



# MODEL S 15SA, S 18SA

## 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 S 15SA and the **<Bold>** numbers to those in the Parts List and exploded assembly diagram for S 18SA.

### 1-1. Disassembly of the Armature Ass'y and the Lock Lever Ass'y

- (1) Loosen the two Brush Caps **[23] <23>**, and take out the Carbon Brushes **[22] <22>**.
- (2) Remove the four Tapping Screws D5 x 45 **[7] <7>**, and remove the Gear Cover **[8] <8>**, and related parts.  
The Armature Ass'y **[13] <13>** can then be taken out together with the Inner Cover **[10] <10>**, the Lock Lever **[12] <12>**, and related parts.
- (3) As illustrated in Fig. 1, the Inner Cover **[10] <10>**, and related parts can be removed from the Armature Ass'y **[13] <13>**, and related parts by utilizing a J-130 sleeve (special repair tool, Code No. 970907) and a J-131 plate (special repair tool, Code No. 305711).
- (4) The Ball Bearing **[11] <11>** can be removed from the Armature Ass'y **[13] <13>** by utilizing the J-30 bearing puller ass'y (special repair tool, Code No. 970804).  
After the Ball Bearing has been removed, the Lock Lever **[12] <12>** can be easily taken off.
- (5) As illustrated in Fig. 2, the Ball Bearing **[15] <15>** can also be removed from the Armature Ass'y **[13] <13>** by utilizing the J-130 sleeve (special repair tool, Code No. 970907) and a J-204 bearing puller (special repair tool, Code No. 970982).  
After the Ball Bearing has been removed, the Dust Seal **[14] <14>** can be easily taken out.

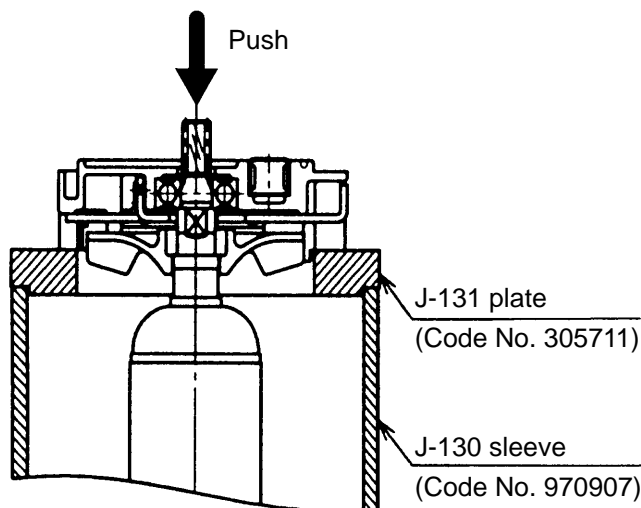


Fig.1

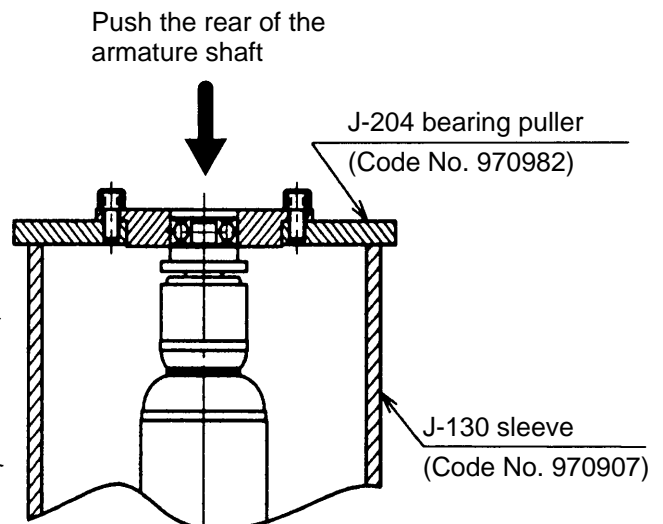


Fig.1

## 1-2. Disassembly of the Stator Ass'y

- (1) After taking off the Armature Ass'y [13] <13>, loosen the five Tapping Screws D4 X 20 [26] <26> and remove the Tail Cover [25] <25>, the Handle Cover [29] <29> and the Fan Guide [16] <16>.
- (2) Disconnect the lead wires of the Stator Ass'y [17] <17> from Switch (C) [30] <33>.  
Then, disconnect the lead wires of Noise Suppressor <30>.
- (3) Disconnect the Brush Terminals [18] <18> from the Brush Holders [21] <21>.
- (4) Loosen the two Hex. Hd. Tapping Screws [27] <27>, and remove the lead wire of the Noise Suppressor <30>.  
And pull out the lead wires of the Stator Ass'y [17] <17> from the Housing Ass'y [19] <19>.  
Then, the Stator Ass'y can be taken out of the Housing Ass'y [19] <19>. If the Stator Ass'y [17] <17> cannot be easily taken out of the Housing Ass'y [19] <19>, disassembly can be facilitated by heating the Housing Ass'y to a temperature of approximately 60 °C (140 °F) in an appropriate heating oven.

## 1-3. Disassembly of the First Gear and the Ball Bearing

- (1) Loosen the four Tapping Screws D5 x 45 [7] <7>, and remove the Gear Cover [8] <8>, together with the Spindle [4] <4>, the First Gear [9] <9>, and the related parts as a single unit.
- (2) Remove the Bearing Caps [3] <3> with the J-21 wrench.
- (3) As illustrated in Fig. 3, support the tip of the Gear Cover [8] <8> with a cylindrical jig of inside diameter 35 mm or more, and push the rear portion of the Spindle [4] <4>.  
At this time, the First Gear [9] <9> will come off of the Spindle.
- (4) Remove the D12 Retaining Ring [6] <6> from the Spindle [4] <4>, and the Ball Bearing [5] <5> can be removed from the Spindle [4] <4> with the J-30 bearing puller ass'y (special repair tool, Code No. 970804).

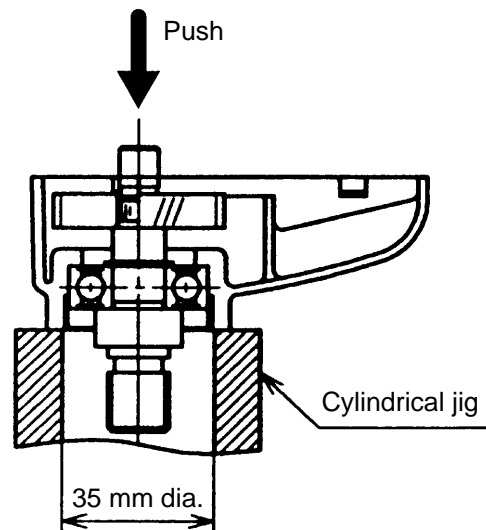


Fig. 3

## 1-4. Reassembly

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

- (1) After disassembly, thoroughly remove old grease from the inside of the Gear Cover [8] <8>, and insert 15 g of new grease (Nippeco JF-375, Code No. 930036, is recommended) prior to reassembly. When inserting grease, apply it to the pinion gear teeth surfaces, and to the needle bearing inside the Inner Cover [10] <10>.
- (2) When replacing the Ball Bearing [15] <15> on the commutator side of the Armature Ass'y [13] <13>, be very careful to ensure that the Dust Seal [14] <14> is assembled in the proper direction. The Dust Seal [14] <14> plays an important role in protecting the ball bearing against dust, and must be replaced with a new one if disassembled.

## 1-5. Tightening Torque

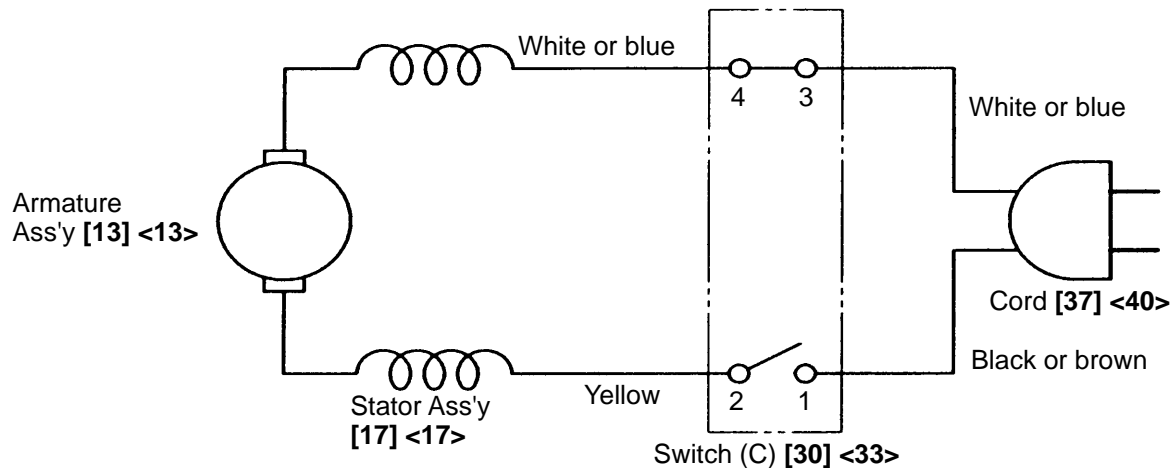
D4 Tapping Screw (W/Flange) [26] <26> [34] <37> .....  $2.0 \pm 0.5 \text{ N} \cdot \text{m}$  ( $20 \pm 5 \text{ kgf} \cdot \text{cm}$ ,  $1.5 \pm 0.4 \text{ ft-lbs}$ )

D5 Tapping Screw [7] <7> } .....

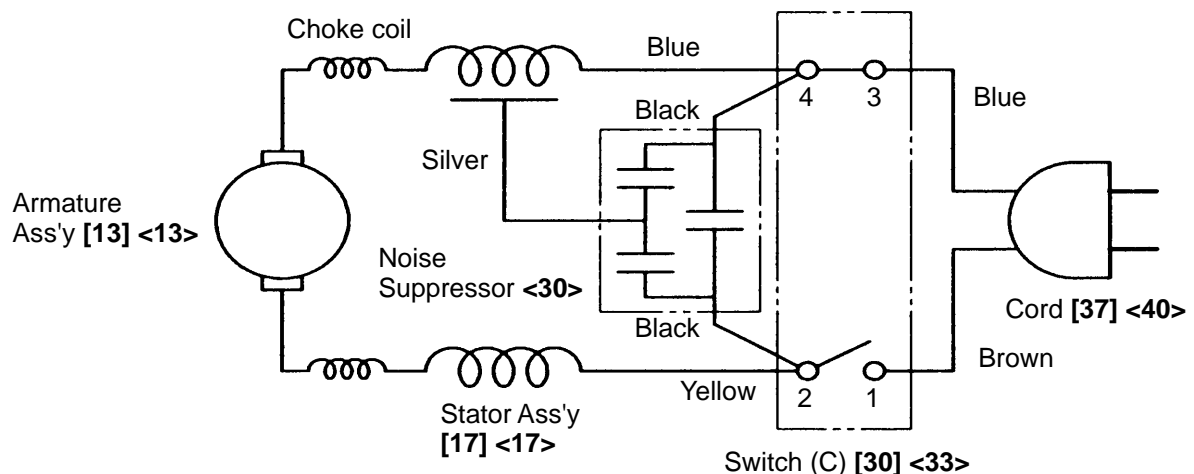
D5 Hex. Hd. Tapping Screw [27] <27> } .....  $2.9 \pm 0.5 \text{ N} \cdot \text{m}$  ( $30 \pm 5 \text{ kgf} \cdot \text{cm}$ ,  $2.2 \pm 0.4 \text{ ft-lbs}$ )

## 1-6. Wiring Diagrams

For the U.S.A., Canada and Asian countries (except China)



For European countries and China



### 1-7. Insulation Tests

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

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

Dielectric strength: AC 4,000 V for 1 minute, with no abnormalities ..... 220 V – 230 V

AC 2,500 V for 1 minute, with no abnormalities ..... 110 V – 127 V

### 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	220	230
Current (A) max.	2.3	2.4	1.3	1.3

## 2. STANDARD REPAIR TIME (UNIT) SCHEDULES

MODEL	Variable		10	20	30	40	50	60 min.
	Fixed							
G 15SA		Work Flow						
G 18SA		Switch Cord			Housing Ass'y Stator			
	General Assembly			Armature Ass'y Ball Bearing (6000DD) Ball Bearing (608VV) Dust Seal Inner Cover				
				Gear Cover First Gear Ball Bearing (6201DD) Spindle Bearing Cap				