

# CORDLESS DEMOLITION HAMMER HM002G

## REPAIR MANUAL



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## 2 CAUTION

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

Follow the instructions described below in advance before repairing:

- Wear gloves.
- In order to avoid wrong reassembly, draw or write down where and how the parts are assembled, and what the parts are.
- It is also recommended to have boxes ready to keep disassembled parts by group.
- Handle the disassembled parts carefully. Clean and wash them properly.
- Remove Batteries, except when they are necessary to check the operation of the machine.

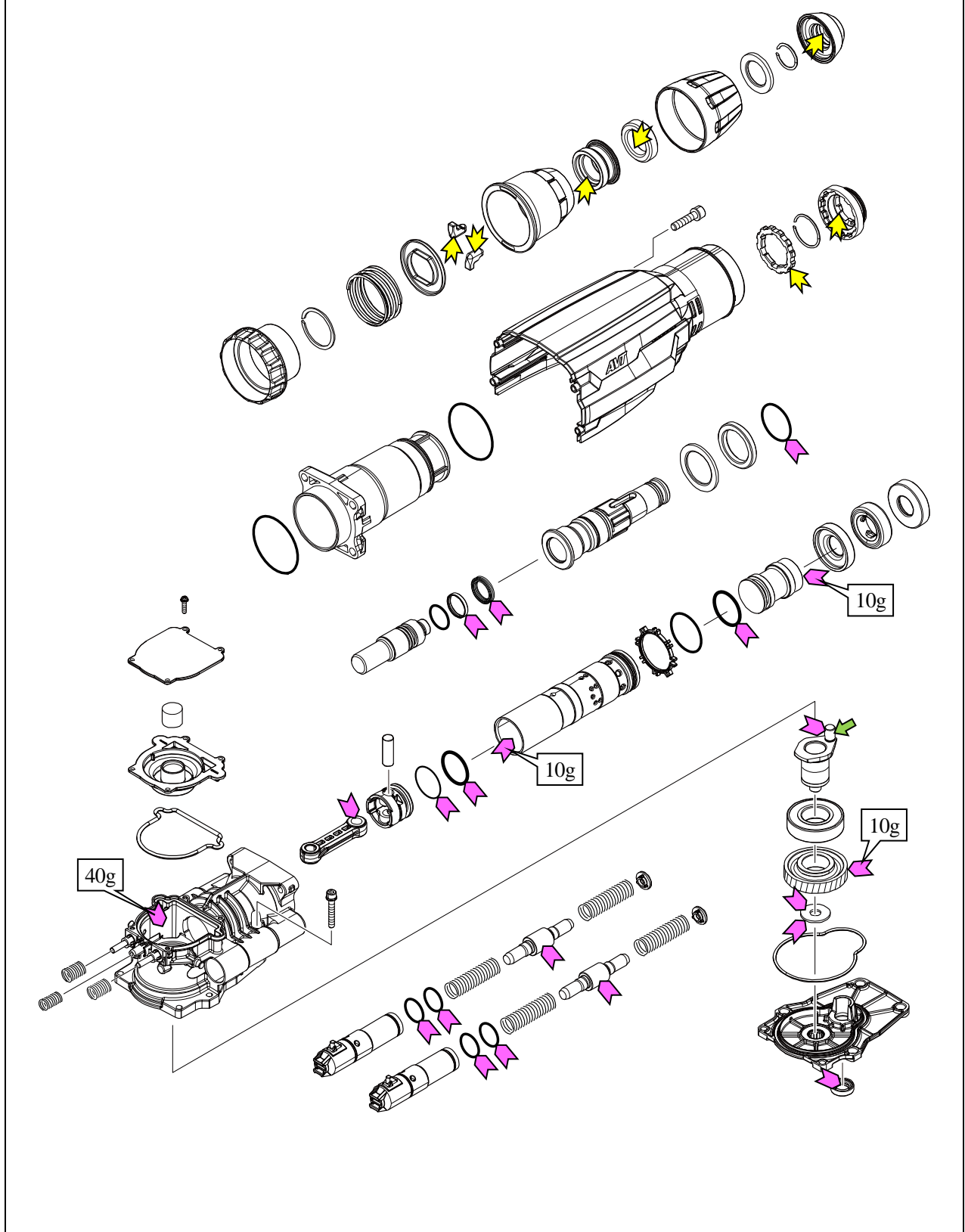
## 3 NECESSARY REPAIRING TOOLS

Code No.	Description	Use for
1R003	Retaining ring pliers ST-2N	removing/assembling Ring spring 35, Retaining ring WR-45 and Ring spring 26
1R045	Gear puller large	removing Motor housing and Rotor
1R132	Bearing puller for 1R089 15-20	removing Ball bearing 6302DDW
1R212	Plier tip for 1R004 large	using with 1R003
1R212-A	Plier tip for 1R004 small	
1R212-B	Plate set with screws	
1R213	Cylinder extractor	removing Crank shaft
1R214	Taper sleeve	shrinking Fluoride ring 28
1R218	Adjuster sleeve for 1R023	supporting Crank housing
1R232	Pipe 30-50	holding Ring spring 26
1R258	V block A-125	supporting Helical gear 57 and Crank housing
1R312	Hammer clamping vise	holding Crank housing
1R363	SDS-MAX ring spring extractor	pushing in Flat washer 30
1R411	Push bar for lead wires	fix Lead wires in Lead wire holders

#### 4 LUBRICANT AND ADHESIVE APPLICATION

	Description	Amount
↑	Makita grease FA. No.2	a little
↑	Makita grease R. No.00	Apply a little unless specified in the figure.
↑	Molybdenum disulfide	a little

Fig. 1

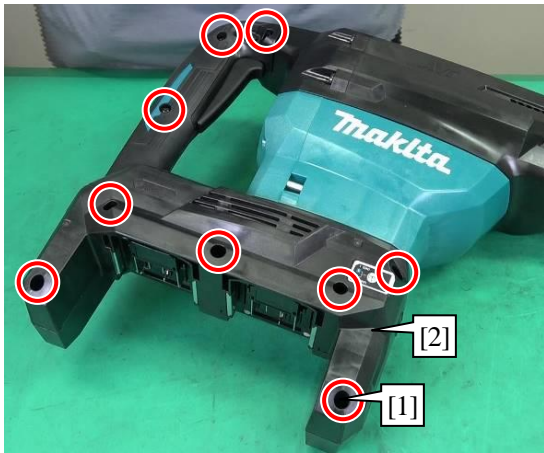


## 5 TIGHTENING TORQUE SPECIFICATIONS

Parts to fasten		Fastener	Tightening torque (N·m)
Crank housing	↔ Barrel	Hex socket head bolt M8x35	29.4 - 39.2
	↔ Crank cap cover	Pan head screw M4x18	0.88 - 1.5
	↔ Motor housing	H.S.H.bolt M6x40 with WR	3.9 - 4.3

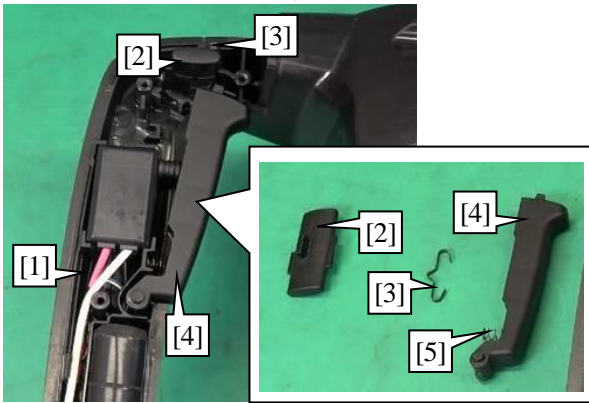
**6 REPAIR**  
**6-1 Disassembling**  
**6-1-1 Housing section**

Fig. 2



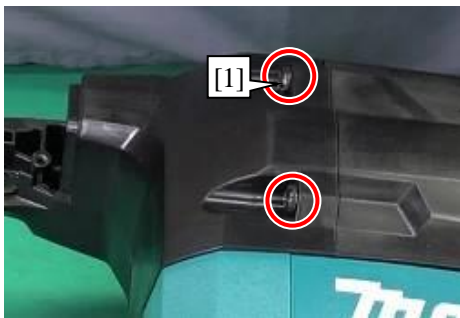
- 1** Remove Tapping screws 4x18 [1] (10 pcs), then remove Housing R [2].

Fig. 3



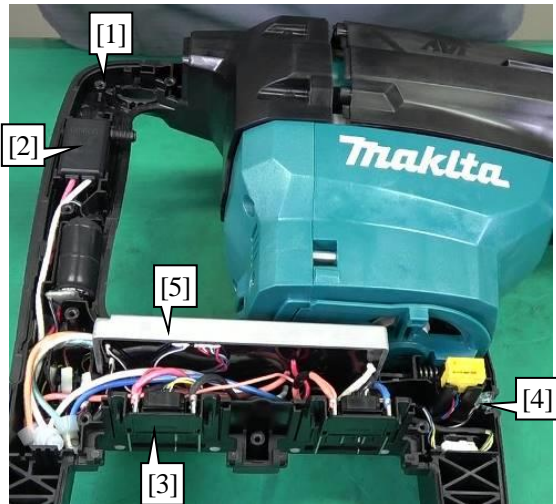
- 2** Remove the following parts from Housing [1]:
- Trigger lock [2]
  - Leaf spring [3]
  - Switch lever [4]
  - Compression spring 5 [5]

Fig. 4



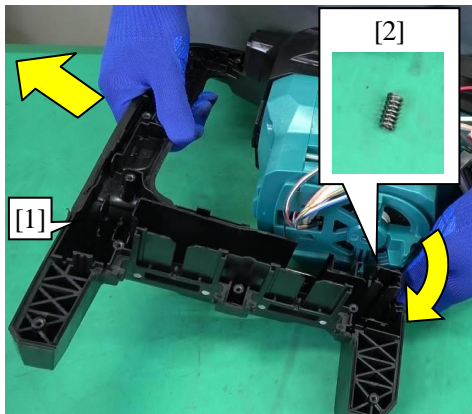
- 3** Remove Tapping screws 5x25 [1] (4 pcs).

Fig. 5



- 4 Remove the following parts from Housing [1]:
- Switch [2]
  - Terminal units [3] (2 pcs)
  - LED circuit [4]
  - Controller [5]

Fig. 6

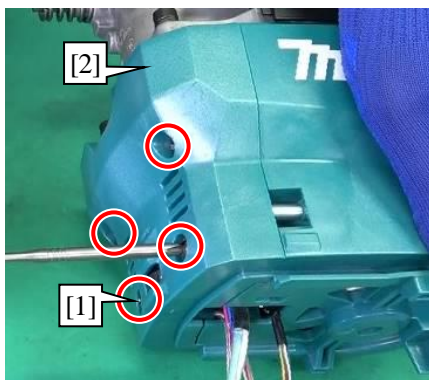


- 5 Remove Housing [1] and Compression spring 8 [2].

Note

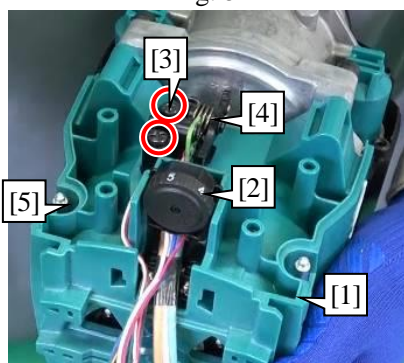
Be careful not to pop out Compression spring 8 [2].

Fig. 7



- 6 Remove Tapping screws 5x25 [1] (4 pcs), then remove Motor housing cover [2].

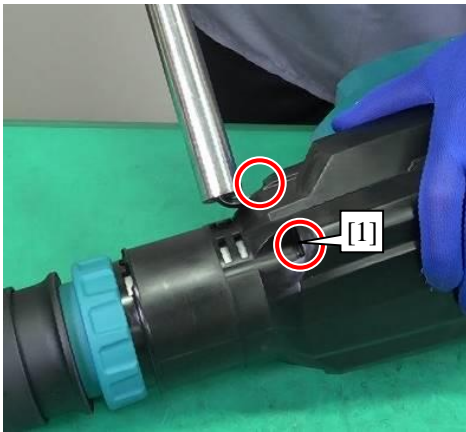
Fig. 8



- 7 Remove the following parts from Motor housing [1]:
- Dial circuit [2]
  - Tapping screws 4x18 [3] (2 pcs)
  - Base section [4]
  - Shoulder pins 4-6 [5] (2 pcs)
- 8 Disconnect each lead wire.

## 6-1-2 Chuck section

Fig. 9

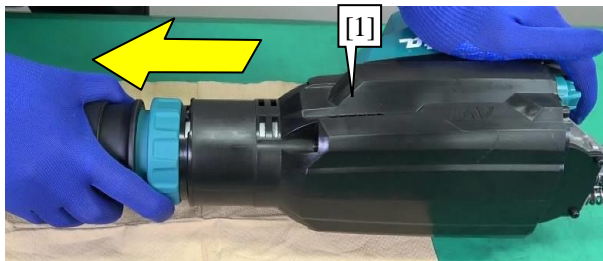


- 1 Remove Hex socket head bolts M8x35 [1] (4 pcs).

### Tips

Remove each Hex socket head bolt M8x35 [1] after loosening it with Hex wrench and Pipe, because Hex socket head bolt M8x35 [1] is firmly tightened.

Fig. 10

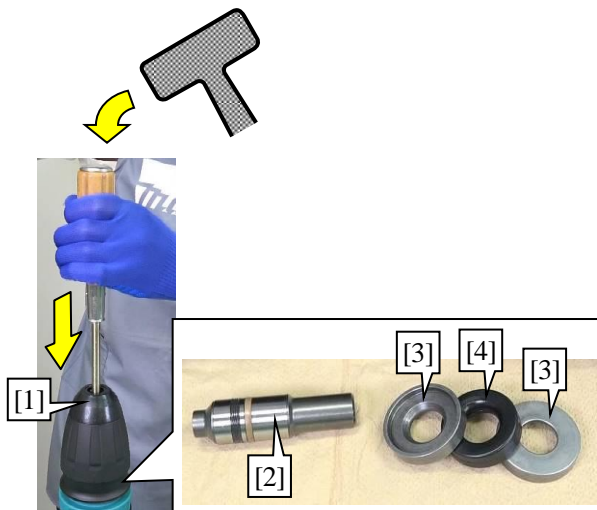


- 2 Remove Housing cover section [1].

### Note

Lay a waste cloth or the like because the grease may leak when removing Housing cover [1].

Fig. 11

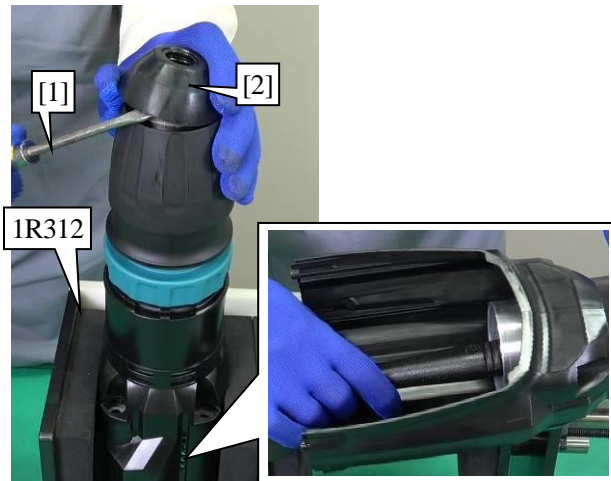


- 3 Insert a screwdriver or the like from the end of Tool holder [1], then remove Impact bolt [2] by tapping the screwdriver with a plastic hammer.

- 4 If Shoulder sleeves [3] (2 pcs) and Rubber ring 39 [4] are left in Tool holder [1], they will be removed together.



Fig. 12

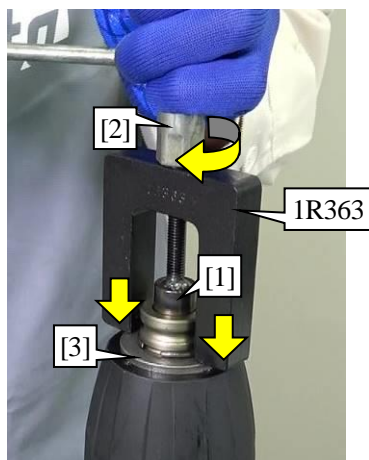


- 5 Hold the machine with 1R312 and remove Tool holder cap [2] with a slotted screwdriver [1].

**Tips**

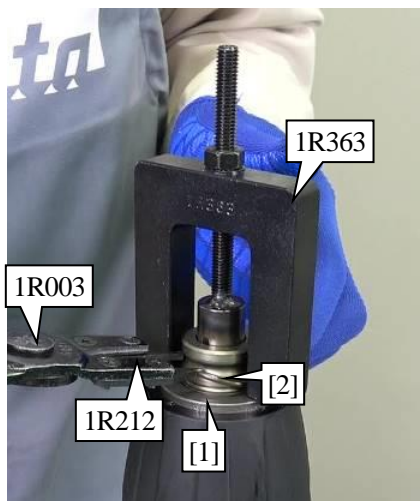
Support Barrel with a grip of plastic hammer to prevent it from falling out.

Fig. 13



- 6 Insert SDS max shank [1] of 1R363 and fix it in the same way as a bit.
- 7 Tighten the nut of 1R363 with Socket wrench 13 [2] to push down Flat washer 30 [3].

Fig. 14

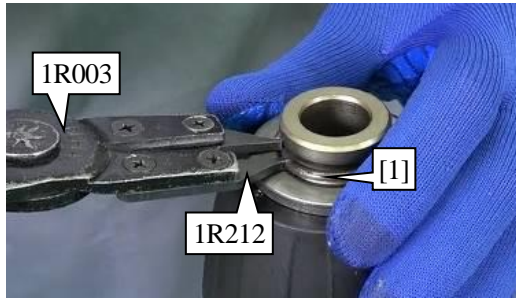


- 8 Push down Flat washer 30 [1] with 1R363, then remove Ring spring 26 [2] from the groove with 1R003 and 1R212.

**Tips**

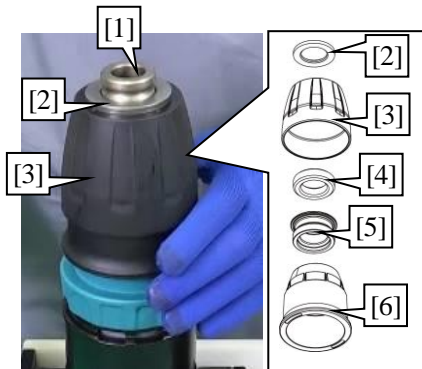
The outer diameter of Ring spring 26 [2] maybe interfere with 1R363 and the gap of Ring spring 26 [2] maybe difficult to open, because the dimensions of 1R363 differ depending on when it is obtained.

Fig. 15



- 9** Remove 1R363, then remove Ring spring 26 [1] with 1R003 and 1R212.

Fig. 16



- 10** Remove the following parts from Tool holder [1]:

- Flat washer 30 [2]
- Chuck cover [3]
- Rubber ring 30 [4]
- Chuck ring [5]
- Release cover [6]

Fig. 17



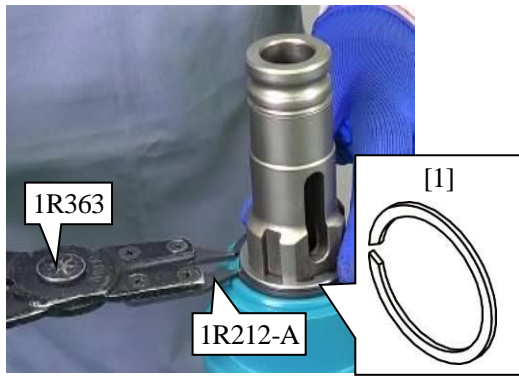
- 11** Push down Spring guide [1], then remove Tool retainers [2] (2 pcs).

Fig. 18



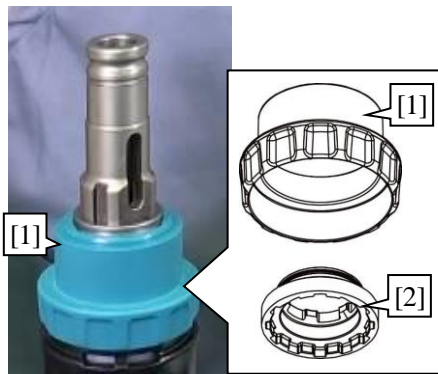
- 12** Remove Spring guide [1] and Compression spring 56 [2].

Fig. 19



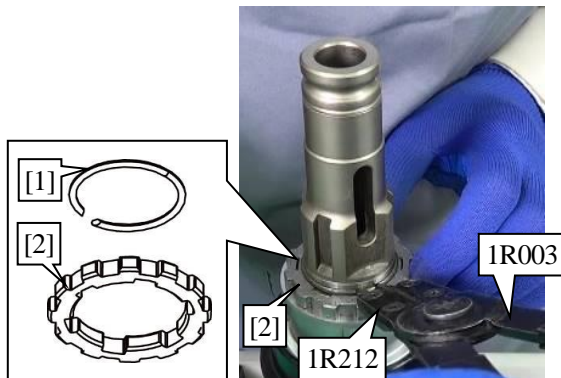
**13** Remove Retaining ring WR-45 [1] with 1R003 and 1R212-A.

Fig. 20



**14** Remove Change ring cover [1] and Change ring [2].

Fig. 21

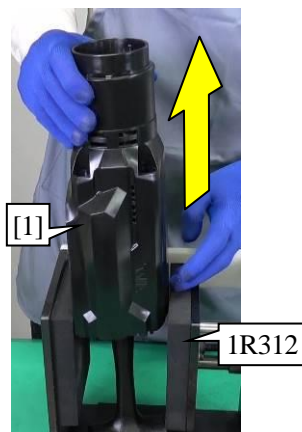


**15** Remove Ring spring 35 [1] with 1R003 and 1R212, then remove Lock ring [2].

**Tips**

Widen Ring spring 35 [1] with 1R003 and 1R212-A, then remove it with 1R003 and 1R212.

Fig. 22



**16** Remove Housing cover [1] from 1R312.

Fig. 23



17 Push out Tool holder [2] from Barrel [1].

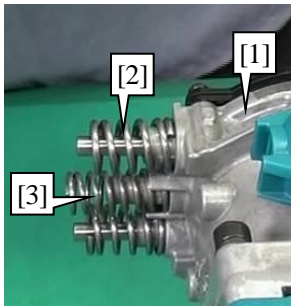
Fig. 24



18 Remove Rubber ring 39 [2], O-ring 35.5 [3] and Flat washer 39 [4] from Tool holder [1].

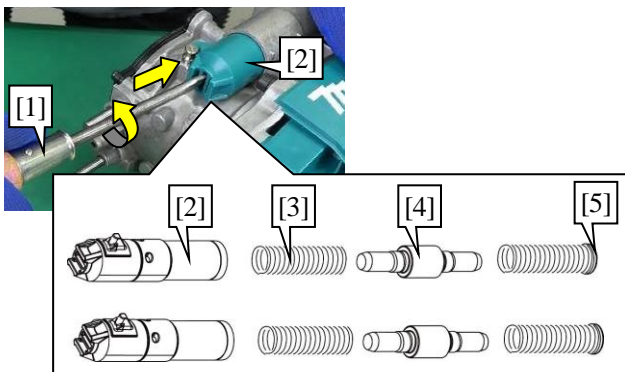
### 6-1-3 Motor section

Fig. 25



1 Remove Compression springs 12 [2] (2 pcs) and Compression spring 10 [3] from Crank housing [1].

Fig. 26



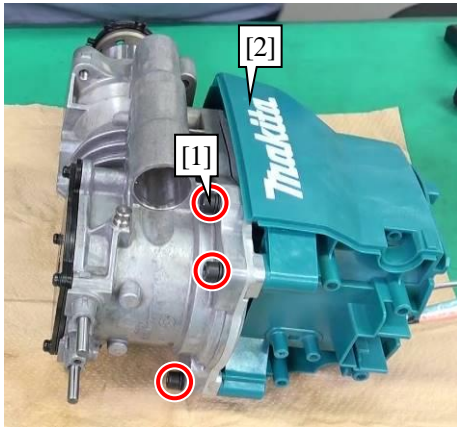
2 Turn Holder [2] with a large slotted screwdriver [1], then remove the following parts:

- Holder completes [2] (2 pcs)
- Compression springs 15 [3] (4 pcs)
- Counter weights [4] (2 pcs)
- Spring plates [5] (2 pcs)

**Note**

Be careful not to pop out Holder [2].

Fig. 27

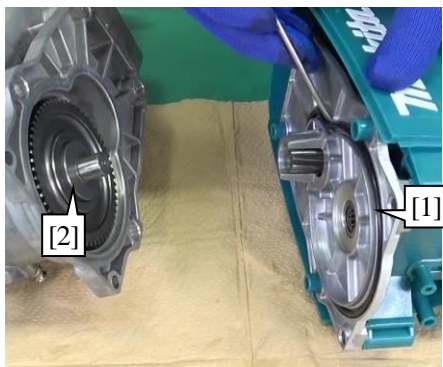


- 3 Remove H.S.H.bolts M6x40 with WR [1] (6 pcs), then remove Motor housing section [2].

Note

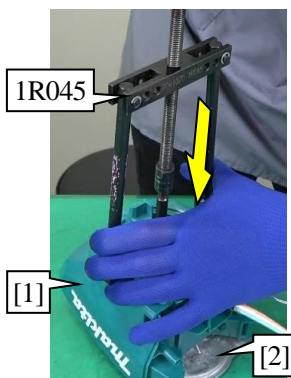
Lay a waste cloth or the like because the grease will leak.

Fig. 28



- 4 Remove Seal ring B [1] and Flat washer 12 [2].

Fig. 29

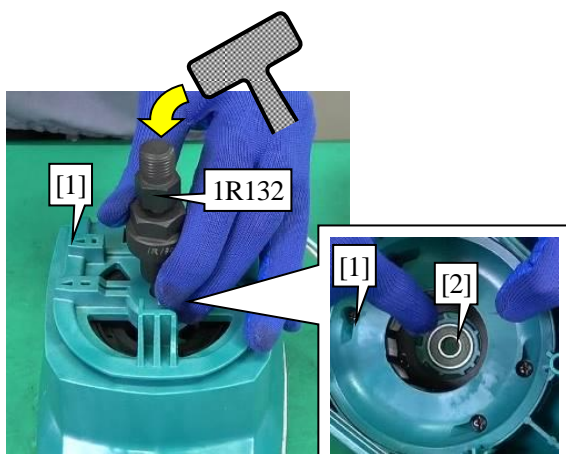


- 5 Attach 1R045 and an appropriate Round bar jig to Motor housing [1], then push out Gear housing [2].

Note

Use an appropriate Round bar with a hole at one end.

Fig. 30

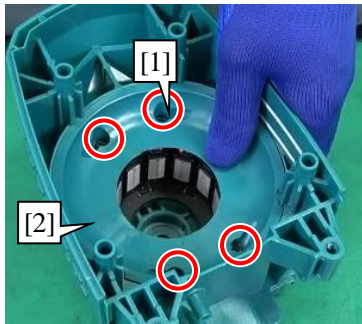


- 6 Insert 1R132 into Motor housing [1], then push out Ball bearing 6000DDW [2] by tapping it with a plastic hammer.

Note

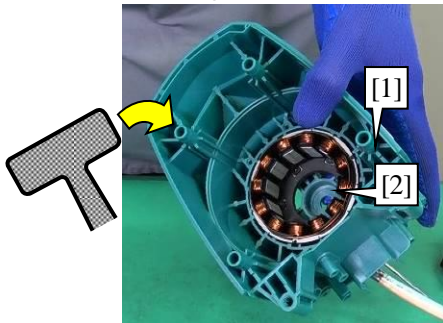
Only when Ball bearing 6000DDW [2] is left in Motor housing [1], do the above step.

Fig. 31



- 7 Remove Tapping screws 4x18 [1] (4 pcs), then remove Baffle plate [2].

Fig. 32



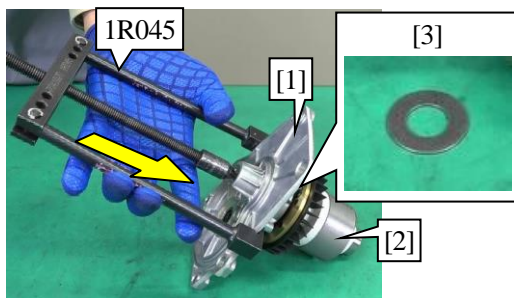
- 8 Tap Motor housing [1] with a plastic hammer to remove Stator [2].

Note

Do not tap the thin portion of Motor housing [1] because it is fragile.

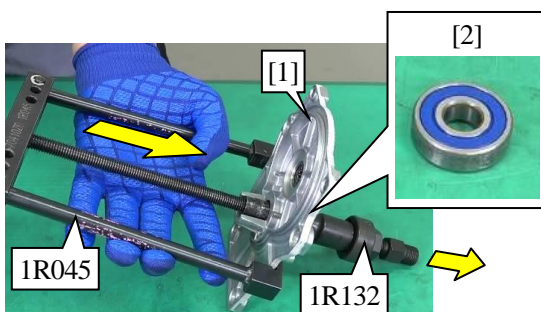
#### 6-1-4 Gear and Crank section

Fig. 33



- 1 Push out Rotor [2] from Gear housing [1] with 1R045.
- 2 Remove Flat washer 15 [3].

Fig. 34

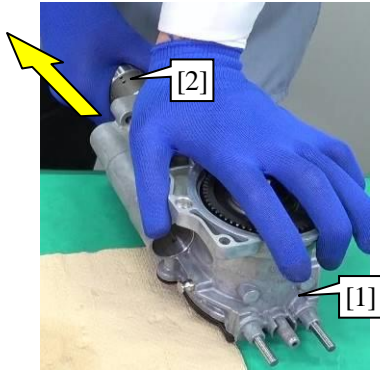


- 3 Insert 1R132 into Gear housing [1], then push out 1R132 and Ball bearing 6302DDW [2] with 1R045.

Tips

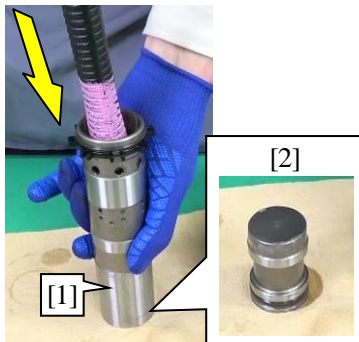
Set 1R132 between Oil seal and Ball bearing.

Fig. 35



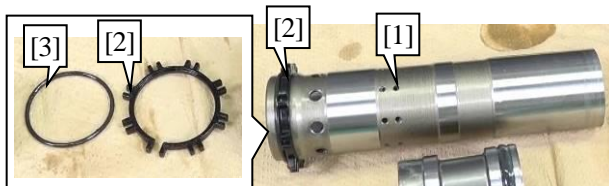
- 4 Pull Cylinder [2] out of Crank housing [1].

Fig. 36



- 5 Insert a grip of Plastic hammer into Cylinder [1], then push out Striker [2] from Cylinder [1].

Fig. 37

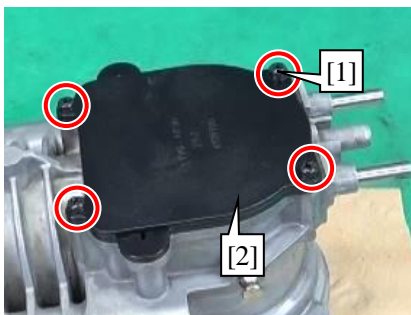


- 6 Remove One way valve guide [2] and O-ring 44 [3] from Cylinder [1].

**Tips**

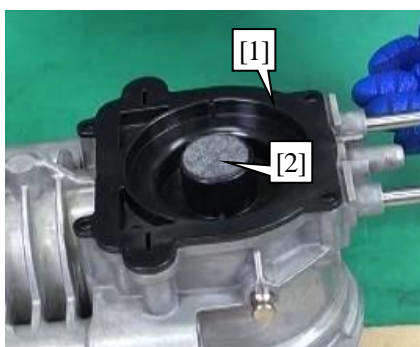
Because One way valve guide [2] has a gap as shown, open the gap.

Fig. 38



- 7 Remove Pan head screws M4x18 [1] (4 pcs), then remove Crank cap cover [2].

Fig. 39



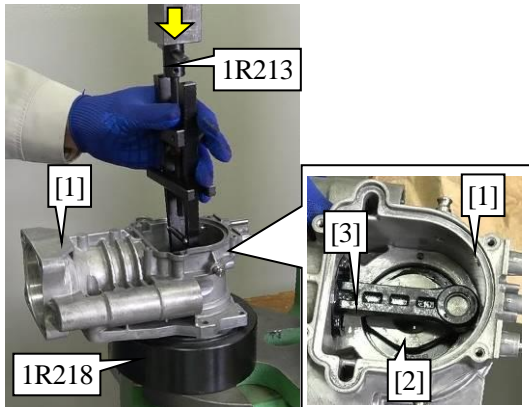
- 8 Remove Crank cap [1] and Filter [2].

Fig. 40



9 Remove Seal ring A [1].

Fig. 41



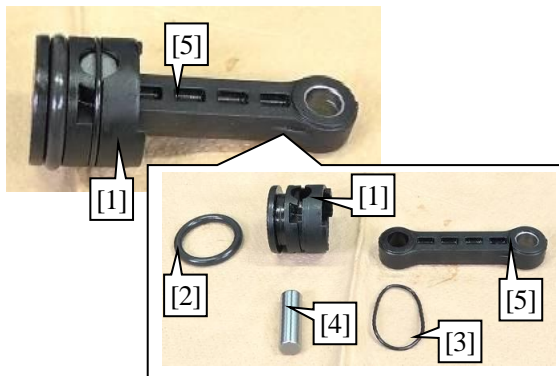
10 Support Crank housing [1] with 1R218, then push out Crank shaft section [2] with 1R213 and Arbor press.

11 Remove Connecting rod [3].

**Note**

- Position Connecting rod [3] at the escape portion in Crank housing [1].
- Make a cushion in 1R218 with a waste cloth or the like in case Crank shaft [2] falls.

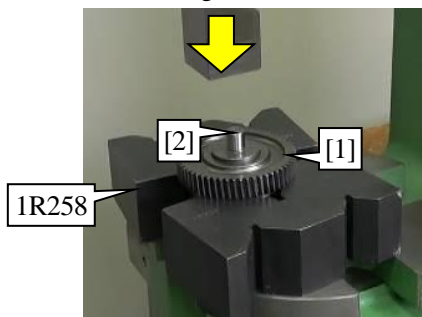
Fig. 42



12 Remove the following parts from Piston [1]:

- O-ring 31.5 [2]
- O ring 35 [3]
- Pin 12 [4]
- Connecting rod [5]

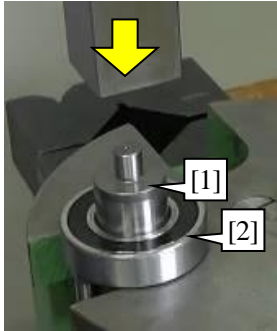
Fig. 43



13 Support Helical gear 57 [1] with 1R258, then push Crank shaft [2] with Arbor press to remove Helical gear 57 [1].



Fig. 44

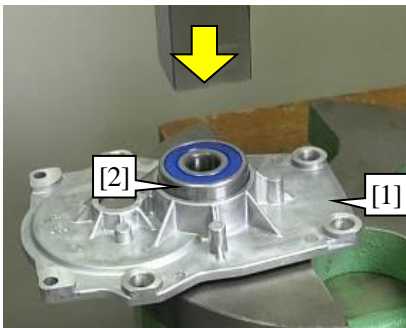


- 14 Push out Crank shaft [1] with Arbor press to remove Ball bearing 6206LLB [2].

## 6-2 Assembling

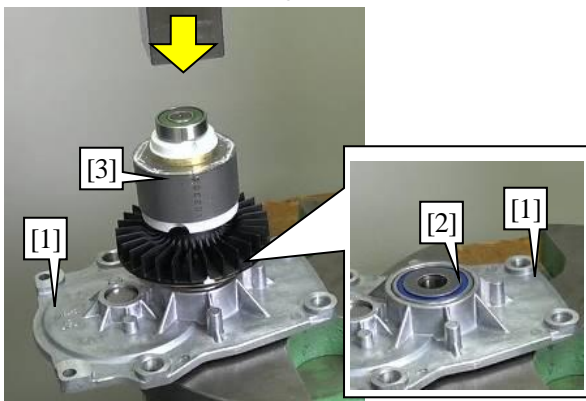
### 6-2-1 Gear and Crank section

Fig. 45



- 1 Assemble Ball bearing 6302DDW [2] to Gear housing [1], then press-fit them.

Fig. 46

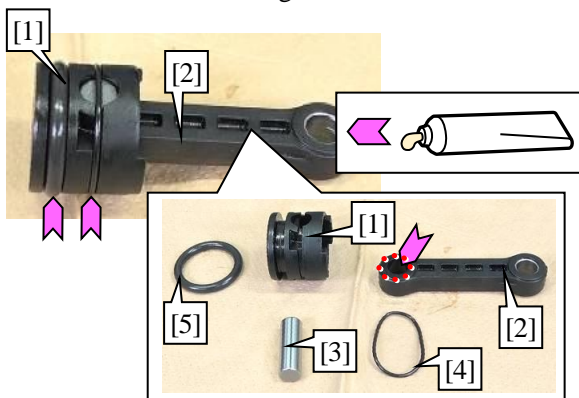


- 2 Assemble Flat washer 15 [2] and Rotor [3] to Gear housing [1], then press-fit them.

#### Note

Apply the specified grease to the oil seal of Gear housing [1].

Fig. 47



- 3 Assemble the following parts to Piston [1]:

- Connecting rod [2]
- Pin 12 [3]
- O ring 35 [4]
- O-ring 31.5 [5]

#### Note

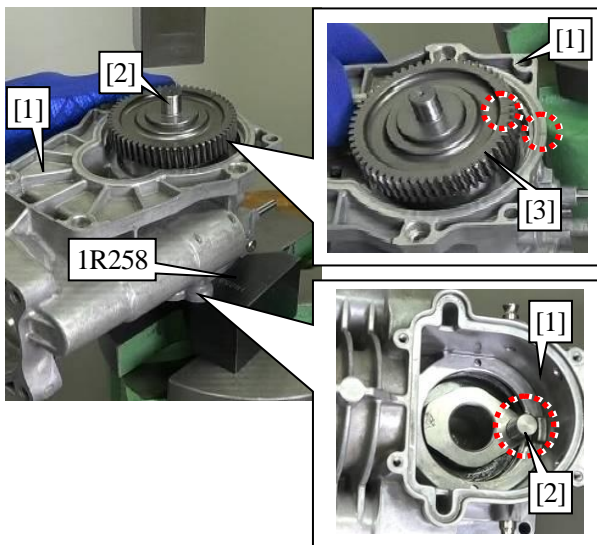
Apply the specified grease to the portion indicated by the arrow.

Fig. 48



- 4 Assemble Ball bearing 6206LLB [2] and Helical gear 57 [3] to Crank shaft [1], then press-fit them with an appropriate Pipe jig.

Fig. 49



- 5 Place Crank housing [1] on 1R258, then align the crank pin of Crank shaft [2] with the escape portion of Crank housing [1].

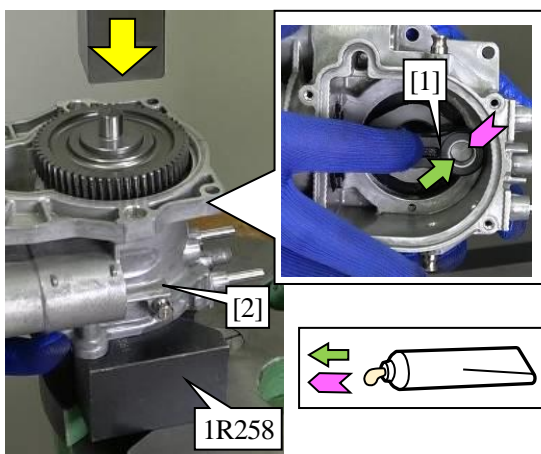
**Note**

If the escape portion of Crank housing [1] and the pin of Crank shaft [2] are not matched, Crank housing [1] cannot be inserted and will be broken. At this point, only alignment is required and press-fitting is the next step.

**Tips**

It is recommended to mark on Helical gear 57 [3] and Crank housing [1] so that the press-fitting position does not shift.

Fig. 50

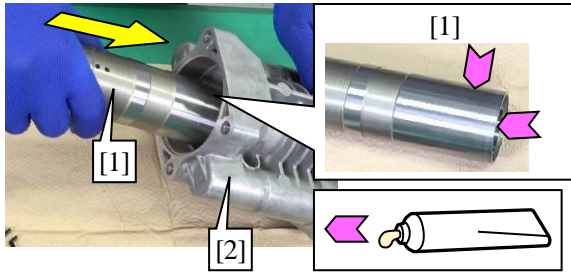


- 6 Assemble Connecting rod [1], then support Crank housing [2] with 1R258, and then press-fit them.

**Note**

- Hold Connecting rod [1] by finger from the bottom, then press-fit Connecting rod [1] while checking that it is straight, because if Connecting rod [1] is twisted, it will break.
- Apply the specified grease (2 types) to the sliding portion of Connecting rod [1].

Fig. 51



7 Assemble Cylinder [1] to Crank housing [2].

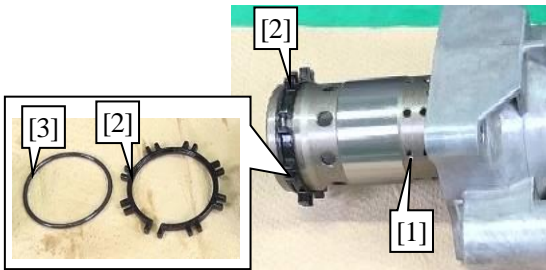
**Tips**

Assemble Cylinder [1] with Piston moved forward and fully.

**Note**

Apply the specified grease to the outer and inner surface of Cylinder [1].

Fig. 52



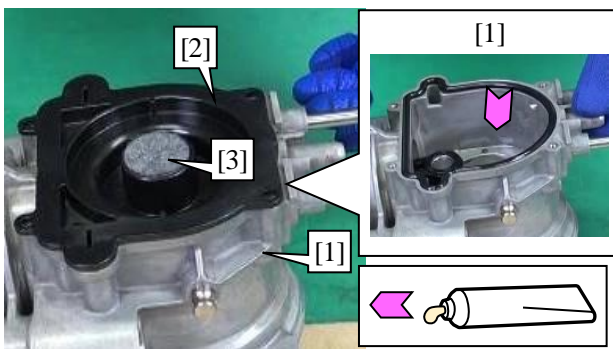
8 Assemble One way valve guide [2] and O-ring 44 [3] to Cylinder [1].

Fig. 53



9 Assemble Seal ring A [2] to Crank housing [1].

Fig. 54

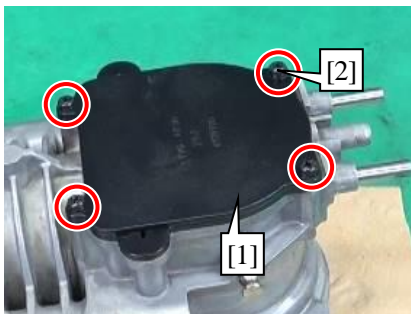


10 Assemble Crank cap [2] and Filter [3] to Crank housing [1].

**Note**

Apply the specified grease into Crank housing [1].

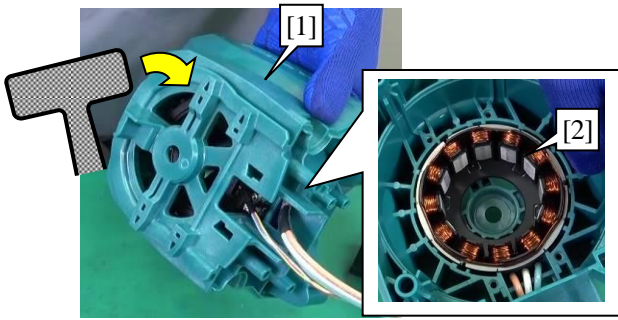
Fig. 55



11 Assemble Crank cap cover [1] with Pan head screws M4x18 [2] (4 pcs).

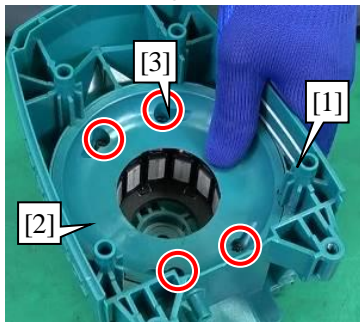
## 6-2-2 Motor section

Fig. 56



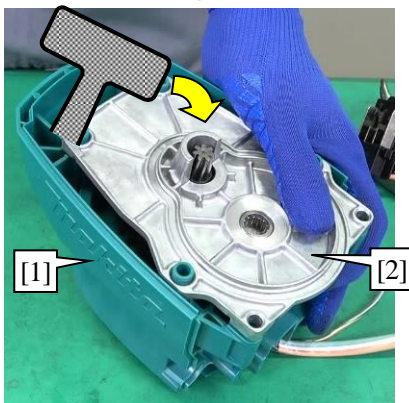
- 1 Assemble Stator [2] to Motor housing [1], then tap the bottom of Motor housing [1] with a plastic hammer and insert Stator [2] fully.

Fig. 57



- 2 Assemble Baffle plate [2] to Motor housing [1] with Tapping screws 4x18 [3] (4 pcs).

Fig. 58

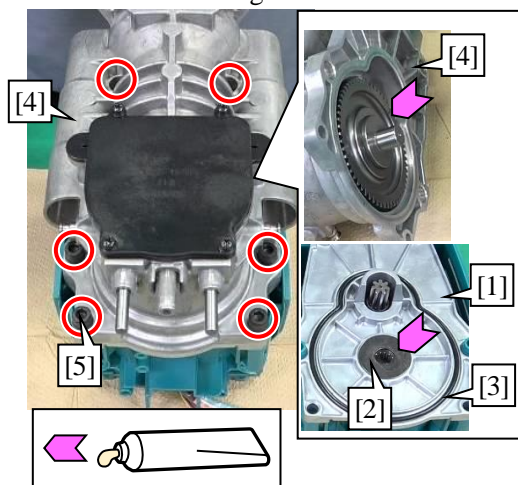


- 3 Assemble Gear housing [2] to Motor housing [1], then tap them with a plastic hammer and insert them all the way.

**Note**

Be careful not to pinch your fingers between Motor housing [1] and Gear housing [2] because Magnetic force is strong.

Fig. 59

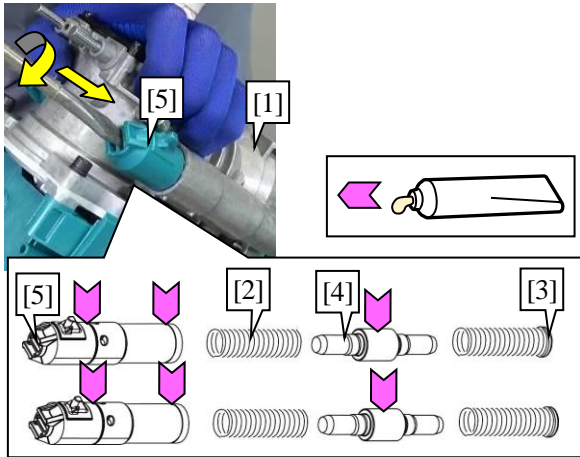


- 4 Assemble Flat washer 12 [2] and Seal ring B [3] to Gear housing [1].
- 5 Assemble Crank housing [4] to Gear housing [1] with H.S.H.bolts M6x40 with WR [5] (6 pcs).

**Note**

Apply the specified grease to the front and back sides of Flat washer 12 [2], then apply the specified grease into Gear housing [1] and Crank housing [4].

Fig. 60

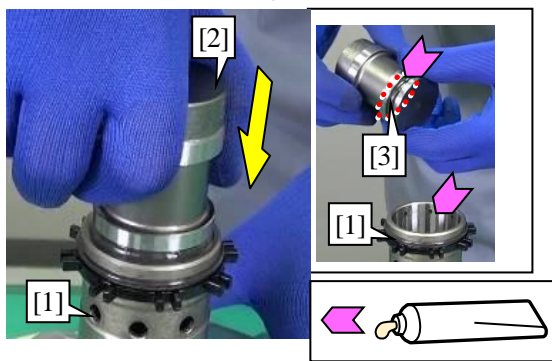


- 6** Assemble the following parts to Crank housing [1]:
- Compression springs 12 [2] (4 pcs)
  - Spring plates [3] (2 pcs)
  - Counter weights [4] (2 pcs)
  - Holder completes [5] (2 pcs)

**Note**

Apply the specified grease to O ring portions of Holder complete [5] and Counter weight [4].

Fig. 61



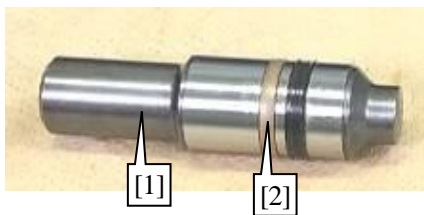
- 7** Insert Striker [2] into Cylinder [1].

**Note**

Apply the specified grease to O-ring 31.5 [3] and Cylinder [1].

**6-2-3 Chuck section**

Fig. 62

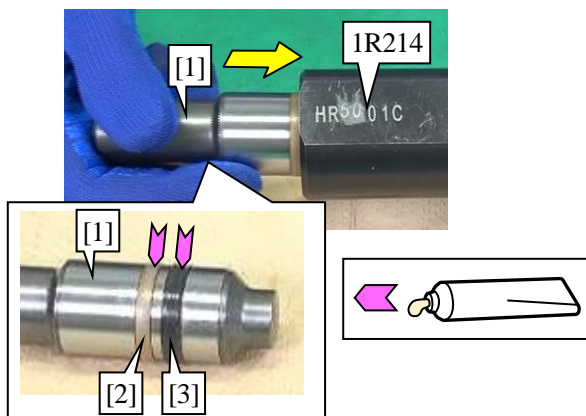


- 1** When replacing Fluoride ring 28 [2] of Impact bolt [1], assemble O ring 23, then assemble Fluoride ring 28 [2].

**Note**

Be careful not to stretch Fluoride ring 28 [2] too much.

Fig. 63

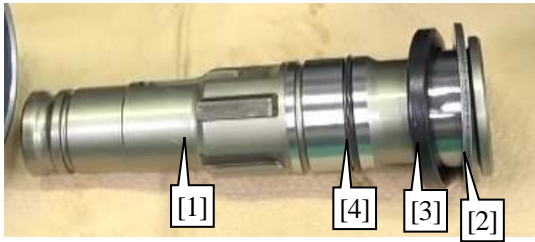


- 2** Insert Impact bolt [1] into 1R214, then pull it out after holding for about 1 minute.

**Note**

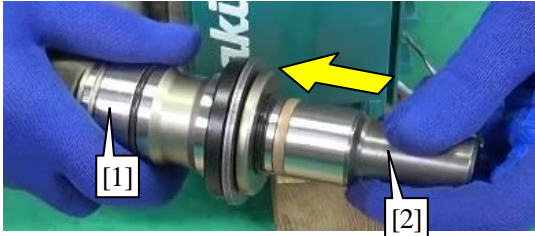
- Once Fluoride ring 28 [2] is stretched, it does not shrink by itself. If you insert it into Tool holder without adjustment, it will be broken. So when you replace it with a new one, use 1R214 to adjust it.
- Apply the specified grease to Fluoride ring 28 [2] and X-ring 21 [3].

Fig. 64



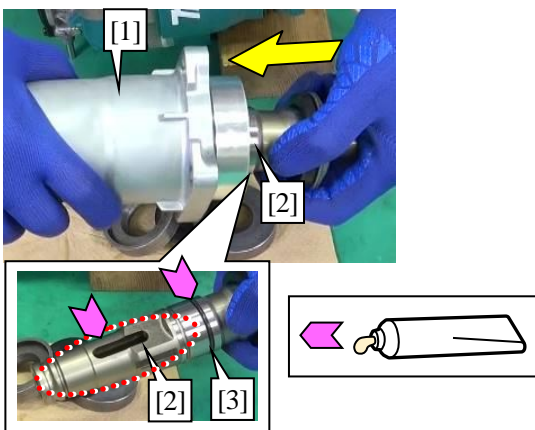
- 3 Assemble Flat washer 39 [2], Rubber ring 39 [3] and O-ring 35.5 [4] to Tool holder [1].

Fig. 65



- 4 Insert Impact bolt [2] into Tool holder [1].

Fig. 66

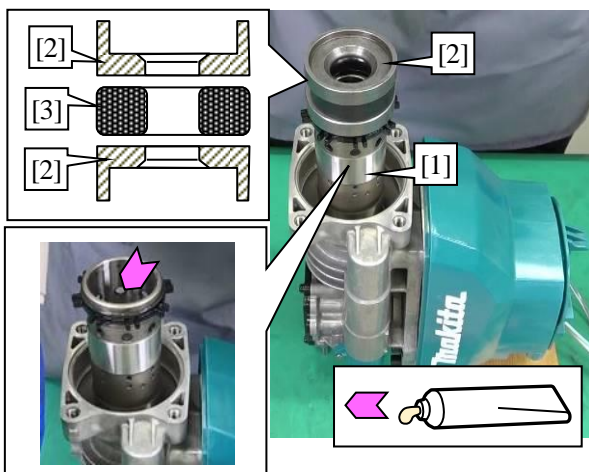


- 5 Insert Tool holder [2] into Barrel [1].

Note

Apply the specified grease to the outer surface of Tool holder [2] and O-ring 35.5 [3].

Fig. 67



- 6 Assemble Shoulder sleeves [2] (2 pcs) and Rubber ring 24 [3] to Cylinder [1].

Note

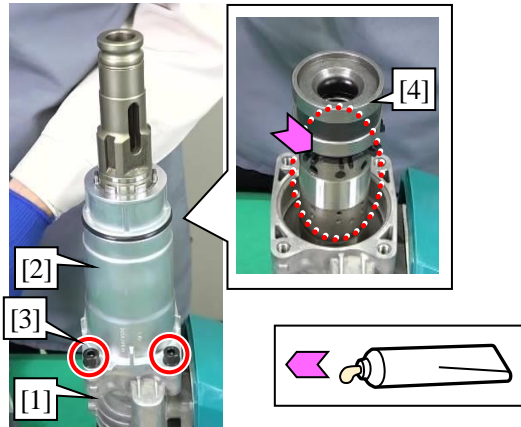
The orientation of Shoulder sleeves [2] (2 pcs) matters.

Apply the specified grease into Cylinder.

Tips

Be careful not to tilt the machine while placing it on a square wood or the like.

Fig. 68



- 7 Assemble Barrel [2] to Crank housing [1] with Hex socket head bolts M8x35 [3] (4 pcs).

Note

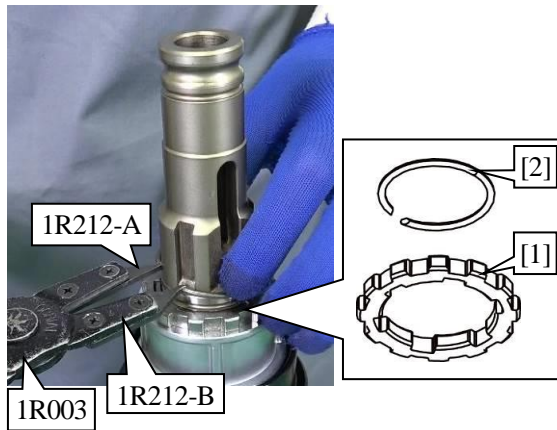
Apply the specified grease to the inside and outer surface of Cylinder [4].

Fig. 69



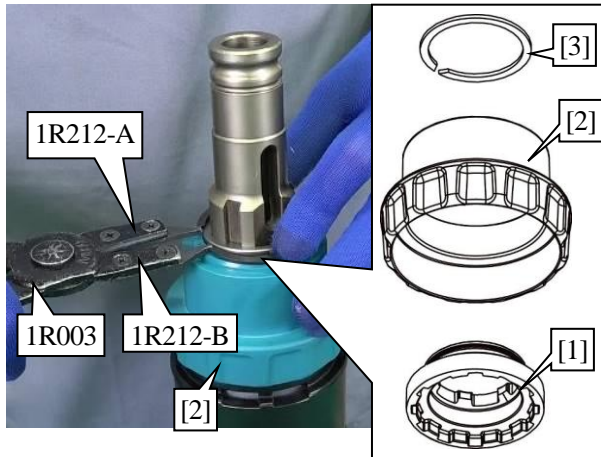
- 8 Assemble Housing cover [1]

Fig. 70



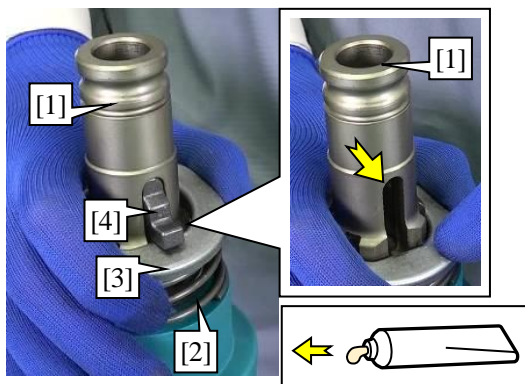
- 9 Assemble Lock ring [1], then assemble Ring spring 35 [2] with 1R003, 1R212-A and 1R212-B.

Fig. 71



**10** Assemble Change ring [1] and Change ring cover [2], then assemble Retaining ring WR-45 [3] with 1R003, 1R212-A and 1R212-B.

Fig. 72

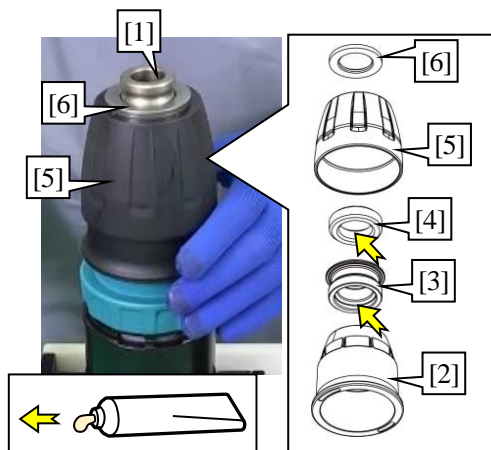


**11** Assemble Compression spring 56 [2] and Spring guide [3] to Tool holder [1], then assemble Tool retainers [4] (2 pcs).

**Note**

Apply the specified grease into Tool holder [4].

Fig. 73



**12** Assemble the following parts to Tool holder [1]:

- Release cover [2]
- Chuck ring [3]
- Rubber ring 30 [4]
- Chuck cover [5]
- Flat washer 30 [6]

**Note**

Apply the specified grease to the inner surface of Chuck ring [3] and Rubber ring 30 [4].

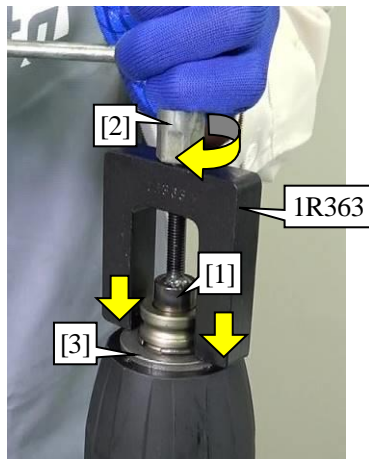
Fig. 74



**13** Temporarily assemble Ring spring 26 [2] to the cap groove of Tool holder [1] with 1R003 and 1R212.



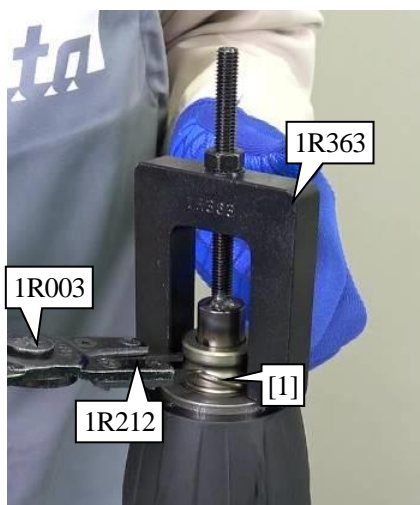
Fig. 75



**14** Insert SDS max shank [1] of 1R363 and fix it in the same way as a bit.

**15** While lowering Chuck cover, tighten the nut of 1R363 with Socket wrench 13 [2] to push down Flat washer 30 [3].

Fig. 76



**16** Assemble Ring spring 26 [1] with 1R003 and 1R212.

**17** Remove 1R363.

**Tips**

If the outer diameter of Ring spring 26 [1] is not opened due to interference with 1R363 because the dimensions of 1R363 differ depending on when 1R363 is obtained, assemble Ring spring 26 [1] in the next step. (Fig. 77)

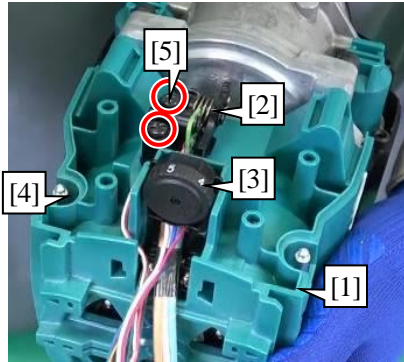
Fig. 77



**18** Place 1R232 on Ring spring 26, then tap 1R232 with a plastic hammer to set Ring spring 26 in place.

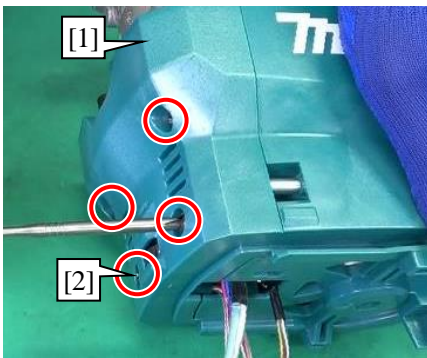
## 6-2-4 Housing section

Fig. 78



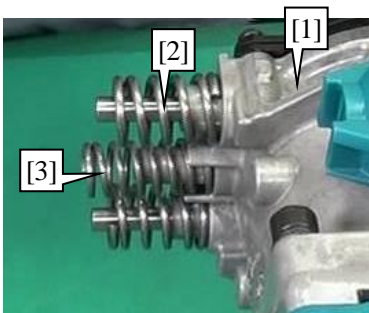
- 1 Assemble Base section [2], Dial circuit [3] and Shoulder pins 4-6 [4] (2 pcs) to Motor housing [1], then tighten Tapping screws 4x18 [5] (2 pcs).

Fig. 79



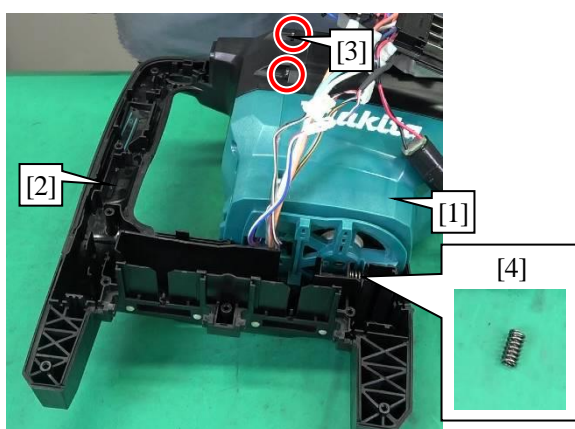
- 2 Assemble Motor housing cover [1] with Tapping screws 5x25 [2] (4 pcs).

Fig. 80



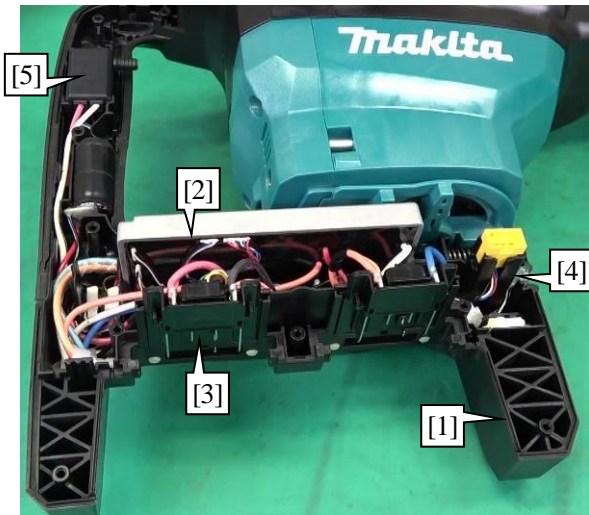
- 3 Assemble Compression springs 12 [2] (2 pcs) and Compression spring 10 [3] to Crank housing [1].

Fig. 81



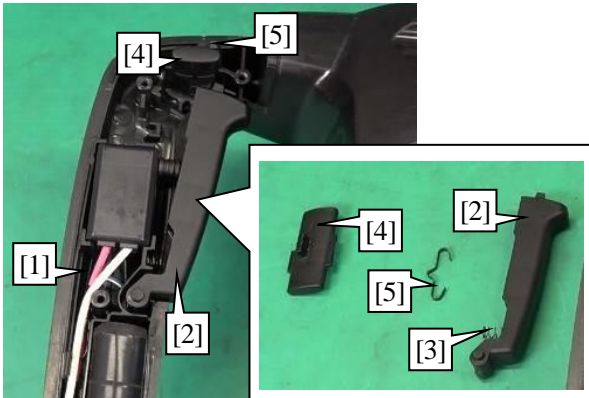
- 4 Assemble Housing [2] to Motor housing [1] with Tapping screws 5x25 [3] (4 pcs).
- 5 Assemble Compression spring 8 [4].

Fig. 82



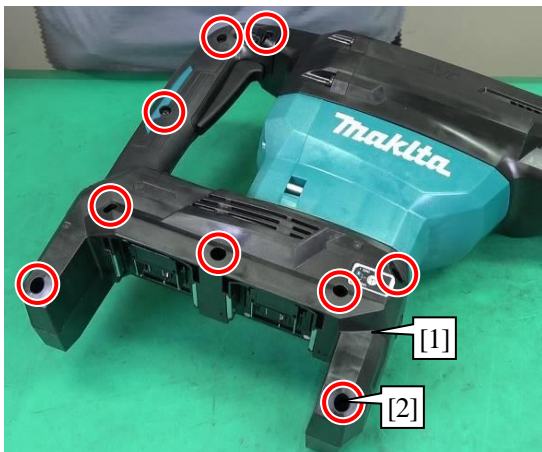
- 6 Assemble the electrical parts in accordance with Circuit diagram and Wiring diagram.
- 7 Assemble the following parts to Housing [1], then fix Lead wires with 1R411.
- Controller [2]
  - Terminal units [3] (2 pcs)
  - LED circuit [4]
  - Switch [5]

Fig. 83



- 8 Assemble the following parts to Housing [1]:
- Switch lever [2]
  - Compression spring 5 [3]
  - Trigger lock [4]
  - Leaf spring [5]

Fig. 84



- 9 Assemble Housing R [1] with Tapping screws 4x18 [2] (10 pcs).

Note

Check that the lock function works properly.

Fig. 85



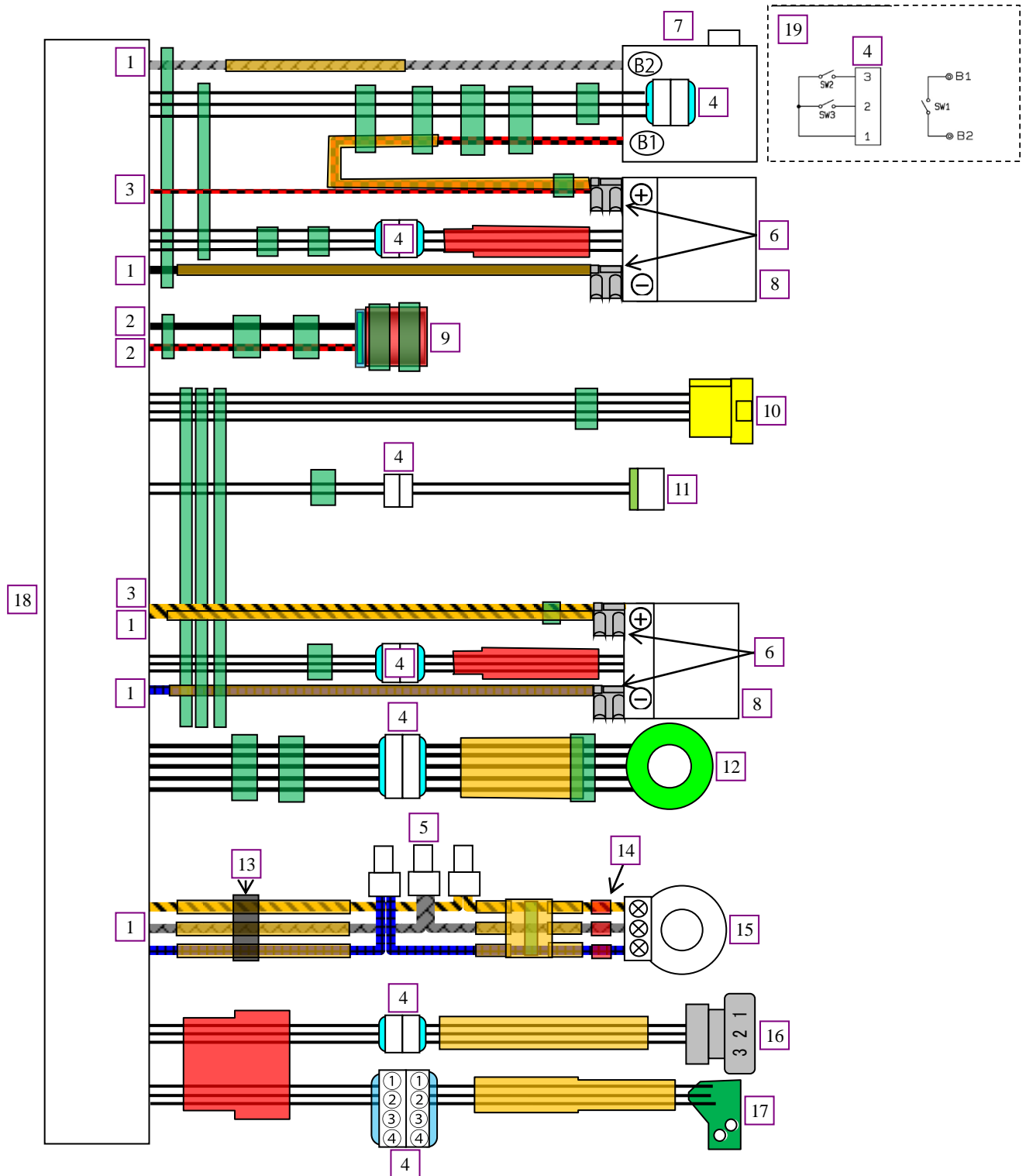
**10** Assemble Tool holder cap [1].

**Note**

Apply the specified grease to the inner surface seal portion of Tool holder cap [1].

# 7 CIRCUIT DIAGRAM

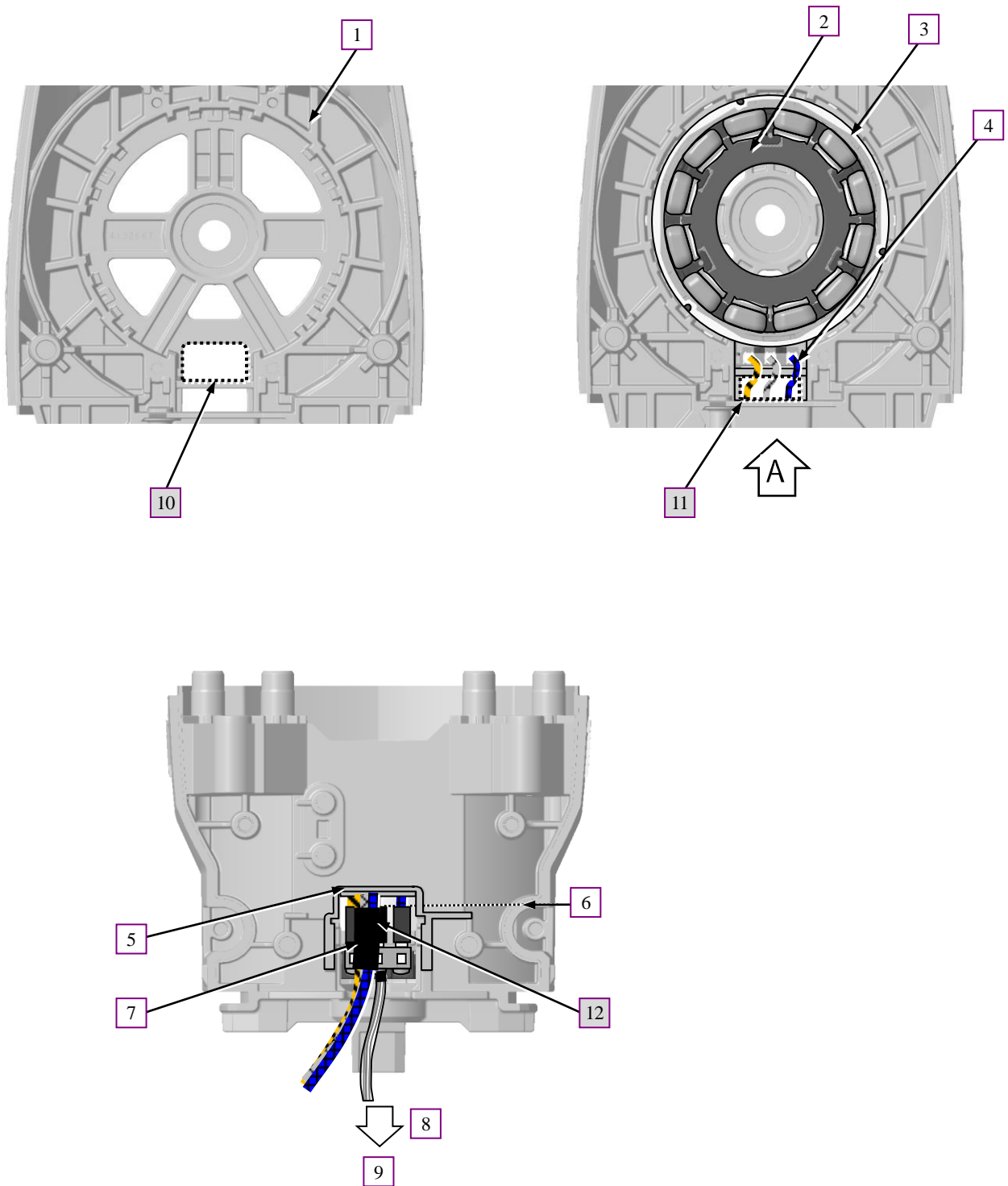
Fig. 86



1	AWG14	11	LED circuit
2	AWG16	12	Controller B
3	AWG22	13	Line filter (if used)
4	Connector	14	Lead unit
5	Closed end splice	15	Stator
6	Flag receptacle (#250, t=0.8)	16	Dial circuit
7	Switch	17	Sensor circuit
8	Terminal unit	18	Controller
9	Capacitor	19	Circuit diagram of Switch
10	Connector for Wireless unit		

**8 WIRING DIAGRAM**  
**8-1 Motor housing section**

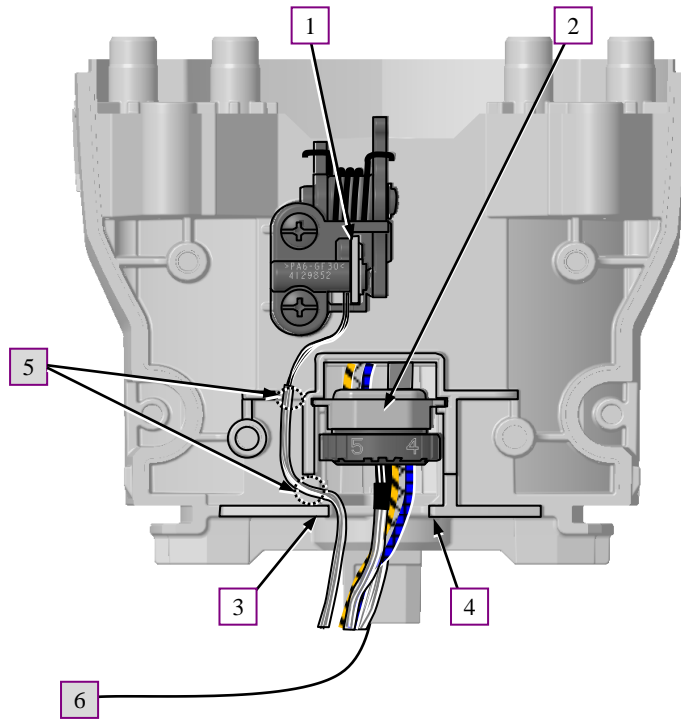
Fig. 87



1	Motor housing	6	The end of Tape
2	Controller B	7	Tape
3	Stator	8	Handle side
4	Lead unit	9	View from "A" in the right drawing of Fig. 87
5	Rib A		
10	Pass Controller B lead wires through this opening of Motor housing.		
11	Pass Lead unit lead wires through this opening of Motor housing.		
12	Route Lead unit lead wires so that their tape ends comes Handle side from Rib A.		

## 8-2 Motor housing section

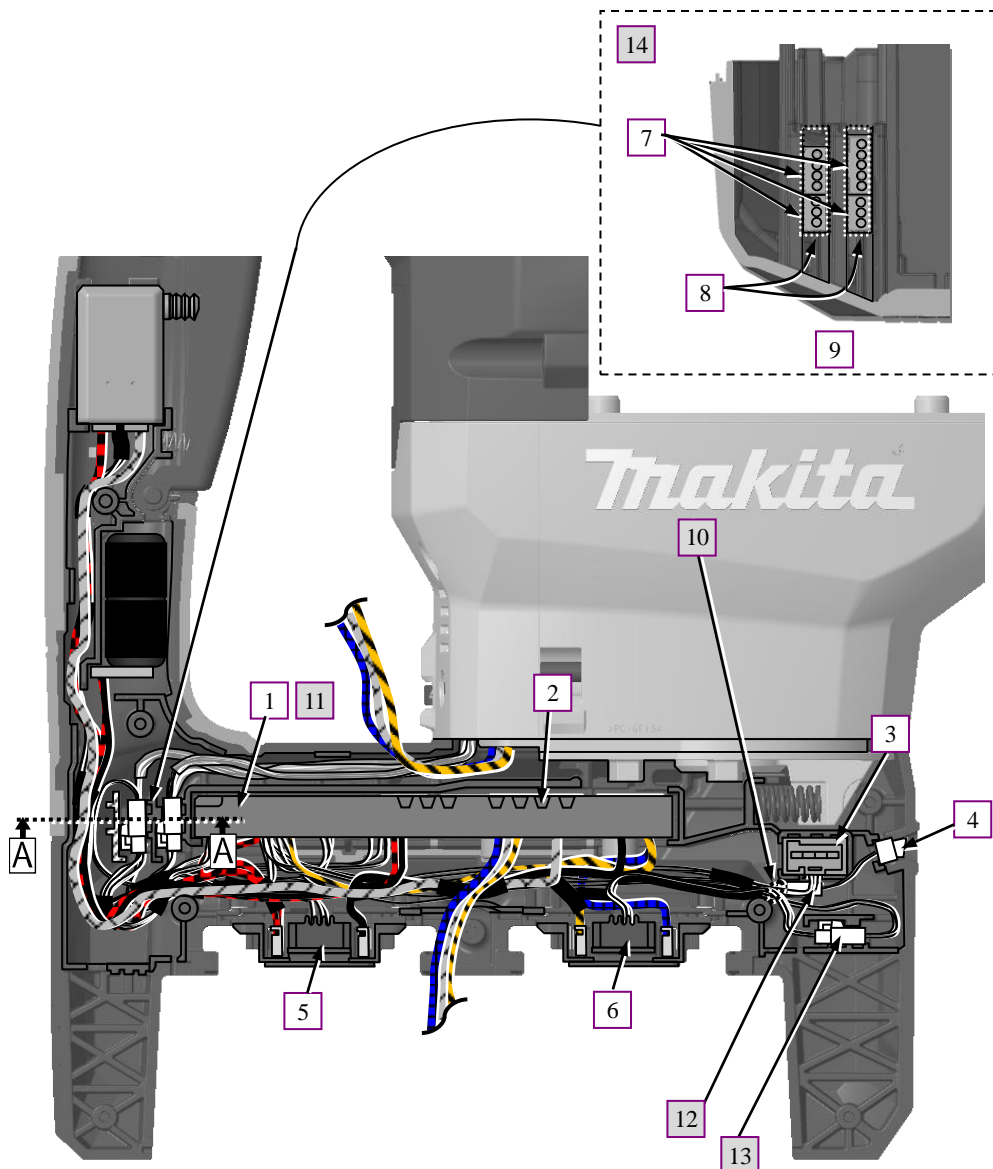
Fig. 88



1	Sensor circuit	3	Rib B
2	Dial circuit	4	Rib C
5	Fix Sensor circuit lead wires in these grooves.		
6	Route the following lead wires between Rib B and Rib C: <ul style="list-style-type: none"> <li>• Lead unit lead wires</li> <li>• Controller B lead wires</li> <li>• Sensor circuit lead wires</li> <li>• Dial circuit lead wires</li> </ul>		

### 8-3 Motor housing section

Fig. 89

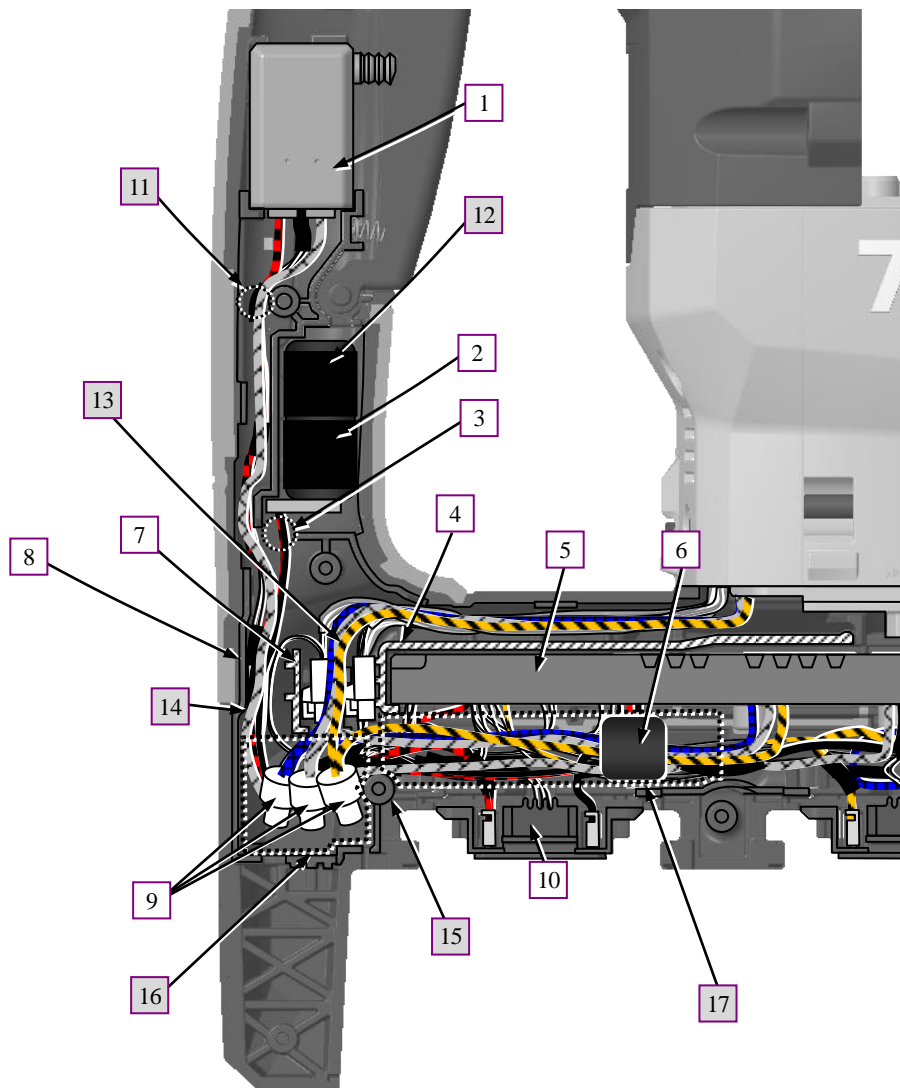


1	Controller	6	Terminal unit (The front side of the machine)
2	The rugged portion of Controller case	7	Connector
3	Connector for Wireless unit	8	The storage portion for Connector
4	LED circuit	9	Cross section A-A
5	Terminal unit (The rear side of the machine)		
10	Fix the following lead wires in this groove: <ul style="list-style-type: none"> <li>• Connector lead wires to LED circuit</li> <li>• Connector lead wires for Wireless unit</li> <li>• Terminal unit (The front side of the machine) lead wires</li> <li>• Controller lead wires to Connector of Terminal unit (The rear side of the machine)</li> </ul>		
11	Assemble Controller so that the rugged portion of Controller case faces the front side of the machine.		
12	Fix Connector lead wires for Wireless unit in this groove.		
13	Put Connector to Terminal unit (The front side of the machine) in the place as shown.		
14	<ul style="list-style-type: none"> <li>• Put Connector to the following parts and Controller in each storage portion as shown: <ul style="list-style-type: none"> <li>• Controller B</li> <li>• Sensor circuit</li> <li>• Dial circuit</li> <li>• Terminal unit (The rear side of the machine)</li> </ul> </li> <li>• Be careful not to place any lead wires under Connector.</li> </ul>		



## 8-4 Motor housing section

Fig. 90



1	Switch	6	Line filter (if used)
2	Capacitor	7	Rib A
3	Groove A	8	Inner wall of Housing
4	Rib B	9	Closed end splice
5	Controller	10	Terminal unit (The rear side of the machine)
11	Fix Lead wires to Switch in this groove.		
12	<ul style="list-style-type: none"> <li>• Put Capacitor in this space so that its black lead wire comes on the top.</li> <li>• Fix Capacitor lead wires in Groove A.</li> </ul>		
13	Route Lead unit lead wires between Rib A and Rib B.		
14	Route Lead wires for Switch, Capacitor lead wires and Controller lead wires for Terminal unit (Back side) between Rib A and the inner wall of Housing.		
15	Be careful not to put Lead wires on this Boss.		
16	Put Closed end splices in this space.		
17	Pass Lead wires (3 pcs) of Closed end splices through Line filter, then put them in this space.		

## 9 TROUBLESHOOTING

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

### 9-1 Note for Repairing

The content may vary depending on the model.

- 1 Use full charged batteries.
- 2 When Housing is disassembled, check the conditions of each part (Mechanical lock, Adherence of iron powder to Rotor and Stator, Disconnection of Connectors, Lead wires, Assembling of Stator, Connection of Terminal unit and Battery, etc.).
- 3 Be sure to test the machine 10 times to correctly diagnose functions such as Variable speed control, etc.
- 4 Use the following Repairing tools for diagnosing LED and Switch.

Repairing tools	Purpose
1R402	For checking variable resistance value or electrical continuity at contact points
1R402-B	
1R412	For checking whether LED lights up
1R413	For checking variable resistance value or electrical continuity at contact points

### 9-2 Test for checking the short-circuit in FET (Field Effect Transistor) of controller

Fig. 91



- 5 Set Digital tester (1R402) to Diode mode.

Fig. 92



- 6 Connect Black probe to the plus pole of Terminal, and Red probe to the minus pole.

#### Tips

By attaching 1R402-B to each probe of 1R402, you can make your hands free for easier check.

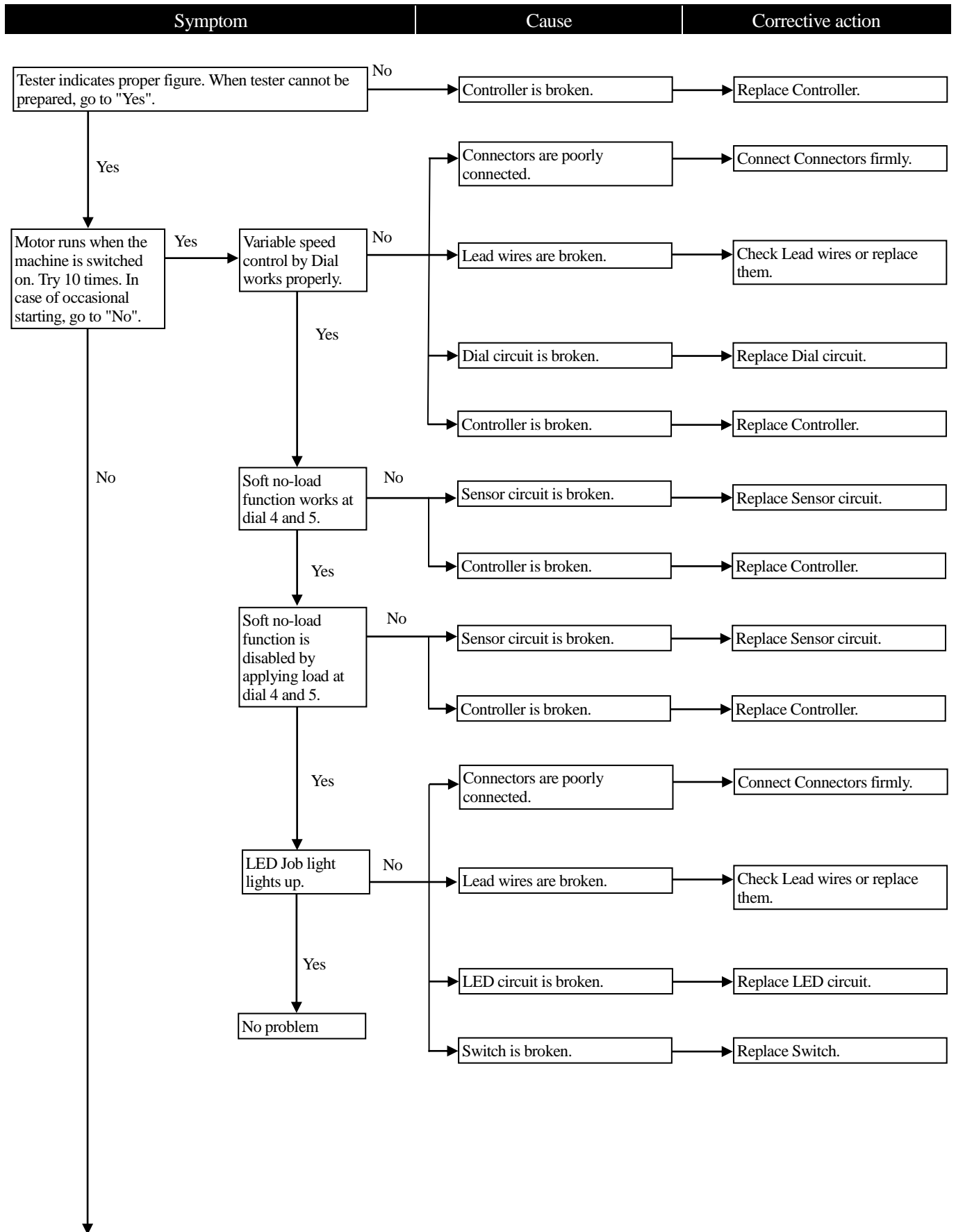
#### Note

Be careful not to reverse them. The reversed contacts could spoil the test.

- 7 Wait until the figure on Tester gets stable.
- 8 Controller is in order if Tester indicates  $1.25 \pm 0.1V$ . If Tester indicates 0V, 0.4V or 0.8V approx., Controller is broken. Replace it with a new one.

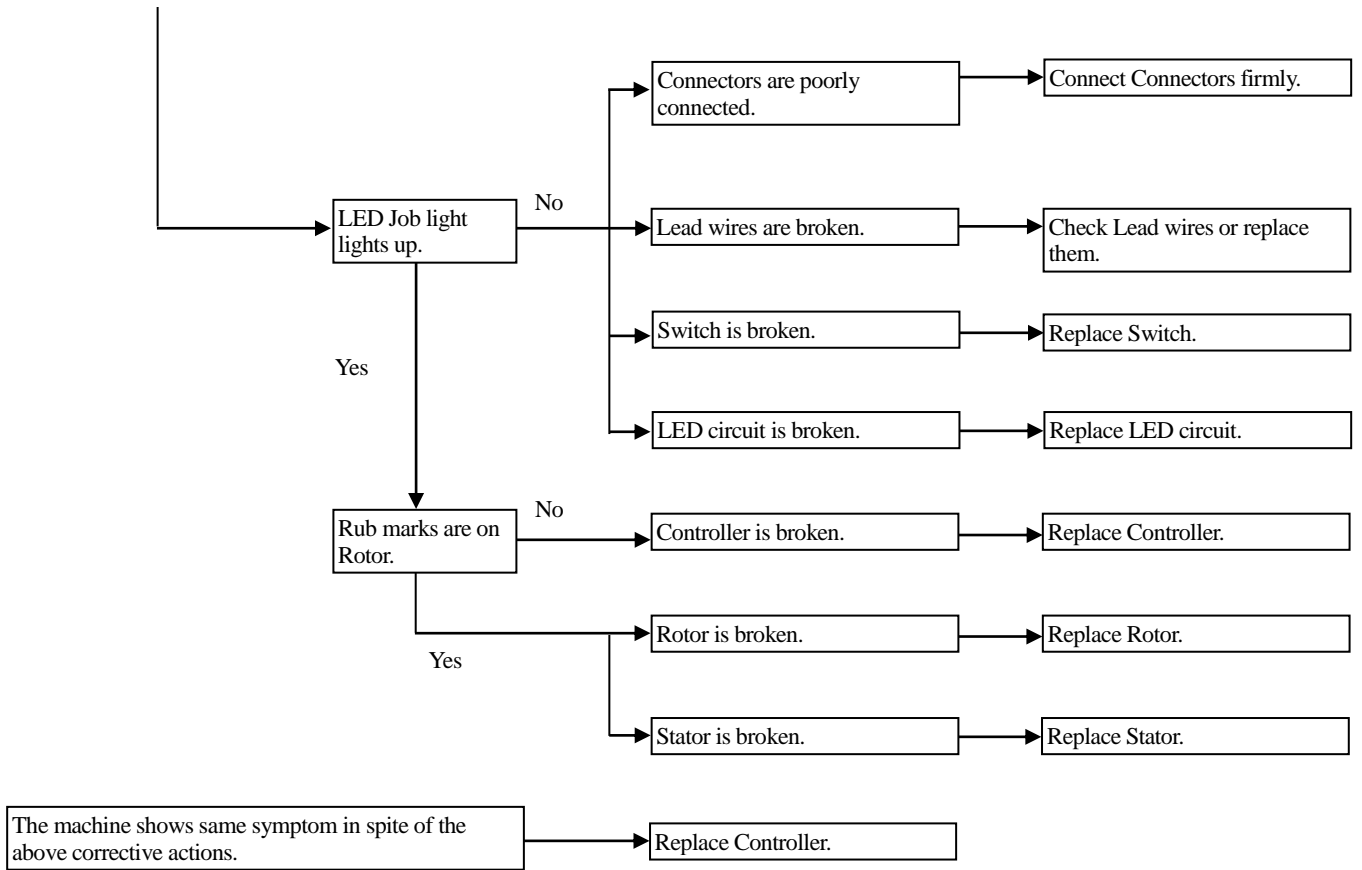
### 9-3 Flowchart for Troubleshooting

Check the items in the following flowchart in order from the top to bottom. Description of the item is referred to CIRCUIT DIAGRAM. After corrective action, return to the start of Troubleshooting and re-check again.



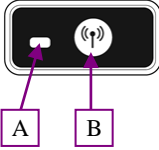
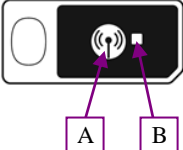
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## 9-4 Wireless activation




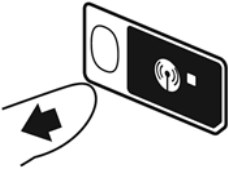
- Be sure to prepare non-defective AWS-supported tool and vacuum cleaner for efficient defect inspection.
- Check Step 1 (9-4-1) to Step 3 (9-4-3) in order and if some troubles happen, see [9-4-4](#).
- During the inspection, do not use microwave oven nearby.

AWS-supported tool		AWS-supported vacuum cleaner	
			
A	Wireless activation lamp	A	Wireless activation button
B	Wireless activation button	B	Wireless activation lamp

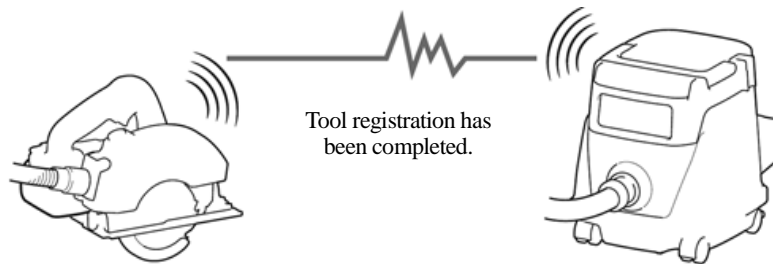
### 9-4-1 Step 1: Preparation for Wireless activation

AWS-supported tool		AWS-supported vacuum cleaner	
<ol style="list-style-type: none"> <li>1 Install battery/batteries.</li> <li>2 Make sure that Wireless activation lamp lights up in red, then the lamp turns off.</li> <li>3 Press Wireless activation button briefly, then make sure that the lamp blinks in blue.</li> </ol> 		<ol style="list-style-type: none"> <li>1 Install battery/batteries or plug in the machine.</li> <li>2 Set the stand-by switch to "AUTO".</li> </ol>  <ol style="list-style-type: none"> <li>3 Make sure that Wireless activation lamp lights up in red, then blinks in blue.</li> </ol>	

## 9-4-2 Step 2: Tool registration

AWS-supported tool	AWS-supported vacuum cleaner
<p><b>1</b> Press and hold down Wireless activation button, then make sure that Wireless activation lamp blinks in green.</p>  <p><b>2</b> After the lamp starts blinking in green, release your finger.</p> 	<p><b>1</b> Press and hold down Wireless activation button, then make sure that Wireless activation lamp blinks in green.</p>  <p><b>2</b> After the lamp starts blinking in green, release your finger.</p> 

- 3** Make sure that, after Wireless activate lamps blink in green, the lamps light up in green (without blinking) for 2 seconds, then start blinking in blue.

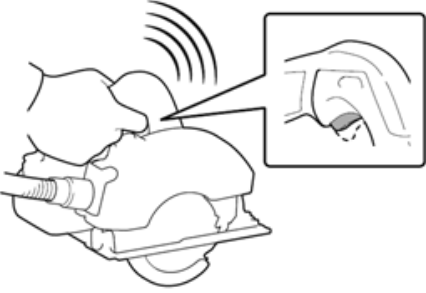
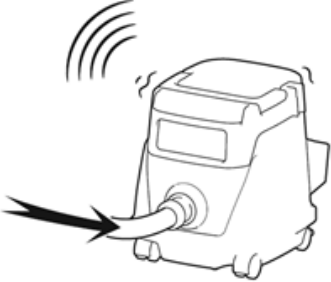


### Note

If Wireless activation lamp does not light up in green, restart from Step 1 (9-4-1).  
 If the light does not light up again, go to [9-4-4](#).

### 9-4-3 Step 3: Checking wireless activation

The tool and cleaner should be about 5m apart from each other.

AWS-supported tool	AWS-supported vacuum cleaner
<p data-bbox="188 315 742 383">Make sure that, when the tool is activated, Wireless activation lamp lights up in blue.</p> 	<p data-bbox="849 315 1453 427">Make sure that, when the tool is activated, Wireless activation lamp lights up in blue and Wireless activation works properly.</p> 

### 9-4-4 What to check and Corrective action

Whenever you disassemble AWS-supported tool and vacuum cleaner, be sure to check AWS-related parts for broken wires or poor wire connection.

AWS-supported tool			AWS-supported vacuum cleaner		
Step	What to check	Corrective action	Step	What to check	Corrective action
1, 2, 3	Wireless unit	check, replace	1	Power switch	check, replace
1, 3	Connector connection failure	check, clean	1, 2, 3	Wireless unit complete	check, replace
1, 3	Sub controller	check, replace	1, 3	Controller	check, replace
1, 3	Controller	check, replace			