

**Service tools needed**

- For dismantling/assembling the plastic cover: Id-no. 9170 3212 00
- For dismantling/assembling the front bearing housing: Id-no. 9170 3020 90
- For dismantling/assembling the nosepiece: Id-no. 9170 3022 60
- Adjustment tool for carbon brushes: Id-no. 9170 0232 60

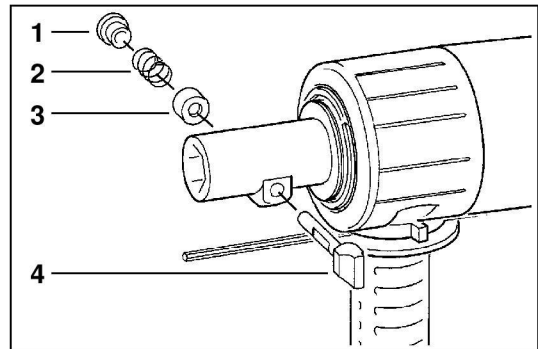
**Important!**

- Before maintenance carry out an introduction examination with high voltage check according to VDE (see chapter Electrical and Mechanical Test Instruction).
- Always disconnect the plug from the socket before carrying out any work on the machine.

**Dismantling**

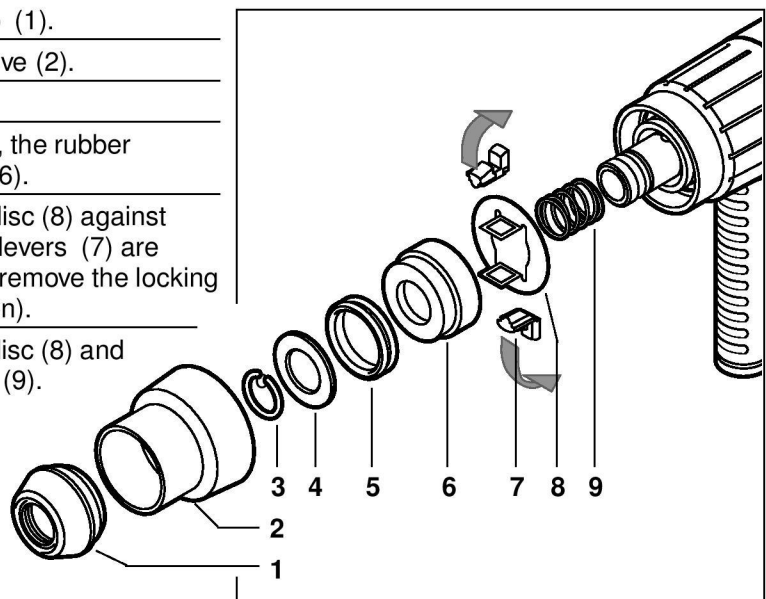
**Removing the tool locking mechanism (PH 5 H, PH 5 F)**

- 1 Expel the latch bar (4) from the nosepiece.
- 2 Remove the latch retainer (1), the spring (2), and the latch spring cover (3).



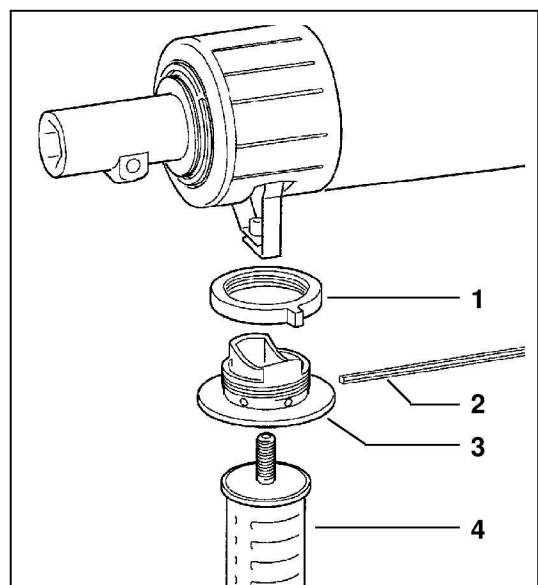
**Dismantling the nosepiece (PH 5 S)**

- 1 Lever off the rubber cap (1).
- 2 Remove the plastic sleeve (2).
- 3 Remove the circlip (3).
- 4 Remove the washer (4), the rubber ring (5) and the sleeve (6).
- 5 Depress the retension disc (8) against resilience - the locking levers (7) are released. Unscrew and remove the locking levers (7) (see illustration).
- 6 Remove the retension disc (8) and the compression spring (9).



**Removing the front handle**

- 1 Unscrew the front handle grip (4).
- 2 Remove the front handle strap guide (3), the depth gauge locking ring (1), and the depth gauge (2).
- 3 Unscrew the depth gauge locking ring (1) from the front handle strap guide (3) (left-handed thread).



PH 5 H  
PH 5 F

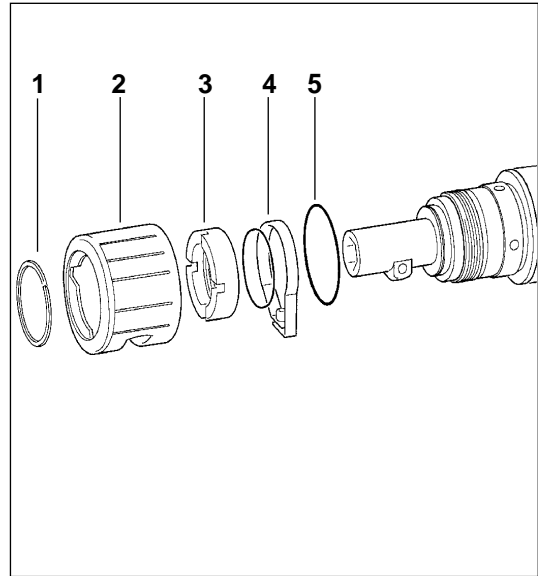
**1**

PH 5 S  
PHE 5 S

**2**

**Dismantling the nosecone**

- 1 Hold the upper part of the machine in a vice.
- 2 Lever out the nosecone retainer (1) with a screwdriver and remove it.
- 3 Twist the nosecone (2) such that its four reliefs match with the reliefs of the nosepiece retainer (3) which is located underneath.
- 4 Place the service tool 9170 3212 00 such that its four lugs grasp the reliefs and unscrew the nosecone clockwise.
- 5 Remove the O-ring (5) (only PH 5 H, PH 5 F).
- 6 Remove the the front handle strap assembly (4) and the nosepiece retainer (3).



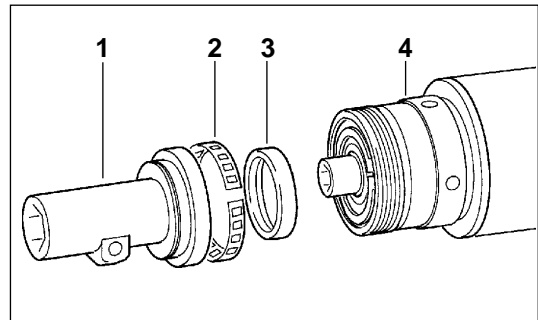
**3**

**Note**

- ☛ The steps 4-7 describe the dismantling of machines with spline shaft reception (PH 5 H, PH 5 F). For dismantling machines with SDS-max reception (PH 5 S), please proceed with step 8.

**Dismantling the nosepiece (PH 5 H, PH 5 F)**

- 1 Hit the top housing (4) with a plastic hammer to loosen the nosepiece (1) and remove the nosepiece.
- 2 Remove the tolerance ring (2) and the nosepiece seal (3).

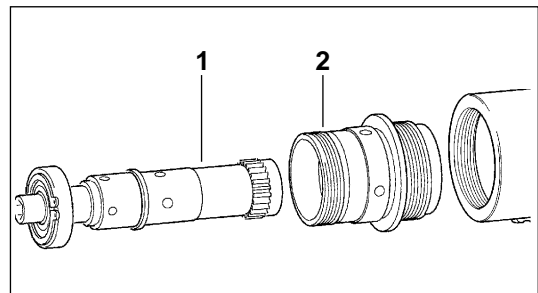


**PH 5 H  
PH 5 F**

**4**

**Detaching the front bearing housing (PH 5 H, PH 5 F)**

- 1 Hold the machine in a vice.
- 2 Unscrew and remove the front bearing housing (2) with service tool 9170 3020 90 (left-handed thread!).
- 3 Remove the driver together with the barrel (1) from the machine.

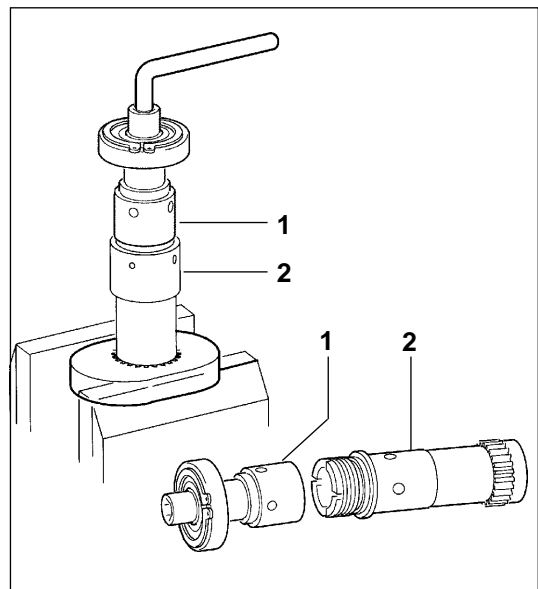


**PH 5 H  
PH 5 F**

**5**

**Separating the driver from the barrel (PH 5 H, PH 5 F)**

- 1 Fix the service tool no. 9170 3022 60 in a vice.
- 2 Fix the driver (1) together with the barrel (2) in the service tool and unscrew the driver (1) (only PH 5 F) from the barrel (2) with aid of an Allen key.

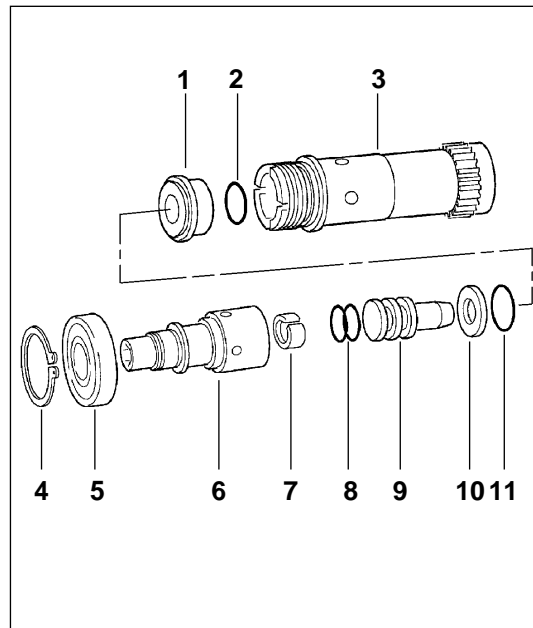


**PH 5 H  
PH 5 F**

**6**

**Dismantling the barrel  
(PH 5 H, PH 5 F)**

- 1 Remove the catcher support ring (1) from the barrel (3).
- 2 Remove the catcher O-ring (2).
- 3 Expel the anvil (9) from the driver (6) (hit the driver lightly with a mandril).
- 4 Remove both seals (8) as well as the recoil transfer ring (10) and the buffer housing ring (1) from the anvil (9).
- 5 Remove the circlip (4) and press the driver bearing (5) from the driver.
- 6 Fix the driver (6) in a vice with the the anvil facing upward and expel the jumper ring (7) with a mandril.



**PH 5 H  
PH 5 F**

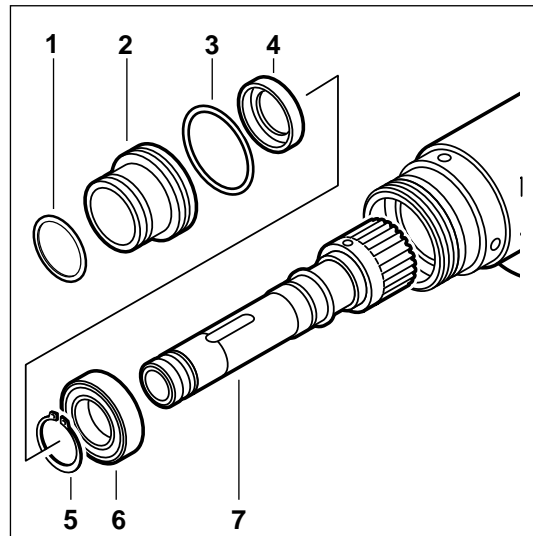
**7**

**Note**

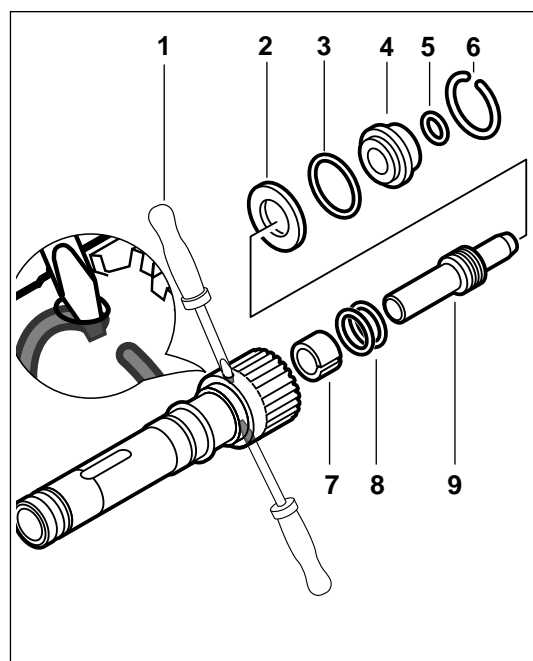
☞ The steps 8-11 describe the dismantling of machines with SDS-max reception (PH 5 S). For dismantling machines with pline shaft reception (PH 5 H, PH 5 F), please proceed with step 12.

**Dismantling the barrel  
(PH 5 S)**

- 1 Remove the complete barrel (7) from the housing (if necessary, hit the housing lightly with a plastic hammer).
- 2 Remove the O-ring (1) and the sleeve (2).
- 3 Remove the O-ring (3) from the sleeve. Lever off the seal ring (4).
- 4 Remove the circlip (5) and press off the bearing (6).
- 5 Removing the round wire ring (6): Put a screwdriver (1) through one of the four service borings and lever off the round wire ring (leave the screwdriver in the boring). Lever off the round wire ring through the other service borings with a second screwdriver.
- 6 Remove the catcher support ring (4) and the O-ring (5).
- 7 Remove the recoil transfer ring (2) and the buffer housing ring (3).
- 8 Press the anvil (9) from the barrel with aid of a screwdriver and remove the O-rings (8) from the anvil.
- 9 Expel the junk ring (7) with a mandril.



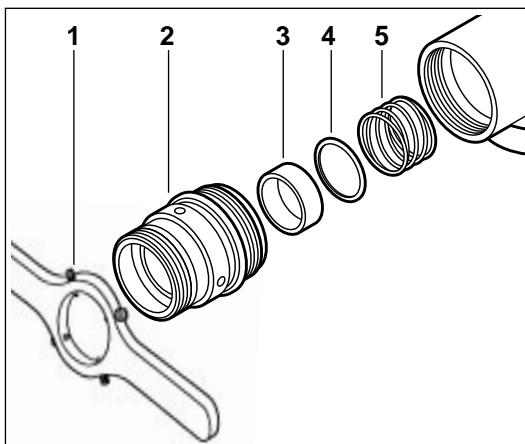
**PH 5 S  
PHE 5 S**



**8**

**Dismantling the front bearing housing (PH 5 S)**

- 1 Fix the machine between cheeks in a vice.
- 2 Unscrew the front bearing housing (2) with service tool no. 9170 3212 00 (1) (left-handed thread!) and remove it.
- ☞ If necessary, heat up the top housing where the front bearing housing is located with a hot-air blower to soften the screw locking device.
- 3 Remove the spring (5) and the disc (4).
- 4 Press out the ring (3).

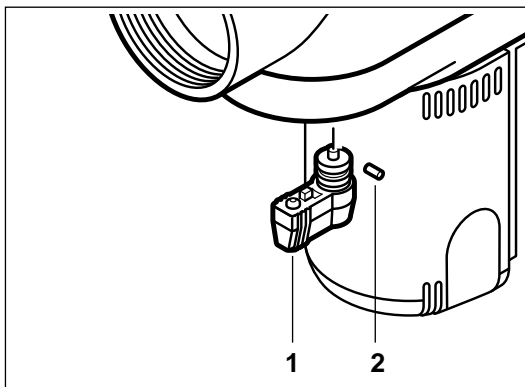


PH 5 S  
PHE 5 S

**9**

**Removing the switch lever (change-over switch hammer drilling/chiselling (PH 5 S))**

- 1 Expel the pin (2) with a mandril.
- 2 Pull out the switch lever (1).

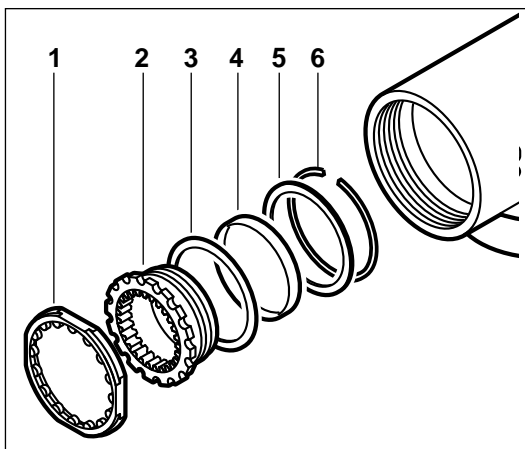


PH 5 S  
PHE 5 S

**10**

**Dismantling the roto-stop (PH 5 S)**

- 1 Remove the following parts from the top housing by hitting the housing lightly with a plastic hammer:
  - star ring (1)
  - star sleeve (2).
- 2 Detach the circlip (6) from the star sleeve (2) and remove the rings (3), (4) and (5).

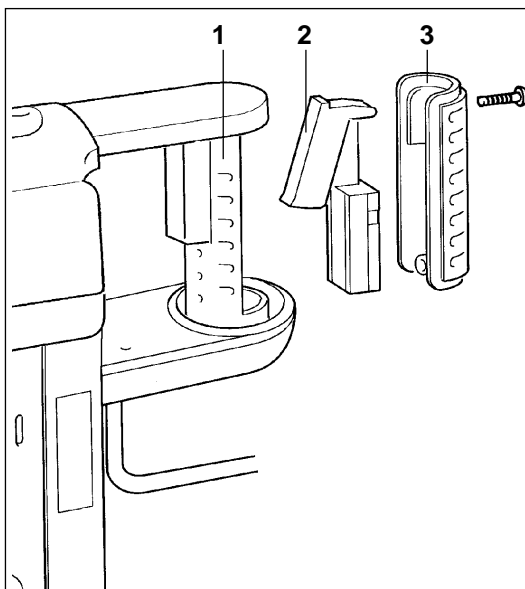


PH 5 S  
PHE 5 S

**11**

**Removing the switch**

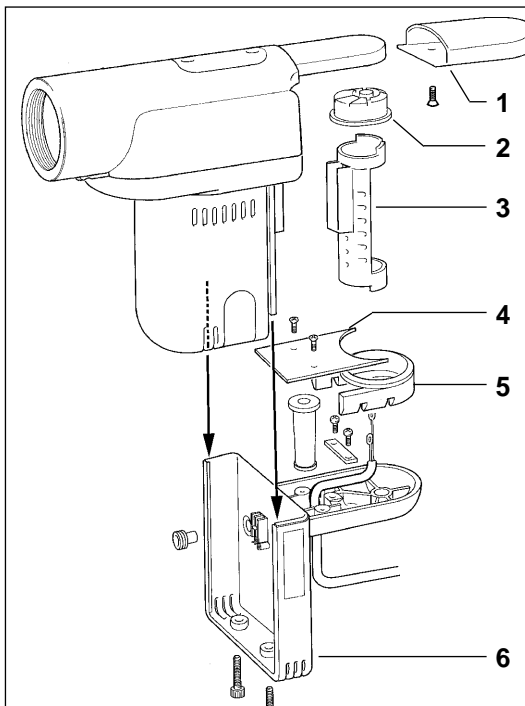
- 1 Unscrew and remove the rear handle soft grip (3).
- 2 Remove the lead from the switch (2).
- 3 Remove the switch from the rear handle front (1).



**12**

**Dismantling the rear handle module**

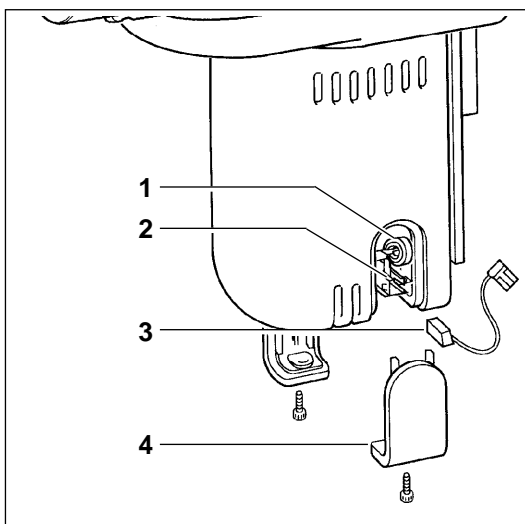
- 1 Unscrew the handle cover (6) and remove it from the motor housing.
- 2 Unscrew and remove the cover plate (4).
- 3 Unscrew and remove the cover plate (4).
- 4 Unscrew and remove the upper handle shroud (1).



**13**

**Removing the carbon brushes**

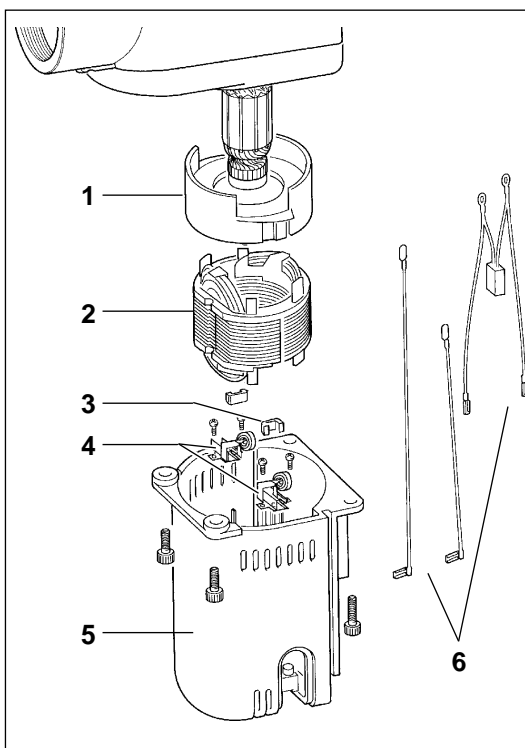
- 1 Unscrew and remove the carbon brush covers (4).
- 2 Lift the retaining springs (1) off the carbon brushes and put them down on the upper edge of the brush holders (2).
- 3 Remove the carbon brush cable lugs (3) and carefully pull out the carbon brushes.



**14**

**Dismantling the motor assembly**

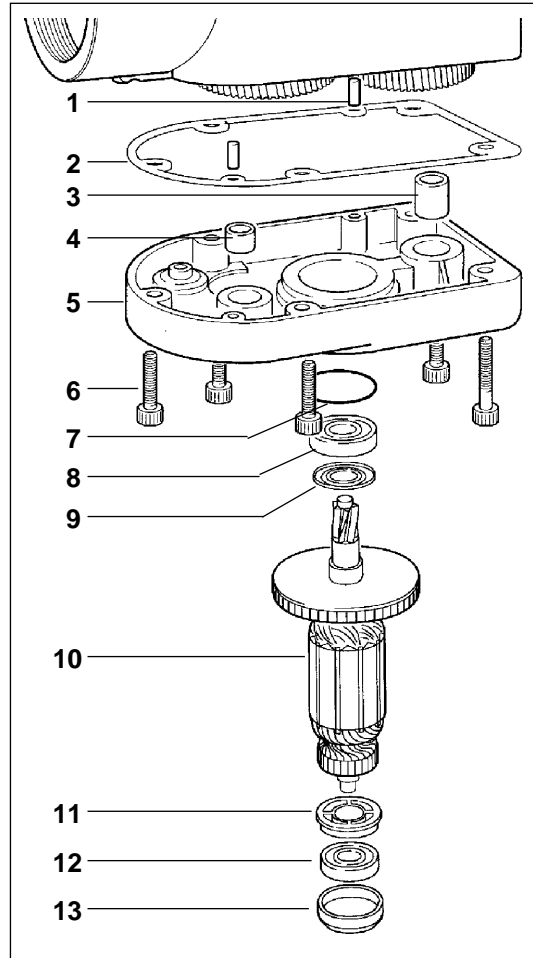
- 1 Unscrew and remove the motor housing (5).
- 2 Remove the baffle (1).
- 3 Pull off and remove the leads (6).
- 4 Remove the field coil (2) (if necessary, tap it lightly with a plastic hammer), minding the two field location rubbers (3).
- 5 Unscrew and remove the carbon brush holders (4) from the motor housing.



**15**


**Dismantling the gearbox**

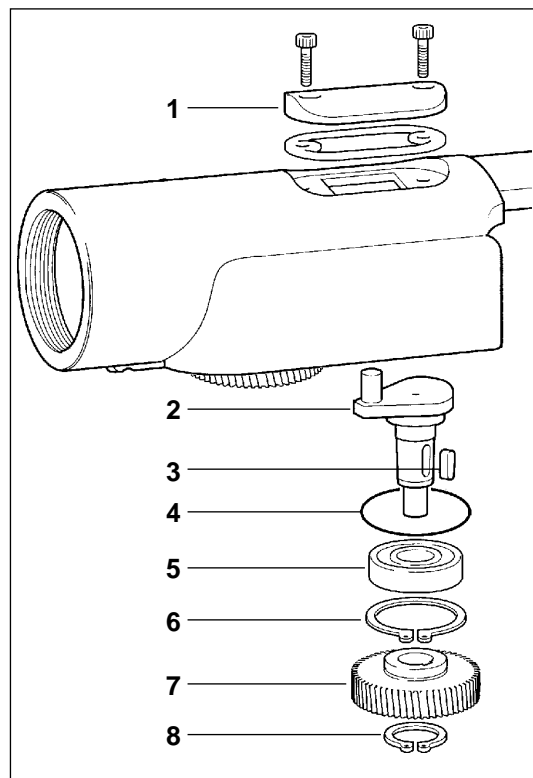
- 1 Remove the five screws (6).
- 2 Loosen the gearbox (5) by tapping the gear housing with a plastic hammer, and remove it.
- 3 Remove the armature (10) from the gearbox (if necessary, tap it lightly with a plastic hammer) and remove the bearing mounting (13) from the commutator bearing. Remove the commutator bearing (12) and the insulation washer (11).
- 4 Remove the armature O-ring (7).
- 5 Pull off the bevel pinion lower bearing (4) and the crankshaft bearing (3) with aid of an interior extractor.
- 6 Remove the two dowel pins (1) and the gearbox gasket (2).



**16**

**Dismantling the crankshaft**

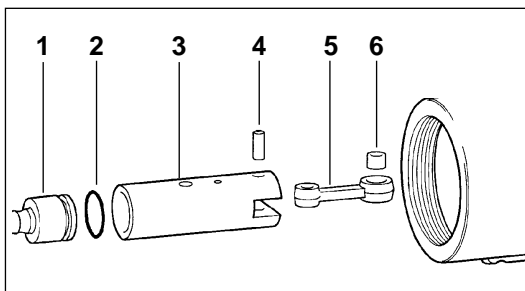
- 1 Unscrew and remove the cover (1).
- 2 Remove the circlip (8).
- 3 Lever off the crank gear (7) with a screwdriver.
-  To remove the toothed wheel use a standard extractor size 2. The jaws of the extractor must be made to fit.
- 4 Remove the crank gear key (3) from the crankshaft (2).
- 5 Remove the circlip (6) and pull out the crankshaft. If necessary, press it out through the top opening with a suitable mandril.
- 6 Press the crank bearing (5) from the crankshaft.
- 7 Remove the O-ring (4) from the housing.



**17**

**Detaching the piston and the connecting rod**

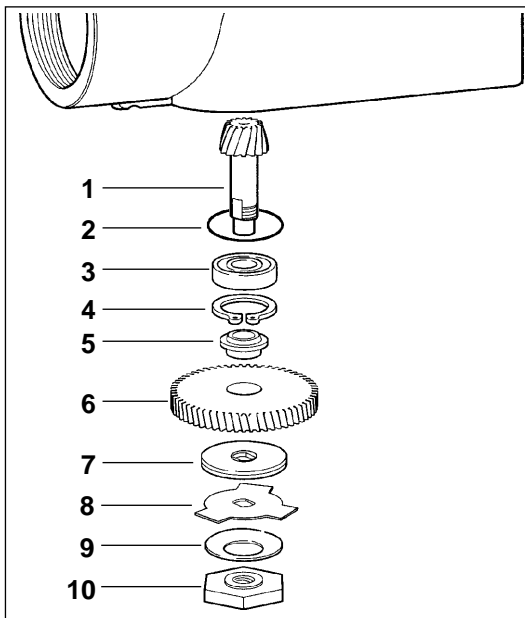
- 1 Pull the piston (3) from the top housing.
- 2 Pull the striker (1) from the piston and remove the striker seal (2) from the striker.
- 3 Push the gudgeon pin (4) from the piston (3) and pull out the con rod (5).
- 4 Press the bearing (6) from the con rod (5).



**18**

**Dismantling the bevel pinion**

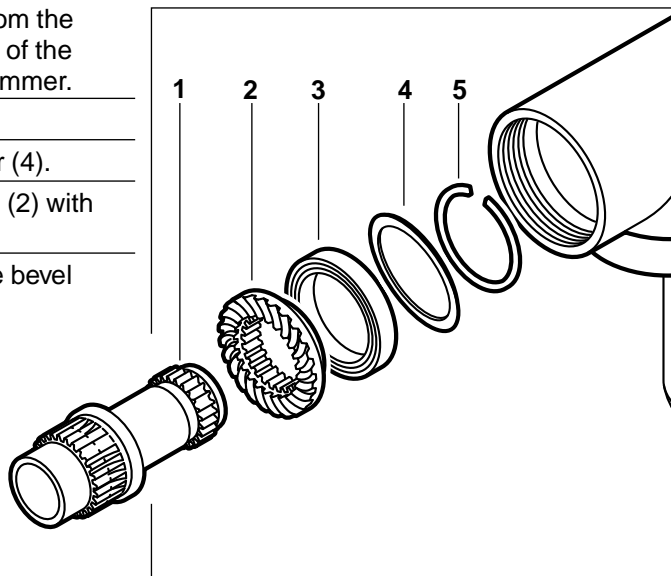
- 1 Bend down the lugs of the locking plate (8).
- 2 Block the drive gear (6) with a screwdriver and remove the spring carrier (10).
- 3 Remove the disk spring (9), locking plate (8), drive gear (6), friction disk assembly (7), and the distance sleeve (5).
- 4 Remove the circlip (4).
- 5 Pull out the bevel pinion (1) with the bevel pinion bearing (3): Fix the bearing in a vice between cheeks and hit the housing lightly with a plastic hammer.
- 6 Press the bearing (3) from the bevel pinion (1).
- 7 Remove the O-ring (2) from the motor housing.



**19**

**Dismantling the bevel sleeve (PH 5 S)**

- 1 Remove the bevel sleeve (1) from the housing by hitting the front part of the housing lightly with a plastic hammer.
- 2 Remove the circlip (5).
- 3 Remove the corrugated washer (4).
- 4 Remove the bevel crown wheel (2) with the bearing (3).
- 5 Remove the bearing (3) from the bevel crown wheel (2).

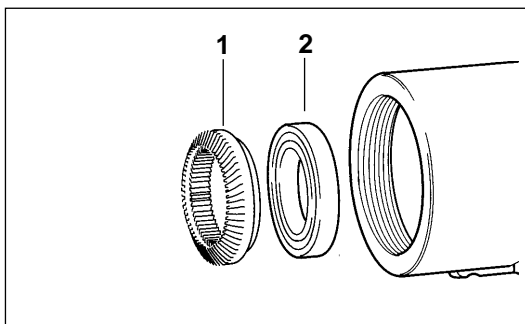


**PH 5 S  
PHE 5 S**

**20**

**Removing the bevel crown wheel (PH 5 H, PH 5 F)**

- 1 Expel the bevel crown wheel (1) from the top housing with a mandril: lead the mandril through the top opening of the housing.
- 2 Remove the crown wheel bearing (2) with aid of an extractor.

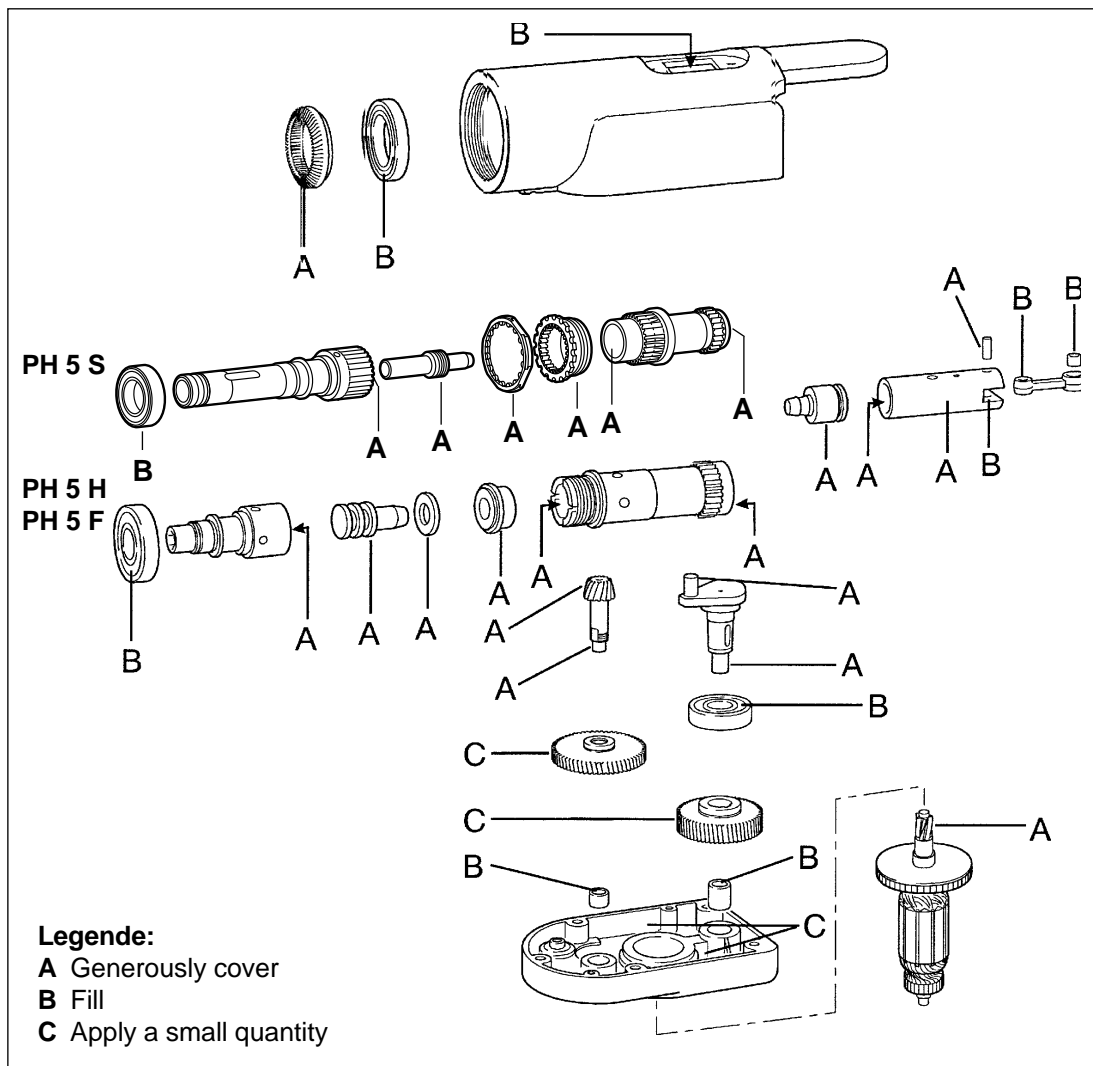


**PH 5 H  
PH 5 F**

**21**

## Maintenance


- General** It is recommended to submit the tool to maintenance after every 150 work hours, if the hammer mechanism gets weak, or if the carbon brushes switch off. When carrying out maintenance all parts of the maintenance set 9170 3180 30 must be exchanged.
- Abrasion test** Check the dismantled parts for abrasion (visual check) and exchange if necessary.
- Electrical test** Before assembly submit all relevant parts to an electrical examination (see chapter Electrical and Mechanical Test Instruction).
- Cleaning** With the exception of the electrical parts all parts must be cleaned with cold cleaner. Attention! No cleaner must enter the encapsulated bearings. Clean the electrical parts with a dry brush.
- Lubrication** At each maintenance the tool must be lubricated as shown in the lubrication chart. After having dismantled the entire tool remove the used grease completely and replace by new grease. For assembly a total of 350 g of grease is necessary. Please pay attention to the following lubrication chart:



- Torque**
- Housing screws ..... 3 Nm  
 Safety clutch nut ..... 3 Nm (use Loctite 222 or Omnifit 80 for securing the nuts)

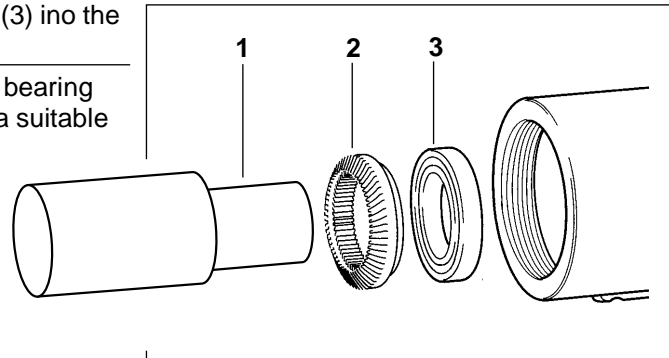


## Assembly

**Note**  When assembling, secure all screwed connections in metal with screw locking device

### Assembling the bevel crown wheel (PH 5 H, PH 5 F)

- 1 Press the crown wheel bearing (3) into the bevel crown wheel (2).
- 2 Press the crown wheel with the bearing into the top housing with aid of a suitable mandril (1).

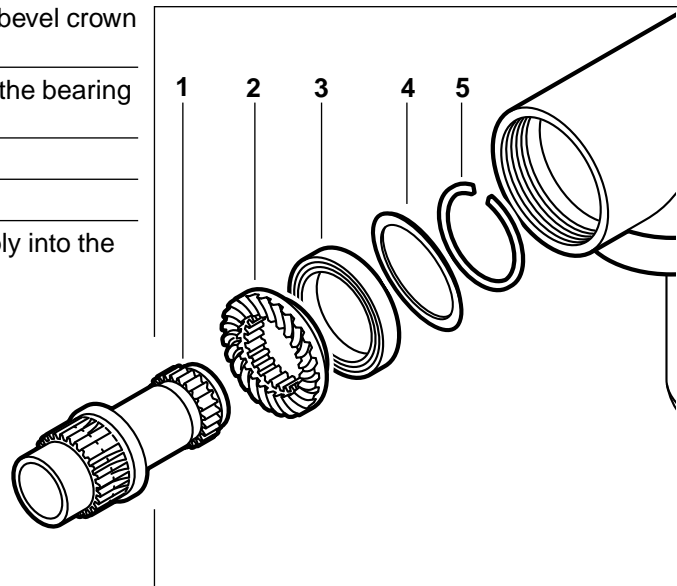


PH 5 H  
PH 5 F

1

### Assembling the bevel sleeve (PH 5 S)


- 1 Press the bearing (3) onto the bevel crown wheel (2).
- 2 Push the crown wheel (2) with the bearing (3) over the bevel sleeve.
- 3 Fit the corrugated washer (4).
- 4 Mount the circlip (5).
- 5 Insert the bevel sleeve assembly into the housing as far as it will go.

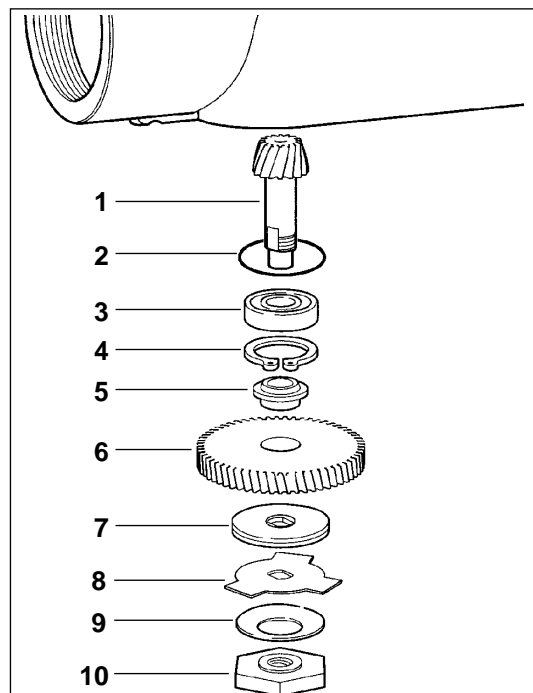


PH 5 S

2

### Assembling the bevel pinion

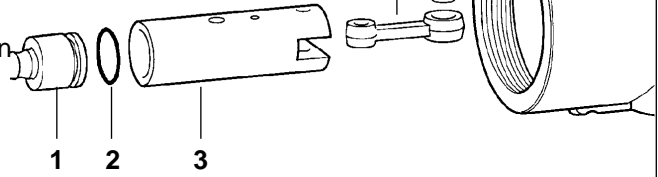
- 1 Insert the O-ring (2) into the housing.
- 2 Press the bearing (3) onto the bevel pinion (1).
- 3 Press the bevel pinion (1) together with the bearing (3) into the housing.
- 4 Insert the circlip (4).
- 5 Push the following parts over the bevel pinion:
  - distance sleeve (5)
  - drive gear (6)
  - friction disc assembly (7) (the coating must face the drive gear)
  - securing ring (8)
  - disk spring (9) (the bulging must face the spring carrier (10))
- 6 Block the bevel pinion to secure against twisting and fasten the spring carrier using a torque wrench with a 32 mm socket as described below: "Apply the torque wrench to the spring carrier with enough pressure to overcome the disk spring resistance, and secure the spring carrier  **Torque 3 Nm**, use locking device.
- 7 Bend the three lugs of the locking plate (8) to secure the spring carrier.



3

**Assembling the piston and the connecting rod**

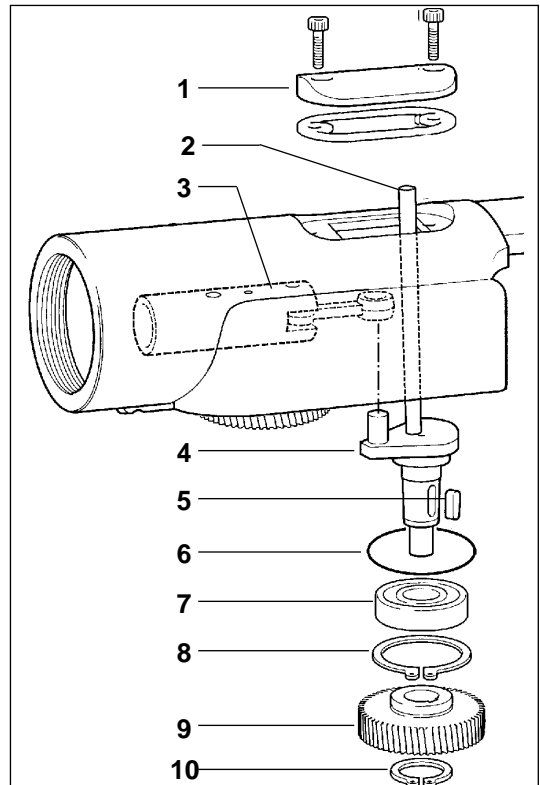
- 1 Press the bearing (6) into the connecting rod (5).
- 2 Fit the O-ring (2) to the striker (1) and push the striker into the piston (3).
- 3 Assemble the piston (3) with the con rod (5) and push the gudgeon pin (4) through the borings.



**4**

**Assembling the crankshaft**

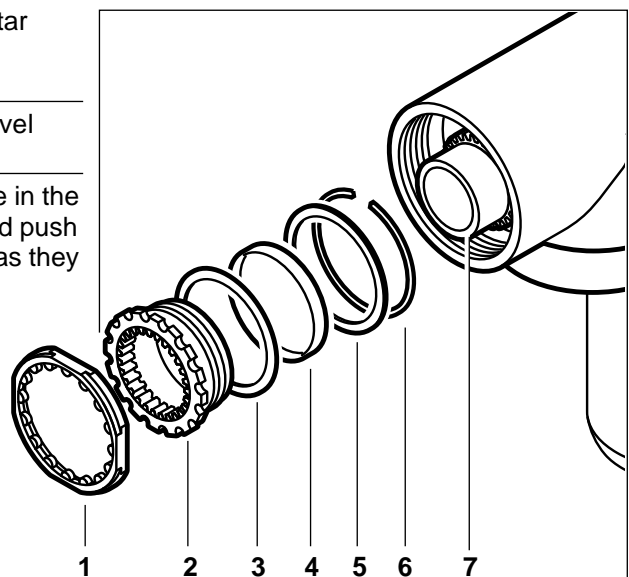
- 1 Press the bevel pinion bearing (7) onto the crankshaft.
- 2 Insert the piston with the con rod (3) into the housing. Insert the crankshaft (4) into the housing and fit it to the con rod bearing.
- 3 Fit the circlip (8).
- 4 Fit the crank gear key (5) to the crankshaft (4).
- 5 Mount the O-ring (6).
- 6 Fit the crank gear (9) with the collar facing the crankshaft and press it on: steady the crankshaft (4) with a suitable mandril which is pushed through the opening in the housing (otherwise the crankshaft is pushed in too far).
- 7 Secure the crank gear (9) with the circlip (10).
- 8 Fill the top housing through the top opening with approx. 25% grease and fit the con rod access cover (1).



**5**

**Assembling the roto-stop (PH 5 S)**

- 1 Fit the rings (3), (4) and (5) to the star sleeve and secure them with the circlip (6).
- 2 Push the star sleeve (2) over the bevel sleeve (7) in the housing.
- 3 Fit the star ring (1) to the star sleeve in the housing (mind the right position) and push them in with aid of a mandril as far as they will go.

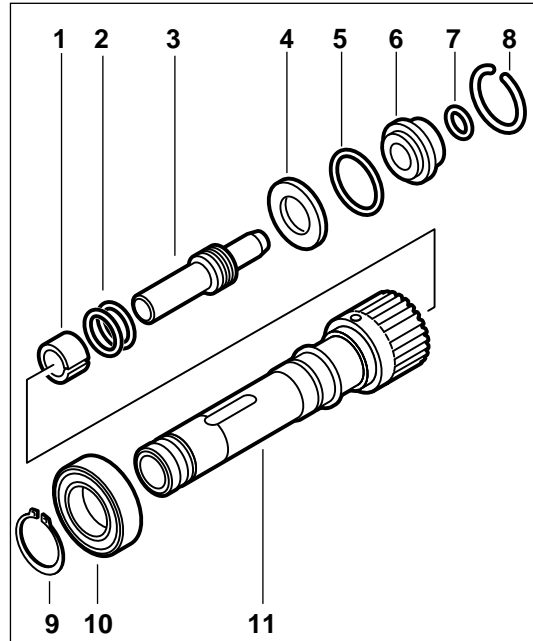


**PH 5 S**

**6**

**Assembling the barrel  
(PH 5 S)**

- 1 Carefully insert the junk ring (1) into the barrel (11) with aid of a mandril.
- 2 Fit the anvil seals (2) to the anvil (3) and insert the anvil into the barrel.
- 3 Insert the following parts into the barrel:
  - recoil transfer ring (4)
  - buffer housing ring (5)
  - catcher support ring (6)
  - catcher O-ring (7)
  - round wire ring (8) (take care that it engages in the groove).
- 4 Push the bearing (10) over the barrel (11) and secure it with the circlip (9).

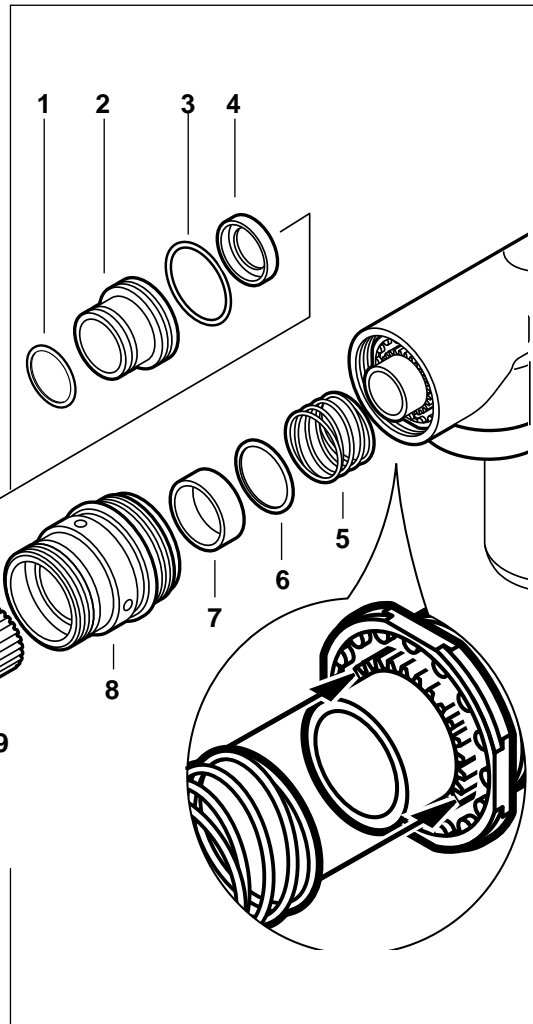


**PH 5 S**

**7**

**Assembling the front bearing housing with the bevel sleeve  
(PH 5 S)**

- 1 Insert the barrel (9) into the front bearing housing (8).
- 2 Insert the ring (7), the disc (6) and the spring (5) from the other side into the front bearing housing (8).
- 3 Apply screw locking device to the thread in the housing and screw the front bearing housing together with the previously inserted parts down to the housing (anti-clockwise).
  - ☞ Take care that the spring (5) is placed properly to the front bearing housing (centered, see detailed illustration). Slightly turn the barrel when screwing down the front bearing housing, until it engages in the bevel sleeve.
- 4 Fasten the front bearing housing (8) with service tool no. 9170 3212 00 (10) (left-handed thread!).
- 5 Insert the seal into the sleeve and fit the O-ring (3).
- 6 Push the sleeve (2) and the disc (1) over the barrel and simultaneously insert them into the front bearing housing (8).

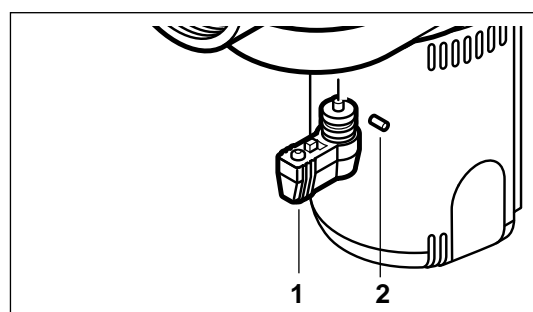


**PH 5 S**

**8**

**Mounting the switch lever  
(change-over switch hammer drilling/chiselling)  
(PH 5 S)**

- 1 Insert the switch lever (1).
- 2 Beat in the pin (2) with a mandril.
  - ☞ Take care that the pin of the switch grasps the provided groove of the star wheel.

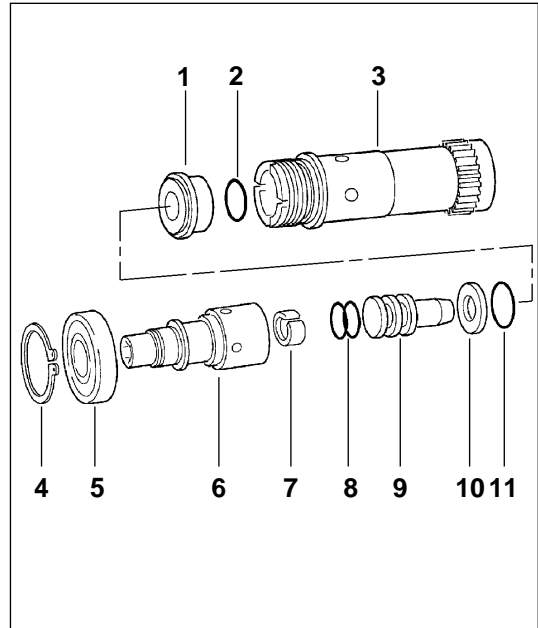


**PH 5 S**

**9**

**Assembling the barrel  
(PH 5 H, PH 5 F)**

- 1 Insert the junk ring (7) into the driver.
- 2 Press the driver bearing (5) onto the driver and secure it with the circlip (4).
- 3 Grease the anvil (9) and fit two new anvil seals (8).  
 ⚠ Take care that the anvil seals are not twisted.
- 4 Fit the recoil transfer ring (10) and the buffer housing ring (11) to the anvil (9).
- 5 Insert the anvil (9) into the driver (6).
- 6 Insert a new O-ring (2) into the catcher support ring (1) and fit the support ring to the barrel (3).

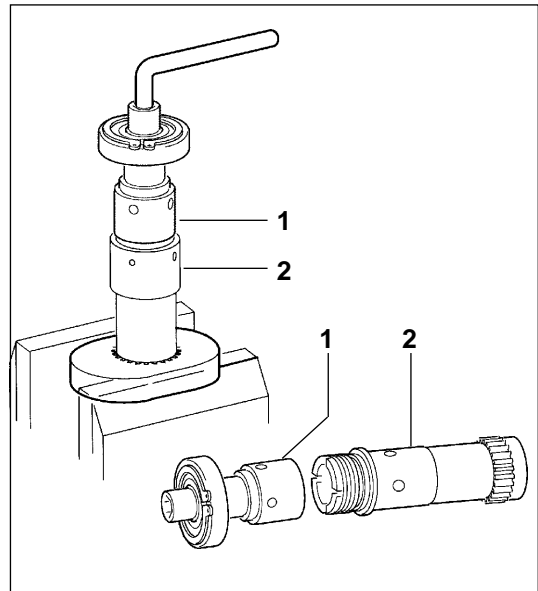


**PH 5 H  
PH 5 F**

**10**

**Refitting the driver and the barrel  
(PH 5 H, PH 5 F)**

- 1 Grease the barrel (2) and fasten it to the driver (1) with screws.
- 2 Hold the service tool 9170 3022 60 in a vice.
- 3 Insert the barrel and the driver into the service tool and fasten them with an Allen key (only PH 5 F) (3 Nm).

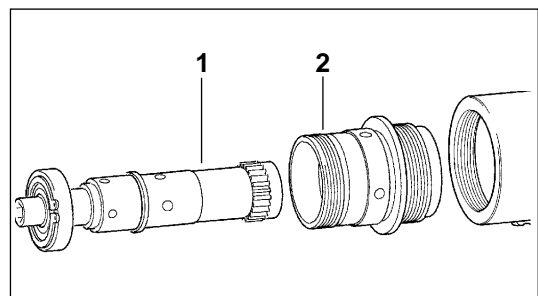


**PH 5 H  
PH 5 F**

**11**

**Refitting the front bearing housing  
(PH 5 H, PH 5 F)**

- 1 Hold the machine in a vice.
- 2 Insert the driver (1) with the barrel into the front bearing housing (2).
- 3 Screw down the front bearing housing (2) with service tool no. 9170 3212 00 (left-handed thread!) (3 Nm, use screw locking device).

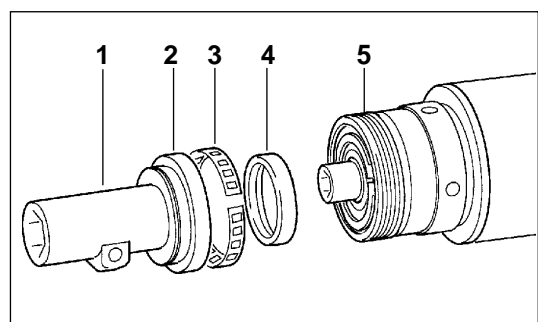


**PH 5 H  
PH 5 F**

**12**

**Assembling the nosepiece  
(PH 5 H, PH 5 F)**

- 1 Insert the tolerance ring (3) and the nosepiece seal (4).
- 2 Insert the nosepiece (1) with a plastic hammer into the top housing (5).  
 ⚠ The collar (2) of the nosepiece must be flush with the front bearing housing (5).

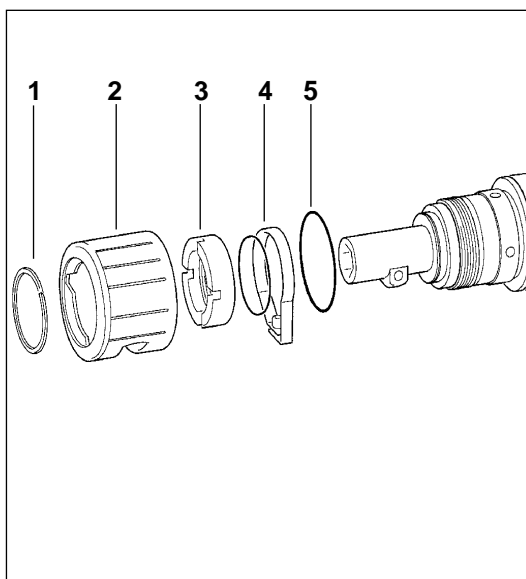


**PH 5 H  
PH 5 F**

**13**

**Assembling the nosecone**

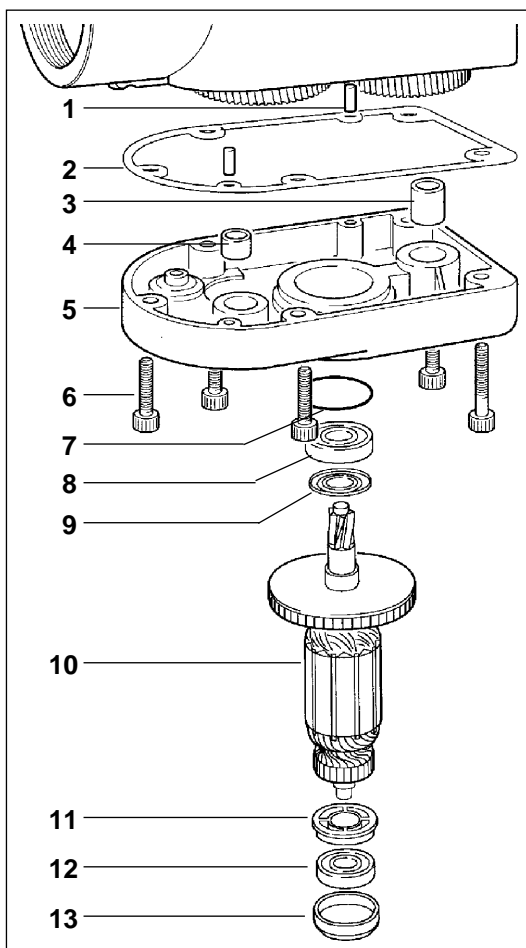
- 1 Insert the O-ring (5) (only PH 5 H, PH 5 F).
- 2 Insert the nosepiece retainer (3) into the nosecone (2).
- 3 Insert the front handle strap assembly (4) such that the lugs of the strap assembly reach through the opening of the nosecone (2).
- 4 Place the nosecone (2) on the machine and twist it such that its four reliefs match with the reliefs of the nosepiece retainer (3).
- 5 Place the service tool 9170 3212 00 on the nosecone such that the four lugs of the service tool grasp the reliefs of the nosecone (2). Secure counter-clockwise.
- 6 Fit and secure the nosecone retainer (1).



**14**

**Assembling the gearbox**

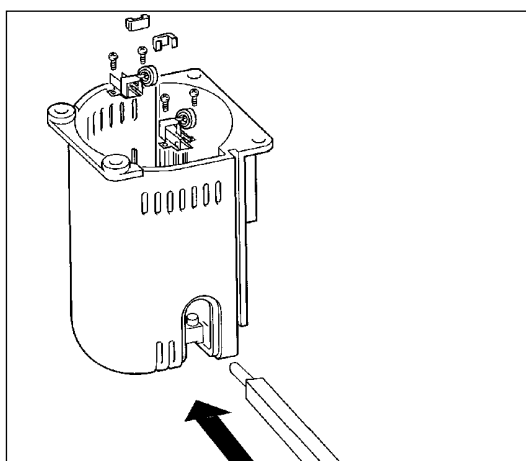
- 1 Press the bevel pinion lower bearing (4) and the bearing (3) into the gearbox (5).
- 2 Insert the two dowel pins (1) and fit the gearbox gasket (2).
- 3 Fasten the gearbox (5) with five screws (6).
- ✎ The rear two screws are longer than the front screws.
- 4 Insert the armature O-ring (7).
- 5 Fit the insulation washer (11) and the commutator bearing (12) to the armature.
- 6 Fit the bearing mounting (13) to the commutator bearing (12) and insert the armature (10) into the gearbox.



**15**

**Refitting the carbon brush holders**

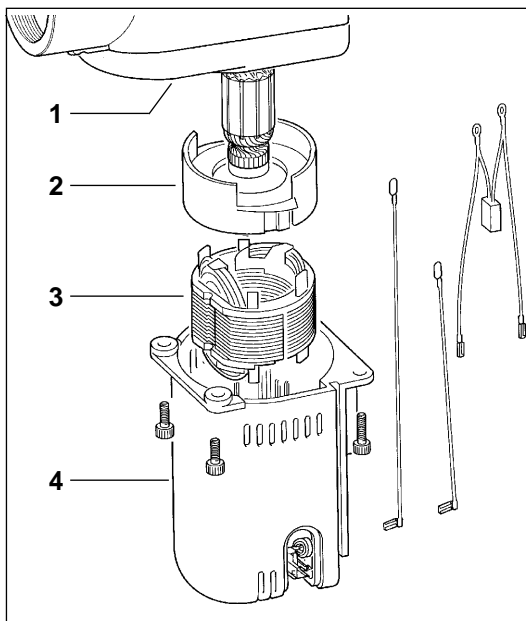
- 1 Insert the carbon brush holders (2) into the motor housing (3) and screw down loosely.
- 2 Insert the adjusting tool (4) 9170 0232 60 from the outside through the carbon brush holders and adjust the carbon brush holders.
- 3 Secure the carbon brush holders and remove the adjusting tool.
- 4 Insert the two field location rubbers (1).



**16**

**Refitting the motor assembly**

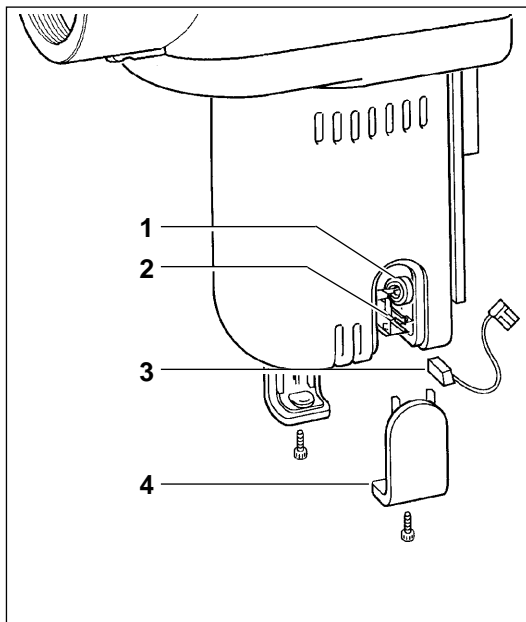
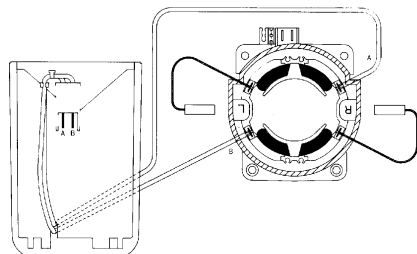
- 1 Fit the leads to the field (3).
- 2 Insert the field (with the edges of the leads facing downward) into the motor housing (4) and pull the edges of the leads through the lower housing opening.
- 3 Lead the leads along the outer wall of the motor housing towards the top and insert them into the contacts.
- 4 Inset the leads into the fixings.
- 5 Fit the baffle (2) above the field in the motor housing.
- 6 Fasten the motor housing (4) to the gearbox (1) with screws.



**17**

**Refitting the carbon brushes**

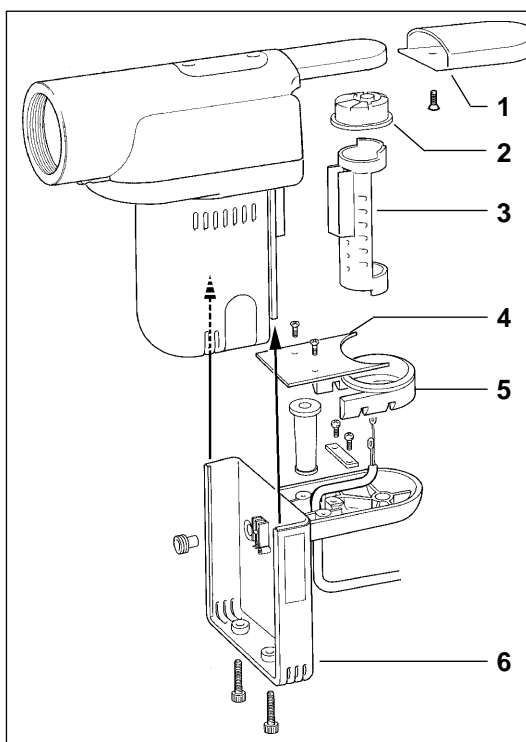
- 1 Place the cable lugs of the carbon brushes (3) on the field using tweezers or thin nose pliers.
- 2 Insert the carbon brushes into the carbon brush holders (2).
- 3 Pull the brush holder retaining springs (1) upwards and push them onto the carbon brushes.
- 4 Fasten the two carbon brush covers (4) with screws.



**18**

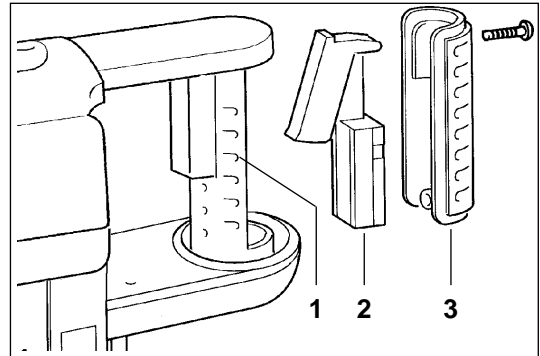
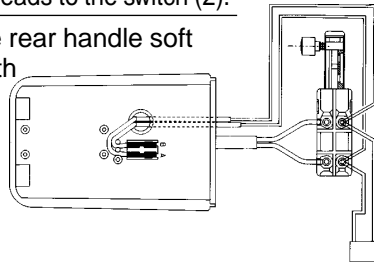
**Assembling the rear handle module**

- 1 Fit and fasten the upper handle shroud (1).
- 2 Insert the support rubbers (2 and 3) and the rear handle front.
- 3 Fit and fasten the cover plate (4).
- 4 Fit the handle cover (6) to the motor housing and take care that the electrical contacts on the inner side engage correctly in the contacts of the motor housing.
- 5 Fit and fasten the handle cover with screws.



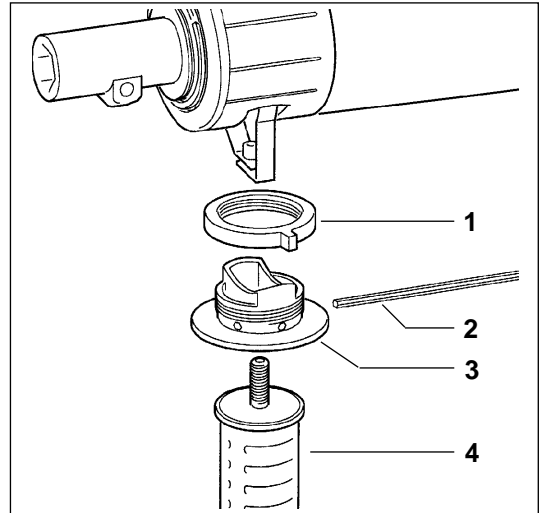
**19**

- Fitting the switch**
- 1 Insert the switch (2) into the rear handle front (1).
  - 2 Fasten the leads to the switch (2).
  - 3 Fasten the rear handle soft grip (4) with screws.



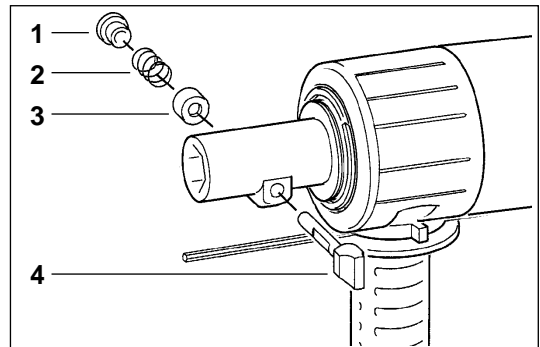
**20**

- Assembling the front handle**
- 1 Fasten the depth gauge locking ring (2) and the front handle strap guide (4) with screws (left-handed thread).
  - 2 Press together the strap lugs and fix the strap guide (4) and the depth gauge locking ring (2) on top.
  - 3 Fix the front handle (5).
  - 4 Insert the depth gauge (3) and fasten the front handle.



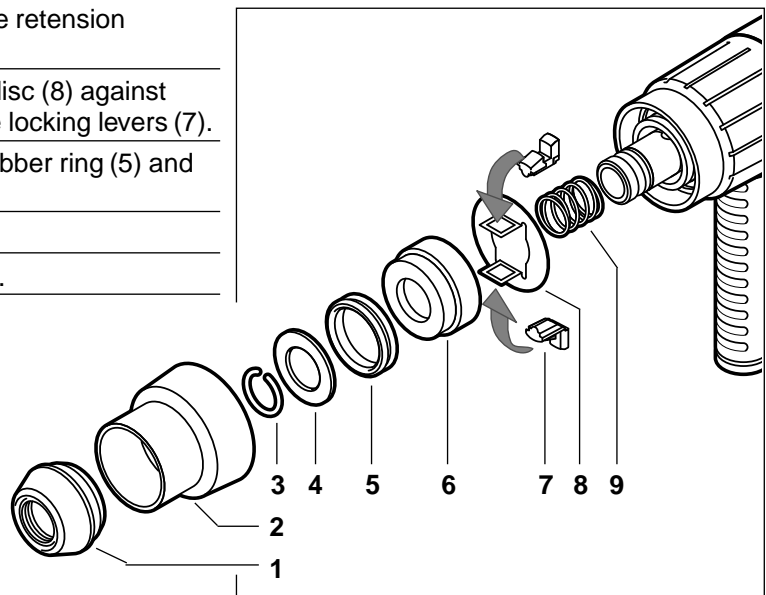
**21**

- Refitting the tool locking mechanism (PH 5 H, PH 5 F)**
- 1 Insert the latch bar (4) into the nosepiece.
  - 2 Insert the latch spring cover (3) and the spring (2).
  - 3 Insert the latch retainer (1) by hitting it lightly with a hammer until it sits flush with the nosepiece.



**PH 5 H  
PH 5 F**

- Assembling the tool locking mechanism (PH 5 S)**
- 1 Fit the spring (9) and the retension disc (8).
  - 2 Depress the retension disc (8) against resilience and insert the locking levers (7).
  - 3 Fit the sleeve (6), the rubber ring (5) and the disc (4).
  - 4 Mount the circlip (3).
  - 5 Fit the plastic sleeve (2).
  - 6 Fit the rubber cap (1).



**22**

**PH 5 S**

**Test run and electrical examination**

Carry out a test run and check for strange noises.  
Carry out an electrical test (see chapter Electrical and Mechanical Test Instruction).