

# T ECHNICAL INFORMATION

**Models No.** ▶ BTD123F

**Description** ▶ Cordless Impact Driver

## CONCEPT AND MAIN APPLICATIONS

Model BTD123F has been added to the MAKSTAR series models.

The brief features of the new 12V impact driver are;

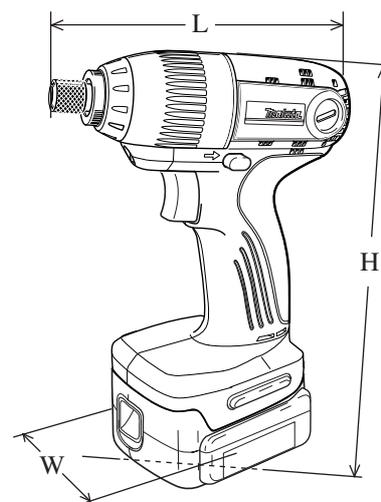
\*Compact design with an overall length of only 163mm (6-3/8")

\*Extra-lightweight with the newly designed, compact and light 12V batteries, BH1220C or BH1233C

\*Screw hole protrusions have been eliminated from hammer case for increased maneuverability, allowing operator not to worry about making scratches on workpiece with the tool.

This new product is available in the following variations.

Model No.	Battery	Charger	Plastic carrying case
<b>BTD123FZ</b>	No	No	No
<b>BTD123FSAE</b>	Ni-MH BH1220C (2.0Ah)/ 2pcs	DC14SC	Yes
<b>BTD123FSJE</b>	Ni-MH BH1233C (3.3Ah)/ 2pcs	DC14SC	Yes



Dimensions: mm ( " )		
	w/ BH1220C	w/ BH1233C
Length ( L )	163 (6-3/8)	
Width ( W )	82 (3-1/4)	
Height ( H )	226 (8-7/8)	234 (9-1/4)

## ► Specification

Battery	Voltage: V		12V
	Capacity: Ah		2.0 (battery BH1220C) / 3.3 (battery BH1233C)
	Cell		Ni-MH
Charging time: min.	2.0Ah battery		approx. 30 with DC14SC
	3.3Ah battery		approx. 50 with DC14SC
Capacities	Machine screw		M4 - M8 (5/32 - 5/16")
	Standard bolt		M5 - M12 (3/16 - 15/32")
	High tensile bolt		M5 - M10 (3/16 - 3/8")
	Coarse thread screw		22 - 120mm (7/8 - 3-3/4")
Impacts per min.: min.-1=bpm.			0 - 3,200
No load speed: min.-1=rpm.			0 - 2,600
Max. fastening torque: N.m (kgf.cm/in.lbs)			125 (1,270/1,110)
Electric Brake			Yes
Variable speed (electric)			Yes
Reversing switch			Yes
Net weight: kg (lbs)	w/ 2.0 Ah battery		1.4 (3.1)
	w/ 3.3 Ah battery		1.6 (3.5)

## ► Standard equipment

\*Plastic carrying case ..... 1 pc.

\*Phillips bit 2-65..... 1 pc.

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

## ► Optional accessories

\*Assorted Phillips bit, Socket bits and Drill chucks

\*Bit piece

\*Stopper assembly

\*Batteries BH1220C, BH1233C, BH1220, BH1233

\*Charger DC14SA, DC14SC, DC24SA

► **Features and benefits**

**Hammer Case Without Screw Hole Protrusions**  
Allows operator not to worry about scratches to made by the tool, increasing maneuverability.

**Phosphorescent (glow-in-the-dark) Bumper**  
Enables operator to easily find this tool even in dark locations.

**LED Job Light**  
For illuminated operation in dark locations

**Easy-to-Operate Large Trigger Switch for Variable Speed Control**

**Compact Design with an Overall Length of Only 163mm (6-3/8")**

**High Performance D28 Type DC Motor**  
\*Rare earth magnet provides strong power.  
\*Dual ball bearing construction for extra-high durability  
\*Motor life is extended by efficient cooling, replaceable armature, and externally accessible carbon brush.

**Rubberized Soft Grip**  
Is ergonomically contoured to fit your palm perfectly for much more comfortable and controlled operation.

**Optional hand strap can be attached.**

**Slits for optional carry hook**

**Newly Designed, Compact and Lightweight 12V Batteries, BH1220C and BH1233C**  
Ensures comfortable operation with reduced fatigue.  
BH1220C: 120g(0.26lbs) lighter than BH1220  
BH1233C: 110g(0.24lbs) lighter than BH1233

**Comes with a Plastic Carrying Case with Built-in Accessory Storage Compartments.**

**Built-in accessory storage compartments**

► **Comparison of products**

Specifications		Model No.	Makita			A
		BTD123F	6980FD	BTD120	A	
Battery	Voltage: V	12V	12V	12V	12V	
	Capacity: Ah	2.0/ 3.3	2.6	2.0/ 3.3	1.7	
	Cell	Ni-MH	Ni-MH	Ni-MH	Ni-Cd	
Charging time (approx.): min.	2.0Ah battery	30 with DC14SC	60 with DC1414	30 with DC14SA	45	
	3.3Ah battery	50 with DC14SC		50 with DC14SA		
Max. fastening torque: N.m (in.lbs)		125 (1,110)	125 (1,110)	100 (887)	115 (1,000)	
No load speed: min.-1=rpm.		0 - 2,600	0 - 2,600	0 - 2,300	0 - 2,400	
Blows per min.: min.-1=bpm.		0 - 3,200	0 - 3,200	0 - 3,000	0 - 3,000	
LED job light		Yes	Yes	No	No	
Carry hook (option)		Yes	No	No	No	
External accessible carbon brush		Yes	Yes	Yes	No	
Soft grip		Yes	Yes	Yes	Yes	
Dimensions	Length (L): mm (")		163 (6-3/8)	163 (6-3/8)	168 (6-5/8)	167 (6-9/16)
	Width (W): mm (")		82 (3-1/4)	94 (3-11/16)	75 (2-15/16)	82 (3-1/4)
	Height (H): mm (")	2.0Ah battery	226 (8-7/8)	235 (9-1/4)	251 (9-7/8)	235 (9-1/4)
		3.3Ah battery	234 (9-1/4)		276 (10-7/8)	
Net weight: kg (lbs)	w/ 2.0 Ah battery	1.4 (3.1)	1.7 (3.7)	1.5 (3.3)	1.7 (3.7)	
	w/ 3.3 Ah battery	1.6 (3.5)		1.7 (3.7)		
Standard equipment		Plastic carrying case with built-in accessory storage compartments	Plastic carrying case	Plastic carrying case	Plastic carrying case	

## ► Comparison of products

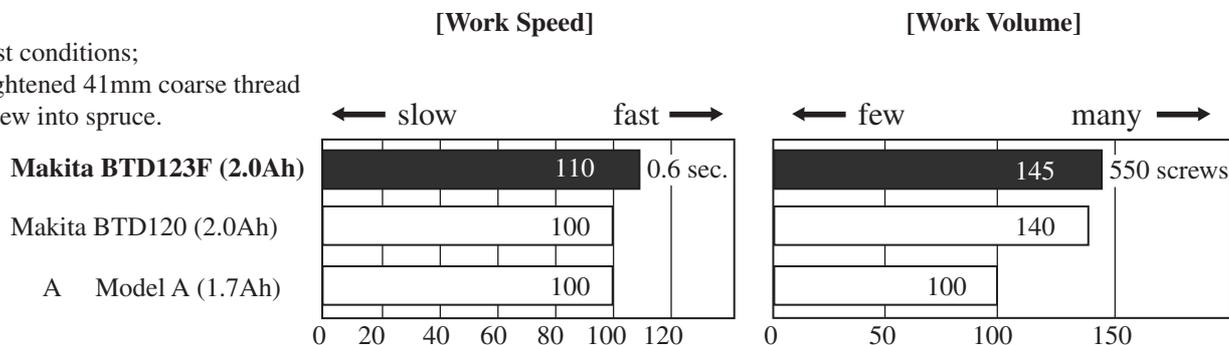
### Comparison of Work Speed and Work Volume

Numbers in chart below are relative values when the capacities of Model A of the competitor A are indexed at 100.

**Note:** The test results depend on the kind of wood to a great extent.

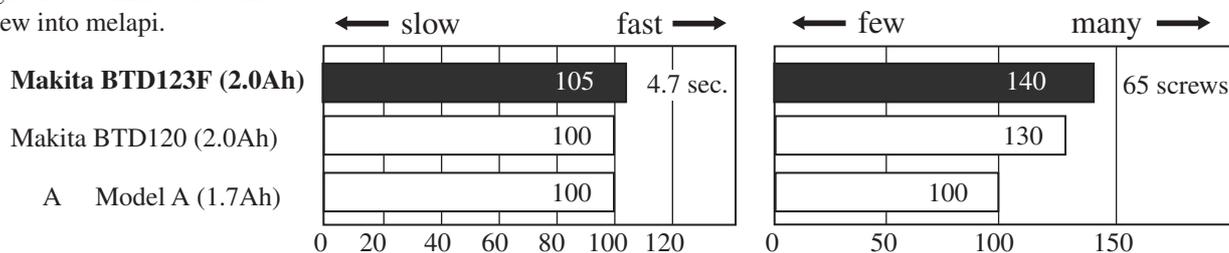
Test conditions;

Tightened 41mm coarse thread screw into spruce.



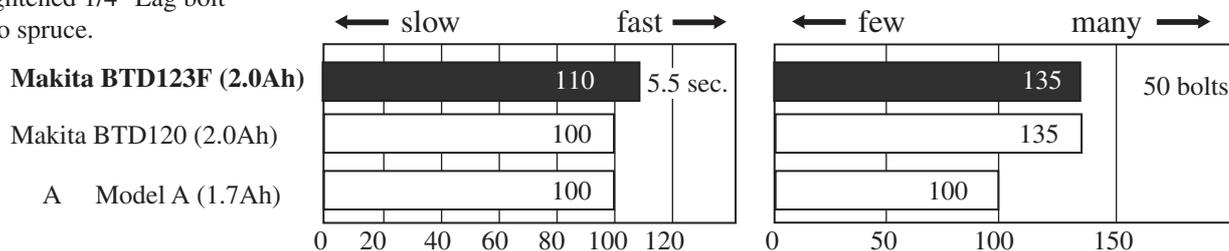
Test conditions;

Tightened 90mm coarse thread screw into melapi.



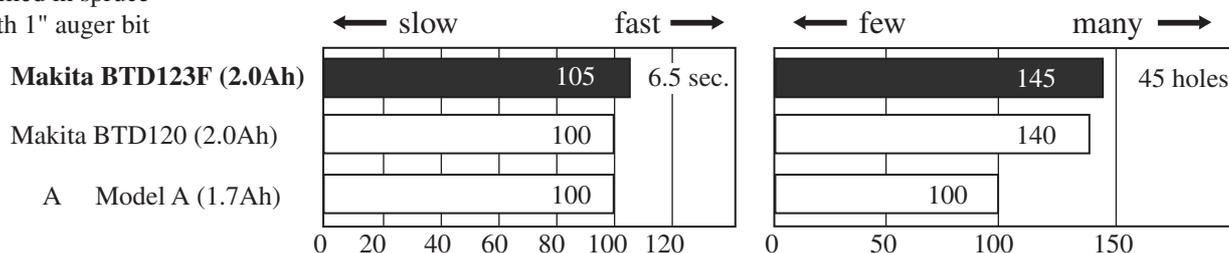
Test conditions;

Tightened 1/4" Lag bolt into spruce.



Test conditions;

Drilled in spruce with 1" auger bit



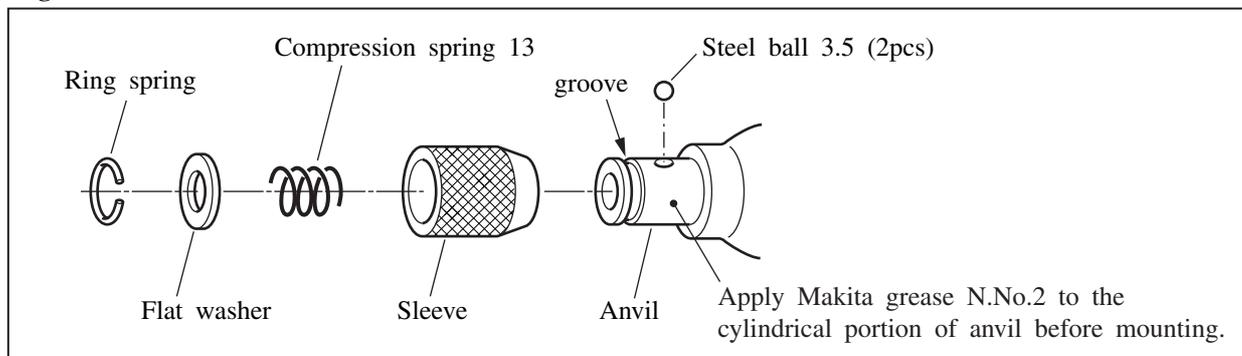
## ▶ Repair

### DISASSEMBLING

#### [1] Disassembling Sleeve Section (Fig. 1)

- (1) Remove Ring spring from the groove on Anvil with retaining pliers or the like.
- (2) Now Flat washer, Compression spring 13, Sleeve and Steel ball 3.5 (2pcs) can be removed from Anvil.
- (3) Remove Anvil from Hammer case.

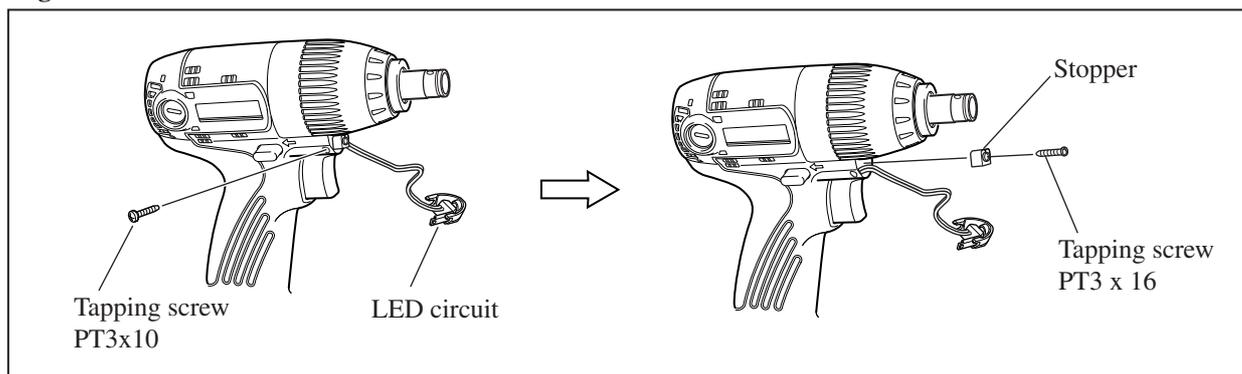
Fig. 1



#### [2] Removing Hammer Case Complete

- (1) Pull LED circuit out of housing by removing PT3x10 Tapping screw. ( Fig. 2)
- (2) Remove stopper by removing PT3x16 Tapping screw. (Fig. 2)

Fig. 2



- (3) Remove bumper from hammer case. (Fig.3)

Fig. 3

- (4) Fit socket 30-78 (Part No.134847-1) over the hex portion of hammer case. And then remove hammer case from housing by turning the socket clockwise as illustrated in Fig. 4.

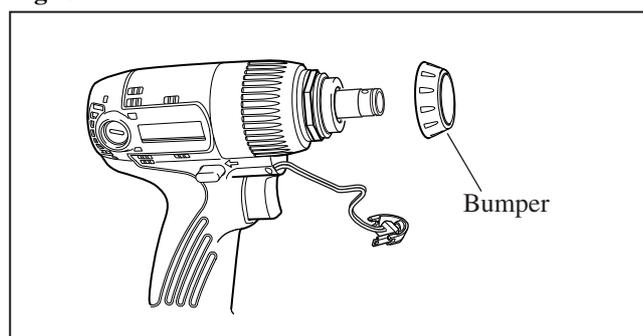
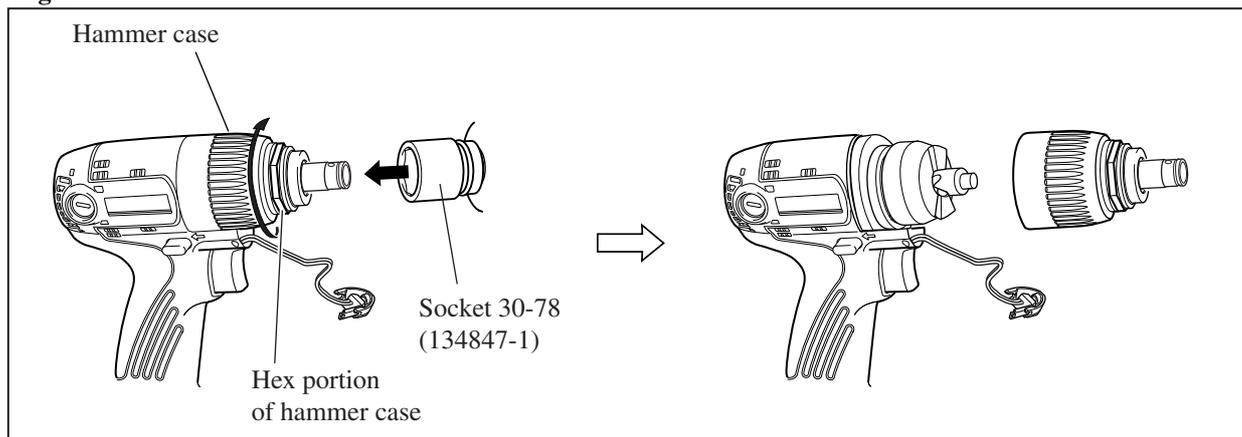


Fig. 4

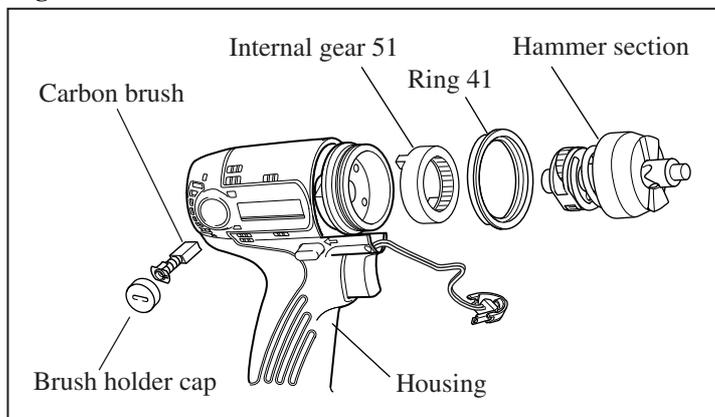


## ► Repair

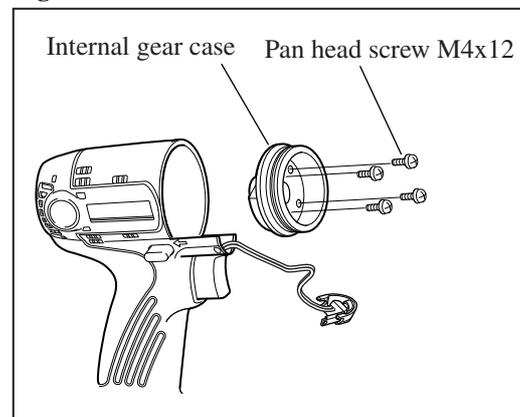
### [3] Disassembling Housing

- (1) After removing Brush holder caps and Carbon brushes, remove Hammer section, Ring 41 and Internal gear 51 from Housing. (**Fig. 5**)
- (2) Separate Internal gear case from Housing by removing four M4x12 Pan head screws. (**Fig. 6**)
- (3) Remove eight PT3x16 Tapping screws. Now Housing (R) can be separated from Housing (L).

**Fig. 5**



**Fig. 6**



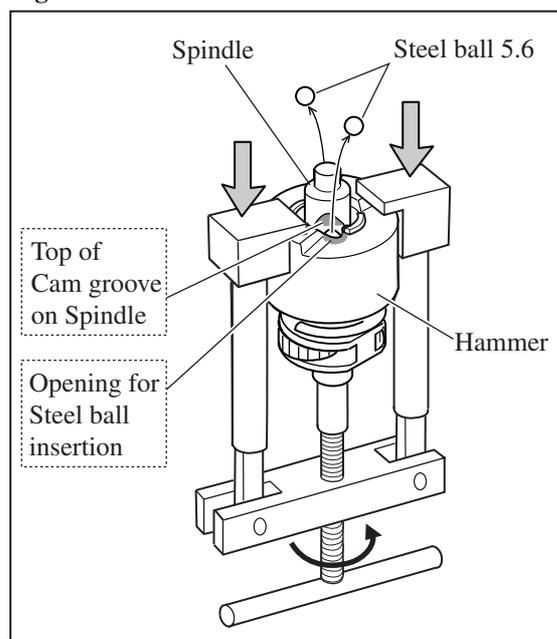
### [4] Disassembling Hammer and Spindle Section

- (1) Press down Hammer using Large gear extractor (1R045) to align the opening for Steel ball insertion with the top of cam groove on Spindle. And then remove Steel ball 5.6 (2pcs) from Spindle. (**Fig. 7**)
- (2) Hold Hammer section as illustrated in **Fig. 8**, and release it from the gear extractor.
 

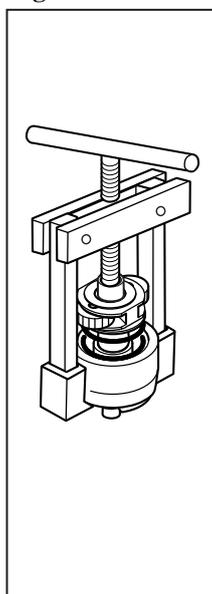
**Caution:** Do not hold gear extractor as illustrated in **Fig. 7** when releasing Hammer section from the gear extractor. Failure to follow this instruction could cause Steel balls 3.5 to get out of hammer.
- (3) Now Hammer section can be disassembled as illustrated in **Fig. 9**
- (4) After removal of Flat washer 24, Steel balls 3.5 can be removed from Hammer. (**Fig. 10**)

\*See next page for lubrication of Spindle section.

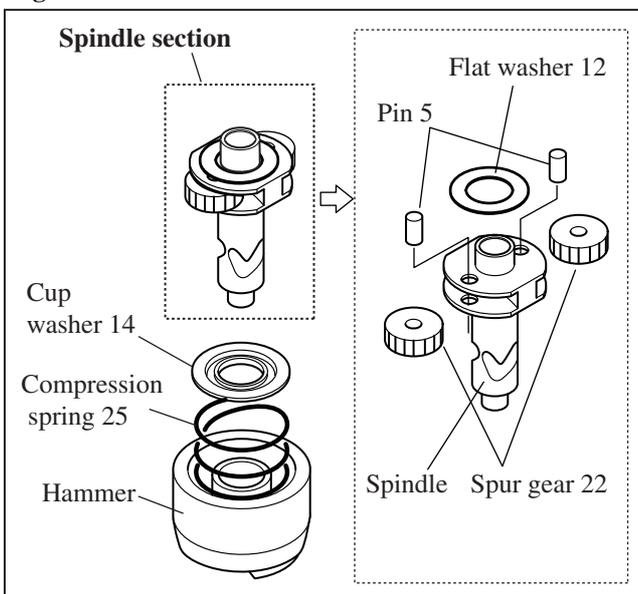
**Fig. 7**



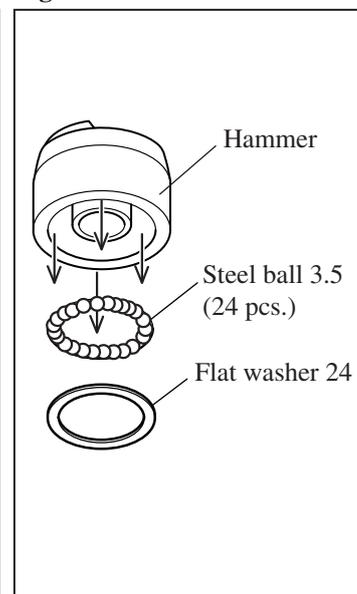
**Fig. 8**



**Fig. 9**



**Fig. 10**



## ▶ Repair

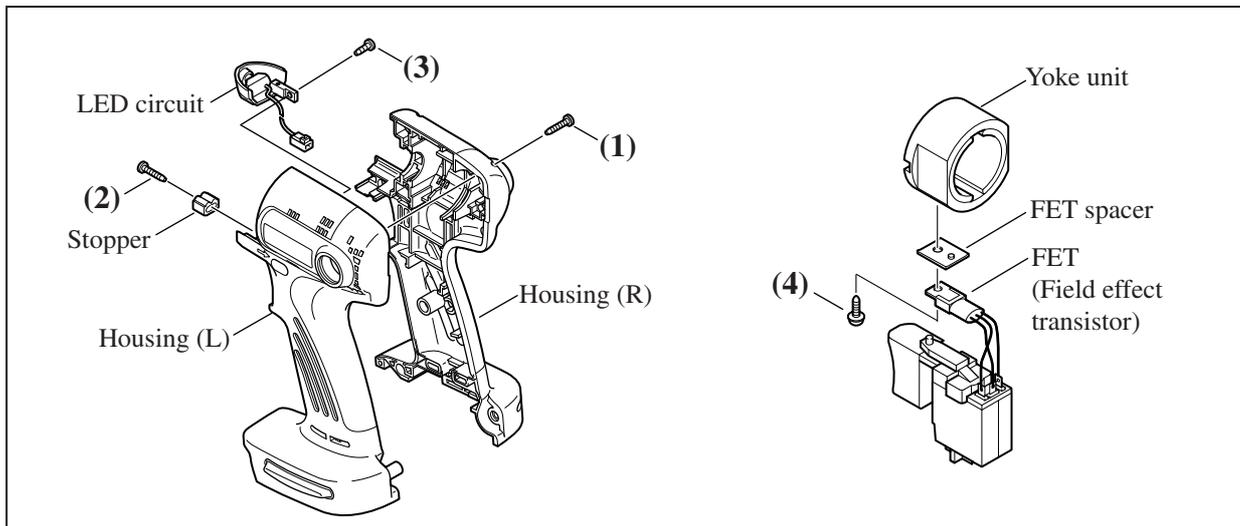
### ASSEMBLING

#### [1] Tightening Tapping Screws

Tighten the following Tapping screws to each recommended torque (**Fig. 11**);

- (1) PT3x16 (8 pcs) for fastening Housing halves together ..... 1.1 - 1.3 N.m (11 - 13 kgf.cm)
- (2) PT3x16 for fastening Stopper to Housing ..... 0.7 - 0.9 N.m (7.1 - 9.2 kgf.cm)
- (3) PT3x10 for fastening LED circuit to Housing ..... 0.7 - 0.9 N.m (7.1 - 9.2 kgf.cm)
- (4) ST3x8 for fastening FET spacer to Yoke unit ..... 1.1 - 1.5 N.m (11 - 15 kgf.cm)

**Fig. 11**



#### [2] Fastening Internal Gear Case to Housing (Fig. 12)

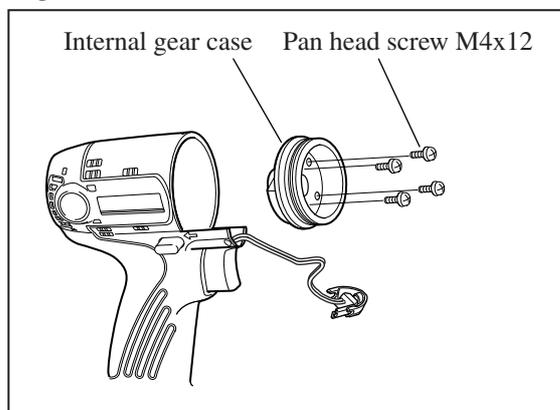
When fastening Internal gear case to Housing, be sure to follow the instructions below.

\*Do not reinstall M4x12 Pan head screws removed from Internal gear case because they are adhesive-coated screws. Always use brand-new M4x12 pan head screws.

\*Tighten four M4x12 pan head screws to the recommended torque of 0.88 - 1.8 N.m (9.0 - 18 kgf.cm).

**Note:** Remember to use a criss-cross tightening pattern.

**Fig. 12**

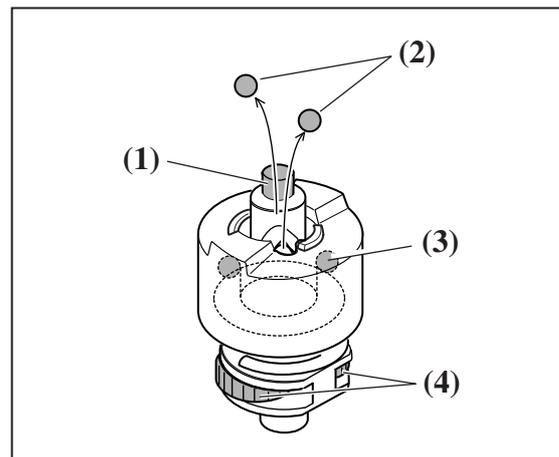


#### [3] Lubrication of Hammer Section

Before assembling, apply Makita grease N. No.2 to the following parts (**Fig. 13**);

- (1) Top of the Spindle where Anvil contacts ..... 0.5 g
- (2) Steel ball 5.6 (2 pcs) ..... 0.5 g
- (3) Steel ball 3.5 (24 pcs) ..... 0.5 g
- (4) Spur gear 22 (2 pcs) ..... 2.0 g

**Fig. 13**



## ► Repair

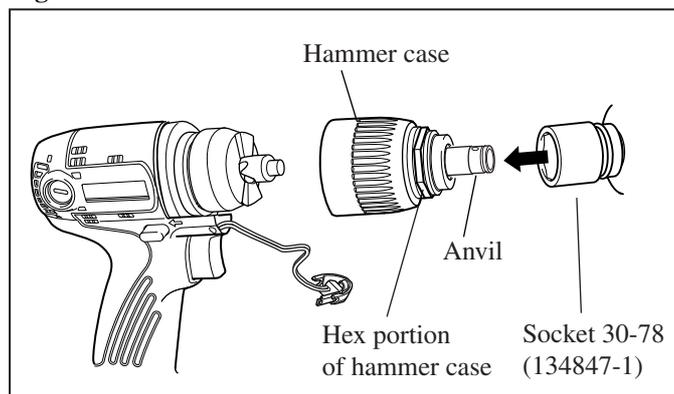
### [4] Fastening Hammer Case to Internal Gear Case

Fit socket 30-78 (Part No.134847-1) over the hex portion of Hammer case, and then tighten the socket to the recommended torque of 25 - 30 N.m (260 - 310 kgf.cm). (Fig.14)

**Caution:**

Remember to install Anvil on Hammer case before fastening Hammer case to Housing.

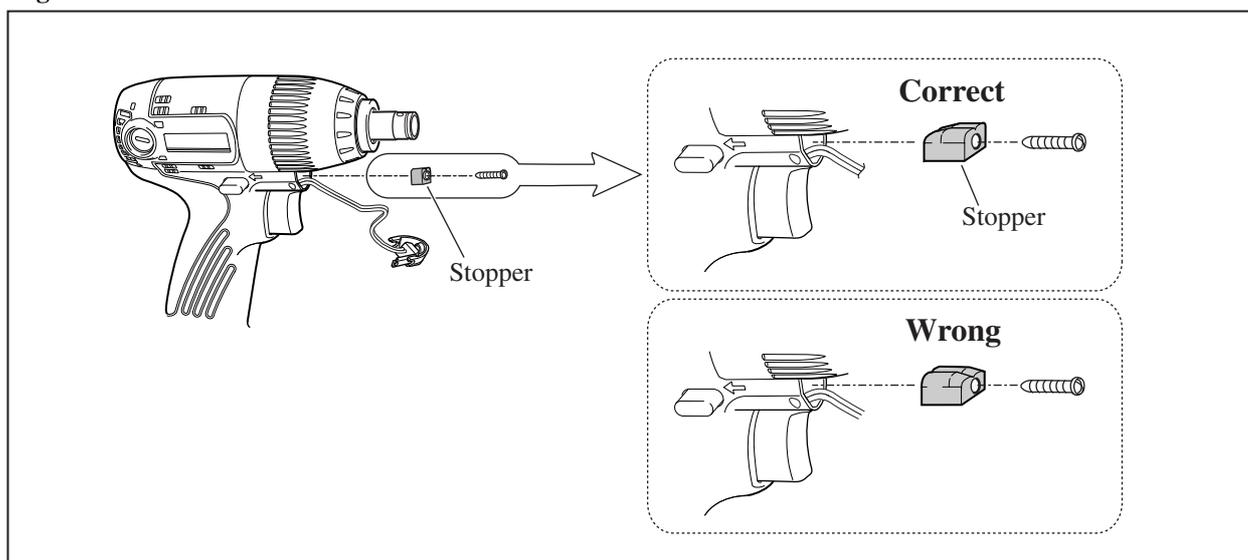
**Fig. 14**



### [5] Installing Stopper on Housing

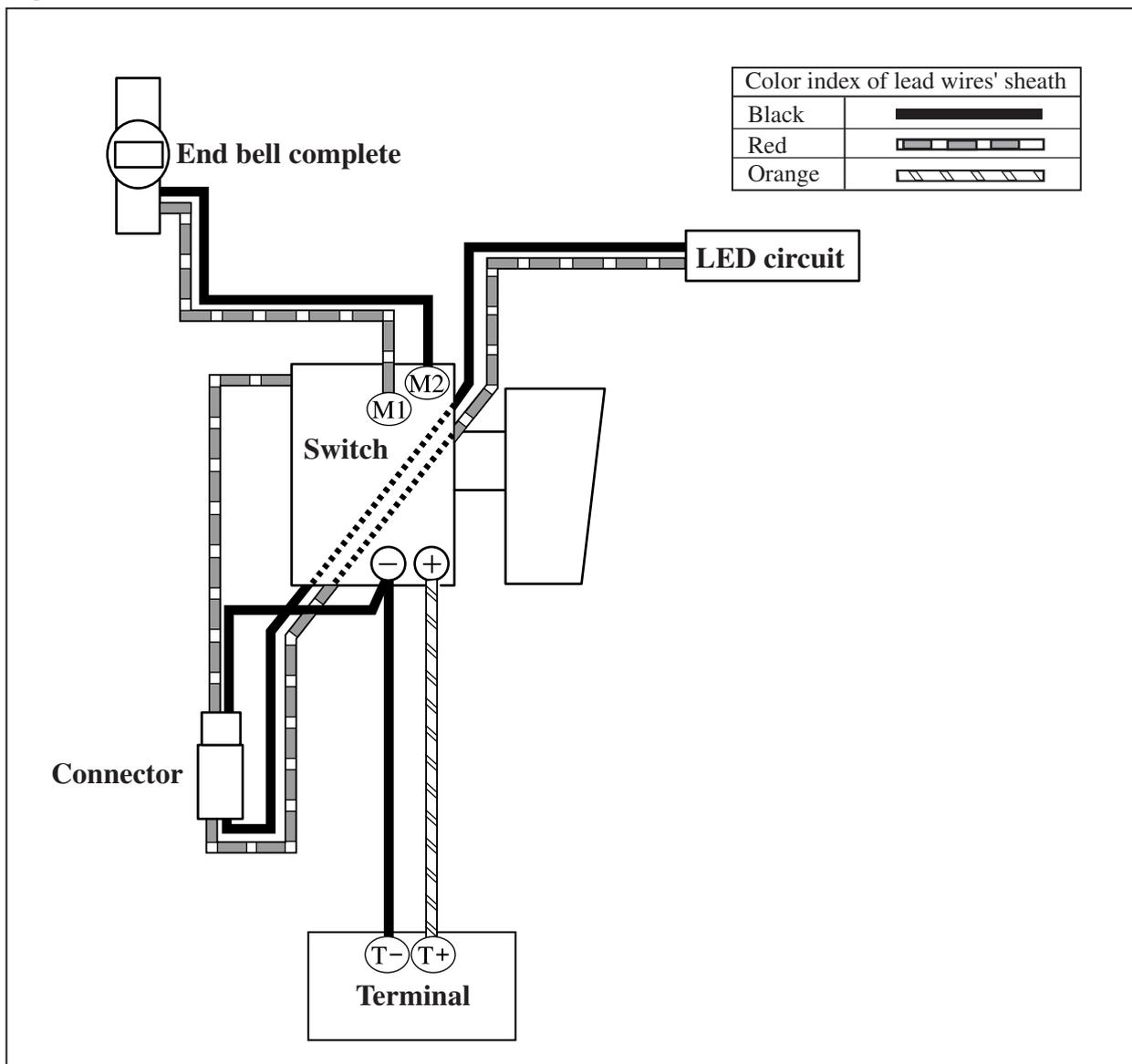
Because Stopper is not reversible when installed on Housing, be sure to place it as illustrated in **Fig. 15**.

**Fig. 15**



► **Circuit diagram**

**Fig. 16**



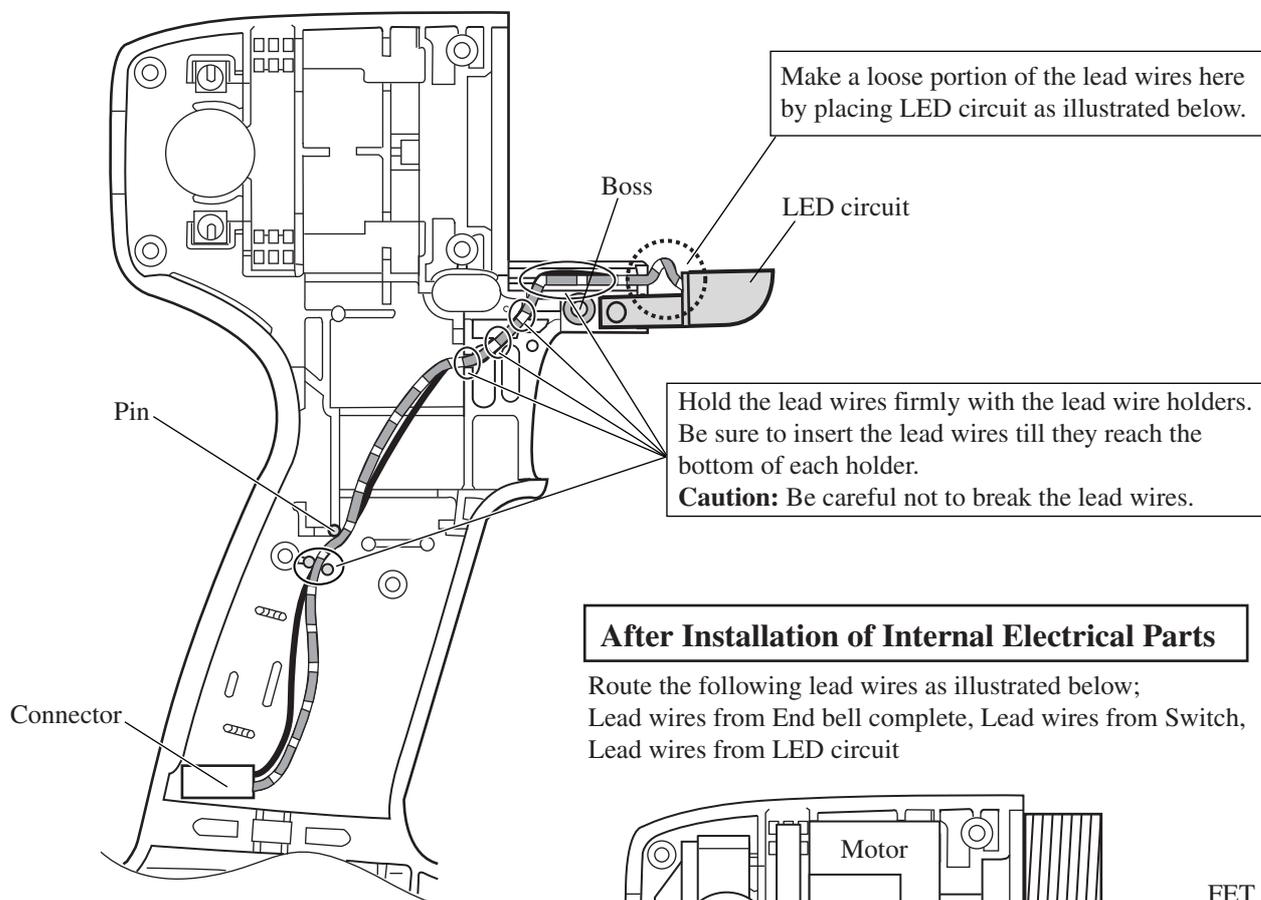
(See next page for Wiring diagram.)

# ▶ Wiring diagram

Fig. 17

## Before Installation of Internal Electrical Parts

Route the two lead wires (black and red) from LED circuit as illustrated below.



## After Installation of Internal Electrical Parts

Route the following lead wires as illustrated below;  
 Lead wires from End bell complete, Lead wires from Switch,  
 Lead wires from LED circuit

