



REPAIR MANUAL

XHU02

► **Repair**

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

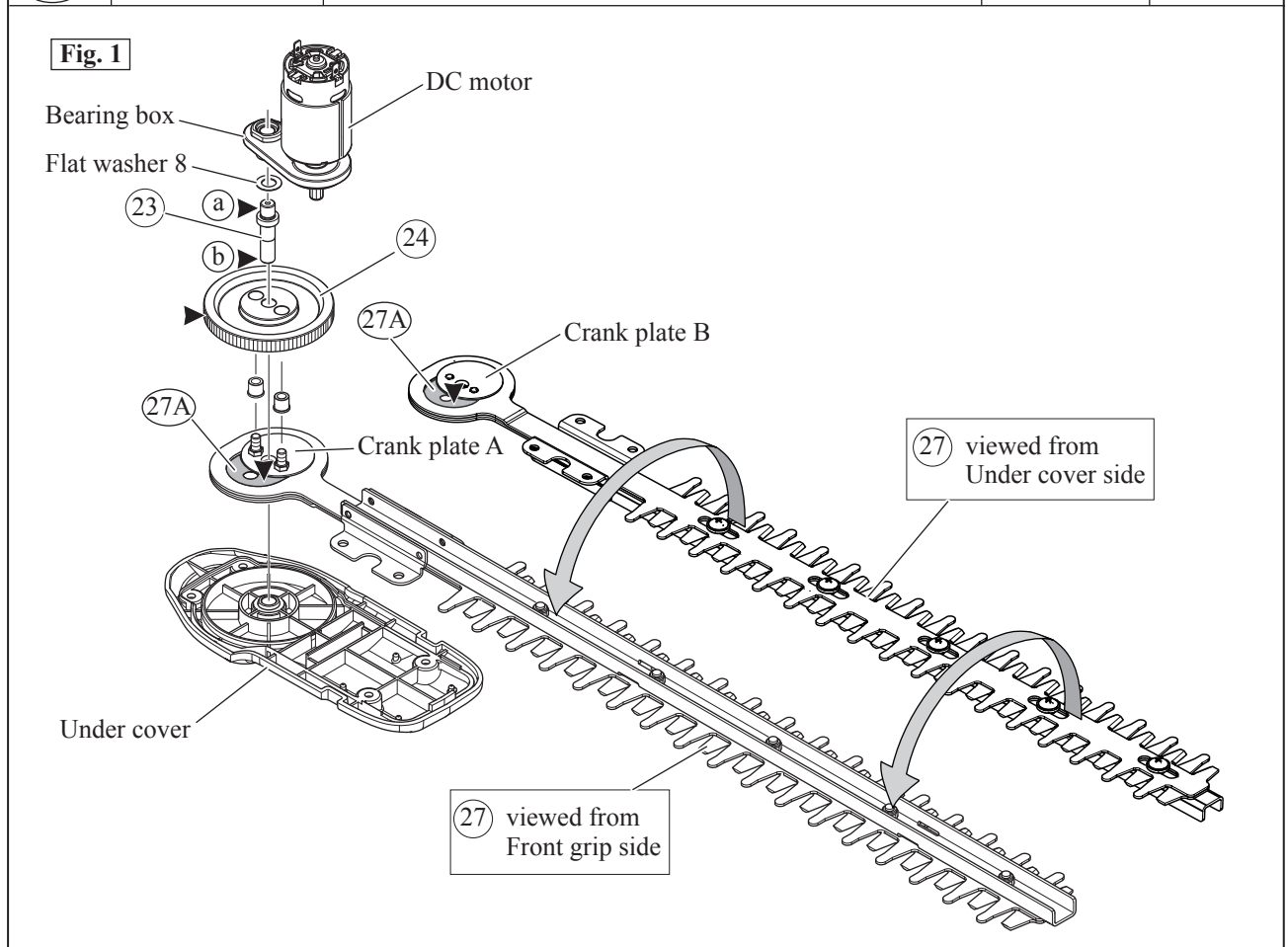
[1] NECESSARY REPAIRING TOOLS

Code No.	Description	Use for
1R035	Bearing Setting Plate	Supporting Spur gear 93, when removing Spindle with Arbor press

[2] LUBRICATION

Apply the following grease to the portions designated with the black triangle to protect parts and product from unusual abrasion.

Item No.	Description	Portion to lubricate	Grease	Amount
⑳	Spindle	㉑ The drum portion which is accepted by Bearing box	Makita grease N No.2	a little
		㉒ The drum portion which is accepted by Under cover		
㉔	Spur gear 93	Teeth portion for smooth engaging with DC motor’s gear		
㉗A	Spacer of Blade	Both side where Crank plate A and Crank plate B contact		a little



► **Repair**

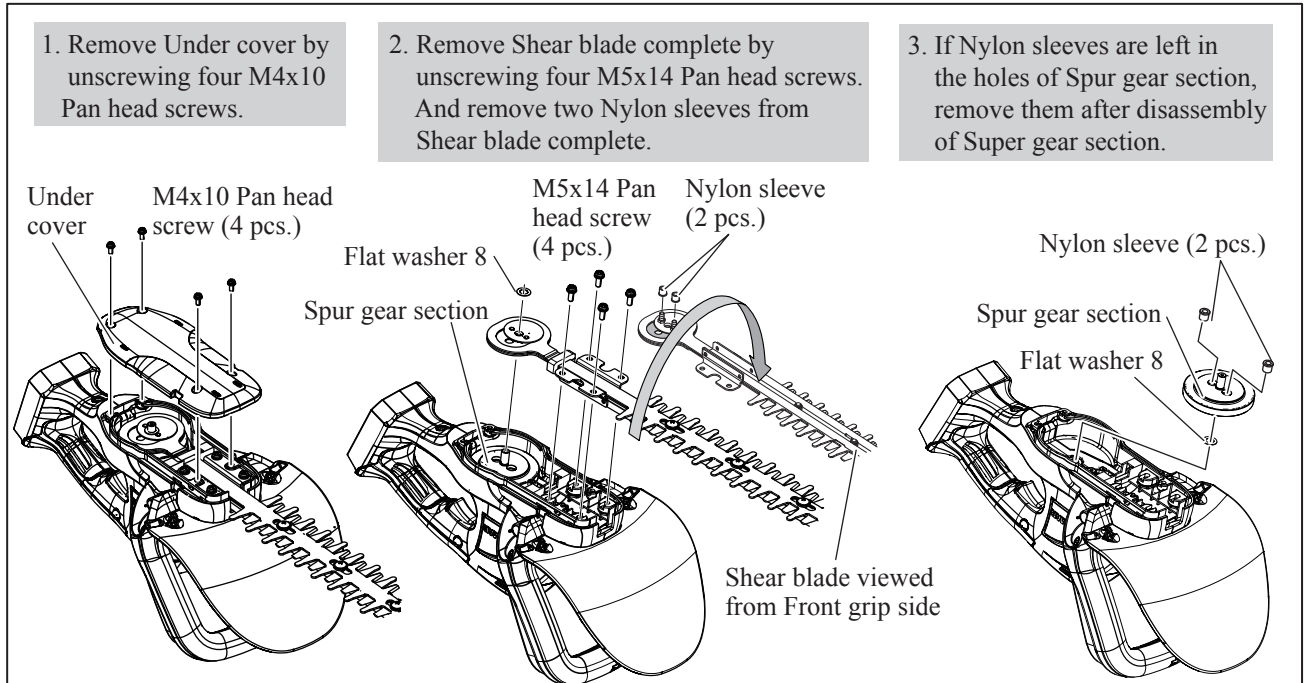
[3] DISASSEMBLY/ASSEMBLY

[3] -1. Shear blade complete

DISASSEMBLING

Disassemble Shear blade complete as drawn in **Fig. 2**.

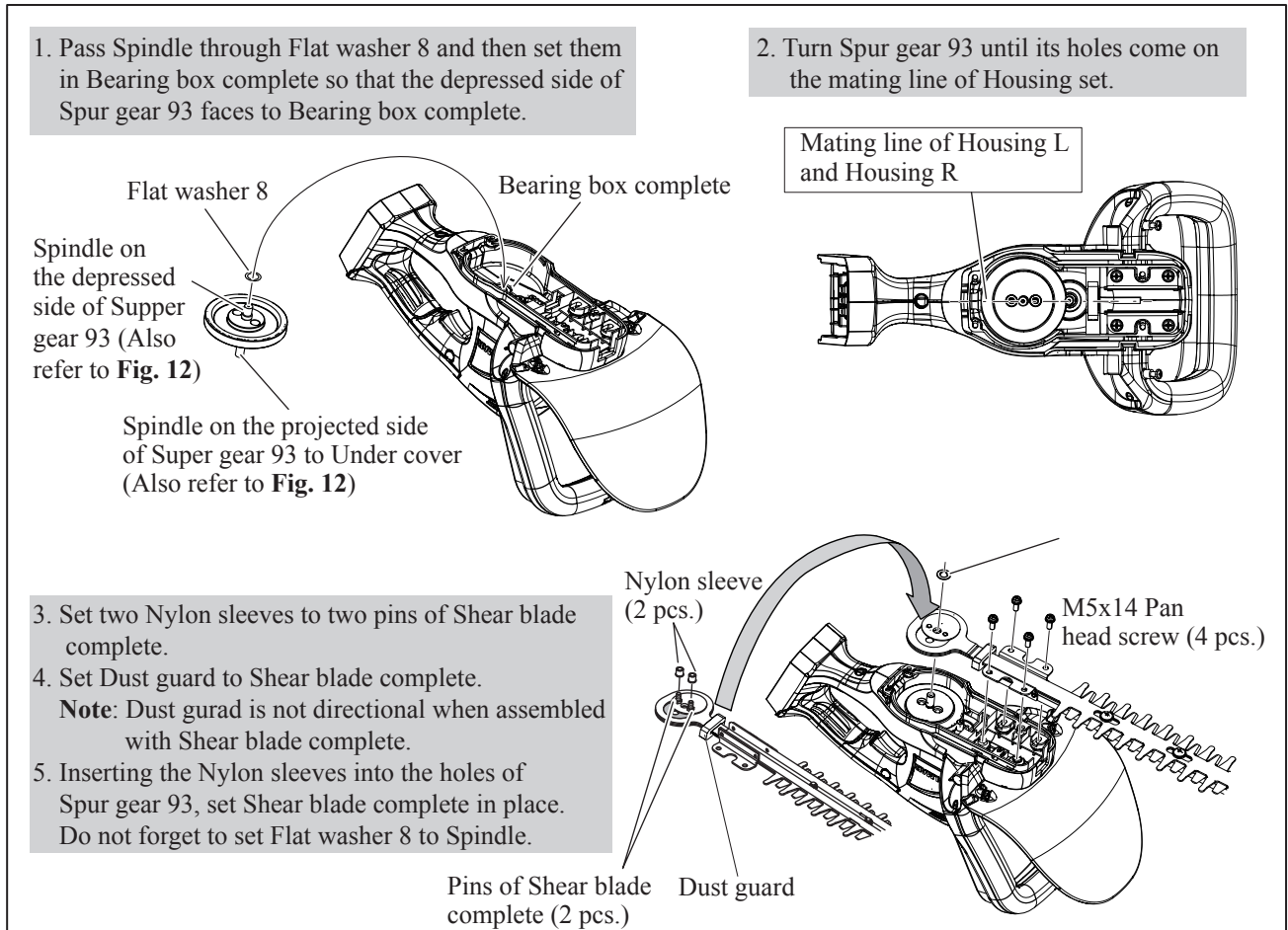
Fig. 2



ASSEMBLING

Assemble Shear blade complete to the machine as drawn in **Fig. 3**.

Fig. 3



► **Repair**

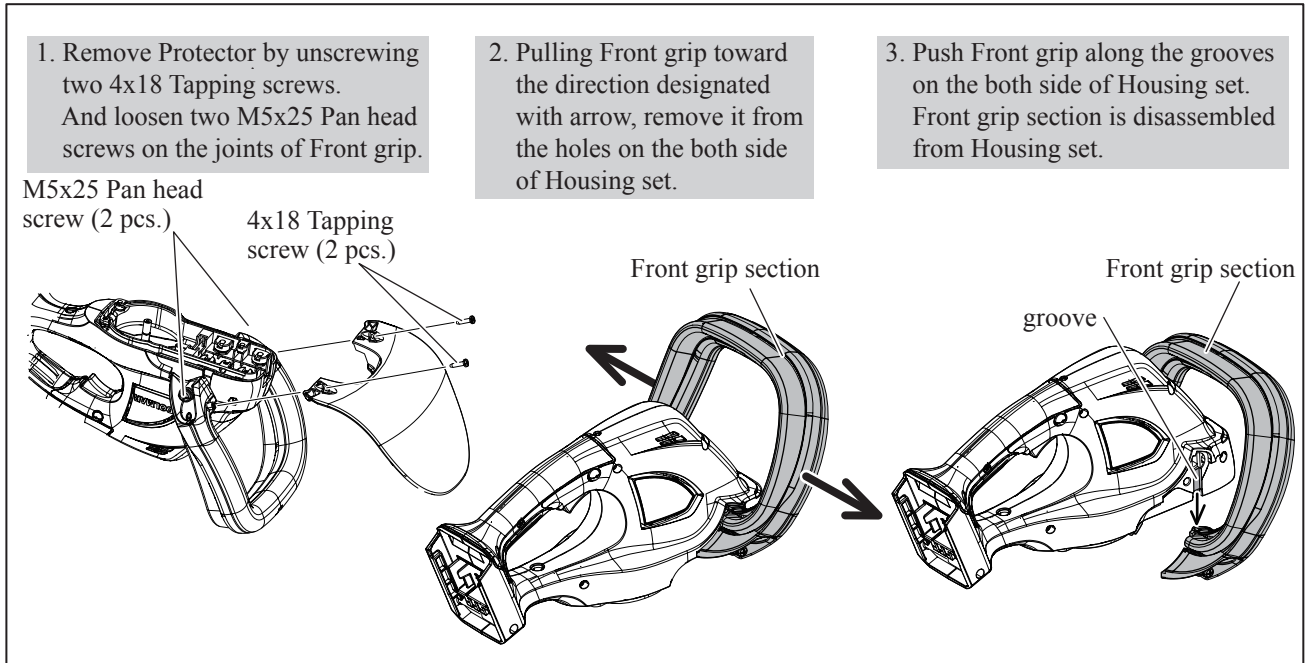
[3] DISASSEMBLY/ASSEMBLY

[3] -2. DC motor

DISASSEMBLING

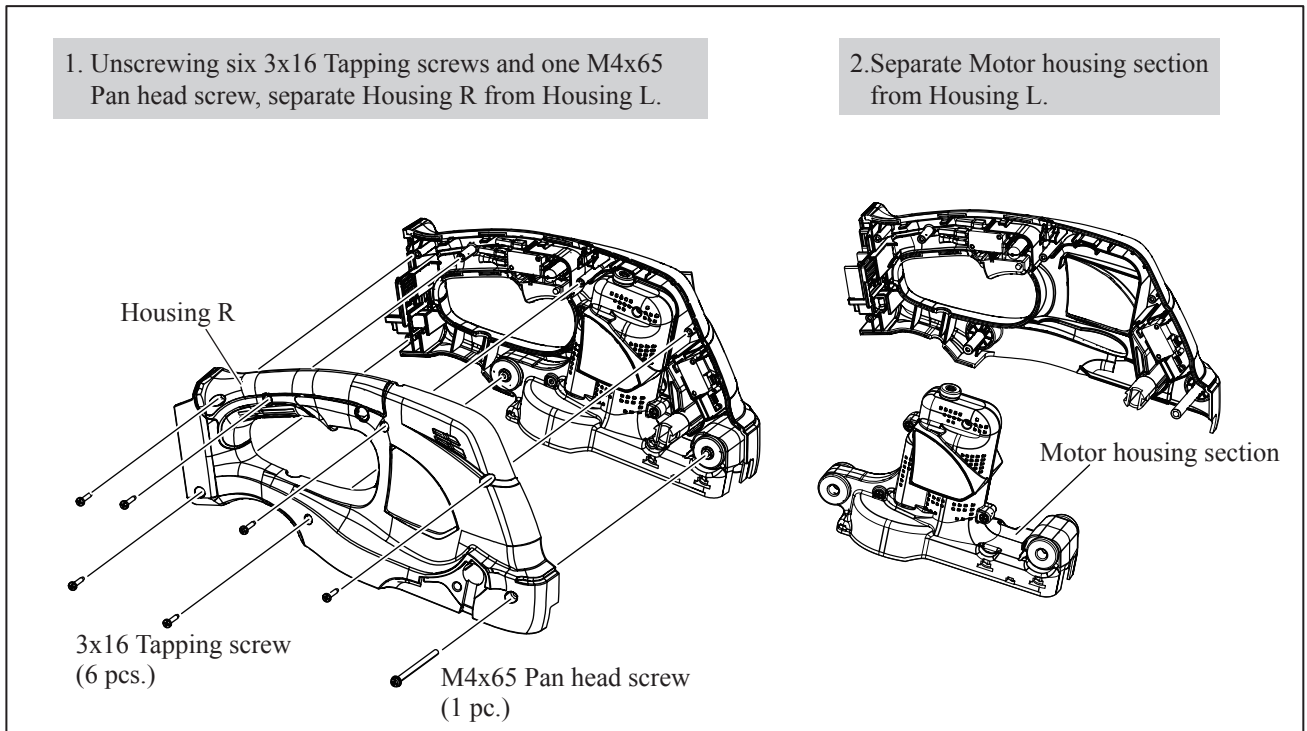
- (1) Disassemble Shear blade complete and Spur gear 93 as drawn in **Fig. 2**.
- (2) Remove Protector and Front grip section as drawn in **Fig. 4**.

Fig. 4



- (3) Separate Housing R from Housing L. Then, remove Motor housing section from Housing L. See **Fig. 5**.

Fig. 5



► **Repair**

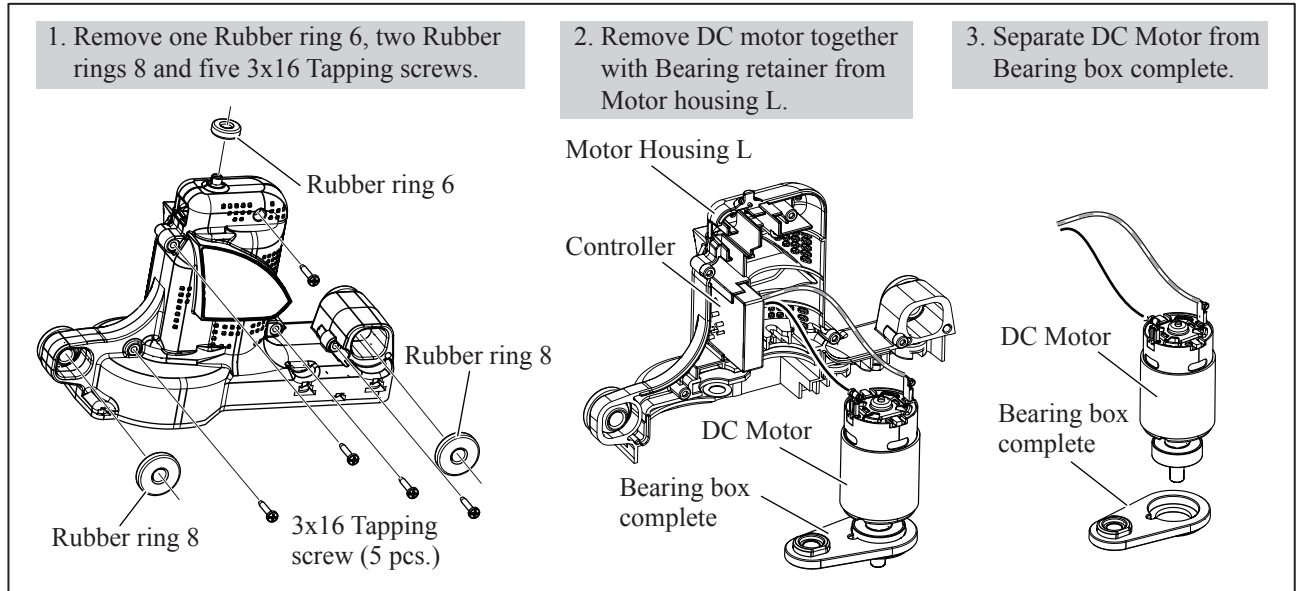
[3] DISASSEMBLY/ASSEMBLY

[3] -2. DC motor (cont.)

DISASSEMBLING

(4) Disassemble DC Motor from Motor housing as drawn in **Fig. 6**.

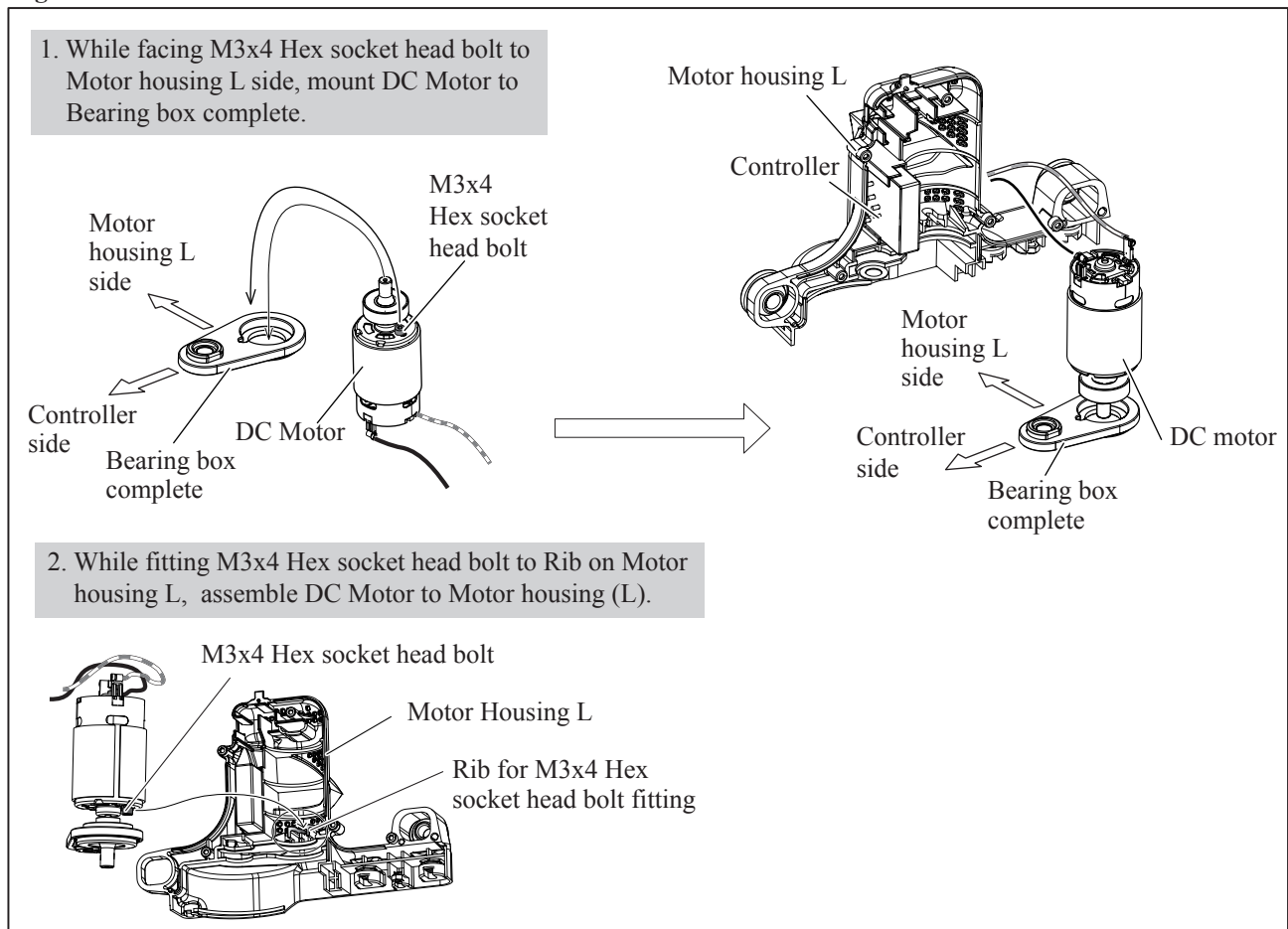
Fig. 6



ASSEMBLING

(1) Assemble DC Motor in the reverse order of Disassembly. (Refer to **Figs. 6, 5 and 4**)
And also refer to **Fig. 7**.

Fig. 7



► **Repair**

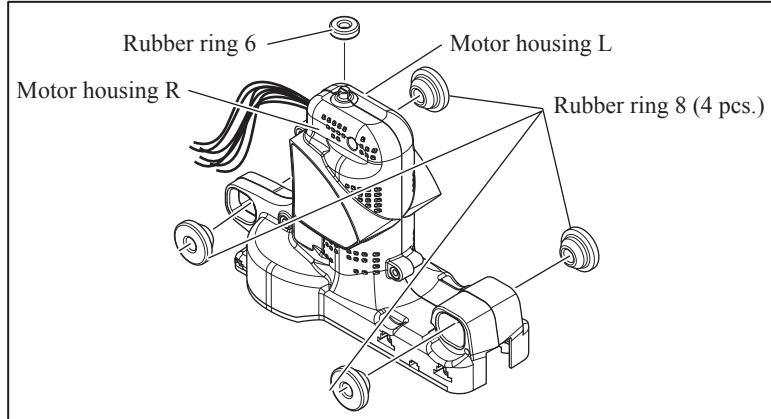
[3] DISASSEMBLY/ASSEMBLY

[3] -2. DC motor (cont.)

ASSEMBLING

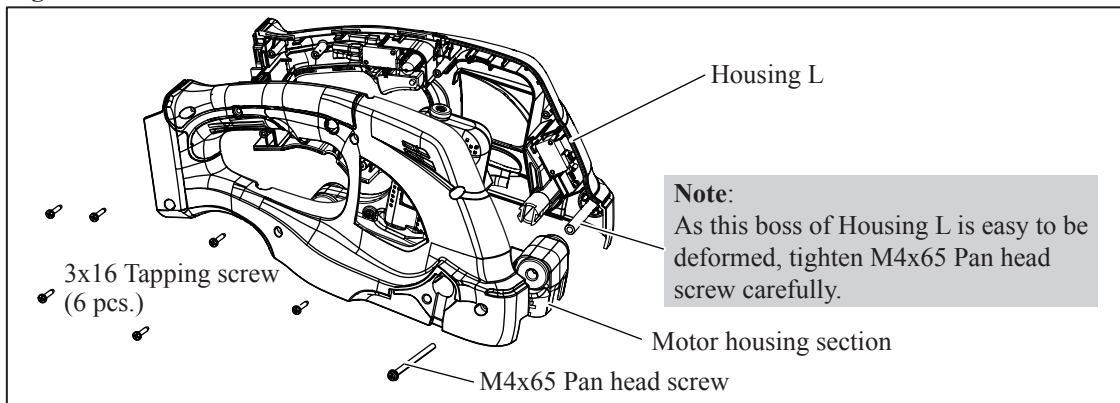
(2) Fix Motor housing R and Motor housing L with Rubber rings as drawn in **Fig. 8**.

Fig. 8



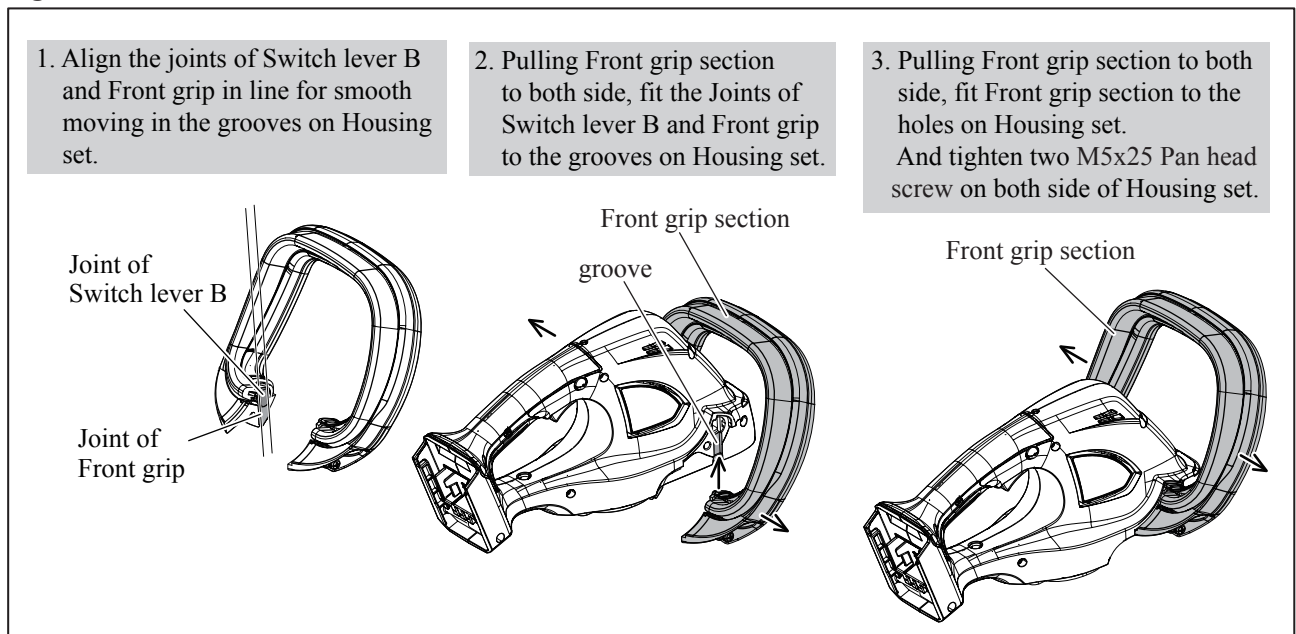
(3) Setting Motor housing section to Housing L, set Housing R in place with six 3x16 Tapping screws and one M4x65 Pan head screw as drawn in **Fig. 9**.

Fig. 9



(4) Assemble Front grip section as drawn in **Fig. 10**.

Fig. 10



► **Repair**

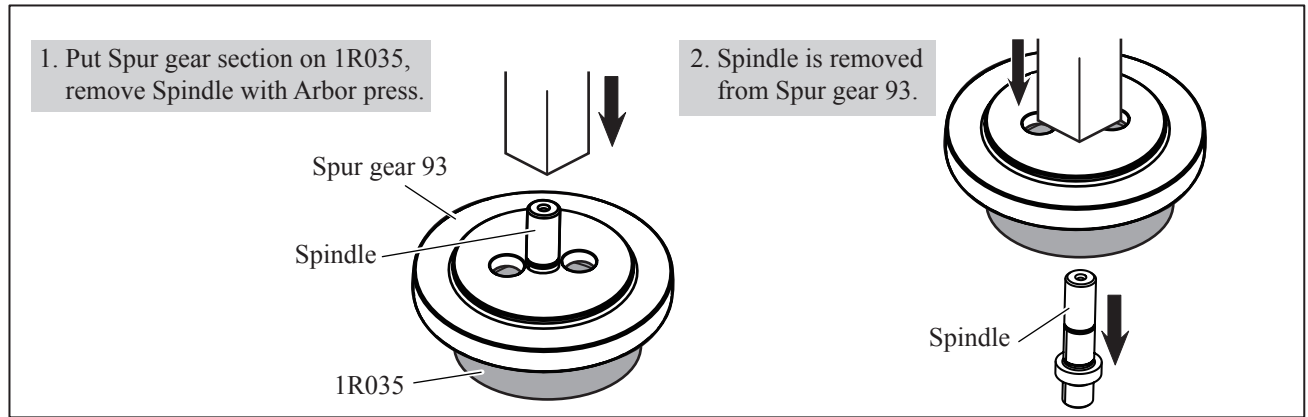
[3] DISASSEMBLY/ASSEMBLY

[3] -3. Spur Gear 93

DISASSEMBLING

- (1) Disassemble Shear blade complete, and then, remove Spur gear section as drawn in **Fig. 2**.
- (2) Disassemble Spur gear 93 as drawn in **Fig. 11**.

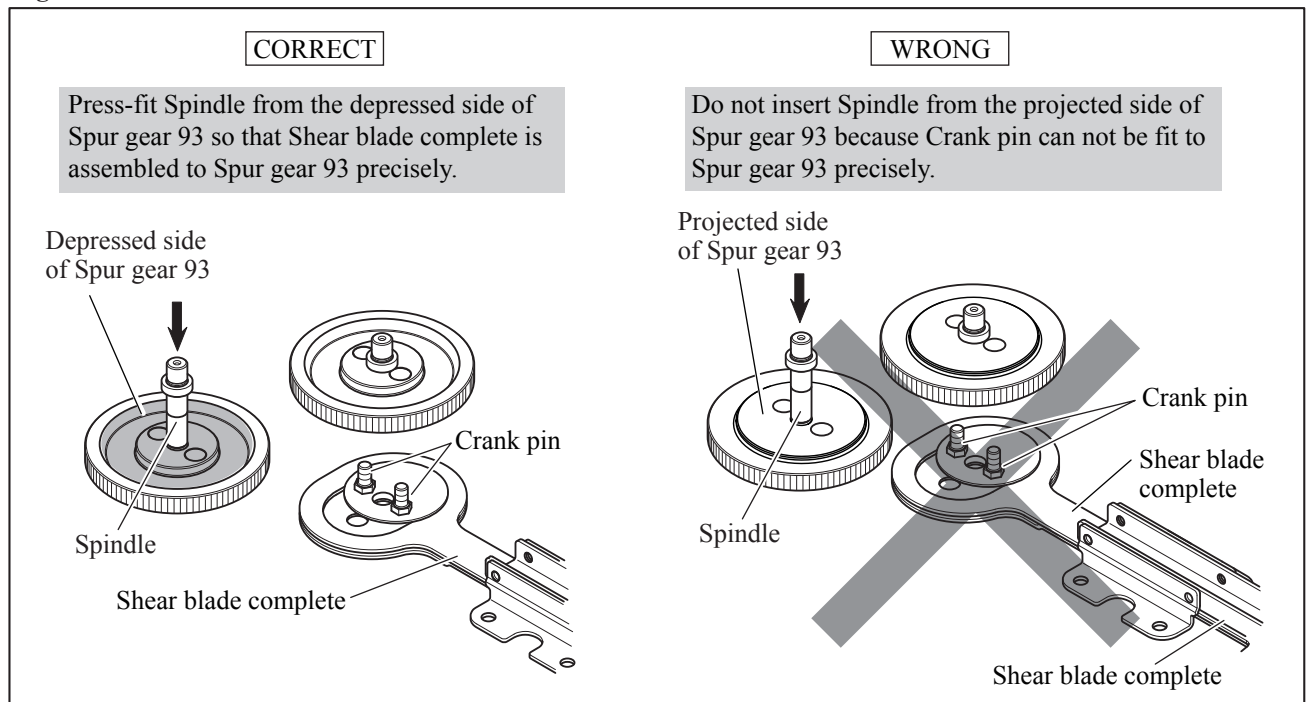
Fig. 11



ASSEMBLING

- (1) Assemble Spindle to Spur gear 93 as drawn in **Fig. 12**.

Fig. 12



- (2) Face its grooved side of Spur gear 93 to Bearing box complete and assemble Spur gear section to Bearing box complete.

Note: Be sure to set two Flat washers 8 on both Spindle ends, two Nylon sleeves into holes of Shear blade complete as drawn in **Fig. 3**.

► **Repair**

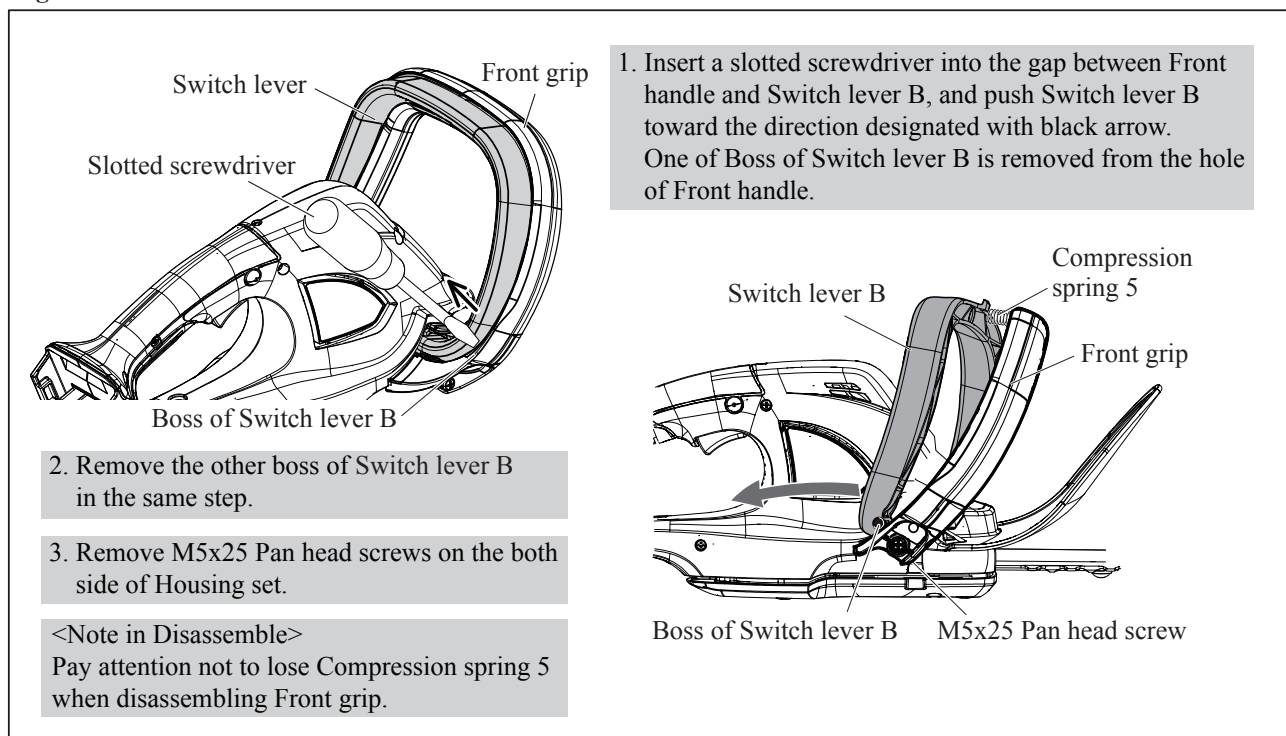
[3] DISASSEMBLY/ASSEMBLY

[3] -4. Front grip

DISASSEMBLING

(1) Remove Front grip section without disassembling Under cover as drawn in **Fig. 13**.

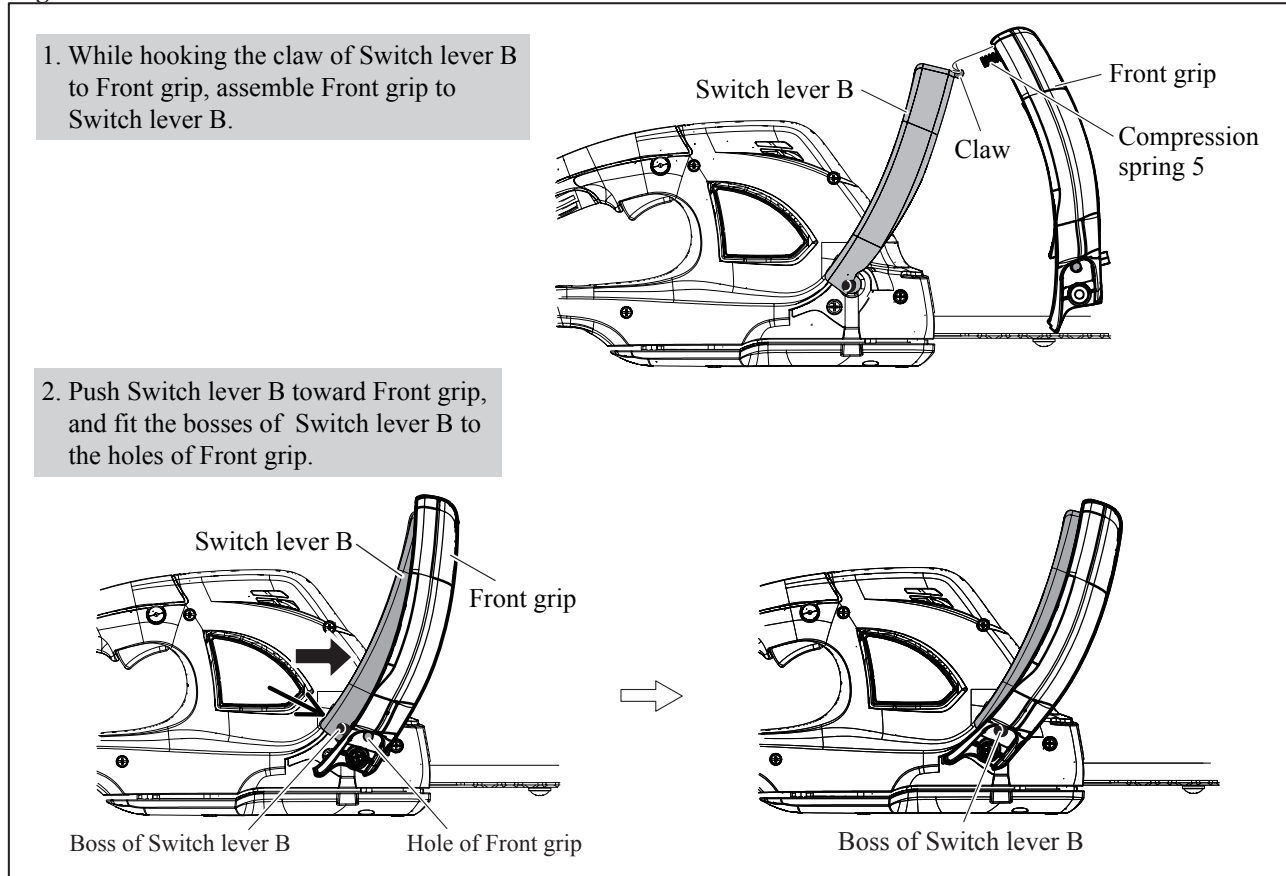
Fig. 13



ASSEMBLING

(1) Assemble Front grip as drawn in **Fig. 14**.
 (2) Assemble Protector to Front grip. Refer to **Fig. 4**.

Fig. 14



► Repair

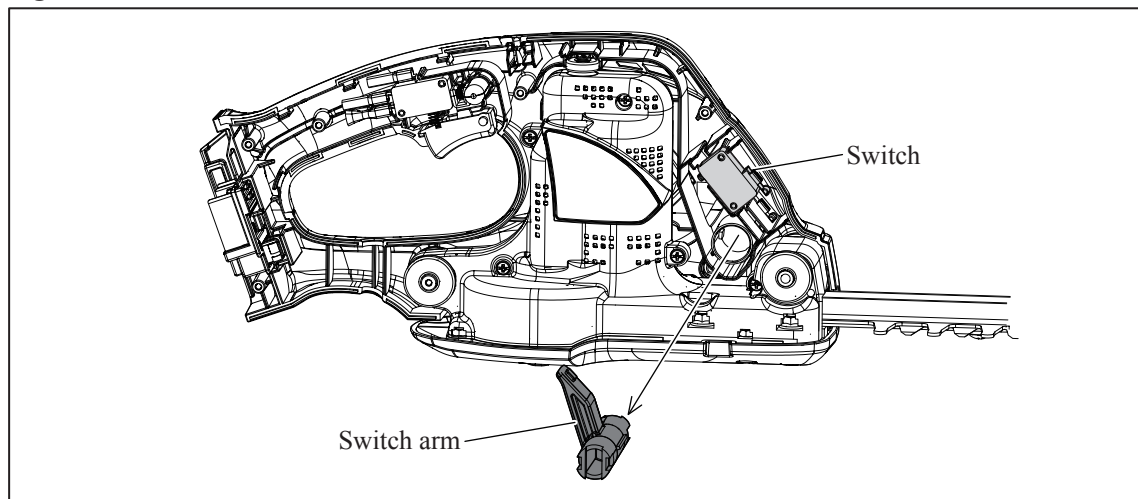
[3] DISASSEMBLY/ASSEMBLY

[3] -5. Switch arm

DISASSEMBLING

- (1) Disassemble Front grip section as drawn in **Fig. 4**.
- (2) Remove Housing R as drawn in **Fig. 5**.
- (3) Switch arm is removed as drawn in **Fig. 15**.

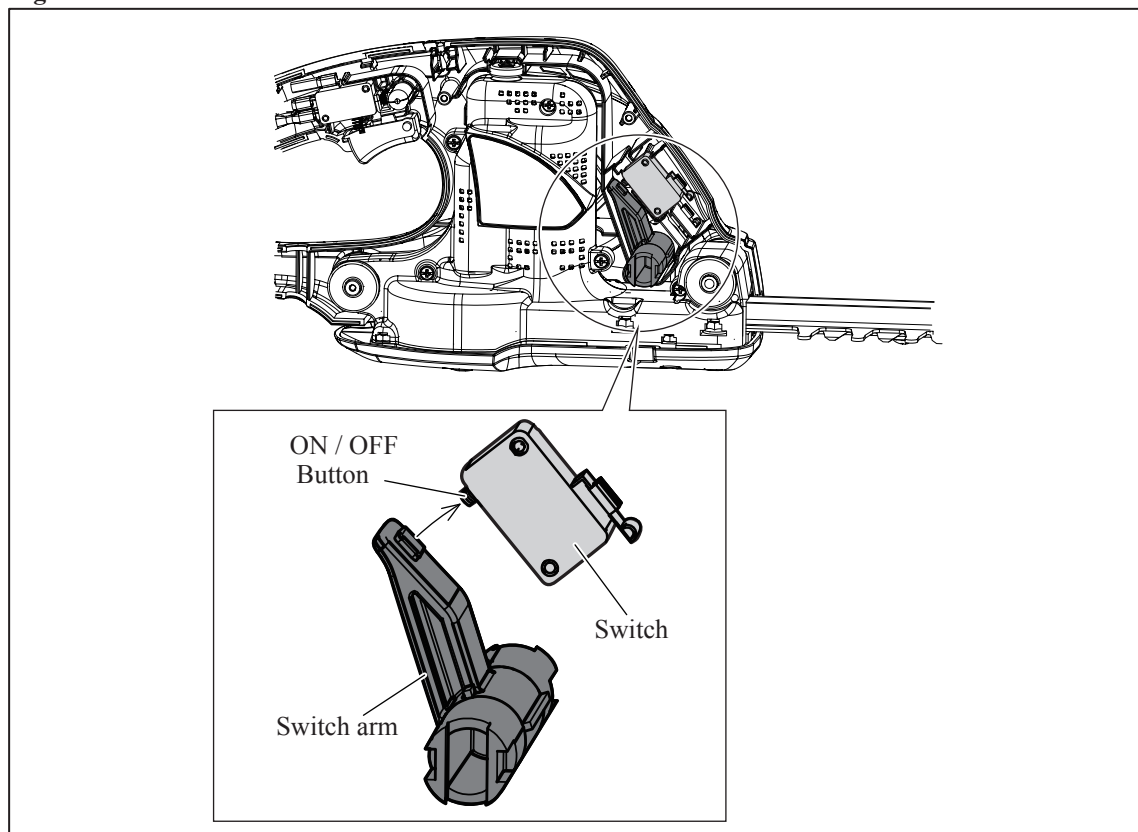
Fig. 15



ASSEMBLING

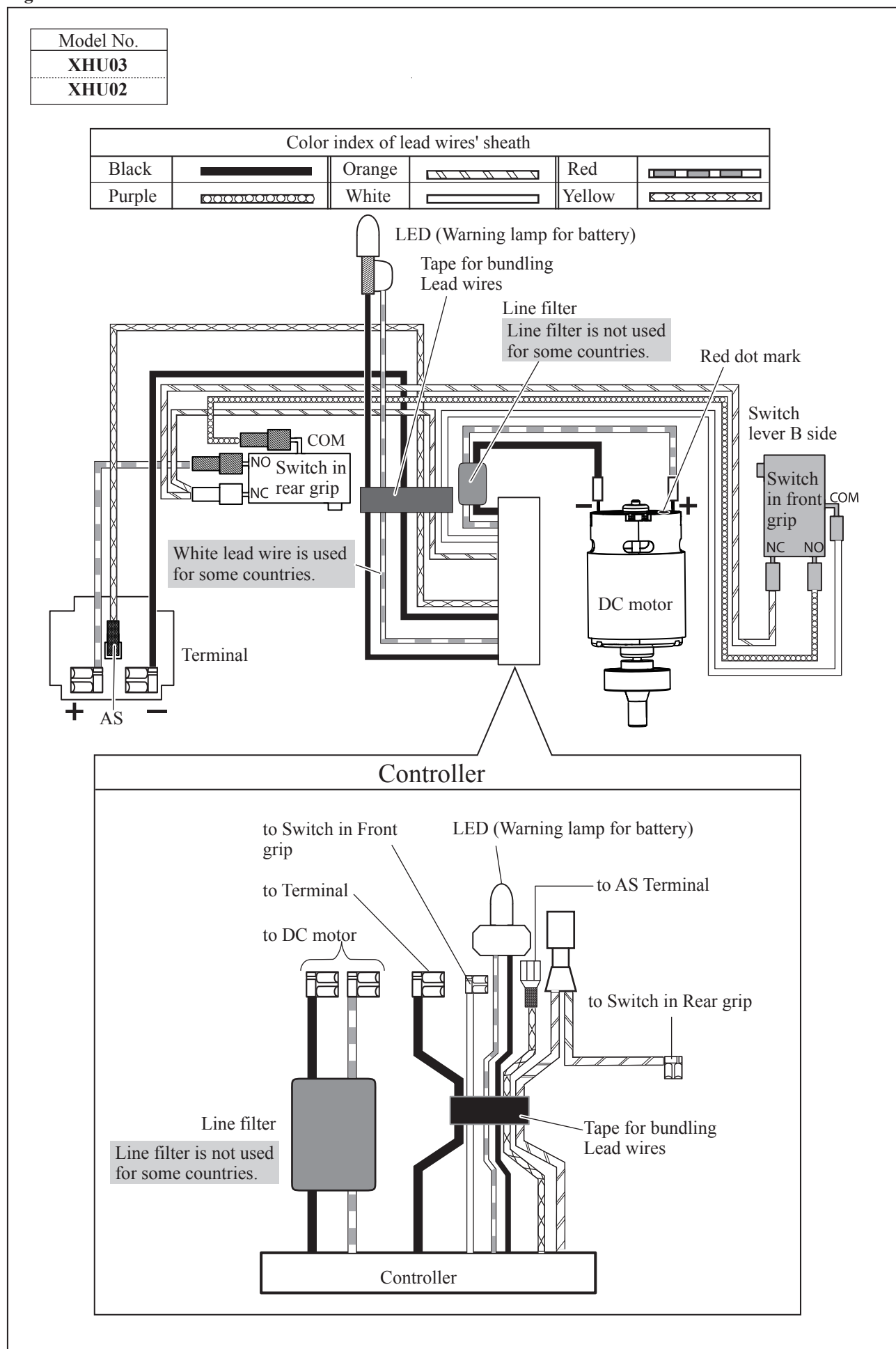
Switch arm has to be assembled to Housing L so that it can push ON/OFF button of Switch to link with Switch lever B's action. See **Fig. 16**.

Fig. 16



► **Circuit diagram**

Fig. D-1



► **Wiring diagram**

Fig. D-2

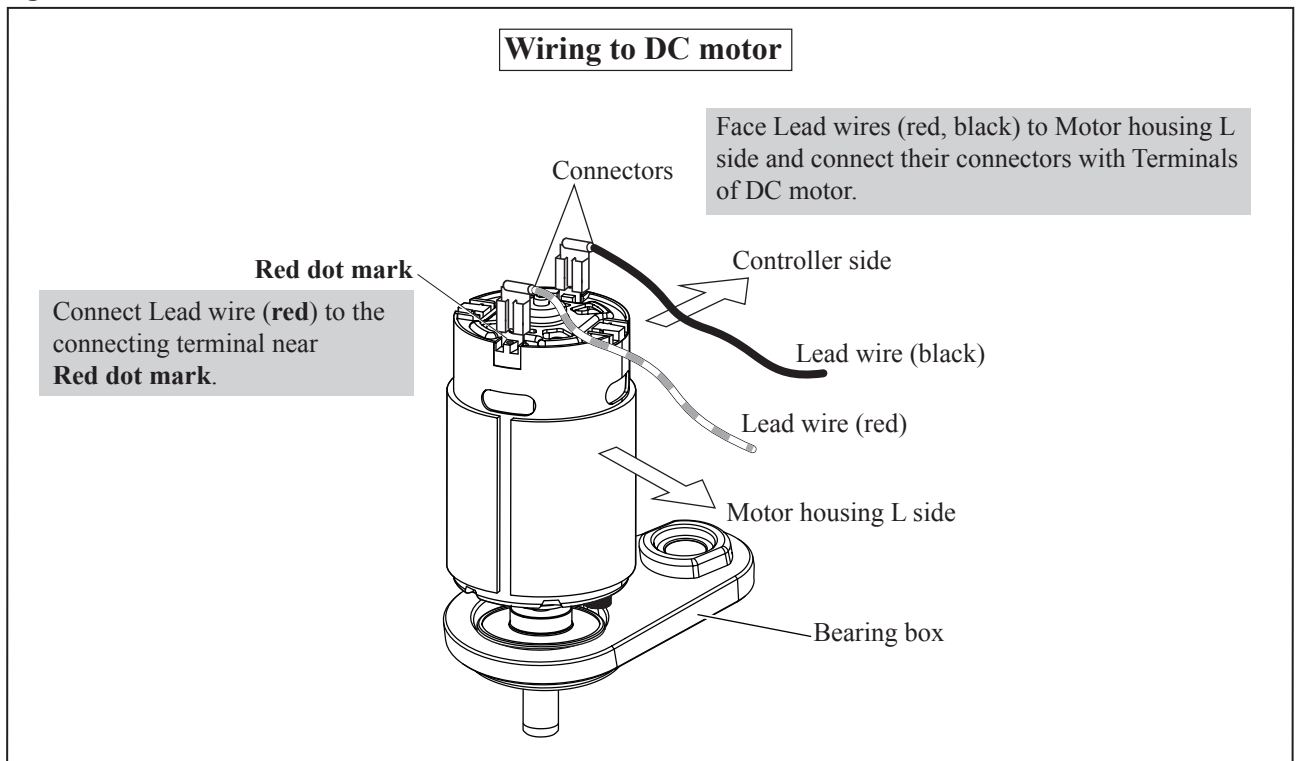
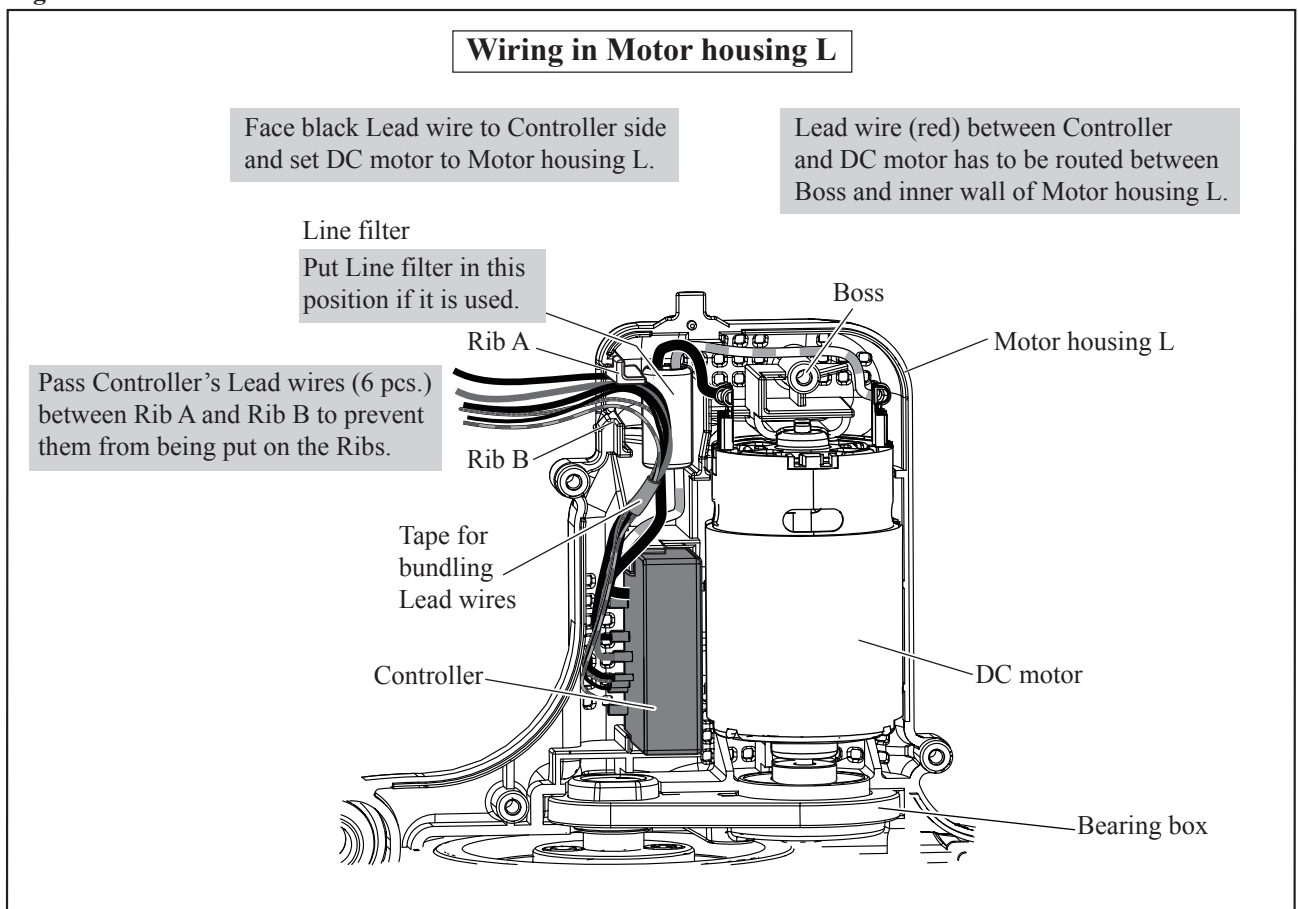
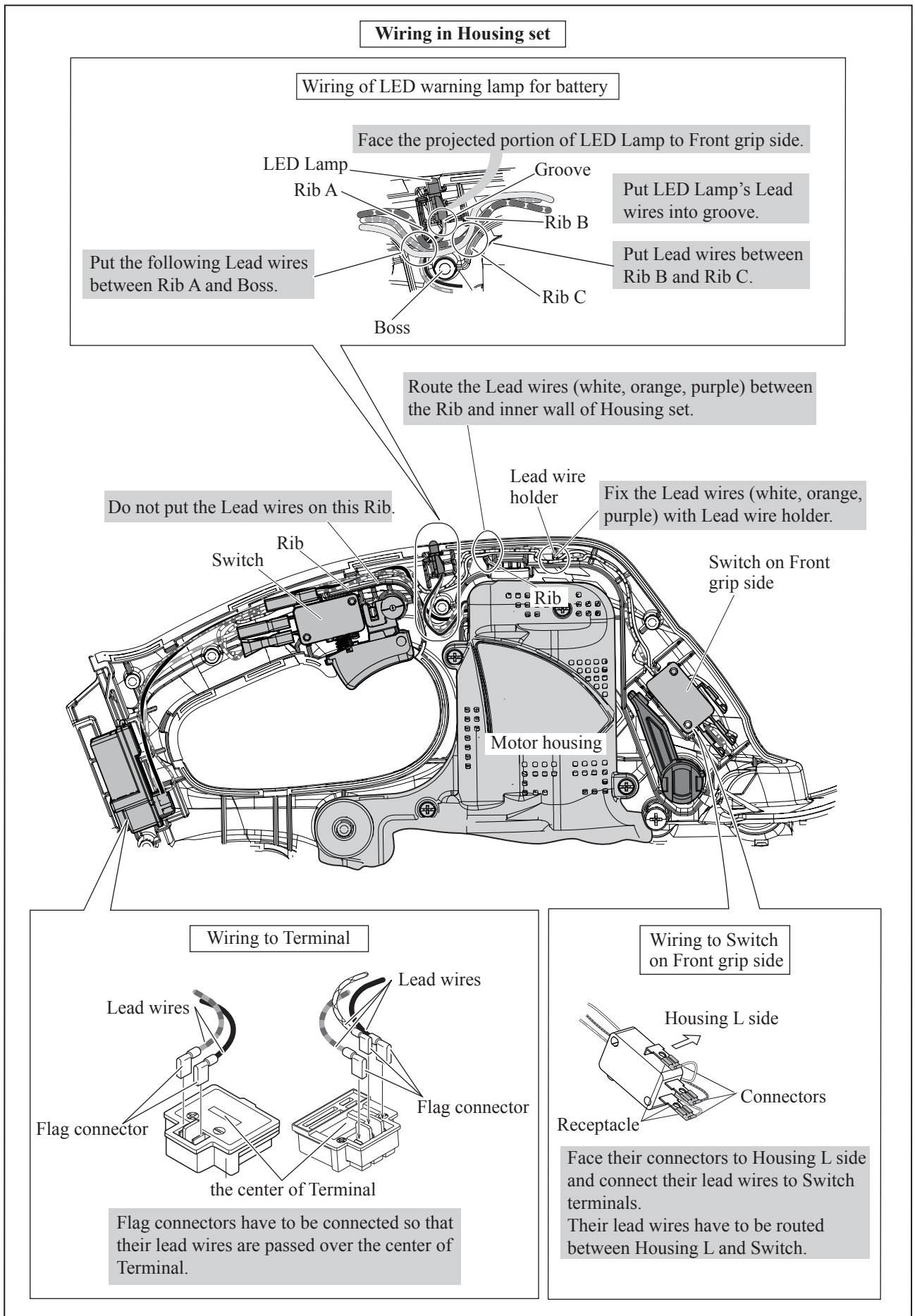


Fig. D-3



► **Wiring diagram (cont.)**

Fig. D-4





REPAIR MANUAL

XBU02

► Repair

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

[1] NECESSARY REPAIRING TOOLS

Code No.	Description	Use for
1R028	Bearing setting pipe 20-12.2	press-fitting Motor housing cover to Rotor
1R032	Bearing setting plate 8.2	holding Rotor when press fitting Motor housing cover
1R045	Gear extractor (large)	removing Fan 110, Rotor
1R247	Round bar for arbor 20-100	press-fitting Rotor and Motor housing cover
1R269	Bearing extractor	removing Ball bearing 626DDW, 698LLU from Rotor

[2] LUBRICATION

No need to lubricate.

► Repair

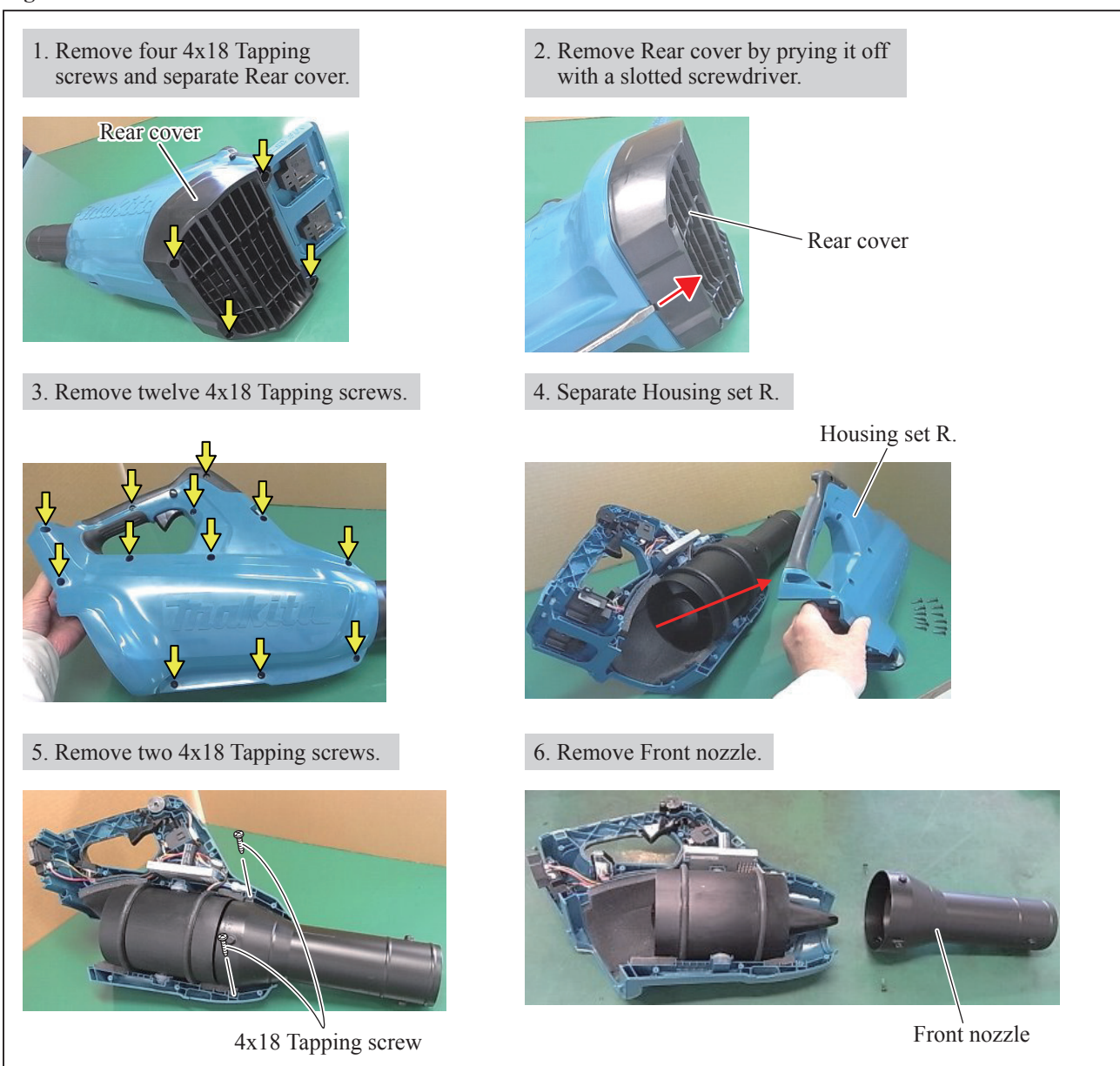
[3] DISASSEMBLY/ASSEMBLY

[3] -1. Fan 110, Rotor

DISASSEMBLING

(1) Remove Front nozzle, Rear cover and Housing set R. (Fig. 1)

Fig. 1



► **Repair**

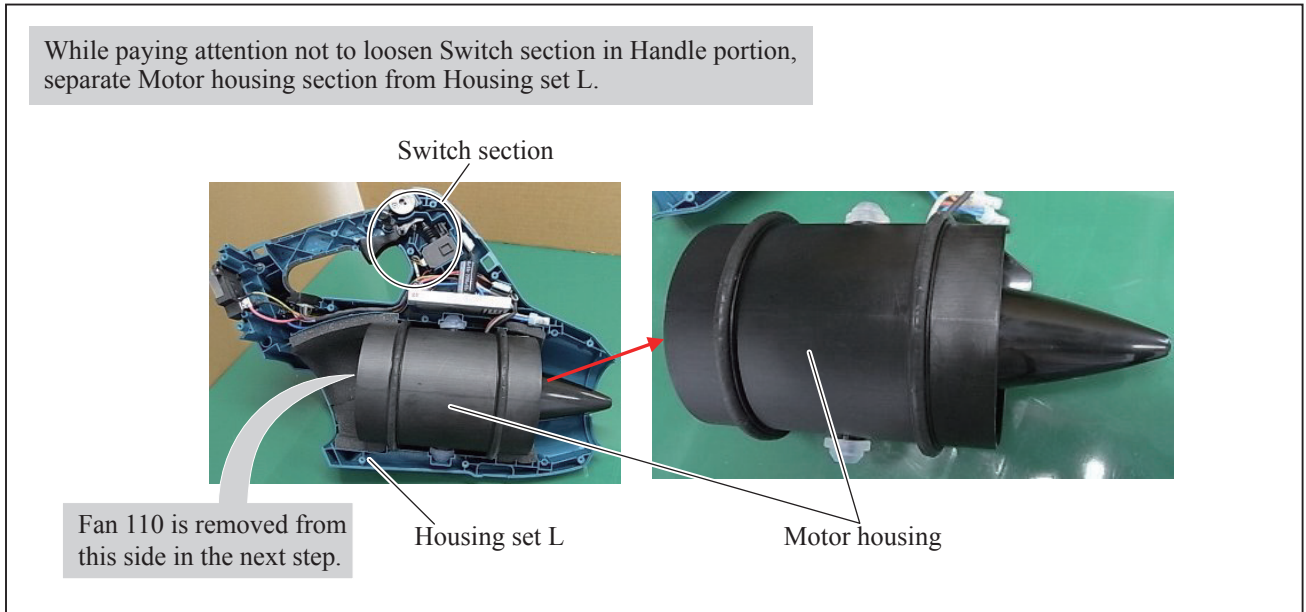
[3] DISASSEMBLY/ASSEMBLY

[3] -1. Fan 110, Rotor (cont.)

DISASSEMBLING

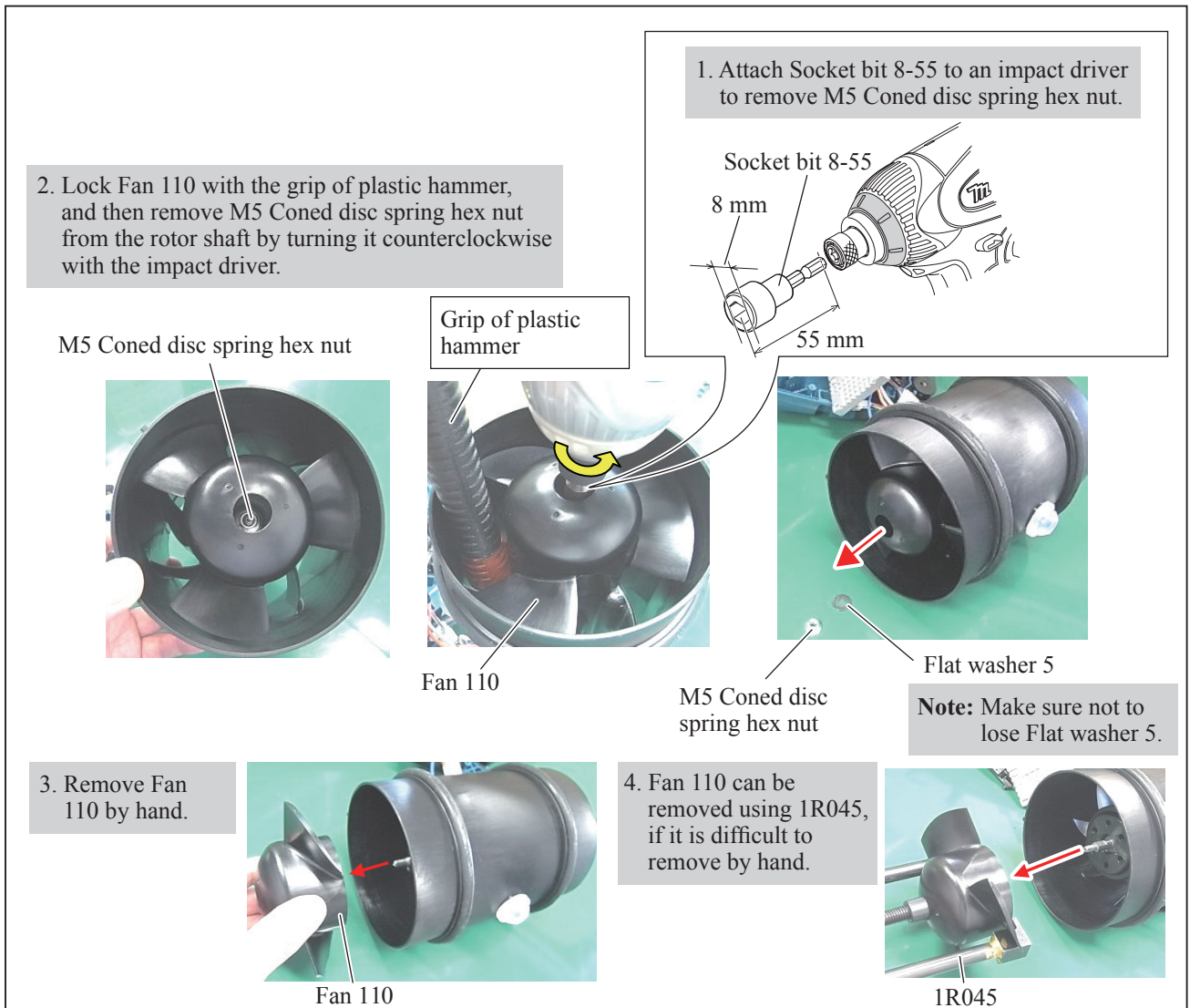
(2) Separate Motor housing from Housing set L. (Fig. 2)

Fig. 2



(3) Remove M5 Coned disc spring hex nut from the rotor shaft and remove Fan 110. (Fig. 3)

Fig. 3



► **Repair**

[3] DISASSEMBLY/ASSEMBLY

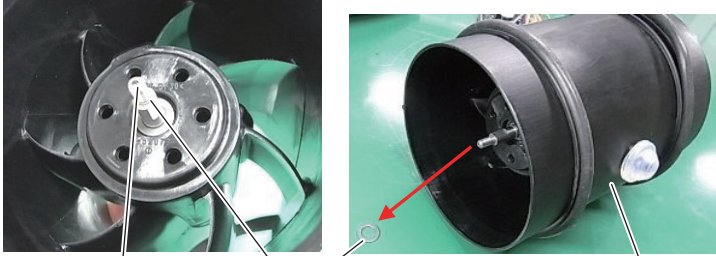
[3] -1. Fan 110, Rotor (cont.)

DISASSEMBLING

(4) Remove Rotor from Motor housing. (Fig. 4)

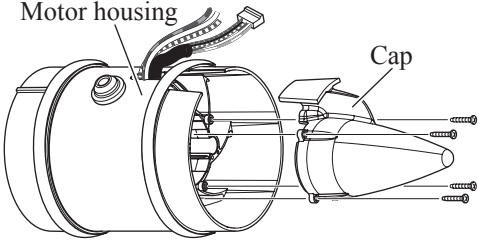
Fig. 4

1. Remove Flat washer 8 from the rotor shaft.



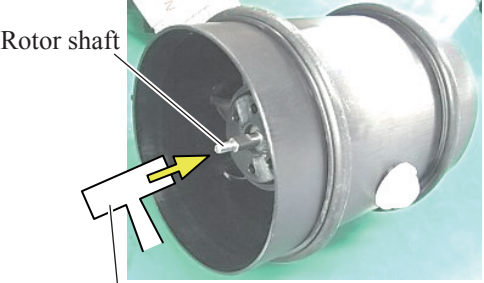
Rotor Flat washer 8 Motor housing

2. Loosen four 3x20 Tapping screws, and disassemble Cap from Motor housing so that Rotor can be removed from the cap side.



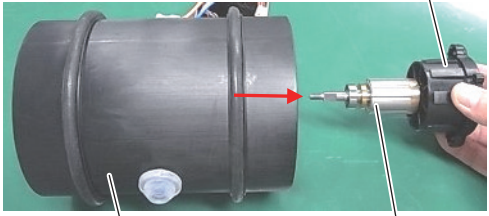
Motor housing Cap

3. Tap the rotor shaft with a plastic hammer.



Rotor shaft Plastic hammer

4. Remove Rotor and Motor housing cover from Motor housing.

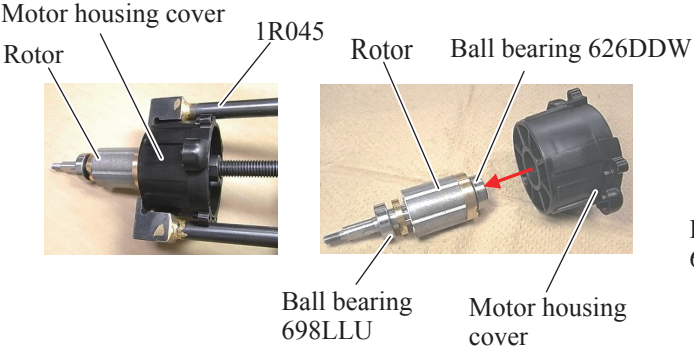


Motor housing cover Motor housing Rotor

(5) Remove Motor housing cover and Ball bearings from Rotor. (Fig. 5)

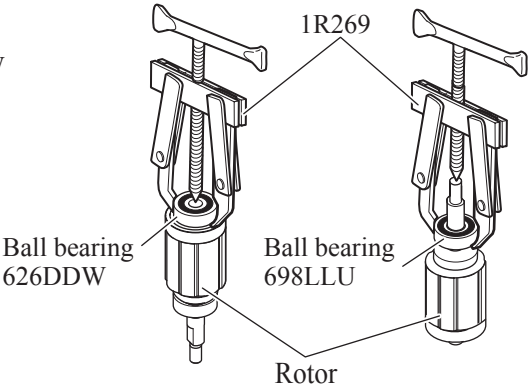
Fig. 5

1. Remove Rotor from Motor housing cover with 1R045.



Motor housing cover Rotor 1R045 Rotor Ball bearing 626DDW Ball bearing 698LLU Motor housing cover

2. Remove Ball bearings from Rotor using 1R269.



1R269 Ball bearing 626DDW Ball bearing 698LLU Rotor

► Repair

[3] DISASSEMBLY/ASSEMBLY

[3] -1. Fan 110, Rotor (cont.)

Caution for Handling of Rotor

When handling or storing multiple Rotors, be sure to keep a proper distance between Rotors as shown in **Fig. 6** because Rotor has a strong magnetic force.

Failure to follow this instruction could result in:

- Finger injury caused by pinching between Rotors
- Magnetic loss of Rotors or damage on the magnet portion of Rotor (**Fig. 7**)

Fig. 6

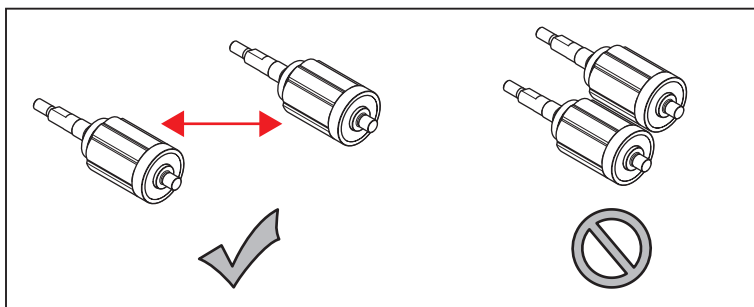
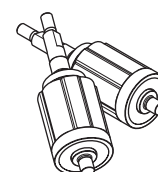


Fig. 7

- * Magnetic loss of Rotors
- * Damage on the magnet portion of Rotor

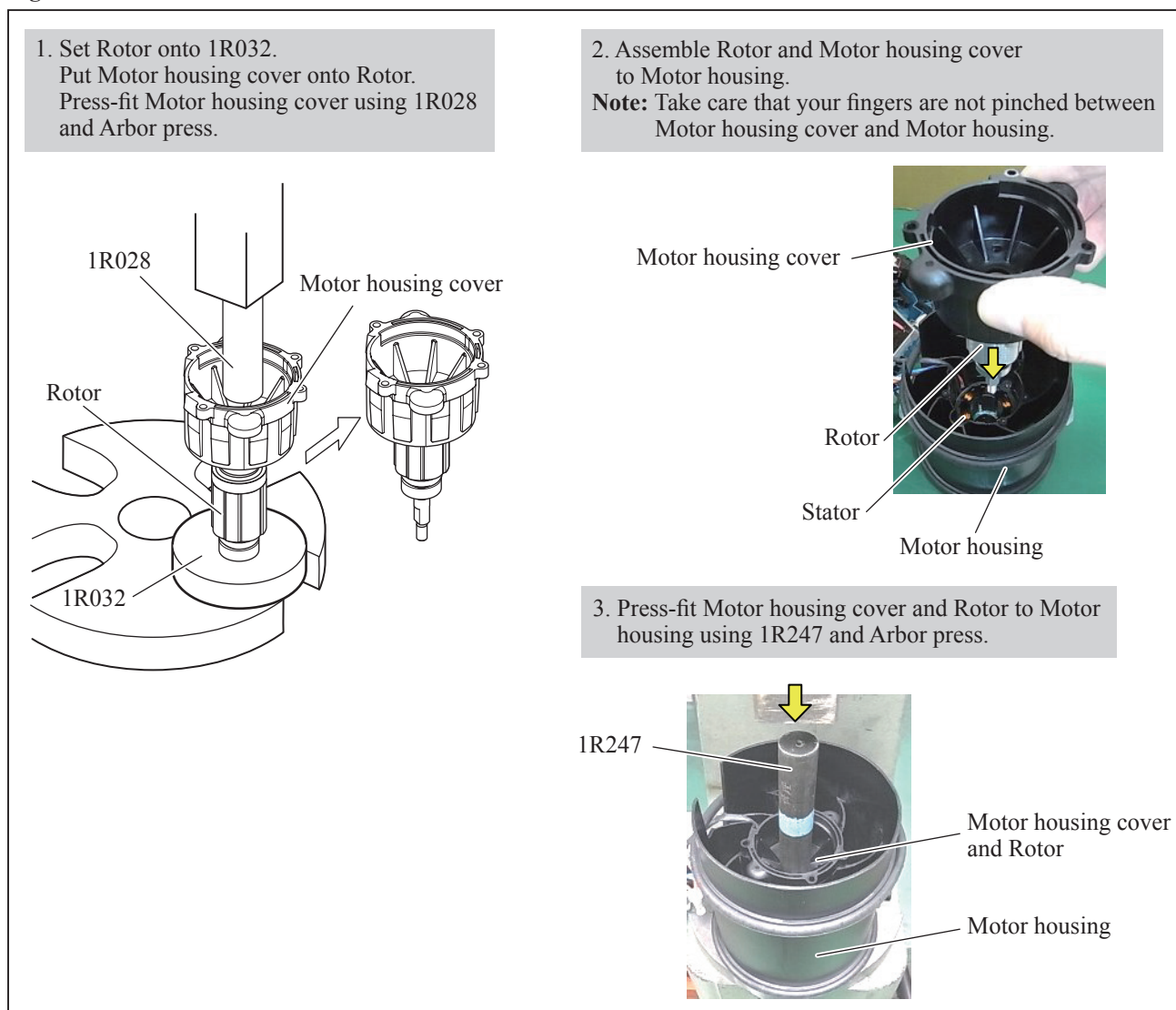


ASSEMBLING

(1) Assemble Ball bearings 626DDW/ 698LLU to Rotor. (**Fig. 5**)

(2) Assemble Motor housing cover to Rotor. And assemble them to Motor housing. (**Fig. 8**)

Fig. 8



► **Repair**

[3] DISASSEMBLY/ASSEMBLY

[3] -1. Fan 110, Rotor (cont.)

ASSEMBLING

(3) Assemble Fan 110 to the rotor shaft. (**Fig. 9**)

Fig. 9

1. Fix Cap to Motor housing with four 3x20 Tapping screws.

2. Assemble Flat washer 8 to the rotor shaft.

2. Assemble Fan 110 to the rotor shaft while aligning their flats on Fan110 and the rotor shaft.

3. Using an awl or a small screwdriver as a guide rail, assemble Flat washer 5 to the rotor shaft.

4. Lock Fan 110 with the grip of plastic hammer.

5. Attach M5 Coned disc spring hex nut to Socket bit 8-55, and tighten M5 Coned disc spring hex nut by turning it clockwise.

6. Rubber ring 8 must be mounted to Motor housing as shown in the figure on the left. Otherwise, Motor housing can not be properly mounted to Housing set L.

► Repair

[3] DISASSEMBLY/ASSEMBLY

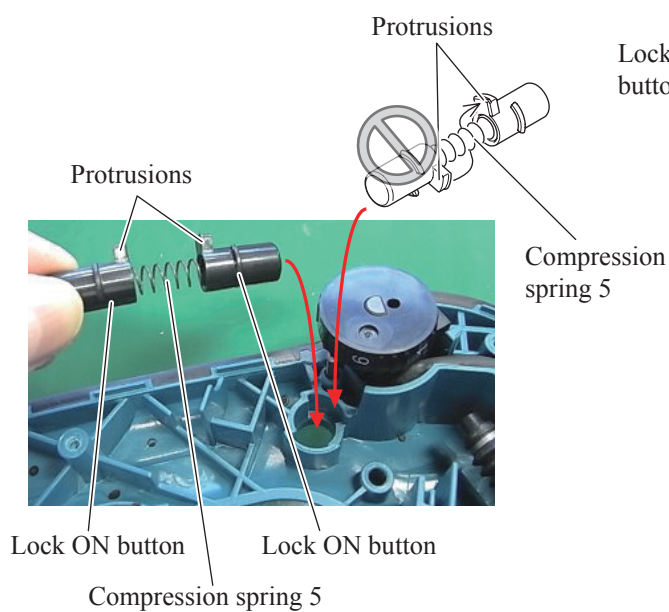
[3] -2. Fan Lock ON button

ASSEMBLING

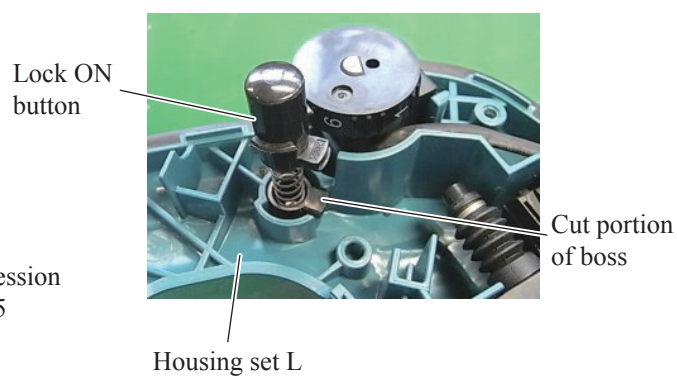
Assemble Lock ON button. (Fig. 10)

Fig. 10

1. Join Lock ON buttons and Compression spring 5 together while aligning their protrusions on Lock ON buttons in the same direction.
If not, Housing set R may not be fixed properly.



2. Assemble Lock ON button to Housing set L while fitting one protrusion to the cut portion of boss.



3. If the Lock ON button protrudes from the mounted Housing set R, Lock ON button is assembled properly.



Note:

If Lock ON button does not protrude from Housing set R, align their protrusions on Lock ON buttons in the same direction.

► Repair

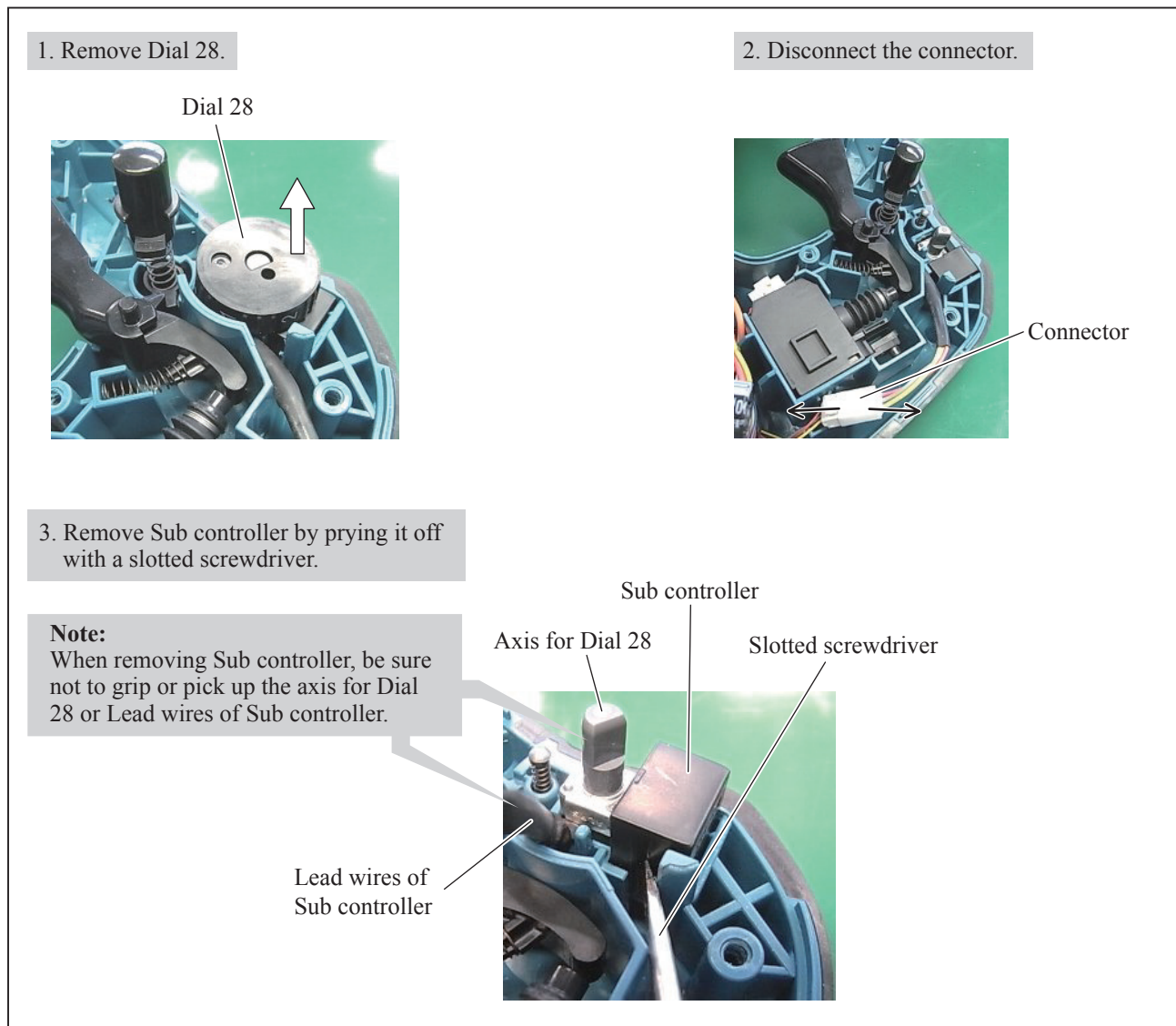
[3] DISASSEMBLY/ASSEMBLY

[3] -3. Sub Controller

DISASSEMBLING

Disassemble Sub controller. (Fig. 11)

Fig. 11



► Repair

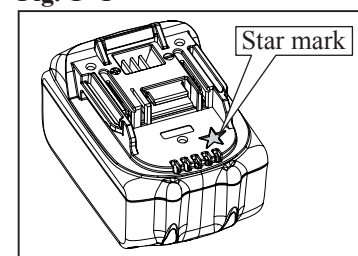
[4] TROUBLESHOOTING

Whenever you find any trouble in your machine, refer to this chapter first.

Note in Repairing

- (1) Use a full charged battery which has the star mark. (**Fig. T-1**)
- (2) When Housing is disassembled, check the conditions of the electrical parts (Connectors, Lead wires, Switches, etc.), Rotor, Stator, Gear section, etc.
- (3) Do a running test 10 times.

Fig. T -1

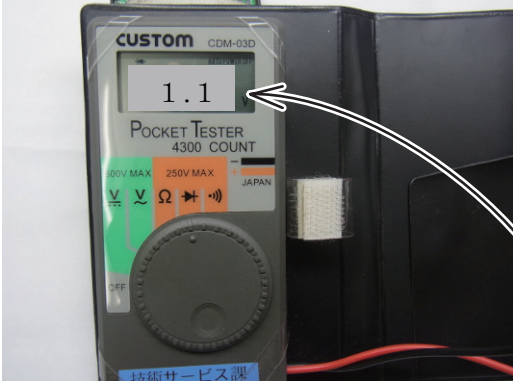


Test for recognizing the trouble on FET (Field effect transistor) of Controller

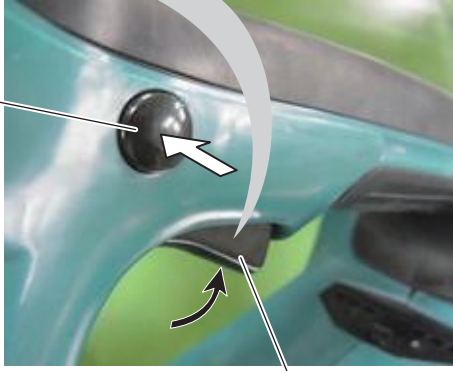
Trouble on Controller can be checked with Tester as follows.

Fig. T -2

1. Set Digital tester (1R402) in the diode mode (▶ mark on the tester).




2. After removing the battery from the machine, lock Switch lever to ON position by pushing Lock ON button.



3. Connect Black test probe to the plus pole, Red test probe to minus pole of Terminal. And, check the value display on the tester.
Note: Be careful not to connect the probes in reverse.

4. Wait until the reading is stable. If it reads within **0.9V - 1.3V**, there is no fault on FET of Controller. If it reads **0V or 0.4V approx., Controller is broken.** Replace it with a new one.



Red test probe Black test probe

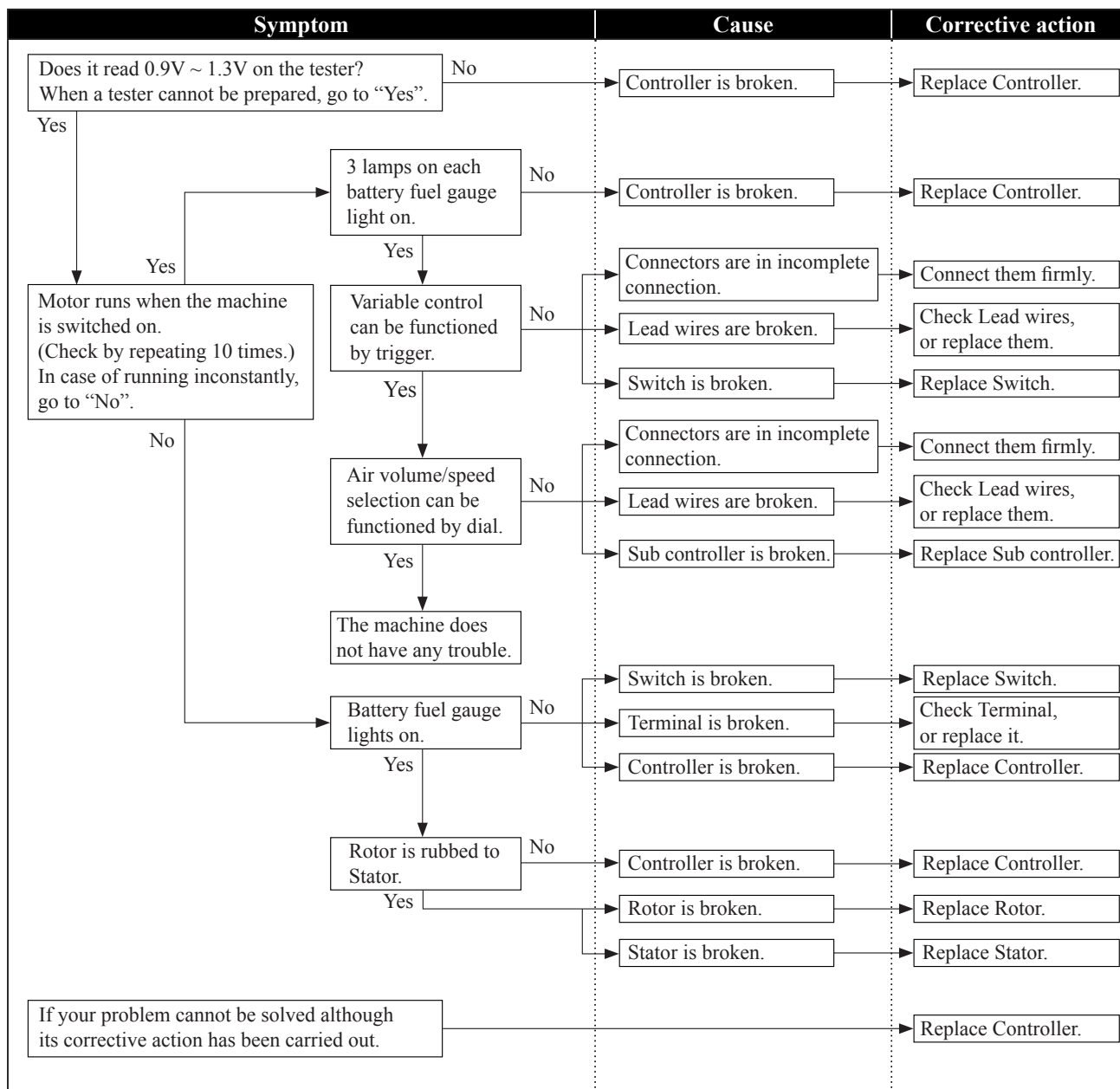
(-) pole (+) pole

► Repair

[4] TROUBLESHOOTING

Check List for Troubleshooting

Check the items from top of the following list. (Description of the item is referred to Circuit diagram in Fig. D-1.)
 After corrective action, return to the start of Trouble shooting and check again.



▶ Wiring diagram

Fig. D-2

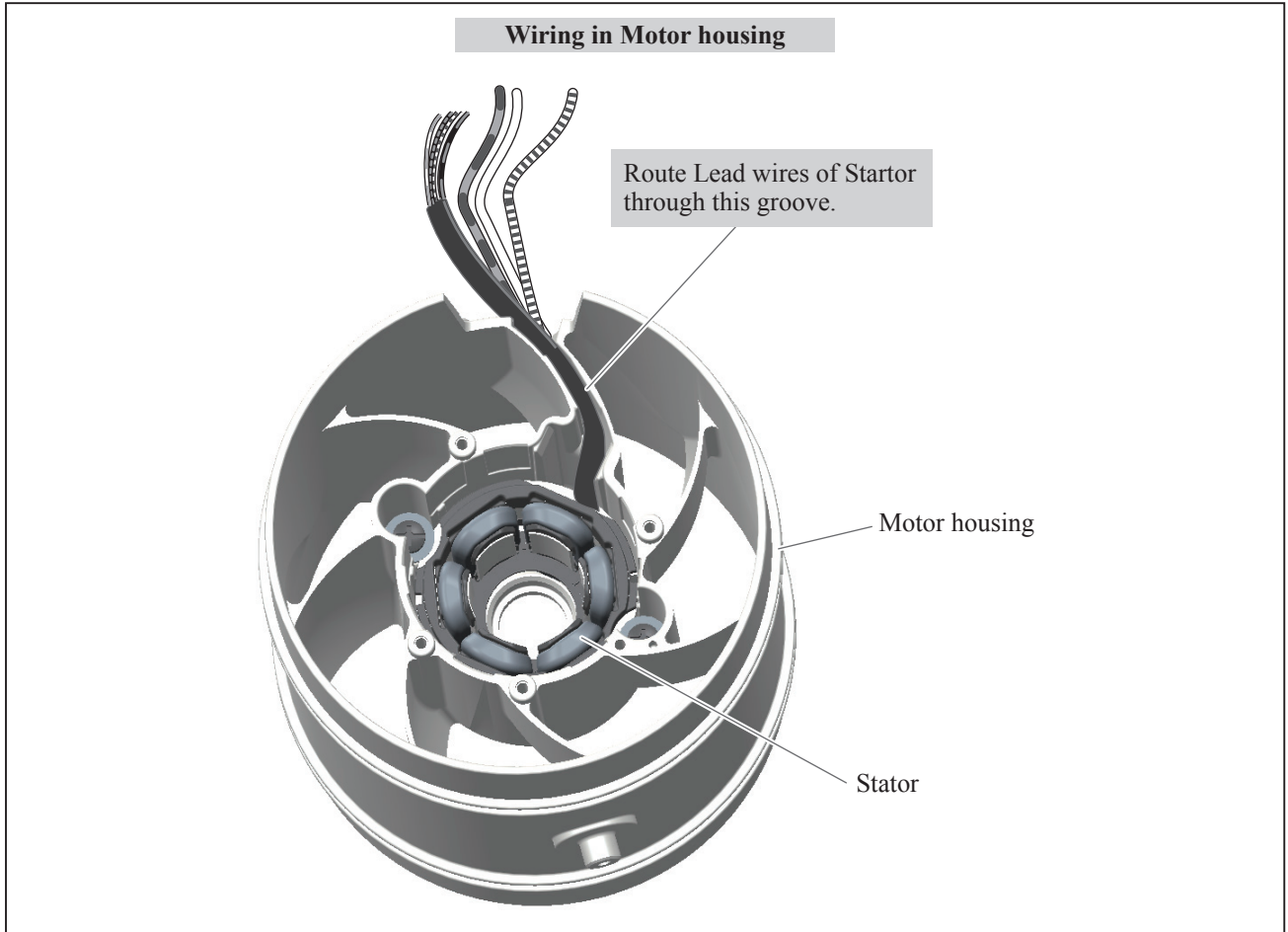
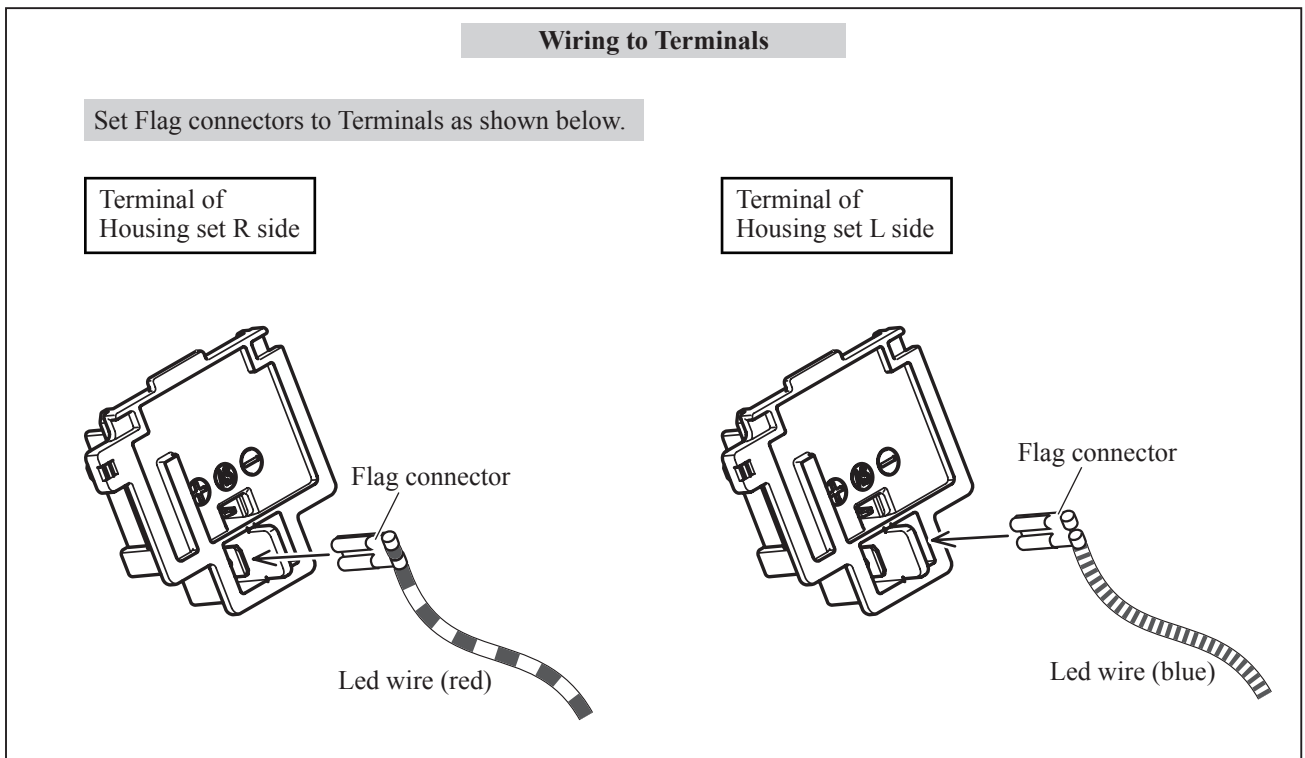


Fig. D-3



▶ Wiring diagram

Fig. D-4

