



KBU 35MQ  
KBU 35MQW; JMU137-MQW

(7 270 55 ...)  
(7 270 56 ...)





## **Technical data**

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

### **Tests**

Up-to-date test data and test instructions after repair can be found on the FEIN Extranet (Customer Service → Repair Guides).

### **Lubricants / Auxiliary substances**

The lubricants or auxiliary substances and their container sizes available from FEIN can be found on the FEIN Extranet (Customer Service → Repair Guides).

### **Lists of spare parts**

Lists of spare parts and exploded views are available online at [www.fein.com](http://www.fein.com)



## 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.**

### 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.

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

The relevant accident prevention regulations of the employer's liability insurance associations are to be observed when commissioning.

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

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



**Lubricants and auxiliary substances required**

**Lubricants**

**KBU 35 Q; KBU 35 QW**

Grease 0 401 18 0300 9 45 g Gearbox

**KBU 35 MQ; KBU 35 MQW**

Grease 0 401 18 0300 9 45 g Gearbox

**KBU 35-2 Q; KBU 35-2 QW**

Grease 0 401 18 0300 9 50 g Gearbox



Troubleshooting

Possible fault	Cause	Possible check
<p><b>Magnetic foot does not attract</b> Check with magnetisable part</p> <p>Indicator flashes/does not light up</p>	<p>There is an interrupt on the following components:</p> <ul style="list-style-type: none"> <li>• Mains cable</li> </ul> <p>Check supply line: Drill jig electronics ↔ drill motor electronics foil connector, drill motor electronics ↔ keypad electronics</p>	<ul style="list-style-type: none"> <li>➤ Measure mains voltage at X2 and X3 on the drill jig electronics</li> <li>➤ Perform continuity test</li> </ul>
	<p>Magnetic foot is defective</p>	<ul style="list-style-type: none"> <li>➤ Measure resistance 2-coil = 214 Ohm per coil 3-coil (230 V) = 428 Ohm per coil 3-coil (110 V) = 107 Ohm per coil</li> </ul>
	<p>Electronics defective</p>	<ul style="list-style-type: none"> <li>➤ Replace drill jig electronics</li> <li>➤ Replace keypad electronics</li> <li>➤ Replace drill motor electronics</li> </ul>
<p><b>Magnetic foot actuates when the magnetic button (drill jig) is pressed but not when the magnetic button on the drill motor is pressed</b></p>	<p>Safety shutdown mat is defective</p>	<ul style="list-style-type: none"> <li>➤ Visual check of safety shutdown mat (check for dirt and missing switch contacts (black))</li> <li>➤ Replace the safety shutdown mat</li> </ul>



Troubleshooting

Possible fault	Cause	Possible check
<b>Magnetic foot actuates when the magnetic button (drill motor) is pressed but not when the magnetic button on the drill jig is pressed</b>	The magnetic button on the drill jig is defective	➤ Replace the magnetic button on the drill jig
<b>Magnetic holding force indicator flashes green when/even though holding force is sufficient</b>	Reed contact is defective	➤ Continuity test on cable to reed contact ➤ Replace magnetic foot
	Drill jig electronics are defective	➤ Visual check of plug/plug connector X9 of drill jig electronics ➤ Replace plug/plug connectors
<b>Magnetic foot attracts briefly and then drops out again</b>  Check with magnetisable part Indicator lights up 1 second green and 1 second red	Magnetic foot incorrectly plugged in/electronics incorrectly coded	➤ See connection diagram
	Magnet is defective	➤ Measure resistance 2-coil = 214 Ohm per coil 3-coil (230 V) = 428 Ohm per coil 3-coil (110 V) = 107 Ohm per coil
	Electronics defective (drill jig electronics, keypad electronics)	➤ Replace drill jig electronics ➤ Replace keypad electronics



Troubleshooting

Possible fault	Cause	Possible check
<b>Magnetic holding force is too weak</b>		➤ Measure release force with load cell (see test instructions for magnetic holding force)
	Magnetic foot is defective	➤ Measure resistance 2-coil = 214 Ohm per coil 3-coil (230 V) = 428 Ohm per coil 3-coil (110 V) = 107 Ohm per coil
	Surface supporting magnetic foot is uneven	➤ Perform visual check. ➤ Measure release force with load cell (See test instructions for magnetic holding force)
	Check polarity of magnet connection	➤ See connection diagram
	Supporting surface is thinner than 10mm	➤ Perform visual check
	Surface is contaminated with: <ul style="list-style-type: none"> <li>• Rust</li> <li>• Paint</li> <li>• Dirt</li> <li>• Swarf</li> </ul>	➤ Perform visual check ➤ Clean surface and magnet



Troubleshooting

Possible fault	Cause	Possible check
<b>Motor not starting</b> Note – The causes listed here will trigger the restart protection. Magnet can be switched on	Correct switching sequence was not followed	<ul style="list-style-type: none"> <li>➤ Prerequisite: Magnet must be switched on</li> <li>➤ LED must light up (sufficient holding force) or flash (insufficient holding force)</li> </ul>
	Carbon brushes are worn	<ul style="list-style-type: none"> <li>➤ Perform visual check</li> </ul>
	There is an interrupt on the following components: Foil connector, drill jig electronics ↔ keypad electronics	<ul style="list-style-type: none"> <li>➤ Perform visual check</li> <li>➤ Check contacts see repair instructions)</li> </ul>
	Motor/field coil supply cable is defective or interrupted	<ul style="list-style-type: none"> <li>➤ Perform continuity test on field coil</li> <li>➤ Visual check of connections, electric carbon brush holder/brush</li> </ul>



**Troubleshooting**

Possible fault	Cause	Possible check
<b>Motor not starting.</b>	Safety shutdown mat is defective	➤ Visual check (check for dirt and missing switch contacts (black))
	Motor is defective	<ul style="list-style-type: none"> <li>➤ Check motor without electronics</li> <li>➤ Disconnect plugs W2 and W5 from drill motor electronics (160) and connect both cables</li> <li>➤ Disconnect plugs W1 and W6 from drill motor electronics (160) and connect test voltage</li> <li>➤ Test voltage: Approx. 100 V AC for 100-120 V motor Approx. 145 V AC for 220-240 V motor</li> </ul>
	Electronics are defective	<ul style="list-style-type: none"> <li>➤ Replace drill motor electronics</li> <li>➤ Replace keypad electronics</li> </ul>
	Gearbox blocked	➤ Output shaft must rotate when turned manually



Troubleshooting

Possible fault	Cause	Possible check
<b>Motor only starts up briefly (1s)</b>	Magnet is defective	➤ Perform visual check (check for grinding marks)
	Drill motor electronics are defective	➤ Replace drill motor electronics
	Console electronics are defective	➤ Replace keypad electronics
<b>Drill motor shuts off for no apparent reason</b>	There may be a loose contact on the following components: <ul style="list-style-type: none"> <li>• Mains cable</li> <li>• Plug connections</li> </ul>	➤ Measure mains voltage at X1, X2 ➤ Perform continuity tests
		➤ Check that tool/workpiece is standing securely and try again (magnetic button lights up red once)



**Troubleshooting**

Possible fault	Cause	Possible check
<b>Speed is too high, too low or fluctuating</b>	Motor is defective	➤ Test motor without electronics (with approx. 145V AC, measure idling speed)
	Magnet is defective	➤ Visual inspection
	Drill motor electronics are defective	<ul style="list-style-type: none"> <li>➤ Replace drill motor electronics</li> <li>➤ If motor is defective, connect replacement motor to X2, X3, X10 of the drill jig electronics</li> <li>➤ Measure idling speed or voltage</li> </ul>
	The following components may be defective: <ul style="list-style-type: none"> <li>• Carbon brushes</li> <li>• Collector</li> <li>• Plug contacts of brush holders</li> </ul>	
Mechanical load (gearbox, bearings, vibrations)	➤ Check without load, measure idling current	
<b>Overload cut-out mechanism cuts out too early, too late or not at all</b>	Electronics defective	<ul style="list-style-type: none"> <li>➤ Replace keypad electronics</li> <li>➤ Replace the drill jig electronics</li> </ul>



### Fitting the holder



1. Remove the circlip (1).
2. Remove the nut (2).

#### Tools:

- Circlip pliers



## Removal

### Fitting the holder



1. Push up outer sleeve (1) and hold.
1. Remove the circlip (2).
2. Remove the disc (3).
3. Remove the sleeve (4).
4. Remove the spiral spring (5).

#### Tools:

- Circlip pliers



## Removal

### Fitting the holder



1. Remove the circlip (1).
2. Remove the cover (2).
3. Remove the spiral spring (3).
4. Remove the sleeve (4).
5. Remove four balls (5).

**Tools:**

- Circlip pliers



## Removal

### Removing the container



#### NOTE:

Fluid may be present in the container.

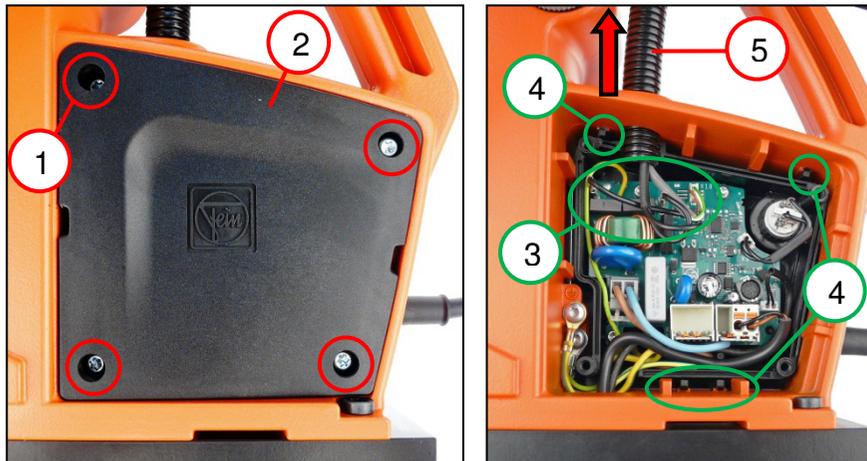
☞ Drain the container (2) before removal.

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



## Removal

### Removing the motor housing



1. Unscrew the four screws (1).
2. Remove the cover (2).
3. Pull off the cables (3).
4. Open the four retaining brackets (4).
5. Pull out the protective hose (5).

#### Tools:

- Torx T15



## Removal

### Removing the control panel



1. Unscrew the two screws (1).
2. Remove the cover (2).
3. Remove switch insert (3).
4. Pull off the plug (4).
5. Open the lock (5).
6. Disconnect the ribbon cable (6).

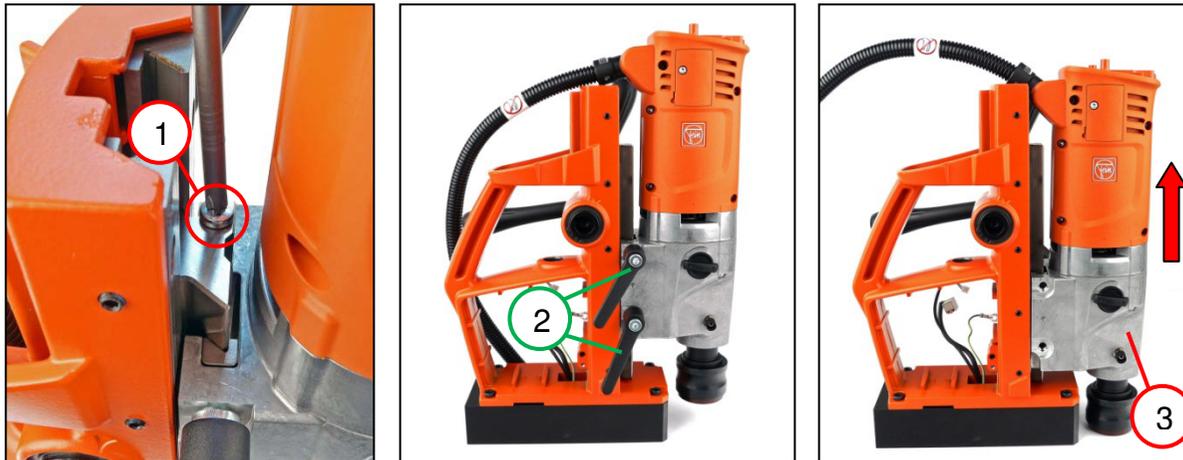
**Tools:**

- Torx T20



## Removal

### Removing the motor housing



1. Unscrew the fillister head screw (1).

#### **Crushing hazard around drill motor!**

The drill motor will rapidly slide downwards once the two screws (2) have been loosened.

☞ First move the drill motor downwards and then unscrew the two screws (2).

2. Unscrew the two levers (2).

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

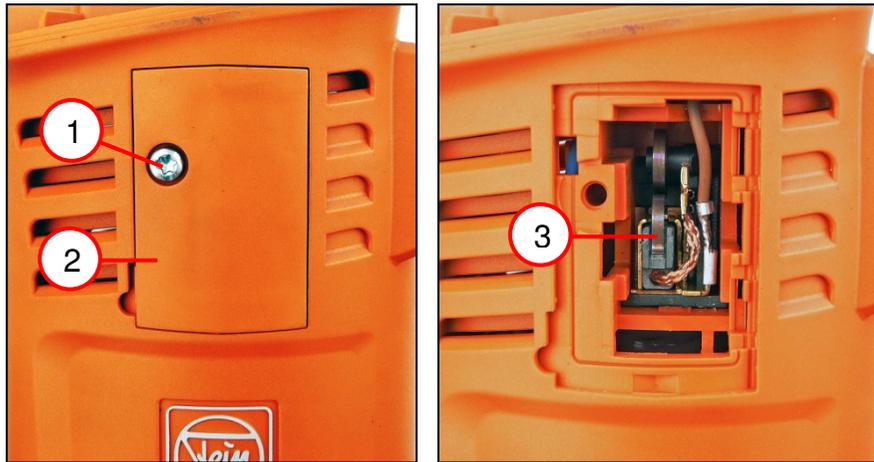
#### **Tools:**

- Cross-tip screwdriver



## Removal

### Removing the motor housing



1. Unscrew the screw (1) [both sides].
2. Remove the cover (2) [both sides].
3. Lift up the spring (3) [both sides].
4. Remove the carbon brush on both sides.

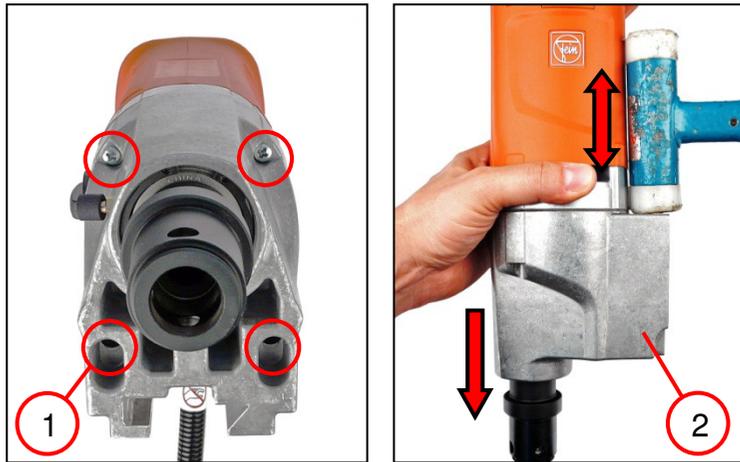
#### Tools:

- Torx T15
- Assembly aid



## Removal

### Removing the motor housing



1. Unscrew the four screws (1).
2. Remove the gearbox housing (2).

#### Tools:

- Torx T20
- Plastic hammer



## Removal

### Removing the motor housing



1. Remove the intermediate gearbox (1).
2. Remove the air guide ring (2).

#### Tools:

- Torx T15
- Assembly aid



## Removal

### Removing the motor housing



1. Disconnect the cable (1).
2. Disconnect the cable (2).
3. Unscrew the five screws (3).
4. Remove the motor housing (4).

#### Tools:

- Long-nosed pliers
- Torx T15



## Removal

### Removing the motor housing



1. Remove all components from the motor housing.
2. Remove the connecting piece (1).

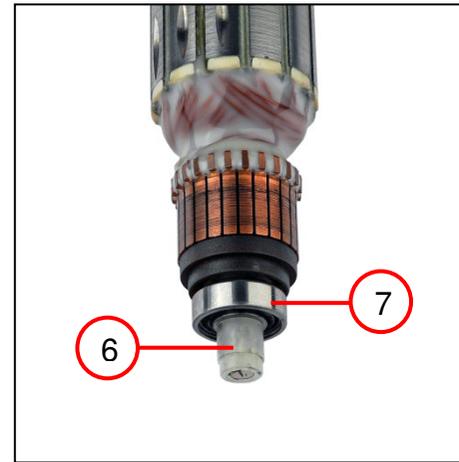
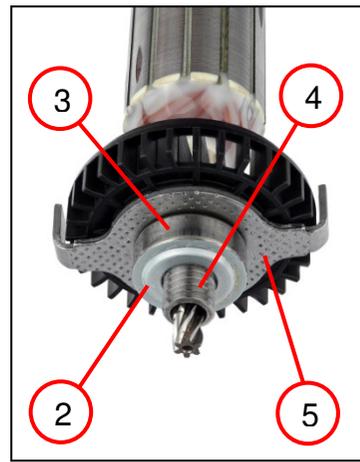
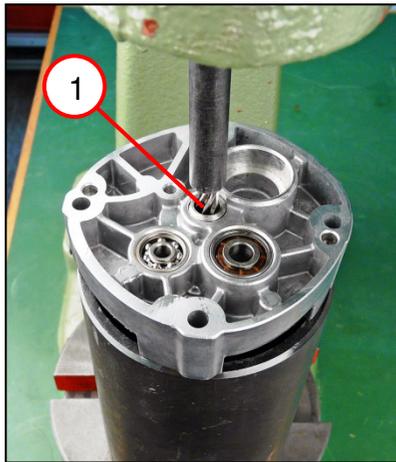
#### Tools:

- Slotted screwdriver



## Removal

### Removing the armature



1. Press out the armature (1).
2. Remove the sealing ring (2).
3. Remove the grooved ball bearing (3) together with the sealing ring (4).
4. Remove the plate (5).
5. Remove the magnet (6).
6. Pull off the grooved ball bearing (7).

#### Tools:

- Arbor press
- Punch, 10 mm
- Drawing-off socket cap
- Chuck cone, 26 mm
- Chuck cone, 19 mm



## Removal

### Removing the gearbox housing



1. Unscrew the four screws (1).
2. Remove the gearbox housing (2).

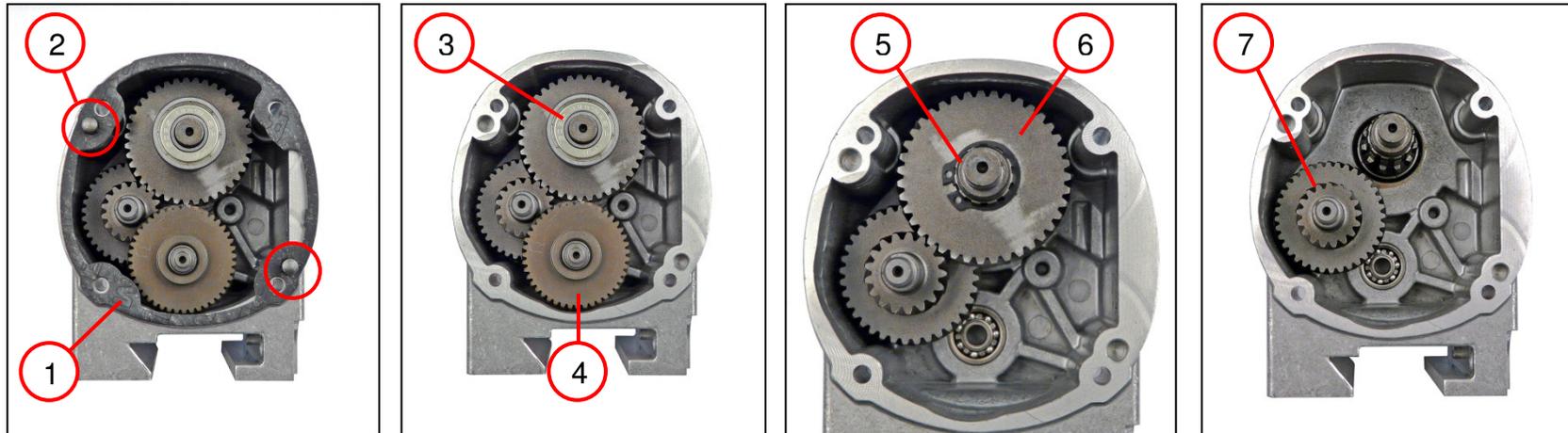
**Tools:**

- Torx T20
- Plastic hammer



Removal

Removing the gearbox housing



1. Remove the seal (1).
2. Remove the two straight pins (2).
3. Pull off the grooved ball bearing (3).
4. Remove the gear-wheel (4).
5. Remove the circlip (5).
6. Remove the gear-wheel (6).
7. Remove the gear-wheel (7).

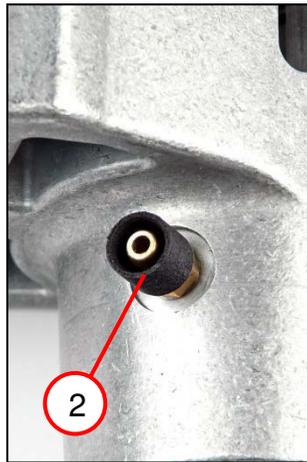
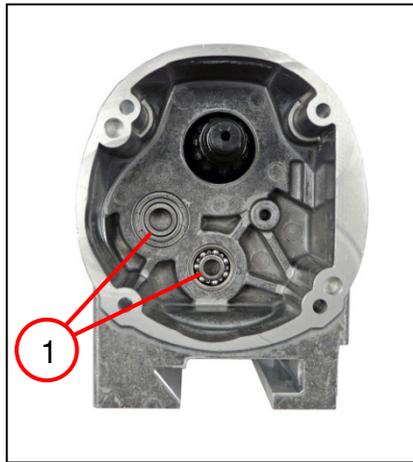
**Tools:**

- Drawing-off socket cap
- Chuck cone 24 mm
- Combination pliers
- Circlip pliers



Removal

Removing the gearbox housing



1. Remove the two grooved ball bearings (1).
2. Remove the sleeve (2).
3. Unscrew the hose socket (3).
4. Remove the circlip (4).
5. Press out the shaft (5).

**Tools:**

- Slide hammer
- Inner puller
- Socket wrench
- Socket wrench insert, 7 mm
- Circlip pliers
- Arbor press
- Sleeve  
44 mm inner diameter  
50 mm outer diameter



## Removal

### Removing the gearbox housing



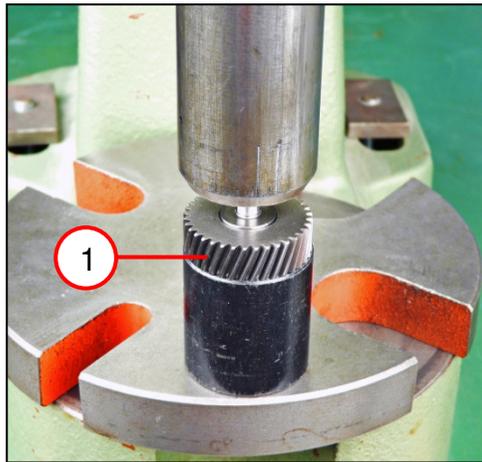
1. Remove the circlip (1).
2. Press down on the grooved ball bearing (2).

#### Tools:

- Circlip pliers
- Arbor press
- Sleeve  
39 mm inner diameter  
42 mm outer diameter



### Removing the gear-wheel



1. Press down on the gear-wheel (1).

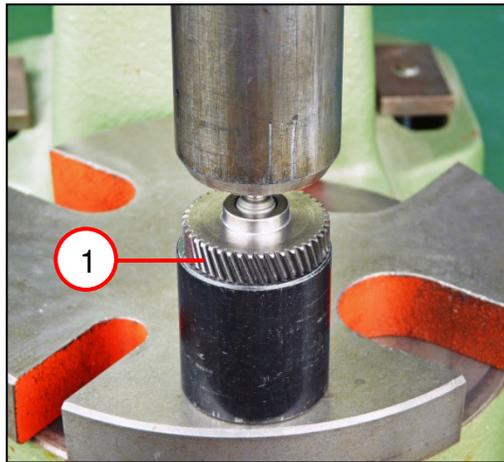
**Tools:**

- Arbor press
- Sleeve  
22 mm inner diameter  
37 mm outer diameter



Removal

Removing the gear-wheel



1. Press down on the gear-wheel (1).

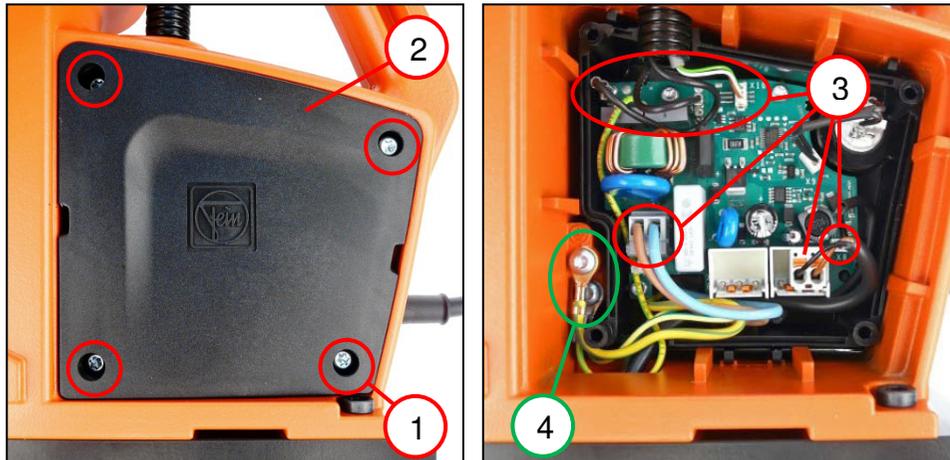
**Tools:**

- Arbor press
- Sleeve  
27 mm inner diameter  
36 mm outer diameter



## Removal

### Removing the electronics



1. Unscrew the four screws (1).
2. Remove the cover (2).
3. Remove the cables (3).
4. Unscrew the two screws (4).

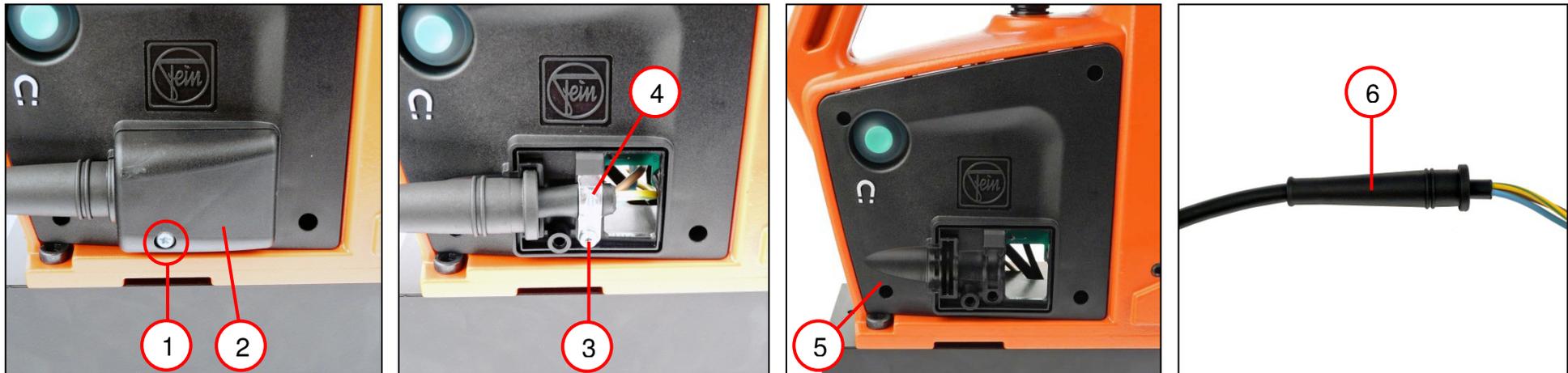
**Tools:**

- Torx T20



## Removal

### Removing the electronics



1. Unscrew the screw (1).
2. Remove the cover (2).
3. Unscrew the screw (3).
4. Remove the cable clamping piece (4).
5. Remove the cover (5).
6. Remove the protective hose (6).

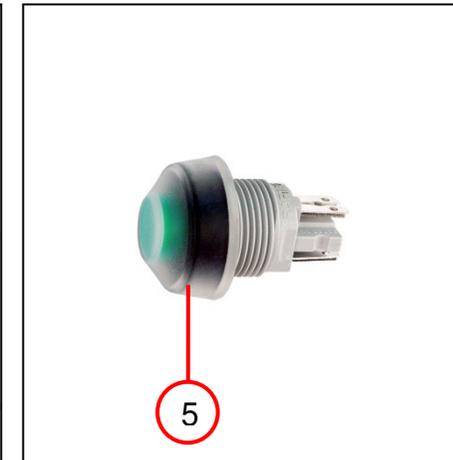
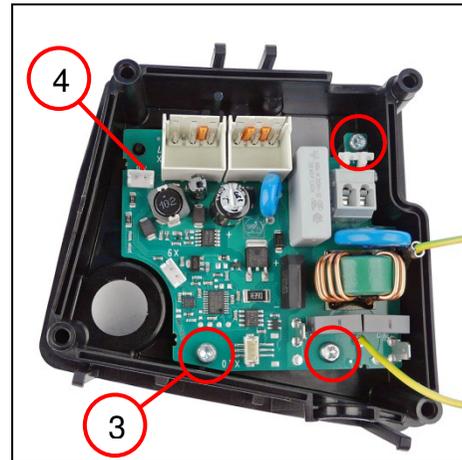
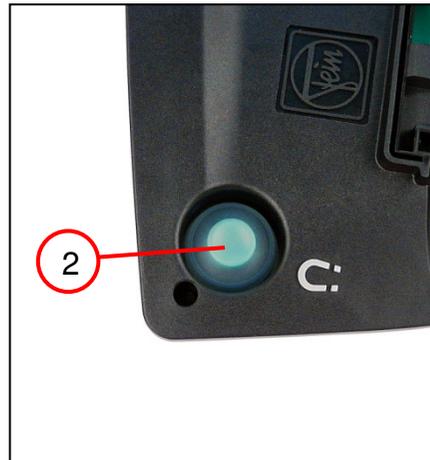
#### Tools:

- Torx T15



## Removal

### Removing the electronics



1. Disconnect the cable (1).
2. Pull out the button (2).
3. Unscrew the three screws (3).
4. Remove the electronics (4).
5. Remove the cap (5).

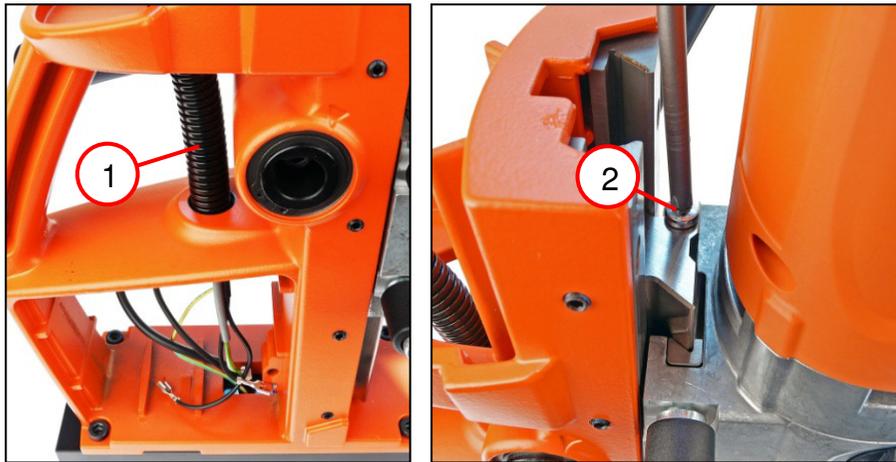
#### Tools:

- Torx T15



## Removal

### Removing the drill motor



1. Remove the protective hose (1).
2. Unscrew the flat headed screw (2).

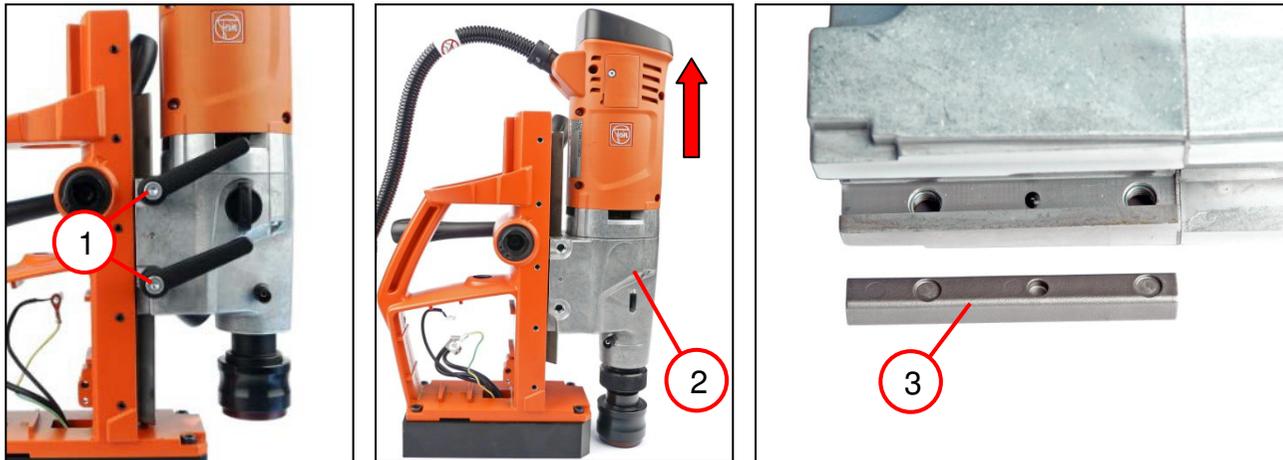
#### Tools:

- PH2 cross-tip screwdriver



## Removal

### Removing the drill motor



### Crushing hazard around drill motor!

☞ The drill motor will rapidly slide downwards once the two screws (1) have been loosened.

1. Unscrew the two screws (1).
2. Remove the drill motor (2).
3. Remove the pressure piece (3).

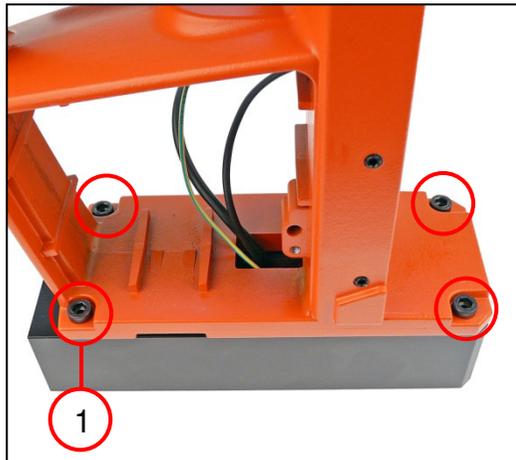
### Tools:

- Socket head wrench, 6 mm



## Removal

### Removing the magnetic foot



1. Unscrew the four screws (1) and remove the magnetic foot.

#### Tools:

- Socket head wrench, 5 mm



## Removal

### Removing the connecting cable



1. Remove the sealing ring (1).

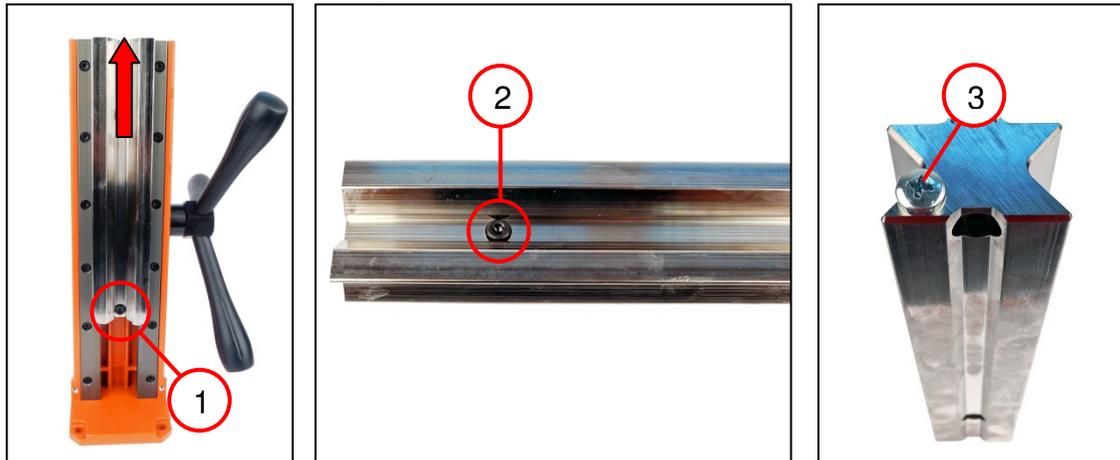
#### Tools:

- Slotted screwdriver



## Removal

### Removing the guide



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 headed screw (3).

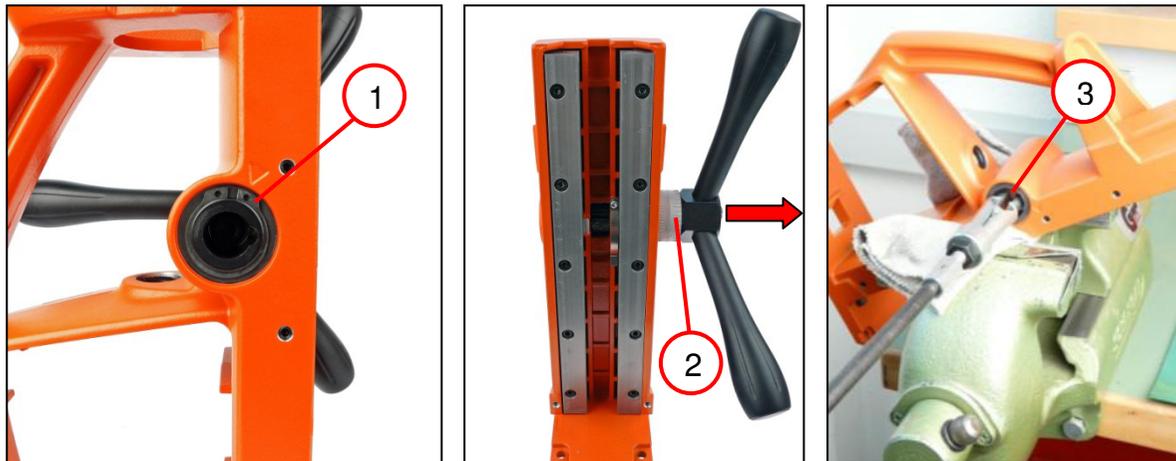
#### Tools:

- Socket head wrench, 4 mm
- Cross-tip screwdriver



## Removal

### Removing the guide



1. Remove the circlip (1).
2. Pull out the spider (2).
3. Remove the bush (3) on both sides.

#### Tools:

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



## Removal

### Removing the guide



1. Remove the disc (1).
2. Unscrew the screw (2) and remove the shaft.
3. Remove scale (3).
4. Unscrew the three handles (4).

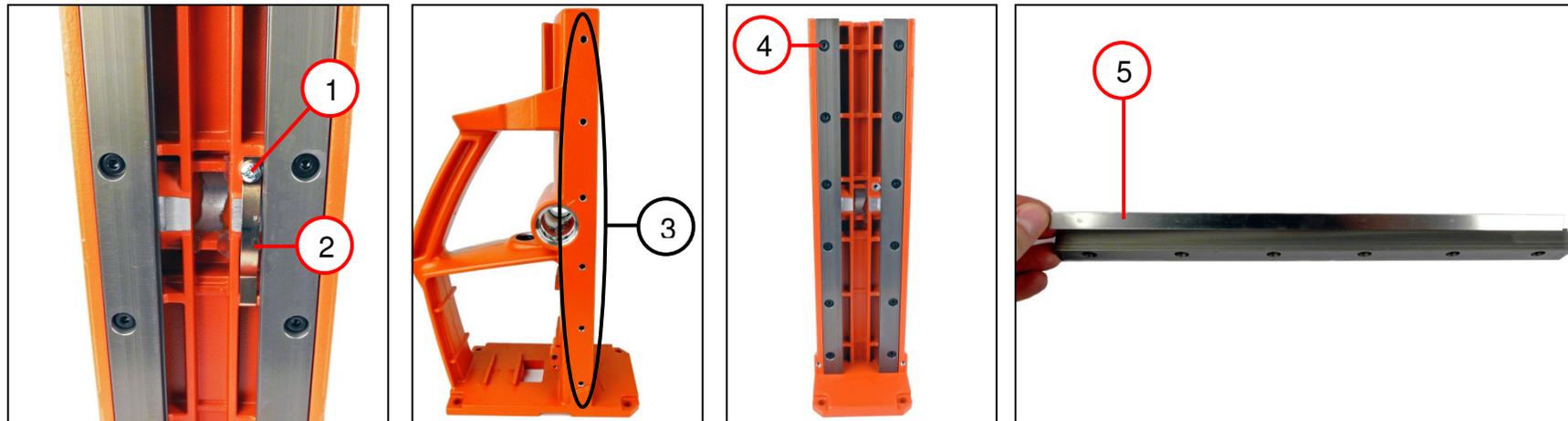
#### Tools:

- Socket head wrench, 5 mm



## Removal

### Removing the guide



1. Unscrew the fillister head screw (1).
2. Remove the leaf spring (2).
3. Unscrew the six set screws (3).
4. Unscrew the six screws (4) and remove the guide strip.
5. Remove the pressure piece (5).

#### Tools:

- Torx T10
- Socket head wrenches, 2.5 mm; 3 mm



## Fitting

### Fitting the guide



1. Place the pressure piece (1) in the correct position.
2. Position the guide strip (2) and press onto the housing.
3. Insert the six cylinder head screws.
4. Position the guide strip (3) and press onto the housing.
5. Insert the six cylinder head screws.
6. Position the six set screws (4).
- ☞ The guide clearance is adjusted after installation of the drill motor.
7. Position the leaf spring (5).
8. Screw in the screw (6) [ $1.1 \text{ Nm} \pm 0.15 \text{ Nm}$ ].

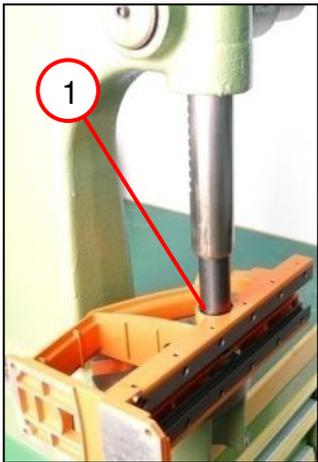
#### Tools:

- Socket head wrenches,  
3 mm; 2.5 mm
- Torx T10



## Fitting

### Fitting bushes



1. Press in the bushes (1) on both sides.

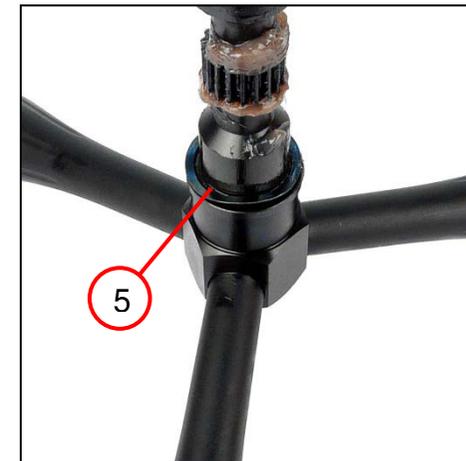
**Tools:**

- Arbor press
- Sleeve  
26 mm inner diameter  
30 mm outer diameter



## Fitting

### Fitting the spider



1. Screw in the three handles (1).
2. Position the scale (2).  
 ☞ Note the unit of measurement of the scale.
3. Position the shaft (3).
4. Screw in the cylinder head screw (4) [8.0 Nm  $\pm 0.5$  Nm].
5. Position the disc (5).
6. Coat the shaft with grease.

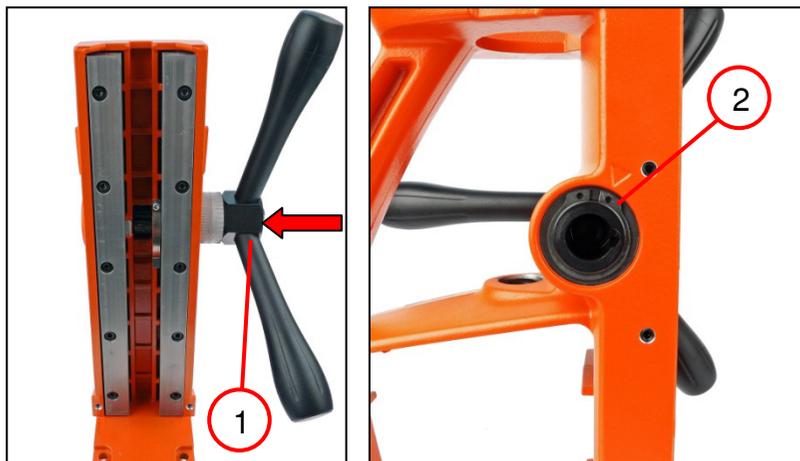
#### Tools:

- Socket head wrench, 5 mm



## Fitting

### Fitting the spider



1. Position the spider (1).
2. Fit the circlip (2).

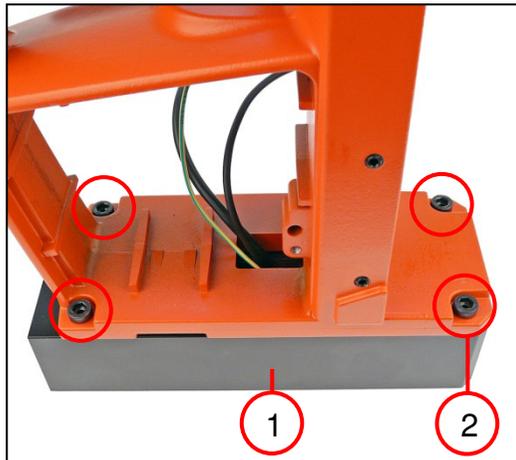
#### Tools:

- Circlip pliers



## Fitting

### Fitting the magnetic foot



1. Position the magnet (1).
2. Screw in the four screws (2) [8.0 Nm  $\pm 0.5$  Nm].

#### Tools:

- Socket head wrench, 5 mm



## Fitting

### Fitting the sealing ring

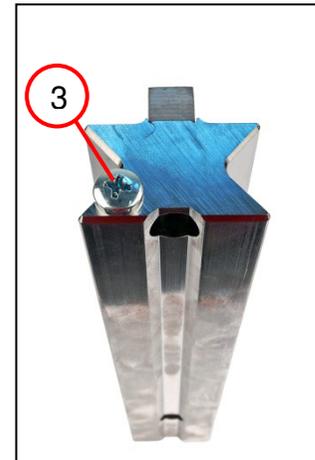
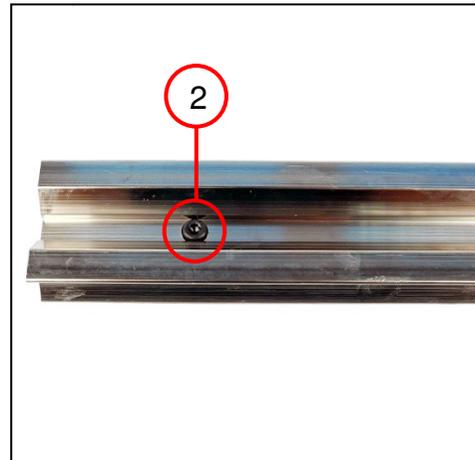
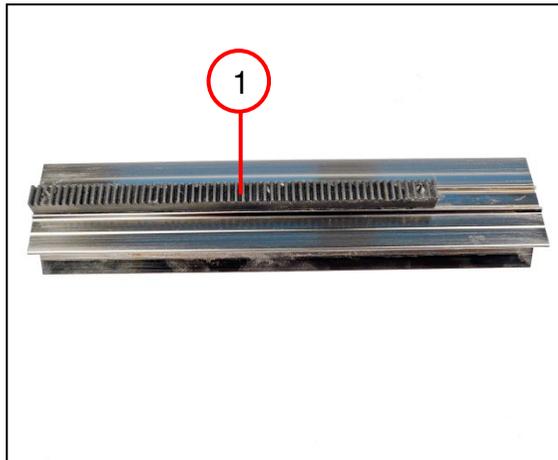


1. Grease the sealing ring (1).
2. Position the sealing ring (1).



## Fitting

### Fitting the guide



1. Position the gear rack (1).
2. Screw in the screw (2) [3.0 Nm  $\pm 0.3$  Nm].
3. Screw in the flat headed screw (3) [1.2 Nm  $\pm 0.15$  Nm].  
 ☞ Check the position.
4. Apply a layer of grease to the gear rack.
5. Coat the guide with grease.
6. Slide the guide into the guide strip.
7. Use the spider to move the guide downwards.
8. Screw in the screw (4) [3.0 Nm  $\pm 0.3$  Nm].

#### Tools:

- PH2 cross-tip screwdriver
- Socket head wrench, 3 mm



## Fitting

### Fitting the drill motor



1. Insert the pressure piece (1) in the correct position.
2. Slide the drill motor (2) onto the guide.
3. Screw in the two screws (3).

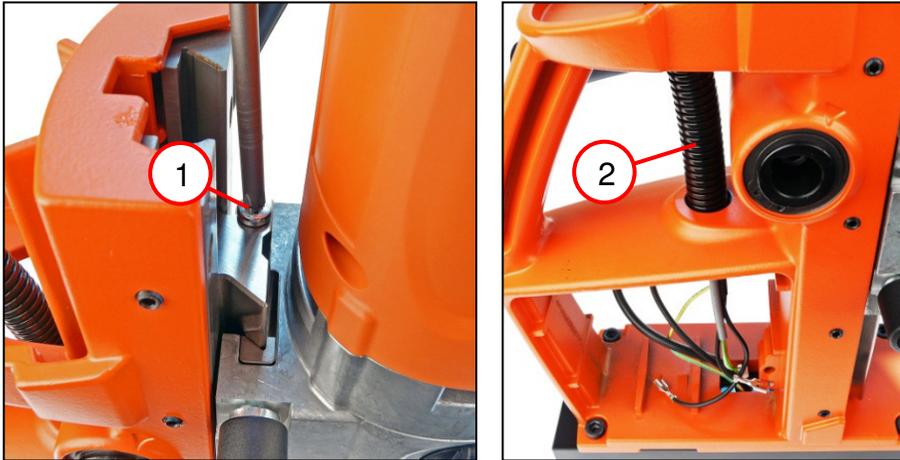
#### Tools:

- Socket head wrench,  
6 mm



## Fitting

### Fitting the drill motor



1. Screw in the flat headed screw (1).
2. Fit the protective hose (2).

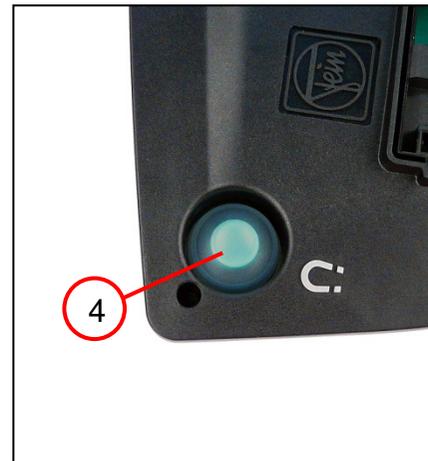
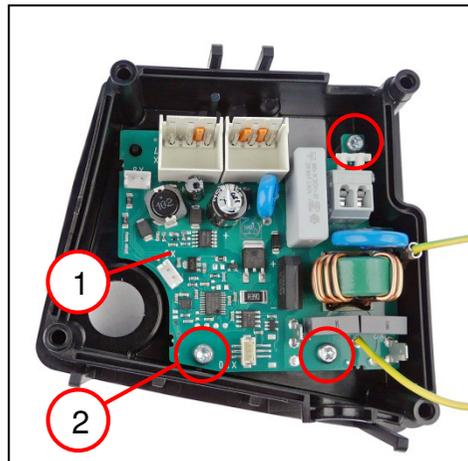
#### Tools:

- Cross-tip screwdriver



## Fitting

### Fitting the electronics



1. Place the electronics (1) in the correct position.
2. Screw in the three screws (2) [2.0 Nm  $\pm 0.3$  Nm].
3. Fit the protective cap (3).
4. Fit the button (4).
5. Connect the cable (5) as shown in the connection diagram.

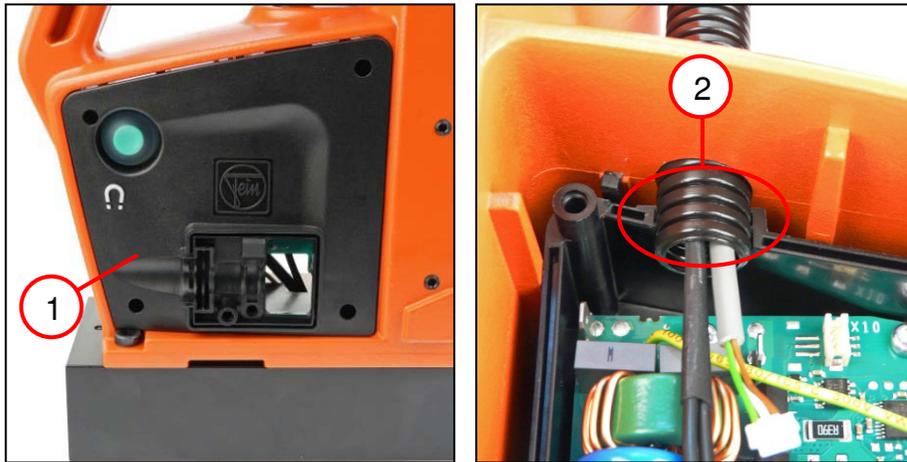
#### Tools:

- Torx T15



## Fitting

### Fitting the electronics

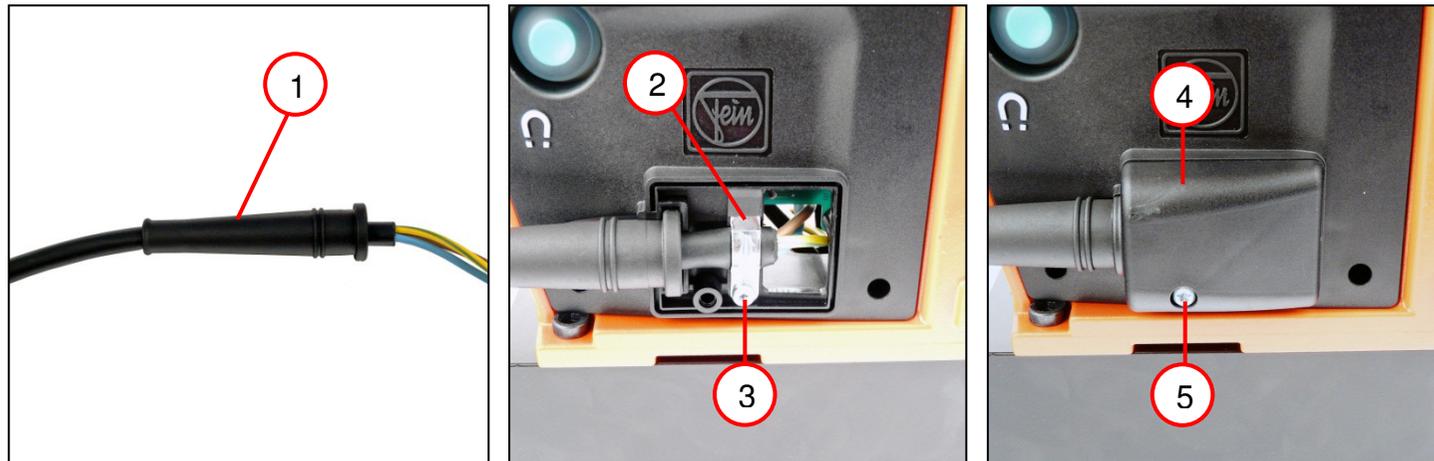


1. Fit the cover (1) in the correct position.
2. Place the protective hose in the recess (2).



## Fitting

### Fitting the cable with plug



1. Slide the protective hose (1) over the cable.
2. Position the cable with the protective hose.
3. Position the cable clamping piece (2).
4. Screw in the screw (3) [0.9 Nm  $\pm 0.1$  Nm].
5. Position the cover (4).
6. Screw in the screw (5) [1.8 Nm  $\pm 0.1$  Nm].

#### Tools:

- Torx T15



## Fitting

### Fitting the electronics



1. Connect all connecting cables as shown in the connection diagram.
2. Position the earthing conductor (1) of the cable with plug.
3. Screw in the screw [1.5 Nm  $\pm 0.2$  Nm].
4. Fit the cover (2).
5. Screw in the four screws (3).

#### Tools:

- Torx T20



## Fitting

### Removing the container



1. Position the container (1).
2. Connect the hose (2) to the hose socket.



## Fitting

### Setting the guide



1. Move drill motor (1) into upper position.
2. Tighten the top three set screws (2) [sequence: Top to bottom] to 1.4 Nm each.

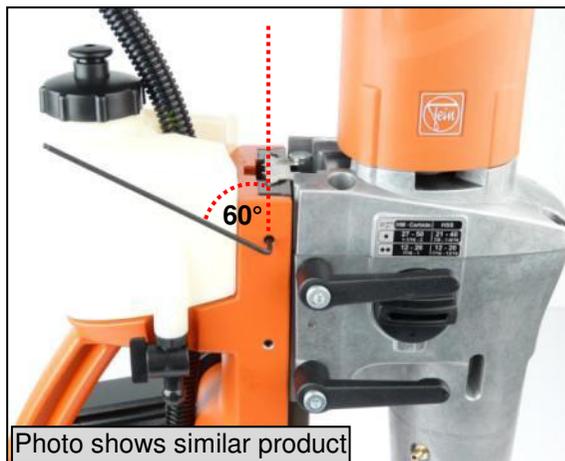
#### Tools:

- Torque wrench with hexagon socket fixture, 2.5 mm



## Fitting

### Setting the guide



1. Turn tightened set screws 60° anticlockwise.

#### Tools:

- Socket head wrench, 2.5 mm



## Fitting

### Setting the guide



1. Move drill motor (1) into lower position.
2. Tighten bottom two set screws (2) to 1.4 Nm each [sequence: Top to bottom].

#### Tools:

- Torque wrench with hexagon socket fixture, 2.5 mm



## Fitting

### Setting the guide



1. Turn tightened set screws 60° anticlockwise.

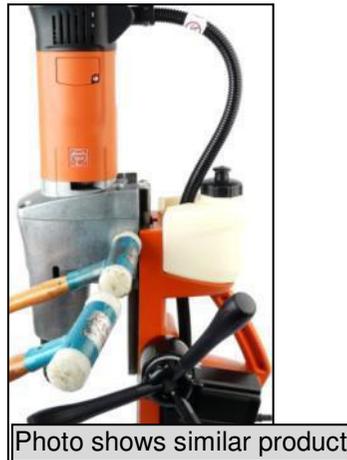
**Tools:**

- Socket head wrench,  
2.5 mm



## Fitting

### Setting the guide



1. Striking the guide hard (1), hammer play out of guide strip.

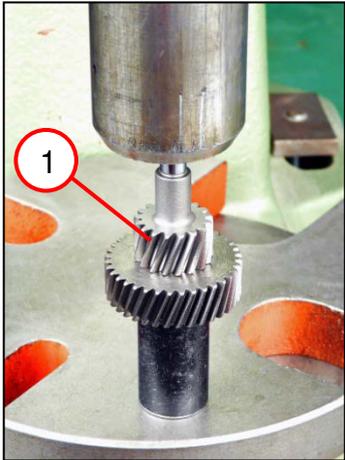
- ☞ Tap on side opposite set screws.
- ☞ Position the plastic hammer such that it is always at the same height as one of the five set screws.
- ☞ If the guide does not run smoothly, turn the set screws anticlockwise in steps of 10°.
- ☞ If the guide moves too readily, turn the set screws clockwise in steps of 10°.
- ☞ After loosening or tightening the set screw, the play must be hammered out of the guide.

**Tools:**

- 2x plastic hammer



### Fitting the gear-wheels



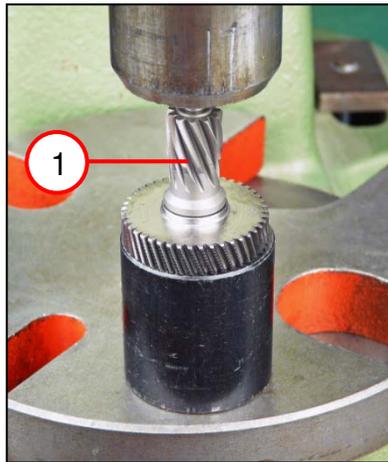
1. Press the gear-wheel [z=36] onto the toothed shaft [z=17] (1).

**Tools:**

- Arbor press
- Sleeve 17 mm inner diameter  
25 mm outer diameter



### Fitting the gear-wheels



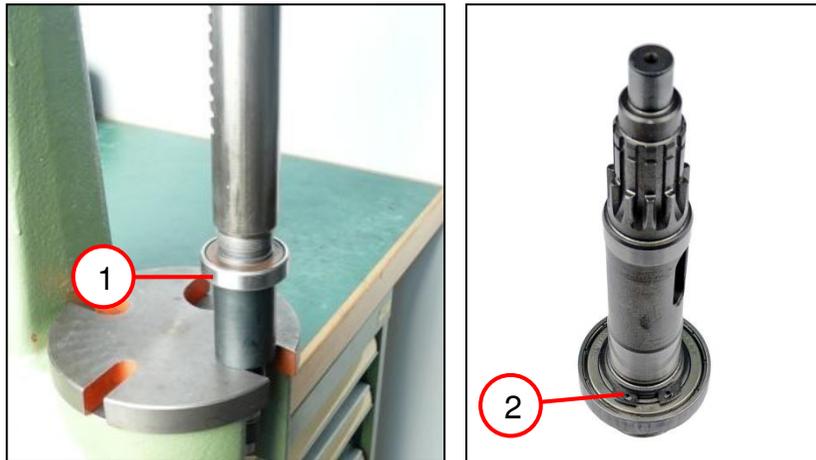
1. Press the gear-wheel [z=43] onto the toothed shaft [z=11] (1).

**Tools:**

- Arbor press
- Sleeve 16 mm inner diameter  
25 mm outer diameter



### Fitting the drill shaft



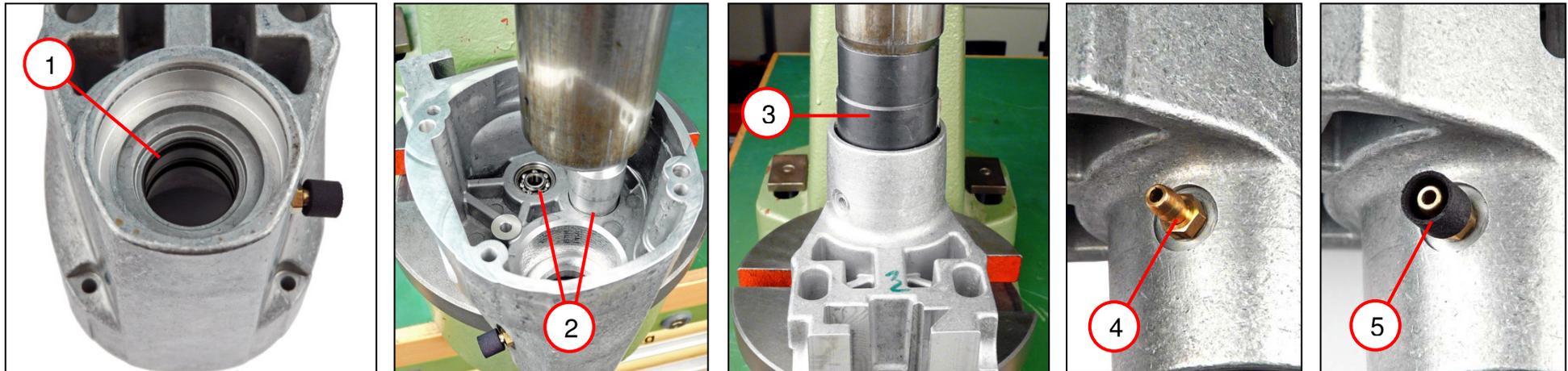
1. Press on the grooved ball bearing (1).
2. Fit the circlip (2).

**Tools:**

- Arbor press
- Sleeve 26 mm inner diameter  
42 mm outer diameter

Fitting

Fitting the gearbox housing



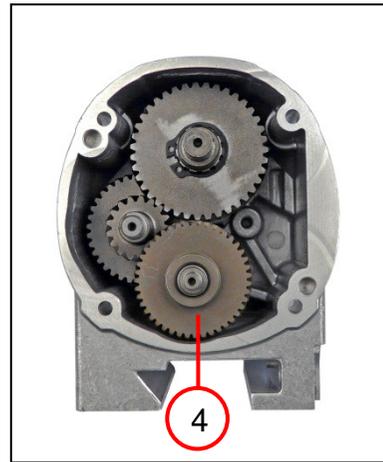
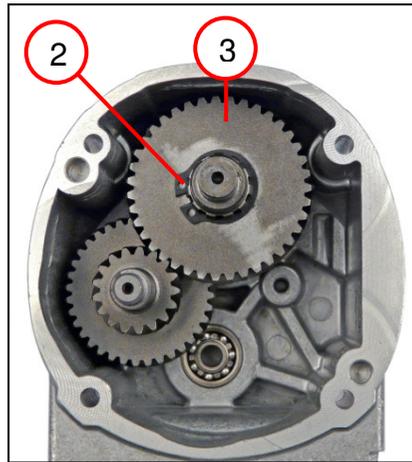
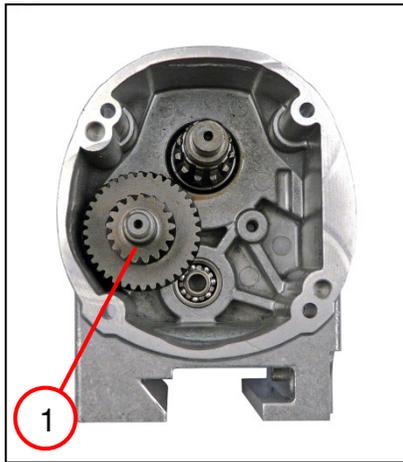
1. Fit the three sealing rings (1).
2. Apply a layer of grease to the three sealing rings (1).
3. Press in the grooved ball bearings (2).
4. Press in the shaft (3).
5. Fit the hose socket (4).
6. Fit the sleeve (5).

**Tools:**

- Arbor press
- Sleeve 7 mm inner diameter  
18 mm outer diameter
- Sleeve Inner dia. 5 mm  
Outer dia. 15 mm
- Circlip pliers
- Sleeve 41 mm inner diameter  
31 mm outer diameter
- Socket wrench insert, 7 mm
- Socket wrench



### Fitting the gearbox housing



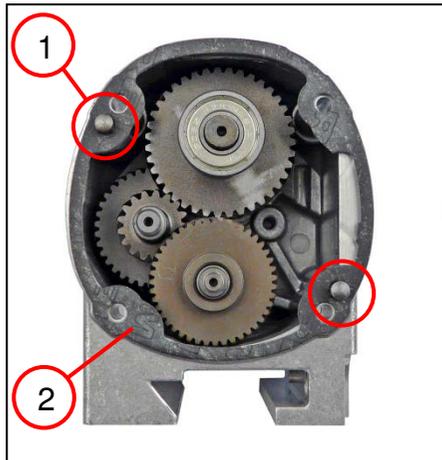
1. Insert the gear-wheel (1).
2. Insert the gear-wheel (2).
3. Fit the circlip (3).
4. Insert the gear-wheel (4).
5. Press on the grooved ball bearing (5).

#### Tools:

- Circlip pliers
- Arbor press
- Sleeve 10 mm inner diameter  
24 mm outer diameter



Fitting the gearbox housing



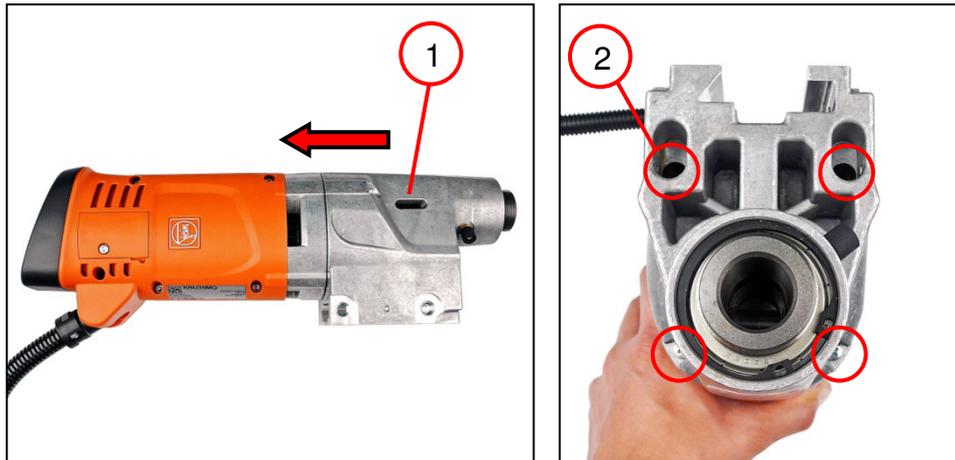
1. Fit the two pins (1).
2. Position the seal (2).

**Tools:**

- Combination pliers



### Fitting the gearbox housing



1. Place the gearbox housing (1) on the drill motor.
2. Screw in the four screws (2).

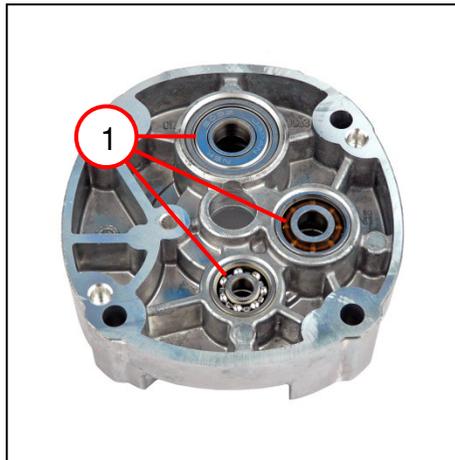
**Tools:**

- Torx T20



## Fitting

### Fitting the intermediate gearbox



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

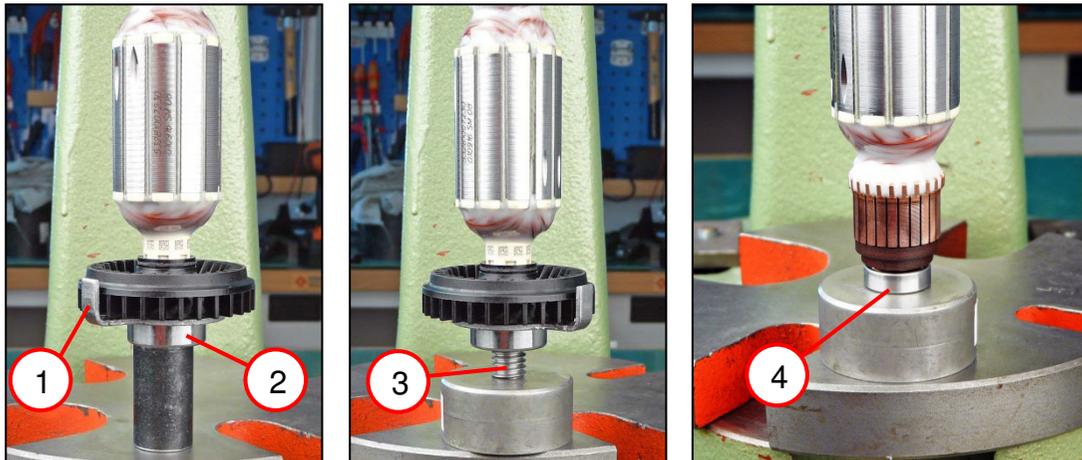
#### Tools:

- Sleeve 5 mm inner diameter  
16 mm outer diameter
- Sleeve 7 mm inner diameter  
18 mm outer diameter
- Sleeve 10 mm inner diameter  
23 mm outer diameter



## Fitting

### Fitting the armature



1. Position the plate (1).
2. Press on the grooved ball bearing (2).
3. Position the sealing ring (3).
4. Press on the grooved ball bearing (3).
5. Position the sealing ring (4).

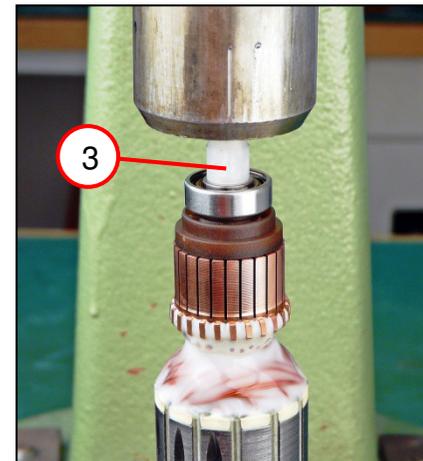
#### Tools:

- Arbor press
- Sleeve 13 mm inner diameter  
26 mm outer diameter
- Sleeve 7 mm inner diameter  
13 mm outer diameter



## Fitting

### Fitting the armature



1. Apply a layer of grease to the sealing ring.
2. Position the sealing ring (1).
3. Press in the armature (5).
4. Press on the magnet (3).

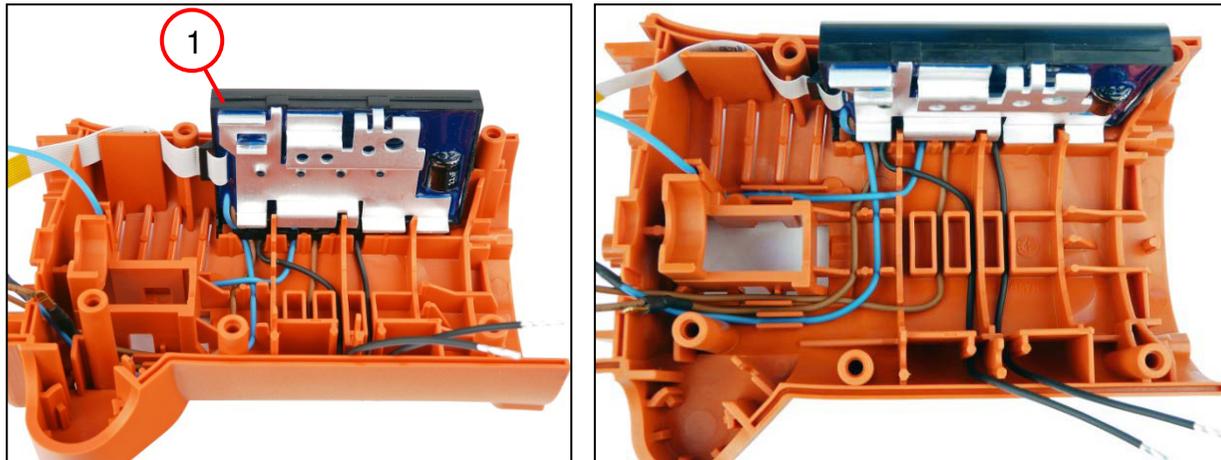
**Tools:**

- Arbor press



## Fitting

### Fitting the electronics

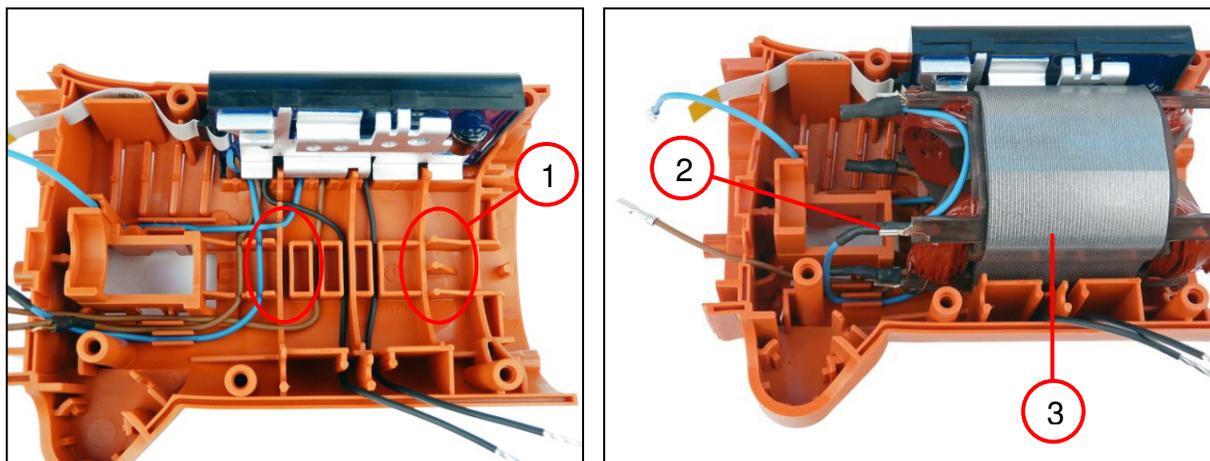


1. Position the electronics (1).
2. Route the cables as shown in the connection diagram.



## Fitting

### Fitting the stator

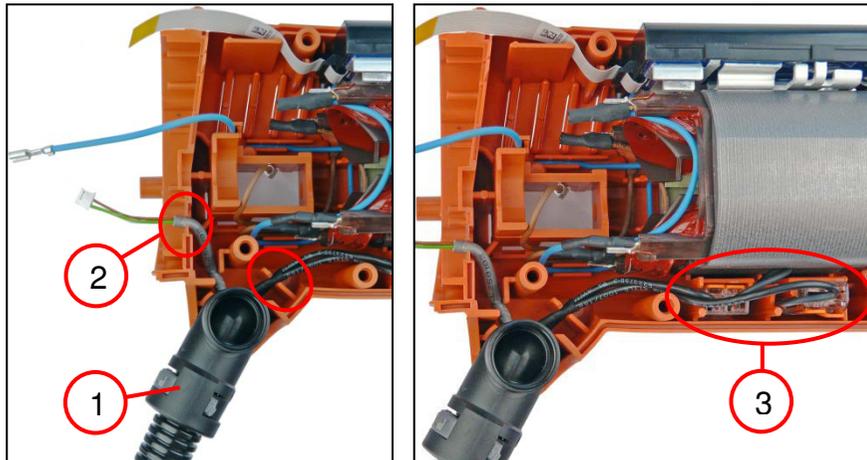


1. Connect the cables (2) to the stator as shown in the connection diagram.
2. Position the stator (3) in the opening (1) in the correct position.



## Fitting

### Fitting the electronics



1. Position the connecting piece (1).
2. Lay the two connecting cables (2).
3. Connect the cables (3) to the connectors as shown in the connection diagram.
4. Position the connectors in the respective opening.



## Fitting

### Fitting the carbon brush holders



1. Connect the brown cable (1).
2. Position the housing half (2).
3. Screw in the five screws (3).
4. Connect the blue cable (4).

#### Tools:

- Long-nosed pliers



## Fitting

### Fitting the intermediate gearbox

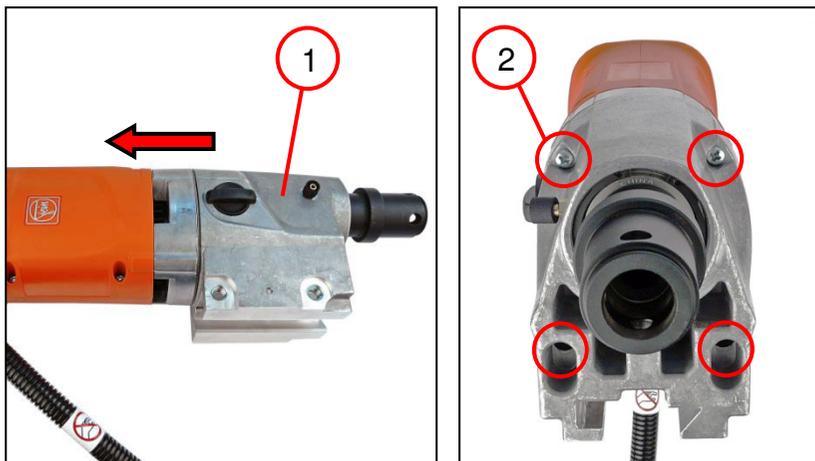


1. Position the air guide ring (1).
2. Fit the intermediate gear box (2) with armature.



## Fitting

### Fitting the gearbox housing



1. Place the gearbox housing on the drill motor.
2. Screw in the four screws (2).

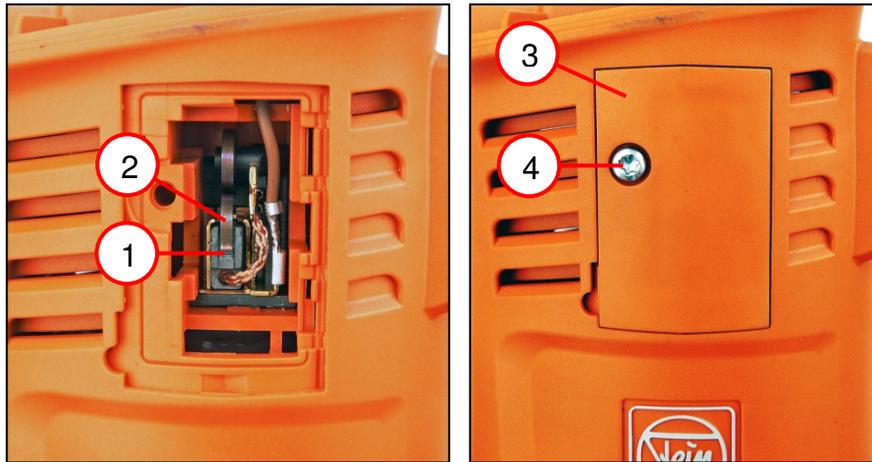
**Tools:**

- Torx T20



## Fitting

### Assembling carbon brushes



1. Insert the carbon brush (1) in the correct position [on both sides].
2. Place the spring (2) on the carbon brush [on both sides].
3. Connect the carbon brush [on both sides].
4. Fit the cover (3) [on both sides].
5. Screw in the screw (4) [on both sides].

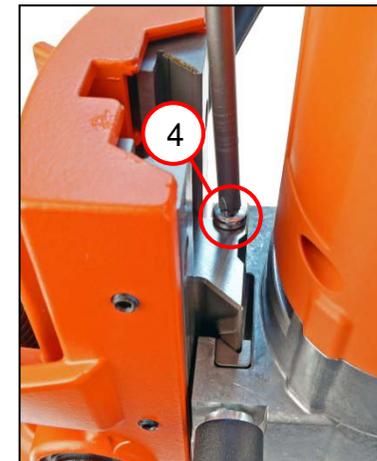
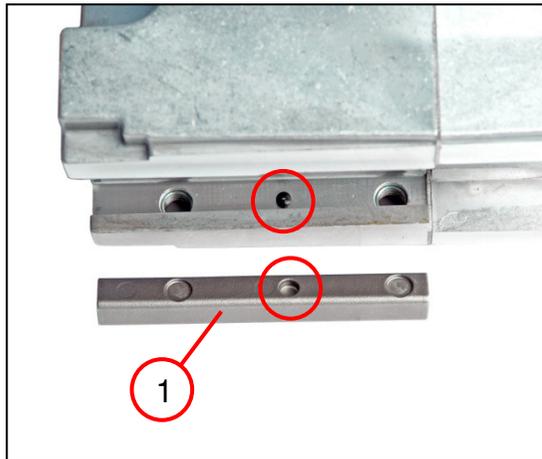
#### Tools:

- Long-nosed pliers
- Assembly aid
- Torx T15



## Fitting

### Fitting the gearbox housing



1. Insert the pressure piece (1).
2. Slide the drill motor (2) into the guide.
3. Screw in the two levers (3).
4. Screw in the fillister head screw (4).

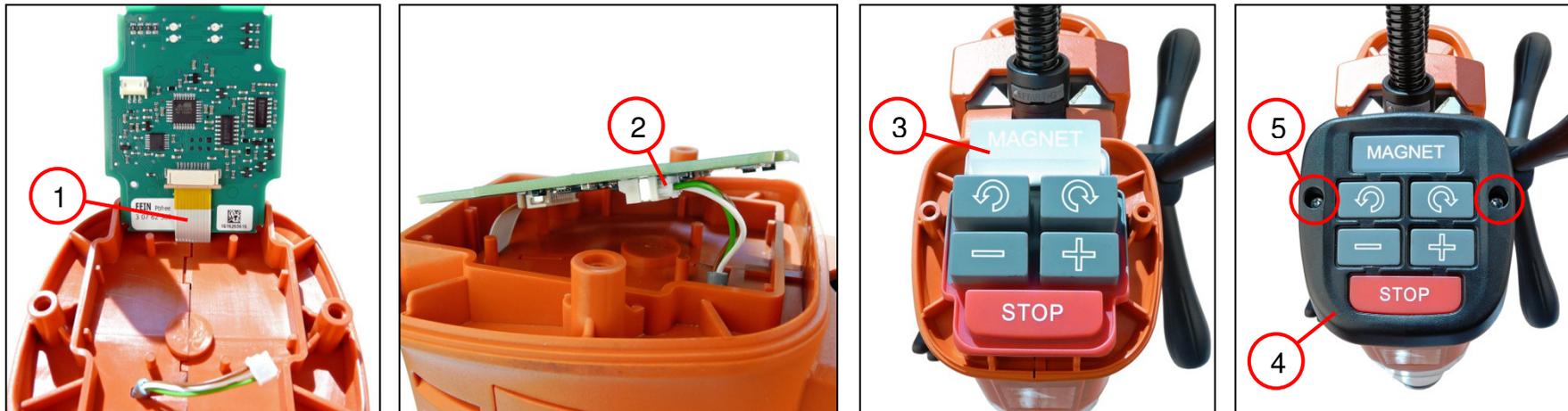
**Tools:**

- Cross-tip screwdriver



## Fitting

### Removing the control panel



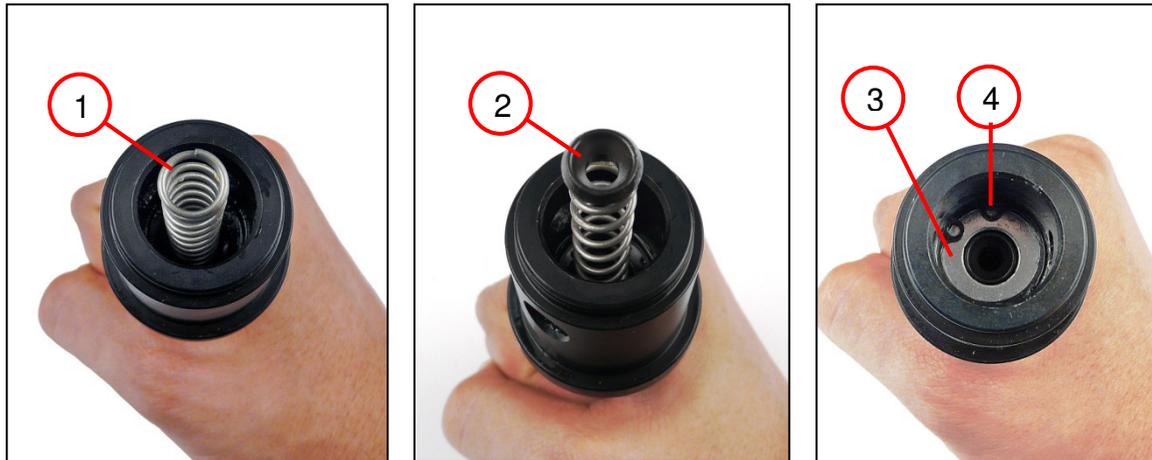
1. Insert the ribbon cable (1) and connect the plug.
2. Connect the plug (2).
3. Add the switch insert (3).
4. Position the cover (4).
5. Screw in the two screws (5).

**Tools:**

- Torx T20



### Fitting the holder



1. Insert the spiral spring (1).
1. Position the sealing ring (2).
2. Position the disc (3).
3. Fit the sealing ring (4).

**Tools:**

- Circlip pliers
- Punch, 6 mm diameter



## Fitting

### Fitting the holder



1. Insert the four balls (1) in shaft.  
☞ Fix balls with a drop of grease.
2. Place sleeve (2) on shaft.
3. Place sleeve (3) on shaft.
4. Insert spiral spring (4) between inner and outer sleeve.

**Tools:**

- Circlip pliers
- Grease



## Fitting

### Fitting the holder



1. Slide nut (1) over shaft.
2. Secure circlip (2) on shaft.

**Tools:**

- Circlip pliers

