Special Tools Require

■ Torx-bit with centricall 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.

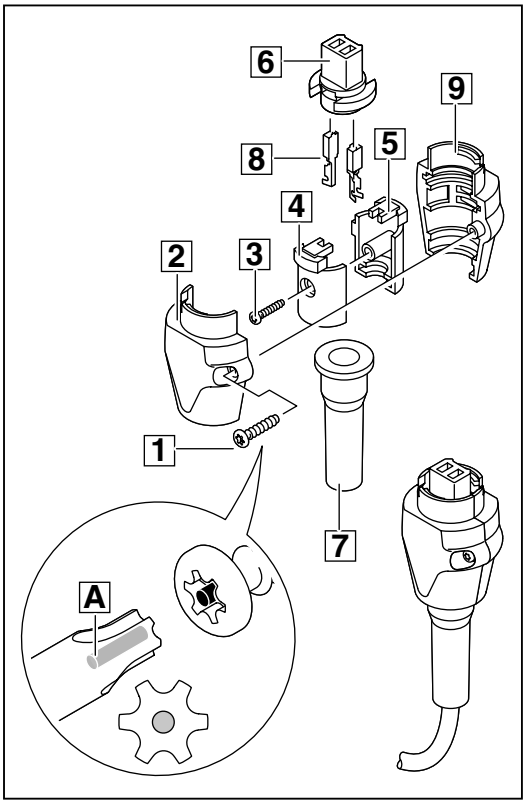
2 Loosen the screw (1) and take apart the plug into two parts (2) and (9).

☞ The screw (1) has a centrical 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.



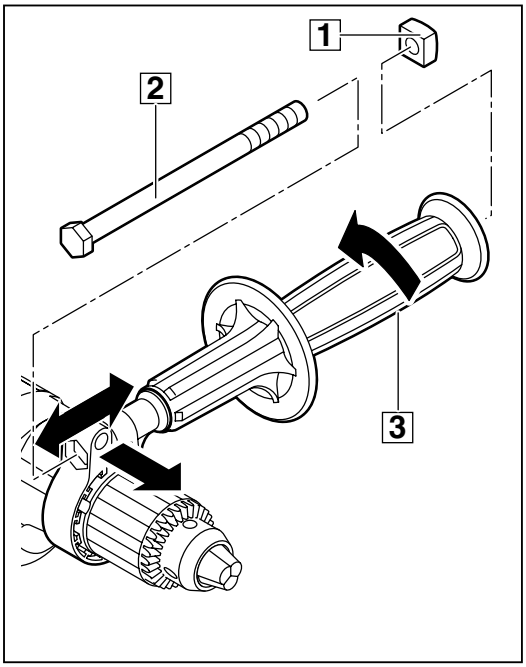
1

Macines with auxiliary handle:

Removing then auxiliary handle

1 Remove the integrated square nut (1) and the screw (2) from the auxiliary handle (3).

2 Slightly bend open the ring at the auxiliary handle (3) (double arrow) and pull it from the machine.



2

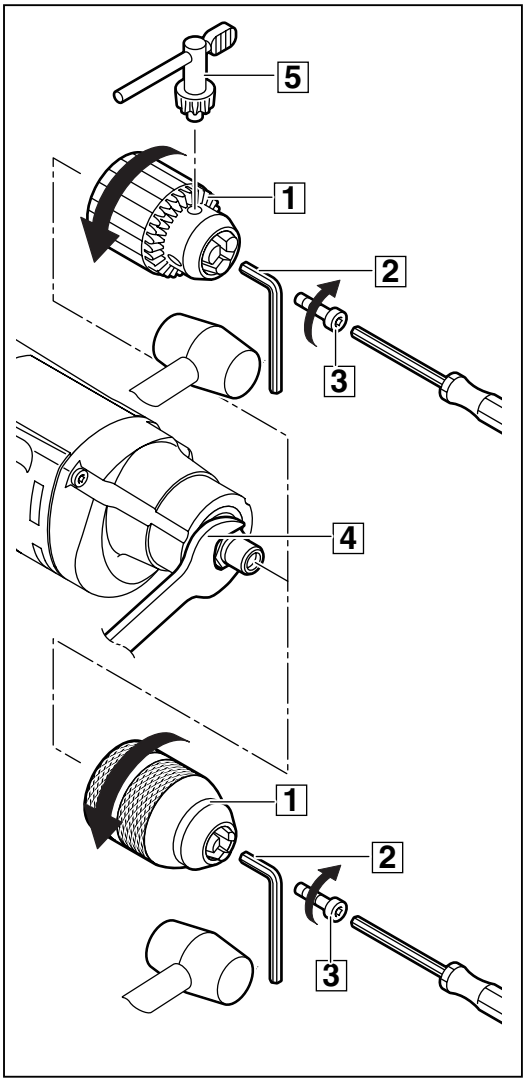
Detaching the drill chuck

1 Remove the locking screw (3) with aid of a screwdriver, turning it clockwise.

2 In case the screw (3) cannot be removed, loosen it as described below:
If there is a pilot for the wrench key, put the wrench key (4) on the pilot and hold it.
Fix the Allen key (2) in the drill chuck (1) and shortly hit the key in the unscrew-direction (right-handed thread) of the drill chuck. Then loosen the screw (3) with a screwdriver, turning it clockwise.

☞ To steady the three-jaw chuck: Insert the chuck key (5) and hold both chuck and key.

3 If there is a pilot for the wrench key on the spindle, put the wrench key (4) (SW 13) on the pilot and hold it.
Unscrew the drill chuck (1) counter-clockwise.



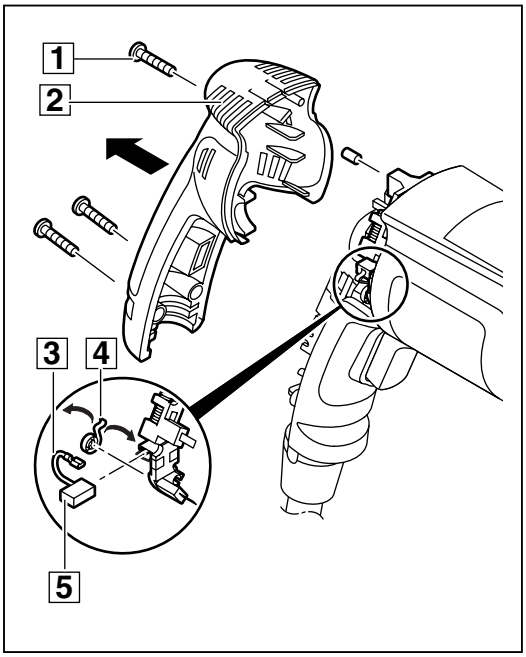
3

Detaching the carbon brushes

1 Remove three screws (1) (TX20) from the handle (2) and detach the handle (2).

2 On both sides, bend the springs (4) on the carbon brushes (5) to the side (see arrows).
Pull the carbon brushes (5) from the brush holders and remove the wires (3) from the supply terminal.

3 Remove the springs (4) on both sides.



4

Removing the armature

1 Remove three screws (3) (TX20) from the gear case (2) and pull off the gear case (2) towards the front.

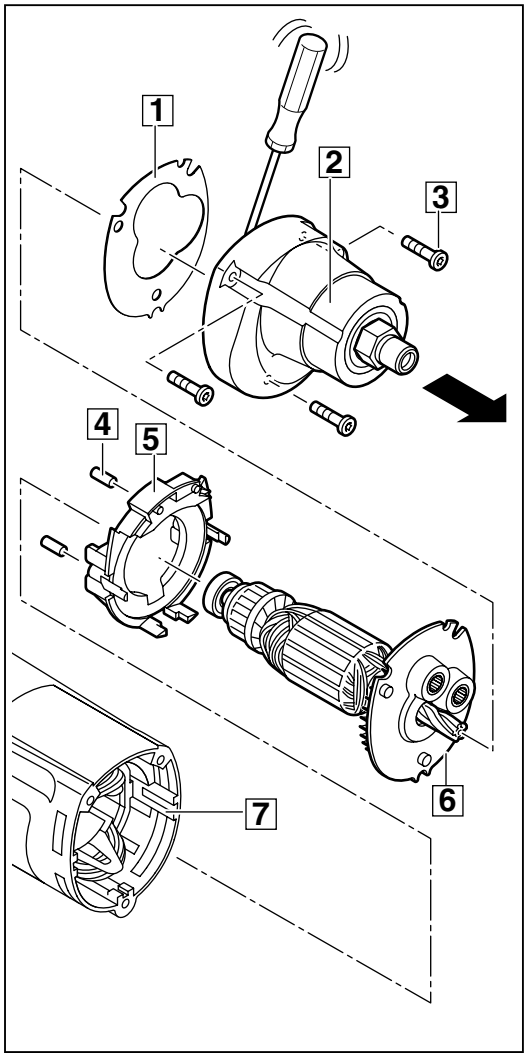
☞ In case of stiffness, lever off the gear box (2) with aid of a screwdriver!

2 Pull the complete armature assembly with bearing end plate (6) from the motor housing (7).

3 Remove the gasket (1).

4 Pull the air deflector ring (5) from the motor housing (7).

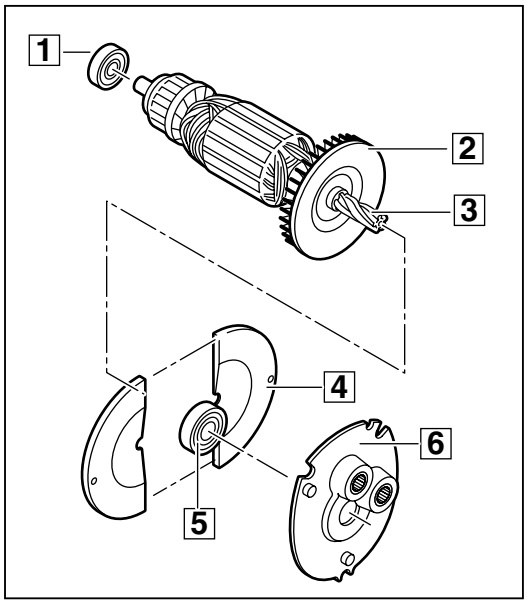
5 Remove two rubber pins (4) from the air deflector ring (5).



5

Disassembling the armature

1 Press off the following parts from the armature shaft with aid of forcing discs (4) (service tool 4931 599 018):
- bearing end plate (6)
- 2 ball bearings (5) and (1)
- fan (2).

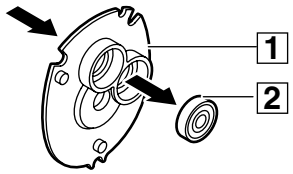


6

Machines with single-stage reducing gear:

Disassembling the bearing end plate

1 Press out the ball bearing (2) from the rear side of the bearing end plate (1) (in direction of arrow).

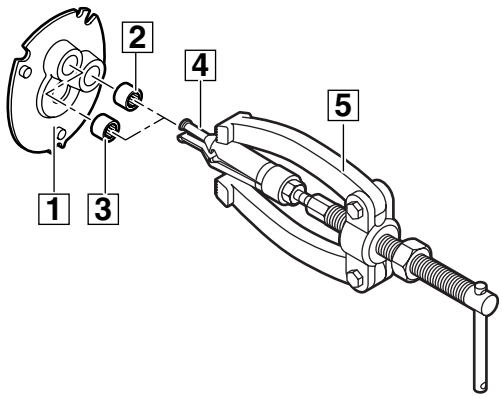


7

Machines with multiple-stage reducing gear:

Disassembling the bearing end plate

1 Pull the needle bearings (2) and (3) from the bearing end plate (1) with an interior extractor (4). Put the supporting rests (5) on the bearing end plate (1).



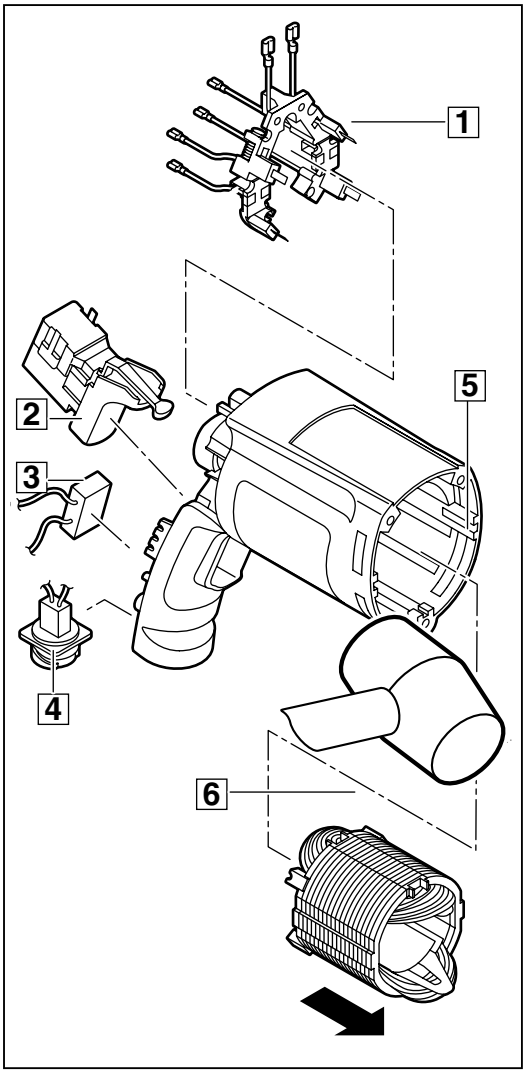
7

Removing the field and the electronic components

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

☞ In case of stiffness, hold the motor housing (5) with the open end down, and lightly tap it with a plastic hammer.

2 Remove the following parts from the rear part of the motor housing (5):
- brush holder assembly (1)
- switch (2)
- capacitor (3) with wires
- housing (4).



8

Machines with single-stage reducing gear, without FIXTEC:

Disassembling the gear

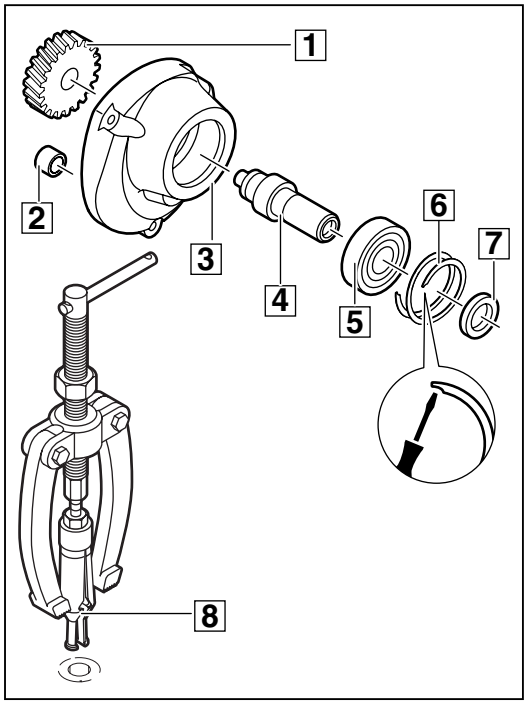
1 Remove the washer (7) from the spindle (4) and peel off the spiral locking ring (6) (e. g. with aid of a screwdriver), beginning at its notch.

2 Remove the spindle gear (1) from the spindle (4).

☞ In case of stiffness lightly tap the gear case (3) with a plastic hammer for support!

3 Pull the sleeve (2) with an interior extractor (8) from the gear case (3).

4 Press the spindle (4) and the ball bearing (5) from the gear case (3).



9

Machines with multiple-stage reducing gear, without FIXTEC:

Disassembling the gear

1 Peel off the spiral locking ring (A) (e. g. with aid of a screwdriver), beginning at its notch.

2 Remove the washer (1) from the reduction gear shaft (3).

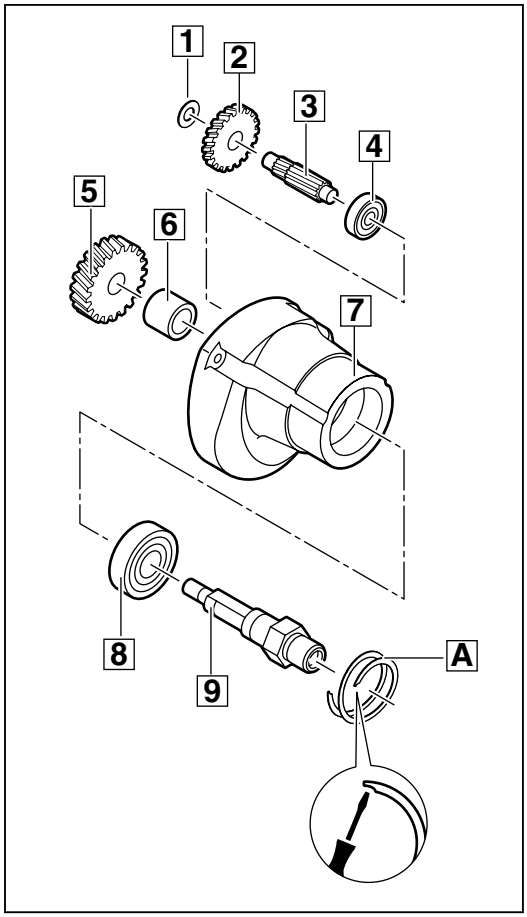
3 Pull the toothed gear (2) together with the reduction gear shaft (3) from the gear box (7).
Press off the toothed gear (2) from the reduction gear shaft (3).

4 Remove res. pull off the spindle gear (5) from the spindle (9).

☞ In case of stiffness lightly tap the gear case (7) with a plastic hammer for support!

5 Remove the distance sleeve (6) from the spindle (9).

6 Press out the spindle (9), ball bearing (8), and ball bearing (4) from the gear box (7).



9

Machines with multiple-stage reducing gear, with FIXTEC:

Disassembling the gear

1 Peel off the spiral locking ring (D) (e. g. with aid of a screwdriver), beginning at its notch.

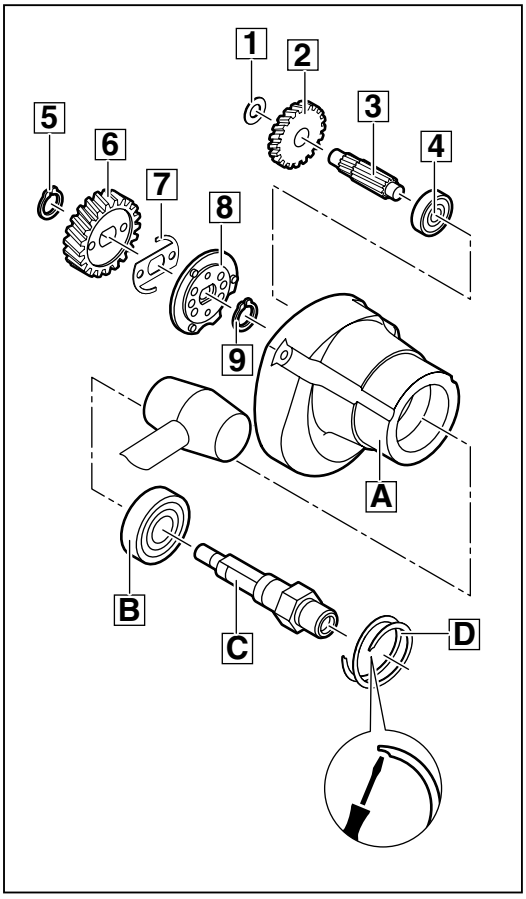
2 Remove the washer (1) from the reduction gear shaft (3).

3 Pull the toothed gear (2) together with the reduction gear shaft (3) from the gear box (A).
Press off the toothed gear (2) from the reduction gear shaft (3).

4 Remove the locking ring (5) from the spindle (C) and detach the following parts:
- spindle gear (6)
- protection washer (7)
- spindle plate (8)
- locking ring (9).

☞ In case of stiffness, lightly tap the gear case (A) with a plastic hammer for support!

5 Press out the spindle (C), ball bearing (B), and ball bearing (4) from the gear case (A).



9

Maintenance

General It is recommended to regularly submit the tool 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.

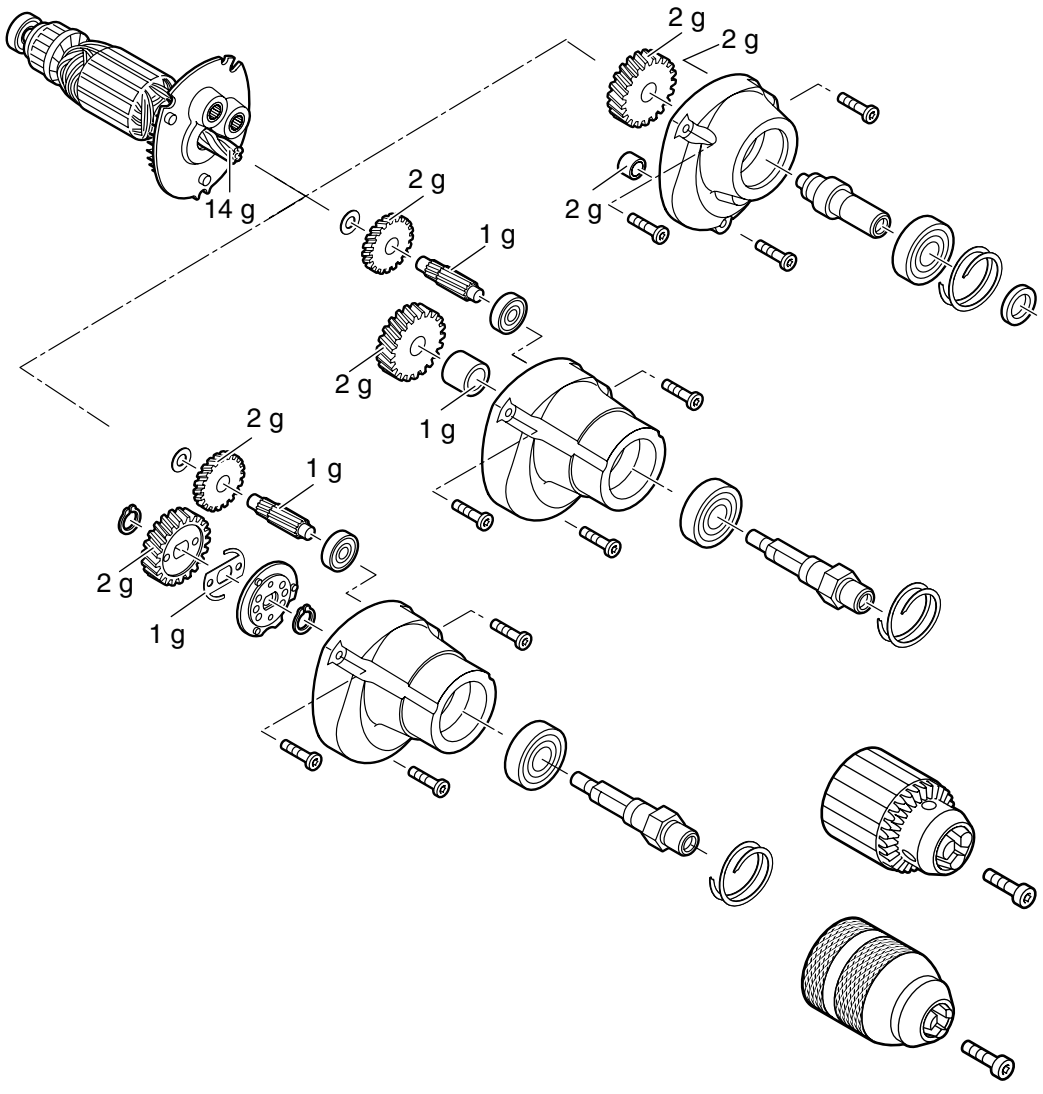
Check for wear Check the disassembled parts for wear (visual inspection) and replace worn parts.

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 lubricates 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:

- Cover res. Fill with a total of 20g grease type Y (Order No.: 49-08-5270).



Torques

Screws in plastic	1.7 Nm
Screws in metal	2.5 Nm
Screw with left-handed thread for fastening the chuck	6 Nm

Assembly

Machines with single-stage reducing gear, without FIXTEC:

Assembling the gear

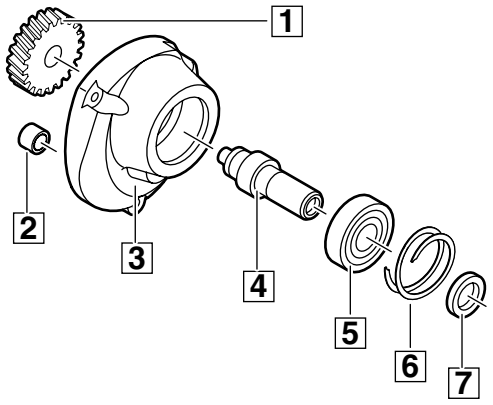
1 Press the ball bearing (5) onto the spindle (4) and press them together into the gear case (3).

2 Insert the spiral locking ring (6) into the front part of the gear case (3).

3 Insert the sleeve (2) into the gear case (3).

4 Push the spindle gear (1) over the spindle (4).

5 Push the washer (7) over the spindle (4).



1

Machines with multiple-stage reducing gear, without FIXTEC:

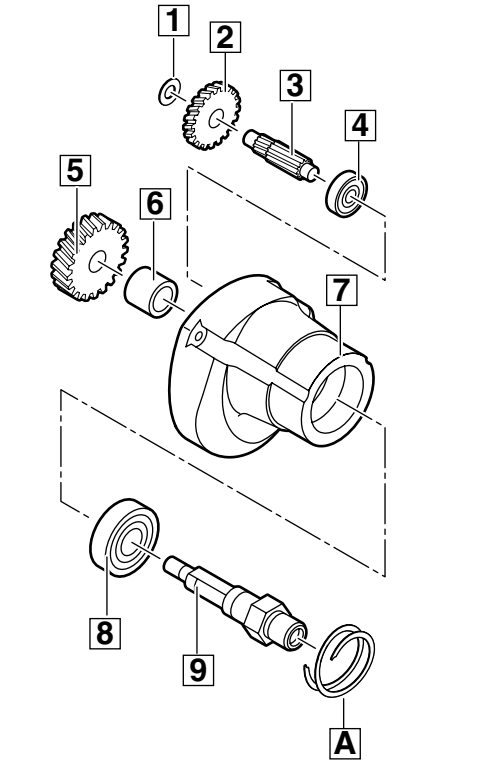
Assembling the gear

1 Press the ball bearings (8) and (4) into the gear case (7). Press the spindle (9) into the ball bearing (8).

2 Insert the spiral locking ring (A) into the front part of the gear case (7).

3 Insert the distance sleeve (6) and push the gear (5) over the end of the spindle (9).

4 Insert the reduction gear shaft (3) and push on the gear (2). Put the washer (1) on the reduction gear shaft (3).



1

Machines with multiple-stage reducing gear, with FIXTEC:

Assembling the gear

1 Press in the ball bearings (B) and (4) into the gear case (A). Press the spindle (C) into the ball bearing (B).

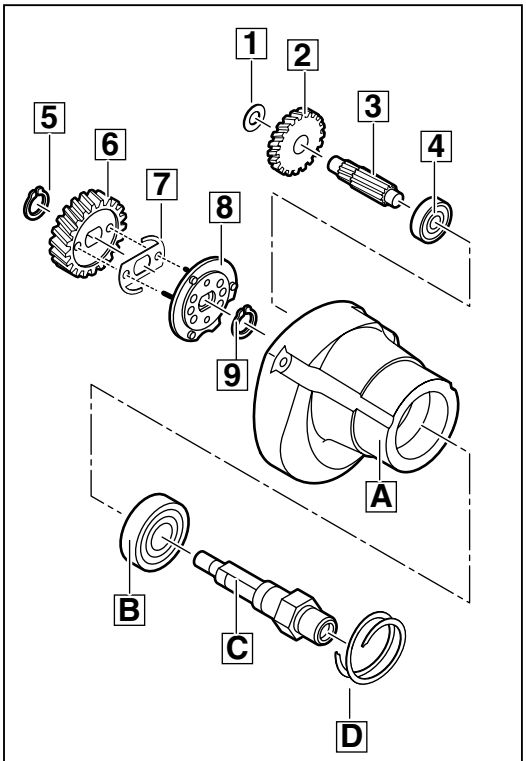
2 Insert the spiral locking ring (D) into the front part of the gear case (A).

3 Mount the following parts on the spindle (C):
- locking ring (9)
- spindle plate (8) (mind the right position!)
- protection washer (7)
- spindle gear (6)
- locking ring (5).

☞ The two pins of the spindle plate (8) must penetrate the protection washer (7) and the spindle gear (6) (see dotted lines)!

4 Press the gear wheel (2) onto the reduction gear shaft (3) and insert them both into the gear case (A).

5 Push the washer (1) over the reduction gear shaft (3).



1

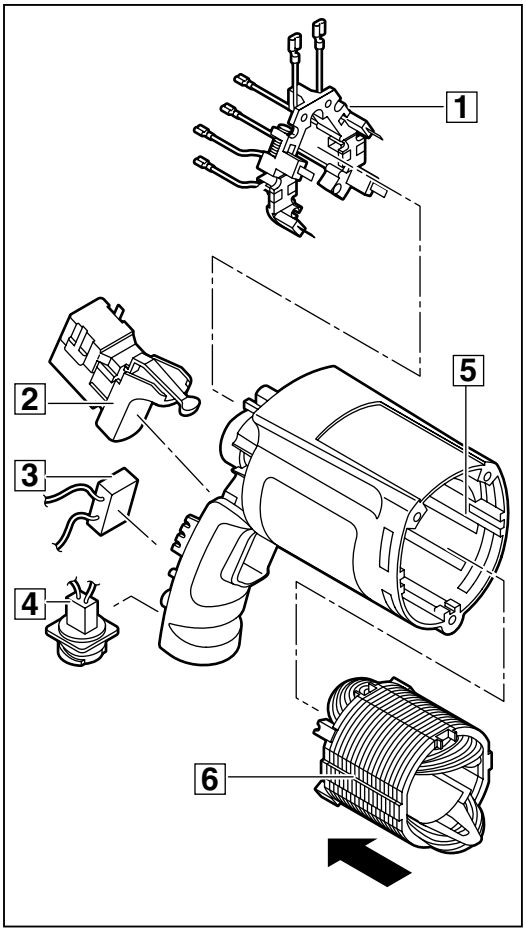
Mounting the field and the electronic parts

1 Insert the field (6) into the motor housing (5) (plug-in connection).

2 Insert the following parts into the rear part of the motor housing (5):
- brush holder assembly (1)
- switch (2)
- capacitor (3) with wires
- housing (2).

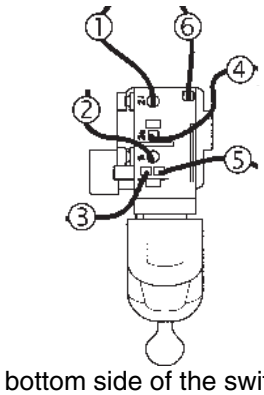
☞ For wiring machines with chuck width 10 mm and 13 mm: pay attention to the wiring diagram on page 10!

☞ For wiring machines with chuck width 6 mm: pay attention to the wiring diagram on page 11!

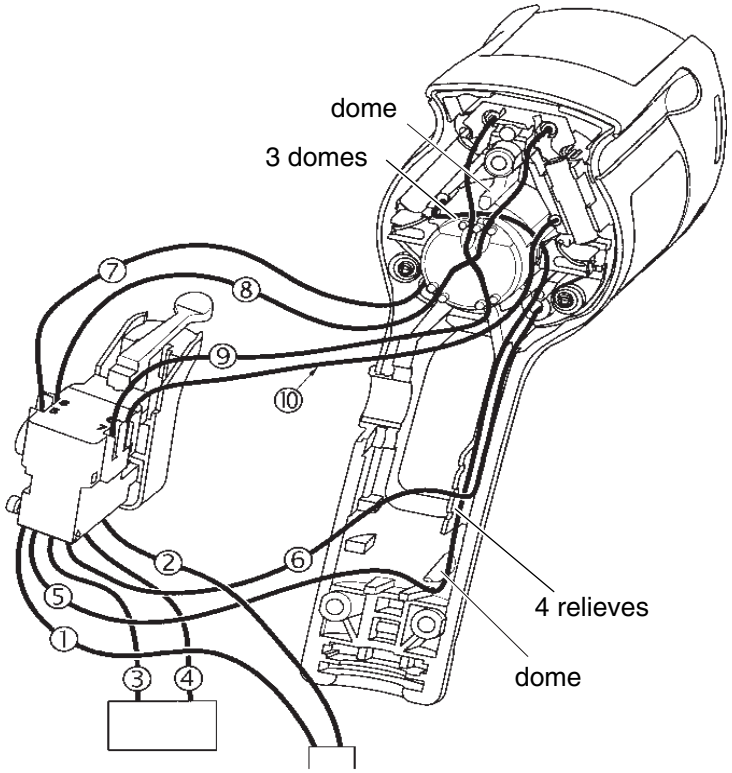


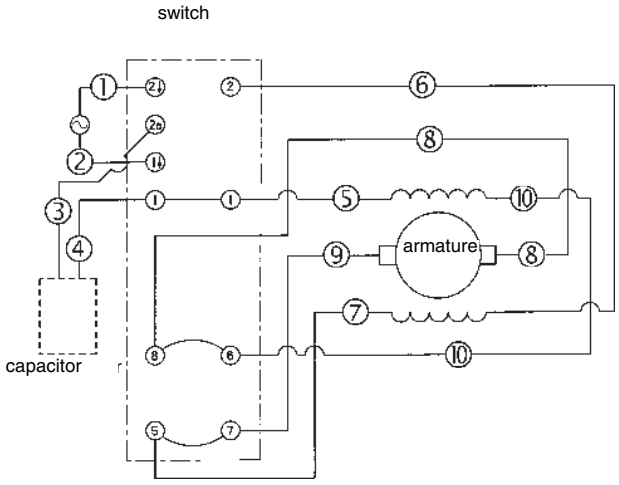
2

Wiring diagram for machines with chuck width 10 mm and 13 mm



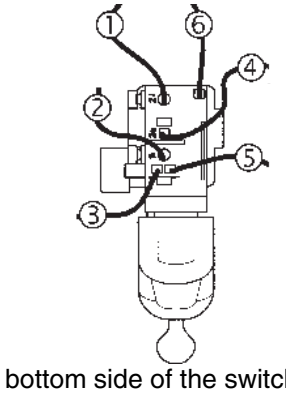
bottom side of the switch



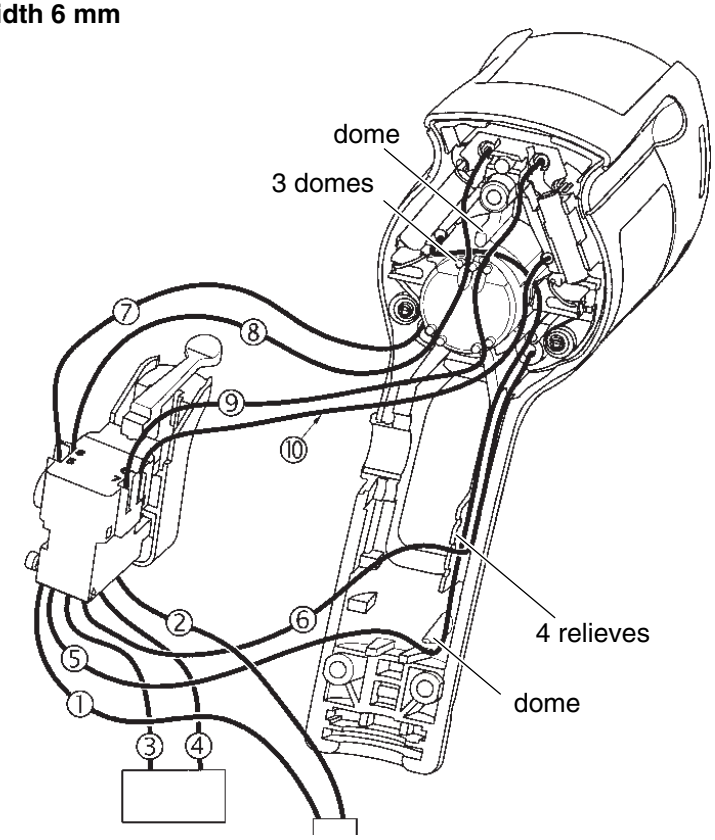


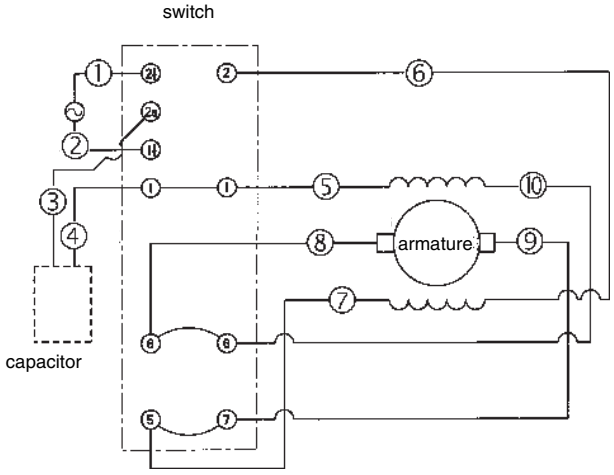
Wire No.	Colour	Function	Position and print on the switch
1	brown	connection between plug and switch	bottom side, on 2⇩
2	blue	connection between plug and switch	bottom side, on 1⇩
3	black	connection between capacitor and switch	bottom side, on 1 or 2a
4	black	connection between capacitor and switch	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	white	connection between carbon brush holder and switch	on the side, on 8
9	blue	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

Wiring diagram for machines with chuck width 6 mm



bottom side of the switch



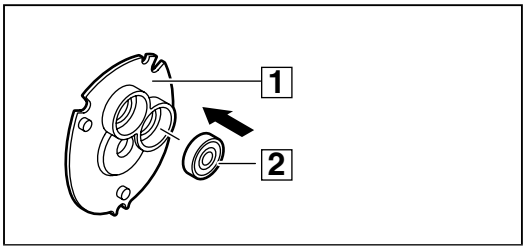


Wire No.	Colour	Function	Position and print on the switch
1	brown	connection between plug and switch	bottom side, on 2⇩
2	blue	connection between plug and switch	bottom side, on 1⇩
3	black	connection between capacitor and switch	bottom side, on 1 or 2a
4	black	connection between capacitor and switch	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

Machines with single-stage reducing gear:

Assembling the bearing end plate

1 Press the ball bearing (2) into the bearing end plate (1) (in direction of arrow).

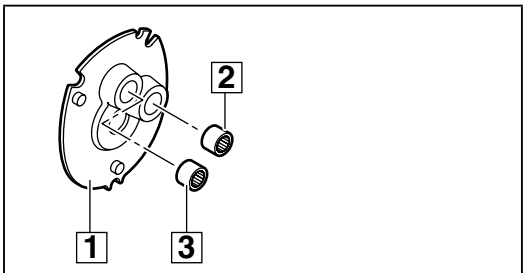


3

Machines with multiple-stage reducing gear:

Assembling the bearing end plate

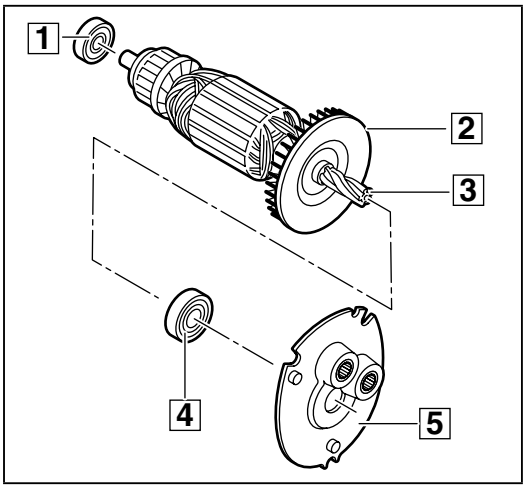
1 Press the ball bearings (2) and (3) into the bearing end plate (1).



3

Assembling the armature

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



4

Inserting the armature

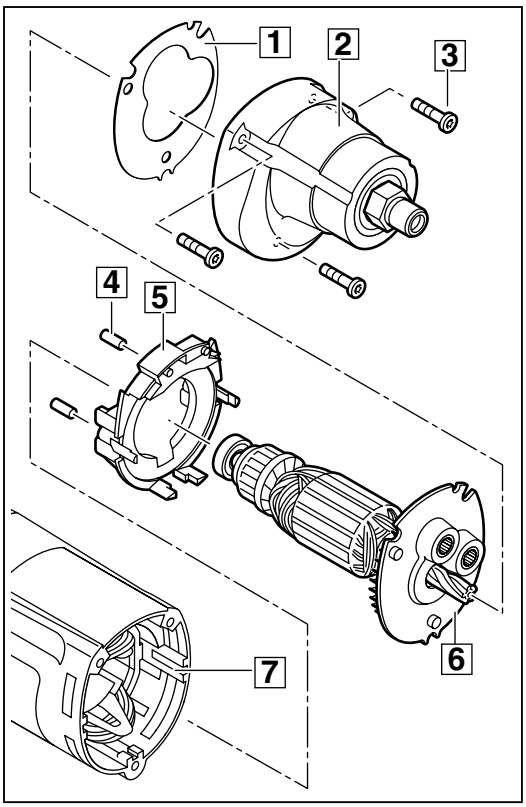
1 Insert two rubber pins (4) into the air deflector ring (5).

2 Insert the air deflector ring (5) into the motor housing (7).

3 Insert the complete armature assembly with the bearing end plate (6) into the motor housing (7).

4 Insert the gasket (1) into the gear case (2).

5 Assemble the gear case (2) with the motor housing (7) and fix them with three screws (3) (TX20).



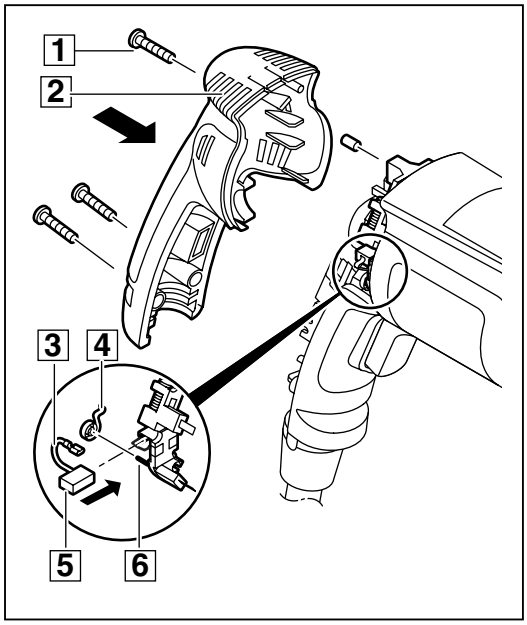
5

Mounting the carbon brushes

1 Insert the carbon brushes (5) into the brush holders on both sides, and connect the wire (3) with the contact.

2 Put the spring (4) on the dome (6) on both sides: the spring end must push the carbon brush against the collector.

3 Mount the handle (2) on the machine and fix it with three screws (1) (TX20).

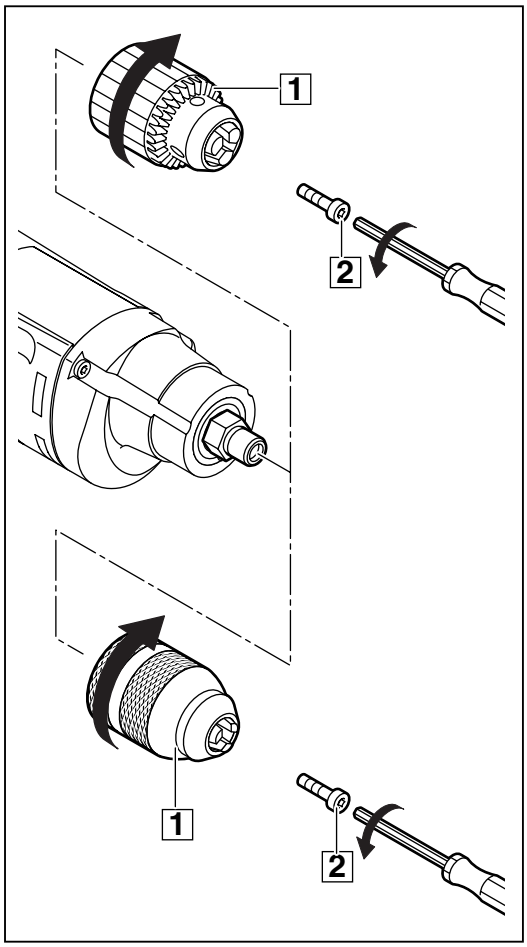


6

Mounting the chuck

1 Screw down the chuck (1) clockwise.

2 Tighten the screw (2) counter-clockwise with 6 Nm.



7

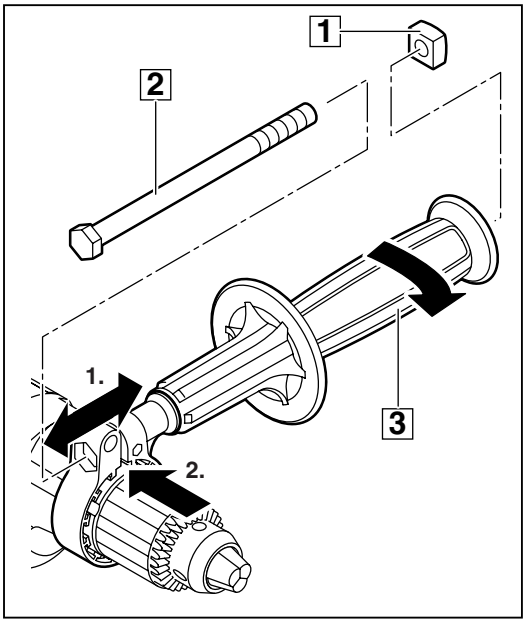
Machines with auxiliary handle:

Mounting the auxiliary handle

1 Insert the square nut (1) into the auxiliary handle (3).

2 Slightly bend open the ring on the auxiliary handle (3) as shown in illustration (1.) (double arrow) and pull it over the front of the machine (2.).

3 Tighten the screw (2) in the auxiliary handle (3).



8

Mounting the QUIK-LOK cable

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!

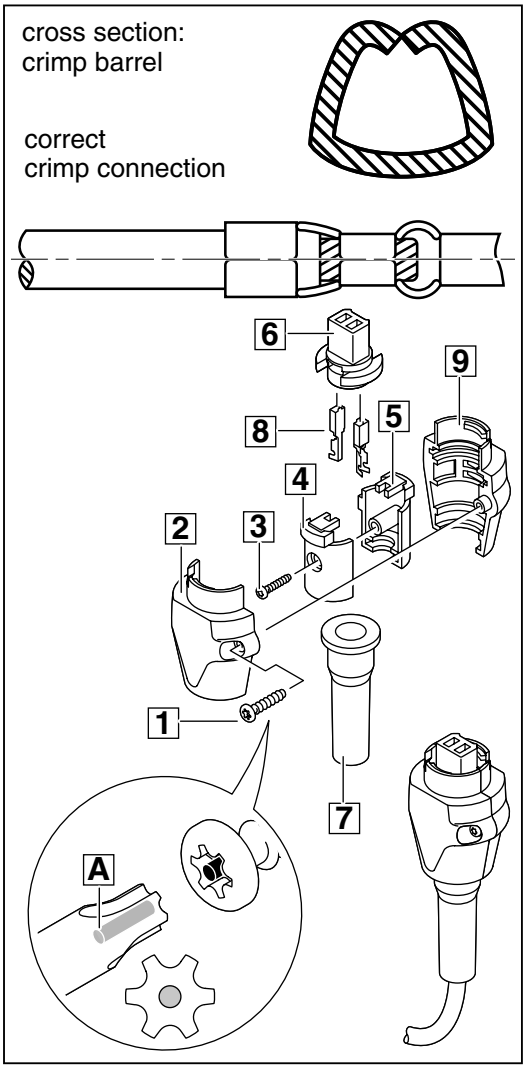
2 Insert the crimping contacts (8) with wires (6) into the sleeve.

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 centrical pin (see enlargment). It can only be fastened with a Torx screwdriver with a respective centrical 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).



9

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).