

# TECHNICAL INFORMATION



PRODUCT

P 1/10

**Model No.** ▶ GA5020C/GA6020C, GA5021C/GA6021C

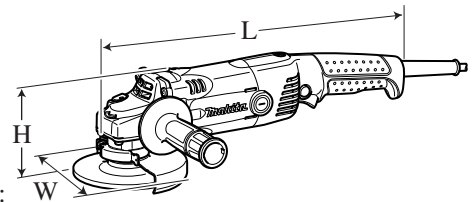
**Description** ▶ Angle Grinders 125mm (5") /150mm (6")

## CONCEPT AND MAIN APPLICATIONS

These four models have been developed as the most advanced models of our GA5010 series, featuring a variety of value-adding functions as follows:

- \*Electronic control including;
  - Constant speed control, Soft start, Electronic current limiter,
  - Anti-restart function, LED power light
- \*Super Joint System (SJS)

GA5020C/GA6020C use Single-finger trigger while GA5021C/GA6021C use Large type trigger.



(The image above is GA5020C/GA6020C.)

Dimensions: mm (")		
Model No.	GA5020C GA5021C	GA6020C GA6021C
Length (L)	390 (15-3/8)	
Width (W)	139 (5-1/2)	169 (6-5/8)
Height (H)	120 (4-3/4)	

## Specification

### GA5020C/GA6020C

Voltage (V)	Current (A)	Cycle (Hz)	Continuous Rating (W)		Max. Output (W)
			Input	Output	
120	12.5	50/60	---	1,000	2,200

### GA5021C/GA6021C

110	14	50/60	1,450	1,000	2,200
120	12.5	50/60	---	1,000	2,200
220	6.9	50/60	1,450	1,000	2,600
230	6.6	50/60	1,450	1,000	2,600
240	6.4	50/60	1,450	1,000	2,600

Model No.		GA5020C	GA6020C	GA5021C	GA6021C
Wheel size: mm (")	Diameter	125 (5)	150 (6)	125 (5)	150 (6)
	Hole diameter	22.23 (7/8)			
No load speed: min.-1 = rpm		10,000	9,000	10,000	9,000
Super Joint System (SJS)		Yes			
Electronic control	Constant speed control	Yes			
	Soft start	Yes			
	Electronic current limiter	Yes			
	Anti-restart function	Yes			
	LED power light	Yes			
Switch trigger		Single-finger		Large type	
Protection against electric shock		Double insulation			
Power supply cord: m (ft)		Australia: 2.0 (6.6), Other countries: 2.5 (8.2)			
Net weight: kg (lbs)		2.5 (5.5)			

## Standard equipment

- Lock nut wrench 35 ..... 1
- Lock nut wrench 28 ..... 1
- Depressed center wheel ..... 1 (125-36 for GA5020C and GA5021C, 150-36 for GA6020 and GA6021C)
- Side grip (soft grip) ..... 1
- Toolless wheel cover ..... 1 (if required)

**Note:** The standard equipment for the tool shown above may differ from country to country.

## Optional accessories

- Anti-vibration grip, Dust cover attachment, Loop handle, Toolless wheel cover
- GA5020C, GA5021C: Accessories for 125mm angle grinder
- GA6020C, GA6021C: Accessories for 150mm angle grinder

## ► Repair

**CAUTION: Unplug the machine and remove the wheel and the wheel cover from the machine for safety before repair/ maintenance in accordance with the instruction manual!**

### [1] NECESSARY REPAIRING TOOLS

Code No.	Description	Use for
1R004	Retaining ring pliers ST-2 [1R291 can be used instead of 1R004.]	Removal/installation of Ring spring 7
1R005	Retaining ring pliers RT-2N	Removing Retaining ring R-30
1R045	Gear extractor (large)	Removing Large spiral bevel gear*1
1R346	Center attachment for 1R045	
1R039	Armature holder 41.5 [one set required]	Removal/installation of Hex nut M7
1R268	Spring pin extractor M3	Disassembling Shaft lock section
1R269	Bearing extractor	Removing Ball bearing 696ZZ
1R350	Ring 60	Disassembling Shaft lock section
---	Adjustable wrench	Removing Lock sleeve and Lock spring 16
---	Wrench 11	Removal/installation of Hex nut M7

\*1: Different spiral bevel gears are used by different models as follows:  
GA5020C and GA5021C/ Spiral bevel gear 35B  
GA6020C and GA6021C/ Spiral bevel gear 38

### [2] LUBRICATION

Lubricate the parts below in order to protect parts and product from unusual abrasion.

Put approx. 15g of Makita grease SG No.0 in the gear room of Gear housing.

Apply Makita Grease SG No.0 to the portions designated with the mark of ▼. (Fig. 1)

Item No.	Description	Portion to lubricate
39	Lock spring 16	Outside surface
49	Spindle	Surface that contacts Large spiral bevel gear

**Fig. 1**

### [3] DISASSEMBLY/ASSEMBLY

#### [3] -1. Armature, Small spiral bevel gear\*2, Ball bearing 6000DDW

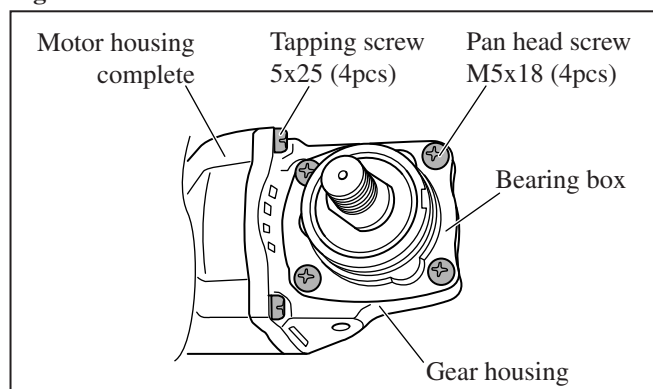
##### DISASSEMBLING

- 1) After removing Carbon brush, separate Gear housing together with Armature from Motor housing complete by unscrewing four M5x18 Pan head screws. (Fig. 2)
- 2) Separate Bearing box from Gear housing by unscrewing four 5x25 Tapping screws. (Fig. 2)

\*2: Different spiral bevel gears are used by different models as follows:

GA5020C and GA5021C/ Spiral bevel gear 11  
GA6020C and GA6021C/ Spiral bevel gear 11A

**Fig. 2**



## ► Repair

### [3] -1. Armature, Small spiral bevel gear, Ball bearing 6000DDW (cont.)

#### DISASSEMBLING

3) Attach one set of 1R039 to vise, then fix Armature in 1R039.

Remove Hex nut M7 from the drive-end of Armature shaft by turning it counterclockwise with Wrench 11. (Fig. 3)

4) Hold Small spiral bevel gear by hand, then pull off Armature from Gear housing. (Fig. 4)

**Note:** If it is difficult to pull off Armature by hand, do the following steps.

1. Lubricate the gear and Armature shaft with spray lubricant.
2. Wrap the gear with cloth to protect the gear teeth.
3. Using water pump pliers or the like, firmly grip the gear wrapped with cloth, then turn the gear.

Fig. 3

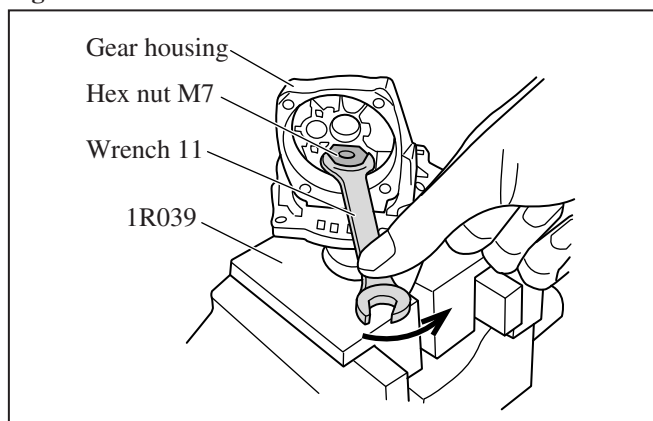
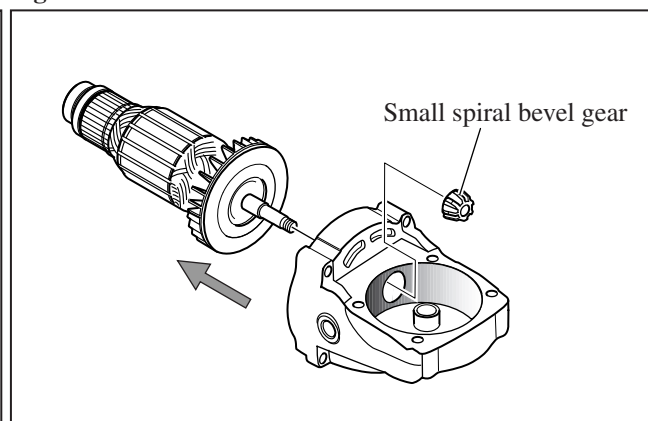


Fig. 4



5) In order to remove Ball bearing 6000DDW from Gear housing, first remove Retaining ring R-30 using 1R005, then remove Flat washer 20 from Gear housing. (Fig. 5)

6) Reassemble Armature to Gear housing, then the spiral bevel gear to Armature shaft. Tighten Hex nut M7 provisionally by turning clockwise. (Refer to Figs. 4, 3)

7) By tapping the end surface of Gear housing with plastic hammer, Ball bearing 6000DDW can be removed together with Armature. (Fig. 6)

8) Remove Ball bearing 608DDW from Armature using 1R269. (Fig. 7)

Fig. 5

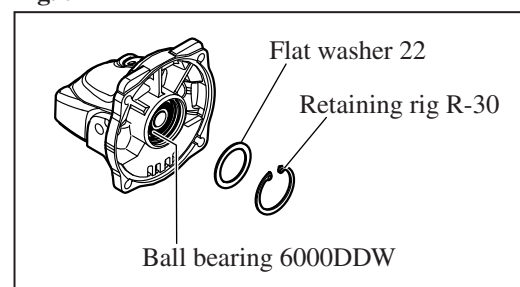


Fig. 6

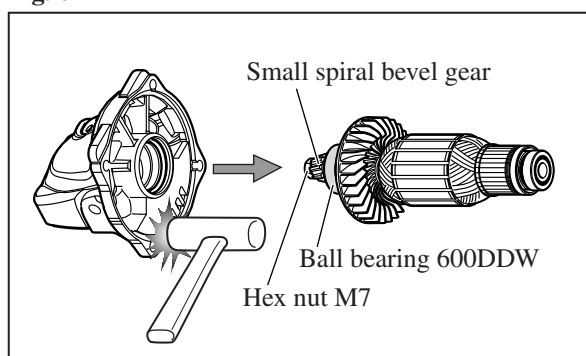
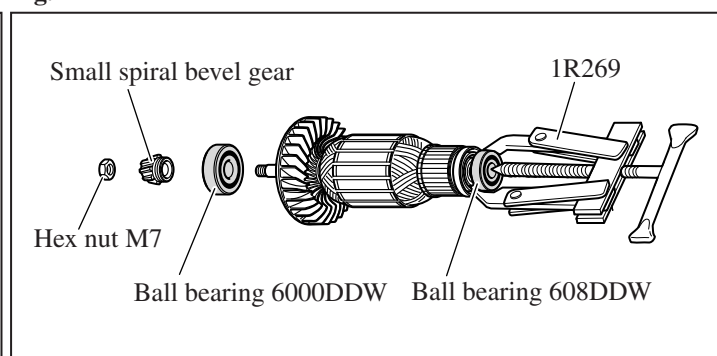


Fig. 7



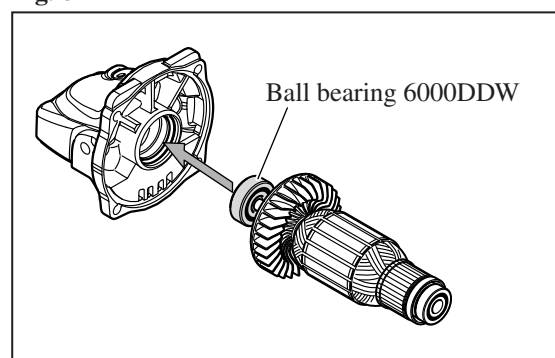
#### ASSEMBLING

1) Mount Ball bearing 6000DDW on Armature by hand, then insert into the bearing installation hole of Gear housing, (Fig. 8)  
Then pull off Armature.

2) Put Flat washer 22 on Ball bearing 6000DDW, and fasten them with Retaining ring R-30 using 1R005.

3) Then do the reverse of the disassembling steps.

Fig. 8



## ► Repair

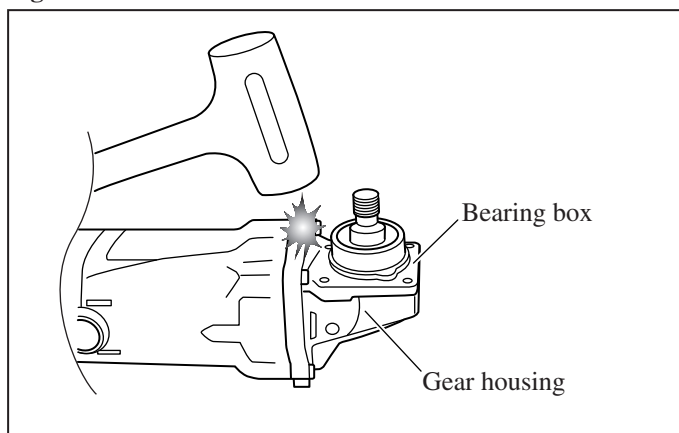
### [3] -2. Large spiral bevel gear and Ball bearing 6002DDW

**Note:** The gear and the ball bearing can be replaced without disassembling the Motor section.

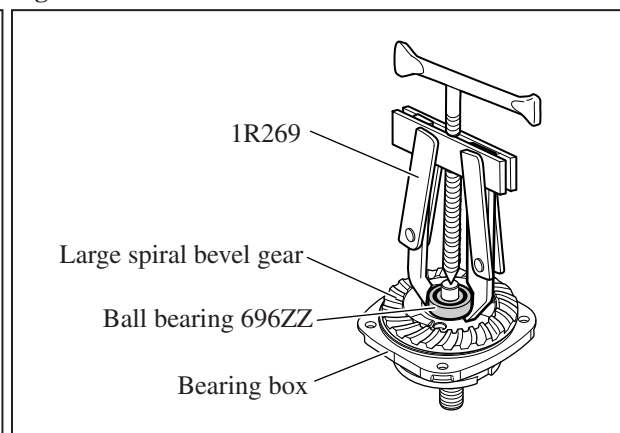
#### DISASSEMBLING

- 1) Separate Bearing box from Gear housing first by unscrewing four M5x18 Pan head screws then by tapping the end of Gear housing with plastic hammer as illustrated in **Fig. 9**. It is not necessary to remove Carbon brushes.
- 2) Remove Ball bearing 6000ZZ using 1R269. (**Fig. 10**)

**Fig. 9**

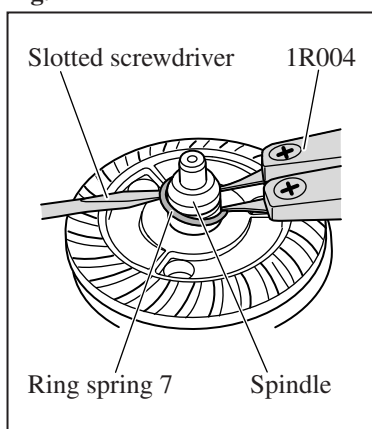


**Fig. 10**

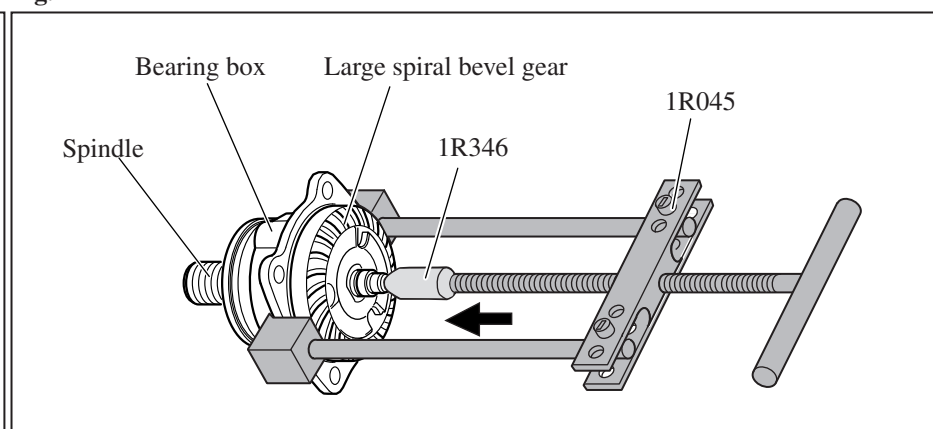


- 3) Remove Ring spring 7 from Spindle by levering up with slotted screwdriver while expanding the ends of the spring a little bit with 1R004 or 1R291. (**Fig. 11**) Then remove Flat washer 8 and Lock washer.
- 4) As illustrated in **Fig. 12**, remove Large spiral bevel from Spindle together with Lock sleeve and Lock spring 16 using 1R045 and 1R346.

**Fig. 11**

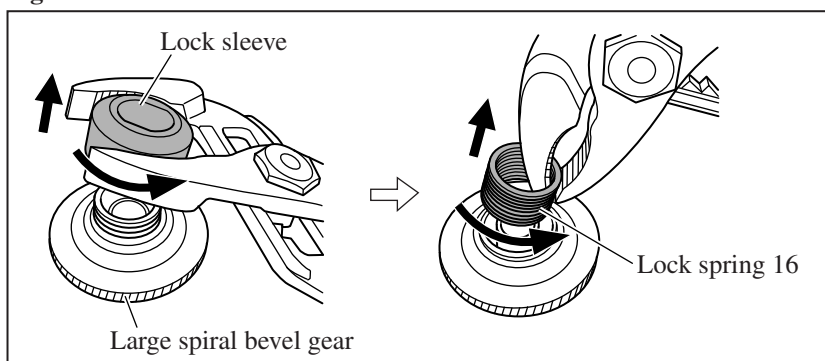


**Fig. 12**

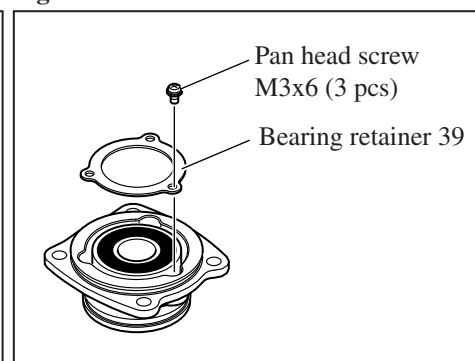


- 5) Hold Large spiral bevel gear securely by hand, and pull off Lock sleeve with adjustable wrench while turning it counterclockwise. Then remove Lock spring 16 the same way as you removed Lock sleeve. (**Fig. 13**)
- 6) After removing Large spiral bevel gear, separate Bearing retainer 39 by removing three M3x6 Pan head screws. (**Fig. 14**)

**Fig. 13**



**Fig. 14**



## ► Repair

### [3] -2. Large spiral bevel gear and Ball bearing 6002DDW (cont.)

#### DISASSEMBLING

- 7) Remove Ball bearing in Bearing box by hitting Bearing box straight down against flat surface of work-bench. (Fig. 15)  
If cannot be removed, use arbor press and a round bar for arbor of an appropriate size as illustrated in Fig. 16.

Fig. 15

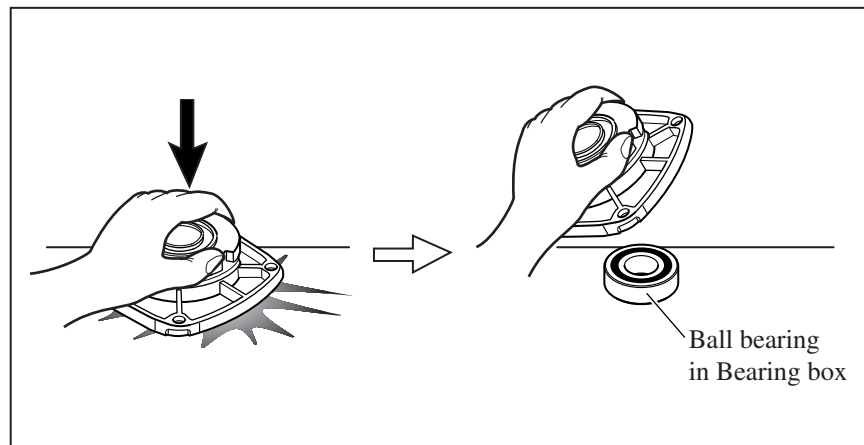
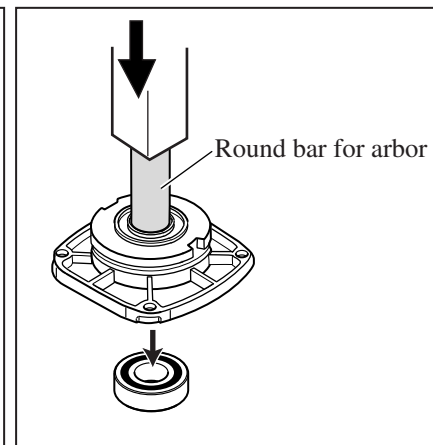


Fig. 16



#### ASSEMBLING

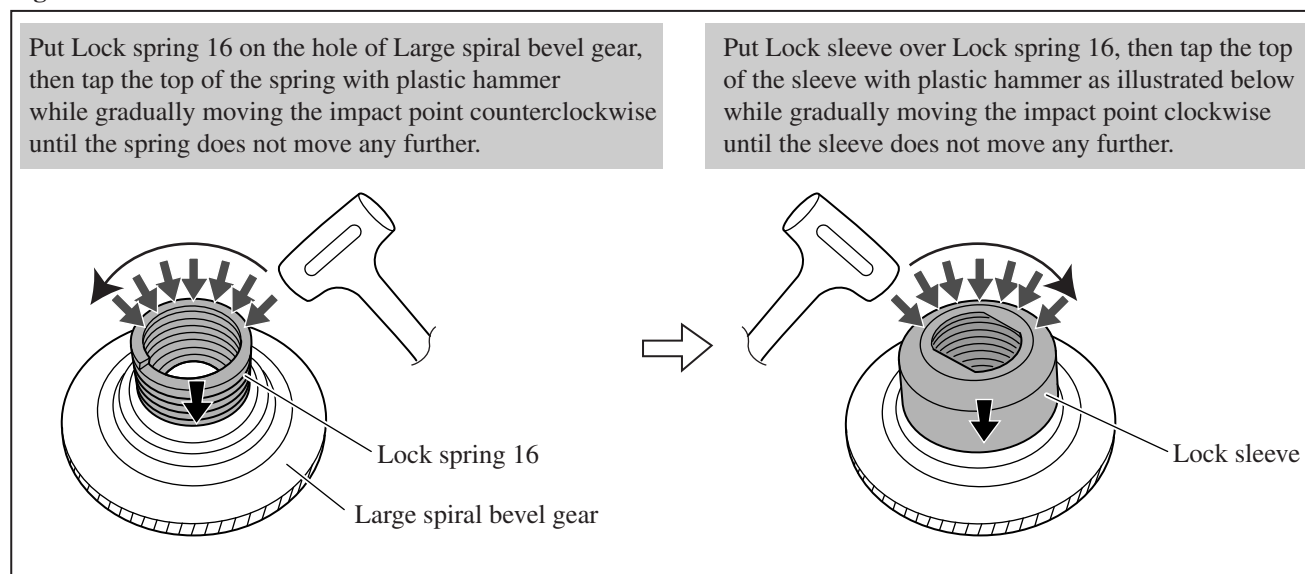
Do the reverse of the disassembling steps.

**Note 1:** Ring spring 7 inevitably loses its elasticity when removed from Spindle. This will also happen to new one when it is assembled to Spindle. Therefore, reuse removed Ring spring 7 if it is not damaged.

Do not forget to fasten Ring spring 7 securely to Spindle using pliers whether it is removed one or new one.

**Note 2:** Do as described in Fig. 17 when assembling Lock spring 16 and Lock sleeve to Large spiral bevel gear.

Fig. 17



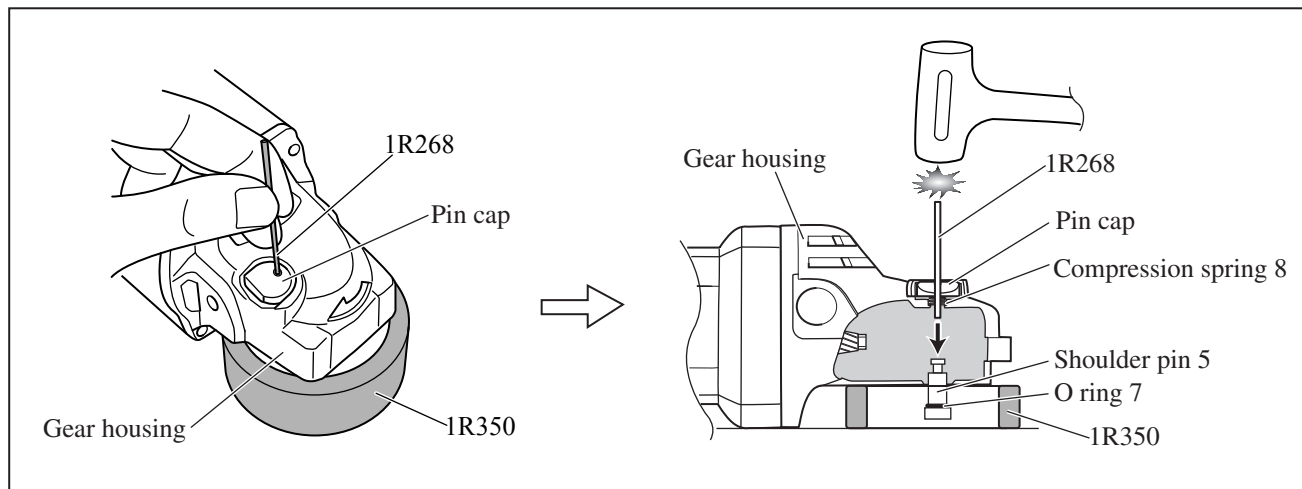
## ► Repair

### [3] -3. Shaft lock section

#### DISASSEMBLING

- 1) Remove Bearing box from Gear housing. (**Fig. 9** on page 4)
- 2) Shoulder pin 5 can be removed from Gear housing using 1R268, 1R350 and plastic hammer as illustrated in **Fig. 18**.

**Fig. 18**



#### ASSEMBLING

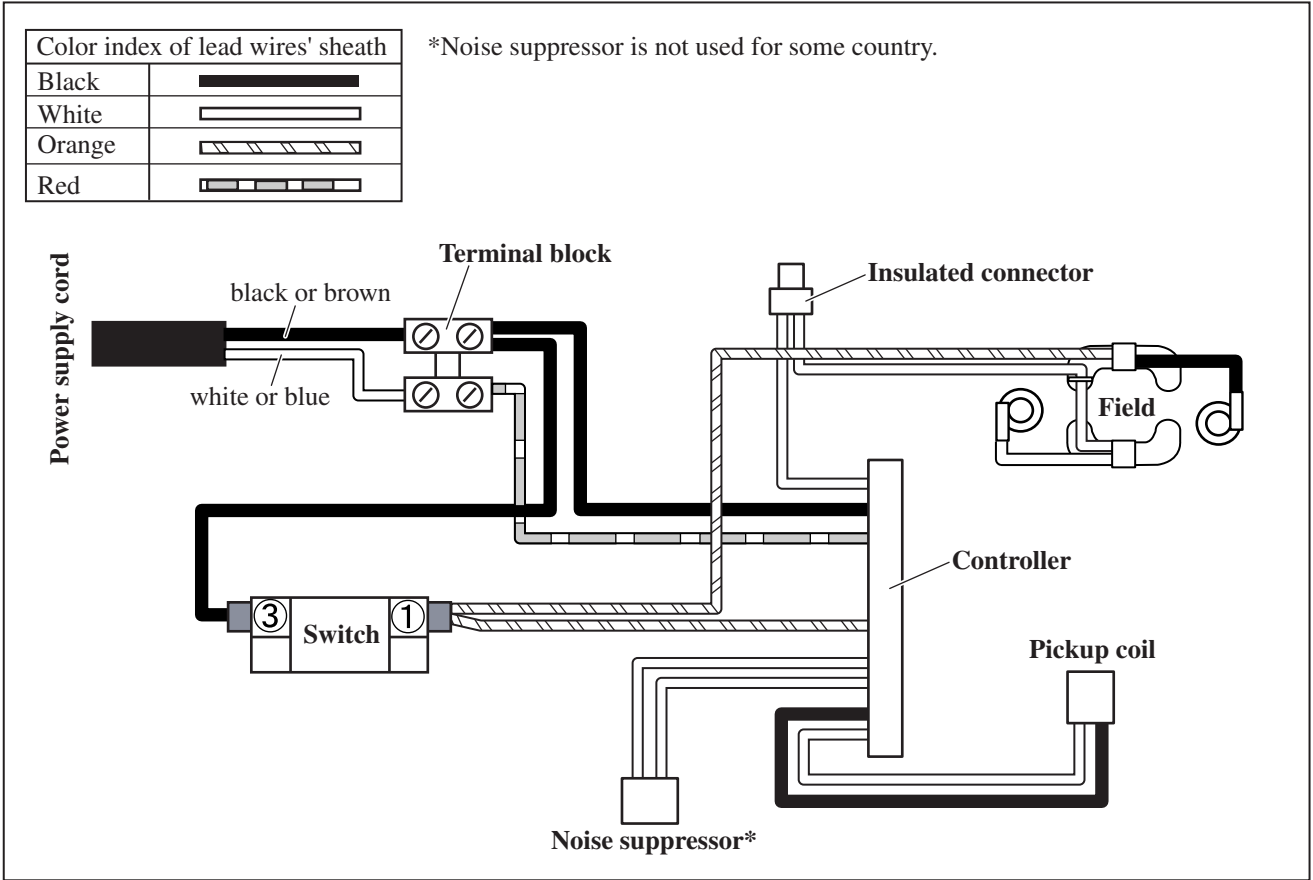
Do the reverse of the disassembling steps.

**Note:** Do not reinstall removed Pin cap because removal of Shoulder pin 5 damages the inside surface of Pin cap.  
Be sure to remove plastic dust of Pin cap from Shoulder pin 5 and to install it onto new Pin cap.

► **Circuit diagram**

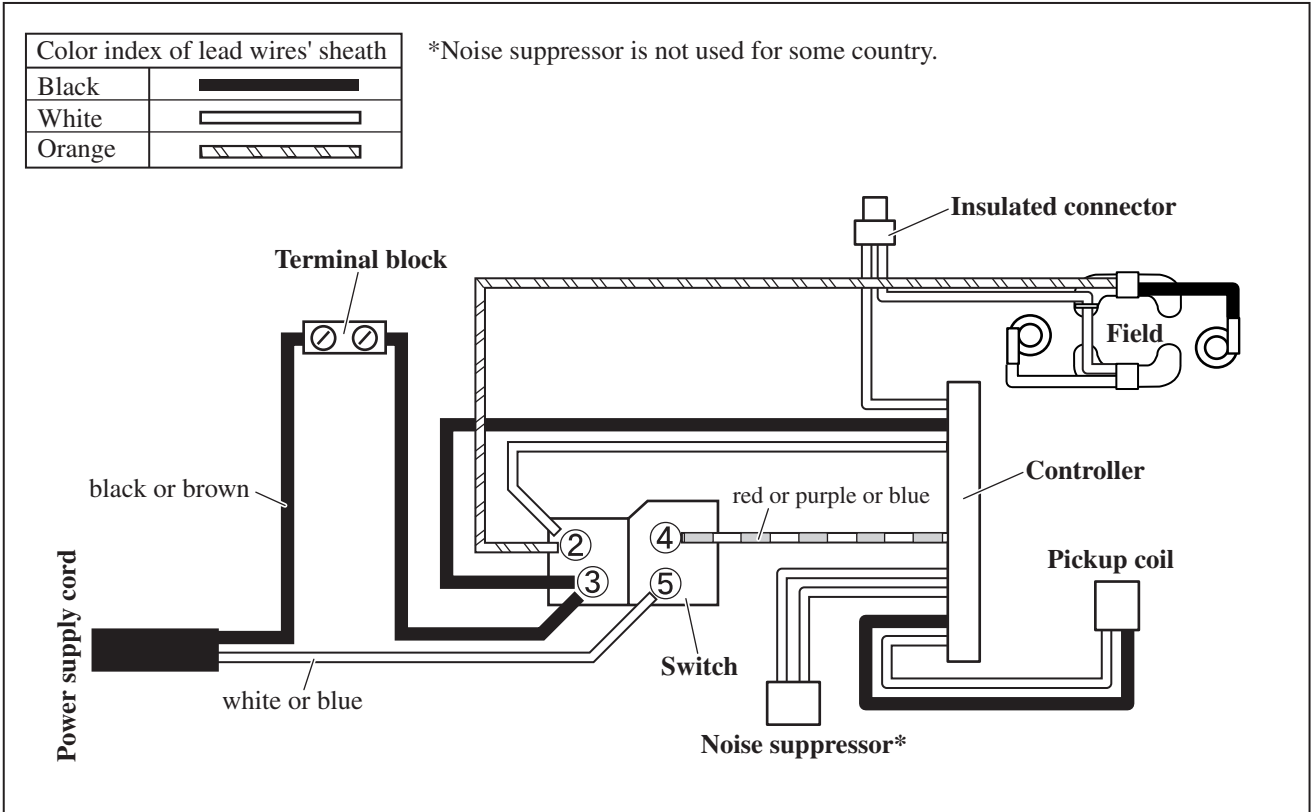
**GA5020C/ GA6020C**

**Fig. D-1**



**GA5021C/ GA6021C**

**Fig. D-2**



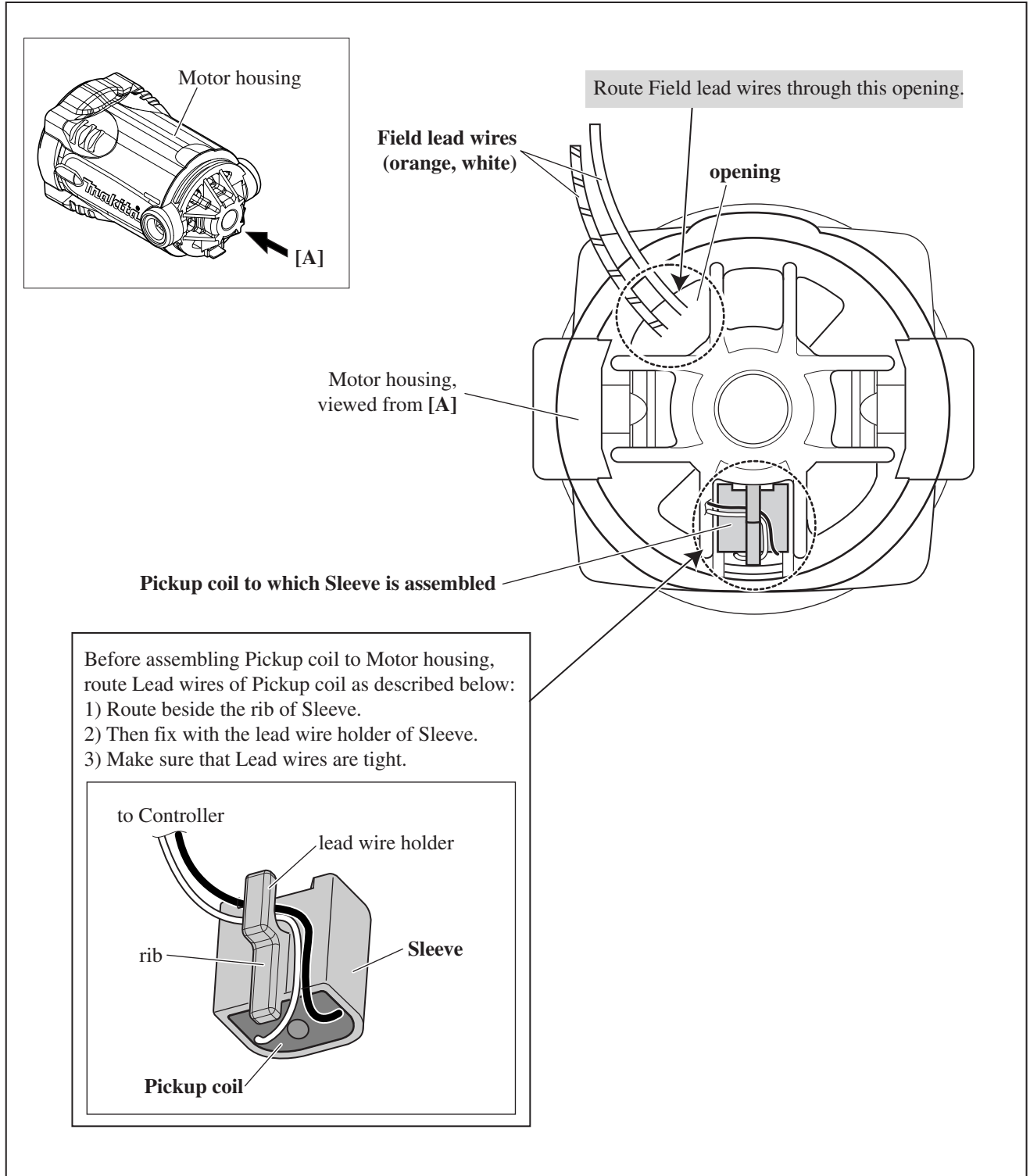
## ► Wiring diagram

### [1] Motor housing

#### All models

Route Field lead wires as illustrated below. (Fig. D-3)

Fig. D-3





## ► Wiring diagram

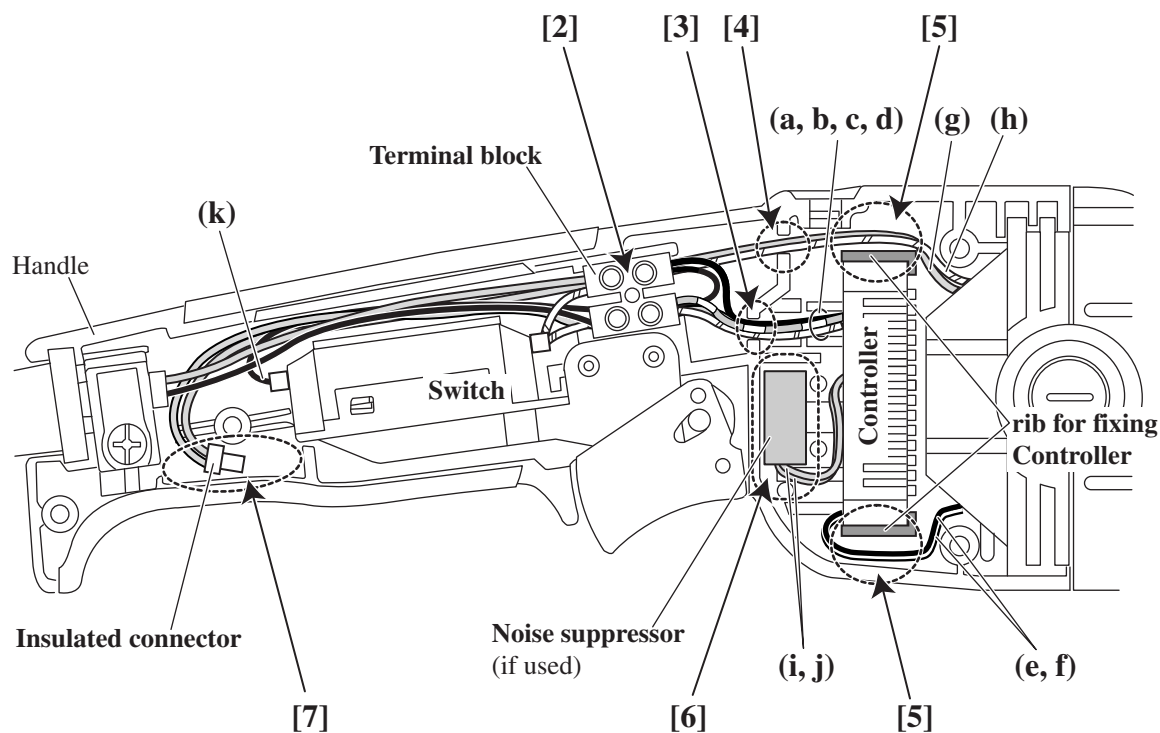
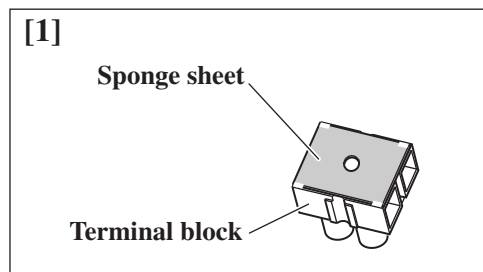
### [2] Handle

**GA5020C/ GA6020C**

Route Field lead wires as described below in **Fig. D-4**.

**Fig. D-4**

- [1] Before routing Lead wires, adhere Sponge sheet to the back of Terminal block as illustrated to right.
- [2] Route the following Lead wires under Terminal block: (a), (d), (g), (h), (k)
- [3] Fix the following Lead wires with this Lead wire holder: (a), (b), (c), (d)
- [4] Fix the following Lead wires with this Lead wire holder: (g), (h)
- [5] Route the following Lead wires between the inside wall of Handle and the rib for fixing Controller: (e), (f); (g), (h)
- [6] Put Noise suppressor in this portion if used.
- [7] Put Insulated connector in this portion.



#### Index of Lead wire

##### **Lead wires of Controller:**

- (a) White, to Insulated connector
- (b) Black, to Terminal block
- (c) Red, to Terminal block
- (d) Orange, to No.1 Terminal of Switch
- (e) Black, to Pickup coil
- (f) White, to Pickup coil

##### **Field lead wires:**

- (g) White, to Insulated connector

- (h) Orange, to No.1 Terminal of Switch

##### **Lead wires of Noise suppressor (if used):**

- (i) White, to Controller

- (j) Black, to Controller

##### **Relay wire:**

- (k) Black, from No.3 Terminal of Switch to Terminal block

## ▶ Wiring diagram

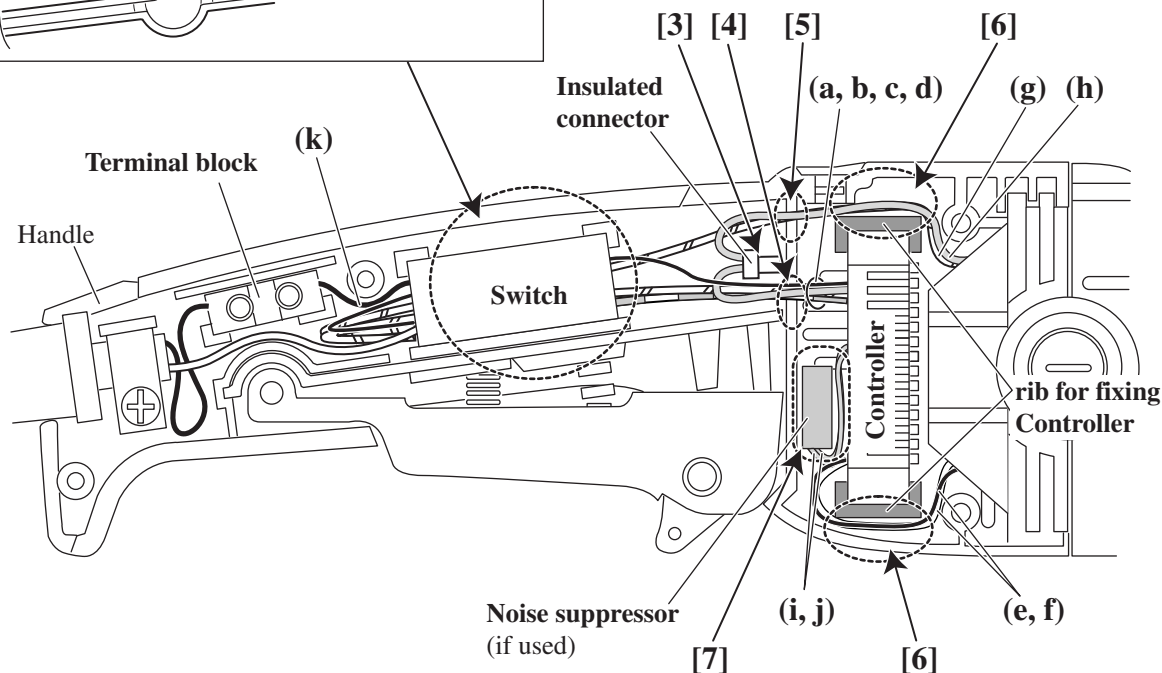
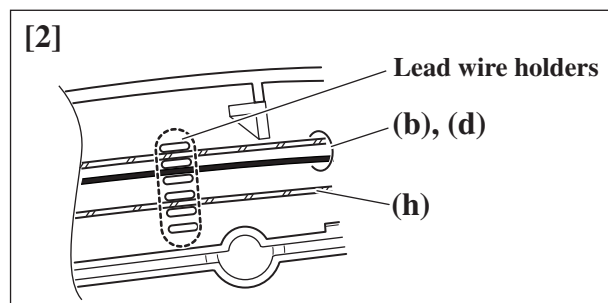
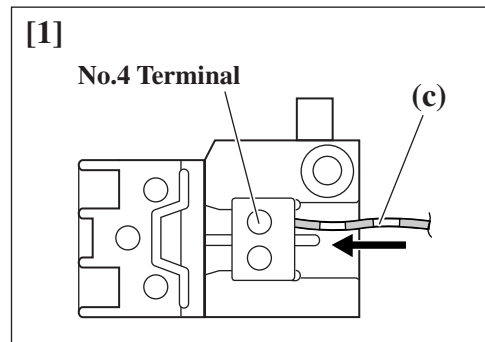
### [2] Handle (cont.)

**GA5021C/ GA6021C**

Route Field lead wires as described below in Fig. D-5.

**Fig. D-5**

- [1] When connecting Lead wire (c) to No.4 Terminal of Switch, insert it from the direction shown in the figure on right.
- [2] Before setting Switch in place, fix the following Lead wires with Lead wire holders under Switch: (b), (d), (h)
- [3] Put Insulated connector in this portion.
- [4] Fix the following Lead wires with this Lead wire holder: (a), (b), (c), (d)
- [5] Fix the following Lead wires with this Lead wire holder: (g), (h)
- [6] Route the following Lead wires between the inside wall of Handle and the rib for fixing Controller: (e), (f); (g), (h)
- [7] Put Noise suppressor in this portion if used.



#### Index of Lead wire

##### **Lead wires of Controller:**

- (a) White, to Insulated connector
- (b) Black, to No.3 Terminal of Switch
- (c) Red or Purple or Blue,  
to No.4 Terminal of Switch
- (d) Orange, to No.2 Terminal of Switch
- (e) Black, to Pickup coil
- (f) White, to Pickup coil

##### **Field lead wires:**

- (g) White, to Insulated connector
- (h) Orange, to No.2 Terminal of Switch

##### **Lead wires of Noise suppressor (if used):**

- (i) White, to Controller
- (j) Black, to Controller

##### **Relay wire:**

- (k) Black, from No.3 Terminal of Switch to Terminal block