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**Special Tools
Required**

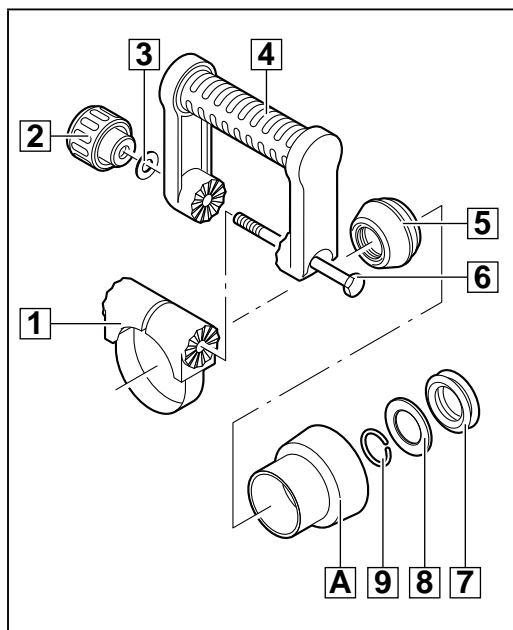
- Adjustment tool for carbon brushes 9170 3022 60
- Pulling-off device 9170 0314 440

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
auxiliary handle**

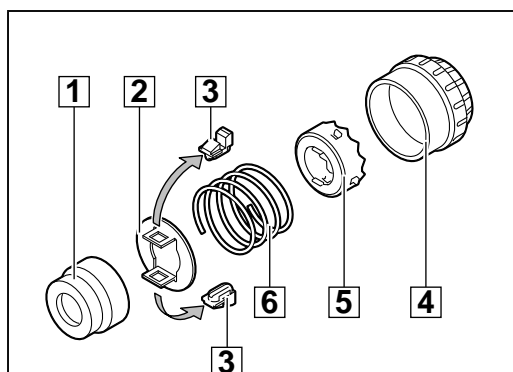
- 1 Unscrew the nut (2) and remove the washer (3).
- 2 Pull out the screw (6).
- 3
 Press the clamping ring (1) and remove the auxiliary handle (4). Release the tension and remove the clamping ring (1).
- 4 Push back the rubber sleeve (A) and lever off the rubber bushing (5).
- 5 Remove the rubber sleeve (A).
- 6 Remove the locking ring (9) with aid of cut special pliers. If necessary, use a screwdriver for support.
- 7 Remove the damping element (8) and the damper (7).



1

**Disassembling
the ball holding
device**

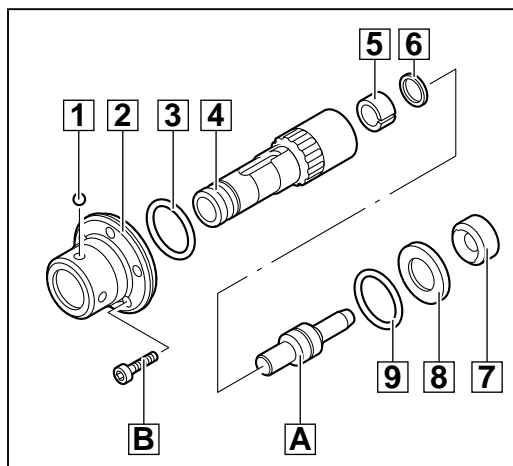
- 1 Remove the locking sleeve (1).
- 2 Depress the retaining plate (2) against resilience - the locking levers (3) are released. Remove the locking levers (3).
- 3 Release the retaining plate (2) and remove the pressure spring (6).
- 4 Remove the locking bolt (4) together with the ball holding device (5).
- 5 Remove the ball holding device (5) from the locking bolt (4).



2

**Disassembling
the tool
acceptance**



- 1 Remove all four balls (1) with aid of a magnet.
- 2 Loosen the five screws (B) of the adapter sleeve (2) and remove the adapter sleeve (2) as well as the O-ring (3). If necessary, hit it lightly with a plastic hammer.
- 3 Remove the tool acceptance (4) completely with the snap die (A), the spacer (5) and the gasket (6).
- 4 Remove the snap die (A) from the tool acceptance (4).
- 5 Remove the O-ring (9), the spacer (8), as well as the recoil ring (7).



3

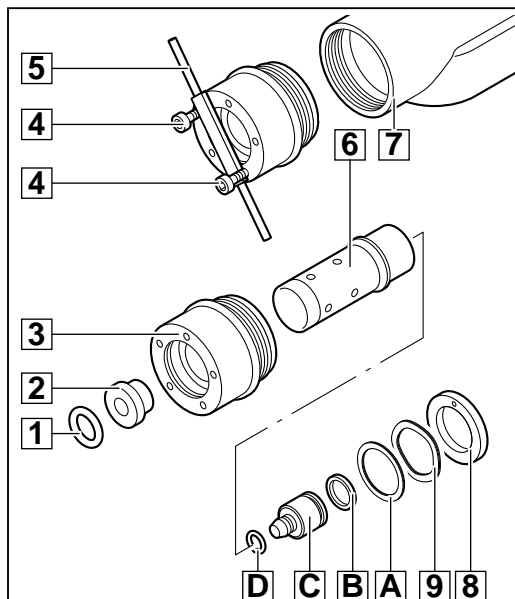
Disassembling the flange

- 1** Remove the rubber ring (1) and the sleeve (2).

- 2** Disassemble the flange (3) as described below:
Fasten two hardened screws (4) in the flange (3).
Fasten the machine in a vice.
 Do not fasten the machine too tightly since the gear box would become distorted.
Heat up the gear box (7) where the flange is located, with a hot air blower.
Insert a flat steel (5) between the two screws (4) and remove the flange (3).
 Attention: left-handed thread!

- 3** Remove the spindle sleeve (6) with the washers (A) and (9) as well as the holder (8).

- 4** Remove the percussion body (C) with the O-ring (D) and the gasket (B) from the spindle sleeve (6), if necessary.



4

Detaching the connecting rod

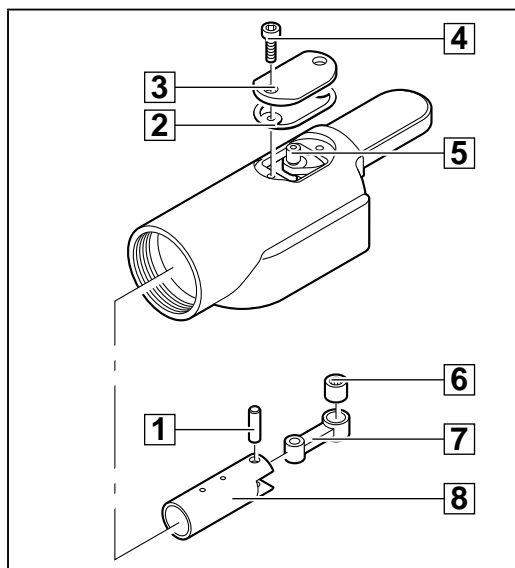
- 1** Remove the two screws (4) and take off the service cover (3) with the gasket (2).

- 2** Remove the connecting rod (7) from the shaft (5).

- 3** Pull out the connecting rod (7) together with the cylinder (8).


- 4** Remove the cylindrical bolt (1) from the cylinder (8).

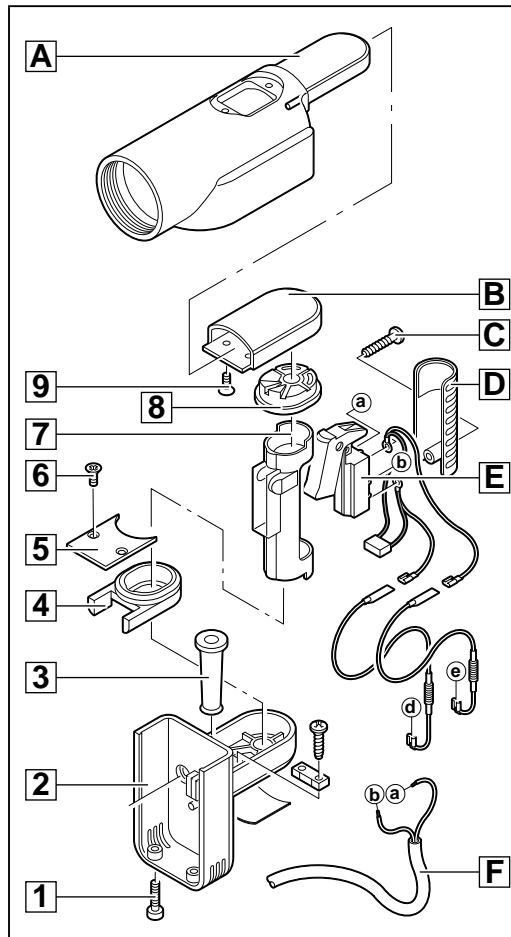
- 5** Pull off the bearing (6) from the connecting rod (7) with aid of an interior extractor.



5

Removing the handle

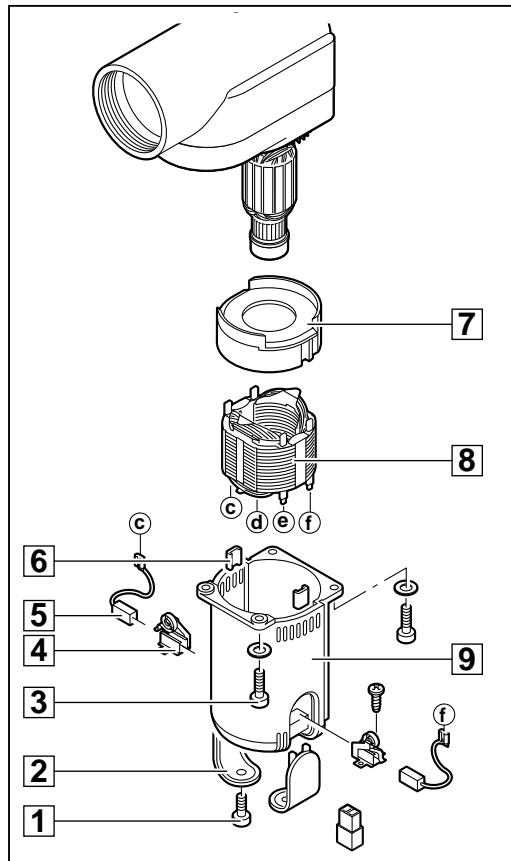
- 1 Loosen the two screws (1) and remove the housing (2).
- 2 Loosen the screws (6) and remove the plate (5).
- 3 Remove the handle (7) including the switch (E) (old model), with the lid (D) (soft grip).
- 4 Loosen the screw (C) and detach the lid (D).
- 5
 -  Only applicable for newer switches: first lever off the lid, then loosen the top screw.
- 6 Remove the rubber stops (8) and (4).
- 7 Remove the connection cable (F) with the cable entry sleeve (3) from the switch (E) and remove the switch from the hand-grip (7).
- 8 Loosen the screws (9) and pull off the guard (B) from the gear box (A).



6

Removing the carbon brushes

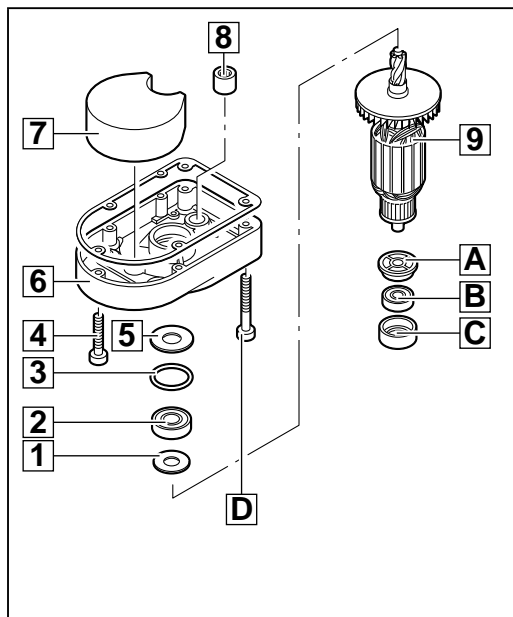
- 1 Loosen the screws (1) and remove the carbon brush covers (2).
- 2 Lift the respective brush spring from the carbon brushes (5) and place them on top of the brush holders.
- 3 Pull the respective cable lug from the carbon brushes (5) and pull out the carbon brushes.
- 4 Loosen the four screws (3) and pull off the motor housing (9) with the electric field (8) and the air deflector ring (7).
- 5 Remove the air deflector ring (7).
- 6 Remove the electric field (8) from the motor housing (9) (if necessary, hit the motor housing lightly with a plastic hammer), watch out for the rubber stops (6) which might fall out.
- 7 Remove the carbon brush holders (4).



7

Dismantling the bearing end plate of the gear box

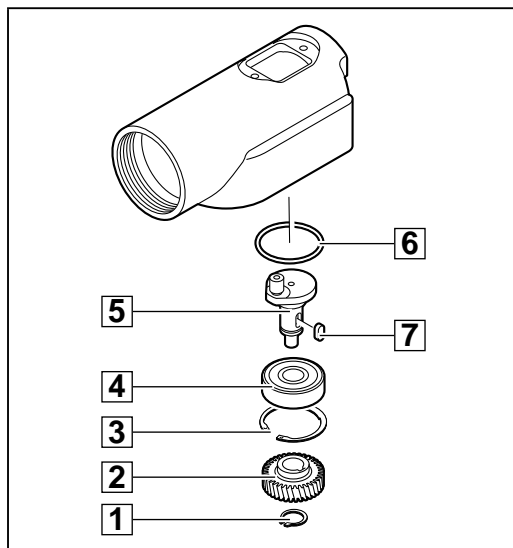
- 1** Loosen the screws (4) and (D). Loosen the bearing end plate (6) by hitting the gear box with a plastic hammer and remove it.
- 2** Pull the armature (9) from the bearing end plate (6) (if necessary, hit the bearing end plate lightly with a plastic hammer) and remove the bearing bush (C) from the ball bearing (B).
- 3** Press off the ball bearing (B) and remove the insulating disc (A).
- 4** Remove the O-ring (3) and the washer (5). Press off the ball bearing (2) and remove the seal ring (1).
- 5** Remove the gasket from the bearing end plate (6) and take out the insert (7).
- 6** Pull out the needle bearing (8) with aid of an interior extractor.



8

Detaching the eccentric shaft

- 1** Remove the locking washer (1).
- 2** Pull off the toothed wheel (2) with aid of a pulling off device (service tool 9170 0314 440).
- 3** Remove the key (7) from the shaft (5).
- 4** Remove the locking washer (3) and pull out the shaft (5); if necessary, press the shaft through the opening in the gear box with aid of a suitable mandrel.
- 5** Press the ball bearing (4) from the shaft.
- 6** Remove the O-ring (6) from the gear box.



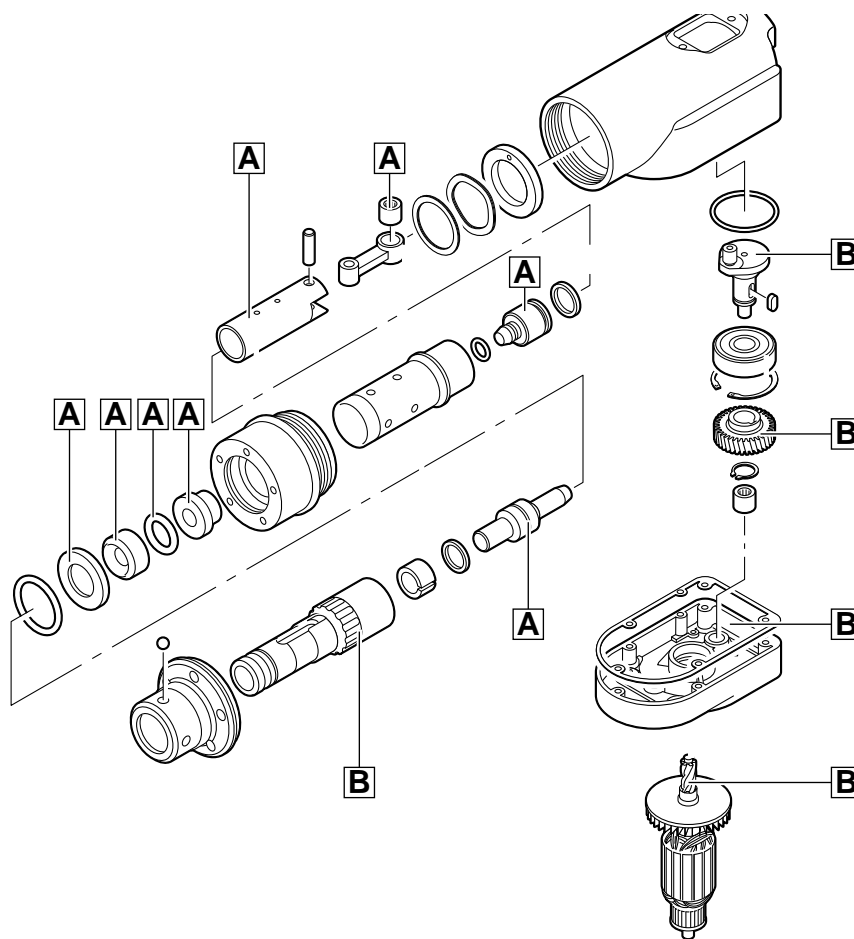
9

Maintenance

General	It is recommended that maintenance be performed on the machine at regular intervals or when the carbon brushes switch off at the latest. When carrying out maintenance, all worn parts must be changed.
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 be applied to the machine as indicated in the lubrication plan.

Legend

- A** Cover with red grease (total 60 g)
- B** Generously cover with blue grease (total 60 g)

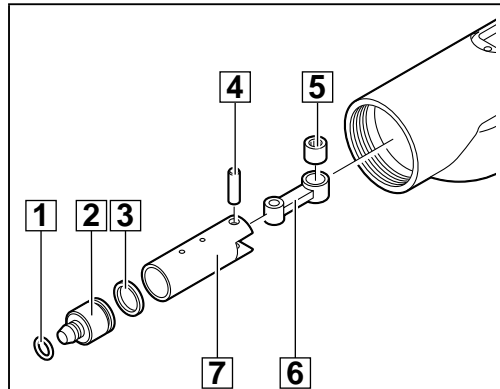


Torques	Screws in plastic	2,0 Nm
	Screws in metall	3,0 Nm

Assembly


Mounting the connecting rod

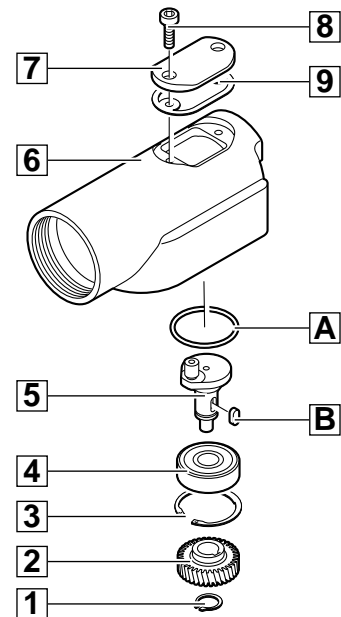
- 1 Press the bearing (5) into the connecting rod (6).
- 2 Fit the O-ring (1) to the percussion body (2).
- 3 Push the percussion body (2) together with the gasket (3) into the cylinder (7).
- 4 Fit together the cylinder (7) with the connecting rod (6) and put the cylindrical bolt (4) through the two borings.



1

Mounting the eccentric shaft

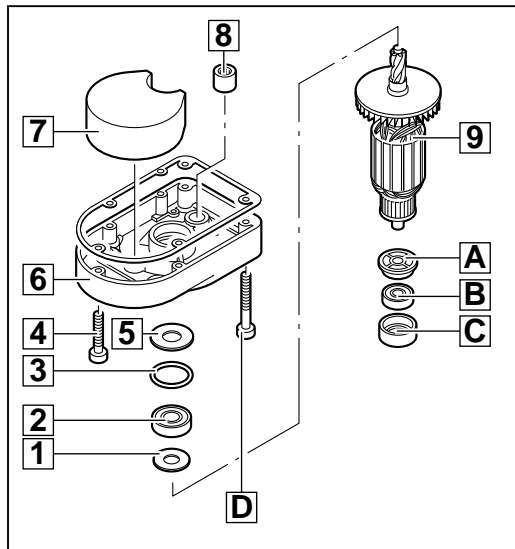
- 1 Insert the O-ring (A) into the gear box (6).
- 2 Press the ball bearing (4) onto the shaft (5).
- 3 Insert the cylinder with the connecting rod (see step 1) into the gear box (6).
- 4 Insert the shaft (5) into the gear box (6) from below and fix it to the con rod bearing.
- 5 Mount the locking washer (3). Fit the key (B) to the shaft (5).
- 6 Fit the toothed wheel (2) with the collar facing the shaft and press it on.
 -  Steady the eccentric shaft with a suitable mandrel which is pushed through the opening in the gear box (otherwise the shaft gets pushed in too far).
- 7 Secure the toothed wheel (2) with the locking washer (1).
- 8 Fill the gear box (6) with grease through the top opening according to the lubrication chart.
- 9 Fasten the gasket (9) and the service cover (7) with the screws (7).



2

Mounting the bearing end plate of the gear box

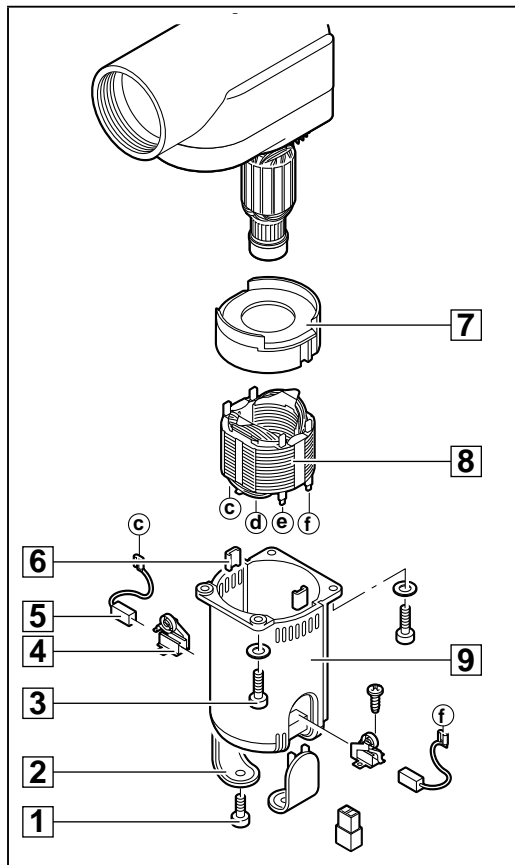
- 1 Press the needle bearing (8) into the bearing end plate (6).
- 2 Place the insert (7) in the bearing end plate (6) (mind the right position!) and fit the gasket.
- 3 Push the seal ring (1) over the armature (9) and press on the needle bearing (2).
- 4 Mount the O-ring (3) and the washer (5).
- 5 Fit the insulating disc (A) and the ball bearing (B) to the armature (9).
- 6 Fit the bearing bush (C) to the ball bearing (B) and insert the armature (9) through the gear box cover (6) **turning it**.
- 7 Fasten the screws (4) and (D).



3

Mounting the carbon brushes


- 1 Insert the carbon brush holders (4) into the motor housing (9) and screw them down (do not yet fasten them completely). Push the adjustment tool (service tool 9170 0232 60) from the outside through the carbon brush holders (4) and adjust the carbon brush holders.
- 2 Screw down the carbon brush holders (4) and remove the adjustment tool.
- 3 Insert both rubber stops (6).
- 4 Insert the field (8) into the motor housing (9) and fit the air deflector ring (7) (mind the right position!).
- 5 Fasten the motor housing (9) to the gear box with the screws (3).
- 6 Fit the cable lugs of the carbon brushes (5) to the field (8).
- 7 Insert the carbon brushes (5) into the carbon brush holders (4).
- 8 Pull up the brush springs of the carbon brush holders (4) by the hook and push them over the carbon brushes (5).
- 9 Fasten the carbon brush covers (2) with the screws (1).



4

Mounting the handle

- 1 Push the guard (B) over the gear box (A) and fasten it with the screws (9).

 Should the switch (E) be damaged, replace by a new one (reversion kit 917 0320 670).

- 2 Connect the cable (F) and the cable entry sleeve (3) with the switch (E) and mount them in the handle (7).


- 3 Connect them according to the wiring diagram.

- 4 Mount the rubber stops (8) and (4).

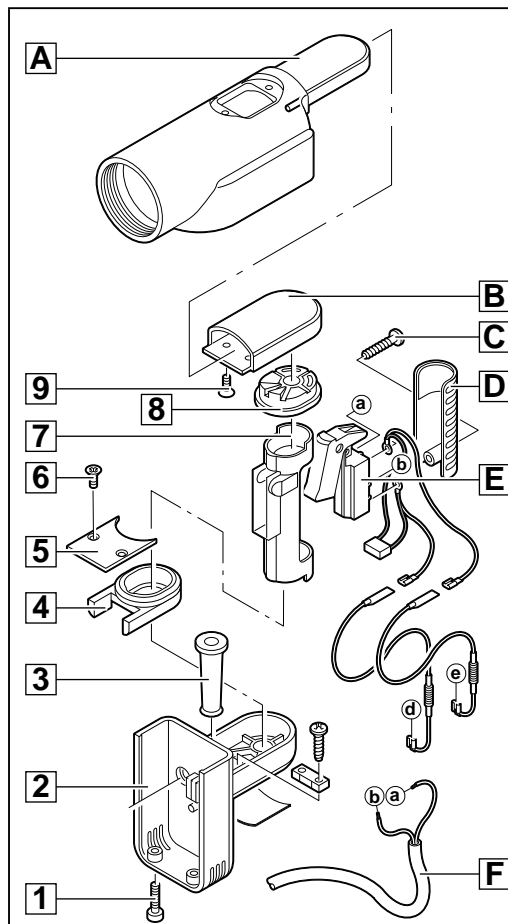
- 5 Fasten the switch (E) to the handle (7) with screws and mount the lid (D) (soft grip).

- 6 Fasten the plate (5) with screws (6).

- 7 Push the housing (2) over the gear box.

 Take care that the contacts in the housing grasp the gear box contacts.

- 8 Fasten the housing with the screws (1).




5

Mounting the flange

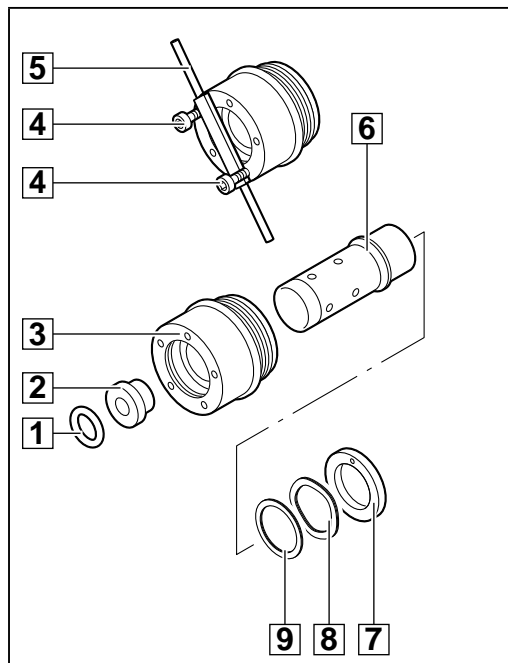
- 1 Push the spindle holder (7) and the washers (8) and (9) over the spindle sleeve (6).

2

 Apply Omnifit 80 to the flange (3) and screw it down (**left-handed thread**).

- 3 Fasten two hardened screws (4) in the flange (3). (They have to be removed before further assembly.)
Fasten the machine in a vice. Do not fasten the machine too tight since the gear box would become distorted.
Insert a flat steel (5) between the two screws (4) and screw down the flange (3).

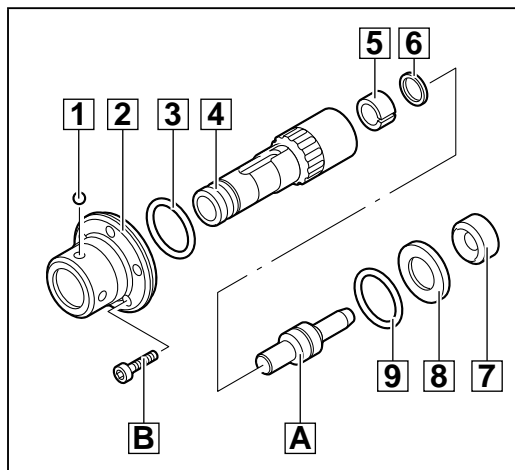
- 4 Insert the sleeve (2) and the rubber ring (1) into the flange (3).



6

Assembling the tool acceptance

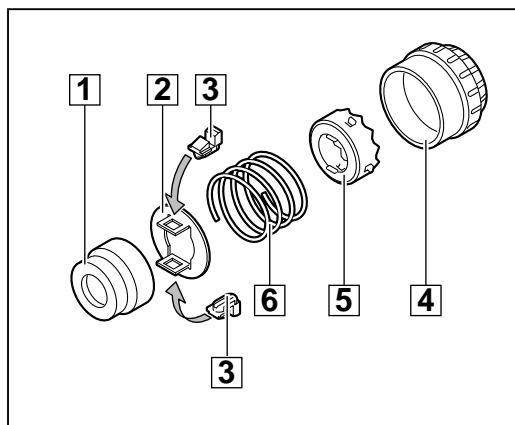
- 1 Insert the recoil ring (7), the spacer (8) and the O-ring (9) into the flange (see step 6).
- 2 Insert the snap die (A) into the tool acceptance (4).
- 3 Insert the tool acceptance completely with the snap die (A), the spacer (5) and the gasket (6) into the gear box.
- 4 Fit the adapter sleeve (2) and fasten it with the five screws (B).
- 5 Insert the four balls (1) into the adapter sleeve (2).



7

Mounting the ball holding device

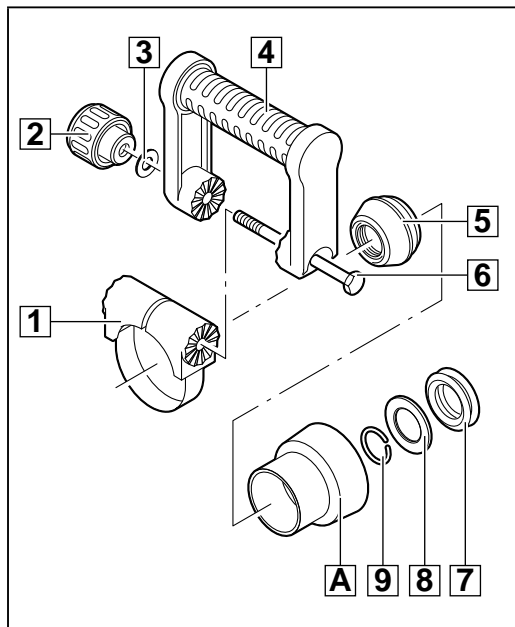
- 1 Fit the locking bolt (4) together with the ball holding device (5).
- 2 Fit the pressure spring (6) and the retaining plate (2), depress them and insert the locking levers (3).
- 3 Mount the locking sleeve (1).



8

Mounting the auxiliary handle

- 1 Mount the damper (7) and the damping element (8) and secure them with the locking ring (9).
- 2 Fit the rubber sleeve (A).
- 3 Push back the rubber sleeve (A) and mount the rubber bushing (5).
- 4 Press the clamping ring (1) and place the auxiliary handle (4) on the clamping ring (1).
- 5 Insert the screw (6) through the clamping ring (1) and the auxiliary handle (4).
- 6 Push the washer (3) over the screw (6).
- 7 Secure the screw (6) with the nut (2).



9

Test Run

Test run the machine and pay attention to noises.

Electrical Test

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