

CORDLESS ANGLE GRINDER DGA419 / DGA469 / DGA519 / DGA520

REPAIR MANUAL



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2 CAUTION

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


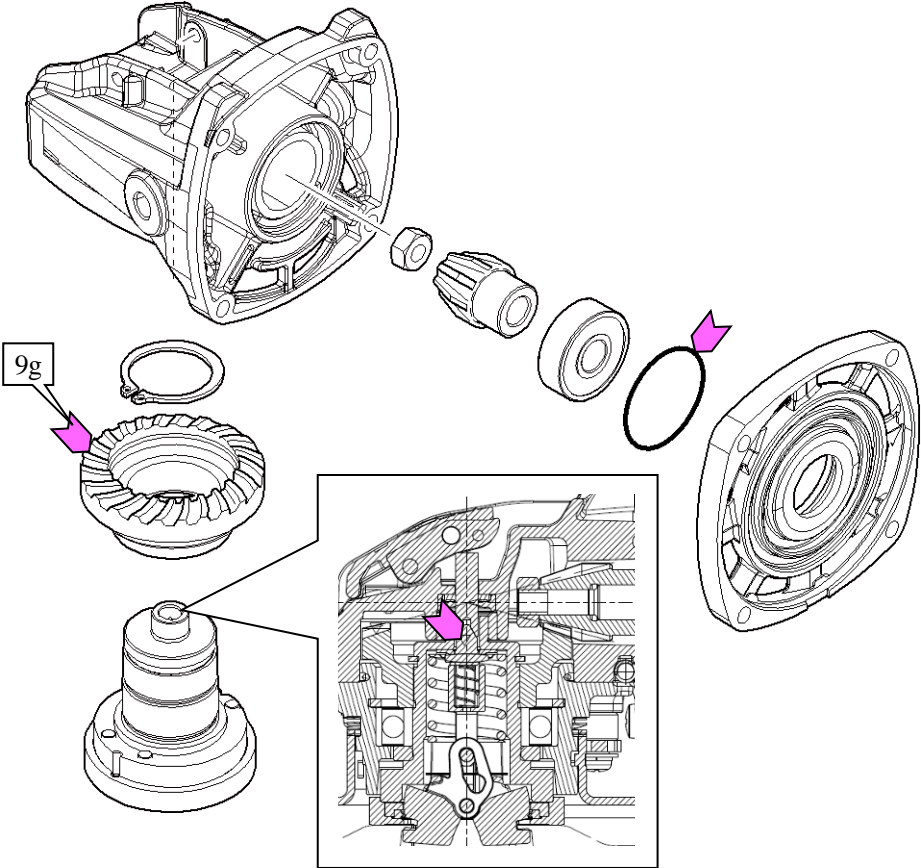
Follow the instructions described below in advance before repairing:

- 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 Battery, except when it is necessary to check the operation of the machine.

3 NECESSARY REPAIRING TOOLS

Code No.	Description	Use for
1R005	Retaining ring pliers RT-2N	removing/ assembling Retaining ring (INT) R-42
1R029	Pipe 15-23-50	removing Spindle, Spiral bevel gear 37
1R031	Pipe 20-28-50	removing Ball bearing 6905DDW
1R032	Ring 8-60-15	press-fitting Ball bearings 629LLB and 607LLB
1R033	Ring 10-60-15	
1R038	Armature holder 32	removing/ assembling M6 Hex. nut
1R164	Ring spring setting tool A	press-fitting Spindle, Spiral bevel gear 37
1R165	Ring spring setting tool B	press-fitting Ball bearing 6905DDW
1R258	V block A-125	removing Spindle, Spiral bevel gear 37
1R269	Bearing puller small	removing Ball bearing 607LLB
1R291	Retaining ring pliers S and R	removing/ assembling Retaining ring S-24
1R401	Bearing puller large	removing Rotor, Ball bearing 629LLB
1R411	Push bar for lead wires	fixing Lead wires
1R415	Spirolock washer removal jig	press-fitting Spindle, Spiral bevel gear 37

4 LUBRICANT AND ADHESIVE APPLICATION

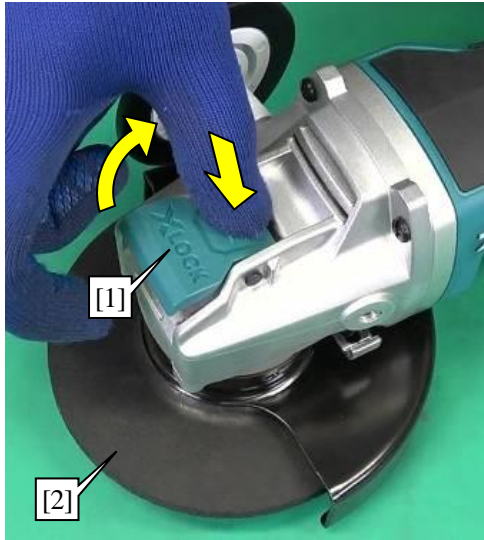
	Description	Amount
	Makita grease R. No.00	<ul style="list-style-type: none"> • Apply 9g in Gear housing ass'y. • Apply a little unless specified in the figure.
<p>Fig. 1</p> 		

5 REPAIR

5-1 Grinding wheel/ Grip section

5-1-1 Disassembling

Fig. 2



- 1 Push Lever [1] and pull it up to remove Wheel [2].

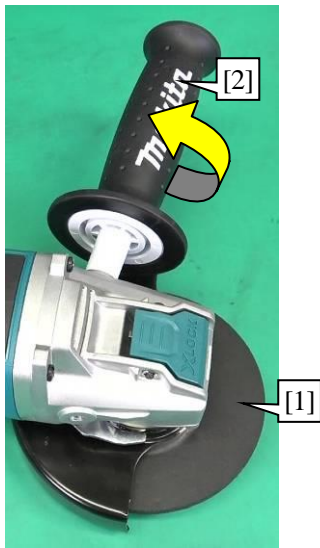
Fig. 3



- 2 Turn and remove Grip [1].

5-1-2 Assembling

Fig. 4

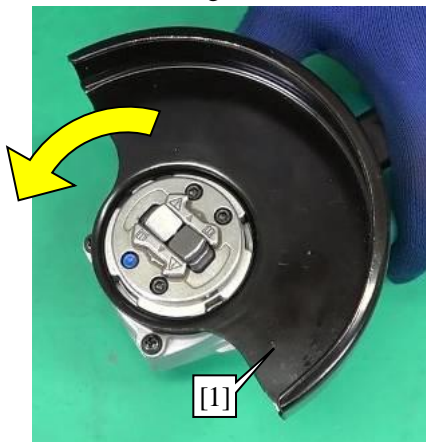


- 1 Set Wheel [1] in place, then turn and assemble Grip [2].

5-2 Electric parts section

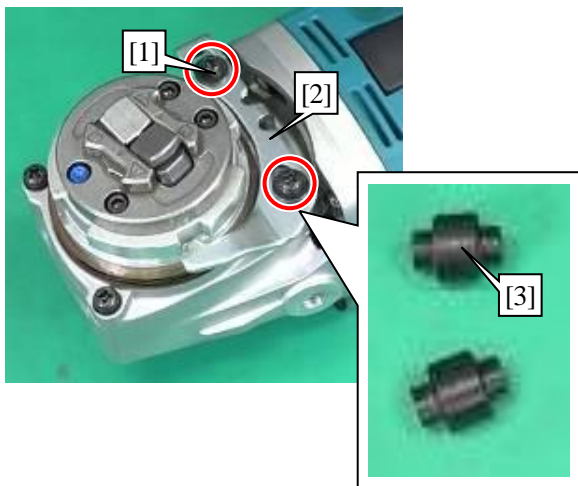
5-2-1 Disassembling

Fig. 5



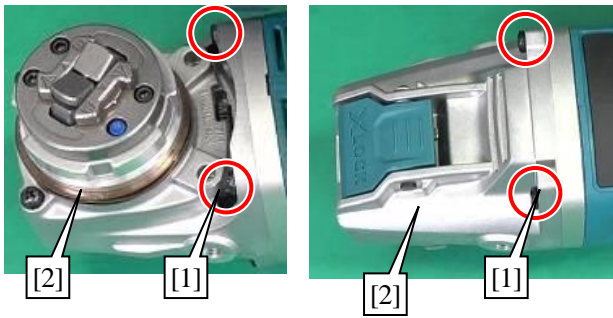
- 1 Turn and remove Wheel cover [1] while pressing Lever.

Fig. 6



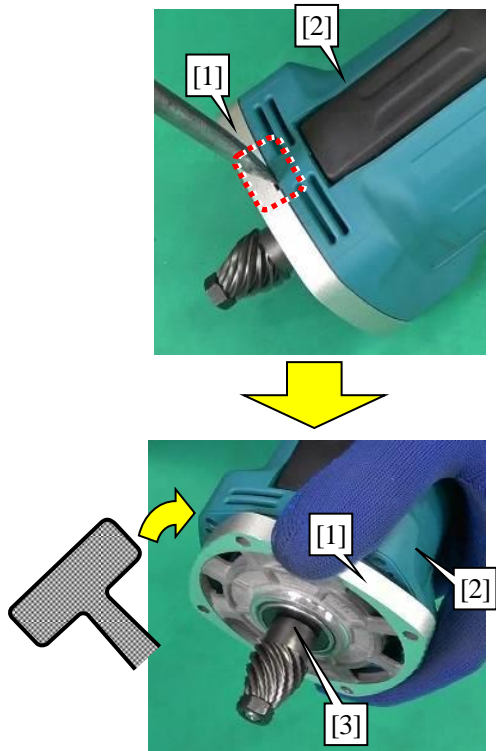
- 2 Remove M4x30 Pan head screws [1] (2 pcs) and remove the following parts.
 - Lever [2]
 - Sleeves 4 [3] (2 pcs)

Fig. 7



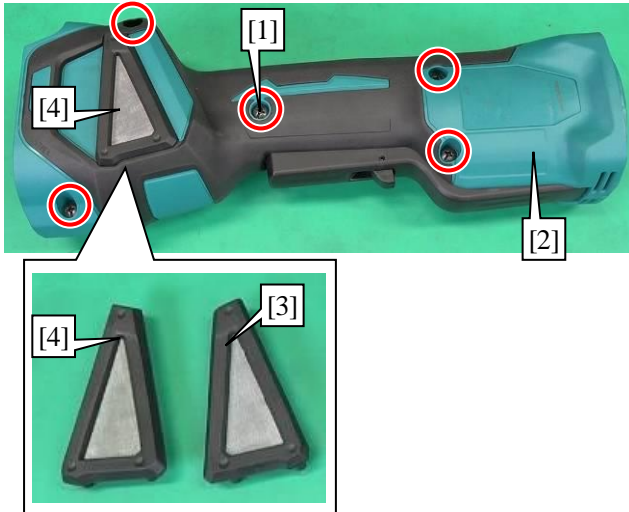
- 3 Remove 4x30 Tapping screws [1] (4 pcs) and Gear housing section [2].

Fig. 8



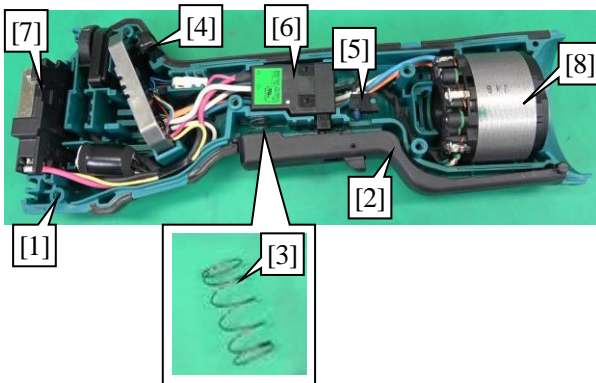
- 4 Make a gap between Gear housing cover assembly [1] and Motor housing set [2] with a slotted screwdriver and turn Gear housing cover assembly [1] about 45 degrees, then remove Rotor ass'y section [3] by tapping a corner of Motor housing set [2] with a plastic hammer.

Fig. 9



- 5 Remove 4x18 Tapping screws [1] (5 pcs) and disassemble Motor housing set [2], Dust cover L [3] and Dust cover R [4].

Fig. 10



- 6 Remove the following parts from Motor housing set [1].
- Switch lever complete [2]
 - Compression spring 11 [3]
 - Indicator panel complete [4]
 - Switch unit [5]
 - Switch TG73BDS-2 [6]
 - Terminal [7]
 - Stator complete [8]

Fig. 11



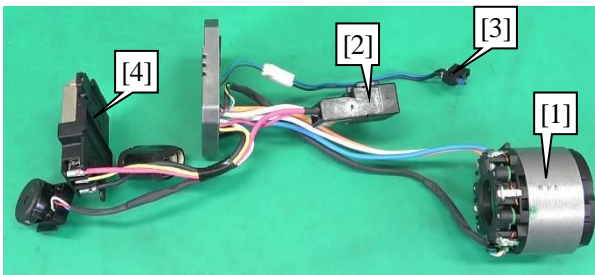
- 7 Disconnect Connectors and Terminals.

Tips

Remove Receptacles while releasing the locks with a slotted screwdriver.

5-2-2 Assembling

Fig. 12



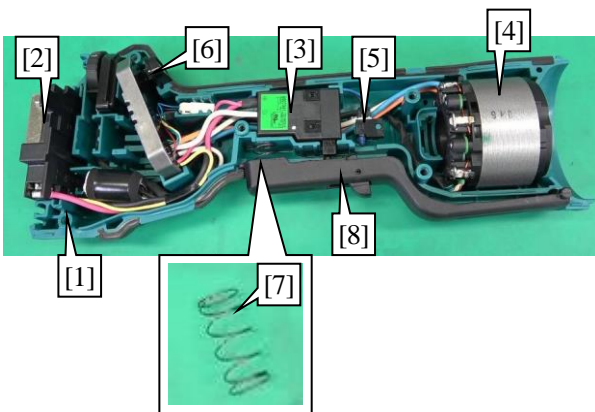
1 Connect Connectors and Terminals to Stator complete [1] and assemble the following parts.

- Switch TG73BDS-2 [2]
- Switch unit [3]
- Terminal [4]

Note

- If it is difficult to insert Lead wires, loosen the screw of Switch [2] with a slotted screwdriver, then spread the sheet metal of the insertion slot and insert Lead wires.
- Connect Terminals (3 positions) connected to Terminal as follows;
 - red (to + marked tab)
 - black (to - marked tab)
 - Yellow (to AS marked tab)

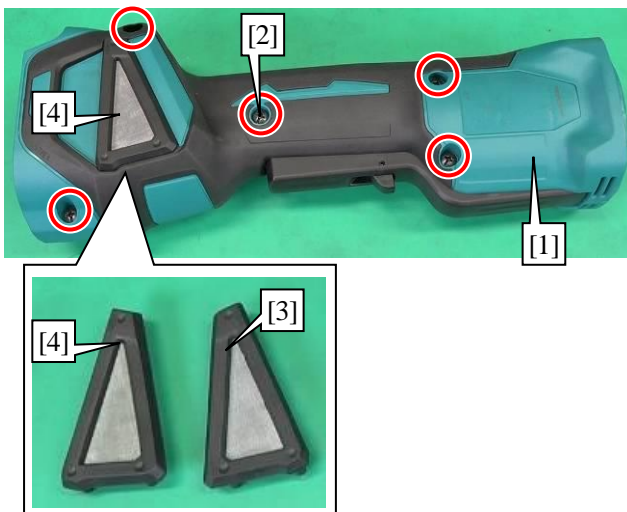
Fig. 13



2 Assemble the following parts to Motor housing set [1] and fix the wires to Motor housing set [1] with 1R411.

- Terminal [2]
- Switch TG73BDS-2 [3]
- Stator complete [4]
- Switch unit [5]
- Indicator panel complete [6]
- Compression spring [7]
- Switch lever complete [8]

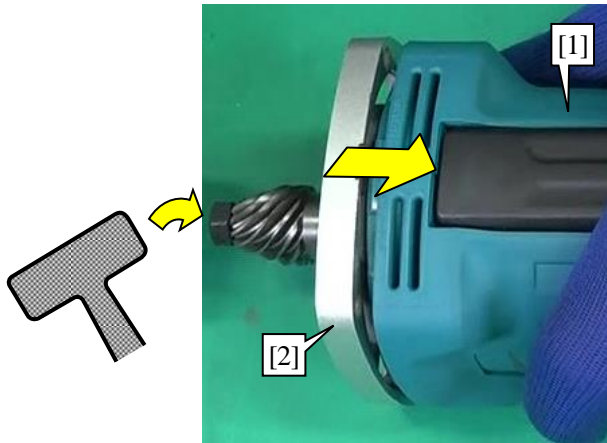
Fig. 14



3 Assemble Motor housing set [1] with 4x18 Tapping screws [2] (5 pcs).

4 Assemble Dust cover L [3] and Dust cover R [4] to Motor housing set [1].

Fig. 15

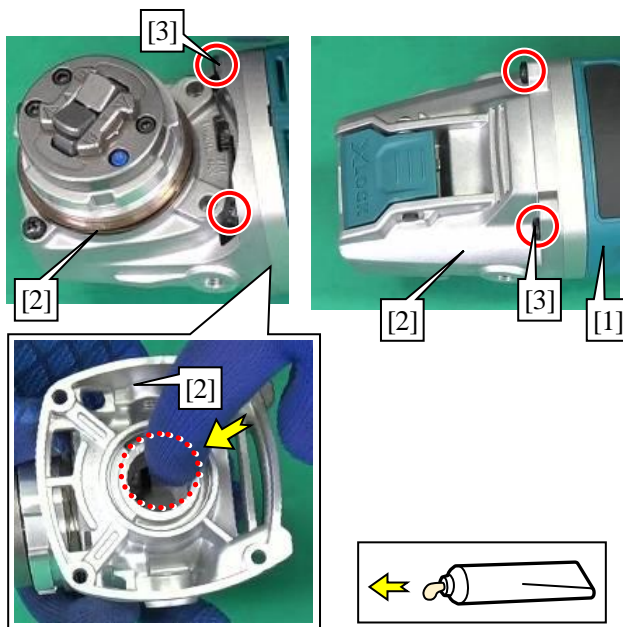


- 5 Assemble Gear housing cover section [2] to Motor housing set [1].
- 6 Insert Gear housing cover section [2] into Motor housing set [1] fully by tapping the tip of Gear housing cover section [2].

Note

Be careful not to pinch your fingers between Motor housing set [1] and Gear housing cover assembly [2] because of the strong magnetic force.

Fig. 16

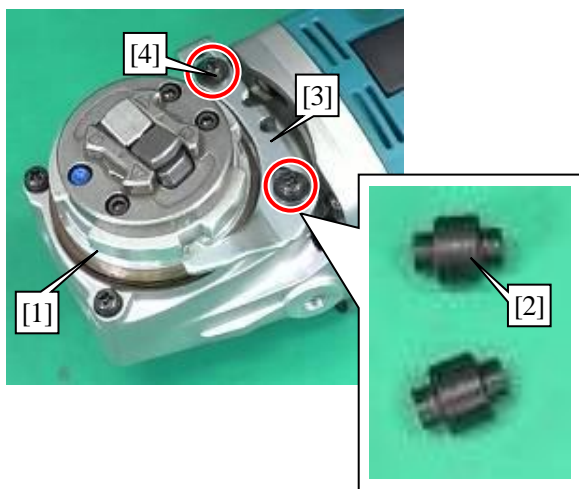


- 7 Assemble Gear housing complete [2] to Motor housing set [1] with 4x30 Tapping screws [3] (4 pcs).

Note

Apply the specified grease in Gear housing complete [2].

Fig. 17



- 8 Assemble the following parts to Bearing box ass'y [1].

- Sleeves 4 [2] (2 pcs)
- Lever [3]
- M4x30 Pan head screws [4] (2 pcs)

Note

Check that Lever [3] can be pulled smoothly and it returns by its spring force.

Fig. 18

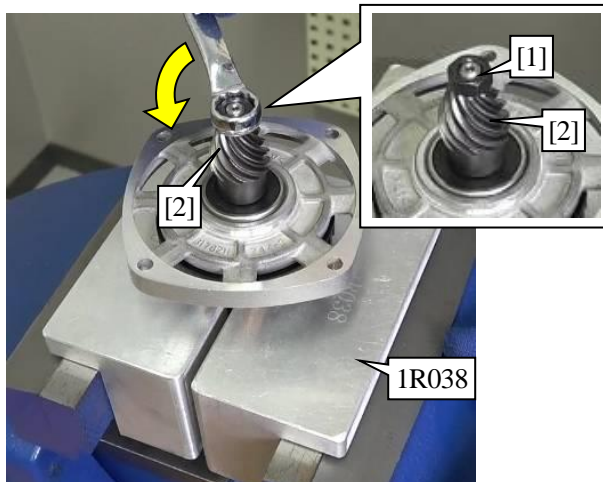


- 9 Assemble and turn Wheel cover [2] while pressing Lever [1].

5-3 Rotor section

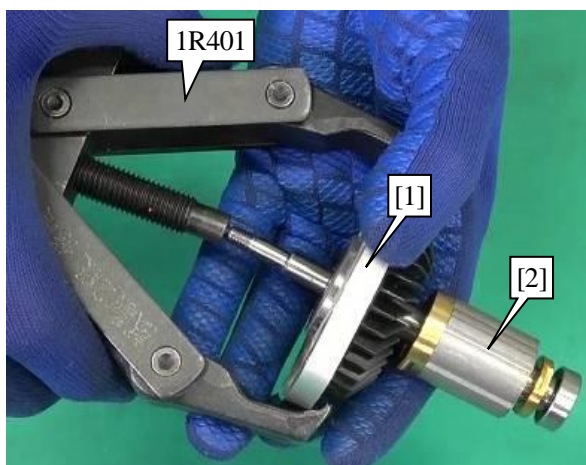
5-3-1 Disassembling

Fig. 19



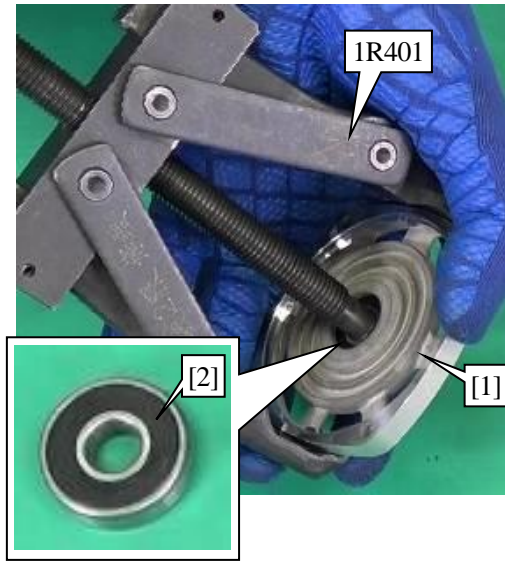
- 1 Hold Rotor in Vise with 1R038 (2 pcs), then turn and remove M6 Hex. nut [1] counterclockwise, then remove Spiral bevel gear 10 [2].

Fig. 20



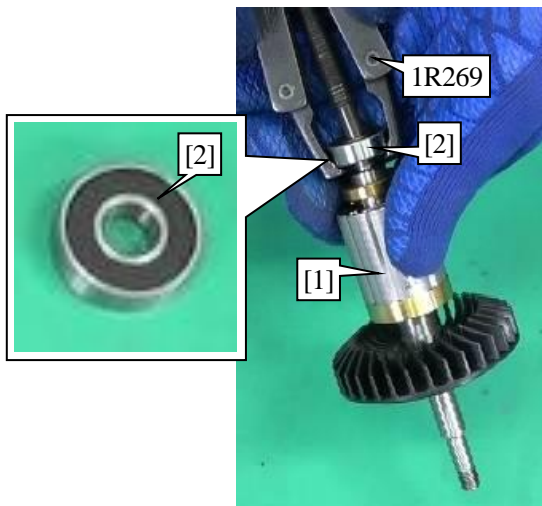
- 2 Push out Rotor ass'y [2] from Gear housing cover assembly [1] with 1R401.

Fig. 21



- 3 Push out Ball bearing 629LLB [2] from Gear housing cover assembly [1] with 1R401.

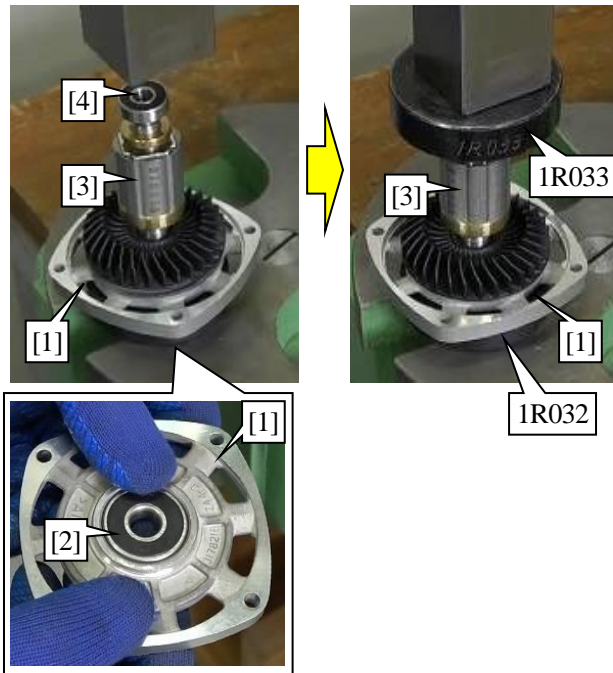
Fig. 22



- 4 Remove Ball bearing 607LLB [2] from Rotor ass'y [1] with 1R269.

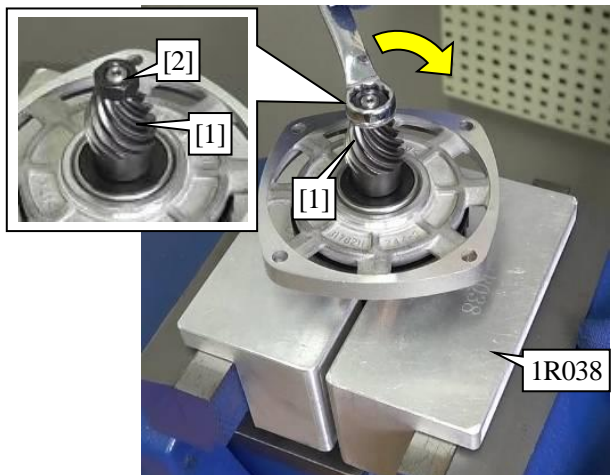
5-3-2 Assembling

Fig. 23



- 1 Assemble Ball bearing 607LLB [4] to Gear housing cover assembly [1].
- 2 Hold Gear housing cover assembly [1] with 1R032, and press-fit the following parts to Gear housing cover assembly [1] with 1R033.
 - Rotor [3]
 - Ball bearing 607LLB [4]

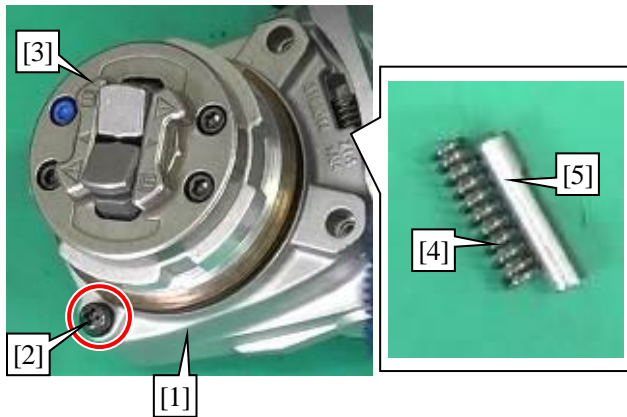
Fig. 24



- 3 Hold Rotor in Vise with 1R038 (2 pcs), then assemble Spiral bevel gear 10 [1] and M6 Hex. nut [2].

5-4 Bearing box ass'y section
5-4-1 Disassembling

Fig. 25



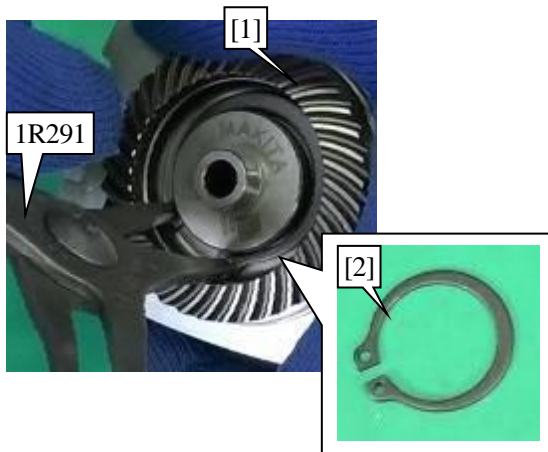
1 Remove M4x20 P. H. screws with WR [2] (2 pcs) from Gear housing complete [1] and disassemble the following parts.

- Bearing box ass'y [3]
- Compression spring 4 [4]
- Shaft [5]

Note

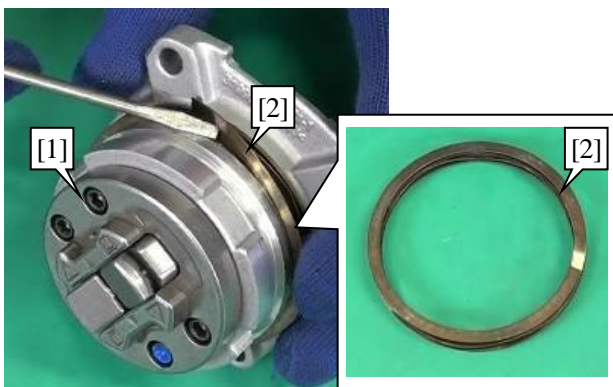
Be careful not to drop Shaft [5].

Fig. 26



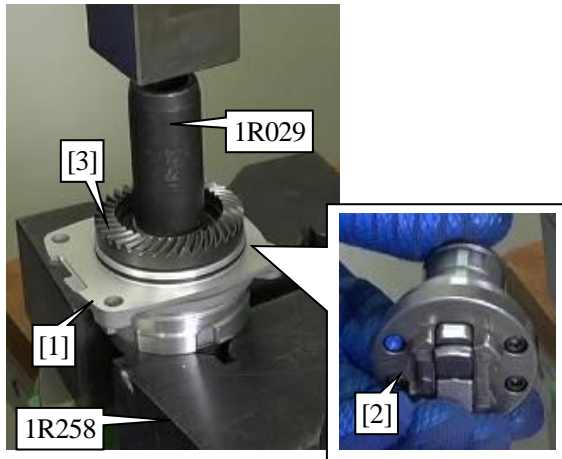
2 Remove Retaining ring S-24 [2] from Bearing box [1] with 1R291.

Fig. 27



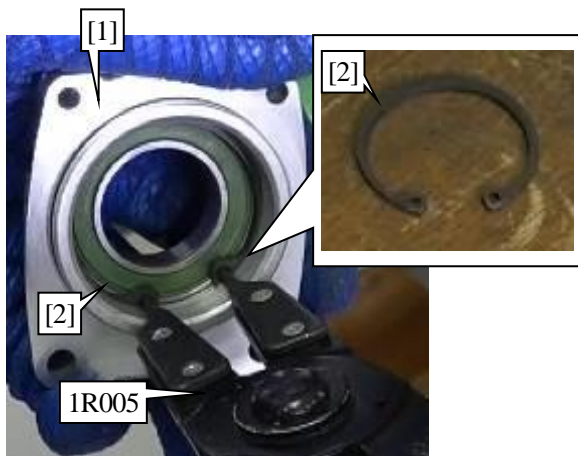
3 Insert a slotted screwdriver to the first slit of Screw wave spring 49 [2], then remove it from the groove of Bearing box ass'y [1] by turning.

Fig. 28



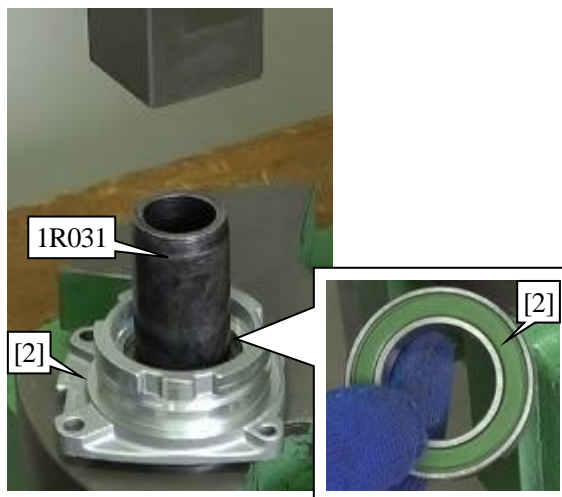
- 4 Hold Bearing box ass'y [1] with 1R258 and push out Spindle assembly [2] and Spiral bevel gear 37 [3] from Bearing box ass'y [1] with 1R029 and Arbor press.

Fig. 29



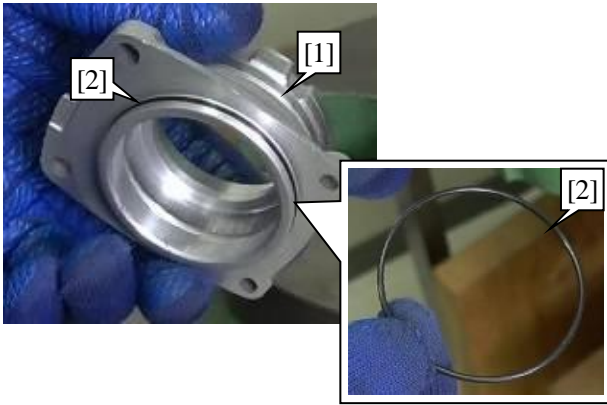
- 5 Remove Retaining ring R-42 [2] from Bearing box [1] with 1R005.

Fig. 30



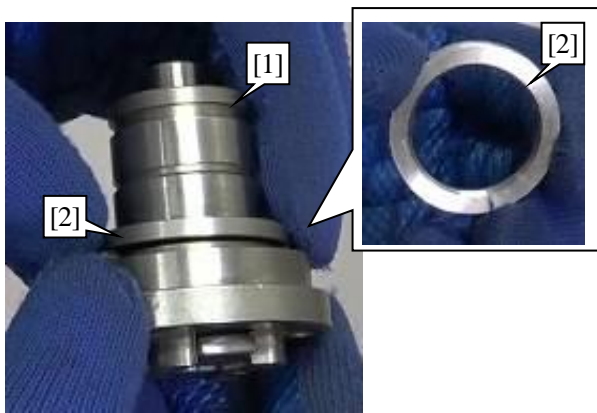
- 6 Push out Ball bearing 6905DDW [2] from Bearing box ass'y [2] with 1R031 and Arbor press.

Fig. 31



7 Remove O ring 45 [2] from Bearing box [1].

Fig. 32

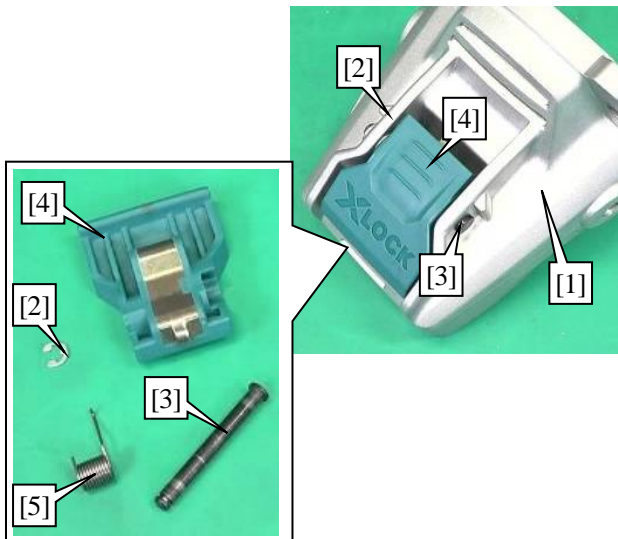


8 Remove Ring 25 [2] from Spindle assembly [2].

Note

Do not disassemble Spindle assembly [1] any further.

Fig. 33

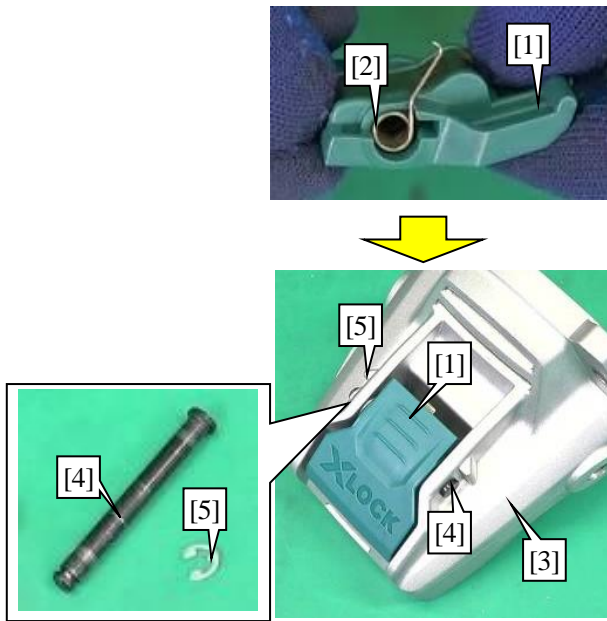


9 Remove the following parts from Gear housing complete [1].

- Stop ring E-3 [2]
- Headed pin 4 [3]
- Lever [4]
- Torsion spring 5 [5]

5-4-2 Assembling

Fig. 34

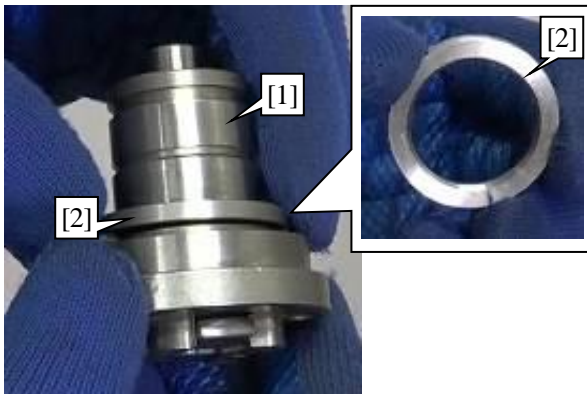


- 1 Assemble Torsion spring 5 [2] to Lever [1].
- 2 Assemble the following parts to Gear housing complete [3].
 - Lever [1]
 - Headed pin 4 [4]
 - Stop ring E-3 [5]

Note

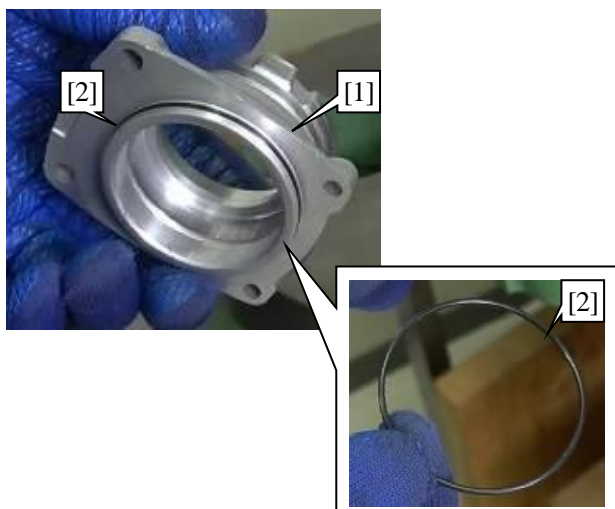
Check that Lever [1] can be pulled smoothly and it returns with its spring force.

Fig. 35



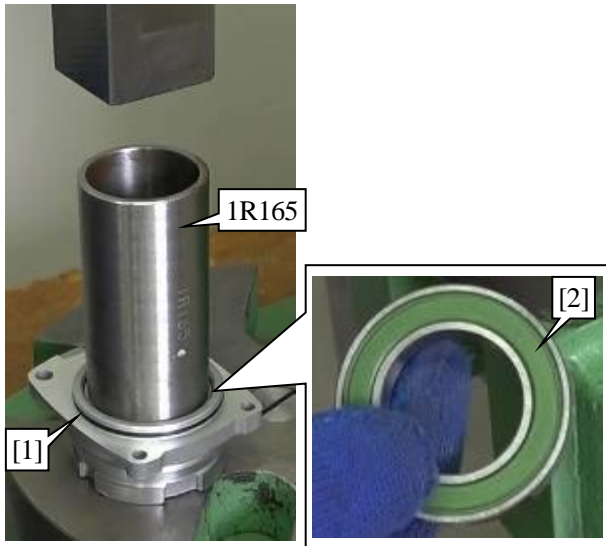
- 3 Assemble Ring 25 [2] to Spindle [1].

Fig. 36



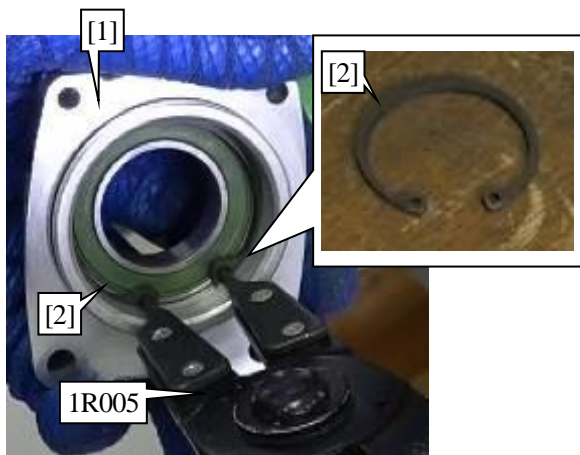
- 4 Assemble O ring 45 [2] to Bearing box [1].

Fig. 37



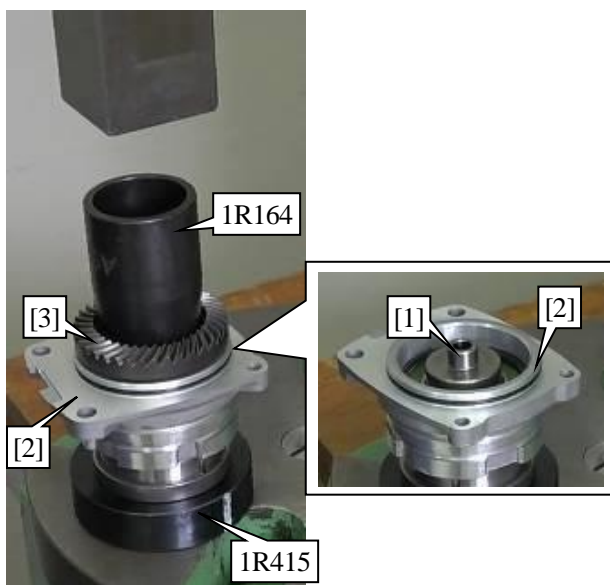
- 5 Press-fit Ball bearing 6905DDW [2] to Bearing box [1] with 1R165.

Fig. 38



- 6 Assemble Retaining ring (INT) R-42 [2] to Bearing box [1] with 1R005.

Fig. 39

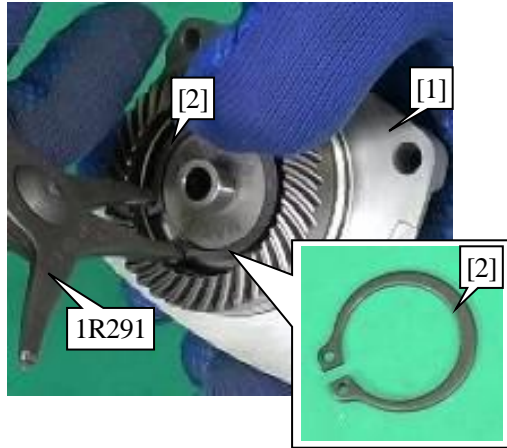


- 7 Hold Spindle [1] with 1R415, then press-fit Bearing box ass'y [2] and Spiral bevel gear 37 [3] into Spindle [1] with a thin surface of 1R164.

Tips

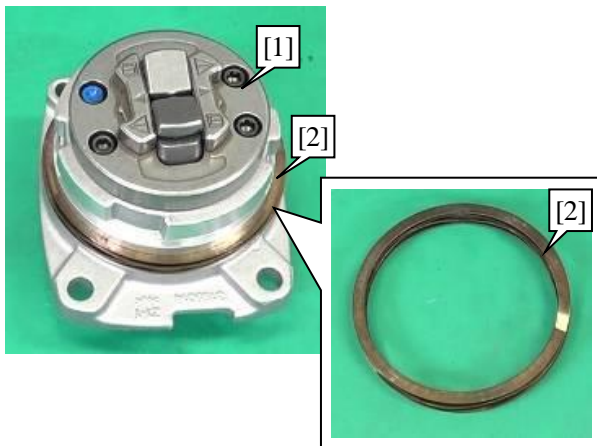
Press-fit while turning them so that they do not tilt.

Fig. 40



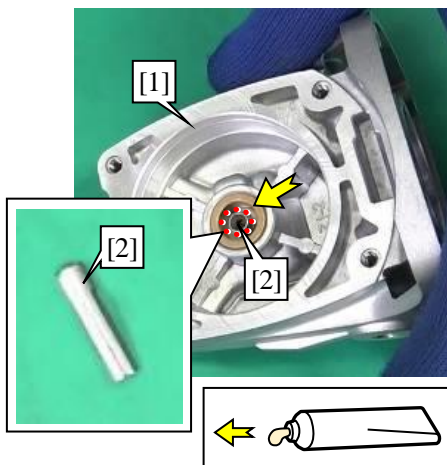
8 Assemble Retaining ring S-24 [2] to Bearing box [1] with 1R291.

Fig. 41



9 Assemble Screw wave spring 49 [2] to Bearing box [1].

Fig. 42

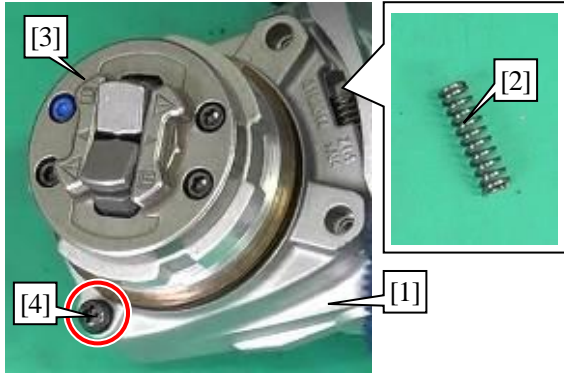


10 Assemble Shaft [2] to Bearing box [1].

Note

Apply the specified grease to Shaft [2].

Fig. 43



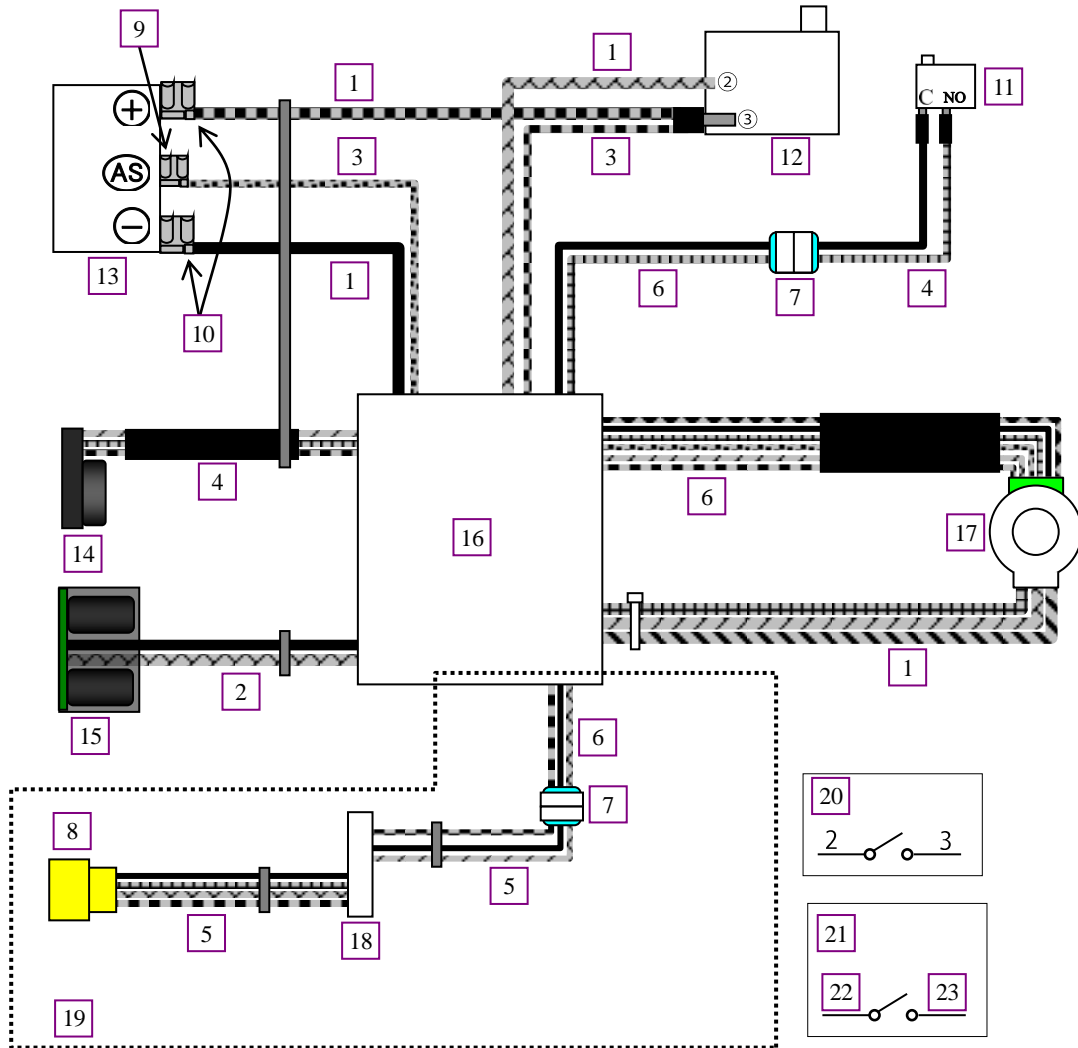
11 Assemble the following parts to Gear housing complete [1].

- Compression spring 4 [2]
- Bearing box ass'y [3]
- M4x20 P. H. screws with WR [4] (2 pcs)

6 CIRCUIT DIAGRAM

Fig. 44

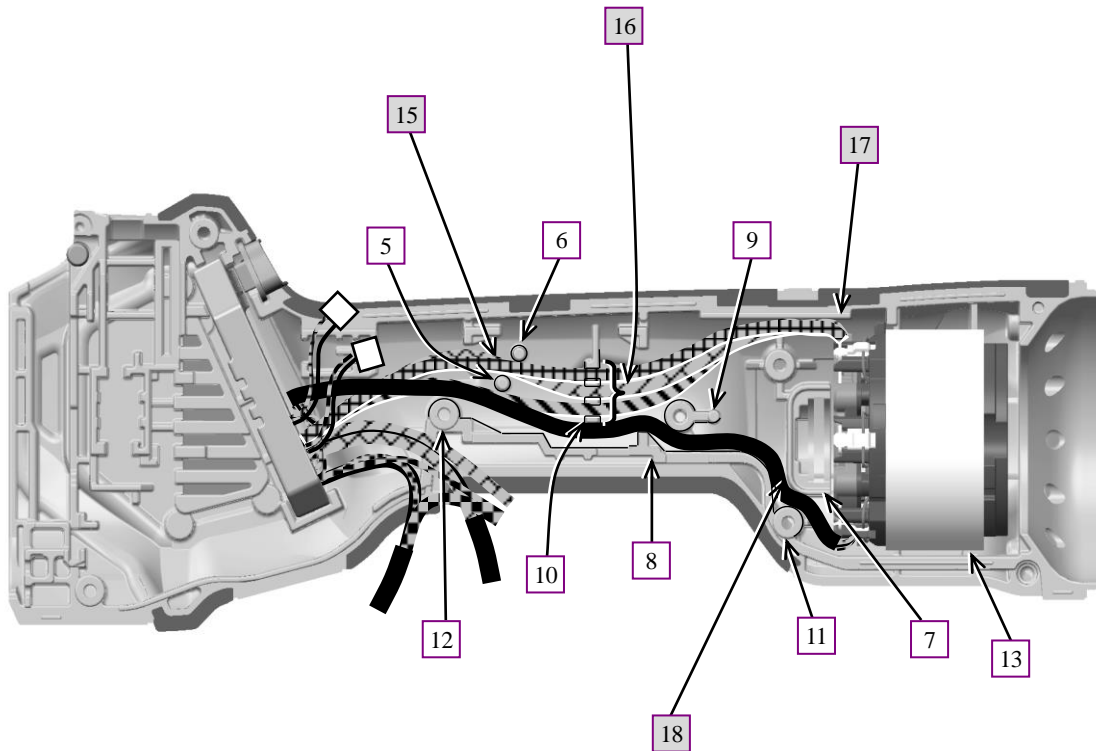
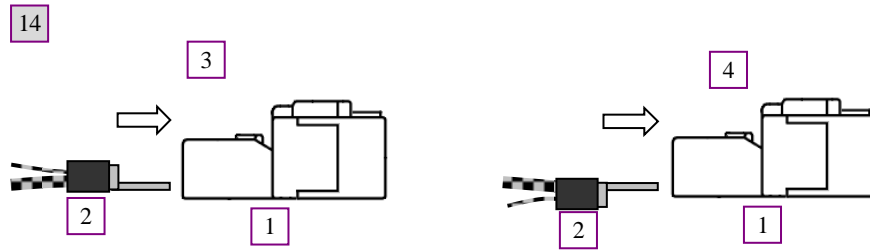
Color index of lead wires' sheath			
White		Orange	
Blue		Green	
Yellow		Black	
Red			



1	AWG14	13	Terminal
2	AWG16	14	Dial section
3	AWG22	15	Noise suppressor
4	AWG24	16	Controller
5	AWG26	17	Stator
6	AWG28	18	Sub controller
7	Connector	19	Only for AWS-supported tool
8	Connector for Wireless unit	20	Switch circuit diagram
9	Flag receptacle with lock (#187, t=0.8)	21	Switch unit circuit diagram
10	Flag receptacle with lock (#250, t=0.8)	22	Blue
11	Switch unit	23	Black
12	Switch		

7 WIRING DIAGRAM
7-1 Stator section

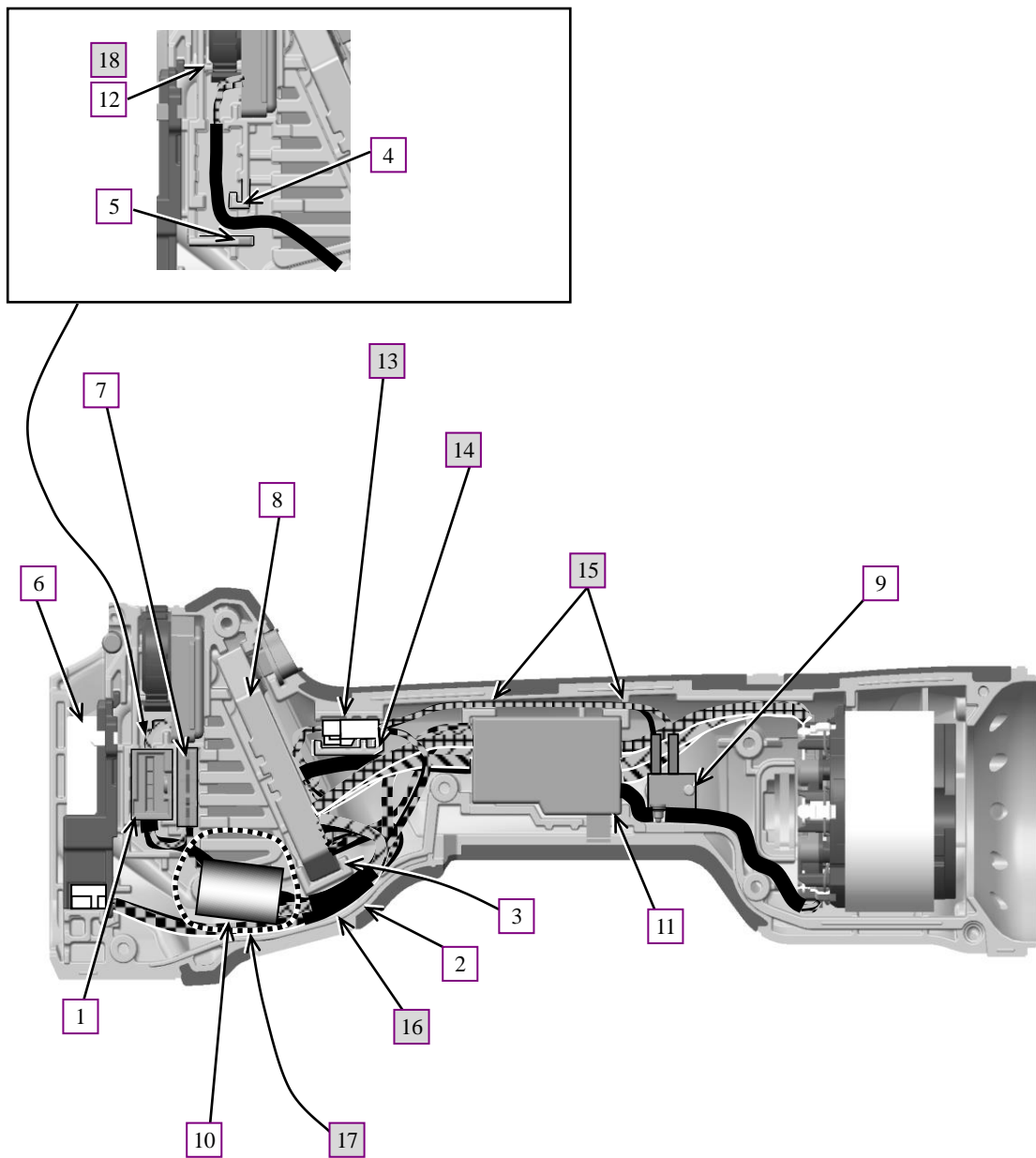
Fig. 45



1	Switch	8	Rib B
2	Non-insulated terminal	9	Rib C
3	Good example	10	Rib D
4	Not good example	11	Boss A
5	Pin A	12	Boss B
6	Pin B	13	Stator
7	Rib A		
14	Assemble Non-insulated terminal to Switch in the direction shown in "Good sample".		
15	Be careful not to put the thick lead wires of Stator on Pin A and Pin B.		
16	Fix the thick lead wires of Stator in this lead wire holder.		
17	Bend the thick lead wires of Stator so as not to pinch them between Motor housings L and R.		
18	Route Lead wires with the tube of Stator between Rib A and Boss A, Rib B and Rib C, Rib B and Rib D, and Boss B and Pin A.		

7-2 Controller section

Fig.46



1	Connector for Wireless unit	7	Sub controller (if used)
2	Rib E	8	Controller
3	Rib F	9	Switch unit
4	Rib G	10	Noise suppressor
5	Rib H	11	Switch
6	Terminal	12	Dial section
13	Fit Connectors (one or two) in the orientation shown in the figure. Do not place any Lead wires under Connectors.		
14	Be careful not to put any Lead wires on this Rib.		
15	Fix Lead wires of Switch unit in this Lead wire holder.		
16	Route Lead wires between Rib E and Rib F. Put Lead wires of Noise suppressor on Lead wires of Terminal.		
17	Put Noise suppressor in this space.		
18	Route Controller lead wires of Dial section between Rib G and Rib H.		

8 TROUBLESHOOTING

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

8-1 Note for Repairing

The content may vary depending on the model.

- 1 Use a full charged battery which has a star mark.
- 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 and Battery, etc.).
- 3 Be sure to test the machine 10 times to correctly diagnose functions such as Variable speed control etc.
- 4 In order to make it easier to reproduce symptoms, run the motor at the lowest speed.
- 5 Use Repairing tools in Troubleshooting in the next pages for each part failure diagnostics.

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

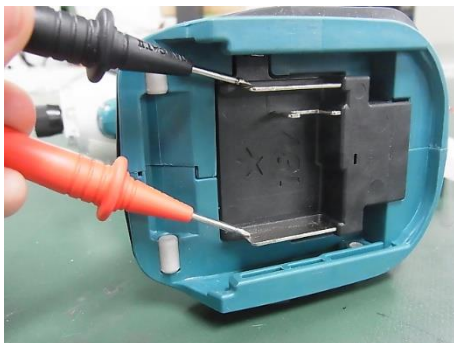
8-2 Test for checking the short-circuit in FET (Field Effect Transistor) of controller

Fig. 47

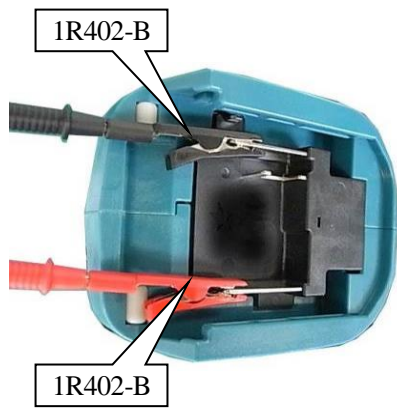


- 1 Set Digital tester (1R402) to Diode mode.

Fig. 48



- 2 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.

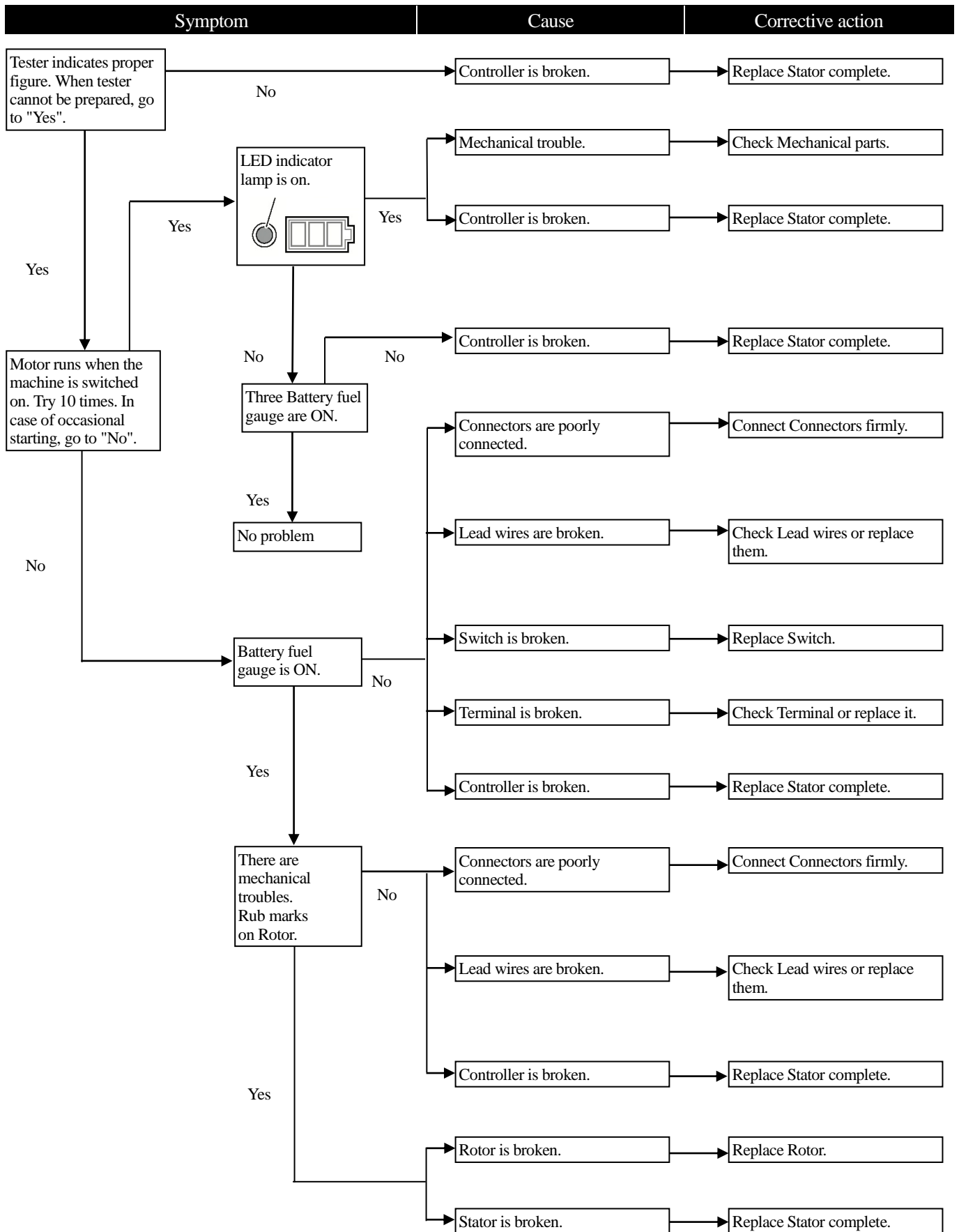
Note

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

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

8-3 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 in Fig. 44.) After corrective action, return to the start of Troubleshooting and re-check again.



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