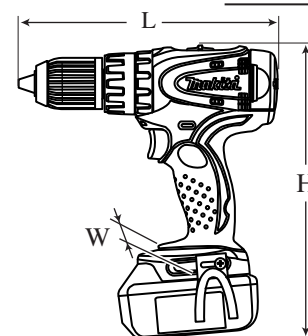


Model No. ► BHP450

Description ► Cordless Percussion-Driver Drill 13mm (1/2")



Dimensions: mm (")	
Length (L)	204 (8)
Width (W)	79 (3-1/8)
Height (H)	244 (9-5/8)

CONCEPT AND MAIN APPLICATIONS

Model BHP450 has been developed as powerful yet compact 18V-13mm Cordless percussion driver drill by adding hammering mechanism to Cordless driver drill Model BDF450. Features the following same advantages as BHP440:

- Developed with the design concept of "More Control and Maneuverability"
- Rubberized soft grip contoured to perfectly fit operator hand and angled to provide best tool balance
- All metal gear construction
- Job light with afterglow function
- Single sleeve chuck

This new product will be available in the following variations.

Model No.	Battery		Charger	Offered to
	type	quantity		
BHP450	BL1830 (Li-ion 3.0Ah)	2	DC18SC	USA, Canada Mexico, Panama
BHP450SFE		2		All countries except those listed above
BHP450SFE3		3		

► Specification

Battery	Voltage: V		18
	Capacity: Ah		3.0
	Cell		Li-ion
Max output (W)			240
No load speed: min-1=rpm		Low/ High	0 - 400/ 0 - 1,400
Blows per minute: min-1=bpm		Low/ High	0 - 6,000/ 0 - 21,000
Capacity of drill chuck: mm (")			1.5 - 13 (1/16 - 1/2)
Capacity: mm (")	Steel		13 (1/2)
	Wood		27 (1-1/16)
	Masonry		13 (1/2)
Torque setting			16 stage + drill mode
Max. clutch torque: N.m (kgf.cm)			1.0 - 5.0 (8.9 - 44.3)
Max. fastening torque: N.m	Soft joint		25
	Hard joint		41
Lock torque: N.m (in.lbs)			36 (320)
Electric brake			Yes
Variable speed control			Yes
Reversing switch			Yes
Net weight*: kg (lbs)			1.8 (3.9)

*Includes battery BL1830

► Standard equipment

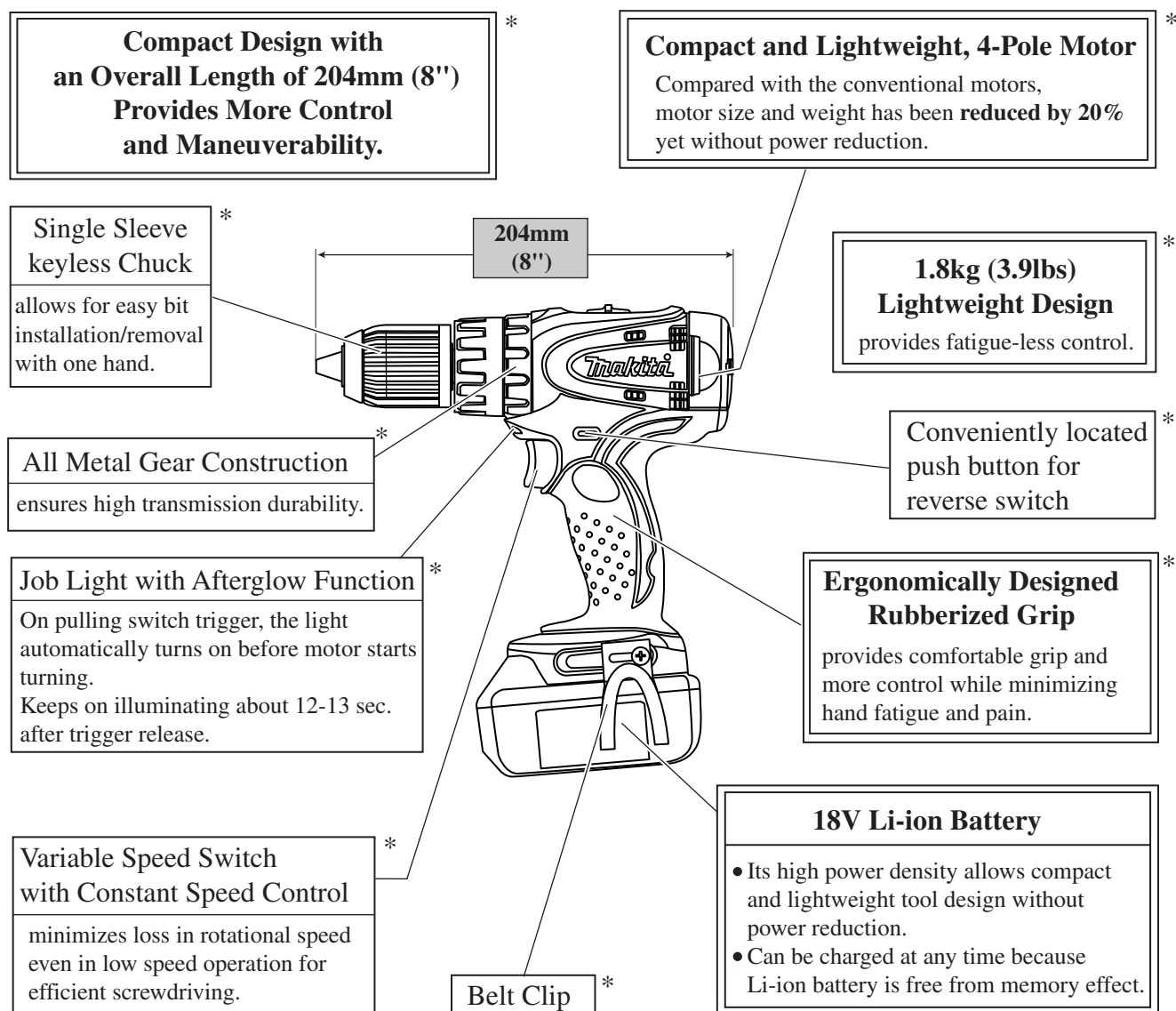
Phillips bit 2-65 1 pc Belt clip..... 1 pc Plastic carrying case 1 pc

Note: The standard equipment for the tool shown above may differ by country.

► Optional accessories

Charger DC18SC	Charger DC24SC	Assorted drill bits for wood	Assorted TCT drill bits
Charger DC24SA	Li-ion battery BL1830	Assorted drill bits for metal	

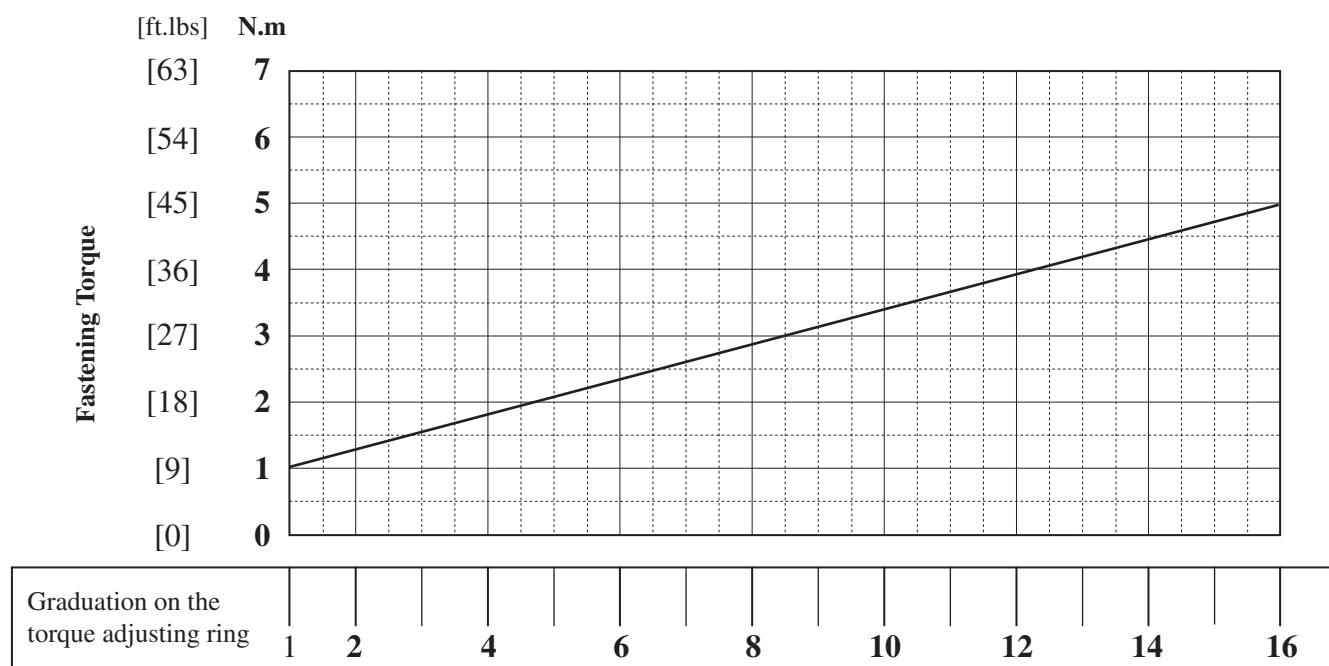
► Features and benefits



*The same advantages as Model BHP440

► Features and benefits

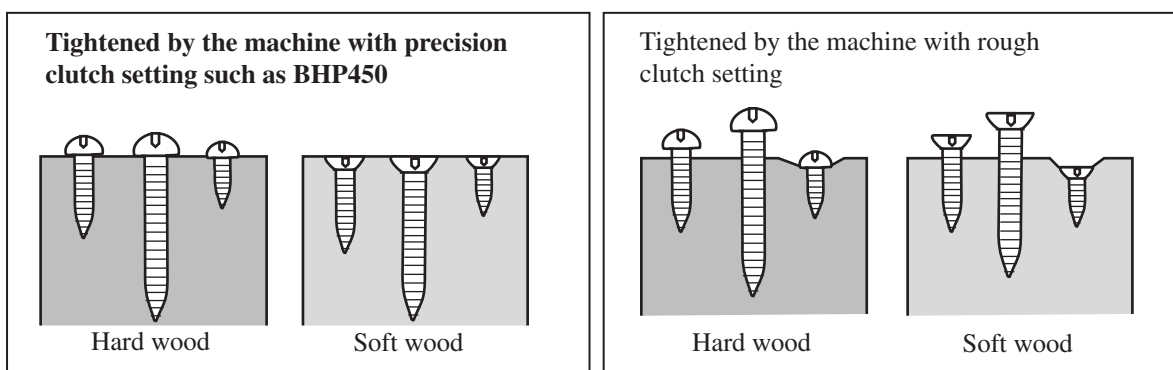
The Graduation on Torque Adjusting Ring and Corresponding Fastening Torque (The Torque When Clutch Is Disengaged=Max. clutch torque)



Applicable screw	Machine screw		M4	M5		M6
	Wood screw	Soft wood (pine, etc.)			<div>← dia. 3.5x22mm</div> <div>dia. 4.1 x 38mm</div>	
		Hard wood (lauan, etc.)	dia. 3.5 x 22mm		dia. 4.1 x 38mm	

16 Stage torque settings allows;

- 1) to perform appropriate torque setting in tightening M4 to M6 machine screws.
- 2) in tightening wood screws, to drive the screw heads to a uniform height regardless of the screw size or the hardness of wood. (See the figures below.)



► Comparison of products

Model No. Specifications			Makita	
			BHP450	BHP440
Battery	Voltage: V		18	14.4
	Capacity: Ah		3.0	3.0
	Cell		Li-ion	Li-ion
No load speed: min-1= rpm	High		0 - 1,400	0 - 1,400
	Low		0 - 400	0 - 400
Blows per minute: min-1= rpm	High		0 - 21,000	0 - 21,000
	Low		0 - 6,000	0 - 6,000
Type of keyless drill chuck			Single sleeve	Single sleeve
Chuck Capacity: mm (")			13 (1/2)	13 (1/2)
Lock Torque: N.m (in.lbs)			36 (320)	36 (320)
Max. fastening torque: N.m	Hard joint		41	38
	Soft joint		25	25
Capacity: mm (")	Steel		13 (1/2)	13 (1/2)
	Wood		27 (1-1/16)	27 (1-1/16)
	Steel		13 (1/2)	13 (1/2)
Torque adjustment			16 + Drill mode	16 + Drill mode
LED Job light	Afterglow type		Yes	Yes
	Normal type			
Belt clip			Yes	Yes
Replaceable carbon brush			Yes	Yes
Soft grip			Yes	Yes
Dimensions: mm (")	Length		204 (8)	204 (8)
	Width		79 (3-1/8)	79 (3-1/8)
	Height		244 (9-5/8)	242 (9-1/2)
Net weight: kg (lbs)			1.8 (3.9)	1.7 (3.7)
Standard equipment	Phillips bit 2-65		Yes	Yes
	Plastic carrying case		Yes	Yes
	Belt clip		Yes	Yes

Note: The lock torque of 18V BHP450 is equal to that of 14.4V BHP440.

This is because these models are designed to meet the reaction torque value requirements prescribed according to grip length in European and North American safety regulations- EN60745 and UL60745.

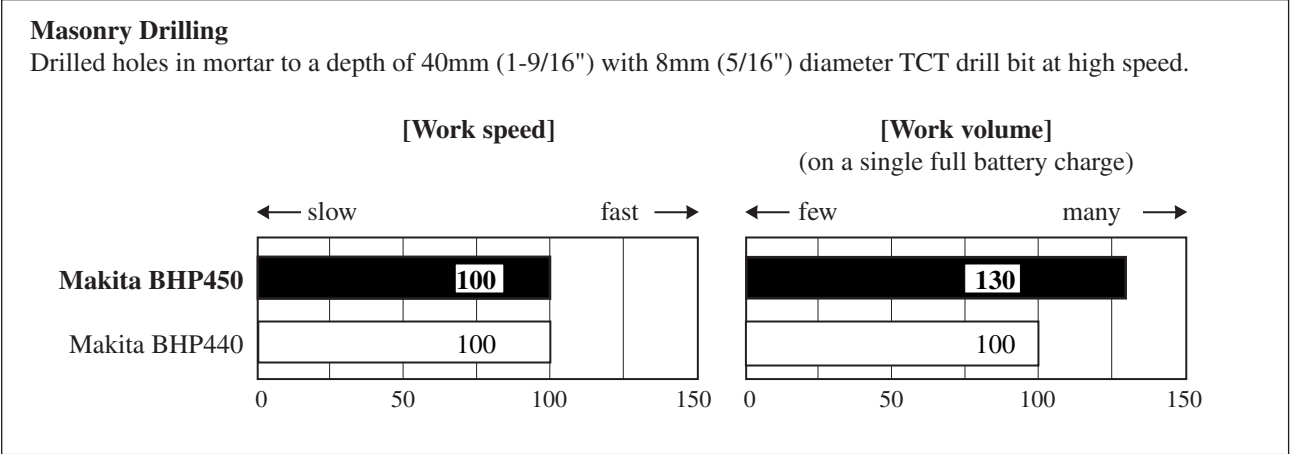
For lock torque higher than present, either vertical grip extension of the current handle or horizontal extension by adding a side handle must be required.

► **Comparison of products**

Performance Comparison

Numbers in charts below are relative values when the capacity of Model BHP440 is indexed at 100.

Note: The test results depend to a great extent on the hardness of the material, etc.



► Repair

CAUTION: Remove the battery cartridge from the machine for safety before repair/maintenance !

[1] NECESSARY REPAIRING TOOLS

Description	Use for
Hex wrench 10	Removing /mounting Drill chuck
Plastic hammer	Removing Drill chuck

[2] LUBRICATION

It is not required to lubricate the gear section because the portion is replaced as a factory-lubricated gear unit.

[3] DISASSEMBLY/ASSEMBLY

[3] -1. Drill Chuck

DISASSEMBLING

Note: It is required to remove Drill chuck when replacing Gear assembly, but you need not when replacing only Housing.

- 1) Open the jaws of Drill chuck fully, and remove the chuck screw (Flat head screw M6x22, left-handed and threadlocker coated) by turning **clockwise** with impact driver in Forward rotation mode.
- 2) Insert a hex wrench into Drill chuck. Then set the Action mode change ring in Drill mode, the Speed change lever in Low speed as illustrated in **Fig. 1**. Holding the machine on work bench firmly, turn Drill chuck counterclockwise by tapping the hex wrench. (**Fig. 2**) Now Drill chuck can be removed from Spindle.

Fig. 1

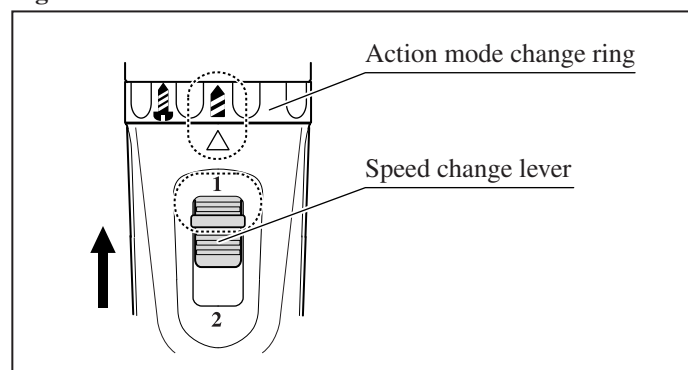
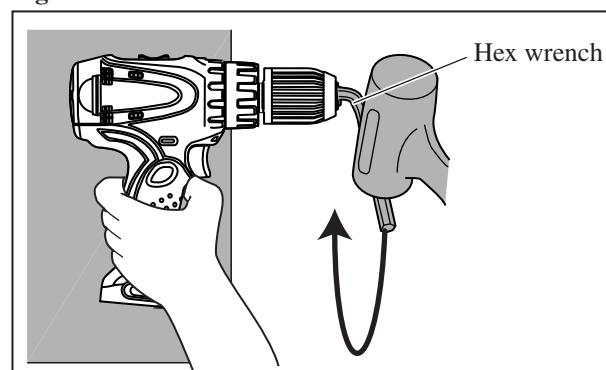


Fig. 2



ASSEMBLING

- 1) Turn Drill chuck clockwise until it sits on the end of the threaded portion of Spindle. (**Fig. 3**)
- 2) See **Fig. 4**. Insert a hex wrench into drill chuck, and fix the other end of hex wrench in vise. Install battery. Then set the Action mode change ring in Drill mode, the Speed change lever in Low speed, and F/R change lever in Forward (clockwise) rotation mode.
- 3) Slowly pull the switch trigger to rotate Spindle until the motor is locked.
Note: Pull the trigger so that Spindle reaches full speed in one second.
Important: Be sure to release the switch trigger just after Spindle is locked.
- 4) Secure Drill chuck with the chuck screw by turning **counterclockwise** with impact driver.
Note: If you reuse the removed Flat head screw M6x22, apply threadlocker to threaded portion.

Fig. 3

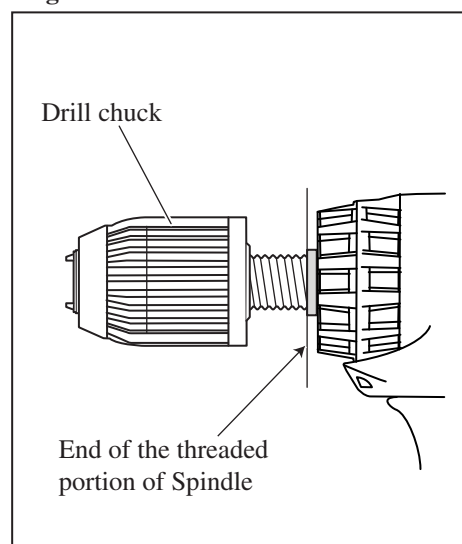
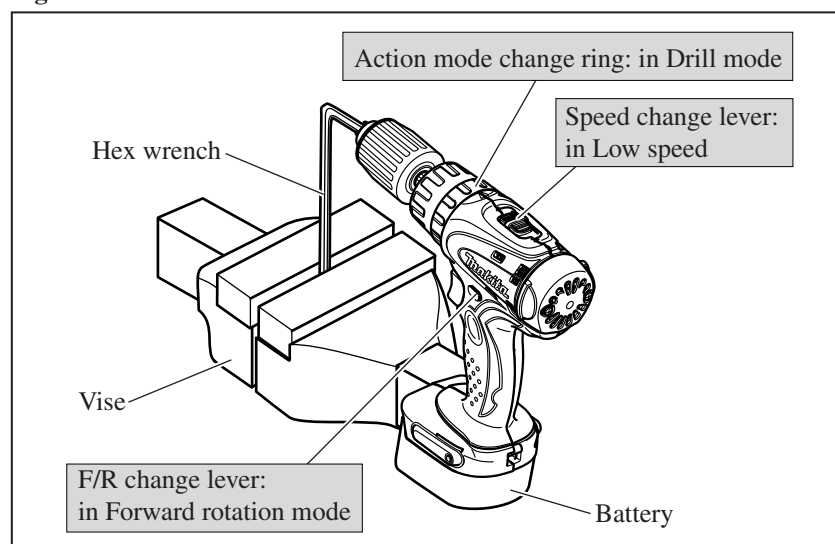


Fig. 4



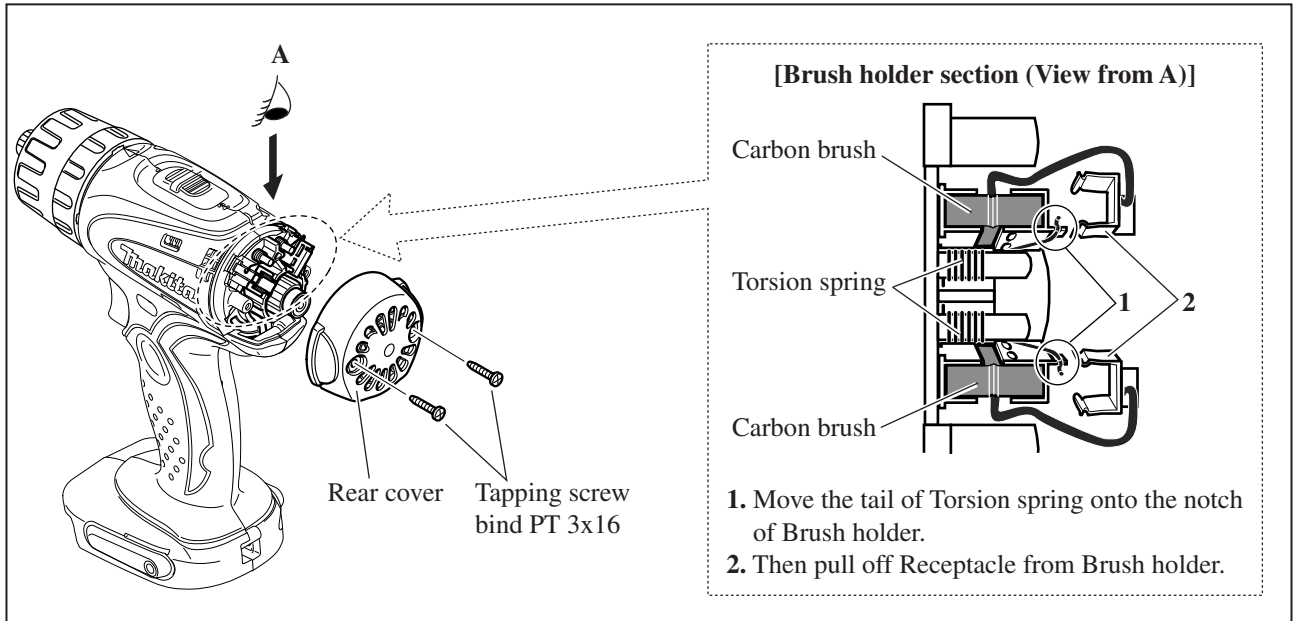
► Repair

[3] -2. Gear Assembly and Motor Section

DISASSEMBLING

1) Remove Rear cover and take off Carbon brush from Brush holder complete. (Fig. 5)

Fig. 5



2) Separate Housing R from Housing L, then remove the assembly of the Gear section and the Motor section. (Fig. 6)

3) Remove Brush holder complete from Armature, then separate the Motor section from the Gear section. (Fig. 7)

4) Put the Motor section on a work bench so that the drive end of Armature touches the work bench.

Then separate yoke unit from armature by pulling it down towards the work bench. (Fig. 8)

Fig. 6

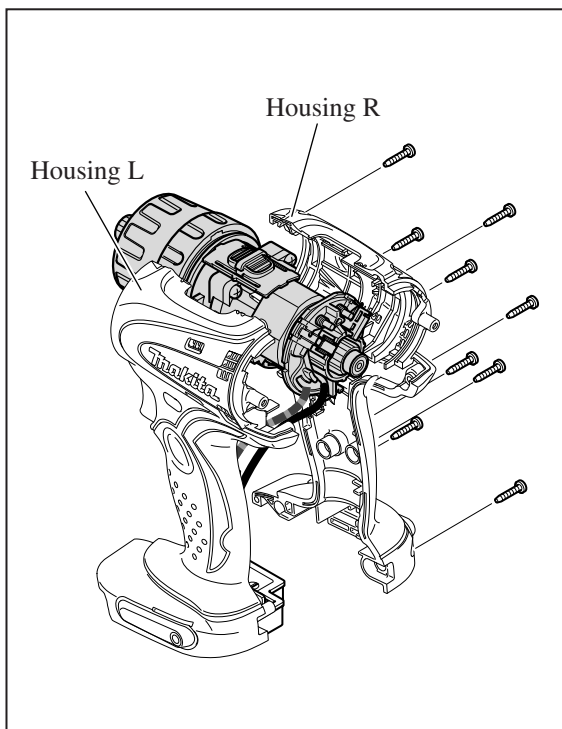


Fig. 7

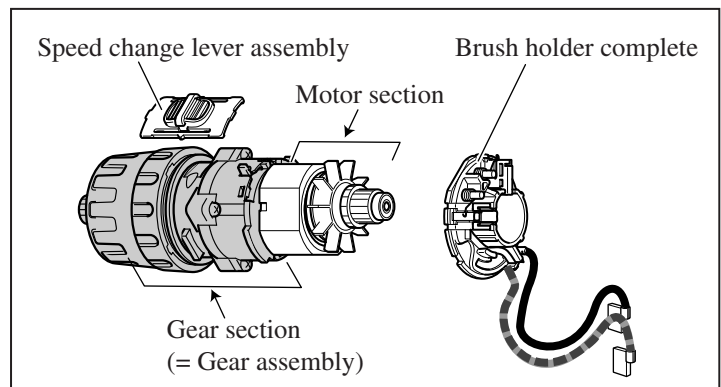
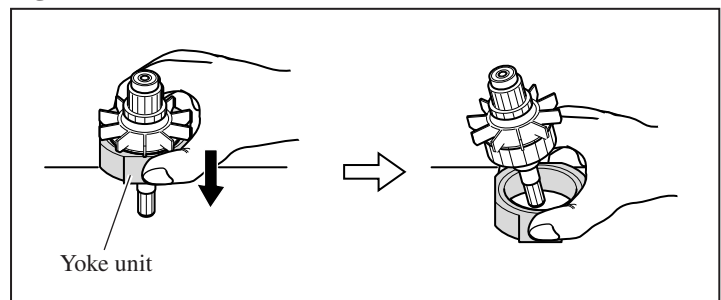


Fig. 8



► Repair

[3] -2. Gear Assembly and Motor Section (cont.)

ASSEMBLING

- 1) Assemble the motor section.

Note 1. Yoke unit is not reversible when assembled to Armature. Be sure to assemble so that the notch in Yoke unit is positioned on the drive-end of Armature as illustrated to **left in Fig. 9**. If assembled wrong, the Motor section cannot be assembled to Housing (L).

Note 2. Because Yoke unit is a strong magnet, when assembling Armature to Yoke unit, be sure to hold the commutator portion as illustrated to **left in Fig. 10**. Do not hold the Armature core as illustrated to right or your fingers will be pinched between Yoke unit and the fan of Armature that is pulled strongly by the magnet force.

Fig. 9

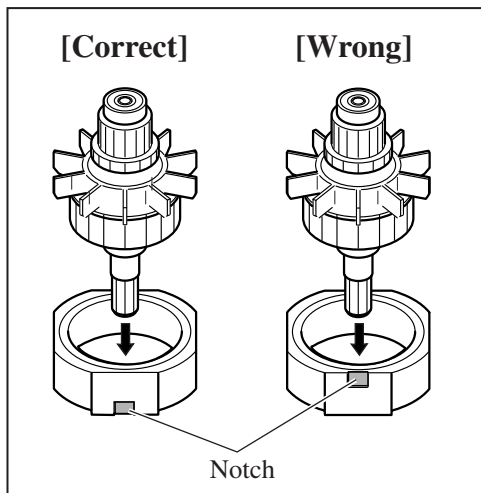
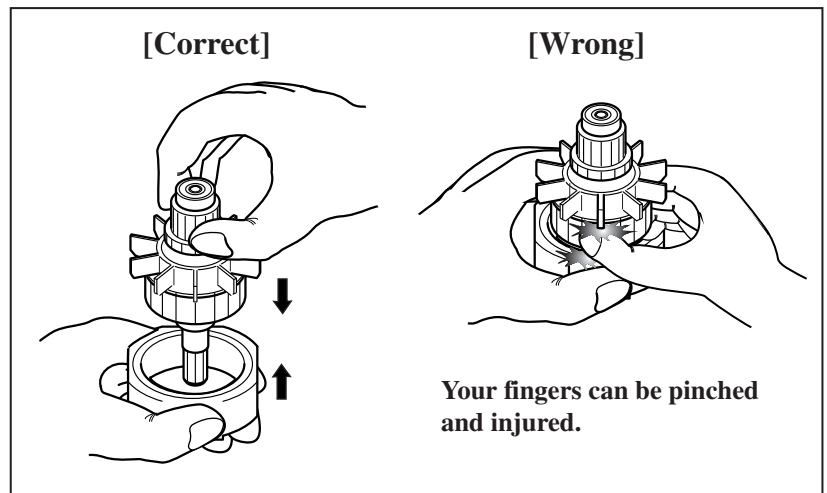


Fig. 10



- 2) Insert the pinion gear on Armature shaft into Gear assembly, and engage it with the plant gears in Gear assembly. Making sure that the pinion gear is engaged in Gear assembly, push Armature into Gear assembly. (**Fig. 11**)
- 3) See **Fig. 12**. Assemble Speed change lever assembly to the protrusion on Gear assembly.

Note: Before installing Gear assembly, make sure that two Compression springs are set in place in the groove on the back of Speed change lever.

- 4) Slide Speed change lever assembly to the position of either "low" or "high". Then assemble Brush holder complete to the Motor section. (**Fig. 13**)

Fig. 11

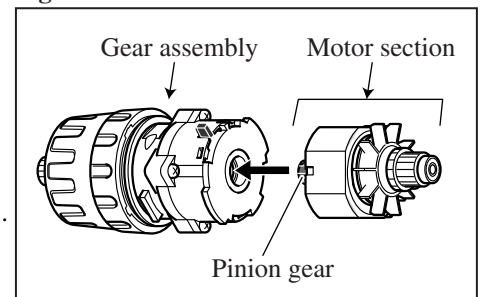


Fig. 12

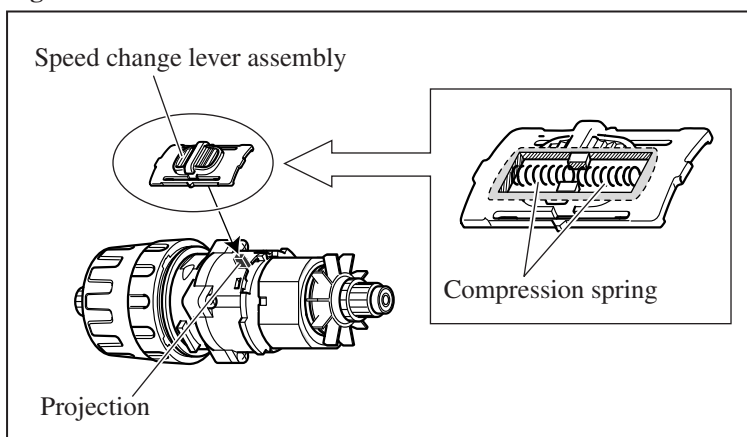
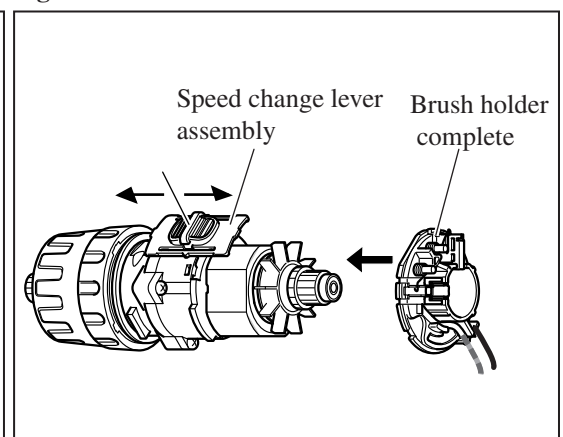


Fig. 13



► Repair

[3] -2. Gear Assembly and Motor Section (cont.)

ASSEMBLING

5) Assemble Leaf spring to Housing L. (**Fig. 14**)

6) Assemble the unit of the Gear section and the Motor section as illustrated in **Fig. 15, 16**.

Fig. 14

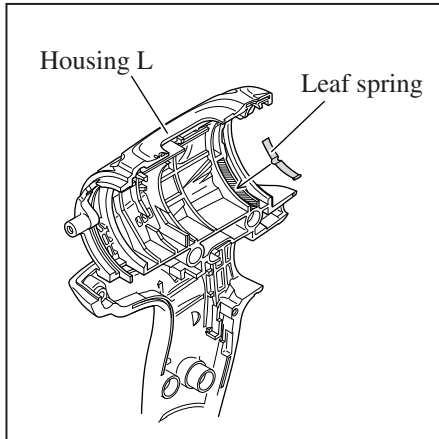


Fig. 15

With the projection on Housing L fit in the notch on Yoke, put Yoke unit between the ribs on Housing L.

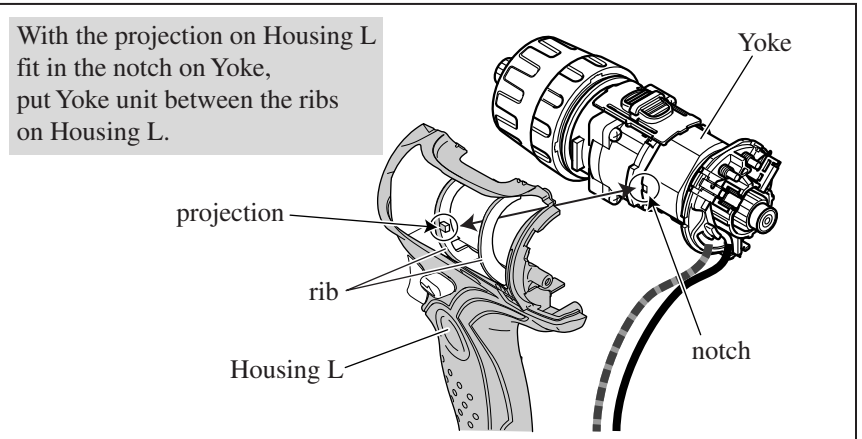
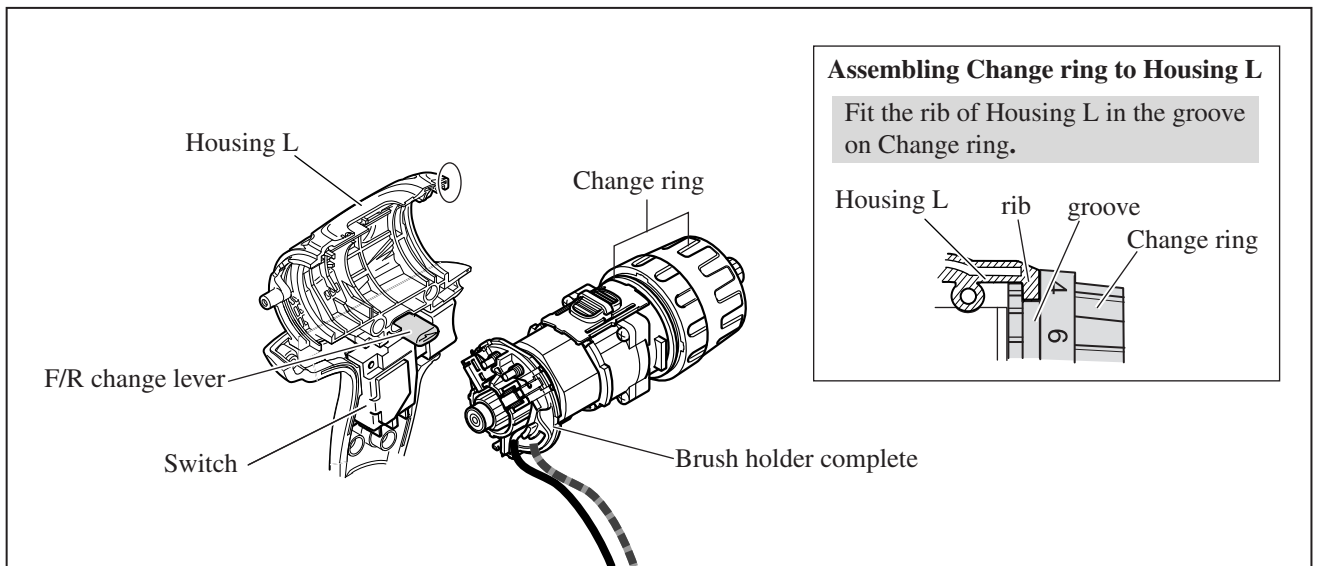
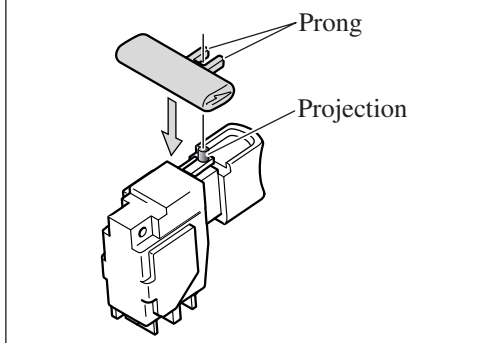


Fig. 16



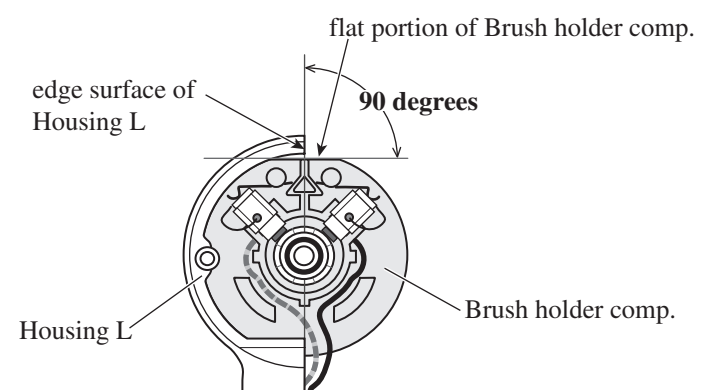
Assembling F/R change lever to Switch

put the projection on Switch between the prongs of F/R change lever.



Assembling Brush holder complete to Housing L

The flat portion of Brush holder complete must be at 90 degrees to the edge surface of Housing L.



► Repair

[3] -2. Gear Assembly and Motor Section (cont.)

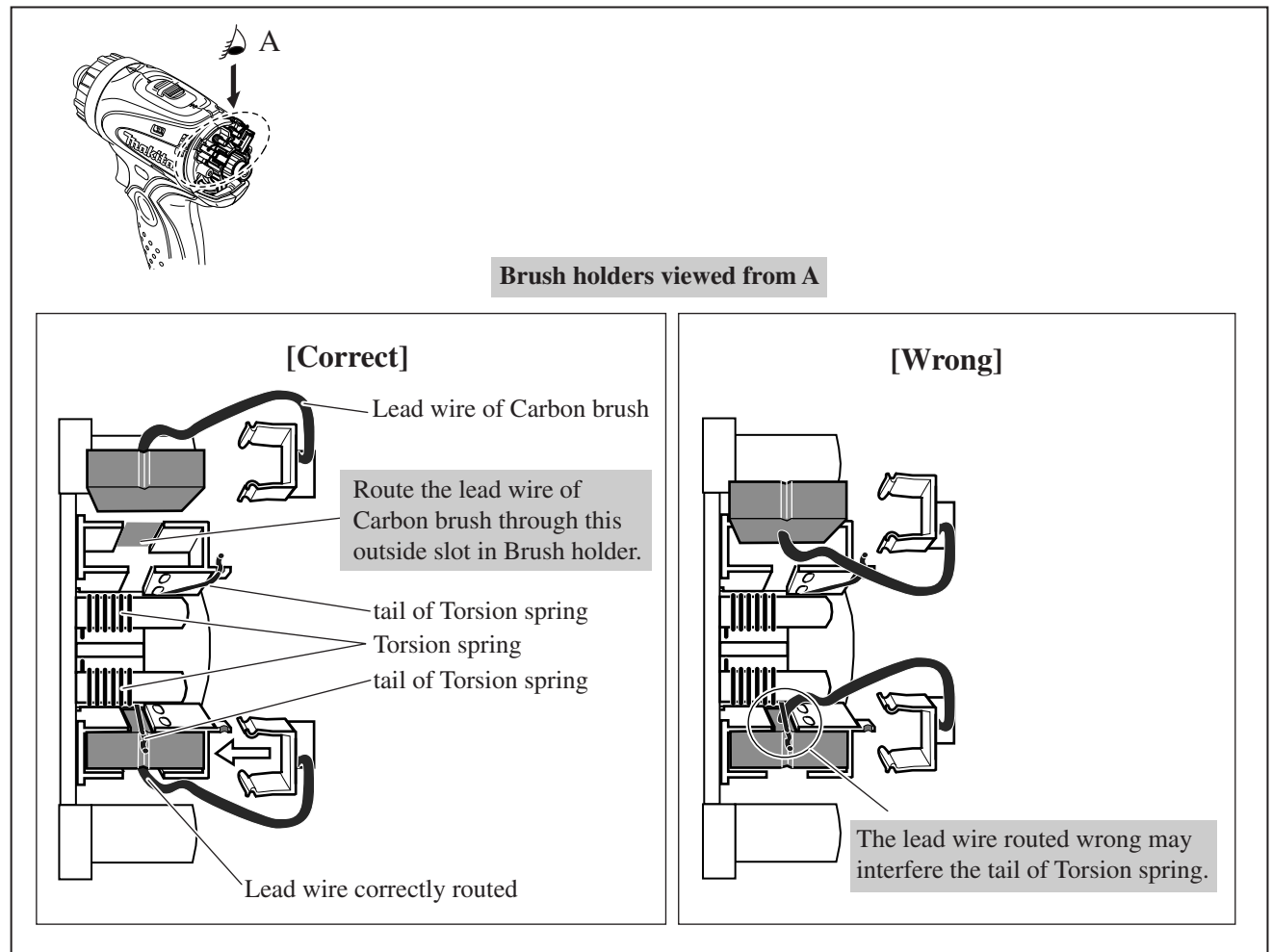
ASSEMBLING

7) Assemble Housing R to Housing L. (Fig. 6)

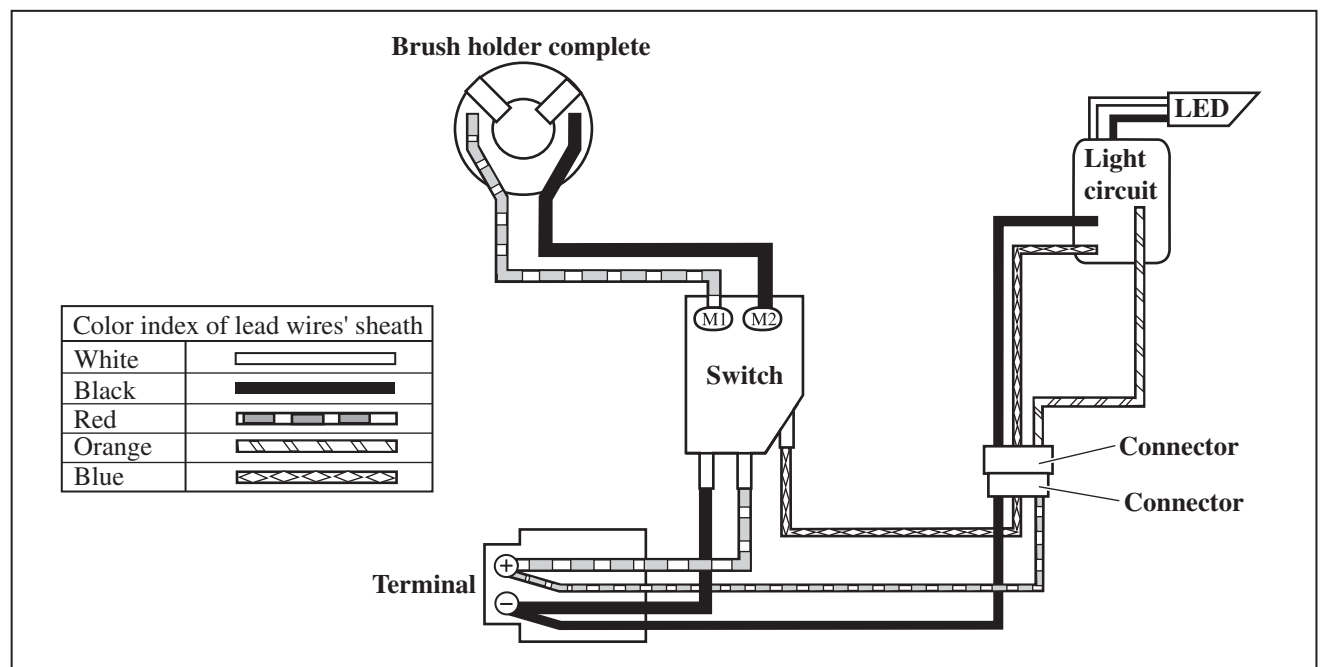
8) Install Carbon brush. (Fig. 17)

9) Mount Rear cover.

Fig. 17

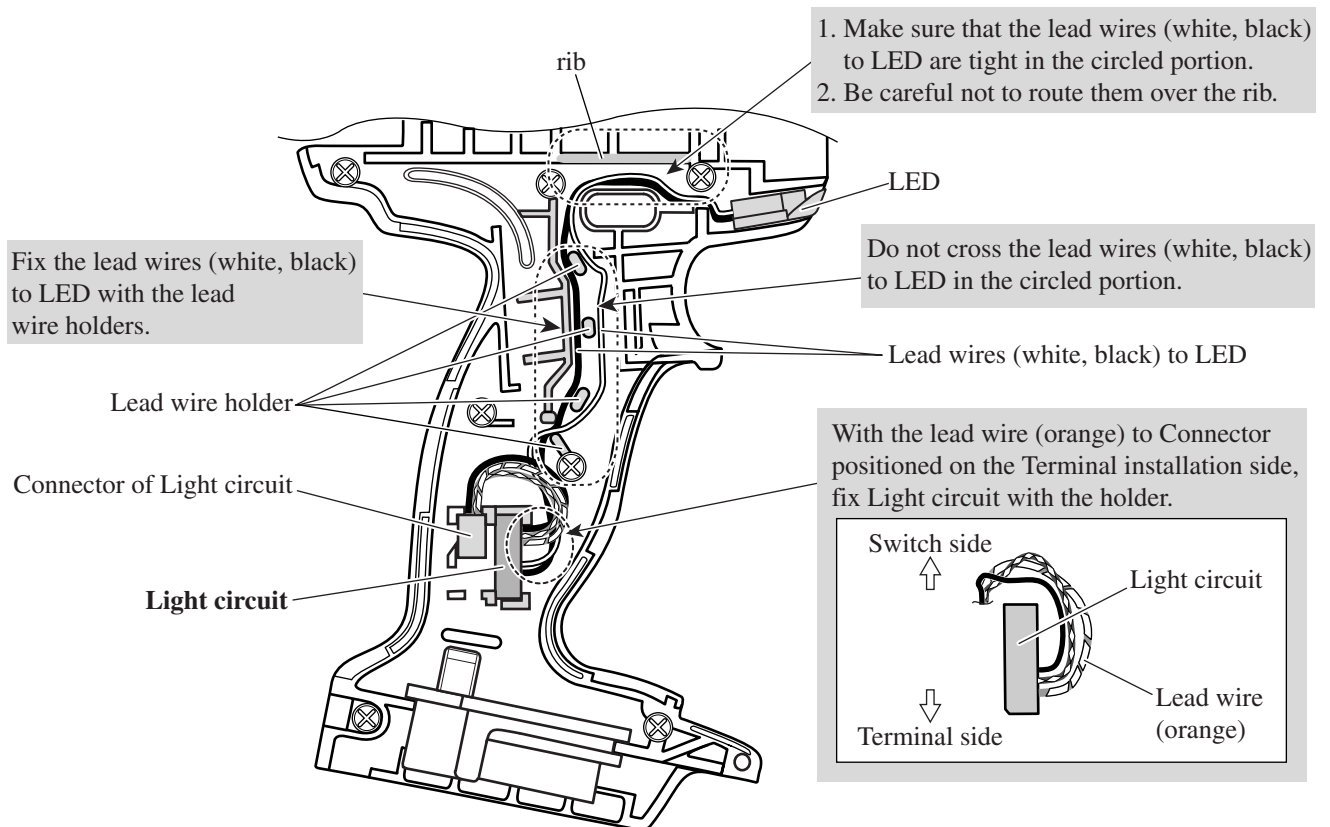


► Circuit diagram



► Wiring diagram

[1] Lead Wires of Light Circuit



[2] Lead Wires of Switch and Brush Holder Complete

