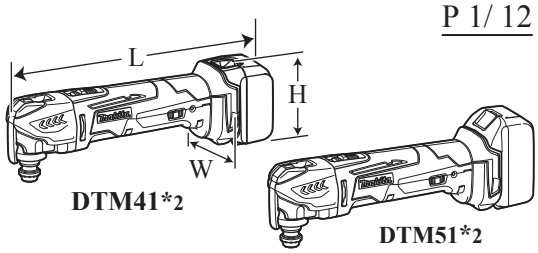
TECHNICAL INFORMATION

Model No. ► DTM41, DTM51

Description ► Cordless Multi tools



DTM41*2 DTM51*2

CONCEPT AND MAIN APPLICATIONS

Models DTM41, DTM51 have been developed based on the current BTM40/DTM40, BTM50/DTM50.
The two models feature the tool-less accessory change system, in addition to the benefits of the current models.

These products are powered by the following Li-ion batteries:
DTM41 by 14.4V Li-ion batteries of BL1415 (1.3Ah)/ BL1415N, BL1415NA (1.5Ah)/ BL1430 (3.0Ah), BL1430A (3.0Ah)/ BL1440 (4.0Ah)/ BL1450 (5.0Ah)
DTM51 by 18V Li-ion batteries of BL1815 (1.3Ah)/ BL1815N (1.5Ah)/ BL1820 (2.0Ah)/ BL1830 (3.0Ah)/ BL1840 (4.0Ah)/ BL1850 (5.0Ah)

Dimensions: mm (")		
	DTM41	DTM51
Length (L)	326 (12-7/8)*1/ 340 (13-3/8)*2	
Width (W)	80 (3-1/8)	
Height (H)	104 (4-1/8)	122 (4-13/16)

*1 With BL1815, BL1815N or BL1820/ BL1415 or BL1415N
*2 With BL1830, BL1840 or BL1850/ BL1430, BL1440 or BL1450

► Specification

Specification \ Model		DTM41	DTM51
Battery	Cell	Li-ion	
	Voltage: V	14.4	18
	Capacity: Ah	1.3, 1.5, 3.0, 4.0, 5.0	1.3, 1.5, 2.0, 3.0, 4.0, 5.0
	Energy capacity: Ah	19, 22, 44, 58, 72	24, 27, 36, 54, 72, 90
	Charging time (approx.): min.	15, 15, 22, 36, 45 with DC18RC	15, 15, 24, 22, 36, 45 with DC18RC
Max output: W		340	390
Oscillation angle, left/right: degree [°]		1.6 (3.2 total)	
Oscillations per minute: opm=min^{-1}		6,000 - 20,000	
Oscillating multi tool accessories		Makita oscillating multi tool accessories equivalent to BOSCH OIS (Oscillating Interface System)	
Electronic control	Variable speed control by dial	Yes	
	Soft start	Yes	
	Anti-restart function	Yes	
Weight according to EPTA-Procedure 01/2003*3: kg (lbs)		2.0 (4.3)*4 2.1 (4.7)*5	2.0 (4.4)*6 2.2 (4.9)*7

*3 with Battery and Vacuum attachment, without Sanding pad
*4 With BL1415 or BL1415N *5 With BL1430, BL1440 or BL1450
*6 With BL1815, BL1815N or BL1820 *7 With BL1830, BL1840 or BL1850

► Standard equipment

Oscillating multi tool accessories
[equivalent to BOSCH OIS (Oscillating Interface System)]
"Dust attachment" for Sanding pad (for European countries only)
"Tool box" for storing oscillating multi tool accessories (for some countries only)
Plastic carrying case or Tool bag (for some countries only)
Battery*8
Charger*8
Battery cover*9
*8: Battery and charger are not supplied with "Z" model *9: Supplied with the same quantity of extra Battery
Note: The standard equipment may vary by country or model variation.

► Optional accessories

Oscillating multi tool accessories
[equivalent to BOSCH OIS (Oscillating Interface System)]
Triangular abrasive papers (Hook & loop type)
Tool box (for storing oscillating multi tool accessories)
Dust attachment set
Li-ion battery BL1415 (for DTM41)
Li-ion battery BL1415N (for DTM41)
Li-ion battery BL1415NA (for DTM41)
Li-ion battery BL1430 (for DTM41)
Li-ion battery BL1440 (for DTM41)
Li-ion battery BL1450 (for DTM41)
Li-ion battery BL1815 (for DTM51)
Li-ion battery BL1815N (for DTM51)
Li-ion battery BL1820 (for DTM51)
Li-ion battery BL1830 (for DTM51)
Li-ion battery BL1840 (for DTM51)
Li-ion battery BL1850 (for DTM51)
Fast charger DC18RC
Charger DC18SD
Charger DC24SC
Four port multi charger DC18SF
Automotive charger DC18SE

► Repair

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

[1] NECESSARY REPAIRING TOOLS

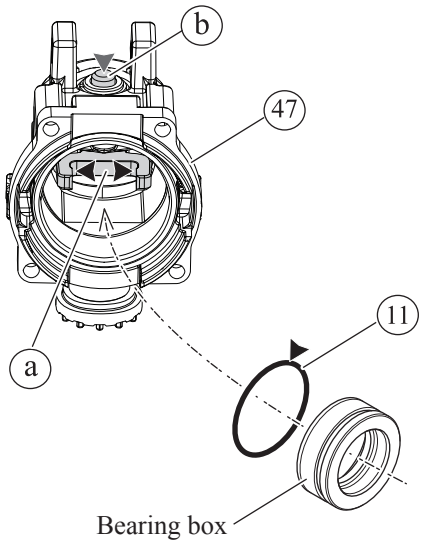
Code No.	Description	Use for
1R027	Bearing setting pipe 18-10.2	holding Crank housing complete when disassembling Lever
1R233	Round bar for Arbor 4-100	removing Pin 5 when disassembling Lever
1R269	Bearing extractor	removing Bearing box from the drive end of Armature shaft
1R291	Retaining ring S and R pliers	removing Retaining ring S-7 from the drive end of Armature shaft
1R306	Ring spring removing jig	holding 1R233 when disassembling Lever

[2] LUBRICATION

Apply **Makita grease FA No.2/ Makita grease N No.2** to the following portions designated with the black/ gray triangles to protect parts and product from unusual abrasion.

Item No.	Description	Portion to lubricate	Amount
(11)	O ring 35	whole portion	a little
(47)	Crank housing complete	(a) Connector portion	4 g
		(b) Tip portion of Driver	a little

Fig. 1



◀ : Makita grease FA No. 2
◀ : Makita grease N No. 2

Repair

[3] DISASSEMBLY/ASSEMBLY

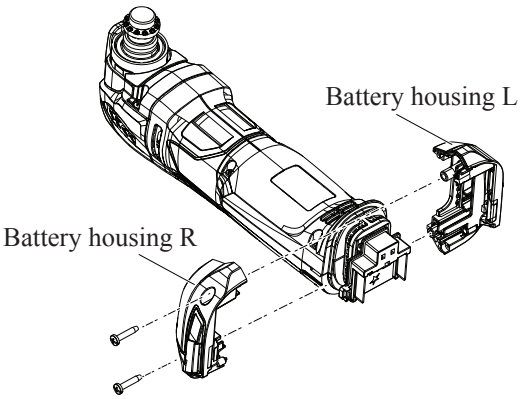
[3] -1. Armature

DISASSEMBLING

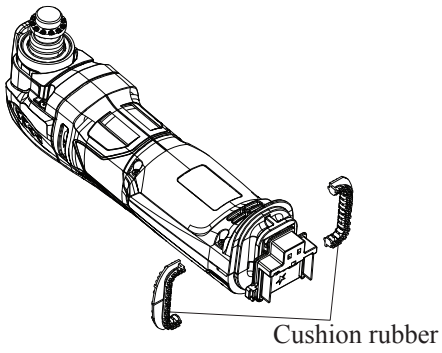
(1) For disassembling Armature, remove Battery housing R/L, Handle cover, Lower/ Upper head covers etc. as drawn in **Fig. 2**.

Fig. 2

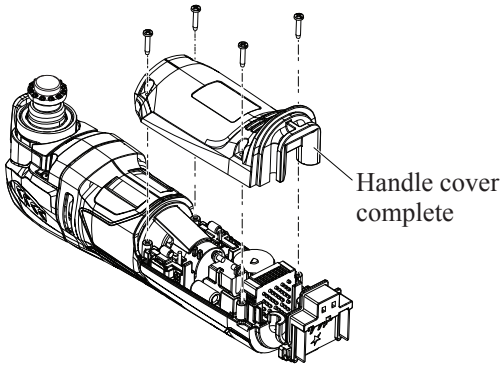
1. Separate Battery housing R/ L from Motor housing by unscrewing two 4x20 Tapping screws.



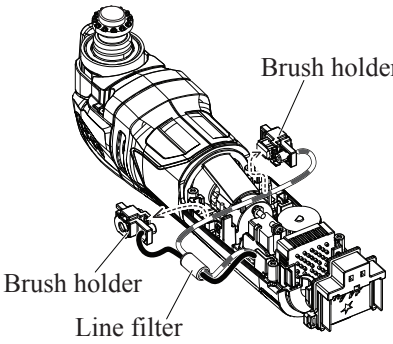
2. Separate Cushion rubbers from Motor housing.



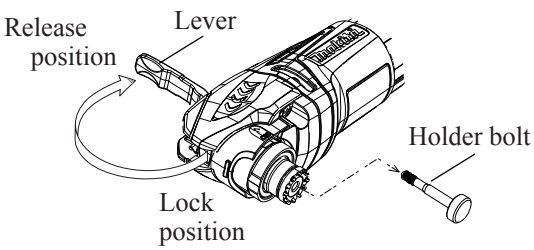
3. Separate Handle cover complete by unscrewing four 3x16 Tapping screws.



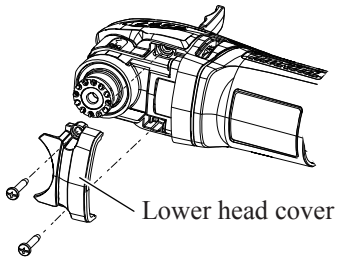
4. Disconnect Carbon brushes from Armature's commutator by pulling off Brush holders.



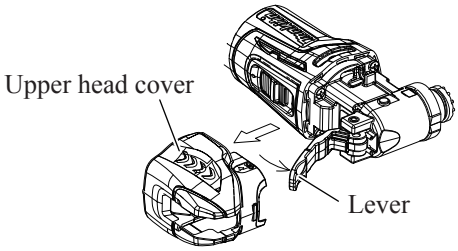
5. Shift Lever fully to the release position from the lock position, then pull off Holder bolt.



6. Remove Lower head cover by unscrewing two 4x20 Tapping screws.



7. Return Lever a little to the lock position, then remove Upper head cover.



Repair

[3] DISASSEMBLY/ASSEMBLY

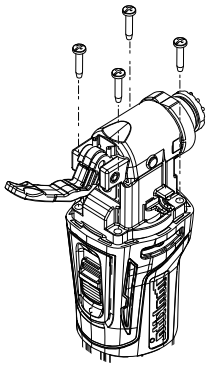
[3] -1. Armature (cont.)

DISASSEMBLING

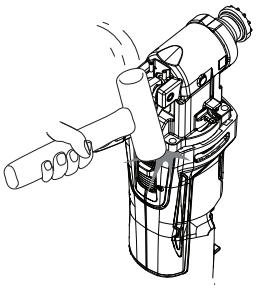
(2) Separating Crank housing complete from Motor housing, remove Armature from Crank housing complete. (**Fig. 3**)

Fig. 3

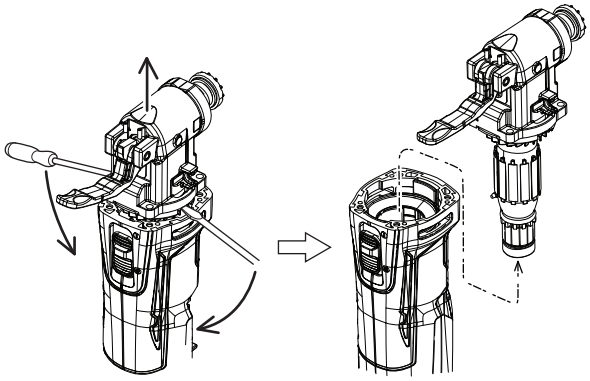
1. Remove four 4x20 Tapping screws.



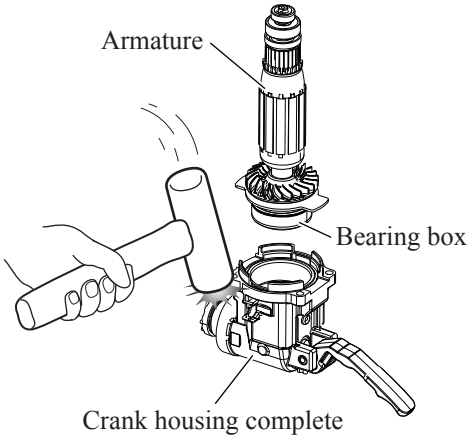
2. Tapping the edge of Motor housing with plastic hammer, reserve the gap between Crank housing section and Motor housing to insert screwdrivers.



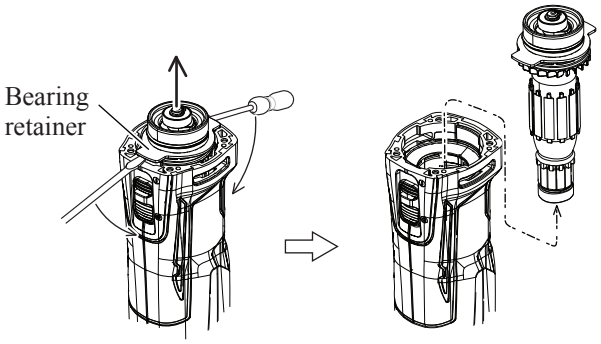
3. Insert 2 slotted head screwdrivers into the gap between Motor housing and Crank housing section. Then, remove Crank housing section by prying it up with the screwdrivers.



4. Remove Armature section by tapping the edge of Crank housing complete.



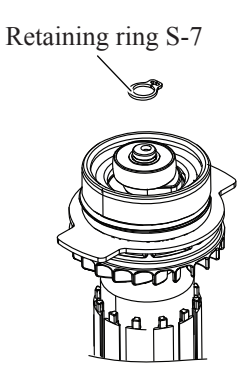
4A. If Armature remains in Motor housing in the step 3, pry up Bearing retainer with Slotted head screwdrivers.



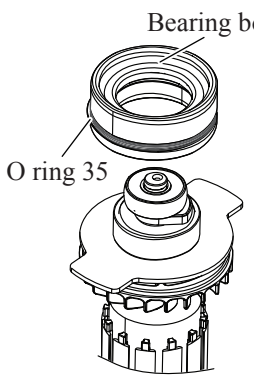
(3) Disassemble the parts that mounted to the drive end of Armature as drawn in **Fig. 4**.

Fig. 4

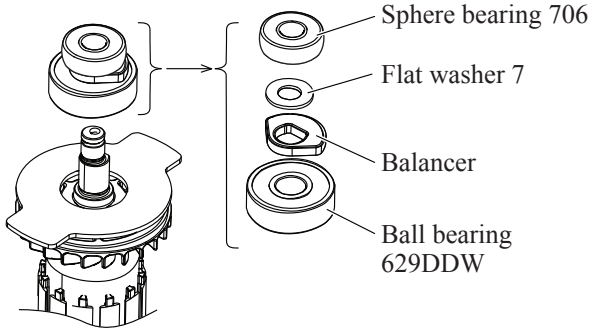
1. Remove Retaining ring S-7 with 1R291.



2. Remove Bearing box with 1R269.



3. With 1R269, remove Ball bearing 629DDW together with Balancer, Flat washer 7 and Sphere bearing 706.



Repair

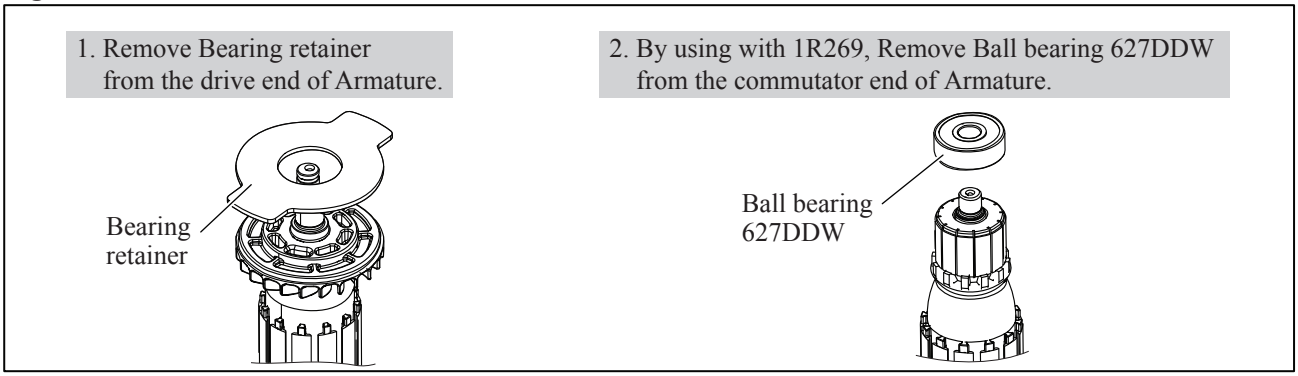
[3] DISASSEMBLY/ASSEMBLY

[3] -1. Armature (cont.)

DISASSEMBLING

(4) Remove Bearing retainer and Ball bearing 627DDW as drawn in **Fig. 5**.

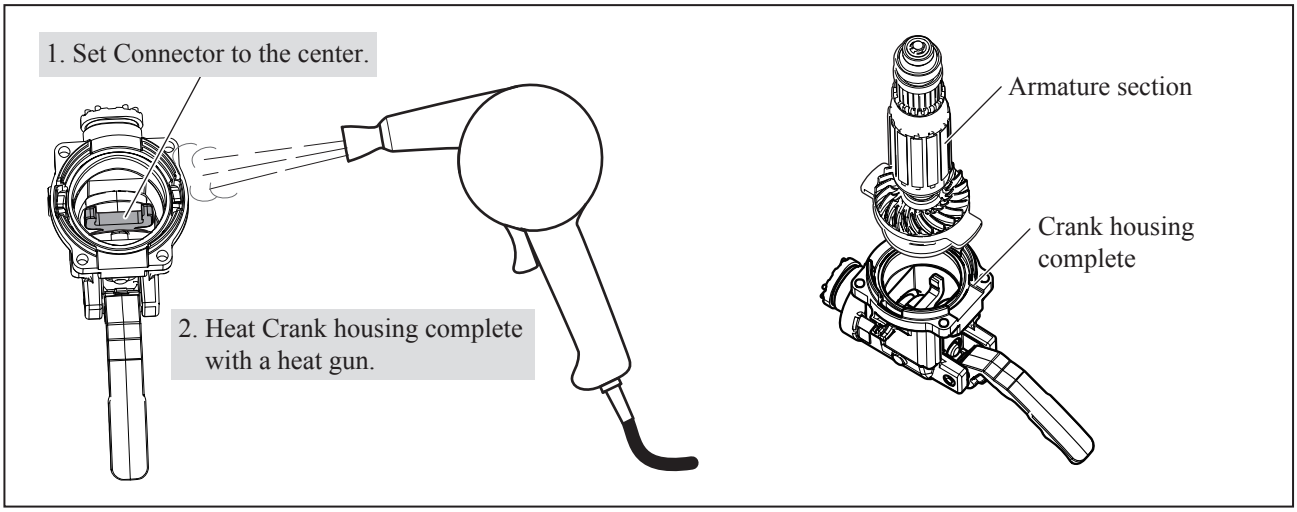
Fig. 5



ASSEMBLING

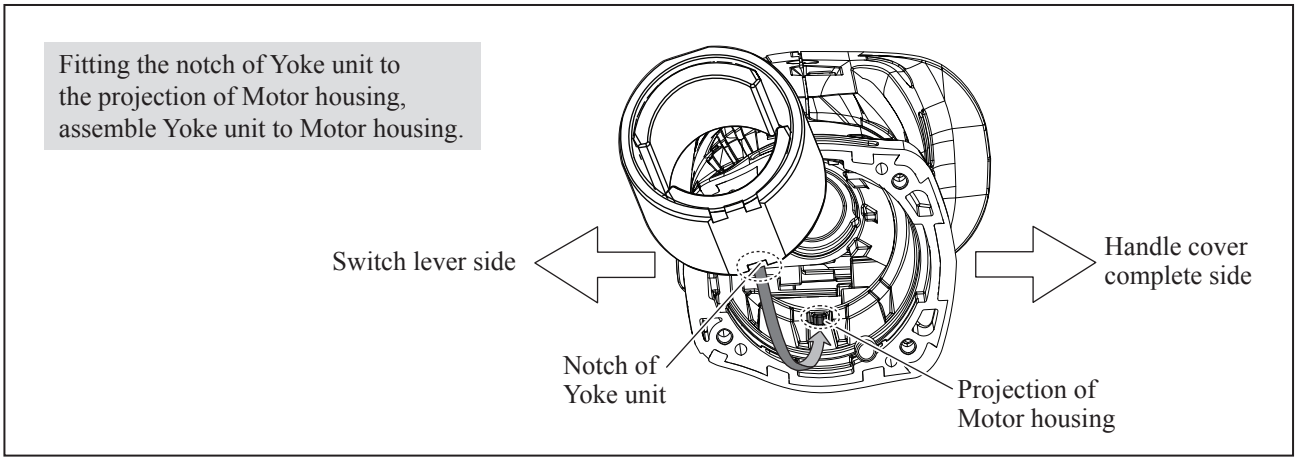
(1) Assemble Ball bearing 627DDW to the commutator end of Armature. (Refer to **Fig. 5**.)
(2) Assemble the component parts to the drive end of Armature by reversing the disassembly procedure. (Refer to **Figs. 5** and **4**.)
(3) Assemble the Armature section to Crank housing complete as drawn in **Fig. 6**.
Note: For easy assembling of Armature section, heat Crank housing complete with a heat gun after setting Connector as drawn in **Fig. 7**.

Fig. 6



(4) If Yoke unit is disassembled or replaced, re-assemble Yoke unit as drawn in **Fig. 7**.

Fig. 7



Repair

[3] DISASSEMBLY/ASSEMBLY

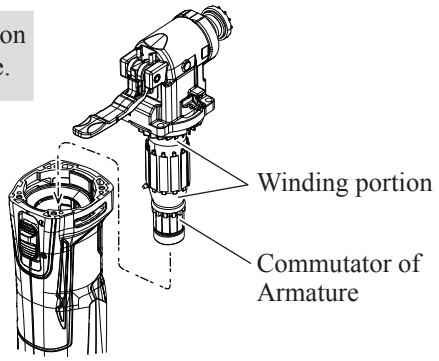
[3] -1. Armature (cont.)

ASSEMBLING

(5) Assemble Crank housing complete and Armature section to Motor housing as drawn in **Fig. 8**.

Fig. 8

Be sure to the following matters, when assembling Armature section to Motor housing, because Yoke unit has very strong magnet force.
1. Do not pinch your finger between Motor housing and Armature fan.
2. Do not scratch Winding portion, Commutator of Armature with Baffle plate or edge of Yoke unit.



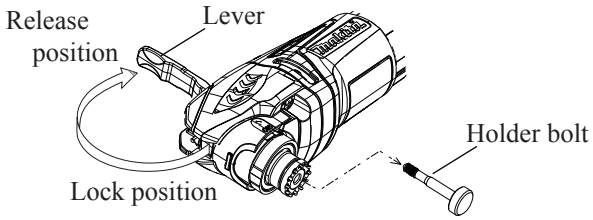
[3] -2. Crank housing complete

DISASSEMBLING

(1) Disassemble Crank housing complete and Armature from Motor housing as drawn in **Figs. 2** and **3**.
Note: Holder bolt has to be removed before disassembling Lever. Otherwise, it is impossible to remove the bolt. (**Fig. 9**)

Fig. 9

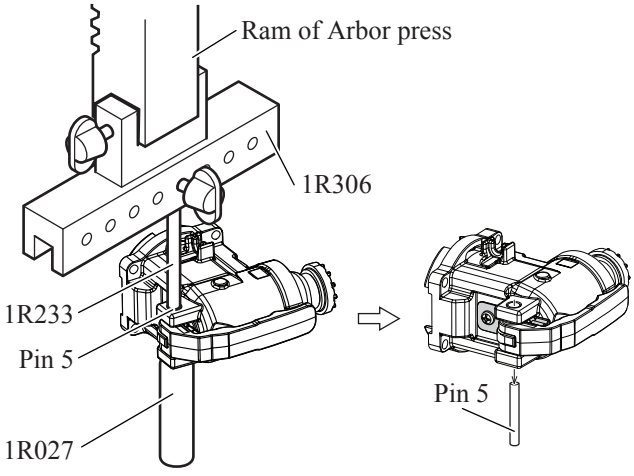
Shift Lever fully to the release position from the lock position, then pull off Holder bolt.



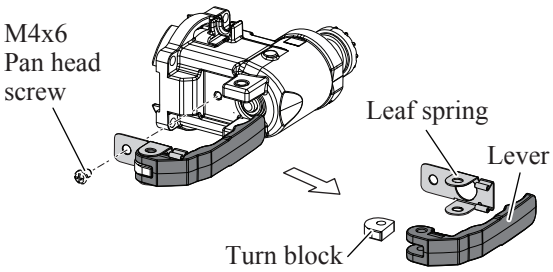
(2) Disassemble Lever section from Crank housing complete as drawn in **Fig. 10**.

Fig. 10

1. Install 1R306 on the ram of Arbor press. Then, set 1R233 to 1R306. And then, supporting Crank housing complete with 1R027, press Pin 5 out from Crank housing complete.



2. Unscrew M4x6 Pan head screw and remove Leaf spring, Lever and Turb block from Crank housing complete.



Note in Disassembling:
Crank housing complete is a factory assembled part, and it is impossible to replace its inner component parts. Replace it with an assembled part.

Repair

[3] DISASSEMBLY/ASSEMBLY

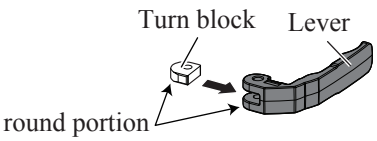
[3] -2. Crank housing complete (cont.)

ASSEMBLING

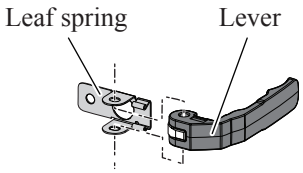
(1) Assemble Lever section to Crank housing complete as drawn in **Fig. 11**.

Fig. 11

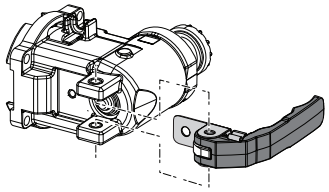
1. Set Turn block while aligning its round portion to Lever's round portion.



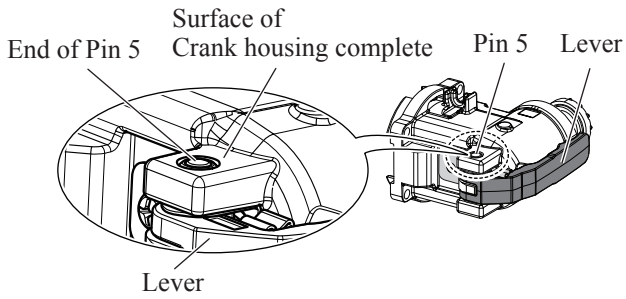
2. Mount Leaf spring to Lever.



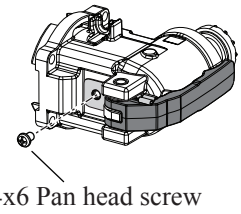
3. Set Lever together with Turn block and Leaf spring to Crank housing complete.



4. Pin 5 has to be pushed into Crank housing complete until Pin's end comes to the same level to the surface of Crank housing complete.



5. Tighten Leaf spring to Crank housing complete with M4x6 Pan head screw.
Note: Be sure to tighten the screw after inserting Pin 5 to Crank housing.



[3] -3. Switch Lever

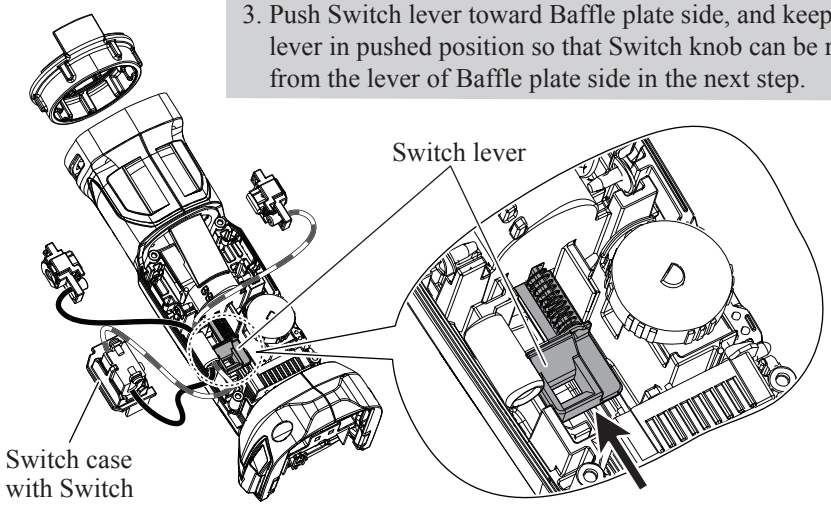
DISASSEMBLING

Note: Switch lever can be disassembled without removing Yoke unit.
(1) Remove Handle cover complete, disconnect Carbon brushes from Armature's commutator by pulling off Brush holders. (Refer to **Fig. 2**.)
(2) Remove Lower/ Upper head covers. (Refer to **Fig. 2**.)
(3) Separate Armature and Crank housing complete from Motor housing. (Refer to **Fig. 3**.)
(4) Move the electrical parts from Motor housing to bring Switch lever into your sight. (See **Fig. 12**.)

Fig. 12

1. Remove Baffle plate.

3. Push Switch lever toward Baffle plate side, and keep Switch lever in pushed position so that Switch knob can be removed from the lever of Baffle plate side in the next step.



2. Remove Switch case together with Switch.

Repair

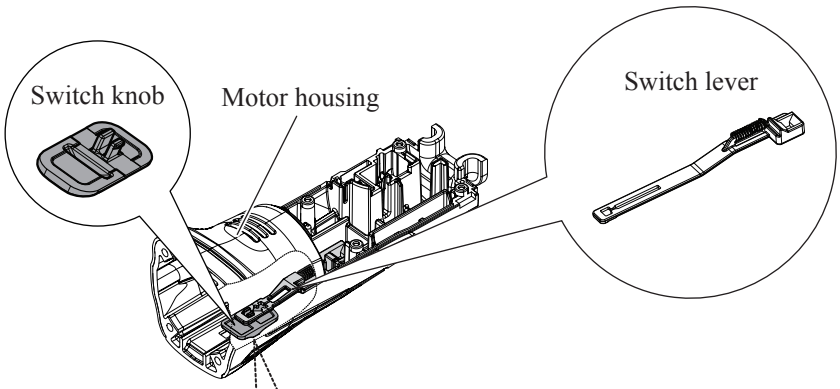
[3] DISASSEMBLY/ASSEMBLY

[3] -3. Switch Lever (cont.)

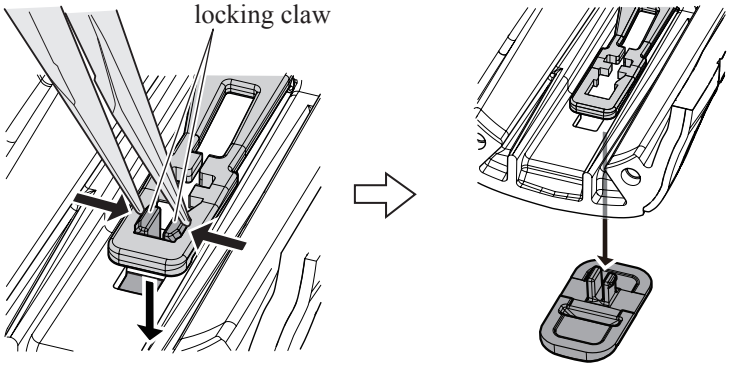
DISASSEMBLING

(5) Remove Switch lever as drawn in **Fig. 13**.

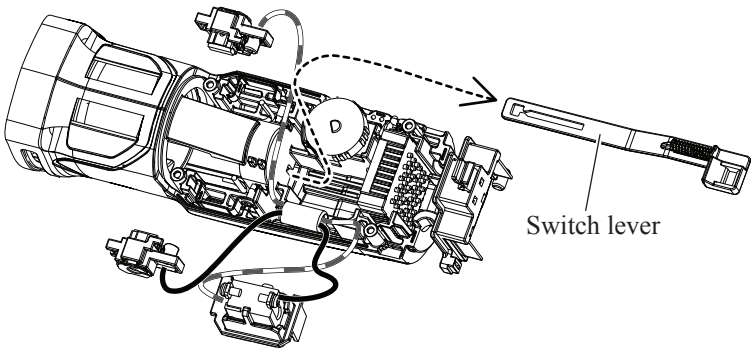
Fig. 13



1. Pressing the locking claws of Switch knob inward with small nose pliers, push Switch knob off from Motor housing.



2. Switch lever can now be removed from Motor housing by bending Switch lever to release its rear end from the ribs on Motor housing then pulling it toward Battery cover side (in the direction of the black arrow).



Repair

[3] DISASSEMBLY/ASSEMBLY

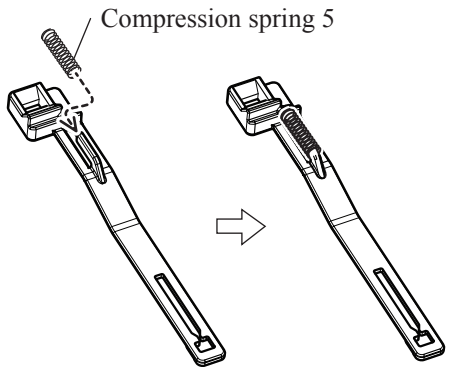
[3] -3. Switch Lever (cont.)

ASSEMBLING

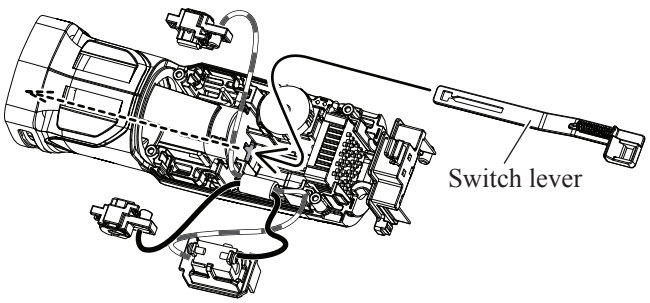
Assemble Switch lever and Switch knob as drawn in **Fig. 14**.

Fig. 14

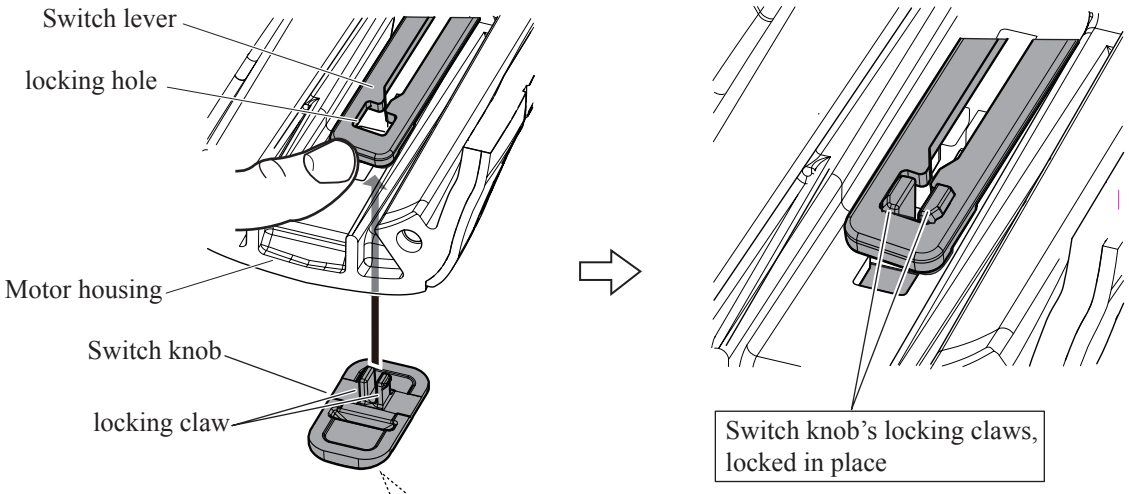
1. Be sure that Compression spring 5 is mounted on the back of Switch lever.



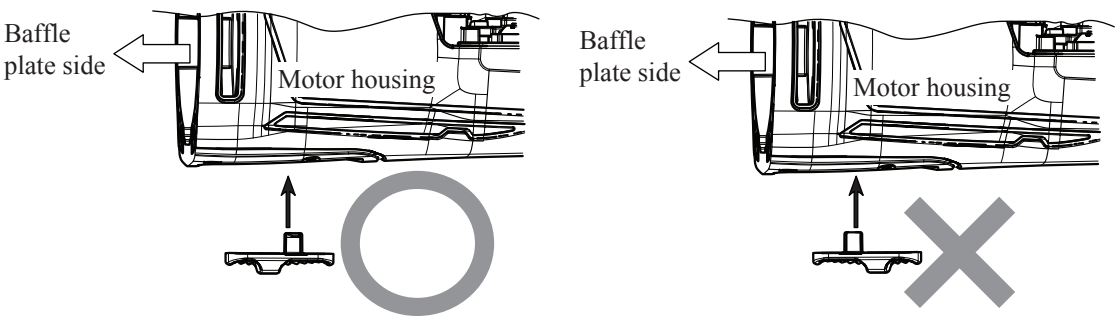
2. Bending the rear end of Switch lever, slide Switch lever into Motor housing as drawn below.



3. Pressing Switch lever against Motor housing, insert the locking claws of Switch knob into the locking hole of Switch lever.



Note in Assembling:
Switch lever is not reversible. Assemble it to bring the lock claw to the opposite side of Baffle plate as per the left shown.



Repair

[3] DISASSEMBLY/ASSEMBLY

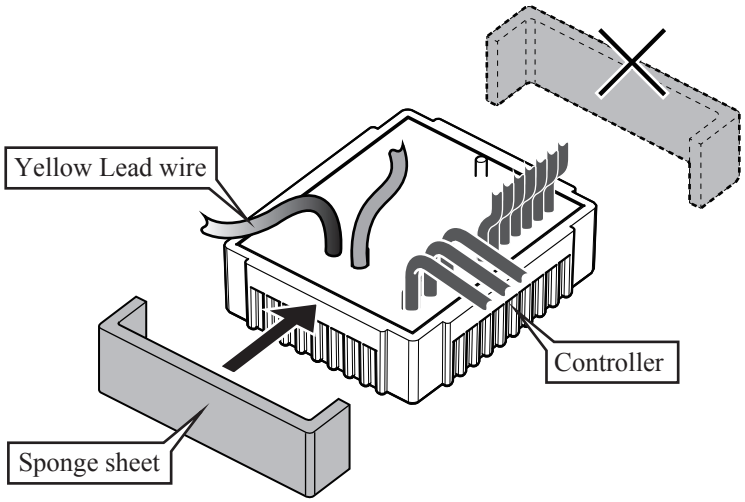
[3] -4. Controller

ASSEMBLING

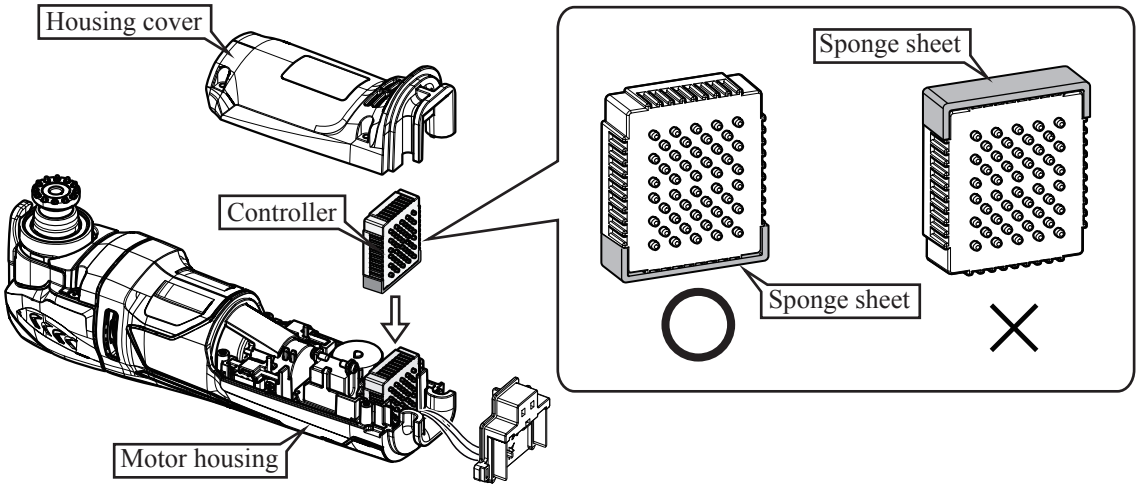
Stick Sponge sheet to Controller as drawn in **Fig. 15**.

Fig. 15

1. Stick Sponge sheet to Controller on the specified space by the side of Yellow lead wire as shown below.
   Note: • Be careful not to stick the sheet on the other side and the wide side.
   • Put the sheet along the bank of Controller so that there is not clearance.

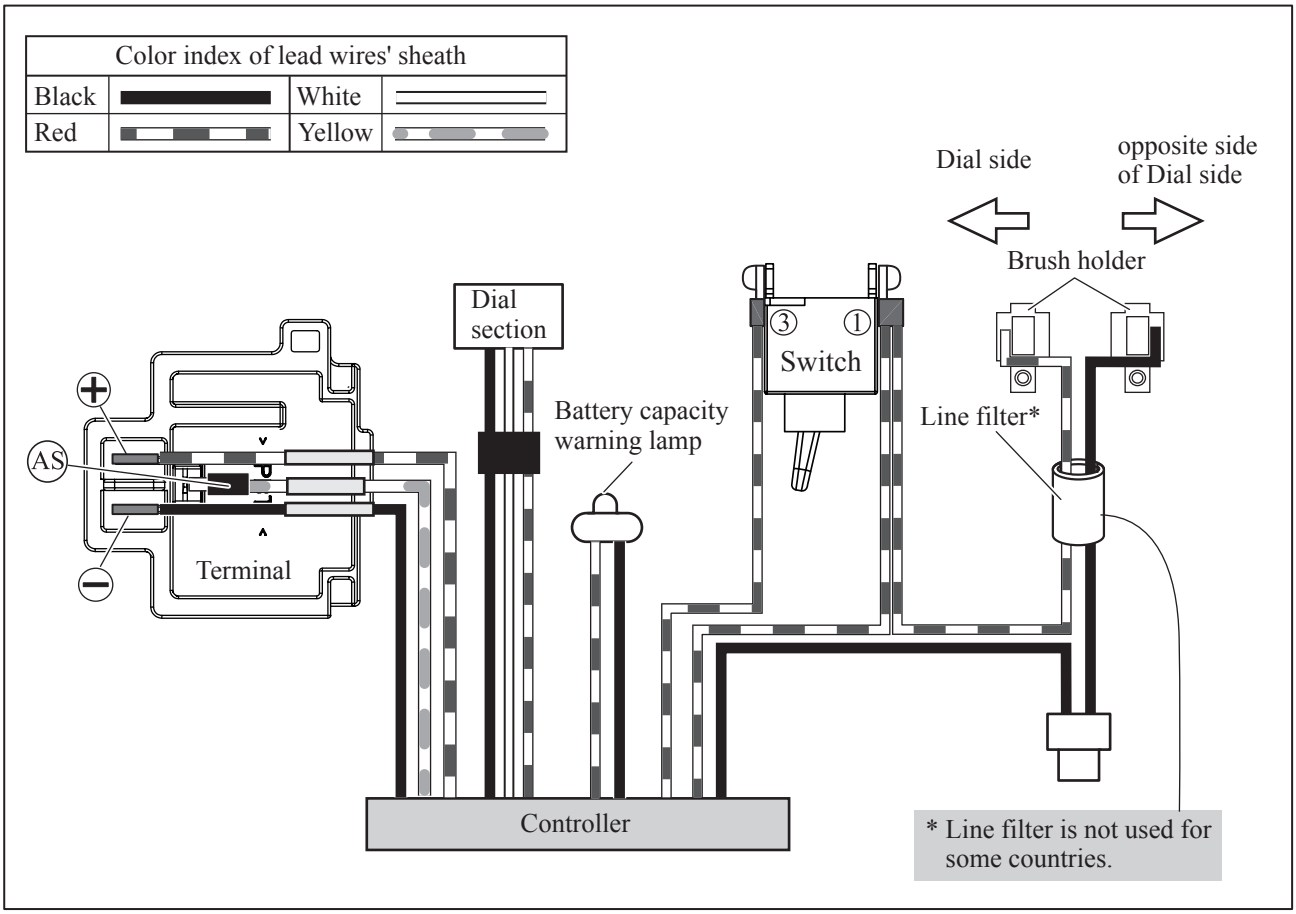


2. Assemble Controller to Motor housing while facing Sponge sheet side toward Motor housing as shown below.



Circuit diagram

Fig. D-1



Wiring diagram

Fig. D-2

Connecting with Terminal

Each Flag terminal must be connected with Terminal so that its wire connecting portion is located over the pole marking of Terminal.

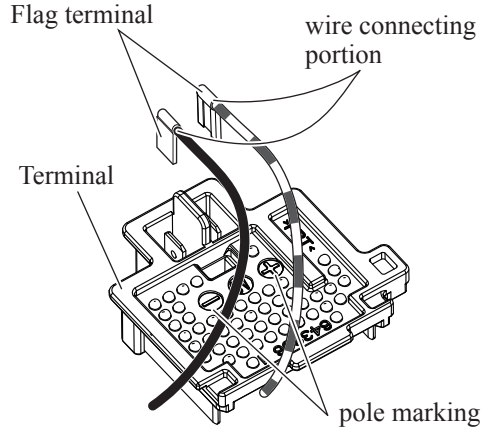
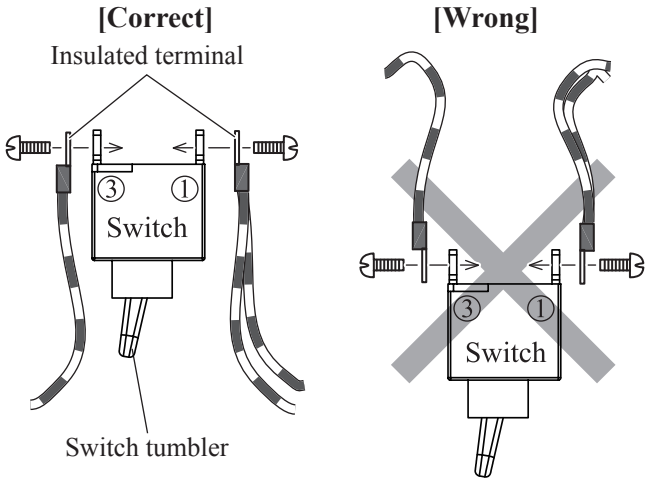


Fig. D-3

Connecting with Switch

Insulated terminals must be connected with Switch so that Lead wires are placed on Switch tumbler side.



Wiring diagram

Fig. D-4