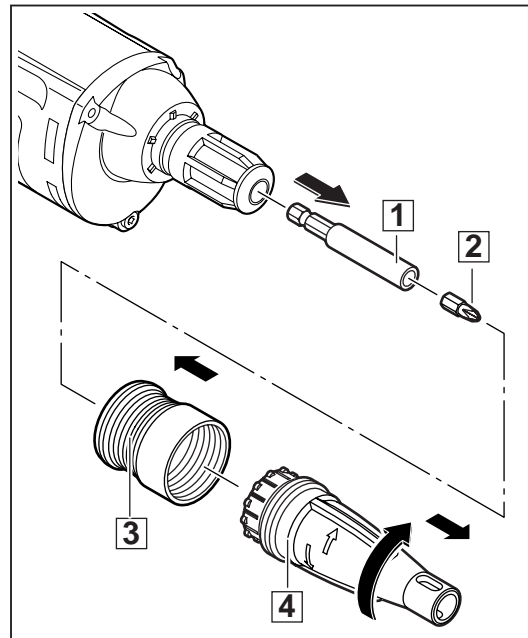


3

### Machines without reducing gear unit:

#### Removing the bit stop cylinder

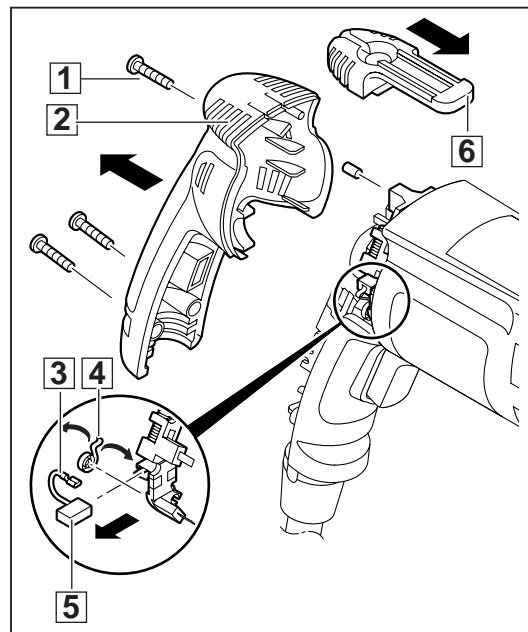
- 1 Unscrew the bit stop cylinder (4) clockwise and remove it from the retention sleeve (3).
- 2 Pull the bit holder (1) with the bit (2) from the front part of the gear case.



3

### Removing the carbon brushes

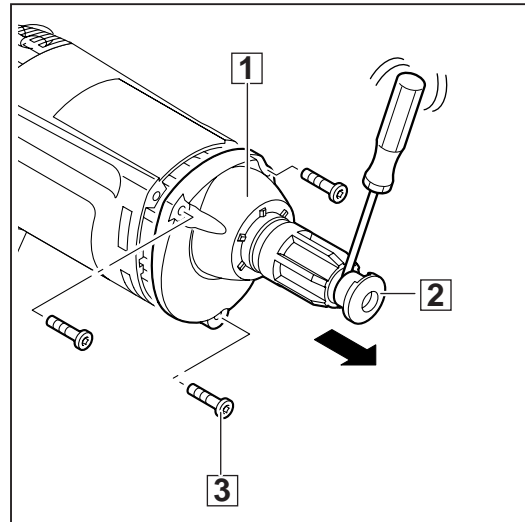
- 1 Unscrew three screws (1) from the handle shell (2) and remove the handle shell (2).
- 2 Bend open the springs (4) on both sides of the carbon brushes (5) (see arrows) and insert them into the guide. Pull the carbon brushes (5) from the brush holders and remove the wire (3) from the connection contact.
- 3 Remove the springs (4) on both sides.
- 4 Pull the clip (6) from the handle shell (2) in direction of arrow.



4

**Removing the front part of the gear case**

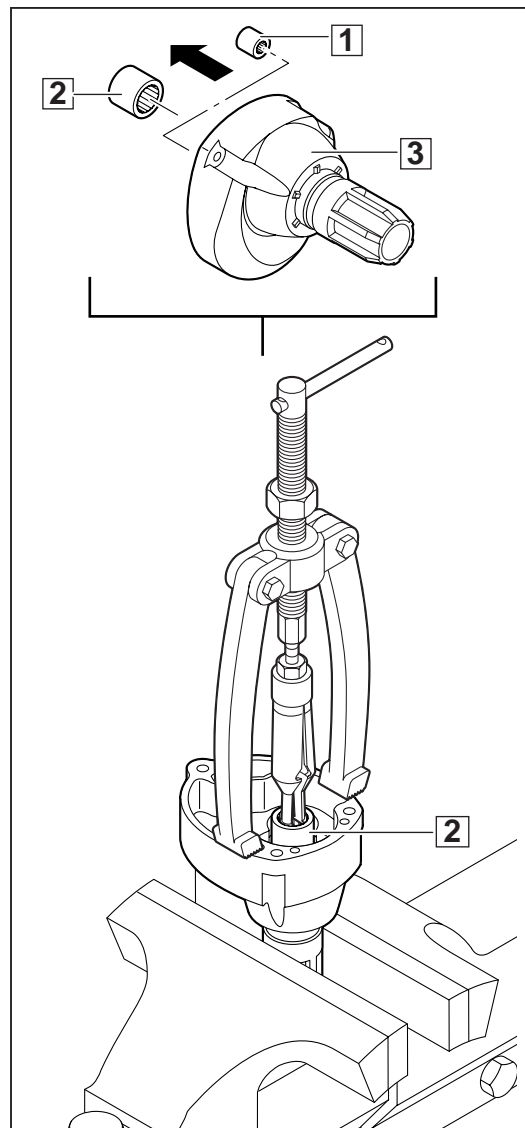
- 1 Lever the diaphragm (2) off the gear case (1) with aid of a screwdriver.
- 2 Loosen the three screws (3) from the front part of the gear case (1) and remove the gear case.



5

**Machines with reducing gear unit:****Disassembling the front part of the gear case**

- 1 Carefully fix the front part of the gear case (3) in a vice provided with protective jaws.
- 2 Pull out both the large needle bearing (2) and the small needle bearing (1) with aid of an interior extractor.

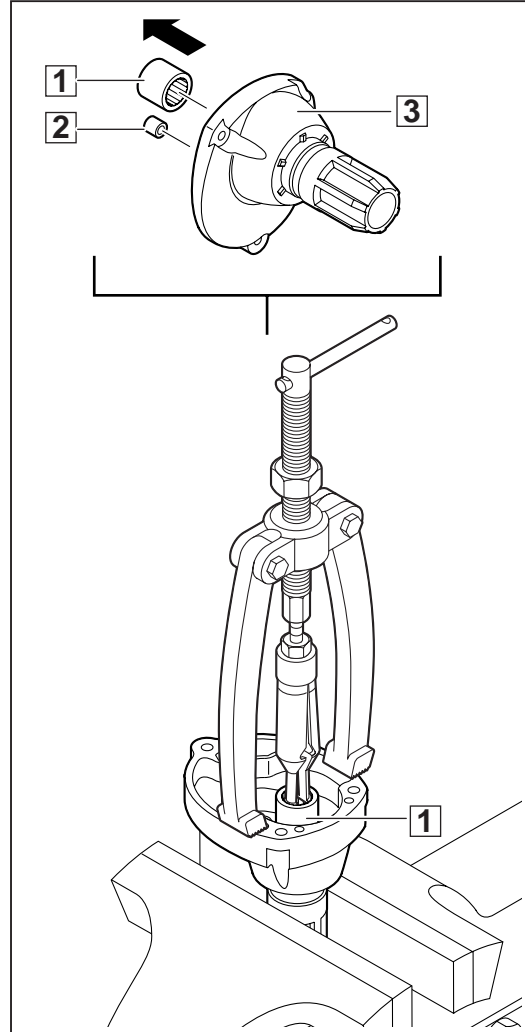


6

### Machines without reducing gear unit:

#### Disassembling the front part of the gear case

- 1 Carefully fix the front part of the gear box (3) in a vice provided with protective jaws.
- 2 Pull out the needle bearing (1) and the bushing (2) with aid of an interior extractor.

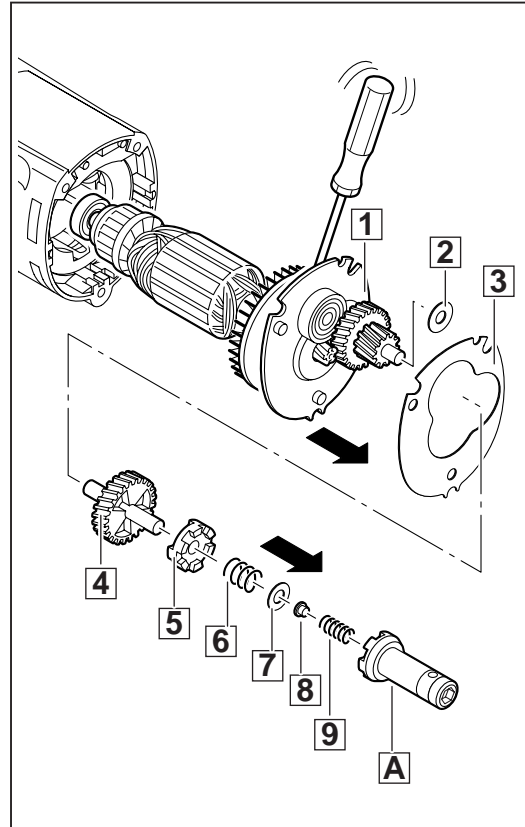


6

### Machines with reducing gear unit:

#### Disassembling the gear

- 1 Remove the following parts:
  - coupling shaft (A)
  - pressure spring (6)
  - coupling (5)
  - clutch wheel (4)
  - disc (2)
  - gasket (3).
- 2 Pull the bearing end plate (1) assembly with the armature from the housing.
- 3 Remove from the coupling shaft (A):
  - washer (7)
  - clamp pin (8)
  - pressure spring (9).



7

### Machines without reduc- ing gear unit:

#### Disassembling the gear

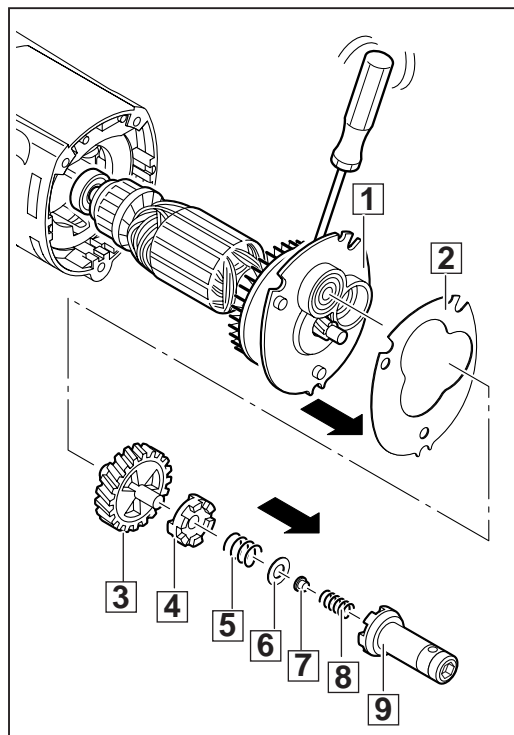
- 1** Remove the following parts:
  - coupling shaft (9)
  - pressure spring (5)
  - coupling (4)
  - clutch wheel (3)
  - gasket (2).

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- 2** Pull the bearing end plate (1) assembly with the armature from the housing.

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- 3** Remove from the coupling shaft (9):
  - washer (6)
  - clamp pin (7)
  - pressure spring (8).



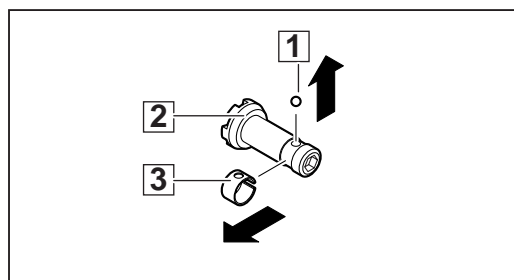
7

#### Dismantling the coupling shaft

- 1** Bend open the ring (3) and remove it.

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- 2** Remove the ball (1).

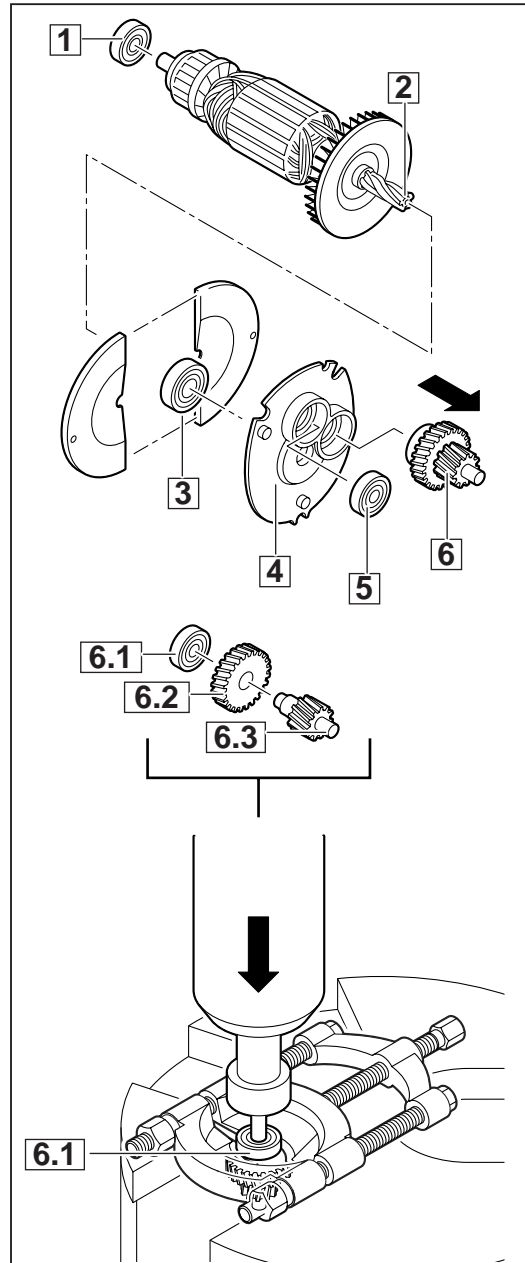


8

### Machines with reducing gear unit:

#### Removing the bearing end plate and the armature

- 1 Press the following parts from the armature shaft (2), using forcing discs (service tool No.: 4931 599 018):
  - bearing end plate (4)
  - two ball bearings (1) and (3).
- 2 Press off the complete reduction gear assembly (6) from the bearing end plate (4) using forcing discs, or expel it with aid of a plastic hammer.
- 3 Pull out the ball bearing (5) with aid of an interior extractor.
- 4 Press the ball bearing (6.1) off the reduction gear (6.2) with aid of a parting-off tool.
- 5 Press the reduction gear shaft (6.3) off the gear (6.2).

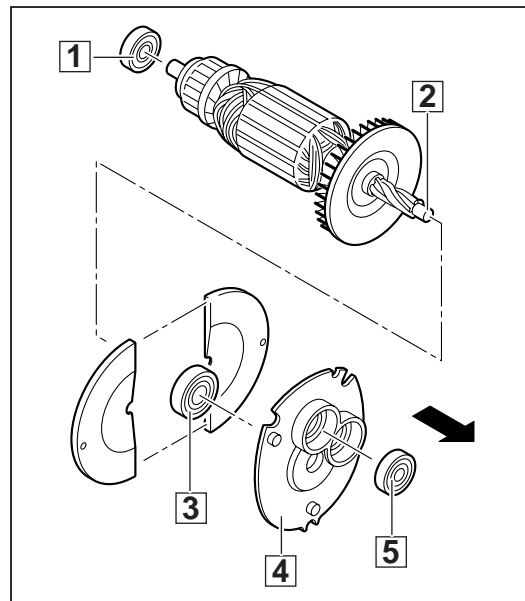


9

### Machines without reducing gear unit:

#### Removing the bearing end plate and the armature

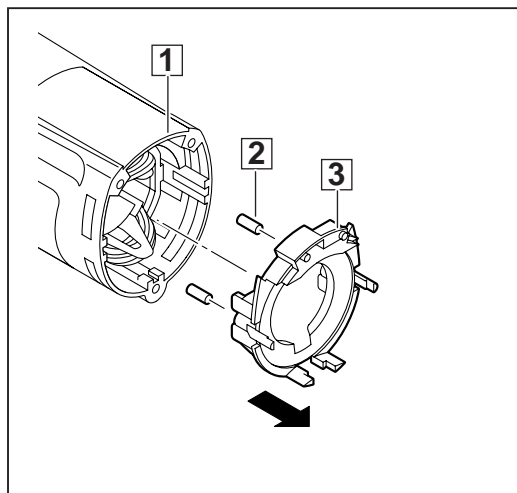
- 1 Press the following parts from the armature shaft (2), using forcing discs (service tool No.: 4931 599 018):
  - bearing end plate (4)
  - two ball bearings (1) and (3).
- 2 Pull the ball bearing (5) from the bearing end plate (4) with aid of an interior extractor.



9

**Removing the air deflector ring**


- 1 Pull the air deflector ring (3) from the motor housing (1).
- 2 Pull two rubber bungs (2) from the air deflector ring (3).



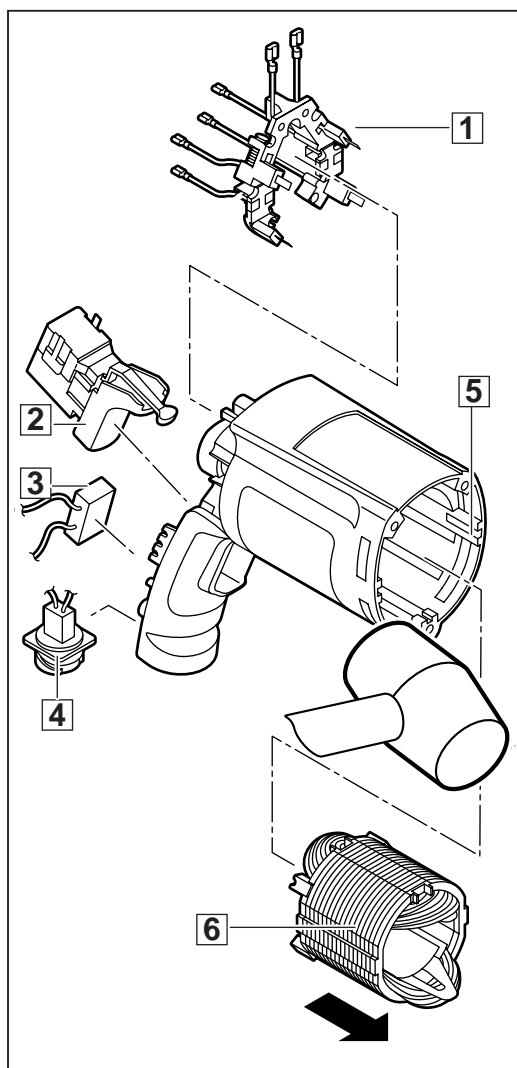
10

**Removing the field and the electric parts**

- 1 Pull the field (6) from the motor housing (5) (plug-in connection).

 In case of stiffness, hold the motor housing (5) with the opening facing downwards, and hit it lightly with a plastic hammer.

- 2 Remove the following parts from the back part of the motor housing (5):
  - brush holder assemblies (1)
  - switch (2)
  - anti-interference capacitor (3) with set of cables
  - housing (4).



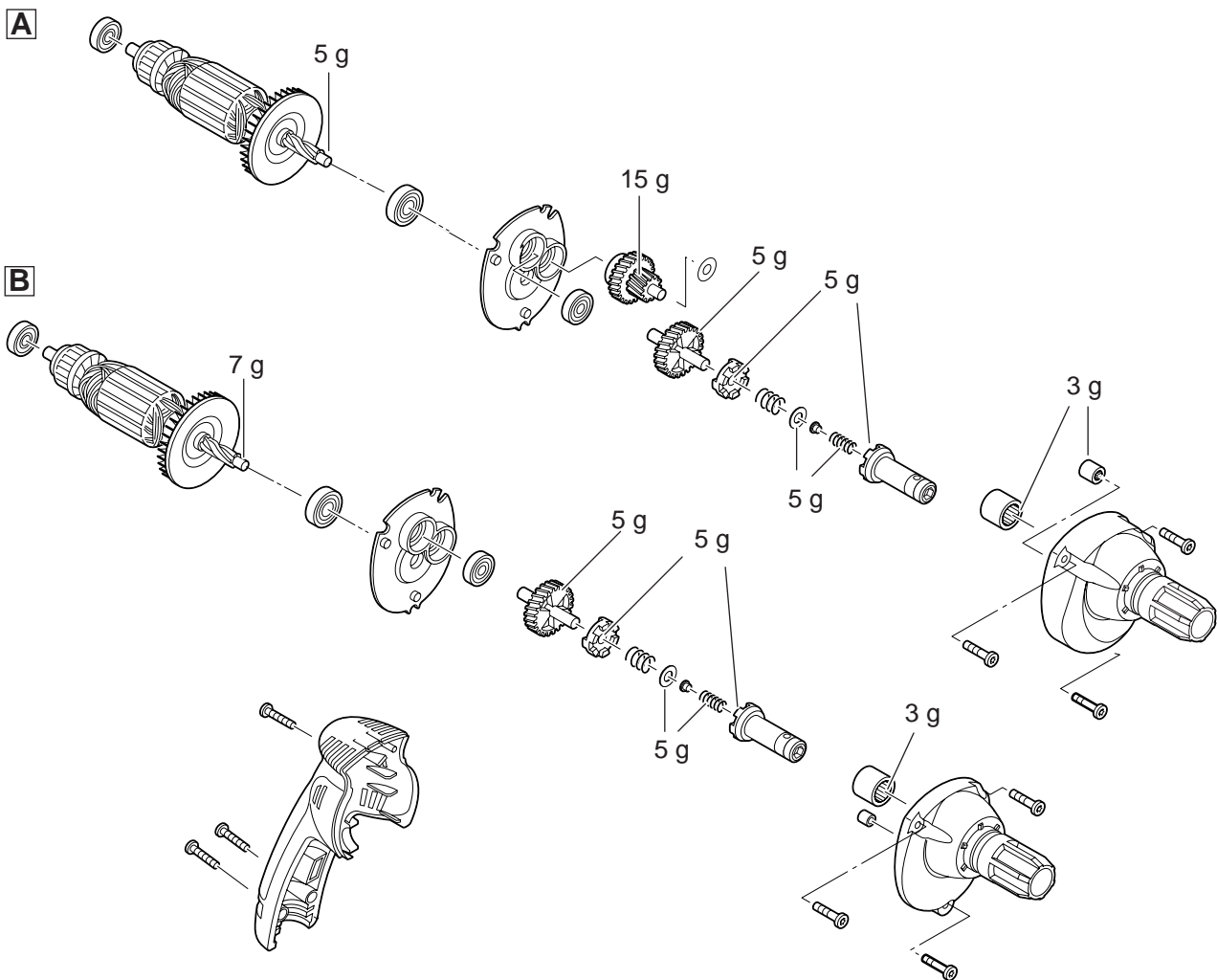
11

## Maintenance

<b>General</b>	It is recommended to regularly submit the tool to maintenance after the carbon brushes have switched off.
<b>Cleaning</b>	Clean all parts – with the exception of the electrical parts – with cold cleaning agent. Caution! No cleaning agent should penetrate into the bearing. Clean the electrical parts with a dry brush.
<b>Check for wear</b>	Check the disassembled parts for wear (visual inspection) and replace worn parts.
<b>Electrical tests</b>	Before reassembling, perform an electrical test on all relevant parts (see chapter Electrical and Mechanical Test Instructions).
<b>Lubrication</b>	Each time maintenance is performed, the machine is to be lubricated as stated in the lubrication plan. After the machine is fully disassembled, completely remove the old grease and replace with new grease. The grease must be applied to the machine as indicated in the lubrication plan.

### Lubrication chart:

- A** Machines with reducing gear unit TKSE 2500 Q
  - Cover res. fill with a total of 38 grams of grease type Y (Order No.: 49-08-5270).
- B** Machines without reducing gear unit DWSE 4000 Q
  - Cover res. fill with a total of 25 grams grease type Y (Order No.: 49-08-5270).



<b>Torques</b>	Screws in plastic (handle)	1.5 Nm
	Screws in metal (front part of gear case)	4.5 Nm



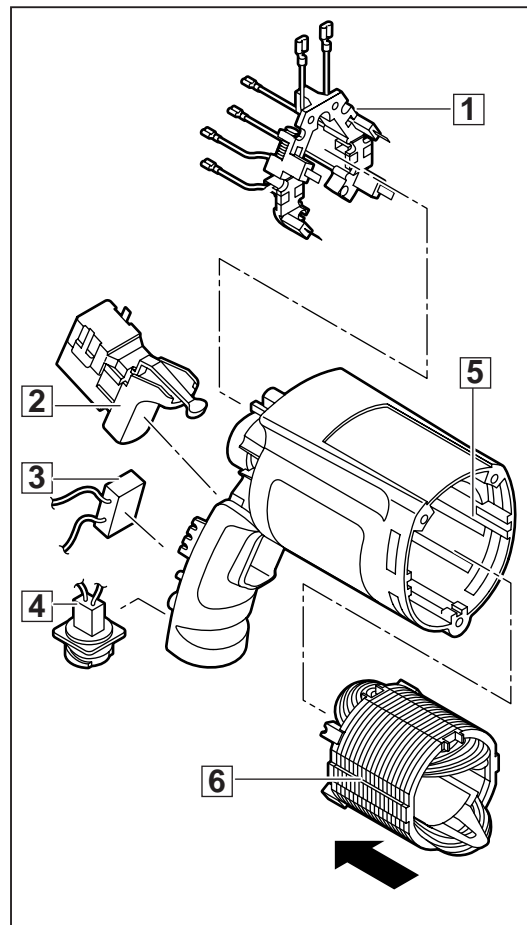
## Assembly

### Mounting the field and the electric parts

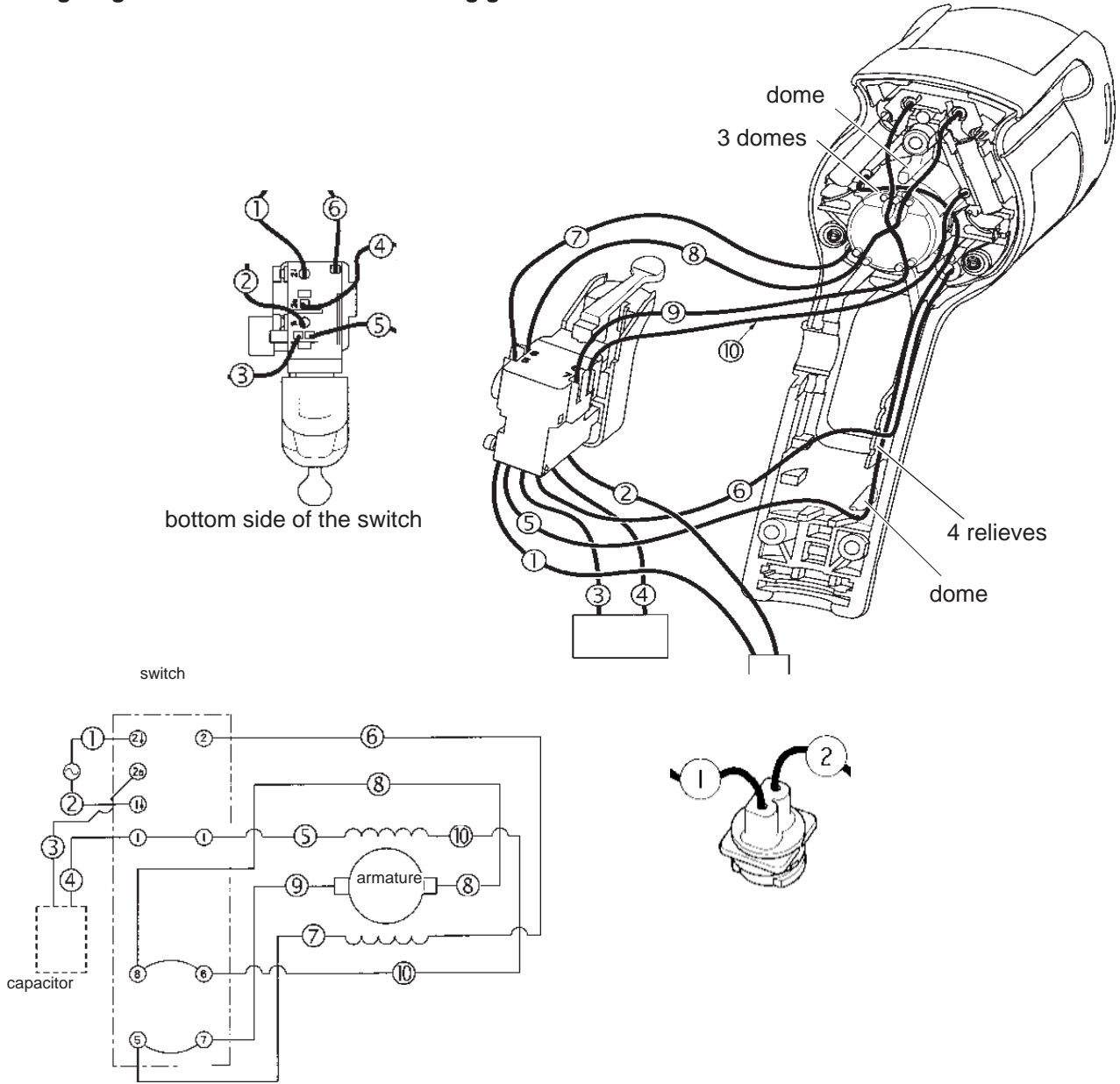
- 1 Insert the field (6) into the motor housing (5) from the front (plug-in connection).
- 2 Insert the following parts into the back part of the motor housing (5):
  - brush holder assembly (1)
  - switch (2)
  - anti-interference capacitor (3) with set of wires
  - housing (4).

☞ For wiring of machines with reducing gear unit: Please refer to wiring diagram on page 10!

☞ For wiring of machines without reducing gear unit: Please refer to wiring diagram on page 11!



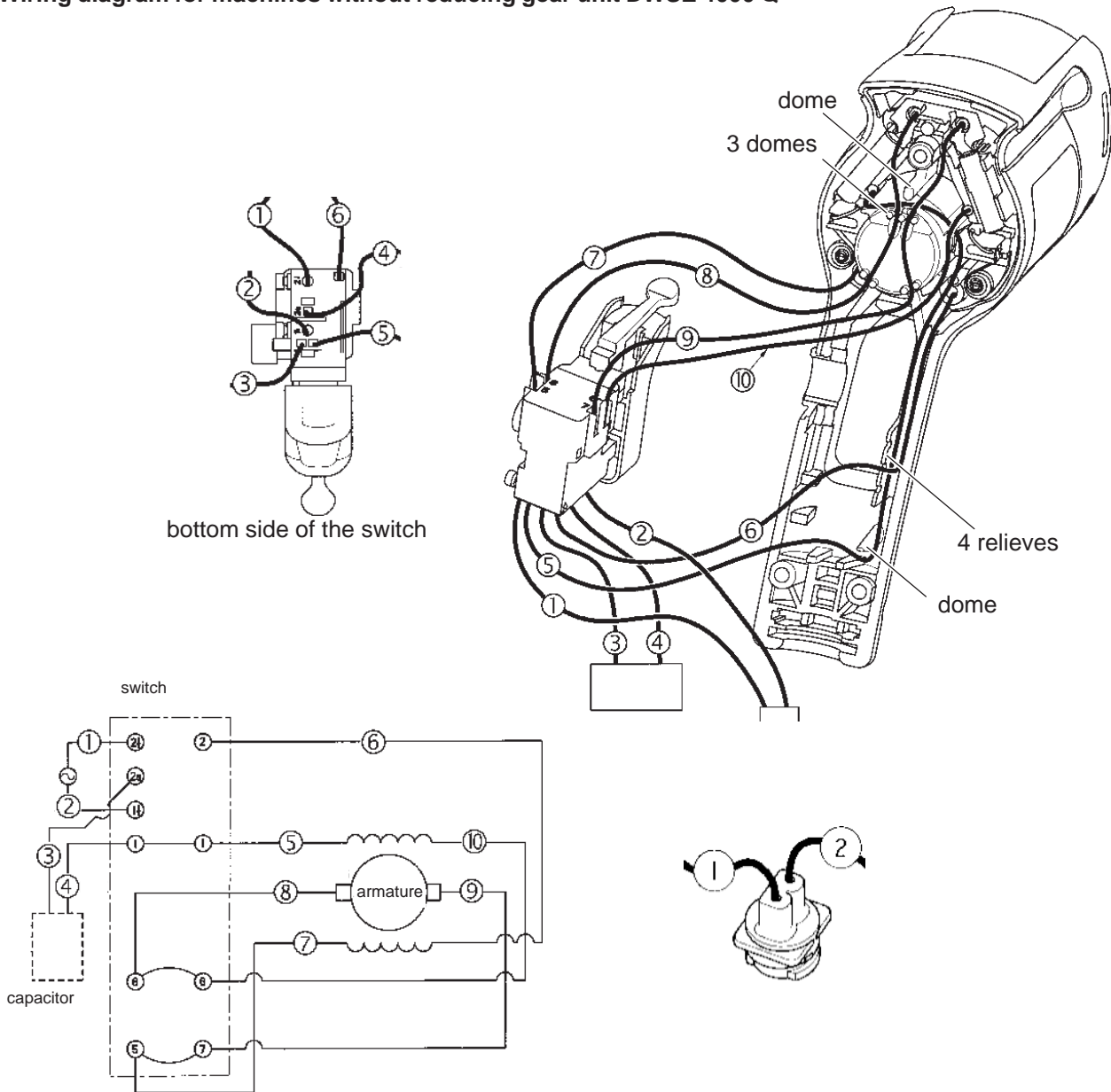
**Wiring diagram for machines with reducing gear unit TKSE 2500 Q**



Wire No.	Colour	Function
1	brown	connection between plug and switch
2	blue	connection between plug and switch
3	black	connection between capacitor and switch
4	black	connection between capacitor and switch
5	white	connection between carbon brush holder and switch
6	brown	connection between carbon brush holder and switch
7	brown	connection between carbon brush holder and switch
8	white	connection between carbon brush holder and switch
9	blue	connection between carbon brush holder and switch
10	black	connection between carbon brush holder and switch

Position and print on the switch
bottom side, on 2 ↓
bottom side, on 1 ↓
bottom side, on 1 or 2a
bottom side, on 2a or 1
bottom side, on 1
bottom side, on ② (marking on the side of the switch)
on the side, on 5
on the side, on 8
on the side, on 7
on the side, on 6

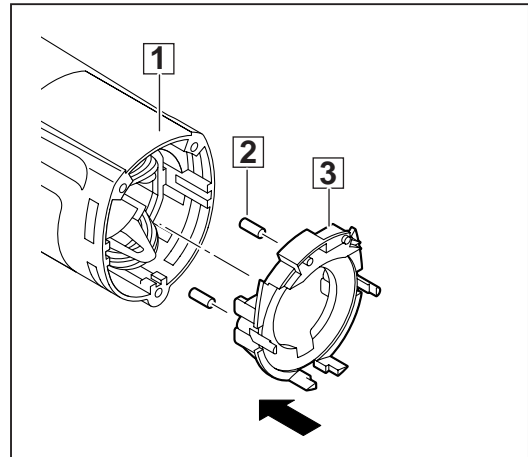
Wiring diagram for machines without reducing gear unit DWSE 4000 Q



Wire No.	Colour	Function	Position and print on the switch
1	brown	connection between plug and switch	bottom side, on 2 ↓
2	blue	connection between plug and switch	bottom side, on 1 ↓
3	black	connection between capacitor and switch	bottom side, on 1 or 2a
4	black	connection between capacitor and switch	bottom side, on 2a or 1
5	white	connection between carbon brush holder and switch	bottom side, on 1
6	brown	connection between carbon brush holder and switch	bottom side, on ② (marking on the side of the switch)
7	brown	connection between carbon brush holder and switch	on the side, on 5
8	blue	connection between carbon brush holder and switch	on the side, on 8
9	whites	connection between carbon brush holder and switch	on the side, on 7
10	black	connection between carbon brush holder and switch	on the side, on 6

**Mounting the air deflector ring**

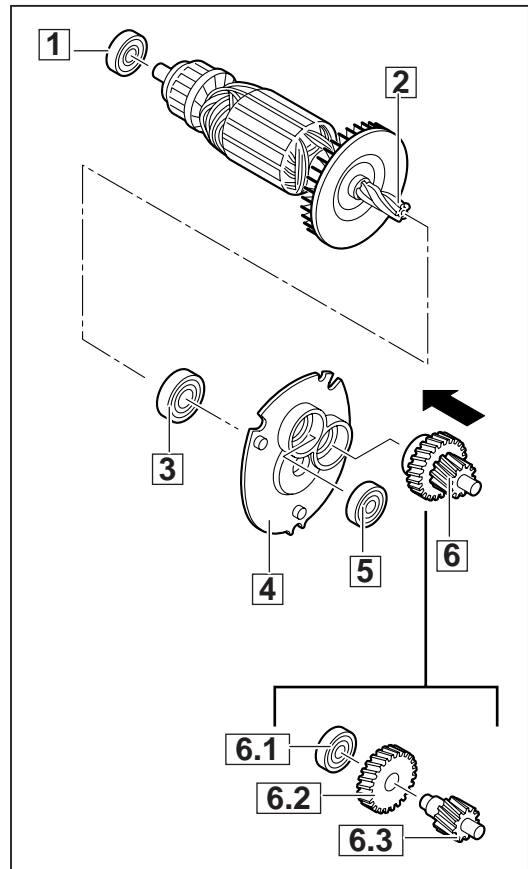
- 1 Insert two rubber bungs (2) into the air deflector ring (3).
- 2 Insert the air deflector ring (3) into the motor housing (1).



2

**Machines with reducing gear unit:****Assembling the bearing end plate and the armature**

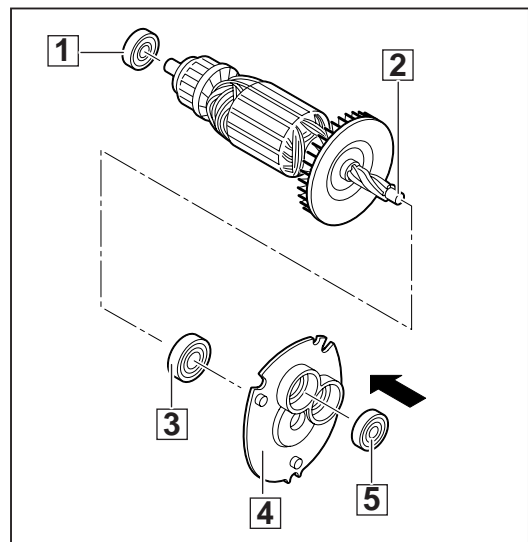
- 1 Press the gear (6.2) and the ball bearing (6.1) onto the reduction gear shaft (6.3).
- 2 Press the ball bearing (5) and the complete reduction gear assembly (6) into the bearing end plate (4).
- 3 Press the following parts onto the armature shaft (2):
  - two ball bearings (1) and (3)
  - bearing end plate assembly (4).



3

**Machines without reducing gear unit:****Assembling the bearing end plate and the armature**

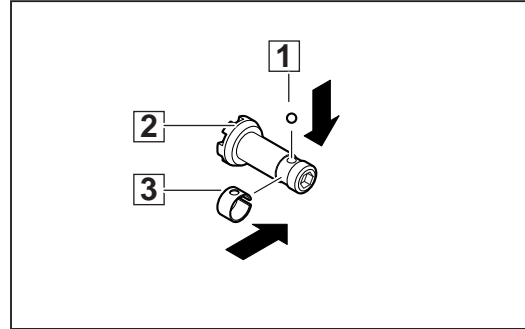
- 1 Press the ball bearing (5) into the bearing end plate (4).
- 2 Press the following parts onto the armature shaft (2):
  - two ball bearings (1) and (3)
  - bearing end plate assembly (5).



3

**Assembling the coupling shaft**

- 1 Insert the ball (1).
  - 2 Mount the ring (3).
- ☞ The ball (1) must fit into the boring of the ring (3).

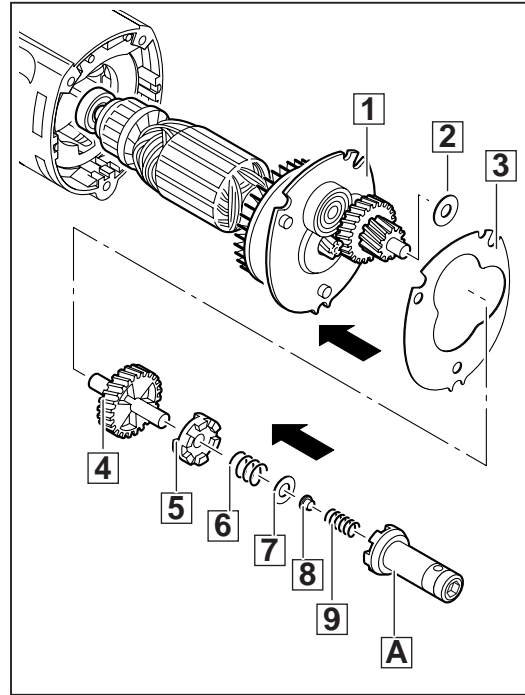


4

**Machines with reducing gear unit:**

**Assembling the gear**

- 1 Insert the following parts into the coupling shaft (A):
  - pressure spring (9)
  - clamp pin (8)
  - washer (7).
- 2 Insert the complete bearing end plate assembly (1) with the armature into the housing.
- 3 Mount the following parts:
  - gasket (3)
  - disc (2)
  - clutch wheel (4)
  - coupling (5)
  - pressure spring (6)
  - coupling shaft assembly (A).



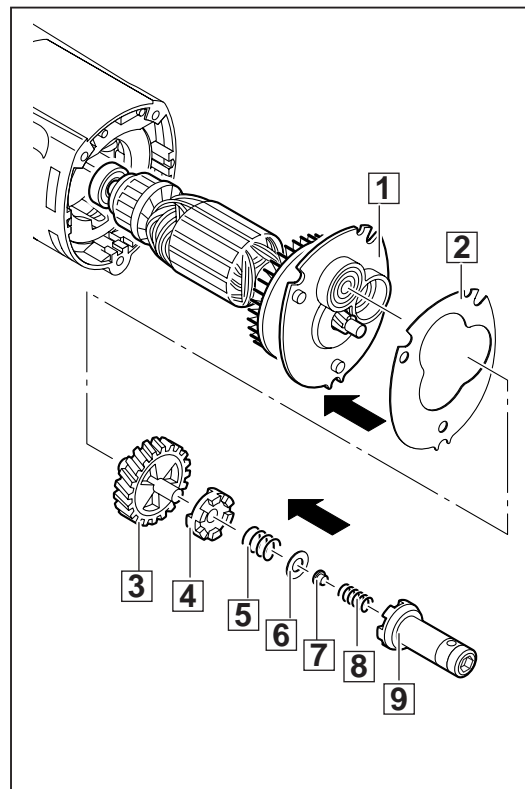
5

**Machines without reducing gear unit:**

**Assembling the gear**

- 1 Insert the following parts into the coupling shaft (9):
  - pressure spring (8)
  - clamp pin (7)
  - disc (6).
- 2 Insert the complete bearing end plate assembly (1) with the armature into the housing.
 

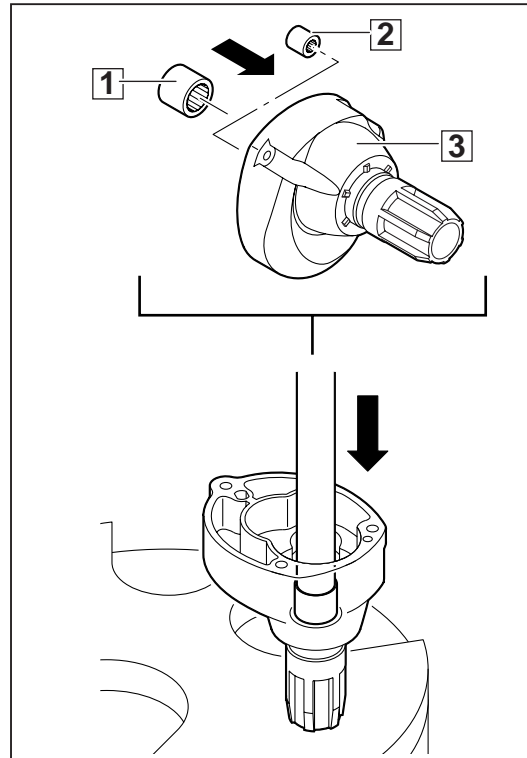
☞ If a **new armature** has been insertet (new: 6 “teeth”, old: 5 “teeth”), a **new gear (3)** must be used!
- 3 Mount the following parts:
  - gasket (2)
  - clutch wheel (3)
  - coupling (4)
  - pressure spring (5)
  - coupling shaft assembly (9).



5

**Machines  
with reducing  
gear unit:****Assembling the  
front part of the  
gear case**

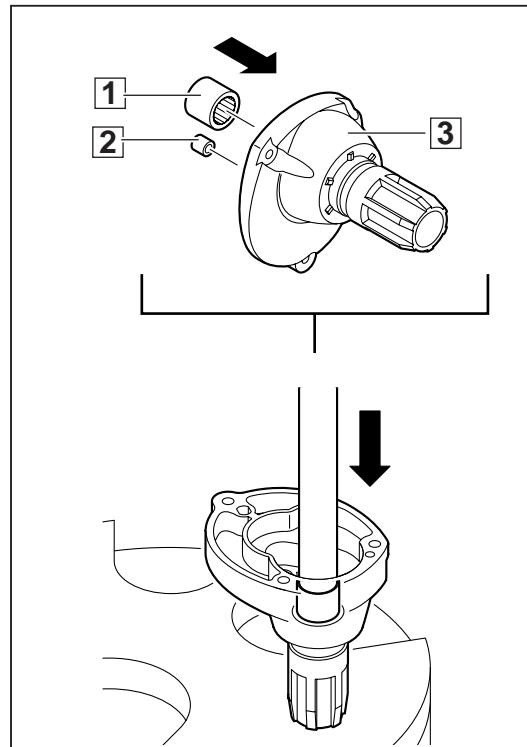
- 1 Press the large needle bearing (1) and the small needle bearing (2) into the front part of the gear case (3).



6

**Machines  
without reduc-  
ing gear unit:****Assembling the  
front part of the  
gear case**

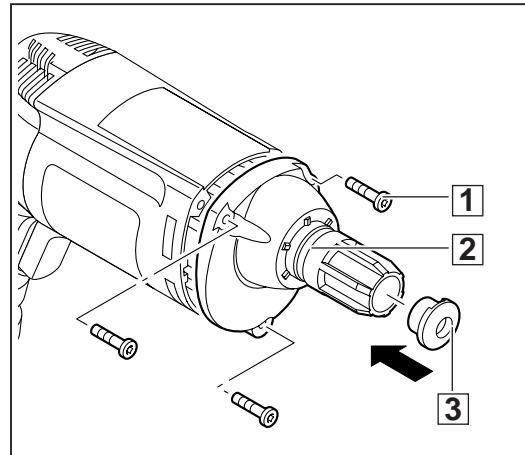
- 1 Press the large needle bearing (1) and the sleeve (2) into the front part of the gear case (3).



6

### Mounting the front part of the gear case

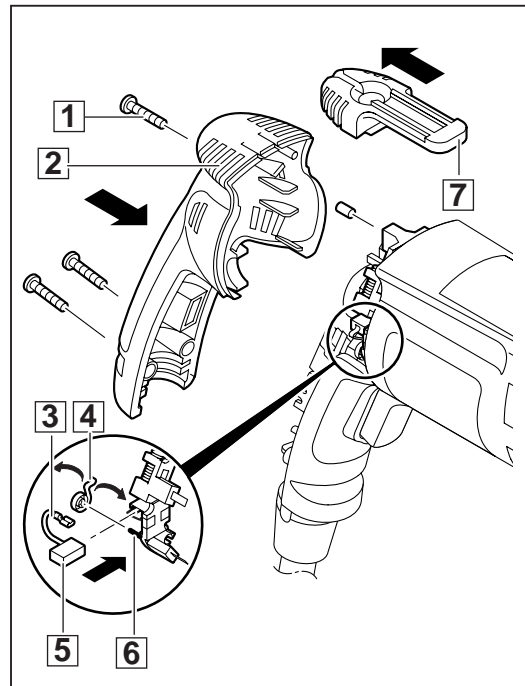
- 1 Fix the front part of the gear case (2) with three screws (1) to the machine.
- 2 Press on the diaphragm (3).



7

### Mounting the carbon brushes

- 1 Insert the carbon brushes (5) on both sides into the brush holders and connect the wire (3) with the contact.
- 2 Put the springs (4) on the dome (6) on both sides: the end of the springs must depress the carbon brushes against the collector.
- 3 Mount the clip (7) on the handle shell (2).
- 4 Put the handle shell (2) on the machine and fix it with the three screws (1).

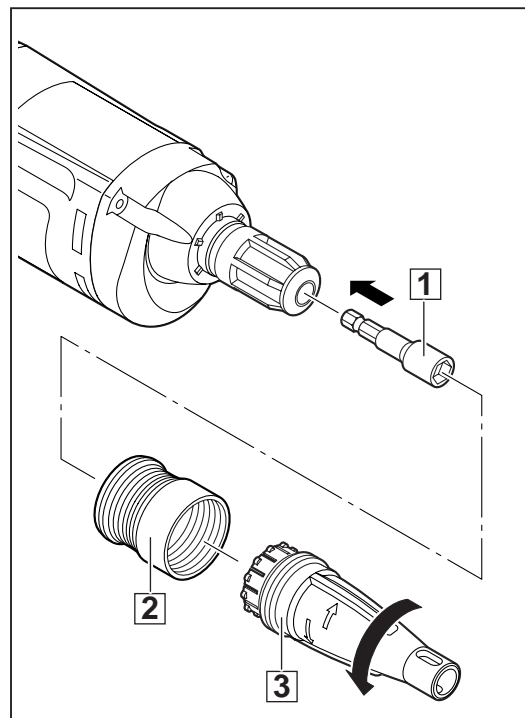


8

### Machines with reducing gear unit:

- 1 Insert the magnetic bit holder (1) into the front part of the gear case.
- 2 Screw the bit stop cylinder (3) in the locking sleeve (2), turning counter-clockwise.

### Mounting the bit stop cylinder

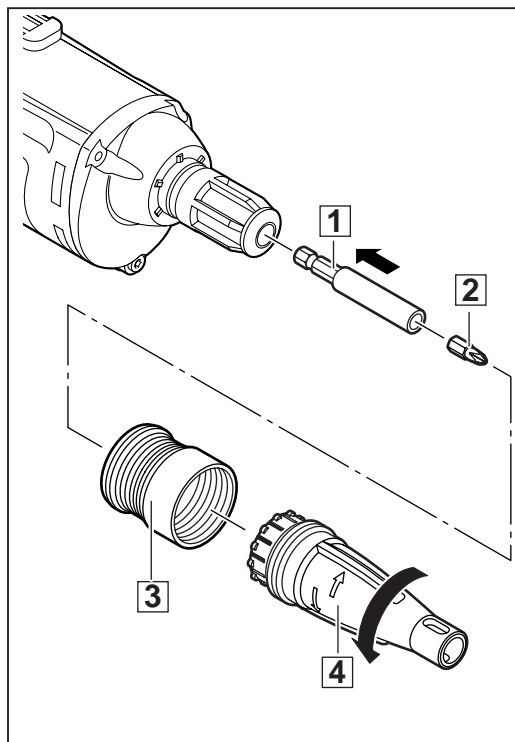


9

### Machines without reduc- ing gear unit:

- 1 Insert the bit holder (1) with the bit (2) into the front part of the gear case.
- 2 Screw the bit stop cylinder (4) in the locking sleeve (3), turning counter-clockwise.

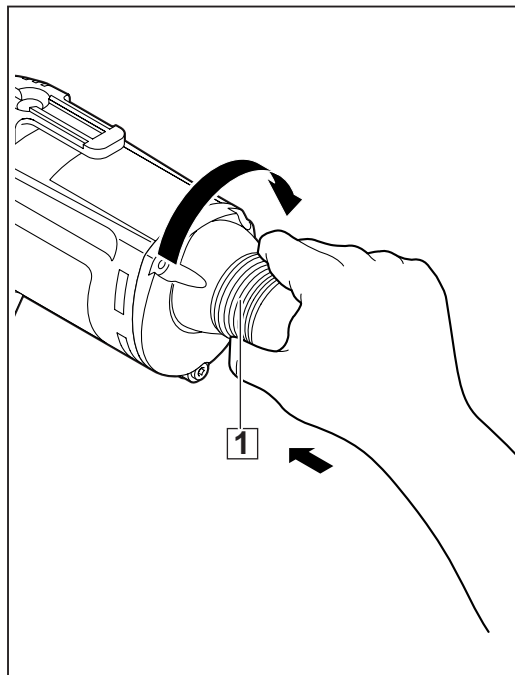
### Mounting the bit stop cylinder



9

### Mounting the locking sleeve with the bit stop cylinder

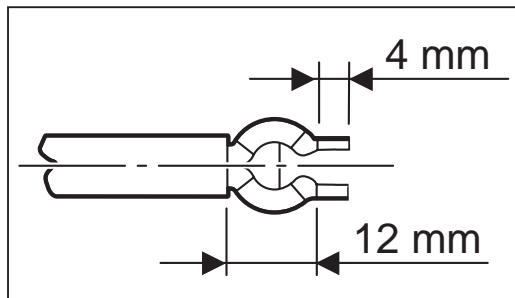
- 1 Mount the locking sleeve with the bit stop cylinder (1) on the machine and lock it, turning clockwise.



10

### Insulating the mains cable

- 1 Insulate the mains cable as shown in illustration. Meet the following measures:
  - Insulating length of wires: approx. 4 mm
  - Wire length with insulation: approx. 12 mm



11



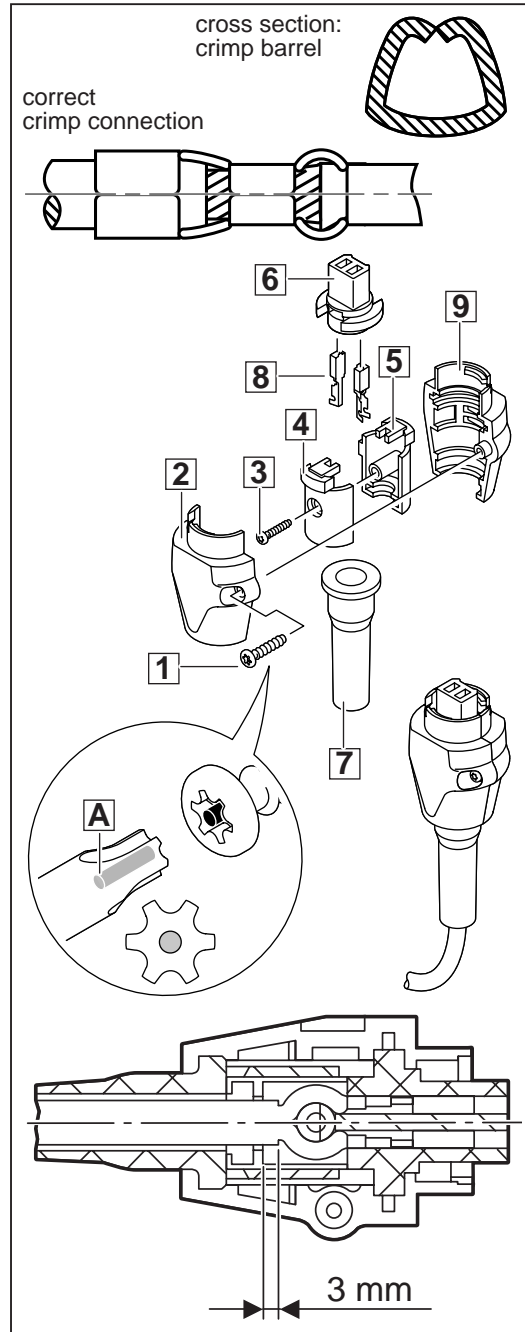
**Mounting the  
QUIK-LOK cable****Producing a  
strain relief**

- 1 Insert the mains cable into the new crimping contacts (8) in accordance with regulations and make a correct crimp connection with aid of a crimping tool (see both illustrations of the crimp connection on the right).

☞ Only a correct crimp connection can meet all mechanical and electrical requirements!

- 2 Insert the crimping contacts (8) with wires (6) into the sleeve.
- 3 Insert the plug halves (4) and (5) into the sleeve (6) on both sides and fix them with the screw (3).
- 4 Insert the cable entry sleeve (7) and the assembled sleeve (6) into the plug (9).
- 5 Put together the two halves of the plug (2) and (9) and fasten them with the screw (1).

☞ The screw (1) has a central pin (see enlargement). It can only be fastened with a Torx screwdriver with a respective central guide boring (A)! This Torx screwdriver is part of the service tool kit. It is also available as service bit Lfb (order number 4931 599 085).



12

**Test Run**

Test run the machine and pay attention to noises.  
Let the machine run-in.

**Electrical Test**

Perform an electrical test on the machine (see chapter Electrical and Mechanical Test Instructions).