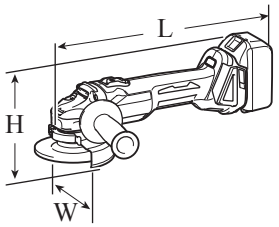
TECHNICAL INFORMATION

Models No. ► DGA404, DGA454, DGA504

Description ► 18V Cordless Angle Grinders



CONCEPT AND MAIN APPLICATIONS

The subject models are cordless angle grinders powered by 18V Li-ion battery, and equipped with highly enhanced Brushless DC motor compared to the current models DGA402/ DGA452.

A built-in controller changes the cutting speed automatically according to load condition, enabling users to obtain high speed rotation on light duty application/ high torque on heavy duty application.

Note: BL1815 is not compatible.

Dimensions: mm (")		
Length (L)*1	All	362 (14-1/4)
Width (W)	DGA404	117 (4-5/8)
	DGA454	130 (5-1/8)
	DGA504	140 (5-1/2)
Height (H)	DGA404	140 (5-1/2)
	DGA454, DGA504	145 (5-3/4)

***1** With BL1830/ BL1840/ BL1850

► Specification

Specification \ Model			DGA404	DGA454	DGA504
Battery	Voltage: V		18		
	Capacity: Ah		1.5, 2.0, 3.0, 4.0, 5.0		
	Cell		Li-ion		
	Energy capacity: W		27, 36, 54, 72, 90		
	Charging time (approx.): min.		15, 18, 22, 36, 45 with DC18RC		
Wheel size: mm (")		Diameter	100 (4)	115 (4-1/2)	125 (5)
		Hole diameter	16 (5/8)	22.23 (7/8)	
		Max. thickness	6 (1/4)		
No load speed: min.$^{-1}$= rpm			8,500		
Switch type			Slide		
Electronic control	Overload warning lamp		No		
	Electronic current limiter		Yes		
	Soft start		Yes		
	Anti-restart function		Yes		
Battery fuel gauge			Yes		
Soft grip			Yes		
Weight according to EPTA-Procedure 01/2003: kg(lbs)*2			2.4 (5.3)	2.5 (5.5)	2.5 (5.6)

***2** With 3.0Ah battery

► Standard equipment

Lock nut wrench 1
Side grip 1
Depressed center grinding wheel ..... 1 (100mm for DGA404, 115mm for DGA454, 125mm for DGA504)
Battery cover ..... 1 (except -Z- model)
Plastic carrying case ..... 1 (except -Z- model)
Charger DC18RC ..... 1 (except -Z- model)
Li-ion battery BL1830 or BL1840 ..... 2 (except -Z- model)

Note: The standard equipment may vary by country or model variation.

► Optional accessories

Depressed center wheels
Rubber pads
Abrasive discs
Wire brushes
Diamond wheels
Abrasive cut off wheels
Toolless wheel covers
Sanding lock nuts
Fast charger DC18RC
Fast charger DC18SD
Charger DC24SC
Automotive charger DC18SE
Four port multi charger DC18SF
Li-ion battery BL1815N
Li-ion battery BL1820
Li-ion battery BL1830
Li-ion battery BL1840
Li-ion battery BL1850

Repair

CAUTION: Repair the machine in accordance with "Instruction manual" or "Safety instructions".

[1] NECESSARY REPAIRING TOOLS

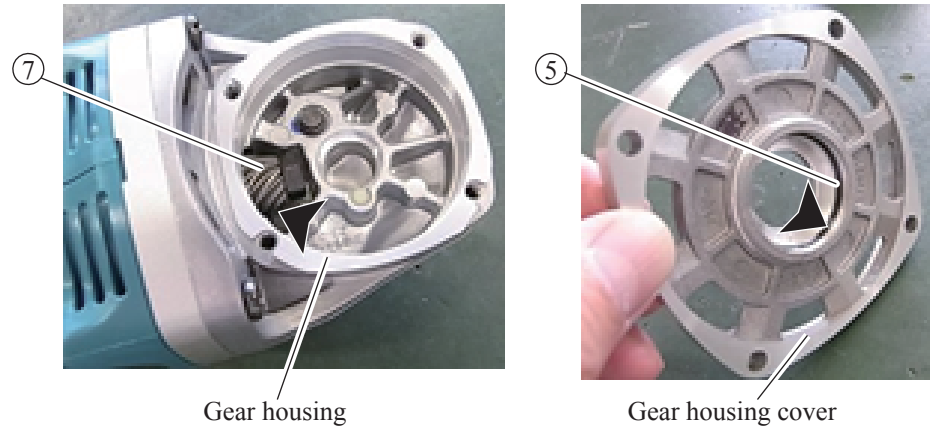
Code No.	Description	Use for
1R004	Retaining ring pliers ST-2	removing/ assembling Ring spring 11
1R027	Bearing setting pipe ø18-ø10.2	pressfitting Rotor
1R029	Bearing setting pipe ø23-ø15.2	pressfitting Spiral bevel gear 37
1R034	Bearing setting plate ø12.2	
1R045	Gear extractor (large)	removing Rotor
1R258	V block	removing Spiral bevel gear 37
1R268	Spring pin extractor M3	disassembling Shaft lock mechanism
1R269	Bearing extractor (small)	removing Ball bearing 607LLB/ 696ZZ
1R280	Round bar for arbor ø6-50	removing Spiral bevel gear 37
1R286	Round bar for arbor ø12-50	removing Ball bearing 629LLB
1R291	Retaining ring S and R pliers	removing Retaining ring R-32

[2] LUBRICATION

Apply the following grease to protect parts and product from unusual abrasion. (**Fig. 1**)

Item No.	Description	Portion to lubricate	Lubricant	Amount
⑤	O ring 26	Inner periphery that appears from Gear housing cover	Makita grease SG. No.0 ◀	9g
⑦	Spiral bevel gear 10	Gear teeth in the gear room of Gear housing		a little

Fig. 1



Repair

[3] DISASSEMBLY/ASSEMBLY

[3]-1. Rotor, Ball bearing 629LLB/ 607LLB, Spiral bevel gear 10

DISASSEMBLING

(1) Remove Gear housing cover with Rotor section from Motor housing. (**Figs. 2, 3 and 4**)
(2) Disassemble Rotor section. (**Fig. 5**)

Fig. 2

Remove four 4x30 Tapping screws.

Fig. 3

Remove the assembled part of Gear housing and Bearing box from Gear housing cover.

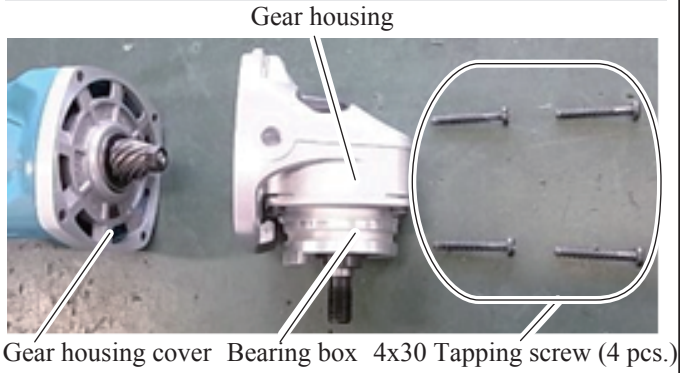
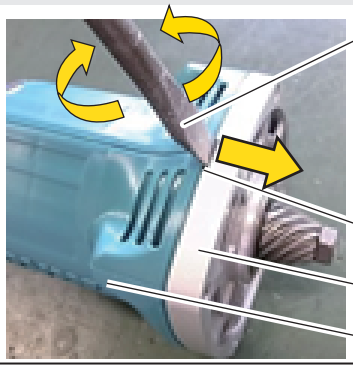


Fig. 4

Insert a thin slotted screwdriver into the groove of Gear housing cover, and remove Gear housing cover from Motor housing.



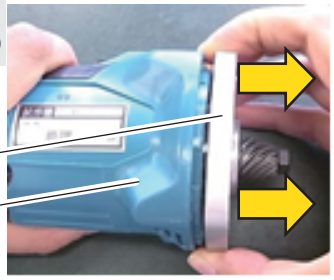
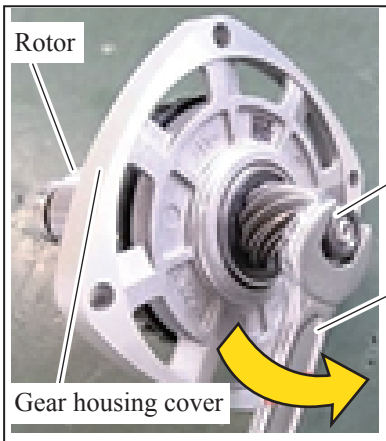
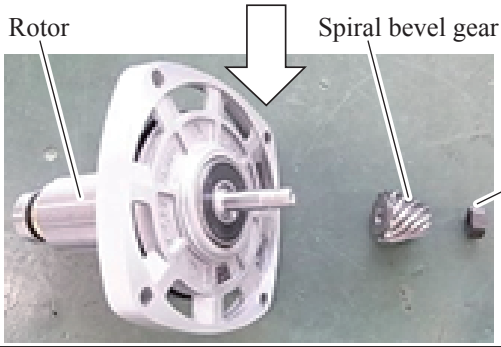
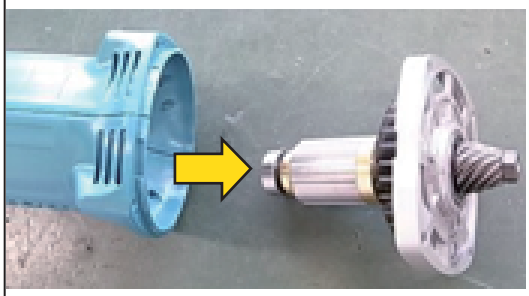


Fig. 5



While holding Rotor by a gloved hand, turn M6 Hex nut counter-clockwise with a Wrench 10.





Repair

[3] DISASSEMBLY/ASSEMBLY

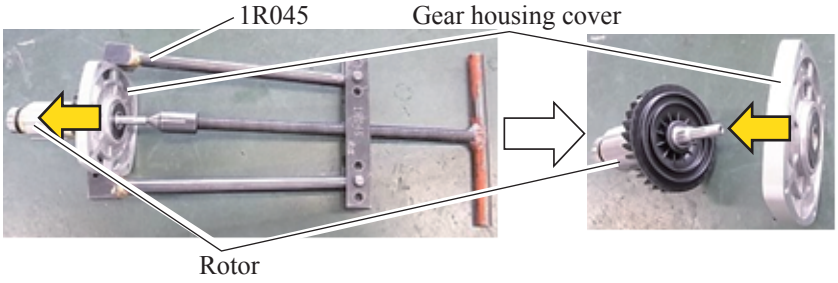
[3]-1. Rotor, Ball bearing 629LLB/ 607LLB, Spiral bevel gear 10 (cont.)

DISASSEMBLING

(3) Disassemlble Gear housing cover and Rotor section. (**Figs. 6 and 7**)

Fig. 6

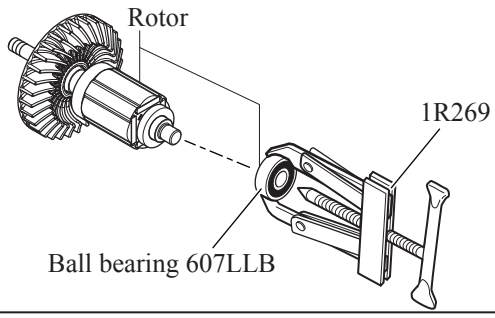
Hook the jaws of 1R045 with Gear housing cover, then push out Rotor.



Press down Ball bearing 629LLB with 1R286.

Fig. 7

Remove Ball bearing 607LLB* from Rotor with 1R269.
* The component of Rotor



Caution for Handling of Rotor

When handling or storing multiple Rotors, be sure to keep a proper distance between Rotors as shown in **Fig. 8** because Rotor is a strong magnet, failure to follow this instruction could result in:

- Finger injury caused by pinching between Rotors pulling each other.
- Magnetic loss of Rotors or damage on the magnet portion of Rotor.

(**Fig. 9**)

Fig. 8

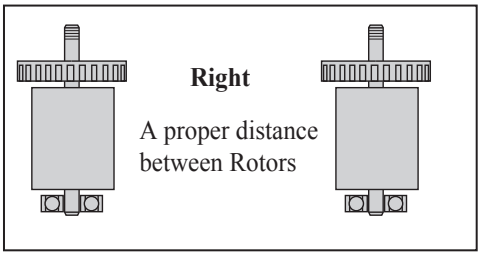
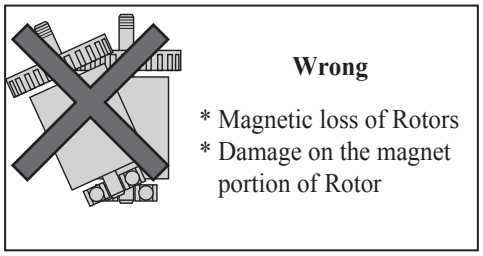


Fig. 9



Repair

[3] DISASSEMBLY/ASSEMBLY

[3]-1. Rotor, Ball bearing 629LLB/ 607LLB, Spiral bevel gear 10 (cont.)

ASSEMBLING

Assemble by reversing the disassembly procedure.
Note: Be careful about the points shown in **Figs. 10, 11 and 12**.

Fig. 10

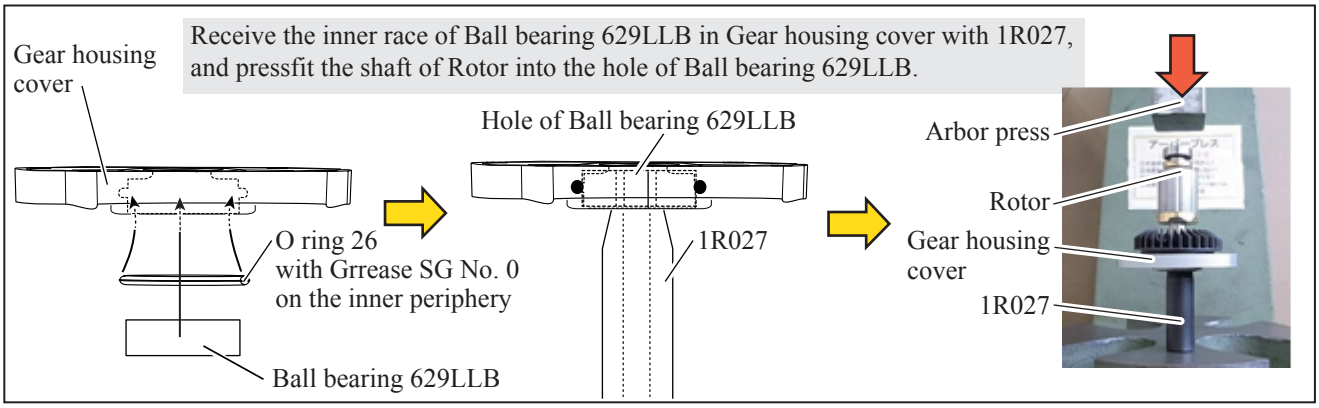


Fig. 11

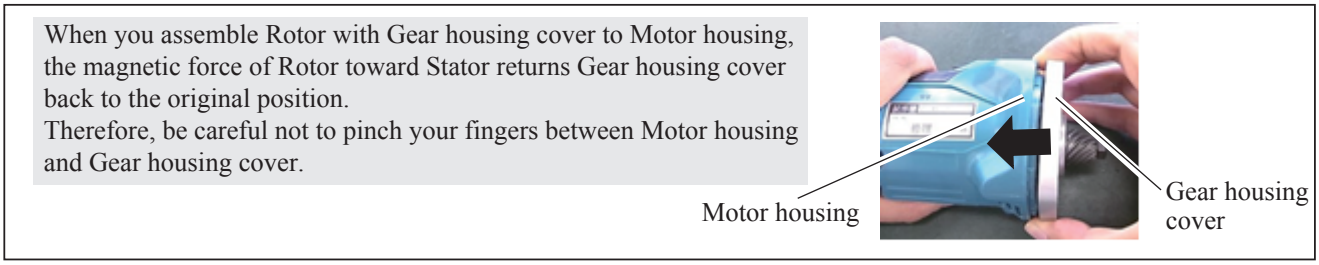
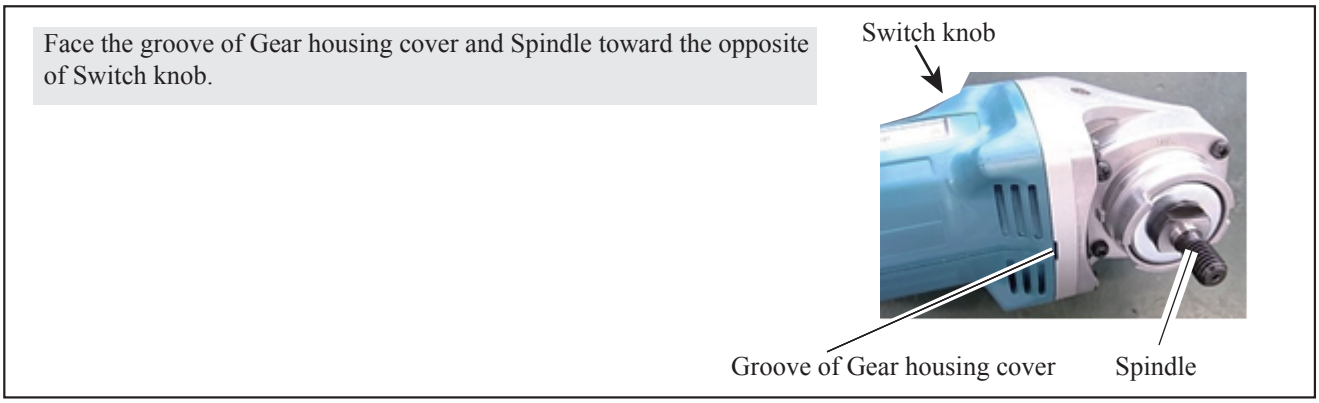


Fig. 12



Repair

[3] DISASSEMBLY/ASSEMBLY

[3]-2. Spiral bevel gear 37, Ball bearing 696ZZ and Ball bearing 6201DDW

DISASSEMBLING

Note: The subject parts can be removed without disassembling Motor section.
Disassemble Bearing box section as drawn in **Fig. 13 to Fig. 19**.

Fig. 13

Remove four M4x14 Pan head screws and Bearing box from Gear housing.

Remove Ball bearing 696ZZ with 1R269.

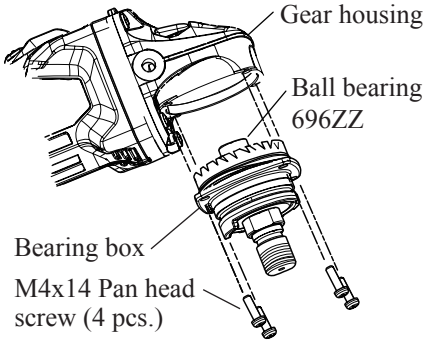


Fig. 14

While opening Ring spring 11 with 1R004, pry and remove it from Spindle with a slotted screwdriver.

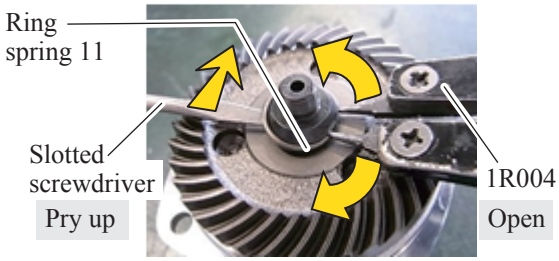


Fig. 15

Receive Bearing box on 1R258.
Provide an impact to Spindle carefully with Arbor press so that Arbor press does not touch Spiral bevel gear 37 and Spindle sinks slightly.

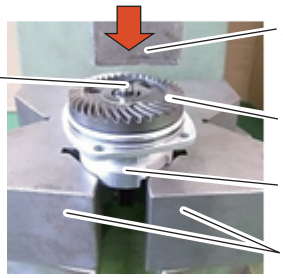


Fig. 16

Press down Spindle with 1R280.

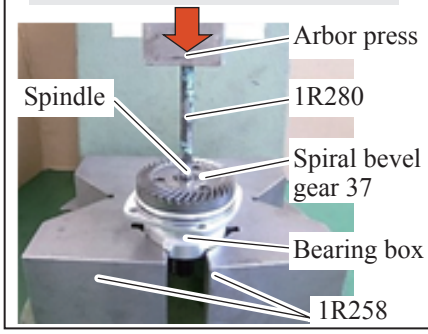


Fig. 17

Remove Retaining ring R-32 from Bearing box with 1R291

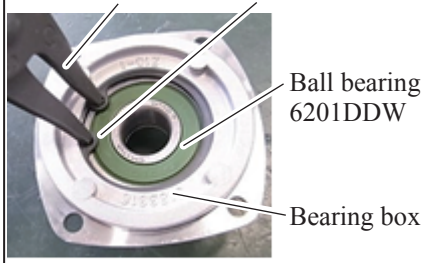
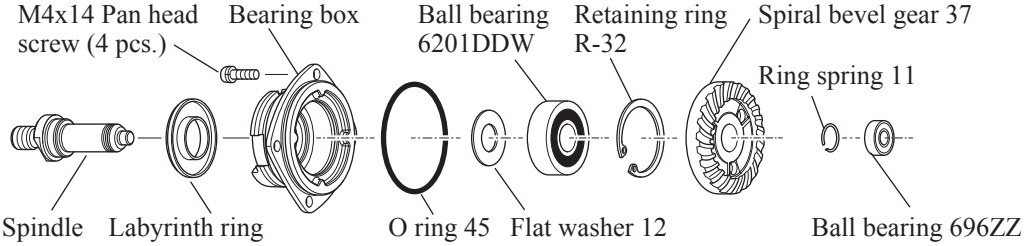


Fig. 18

Turn Bearing box upside down.
Receive Bearing box on U groove of Arbor press table as shown right, and press down Flat washer 12 and Ball bearing 6201DDW with 1R027

Fig. 19

Bearing box section can be disassembled. Be careful about each position and the direction of Labyrinth ring



Note: When Spindle is removed from Spiral bevel gear 37, Ball bearing 6201DDW has a damage during the removal process. Therefore, replace Ball bearing 6201DDW with a new one.

Repair

[3] DISASSEMBLY/ASSEMBLY

[3]-2. Spiral bevel gear 37, Ball bearing 696ZZ and Ball bearing 6201DDW (cont.)

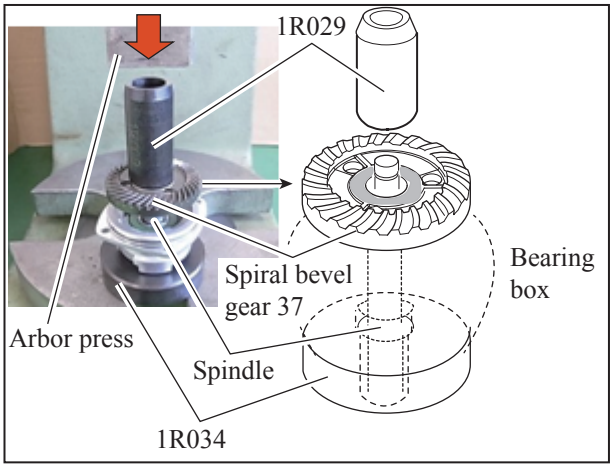
ASSEMBLING

Assemble by reversing the disassembly procedure.
Note: When Spindle is pressfit into Spiral bevel gear 37:

1. insert the thread of Spindle into the hole of 1R034 to receive the stepped portion of Spindle on 1R034.
2. put 1R029 on the area around the center hole of Spiral bevel gear 37 and then press it down.

See **Fig. 20**.

Fig. 20



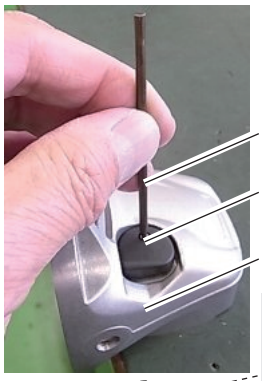
[3]-3. Shaft lock section

DISASSEMBLING

(1) According to **Fig. 13 in the previous page**, remove Bearing box from Motor housing.
(2) Disassemble Shaft lock section as drawn in **Figs. 21 and 22**.

Fig. 21

Apply 1R268 to Shoulder pin 4 through the small hole on Pin cap and tap 1R268 with a metal hammer. Shoulder pin 4 is removed from Gear housing.



Note: Remove some plastic dust on this area before reassembling.

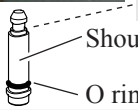
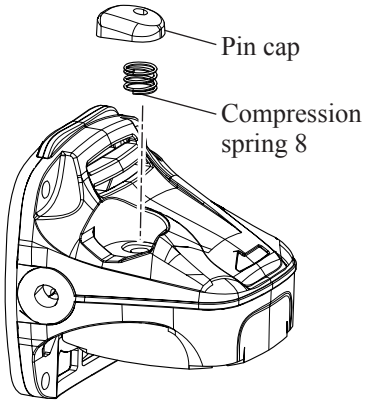


Fig. 22

Release 1R268 from Pin cap carefully so that Pin cap is not slung by Compression spring 8.



Note: Do not re-use removed Pin cap because removal one damages the inside surface of the cap.

ASSEMBLING

Assemble by reversing the disassembly procedure.

Repair

[3] DISASSEMBLY/ASSEMBLY

[3]-4. Assembling of Stator complete

Refer to **Figs. 23 and 24**.

Fig. 23

Fit four projections on Housing set into four the mating cavity in Stator complete.

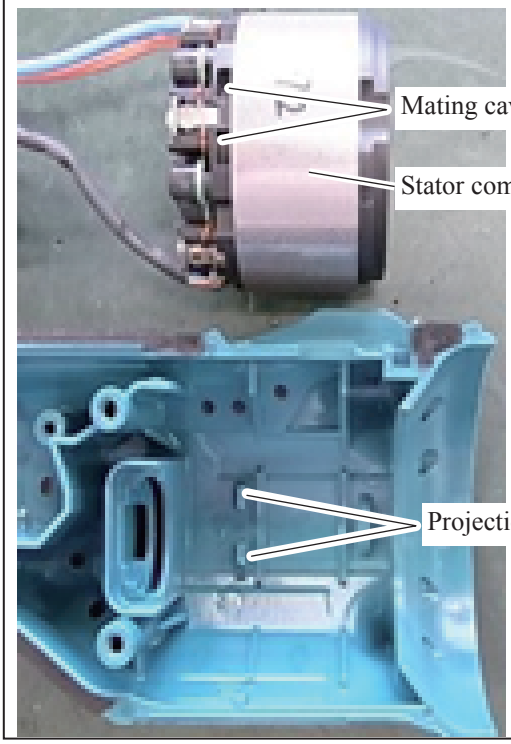
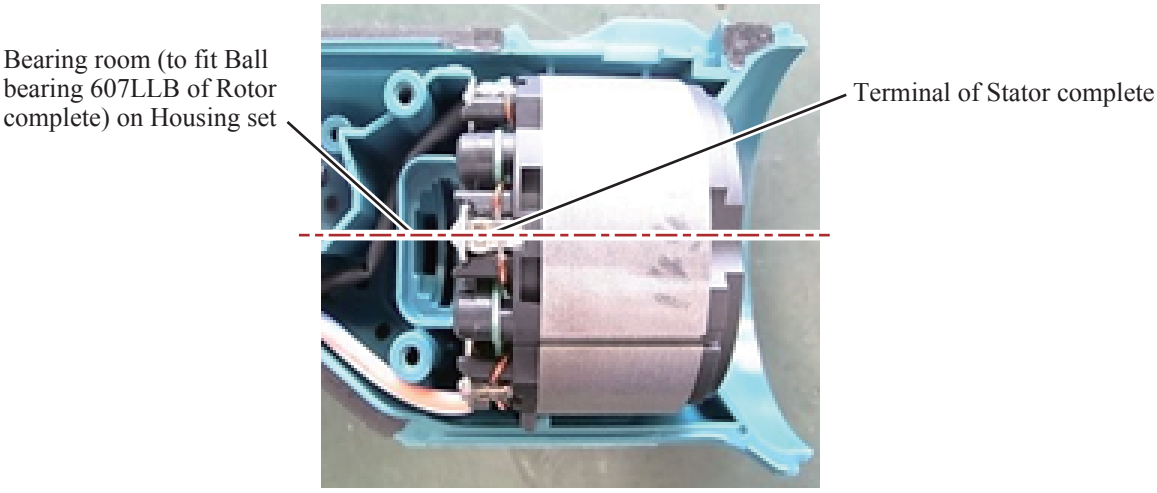


Fig. 24

Be sure to align the center line of Bearing room with the terminal of Stator complete.



Repair

[3] DISASSEMBLY/ASSEMBLY

[3]-5. Assembling of Switch knob and Switch lever

Refer to the following and next pages. (**Figs. 25, 26, 27, and 28)**

Fig. 25

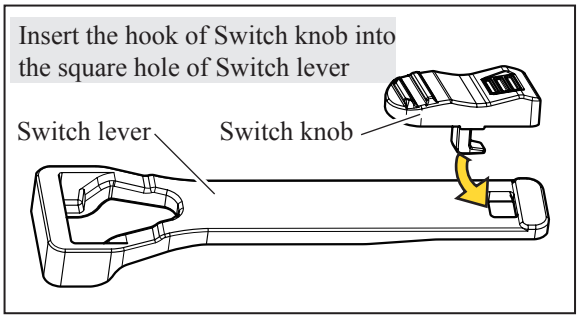


Fig. 26

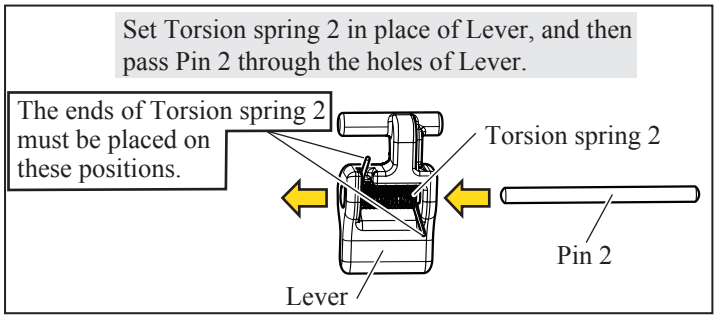
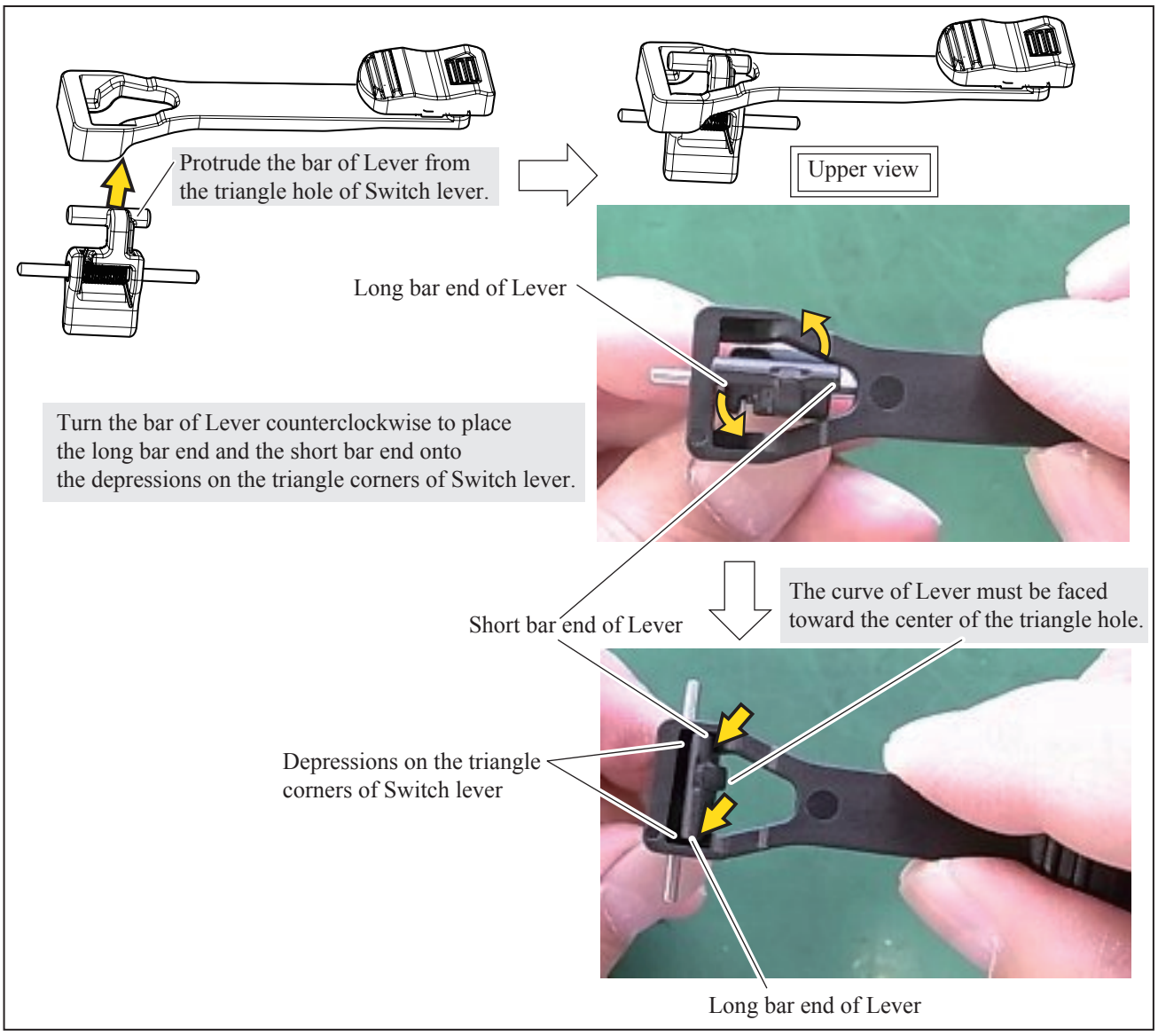


Fig. 27



Repair

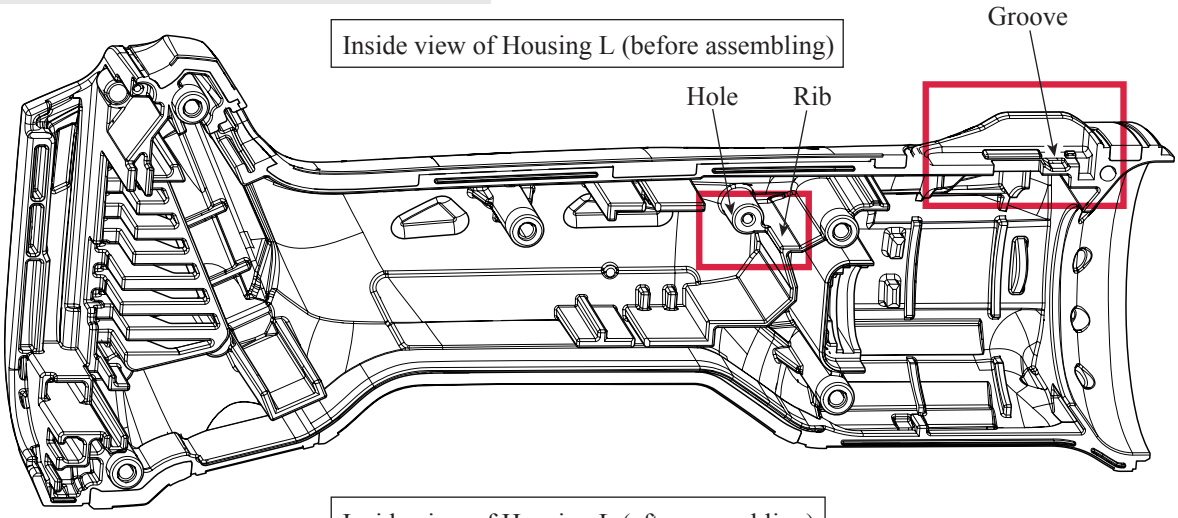
[3] DISASSEMBLY/ASSEMBLY

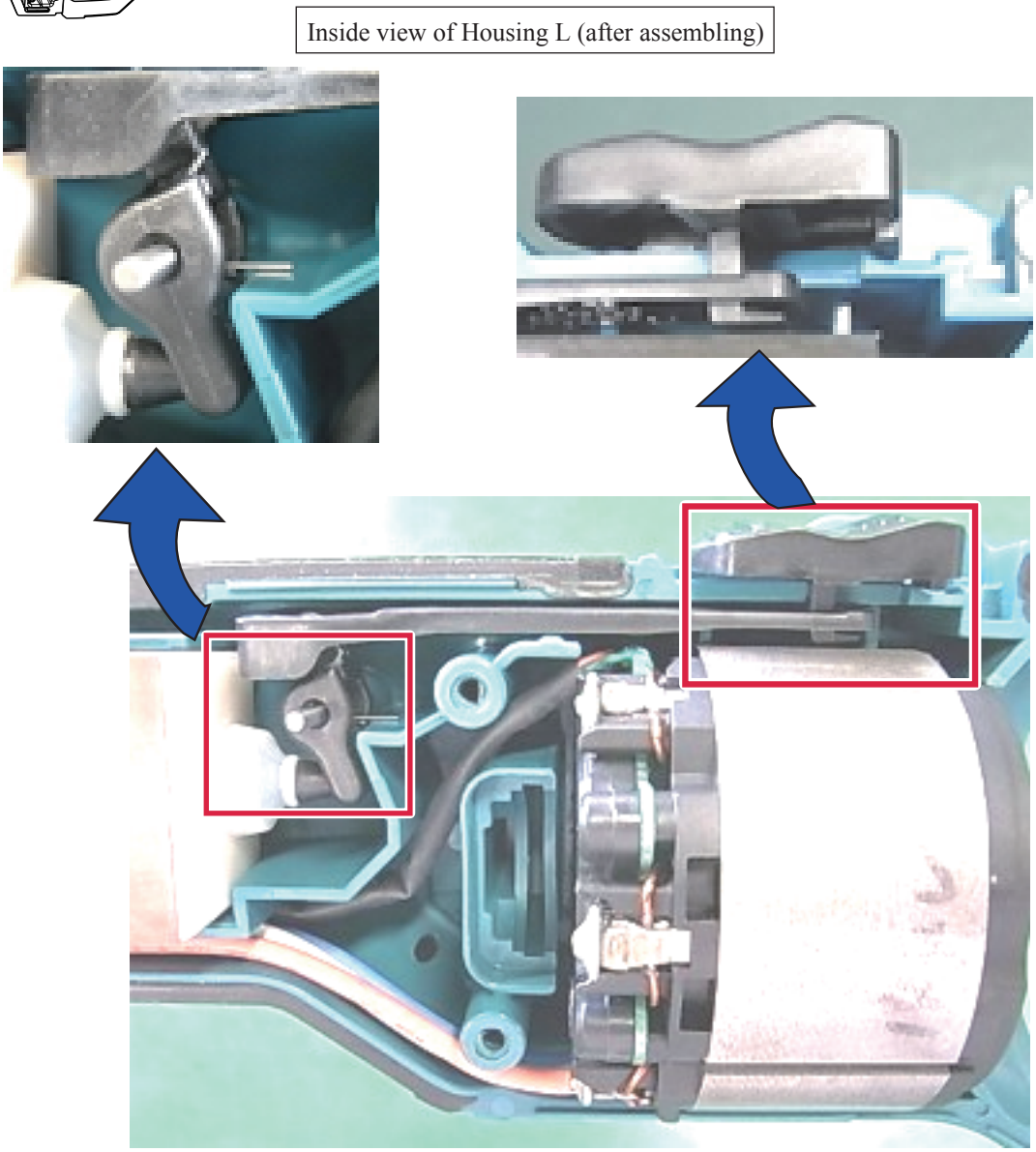
[3]-5. Assembling of Switch knob and Switch lever (cont.)

Fig. 28

Insert one end of Pin 2 into the hole of Housing L. and put the one end of Torsion spring 2 on the rib of Housing L. (See below for the detail.)
The other end of Pin 2 should be inserted into the hole of Housing R.

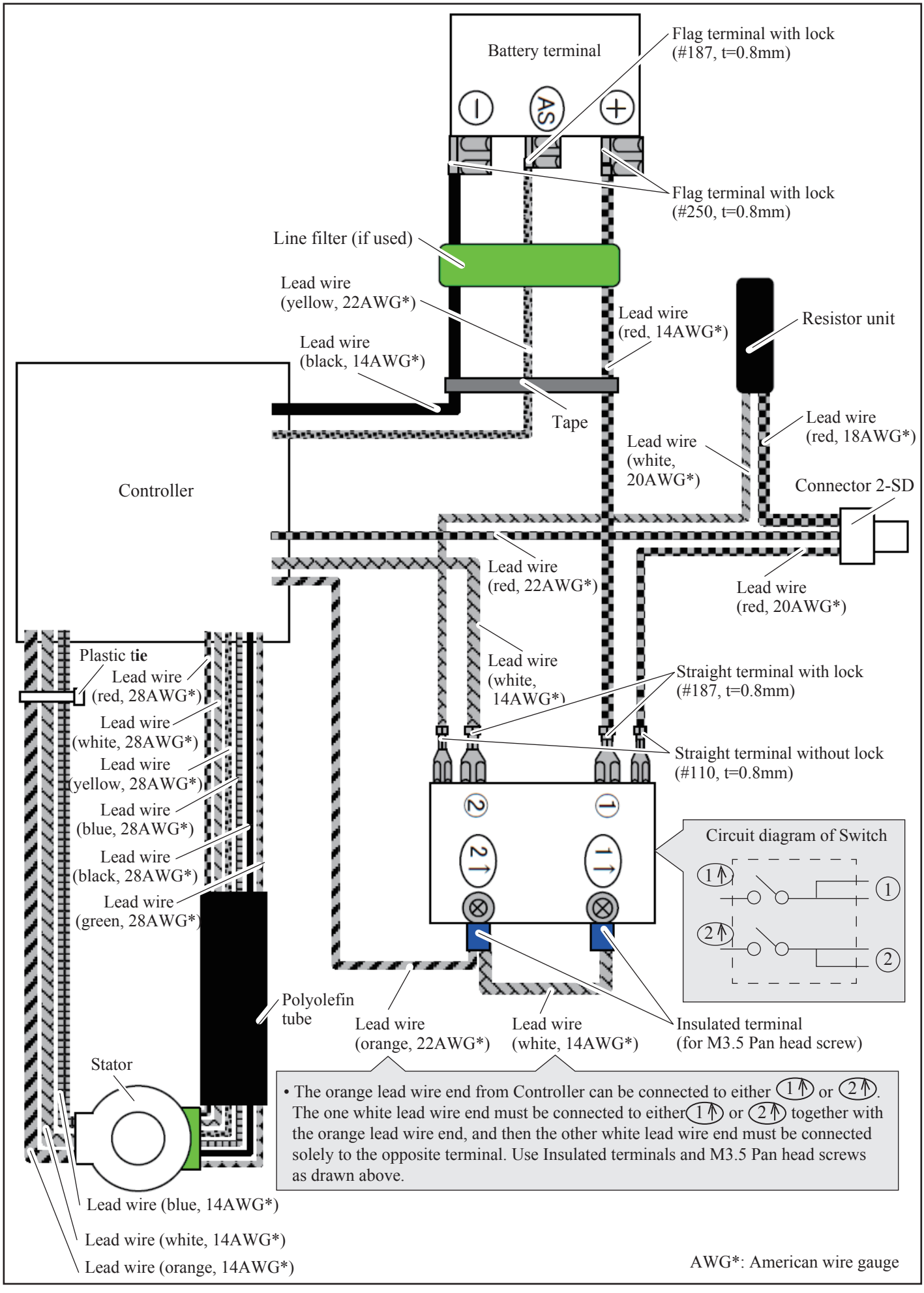
Place the top projection on the reverse side of Switch knob into the groove of Housing L. (See below for the detail.)





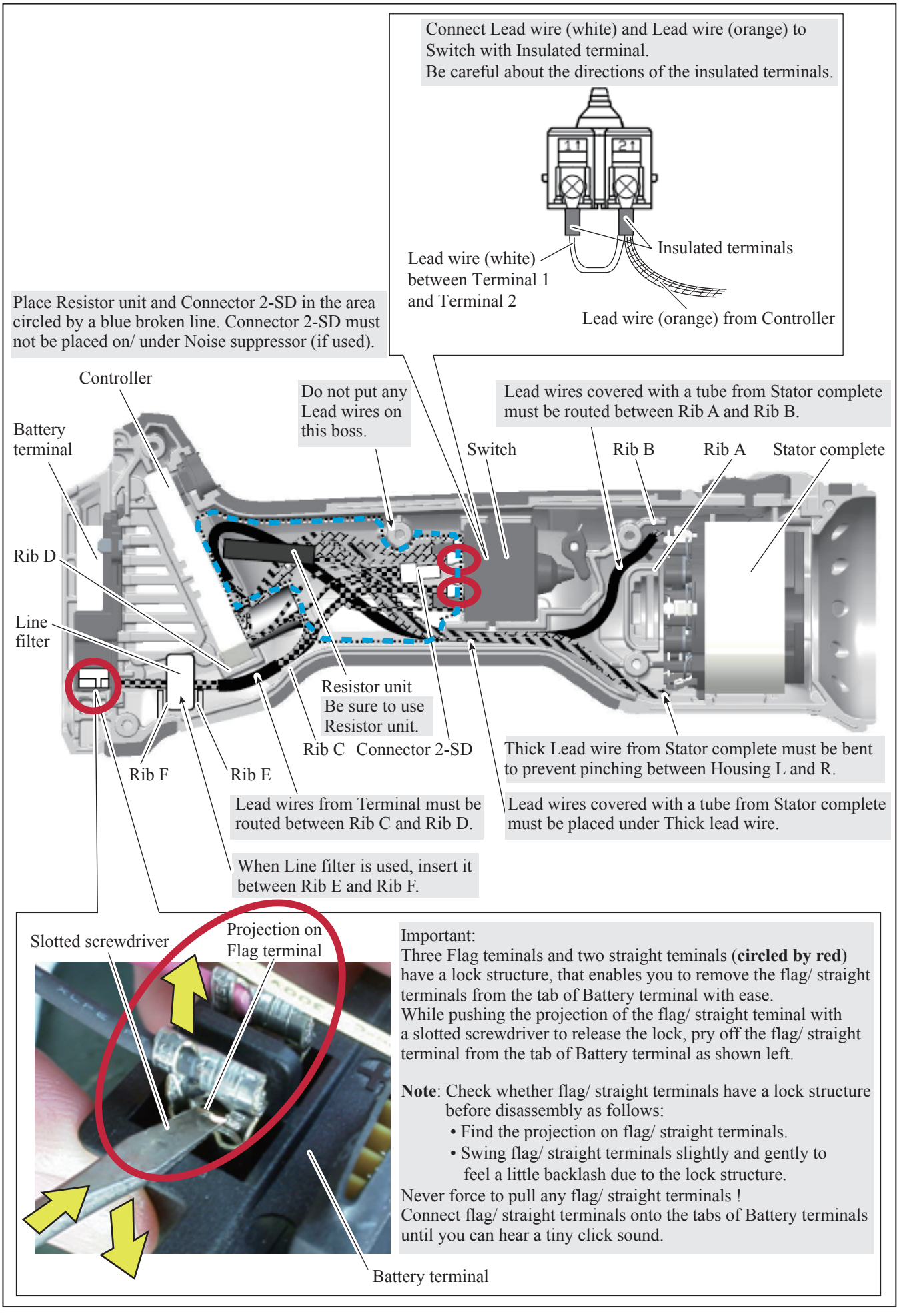
► Circuit diagram

Fig. D-1



Wiring diagram

Fig. D-2



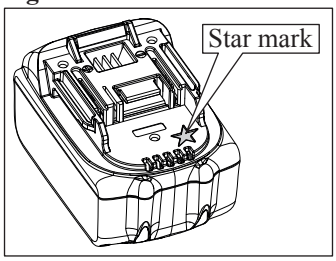
Trouble shooting

Whenever you find any trouble in your machine, first, refer to this list to check the machine for solution.

Note in Repairing

(1) Use the full charged battery which has the star mark. (**Fig. D-3**)
(2) Check the functions by repeating 10 times.
(3) When Housing is disassembled, check the following conditions:
mechanical trouble (lock or wrong setting etc.) poor connection of Connectors, Terminals and screws, lead wire breakage and pinching, wrong contact between Battery and Terminal

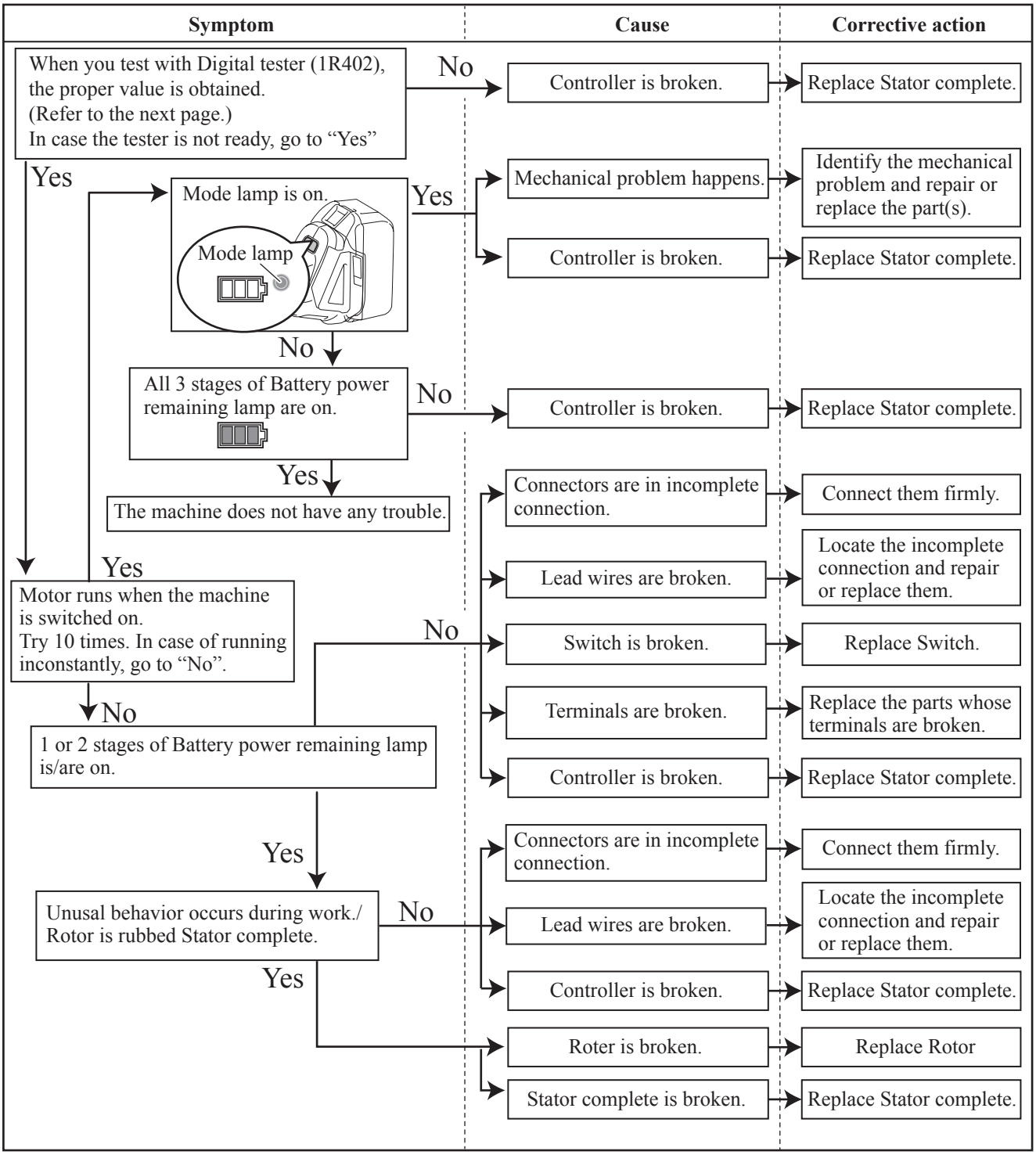
Fig. D-3



Check List for Trouble Shooting (Fig. D-4)

Check the items from the top of the following list. (Descriptions of the items are referred to Circuit diagram in **Fig. D-1**.)

Fig. D-4



Trouble shooting

Test for recognizing the trouble on Stator complete

(1) Set Digital tester (1R402) in the diode mode (⊣▶⊢ mark on the tester: Refer to **Fig. D-5.**)
(2) Remove Battery, and then turn on Switch. (**Fig. D-6**)
(3) Attach Black tester bar to Plus terminal of Battery terminal.
Attach Red tester bar to Minus terminal of Battery terminal. (**Fig. D-7.**)
Note: Be careful not to revere them. The reverse attachment could spoil the test.
(4) Wait until the Tester shows the value without fluctuation. There is no fault on Stator complete if the tester indicates **within 0.8V plus/minus 0.1V**.
If Tester indicates 0V or 0.4V approximately, Stator complete is out of order.
Replace Stator complete with new one.

Fig. D-5

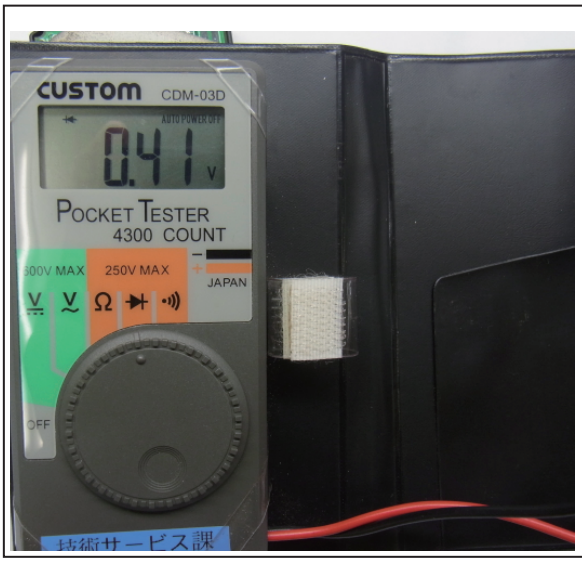


Fig. D-6

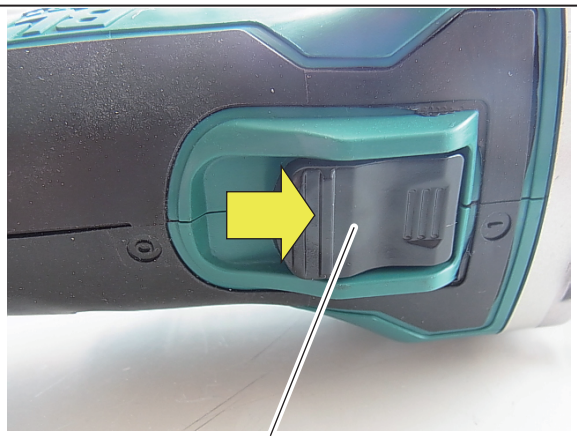


Fig. D-6