

# TECHNICAL INFORMATION



PRODUCT

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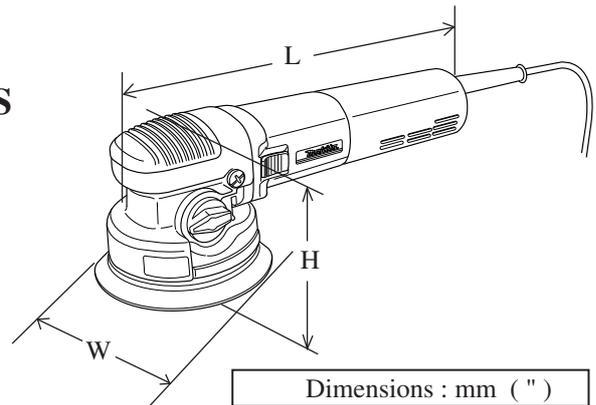
**Models No.** ▶ BO6040

**Description** ▶ 150 mm Random Orbit Sander

## CONCEPTION AND MAIN APPLICATIONS

This models is versatile random orbit sander for professional use.

Due to the two mode selection, "Forcible rotation mode" / "Free-rotation mode", rough sanding, fine finishing and polishing can be done only with this machine.



Dimensions : mm ( " )	
Width ( W )	150 (5-7/8)
Height ( H )	132 (5-3/16)
Length ( L )	316 (12-1/2)

## ► Specification

Voltage (V)	Current (A)	Cycle (Hz)	Continuous Rating (W)		Max. Output(W)
			Input	Output	
110	7.2	50 / 60	750	390	850
120	6.6	50 / 60	750	390	850
220	3.6	50 / 60	750	390	850
230	3.4	50 / 60	750	390	850
240	3.3	50 / 60	750	390	850

Orbits per min. : (min <sup>-1</sup> = spm)	1,600 - 5,800
Oscillation rate per min.: spm = min <sup>-1</sup>	3,200 - 11,600
Rpm.of pad with Forcible-Rotation : rpm = min <sup>-1</sup>	180 - 670
Orbit diameter : mm (")	5.5 ( 7/32)
Pad diameter : mm (")	150 ( 6 )
Cord length : m ( ft )	2.5 ( 8.2 )
Net weight :Kg ( lbs )	2.7 ( 5.9 )

## ► Standard equipment

- \* Pad 150 (soft ) ..... 1pc. (factory-attached to the machine)
- \* Abrasive disc 150-120 (Hook and loop type) ..... 1 pc.
- \* Hex wrench 6 ..... 1 pc.
- \* Joint ..... 1 pc. ( only for European market)

< Note > The standard equipment for the tool shown may differ from country to country.

## ► Optional accessories

- \* Pad 150 ( hard)
- \* - ditto - ( soft)
- \* - ditto - ( super soft)
- \* Abrasive disc 150 - 40, 60, 80, 120, 180, 240, 400
- \* Sanding cloth 150 - 100, 200, 800
- \* Sponge pad 150 ( hook and loop type)
- \* Felt pad 150 ( hook and loop type )
- \* Wool pad 150 ( hook and loop type )
- \* Side grip

► **Features and benefits**

**BO6040**

**Durable Cord Guard**

More durable against disconnection than ever, due to the flexible and elastic rubber cord guard.

**Easy Palm-gripping makes operation comfortable**

**Low Tool Height for More Efficient Operation**

Tool height of the part is lower than that of FESTO.

**Speed Control Dial**

For getting optimum rotating speed to suit various work piece. Can adjust speed, according to applications.

**Hose can be connected to Vacuum Cleaner**

(Diameter of Nozzle is same as that of #BO5020.)

**Hook-and-Loop Backing Pad**

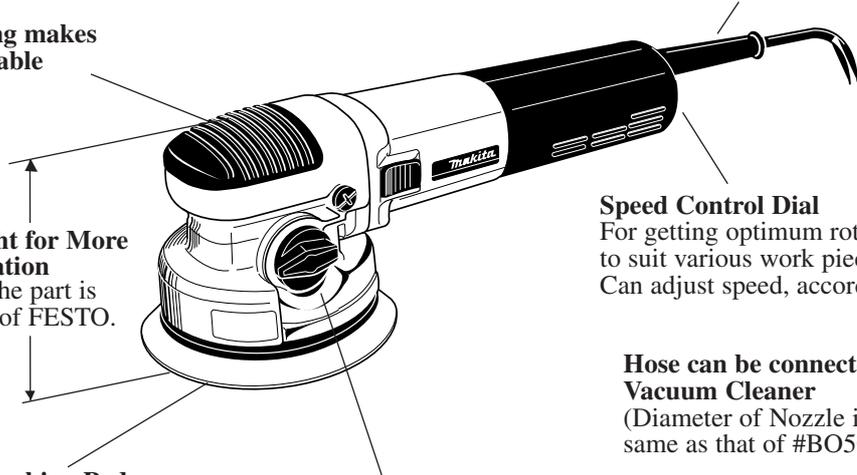
The position of hole for dust collection is same and interchangeable with those of FESTO and BOSCH type.

**Two Mode Selection By Easy Operation**

"\*Forcible rotation mode" or "\*\*Free-Rotation mode" can be selected by change lever.

\*Forcible rotation mode : Orbital action plus mechanical rotary drive for rough sanding and polishing.

\*\*Free-Rotation mode : Orbital action for fine sanding.



**Typical applications for sanding and polishing**

Sanding

Use / Material	Rotation mode Forcible / Free	Speed control setting	Pad
(Paint work) Sanding Repairs (scratches, rust spots) Rough paint removal	Free Forcible / Free Forcible	1 - 3 2 - 3 4 - 5	Soft Hard Soft
(Plastics) Soft plastics (PVC / ABS) Hard plastics (FRP)	Forcible / Free Forcible	1 - 3 1 - 3	Super soft / Soft Soft / Hard
(Woods) Soft wood Hard wood Veneers	Free Forcible / Free Forcible	1 - 3 3 - 5 1 - 2	Super soft / Soft Soft Super soft
(Metals) Non-ferrous metal Steel Rust removal on steel Hard metal (stainless steel )	Forcible / Free Forcible Forcible Forcible	1 - 3 3 - 5 4 - 5 4 - 5	Soft Soft / Hard Super soft Soft

Polishing

Use / Material	Rotation mode Forcible / Free	Speed control setting	Pad
Applying wax Removing wax Polishing	Forcible Forcible Forcible	2 - 4 4 - 5 4 - 5	Sponge pad Felt pad Wool pad

< Note >

The above information is intended only as a guide. Please select most suitable rpm. by pre-sanding with test piece, before starting your work.

## ► Comparison of products

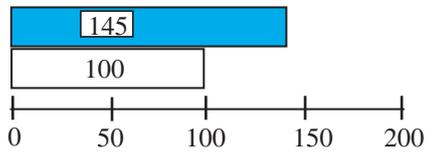
The following diagram is showing Mod.BO6040's superiority to competitor B in the sanding work.

Numbers in chart below are relative values when setting competitor B 's capacity as 100.

 Mod.BO6040 of MAKITA       Competitor B

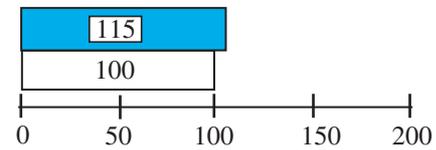
The conditions

- \* Work piece : Hard wood
- \* Grit of abrasive disc : 60
- \* Action mode : Forcible rotation mode



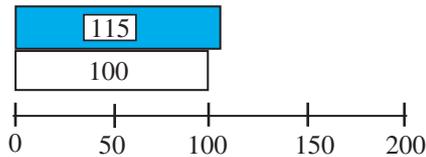
The conditions

- \* Work piece : Removal of paint (fine)
- \* Grit of abrasive disc : 120
- \* Action mode : Free-Rotation mode



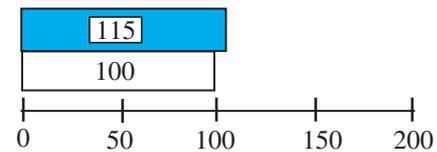
The conditions

- \* Work piece : Douglas pine (produced in USA.)
- \* Grit of abrasive disc : 60
- \* Action mode : Forcible rotation mode



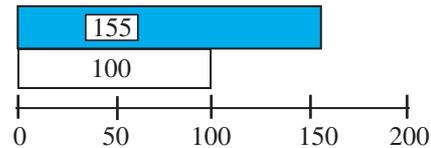
The conditions

- \* Work piece : Removal of paint (coarse)
- \* Grit of abrasive disc : 60
- \* Action mode : Forcible rotation mode



The conditions

- \* Work piece : Spruce (soft wood produced in USA.)
- \* Grit of abrasive disc : 120
- \* Action mode : Free-Rotation mode



Manufacturer Model No.	MAKITA BO6040	Competitor B B	Competitor A A
Power input ( W )	750	500	550
Equipped motor	S60-40	50-50	58-40
Orbits per min.: opm = min <sup>-1</sup>	1,600 - 5,800	2,000 - 5,600	2,400 - 6,000
Oscillation rate per min.: spm = min <sup>-1</sup>	3,200 - 11,600	4,000 - 11,200	4,800 - 12,000
Orbit diameter : mm ( " )	5.5 ( 7/32)	5.0 ( 13/64)	4.5 ( 3/16)
Change of action mode (Forcible-Rotation / Free-Rotation)	Yes	Yes	Yes
Rpm.of pad with Forcible-Rotation : rpm = min <sup>-1</sup>	180 - 670	240 - 560	80 - 200
Type of pad	Hook and loop	Hook and loop	Hook and loop
Electronic for constant speed	Yes	Yes	Yes
Braking pad	No	Yes	Yes
Connection to vacuum cleaner	Yes	Yes	Yes Available for self dust extraction, too.
Hight of machine : mm ( " )	132 (5-3/16)	138 (5-7/16)	152 (6 )
Net weight :Kg ( lbs )	2.7 (5.9)	2.3 (5.1)	2.4 (5.3)
Plastic carrying case	Yes	Yes	No
Standard equipment	* Abrasive disc * Hex wrench 6 * Joint (only for Europe)	* Abrasive disc * Hex wrench 6 * Side grip	* Abrasive disc * Dust bag * Side grip

< 1 > Replacing armature and spiral bevel gear 9

- 1) Take off tapping screw 4x18 and detach rear cover from motor housing. And detach carbon brush as illustrated in Fig.1.

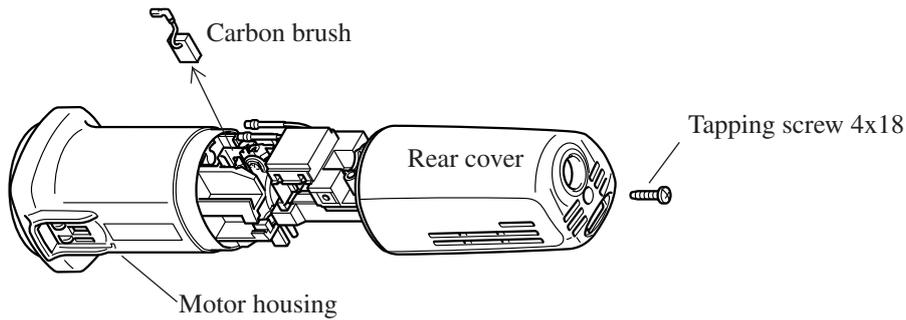


Fig. 1

- 2) Put the torsion spring installed on brush holder, on the side of brush holder after detaching carbon brush as illustrated in Fig.2. This is necessary for avoiding to scratch the armature's commutator, when armature is pulled out from motor housing.

The torsion spring put on the side of brush holder

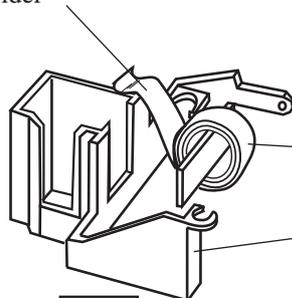


Fig.2

The torsion spring positioned as illustrated in Fig.2A can scratch the armature's commutator.

Torsion spring

Brush holder

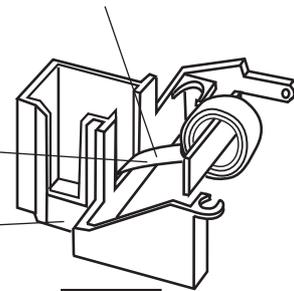


Fig.2A

It is not necessary to remove brush holder itself, when removing armature.

- 3) After pulling out armature from motor housing, remove retaining ring 6 with retaining ring plier, and detach spiral bevel gear 9 as illustrated in Fig.3.

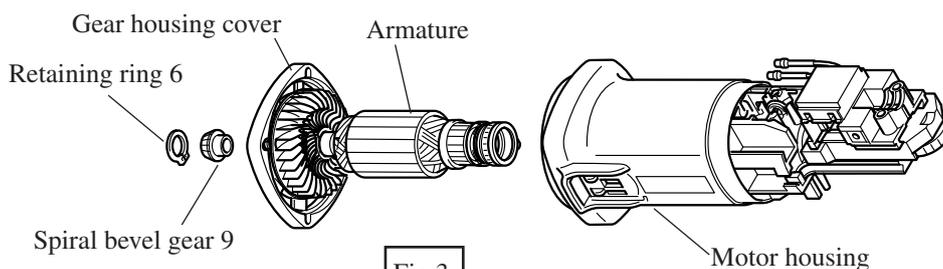


Fig.3

- 4) Remove armature from gear housing cover by pressing the armature shaft with arbor press as illustrated in Fig.4.

- 5) Take reverse step of the above, when assembling armature and spiral bevel gear.

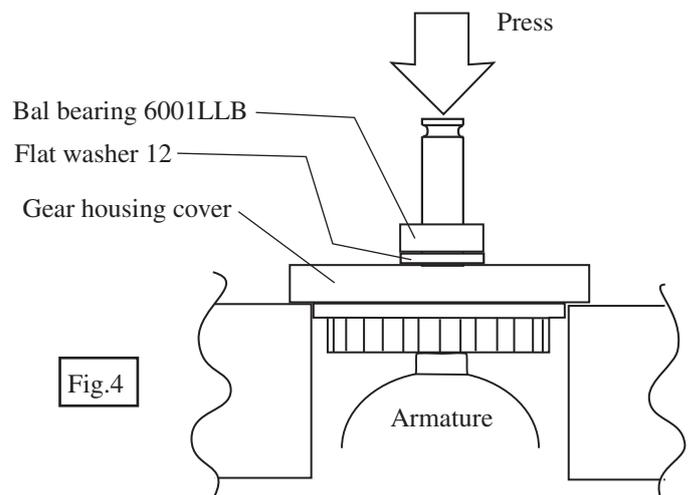


Fig.4

< 2 > Replacing ball bearing 6201LLB installed in skirt

- (1) Unscrew flat head screw M8x11 and detach head cover from gear housing. See Fig.5.
- (2) Unscrew pan head screw M4x12 and detach skirt from gear housing. See Fig.5.

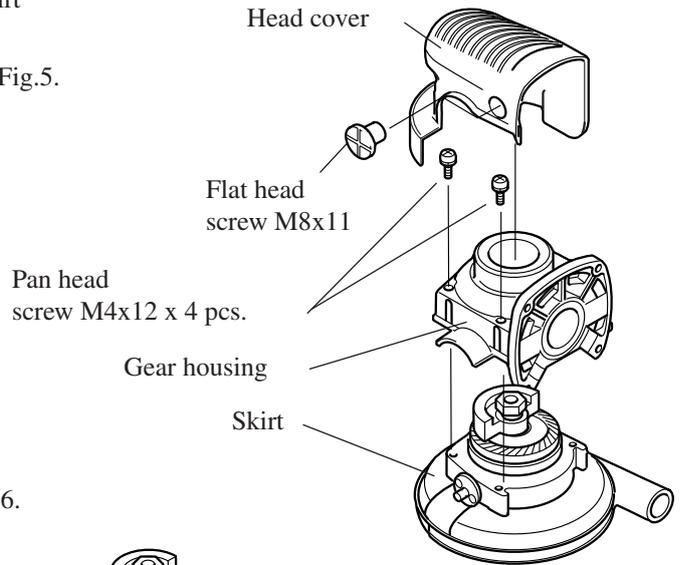


Fig. 5

- (3) Unscrew pan head screw M4x12 and detach bearing retainer 80 from skirt. See Fig.6.

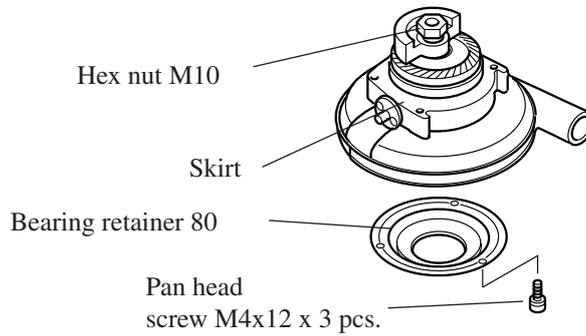


Fig. 6

- (4) Set box wrench 17 on hex nut M10 and insert hex wrench 6 into the hole of "spur gear 26 complete" as illustrated in Fig. 7. And loosen hex nut M10 with box wrench 17.

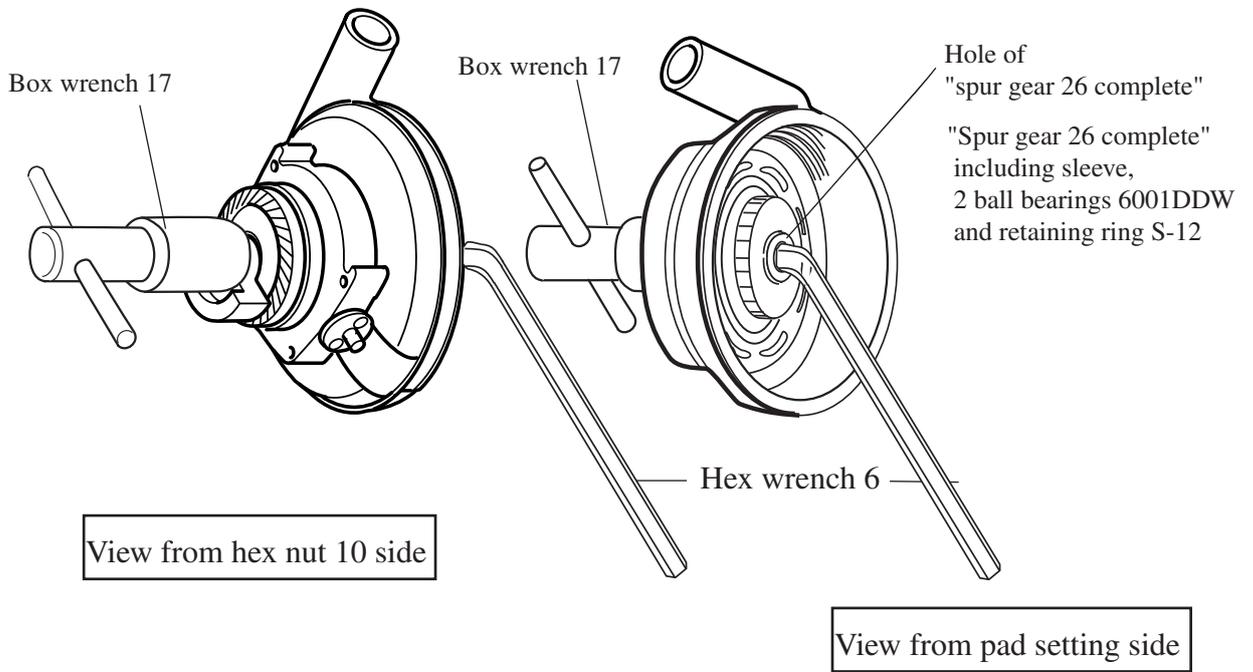
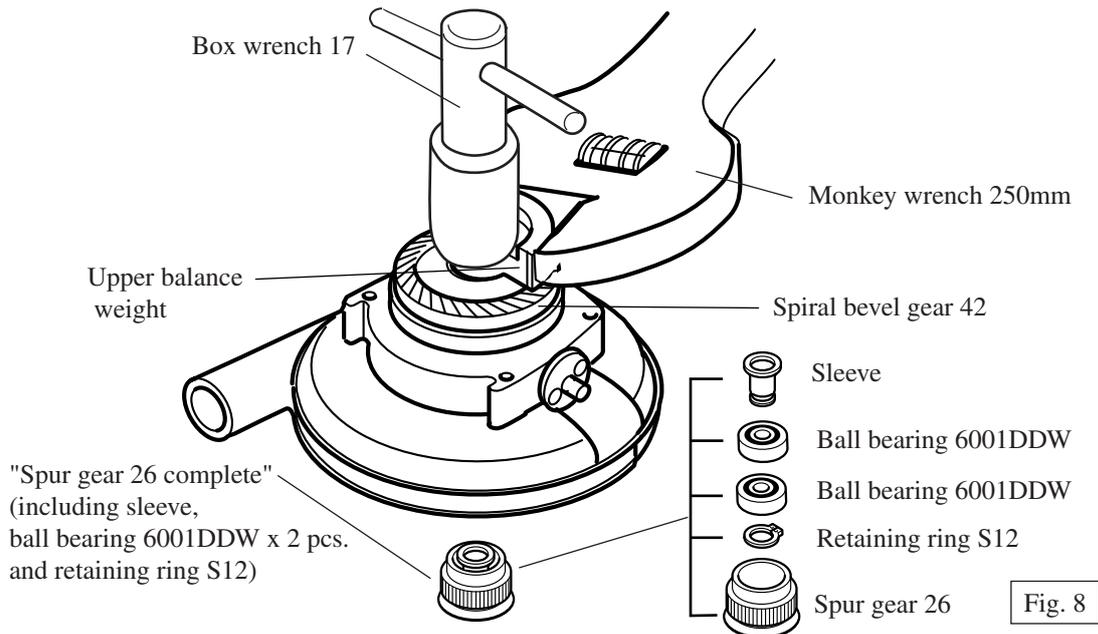
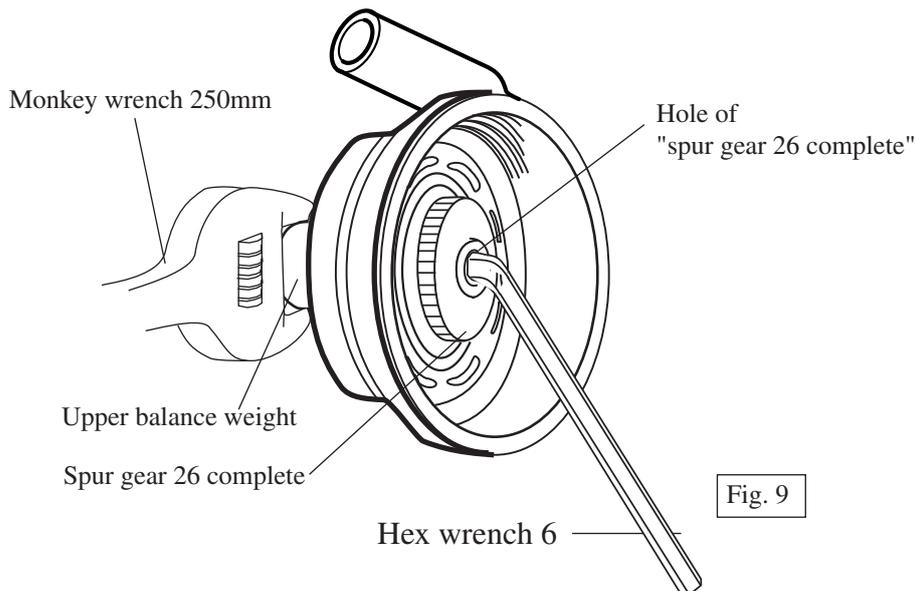


Fig. 7

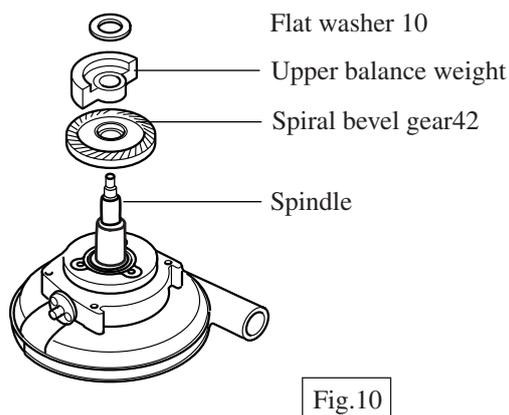
(4-A) If "spur gear 26 complete" is loosened first, Remove "spur gear 26 complete". And loosen hex nut M10 with box wrench 17, gripping upper balance weight with monkey wrench 250mm. See Fig. 8.



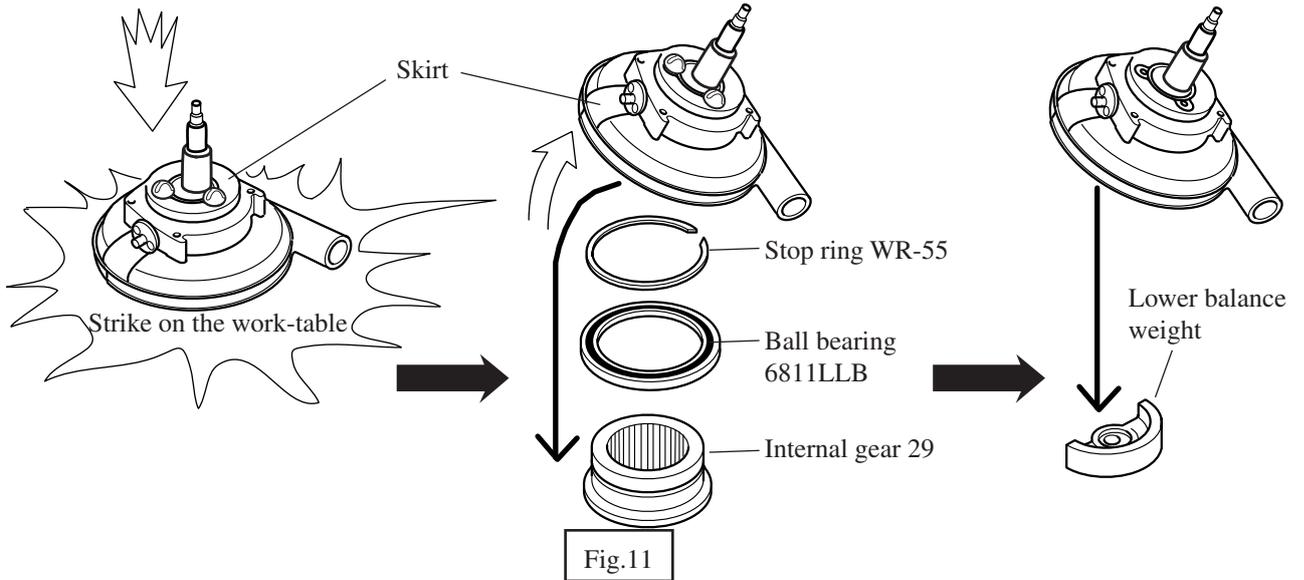
(4-B) If hex nut M10 is loosened first, Tighten hex nut M10 provisionally And remove upper balance weight with monkey wrench 250m, holding "spur gear 26 complete" with hex wrench 6. See Fig. 9.



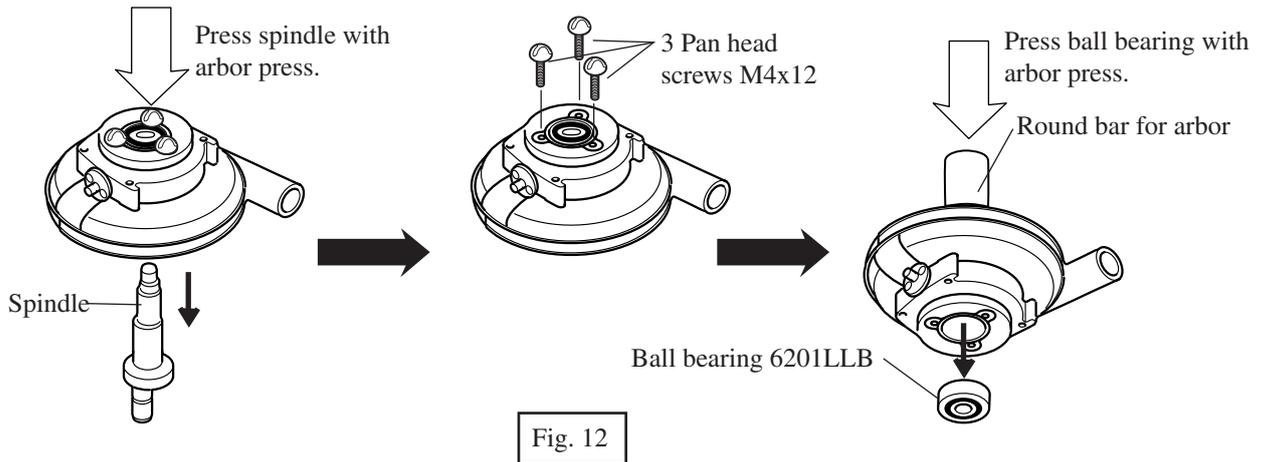
(5) Remove flat washer 10, upper balance weight and spiral bevel gear42 from spindle as illustrated in Fig.10.



(7) Remove internal gear 29, ball bearing 6811LLB and stop ring WR-55 by striking skirt on the work-table covered with soft sheet as illustrated in Fig.11. And then, remove lower balance weight.

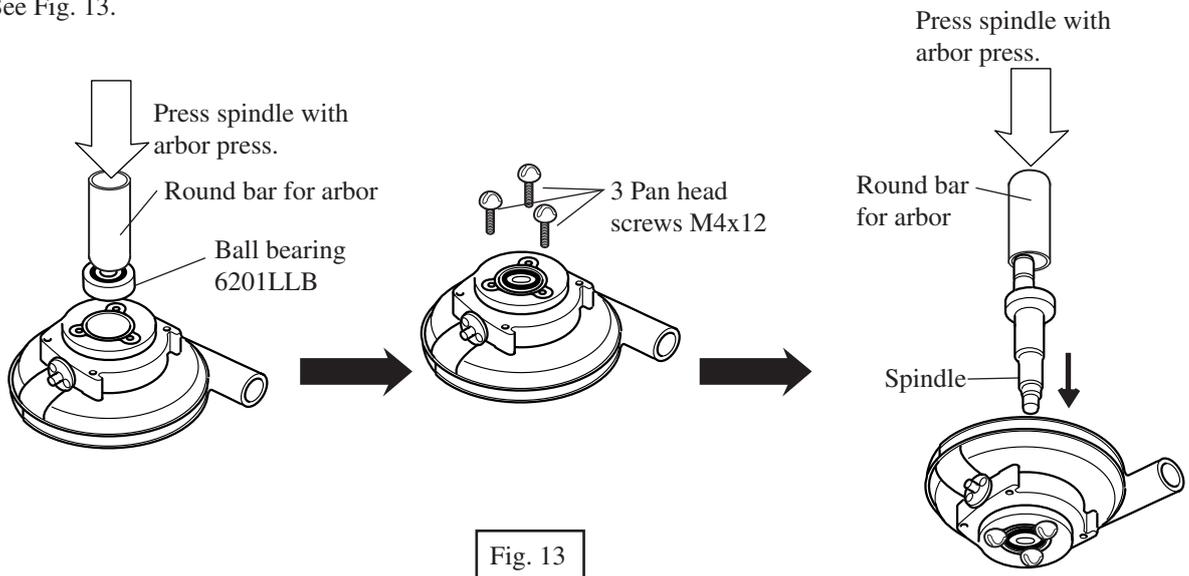


(8) Remove spindle from skirt with arbor press as illustrated in Fig. 12. Take off 3 pan head screws M4x12 holding ball bearing 6201LLB. And then, remove ball bearing 6201LLB with arbor press from skirt.

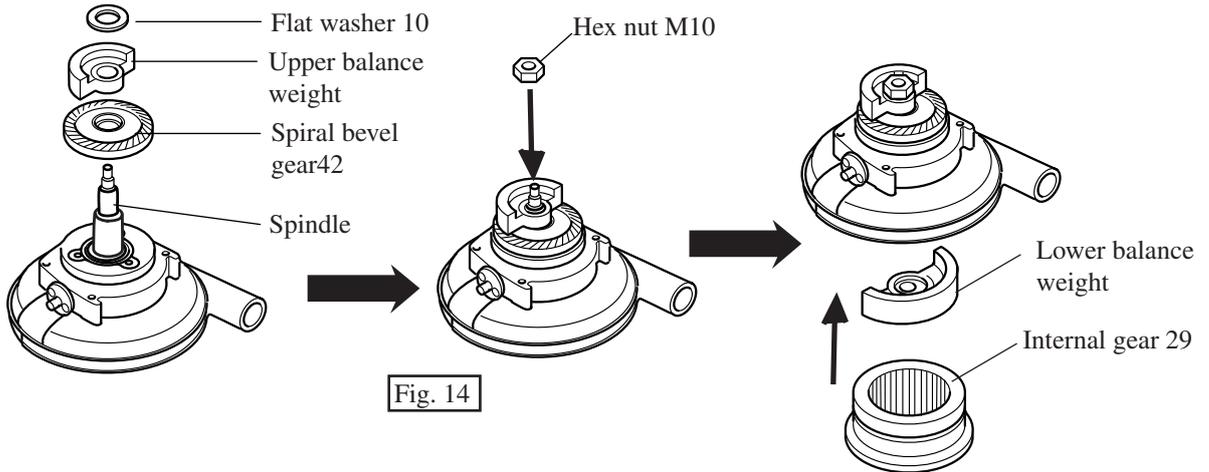


(9) Assembling skirt section

(9-1) Assemble ball bearing 6201LLB by pressing it with arbor press. Fix the ball bearing 6201LLB with 3 pan head screws M4x12. And then, assemble spindle with arbor press. See Fig. 13.

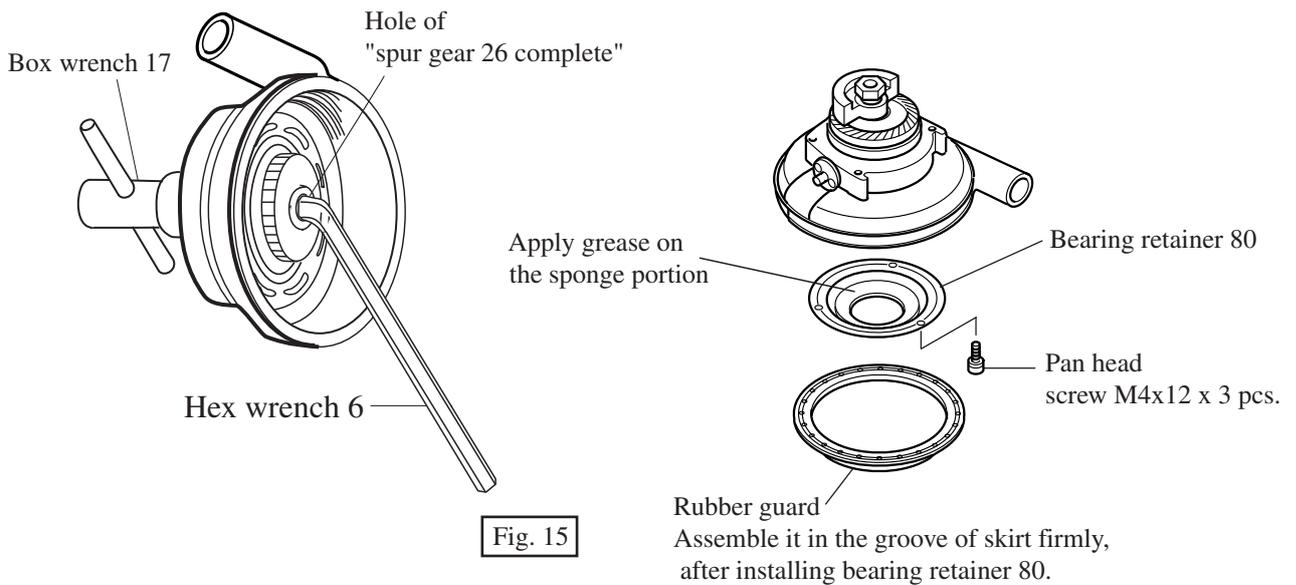


(9-2) Assemble spiral bevel gear 42, upper balance weight and flat washer 10. And then, tighten hex nut M10 provisionally. Assemble internal gear 29 after installing lower balance weight.



(9-3) Set box wrench 17 on hex nut M10 and insert hex wrench 6 into the hole of "spur gear 26 complete" as illustrated in Fig. 15. And fasten hex nut M10 with box wrench 17. Hold bearing retainer 80 with 3 pan head screws M4x12.

< Note > Apply grease on the sponge portion of bearing retainer 80.



< 3 > Replacing ball bearing 6001DDW installed in "spur gear 26 complete"

See Fig. 16.

- 1) In order to replace ball bearing 6001DDW, the removed spindle is needed as a repairing tool.  
Screw spindle into sleeve installed in "spur gear 26 complete" as illustrated in Fig. 17.

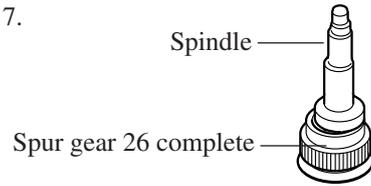


Fig. 17

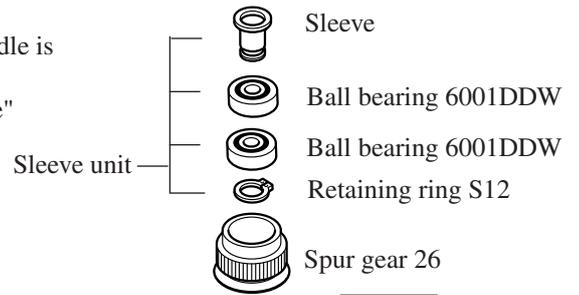


Fig. 16

- 2) Hold "spur gear 26 complete" with No.1R232 pipe 30 and No.1R037 bearing setting plate as illustrated in Fig. 18.  
Remove spindle together with sleeve unit (including 2 ball bearings 6001DDW and retaining ring S-12) from spur gear 26, by pressing No.1R235 "round bar for arbor" with arbor press as illustrated in Fig. 18. And then, remove spindle from sleeve unit by unscrewing.

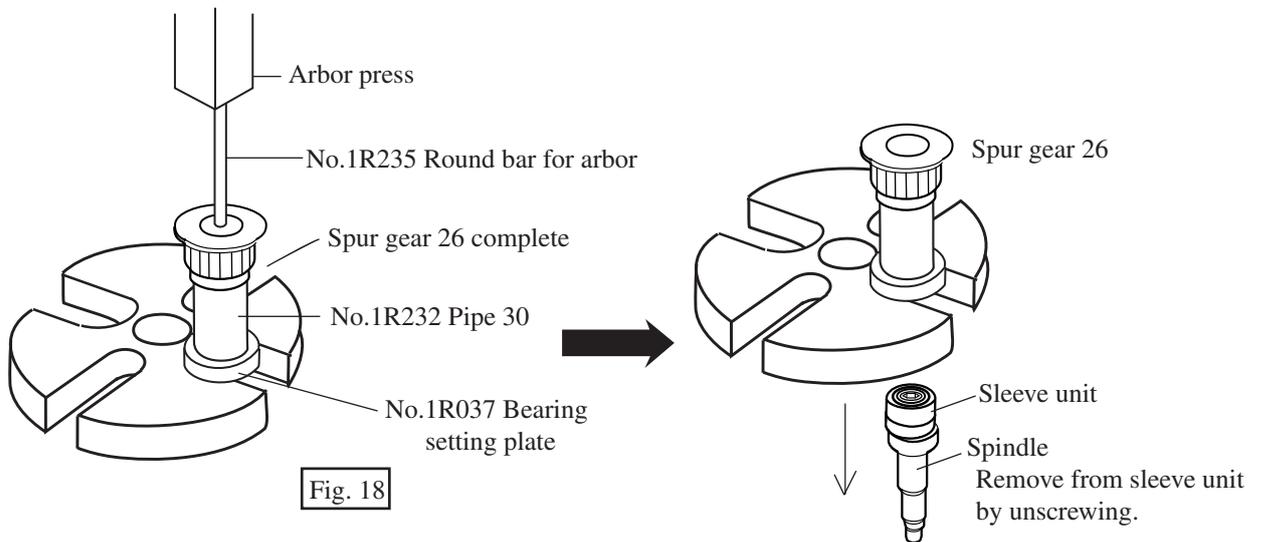


Fig. 18

- 3) Remove retaining ring S-12 from sleeve with retaining ring plier ST-1.  
Press No.1R235 "round bar for arbor" set on sleeve. Then, Ball bearing 6001DDW can be separated from sleeve. See Fig. 19.

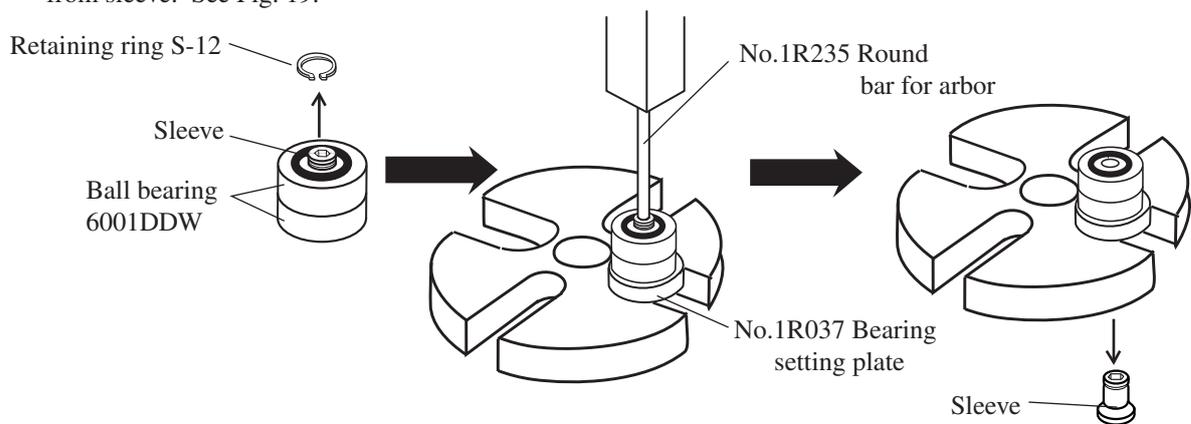


Fig. 19

- 4) Assembling ball bearing 6001DDW installed in "spur gear 26 complete"  
 Assemble sleeve to new ball bearings 6001DDW by pressing it, and assemble retaining ring S-12 to sleeve.  
 And then, press them into spur gear 26. See Fig. 20.

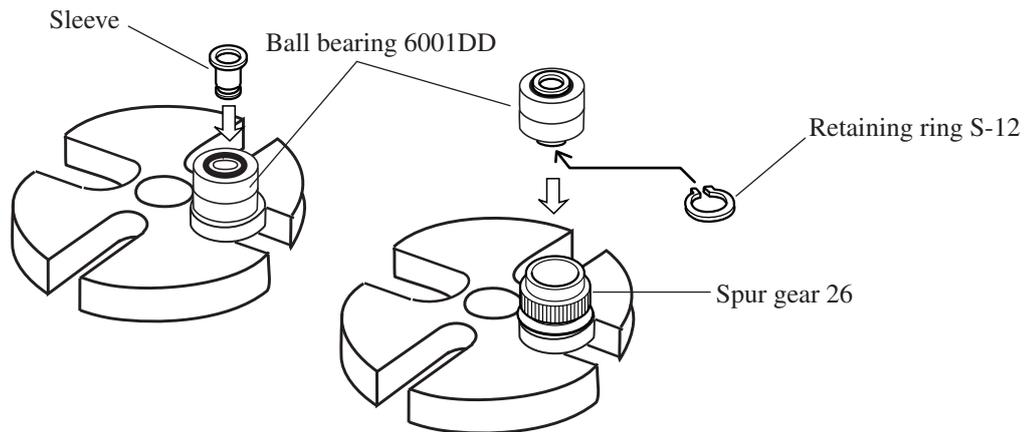


Fig. 20

< 4 > Replacing ball bearing 6811LLB installed in internal gear 29

- 1) Remove stop ring WR-55 with No.1R003 retaining plier from internal gear 29. The, ball bearing 6811LLB can be removed from internal gear 29 with hand. See Fig. 21.

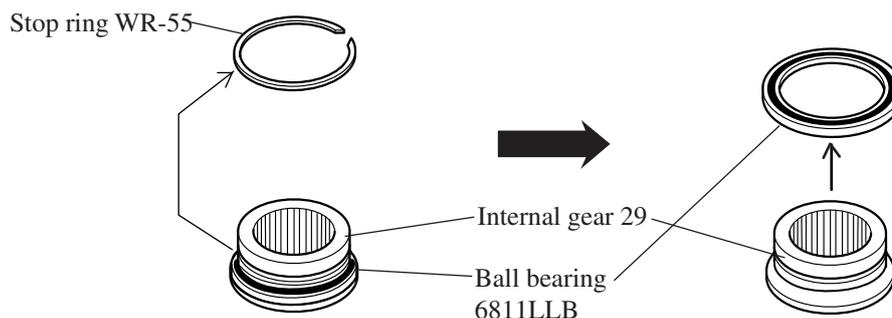


Fig. 21

When assembling ball bearing 6811LLB, take reverse step of Fig. 21.

< 5 > Replacing holder for action mode change

- 1) Install unit of internal gear 29 (including ball bearing 6811LLB and stop ring WR-55) in skirt.
- 2) Detach cap. And then, remove pan head screw M4x12, knob, spring holder and compression spring 4 as illustrated in Fig. 22.
- 3) Remove holder from skirt. And apply grease to the surface of new holder.
- 4) When assembling, install new holder, compression spring 4, spring holder and knob. And assemble cap by fastening it with pan head screw M4x12.

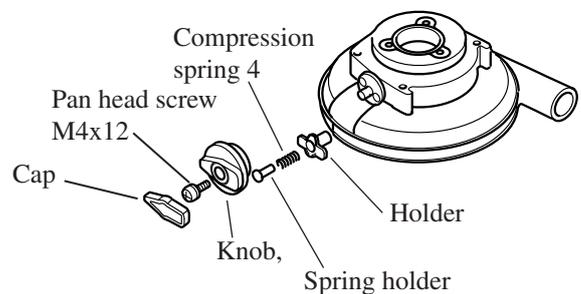
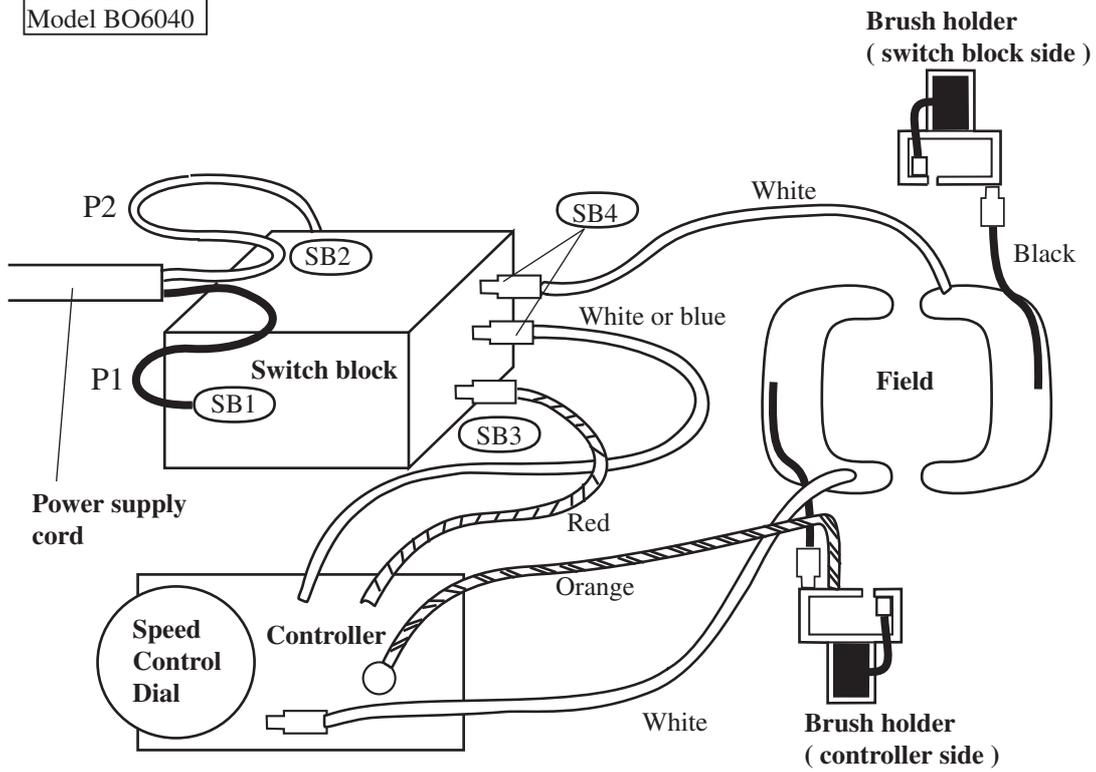


Fig. 22

Model BO6040



< Note >

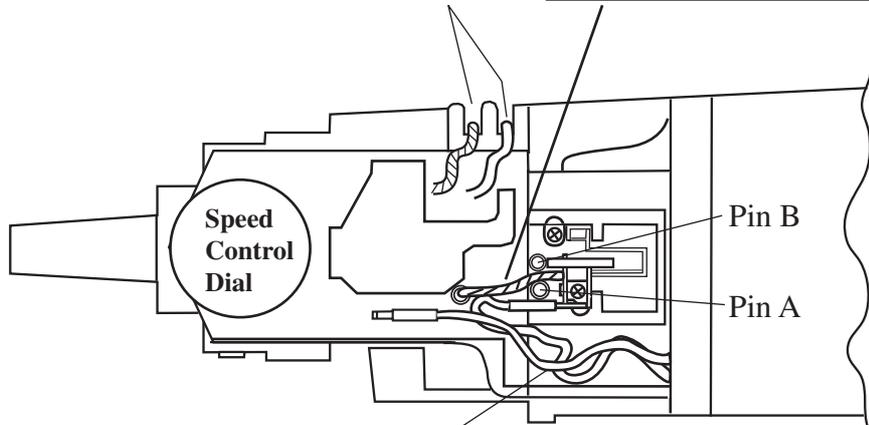
The lead wire (orange) for connection of controller and brush holder is not used in some countries.

Fig. 23

Model BO6040

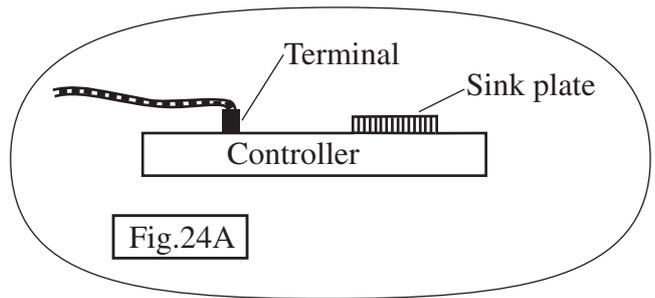
Put the lead wires of controller in the lead holder so that they are not slacken.

Fix lead wire of controller with lead holder between pin A and pin B.  
Infect the lead wire at the terminal in right angle. See Fig 24A.



Be careful not to loosen the lead wires of field in motor housing  
Put the loosened lead wires in the above place.

Fig. 24



Put lead wires of power supply cord by strain relief as illustrated in Fig. 25.

Do not loosen the lead wires of filed in motor housing.  
Put the loosened ones in the place as illustrated in Fig.25.

Fix lead wires of controller with lead holder.

Put their slack part in the place as illustrated in Fig.25.

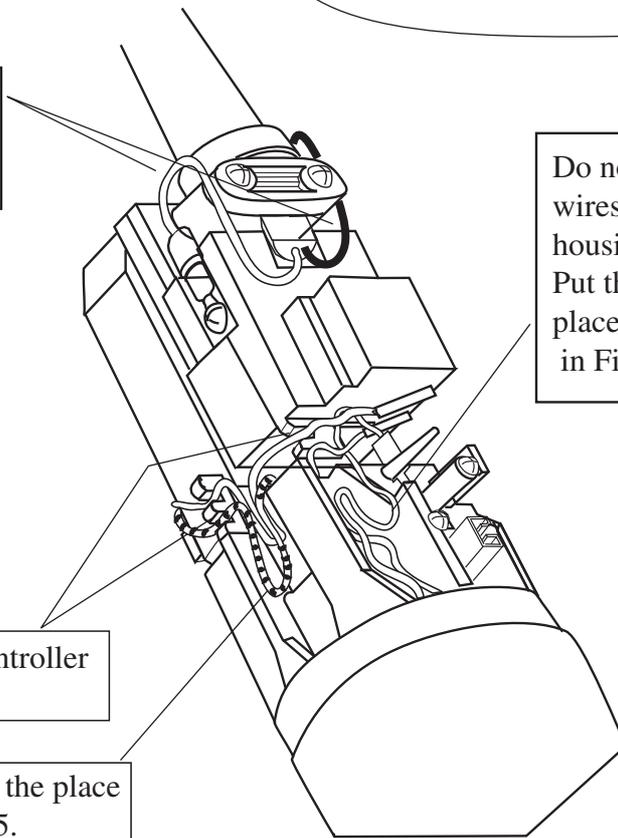


Fig. 25