



# MODEL DH 24PD

## 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.

### 1-1. Disassembly

(1) Disassembly of the Dust Collection Mechanism: Refer to Fig. 11 and Fig. 12.

Remove the four Tapping Screws D5 x 90 **[8]** which fix the Gear Cover **[7]**, insert the tip of a slotted-head screwdriver into the notch provided between Casing (B) **[37]** and the Gear Cover **[7]** (including the Inner Cover **[33]**), and turn the screwdriver gently to open a gap between them. Then, apply two slotted-head screwdrivers at diagonally opposite points (near the screw mounting holes) between the Inner Cover **[33]** and Casing (B) **[37]** and pry them gently apart so that the gap between them is enlarged evenly at both sides. When the gap is opened sufficiently, the dust collection mechanism, consisting of Casing (B) **[37]**, Casing (A) **[55]**, the Dust Shaft **[51]**, Dust Fan **[50]**, and related parts, can be separated from the Gear Cover **[7]** (including the Inner Cover **[33]**). Next, remove the three Tapping Screws D4 x 20 **[78]** and the Handle Cover **[79]**, take out the Carbon Brushes **[83]** (together with the Brush Holders **[84]**), hold Casing (A) **[55]**, and remove the Housing **[64]**. (The Armature **[57]** will either remain in the Housing **[64]** or come off together with Casing (A) **[55]**.) Then, after separating Casing (B) **[37]** from Casing (A) **[55]**, support Casing (A) **[55]** with an appropriate sleeve and press down on the spline-hole end of the Dust Shaft **[51]** with a hand press to remove the Dust Shaft **[51]** from Casing (A) **[55]**. The Ball Bearing 6001DDUCMPS2S **[53]** should remain in Casing (A) **[55]**, should it come off together with the Dust Shaft **[51]**, insert two slotted-head screwdrivers between the back surface of the Dust Fan **[50]** and the Ball Bearing 6001DDUCMPS2S **[53]**, and pry them gently and evenly apart to remove the Ball Bearing 6001DDUCMPS2S **[53]** from the Dust Shaft **[51]**.

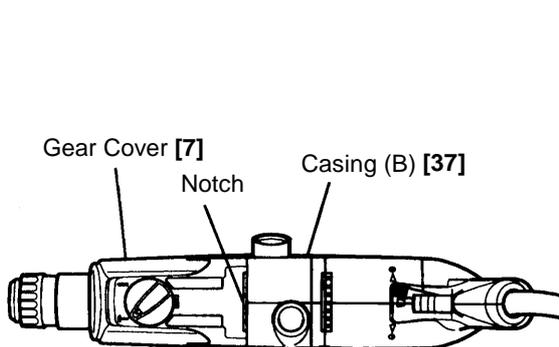


Fig. 11

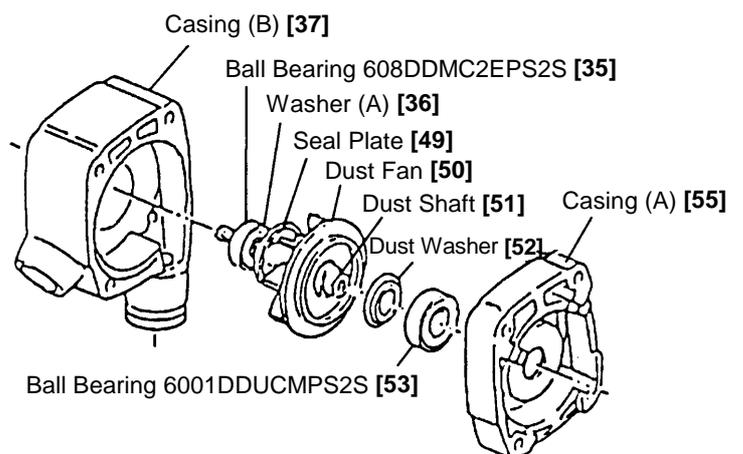


Fig. 12

## (2) Disassembly of the Dust Collection Adapter Ass'y

### ● Disassembly of the Hose Ass'y [74] Only

Loosen the knob that fixes the stopper, and push pipe (A) to its maximum stroke position. This will cause the Hose Ass'y [74] connection portion of pipe (A) to come out of the rear end of pipe (B). In that state, pull on the Hose Ass'y [74] to separate it from pipe (A).

### ● Disassembly of the Dust Collection Adapter Ass'y (Refer to Fig. 13.)

Disassemble the Rubber Cap [70] and the Nozzle Seal [69] from the nozzle portion, and remove the screw that fastens nozzle (A) and nozzle (B). While pressing the claw head of nozzle (B) in the direction indicated by arrow 'A' in Fig. 13, insert the tip of a thin slotted-head screwdriver between the surfaces in front of the claw-connected portion and pry up gently to disengage the claw so that nozzle (A) and nozzle (B) can be removed from pipe (A). Next, take the stopper off from pipe (A), and remove the o-ring from the tail cap side so that the tail cap can be removed from pipe (B). Pipe (A) can then be taken out from pipe (B) by enlarging its split section after removing the retaining wing bolt.

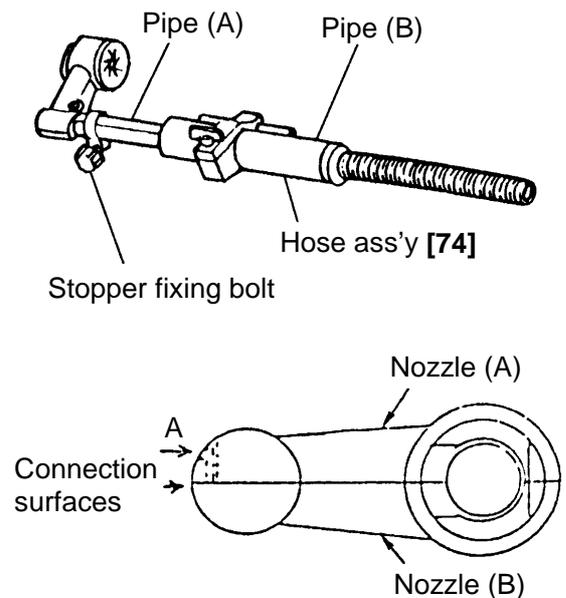


Fig. 13

## (3) Disassembly of the Striking Mechanism Section

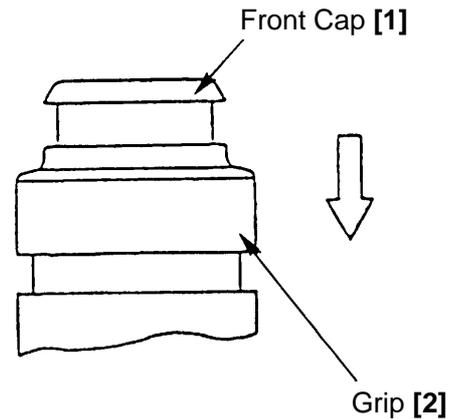
With a drill bit or screwdriver tip, push in the Second Hammer [25] to release the Striker [28] from the O-Ring FPM810 [27]. Set the Change Lever [13] to a position halfway between the "Drill" and "Hammer" marks on the Gear Cover [7], insert a small slotted-head screwdriver into the concave position located on the rear end of the Change Lever [13], and pull it off. (It is very important to ensure that the Change Lever [13] is positioned halfway between the "Drill" and "Hammer" marks when it is disassembled or assembled.) Loosen the four Tapping Screws D5 x 90 [8], and remove the Gear Cover [7]. For directions on how to remove the Gear Cover [7], please refer to paragraph (1) Disassembly of the Dust Collection Mechanism.

Remove Spring (B) [38] from the end of the Second Shaft [39] and turn the Second Shaft [39] so that the Piston [30] moves to its maximum upper position (inner cover side). The arm of the Reciprocating Bearing [44] can then be disconnected from the Piston Pin [31], and the Second Shaft [39] and the components mounted on it can be removed from the Inner Cover [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 [45] from the Second Shaft [39]. Then take off the Reciprocating Bearing [44]. At this time, carefully note that the First Gear [45] must be aligned with and press-fitted onto the 9 mm diameter end of the Second Shaft [39]. Move the Clutch [42] to the pinion side of the Second Shaft [39], and pull off the O-Ring S-8 [43]. The Clutch Spring [41] and Washer (B) [40] can then be removed from the Second Shaft [39].

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

As shown in Fig. 14, slide the Grip [2] in the direction indicated by the arrow mark, and remove the Front Cap [1]. The Grip [2], Ball Holder [3] inside the Grip [2], Holder Spring [4], Washer (B) [5] and Steel Ball [18] can then be removed from the Cylinder [20].



**Fig. 14**

#### (5) Disassembly of the Cylinder, Second Gear (Slip Mechanism Section) and Related Parts

- Take the Inner Cover [33], off from the Gear Cover [7], and remove the entire chuck section.

Extract the Retaining Ring for D20 Shaft [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] upright and use a hand press to extract the Cylinder [20] from the Gear Cover [7]. The Sleeve [15] can then be extracted from the Cylinder [20]. At this time, be very careful not to lose the three Steel Balls [19].

Remove the Retaining Ring for D30 Shaft [24] from the upper part of the Cylinder [20]. The Second Gear [21], Spring (A) [22], and Washer (A) [23] can then be removed from the Cylinder [20]. Then, extract the O-Ring [27] from the inner part of the Cylinder [20], and the Second Hammer [25] can be extracted from the Cylinder [20]. (For easy extraction of this O-Ring [27], fit a Special Repair Tool J-201 Spring Hook [Code No. 970977] onto the outer circumference of the O-Ring [27], and pull it out. See Fig. 17.)

As the O-Ring [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], turn the Gear Cover [7] so that its tip portion is upward, and use a hand press to extract the Ball Bearing [16] from the Gear Cover [7]. Next, turn the Gear Cover [7] and use the hand press to extract the Oil Seal [14] from the Gear Cover [7]. Ensure that the Oil Seal [14] is replaced with a new one whenever it is disassembled.

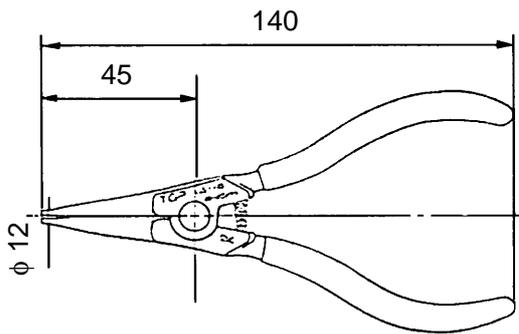
● Use of Special Repair Tool

- Snap Ring Pliers [J-200]: (See Fig. 15.)

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

- Spring Hook [J-201]: (See Fig. 16.)

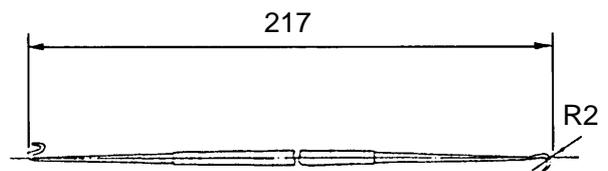
Used to extract the O-Ring [27] inserted at the inner part of the Cylinder [20] which is designed to catch and grip the Striker [28] to prevent idle striking. As shown in Fig. 17, fit the Spring Hook [J-201] onto the O-Ring [27] from its outer circumference, and pull it out.



(1) Snap Ring Pliers [J-200]

Code No. 970976

Fig. 15



(2) Spring Hook [J-201]

Code No. 970977

Fig. 16

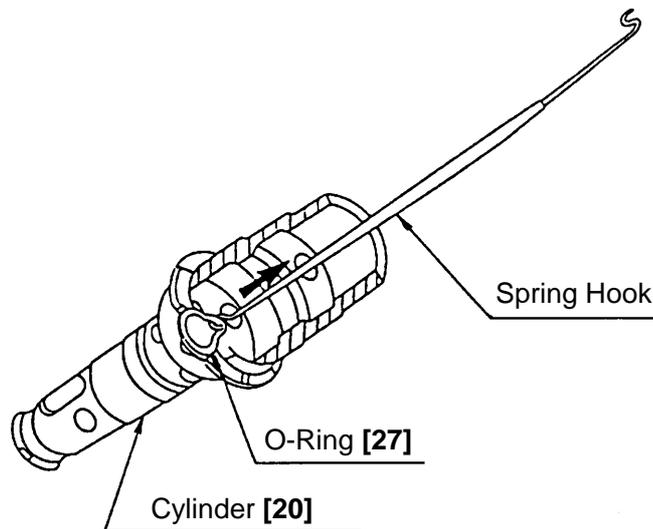


Fig. 17

## 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], [18],[19].
- (2) When assembling Housing [64], Casing (A) [55], Casing (B) [37] and Gear Cover [7], at first perform the assembling of dust collection mechanism ass'y [35], [36], [49] - [55] and the armature section ([56], [57], [36], [63]) as illustrated below. Then, reassemble the Housing [64], the Casing (B) [37] and the Gear Cover [7].  
This procedure will significantly facilitate reassembly.
- (3) When mounting the Nozzle Seal [69], ensure without fail that the section marked 'A' is properly aligned with and fitted into the groove on the nozzle, as indicated in Fig. 18.

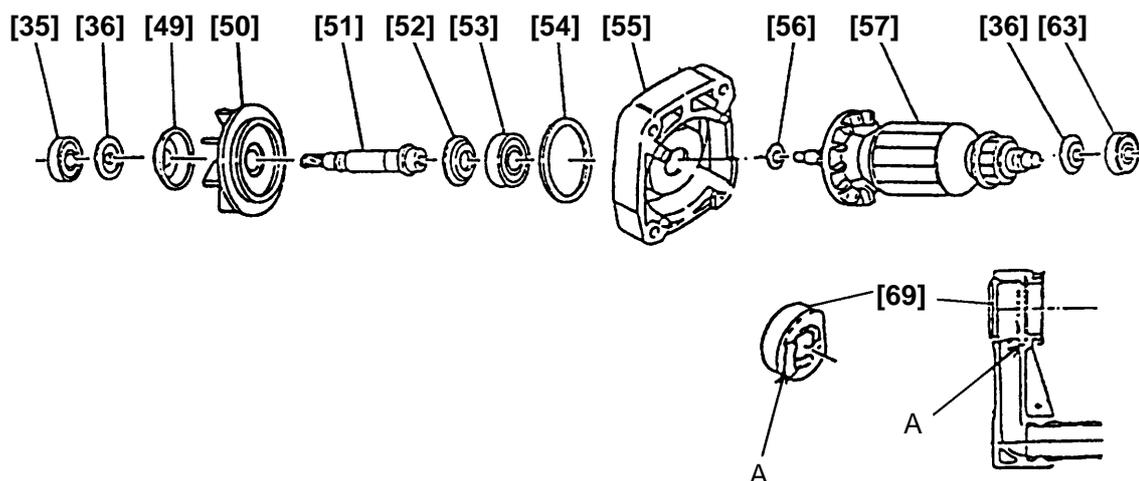


Fig. 18

### (4) Reassembly of the Change Lever [13]

With a slotted-head screwdriver or similar tool, move the Clutch [42] and Reciprocating Bearing [44] so that the claw (protruding portion) of the Reciprocating Bearing [44] and the claw (protruding portion) of the Clutch [42] are in contact. After inserting the Spring [H] [10] and Steel Ball [11] into the recessed portion of the Gear Cover [7], apply grease to the pin portion of the Change Lever [13], and then forcefully push the Change Lever [13] into the Gear Cover [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 change lever.

### (5) Reassembly of the Oil Seal [14]

Prior to reassembly, apply grease to the inner circumference of the Oil Seal [14]. However, do not apply grease to its outer circumference. Also, when press-fitting the Oil Seal [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], and Piston [30], O-Ring (A) [29] mounted on the Striker [28], the Reciprocating Bearing [44], the reciprocating bearing mounting portion of the Second Shaft [39], the O-Ring FPM810 [27] and the clutch-claw portions of the Cylinder [20], the inner circumference of the metal inside the Inner Cover [33], the grooves of Clutch [42] and the spline portion of the Armature [57]. Also, without fail, insert 70 g (0.15lbs.) of special grease inside the Gear Cover [7].

### 1-4. Tightening Torques

D4 Tapping Screws [78], [89]	$2.0 \pm 0.5 \text{ N}\cdot\text{m}$ ( $20 \pm 5 \text{ kgf}\cdot\text{cm}$ , $17.4 \pm 4.3 \text{ in}\cdot\text{lbs}$ )
D5 Tapping Screws [8]	$2.9 \pm 0.5 \text{ N}\cdot\text{m}$ ( $30 \pm 5 \text{ kgf}\cdot\text{cm}$ , $26.0 \pm 4.3 \text{ in}\cdot\text{lbs}$ )

### 1-5. Wiring Diagrams

(1) Products with Noise Suppressor

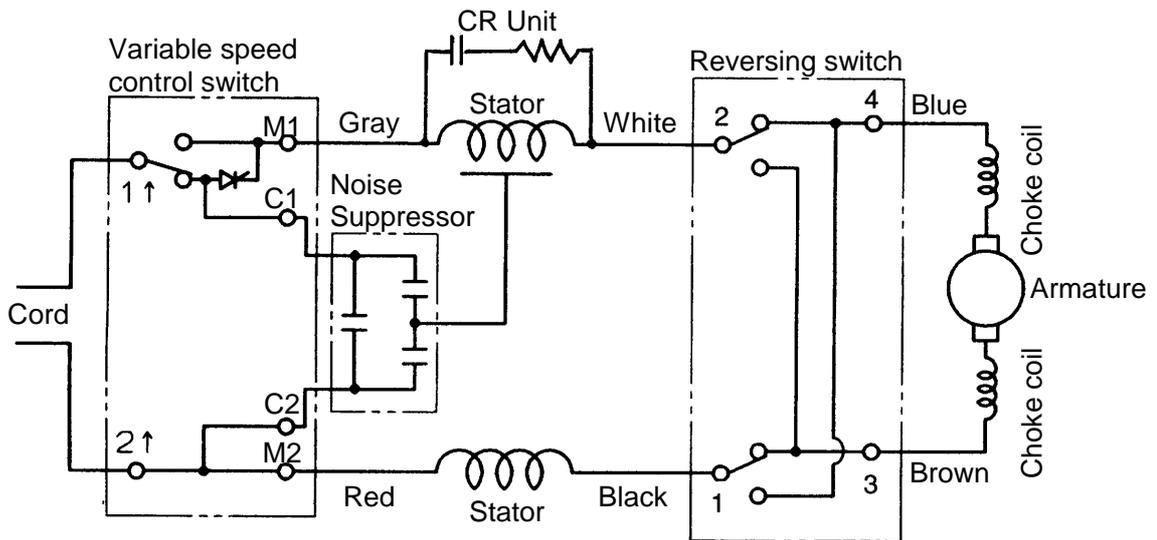


Fig. 19

(2) Products without Noise Suppressor

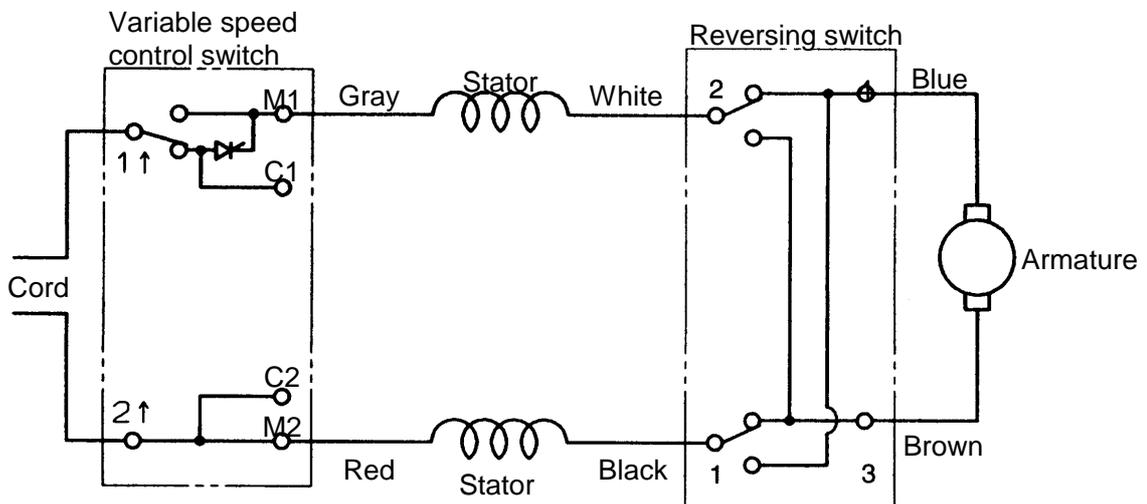


Fig. 20

## 1-6. Internal Wire Arrangement and Wiring Work

### A. Internal Wire Arrangement

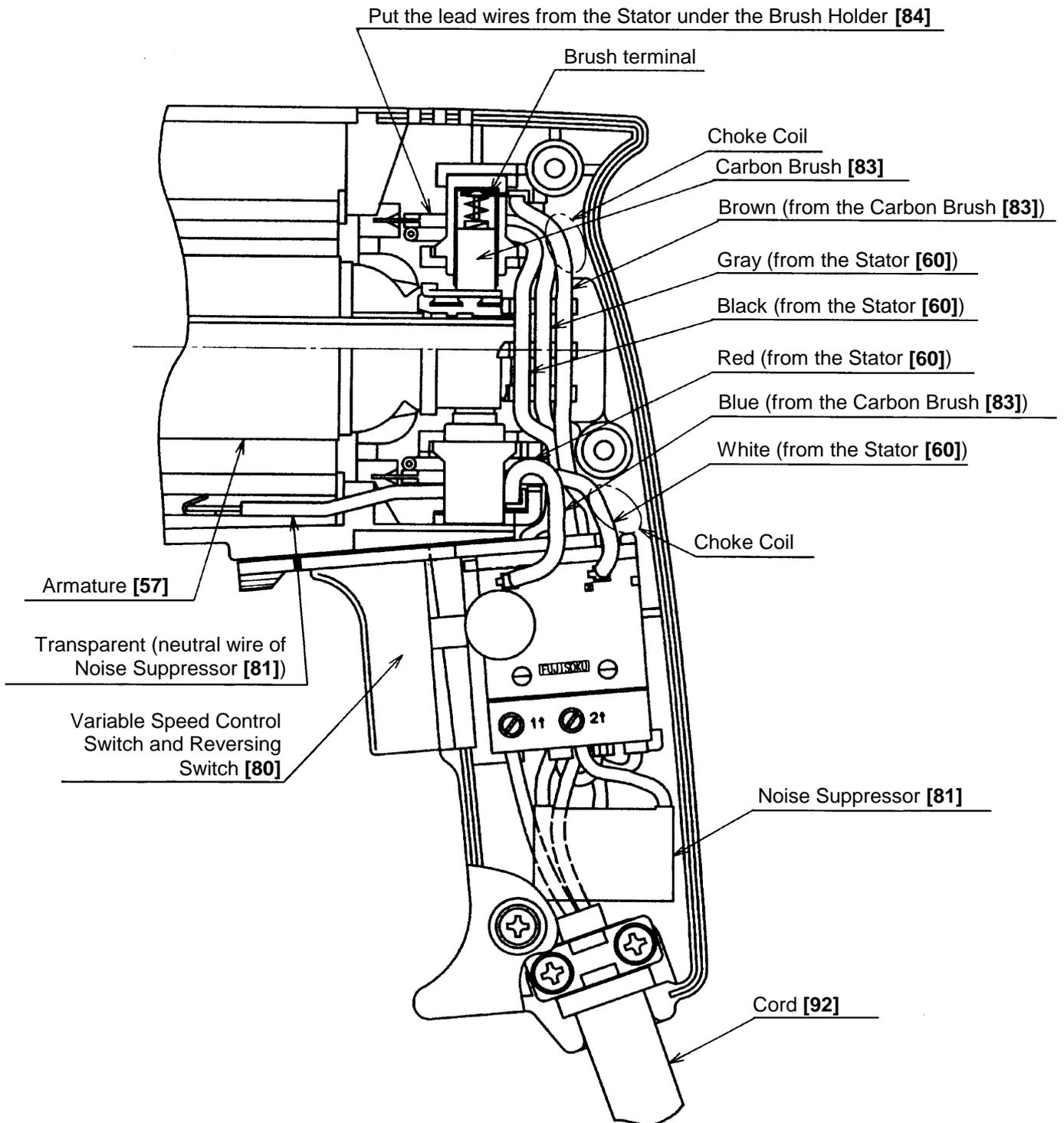


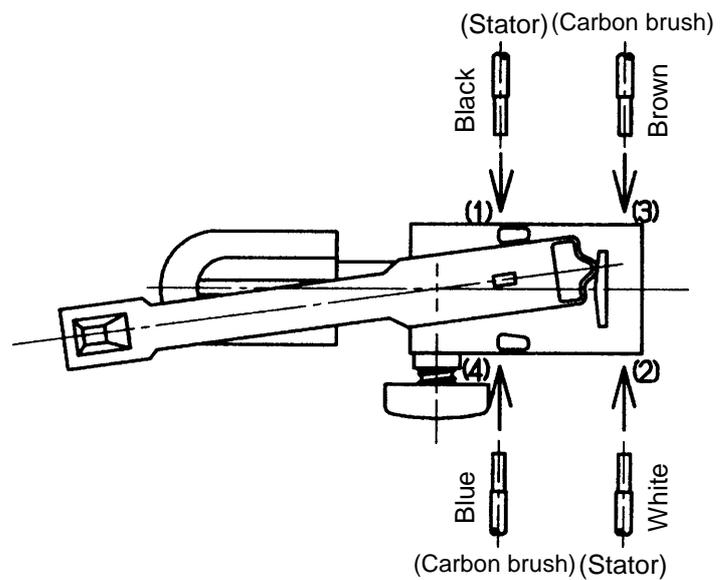
Fig. 21 Schematic diagram

## B. Additional Wiring Work

General internal wiring can be accomplished by referring to paragraph 1-5 and 1-6. The following are special instructions for switch connection.

### (1) Wiring of reversing switch

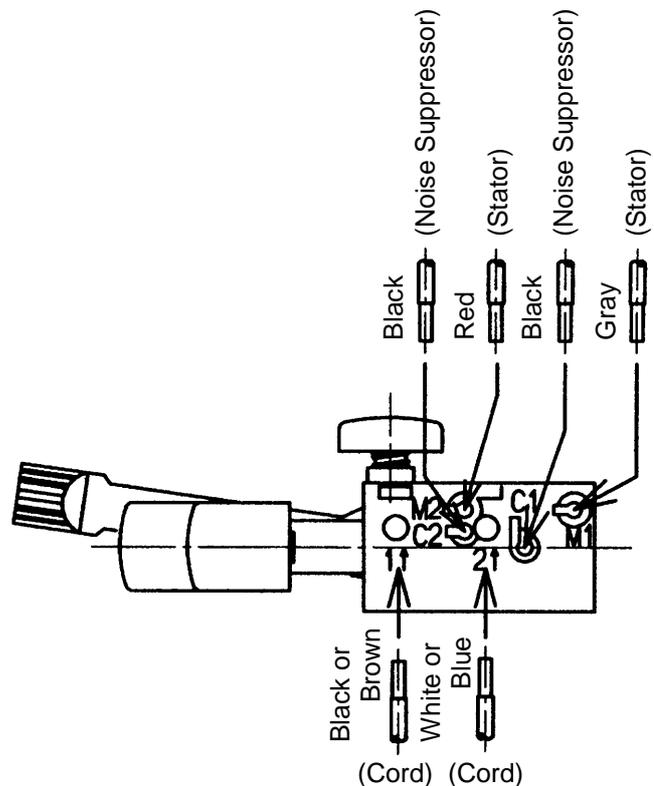
Insert the lead wire (black) coming from the stator into the terminal (1) of the reversing switch, and the lead wire (white) into the terminal (2) as shown in Fig. 22. Insert the lead wire (brown) coming from the carbon brush into the terminal (3) and the lead wire (blue) into the terminal (4). After the insertion, pull each lead wire slightly to check that the lead wires do not come off. To disconnect the lead wires, insert a small slotted-head screwdriver into the windows near the lead wires and pull out the lead wires.



**Fig. 22 Connection of reversing switch**

### (2) Wiring of variable speed control switch

Insert each cord into the terminal 1 ↑ and terminal 2 ↑ of the variable speed control switch as shown in Fig. 23 and tighten the screw (tightening torque:  $0.6 \pm 0.2$  N·m ( $6 \pm 2$  Kgf·cm,  $5.2 \pm 1.7$  in·lbs)). Insert the lead wire (gray) coming from the Stator [60] into the terminal M1 and the lead wire (red) into the terminal M2. Insert each lead wire (black) coming from the Noise Suppressor [81] into the terminal C1 and C2. After the insertion, pull each lead wire slightly to check that the lead wires do not come off. To disconnect the lead wires, insert a small slotted-head screwdriver into the window near the lead wires and pull out the lead wires.



**Fig. 23 Connection of variable speed control switch**

**1-7. Insulation Teats**

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

Insulation resistance : 7 MΩ or more with DC 500 V Megohm Tester

Dielectric strength : AC 4,000V/1 minute, with no abnormalities 220 V - 240 V  
(and 110V for U.K. products)  
AC 2,500V/1 minute, with no abnormalities 110 V - 127 V  
(except for 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							
DH 22PD		Work Flow						
			Switch 100V Cord 100V	Armature Ass'y Rubber Sleeve Ball Ball Bearing (608VVMC)	Inner Cover O-Ring (P-22) Ball Bearing (608DDMC) Casing (B) Seal Plate Dust Fan Dust Shaft Ball Bearing (6001DDUCM) Casing (A)	Housing Stator		
	General Assembly	Change Lever O-Ring (S-30)	Front Cap Grip Oil Seal Steel Ball	Retaining Ring (2 pcs.) Cylinder Steel Ball (3 pcs.) Second Gear Spring (A) Second Hammer O-Ring (B) O-Ring (FPM)	Striker O-ring (A) Piston Piston Pin Washer (C)	Gear Cover Ball Bearing (6904DD) Retaining Ring		
	Fixed Cost							
	Switch	0 min						
	Cord	10 min						
	Others	20 min						