



## MODELS

## DH 24PA/DH 24PB

### 1. PRECAUTIONS IN DISASSEMBLY AND REASSEMBLY

The **[Bold]** numbers in the descriptions below correspond to the item numbers in the Parts List and exploded assembly diagram for DH 24PA and the **<Bold>** numbers to those in the Parts List exploded assembly diagram for DH 24PB.

#### 1-1. Disassembly

##### (1) Disassembly of the Striking Mechanism Section

- With a drill bit or screwdriver bit, push in the Second Hammer **[25] <25>** to release the Striker **[28] <28>** from the O-Ring RPH810 **[27] <27>**.
- Set the Change Lever **[13] <13>** to a position halfway between the “Drill” and “Hammer” marks on the Gear Cover **[7] <7>**, insert a small slotted-head screwdriver into the concave position located on the rear end of the Change Lever **[13] <13>**, and pull it off. (It is very important to ensure that the Change Lever **[13] <13>** is positioned halfway between the “Drill” and “Hammer” marks when it is disassembled or assembled.)
- Loosen the four Tapping Screws D5 x 35 **[8] <8>**, and remove the Gear Cover **[7] <7>**. The Inner Cover **[33] <33>** and the Housing **[54] <54>** are loosely fitted together. Attempting to pull them out first could cause the Armature **[47] <47>** to be pulled out at the same time, causing damage to the Carbon Brushed **[64] <63>**.
- Remove Spring (B) **[34] <34>** from the end of the Second Shaft **[35] <35>**, and turn the Second Shaft **[35] <35>** so that the Piston **[30] <30>** moves to its maximum upper position (inner cover side). The arm of the Reciprocating Bearing **[40] <40>** can then be disconnected from the Piston Pin **[31] <31>**, and the Second Shaft **[35] <35>** and the components mounted on it can be removed from the Inner Cover **[33] <33>** as a unit.
- With a bearing puller (Special Repair Tool J-30 Bearing Puller Ass'y, Code No. 970804, is recommended), remove the First Gear **[41] <41>** from the Second Shaft **[35] <35>**. Then take off the Reciprocating Bearing **[40] <40>**. At this time, carefully note that the First Gear **[41] <41>** must be aligned with and press-fitted onto the 9 mm diameter and of the Second Shaft **[35] <35>**.
- Move the Clutch **[38] <38>** to the pinion side of the Second Shaft **[35] <35>**, and pull off the O-Ring S-8 **[39] <39>**. The Clutch Spring **[37] <37>** and Washer (B) **[36] <36>** can then be removed from the Second Shaft **[35] <35>**.

##### (2) Disassembly of the Chuck Section

As shown in Fig. 10, slide the Grip **[2] <2>** in the direction indicated by the arrow mark, and remove the Front Cap **[1] <1>**. The Grip **[2] <2>**, Ball Holder **[3] <3>** inside the Grip, Holder Spring **[4] <4>**, Washer (B) **[5] <5>** and Steel Ball **[18] <18>** can then be removed from the Cylinder **[20] <20>**.

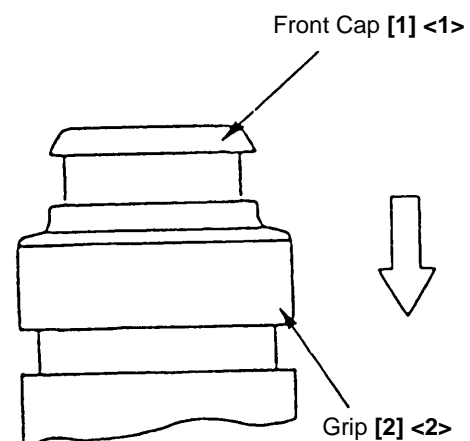


Fig. 10

(3) Disassembly of the Cylinder, Second Gear (Slip Mechanism Section) and related parts

- Take the Inner Cover [33] <33> off from the Gear Cover [7] <7>, and remove the entire chuck section. Extract the Retaining Ring for D20 Shaft [6] <6>. (For easy removal of this retaining ring, use of Special Repair Tool J-200 Snap ring Pliers [Code No. 970976] is recommended.) Then, turn the Gear Cover [7] <7> upright and use a hand press to extract the Cylinder [20] <20> from the Gear Cover [7] <7>. The Sleeve [15] <15> can then be extracted from the Cylinder [20] <20>. At this time, be very careful not to lose the three Steel Balls [19] <19>. Remove the Retaining Ring for D30 Shaft [24] <24> from the upper part of the Cylinder [20] <20>. The Second Gear [21] <21>, Spring [22] <22>, and Washer (A) [23] <23> can then be removed from the Cylinder [20] <20>. Then, extract the O-Ring [27] <27> from the inner part of the Cylinder [20] <20>, and the Second Hammer [25] <25> can be extracted from the Cylinder [20] <20>. (For easy extraction of this O-Ring [27] <27>, fit a Special Repair Tool J-201 Spring Hook [Code No. 970977] onto the outer circumference of the O-Ring [27] <27>, and pull it out. ) As the O-Ring [27] <27> is employed to prevent idle striking, please advise customers to replace it with a new one whenever it is disassembled.

Extract the Retaining Ring for D37 Hole [17] <17>, turn the Gear Cover [7] <7> so that its tip portion is upward, and use a hand press to extract the Ball Bearing [16] <16> from the Gear Cover [7] <7>. Next, turn the Gear Cover [7] <7> over and use the hand press to extract the Oil Seal [14] <14> from the Gear Cover [7] <7>. Ensure that the Oil Seal [14] <14> is replaced with a new one whenever it is disassembled.

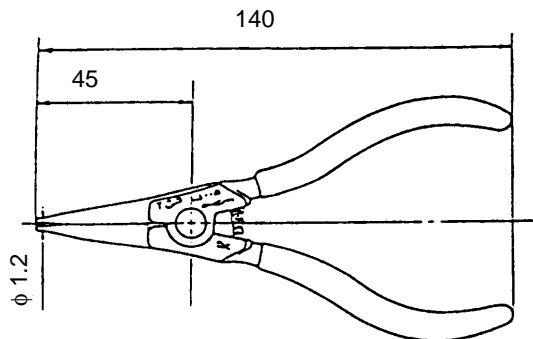
- Use of Special Repair Tools

- Snap Ring Pliers [J-200] : (See Fig. 11.)

Used to remove the Retaining Ring for D20 Shaft [6] <6> which fixes the Cylinder [20] <20> at the tip end of the Gear Cover [7] <7>.

- Spring Hook [J-201] : (See Fig. 12.)

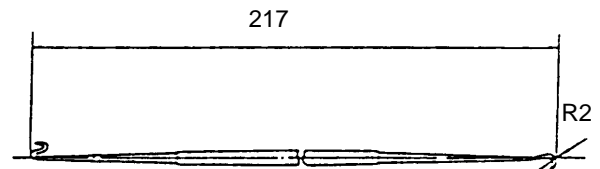
Used to extract the O-Ring [27] <27> inserted at the inner part of the Cylinder [20] <20> which is designed to catch and grip the striker to prevent idle hammering. As shown in Fig. 13, fit the Spring Hook [J-201] onto the o-ring from its outer circumference, and pull it out.



(1) Snap Ring Pliers (J-200)

Code No. 970976

Fig 11



(2) Spring Hook

Code No. 970977

Fig 12

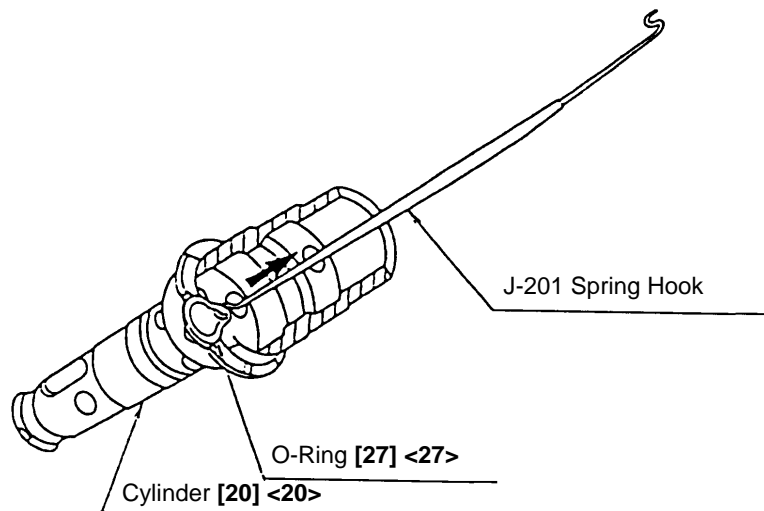


Fig 13

**1-2. Reassembly**

Perform reassembly in the reverse order of disassembly while observing the given precautions and taking care of the following points.

- (1) To make reassembly easier, coat grease on the Steel Balls [11] <11>, [18] <18>, [19] <19>.
- (2) Reassembly of the Change Lever [13] <13>

With a slotted-head screwdriver or similar tool, move the Clutch [38] <38> and the Reciprocating Bearing [40] <40> so that the claw (protruding portion) of the Reciprocating Bearing [40] <40> and the claw (protruding portion) of the Clutch [38] <38> are in contact.

After inserting the Spring [10] <10> and Steel Ball [11] <11> into the recessed portion of the Gear Cover [7] <7>, apply grease to the pin portion of the Change Lever [13] <13> into the Gear Cover [7] <7> so that it is positioned midway between the “Hammer” mark and the “Drill” mark. Be careful that should the mounting position of the change lever be incorrect, it will deform the claws of the change lever.

- (3) Reassembly of the Oil Seal [14] <14>

Prior to reassembly, apply grease to the inner circumference of the Oil Seal [14] <14>. However, do not apply grease to its outer circumference. Also, when press-fitting the Oil Seal [14] <14>, ensure it is straight and level.

**1-3. Lubrication**

Apply special grease (N.P.C.FG-6A, Code No. 980927, is recommended.) to the inner and outer circumferences of the Piston Pin [31] <31> and Piston [30] <30>, O-Ring (A) [29] <29> mounted on the Striker [28] <28>, O-Ring (B) [26] <26> mounted on the Second Hammer [25] <25>, the Reciprocating Bearing [40] <40>, the Reciprocating Bearing [40] <40> mounting portion of the Second Shaft [35] <35>, the O-ring [27] <27> and the clutch-claw portions of the Cylinder [20] <20>, the inner circumferences of the metal inside the Inner Cover [33] <33>, and external grooves of [38] <38>. Also, without fail, insert 70 g (0.15 lbs.) of special grease inside the Gear Cover [7] <7>.

**1-4. Tightening Torque**

- M4 Tapping Screws [58] <58>, [68] <69> .....2.0 ± 0.5 N·m (20 ± 5kgf-cm, 17.4 ± 4.3 in-lbs)
- M5 Tapping Screws [8] <8> .....2.9 ± 0.5 N·m (30 ± 5kgf-cm, 26.0 ± 4.3 in-lbs)

1-5. Wiring Diagrams

(1) Model DH 24PA (Products with noise suppressor)

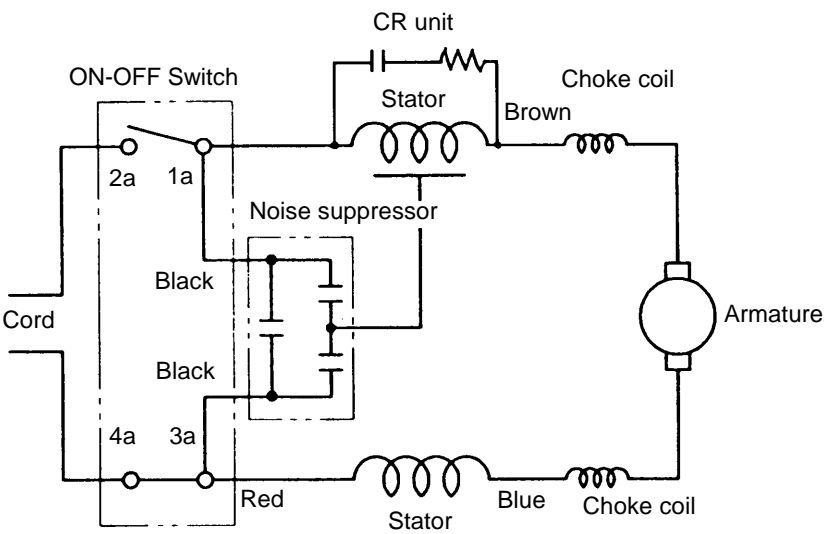


Fig. 14

(2) Model DH 24PA (Product with noise suppressor)

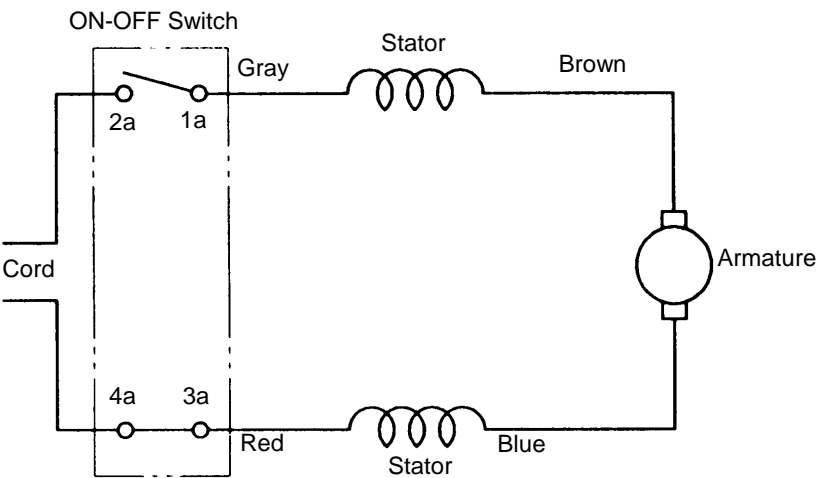


Fig.15

(3) Model DH 24PB (Product with noise suppressor)

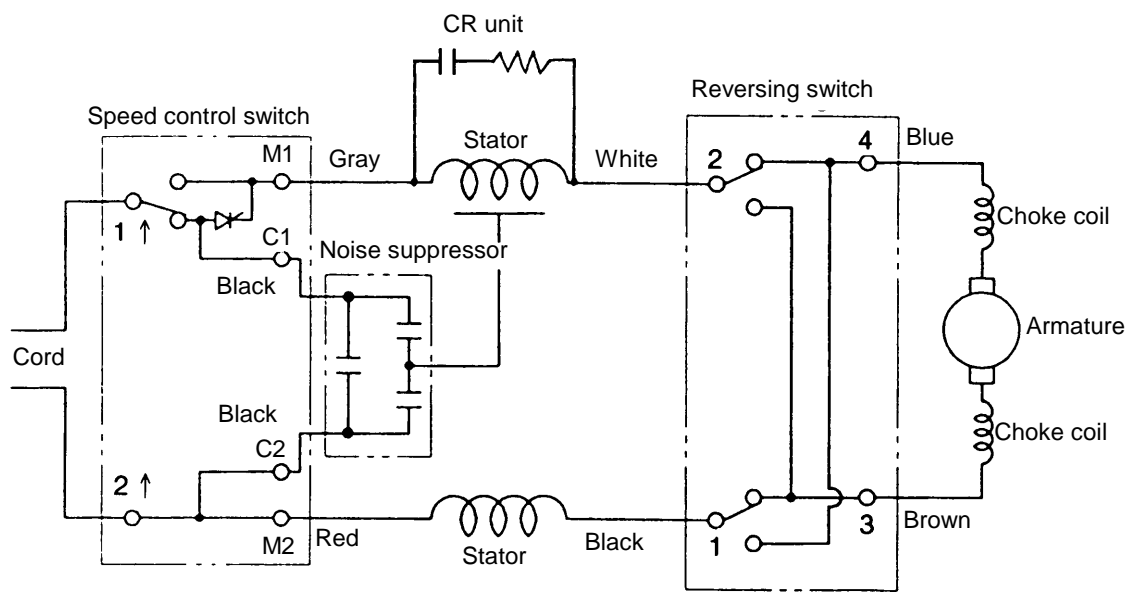


Fig. 16

(4) Model DH 24PB (Product without noise suppressor)

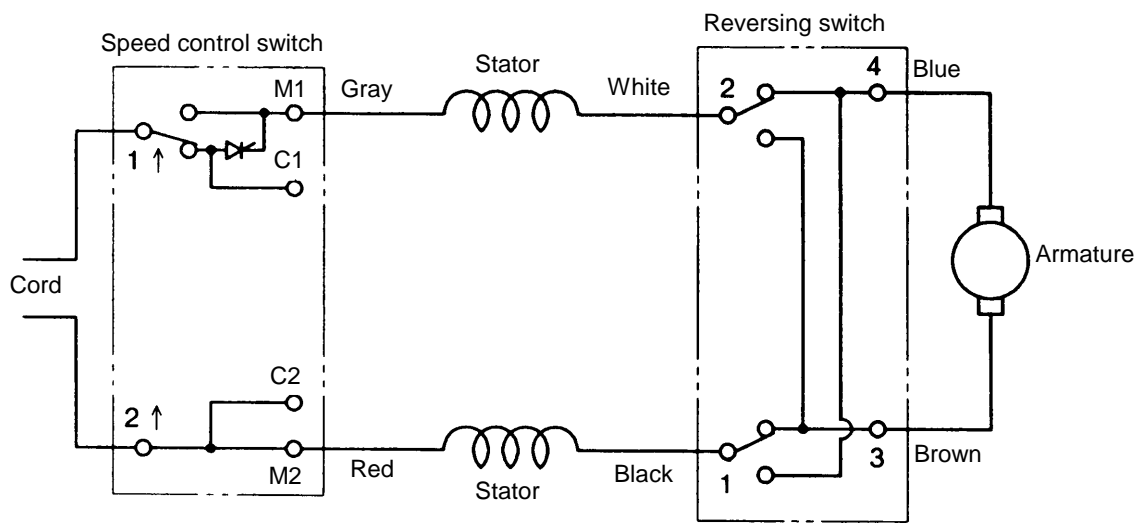


Fig. 17

1-6. Internal Wire Arrangement and Wiring Work

A. Internal Wire Arrangement

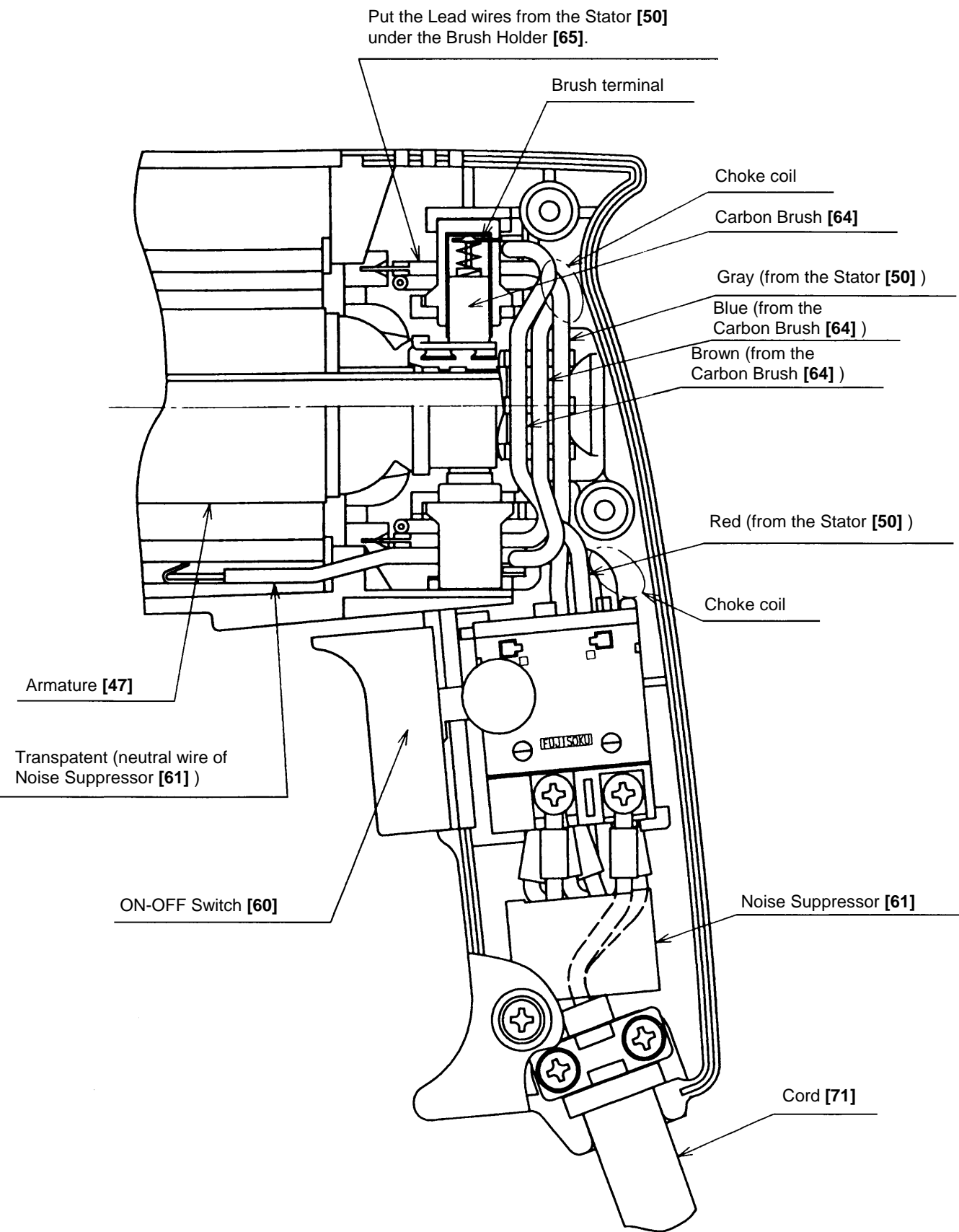
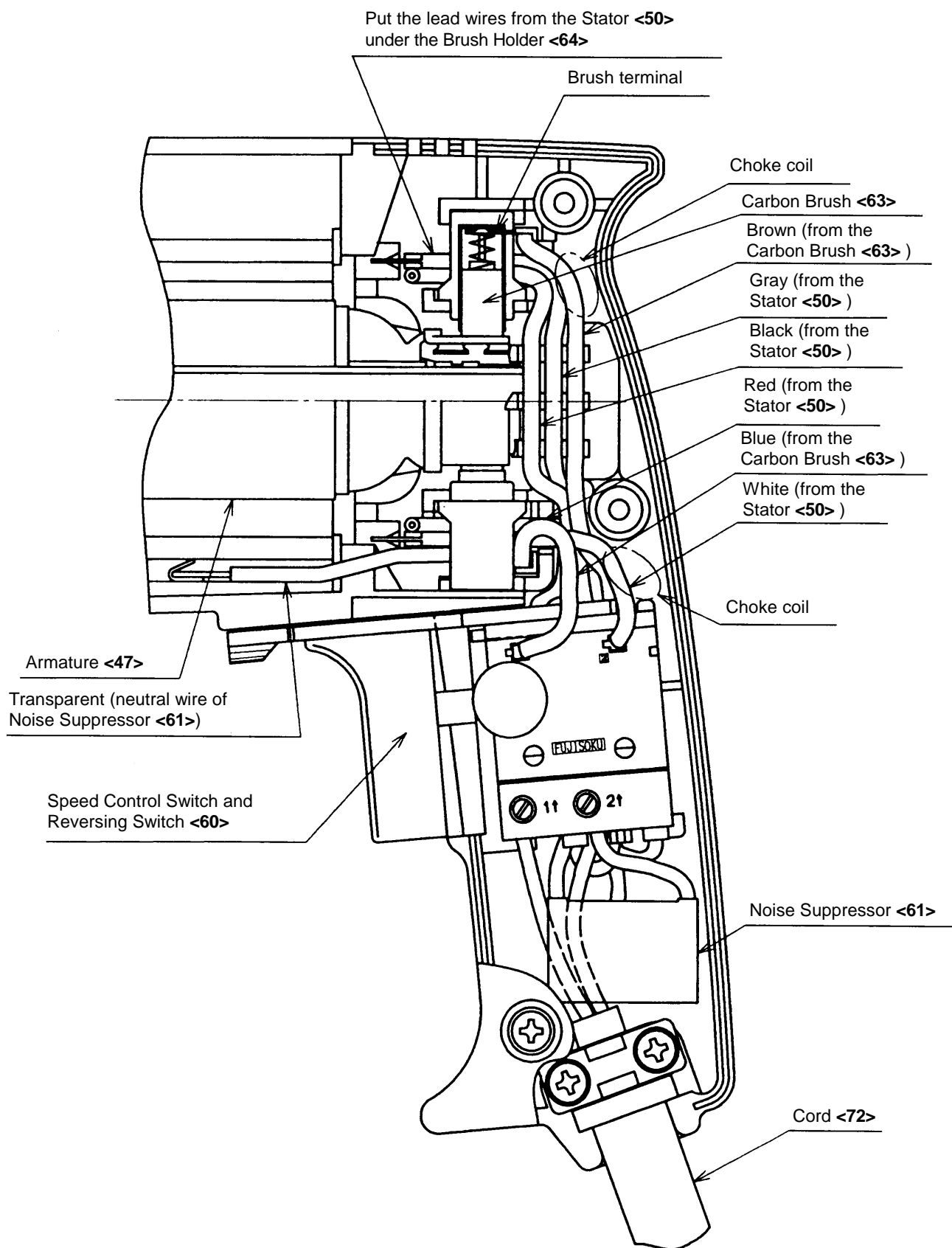


Fig. 18 Schematic diagram (Model DH 24 PA)



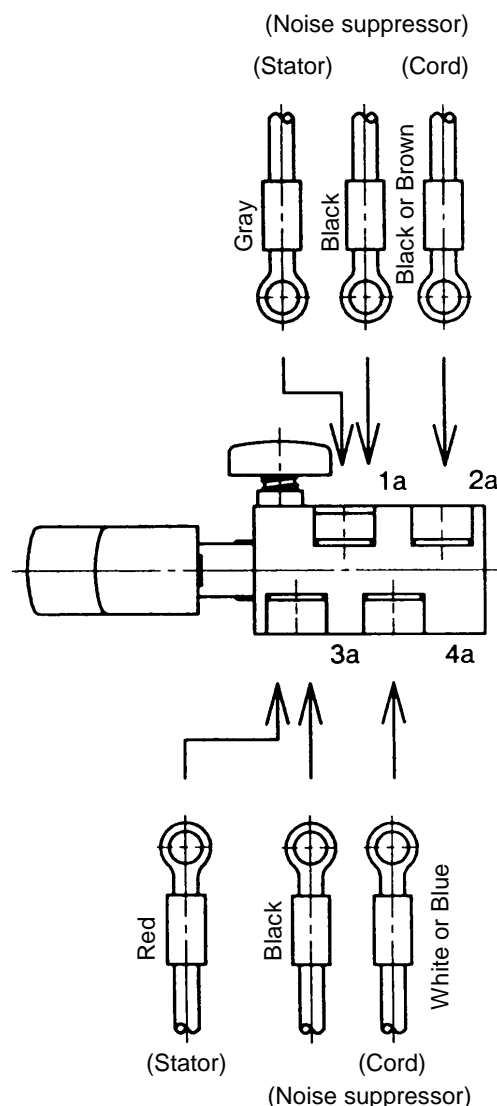
**Fig. 19 Schematic diagram (Model DH 24PB)**

## B. Additional Wiring Work

General internal wiring can be accomplished by referring to paragraphs 1-4 and 1-5. The following are special instructions for switch connection .

### (1) Wiring of ON-OFF switch (DH 24PA)

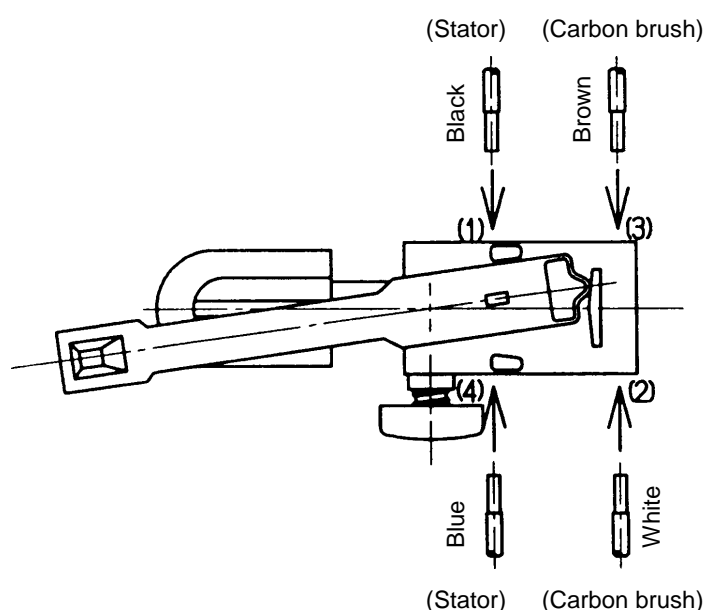
Fix the terminals coming from the cord to the terminal number 2a and 4a of the ON-OFF switch with the screws as shown in Fig. 20. Fix the terminal (gray) coming from the stator and the terminal (black) coming from the noise suppressor together to the terminal number 1a with the screw. Fix the terminal (red) coming from the stator and the terminal (black) coming from the noise suppressor together to the terminal number 3a with the screw in the same manner. Tightening torque of the screw is  $0.6 \pm 0.2$  N·m ( $6 \pm 2$  kgf-cm,  $5.2 \pm 1.7$  in-lbs) .



**Fig. 20 Wiring of ON-OFF switch (DH 24PA)**

### (2) Wiring of reversing switch (DH24PB)

Insert the lead wire (black) coming from the stator into the terminal (1) of the reversing switch, and the lead wire (white) into the terminal (2) as shown in Fig. 21. Insert the lead wire (brown) coming from the carbon brush into the terminal (3) and the lead wire (blue) into the terminal (4) . After the insertion, pull each lead wire slightly to check the lead wires do not come off. To disconnect the lead wires, insert a small slotted-head screwdriver into the windows near the terminals and pull out the lead wires.



**Fig. 21 Wiring of reversing switch (DH 24PB)**



(3) Wiring of speed control switch (DH24PB)

Insert each cord into the terminal 1 ↑ and terminal 2 ↑ of the speed control switch as shown in Fig. 22 and tighten the screw (tightening torque :  $0.6 \pm 0.2\text{N}\cdot\text{m}$  ( $6 \pm 2\text{kgf}\cdot\text{cm}$ ,  $5.2 \pm 1.7\text{ in}\cdot\text{lbs}$ )). Insert the lead wire (gray) coming from the stator into the terminal M1 and the lead wire (red) into the terminal M2. Insert each lead wire (black) coming from the noise suppressor into the terminal C1 and C2. After the insertion, pull each lead wire slightly to check the lead wires do not come off. To disconnect the lead wires, insert a small slotted-head screwdriver into the windows near the terminals and pull out the lead wires.

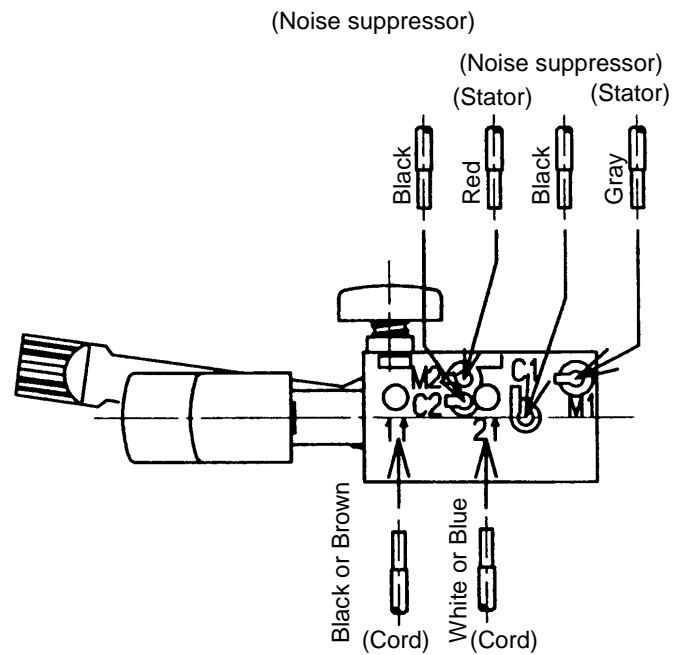


Fig. 22 Wiring of reversing switch (DH 24PB)

1-7. Insulation Tests

On completion of reassembly after repair, measure the insulation resistance and conduct the dielectric strength test.

Insulation resistance :  $7\text{M } \Omega$  or more with DC 500 V Megohm Tester

Dielectric strength : AC 4,000 V/1 minute, with no abnormalities 220 V - 240 V (and 110 V for U.K. products)  
AC 2,500 V/1 minute, with no abnormalities 110V-127 V (except U.K. products)

1-8. No-load Current Values

After no-load operation for 30 minutes, the no-load current value should be as follows.

Voltage (V)	110	115	120	127	220	230	240
Current (A) max.	3.0	3.0	2.7	2.7	1.9	1.9	1.8

## 2. STANDARD REPAIR TIME (UNIT) SCHEDULES

MODEL	Variable		10	20	30	40	50	60 min.
	Fixed							
<div>DH 24PA</div> <div>DH 24PB</div>		Work Flow						
		Switch Cord		Armature Ass'y Inner Cover O-Ring Ball Bearing (608DDM) Washer (A) x 2 Ball Bearing (608VVM)	Housing Stator			
		General Assembly						
		Change Lever		Front Cap Grip Oil Seal Steel Ball	Cylinder Steel Ball x 3 Second Gear Spring (A) Washer (A) Second Hammer O-Ring (B) O-Ring (FPM) Retaining Ring for D20 Retaining Ring for D30	Gear Cover Ball Bearing (6904CM) Retaining Ring for D37		
	Fixed Cost Switch 0 min. Cord 10 min. Other 20 min.			Striker O-Ring (A) Piston Piston Pin Washer (C)	Spring (B) Second Shaft Washer (B) Clutch Spring Clutch O-Ring (S8) Reciprocating Bearing First Gear Spacer Ball Bearing (626VVMC)			