



MODEL H 60MA, H 60MB

1. REPAIR GUIDE

1-1. Precautions and Suggestions for Disassembly and Reassembly of the Main Body

The numbers in **[Bold]** and **<bold>** correspond to the item numbers in the Parts List and exploded assembly diagrams. ([]: H 60MA and H 60MB, < >: H 60MB only)

1-1-1. Disassembly

- Piston and striker disassembly

Remove the Hex. Socket Hd. (W/Flange) Bolt M8 **[30]** fixing the Cylinder Case **[29]**, and disassemble the Cylinder Case **[29]** from the Crank Case **[38]**. As the Piston **[35]** remains in the Crank Case **[38]** side, remove the Retaining Ring **[37]** to remove the Connecting Rod **[36]** from the Crank Shaft **[43]**. The Striker **[32]** can be removed by tapping the Cylinder Case **[29]** lightly with a plastic hammer. If it does not come out easily, push the disassembled Piston **[35]** with the Connecting Rod **[36]** back into the Cylinder, and pull them apart again quickly. The Striker can come out at the same time.

- First gear and crank shaft disassembly

Remove the grease from the Connecting Rod **[36]** side and the First Gear **[54]** side of the Crank Case **[38]**. Remove the two Seal Lock Hex. Socket Hd. Bolts M5 **[45]** fixing the Bearing Cover **[46]**. Then place the Connecting Rod **[36]** side of the Crank Case **[38]** downward on a workbench and apply pressure on the end surface of the Crank Shaft **[43]** with a hand press to remove the First Gear **[54]** and the Crank Shaft **[43]** (Fig. 1). Before removing them, make sure that the two Seal Lock Hex. Socket Hd. Bolts M5 **[45]** fixing the Bearing Cover **[46]** are removed.

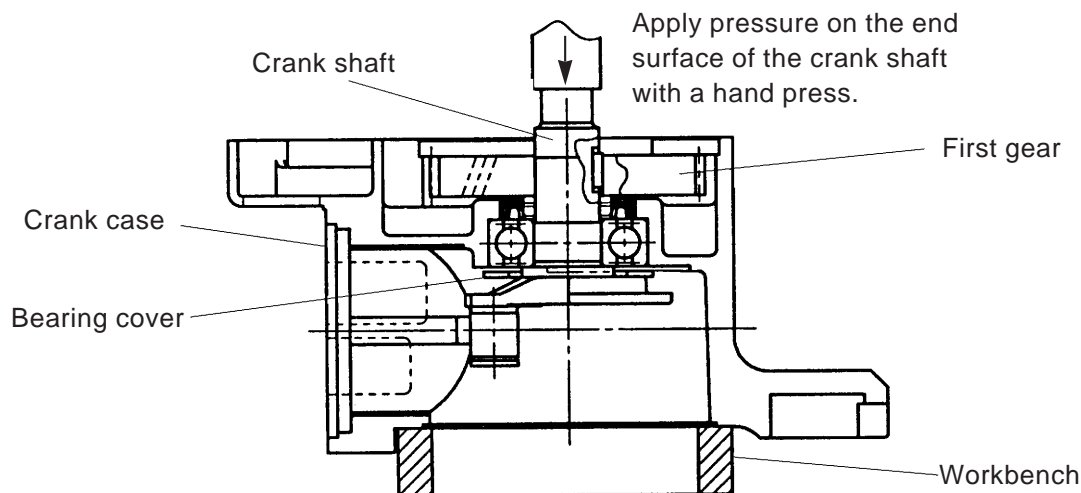


Fig. 1

- Retainer disassembly (See Figs. 2 and 3.)

Pull Grip (A) **[2]** fully in the arrow direction as shown in Fig. 2 and remove the Front Cap **[1]** (since the Front Cap **[1]** is made of rubber and engaged firmly with Grip (A), pull it strongly to remove). This allows Grip (A) **[2]** to be separated from the Retainer Sleeve **[19]**.

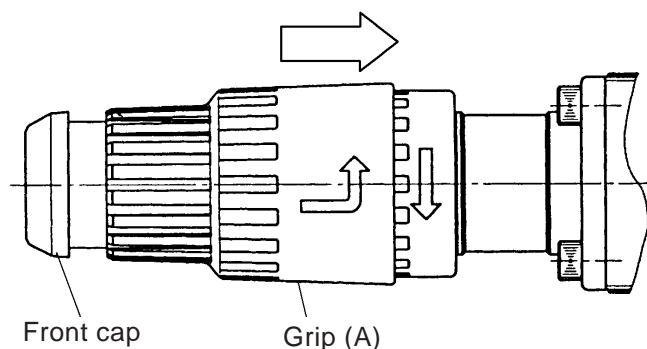


Fig. 2

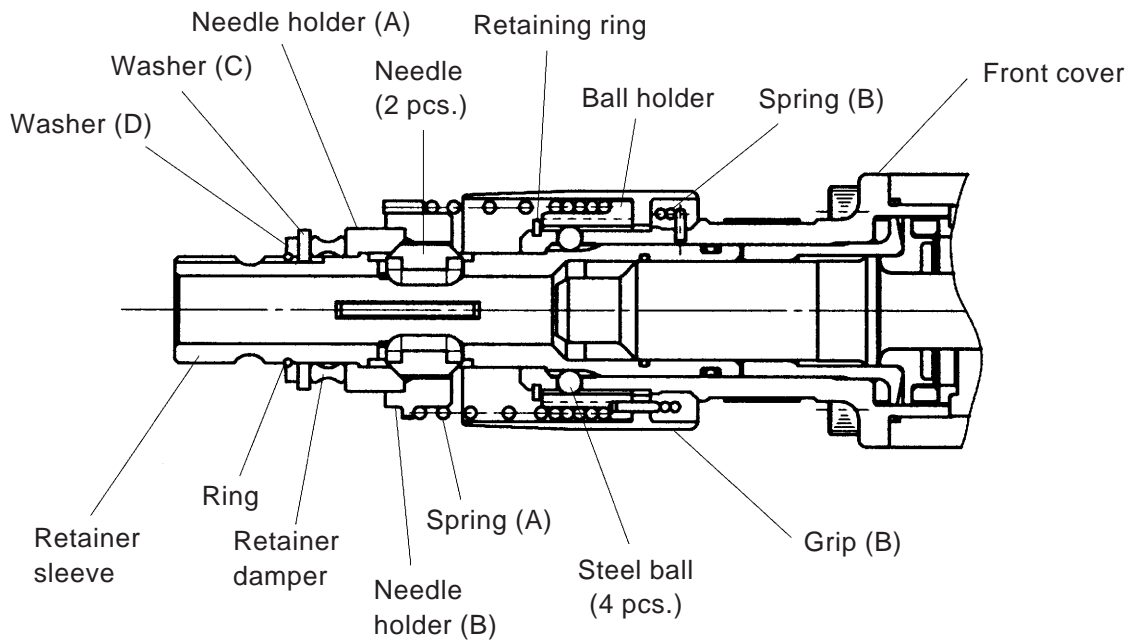


Fig. 3

Remove the Ring [3] by means of a snap ring remover, then Washer (D) [4], Washer (C) [5], the Retainer Damper [6], Needle Holder (A) [7], Needle Holder (B) [9], the two Needles [8] and Spring (A) [10] can be removed from the Retainer Sleeve [19]. Furthermore, remove the Retaining Ring [11] by means of a snap ring remover, then the Ball Holder [12], Grip (B) [13], the four Steel Balls [16] and Spring (B) [14] can be removed from the Front Cover [18] (Fig. 3).

1-1-2. Reassembly

Reassembly can be accomplished by following the disassembly procedure in reverse. However, special attention should be given to the following items.

- First gear and crank shaft reassembly

Press-fit the Ball Bearing [47] in the Crank Case [38] and fix the Bearing Cover [46] with the two Seal Lock Hex. Socket Hd. Bolts M5 [45]. Press-fit the Crank Shaft [43]. Then press-fit Distance Ring (C) [49] and mount the Oil Seal [48]. Put the Feather Key [44] into the groove of the Crank Shaft [43] and press-fit the First Gear [54] with a suitable tool while holding the flat portion of the Crank Shaft [43] with a steel bar. Before press-fitting, make sure that the Feather Key [44] fits in the key groove of the First Gear [54] (Fig. 4).

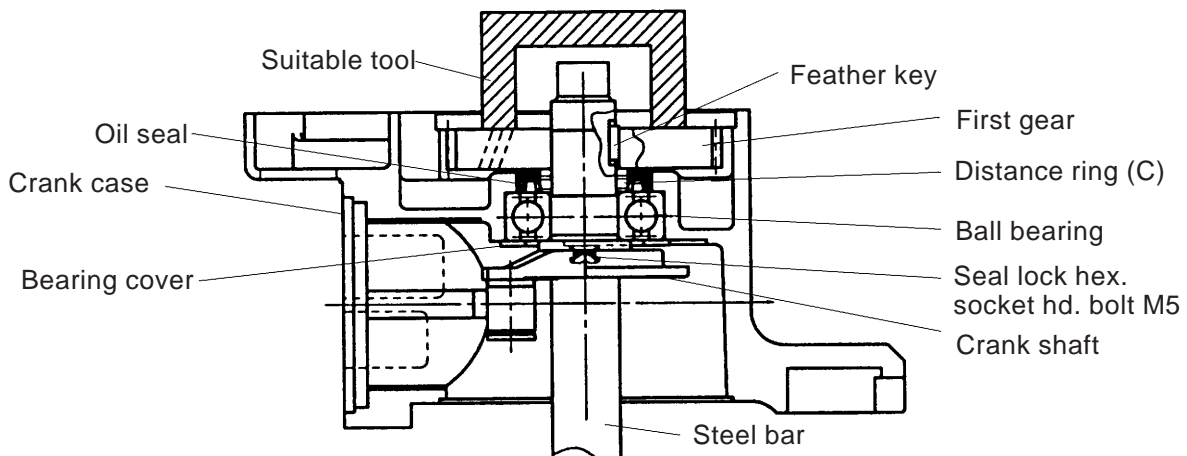


Fig. 4

Apply special grease (grease for electric impact drills) to the inner circumference of the Connecting Rod **[36]**, O-Rings (A) **[33]** in the Striker **[32]** and in the Piston **[35]**, the outer circumference of the Retainer Sleeve **[19]**, the sliding portion of the Second Hammer **[24]**, the Oil Seal **[48]**, the Damper **[26]**, Damper (B) **[22]**, the Damper Washer **[27]** and the outer polished surface of the Ball Holder **[12]**. Seal 60 g of the special grease into the Crank Case **[38]** (Connecting Rod **[36]** side). Apply Hitachi Motor Grease No. 29 to Needle Bearing (A) **[55]**, the pinion portion of the Armature Ass'y **[65]**, the Steel Ball **[16]** and the Needle **[8]**. Seal 40 g of the Hitachi Motor Grease No. 29 into the Crank Case **[38]** (First Gear **[54]** side).

Be very careful not to damage the O-Ring [42] in the Crank Cover [41], O-Rings (A) [33] in the Striker [32] and in the Piston [35], the Oil Seal [48] in the Crank Case [38], the O-Ring [31] on the Cylinder Case [29], the O-Ring [28] on the Front Cover [18], the O-Ring [20] in the Retainer Sleeve [19], and X-Ring [21].

Retaining ring

Ball holder

Grip (B)

Spring (B)

Retainer sleeve

Steel ball (4 pcs.)

D2.7 Hole

Cylinder case

D2.6 Hole

Arrow mark

D4.8 Hole

D6.5 Hole

Front cover

Mount the Front Cover **[18]** to the Cylinder Case **[29]** positioning the D 2.7 hole to the top. Turn the Retainer Sleeve **[19]** so that the Steel Ball **[16]** is inserted in the D 6.5 hole of the Front Cover **[18]** to the deepest position. Fix the Steel Ball **[16]** in the D 6.5 hole with grease. Insert the (A) portion of Spring (B) **[14]** in the D 2.7 hole of the Front Cover **[18]**, and then fit the (B) portion in the D 4.8 hole of Grip (B) **[13]**. Turn Grip (B) **[13]** about 40° in the arrow direction while pressing against the Cylinder Case **[29]**. Holding this arrangement, insert the Ball Holder **[12]** into Grip (B) **[13]** so that the (B) portion of Spring (B) **[14]** is inserted in the D 2.6 hole of the Ball Holder **[12]**, and fix them with the Retaining Ring **[11]**. Check that Grip (B) **[13]** goes back to the original position by itself when turning Grip (B) **[13]** 6° in the arrow direction and releasing the hand.

1-1-3. Screw locking agent TB1401

Apply screw locking agent TB1401 to all hex. socket hd. bolts M5 and M6. (As the hex. socket hd. bolts for M8 that secure the front cover and the hex. socket hd. bolts (w/flange) for M8 that secure the cylinder case are special bolts, they cannot be re-used if removed. Use fresh service parts only.)

Caution: If bolts are loosened by vibration, it could cause damage to the hammer body. Ensure without fail that screw locking agent is applied to threaded portions prior to reassembly.

1-1-4. Tightening torque

(1) Hex. socket hd. bolts M5	$7.84^{+1.96}_0 \text{ N}\cdot\text{m}$ ($80^{+20}_0 \text{ kgf}\cdot\text{cm}$, $69.4^{+17.4}_0 \text{ in-lbs}$)
(2) Attached bolts of handle (Hex. socket hd. bolts M5 x 12)	$4.90^{+1.96}_0 \text{ N}\cdot\text{m}$ ($50^{+20}_0 \text{ kgf}\cdot\text{cm}$, $43.4^{+17.4}_0 \text{ in-lbs}$)
(3) Hex. socket hd. bolts M6	$9.80^{+1.96}_0 \text{ N}\cdot\text{m}$ ($100^{+20}_0 \text{ kgf}\cdot\text{cm}$, $86.8^{+17.4}_0 \text{ in-lbs}$)
(4) Tapping screws D4	$1.96^{\pm 0.49} \text{ N}\cdot\text{m}$ ($20^{\pm 5} \text{ kgf}\cdot\text{cm}$, $17.4^{\pm 4.3} \text{ in-lbs}$)
(5) Tapping screws D5	$2.94^{\pm 0.49} \text{ N}\cdot\text{m}$ ($30^{\pm 5} \text{ kgf}\cdot\text{cm}$, $26.0^{\pm 4.3} \text{ in-lbs}$)
(6) Attached bolts of front cover (Hex. socket hd. bolts M8 x 25)	$39.2^{\pm 0.98} \text{ N}\cdot\text{m}$ ($400^{\pm 10} \text{ kgf}\cdot\text{cm}$, $347.2^{\pm 8.7} \text{ in-lbs}$)
(7) Attached bolts of cylinder case (Hex. socket hd. bolts (w/flange) M8 x 35)	$19.6^{+1.96}_0 \text{ N}\cdot\text{m}$ ($200^{+20}_0 \text{ kgf}\cdot\text{cm}$, $173.6^{+17.4}_0 \text{ in-lbs}$)

1-1-5. Internal wiring

- Wiring diagram of Model H 60MA (products without control circuit ass'y)

- (1) For products with noise suppressor

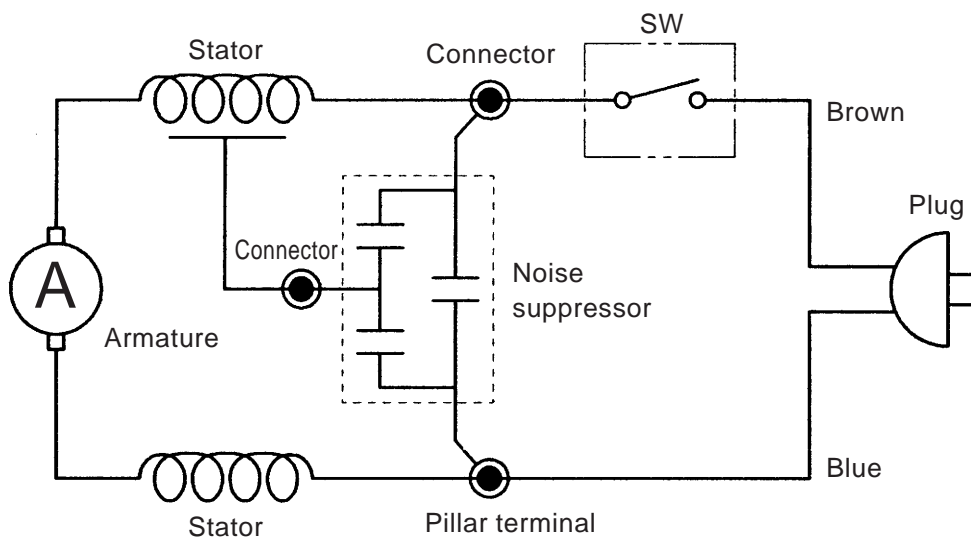


Fig. 6

(2) For products without noise suppressor

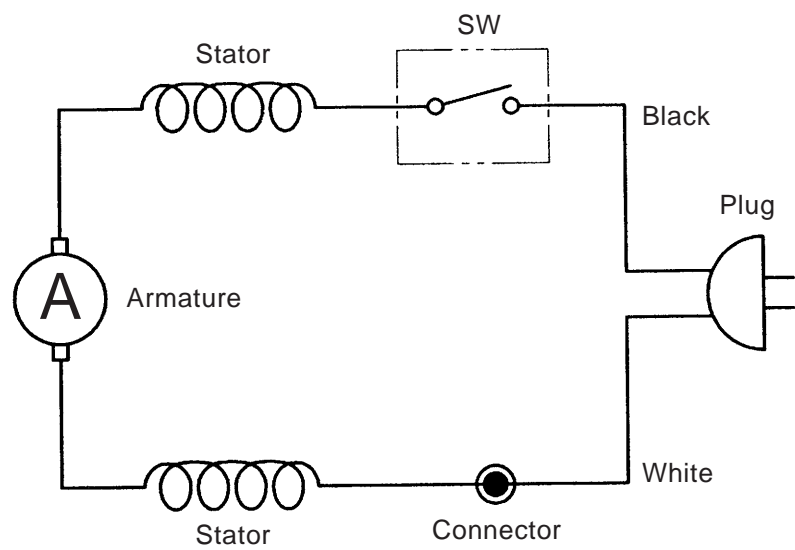


Fig. 7

• Wiring diagram of Model H 60MB (products with control circuit ass'y)

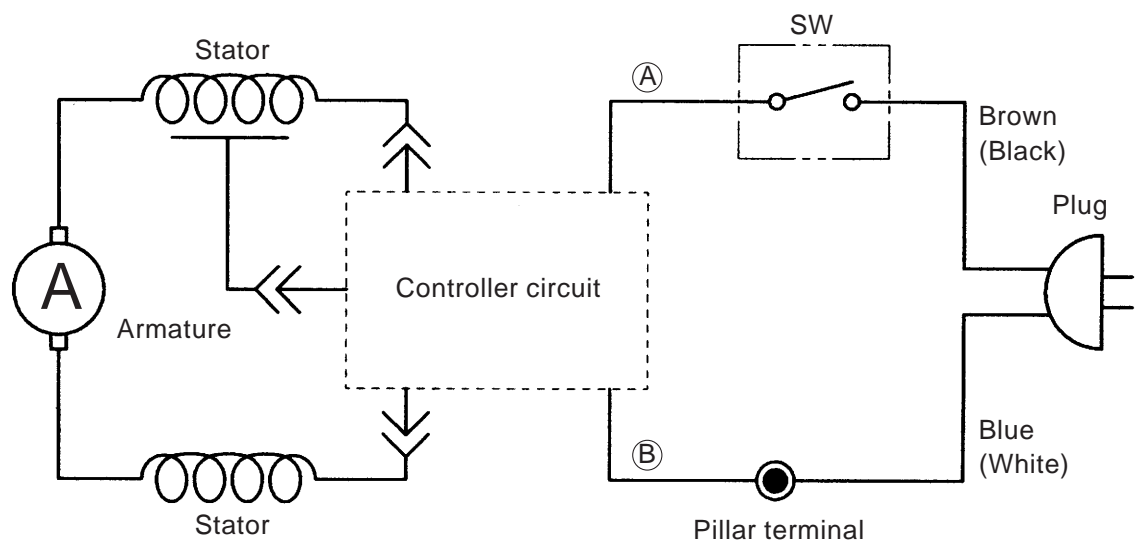


Fig. 8

Volt \ Leadwire	Ⓐ	Ⓑ
110 – 115 V	Black	Black
220 – 230 V	Black	White
240 V	Black	White
115 V (USA)	Yellow	Yellow

• Schematic diagram of Model H 60MA (products without control circuit ass'y)

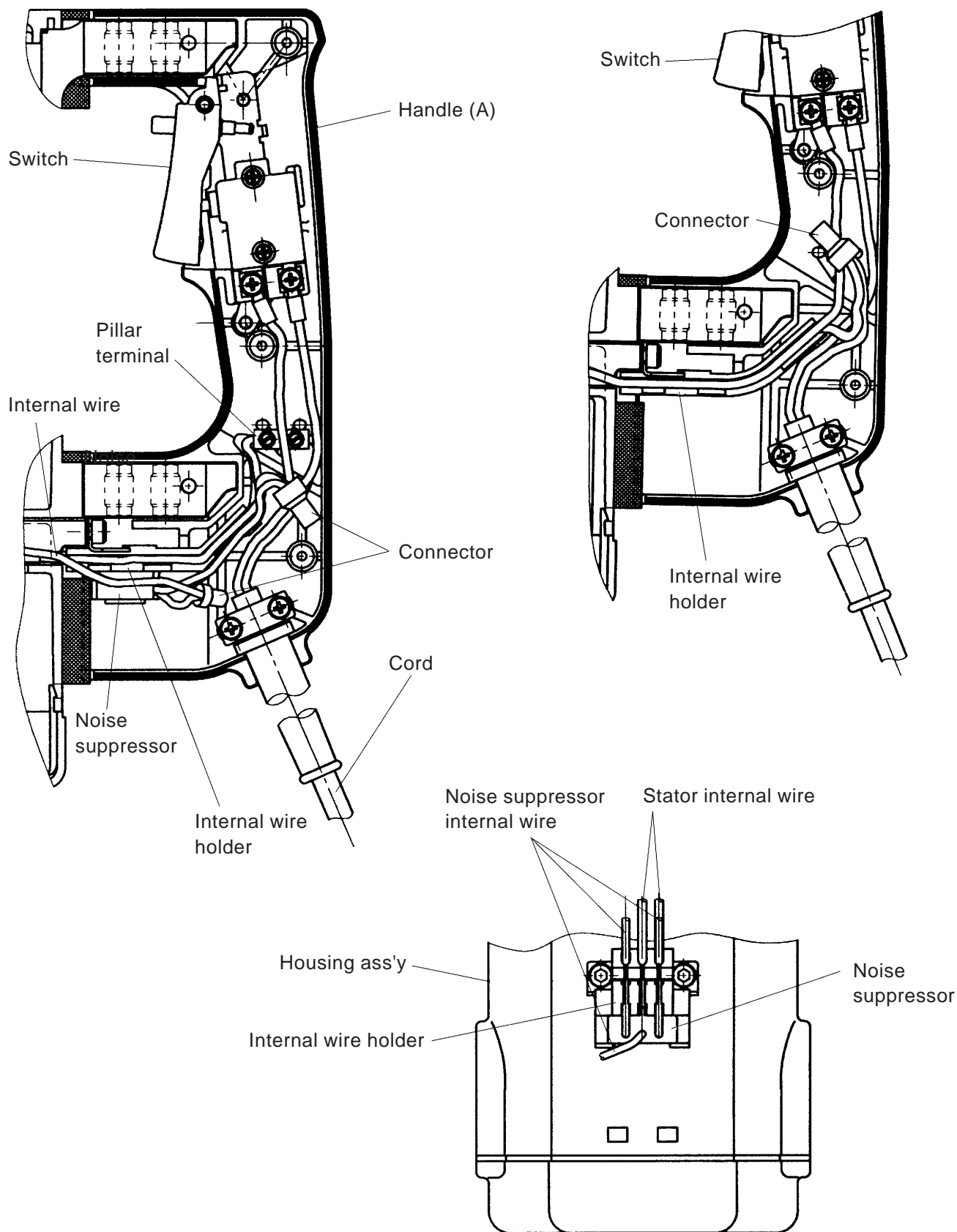


Fig. 9

- Wiring of control circuit ass'y

Put two internal wires of the Stator Ass'y <68> and an internal wire of the Internal Wire <87> (grounding wire) through the 9 × 10 hole of Case (B) <85>. Insert the two internal wires of the Stator Ass'y <68> into the two tabs at the upper portion of the Controller Circuit <86> and insert the Internal Wire <87> into the lower tab. The upper two tabs have no relation in connecting position. Put the two internal wires of the Controller Circuit <86> through the 14 × 16 hole at the upper portion of Case (B) <85>. Position the dial to the dial hole, and then put the Controller Circuit <86> in Case (B) <85>. Putting the two internal wires of the Controller Circuit <86> through the handle side of the Sleeve <81>, put the Controller Circuit <86> and Case (B) <85> in the Housing Ass'y <72>. Perform wiring according to the wiring diagram as shown in Fig. 8. At this time, make sure that the two internal wires of the Controller Circuit <86> are held with the Internal Wire Holder <82>.

1-1-6. Insulation tests

On completion of disassembly and repair, measure the insulation resistance and dielectric strength.

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

Dielectric strength: AC 4000 V/1 minute, with no abnormalities ... 220 V – 240 V
(and 110 V for U.K. products)
AC 2500 V/1 minute, with no abnormalities ... 110 V – 127 V
(except U.K. products)

1-1-7. No-load current value

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

Voltage (V)	110	220	230	240
Current (A) (Max.)	7.5	7.2	3.6	3.5

2. STANDARD REPAIR TIME (UNIT) SCHEDULES

MODEL	Variable		10	20	30	40	50	60 min
	Fixed							
H 60MA H 60MB		Work Flow						
	General Assembly			Switch (B) Cord			Gear Cover Ass'y Needle Bearing (A)	Housing Ass'y Stator Ass'y
							Armature Ass'y BB (6201DD) BB	
					Handle (A) Handle (B) Transatory Unit		Crank Shaft Feather Key (3x3) BB (6203DD) O-Ring Oil Seal First Gear	Crank Case
		Front Cap Grip (A) Ring Washer (C) Washer (D) Retainer Damper Needle Holder (A) Needle Holder (B) Needle Spring (A)	Ball Holder Grip (B) Spring (B) Steel Ball (D6.35) Front Cover Retainer Sleeve O-Ring (S-26) X-Ring Second Hammer Hammer Holder Damperx2 Washerx2 O-Ring					
					Striker O-Ringx2 Piston Pin Piston Connecting Rod		Cylinder Case Ass'y	