

# FEIN – Repair – Tools



**BOP 6 / BOP 10 / BOP 10-2 / BOP 13-2**



# FEIN – Repair – Tools



## BOP 6 / BOP 10 / BOP 10-2 / BOP 13-2

### Technical data:

		BOP6	BOP10	BOP10-2
		7 205 43	7 205 44	7 205 45
<b>P<sub>1</sub></b>	W	500	500	500
<b>P<sub>2</sub></b>	W	270	270	270
<b>n<sub>0</sub></b>				
1.	/min	0-4000	0-1500	0-700
2.	/min	-	-	0-2250
<b>n<sub>1</sub></b>				
1.	/min	0-2700	0-900	0-460
2.	/min	-	-	0-1350
	kg	1.7	1.8	2.0
	mm	6	10	10/8
	mm	10	15	16/10
	mm	15	25	30/20
	mm	-	M6	M10
	<b>d<sub>1</sub></b>	mm	0.5-10	1.5-13
	<b>d<sub>2</sub></b>	mm	1/2" - 20UNF	1/2" - 20UNF
	<b>d<sub>3</sub></b>	mm	43	43



## Motor - BOP 6 / BOP 10 / BOP 10-2 / BOP 13-2



1. Remove pushbutton
2. Loosen handle screws

Tool:

- Cross-tip screwdriver PH 1
- Cross-tip screwdriver PH 2



## Motor - BOP 6 / BOP 10 / BOP 10-2 / BOP 13-2



1. Remove top handle cover
2. Loosen bottom handle cover from motor housing and fold away to side
3. Remove both carbon brushes from carbon holder

Tool:

- Cable hooks



## Drill chuck - BOP 6 / BOP 10 / BOP 10-2 / BOP 13-2



### Tools with old drill shaft (without wrench flat)

If the drill chuck cannot be unscrewed from the outside, the gearbox head must be removed and the drill shaft blocked at the clutch ring with a special tool.

### Tools with new drill shaft (with wrench flat)

To allow easy replacement of the drill chuck, all BOP and ABOP tools now have a slightly longer drill shaft with a wrench flat. The shaft can be blocked at the wrench flat with an open-ended spanner.



## Drill chuck - BOP 6 / BOP 10 / BOP 10-2 / BOP 13-2

### Drill shaft without wrench flat



1. Unscrew gearbox head.
2. Remove gearbox parts.  
Only the drill shaft and clutch ring must remain the gearbox.
3. Position special tool against clutch ring.
4. Clamp special tool and gearbox head in a vice.
5. Clamp socket wrench in the drill chuck.
6. Unscrew drill chuck.

#### Tool:

- Special disassembly tool  
6 41 22 116 000
- Socket wrench



## Drill chuck - BOP 6 / BOP 10 / BOP 10-2 / BOP 13-2

### Drill shaft with wrench flat



1. Clamp socket wrench in drill chuck.
2. Firmly hold drill shaft with open-ended spanner.
3. Unscrew drill chuck with socket wrench.

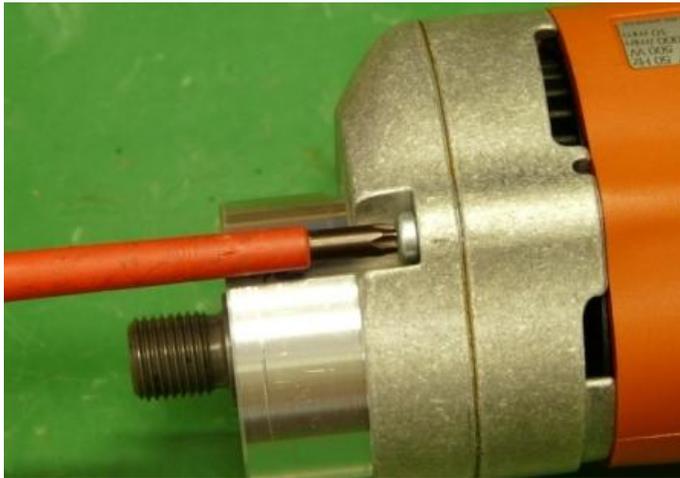
#### Tool:

-Open-ended spanner, 17 mm (width  
4 mm)  
6 29 03 002 00 9  
-Socket wrench

# FEIN – Repair – Tools



## Motor - BOP 6 / BOP 10 / BOP 10-2 / BOP 13-2



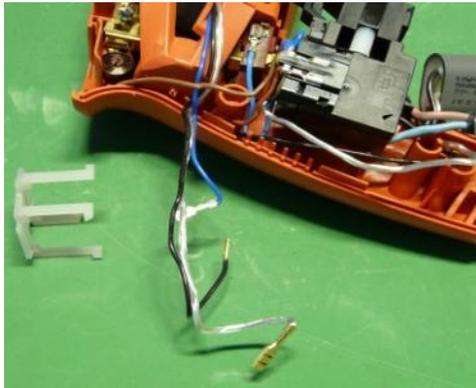
1. Loosen screws on gearbox housing
2. Remove armature from motor housing together with gearbox housing

Tool:

- Cross-tip screwdriver PH 2



## Motor - BOP 6 / BOP 10 / BOP 10-2 / BOP 13-2



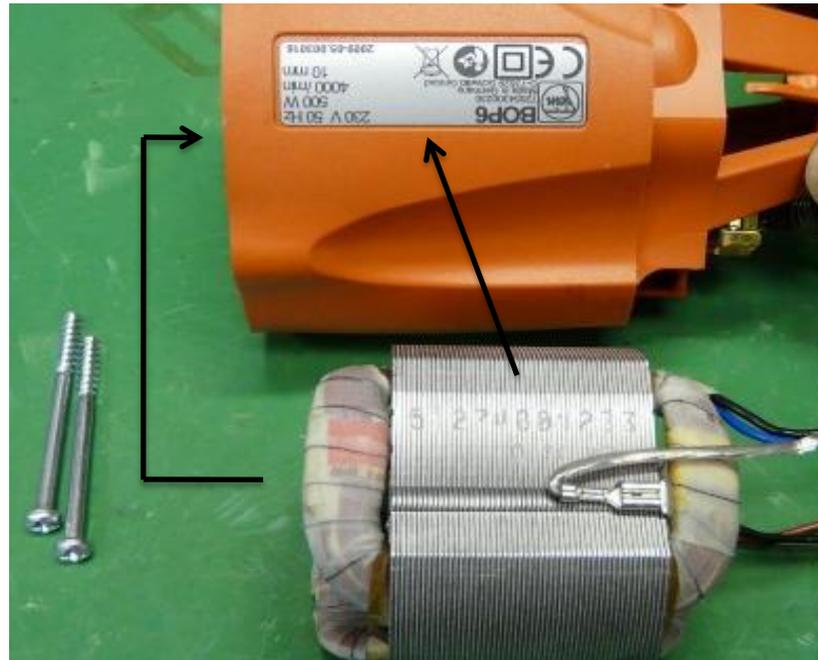
1. Loosen field coil plug contacts on switch
2. Loosen screws on field coil fastening
3. Drive field coil out of motor housing by gently hitting it with the plastic hammer

Tool:

- Cross-tip screwdriver PH 2
- Flat nose pliers



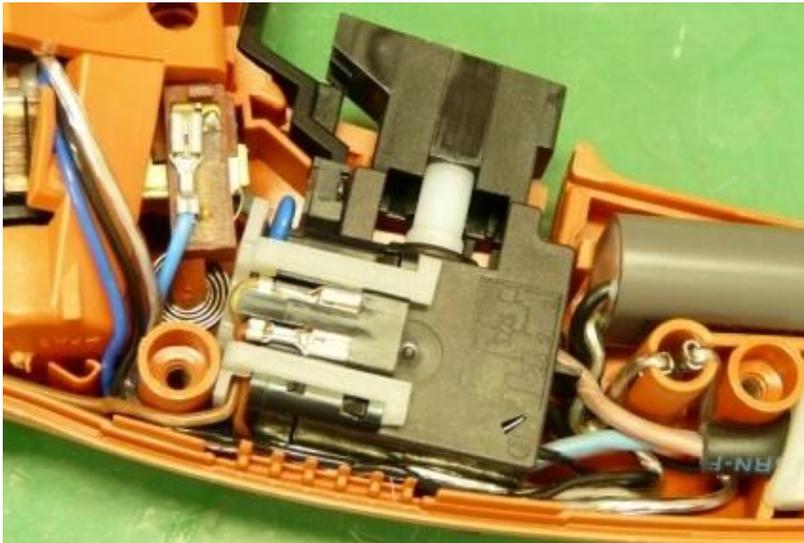
## Motor - BOP 6 / BOP 10 / BOP 10-2 / BOP 13-2



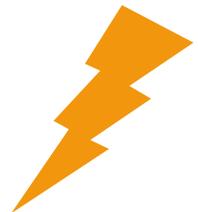
When fitting the field coil, ensure that the field coil material number is always installed in the direction of the type plate attached to the motor housing. The direction of installation is important for connecting to the switch. (Clockwise / anti-clockwise rotation)



## Switch - BOP 6 / BOP 10 / BOP 10-2 / BOP 13-2



**Warning** – when assembling the tool, ensure that the cables are laid correctly (see photos), otherwise the cables may be pinched or jammed as a result of the very tight space and therefore impair the tool's functionality.





## Gearbox - BOP 6



1. Remove intermediate bearing shield
2. Remove ball bearing, remove circlip from gear-wheel
3. Drive gear-wheel out of gearbox housing by gently hitting the housing

Tool:

- Flat nose pliers
- External circlip pliers, small
- External circlip pliers, large



## Gearbox - BOP 6



1. Remove circlip on ball bearing
2. Press out drill shaft

Tool:

- Arbor press
- Internal circlip pliers



## Gearbox - BOP 6



1. Remove plastic washer
2. Remove circlip
3. Press spindle out of ball bearing

Tool:

- Arbor press
- External circlip pliers



## Gearbox - BOP 10



1. Remove intermediate bearing shield
2. Remove intermediate gear
3. Pull out ball bearing
4. Remove circlip

Tool:

- Extractor tool
- External circlip pliers



## Gearbox - BOP 10



1. Remove gear-wheel from gearbox housing by gently hitting the housing – do not lose the 6 bolts, otherwise the spindle lock will not work
  - Remove circlip
3. Press out drill spindle

Tool:

- Internal circlip pliers
- Arbor press



## Gearbox - BOP 10



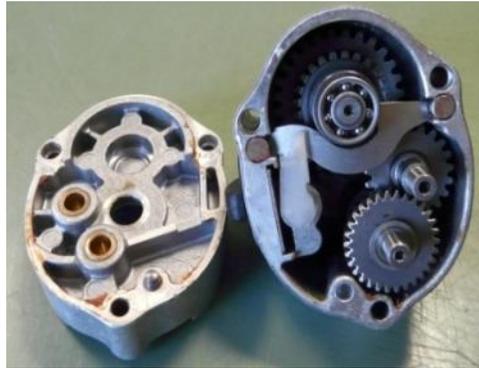
1. Remove circlip
2. Press out drill spindle

Tool:

- External circlip pliers
- Arbor press



## Gearbox - BOP 10-2 / BOP 13-2

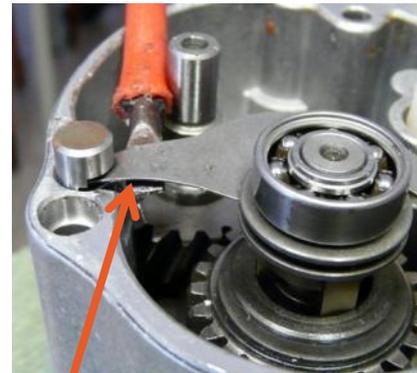


1. Remove intermediate bearing shield, remove grease
2. Remove both intermediate gears, drive out from housing by gently hitting with a plastic hammer

Tool:  
- Plastic hammer



## Gearbox - BOP 10-2 / BOP 13-2



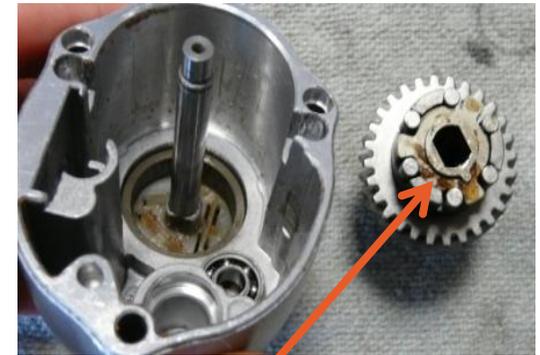
1. Remove locking spring for switching button
2. Remove switching button
3. Use screwdriver to push leaf springs upwards (opposite switch bolt first), remove metal bolt, fully prise out and remove leaf springs together with switch bolt and metal bolt – **warning, do not damage switchover!!!!!!**

**Use hand as guard when prising out, the leaf springs are under tension and the two bolts may jump out.**

Tool:  
- Slotted screwdriver



## Gearbox - BOP 10-2 / BOP 13-2



1. Pull ball bearing out of drill spindle
2. Remove small circlip
3. Remove large circlip
4. Completely remove gear-wheel or let it fall out by turning gearbox housing – **warning, do not lose the 6 needle rollers, as they are required for the spindle lock!!!**

Tool:

- Small circlip pliers
- Large circlip pliers



## Gearbox - BOP 10-2 / BOP 13-2



1. Remove gear-wheels from drive – **warning, there are 6 balls underneath the gear-wheels!!!**
2. Remove the 6 cylinder rollers and cam ring
3. Remove the 6 balls and draw key from the drive



## Gearbox - BOP 10-2 / BOP 13-2



1. Remove circlip
2. Fully press drill shaft out of housing

Tool:  
- Arbor press  
- Internal circlip pliers



## Gearbox - BOP 10-2 / BOP 13-2



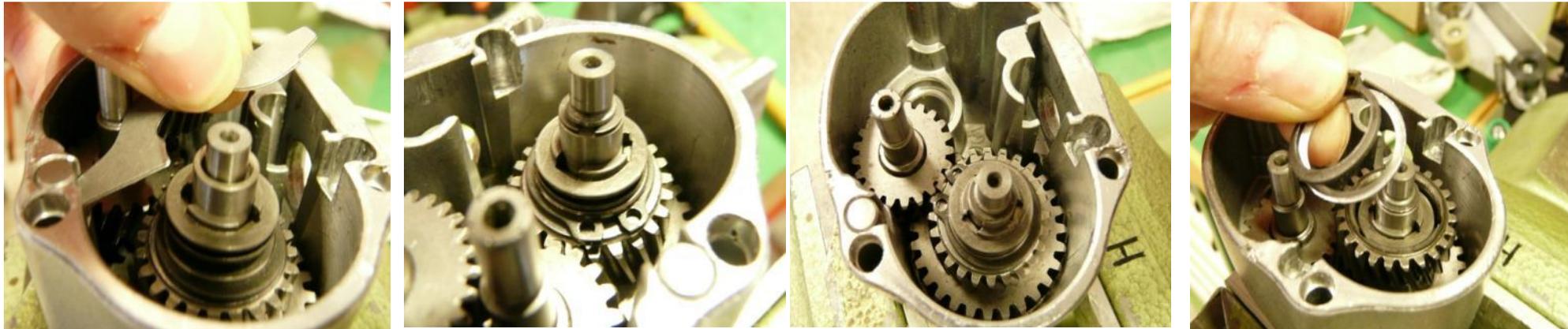
1. Remove circlip
2. Fully press drill shaft out of bearing

Tool:

- Arbor press
- External circlip pliers



## Repair information, gearbox - BOP 10-2 / BOP 13-2



1. Slide leaf springs backwards and remove
2. Drive intermediate gear out of housing by gently hitting it with the plastic hammer.  
Sometimes both intermediate gears can be removed in this way, other times, just one
  - If one intermediate gear remains in the housing, remove the circlip and washer for fixing the gear-wheels

Tool:

- Plastic hammer
- Circlip pliers



## Repair information, gearbox - BOP 10-2 / BOP 13-2



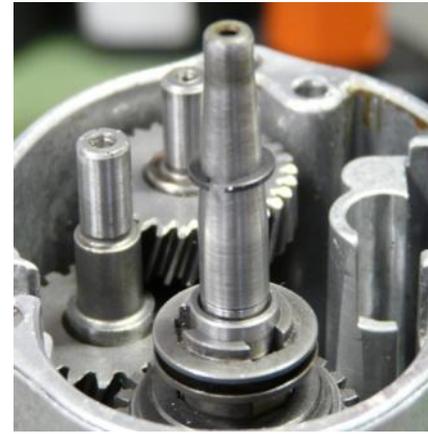
1. Remove gear wheels – **caution, there are balls under the gear-wheels which are required for driving the gear wheels. Do not lose them**
2. Deburr the grooves in the gear-wheels, this is the error when the tool cannot be switched.  
You can also identify this problem if you try to move the gear-wheels by hand and they can only be turned with a great deal of effort or not at all. Grinding marks can also be found on the running surface of the drive

Tool:

- Whetstone or  
semi-circular file



## Repair information, gearbox - BOP 10-2 / BOP 13-2



To guarantee a correct gear changeover, the circlip **must** be fitted correctly. In other words, it must be correctly snapped into the right groove. This requires special tool 64131017000, comprising a sleeve and pull-on taper, to be used to fit the circlip (special tool catalogue).

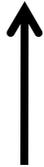
When pulling on the circlip, you have to overcome the spring torque of the corrugated spring under the drive because the circlip groove cannot otherwise be viewed in full. If the circlip doesn't snap into the groove, gear will not change over correctly if at all. The sleeve is placed on the shaft to correctly insert the circlip. The circlip is then placed on the conical sleeve and a rapid and powerful downwards movement undertaken with the pull-on taper to press the circlip into the intended groove.

Tool:

Special tool  
64131017000



## Special tools



Order number: 6 41 22 114 000

Special tool for changing the drill chuck on BOP 6

Order number: 6 41 22 115 000

Special tool for changing the drill chuck on BOP 10 / 10-2 / 13-2





## Special tools



Order number: 6 41 22 116 000

If the drill chuck cannot be changed from outside using the two aforementioned special tools, the gearbox has to be removed. To do this, the fixture with the hexagon bolt is clamped in the vice and the drill shaft secured in the fixture with the cam ring. The drill chuck can now be removed using the aforementioned special tools and an open-ended spanner.



## Frequently required spare parts

2 leaf springs		30904045000
Bolts		30217357000
2 carbon brushes		30711134005
Speed setting switch		30701228002
Armature		53274004235
Stator		51274004233
Circlip		42615090002
Quantity of grease	BOP 6	- 12g
	BOP 10; 10-2; 13-2	- 25g
Typ of grease	040 10 101 004	