

**Models No.** ▶ BTS130

**Description** ▶ Cordless Oil-Impulse Driver

## CONCEPT AND MAIN APPLICATIONS

Model BTS130 has been developed as an impact driver with the impact mechanism using oil unit with the design concept of "operation with low noise, yet still with high operation efficiency".

Its brief features and benefits are;

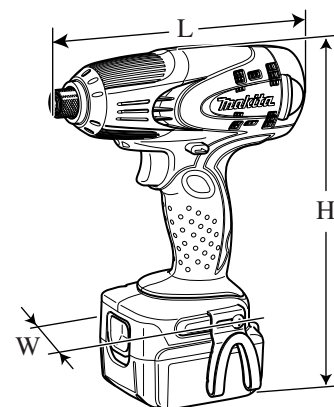
\*Incredibly low noise operation thanks to the impact mechanism using oil unit instead of anvil and hammer

\*With the cooling system for oil unit, capable of long continuous operation

This new product is available in the following variation.

(Use this sentence for cordless tools.)

Model No.	Battery		Charger
	type	quantity	
BTS130SFE	BL1430 (Li-ion 3.0Ah)	2	DC18SC



Dimensions: mm (")	
Length (L)	183 (7-1/4)
Width (W)	79 (3-1/8)
Height (H)	240 (9-1/2)

## ► Specification

Battery	Voltage: V	14.4
	Capacity: Ah	3.0
	Cell	Li-ion
Max output (W)		200
Driving shank		6.35mm (1/4") Hex
Capacities	Machine screw	M4 - M8 (5/32 - 5/16")
	Standard bolt	M6 - M10 (1/4 - 3/8")
	High tensile bolt	M6 - M8 (1/4 - 5/16")
	Coarse thread screw	22 - 125mm (7/8 - 4-7/8")
Impacts per min.: min.-1=ipm		0 - 1,600
No load speed: min.-1=rpm		0 - 2,400
Max. fastening torque: N.m (in.lbs)		30 (266)
Electric Brake		Yes
Variable speed (electric)		Yes
Reversing switch		Yes
Net weight*: kg (lbs)		1.7 (3.7)

\*Includes battery BL1430

## ► Standard equipment

Belt clip ..... 1 pc

Plastic carrying case ..... 1 pc

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

## ► Optional accessories

Assorted Phillips bits

Socket bits

Connecting bit 6.35-48

Drill chuck

Stopper pole assembly

Li-ion battery BL1430

Charger DC14SA (low voltage countries)

Charger DC14SC (high voltage countries)

Charger DC18SA (low voltage countries)

Charger DC18SC (high voltage countries)

Charger DC24SA (low voltage countries)

Charger DC24SC (high voltage countries)

## ► Repair

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

### [1] NECESSARY REPAIRING TOOLS

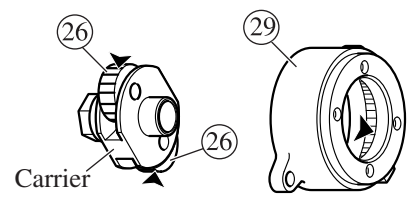
Code No.	Description	Use for
1R028	Bearing setting pipe 20-12.2	Mounting Ball bearing
1R045	Gear extractor, large	Removing Armature
1R165	Ring spring setting tool B	Holding Oil unit complete when assembling Ball bearing to it
1R269	Bearing extractor	Removing Ball bearing
1R280	Round bar for arbor 6-50	Removing Ball bearing from Oil unit complete (for modular use with No.1R269)
1R291	Retaining ring S and R pliers	Removing Ring spring 10 from the Bit holder section, and removing Retaining ring S-14 that secures Fan 46 to Armature

### [2] LUBRICATION

Apply Makita grease N. No.2 to the following portions designated with the black triangle to protect parts and product from unusual abrasion.

Item No.	Description	Portion to lubricate
26	Spur gear 22 (2pcs)	Teeth portion
29	Internal gear case	Teeth portion which engages with spur gear 22
Put approx. 3.0g in total.		

**Fig. 1**



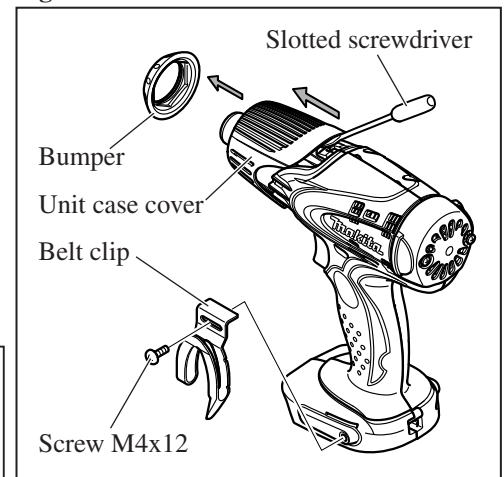
### [3] DISASSEMBLY/ASSEMBLY

#### [3] -1. Bit Holder Section and Oil Unit Complete

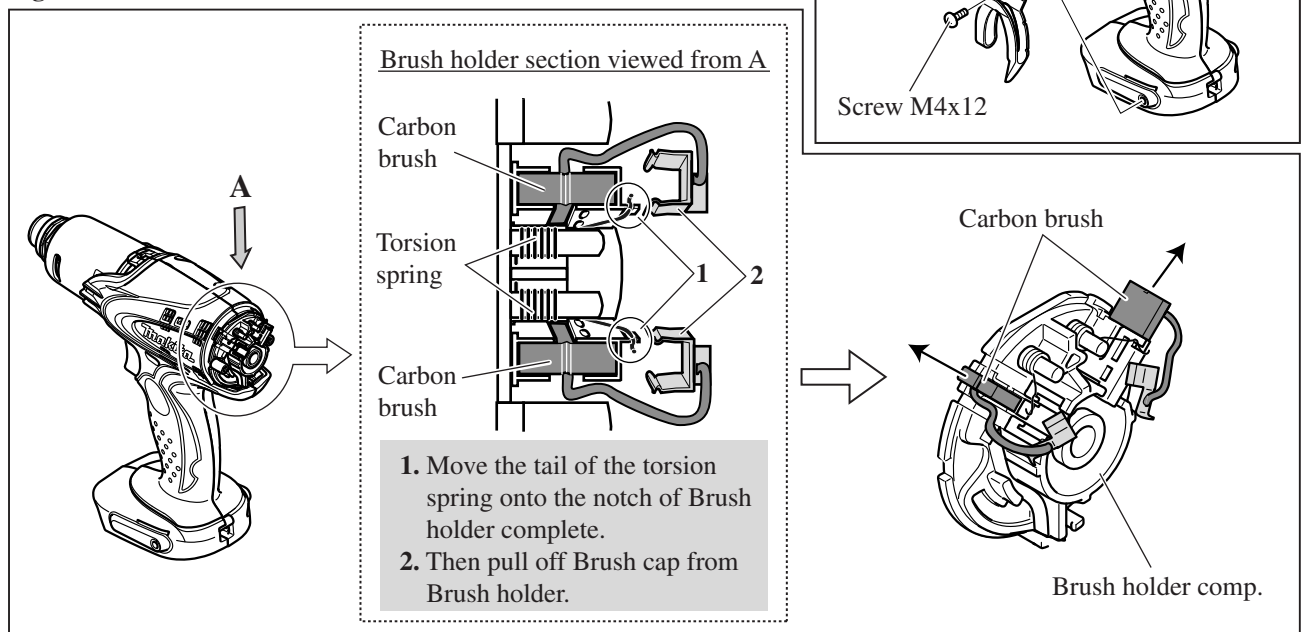
##### DISASSEMBLING

- 1) Remove Bumper, Unit case cover and Belt clip. (Fig. 2)
- 2) Remove Rear cover by unscrewing two PT3x16 Tapping screws. Carbon brushes pressed by the torsion spring of Brush holder complete will now be visible. Carbon brush can be lifted off the commutator by moving the tail of the torsion spring from the brush onto the notch in Brush holder. Then pull off Receptacle from Brush holder. Now Carbon brush can be removed from Brush holder by pulling toward the directions designated with the arrows. (Fig. 3)

**Fig. 2**



**Fig. 3**



► **Repair**

**[3] DISASSEMBLY/ASSEMBLY**

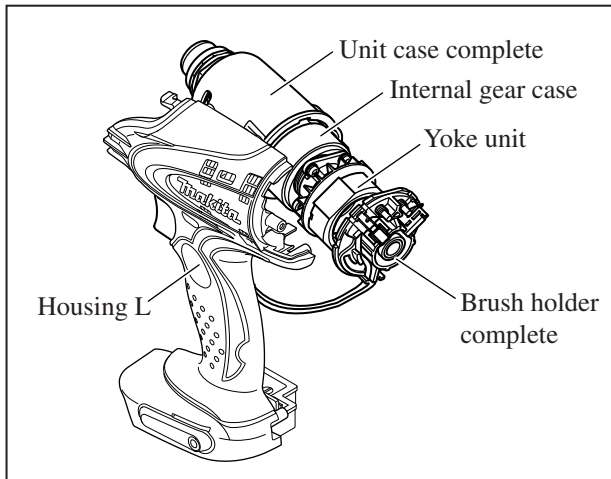
**[3] -1. Bit Holder Section and Oil Unit Complete**

**DISASSEMBLING**

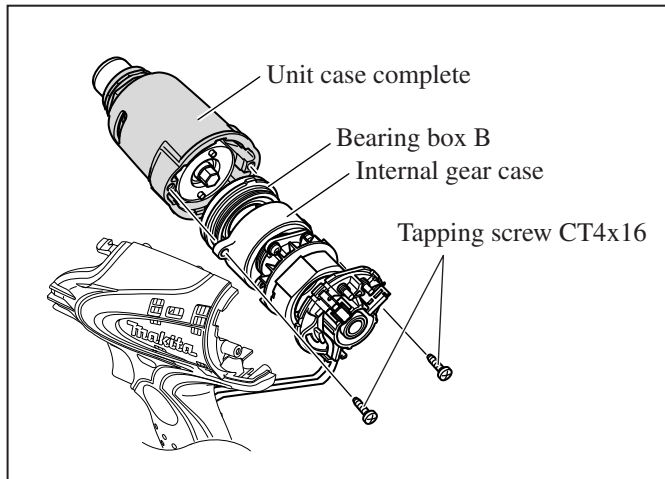
3) Separate Housing R from Housing L by unscrewing nine PT3x16 tapping screws. Then take out the assembly of the inner parts (Unit case complete, Internal gear case, Yoke unit, Brush holder complete, etc). (**Fig. 4**)

4) Separate Unit case complete from Internal gear case by unscrewing two CT4x16 Tapping screws. (**Fig. 5**)

**Fig. 4**



**Fig. 5**

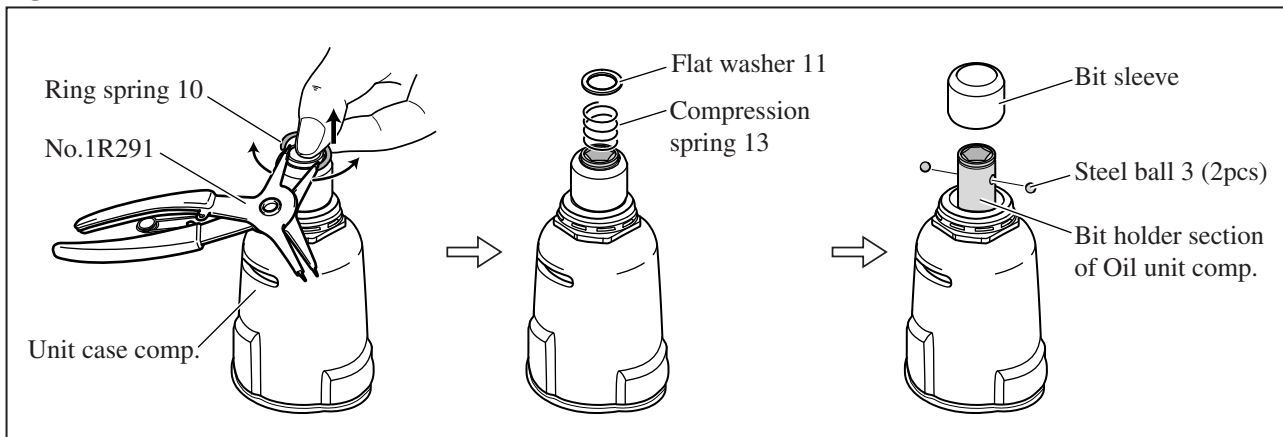


5) See **Fig. 6**. Remove Ring spring 10 from Bit holder by first expanding with Retaining ring S and R pliers (No.1R291) while pressing down with thumb, then by lifting up the side opposite to the expanded side with index finger.

[**Note:** Be sure to push down the ring with thumb or it will fly away.]

You can now remove Flat washer 11, Compression spring 13, Bit sleeve and Steel ball 3.

**Fig. 6**

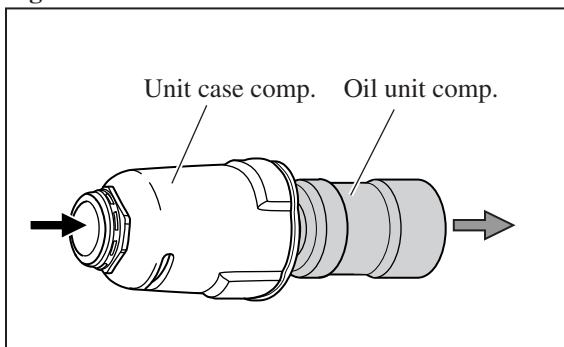


6) Remove Oil unit complete from Unit case complete by pushing the end surface of Oil unit complete. (**Fig. 7**)

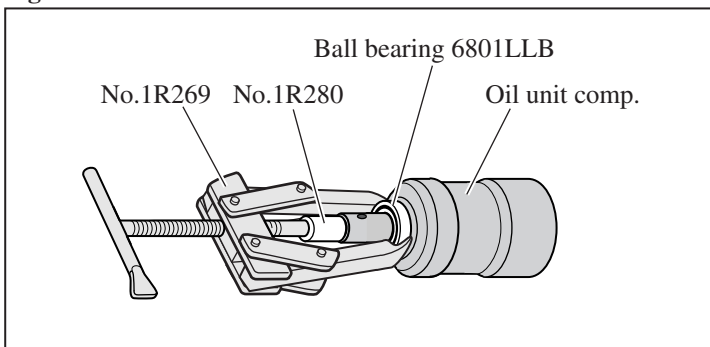
7) Ball bearing 6801LLB can be removed from Oil unit complete using Round bar for arbor 6-50 (No.1R280) and Bearing extractor (No.1R269) as illustrated in **Fig. 8**.

**Important: Do not disassemble Oil unit complete.**

**Fig. 7**



**Fig. 8**



## ► Repair

### [3] DISASSEMBLY/ASSEMBLY

#### [3] -1. Bit Holder Section and Oil Unit Complete

##### ASSEMBLING

Do the reverse of the disassembling steps.

**How to Assemble Ball Bearing 6801LLB to Oil Unit Complete (Fig. 9)**

- 1) Put Oil unit complete on Ring spring setting tool B (No.1R165).
- 2) Put Bearing setting pipe 20-12.2 (No.1R028) on Ball bearing 6801LLB.
- 3) Press-fit Ball bearing 6801LLB on Oil unit complete by pressing down No.1R028 with arbor press.

#### [3] -2. Bearing Box B, Internal Gear Case and Unit Case Complete

##### DISASSEMBLING

Bearing box can be separated from Internal gear case when removing Unit case complete with oil unit complete. (Fig. 5)

##### ASSEMBLING

- 1) See Fig. 10. With the projection on Bearing box B aligned with that on Internal gear case, fit the two sections together.
  - [Note 1. There are two projections on Bearing box B. Align with either one.]
  - Note 2. Before fitting, make sure that O ring 38 is mounted to Bearing box B. Then mount Lock washer and Wave washer 5 to Bearing box B.
- 2) With the projection on Unit case complete aligned with that of Internal gear case, fit the two sections together, and secure them with two CT4x16 Tapping screws. (Fig. 11)

Fig. 9

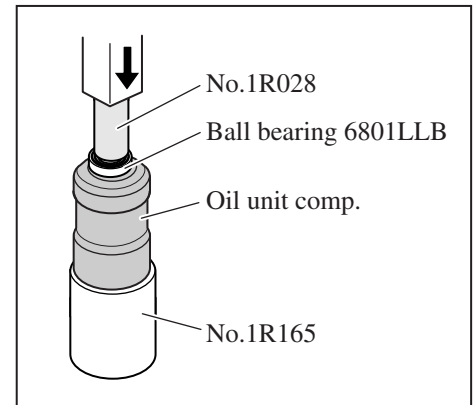


Fig. 10

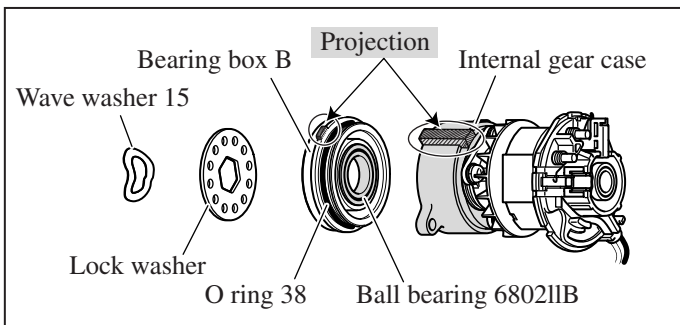
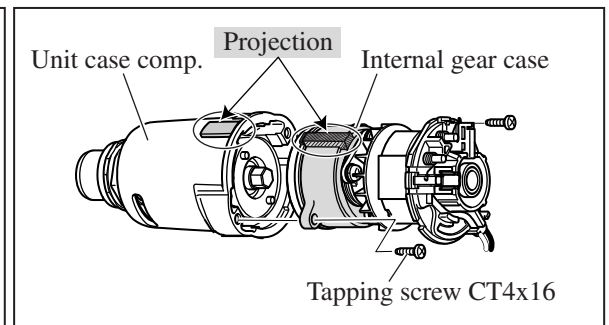


Fig. 11



#### [3] -3. Armature and Bearing Box A

##### DISASSEMBLING

- 1) Referring to the disassembling steps 1) to 3) of [3] -1. Bit Holder Section and oil unit Complete, take out the motor section and the mechanical section. (Fig. 2, 3, 4) Then remove Brush holder complete from Armature. (Fig. 12)
  - Note: You don't have to remove Carbon brushes. However, they must be lifted off the commutator when Brush holder complete is removed from Armature. Be sure to move the tail of the torsion spring from the brush onto the notch in Brush holder. (Fig. 3)
- 2) Remove the motor section from Bearing box A. Remove Retaining ring S-14 from the armature shaft, Wave washer 5. Armature can now be separated from Yoke unit by removing Fan 46. (Fig. 13)

Fig. 12

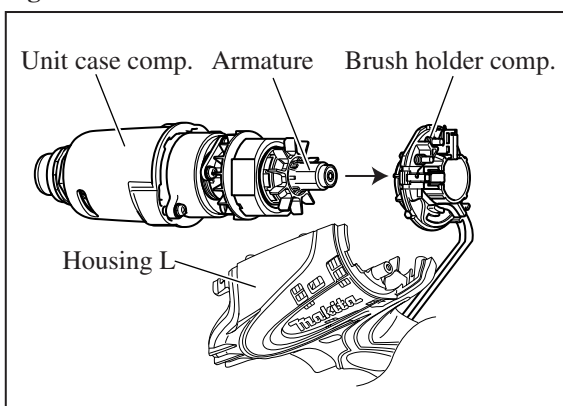
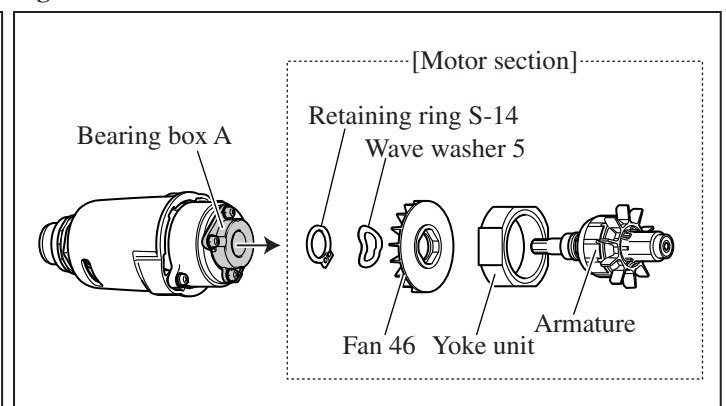


Fig. 13



## ► Repair

### [3] DISASSEMBLY/ASSEMBLY

#### [3] -3. Armature and Bearing Box A

##### DISASSEMBLING

If it is difficult to remove the motor section from Bearing box A by hand, take the following steps;

- ① Separate Unit case complete from internal gear case by removing two CT4x16 Tapping screws.  
Then remove Bearing box B and the Planet gear unit (the assembly of Carrier, Spur gear 22, Flat washer 12 and Pin 5) from Internal gear case. (Fig. 14)
- ② Using Gear Extractor, large (No.1R045), remove the motor section from the assembly of Bearing box A and Internal gear case. (Fig. 15)

Fig. 14

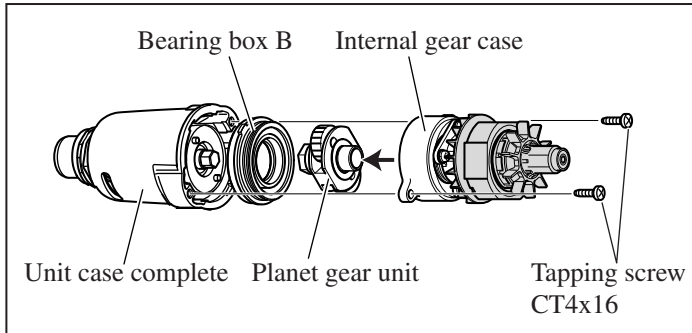
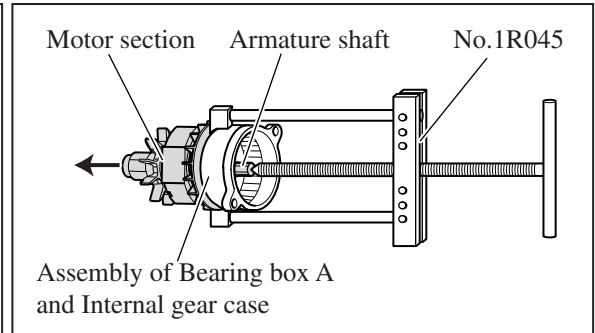


Fig. 15

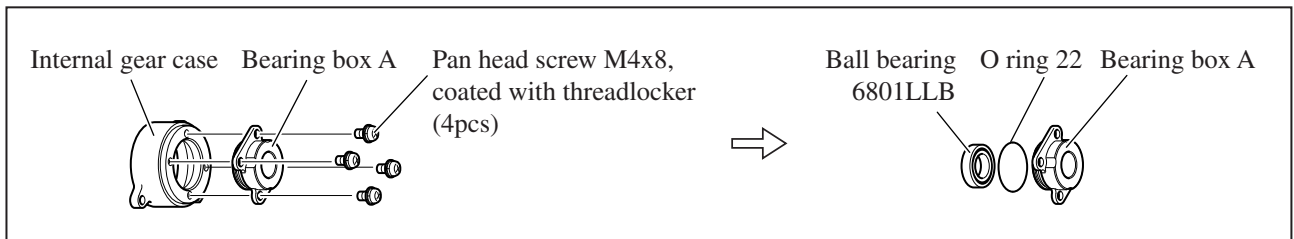


- 3) By removing four M4x8 Pan head screws, Bearing box A can be removed from Internal gear case.

[Note: It is recommended to use a cordless impact driver because the screws are coated with threadlocker.]

Ball bearing 6801LLB and O ring 22 can now be removed. (Fig. 16)

Fig. 16



##### ASSEMBLING

Do the reverse of the disassembling steps.

**Note 1.** When assembling Bearing box A to Internal gear case;

- Do not forget to fit O ring 22 on Bearing box A. (right in Fig. 16)
- Apply threadlocker to four M4x8 Pan head screws. (left in Fig. 16)

**Note 2.** When inserting Armature through Yoke unit;

- Place Yoke unit so that the notch in Yoke unit is positioned on the Fan installation side. (Fig. 17)
- Because Armature is pulled toward Yoke unit by strong magnetic force, be careful not to;
  1. damage the copper wires of Armature.
  2. have your finger pinched between Yoke unit and Armature.

**Note 3.** When assembling the motor section to Bearing box A;

Be sure to engage the gear of Armature shaft with the Planet gears (two 22 Spur gears) in Internal gear case. (Fig. 18)

Fig. 17

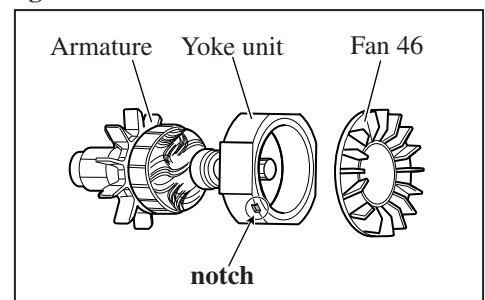
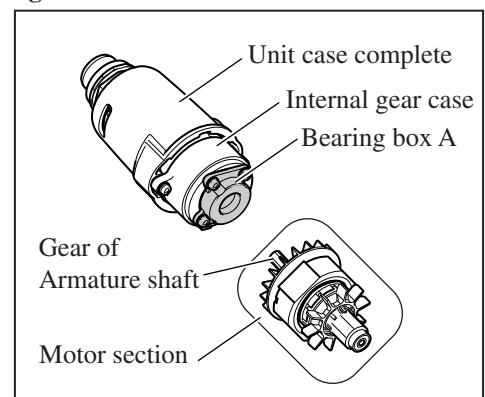


Fig. 18





► **Repair**

**[3] DISASSEMBLY/ASSEMBLY**

**[3] -3. Armature and Bearing Box A**

ASSEMBLING

If it is difficult to insert the motor section into Internal gear case by hand, take the following steps;

- ① From Internal gear case, remove Unit case complete, Wave washer 5, Lock washer and Bearing box B. (Fig. 11, 10)
- ② Then remove Planet gear unit (Carrier, Spur gear 22, Pin 5 and Flat washer 12) from Internal gear case. (Fig. 19)
- ③ Using arbor press, press-fit the motor section onto Bearing box A (Fig. 20)
- ④ Assemble the Planet gear unit to Internal gear case while engaging with the gear of Armature shaft. (Fig. 21)

Fig. 19

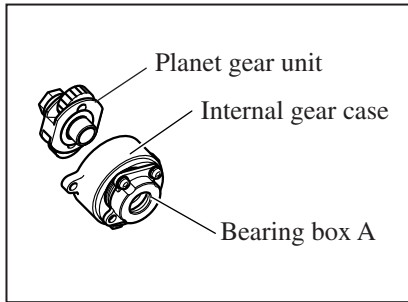


Fig. 20

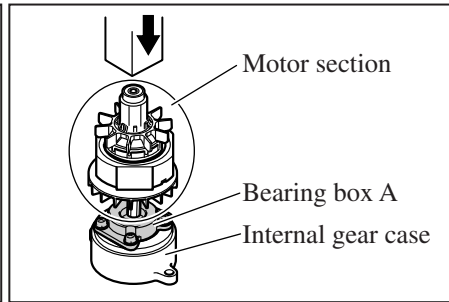
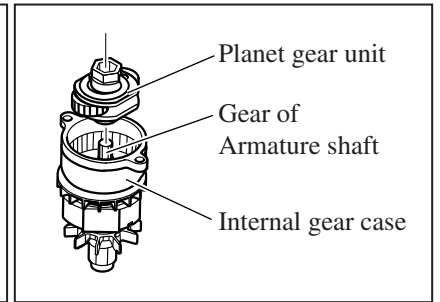


Fig. 21

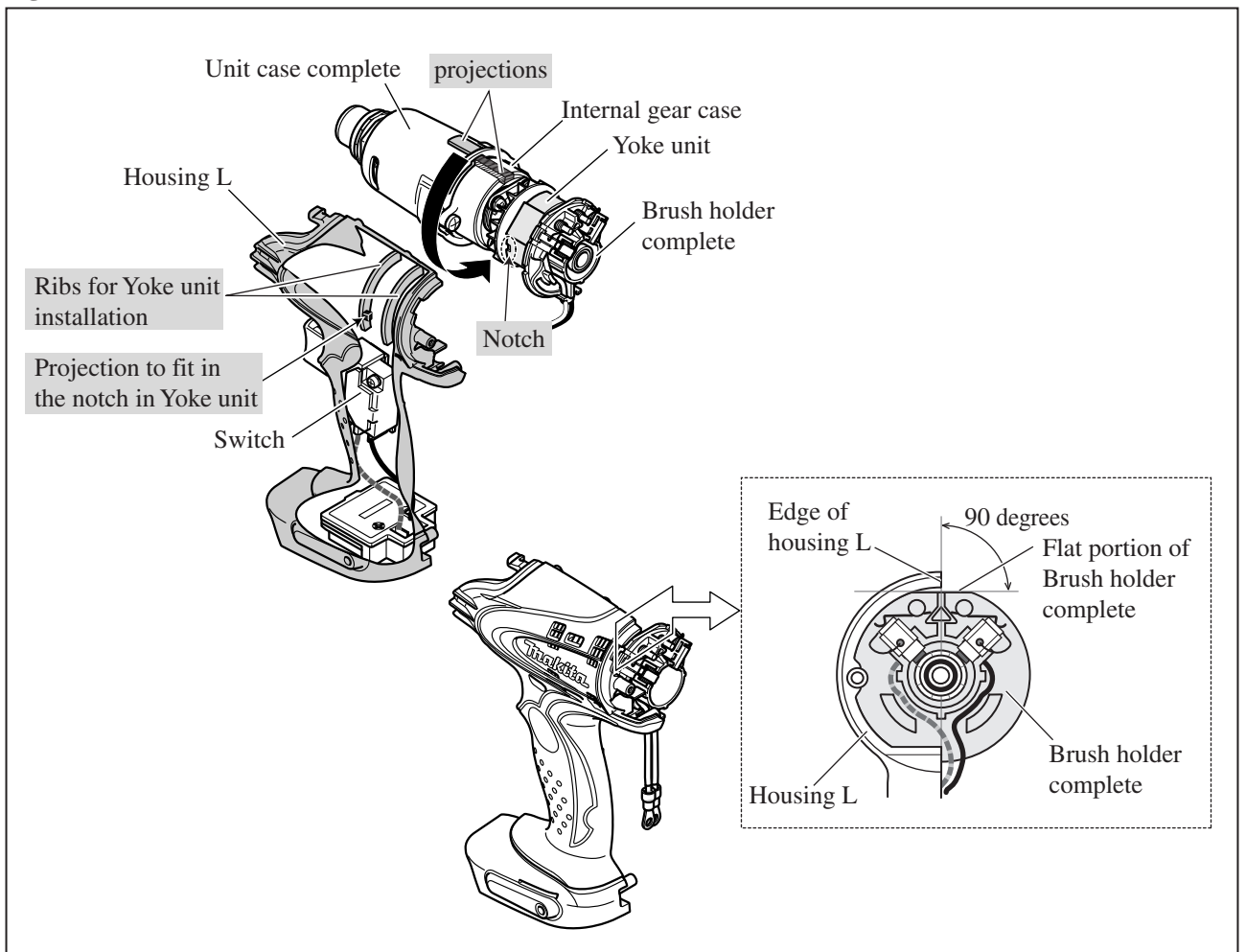


**[3] -4. Fitting the Assembled Inner Parts Onto Housing L**





ASSEMBLING

- 1) See **top-right in Fig. 22**. Place the assembled inner parts so that projections of Unit case complete and Internal gear case are positioned on the Switch to switch. Then fitting the notch in Yoke unit in the projection on housing L, put Yoke unit between the ribs on Housing L.
- 2) Fit Brush holder complete onto Housing L so that the flat portion of Brush holder is at right angle to the edge of Housing L. (**bottom-left in Fig. 22**)

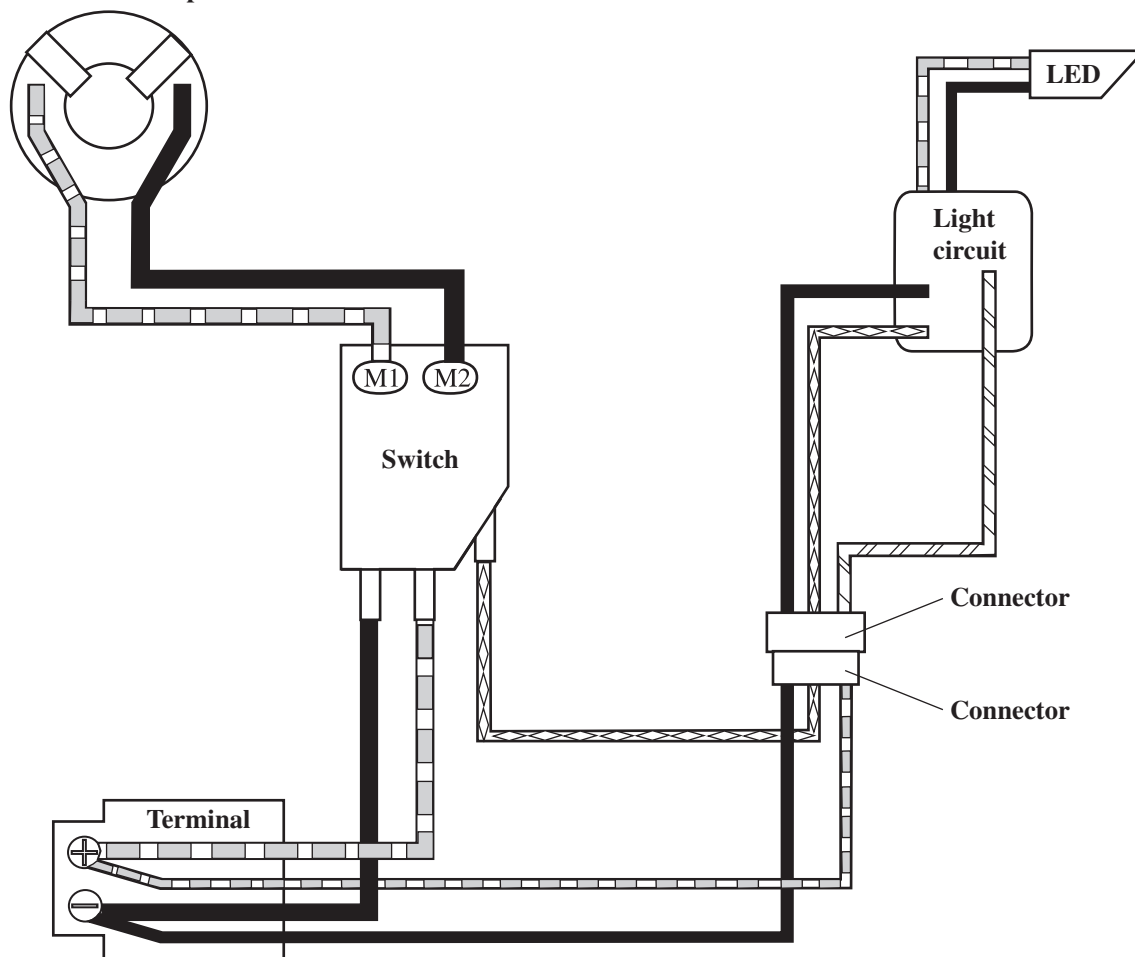
Fig. 22



► **Circuit diagram**

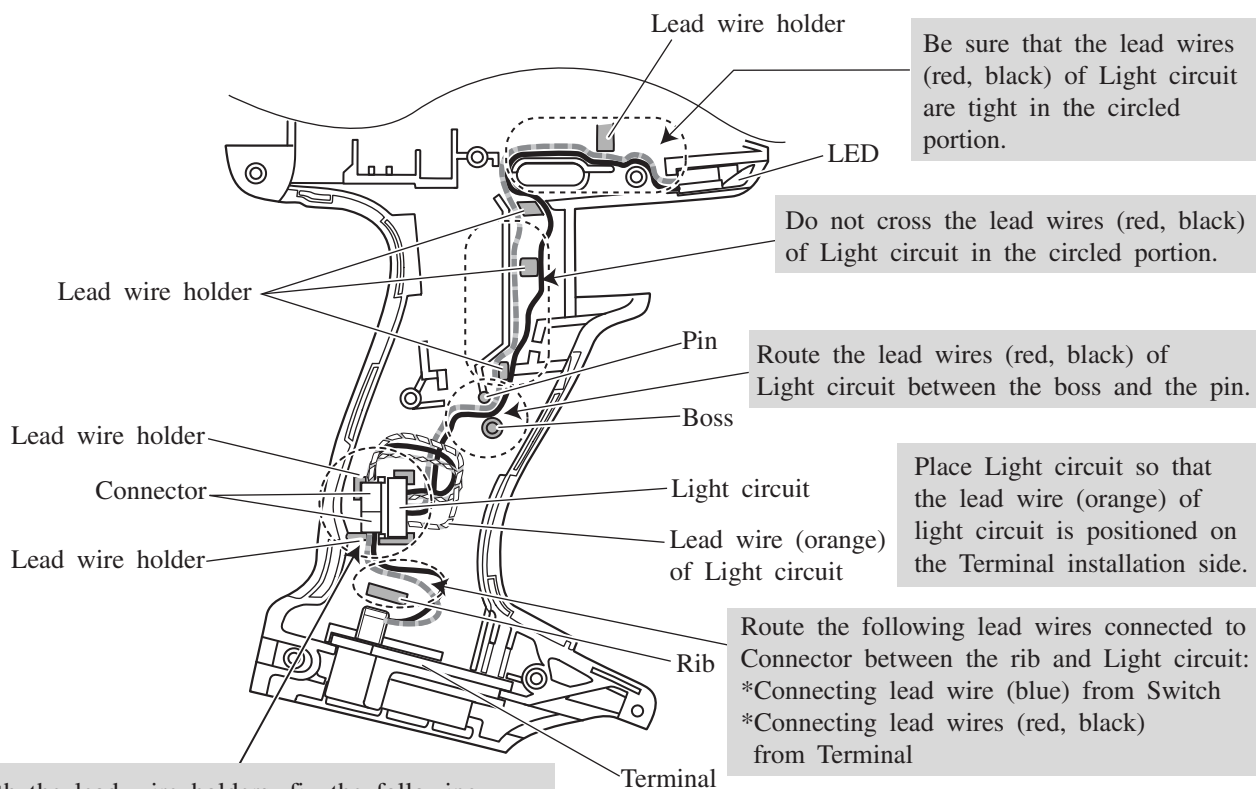
Color index of lead wires' sheath	
Black	
Red	
Orange	
Blue	

**Brush holder complete**



► **Wiring diagram**

**Before Mounting Switch and Brush Holder Complete**



With the lead wire holders, fix the following six lead wires connected to Connector:

- \*Lead wires (black, blue, orange) of Light circuit
- \*Switch lead wire (blue)
- \*Connecting lead wires (red, black) from Terminal

**After Mounting Switch and Brush Holder Complete**

