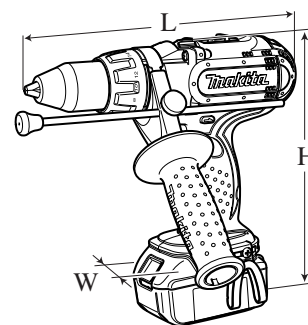


Model No. ▶ BHP451

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



CONCEPT AND MAIN APPLICATIONS

Model BHP451 has been developed as an upgraded sister model of Model 8444D with the design concept of "More Control and Maneuverability".

Features lightweight and compact design achieved by using 4-pole motor and Lithium-ion battery as power unit.

Also features the same advantages as BHP440:

- 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.

Dimensions: mm (")	
Length (L)	250 (9-7/8)
Width (W)	78 (3-1/16)
Height (H)	257 (10-1/8)

Model No.	Battery		Charger	Offered to
	type	quantity		
BHP451	BL1830 (Li-ion 3.0Ah)	2	DC18SC	USA, Canada Mexico, Panama
BHP451SFE		2		All countries except those listed above
BHP451SFE3		3		

► Specification

Battery	Voltage: V		18
	Capacity: Ah		3.0
	Cell		Li-ion
Max output (W)			300
No load speed: min-1=rpm	1st/ 2nd/ 3rd	0 - 300/ 0 - 600/ 0 - 1,700	
Blows per minute: min-1=bpm	1st/ 2nd/ 3rd	0 - 4,500/ 0 - 9,000/ 0 - 25,500	
Capacity of drill chuck: mm (")			1.5 - 13 (1/16 - 1/2)
Capacity: mm (")	Steel	13 (1/2)	
	Wood	65 (2-9/16)	
	Masonry	16 (5/8)	
Torque setting			16 stage + drill mode
Max. clutch torque: N.m (ft.lbs)			1.0 - 5.9 (0.7 - 4.3)
Max. fastening torque: N.m (ft.lbs)	Soft joint	40 (25.7)	
	Hard joint	80 (59.0)	
Electric brake			Yes
Variable speed control			Yes
Reversing switch			Yes
Net weight*: kg (lbs)			2.2 (4.9)

*Includes battery BL1830

► Standard equipment

Philips bit 2-45 2 pc Belt clip..... 1 pc Stopper pole assembly 1 pc Plastic carrying case 1 pc
 Bit holder..... 1 pc Grip assembly..... 1 pc + Screw M4x12 2 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 BL1430 Assorted drill bits for metal

► 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 Speed change lever in 1st speed, and Action mode change lever in Drill mode as illustrated in **Fig. 1**. Holding the machine on work bench firmly, turn Drill chuck counter clockwise by tapping the hex wrench. Now Drill chuck can be removed from Spindle. (**Fig. 2**)

Fig. 1

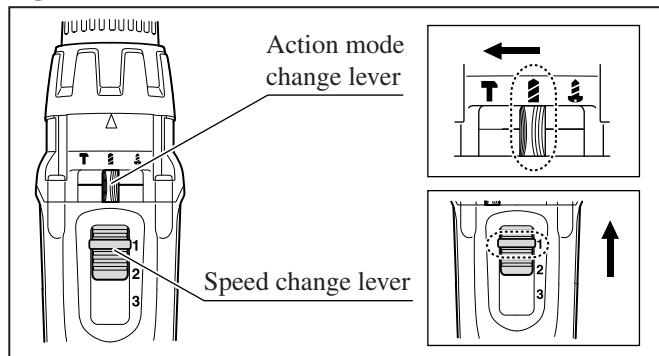
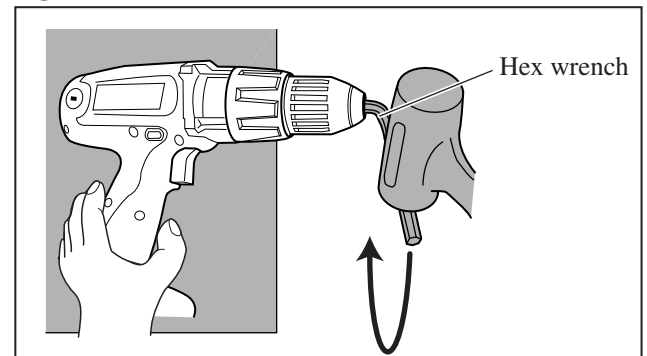


Fig. 2



ASSEMBLING

- 1) Make sure that Flat washer 13 is set in place before installing Drill chuck. (**Fig. 3**)
- 1) Turn Drill chuck clockwise until it sits on the end of the threaded portion of Spindle. (**Fig. 4**)
- 2) See **Fig. 5**. 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 lever in Drill mode, the Speed change lever in 1st speed, and F/R change lever in Forward 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 chuck screw, apply threadlocker to threaded portion.

Fig. 3

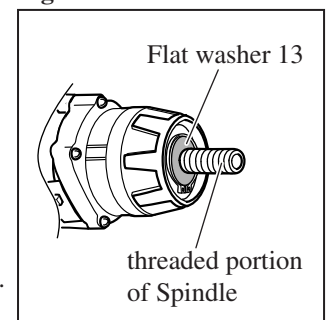


Fig. 4

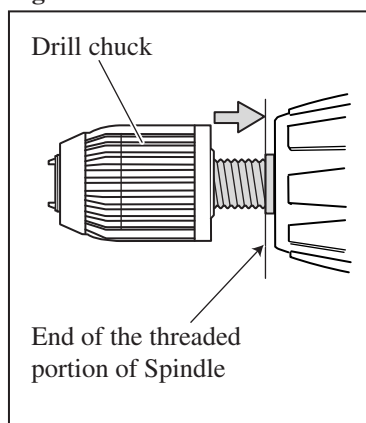
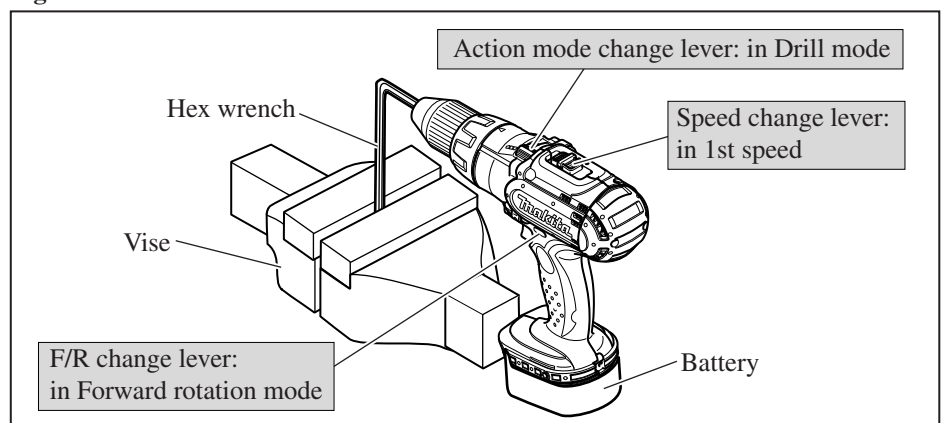


Fig. 5



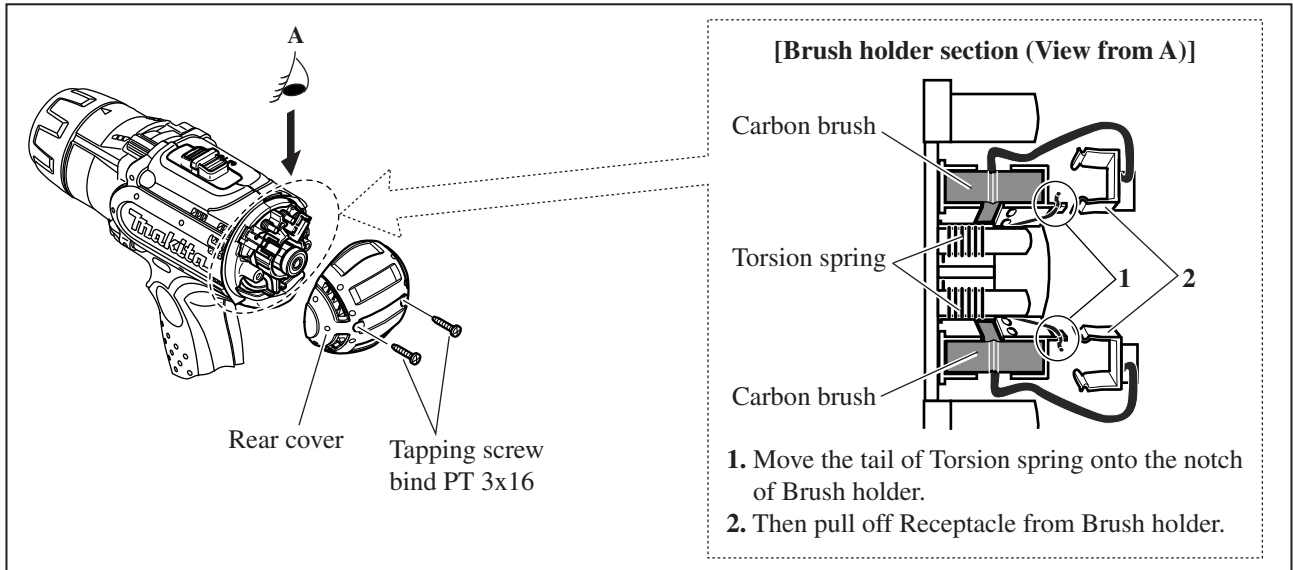
► Repair

[3] -2. Gear Assembly and Motor Section

DISASSEMBLING

1) Remove Rear cover and take off Carbon brush from Brush holder complete. (Fig. 6)

Fig. 6



- 2) Unscrew four PT4x20 Tapping screws to disconnect Gear assembly from Housing. Then by removing eight PT3x16 Tapping screws, separate Housing R from Housing L. (Fig. 7)
- 3) Pull off Heat sink from Yoke unit of the Motor section. Then remove the assembly of the Gear section and the Motor section from housing L. (Fig. 8)
- 3) Remove Brush holder complete from Armature, then separate the Motor section from the Gear section. (Fig. 9)
- 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. 10)

Fig. 7

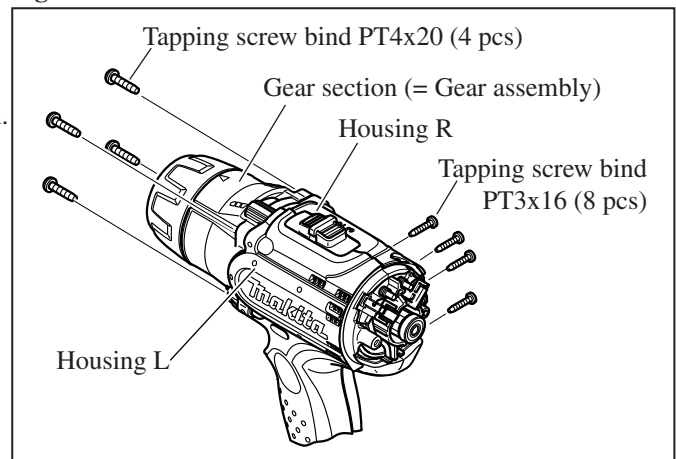


Fig. 8

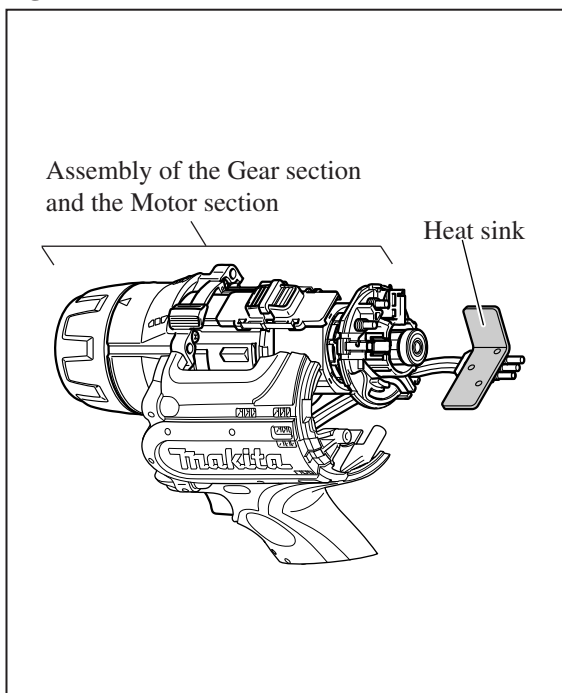


Fig. 9

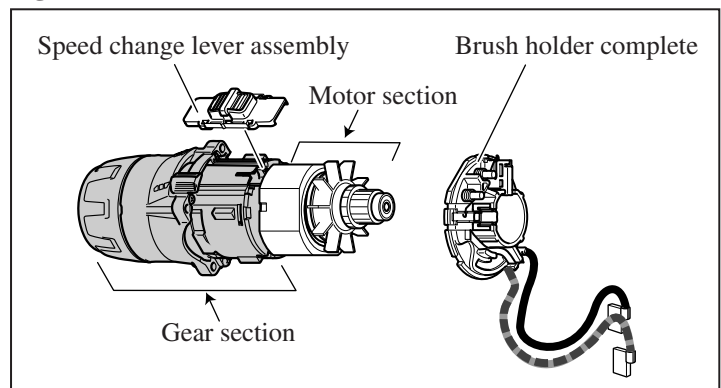
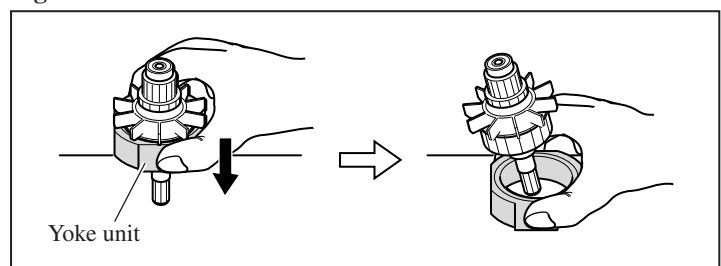


Fig. 10



► 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

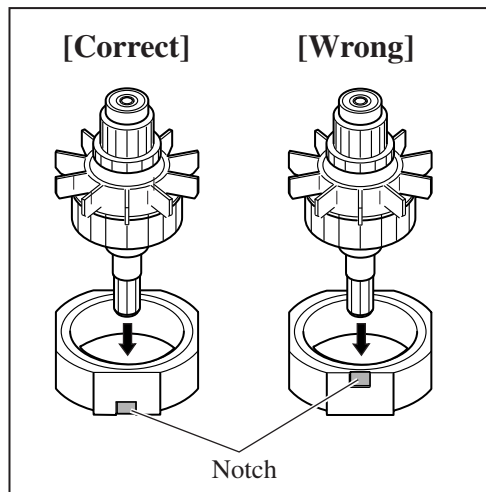
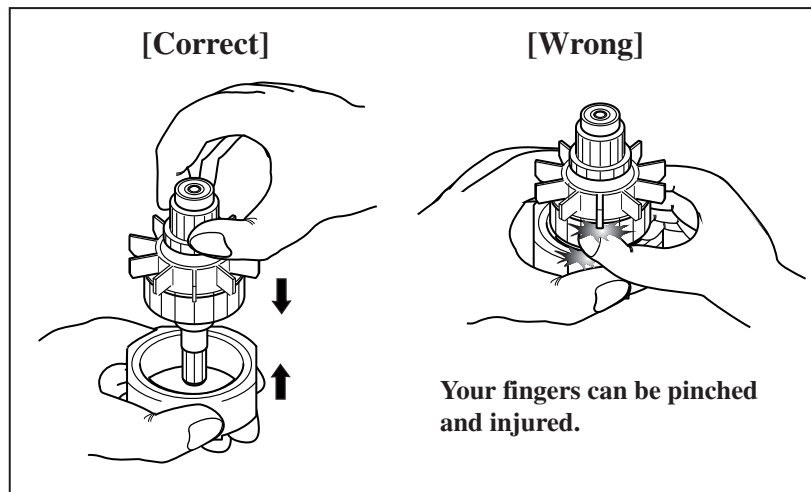


Fig. 10



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 Leaf springs and two Compression springs are set in place on Speed change lever as illustrated in **Fig. 12**.

Fig. 11

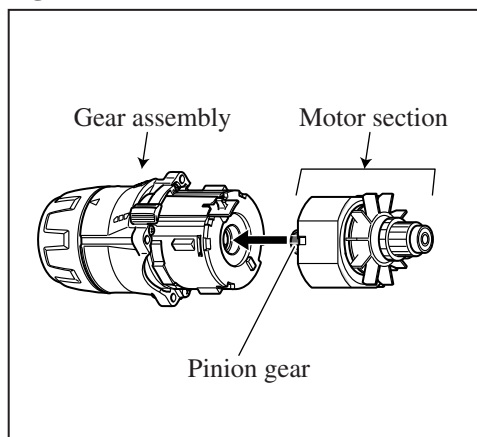
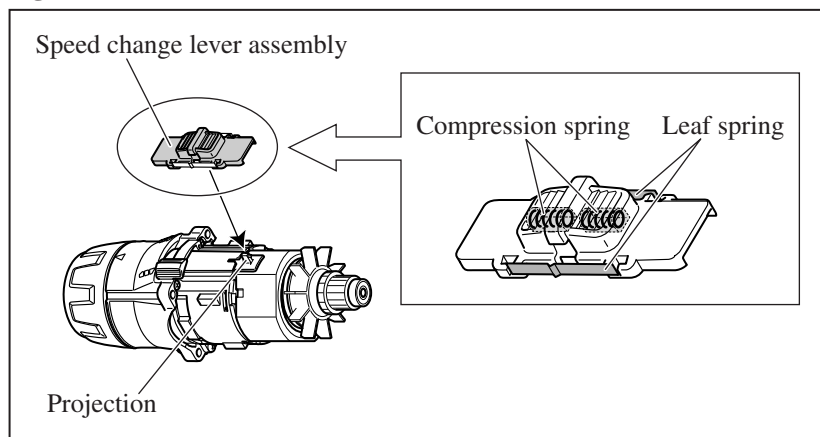
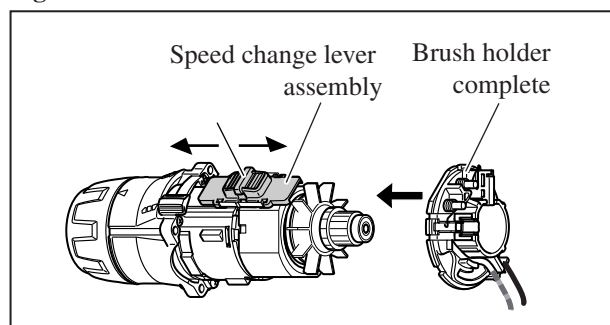


Fig. 12



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. 13



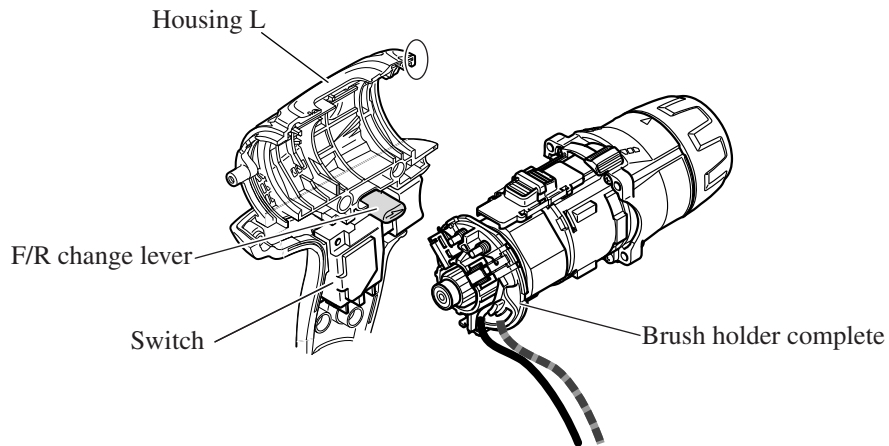
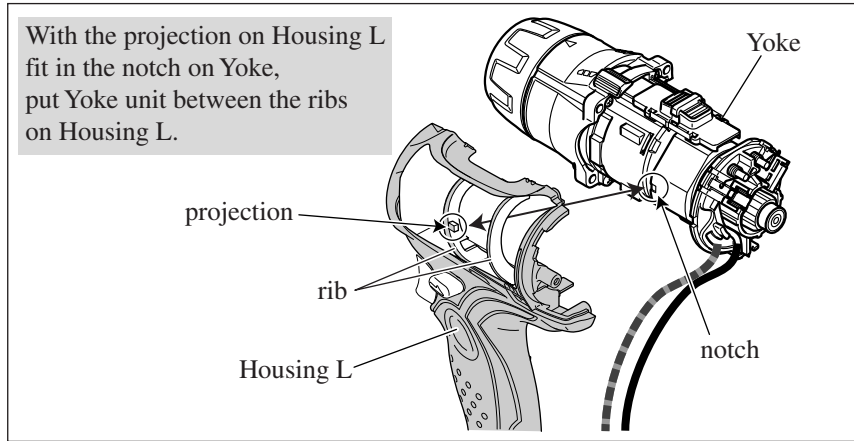
► **Repair**

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

ASSEMBLING

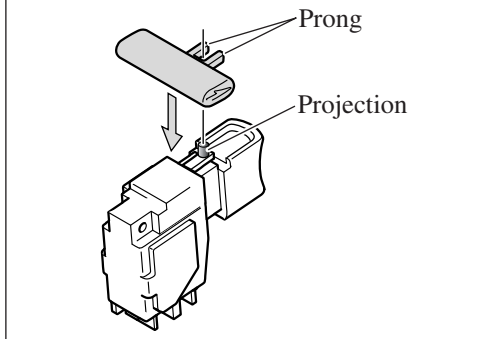
5) Assemble the unit of the Gear section and the Motor section as illustrated in **Fig. 14**.

Fig. 14



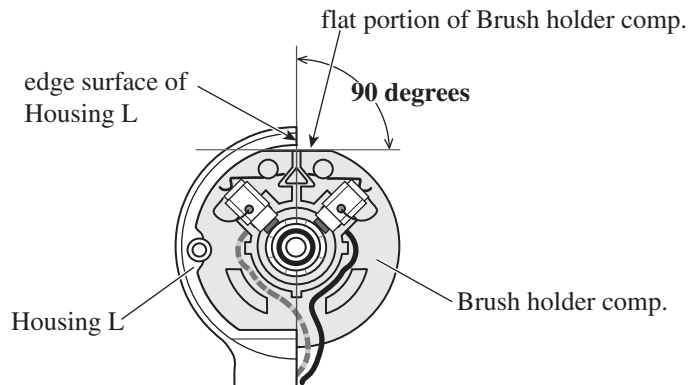
Assembling F/R change lever to Switch

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.



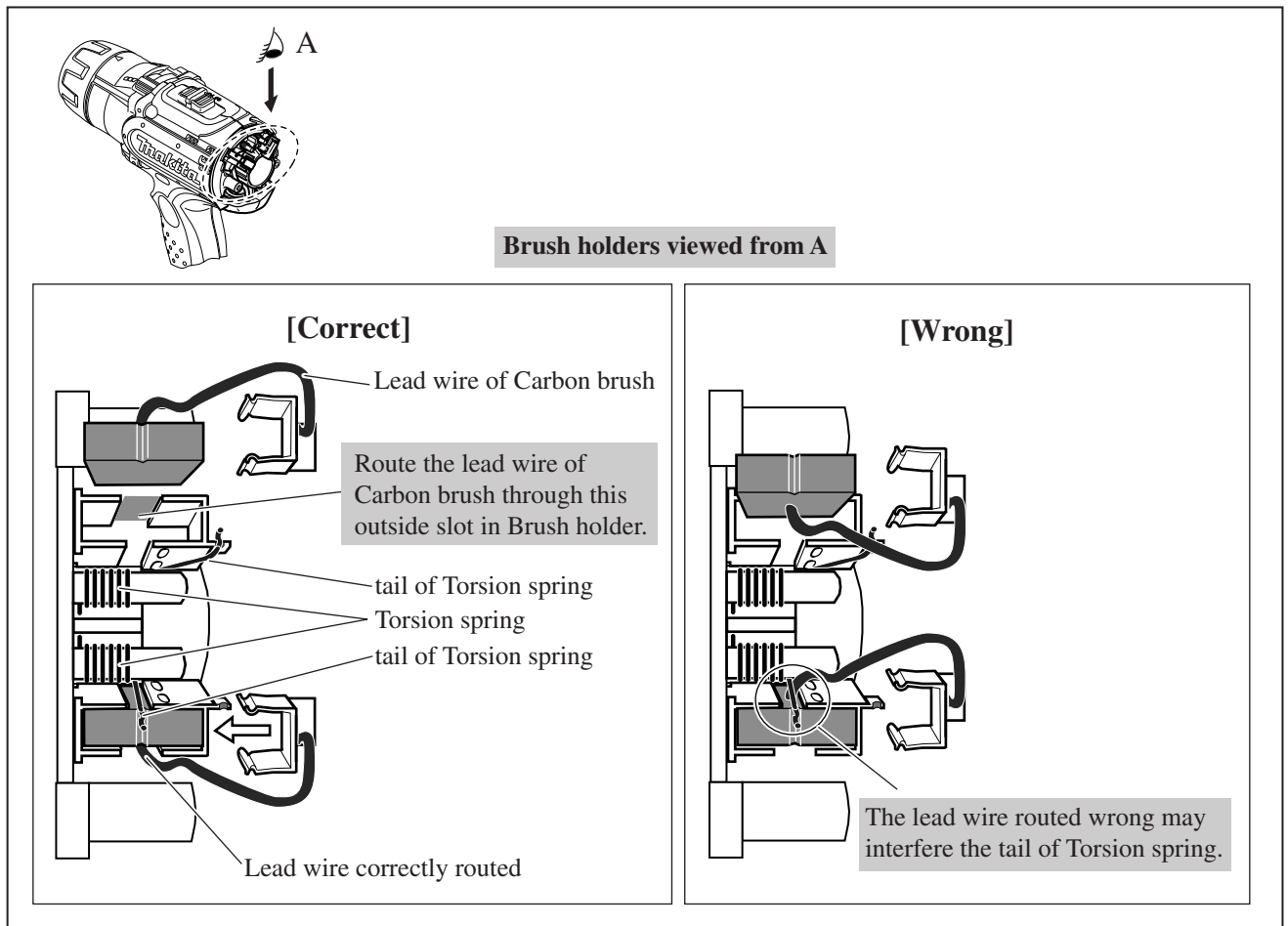
► Repair

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

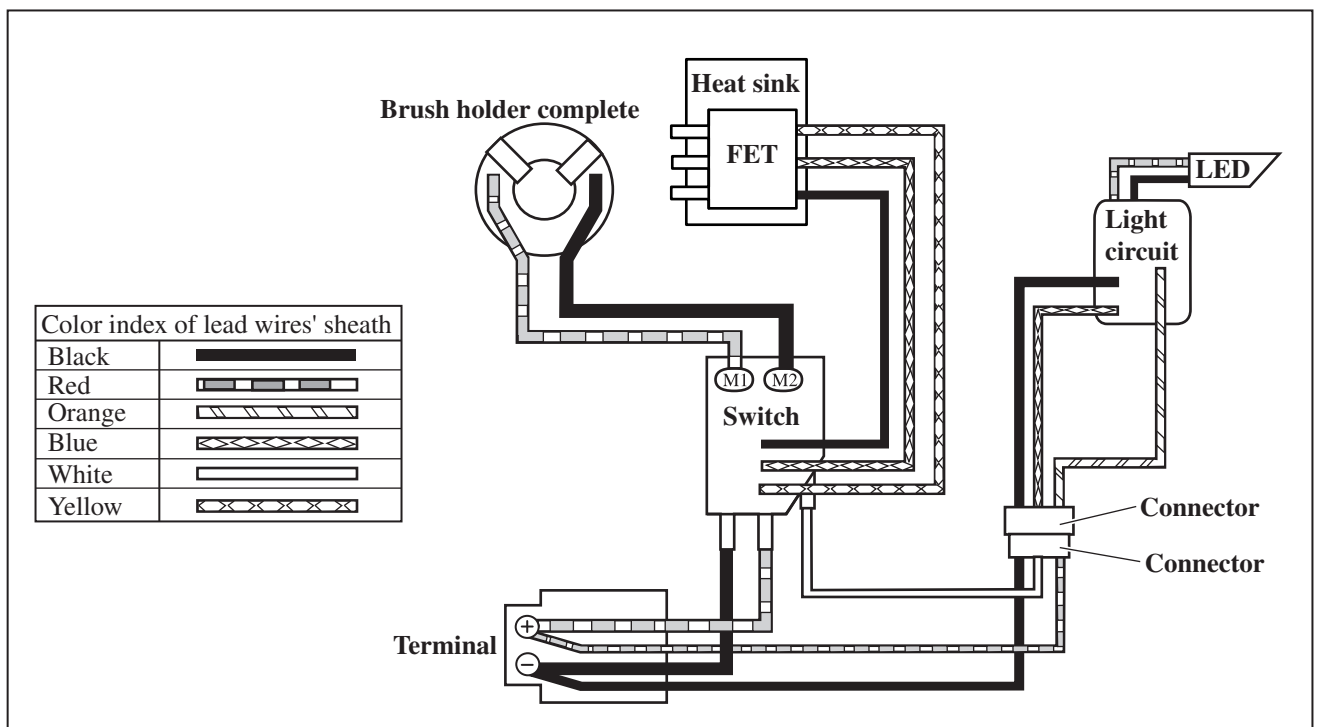
ASSEMBLING

- 6) Assemble Housing R to Housing L. (Fig. 7)
- 7) Install Carbon brush. (Fig. 15)
- 8) Mount Rear cover.

Fig. 15

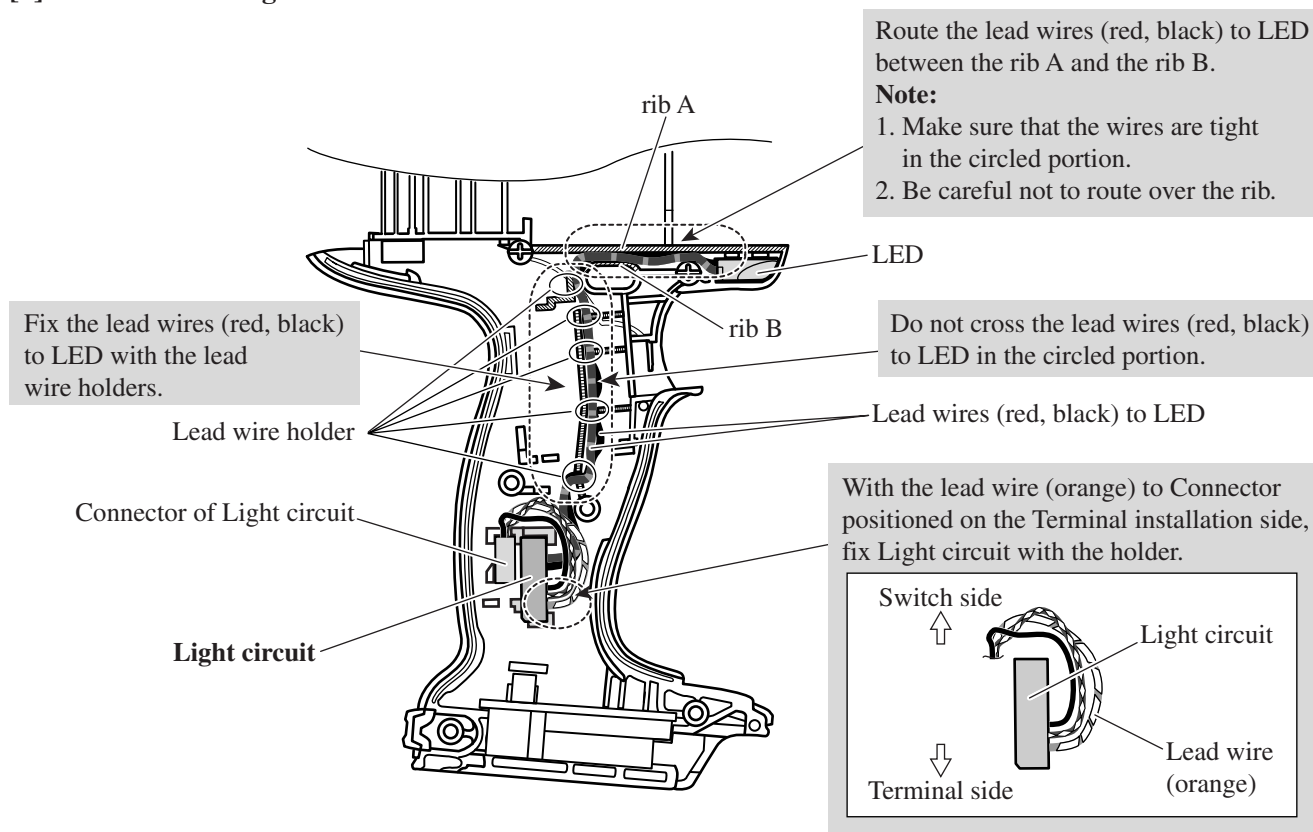


► Circuit diagram



► Wiring diagram

[1] Lead Wires of Light Circuit



[2] Lead Wires of Switch, Brush Holder Complete and FET

