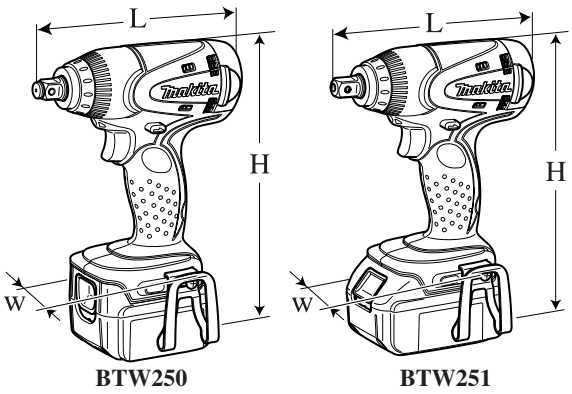
**Models No.** ► BTW250, BTW251

**Description** ► Cordless Impact Wrench



BTW250 BTW251

# CONCEPT AND MAIN APPLICATIONS

Models BTW250 and BTW251 are compact and lightweight cordless impact wrenches, featuring maximum fastening torque of 230N.m (170ft.lbs).
BTW250 is powered by Model BL1430 14.4V Li-ion battery, and BTW251 by Model BL1830 18V Li-ion battery.

These products are available in the following variations:

**BTW250**

| Model No. | Charger | Battery | | Plastic carrying case |
|---|---|---|---|---|
| | | type | quantity | |
| BTW250Z | No | No | No | No |
| BTW250RFE | DC18RA | BL1430 | 2 | Yes |

| Dimensions: mm (") | |
|---|---|
| Model | **BTW250, BTW251** |
| Length (L) | 165 (6-1/2) |
| Width (W) | 79 (3-1/8) |
| Height (H) | 234 (9-1/4) |

**BTW251**

| Model No. | Charger | Battery | | Plastic carrying case | Offered to |
|---|---|---|---|---|---|
| | | type | quantity | | |
| BTW251Z | No | No | No | No | All countries |
| BTW251 | DC18RA | BL1830 | 2 | Yes | USA, Canada, Mexico, Panama |
| BTW251RFE | | | | | All countries other than the four listed above |

The items listed below in "Standard Equipment" also come with the above items.

## ► Specification

| Specification \ Model | | BTW250 | BTW251 |
|---|---|---|---|
| Battery | Voltage: V | 14.4 | 18 |
| | Capacity: Ah | 3.0 | |
| | Cell | Li-ion | |
| Max output (W) | | 235 | 280 |
| Driving shank | | 12.7mm (1/2") Square | |
| Impacts per min.: min.-1=ipm | | 0 - 3,200 | |
| No load speed: min.-1=rpm | | 0 - 2,200 | 0 - 2,100 |
| Max. fastening torque*: N.m (in.lbs) | | 230 (2,040) | |
| Net weight**: kg (lbs) | | 1.6 (3.5) | 1.7 (3.7) |

*catalog value (torque at 6 seconds after seating) **with battery

## ► Standard equipment

Belt clip ..... 1
Plastic carrying case ..... 1

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

## ► Optional accessories

Sockets
Extension bar
Universal joint
Bit adapter assembly
Battery BL1430 (for BTW250 only)
Battery BL1830 (for BTW251 only)
Fast charger DC18RA
Charger DC24SA
Charger DC24SC (for BTW250 only)

# ► Repair

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

## [1] NECESSARY REPAIRING TOOLS

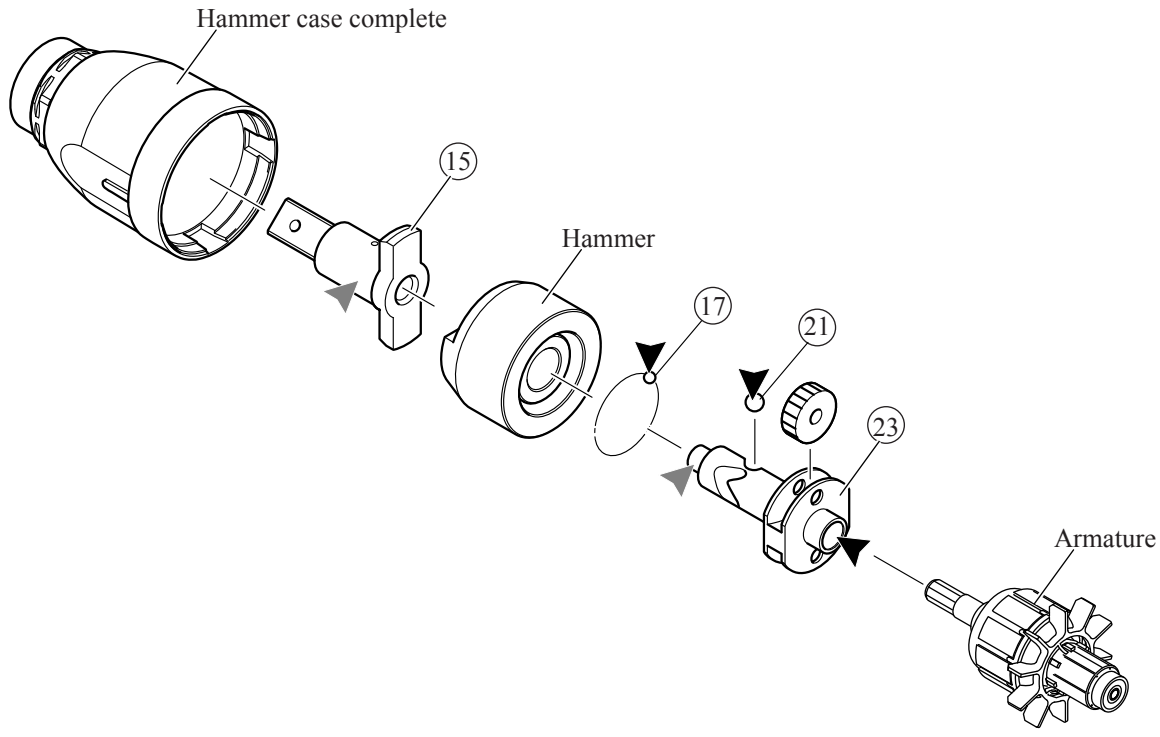
| Code No. | Description | Use for |
|---|---|---|
| 1R045 | Gear extractor (Large) | Disassembling Hammering mechanism |
| 1R346 | Center attachment for 1R045 | |
| 1R288 | Screwdriver magnetizer | Magnetizing screwdriver for removing Steel balls |
| 1R041 | Vise plate (2 pcs) | Removing Hammer case complete |
| 1R223 | Torque wrench shaft | |
| 1R224 | Ratchet head | |
| 134848-9 | Socket 32-50 (2 pcs) | |

## [2] LUBRICATION

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

| Item No. | Description | Portion to lubricate | Grease |
|---|---|---|---|
| ⑮ | Anvil | Surface that contacts Hammer case complete | ▼ |
| ⑰ | Steel ball 3.5 (24 pcs) | Whole surface | ▼ |
| ㉑ | Steel ball 5.6 (2 pcs) | Whole surface | ▼ |
| ㉓ | Spindle | Put 2g of Makita grease N. No.2 in the hole. | ▼ |
| | | Surface that contacts Anvil | ▼ |

**Fig. 1**



# Repair

## [3] DISASSEMBLY/ASSEMBLY

### [3] -1. Disassembling/Assembling Hammering Mechanism

DISASSEMBLING

1) Remove Belt clip by unscrewing Screw M4x12. Remove Bumper and Hammer case cover by hand, Remove Rear cover by unscrewing two PT3x16 Tapping screws. (**Fig. 2**)

2) Disconnect Carbon brush from Commutator as illustrated in **Fig. 3**.

**Fig. 2**

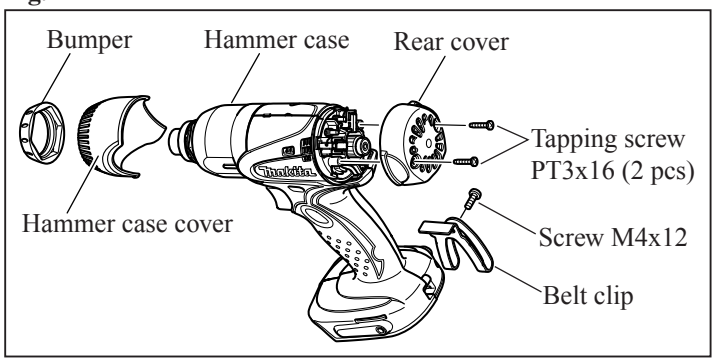
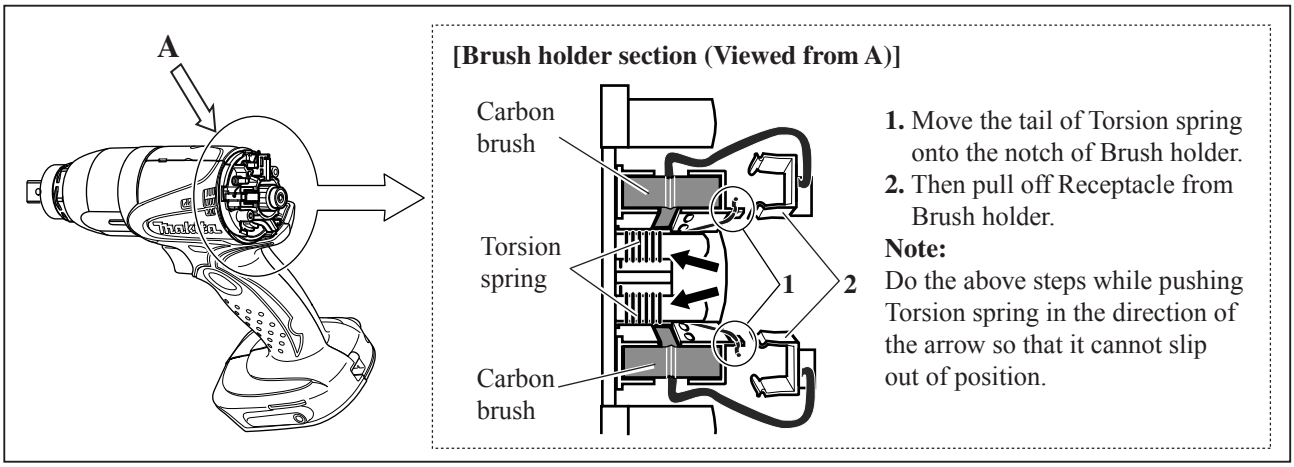



**Fig. 3**

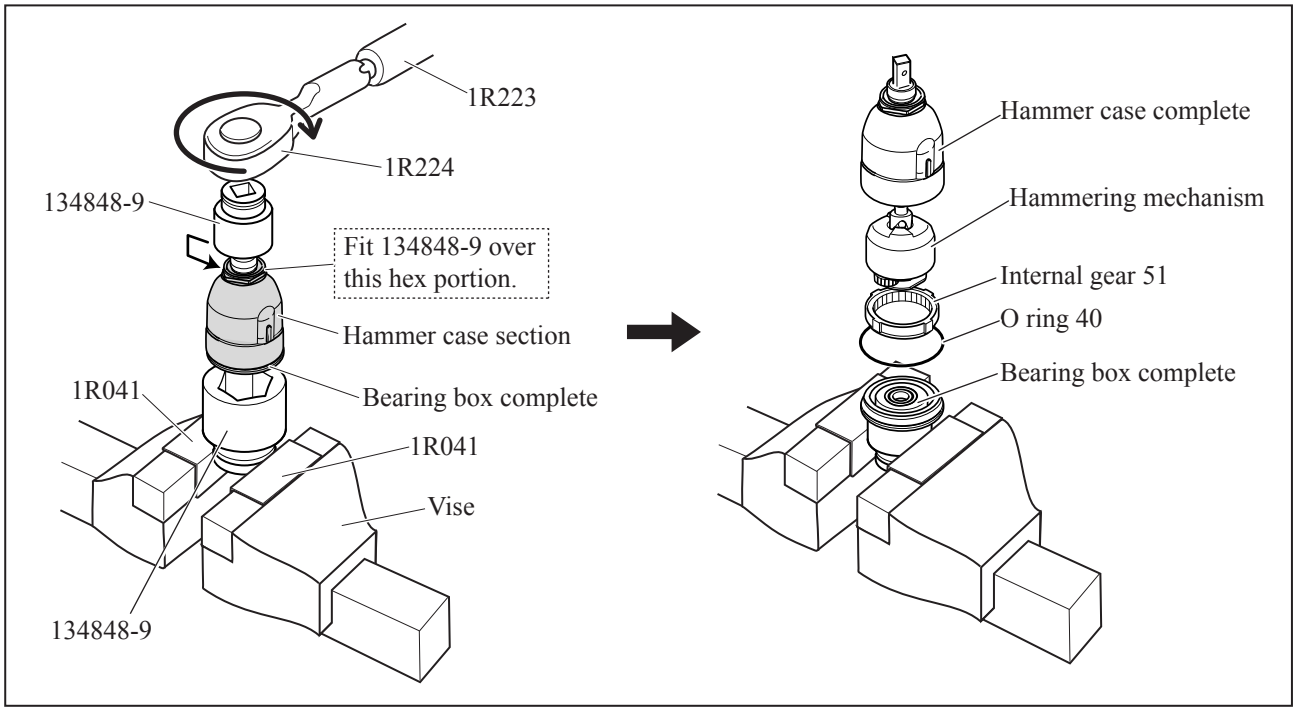



3) Separate Housing (R) from Housing (L) by removing eight PT3x16 Tapping screws.

4) Remove the assembly of Hammer case section and Motor section from Housing (L), and separate Hammer case section from Motor section.

5) See **Fig. 4**. Attach 1R041 (2 pcs) to vise. Fix 134848-9 in vise securely. Put Hammer case section on 134848-9 while fitting the hexagonal portion of Bearing box complete in 134848-9. Fit another 134848-9 over the hexagonal portion of Hammer case complete. By turning 134848-9 clockwise with 1R223 and 1R224, the Hammer case section can be disassembled as illustrated to right.

**Fig. 4**



# Repair

## [3] -1. Disassembling/Assembling Hammering Mechanism (cont.)

6) Install 1R346 on 1R045. (**Fig. 5**)
7) Set 1R045 on Hammering mechanism (= assembled unit of Hammer, Spindle, Spur gears, Steel balls, etc.) as illustrated in **Fig. 6**.
Then turn the handle of 1R045 clockwise to lower Hammer to the full.
8) Align the notch in Hammer with the top of Cam groove on Spindle.
Then take two 5.6 Steel balls out of spindle using tweezers or a slotted screwdriver magnetized using 1R288. (**Fig. 7**)

**Fig. 5**

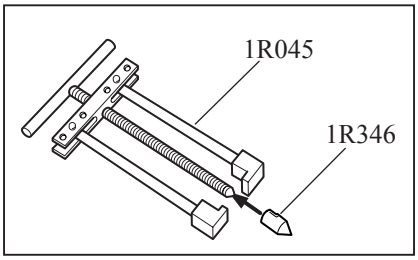



**Fig. 6**

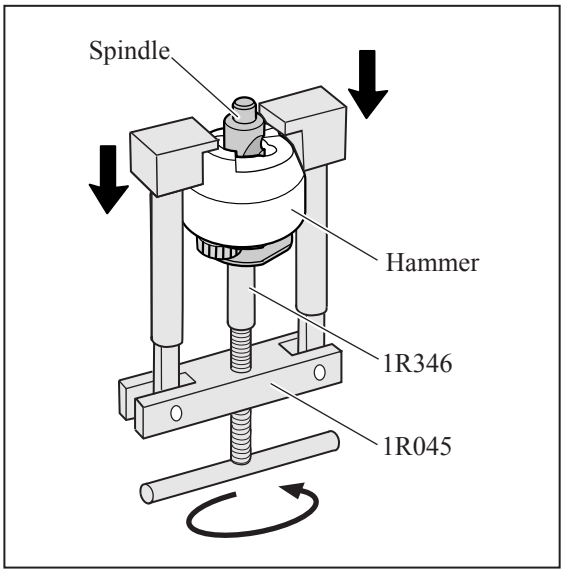
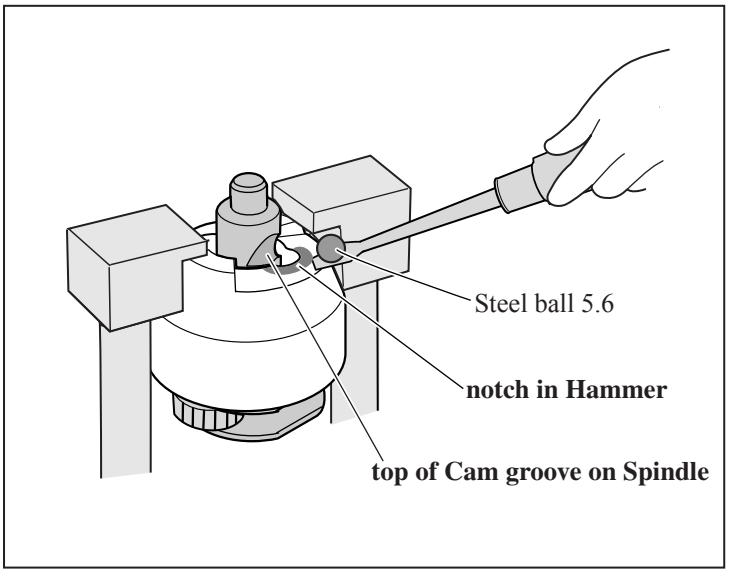



**Fig. 7**




9) Remove 1R045 by turning the handle counterclockwise.
10) Remove Spindle, Compression spring 25 and Cup washer 14 from Hammer as illustrated in **Fig. 8**.
**Important:** Be sure to lower the Hammer side in order to prevent Steel balls in Hammer from scattering around.
11) Now Steel ball 3.5 can removed from Hammer. (There are twenty-four 3.5 Steel balls in the groove on the inside of Hammer.)
**Note:** As illustrated in **Fig. 9**, the groove of Hammer is designed to have a space equivalent to about one 3.5 Steel ball when twenty-four 3.5 Steel balls are set in place.

**Fig. 8**

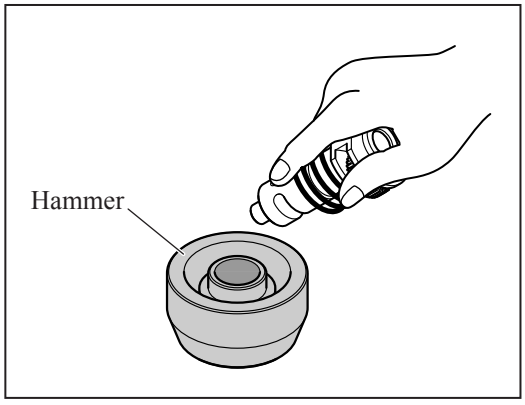
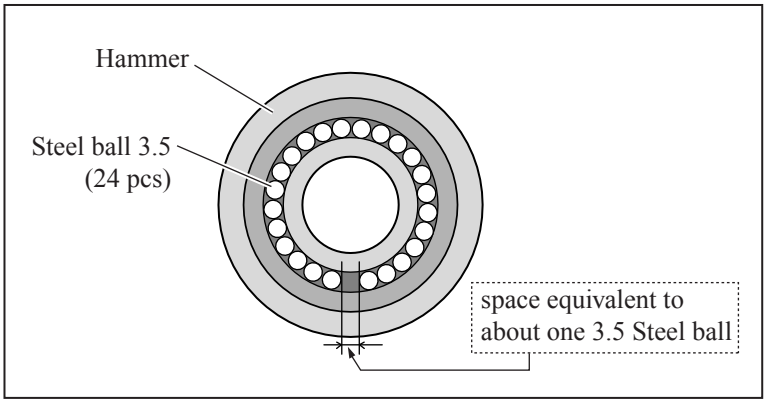



**Fig. 9**



# Repair

## [3] -1. Disassembling/Assembling Hammering Mechanism (cont.)

ASSEMBLING

Do the reverse of assembling steps.

**Note:**

1) Assemble by piling up component parts on Bearing box complete as illustrated in **Fig. 10**.
2) Make sure that twenty-four 3.5 Steel balls are in place inside Hammer.
3) Make sure that O ring 40 is assembled to Bearing box complete before assembling Internal gear 51. (**Fig. 11**)
4) Internal gear 51 is not reversible when assembled to Bearing box complete. Make sure that the stepped end of Internal gear 51 is positioned on the Bearing box complete side. (**Fig. 11**)
5) Assemble Hammer case complete to Bearing box as illustrated in **Fig. 12**.

**Fig. 10**

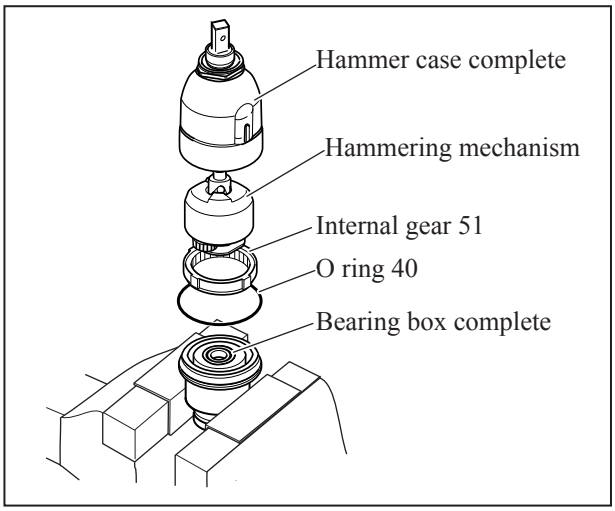



**Fig. 11**

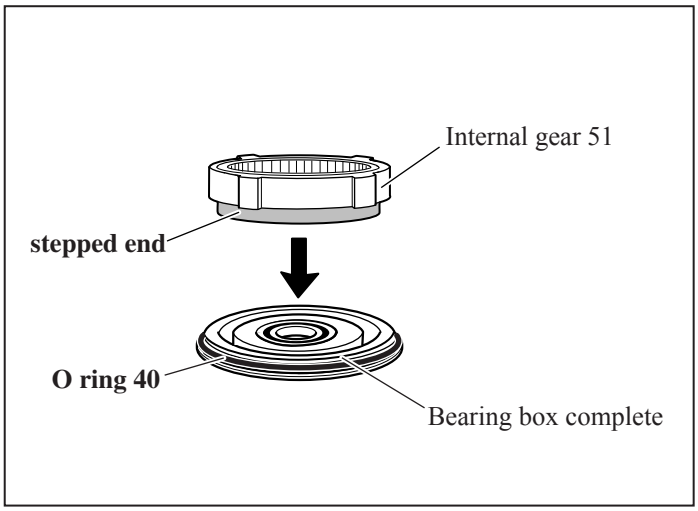
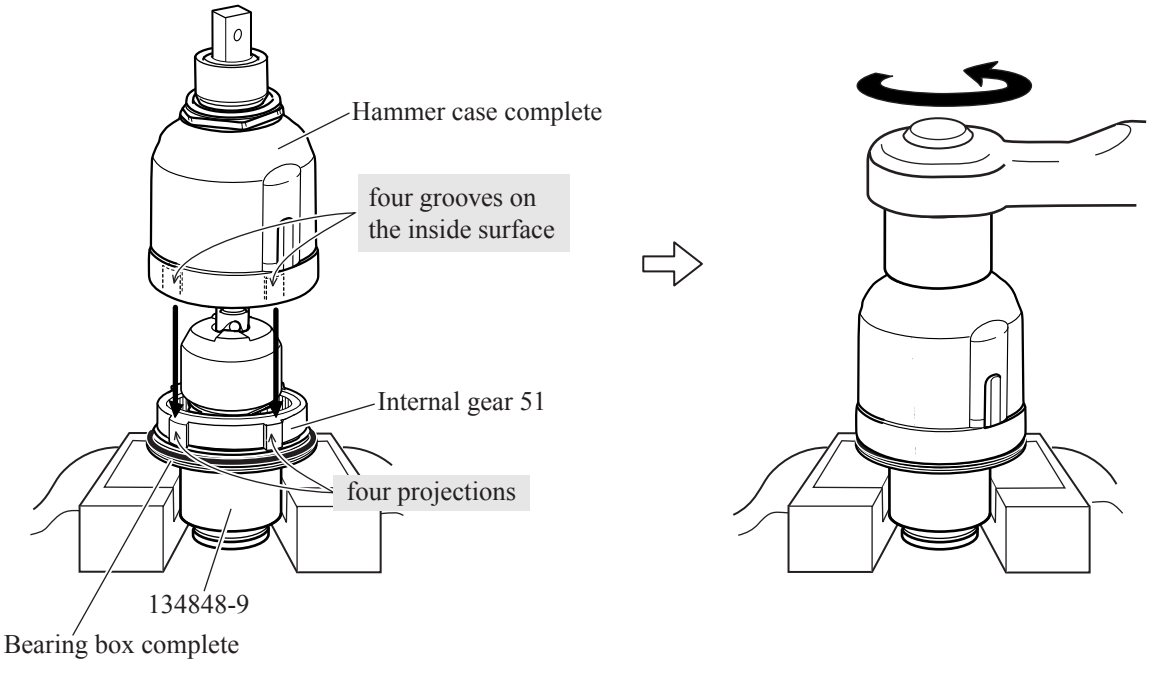



**Fig. 12**

Fit Hammer case complete over Internal gear 51 while aligning the four grooves on the inside of Hammer case complete with the corresponding projections on Internal gear 51.

Fasten Hammer case complete to Bearing box complete to the recommended torque of **30 - 40 N.m** by turning counterclockwise using 1R224 and No.1R223,



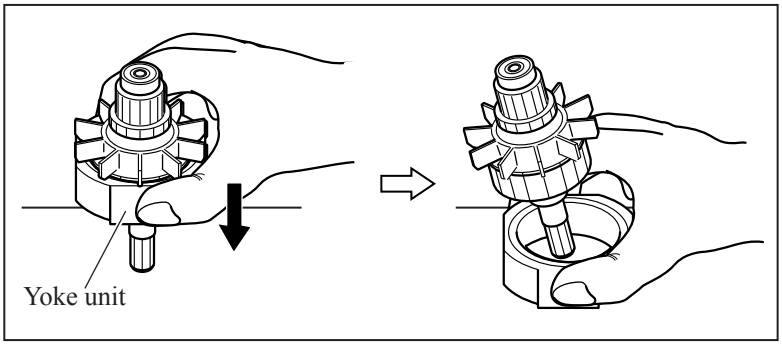
# Repair

## [3] -2. Disassembling/Assembling Motor Section

DISASSEMBLING

1) Separate the assembly of Armature and Yoke unit from the machine. (Refer to 1) to 4) of [3] -1.)
2) Put the assembly of Yoke unit and Armature on a work bench with the drive end of the Armature down. Separate Yoke unit from armature by pressing down towards the work bench. (**Fig. 13**)

**Fig. 13**




ASSEMBLING

Do the reverse of disassembling steps.

**Important:**

1) Yoke unit is not reversible when assembled to Armature. Be sure to assemble with the notch in Yoke unit on the drive-end of Armature. If assembled wrong, the Motor section cannot be assembled to Housing (L). (**Fig. 14**)
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. 15**. 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. 14**

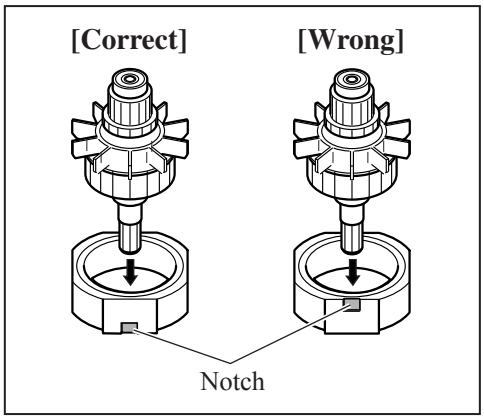
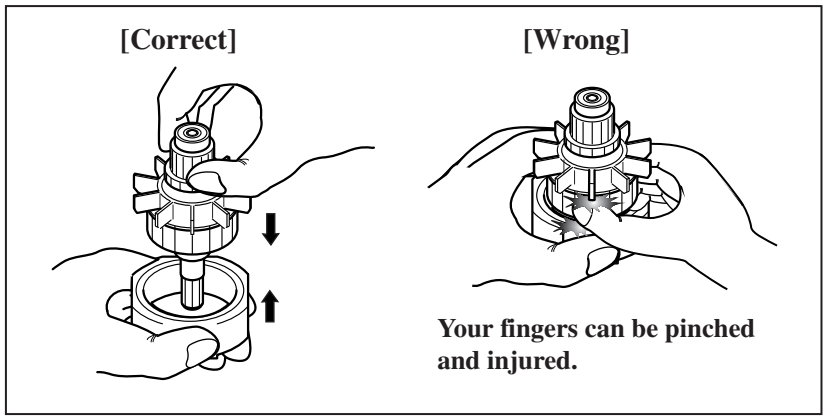
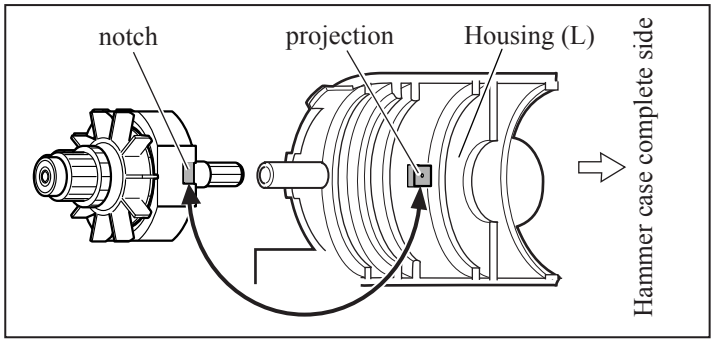



**Fig. 15**




3) When assembling the Motor section to Housing (L), fit the notch in Yoke unit onto the projection on Housing (L) (**Fig. 16**)

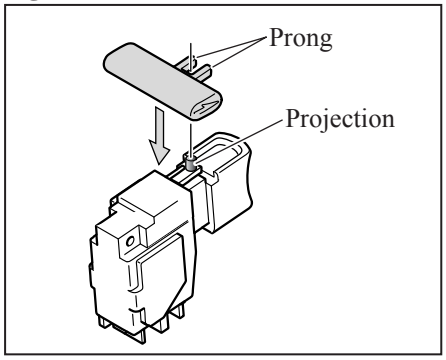
**Fig. 16**




## [3] -3. Assembling F/R Change Lever to Switch

Put the projection on Switch between the prongs of F/R change lever. (**Fig. 17**)

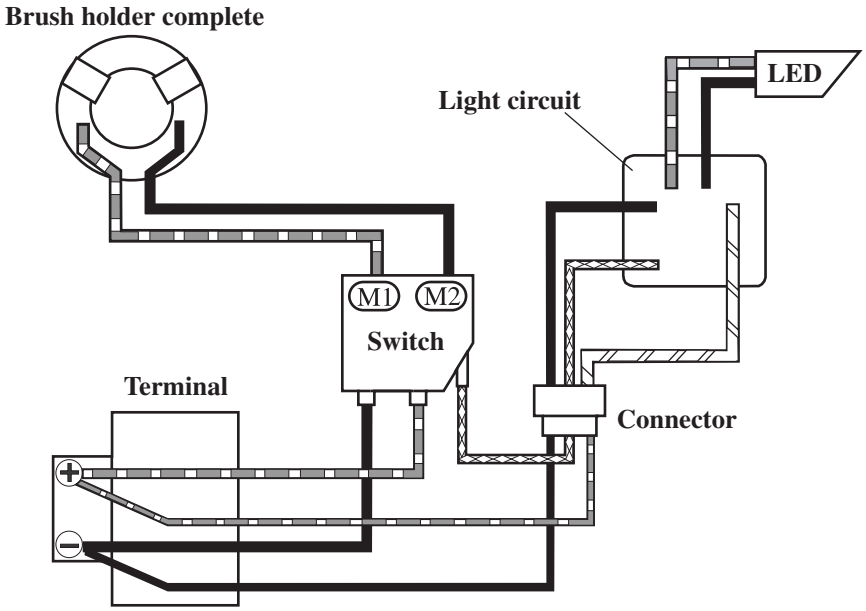
**Fig. 17**



## Circuit diagram

**Fig. 18**

| Color index of lead wires' sheath | |
|---|---|
| Black | |
| Red | |
| Orange | |
| Blue | |




## Wiring diagram

### [1] Lead Wire of Carbon Brush

As illustrated to left in **Fig. 19**, put each Carbon brush into Brush holder so that its lead wire is placed outside.
Then route the lead wire of Carbon brush through the outside slot in Brush holder as illustrated to left in **Fig. 19**.
(Illustrations in **Fig. 19** are the Carbon brush section viewed from A.)

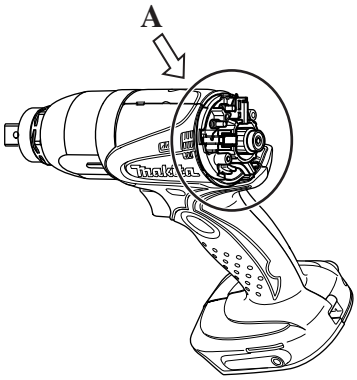
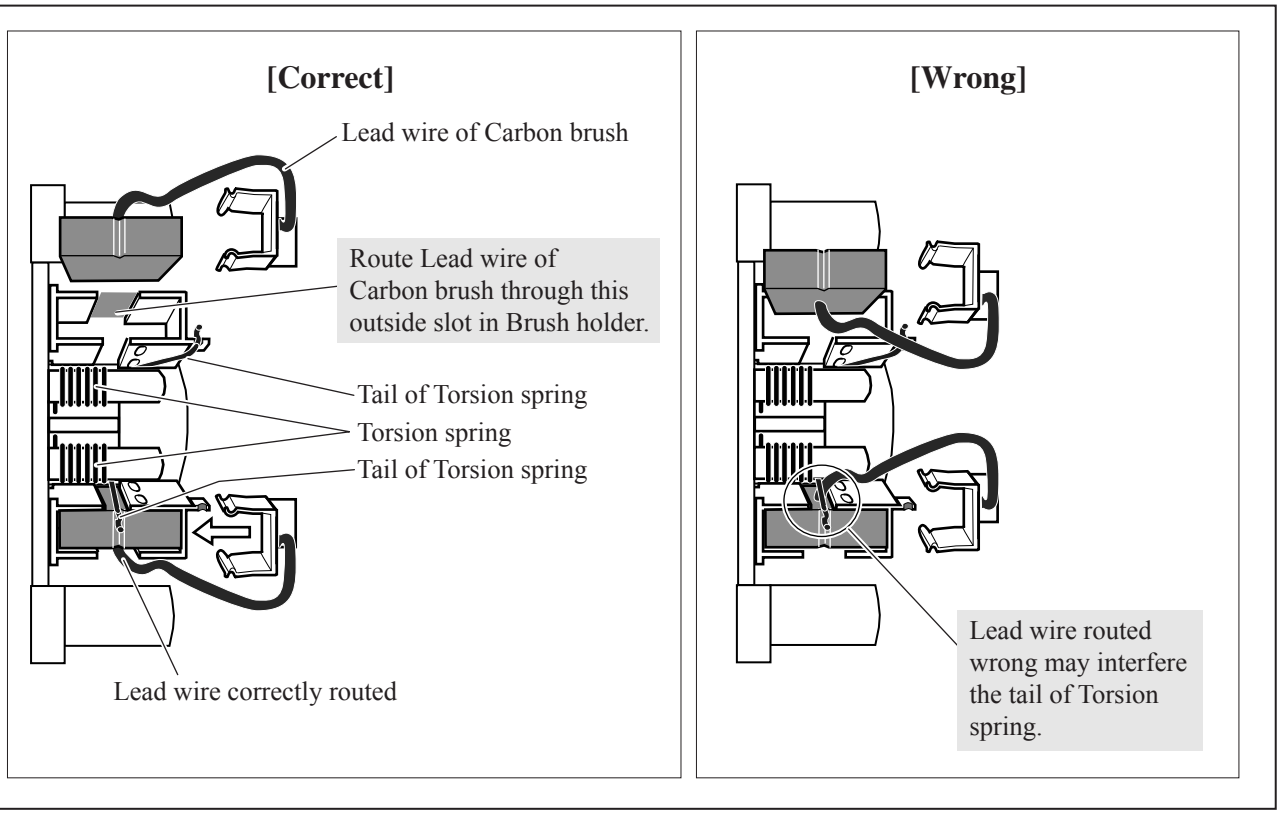



**Fig. 19**



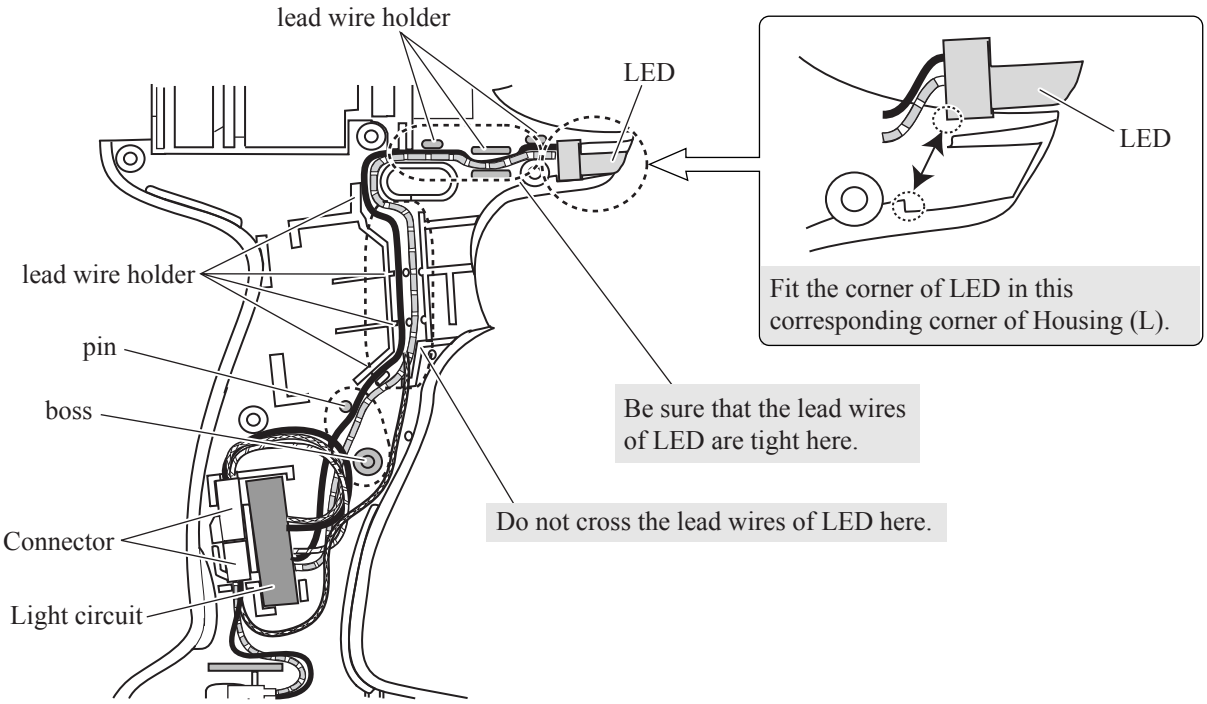
# Wiring diagram

## [2] Wiring in Housing

**Fig. 20**

### [2] -1. Lead Wires of LED

As illustrated below, fix the two lead wires (red and black) of LED with lead wire holders, and route them between the pin and the boss.




### [2] -2. Other Lead Wires