

**Special Tools
Require**

- Forcing discs
- TX 15

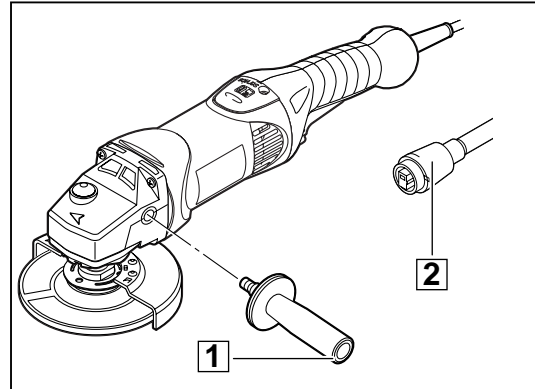
4931 5990 18
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Important!

- 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**Detaching
the handle**

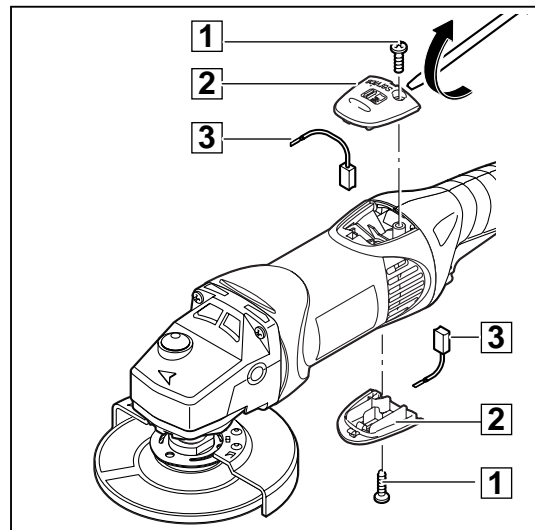
- 1 Unscrew the handle (1).
- 2 **Machines with QUIK-LOK:** Pull off the Quick-Lock connection cable (2).



1


**Removing the
carbon brushes**

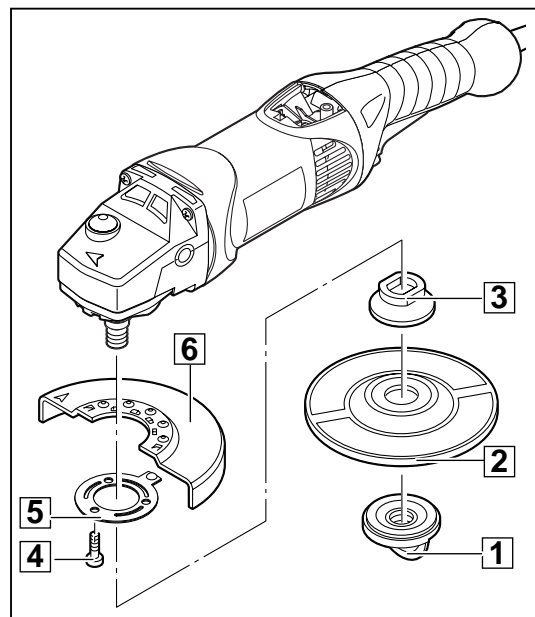
- 1 Loosen the screws (1) on both service covers (2) with TX 15.
- 2 Carefully lever off the service cover (2) with aid of a screwdriver.
- 3 Loosen the plug contact of the carbon brushes (3) on both sides and remove the carbon brushes (3).



2

**Detaching the
guard cap**

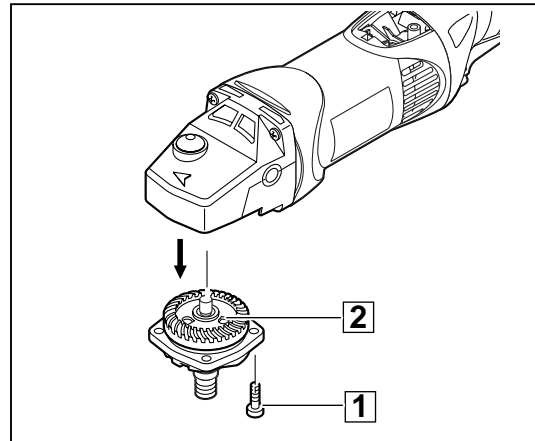
- 1 Fold away the hoop on the Fixtec nut (1) and unscrew the Fixtec nut (1).
 In case of stiffness, a pin-type face spanner can be used.
- 2 Remove the grinding disc (2).
- 3 Remove the clamping flange (3).
- 4 Loosen three screws (4) and remove the spring washer (5).
- 5 Remove the guard cap (6).



3

Removing the complete spindle assembly

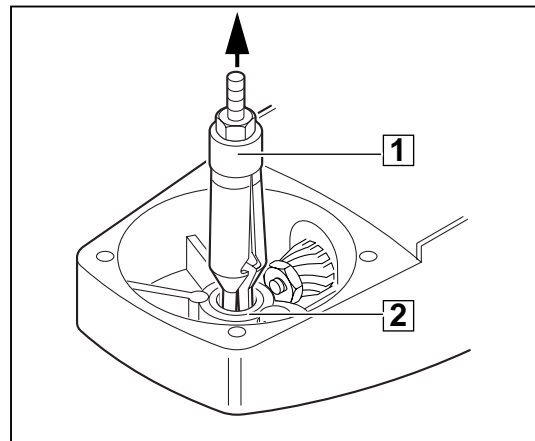
- 1 Loosen four screws (1) on the bearing end plate (2).
- 2 Remove the complete bearing end plate (2).



4

Removing the bearing

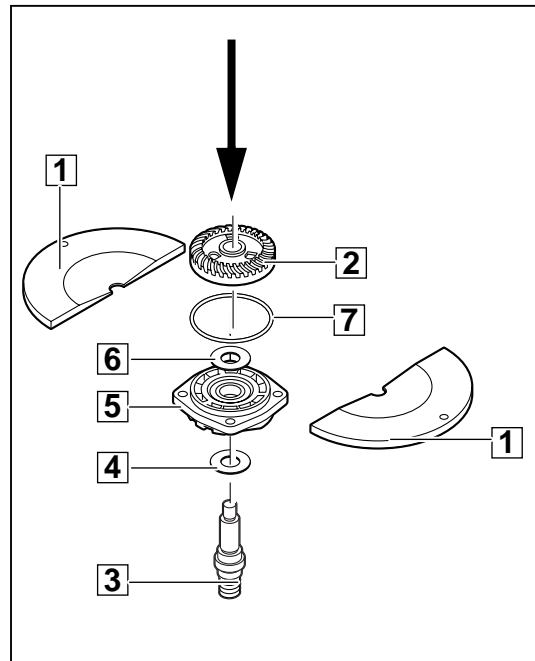
- 1 Pull off the bearing (2) from the front gear box with aid of an interior extractor (1) in direction of arrow.



5

Dismantling the spindle assembly

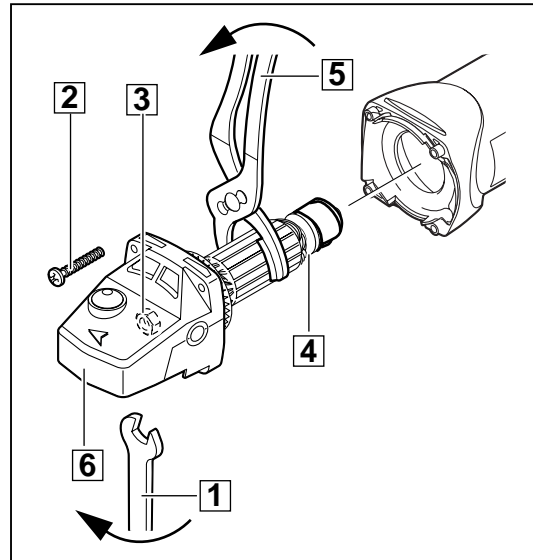
- 1 Place the complete bearing end plate (2) - (7) on a press. Apply pressure on the spindle in direction of arrow. A gap will appear between bevel gear wheel (2) and bearing end plate (5). Insert the forcing discs (service tool) into this gap and press off the bevel gear wheel (2). Finally, press out the spindle assembly.
- 2 Dismantle the spindle assembly as follows:
 - bevel gear wheel (2),
 - O-ring (7),
 - upper disc (6),
 - bearing end plate (5),
 - lower disc (4),
 - spindle (3).



6

Removing the complete armature

- 1 Loosen four screws (2).
- 2 Remove the gear box (6) with the complete armature (4).
 If necessary, hit the gear box lightly with a plastic hammer to remove it.
- 3 Steady the nut (3) with a fork wrench (SW12) and grasp the armature (4) **carefully** with pliers (5). Loosen them contra-rotating. (The armature can also be carefully fixed in a vice provided with protective jaws.)
- 4 Remove the nut (3).

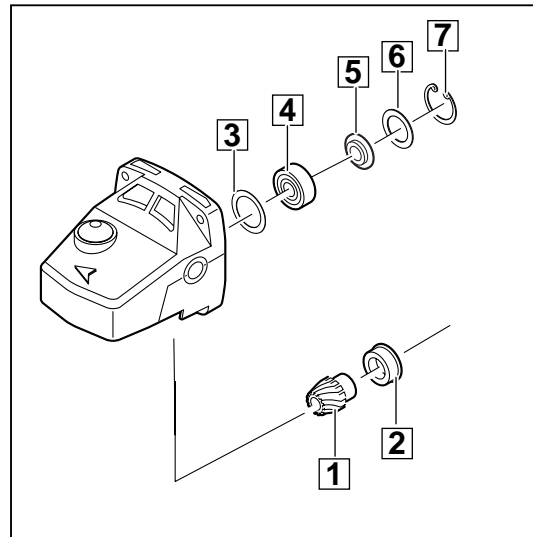


7

Machines with seal ring:

Removing the pinion

- 1 Remove the locking ring (7) and the following parts:
 - disc (6),
 - seal ring (5),
 - press off the bearing (4),
 - washer (3).
- 2 Remove the pinion (1) with the washer (2) from the gear box.
- 3 Remove the washer (2) from the pinion (1), if necessary, peel it off with aid of a screwdriver.

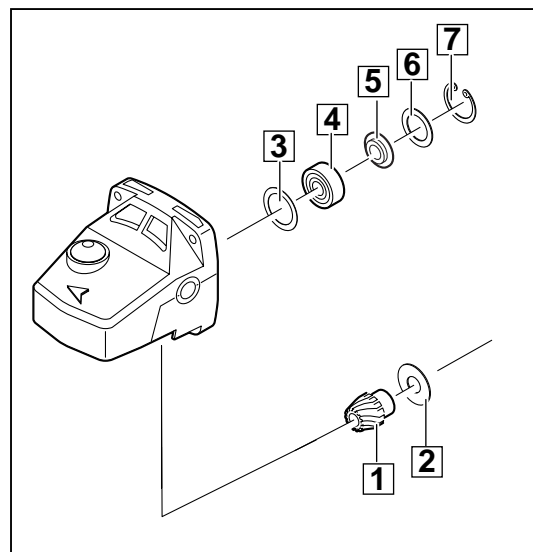


8

Machines with sealing washer:

Removing the pinion

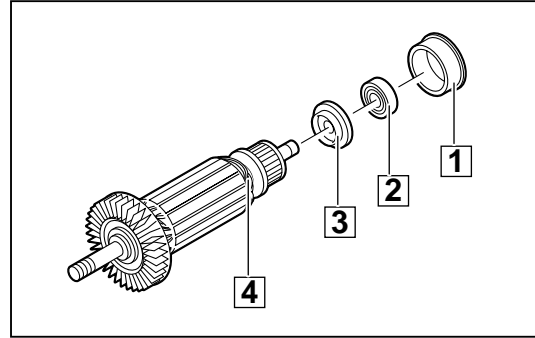
- 1 Remove the locking ring (7) and the following parts:
 - disc (6),
 - seal ring (5),
 - press off the bearing (4),
 - washer (3).
- 2 Remove the pinion (1) with the washer (2) from the gear box.



8

Machines without electronics:**Detaching the armature**

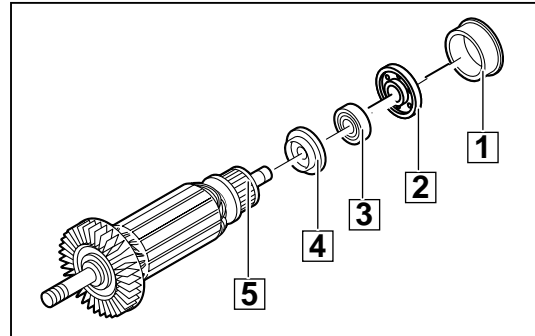
- 1 Remove the following parts from the armature (4):
 - bearing sleeve (1),
 - press off the bearing (2),
 - insulating disc (3).



9


Machines with electronics:**Detaching the armature**

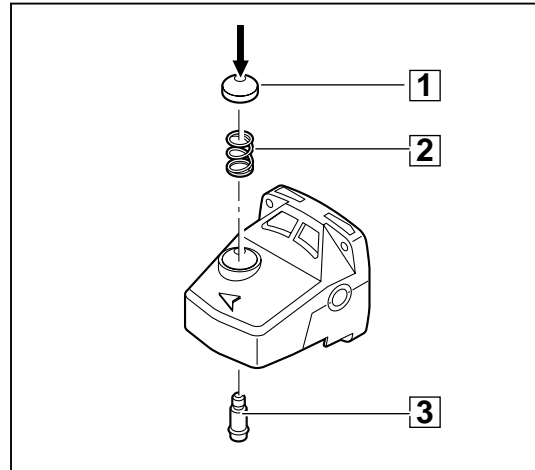
- 1 Remove the following parts from the armature (5):
 - bearing sleeve (1),
 - magnetic disc (2),
 - press off the bearing (3),
 - insulating disc (4).



9

Removing the spindle lock

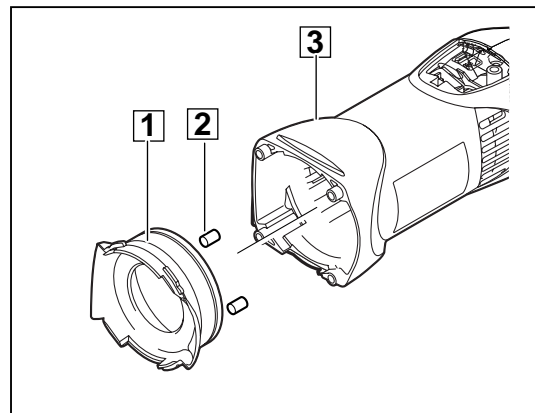
- 1 Press the press ram with a suitable mandrel (steel pin) in direction of arrow onto the middle of the push button (1).
 - 2 Remove the push button (1), the pressure spring (2) and the locking bolt (3).
-  The push button is destroyed (1).



10

Removing the air deflector ring

- 1 Remove the air deflector ring (1) with the holding-down devices (2) from the motor housing (3).




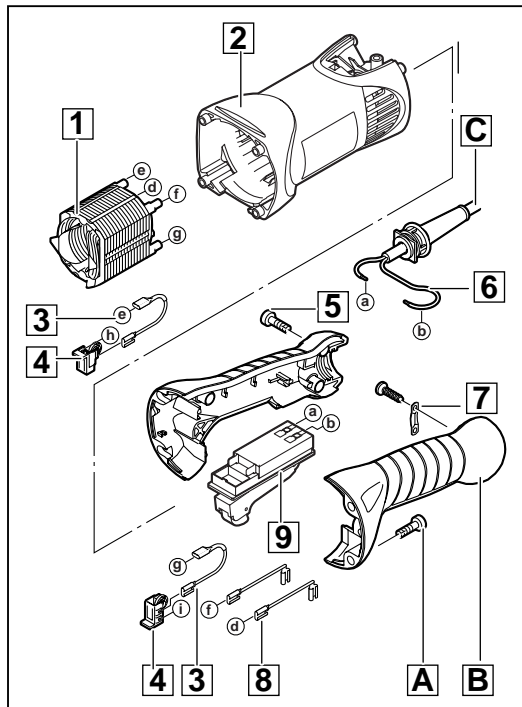
11

Machines without electronics:

Removing the field

- 1 Remove seven screws (5) and (A) from the handle (B) and detach the handle.
- 2 Branch off the field wires (e, d, f, g) and remove the brush holders (4) and the connecting cables (3) and (8) from both sides.
- 3 Unscrew the strain relief (7).
- 4 Remove the switch (9) and branch off the mains feed lines (6) (a, b). Remove the mains connection cable (C).
- 5 Remove the field (1) from the motor housing (2).

 If necessary, hit the motor housing (2) lightly with a plastic hammer for support.




12

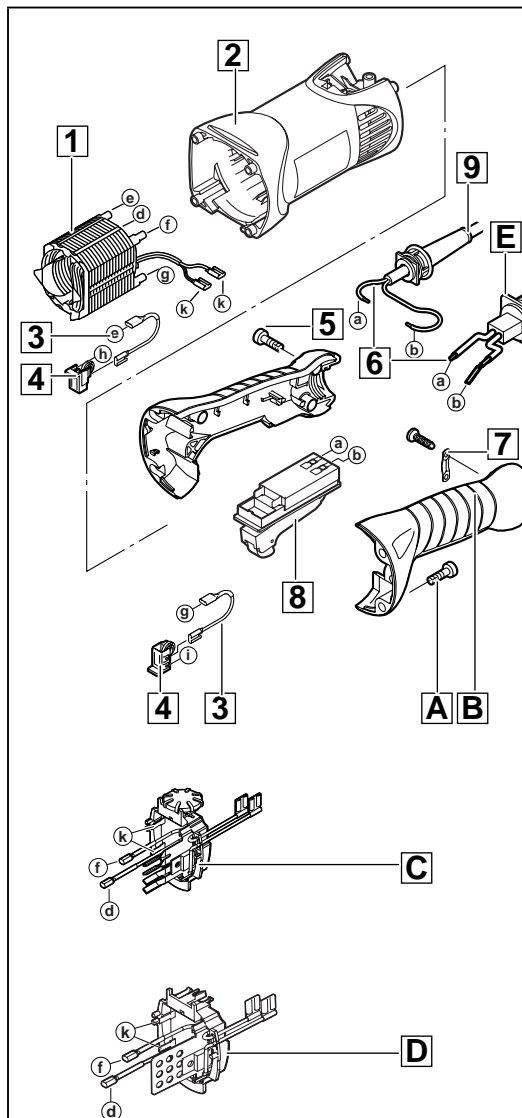
Machines with electronics:

Removing the field

Removing the electronic component

- 1 Remove seven screws (5) and (A) from the handle (B) and detach the handle.
- 2 Branch off the field wires (e, d, f, g, k) and remove the connecting cables (3) and the brush holders (4) from both sides.
- 3 Unscrew the strain relief (7).
- 4 Branch off the switch (8) and remove it. Branch off the mains feed lines (6) (a, b). Remove the mains connection cable (9). **Machines with QUIK-LOK:** Remove the insert (E).
- 5 **Machines with speed electronics:** Remove the electronic element (C).
- 6 **Machines with constant electronics:** Remove the electronic element (D).
- 7 Remove the field (1) from the motor housing (2).

 If necessary, hit the motor housing (2) lightly with a plastic hammer for support.



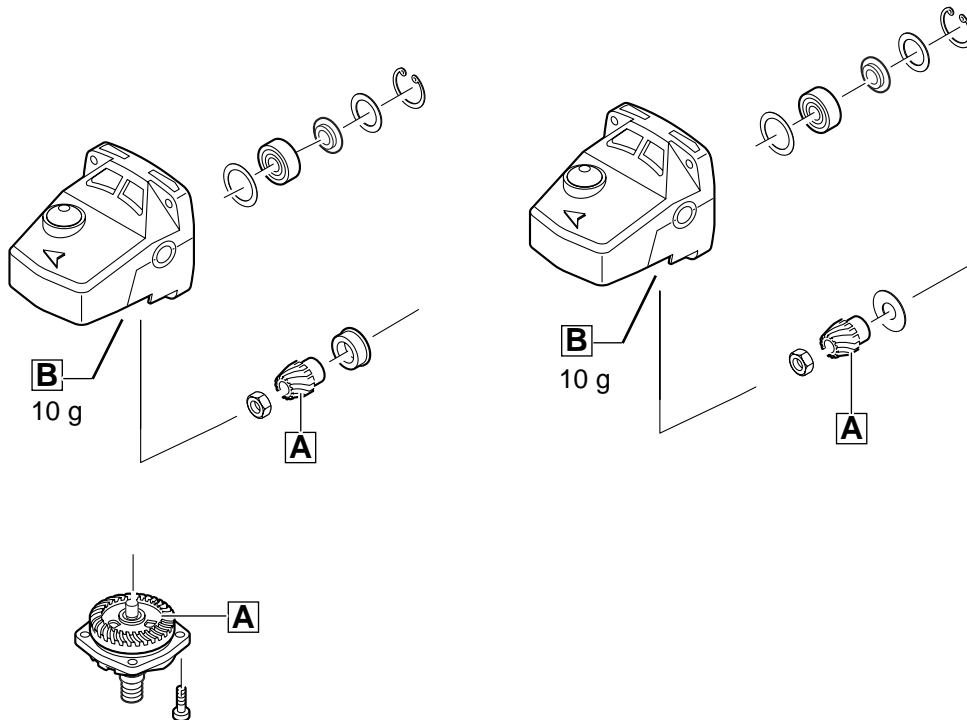
12

Maintenance

General	It is recommended to submit the machine to maintenance after the carbon brushes have switched off.
Cleaning	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.
Check for wear	Check the disassembled parts for wear (visual inspection) and replace worn parts.
Electrical tests	Before reassembling, perform an electrical test on all relevant parts (see chapter Electrical and Mechanical Test Instructions).
Lubrication	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.

Legend

- Use a total of 12 g grease Centoplex O Est (4931 621 977 - 100 g Tube).
- A** Cover with 2 g grease Centoplex O Est.
- B** Fill with 10 g grease Centoplex O Est.




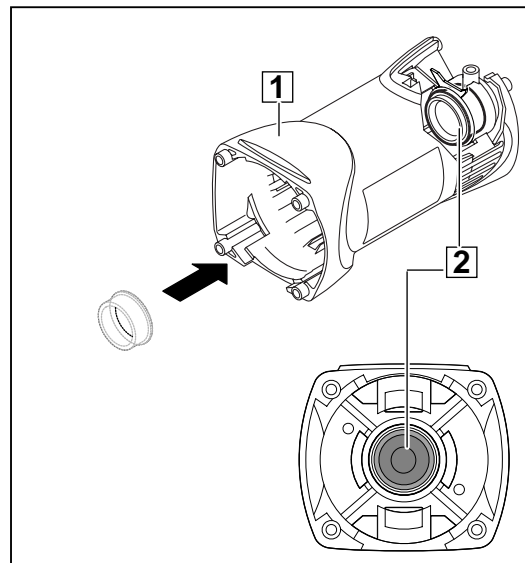
Torques	Screws in plastic	1.8 Nm
	Screws in metal	2.5 Nm
	Nut	6.0 Nm

Assembly

Mounting the bearing sleeve

- 1 Insert the bearing sleeve (2) into the housing (1) as far as it will go.

 **Do not pre-assemble the bearing sleeve (2) on the armature.** When mounting the armature in the motor housing (1), the bearing sleeve (2) is pushed into the magnetic disc of the armature. This might result in malfunction of the machine!




1

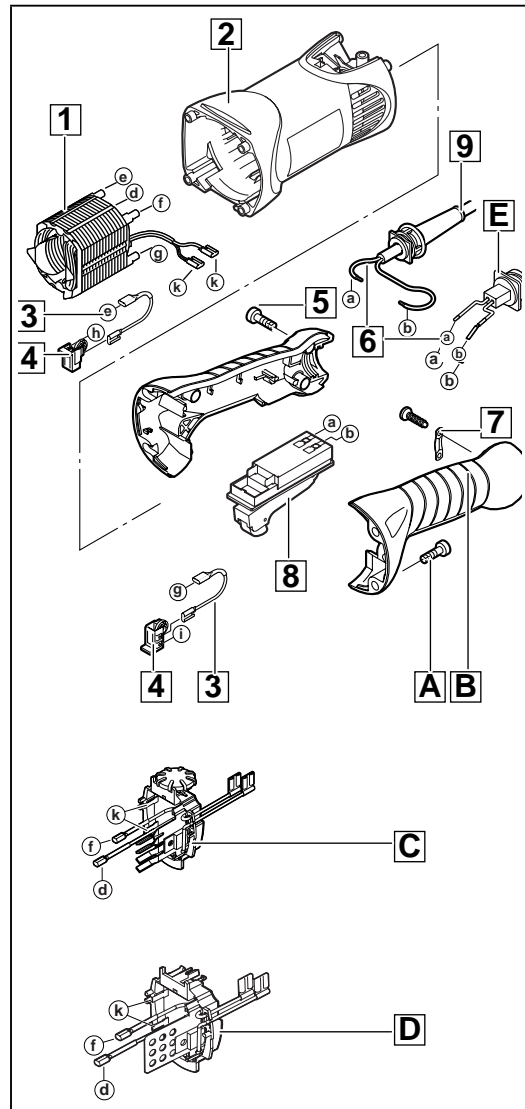
Machines with electronics:

Mounting the field

Mounting the electronic element

- 1 Insert the field (1) into the motor housing (2).
- 2 **Machines with constant electronics:** Connect the electronic element (D) to the field (1) (e, d, f, g, k) and insert it.
- 3 **Machines with speed electronics:** Connect the electronic element (C) to the field (1) (e, d, f, g, k) and insert it.
- 4 **Machines with QUIK-LOK:** Mount the insert (E) (to connect the Quick-Lock cable).
- 5 Insert the mains connection cable (9). Connect the mains feed lines (a, b) (6) to the switch (8). Insert the switch (8).
- 6 Screw down the strain relief (7).
- 7 Connect the connecting cables (3) to the carbon brush holders (4) and insert them on both sides.
- 8 Put together the handle halves (B) and fasten them with seven screws (A) and (5).

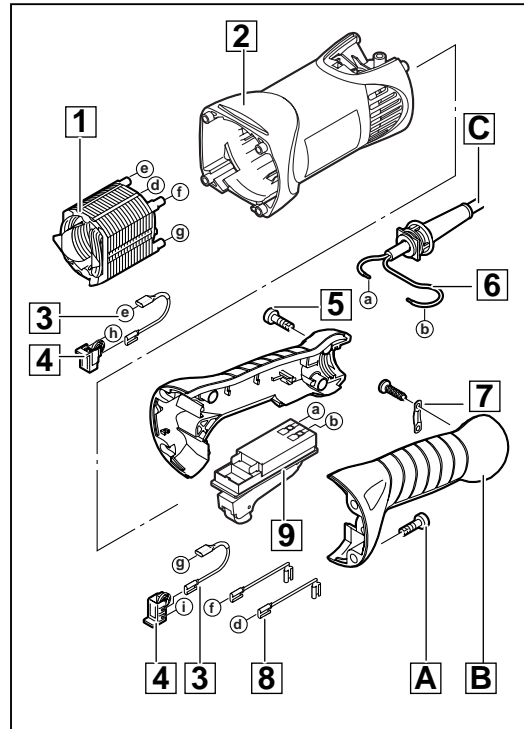
 Take care that all electronic parts are inserted properly into the handle (B) and that no part is squeezed or jammed!



2

Machines without electronics:**Mounting the field**

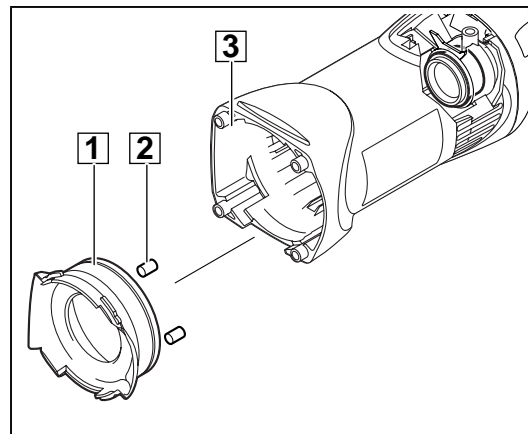
- 1** Insert the field (1) into the motor housing (2). Press it in, if necessary.
- 2** Insert the mains connection cable (C) and connect the mains feed lines (a, b) (6) to the switch (9).
- 3** Screw down the strain relief (7).
- 4** Connect the connecting cables (3) and (8) (e, d, f, g) to the field (1). Connect the connecting cables (3) to the carbon brush holders on both sides (4) and insert them on both sides.
- 5** Put together the handle halves (B) and fasten them with seven screws (A) and (5).



2

Mounting the air deflector ring

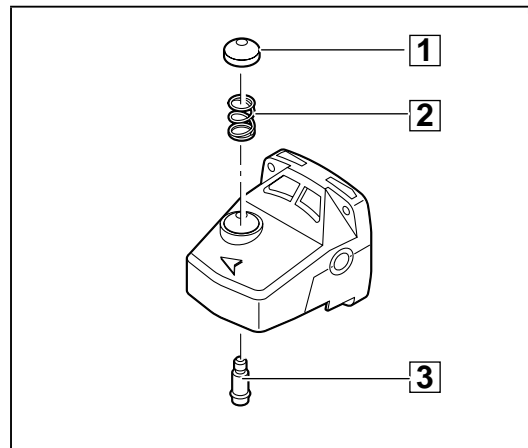
- 1** Insert both holding-down devices (2) into the motor housing (3).
- 2** Put on the air deflector ring (1).



3

Mounting the spindle lock

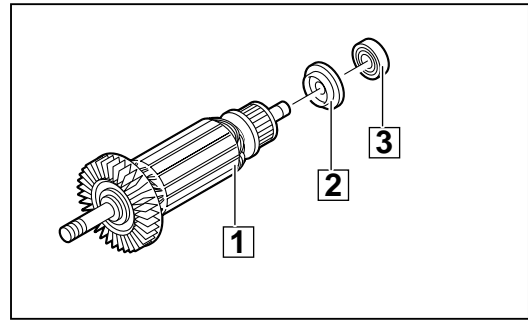
- 1** Mount a new push button (1), the pressure spring (2) and the locking bolt (3) and insert them into the front gear box.



4

Machines without electronics:**Mounting the armature**

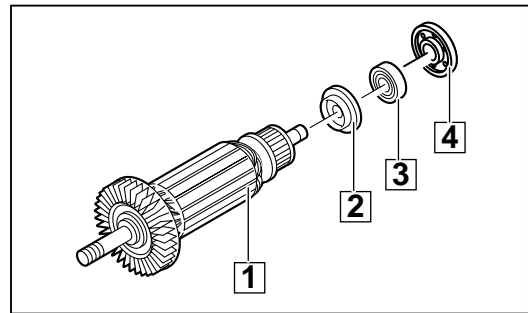
- 1 Mount the following parts on the armature (1):
 - insulating disc (2),
 - press on the bearing (3).



5

Machines with electronics:**Mounting the armature**

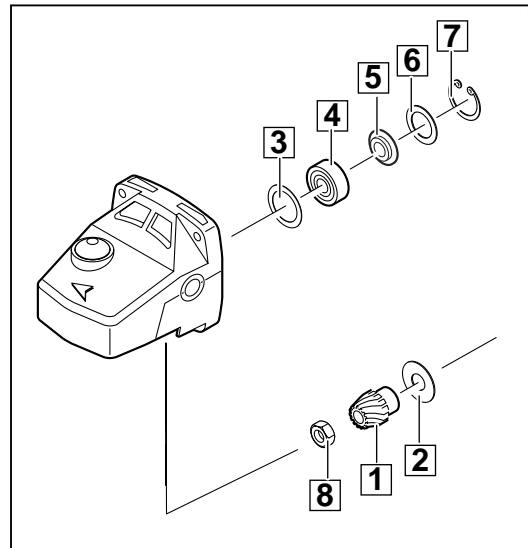
- 1 Mount the following parts on the armature (1):
 - insulating disc (2),
 - press on the bearing (3),
 - magnetic disc (4).



5

Machines with sealing washer:**Mounting the pinion**

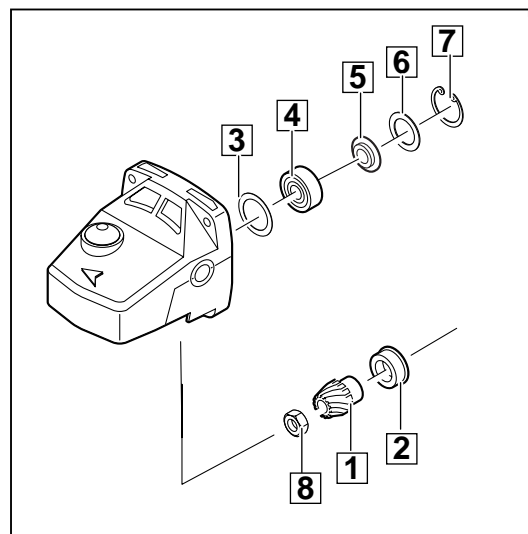
- 1 Mount the following parts in the front gear box:
 - washer (3),
 - press in the bearing (4),
 - seal ring (5),
 - disc (6),
 - locking ring (7).
- 2 Insert the washer (2), the pinion (1) and the nut (8) into the gear box in preparation for mounting the armature.



6

Machines with seal ring:**Mounting the pinion**

- 1 Mount the following parts in the front gear box:
 - washer (3),
 - press in the bearing (4),
 - seal ring (5),
 - disc (6),
 - locking ring (7).
- 2 Mount the washer (2) on the pinion (1).
- 3 Insert the assembled pinion (1) and the nut (8) into the gear box in preparation for mounting the armature.



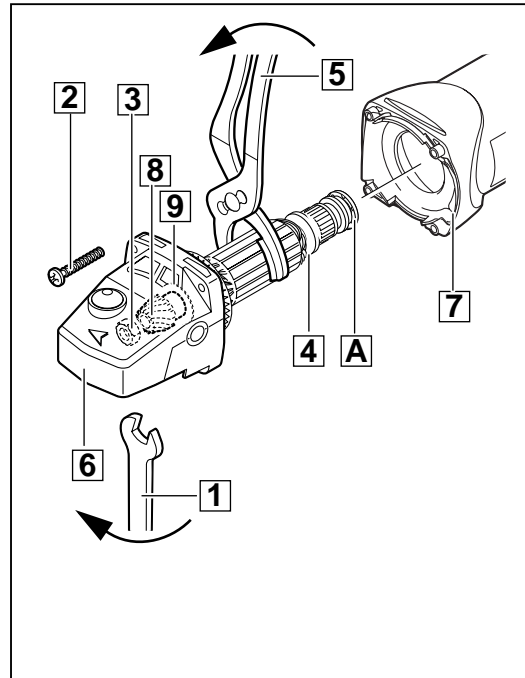
6

Inserting the complete armature

- 1 Insert the completely assembled armature (4) into the front gear box, rotating it. **Carefully** hold the armature with pliers for support. (The armature can also be carefully fixed in a vice provided with protective jaws.)

☞ **Machines without electronics:** Magnetic disc (A) does not exist.

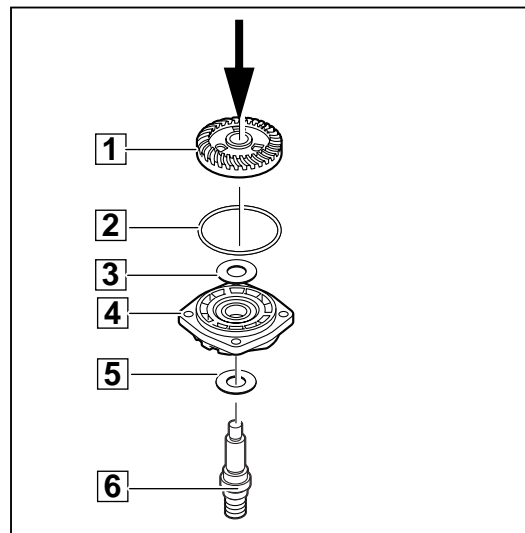
- 2 **Machines with sealing washer:** Put the washer (9) on the end of the shaft.
- 3 Put the pinion (8) and the nut (3) on the end of the armature shaft (4). Use a fork wrench (SW12) and pliers (5) to screw in the armature, contra-rotating.
- 4 Use four screws (2) to fasten the front gear box to the motor housing (7).



7

Assembling the spindle

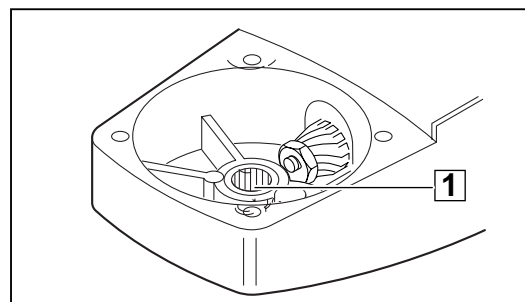
- 1 Mount the following parts on the spindle shaft (6):
 - disc (5),
 - bearing end plate (4),
 - disc (3),
 - O-ring (2),
 - press on the bevel gear wheel (1) flush in direction of arrow.



8

Mounting the bearing

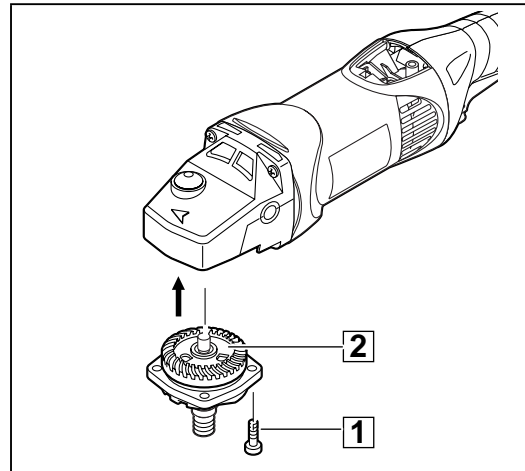
- 1 Press the bearing (1) into the front gear box as far as it will go.



9

Mounting the complete spindle assembly

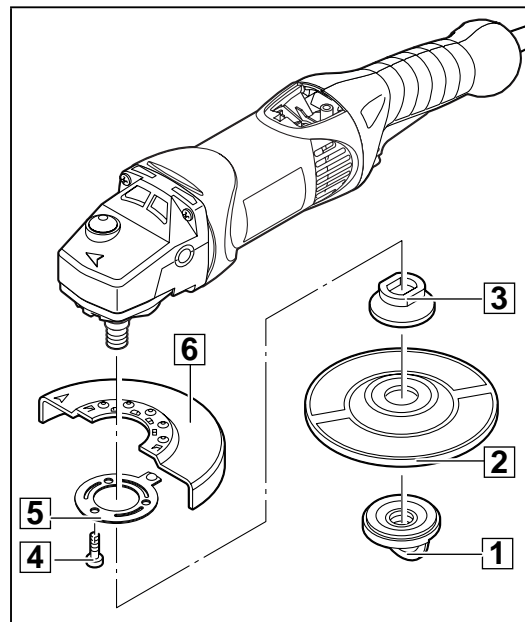
- 1 Insert the complete bearing end plate assembly (2) in direction of arrow.
- 2 Fasten the bearing end plate (2) with four screws (1).



10

Mounting the guard cap

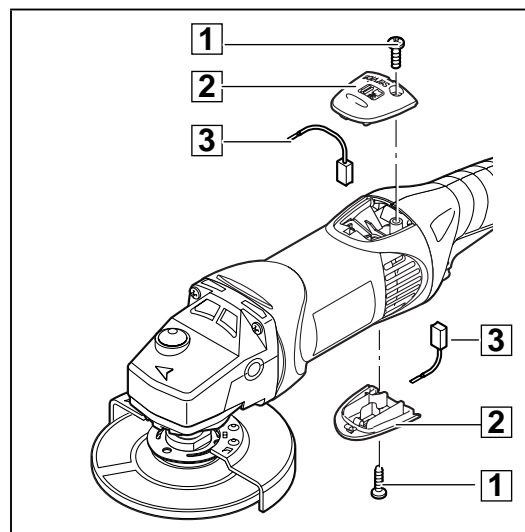
- 1 Mount the guard cap (6) and fix it with the spring washer (5) and three screws (4).
- 2 Put on the clamping flange (3).
- 3 Insert the grinding disc (2).
- 4 Screw down the Fixtec nut (1).



11

Mounting the carbon brushes

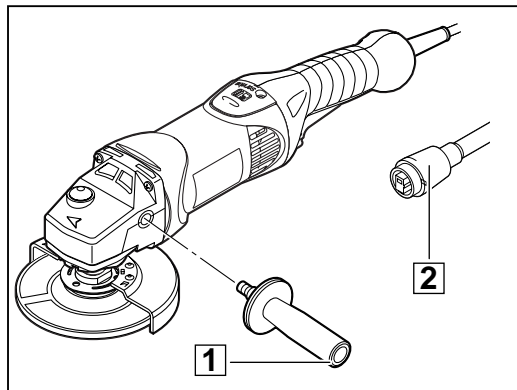
- 1 Insert the carbon brushes (3) on both sides and connect the plug contact.
- 2 Insert the service covers (2) on both sides.
- 3 Fasten the service covers (2) with one screw (1) each, using TX 15.



12

**Mounting
the handle**

- 1 Screw down the handle (1).
- 2 **Machines with QUIK-LOK:** Fasten the Quick-Lock cable (2).



13

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).