

TECHNICAL INFORMATION



PRODUCT

P 1/12

- Models No.** ▶ BBC231U
BBC300L
- Description** ▶ Cordless Brushcutter 230mm (9")
Cordless String Trimmer 300mm (11-3/4")

CONCEPT AND MAIN APPLICATIONS

Models BBC231U/ BBC300L are cordless brushcutters/ String trimmer powered by 36V/2.6Ah Li-ion battery BL3626. As shown below, their main advantages are "Human- and Environment-friendly" and "Cost-effective" obtained by using Li-ion battery and Brushless DC motor as the power unit instead of gasoline and engine:

- Zero exhaust emission
- Extremely low noise and low vibration
- Extra-easy to start operation, simply by loading battery then pulling switch trigger
- Very low running cost owing to no fuel and oil consumption
- Almost zero maintenance; no need for oil replacement, draining fuel for storage, cleaning of air filter/muffler/spark plug, brush replacement, etc.

With these Makita advantages, the two products will be one of the best choices for use especially in public places or among residential areas.

Models BBC231U and BBC300L are available in the following variations.

Model No.	Battery		Battery cover	Charger	Handle style	Offered to
	type	quantity				
BBC231UZ	No		No	No	Bike handle	all countries
BBC231URD	BL3626	1	0	DC36RA		
BBC231URDE		2	1			
BBC300LZ	No		No	No	Loop handle	all countries except the two listed below USA, Canada
BBC300LRD	BL3626	1	0	DC36RA		
BBC300LRDE		2	1			
BBC300L		1	0			

The models also includes the accessories listed below in "Standard equipment".

Specification

Specifications		Model	BBC231U	BBC300L
Battery	Cell		Li-ion	
	Voltage: V		36	
	Energy capacity: Wh		94	
	Charging time (approx.): min.		22 with DC36RA	
No load speed*1: min.-1 = rpm	High		0 - 7,300	0 - 6,600
	Low		0 - 5,300	0 - 4,900
Standard cutting tool			230mm (9") diameter 4-tooth star blade	Nylon cutting head
Handle style			Bike handle	Loop handle
Overload protection			Current limiter	
Electric brake			Yes	
Variable speed control			Yes	
Soft start			Yes	
Reversing switch			Yes	
Waist cushion			Yes	No
Net weight*2: kg (lbs)			7.1 (15.7)	5.9 (13.0)

*1 No load speed of the cutting tool

*2 Weight according to EPTA-Procedure 01/2003, with Cutting tool and Shoulder harness

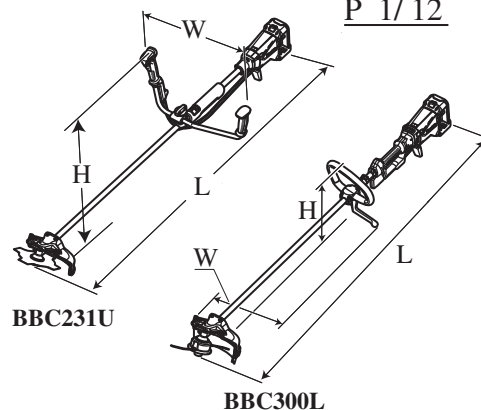
Standard equipment

4-tooth star blade 230mm (9")	1 (for BBC231U)	Universal guard (=Protector)	1
Blade cover	1 (for BBC231U)	Socket wrench	1
Nylon cutting head (Bump & Feed 4)	1 (for BBC300L)	Hex wrench (for M4)	1
Shoulder harness with double shoulder straps	1 (for BBC231U)	Hex wrench (for M5)	1
Shoulder harness with single shoulder strap	1 (for BBC300L)		

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

Optional accessories

Cutter blade, Nylon cutting head, Charger DC36RA, Battery BL3626, Pole hedge trimmer attachment (for **BBC300L**), Pole saw attachment (for **BBC300L**), Cultivator attachment (for **BBC300L**)



Dimensions: mm (")		
	BBC231U	BBC300L
Length (L)	1,880 (74)	1,850 (73)
Width (W)	620 (24-3/8)	340 (13-3/8)
Height (H)	490 (19-1/4)	325 (12-3/4)

► Repair

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

[1] NECESSARY REPAIRING TOOLS

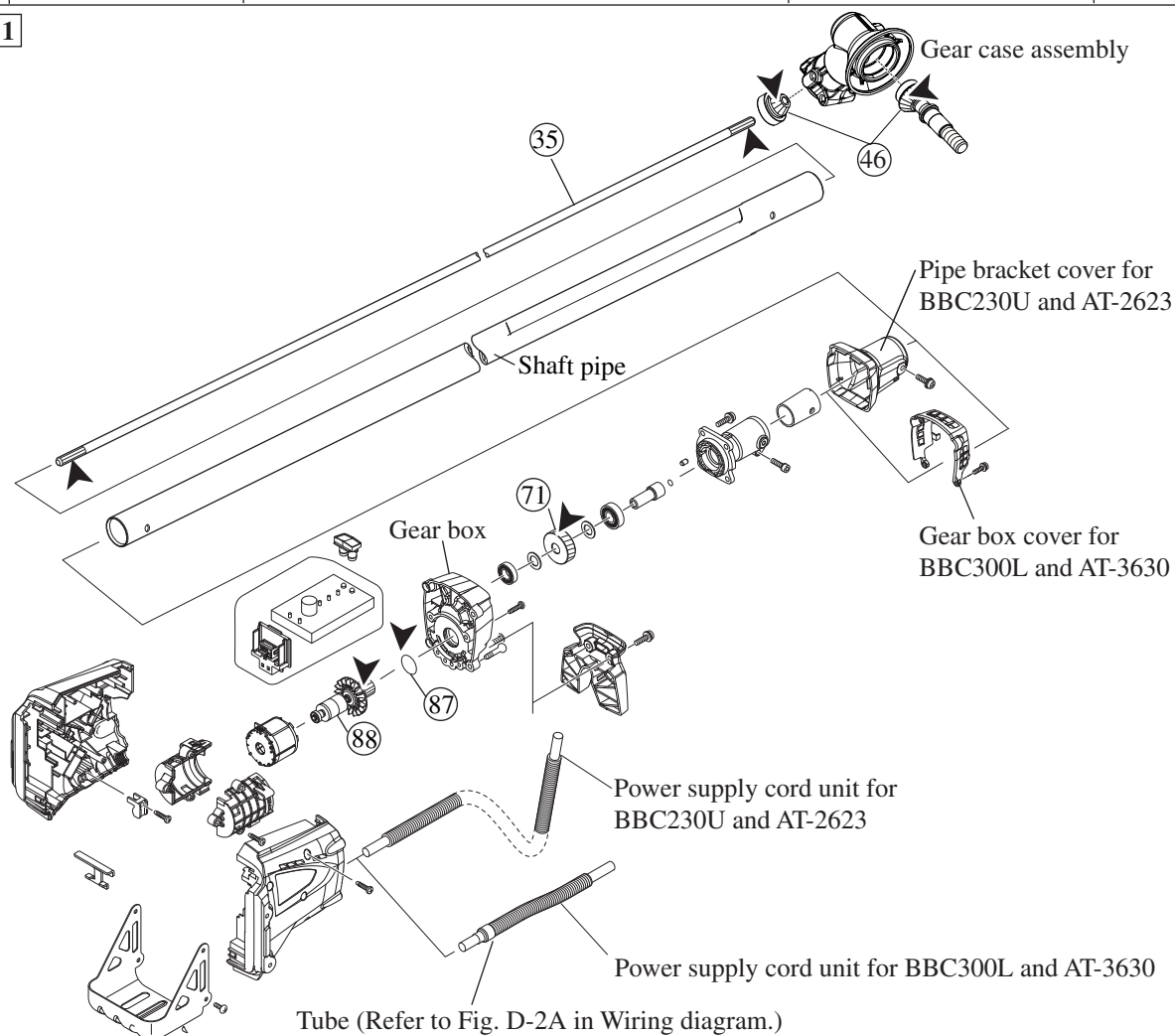
Code No.	Description	Use for
1R006	Retaining ring pliers RT-2E	Removing /Assembling Retaining ring R-24
1R028	Bearing setting pipe 20-12.2	Pressfitting Cutter shaft into Gear case
1R031	Bearing setting pipe 28-20.2	Removing Spiral bevel gear 14 (a component of Cutter shaft set)
1R033	Bearing setting plate 10.2	Removing Cutter shaft from Gear case
1R036	Bearing setting plate 17.2	Removing Spindle hub from Helical gear 33 section
1R045	Bearing extractor (large)	Removing Ball bearing 6001LLU from Gear shaft
1R232	Pipe 30	Removing Helical gear 33 from Spindle hub
1R282	Round bar for arbor 8-50	Removing Spiral bevel gear 14 (a component of Cutter shaft set)
1R285	Round bar for arbor 11-50	Removing Helical gear 33 from Spindle hub
1R291	Retaining ring S and R pliers	Removing /Assembling Retaining rings
1R350	Ring 60	Assembling Motor housing R to Motor housing L
264025-0	M10-17 Hex nut of BBC230U and AT-2623	Disassembling Cutter shaft from Gear case

[2] LUBRICATIONS

Apply **the following lubricants** to the portions to protect the parts and product from unusual abrasion.

Item No.	Description	Portion to lubricate	Lubricant	Amount
③5	Shaft	Spline portions	Makita grease N No.2 ▼	a little
④6	Cutter shaft set	Gear teeth in Gear case assembly		8g
⑧7	O ring 22	Whole portion		a little
⑦1	Helical gear 33	Gear teeth in Gear box		3g
⑧8	Rotor			

Fig. 1



► **Repair**

[3] DISASSEMBLY/ ASSEMBLY

[3]-1. Shaft pipe complete (for BBC231U and AT-3623)

DISASSEMBLING

- 1) Loosen two M6x30 Hex socket head bolts, and then remove Protector. **(Fig. 2)**
- 2) Enlarge the clamp pitch of Protector cover carefully and slide two holes of Protector cover from the bolts-heads of two M5x14 Hex socket head bolts. **(Fig. 3)** Protector cover can be removed.
- 3) Remove two M5x14 Hex socket head bolts and separate Protector clamp from Gear case assembly. Then loosen M5x25 Hex socket head bolt as the clamp of Gear case assembly. **(Fig. 4)** Gear case assembly can be pulled out from Shaft pipe.
- 4) Remove two M5x25 Hex socket head bolts and Pipe clamp as the clamps for Handle 19. Handle 19 section can be separated from Shaft pipe. **(Fig. 5)**
- 5) Remove M5x20 Pan head screw and M5x20 Hex socket head bolt. And then separate Pipe bracket cover from Pipe bracket by sliding Pipe bracket cover itself in the direction designated as illustrated in **Fig. 6**
- 6) Pull out Shaft pipe and Shaft from Pipe bracket by hand. Refer to **Fig. 7**.
Note: When removing Shaft is difficult, pull out Shaft with water pump pliers. **(Fig. 8)**
- 7) Remove four M4x12 screws and Battery guard. **(Fig. 9)**
- 8) Remove two 5x25 Tapping screws that fastens Gear box and Housing R, and remove five 4x18 Tapping screws. **(Fig. 10)** Housing R can be removed.
- 9) Disconnect Power supply cord unit and Controller complete by removing their connectors.
Then remove 4x18 Tapping screw and Strain relief from Housing L. **(Fig. 11)**

Fig. 2

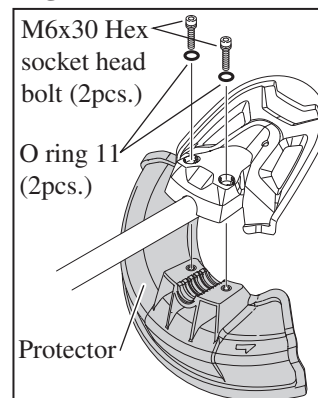


Fig. 3

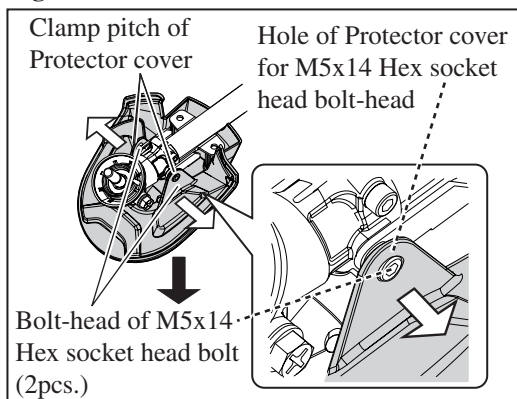


Fig. 4

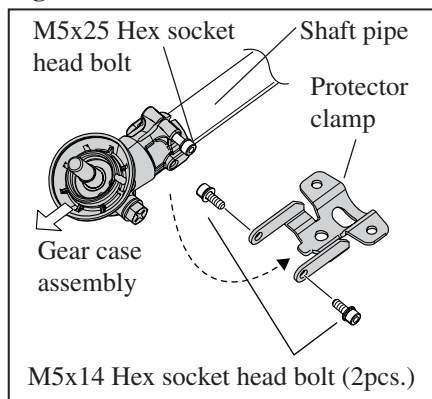


Fig. 5

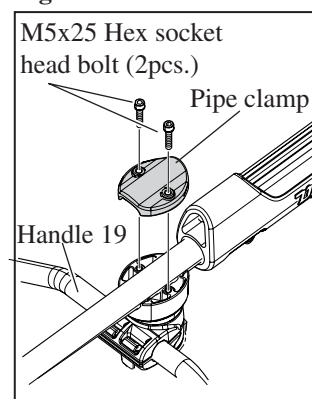


Fig. 6

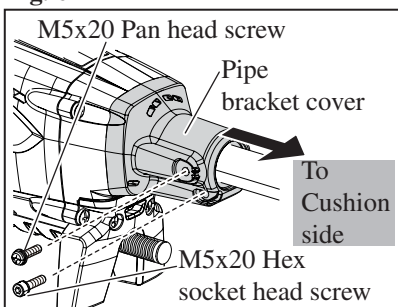


Fig. 7

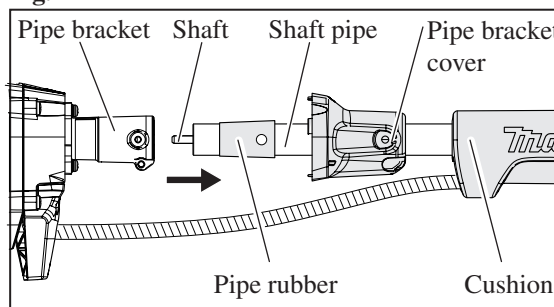


Fig. 8

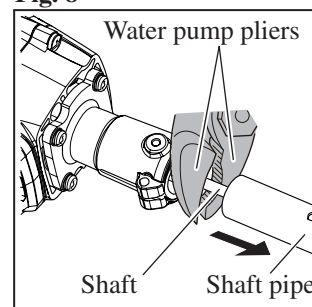


Fig. 9

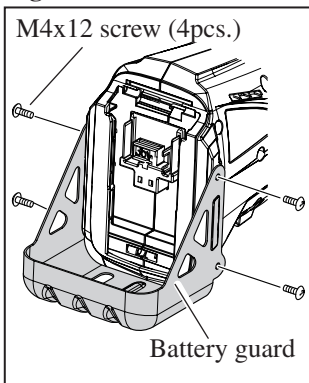


Fig. 10

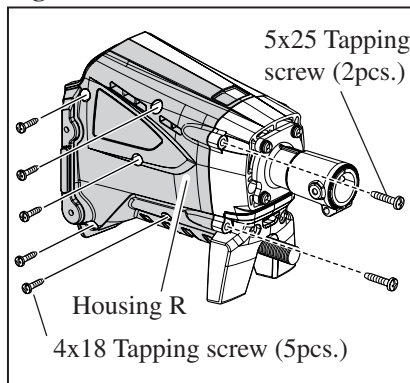
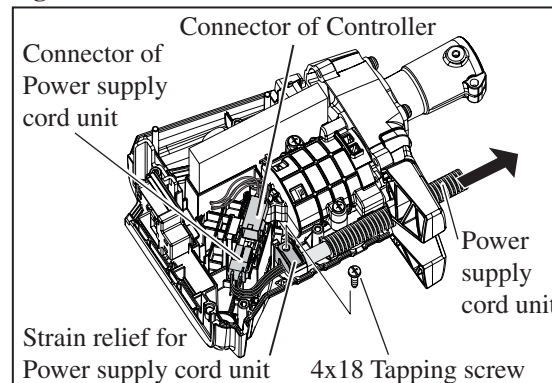


Fig. 11



► Repair

[3] DISASSEMBLY/ ASSEMBLY

[3]-1A. Shaft pipe complete (for BBC300L and AT-3630)

DISASSEMBLING

- 1) Loosen two M6x30 Hex socket head bolts, and then remove Protector and Protector extension complete. (**Fig. 2A**)
- 2) Enlarge the clamp pitch of Protector cover carefully and slide two holes of Protector cover from the bolts-heads of two M5x14 Hex socket head bolts. (**Fig. 3**) Protector cover can be removed.
- 3) Remove two M5x14 Hex socket head bolts and separate Protector clamp from Gear case assembly.
Then loosen M5x25 Hex socket head bolt as the clamp of Gear case assembly. (**Fig. 4**) Gear case assembly can be pulled out from Shaft pipe.
- 4) Remove four M6x30 Pan head screws. Loop handle 24 and Handle clamp 24 can be removed. (**Fig. 5A**)
- 5) Remove M5x20 Pan head screw. M5x18 Hex socket head screw with washer & spring washer, and eight 4x18 Tapping screws. Grip L and Grip R can be removed. (**Fig. 5B**)
- 6) Remove M5x20 Pan head screw and M5x20 Hex socket head bolt. And then separate Pipe bracket cover from Pipe bracket by sliding Pipe bracket cover itself in the direction designated as illustrated in **Fig. 6**
- 7) Pull out Shaft pipe and Shaft from Pipe bracket by hand.
Refer to **Fig. 7**.
Note: When removing Shaft is difficult, pull out Shaft with water pump pliers. (**Fig. 8**)
- 8) Remove four M4x12 screws and Battery guard. (**Fig. 9**)
- 9) Remove two 5x25 Tapping screws that fastens Gear box and Housing R, and remove five 4x18 Tapping screws. (**Fig. 10**) Housing R can be removed.
- 10) Disconnect Power supply cord unit and Controller complete by removing their connectors.
Then remove 4x18 Tapping screw and Strain relief from Housing L. (**Fig. 11**)
- 11) Remove Pipe rubber, Pipe bracket cover and Shaft from Shaft pipe.
Note: Receive the end of Shaft pipe on wood and tap Cushion with plastic hammer to remove Cushion from Shaft pipe without difficulty. Refer to **Fig. 12**.

Fig. 2A

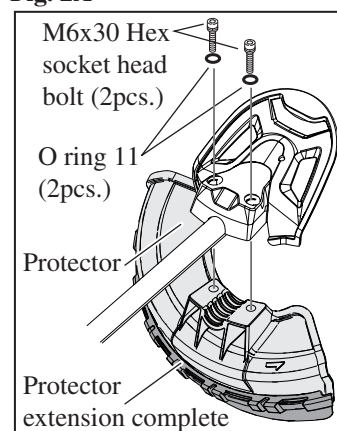


Fig. 5A

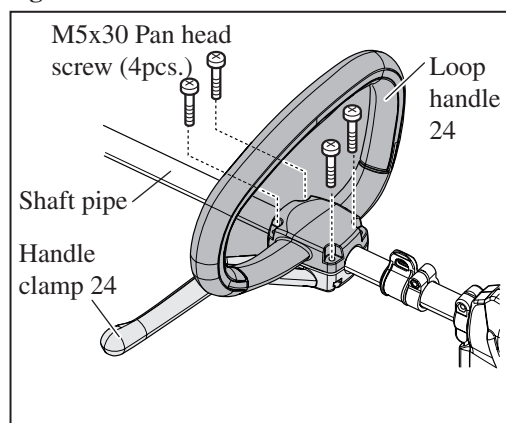


Fig. 5B

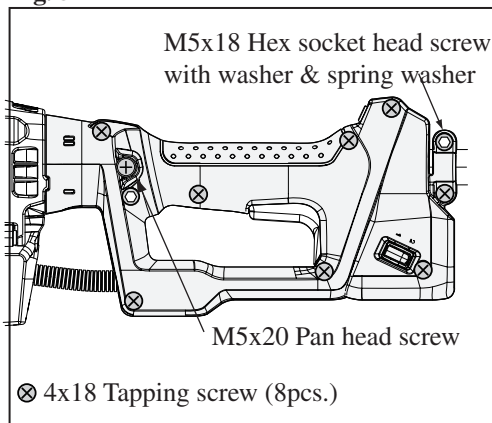
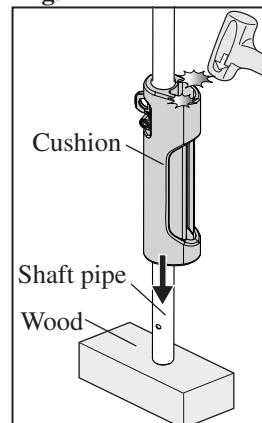


Fig. 12



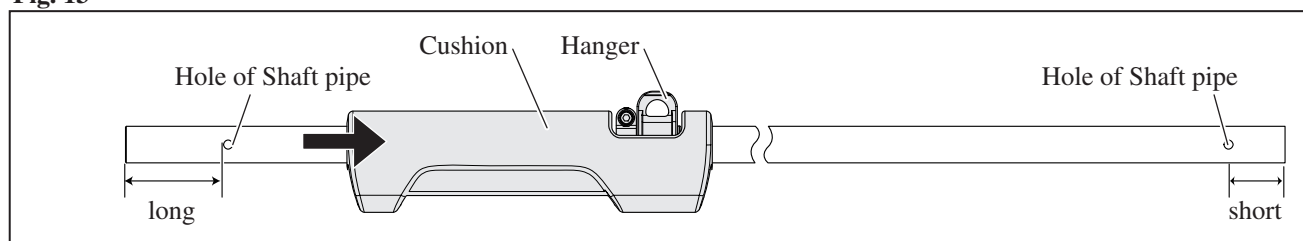
ASSEMBLING

For all models

Take the disassembling step in reverse.

Note: Shaft pipe have two holes around the both ends. Install Hanger and Cushion to Shaft pipe from the specific side that the distance between the hole and the end is long. (**Fig. 13**)

Fig. 13



► Repair

[3]-2. Gear case assembly (for all models)

1) Remove Gear case assembly from Shaft pipe. Refer to the previous page.

2) Remove M8x10 Hex bolt with plain washer 8. (Fig. 14)

Note: Do not miss them. The installation hole on Gear case assembly is a pouring spout of lubricant to gear teeth.

If they are not seated on, Gear case assembly leaks lubricant.

3) Remove Retaining ring R-24 using 1R006. (Fig. 14)

4) Strike Gear case assembly against worktable. Spiral bevel gear 14 with Ball bearing 609ZZ and Retaining ring S-9 can be removed. (Fig. 15)

5) Remove Retaining ring S-9 using 1R291.

6) Separate Ball bearing 609ZZ from Spiral bevel gear 14 using arbor press, 1R282 and 1R031 as illustrated in Fig. 16.

The parts mentioned above are as shown in Fig. 17.

Fig. 14

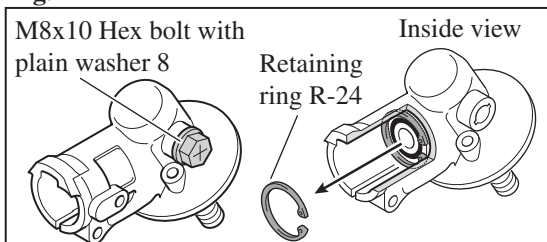


Fig. 15

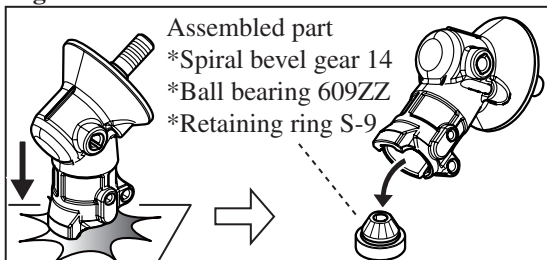


Fig. 16

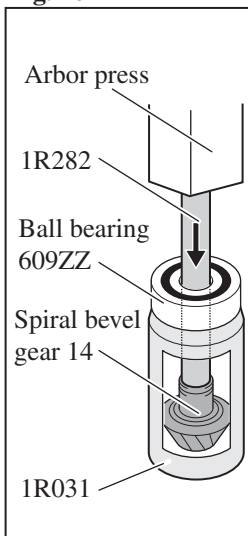
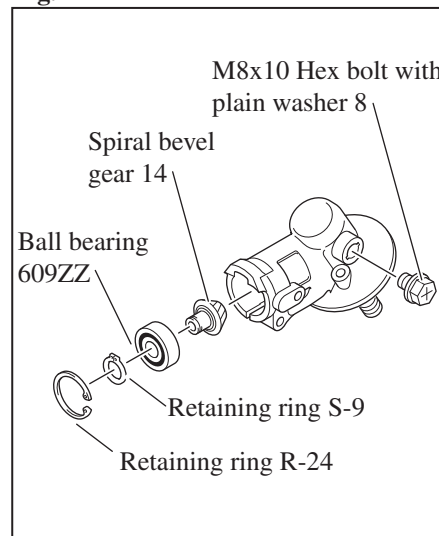


Fig. 17



7) Remove Retaining ring R-28 using 1R291. (Fig. 18)

8) Assemble 1R033 and Receive washer to Cutter shaft by tightening M10-17 Hex nut, and then tap Gear case assembly using plastic hammer as illustrated in Fig. 19.

Cutter shaft with Ball bearing 6001LLU can be removed by the weight of 1R033.

The parts mentioned above are shown in Fig. 20.

Note: 1) The following parts are not included in models BBC300L and AT-3630.

Therefore, they are not shown in Fig. 20. However, use M10-17 Hex nut and 1R033 to remove Cutter shaft for BBC300L and AT-3630.

*Clamp washer *Cup *M10-17 Hex nut

2) Refer to the instruction manual and the parts breakdown, and set Receive washer in place when assembling.

9) Remove Ball bearing 6001LLU from Cutter shaft using 1R045.

Fig. 18

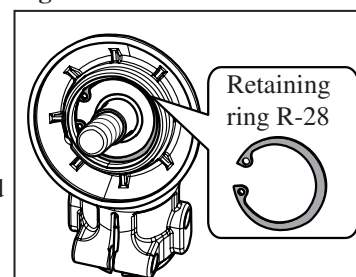


Fig. 19

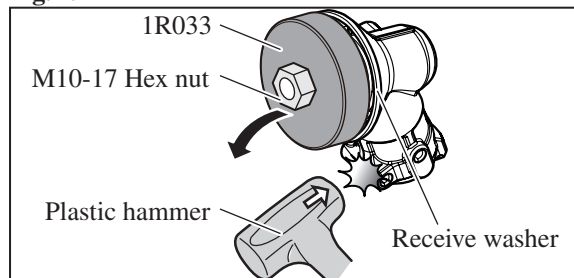
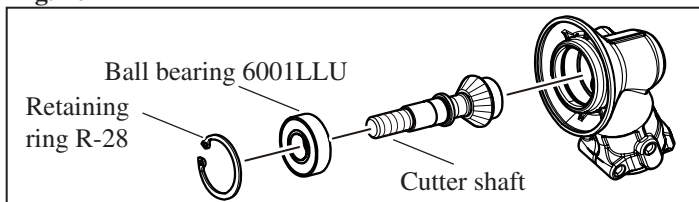


Fig. 20



► Repair

[3] DISASSEMBLY/ ASSEMBLY

[3]-2. Gear case assembly (for all models) (cont.)

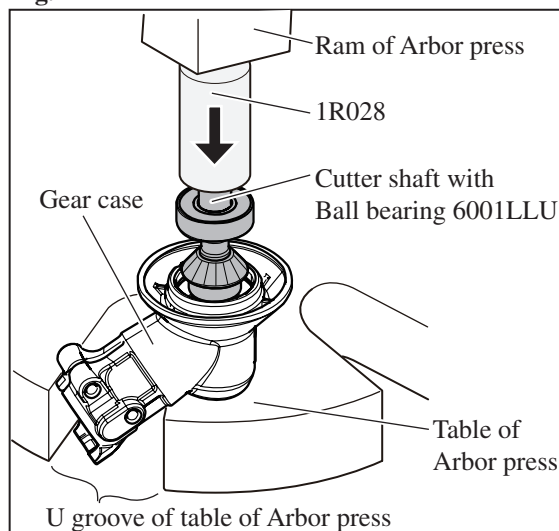
ASSEMBLING

Take the disassembling step in reverse.

Note: Pressfit Cutter shaft with Ball bearing 6001LLU into Gear case as follows;

- 1) Receive Gear case on table of Arbor press so that the shaft installation side faces the U groove of the table.
- 2) Press down the top of Cutter shaft using 1R028.

Fig. 21



[3]-3. Helical gear 33, Spindle hub (for all models)

DISASSEMBLING

- 1) Remove Gear case assembly from Shaft pipe.
- 2) Remove four M5x20 Pan head screws and Pipe bracket. (Fig. 22)
- 3) Remove Helical gear 33 with Spindle hub etc. from Gear box.

Refer to Fig. 23. The assembled section shown in Fig. 23 can be removed as illustrated in Fig. 24.

Fig. 22

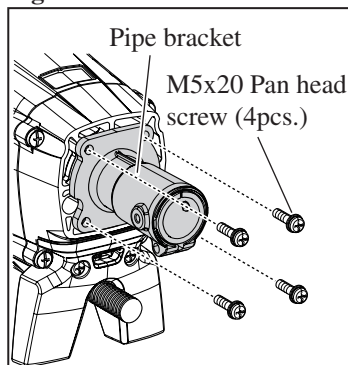


Fig. 23

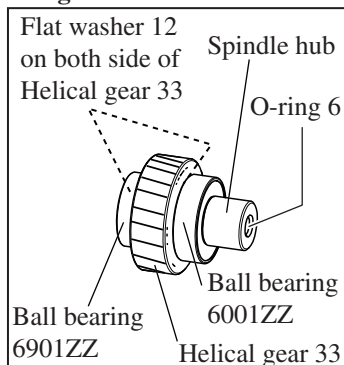
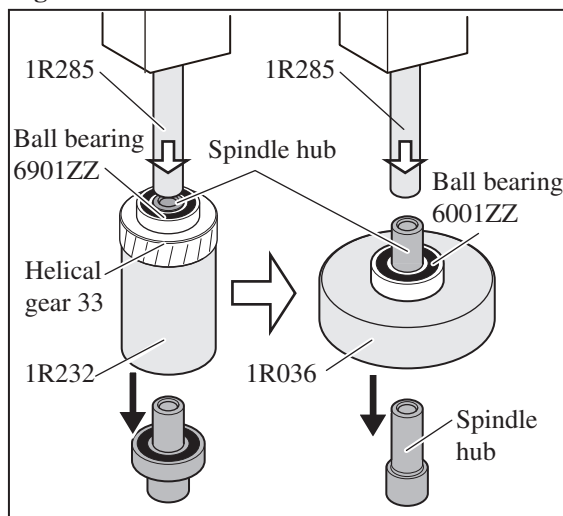


Fig. 24



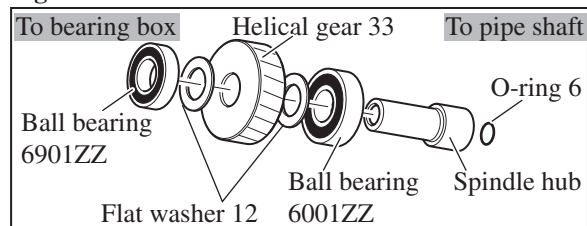
ASSEMBLING

Take the disassembling step in reverse.

Note: Refer to Figs. 23 and 25 for the positions of the components of Helical gear 33 section.

Do not fail to set O-ring 6 and two Flat washer 12 in place.

Fig. 25



► **Repair**

[3] DISASSEMBLY/ ASSEMBLY

[3]-4. Rotor, Stator (for all models)

DISASSEMBLING

- 1) Remove M5x20 Pan head screw and M5x20 Hex socket head screw, and then slide Pipe bracket cover to Cushion side. (Fig. 6)
- 2) Remove four M5x20 Pan head screws and Pipe bracket. (Fig. 22)
- 3) Remove two M5x20 Pan head screws and Stand. (Fig. 26)
- 4) Remove four M5x25 Tapping screws for fastening Gear box and Housing set. (Fig. 27) Gear box can be removed.
- 5) Remove four 4x18 Tapping screws and Housing R. (Fig. 28)
- 6) Disconnect Stator and Controller by their Connectors. (Fig. 11)
- 7) Remove the following parts together from Housing L.
 - * Gear box
 - * Motor housing set
 - * Rotor
 - * Stator
- 8) Remove four 4x18 Tapping screws and Gear box from the above parts. (Fig. 29)
- 9) Remove Three 4x18 Tapping screws and Motor housing R from Motor housing L. (Fig. 30)
- 10) Push the shaft end of Rotor against work table and slide Stator to work table. Then pull out Rotor from Stator. as illustrated in Fig. 31.

Fig. 26

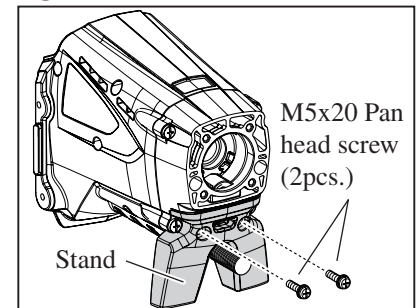


Fig. 27

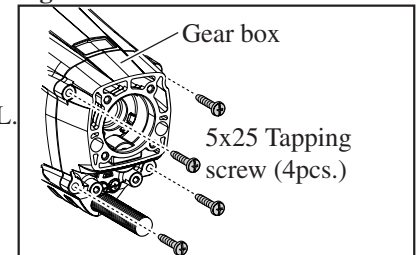


Fig. 28

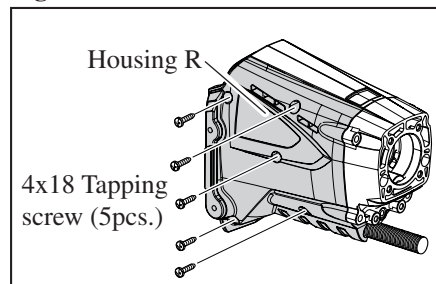


Fig. 29

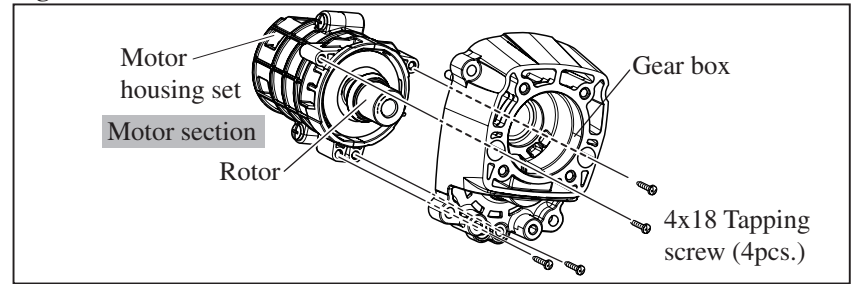


Fig. 30

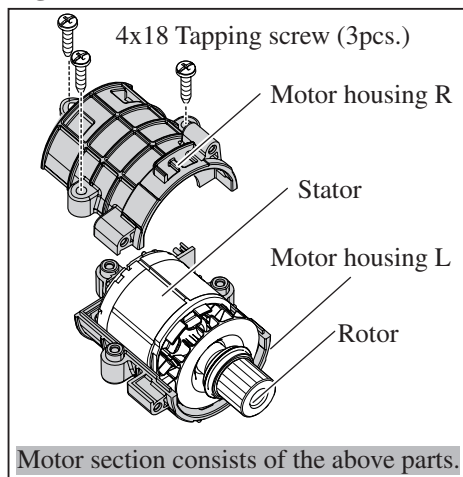
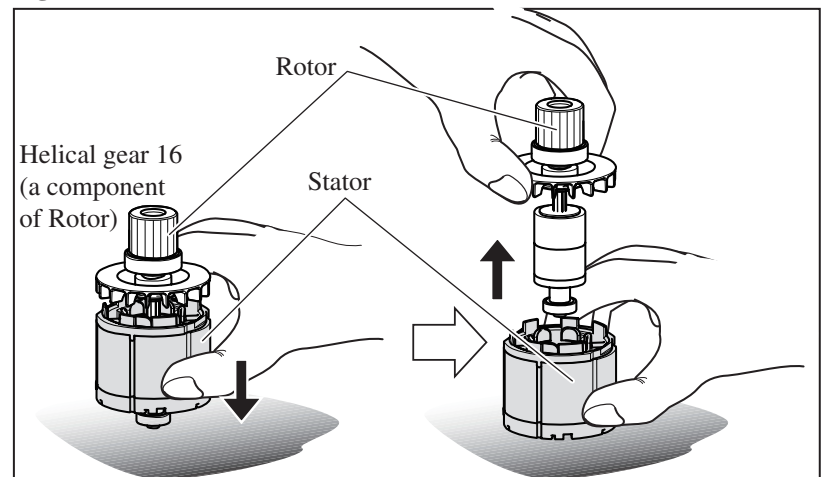


Fig. 31



► **Repair**

[3] DISASSEMBLY/ ASSEMBLY
[3]-4. Rotor, Stator (for all models)

ASSEMBLING

Insert Rotor into Stator slowly so as not to scratch the inside of Stator.

- Note:**
1. Hold them firmly and carefully so that the ball bearing of Rotor does not touch the circuit board of Stator. Quick insertion without care may cause a damage.
 2. Maintain enough distance between Rotors in stock. Even if one is close to another during carrying and storing, they suddenly attract due to strongly magnetic force. The contact of Rotors cause cracks and damage of the magnet and weakening the magnetic force. (Fig. 32)
 3. Two halves of Motor housing set are difficult to meet their matching surfaces. Therefore, put them on 1R350 to align the four holes surfaces with Gear box contact portions. And tighten three 4x18 Tapping screws for assembling Motor housing R to Motor housing L.

Fig. 32

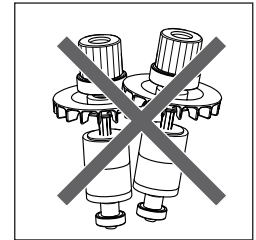
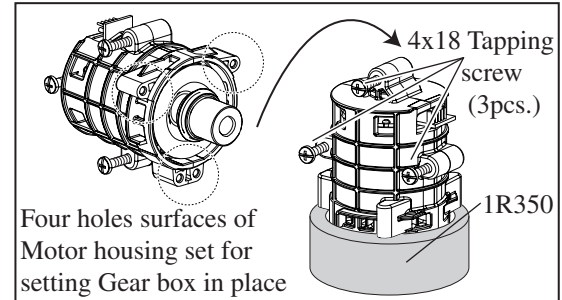


Fig. 33



[3]-5. Replacing Indicator (for all models)

Refer to Fig. 34 (for BBC231U and AT-3623) / Fig. 34A (for BBC300L and AT-3630).

- Note:**
1. Steel ball 5.0 and Compression spring 2 are easy to miss. Therefore, hold them by fingers and remove Indicator from Main grip L when disassembling.
 2. Insert Indicator into Main grip L, and attach Steel ball 5.0 to Indicator. After above steps, set Compression spring 2 in place.

Fig. 34

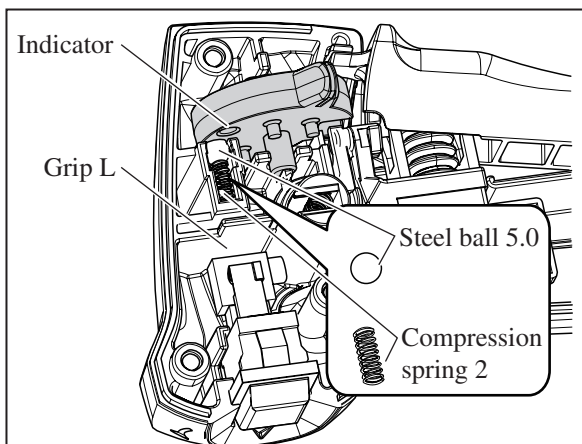
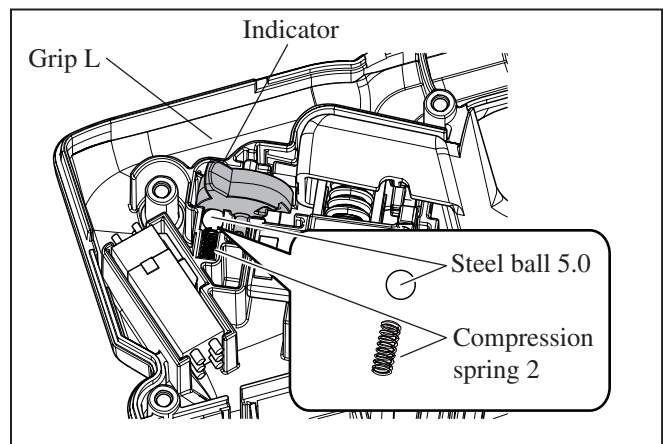


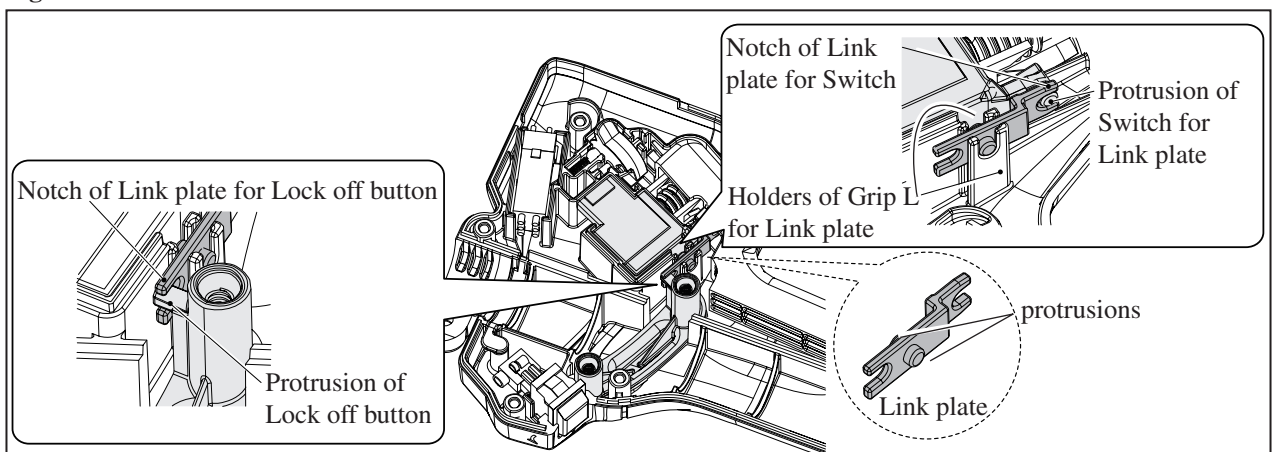
Fig. 34A



[3]-5. Replacing Link plate (only for BBC231U and AT-3623)

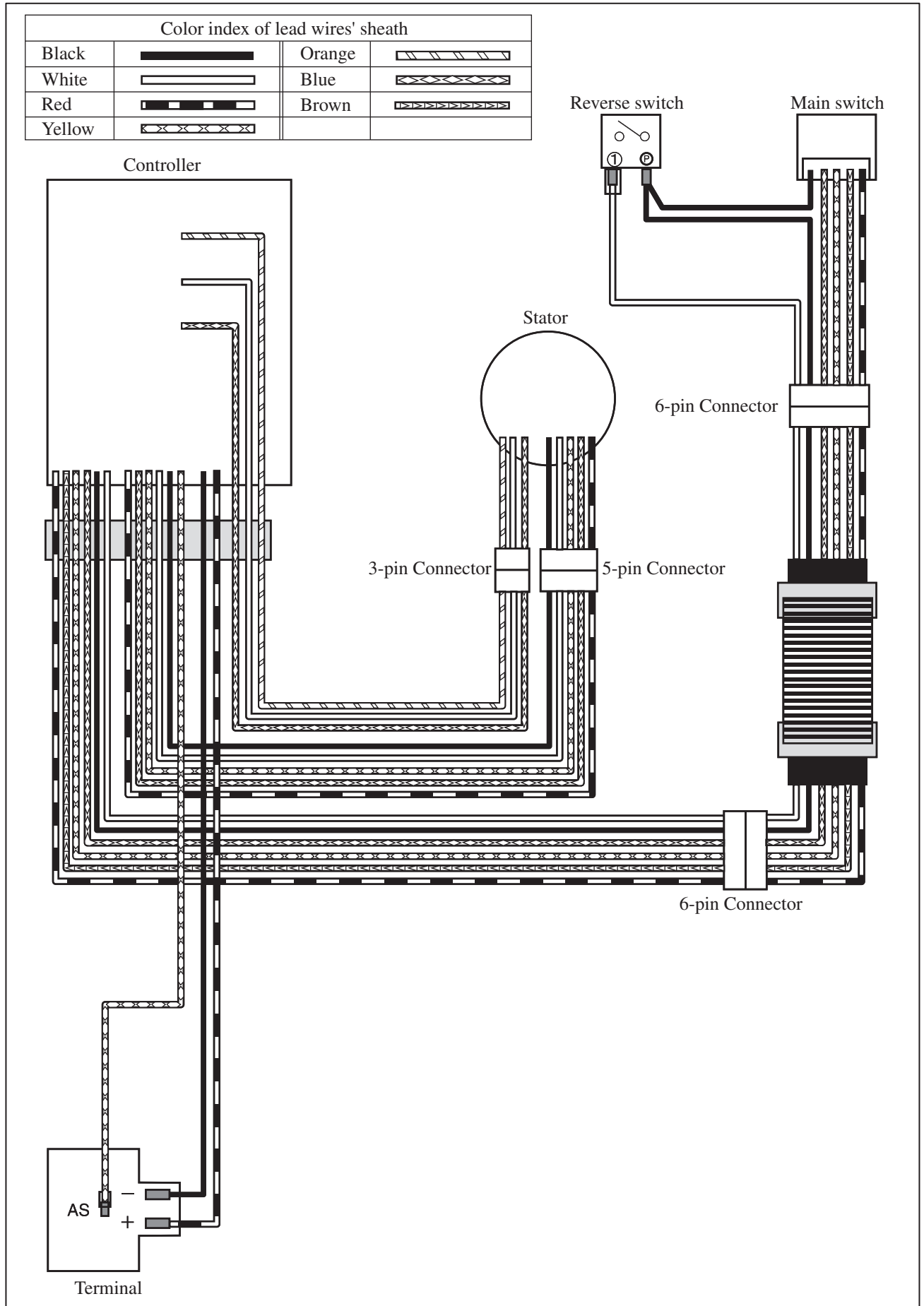
- Fit the protrusions of Link plate into the holders of Grip L.
 Fit the protrusion of Switch into the notch of Link plate.
 Fit the protrusion of Lock off button into the notch of Link plate. (Fig. 35)

Fig. 35



► **Circuit diagram (for all models)**

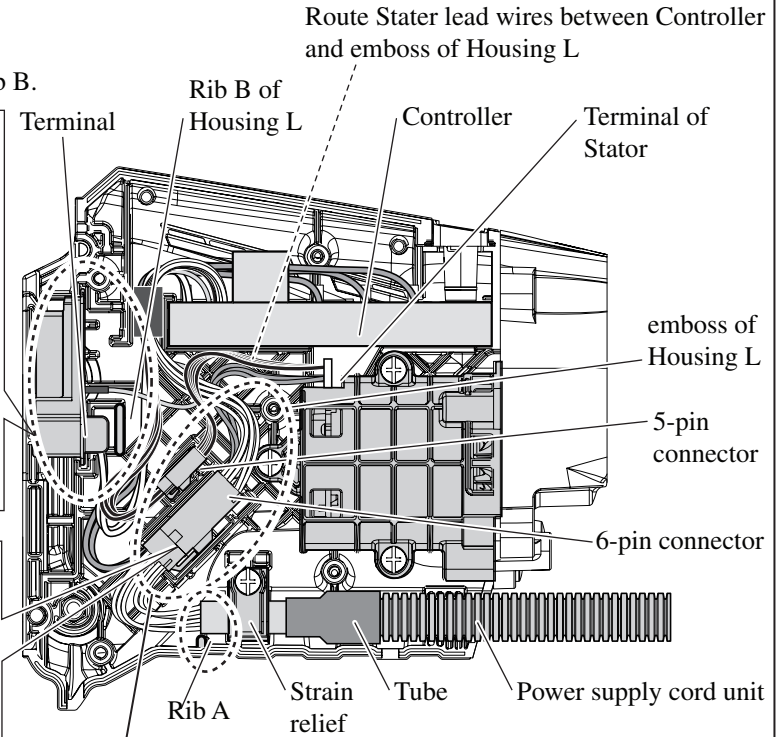
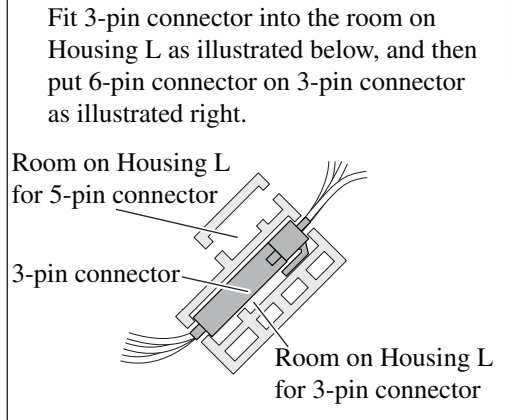
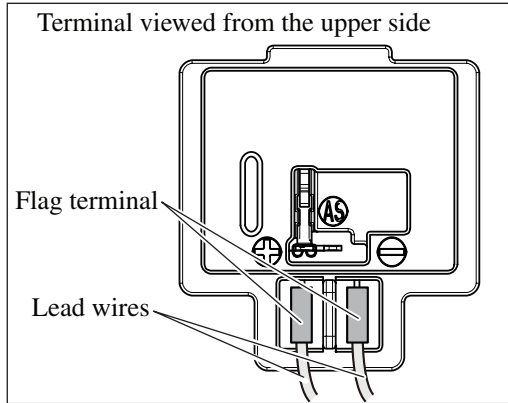
Fig. D-1



► **Wiring diagram (for BBC230U and AT-3623)**

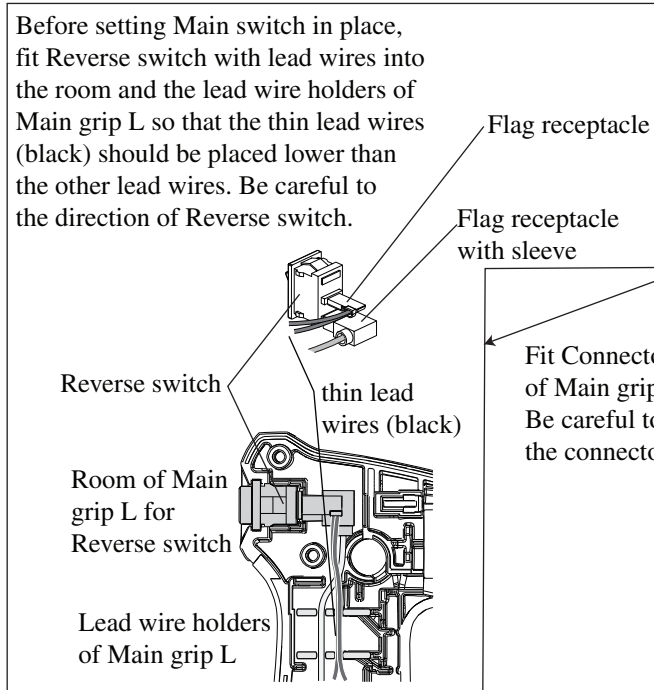
Fig. D-2

Connect Flag terminals with Terminal so that Lead wires face outside of Terminal. Do not route the Lead wires between Terminal and Rib B.

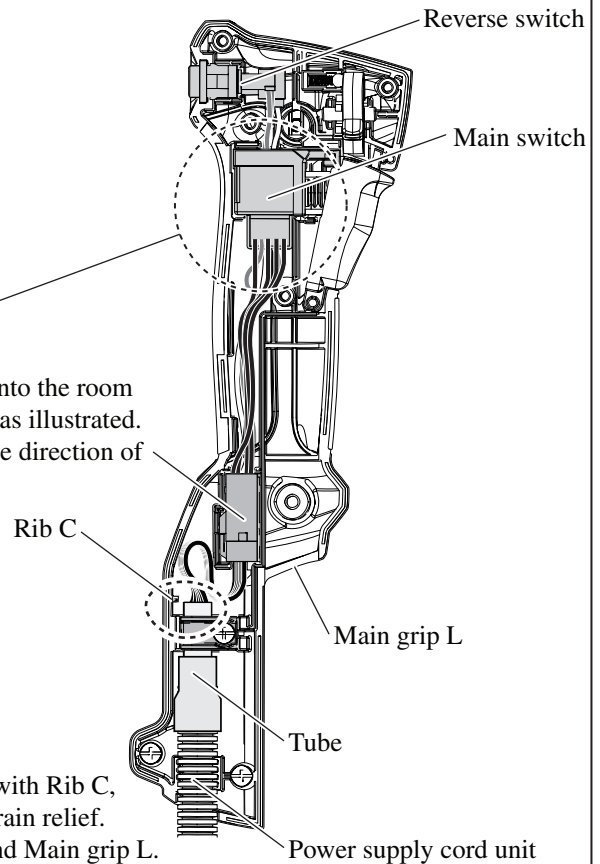


Align one end of Power supply cord with Rib A, and secure Power supply cord unit with Strain relief. Do not pinch Tube between Strain relief and Housing L.

Do not put Lead wires on 3-pin connector and 6-pin connector.



Fit Connector into the room of Main grip L as illustrated. Be careful to the direction of the connector.

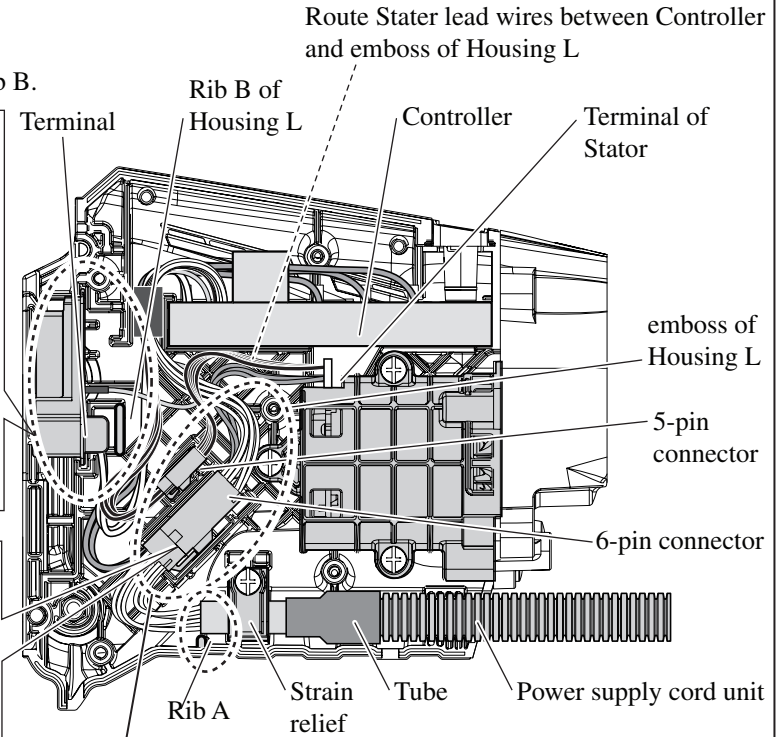
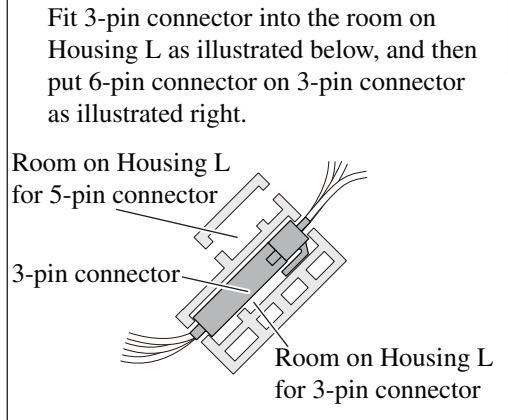
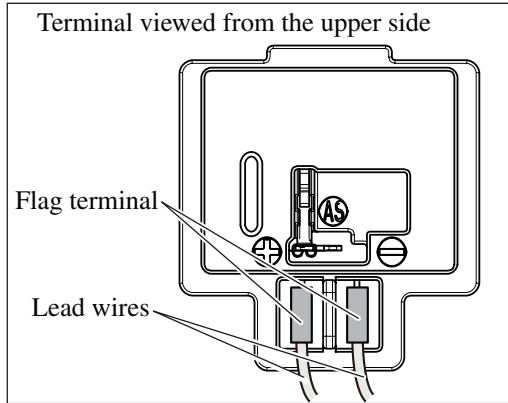


Align the other end of Power supply cord with Rib C, and secure Power supply cord unit with Strain relief. Do not pinch Tube between Strain relief and Main grip L.

► **Wiring diagram (for BBC300L and AT-3630)**

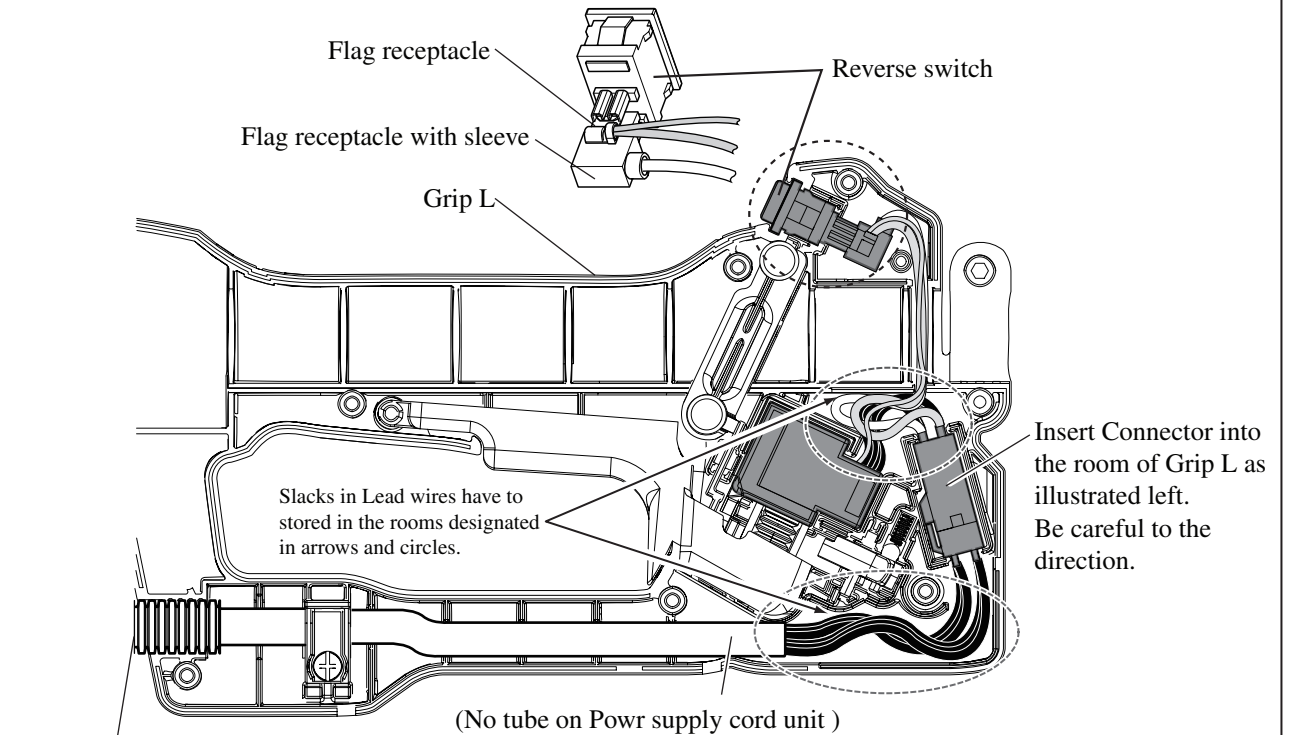
Fig. D-2A

Connect Flag terminals with Terminal so that Lead wires face outside of Terminal. Do not route the Lead wires between Terminal and Rib B.



Align one end of Power supply cord with Rib A, and secure Power supply cord unit with Strain relief. Do not pinch Tube between Strain relief and Housing L.

Do not put Lead wires on 3-pin connector and 6-pin connector.



(Tube side of Power supply cord unit with tube)

Face the tube side of Power supply cord unit to Strain relief side, and fix Power supply cord unit with Strain relief.

► Troubleshooting (for all models)

Refer to the following list.

If malfunctions are not improved after trying the steps shown in the sheet, replace Controller.

Malfunction	Warning lamps status	Action
Motor does not revolve.	Neither Battery warning lamp nor Motor warning lamp is turned on.	Check the connection of connectors.
		Replace Main switch.
		Check assembling Lock-off lever properly.
	Battery warning lamp is turned on.	Install Battery firmly.
		Check the connection of connectors. Recharge Battery.
Motor warning lamp is turned on.	Machine reaches high temperature. Cool it down.	
Motor warning lamp blinks.	Remove objects around Blade to eliminate the locking.	
	Check the connection of connectors. Replace Stator.	
Battery warning lamp and Motor warning lamp blinks alternatively.	Check assembling the inner components of right handle.	
	Replace Stator.	
	Check the connection of connectors.	
Motor does not revolve in reverse direction.		Check the connection of connectors. Replace Reverse switch.
Motor does not revolve in forward direction.		Replace Reverse switch.
Motor does not revolve continuously.		Check if Reverse switch is shifted to reverse position.
		Replace Reverse switch.
Motor speed is not stable.		Replace Main switch.
Motor speed does not reach the maximum.		Check assembling the inner components of right handle.
		Check if Reverse switch is shifted to reverse position.