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**Special Tools
Require**

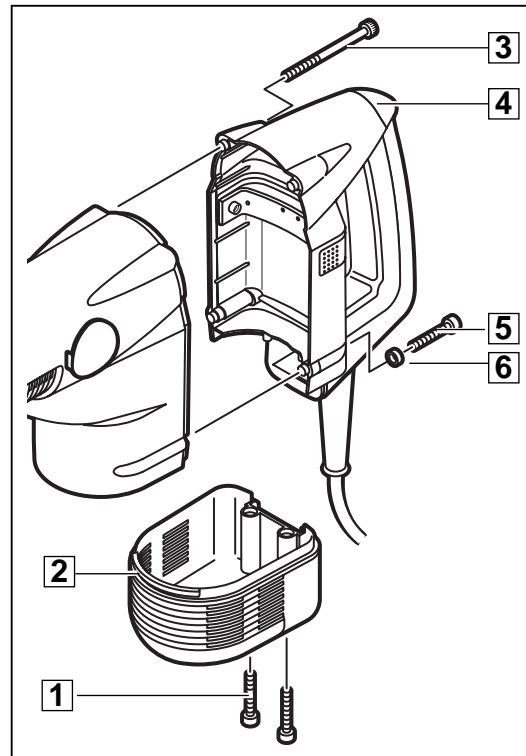
- | | |
|------------------------|--------------|
| ■ Allen key, long | 4931 599 010 |
| ■ Forcing disks | 4931 599 018 |
| ■ (Dis-) Assembly tool | 4931 599 011 |

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!
- Before dismantling, the machine must be connected to RTR-READER (maintenance measuring instrument) to check for a possible maintenance interval.

Disassembly**Detaching the
housing**

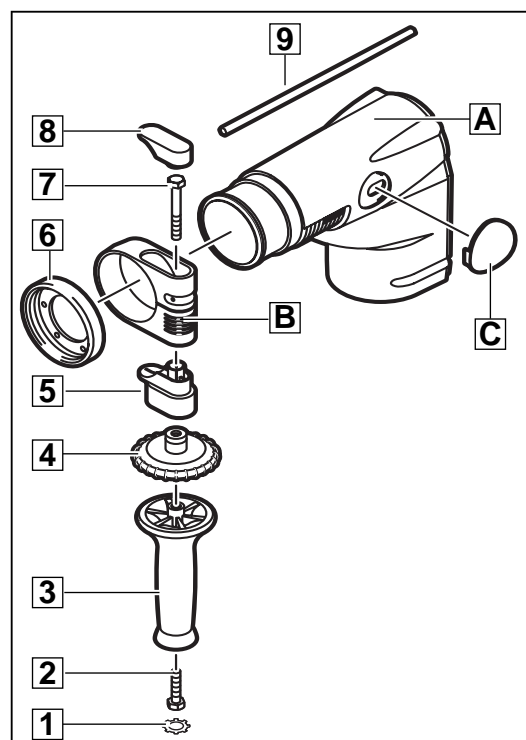
- 1 Undo both screws (1) and remove the motor cover (2).
- 2 Remove both screws (3) as well as the two screws (5) with distance sleeves (6).
- 3 Remove the complete housing (4).



1

**Detaching the
auxiliary handle**

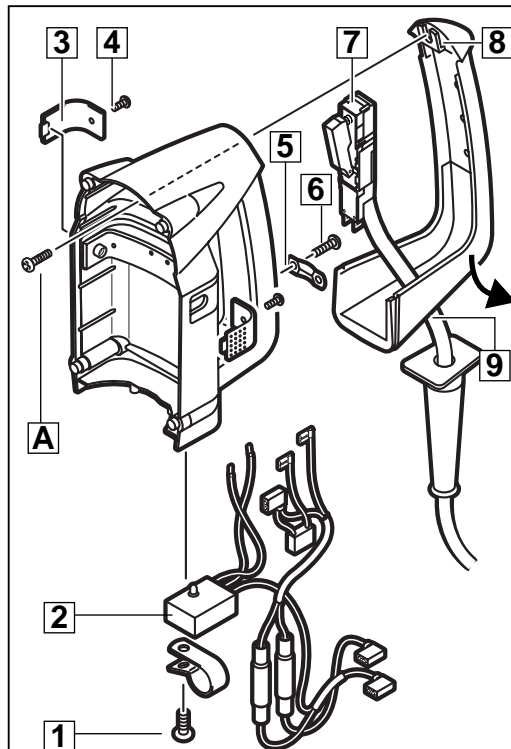
- 1 Unscrew the auxiliary handle (3), push out the screw (2) and remove it together with the fan type lock washer (1).
- 2 Screw off the clamping ring (4) and remove the following parts:
 - depth gauge (9),
 - support (5),
 - cover cap (8),
 - dust seal (6) and
 - tightening strap (B).
- 3 Lever off the cover (C).
- 4 Pull the plastic housing (A) from the machine.



2

Removing the electric components

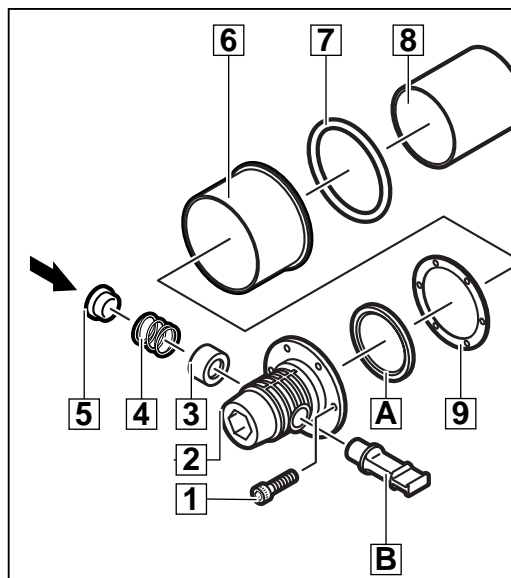
- 1 On both sides, loosen the screw (4) and remove the cover (3).
- 2 Loosen the screw (A).
- 3 Lever off the Softgrip (8) from above since it is fitted at the top (see arrow in illustration).
- 4 Loosen the screws (6) and detach the cable clamp (5).
- 5 Lay bare the connection cable (9) with the switch (7). Branch off the connection cable from the switch (7).
- 6 Loosen the screw (1) and detach the service-LED-module (2).



3

Dismantling the nosepiece

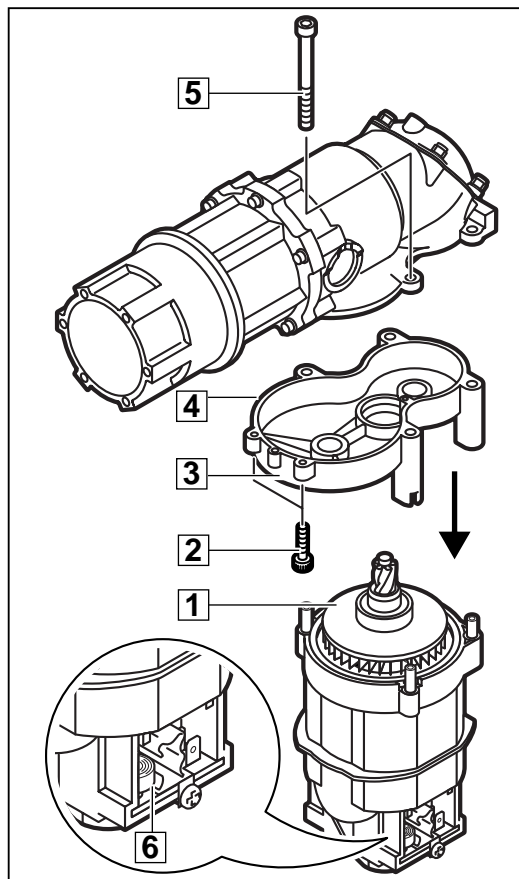
- 1 Undo the six screws (1) (screws are secured, therefore tight). Remove the nosepiece (2) as well as the grease seal (A).
- 2 Remove the seal (9), bearing (6), O-ring (7) and sleeve (8).
- 3 Press out the lever (B) with aid of a press in direction of arrow.
- 4 Remove the bolt (5), spring (4) and sleeve (3).



4

Detaching the gear box cover

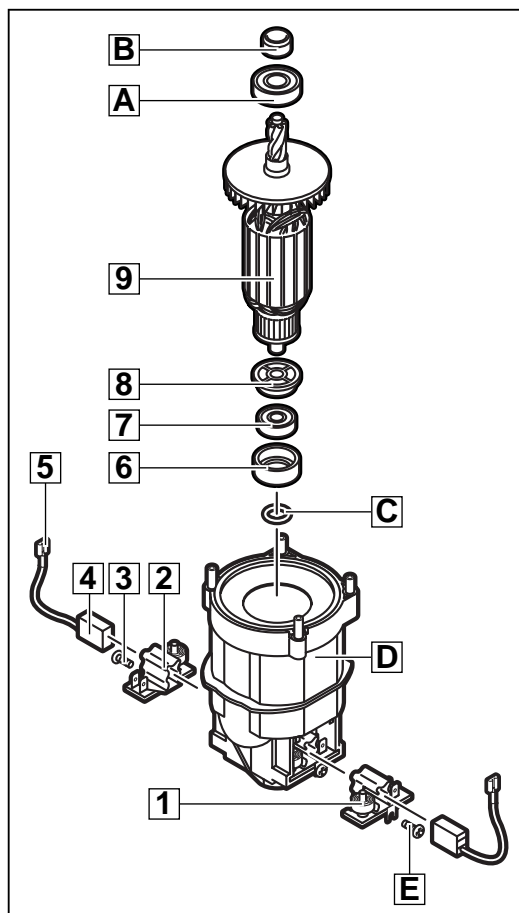
- 1 Loosen two screws (2) and then the four screws (5) and detach the complete motor (1) with the gear box cover (3) and the gasket (4).
- 2 Remove the complete motor (1) by hitting the gear box cover (3) or the armature pinion with a plastic hammer.
- 3 Lift off the respective brush springs (6) from the carbon brushes and place them on the top edge of the brush holders.



5

Detaching the armature

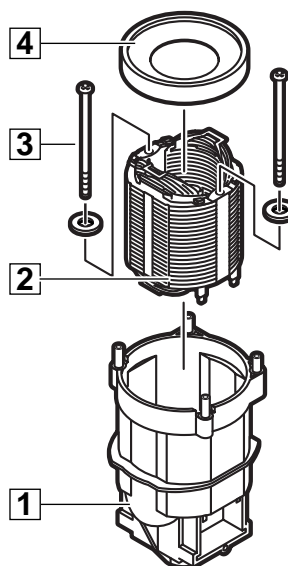
- 1 Pull off the respective cable lugs (5) and remove the carbon brushes (4).
- 2 Pull the complete armature (9) from the motor housing (D).
- 3 Pull the O-ring (C), the rubber sleeve (6) and the bearing ring (B) from the armature (9).
- 4 Press off the ball bearings (A) and (7) with aid of the forcing disks (service tool).
- 5 Remove the seal ring (8).
- 6 Loosen the screws (3) and (E) and detach the brush holders (1) and (2).



6

Detaching the field

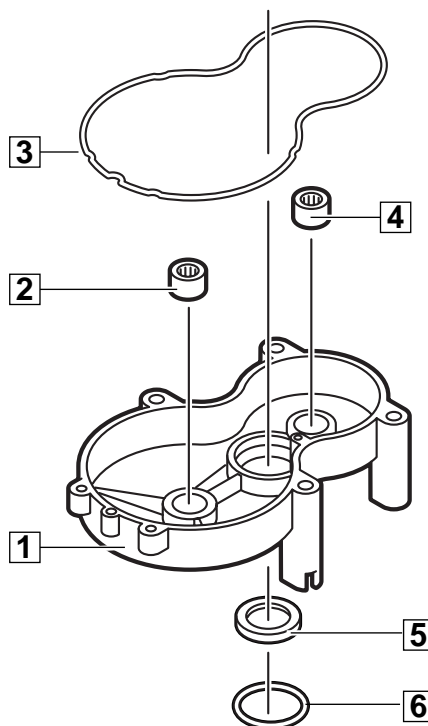
- 1 Remove the air deflector ring (4) from the motor housing (1).
- 2 Undo both screws together with their spring washers (3) and knock the field (2) from the motor housing (1) with aid of a plastic hammer.



7


Detaching the needle bearings

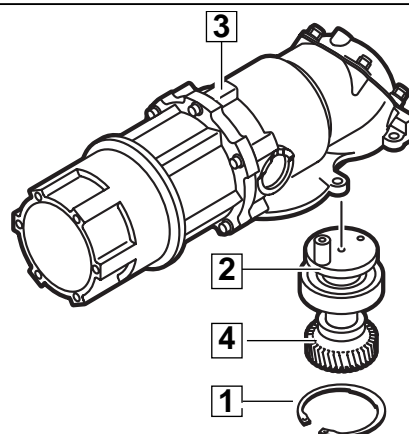
- 1 Remove the O-ring (6) and the seal ring (5) as well as the O-ring (3) from the gear box cover (1).
- 2 Pull out the needle bearings (2) and (4) with aid of an interior extractor.



8

Removing the crank

- 1 Apply special pliers between gear wheel and gear housing (3) to remove the locking ring (1).
 - 2 Remove the crank (2) from the gear housing (3).
-  For further dismantling, press off the toothed gear (4) with forcing disks.

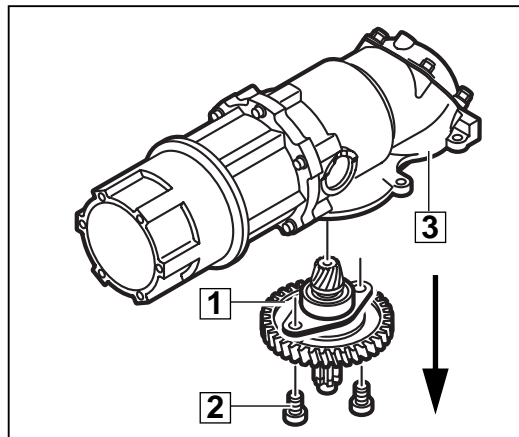


9

Removing the drive shaft

- 1 Loosen 2 screws (2).
- 2 Pull the complete drive shaft (1) from the gear box (3).

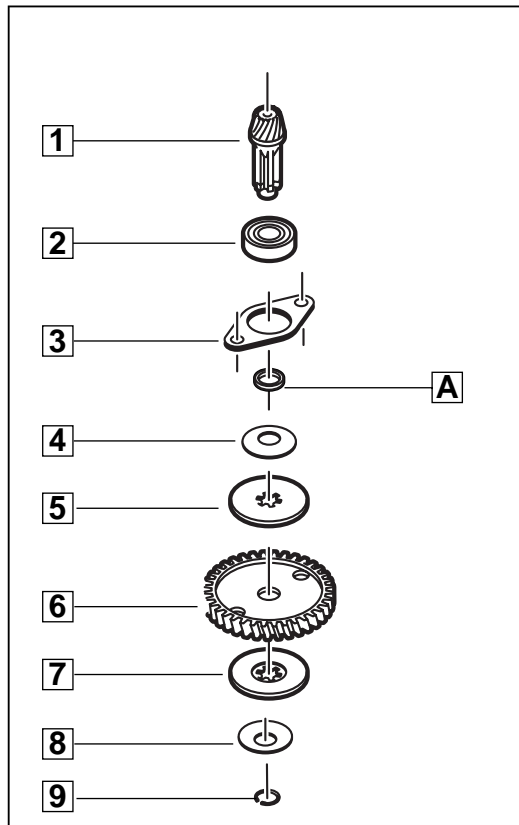
☞ If necessary, hit the drive (1) with a plastic hammer for support or fix the projecting drive in a vice with aluminium jaws and pull off the gear box (3).



10

Detaching the pinion

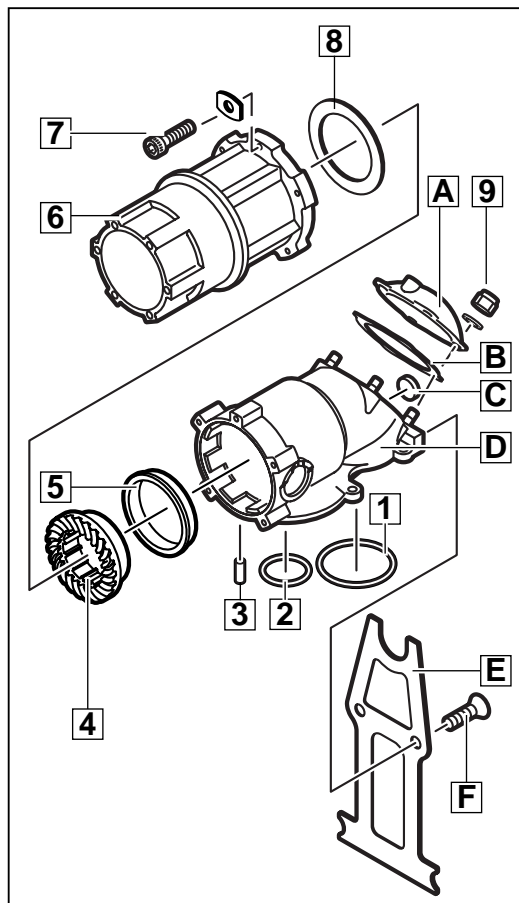
- 1 Remove the locking ring (9) with aid of the dis-assembly tool (service tool 4931 539 011) by depressing the spring plate (8).
- 2 The following parts must be removed from the pinion (1):
spring plate (8),
friction disk (7),
drive (6),
friction disk (5),
spring plate (4),
spacer (A),
plate (3).
- 3 Press off the ball bearing (2) with aid of the forcing disks (service tool).



11

**Detaching the
bevel wheel**

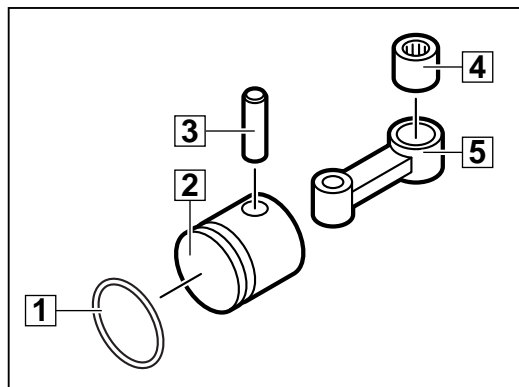
- 1 Undo the two screws (F) and remove the anti-vibration plate spring (E).
- 2 Undo the five screws (7) together with their washers and remove the flange (6) from the gear box (D).
- 3 Undo the four nuts (9), remove the washers and detach the cover (A) as well as the gasket (B). Remove the felt ring (C).
- 4 Take off the O-rings (1) and (2) as well as both pins (3).
- 5 Take a plastic hammer and knock against the opening of the gear box (D). This will undo the bevel wheel (4) and the ball bearing (5).
- 6 Remove the O-ring (8).



12

**Detaching the
connecting rod**

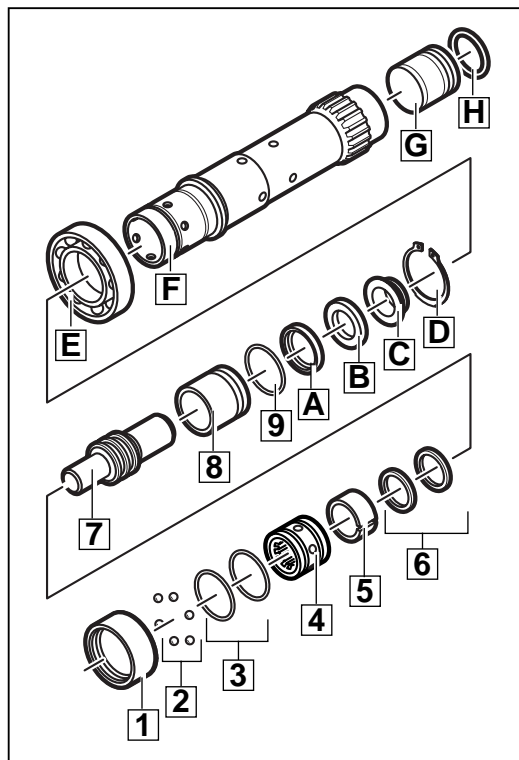
- 1 Remove the O-Ring (1) from the piston (2).
- 2 Push the bolt (3) from the piston (2) and pull out the connecting rod (5).
- 3 Press the needle bearing (4) from the connecting rod.



13

Disassembling the spindle sleeve

- 1 Remove the striker (G) from the spindle sleeve (F) and remove the O-ring (H) from the striker (G).
- 2 Remove the following parts:
 - bearing ring (1),
 - balls (2) (6 pcs.),
 - O-rings (3),
 - driver (4),
 - ring (5),
 - O-rings (6),
 - anvil (7),
 - sleeve (8),
 - O-ring (9),
 - rings (A, B and C),
 - locking ring (D) and
 - ball bearing (E).



14

Maintenance

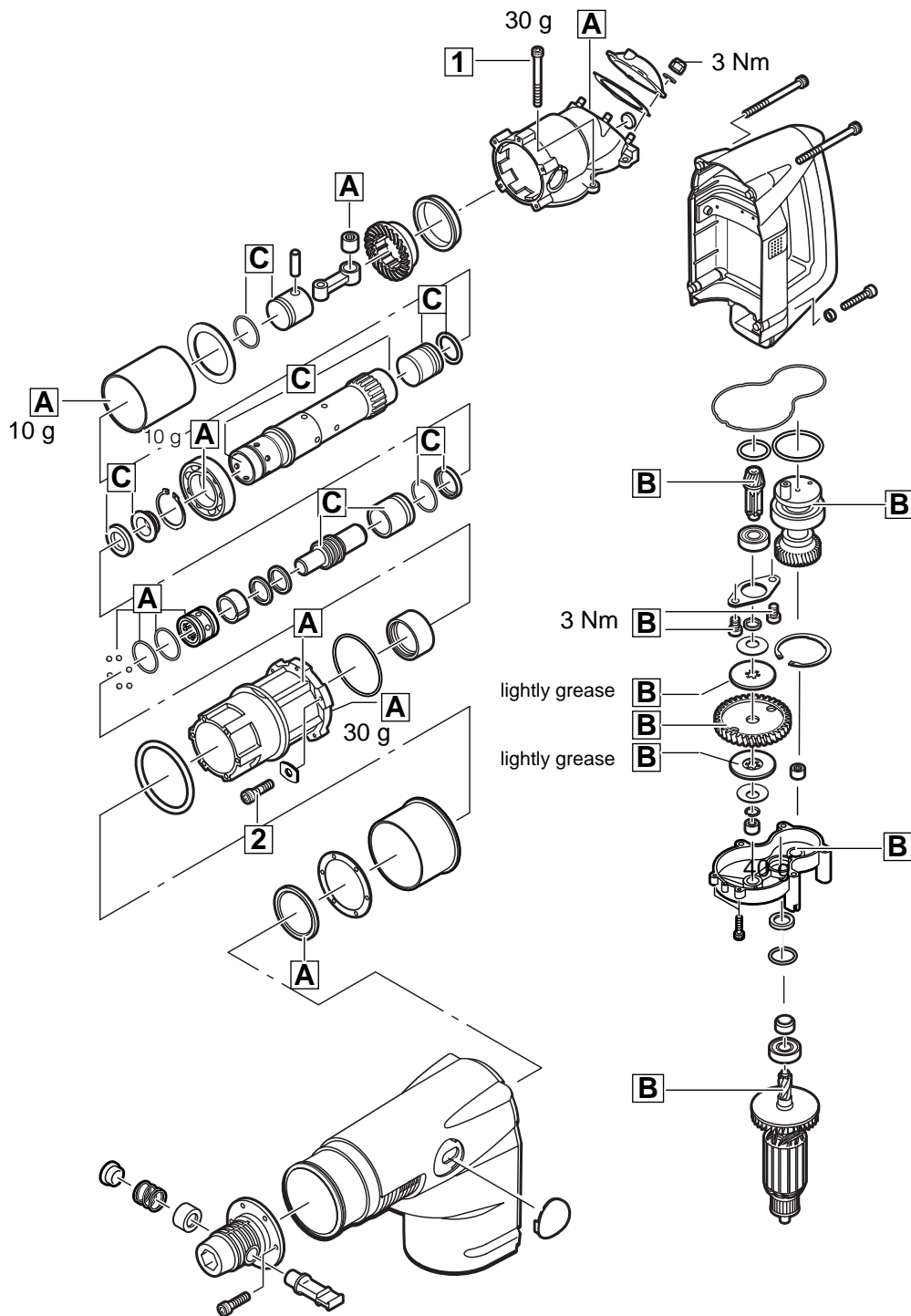
General	It is recommended to submit the machine to maintenance after the carbon brushes have switched off.
Cleaning	Clean all parts – with the exception of the electrical parts – with cold cleaning agent. Caution! No cleaning agent should penetrate into the bearing. Clean the electrical parts with a 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

A Cover with grease DARINA (total of 50 g) (4931 622 229)

B Cover with blue grease Mobilith HP 222 (40 g total) (9170 304 322)

C Cover with Tivela Compound A (10 g) (4931 70 215 436)



Torques

Screws in plastic	1,5 Nm
Screws in metal	4,0 Nm
Motor housing screws (1)	4,0 Nm
Flange screws gear (2)	10,0 Nm

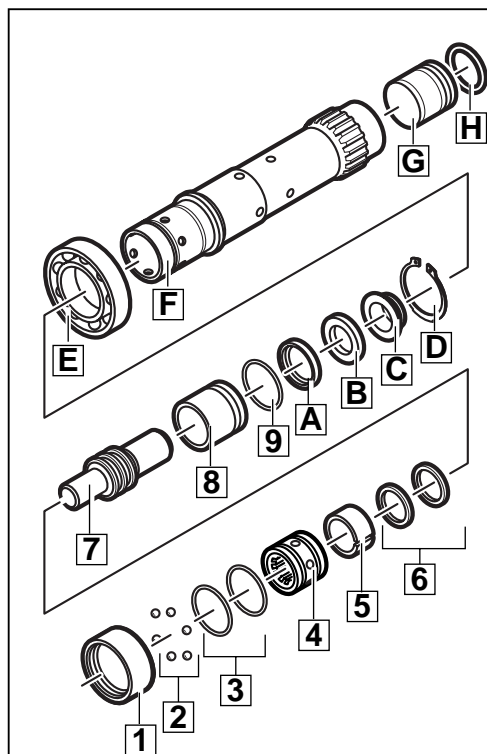
Screw locking device

Secure all screws in metal with locking device Loctite 222 or Omnifit 80.

Assembly

Assembling the spindle sleeve

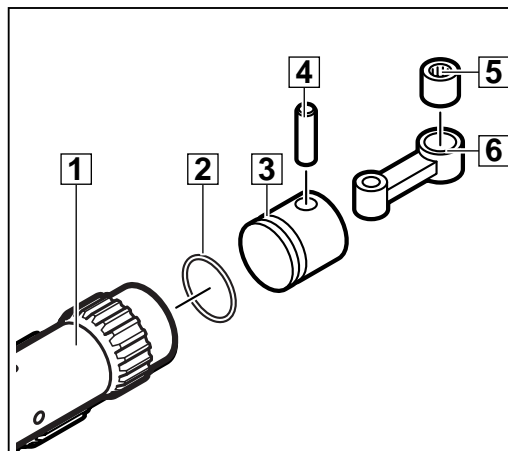
- 1 Mount the ball bearing (E) and the locking ring (D) on the spindle sleeve (F).
- 2 Mount the following parts inside the spindle sleeve (F):
 - rings (C, B and A),
 - O-ring (9),
 - sleeve (8),
 - anvil (7),
 - O-ring (6),
 - ring (5),
 - driver (4),
 - O-rings (3),
 - balls (2),
 - bearing ring (1).
- 3 Insert the striker (G) with the O-ring (H) into the spindle sleeve (F).



1

Mounting the connecting rod

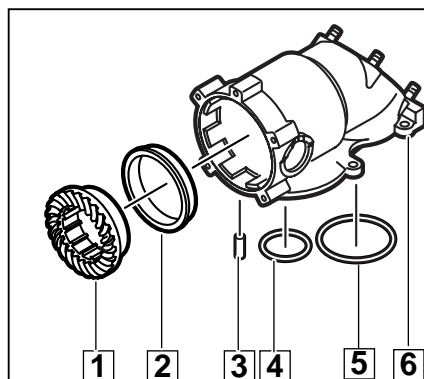
- 1 Press the needle bearing (5) into the connecting rod (6).
- 2 Push the connecting rod (6) into the piston (3) and secure it with the pin (4).
- 3 Push the O-Ring (2) onto the piston (3).
 - ☞ Take care that the O-ring (2) on the piston (3) is not twisted. If necessary, lift the O-ring (2) with a screwdriver and straighten it.
- 4 Insert the piston (3) completely with the connecting rod (6) into the drill spindle sleeve (1).



2

Mounting the bevel wheel


- 1 Press the ball bearing (2) flush into the gear box (6).
- 2 Press the bevel wheel (1) into the ball bearing (2).
- 3 Press the pin (3) as well as the O-rings (4 and 5) into the gear box (6).



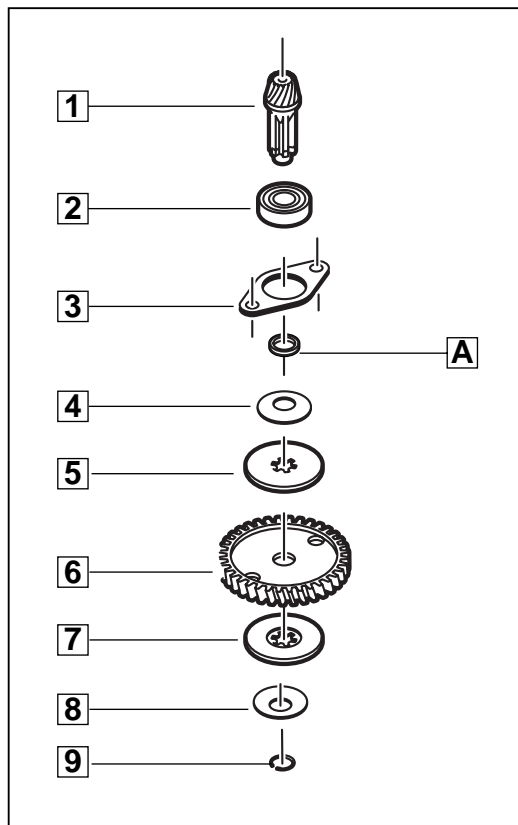
3

**Mounting
the pinion**


- 1** Mount the following parts on the pinion (1):
- ball bearing (2) (press on),
 - plate (3),
 - sleeve (A),
 - spring plate (4),
 - friction disk (5),
 - drive wheel (6),
 - friction disk (7),
 - spring plate (8).

 With a cloth, thinly grease the friction disks (5) and (7) with blue grease before mounting.

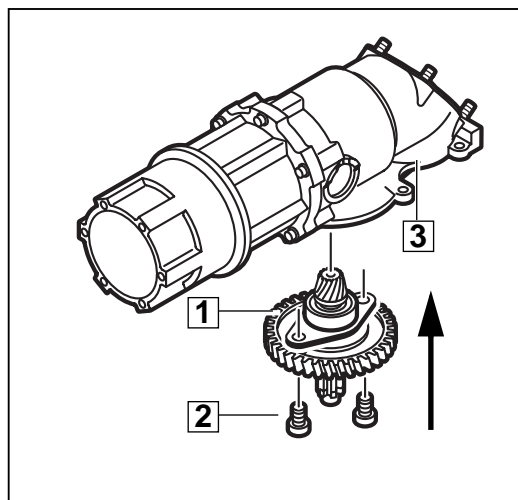
- 2** Mount the locking ring (9) with aid of an assembly tool.

**4****Inserting the
drive shaft**

- 1** Insert the completely assembled drive shaft (1) into the gear box (3).

 The drive shaft (1) must rotate easily.

- 2** Cover two screws (2) with locking agent. Fasten the two screws (2) through pinion and plate (tightening moment = 2 Nm).

**5**

**Mounting
the crank**

- 1 Insert the complete spindle sleeve with piston and connecting rod (6) into the gear box (5).
 ➔ Take care that the tothing of the spindle sleeve and the tothing of the gear wheel work into each other.

- 2 Insert the complete crank (2) into the gear housing (3) from below and hang it in the connecting rod.

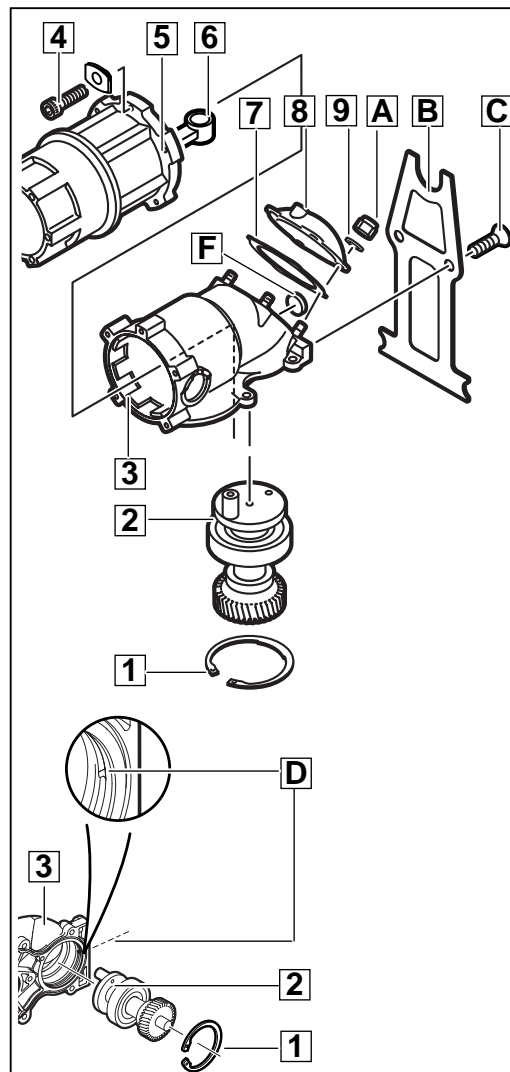
- 3 Insert the locking ring (1) with aid of specially cut pliers between toothed wheel and gear housing (3).
 ➔ The locking ring (1) must cover the boring (D) (dotted line) to avoid the escaping of any grease.

- 4 Cover the screws (4) with locking agent. Put the flange (5) onto the gear box (3) and fasten it with the screws (4) (tightening moment = 10 Nm).

- 5 Through the opening, fill in the gear box (3) with grease according to the lubrication chart.

- 6 Fit the service cap (8) with the gasket (7), mount four washers (9), and fasten the service cap (8) with the four nuts (A) (tightening moment = 3 Nm).

- 7 Fit the anti-vibration plate spring (B) to the gear box (3) and fasten it with the secured screws (C) (tightening moment = 5 Nm).



6

**Mounting the
gear box cover**

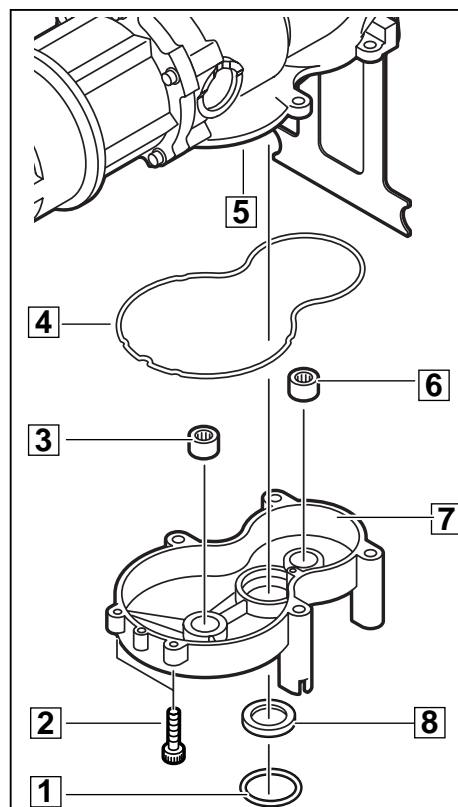
- 1 Press the needle bearings (3) and (6) into the gear box cover (7).

- 2 Insert the seal ring (8) and the O-ring (1) into the gear box cover (7).

- 3 Lightly cover the seal ring (4) with blue grease and insert it.

- 4 Fit the gear box cover (7) and the gasket (4) to the gear box (5).

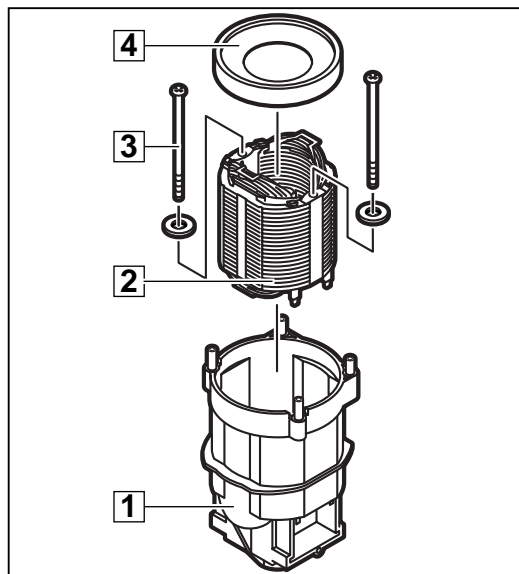
- 5 Apply screw locking device to the screws (2) and fasten them (tightening moment = 3 Nm).



7

Mounting the field

- 1 Insert the field (2) into the motor housing (1) (mind the right position!) and fasten it with screws (3) and washers (tightening moment = 8 Nm).
- 2 Mount the air deflector ring (4).

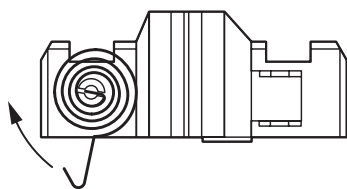


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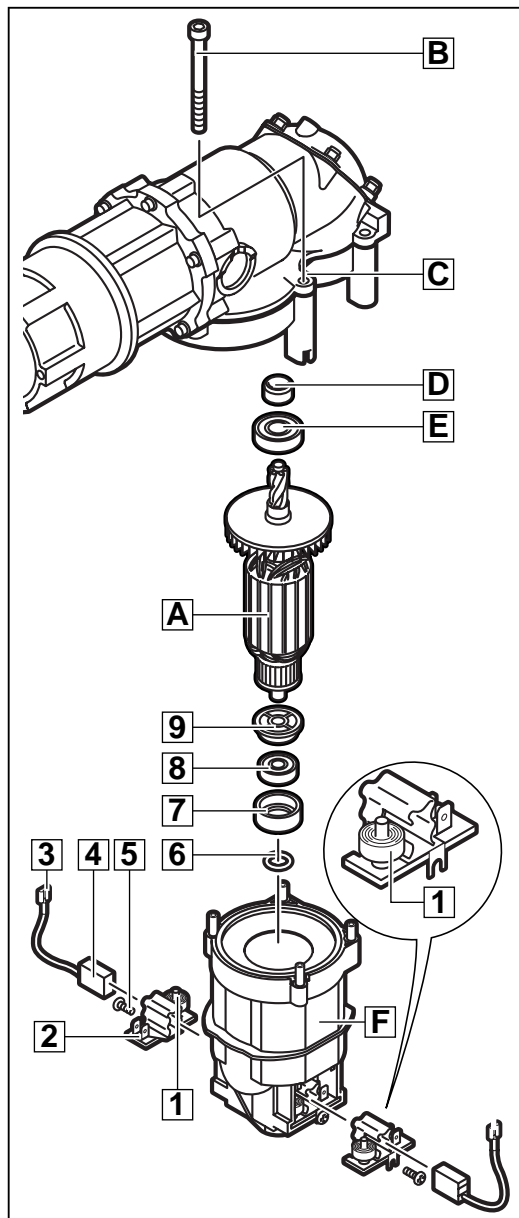
Mounting the armature

- 1 Fit the seal ring (9) to the armature (A).
- 2 Press the ball bearings (8) and (E) onto the armature (A).
- 3 Mount the bearing ring (D), rubber sleeve (7) and O-ring (6) on the armature (A).
- 4 Insert the armature (A) into the gear box (C), turning it.
- 5 Fit the motor housing (F) to the gear box (C) and fasten it with the secured screws (B) (tightening moment = 4 Nm).
- 6 Insert the respective brush holders (2) into the motor housing (F), align them and fasten them with the screws (5).
- 7 Insert the carbon brushes (4) into the brush holders (2).
- 8 Pull up the brush springs (1) with their hooks and push them over the carbon brushes (4).

⚠ Attention: Mind the mounting position of the flat spiral spring (1): Pre-tension the spring 3/4 turn!



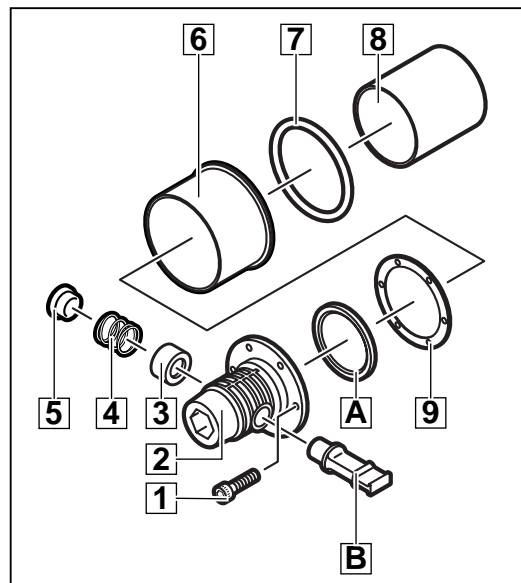
- 9 Connect the cable lugs (3) according to the wiring diagram.



9

**Mounting the
nosepiece**

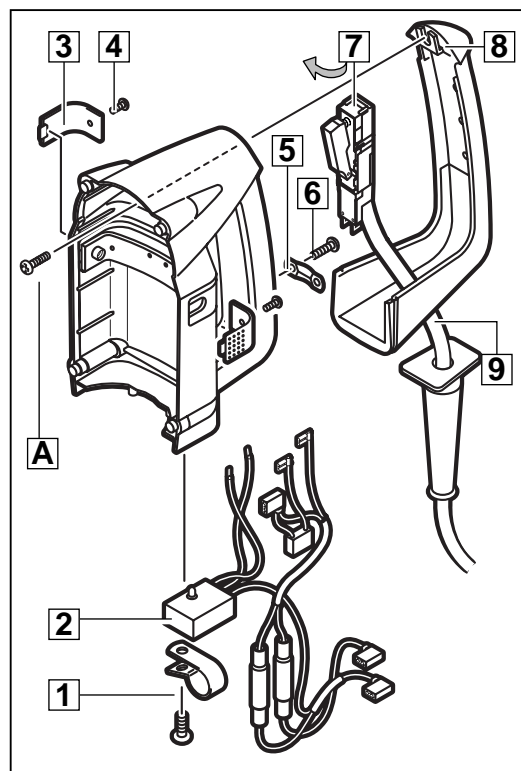
- 1 Insert the sleeve (3), the spring (4) and the bolt (5) in the nosepiece (2) from the side. Press the lever (B) onto the bolt (5) from the opposite side.
- 2 Mount the sleeve (8), the O-ring (7), the bearing (6) and the gasket (9).
- 3 Cover the screws (1) with locking agent. Insert the nosepiece (2) with the grease seal (A) and fasten them with the six screws (1).



10

**Mounting the
electric
components**

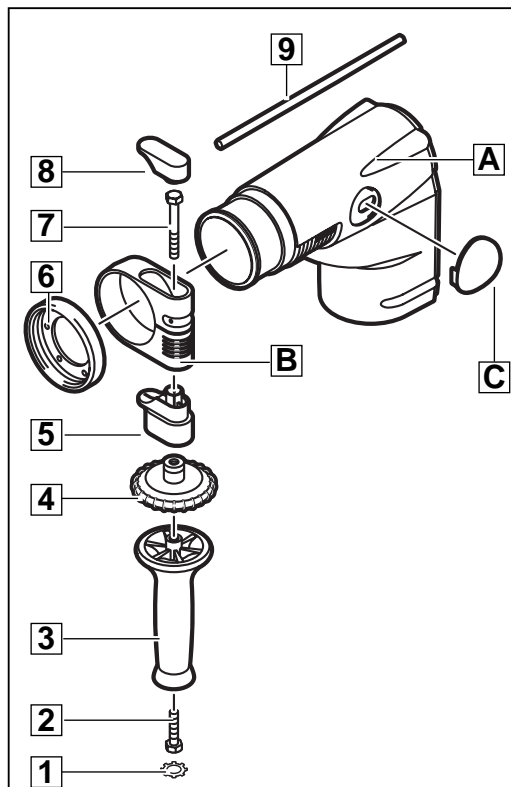
- 1 Insert the service-LED-module (2) into the housing and fasten it with the screw (1).
- 2 Lead the connection cable (9) through the Softgrip (8) and connect the switch (7).
- 3 Fasten the connection cable (9) with aid of the cable clamp (5) and the screw (6).
- 4 Fit the Softgrip (8) from above.
- 5 Mount the screw (A) to fix the Softgrip (8).
- 6 Fit the covers (3) and fasten them with the screws (4) (tightening moment = 3 Nm).



11

Mounting the auxiliary handle

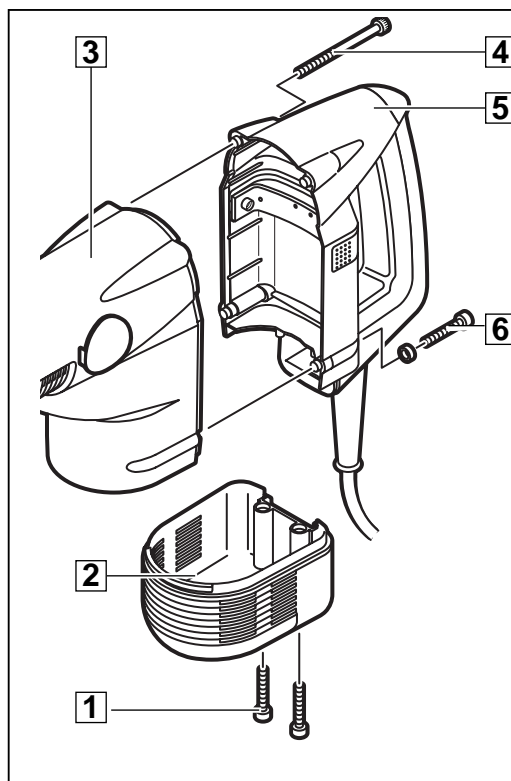
- 1 Push the plastic housing (A) over the machine.
- 2 Fit the cover (C).
- 3 Insert the dust seal (6) into the front of the plastic housing (A).
- 4 Mount the tightening strap (B), the screw (7), cover (8), support (5), depth gauge (9) and clamping ring (4).
- 5 Insert the fan-type lock washer (1) into the auxiliary handle (3) and fasten it with the screw (2).



12

Mounting the housing

- 1 Mount the complete handle (5) on the plastic housing (3) and fasten it with screws (4) and (6) as well as distance sleeves.
- 2 Fit the motor cap (2) and fasten it with the secured screws (1).



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).