Metal core drilling

Repair instructions



Applies to:

KBE 50-2 (A), KBE 50-2 (B), KBE 50-2 (C)

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1 Models described

These repair instructions describe how to repair the following models:

Model	Material number
KBE 50-2 (A)	7 270 63 .. .. .
KBE 50-2 (B)	7 270 67 .. .. .
KBE 50-2 (C)	7 270 81 .. .. .

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2 Technical data

Technical data

The complete technical data can be found in the operating instructions for the model.

Troubleshooting

Troubleshooting for all devices can be found in the FEIN electronic information system.

Specific test specifications and measured values

Up-to-date test data for all devices can be found in the FEIN electronic information system.

Special tools, lubricants and auxiliary substances

The special tools catalogue and the lubricants and container sizes available from FEIN can be found in the FEIN electronic information system.

Lists of spare parts

Lists of spare parts and exploded views are available online in our spare parts catalogue, which can be accessed via the FEIN website.

Connection diagram

Lists of spare parts and exploded views can be found in the FEIN electronic information system.

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3 Symbols used

	Refers to measures for avoiding the risk of injuries.
	Caution: Crushing hazard
	Refers to information or instructions that should be followed. Non-observance can result in damage or malfunctions.
	Read the operating instructions.
	Indicates notes that provide information or instructions that may provide a better understanding and contribute to the more effective use of the product.
	Part of the navigation interface.

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4 Notes and requirements

Please note

These instructions are only intended for persons with suitable technical training. It is assumed that the reader has mechanical and electrical training.

Only use original FEIN spare parts.

PLEASE NOTE:

Read the operating instructions for the product before carrying out the repair work.

Provisions

Please note that power tools may only be repaired, maintained and checked by a trained electrician, as improper repair can result in serious risks to the user.

Outside Germany, the regulations applicable in the relevant country must be observed.

The provisions set out in ***DIN VDE 0701-0702*** should be observed after repairs.

The relevant accident prevention regulations are to be observed during commissioning.

The German Equipment and Product Safety Act [ProdSG] applies for correct use.

Disclaimer

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5 Safety instructions

5.1 Structure

SIGNAL WORD FOR THE DANGER CLASSIFICATION.

Type and source of the danger.

Possible consequences.

Measure that must be taken in order to avoid this danger.

5.2 Danger classification

Warning

This warning refers to a dangerous situation. If the situation is not avoided, this may result in severe injuries or death.

WARNING!

Type and source of the danger.

Possible consequences.

Measure that must be taken in order to avoid this danger.

Caution

This warning refers to a potentially dangerous situation. If the situation is not avoided, this may result in slight or minor injuries. This may also be used as a warning against material damage.

CAUTION!

Type and source of the danger.

Possible consequences.

Measure that must be taken in order to avoid this danger.

Please note

Indicates a potentially harmful situation. If this situation is not avoided, the product or an object in its environment could be damaged.

PLEASE NOTE:

Type and source of the danger.

Damage to the product or its environment.

Measure that must be taken in order to avoid this danger.

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5.3 Information

Indicates notes that provide information or instructions that may provide a better understanding and contribute to the more effective use of the product.

INFORMATION
Tip

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6 Tools, lubricants and auxiliary substances required

6.1 Standard tools

Cross-head screwdriver	PH2
Torx	T20
Slotted screwdriver	125x7
Socket head wrench set	
Circlip pliers	
Plastic hammer	
Arbor press	
Long-nosed pliers	
Combination pliers	
Socket wrench	7 mm
Sleeve	60 mm inner diameter 85 mm outer diameter; 56 mm inner diameter 60 mm outer diameter; 36 mm inner diameter 55 mm outer diameter; 24 mm inner diameter 42 mm outer diameter; 26 mm inner diameter 30 mm outer diameter; 8 mm inner diameter 21 mm outer diameter; 12 mm inner diameter 27 mm outer diameter; 8 mm inner diameter 20 mm outer diameter; 7 mm inner diameter 26 mm outer diameter; 10 mm inner diameter 21 mm outer diameter; 15 mm inner diameter 30 mm outer diameter
Torque wrench with hexagon socket fixture	2.5 mm

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6.2 Special tools

Assembly aid		64122121010
Drawing-off socket cap		64104150000
Chuck cone	19 mm diameter	64107019007
	26 mm diameter	64107026000

6.3 Lubricants and auxiliary substances required

Grease	04013203000	130 g	Gearbox
Grease	04012803000		Guide, gear rack

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7 Test and diagnostics options

Not currently available.

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8 Removal

8.1 Removing the container



INFORMATION

Tip

Fluid may be present in the container.

- Always drain the container (**1**) before disassembly.

1. Remove the container (**1**).
2. Remove the hose (**2**) from the hose socket.

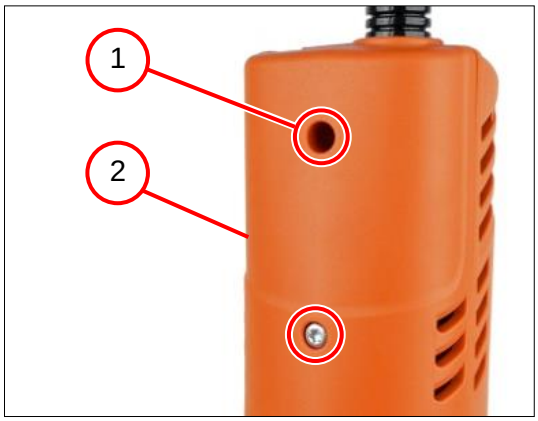
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8.2 Removing the motor housing

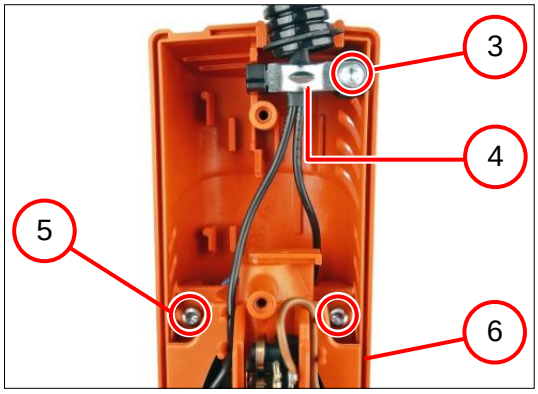
8.2.1 Removing the connecting cable

Tool(s):

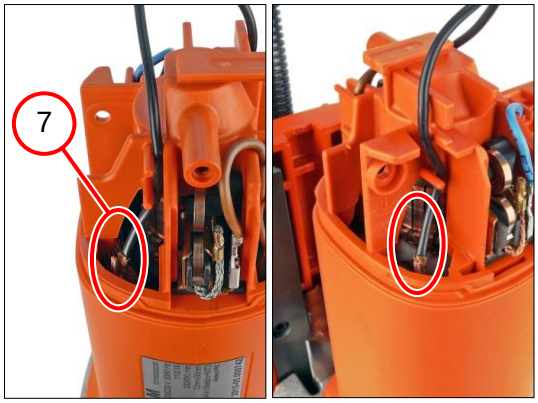
- Torx T15



1. Unscrew the two screws (**1**).
2. Remove the cover (**2**).



3. Unscrew the screw (**3**).
4. Remove the cable clamping piece (**4**).
5. Unscrew the two screws (**5**).
6. Remove the cover (**6**).



7. Remove the two strands (**7**).

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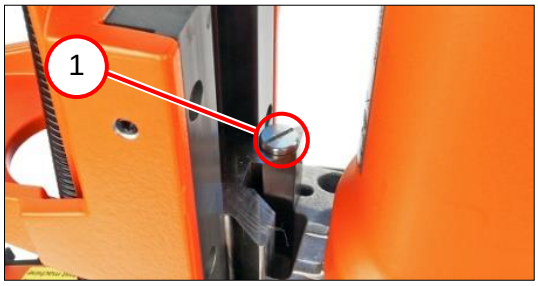
8.2.2 Removing the drill motor

Steps that must be completed:

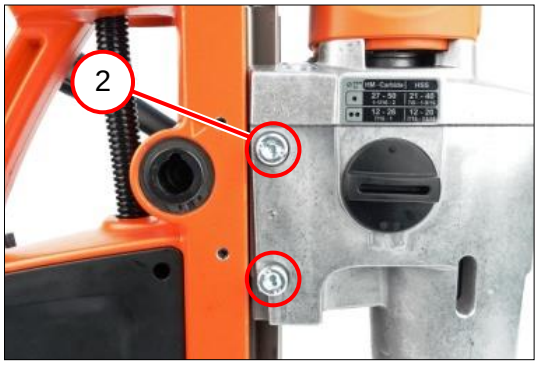
- Removing the container
- Removing the connecting cable

Tool(s):

- Slotted screwdriver
- Socket head wrench, 6 mm



1. Unscrew the flat-head screw (**1**).



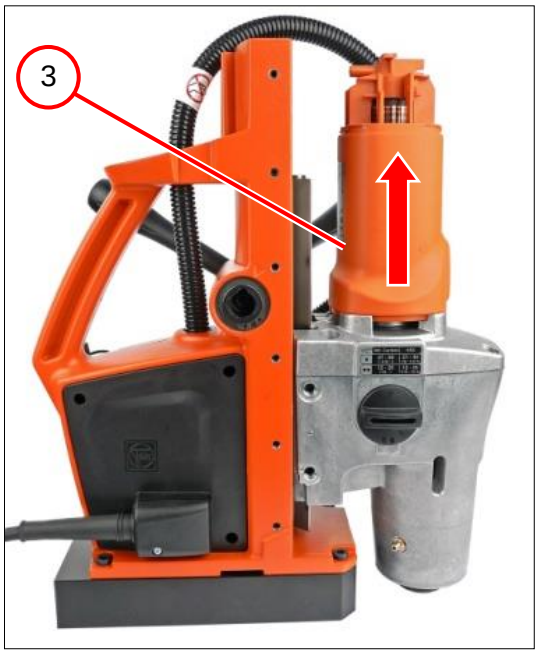
CAUTION!

Crushing hazard around the drill motor

Crushing can occur.

Move the drill motor down using the spider, before the two screws (**2**) are unscrewed.

2. Unscrew the two screws (**2**).



3. Slide the drill motor (**3**) out of the guide.

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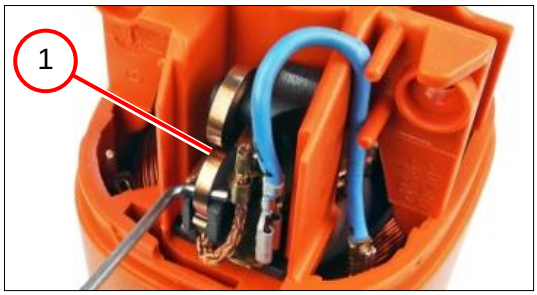
8.2.3 Removing the carbon brushes

Steps that must be completed:

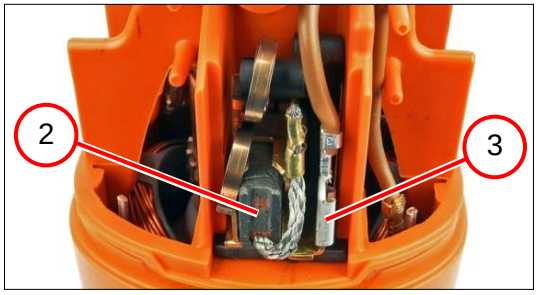
- Removing the connecting cable

Tool(s):

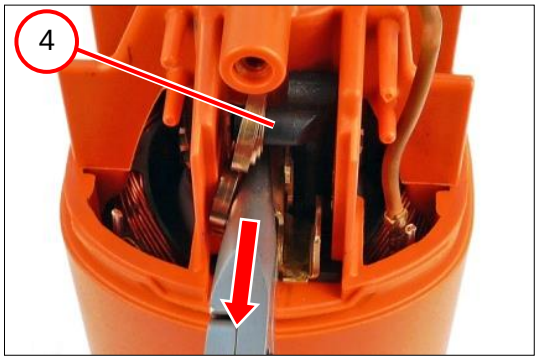
- Assembly aid
- Long-nosed pliers



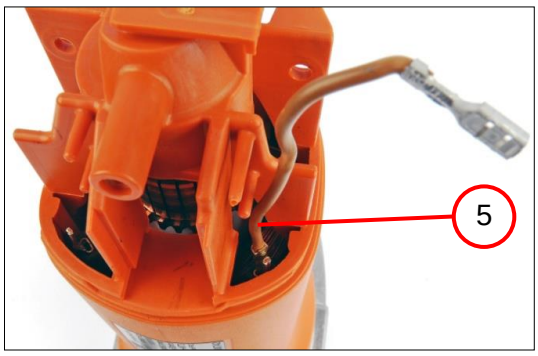
1. Lift up the spring (**1**).



2. Remove the carbon brush (**2**).
3. Pull off the plug (**3**).



4. Remove the carbon brush holder (**4**).



5. Disconnect the cable (**5**).
6. Repeat steps 1 to 5 on the opposite side of the machine.

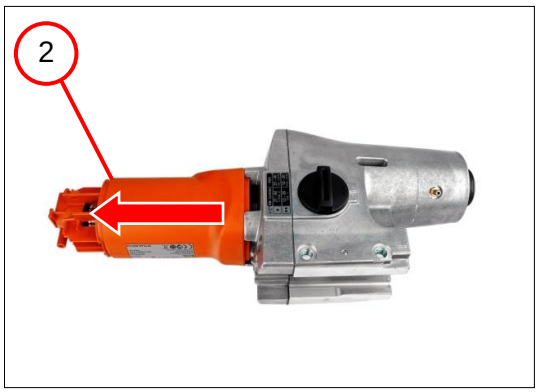
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8.2.4 Removing the motor housing

Steps that must be completed: - Removing the connecting cable - Removing the drill motor
Tool(s): - Socket head wrench, 5 mm



1. Unscrew the four screws (**1**).



2. Remove the motor (**2**).

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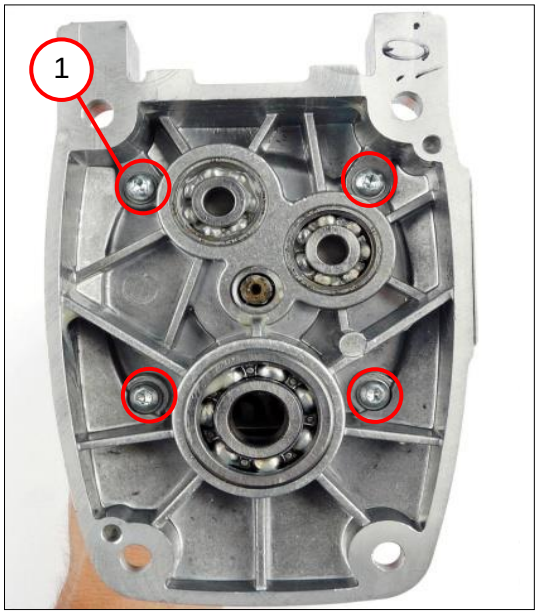
8.2.5 Removing the intermediate gear box

Steps that must be completed:

- Removing the connecting cable
- Removing the drill motor
- Removing the carbon brushes
- Removing the drill motor

Tool(s):

- Torx T20



1. Unscrew the four screws (**1**).



2. Remove the intermediate gear box (**2**).

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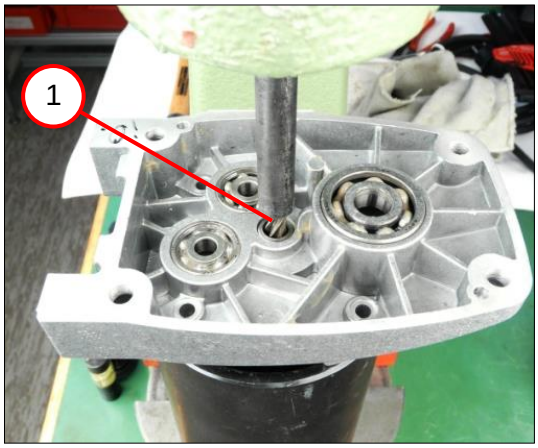
8.2.6 Removing the intermediate gear box

Steps that must be completed:

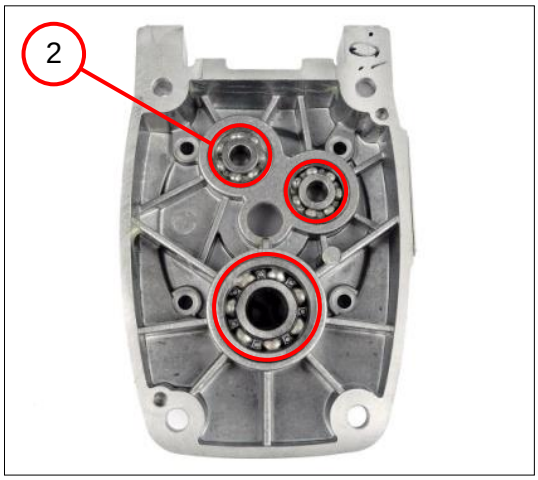
- Removing the connecting cable
- Removing the drill motor
- Removing the carbon brushes
- Removing the drill motor
- Removing the intermediate gear box

Tool(s):

- Arbor press
- Inner puller
- Sleeve
  60 mm inner diameter
  85 mm outer diameter
- Punch, dia. 7 mm



1. Press out the armature (**1**).



2. Remove the three grooved ball bearings (**2**).

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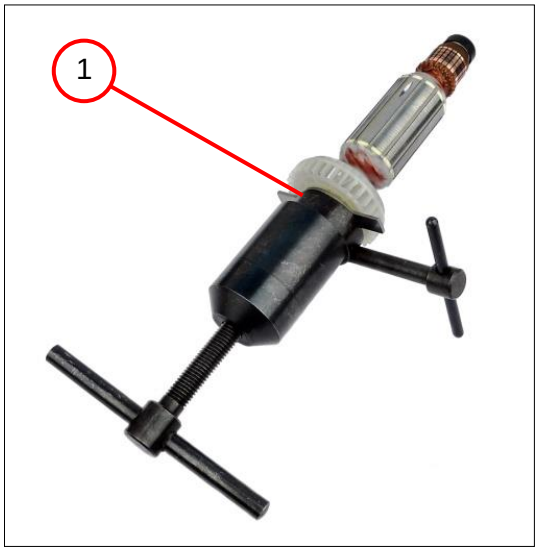
8.2.7 Removing the armature

Steps that must be completed:

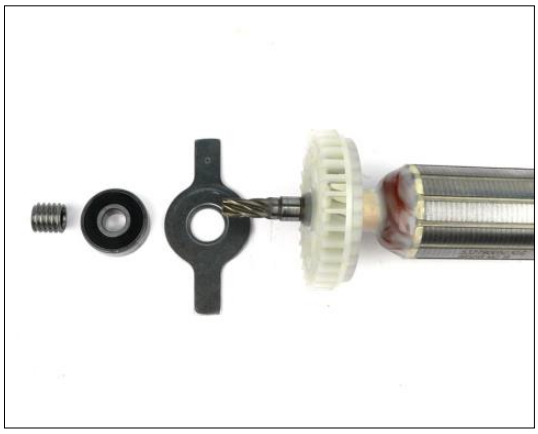
- Removing the connecting cable
- Removing the drill motor
- Removing the carbon brushes
- Removing the drill motor
- Removing the intermediate gear box
- Removing the intermediate gear box

Tool(s):

- Drawing-off socket cap
- Chuck cone, 26 mm; 19 mm



1. Remove the grooved ball bearing (**1**).

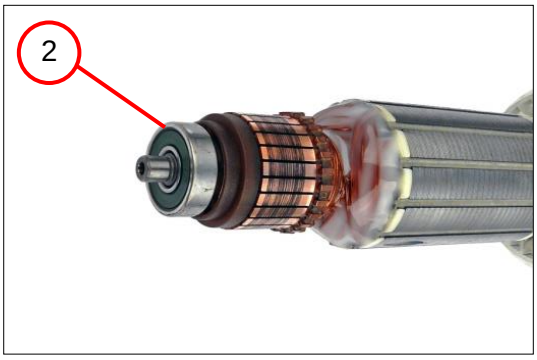


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8.2.7 Removing the armature



2. Remove the bearing bush (**1**).



3. Remove the grooved ball bearing (**2**).

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8.2.8 Removing the motor housing

Steps that must be completed:

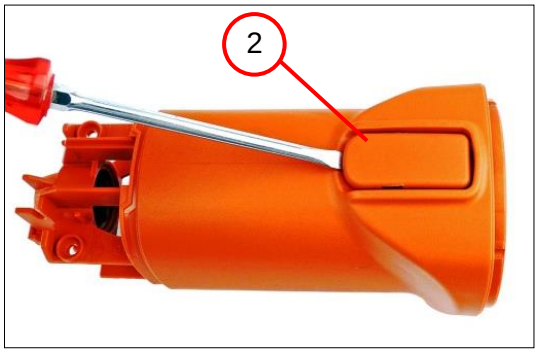
- Removing the connecting cable
- Removing the drill motor
- Removing the carbon brushes
- Removing the drill motor
- Removing the intermediate gear box

Tool(s):

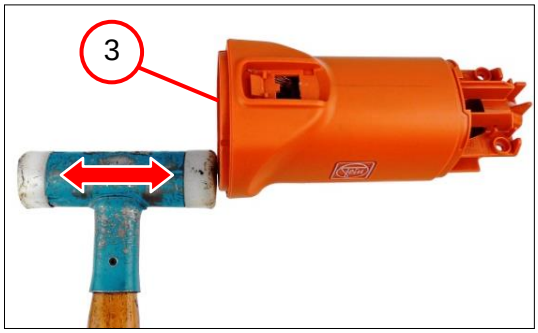
- Slotted screwdriver
- Plastic hammer



1. Remove the air guide ring (**1**).



2. Remove the cover (**2**).



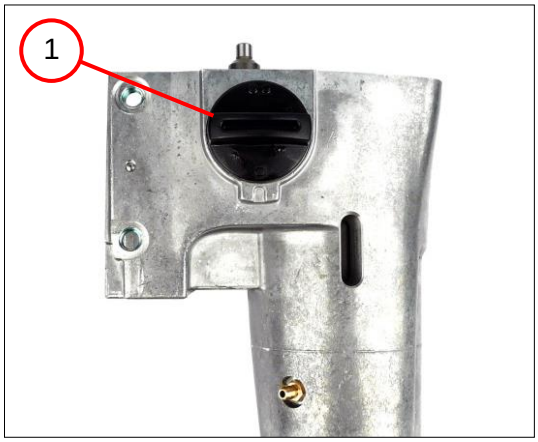
3. Remove the stator (**3**).

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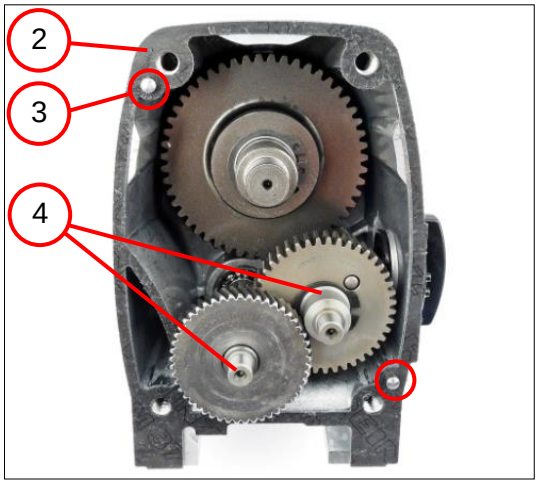
8.3 Removing the gearbox housing

8.3.1 Removing the gearbox parts

Steps that must be completed: - Removing the connecting cable - Removing the drill motor - Removing the motor housing
Tool(s): - Combination pliers - Circlip pliers



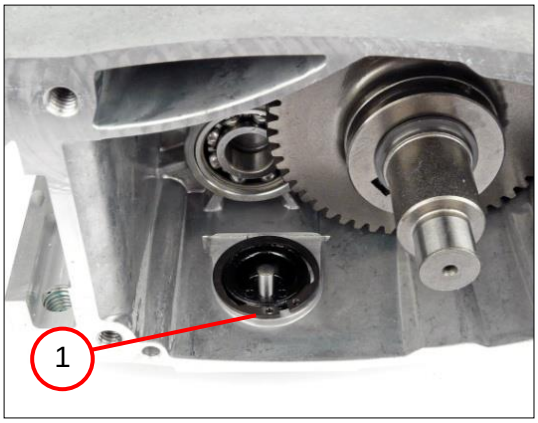
1. Turn the rotary knob (**1**) to the “•” position.



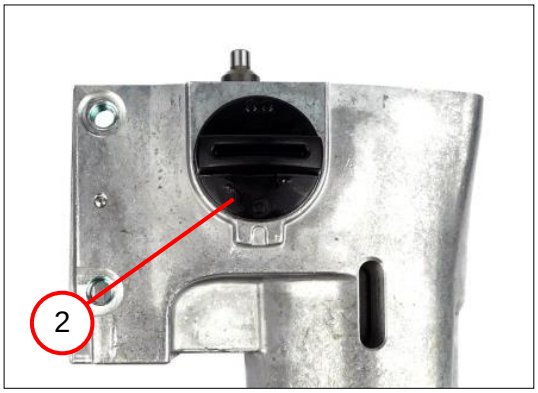
2. Remove the seal (**2**).
3. Remove the two straight pins (**3**).
4. Remove the two gear wheels (**4**).

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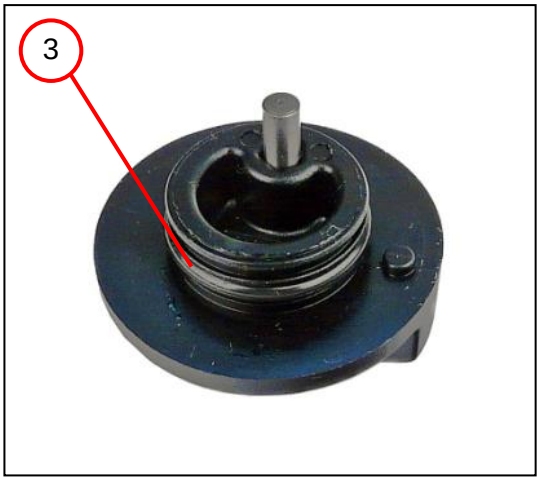
8.3.1 Removing the gearbox parts



5. Remove the circlip (**1**).



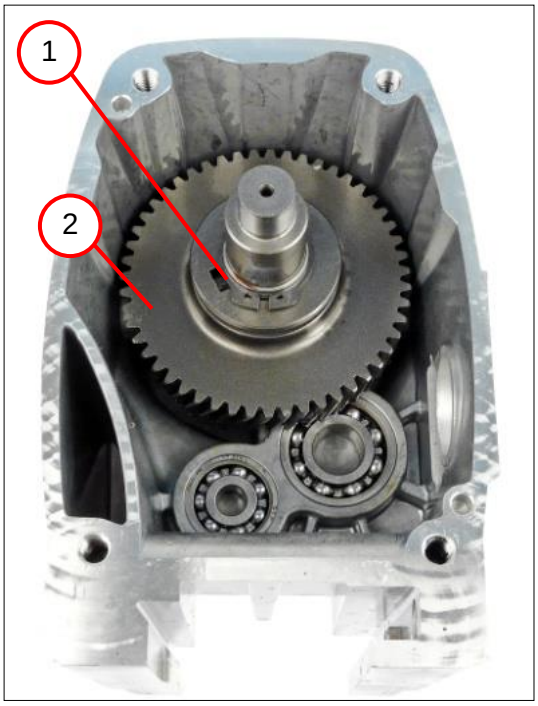
6. Remove the rotary knob (**2**).



7. Remove the sealing ring (**3**).

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8.3.1 Removing the gearbox parts



8. Remove the circlip (**1**).
9. Remove the gearwheel (**2**).

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8.3.2 Removing the shaft

Steps that must be completed:

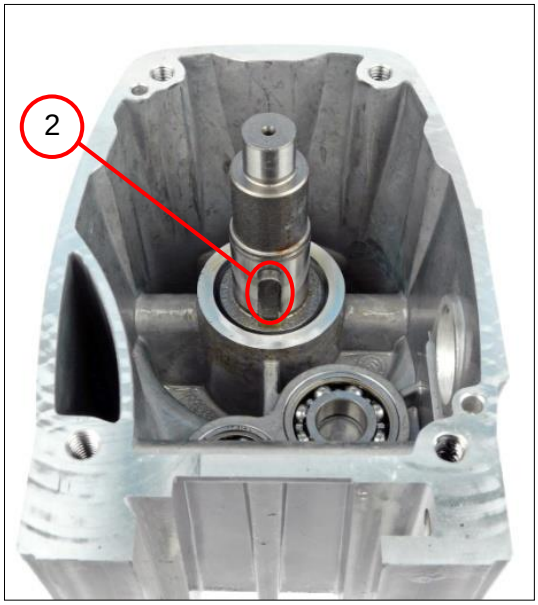
- Removing the connecting cable
- Removing the drill motor
- Removing the motor housing
- Removing the gearbox parts

Tool(s):

- Circlip pliers
- Combination pliers
- Arbor press
- Sleeve
  56 mm inner diameter; 60 mm outer diameter



1. Remove the circlip (**1**).



2. Remove the feather key (**2**).

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8.3.2 Removing the shaft



3. Press out the shaft (**1**).

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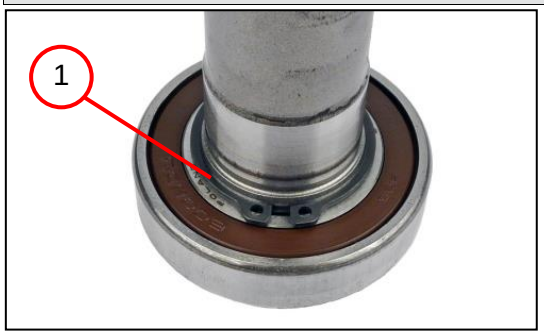
8.3.3 Removing the shaft

Steps that must be completed:

- Removing the connecting cable
- Removing the drill motor
- Removing the motor housing
- Removing the gearbox parts

Tool(s):

- Circlip pliers
- Arbor press
- Sleeve
  36 mm inner diameter; 55 mm outer diameter



1. Remove the circlip (**1**).



2. Press the grooved ball bearing (**2**) off the shaft.

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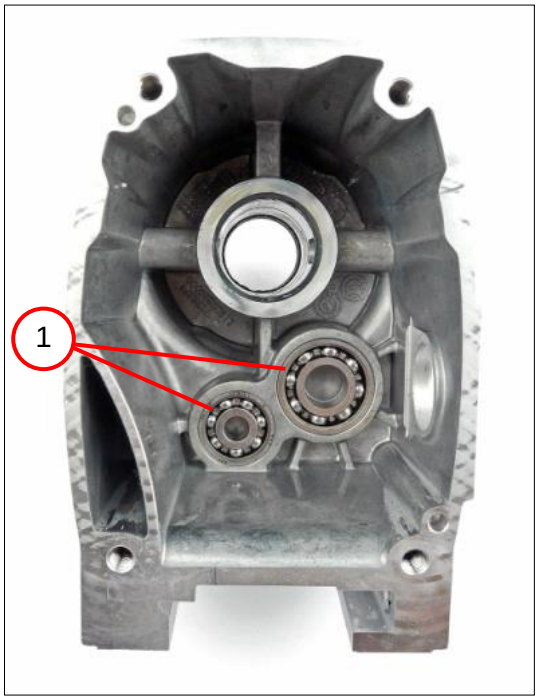
8.3.4 Removing the gearbox parts

Steps that must be completed:

- Removing the connecting cable
- Removing the drill motor
- Removing the motor housing
- Removing the gearbox parts
- Removing the shaft

Tool(s):

- Circlip pliers
- Combination pliers
- Arbor press
- Sleeve
  36 mm inner diameter; 55 mm outer diameter
  24 mm inner diameter; 42 mm outer diameter
- Socket wrench
- Socket wrench insert, 7 mm
- Slide hammer
- Inner puller
- Slotted screwdriver
- Punch, 7 mm



1. Remove the two grooved ball bearings (**1**).

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8.3.4 Removing the gearbox parts



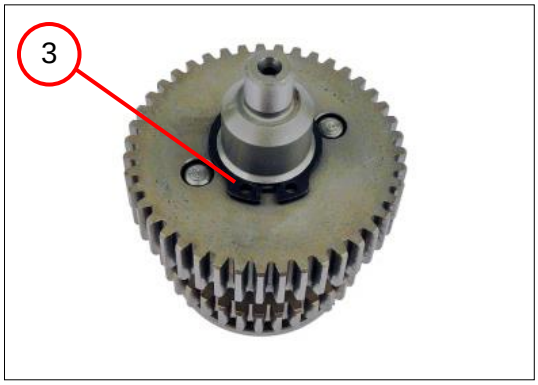
2. Remove the hose socket (**1**).



INFORMATION

The sealing rings (**2**) are destroyed during disassembly and must be replaced.

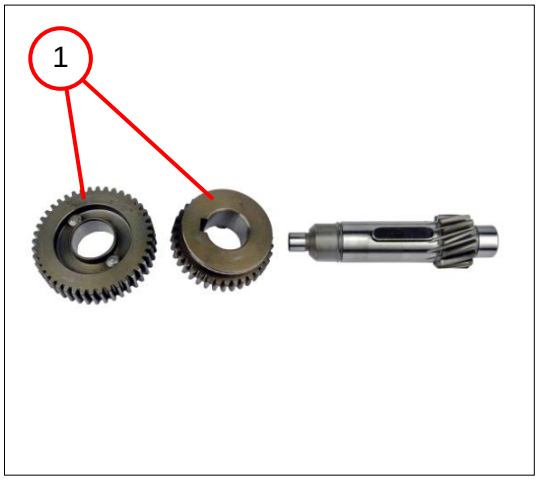
3. Remove the three sealing rings (**2**).



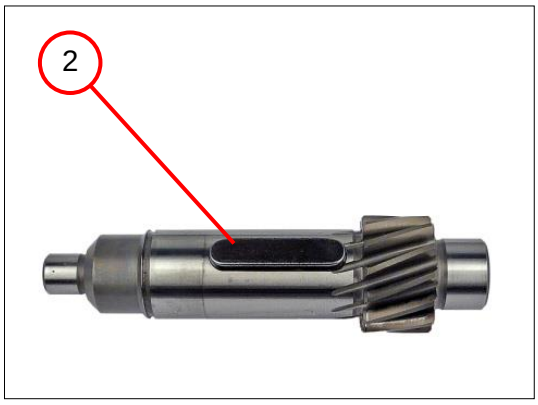
4. Remove the circlip (**3**).

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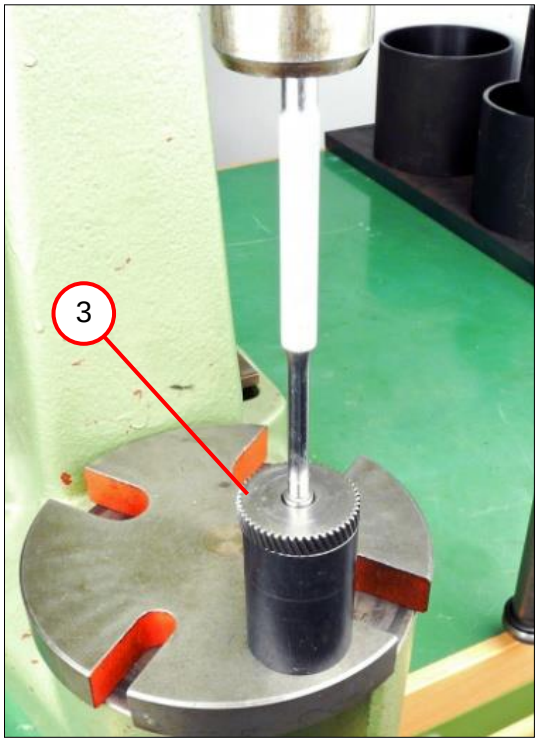
8.3.4 Removing the gearbox parts



5. Remove the two gear wheels (**1**).



6. Remove the feather key (**2**).



7. Press the gearwheel (**3**) off the shaft.

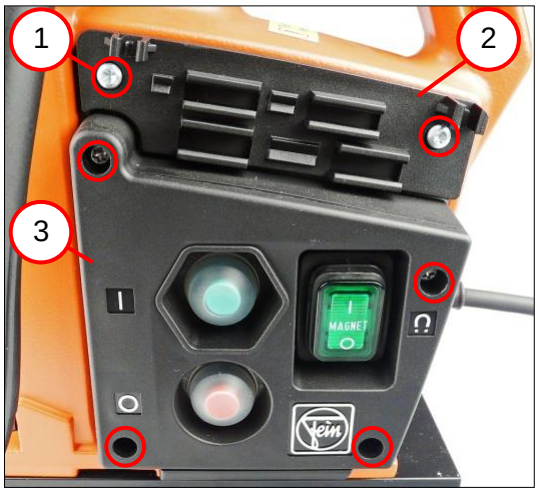
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8.4 Disassembling the drill jig

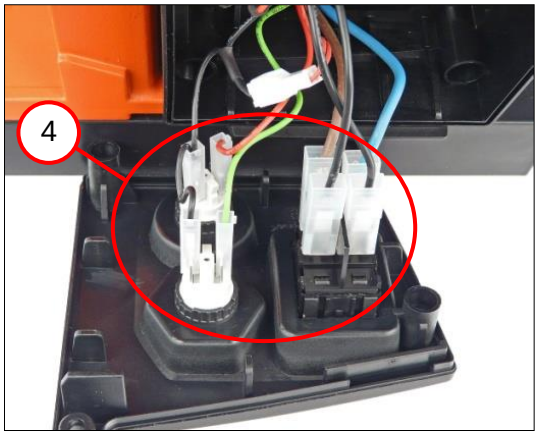
8.4.1 Removing the control panel

Tool(s):

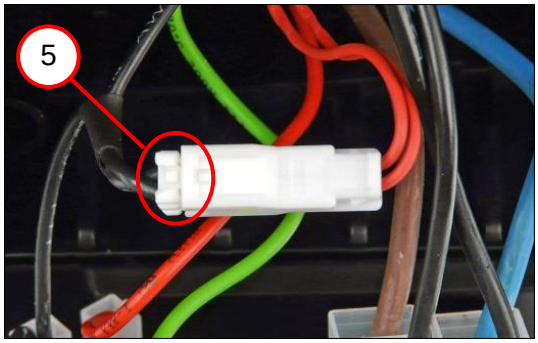
- Torx T20



1. Unscrew the six screws (**1**).
2. Remove the holder (**2**).
3. Remove the cover (**3**).



4. Remove all connectors (**4**).



5. Press and hold the lock (**5**) on the plug.
6. Pull off the plug.

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8.4.2 Removing the control panel

Steps that must be completed:

- Removing the control panel

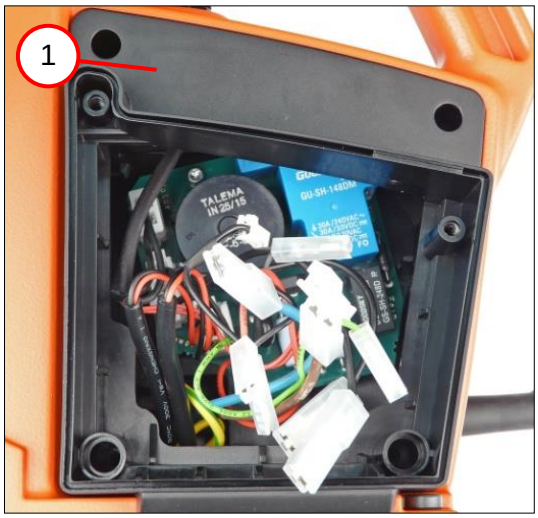


1. Remove the two buttons (**1**).
2. Remove the switch (**2**).

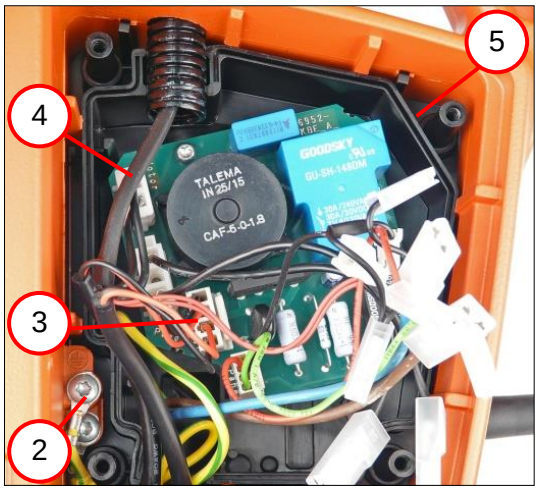
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8.4.3 Removing the electronics

Steps that must be completed: - Removing the control panel
Tool(s): - Torx T20



1. Remove the cover (**1**).



2. Unscrew the screw (**2**).
3. Disconnect the cable (**3**).
4. Disconnect the cable (**4**).
5. Remove the cover (**5**) with the electronics.

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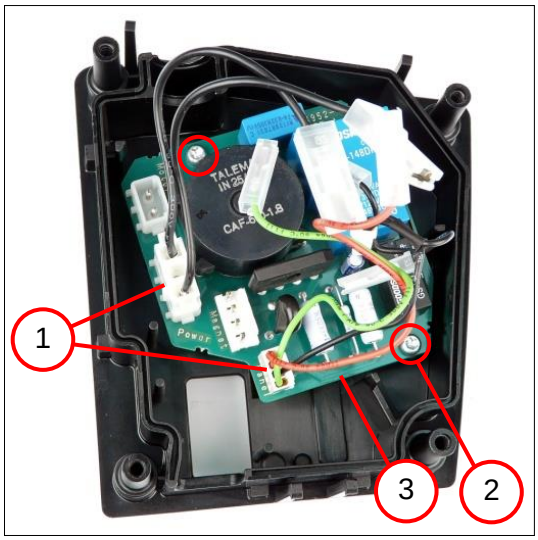
8.4.4 Removing the electronics

Steps that must be completed:

- Removing the control panel
- Removing the electronics

Tool(s):

- Torx T20



1. Remove the two cables (**1**).
2. Unscrew the two screws (**2**).
3. Remove the electronics (**3**).

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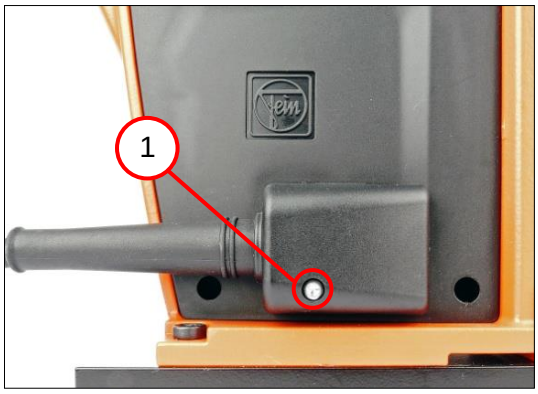
8.4.5 Removing the power cable

Steps that must be completed:

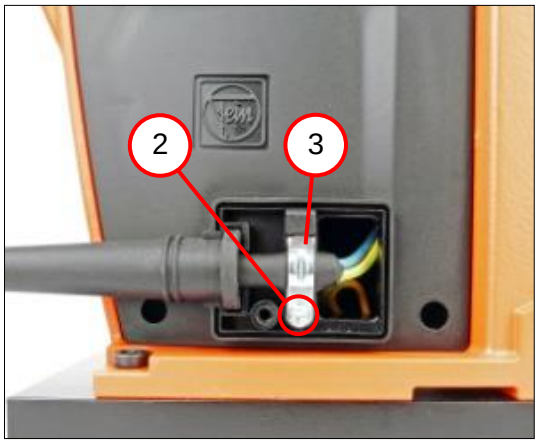
- Removing the control panel
- Removing the electronics

Tool(s):

- Torx T15



1. Unscrew the screw (**1**).

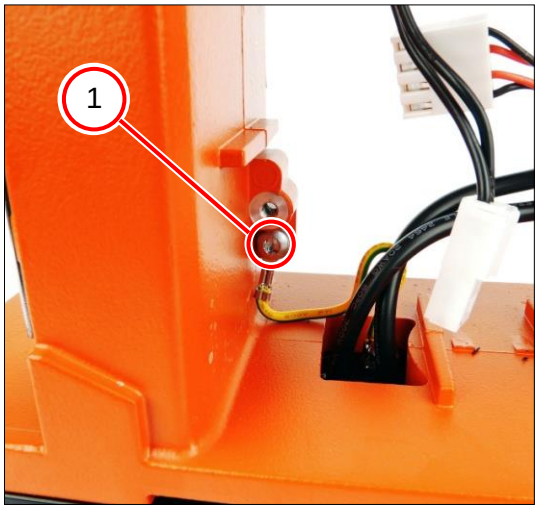


1. Unscrew the screw (**2**).
2. Remove the cable clamping piece (**3**).

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8.4.6 Removing the magnetic foot

Steps that must be completed: - Removing the control panel - Removing the electronics
Tool(s): - Torx T20 - Socket head wrench, 5 mm - PH2 cross-head screwdriver



1. Unscrew the screw (**1**).



Photo shows similar product

2. Unscrew the four screws (**2**).
3. Remove the magnetic foot (**3**).

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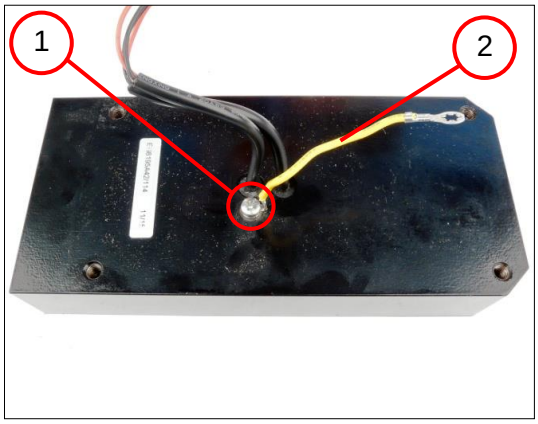
8.4.7 Removing the magnetic foot

Steps that must be completed:

- Removing the control panel
- Removing the electronics
- Removing the magnetic foot

Tool(s):

- PH2 cross-head screwdriver



1. Unscrew the screw (**1**).
2. Remove the cable (**2**).

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8.4.8 Removing the protective hose

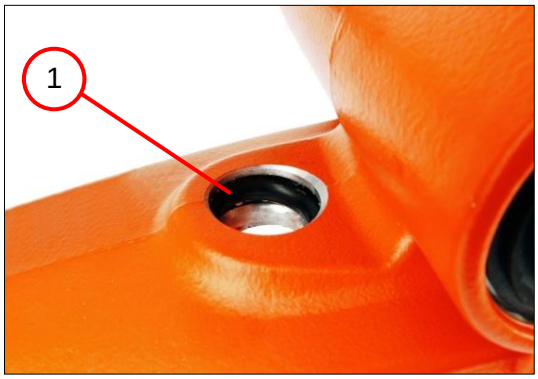
Steps that must be completed:

- Removing the control panel
- Removing the electronics



Photo shows similar product

1. Remove the protective hose (**1**).



2. Remove the sealing ring (2).

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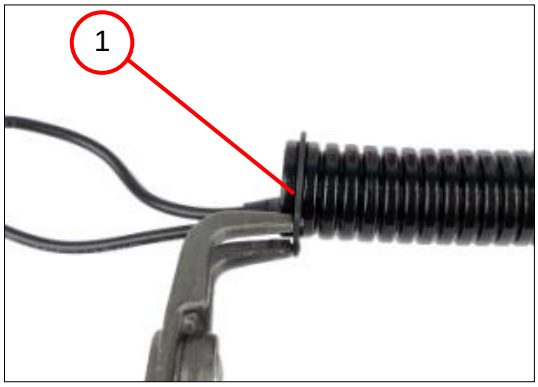
8.4.9 Disassembling protective hose

Steps that must be completed:

- Removing the control panel
- Removing the electronics
- Removing the magnetic foot
- Removing the protective hose

Tool(s):

- Circlip pliers



1. Remove the circlip (**1**).

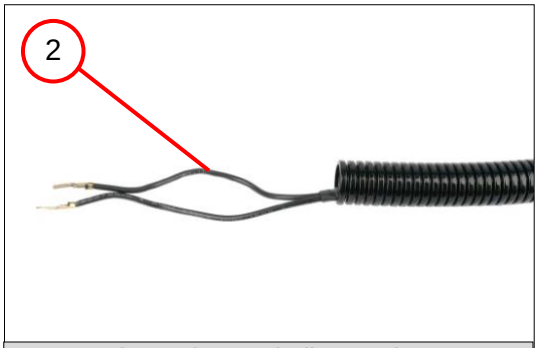


Photo shows similar product

2. Remove the connecting cable (**2**).

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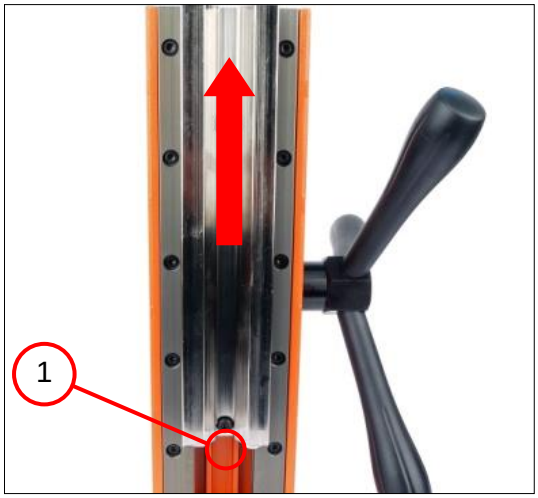
8.4.10 Removing the guide

Steps that must be completed:

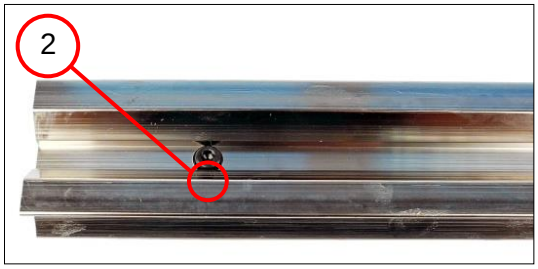
- Removing the container
- Removing the connecting cable
- Removing the drill motor

Tool(s):

- Socket head wrench, 2.5 mm; 3 mm; 4 mm
- Slotted screwdriver
- PH2 cross-head screwdriver



1. Unscrew the screw (**1**).
2. Move the guide upwards using the spider.
3. Remove the guide.



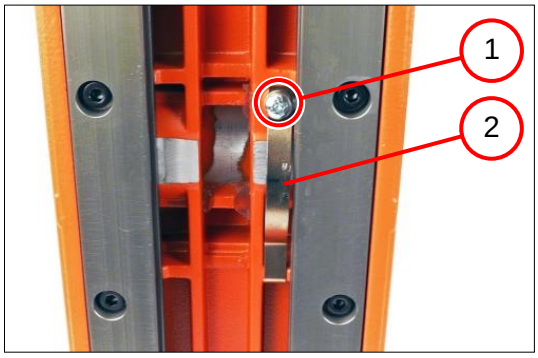
4. Unscrew the screw (**2**).



5. Unscrew the flat-head screw (**3**).

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8.4.10 Removing the guide



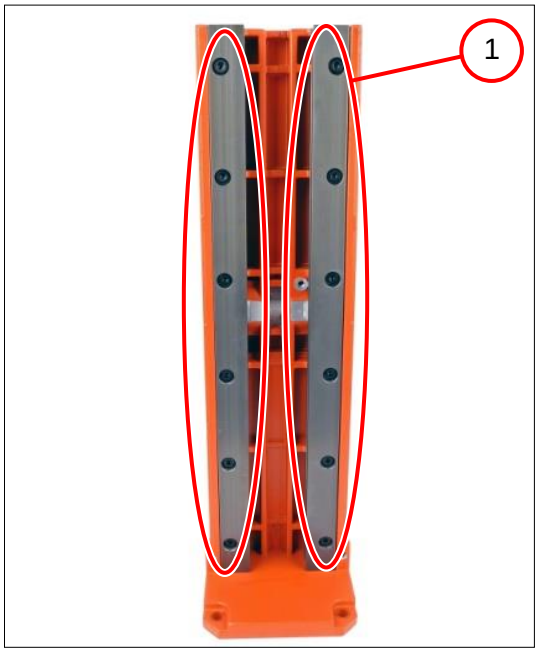
6. Unscrew the screw (**1**).
7. Remove the leaf spring (**2**).



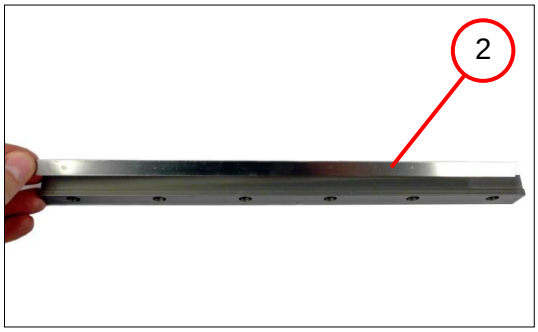
8. Unscrew the six set screws (**3**).

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8.4.10 Removing the guide



9. Unscrew the twelve screws (**1**).
10. Remove the two guide strips.



11. Remove the pressure piece (**2**).

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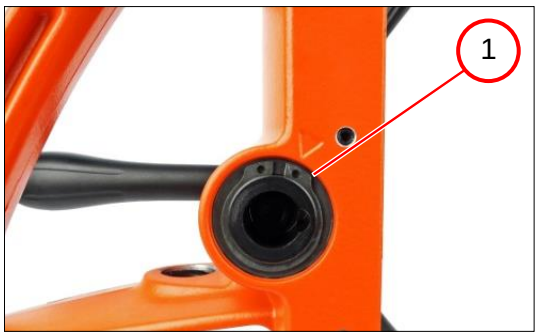
8.4.11 Removing the spider

Steps that must be completed:

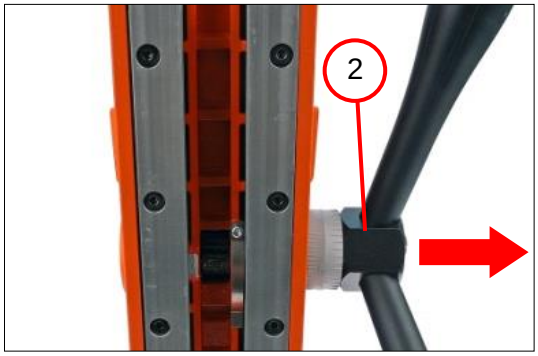
- Removing the electronics
- Removing the drill motor
- Removing the guide

Tool(s):

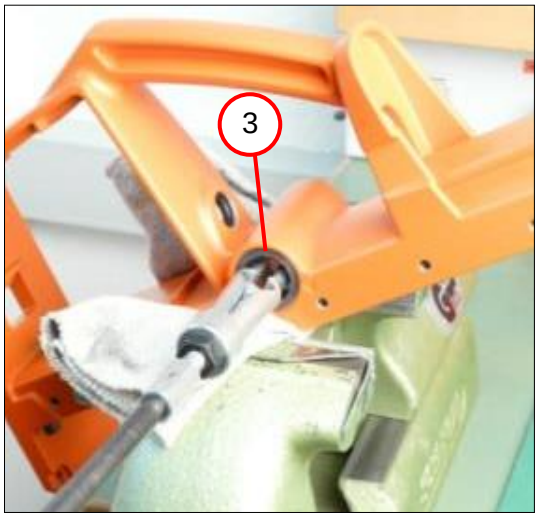
- Circlip pliers
- Inner bearing puller, 18–22 mm
- Slide hammer



1. Remove the circlip (**1**).



2. Pull out the spider (**2**).



3. Remove bush (**3**).
4. Repeat step 3 on the opposite side of the machine.

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8.4.12 Removing the spider

Steps that must be completed:

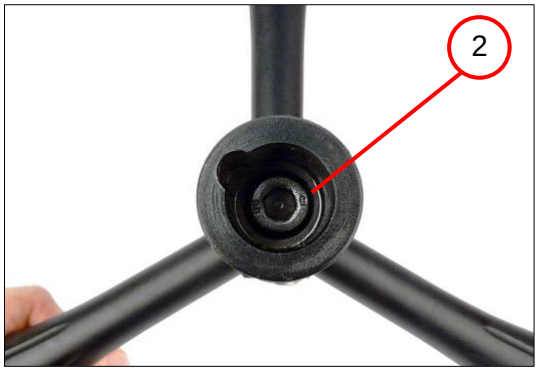
- Removing the electronics
- Removing the drill motor
- Removing the guide
- Removing the spider

Tool(s):

- Socket head wrench, 5 mm



1. Remove the disc (**1**).



2. Unscrew the screw (**2**).
3. Remove the shaft.



4. Remove the scale (**3**).
5. Unscrew the three handles (**4**).

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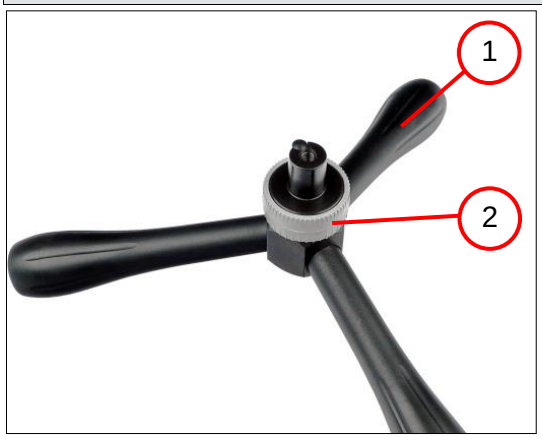
9 Fitting

9.1 Assembling the drill jig

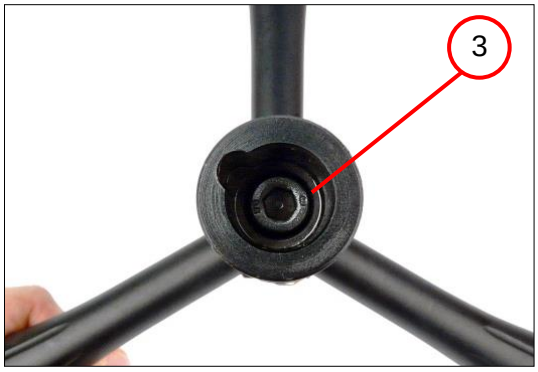
9.1.1 Fitting the spider

Tool(s):

- Socket head wrench, 5 mm



1. Screw in the three handles (**1**).
2. Position the scale (**2**).



3. Position the shaft.
4. Screw in the screw (**3**) [8.0 Nm ±0.5 Nm].



5. Position the disc (**4**).
6. Coat the shaft with grease.

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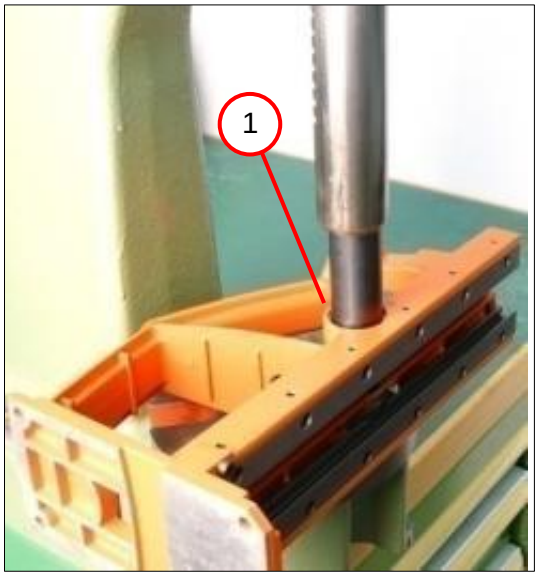
9.1.2 Positioning the spider

Steps that must be completed:

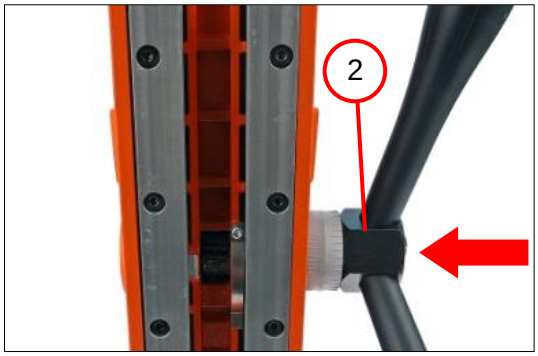
- Fitting the spider

Tool(s):

- Arbor press
- Sleeve
  26 mm inner diameter; 30 mm outer diameter
- Circlip pliers



1. Press in the bush (**1**).
2. Repeat step 1 on the opposite side of the machine.



3. Position the spider (**2**).

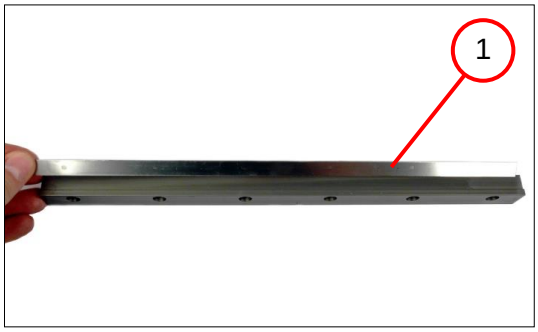


4. Position the circlip (**3**).

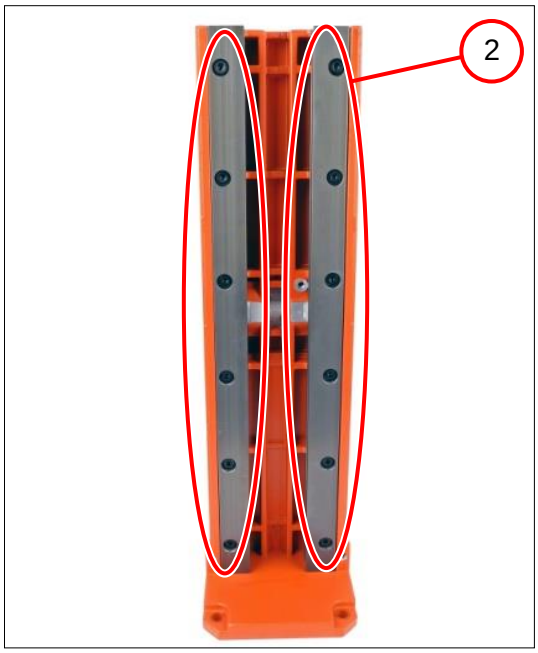
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9.1.3 Positioning the guide

Steps that must be completed: - Fitting the spider - Positioning the spider
Tool(s): - PH2 cross-head screwdriver - Slotted screwdriver - Socket head wrench, 2.5 mm; 3 mm; 4 mm



1. Place the pressure piece (**1**) in the correct position.



2. Screw in the twelve screws (**2**).
3. Remove the two guide strips.

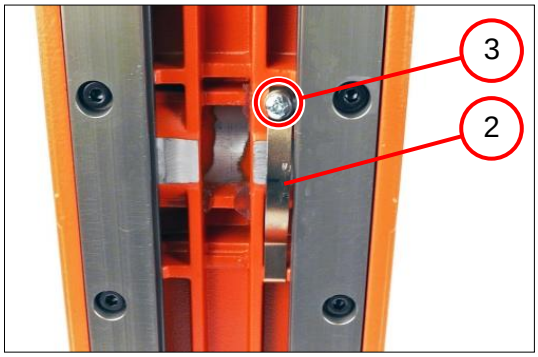
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9.1.3 Positioning the guide



4. Unscrew the six set screws (**1**).

> **INFORMATION**
>
> The thread play is adjusted after installation of the drill motor.



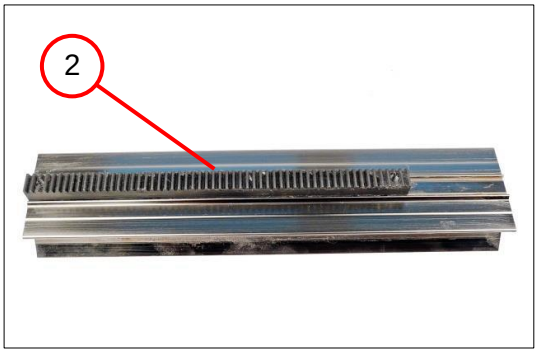
5. Position the leaf spring (**2**).
6. Screw in the screw (**3**) [1.1 Nm $^{\pm 0.15\ Nm}$].

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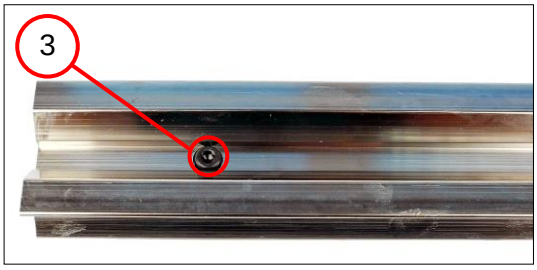
9.1.3 Positioning the guide



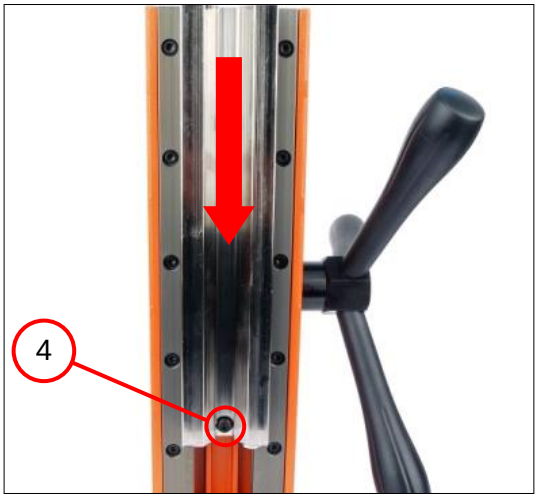
7. Screw in the flat-head screw (**1**) [1.2 Nm ±0.15 Nm].



8. Position the gear rack (**2**).
9. Coat the gear rack (**2**) and the guide with grease.



10. Screw in the screw (**3**) [3.0 Nm ±0.3 Nm].



11. Position the guide.
12. Move the guide downwards using the spider.
13. Screw in the screw (**4**) [3.0 Nm ±0.3 Nm].

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9.1.4 Fitting the protective hose

Tool(s):

- Circlip pliers

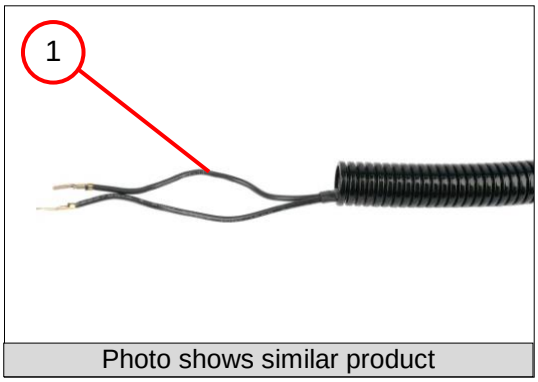
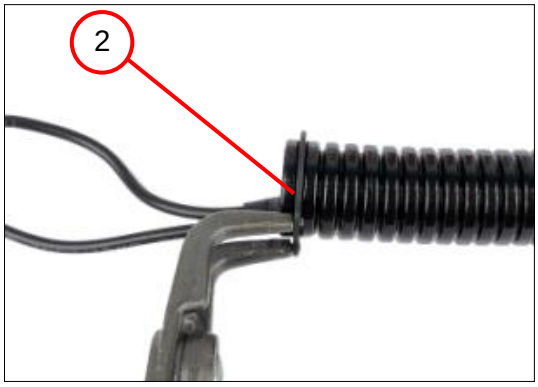


Photo shows similar product

1. Position the connecting cable (**1**).



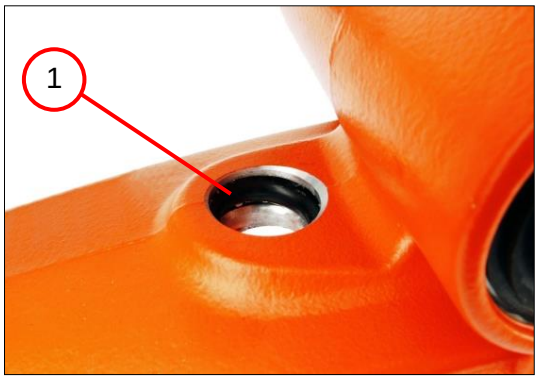
2. Position the circlip (**2**).

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9.1.5 Positioning the protective hose

Steps that must be completed:

- Fitting the protective hose



1. Position the sealing ring (**1**).



Photo shows similar product

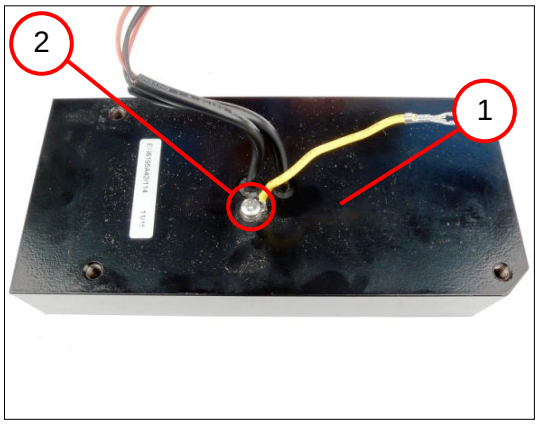
2. Position the protective hose (**2**).

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9.1.6 Fitting the magnetic foot

Tool(s):

- PH2 cross-head screwdriver



1. Position the cable (**1**).
2. Screw in the screw (**2**) [1.5 Nm $^{\pm 0.2\ Nm}$].

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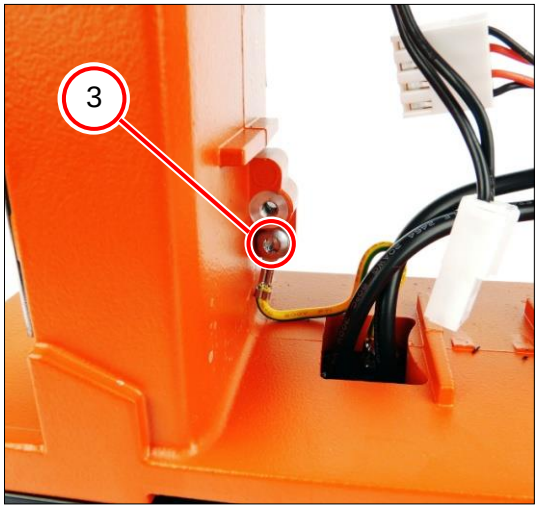
9.1.7 Positioning the magnetic foot

Steps that must be completed: - Fitting the magnetic foot
Tool(s): - Socket head wrench, 5 mm - Torx T20



Photo shows similar product

1. Position the magnetic foot (**1**).
2. Screw in the four screws (**2**) [8.0 Nm ±0.5 Nm].



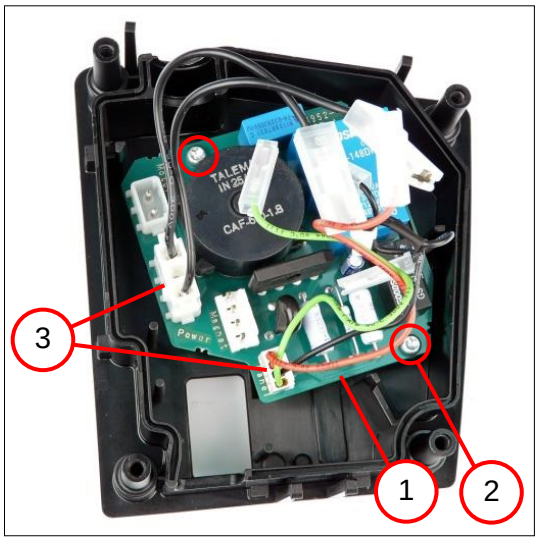
3. Position the connecting cable.
4. Screw in the screw (**3**) [1.5 Nm ±0.2 Nm].

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9.1.8 Fitting the electronics

Tool(s):

- Torx T20

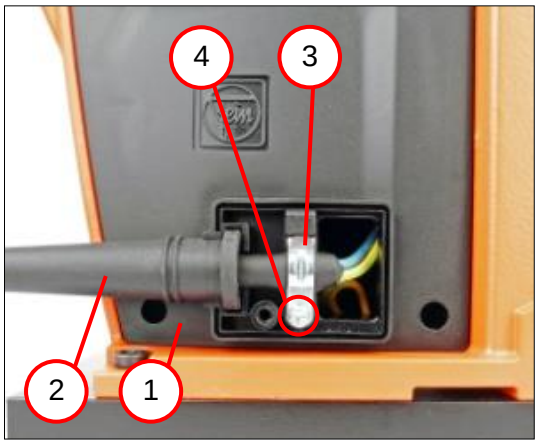


1. Position the electronics (**1**).
2. Screw in the two screws (**2**).
3. Connect the two cables (**3**) as shown in the connection diagram.

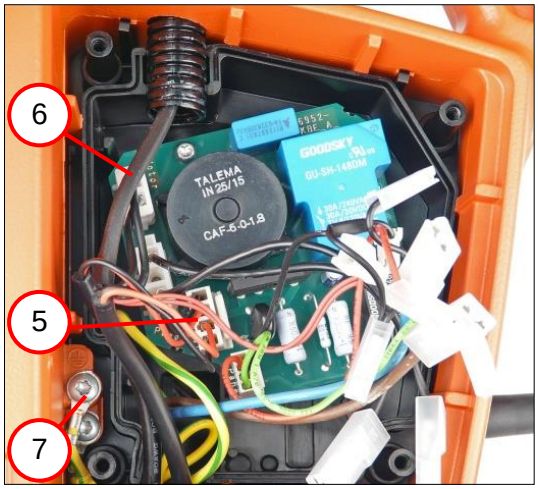
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9.1.9 Positioning the electronics

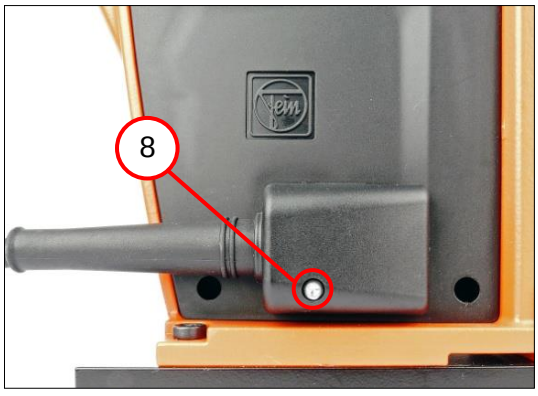
Steps that must be completed: - Fitting the electronics
Tool(s): - Torx T15, T20



1. Position the cover (**1**) with the electronics.
2. Position the power cable (**2**).
3. Position the cable clamping piece (**3**).
4. Screw in the screw (**4**) [0.9 Nm ±0.1 Nm].



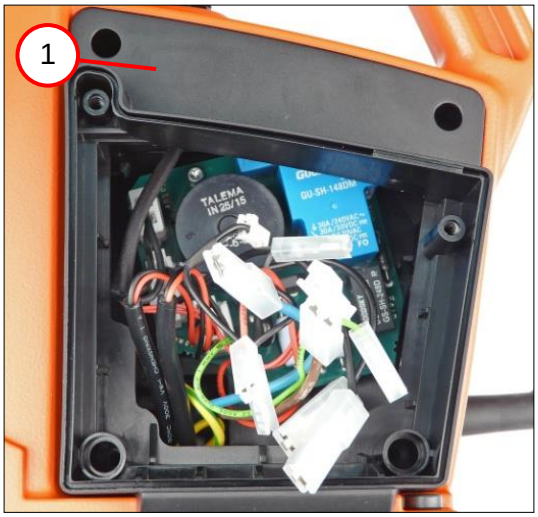
5. Connect the cable (**5**) as shown in the connection diagram.
6. Connect the cable (**6**) as shown in the connection diagram.
7. Screw in the screw (**7**) [1.5 Nm ±0.2 Nm].



8. Screw in the screw (**8**) [1.8 Nm ±0.1 Nm].

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9.1.9 Positioning the electronics



9. Position the cover (**1**).

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9.1.10 Fitting the control panel

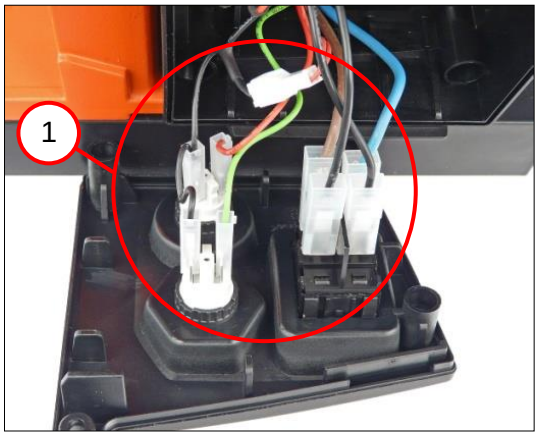


1. Position the two buttons (**1**).
2. Position the switch (**2**).

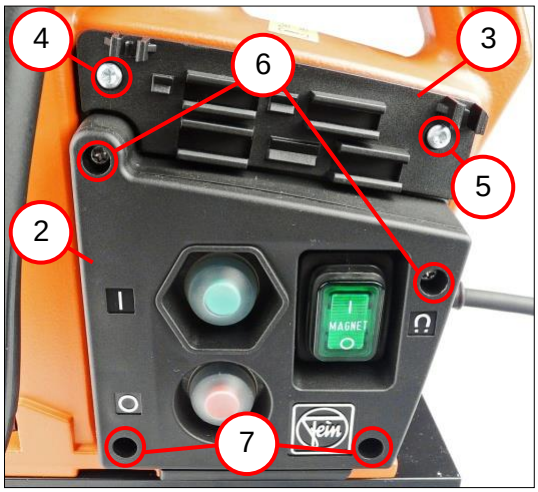
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9.1.11 Positioning the control panel

Steps that must be completed: - Fitting the electronics - Positioning the electronics - Fitting the control panel
Tool(s): - Torx T20



1. Connect all connectors (**1**) as shown in the connection diagram.



2. Position the cover (**2**).
3. Position the holder (**3**).
4. Screw in the screw [4x48] (**4**) [2.0 Nm ±0.3 Nm].
5. Screw in the screw [4x35] (**5**) [2.0 Nm ±0.3 Nm].
6. Screw in the two screws [4x18] (**6**) [2.0 Nm ±0.3 Nm].
7. Screw in the two screws [4x48] (**7**) [2.0 Nm ±0.3 Nm].

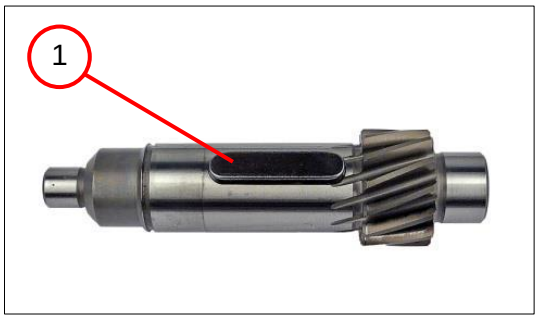
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9.2 Fitting the gearbox housing

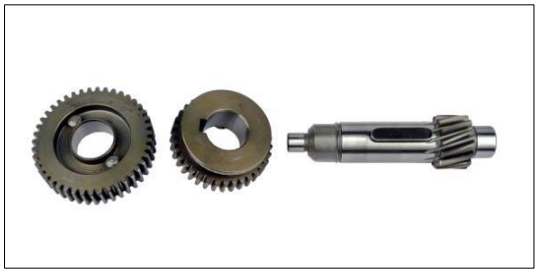
9.2.1 Fitting the gearbox parts

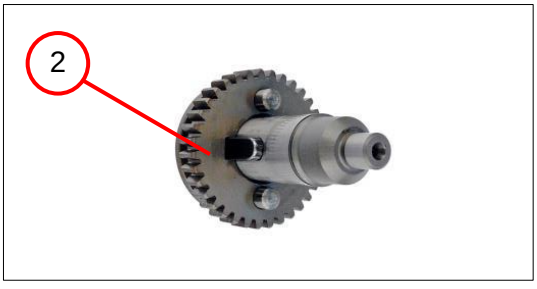
Tool(s):

- Circlip pliers
- Combination pliers
- Arbor press
- Sleeve
  24 mm inner diameter; 42 mm outer diameter
  8 mm inner diameter; 21 mm outer diameter
  12 mm inner diameter; 27 mm outer diameter
- Socket wrench
- Socket wrench insert, 7 mm
- Slide hammer
- Inner puller
- Slotted screwdriver
- Punch, 7 mm



1. Position the feather key (**1**).

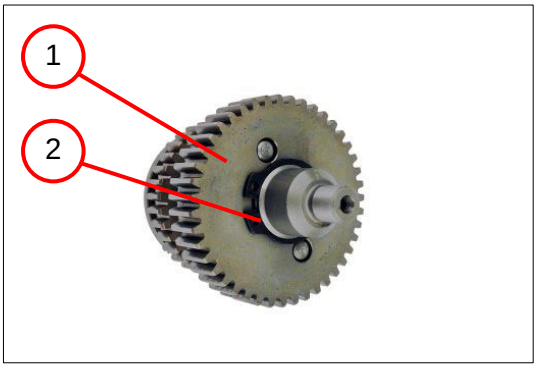




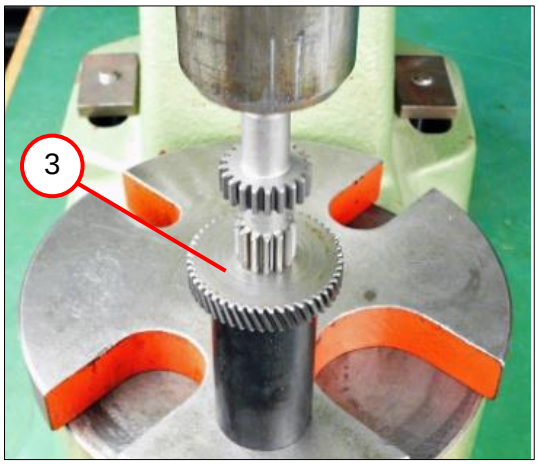
2. Position the gearwheel (**2**).

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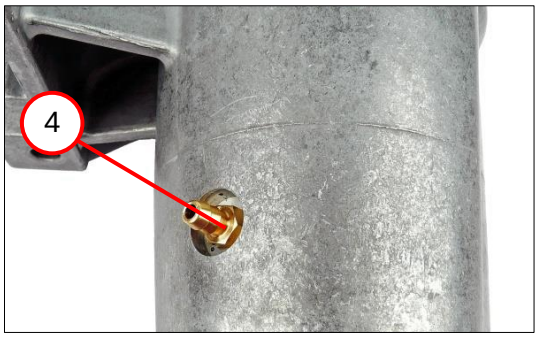
9.2.1 Fitting the gearbox parts



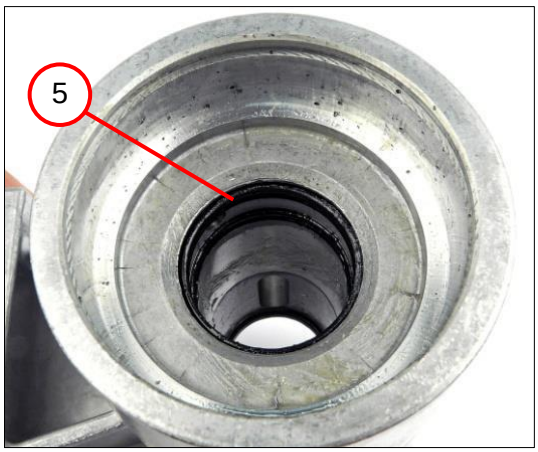
3. Position the gearwheel (**1**).
4. Position the circlip (**2**).



5. Press on the gearwheel (**3**).



6. Screw in the hose socket (**4**) [1.8 Nm $^{\pm 0.1\ Nm}$].



INFORMATION

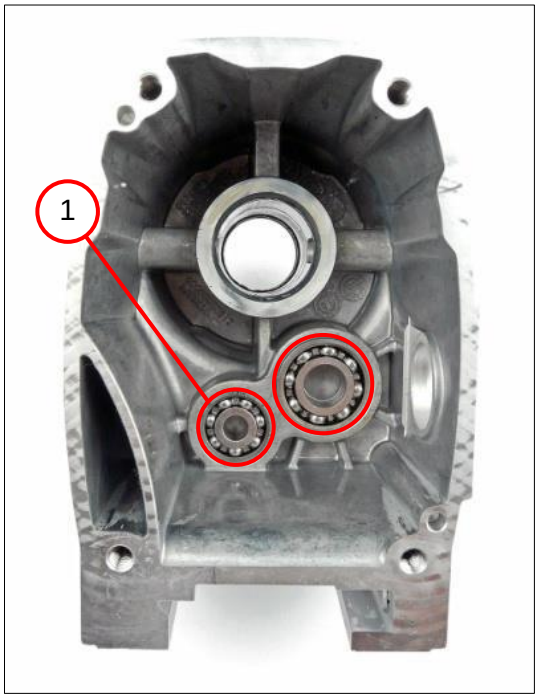
Use new sealing rings for each new fitting.

7. Coat the three sealing rings (**5**) with oil.
8. Position the three sealing rings (**5**).

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9.2.1 Fitting the gearbox parts





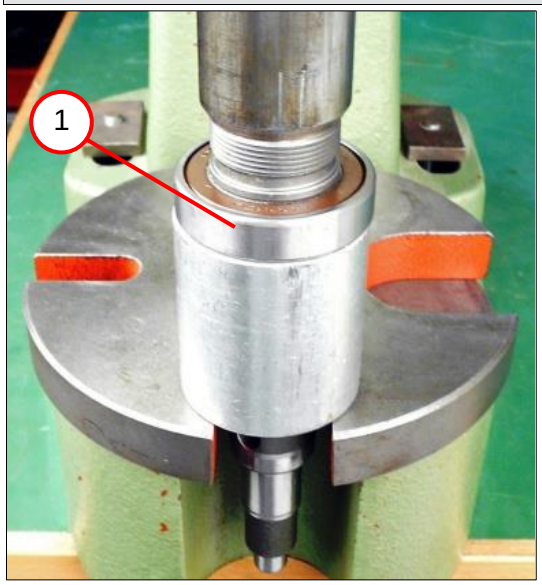
9. Press in the two grooved ball bearings (**1**).

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9.2.2 Fitting the shaft

Tool(s):

- Arbor press
- Sleeve
  36 mm inner diameter; 55 mm outer diameter
- Circlip pliers



1. Press on the grooved ball bearing (**1**).



2. Position the circlip (**2**).

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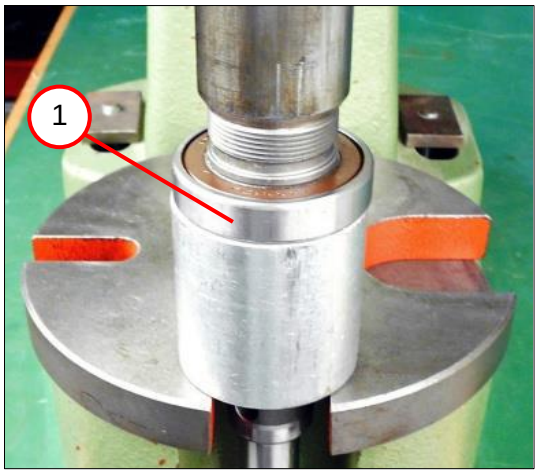
9.2.3 Positioning the shaft

Steps that must be completed:

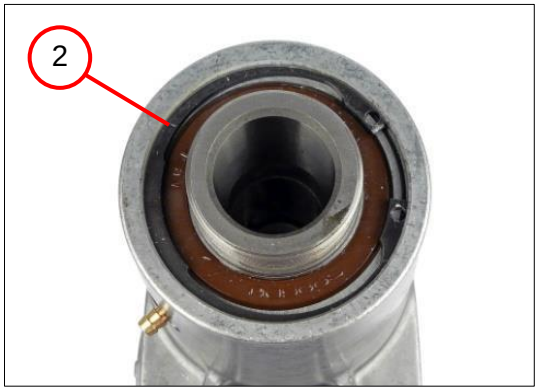
- Fitting the shaft

Tool(s):

- Combination pliers
- Circlip pliers
- Arbor press
- Sleeve
  56 mm inner diameter; 60 mm outer diameter



1. Press on the grooved ball bearing (**1**).



2. Position the circlip (**2**).

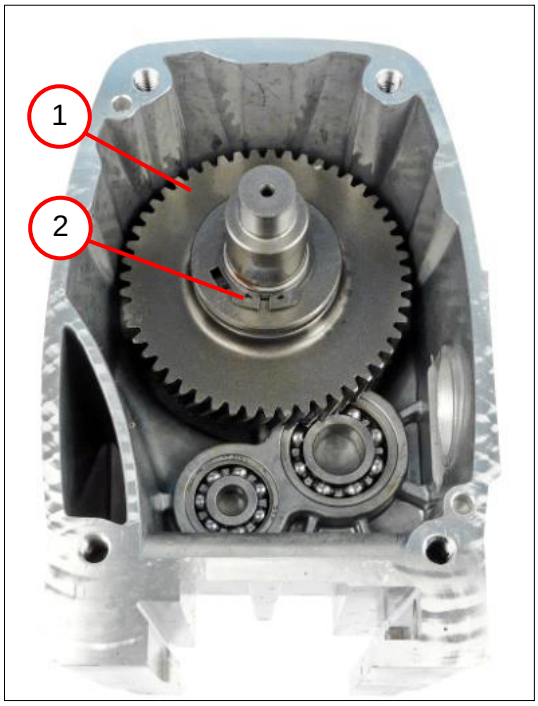


3. Position the feather key (**3**).

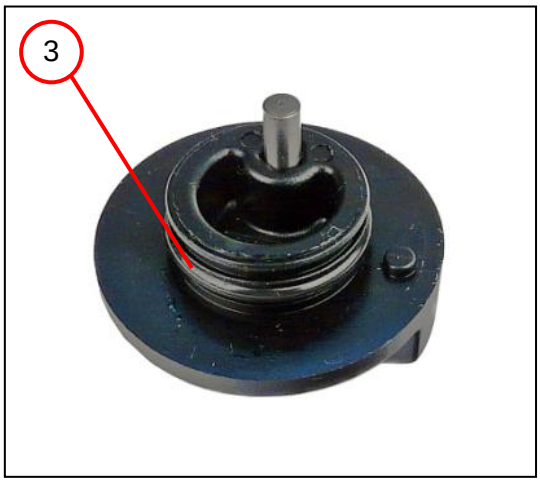
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9.2.4 Positioning the gearbox parts

Steps that must be completed: - Fitting the gearbox parts - Fitting the shaft - Positioning the shaft
Tool(s): - Circlip pliers



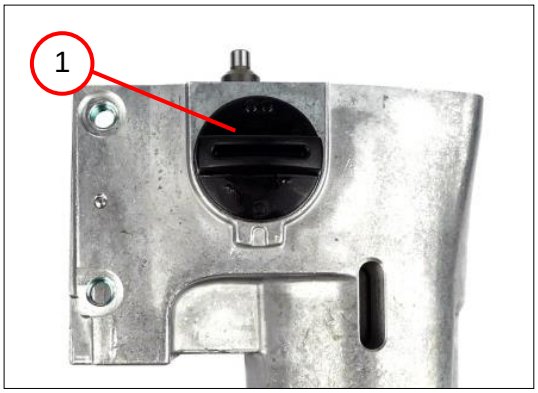
1. Position the gearwheel (**1**).
2. Position the circlip (**2**).



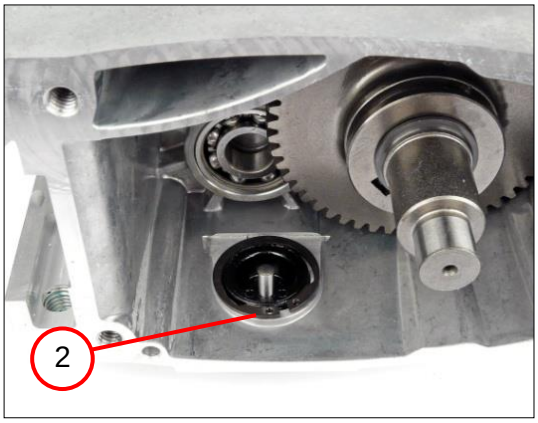
3. Coat the sealing ring (**3**) with oil.
4. Position the sealing ring (**3**).

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9.2.4 Positioning the gearbox parts



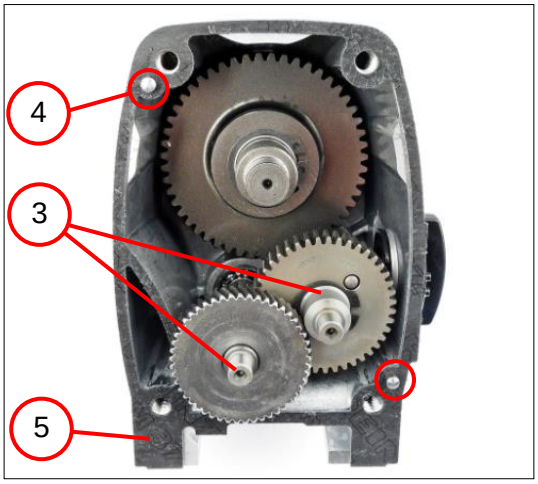
5. Position the rotary knob (**1**).



6. Position the circlip (**2**).



7. Turn the rotary knob to the “•” position.



8. Position the two gearwheels (**3**).
9. Position the two straight pins (**4**).

> **INFORMATION**
>
> Use a new seal for each new fitting.

10. Position the seal (**5**).
11. Fill the gearbox with 130 g grease.

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9.3 Fitting the motor housing

9.3.1 Fitting the motor housing

Tool(s):

- Arbor press
- Pressure piece
- 4x round material, diameter 20 mm; length 60 mm



1. Press in the stator (**1**).



2. Position the cover (**2**).



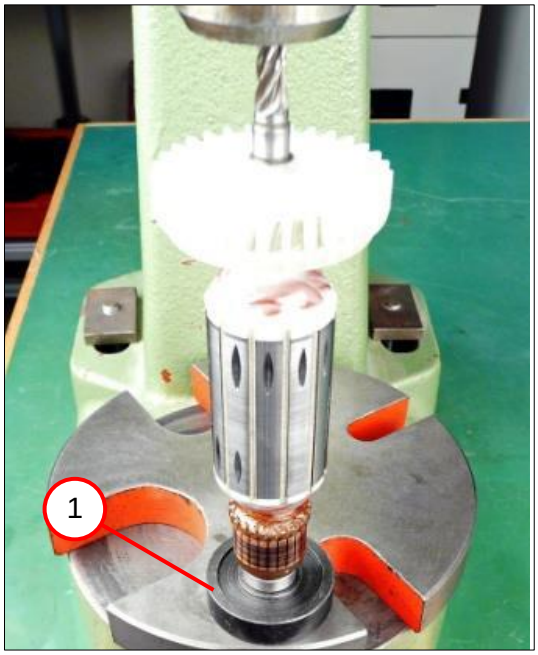
3. Position the air guide ring (**3**).

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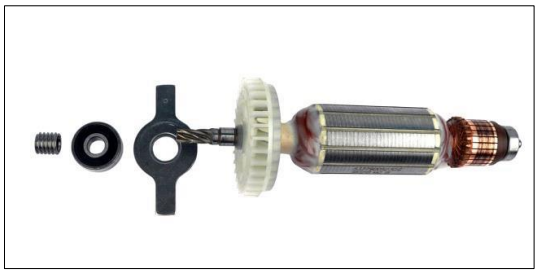
9.3.2 Fitting the armature

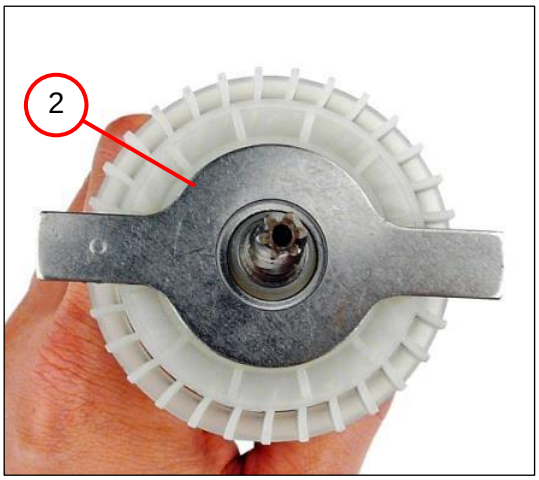
Tool(s):

- Arbor presses
- Sleeve
  8 mm inner diameter; 20 mm outer diameter
  7 mm inner diameter; 26 mm outer diameter



1. Press on the grooved ball bearing (**1**).





2. Position the plate (**2**).

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9.3.2 Fitting the armature



3. Press on the grooved ball bearing (**1**).



4. Press on the sealing ring (**2**).

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9.3.2 Fitting the armature



5. Position the bearing bush (**1**).

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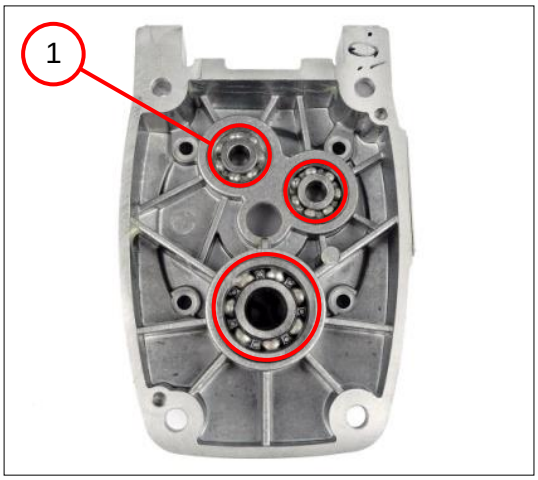
9.3.3 Fitting the intermediate gear box

Steps that must be completed:

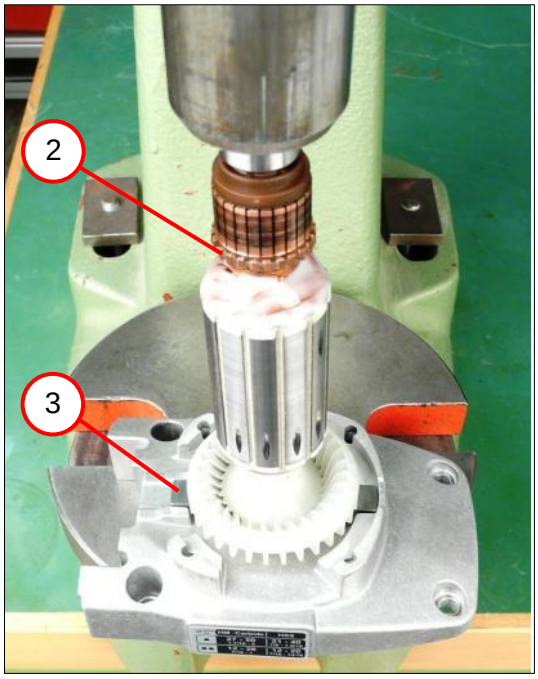
- Fitting the armature

Tool(s):

- Arbor press
- Sleeve
  10 mm inner diameter; 21 mm outer diameter
  15 mm inner diameter; 30 mm outer diameter



1. Press in the three grooved ball bearings (**1**).



PLEASE NOTE:

Damage to the armature.

The armature (**2**) can be damaged by an incorrectly positioned plate (**3**).

Pay attention to the position of the plate (**3**).

2. Press in the armature (**2**).

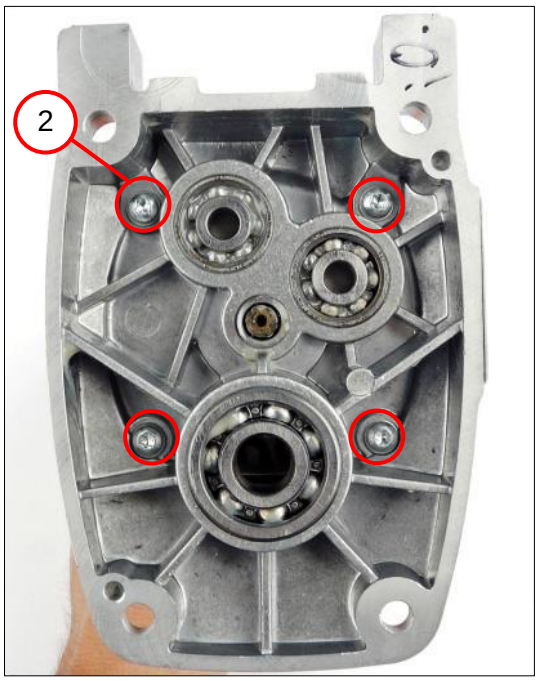
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9.3.4 Positioning the intermediate gear box

Steps that must be completed: - Fitting the armature - Fitting the intermediate gear box
Tool(s): - Torx T20



1. Position the motor housing (**1**).



INFORMATION

Use new sealing rings for each new fitting.

2. Screw in the four screws with the sealing ring (**2**) [1.8 Nm $^{\pm 0.1\ Nm}$].

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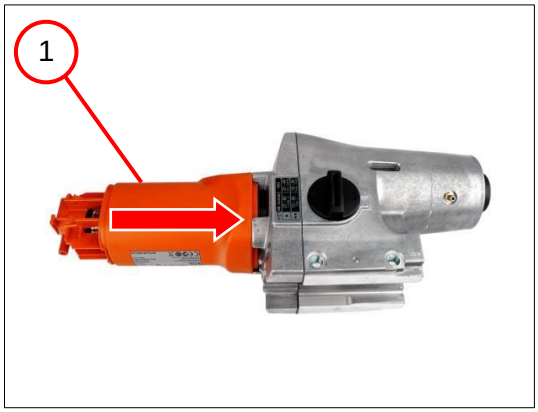
9.3.5 Positioning the motor housing

Steps that must be completed:

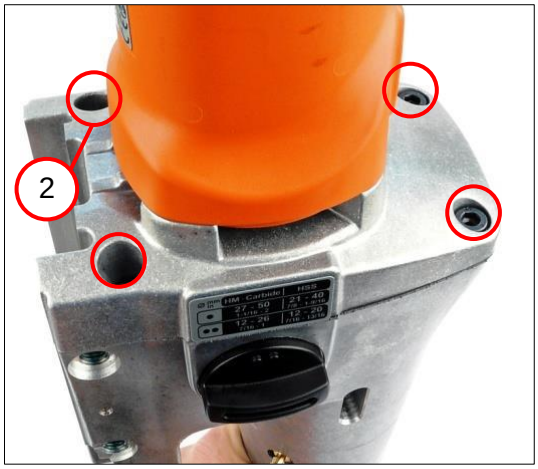
- Fitting the gearbox parts
- Positioning the shaft
- Fitting the armature
- Fitting the intermediate gear box

Tool(s):

- Socket head wrench, 5 mm



1. Position the motor housing (**1**).



2. Screw in the four screws (**2**) [8.0 Nm $^{\pm 0.3\ Nm}$].

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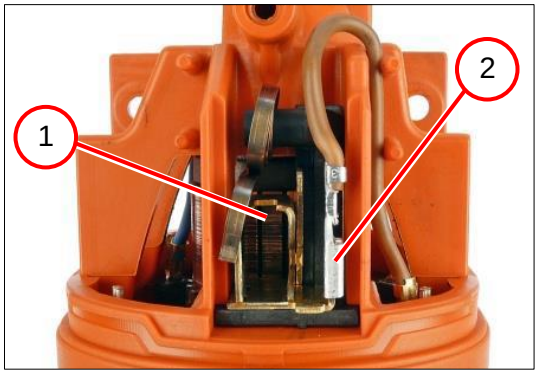
9.3.6 Positioning the carbon brushes

Steps that must be completed:

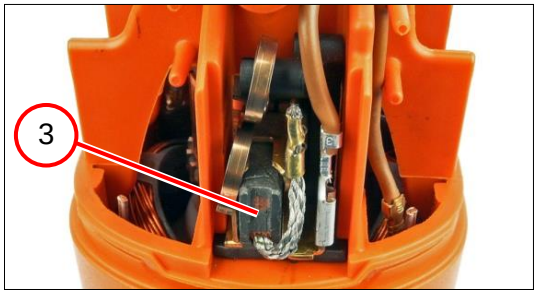
- Fitting the gearbox parts
- Positioning the shaft
- Fitting the motor housing
- Fitting the armature
- Fitting the intermediate gear box
- Positioning the intermediate gear box
- Positioning the motor housing

Tool(s):

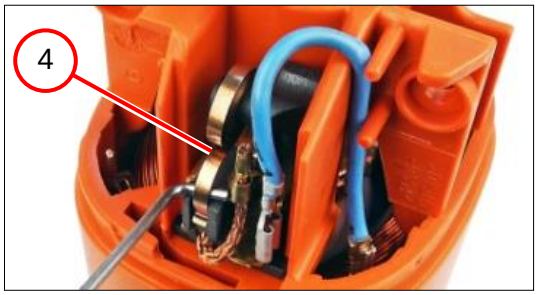
- Long-nosed pliers
- Assembly aid



1. Position the carbon brush holder (**1**).
2. Connect the cable (**2**) as shown in the connection diagram.



3. Position the carbon brush (**2**).
4. Connect the carbon brush (**2**) as shown in the connection diagram.



5. Position the spring (**4**).
6. Repeat steps 1 to 5 on the opposite side of the machine.

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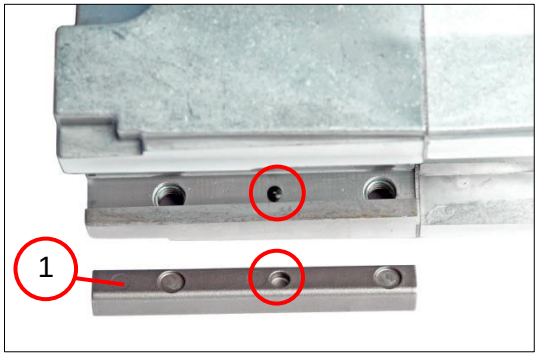
9.3.7 Positioning the drill motor

Steps that must be completed:

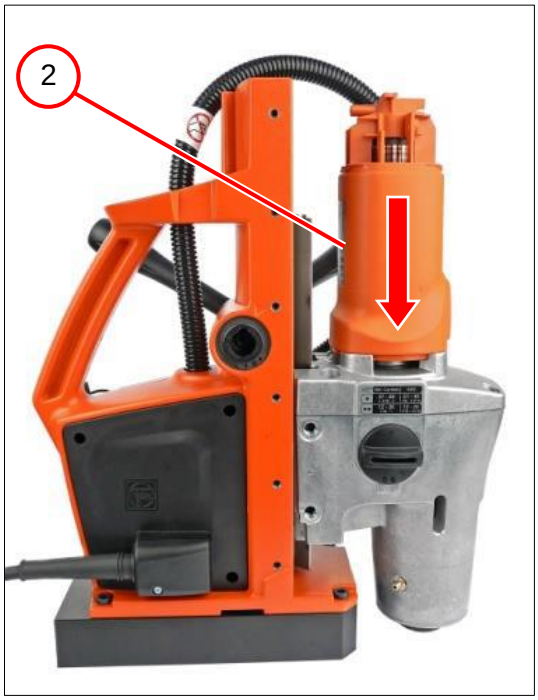
- Fitting the gearbox parts
- Positioning the shaft
- Fitting the motor housing
- Fitting the armature
- Fitting the intermediate gear box
- Positioning the intermediate gear box
- Positioning the motor housing
- Positioning the carbon brushes

Tool(s):

- Socket head wrench, 6 mm
- Slotted screwdriver



1. Place the pressure piece (**1**) in the correct position.



CAUTION!

Crushing hazard around the drill motor

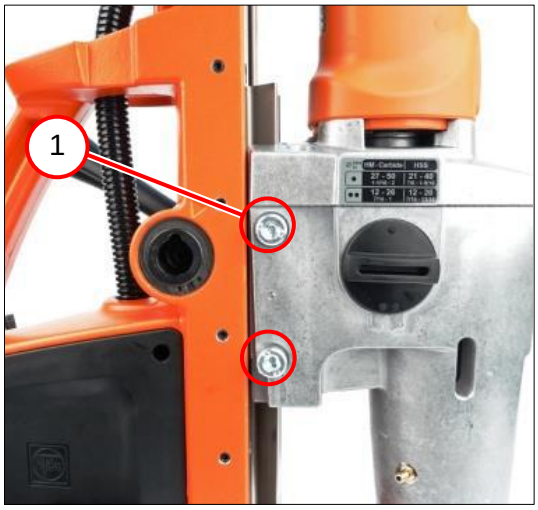
Crushing can occur.

Do not place your hands under the drill motor (**2**).

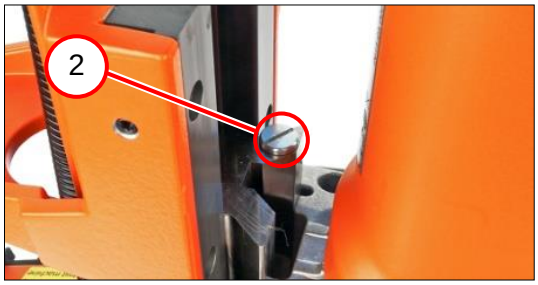
2. Slide the drill motor (**2**) into the guide.

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9.3.7 Positioning the drill motor



3. Screw in the two screws (**1**).



4. Screw in the flat-head screw (**2**) [1.2 Nm $^{\pm 0.15\ Nm}$].

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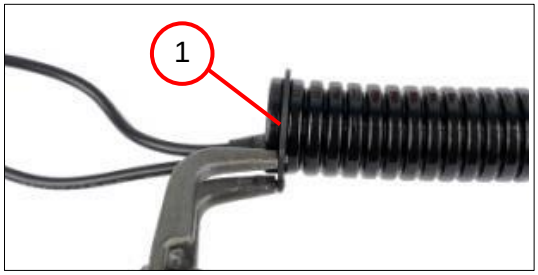
9.3.8 Positioning the connecting cable

Steps that must be completed:

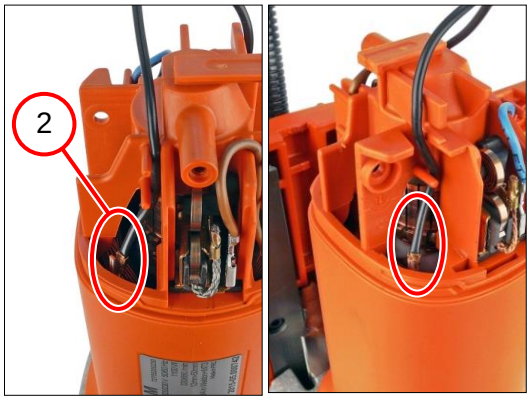
- Fitting the gearbox parts
- Positioning the shaft
- Fitting the motor housing
- Fitting the armature
- Fitting the intermediate gear box
- Positioning the intermediate gear box
- Positioning the motor housing
- Positioning the carbon brushes
- Positioning the drill motor

Tool(s):

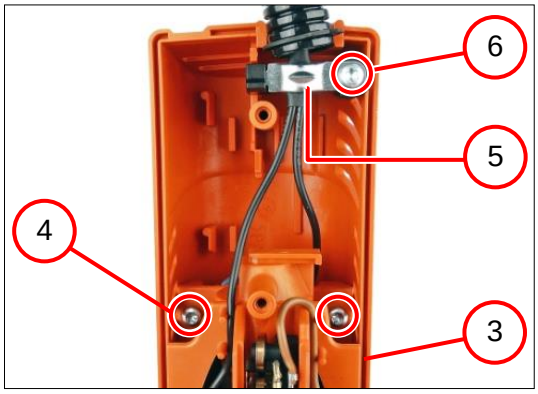
- Torx T15



1. Position the circlip (**1**).



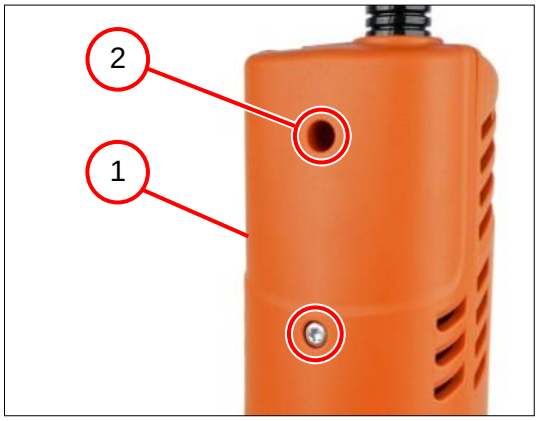
2. Connect the two strands (**2**) as shown in the connection diagram.



3. Position the cover (**3**).
4. Screw in the two screws (**4**) [1.6 Nm ±0.25 Nm].
5. Position the cable clamping piece (**5**).
6. Screw in the screw (**6**) [1.6 Nm ±0.25 Nm].

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9.3.8 Positioning the connecting cable



7. Position the cover (**1**).
8. Screw in the two screws (**2**) [1.6 Nm ±0.25 Nm].

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9.4 Setting the guide

Tool(s):

- Socket head wrench, 2.5 mm



Photo shows similar product

1. Use the six set screws (**1**) to set zero backlash on the guide.

INFORMATION

To check the setting, move the drill motor up and down using the spider.

At the places where the drill unit moves too fast or too slowly, screw the stud bolts in or out a little further.

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9.5 Positioning the container



1. Position the container (**1**).
2. Place the hose (**2**) on the hose socket.

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10 Inspection following repairs

In all cases:	Visual inspection
	Speed check
	Check coolant function
	Perform drilling test in metal
Mains-powered machines:	Electrical safety test
Machine with magnet:	Check magnetic holding force
Restart lock present:	Check restart lock

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