# Repair instructions

**Applies to:**

CG 15-125; CG15-150

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# 1 Models described

These repair instructions describe how to repair the following models:

| Model | Material number |
|---|---|
| **CG 15-125 BL** | 7 222 67 .. .. .<br>7 225 06 .. .. . |
| **CG 15-125 BL Inox** | 7 222 86 .. .. .<br>7 225 07 .. .. . |
| **CG 15-125 BLP** | 7 222 76 .. .. .<br>7 225 08 .. .. . |
| **CG 15-125 BLP Inox** | 7 222 85 .. .. .<br>7 225 09 .. .. . |
| **CG 15-150 BL** | 7 222 78 .. .. .<br>7 225 10 .. .. . |
| **CG 15-150 BLP** | 7 222 77 .. .. .<br>7 225 11 .. .. . |



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# 2 Technical data

### Technical data

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

### Special tools

The special tools catalogue can be found in the FEIN electronic information system.

### Lubricants and auxiliary substances

The lubricants catalogue 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

The connection diagram can be found in the FEIN electronic information system.

### Documents required for further repair work

- FEIN lubricants catalogue
- FEIN special tools catalogue
- All relevant service communications



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# 3 Symbols used

| | |
|---|---|
| | Refers to measures for avoiding the risk of injuries. |
| | Caution: danger of crushing. |
| | Caution: danger of cutting. |
| | ESD warning symbol to identify electrically sensitive components and parts. |
| | Refers to information or instructions that should be followed. Non-observance can result in damage or malfunctions. |
| | Read the operating instructions. |
| | This spare part must always be replaced after disassembly. |
| | 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!**

Read the operating instructions for the product before carrying out any 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 respective individual 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.

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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**



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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.

## 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

## 5.4 ESD protection

Damage from electrostatic charge.

Failure to comply with the safety regulations for ESD protection may cause damage to the electronics.

Only perform assembly/disassembly work on electronics at a workstation with ESD protection.

**ESD**

Avoiding the failure of electronics



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# 6 Tools, lubricants and auxiliary substances required

## 6.1 Standard tools

| | |
|---|---|
| Slotted screwdriver | 2.5 |
| Plastic hammer | |
| Torx screwdriver | T15 |
| Torx screwdriver | T20 |
| Punch | 6 mm diameter |
| Arbor press | |
| Ball bearing support | 19 mm; 26 mm |
| Sleeve | 35 mm inner diameter |
| | 19 mm outer diameter<br>14 mm inner diameter |
| | 42 mm outer diameter<br>30 mm inner diameter |
| | 20 mm outer diameter<br>15 mm inner diameter |
| | 27 mm outer diameter<br>15 mm inner diameter |
| 4x round material | 20 mm in diameter<br>Length 60 mm |

## 6.2 Special tools

| | |
|---|---|
| Drawing-off socket cap | SW0016 |
| Chuck cone | SW0019, 19 mm diameter |
| Chuck cone | SW0019, 26 mm diameter |
| Drawing-off plate | SW0011 |
| Pipe | SW0002 |
| Assembly aid | SW0069 |

## 6.3 Lubricants and auxiliary substances required

| | | | |
|---|---|---|---|
| Grease | SM0019 | 30 / 35 g | Gearbox |
| Sealant | HS0034 | 0.2 g | Mains cable, electronics |



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# 7 Test and diagnostics options

**Test data**

The permitted parameters for the machine can be found in the FEIN electronic information system.



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# 8 Disassembly

## 8.1 Removing the safety hood and handle

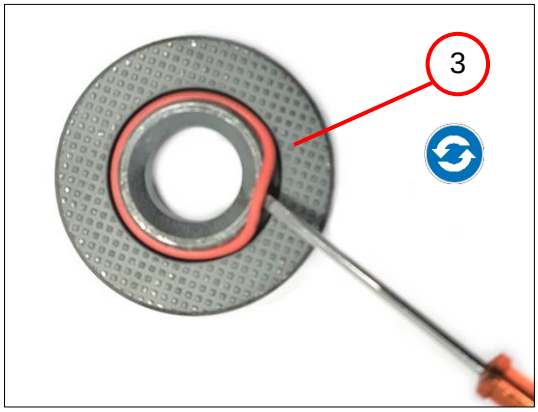
**Tools:**

- Pin-type face wrench
- Slotted screwdriver

### Information

Remove the safety hood as described in the relevant operating instructions.

1. Remove the safety hood (**1**).
2. Unscrew the handle (**2**).




### Note!

Missing or damaged O-ring (**3**).

It cannot be guaranteed that the grinding tools will be installed correctly.

Replace the O-ring.



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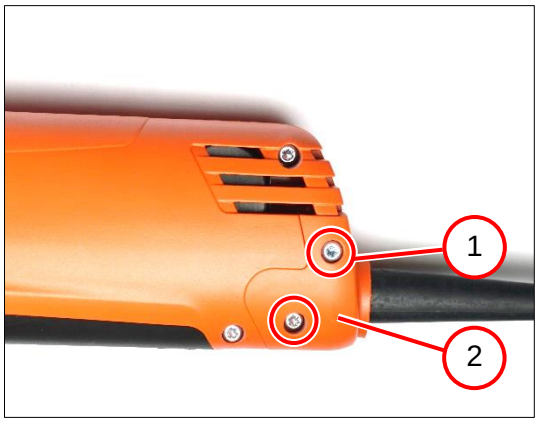
## 8.2 Removing the mains cable

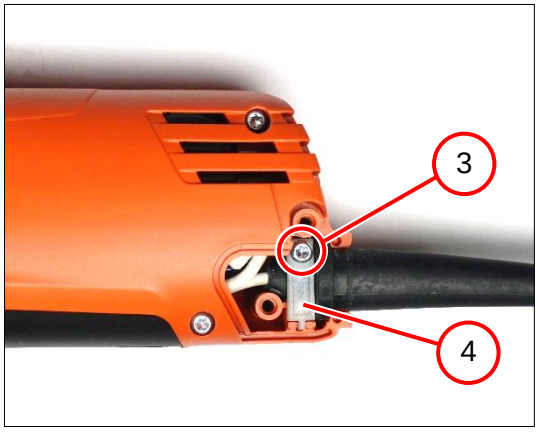
### 8.2.1 Removing the CG15-BL mains cable

**Tools:**

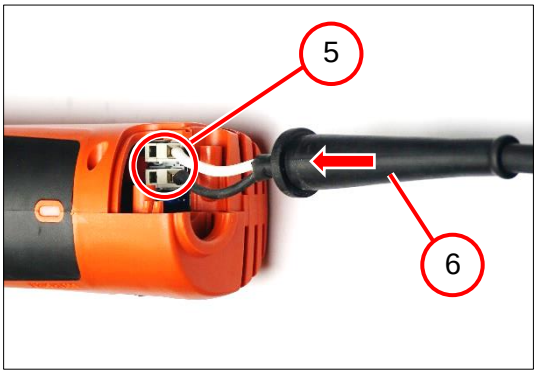
- Torx T15
- Slotted screwdriver – 2.5 mm




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




3. Remove the cover (**3**).
4. Remove the cable clamp (**4**).




5. Remove the two cables (**5**).
6. Remove the cable grommet (**6**).



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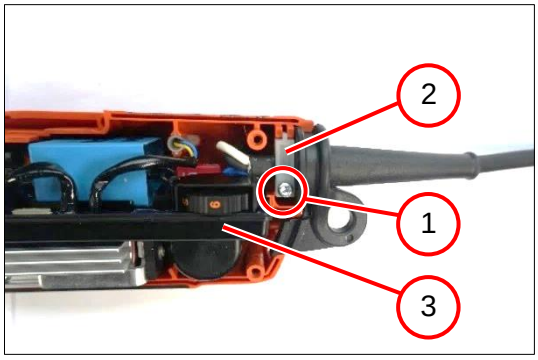
## 8.2.2 Removing the **mains cable CG15-BLP**

**Steps that must be completed:**

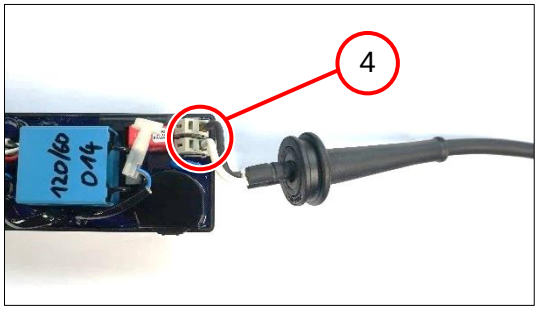
- Removing the leverRemoving the lever
- Removing the bearing plate
- Removing the gearbox housing
- Removing the CG15-BLP motor housing

**Tools:**

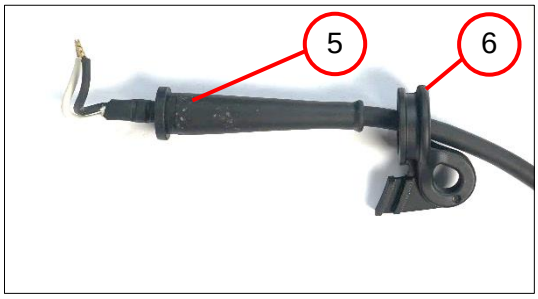
- Torx T15
- Slotted screwdriver – 2.5 mm




1. Unscrew the screw (**1**).
2. Remove the cable clamp (**2**).
3. Remove the electronics (**3**).




4. Remove the two cables (**4**).




5. Remove the cable grommet (**5**).
6. Remove the eyelet (**6**).



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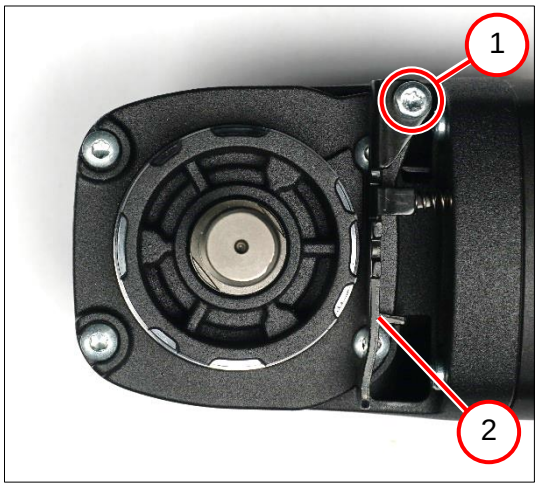
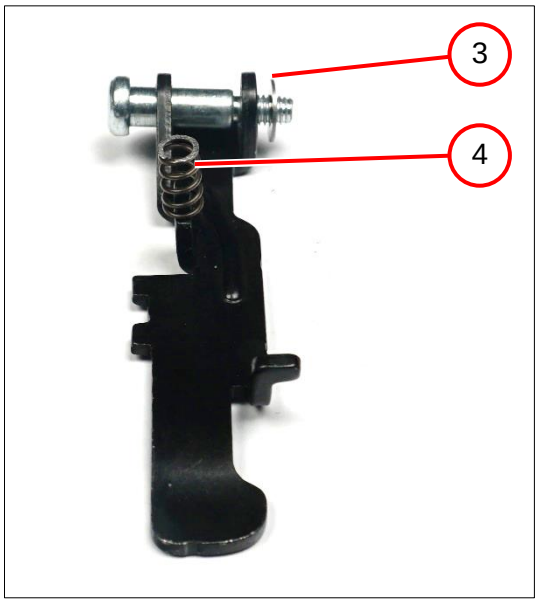
## 8.3 Disassembling the gearbox

### 8.3.1 Removing the lever

| |
|---|
| **Steps that must be completed:**<br>- Removing the safety hood and handle |
| **Tools:**<br>- Torx T20 |




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




3. Remove the washer (**3**).
4. Remove the spring (**4**).



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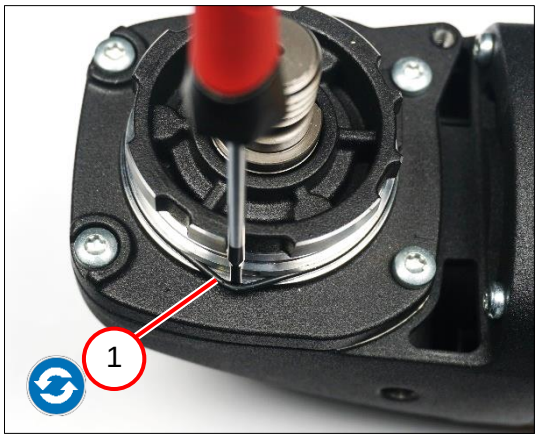
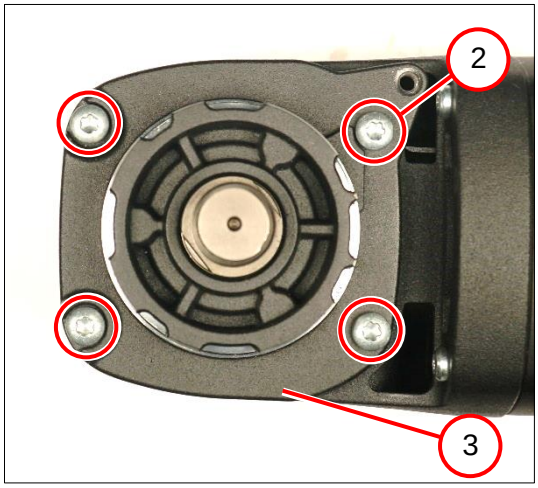
## 8.3.2 Removing the bearing plate

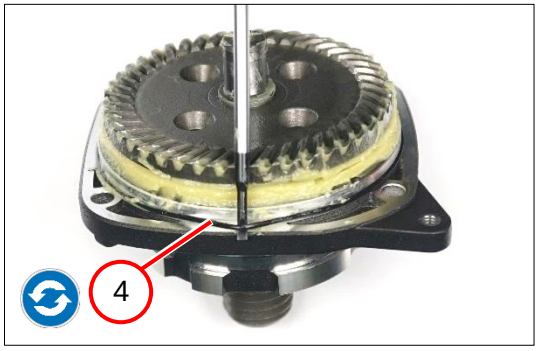
| |
|---|
| **Steps that must be completed:**<br>- Removing the safety hood and handle |
| **Tools:**<br>- Slotted screwdriver – 2.0 mm<br>- Torx T20 |




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




2. Unscrew the four screws (**2**).
3. Remove the bearing plate (**3**).




4. Remove the sealing ring (**4**).



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## 8.3.3 Disassembling the bearing plate

**Steps that must be completed:**

- Removing the lever
- Removing the bearing plate

**Tools:**

- Arbor press
- Sleeve, 35 mm inner diameter
- Torx T20
- Sleeve, 14 mm inner diameter, 19 mm outer diameter
- Sleeve, 30 mm inner diameter, 42 mm outer diameter

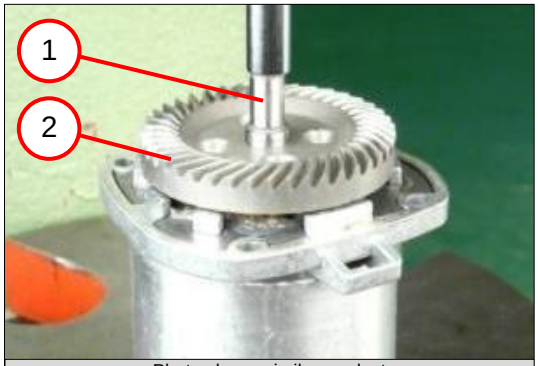

Photo shows similar product

1. Press out the shaft (**1**).
2. Remove the gearwheel (**2**).

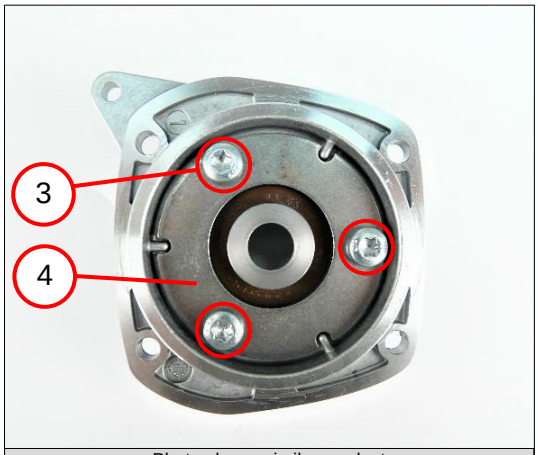

Photo shows similar product

3. Unscrew the three screws (**3**).
4. Remove the plate (**4**).



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# Disassembly

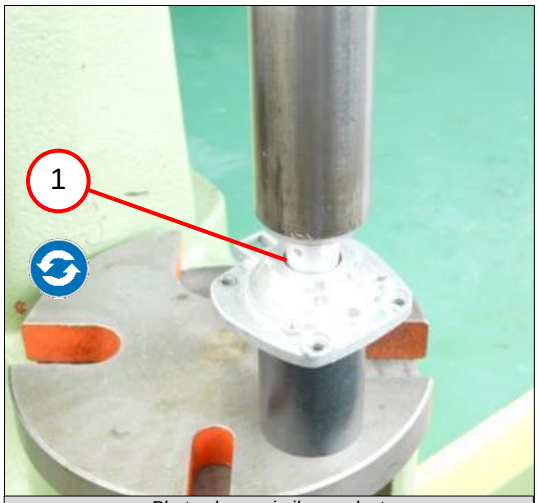

Photo shows similar product

5. Press out the grooved ball bearing (**1**).



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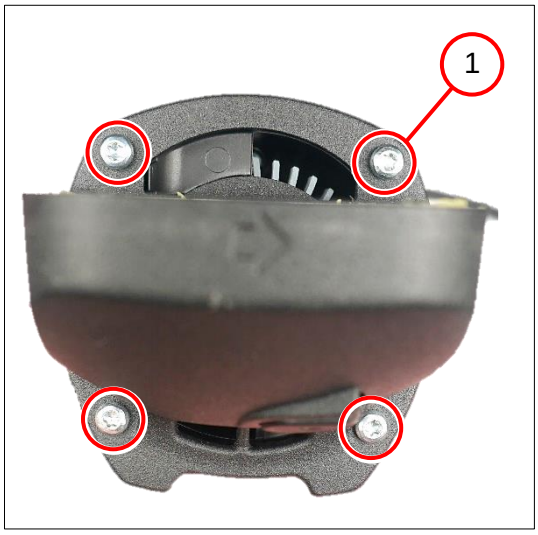
## 8.3.4 Removing the gearbox housing

**Steps that must be completed:**

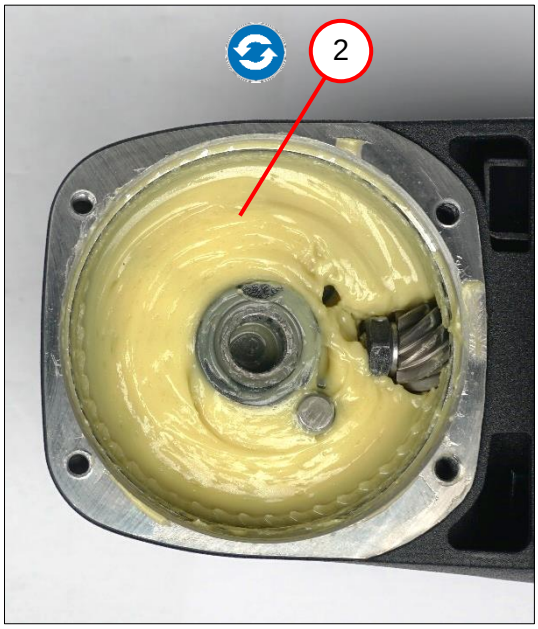
- Removing the lever
- Removing the bearing plate

**Tools:**

- Torx T15
- Cleaning area




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




2. Remove the grease (**2**).



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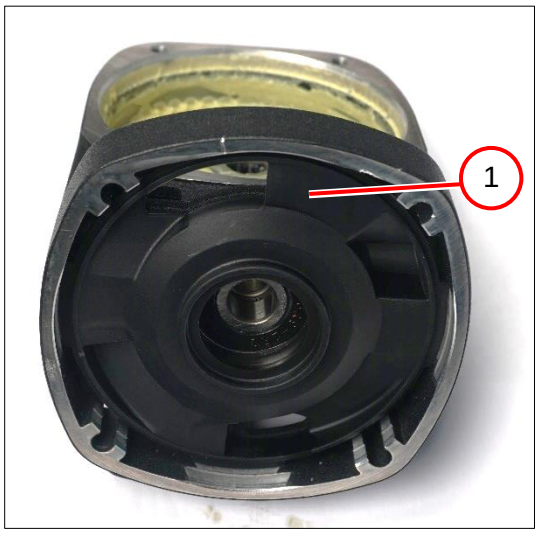
## 8.3.5 Disassembling the gearbox housing

**Steps that must be completed:**

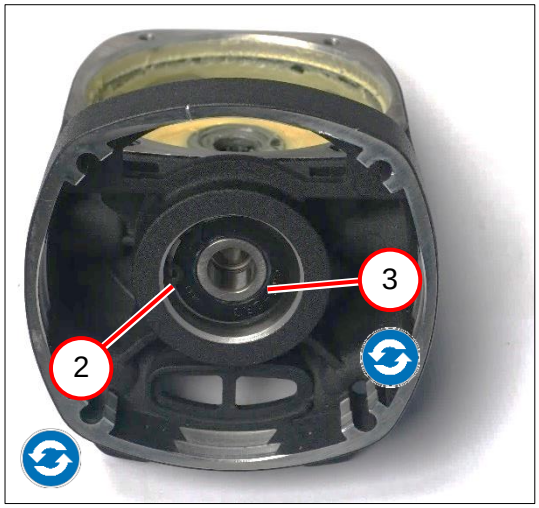
- Removing the lever
- Removing the bearing plate
- Removing the gearbox housing
- Removing the CG15-BL/CG15-BLP motor housing
- Removing the motor

**Tools:**

- Circlip pliers
- Internal puller




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




2. Remove the circlip (**2**).
3. Remove the bearing (**3**).



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## 8.3.6 Removing the pushbutton.

**Steps that must be completed:**

- Removing the lever
- Removing the bearing plate

**Tools:**

- Slotted screwdriver
- Punch, 3 mm

1. Remove the pushbutton (**1**).

2. Remove the spring (**2**).
3. Remove the bolt with sealing ring (**3**).



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## 8.4 Disassembling the housing

### 8.4.1 Removing the CG15-BL motor housing

**Steps that must be completed:**

- Removing the lever
- Removing the bearing plate
- Removing the gearbox housing

**Tools:**

- Blade
- Slotted screwdriver

1. Cut through the label (**1**).

2. Cut through the label (**2**).



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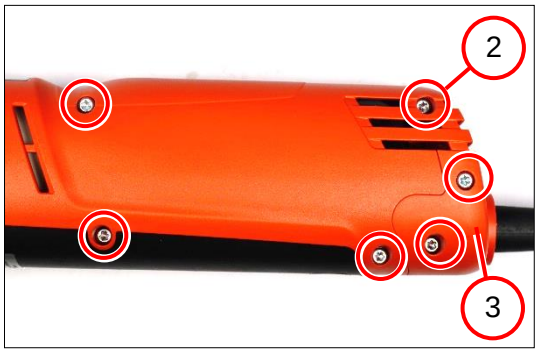
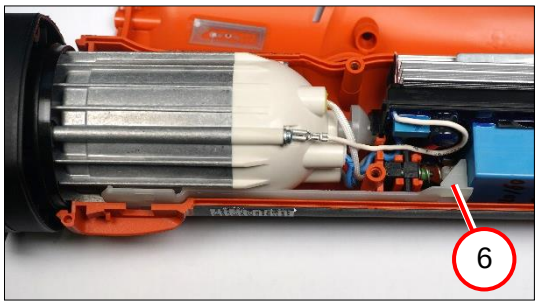
## Disassembly

3. Remove the slide switch (**1**).

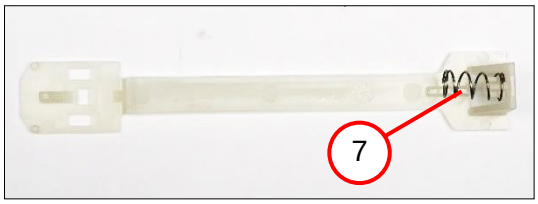



4. Remove the six screws (**2**).
5. Remove the cover (**3**).

6. Pull out the gearbox housing (**4**) by approx. 5 mm.
7. Remove the housing shell (**5**).




8. Remove the control rod (**6**).




9. Remove the spring (**7**).



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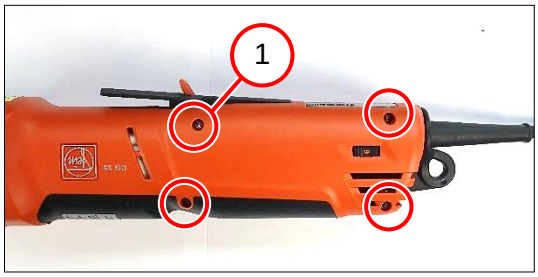
## 8.4.2 Removing the CG15-BLP motor housing

**Steps that must be completed:**

- Removing the lever
- Removing the bearing plate
- Removing the gearbox housing

**Tools:**

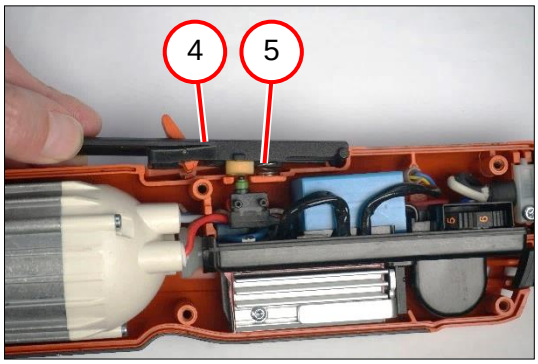
- Torx T15



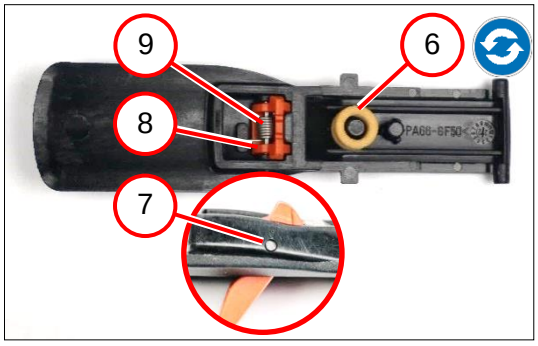

1. Unscrew the four screws (**1**).

Photo shows similar product

2. Pull out the gearbox housing (**2**) by approx. 5 mm.
3. Remove the housing shell (**3**).




4. Remove the switch rail (**4**).
5. Remove the spring (**5**).




6. Remove the seal (**6**).
7. Remove the pin (**7**).
8. Remove the inhibitor (**8**).
9. Remove the spring (**9**).



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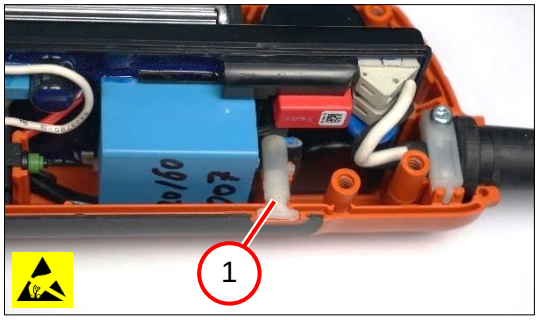
### 8.4.3 Removing the CG15-BL electronics

**Steps that must be completed:**

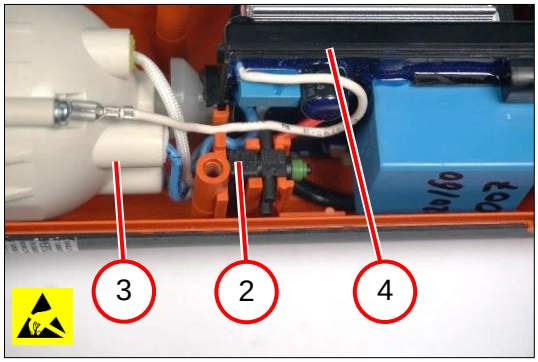
- Removing the CG15-BL mains cable
- Removing the lever
- Removing the bearing plate
- Removing the gearbox housing
- Removing the CG15-BL motor housing

**Tools:**

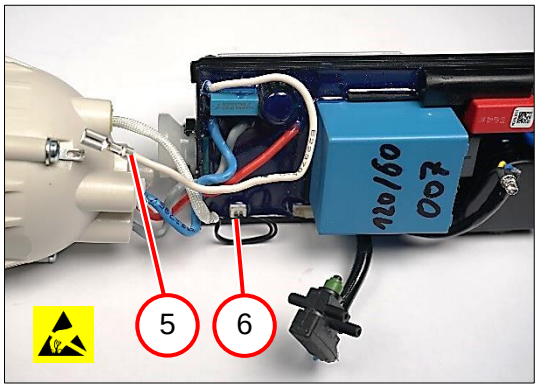
- Slotted screwdriver – 2.5 mm




1. Remove the optical cable (**1**).




2. Remove the switch (**2**).
3. Remove the motor (**3**) together with the electronics (**4**).




4. Remove the plug (**5**).
5. Remove the plug (**6**).



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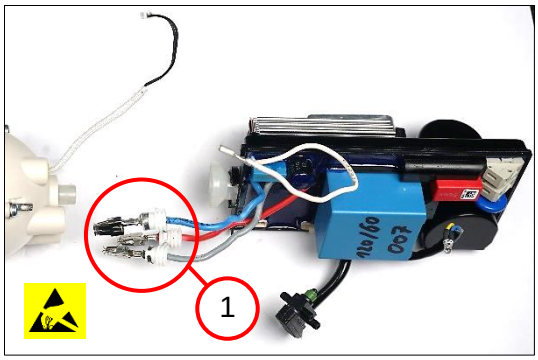
## Disassembly




6. Remove the three plugs (**1**).



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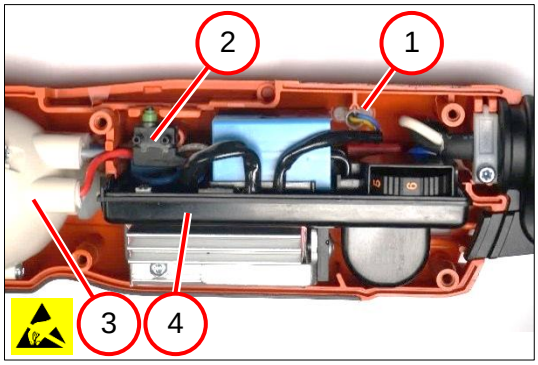
## 8.4.4 Removing the CG15-BLP electronics

**Steps that must be completed:**

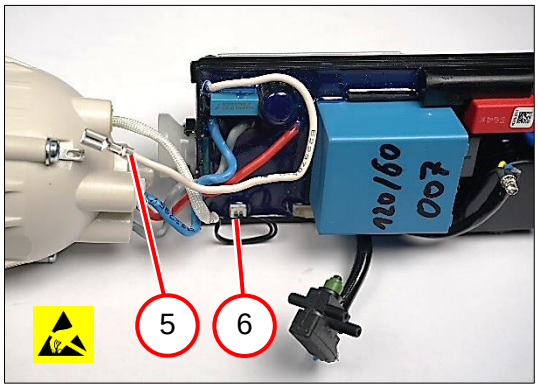
- Removing the CG15-BLP mains cable

**Tools:**

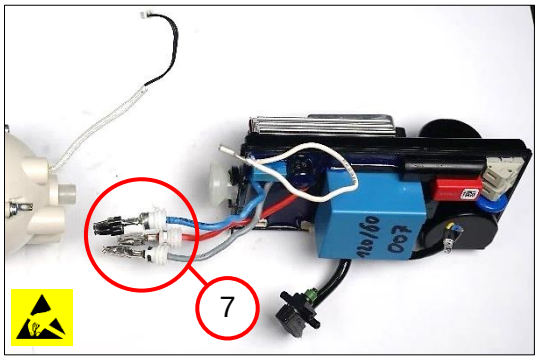
- Slotted screwdriver – 2.5 mm




1. Remove the optical cable (**1**).
2. Remove the switch (**2**).
3. Remove the motor (**3**) with the electronics (**4**).




4. Remove the plug (**5**).
5. Remove the plug (**6**).




6. Remove the three plugs (**7**).



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## 8.5 Removing the motor

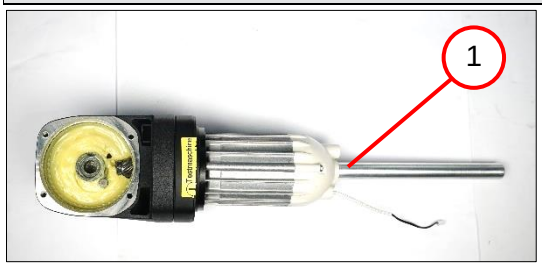
### 8.5.1 Removing the motor

**Steps that must be completed:**

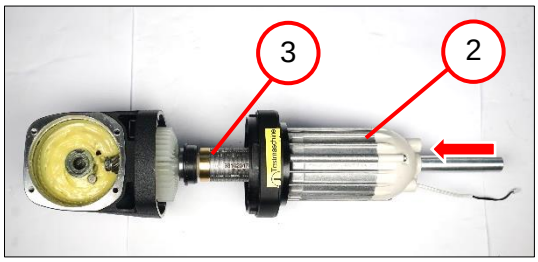
- Removing the lever
- Removing the bearing plate
- Removing the gearbox housing
- Removing the CG15-BL/CG15-BLP electronics

**Tools:**

- Open-ended spanner, WAF 10
- Open-ended spanner, WAF 6
- SW0069




1. Place the tool (**1**) on the magnetic holder.

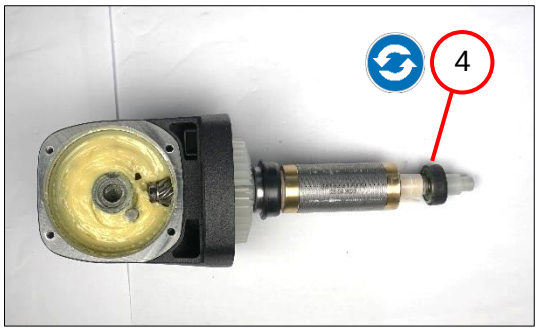



2. Remove the stator housing (**2**).

**Information**

Secure the stator housing (**2**).

Slide the rotor (**3**) out of the stator housing (**2**) using the tool (**1**).




3. Remove the rubber socket (**4**).



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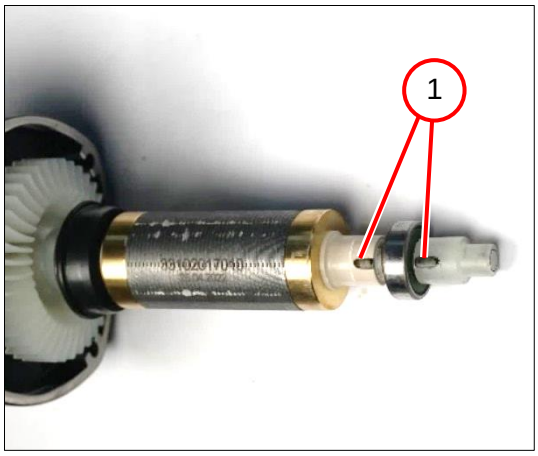
## Disassembly



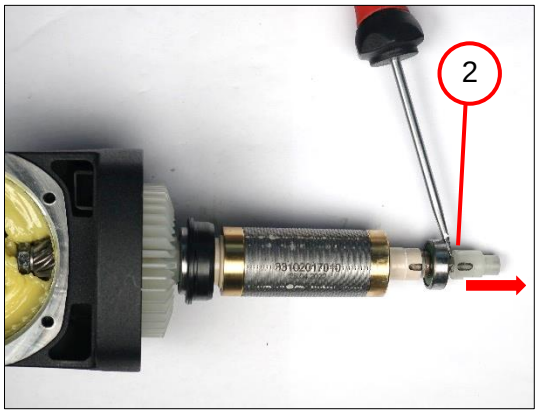

4. Note the position of the magnetic holder (**1**).

**Note!**

Magnet incorrectly positioned (**1**) in relation to the rotor.

The motor will not work correctly.

The rotor and magnet must be exactly aligned with one another.

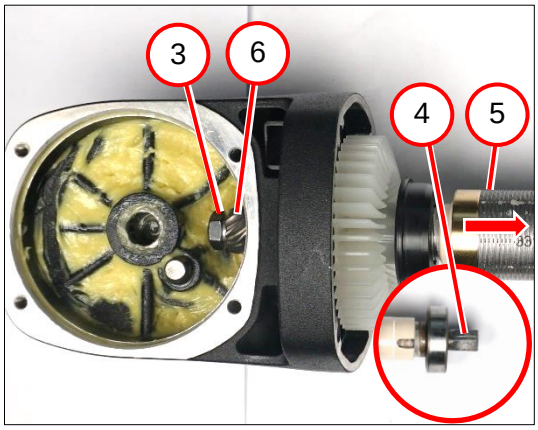



5. Pull off the magnetic holder (**2**).

**Information**

Carefully loosen the magnetic holder (**2**) using the screwdriver.

Then pull it off manually.




6. Unscrew the nut (**3**).

**Note!**

Do not clamp the rotor (**5**) in a vice.

This will make the rotor unusable.

Use the spanner flats (**4**) of the rotor shaft to hold the nut when loosening it.

7. Remove the rotor (**5**).

**Note!**

The electronics are not calibrated after the rotor (**5**) has been replaced.

The motor will not work correctly.

Follow the calibration process described in Section 10.2 after installation.

8. Remove the pinion (**6**).



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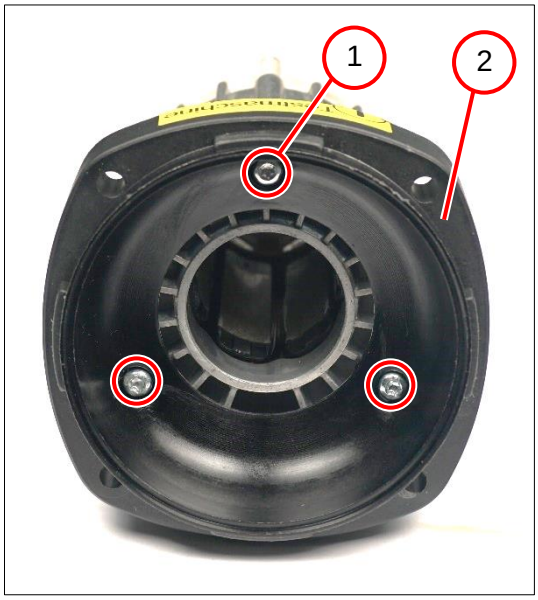
## Disassembly

9. Press out the pinion (**6**).




10. Unscrew the three screws (**1**).
11. Remove the intermediate gear box (**2**).



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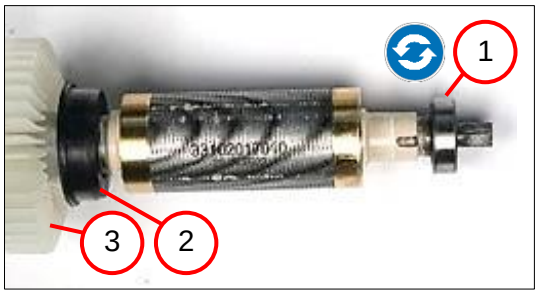
## 8.5.2 Disassembling the rotor

**Steps that must be completed:**

- Removing the motor

**Tools:**

- SW0016
- SW0019, 19 mm diameter




1. Pull off the grooved ball bearing (**1**).

**Note!**

The bearing and rubber socket (**2**) are not interchangeable.

The fan wheel (**3**) cannot be assembled safely.

Replace the assembly if necessary.



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# 9 Assembly

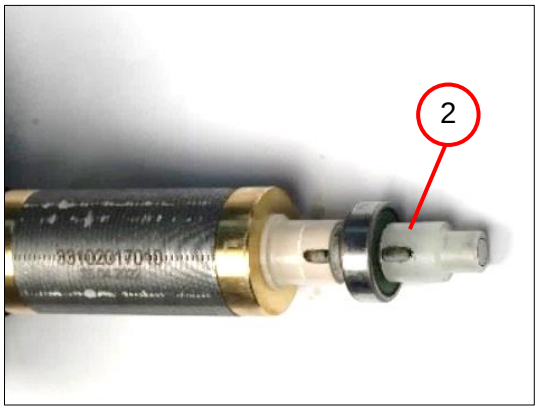
## 9.1 Assembling the motor

### 9.1.1 Assembling the rotor

**Tools:**

- Arbor press
- Sleeve, 7 mm inner diameter

1. Press on the deep groove ball bearing (**1**).




2. Position the magnet (**2**).

**Note!**

Magnet incorrectly positioned (**2**) in relation to the rotor.

The motor will not work correctly.

The rotor and magnet are exactly aligned with one another and can only be repaired together.

**Note!**

The rotor is not calibrated with the electronics.

The motor will not work correctly.

Follow the calibration process after replacement. See Section 10.2



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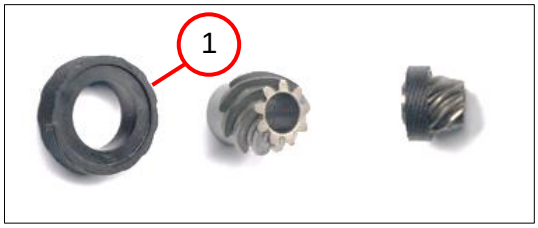
## 9.1.2 Positioning the motor

**Steps that must be completed:**

- Fitting the rotor
- Assembling the gearbox housing

**Tools:**

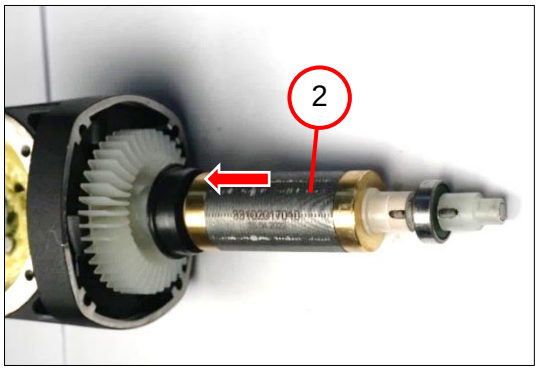
- Arbor press
- Sleeve, 13 mm diameter
- Open-ended torque spanner, WAF 10 mm
- Open-ended spanner, WAF 6 mm



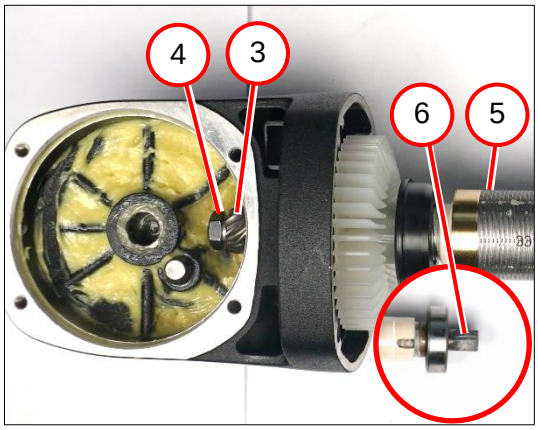

1. Press on the washer (**1**).

### Information

Ensure that the washer (**1**) is in the correct position.




2. Position the rotor (**2**).




3. Position the pinion (**3**).
4. Screw in the nut (**4**) [7 Nm].

### Note!

Do not clamp the rotor (**5**) in a vice.

This will make the rotor unusable.

Use the spanner flats (**6**) of the rotor shaft to hold the nut when tightening it.



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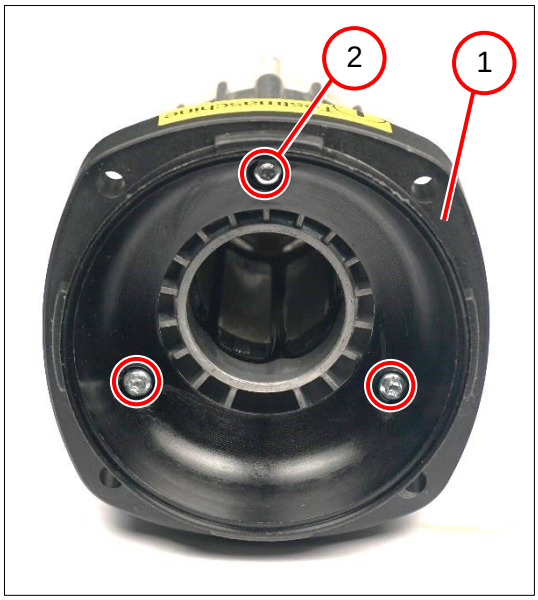
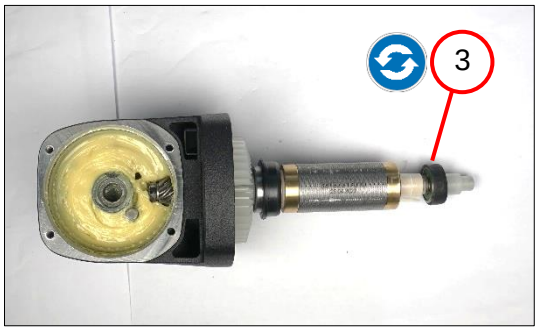
## Assembly

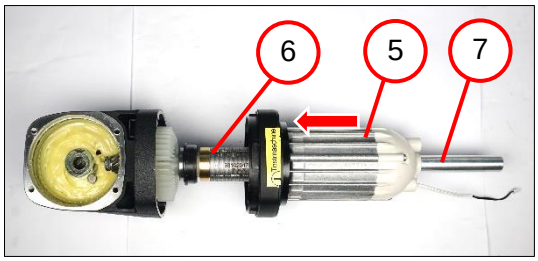



5. Position the intermediate gear box (**1**).
6. Screw in the three screws (**2**) [1.2 Nm].




7. Position the rubber socket (**3**).

8. Position the tool (**4**) on the magnet.




9. Position the stator housing (**5**).

### Information

Secure the stator housing (**5**).

Push the rotor (**6**) together into the stator housing (**5**) using the tool (**7**) as a guide.

Ensure that the stator housing is in the correct position in relation to the gearbox.



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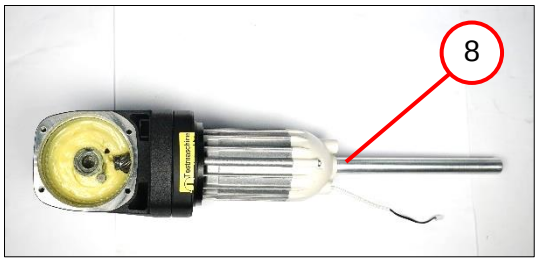
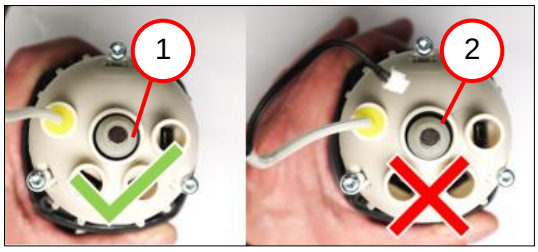
## Assembly




10. Remove the tool (**8**).




11. Check the positioning.

**Note!**

Magnet incorrectly positioned (**2**).

This will damage the rotor and make it unusable.

If the magnet is incorrectly positioned (**2**), ensure that the rubber socket is seated and repeat steps ‘7’ to ‘10’ until the magnet is positioned centrally (**1**).



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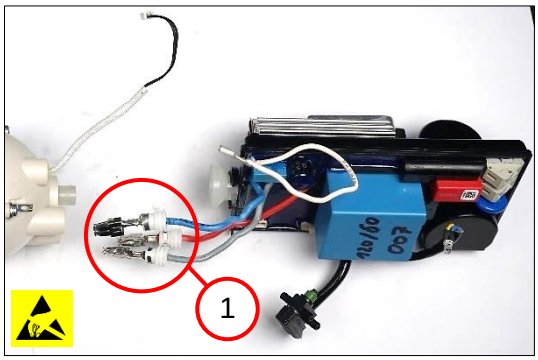
## 9.2 Assembling the housing

### 9.2.1 Positioning the CG15-BL electronics

**Steps that must be completed:**

- Positioning the motor



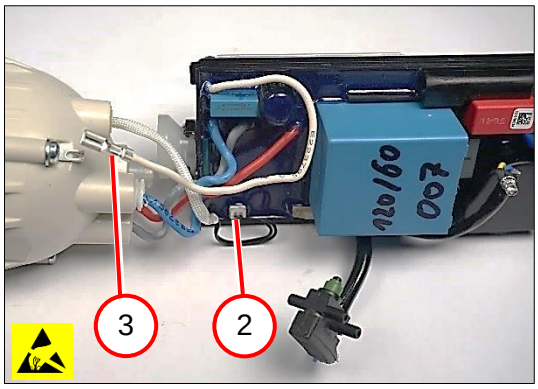

1. Position the three plugs (**1**).

**Note!**

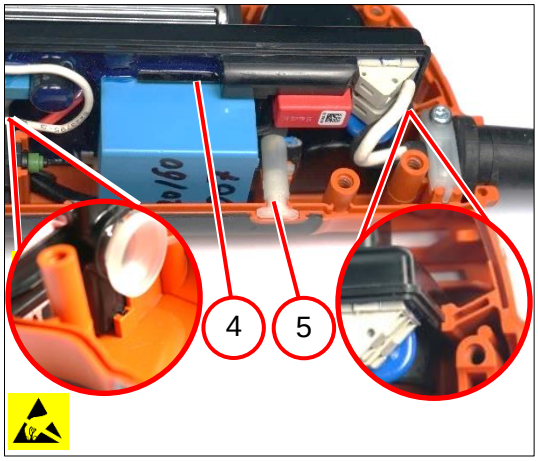
Do not swap the connections.

The motor will not work correctly.

Follow the applicable connection diagram.




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




4. Position the electronics (**4**).

**Note!**

Do not position the electronics (**4**) outside the guide.

The motor will not work correctly.

Follow the housing guides and avoid cables being crushed.

5. Position the optical cable (**5**).



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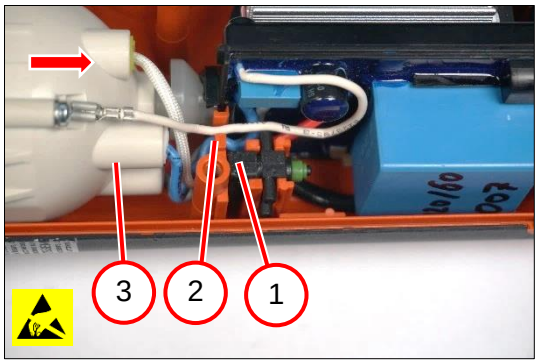
## Assembly




6. Position the switch (**1**).
7. Position the cables (**2**).
8. Position the motor (**3**).



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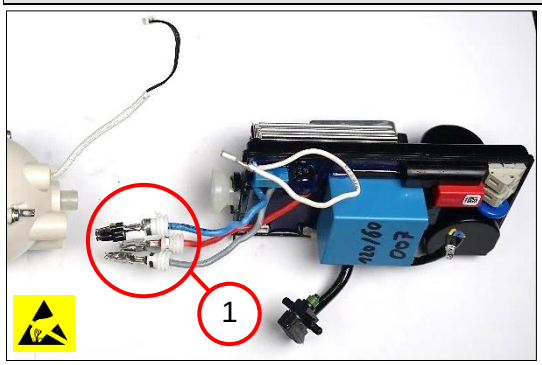
## 9.2.2 Positioning the CG15-BLP electronics

**Steps that must be completed:**

- Positioning the motor



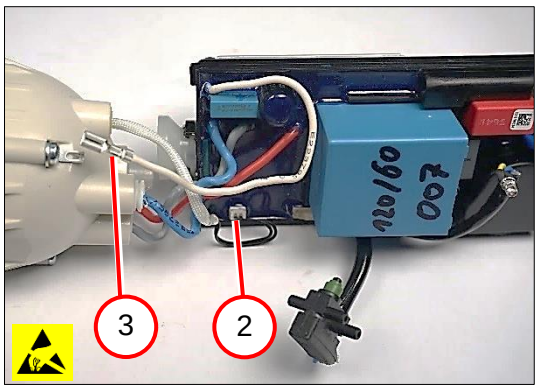

1. Position the three plugs (**1**).

**Note!**

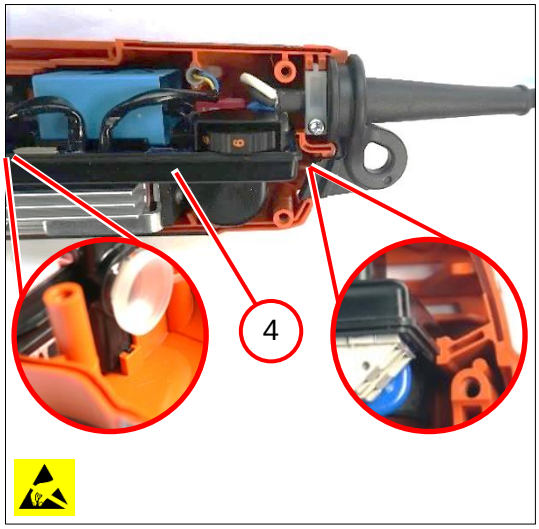
Do not swap the connections.

The motor will not work correctly.

Follow the applicable connection diagram.




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




4. Position the electronics (**4**).

**Note!**

Do not position the electronics (**4**) outside the guide.

The motor will not work correctly.

Follow the housing guides and avoid cables being crushed.



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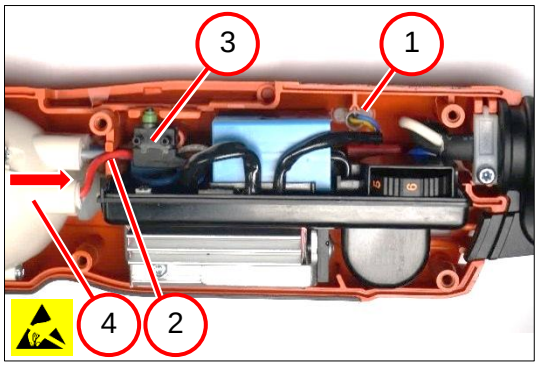
## Assembly




5. Position the optical cable (**1**).
6. Position the cables (**2**).
7. Position the switch (**3**).
8. Position the motor (**4**).



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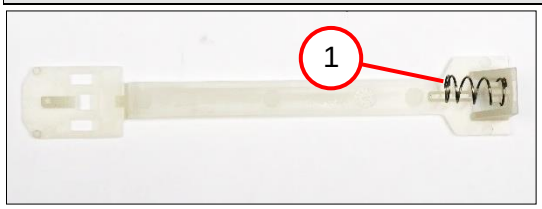
### 9.2.3 Positioning the CG15-BL motor housing

**Steps that must be completed:**

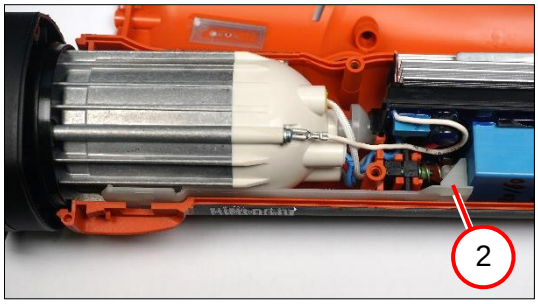
- Positioning the CG15-BL electronics

**Tools:**

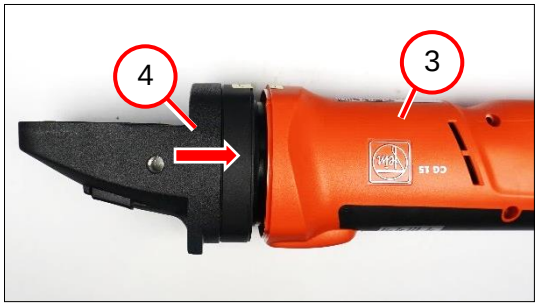
- Torx T15



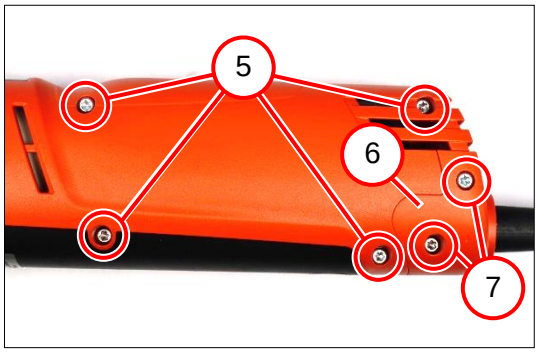

1. Position the spring (**1**).




2. Position the control rod (**2**).




3. Position the housing half (**3**).
4. Position the gearbox housing (**4**).




5. Screw in the four screws (**5**) [1.5 Nm].
6. Position the cover (**6**).
7. Screw in the two screws (**7**) [1.5 Nm].



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## Assembly

8. Press on the slide switch (**1**).



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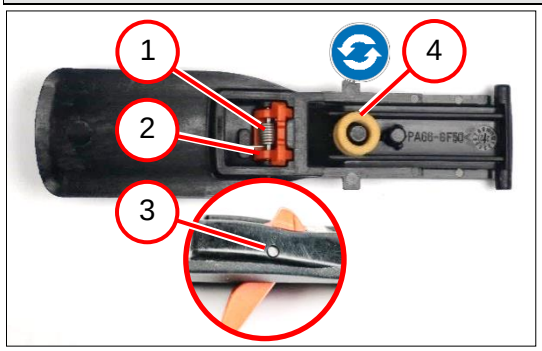
## 9.2.4 Positioning the CG15-BLP motor housing

**Steps that must be completed:**

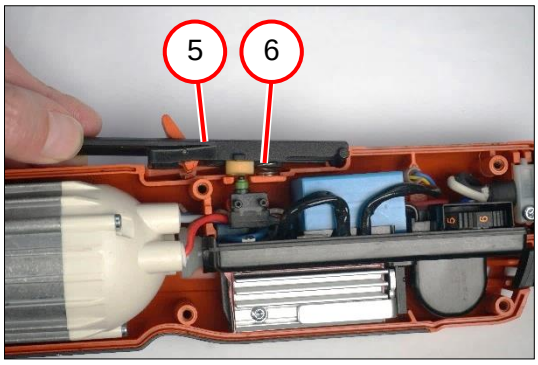
- Positioning the CG15-BLP electronics

**Tools:**

- Torx T15




1. Position the spring (**1**).
2. Position the inhibitor (**2**).
3. Position the pin (**3**).
4. Position the seal (**4**).




5. Position the switch rail (**5**).
6. Position the spring (**6**).

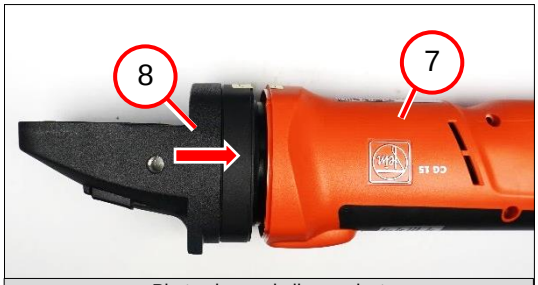
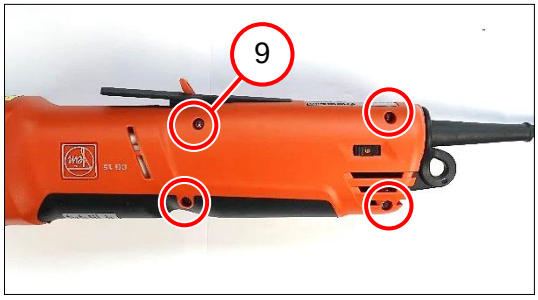



Photo shows similar product

7. Position the housing half (**7**).
8. Position the gearbox housing (**8**).




9. Screw in the four screws (**9**) [1.5 Nm].



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## 9.3 Assembling the gearbox

### 9.3.1 Assembling the gearbox housing

**Tools:**

- Arbor press
- Sleeve, 25 mm diameter
- Circlip pliers

1. Position the bolt with sealing ring (**1**).
2. Position the spring (**2**).

3. Press on the pushbutton (**3**).



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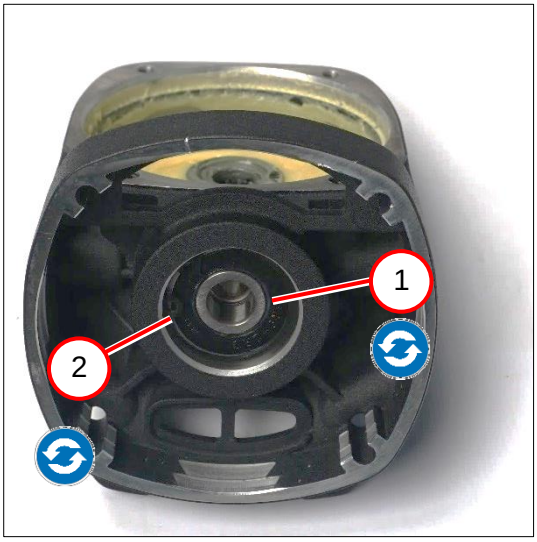
## Assembly




4. Press in the bearing (**1**).
5. Position the circlip (**2**).

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



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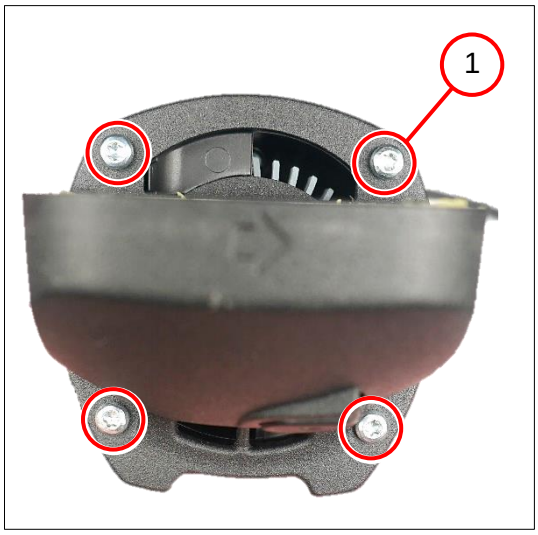
## 9.3.2 Positioning the gearbox housing

**Steps that must be completed:**

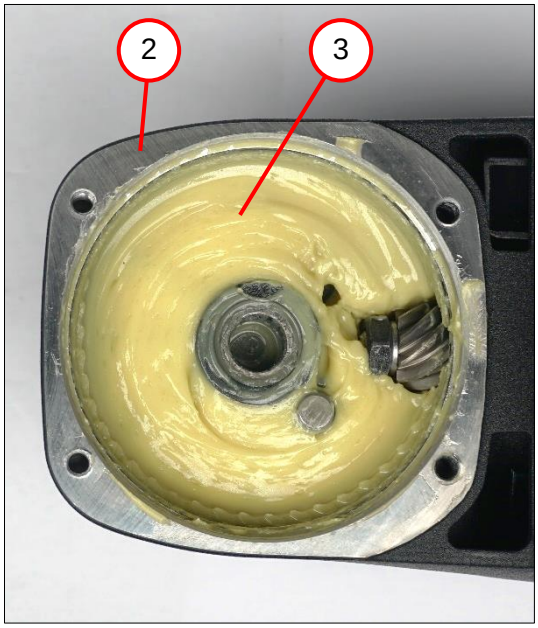
- Positioning the CG15-BL/CG15-BLP motor housing

**Tools:**

- Torx T15
- SM0019




1. Screw in the four screws (**1**) [2.7 Nm].




2. Fill the gearbox housing (**2**) with SM0019 (**3**).

### Information

CG15-125 BL / BLP **30 g**

CG15-125 BL / BLP Inox; CG15-150 BL / BLP **35 g**



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### 9.3.3 Assembling the bearing plate

**Tools:**

- Arbor press
- Sleeve, 19 mm inner diameter, 27 mm outer diameter
- Sleeve, 12 mm inner diameter, 20 mm outer diameter
- Torx T20

Photo shows similar product

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

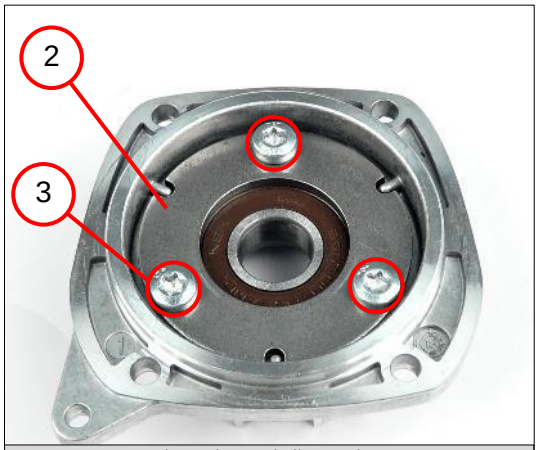

Photo shows similar product

2. Position the plate (**2**).
3. Screw in the three screws (**3**) [2.4 Nm].



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## Assembly

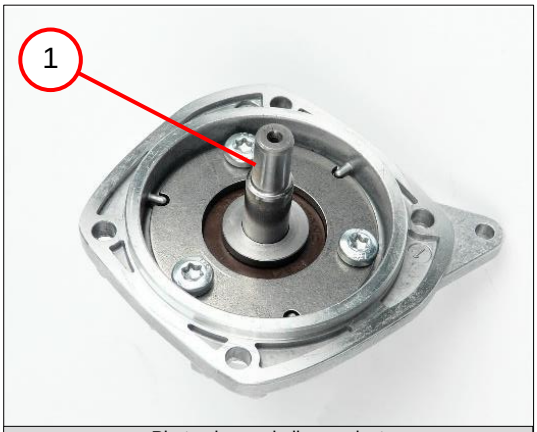


Photo shows similar product

4. Press in the shaft (**1**).

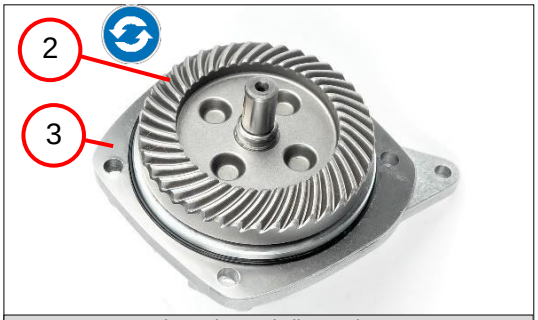


Photo shows similar product

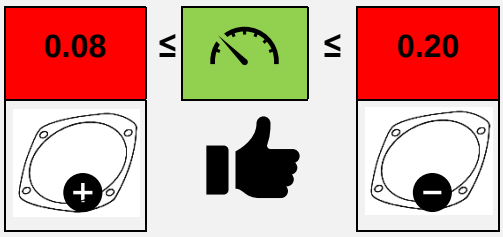
5. Press the gear wheel (**2**) onto the shaft.
6. Position the washer(s) (**3**).

**Note!**

Non-compliance with gear backlash.

The gearbox will be subject to increased wear.

The number of shims (**3**) required depends on the parameter determined after using the special tool SW0066.



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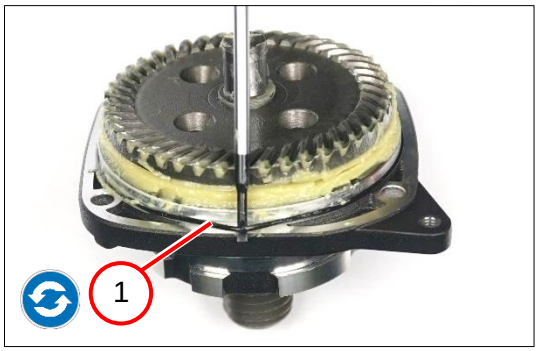
## 9.3.4 Positioning the bearing plate

**Steps that must be completed:**

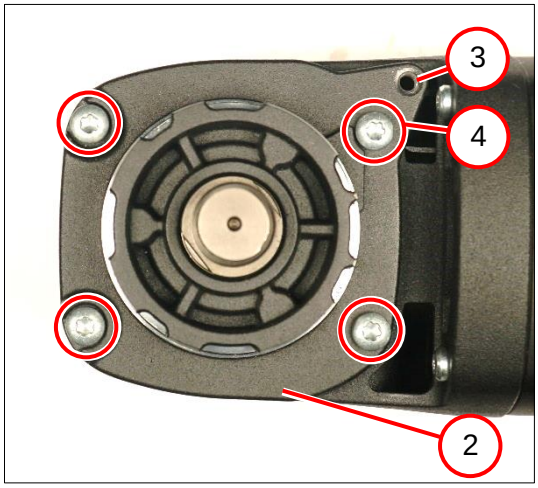
- Assembling the bearing plate
- Positioning the stator

**Tools:**

- Torx T20




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

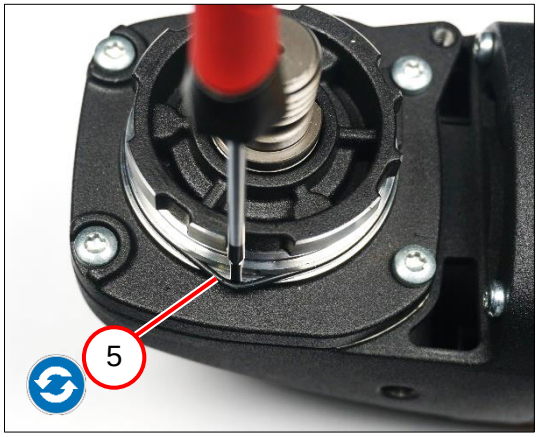



2. Position the bearing plate (**2**).

**Information**

Ensure that the position of the hole (**3**) is correct.

3. Screw in the four screws (**4**) [3.8 Nm].




4. Position the sealing ring (**5**).



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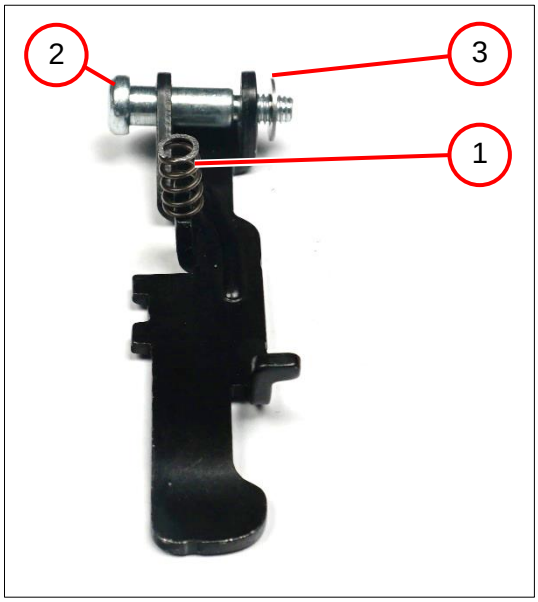
## 9.3.5 Positioning the lever

**Steps that must be completed:**

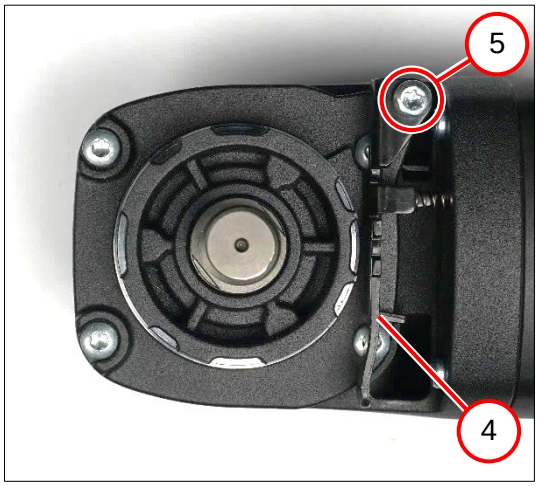
- Positioning the bearing plate

**Tools:**

- Torx T20




5. Position the spring (**1**).
6. Position the screw (**2**).
7. Position the washer (**3**).




8. Position the lever (**4**).
9. Screw in the screw (**5**) [2.2 Nm].



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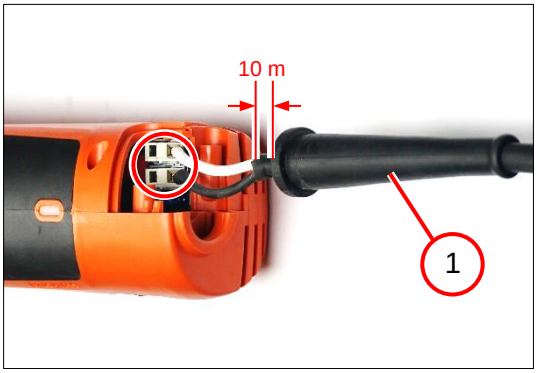
## 9.4 Assembling the mains cable

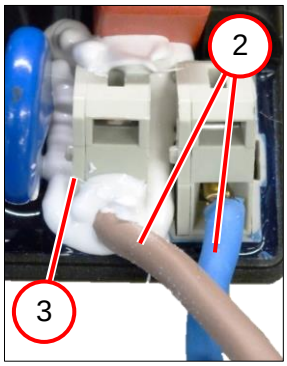
### 9.4.1 Positioning the BL mains cables

**Tools:**

- Slotted screwdriver – 2.5 mm
- Torx T15




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




2. Position the two cables (**2**).

**Information**

The cable labelling may differ.

Follow the applicable connection diagram.

3. Seal the inner connection terminal (**3**) all round with 2 g of HS0034.

4. Position the cover (**4**).



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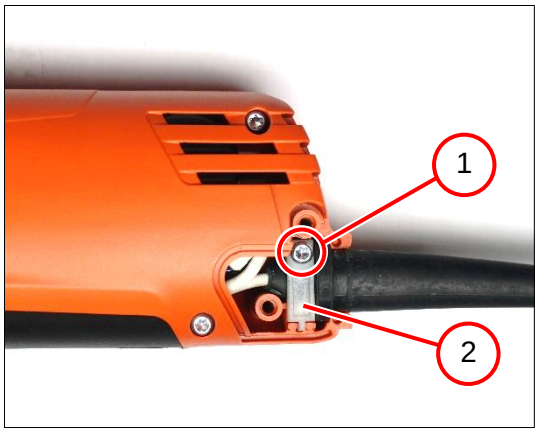
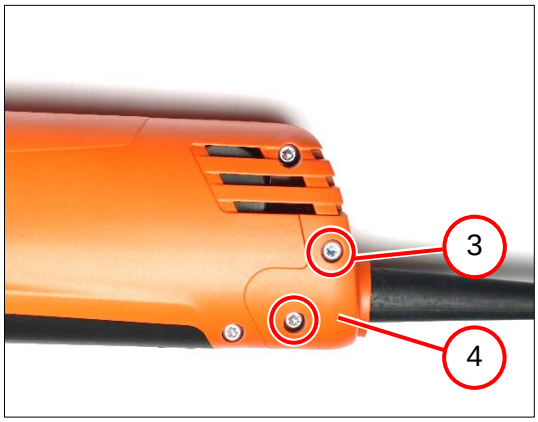
## Assembly




5. Position the cable clamp (**1**).
6. Screw in the screw (**2**) [1.5 Nm].




7. Position the cover (**3**).
8. Screw in the two screws (**4**) [1.5 Nm].



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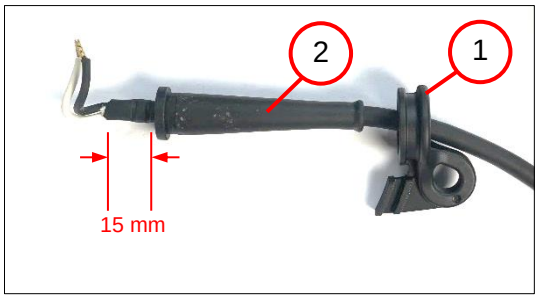
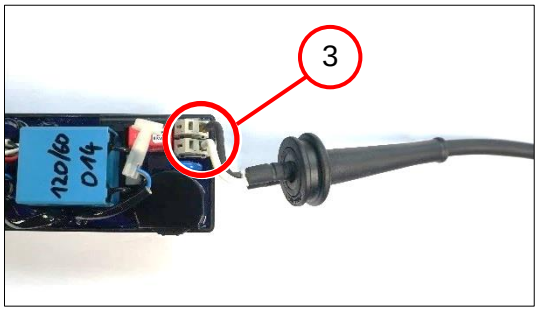
## 9.4.2 Positioning the BLP mains cables

**Tools:**

- Slotted screwdriver – 2.5 mm
- Torx T15




1. Position the eyelet (**1**).
2. Position the cable grommet (**2**).

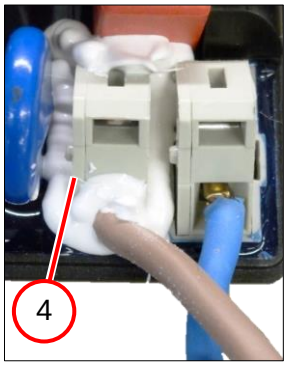



3. Position the two cables (**3**).

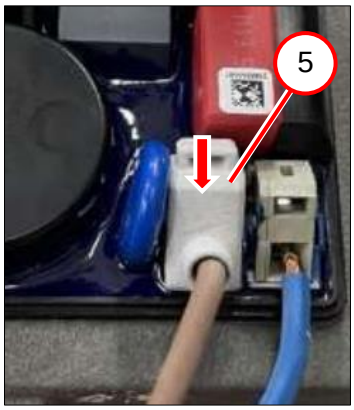
**Information**

The cable labelling may differ.

Follow the applicable connection diagram.




4. Seal the inner connection terminal (**4**) all round with 2 g of HS0034.




5. Position the cover (**5**).



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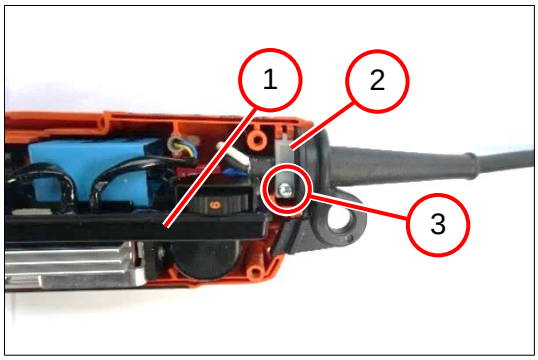
## Assembly

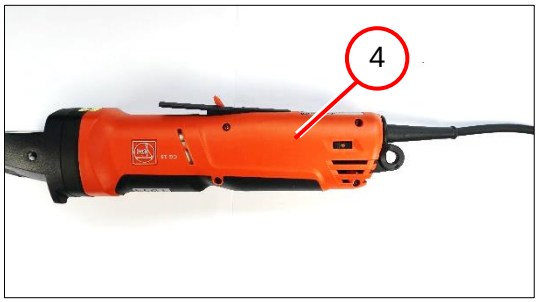



6. Position the electronics (**1**).

### Information

Follow steps ‘4’ to ‘8’ in Section 9.2.2.

7. Position the cable clamp (**2**).
8. Screw in the screw (**3**) [1.5 Nm].




9. Position the motor housing (**4**).

### Information

Follow steps ‘5’ to ‘9’ in Section 9.2.4.



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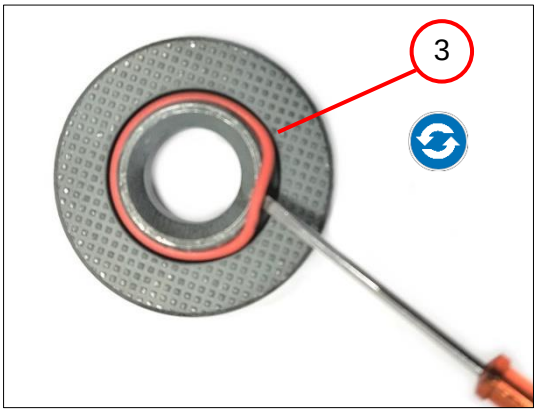
## 9.5 Positioning the safety hood and handle

### Information

Position the safety hood as described in the relevant operating instructions.

1. Position the safety hood (**1**).
2. Screw in the handle (**2**).




### Note!

Missing or damaged O-ring (**3**).

It cannot be guaranteed that the grinding tools will be installed correctly.

Replace the O-ring.



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# 10 Inspection following repairs

## 10.1 Functionality and safety

A visual and functional check as well as a professional electrical safety test must always be performed after carrying out repair and maintenance work. The regulations and legal requirements applicable in the respective country apply.

Minimum tests recommended for this type of machine:

| | |
|---|---|
| Always: | Visual inspection<br>Speed check<br>Insert tool<br>Test on metal with a grinding or polishing disc |
| Mains-operated machines: | Electrical safety test |
| If restart lock present: | Check restart lock |
| If brake present: | Check brake functionality after switching off<br>[maximum 2 s to standstill] |
| If soft start present: | Check slow increase to operating speed |



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## 10.2 Calibration

The electronics must be calibrated after motor components and/or electronics have been replaced. Calibration requires either an automatic or manual calibration request in the electronics software depending on the type of repair:

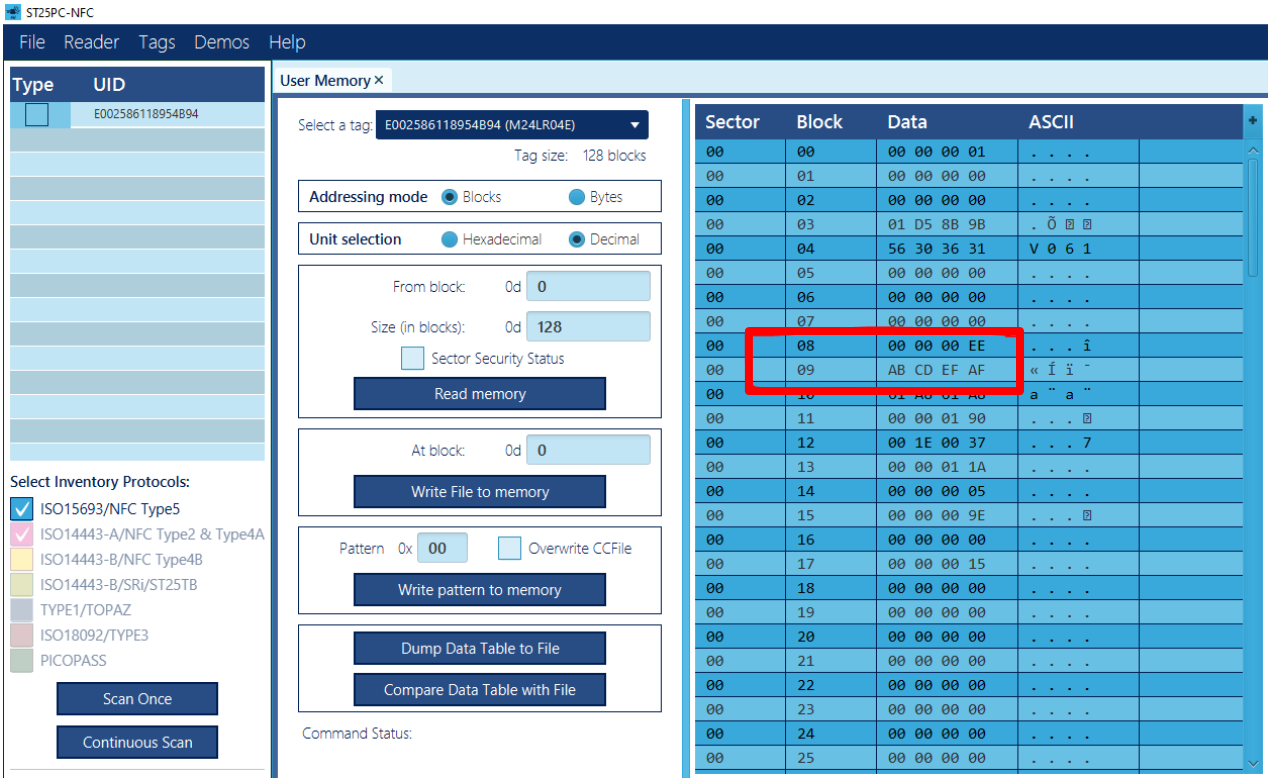
| **Repair:** | Motor remains | Motor components |
|---|---|---|
| Electronics remain | **Not applicable** | **Manual** |
| Electronics (brand new) | **Automatic** | **Automatic** |

Special case: The calibration request must also be set up manually if functioning used electronics are installed.

An NFC-capable programming device and NFC software are required to start the calibration manually. Follow these steps:

- Start the software
- Connect the programming device
- Scan NFC chip <Scan once> [Scan position on speed dial]
- Click on UID number
- Enter **'AB CD EF AF'** in block 09

Block 9 – Data: before calibration:



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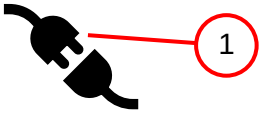
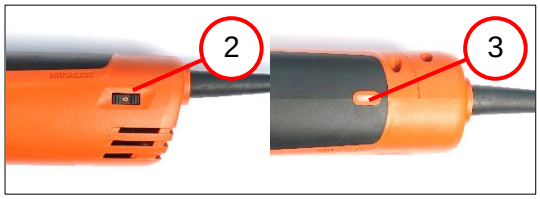
# Inspection following repairs

## Start calibration after the next switch-on

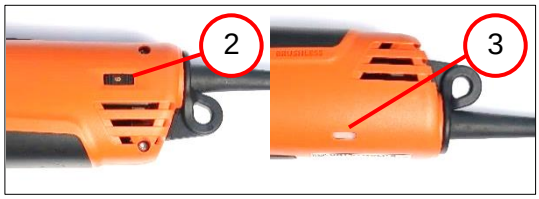



1. Connect the mains cable (**1**) to the power supply.

**CG15 BL:**




**CG15 BLP:**




2. Set the speed selection (**2**) to maximum.
3. Power up the machine [approx. 3 seconds].

### Information

The LED display (**3**) is flashing.

The speed of the machine is reduced, regardless of the set speed level.

The brake function is not active.

Up to eight switch-on processes may be necessary.

4. Switch off the machine.
5. Wait for the machine to come to a standstill.

### Information

If the machine has already switched itself off, repeat step ‘2’.

6. Switch the machine on again to check that the calibration was successful.
7. Check the speed.
8. Switch off the machine and check the brake function.

### Information

The LED display (**3**) is lit up continuously.

The maximum speed of the machine is now available.

The brake function is active.



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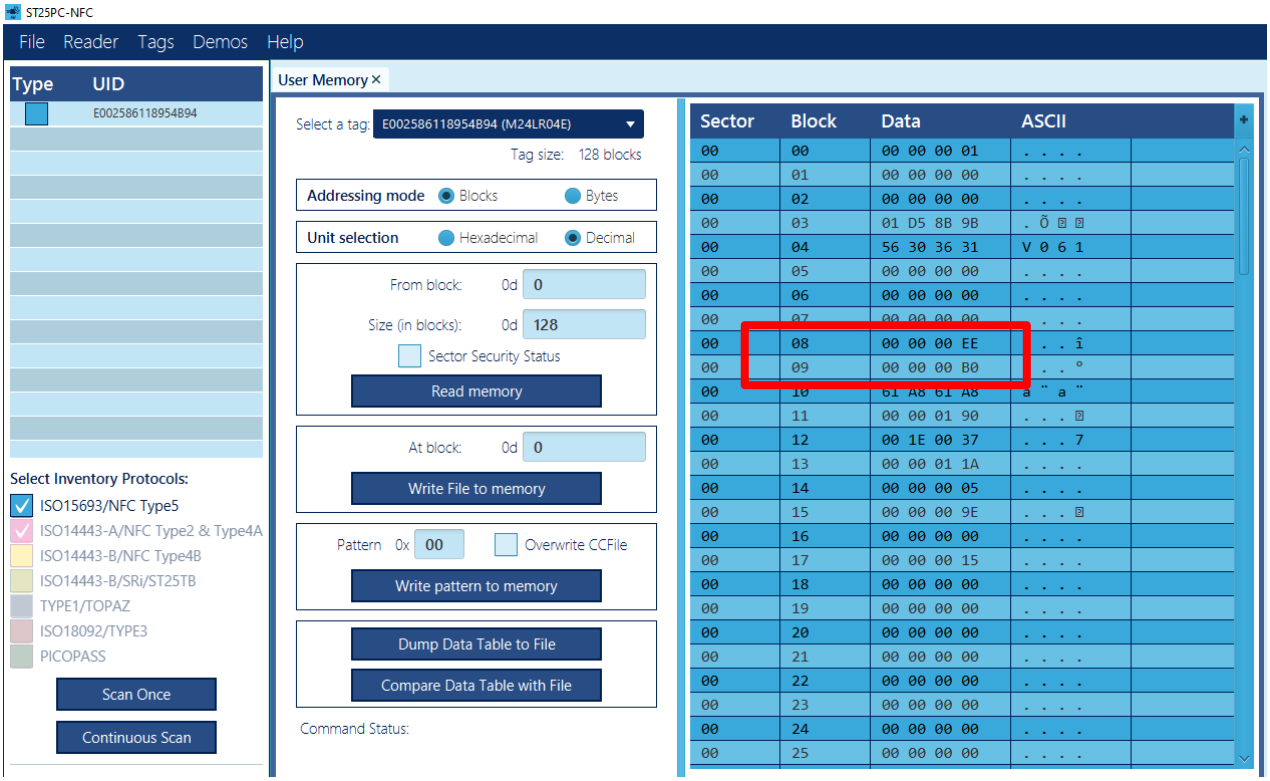
# Inspection following repairs

### Calibration check with NFC software

- ☞ Start the software
- ☞ Connect the programming device
- ☞ Scan NFC chip <Scan once> [Scan position on speed dial]
- ☞ Click on UID number
- ☞ New entry in block 09:

| Status | Minimum value | Entry | Maximum value | Measure |
|---|---|---|---|---|
| ✓ | 00 00 00 AF ≤ | [ Value ] | ≤ 00 00 00 BD | Save and close |
| ⊘ | 00 00 00 AF > | [ Value ] | > 00 00 00 BD | Repeat calibration request |

Block 9 – Data after successful calibration:



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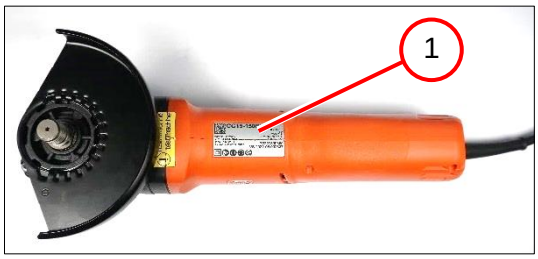
# 11 Labelling requirement




### CG15-BL

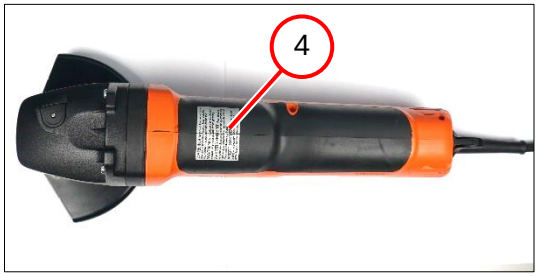
| | |
|---|---|
| | Type plate (**1**) |

### CG15-BLP

| | |
|---|---|
| | Type plate (**2**) |

### CG15-BL USA/Canada

| | |
|---|---|
| | Safety notice (**3**) |




### CG15-BLP USA/Canada

| | |
|---|---|
| | Safety notice (**4**) |



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