MODEL DH 24PC

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 Striking Mechanism Section

- Push the Second Hammer **[28]** in the main body with a drill bit or screwdriver to release the striker from the O-Ring **[30]**.
- Pressing the Pushing Button **[17]**, move the Change Lever **[15]** to the "striking only" mode (T mark). (Be sure to keep pressing the Pushing Button **[17]** when operating the Change Lever **[15]**.)
- Loosen the four Tapping Screws D5 x 35 **[10]**, and remove the Gear Cover **[9]**. The Inner Cover **[36]** and the Housing **[57]** are loosely fitted together. Attempting to pull them out first could cause the Armature Ass'y **[50]** to be pulled out at the same time, causing damage to the Carbon Brushes **[66]**.
- Remove Springs (B) **[11]** from the rails in the Gear Cover **[9]** as shown in Fig. 1.
- Pull out the Second Pinion **[39]**, the Clutch Spring **[40]**, the Clutch **[41]**, and the Lock Plate **[38]** (these parts are sandwiched by means of the Lock Plate **[38]** as a unit as shown in Fig. 2) from the end of the second shaft of the Gear. Shaft Set **[42]**. Turn the Reciprocating Bearing **[44]** so that the Piston **[33]** is moved to its maximum upper position (inner cover side). The arm of the Reciprocating Bearing **[44]** can then be disconnected from the Piston Pin **[34]**, and the Gear. Shaft Set **[42]** and the components mounted on the second shaft can be removed from the Inner Cover **[36]** as a unit.
- Remove the first gear of the Gear. Shaft Set **[42]** from the second shaft with a bearing puller (special repair tool J-30 bearing puller ass'y, Code No. 970804, is recommended). Then take off the Reciprocating Bearing **[44]**. At this time, take care not to damage the end surface of the second shaft because the first gear is press-fitted in alignment with the 9 mm diameter end surface of the second shaft.

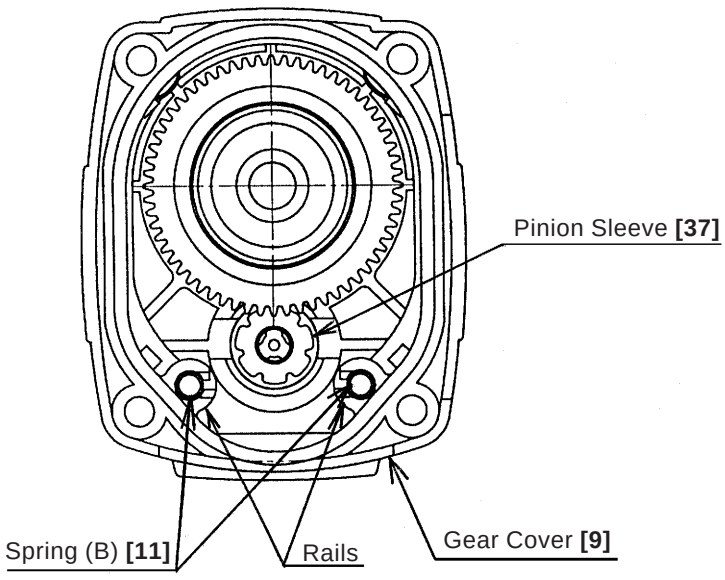


Fig. 1

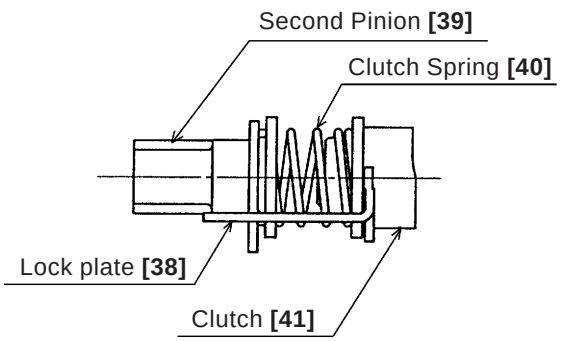


Fig. 2

(2) Disassembly of the Change Lever

• As shown in Fig. 3, pressing the Pushing Button **[17]** hard, turn the Change Lever **[15]** 45° counterclockwise from the "striking only" position (T mark). Pry out the Change Lever **[15]** at this position.

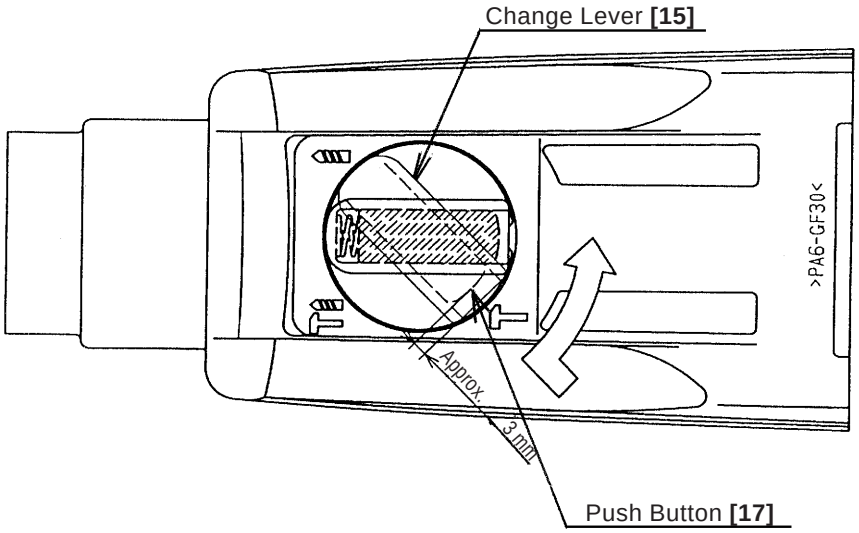


Fig. 3

(3) Disassembly of the Chuck Section

As shown in Fig. 4, slide the Grip **[2]** in the direction indicated by the arrow, and remove the Front Cap **[1]**. The Grip **[2]**, the Ball Holder **[3]** inside the Grip, the Holder Spring **[4]**, Washer (B) **[5]** and the Steel Ball **[21]** can then be removed from the Cylinder **[23]**.

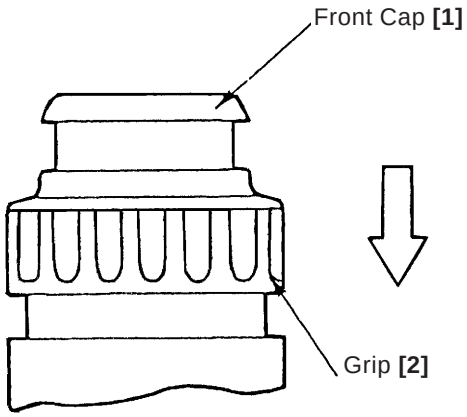


Fig. 4

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

• Take the Inner Cover **[36]** off of the Gear Cover **[9]**, 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 **[9]**, upright and use a hand press to extract the Cylinder **[23]** from the Gear Cover **[9]**. The Sleeve **[18]** can then be extracted from the Cylinder **[23]**. At this time, be very careful not to lose the three Steel Balls **[22]**. Remove the Retaining Ring D30 **[27]** from the upper part of the Cylinder **[23]**. The second Gear **[24]**, Spring (A) **[25]** and Washer (A) **[26]** can then be removed from the Cylinder **[23]**. Next, extract the O-Ring **[30]** from the inner part of the Cylinder **[23]**, and the Second Hammer **[28]** can be extracted from the Cylinder **[23]**. (For easy extraction of this O-Ring **[30]**, fit a special repair tool J-201 spring hook [Code No. 970977] onto the outer circumference of the O-Ring **[30]**, and pull it out.) As the O-Ring **[30]** 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 **[20]**, turn the Gear Cover **[9]** so that its tip portion is upward, and extract the Ball Bearing **[19]** from the Gear Cover with a hand press. Pinch the bend of the Retaining Ring **[7]** with a pair of long-nose pliers in the arrow direction shown in Fig. 5. Catch the loosened Retaining Ring **[7]** with the spring hook H-75 [J-201] and pull it out.

• Turn the Gear Cover **[9]** over and extract the Oil Seal **[8]** from the Gear Cover **[9]** with a hand press. Ensure that the Retaining Ring **[7]** and the Oil Seal **[8]** are replaced with new ones whenever they are disassembled.

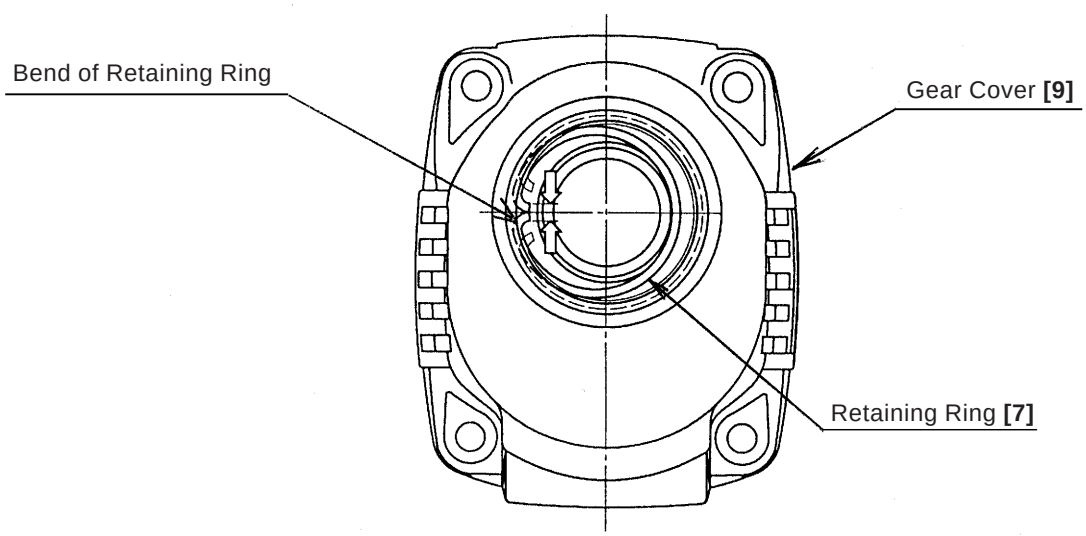


Fig. 5

• Pinch the Pinion Sleeve **[37]** with the pinion sleeve puller (J-302) and fix the pinion sleeve puller to a vise. Pull the Gear Cover **[9]** to remove the Pinion Sleeve **[37]** from the Gear Cover (Fig. 6).

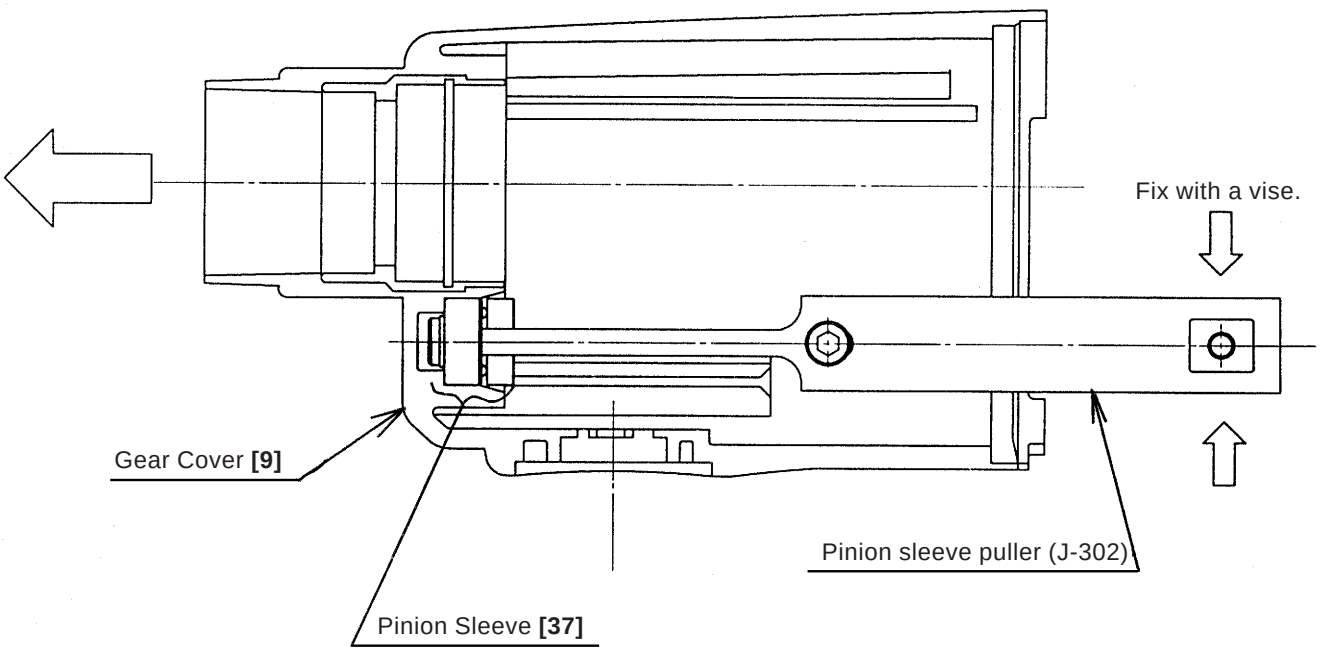


Fig. 6

• Use of special repair tools

• Snap ring pliers [J-200] (See Fig. 7.)

Used to remove the Retaining Ring for D20 Shaft **[6]** which fixes Cylinder **[23]** at the tip end of the Gear Cover **[9]**.

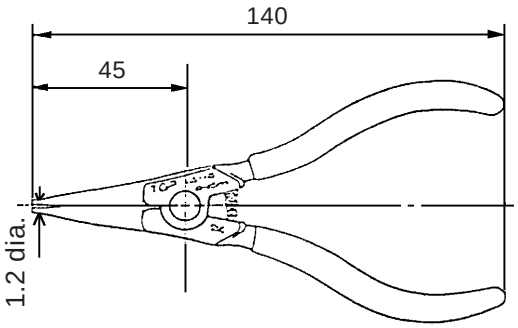
• Spring hook [J-201] (See Fig. 8.)

Used to extract the O-Ring **[30]** inserted at the inner part of the Cylinder **[23]** which is designed to catch and grip the striker to prevent idle hammering. As shown in Fig. 10, fit the spring hook [J-201] onto the O-ring from its outer circumference, and pull it out.

Used to remove the Retaining Ring from the tip end of the Gear Cover. See "1-1. Disassembly - (4)".

• Pinion sleeve puller [J-302] (See Fig. 9.)

Used to remove the Pinion Sleeve **[37]** which is press-fitted at the inner part of the Gear Cover **[9]**. Adjust with the adjuster turning so that the claws of the pinion sleeve puller are caught in the groove of the Pinion Sleeve **[37]** as shown in Fig. 11.

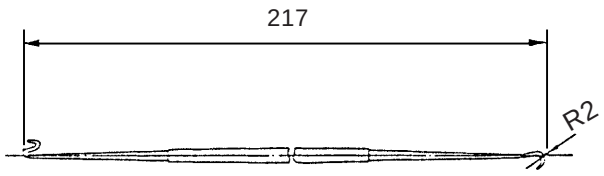


(1) Snap ring pliers [J-200]

Code No. 970976

Fig. 7

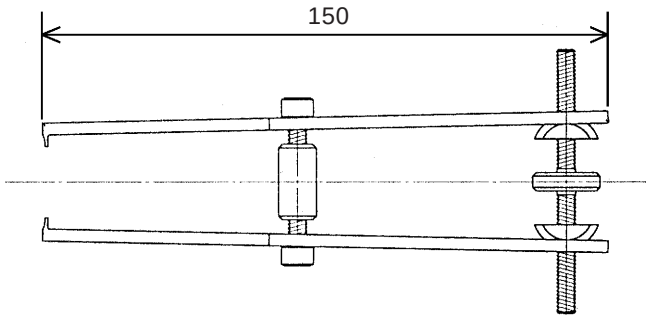
All dimensions in millimeters



(2) Spring hook [J-201]

Code No. 970977

Fig. 8



(3) Pinion sleeve puller [J-302]

Fig. 9

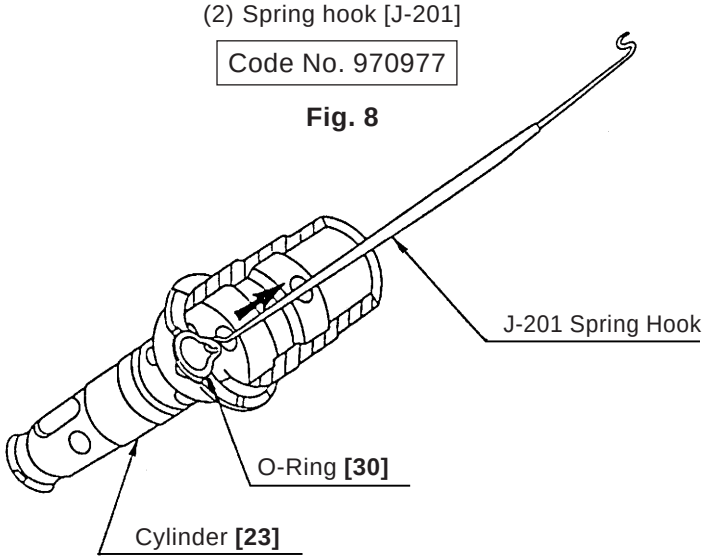


Fig. 10

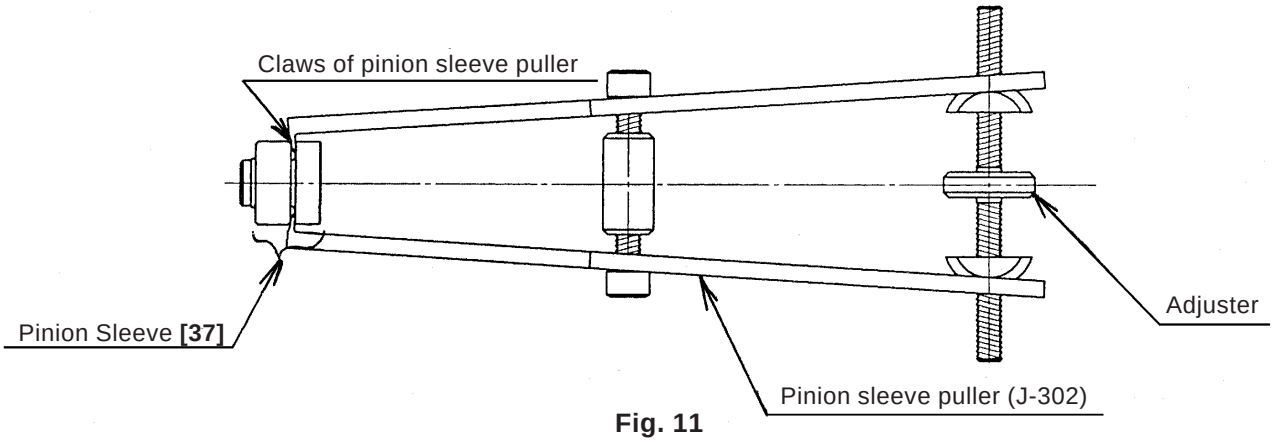


Fig. 11

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 the Steel Balls **[21]**, **[22]** with grease.

(2) Reassembly of the Change Lever **[15]**

Press the Pushing Button **[17]** deeply into the hole of the Change Lever **[15]**. Adjust the Change Lever **[15]** to the position shown in Fig. 12 of the Gear Cover **[9]** and press it hard. Then move the Change Lever to the "striking only" position (T mark).

- If the Change Lever is stiff, apply grease No. 29 (Code No. 930035, is recommended) to the O-ring and claws of the Change Lever.

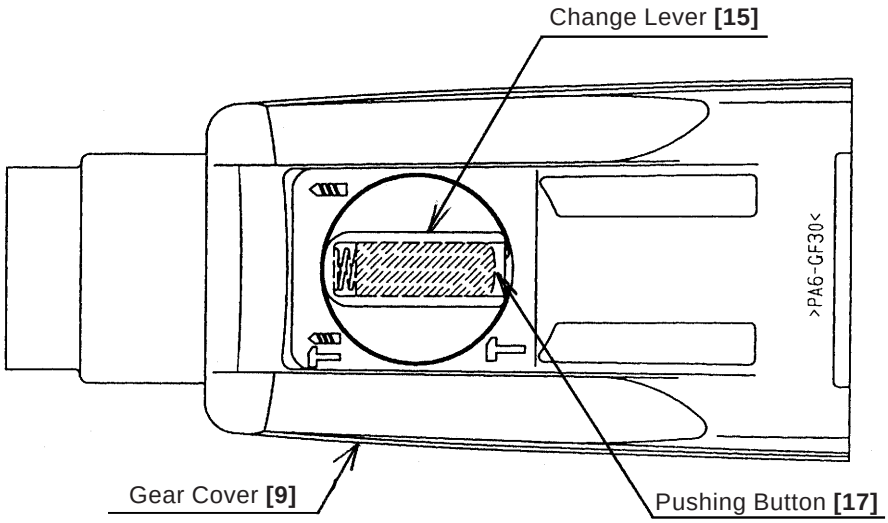


Fig. 12

(3) Reassembly of the First Gear

Press-fit the first gear of the Gear Shaft Set **[42]** aligning it with the 9 mm diameter end surface of the second shaft of the Gear Shaft Set **[42]**. After press-fitting the first gear on the second shaft, check that the inner ring of the Reciprocating Bearing **[44]** turns smoothly.

(4) Reassembly of the Oil Seal **[8]**

Prior to reassembly, apply grease to the inner circumference of the Oil Seal **[8]**. However, do not apply grease to its outer circumference. Also, when press-fitting the Oil Seal **[8]**, ensure that it is straight and level. After mounting the Oil Seal **[8]**, mount the Retaining Ring **[7]** to prevent the Oil Seal **[8]** from coming off.

(5) Reassembly of the Gear Cover **[9]**

After reassembly as shown in Fig. 13, ensure that the Change Lever **[15]** is adjusted to the "striking only" position. Engage the claws of the Clutch **[41]** and the Reciprocating Bearing **[44]** each other. Align the wing portion of the Lock Plate **[38]** horizontally and reinstall the Gear Cover **[9]** so that the wing portion of the Lock Plate is contained in the rail inside of the Gear Cover. When the second shaft contacts the Pinion Sleeve **[37]** inside the Gear Cover, move the Change Lever **[15]** to the "rotation and striking" mode and rotate the grip. Then the second shaft and the Pinion Sleeve **[37]** are engaged and the end surface of the Gear Cover **[9]** contacts that of the Housing **[57]**. At this time, rotate the grip to check that the rotation of the Cylinder **[23]** is transmitted to the armature shaft.

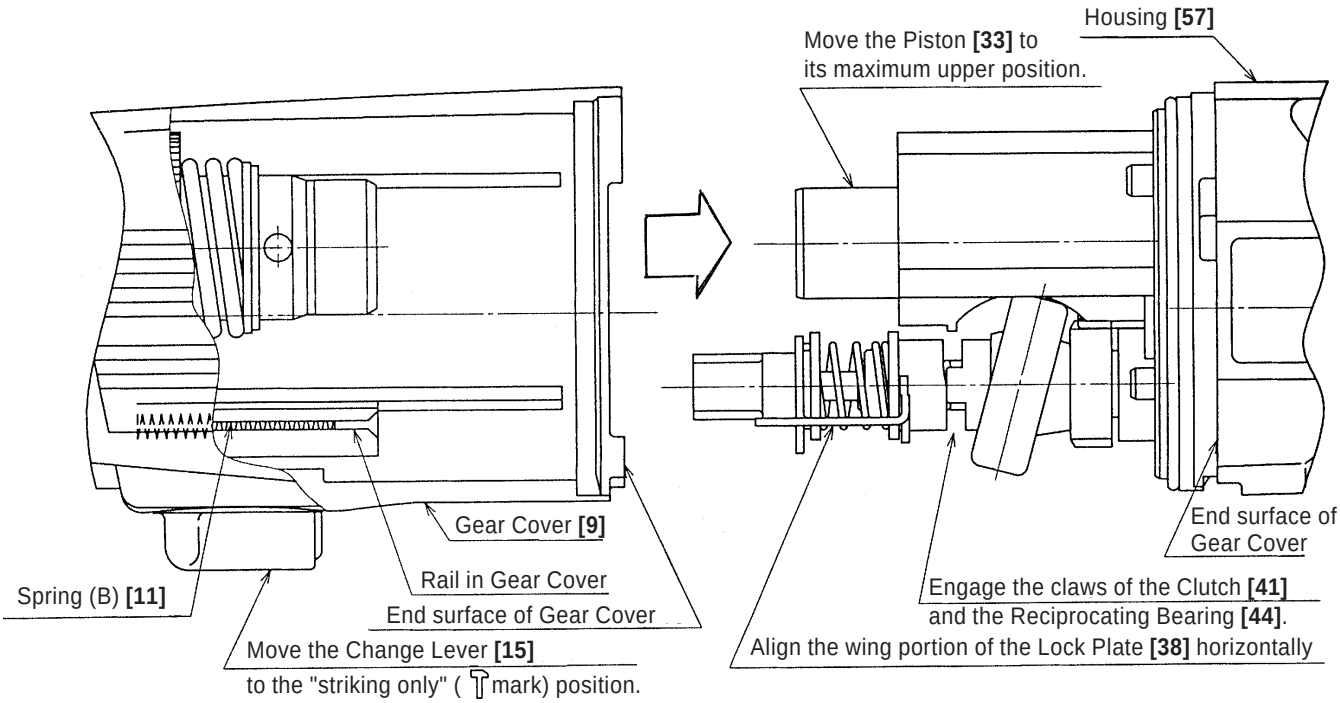


Fig. 13

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 **[34]**, and the Piston **[33]**, O-Ring (A) **[32]** mounted on the Striker **[31]**, O-Ring (B) **[29]** mounted on the Second Hammer **[28]**, the Reciprocating Bearing **[44]**, the Reciprocating Bearing **[44]** mounting portion and the Second Pinion **[39]** mounting portion of the second shaft of the Gear. Shaft Set **[42]**, the O-Ring **[30]** and the clutch-claw portions of the Cylinder **[23]**, the end surfaces of the Clutch Spring **[40]**, the inner circumferences of the metal inside the Inner Cover **[36]**, the inner circumference of the Oil Seal **[8]** and the flange of the Clutch **[41]**. Also, without fail, insert 55g (1.94 oz) of special grease inside the Gear Cover **[9]**.

1-4. Tightening Torque

M4 Tapping Screws **[61]**, **[72]** ····· 2.0 ± 0.5 N·m (20 ± 5 kgf·cm, 17.4 ± 4.3 in-lbs)

M5 Tapping Screws **[10]** ····· 2.9 ± 0.5 N·m (30 ± 5 kgf·cm, 26.0 ± 4.3 in-lbs)

1-5. Wiring Diagrams

(1) Products with noise suppressor

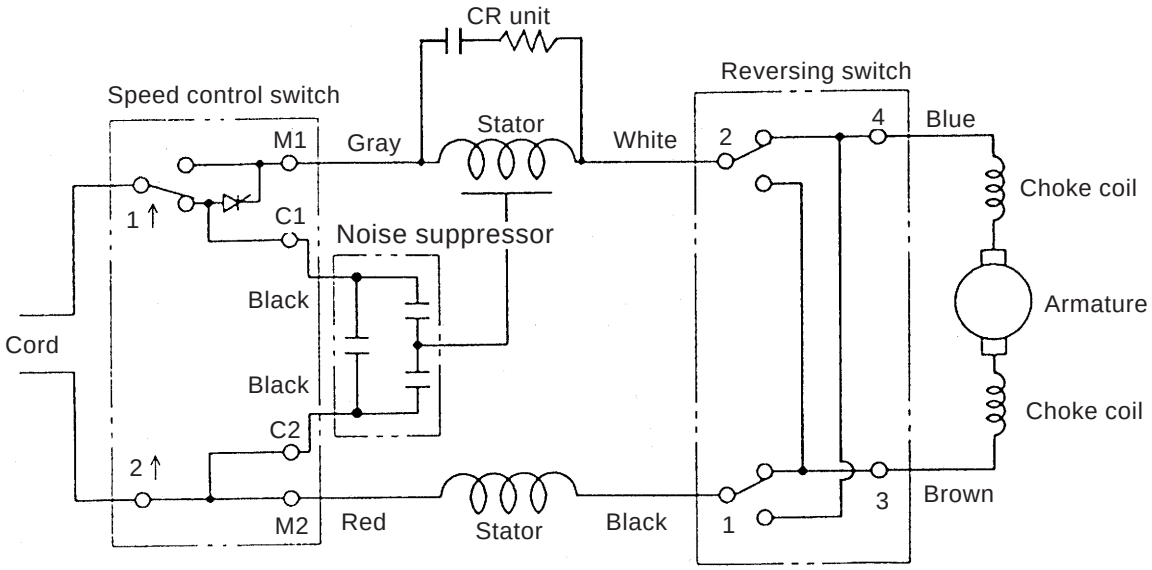


Fig. 14

(2) Products without noise suppressor

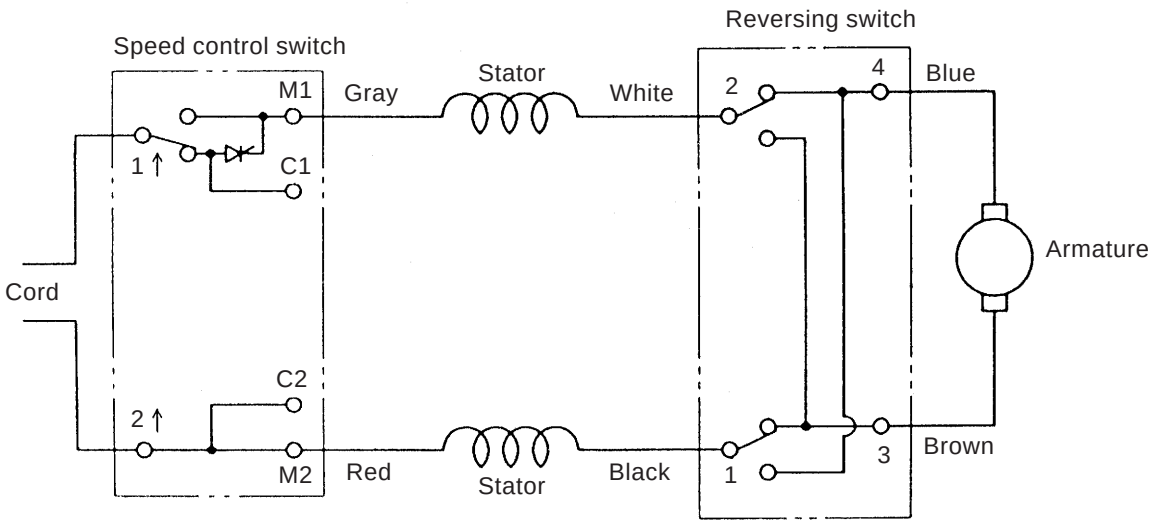


Fig. 15

1-6. Internal Wire Arrangement and Wiring Work

A. Internal Wire Arrangement

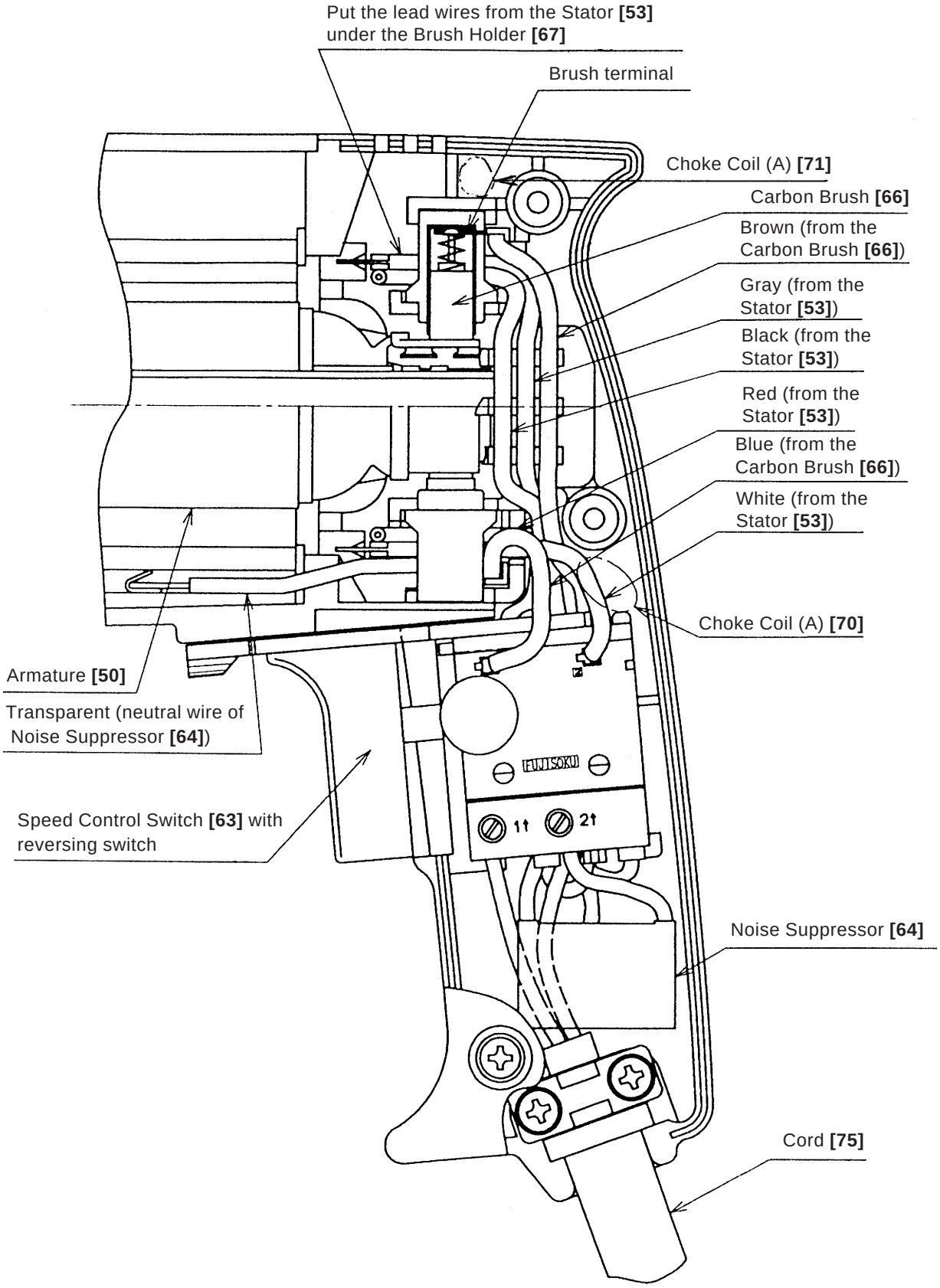


Fig. 16 Schematic diagram

B. Additional Wiring Work

General internal wiring can be accomplished by referring to paragraph 1-5 and 1-6-A. The followings 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. 17. Insert the lead wire (brown) coming from the carbon brush into the terminal (3) and the lead wire (blue) into the terminal (4). After insertion, pull each lead wire slightly to check that the lead wires do not come off. To disconnect the lead wires, insert a small flatblade screwdriver into the slots near the terminals and pull out the lead wires.

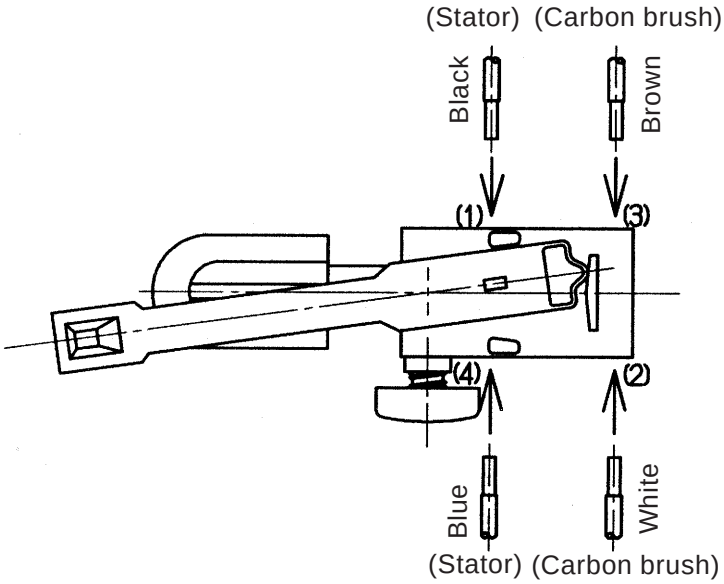


Fig. 17 Wiring of reversing switch

(2) Wiring of variable speed control switch

Insert each cord into the terminal 1↑ and terminal 2↑ of the speed control switch as shown in Fig. 18 and tighten the screw [tightening torque: 0.6 ± 0.2 N·m (6 ± 2 kgf·cm, 5.2 ± 1.7 in-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 insertion, pull each lead wire slightly to check the lead wires do not come off. To disconnect the lead wires, insert a small flatblade screwdriver into the slots near the terminals and pull out the lead wires.

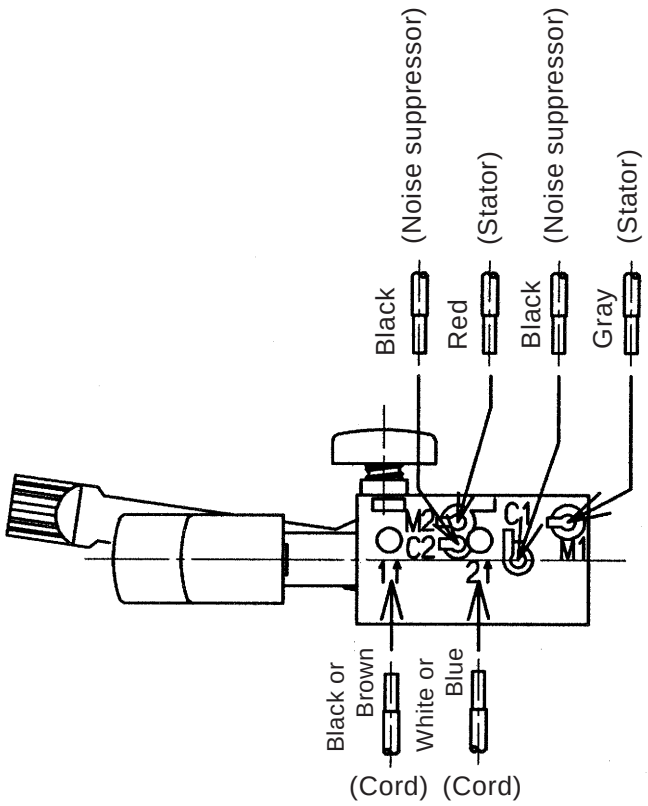


Fig. 18 Wiring of speed control switch

1-7. Insulation Tests

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 4,000 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 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 / Fixed	10	20	30	40	50	60 min.
DH 24PC	General Assembly Fixed Cost Switch 0 min. Cord 10 min. Others 20 min.	Work Flow Switch Cord Change Lever O-Ring(S30)	Armature Ass'y Inner Cover O-Ring Ball Bearing (608DDM) Washer x 2 Ball Bearing (608VVM) Front Cap Grip Needle Holder Retaining Ring Oil Seal Steel Ball Needle Roller (2 pcs.) Striker O-Ring(A) Piston Piston Pin Washer(C) Spring(C)	Housing Stator Retaining Ring Cylinder Steel Ball (4 pcs.) Second Gear Spring(A) Washer(A) Retaining Ring Second Hammer O-Ring(B) O-Ring(FPM) Spring(B) Second Shaft Washer(B) Clutch Spring Clutch O-Ring(S8) Reciprocating Bearing First Gear Key 3 x 3 x 3 Spacer Ball Bearing (626VVMC)	Gear Cover Ball Bearing (6904CM) Retaining Ring		