



# MODEL

# FP 20SA

## 1. PRECAUTIONS IN DISASSEMBLY AND REASSEMBLY:

The circled numbers in the descriptions below correspond to the item numbers in the Parts List and exploded assembly diagram.

### 1-1. Disassembly:

#### (1) Removal of the Planer Blades, Belt and Related Parts:

- Remove the D4 x 12 Tapping Screw (21) which fixes the Belt Cover (22), and disassemble the Belt Cover from the main body.
- As illustrated in Fig. 1, hold the Belt (23) in position with one hand, and with the 8 mm Box Wrench (501) loosen and remove the two Bolts (17) and Spring Lock Washers (16) which fix the Planer Blade (14). The Planer Blade (14) and Blade Holder (15) can then be removed.
- [NOTE] Be very careful not to lose the very small Spring Lock Washers (16).
- Rotate the Belt (23) by hand to invert the Cutter Block (13), and repeat the above procedures to remove the remaining Planer Blade (14) and Blade Holder (15).
- After the Planer Blades (14) have been removed, remove the Belt (23) while rotating it by hand.

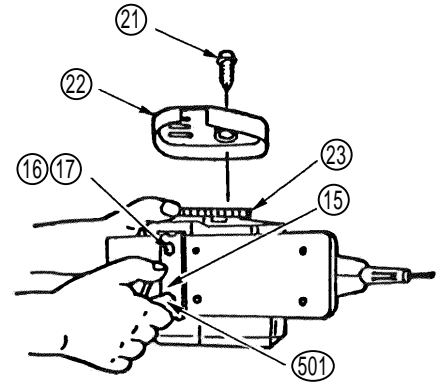


Fig. 1

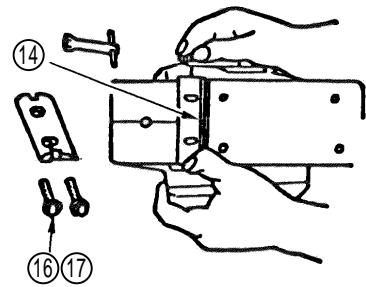


Fig. 2

#### (2) Removal of the Carbon Brushes: (Figs. 3, 4 and 5)

- Loosen the three D4 x 16 Tapping Screws (11), and remove the Tail Cover Ass'y (10).
- To remove the Brush Holders (37), as illustrated in Fig. 4, gently lift the Brush Holders upward while pressing their rear portions toward the commutator surface of the Armature (28). At this time, be very careful not to pull out excessively on the Internal Wires (A) (19).
- Next, while pushing the Carbon Brushes (38) fully into the Brush Holders (37) as illustrated in Fig. 5, gently pull out the brush terminals to disconnect them from the Carbon Brushes (38). The Carbon Brushes can then be taken out of the Brush Holders (37).

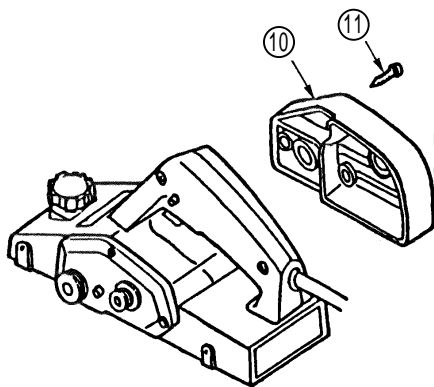


Fig. 3

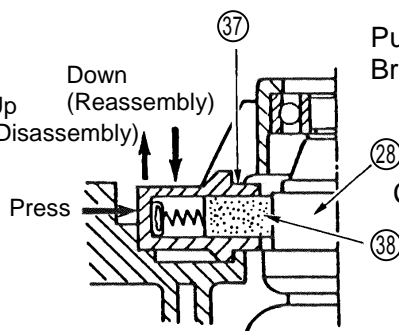


Fig. 4

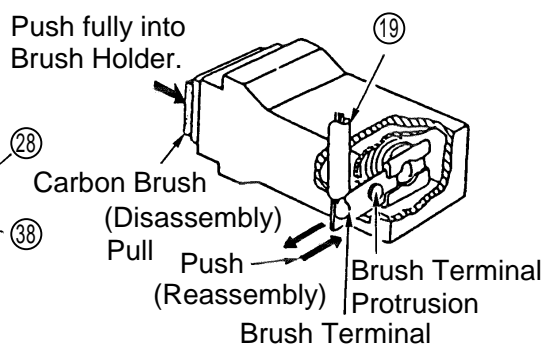


Fig. 5

### (3) Removal of the Armature and Cutter Block: (Figs. 6 & 7)

- Loosen and remove the four D4 x 20 Tapping Screws (27) which fix the End Bracket (26).
- As illustrated in Fig. 6, alternately hold a plastic rod with a diameter of approximately 8 mm against the end surface of the shaft of the Armature (28) and the spindle of the Cutter Block (13), and alternately tap each of them gently with a wooden hammer to remove little by little the End Bracket (26), Armature (28) and Cutter Block (13) in a single body. The Fan Guide Ass'y (29) will also be removed at this time.

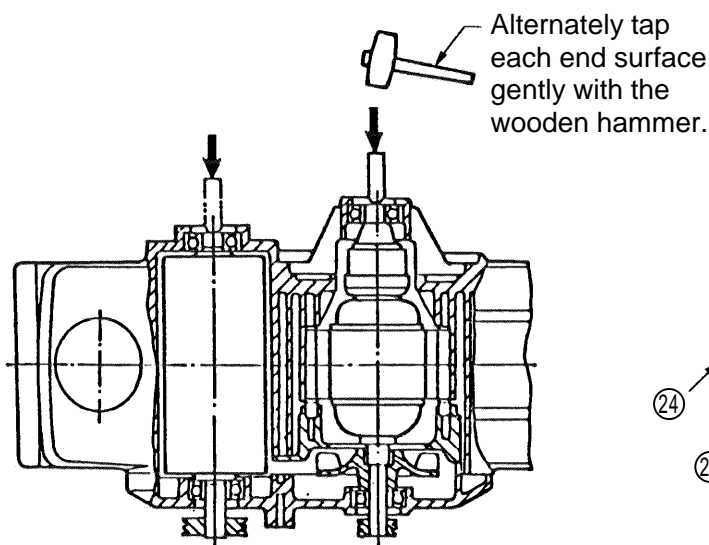


Fig. 6

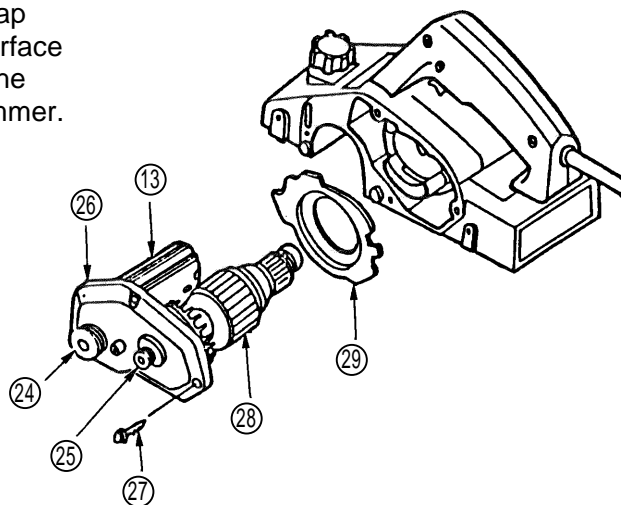


Fig. 7

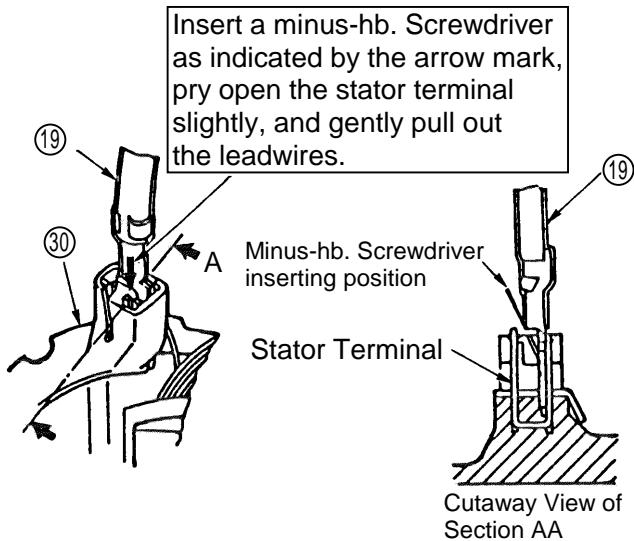
- Support the End Bracket (26) on an appropriate surface, and tap the end surface of the Armature (28) (the Pulley (A) end) gently with a wooden hammer to loosen and remove the Armature (28) from the End Bracket (26). Then, use a bearing puller to remove Pulley (A) (25) from the Armature (28).

[NOTE] The special repair tool J-30 Bearing Puller (Code No. 970804) is recommended for Pulley (A) removal.

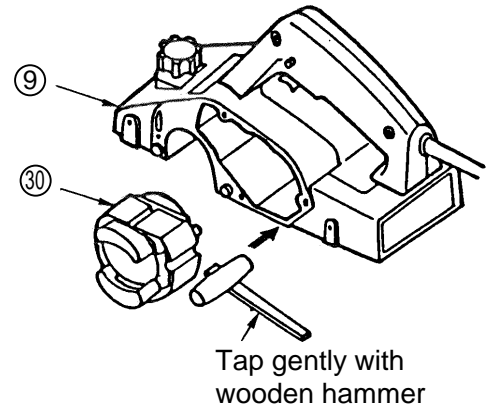
- After removing Pulley (B) (24) with a bearing puller (the J-30 Bearing Puller is recommended), tap gently on the end surface of the spindle of the Cutter Block (13) to loosen and remove the Cutter Block from the End Bracket (26).

(4) Removal of the Stator: (Figs. 8 & 9)

- As illustrated in Fig. 8, use a slender minus-head screwdriver to disconnect the two Internal Wires (A) ①⑨ and, on applicable models, the red and gray leadwires from the Noise Suppressor ④⑥ from the Stator ③⑩.
- As illustrated in Fig. 9, tap gently on the End Bracket mounting side of the Housing ⑨ with a wooden hammer or similar tool to loosen and remove the Stator ③⑩.



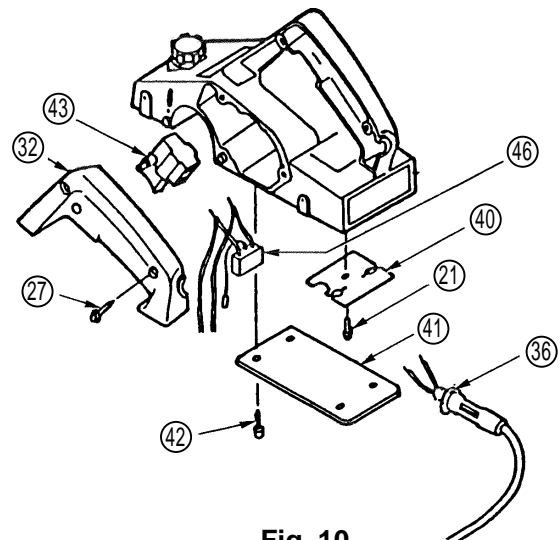
**Fig. 8**



**Fig. 9**

(5) Removal of the Switch, Cord and Noise Suppressor: (Fig. 10)

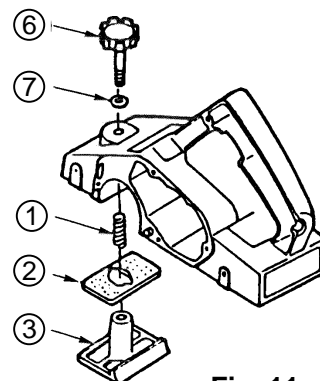
- Loosen the two D4 x 20 Tapping Screws ②⑦ which fix the Handle Cover ③②, and take off the Handle Cover.
- Loosen the four D4 x 16 Flat Hd. Tapping Screws ④②, and remove the Rear Base ④①.
- Loosen the D4 x 12 Tapping Screw ②① which fixes the Plate ④④, and take off the Plate.
- On completion of the above, the Switch ④③, Cord ③⑥ and Noise Suppressor ④⑥ (where applicable) can be disassembled.



**Fig. 10**

(6) Removal of the Front Base and Related Parts: (Fig. 11)

- Loosen the Knob ⑥ by turning it counter-clockwise. The Front Base ③, Rubber packing ②, Adjusting spring ①, Knob ⑥ and Bolt Washer ⑦ can then be removed.



**Fig. 11**

## 1-2. Reassembly:

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

- (1) The fitting of the Housing (9) and the Stator (30) is such that the Stator can be installed without the necessity of heating the Housing. As the Stator is not fixed into the housing by screws, carefully ensure that the ribs in the Housing (9) are properly aligned with and fitted into the matching grooves on the Stator (30) as illustrated in Fig. 12, and that the Stator is fully installed so that it comes in contact with the inner wall of the Housing.

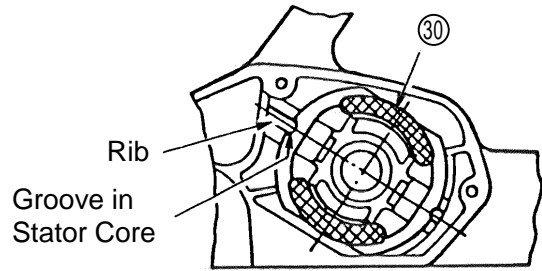


Fig. 12

- (2) Press Fitting of Pulley (A): (Fig. 13)

First, press fit 608VVC2 Ball Bearings (12) onto the commutator side and fan side of the Armature (28), and ensure that they are properly in contact with the Armature shaft fitting portion and fan fitting portion respectively. Then, press fit Pulley (A) (25) onto the Armature shaft, and carefully ensure that the outer surface of Pulley (A) is flush with the end surface of the Armature shaft as illustrated in Fig. 13.

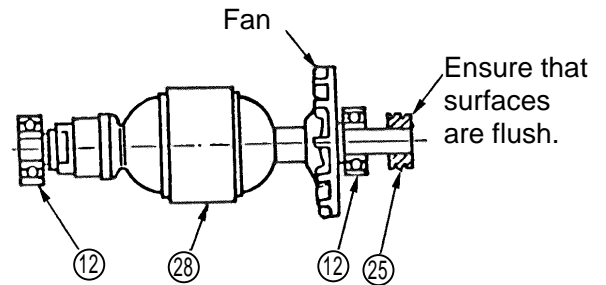


Fig. 13

- (3) Press Fitting of Pulley (B): (Fig. 14)

First, mount the End Bracket (26) onto the Cutter Block (13) as illustrated in Fig. 14. Then, press fit pulley (B) (24) onto the Cutter Block spindle so that the dimension between the outer surface of the 608VVC2 Ball Bearing (12) and the outer surface of Pulley (B) is as indicated in Fig. 14.

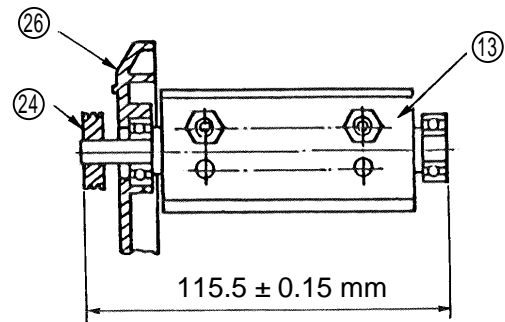
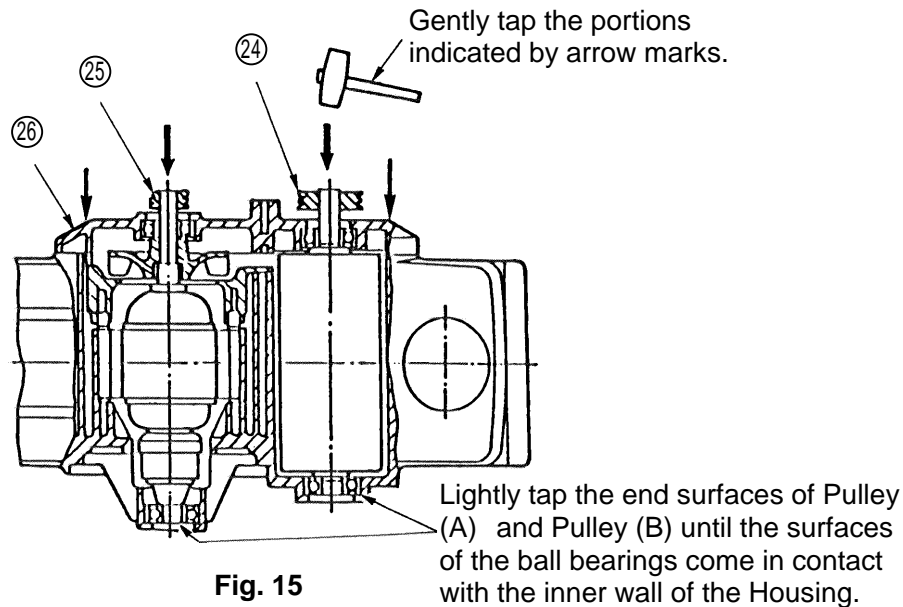


Fig. 14

- (4) Mounting the End Bracket: (Fig. 15)

The Armature (28) and Cutter Block (13) are first assembled onto the End Bracket (26), and then the assembled unit is installed in the Housing (9). As illustrated in Fig. 15, fit the 608VVC2 Ball Bearing (12) of the Armature (28) and Cutter Block (13) into the bearing chambers in the Housing (9), and lightly tap the end surfaces of Pulley (A) (25) and Pulley (B) (24), and the surface of the End Bracket (26) as indicated, alternately with a wooden hammer to drive the ball bearings into the bearing chambers slowly and evenly so that the fitting joint and protrusion of the End Bracket (26) are properly aligned with the matching joint and recessed portions of the Housing (9).

When the 608VVC2 Ball Bearings (12) have come fully and evenly into contact with the inner walls of the bearing chambers of the Housing (9), gently tap the End Bracket (26) to ensure it is properly seated, and fasten it with the D4 x 20 Tapping Screws (27).



**(5) Reassembly of the Carbon Brushes and Brush Holders:**

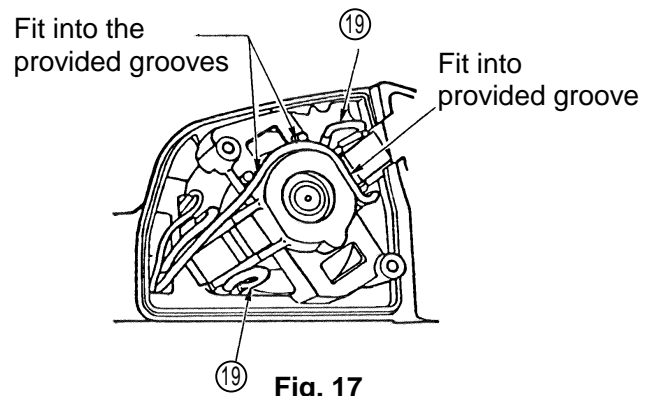
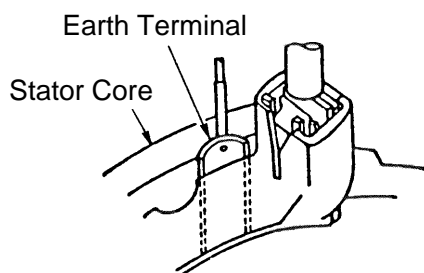
When reassembling the Carbon Brushes (38) and Brush Holders (37), please refer to Figures 4 and 5, above.

**(6) Wiring and Leadwire Arrangements: (Figs. 8, 16 & 17)**

Ensure that the Internal Wires (A) (19) and the red and grey leadwires of the Noise Suppressor (46) (when applicable) are inserted fully into the terminals of the Stator (30), as illustrated in Fig. 8.

Ensure that the earth terminal is properly inserted into the gap between the Stator Core and the Housing (9), as illustrated in Fig. 16.

Arrange the leadwires so that they are fitted into the provided grooves, as illustrated in Fig. 17, and carefully ensure that none of the leadwires comes in contact with the Armature (28).



**1-3. Lubrication:**

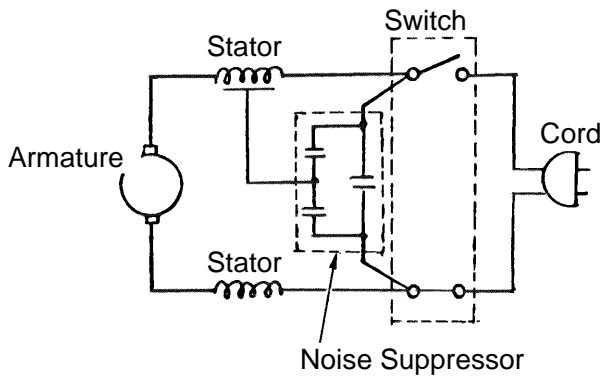
When mounting the Front Base (3) to the Housing (9), without fail, coat Shell Omala Oil #150 on the external surface of the cylindrical part of the Front Base (3). In addition, coat grease (Hitachi Motor Grease No. 29, Code No. 930035, is recommended) on the threaded portion of the Knob (6), and the Bolt Washer (7).

**1-4. Tightening Torques:**

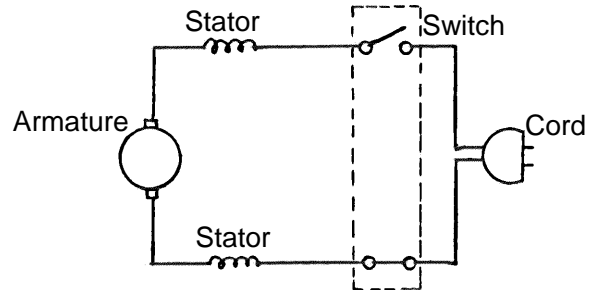
|                                                        |                |
|--------------------------------------------------------|----------------|
| D4 Tapping Screws (11) (21) (27) .....                 | 15 - 25 kgf-cm |
| D4 x 16 Flat Hd. Tapping Screws (42) .....             | 15 - 25 kgf-cm |
| Bolts (17) (for Blade Holders and Planer Blades) ..... | 60 - 80 kgf-cm |

### 1-5. Wiring Diagrams:

(a) For New Zealand, South Africa, and  
European Countries:



(b) For other countries:



### 1-6. Insulation Tests:

On completion of disassembly and repair, measure the insulation resistance and conduct insulation tests (dielectric strength test).

Insulation Resistance: 7 M $\Omega$  or more with DC500V Megohm Tester.

Dielectric Strength: AC4000V/1 minute, with no abnormalities..... 220 V - 240 V (and 110 V  
for U.K. products)  
AC2500V/1 minute, with no abnormalities..... 110 V - 127 V (except U.K.  
products)