



MODEL P 20SA2

1. MAINTENANCE GUIDE

As suggestions for the use and general maintenance of the planer are covered in the Handling Instructions, only special suggestions relative to planer blade adjustment, disassembly, reassembly and repair are described here. Thorough attention in handling should be exercised at all times to carefully maintain the flatness and alignment between the front base and rear surface of the base, and to avoid possible injury when installing, adjusting or handling the planer blades. In addition, ensure without fail that the power cord is disconnected from the power outlet prior to carrying out maintenance, cleaning, blade replacement, etc. The **[Bold]** numbers in the descriptions below correspond to the item numbers in the Parts List and exploded assembly diagram.

1-1. Planer Blade Adjustment

The procedures for blade height adjustment are described in the Handling Instructions. Accordingly, only supplementary information is presented here.

1-2. Planer Blade Height Adjustment

A. Resharpenable type (for Asia, etc.) (See Figs. 1 and 2.)

- (1) Loosen the two machine screws holding the blade and set plate (A).
- (2) Make the bent surface of set plate (A) flush with wall surface (b) after contacting the blade tip with wall surface (a) of set gauge. Then, tighten them with the two screws.

B. Double edged type (for Europe, etc.) (See Figs. 1 and 3.)

- (1) Loosen the two machine screws holding the blade, set plate (A) and set plate (B).
- (2) Adjust the planer blade height in the same procedure as in above.

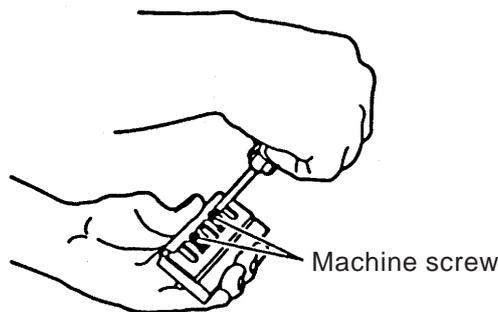


Fig. 1

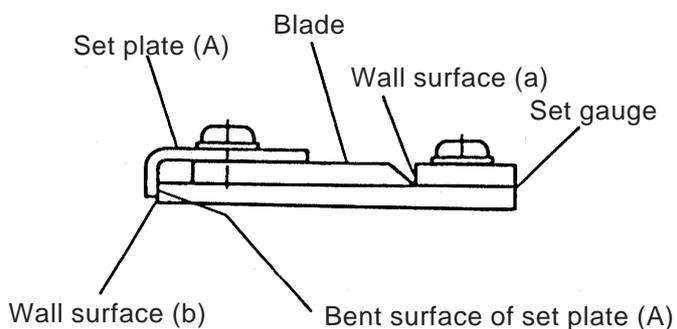


Fig. 2

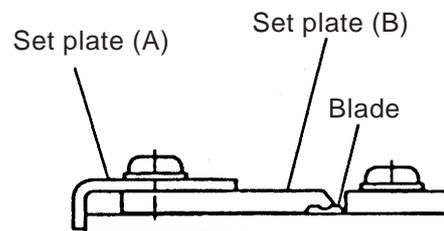


Fig. 3

1-3. Troubleshooting Guide

General troubleshooting and repair of the Model P 20SA2 can be conducted by referring to Table 1 below, which is based on the troubleshooting guide for electric power tools utilizing commutator motors.

Table 1. Troubleshooting guide

Failure	Possible cause	Check method	Countermeasure	
1. Motor does not rotate.	• Power outlet	• Check power source	Replace fuse/Turn ON breaker	
	• Damaged cord	• Check conductivity	Repair/Replace	
	• Open circuit in armature or stator	• Inspect	Repair/Replace	
	• Faulty switch	• Check conductivity	Replace	
	• Worn carbon brushes	• Inspect	Adjust/Replace	
2. Excessive current or blown fuse	• Short circuit in armature or stator	• Inspect	Replace	
	• Mechanical malfunction	• Disassemble/Inspect	Replace damaged parts	
	• Incursion of foreign materials	• Disassemble/Inspect	Remove foreign materials	
	• Defective insulation	• Measure resistance	Repair/Replace damaged parts	
3. Motor rotates	• with excessive noise	• Defective cutter block ass'y	• Inspect	Repair/Replace
		• Defective carbon brush contact	• Check carbon brush	Adjust/Replace
		• Defective ball bearings	• Check for damage or lack of lubricant	Lubricate/Replace
	• with excessive vibration	• Armature imbalance	• Inspect	Replace
		• Worn ball bearings	• Inspect	Replace
		• Defective belt	• Inspect	Adjust/Replace
		• Defective pulleys	• Inspect	Repair/Replace
		• Imbalanced cutter block ass'y	• Inspect	Repair/Replace
	• irregularly rotation or with overheating	• Short circuit in armature or stator	• Inspect	Replace
		• Open circuit in armature	• Inspect	Replace
• with excessive sparks from carbon brushes	• Belt slippage	• Inspect belt	Reduce load if necessary	
	• Worn mechanical parts	• Inspect mechanism	Replace damaged or worn parts	
• but no-load rotation too slow	• Loose circuit connection	• Inspect circuit	Repair	
	• Faulty switch	• Inspect	Replace	
• with excessive sparks from carbon brushes	• Defective carbon brush contact	• Inspect carbon brush and commutator surface of armature	Adjust carbon brush/ Replace armature if necessary	
	• Worn carbon brushes	• Inspect	Adjust/Replace	
• but no-load rotation too slow	• Mechanical failure	• Inspect mechanism	Lubricate/Replace damaged parts	
	• Source voltage drop	• Check power source with voltmeter	Consult power company	
	• Short circuit in armature	• Check armature with growler	Replace	
• but no-load rotation too fast	• Short circuit in stator	• Check stator with universal tester	Replace	
	• Excessive voltage	• Check power source with voltmeter	Consult power company	

1-4. Disassembly

1-4-1. Armature, Cutter Block, and End Bracket Disassembly (See Figs. 4 and 5)

- (1) Loosen the two D4 x 16 ⊕-Hd. Tapping Screws [16], and remove the Tail Cover [15].
- (2) Remove the Carbon Brushes [8] and the Brush Holders [9] by slightly prying the brush holders upward. Then, loosen the two D4 x 14 ⊕-Hd. Machine Screws [12] and remove the Cover [10] and Blade Cover [14] together.
- (3) Loosen the single D4 x 25 ⊕-Hd. Tapping Screw [42] and remove the Belt Cover [43]. Next, loosen the four D4 x 25 ⊕-Hd. Tapping Screw [42] that secure the End Bracket [47] to the Housing Ass'y [7]. Finally, tap the end bracket side of the housing ass'y gently with a wooden or plastic hammer, and the End Bracket [47], Armature [31], and Cutter Block Ass'y [19] should come off simultaneously.

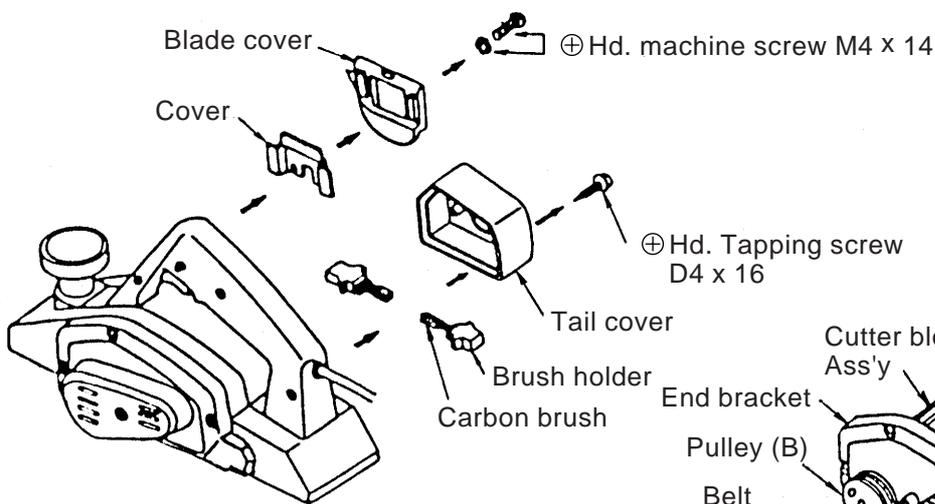


Fig. 4

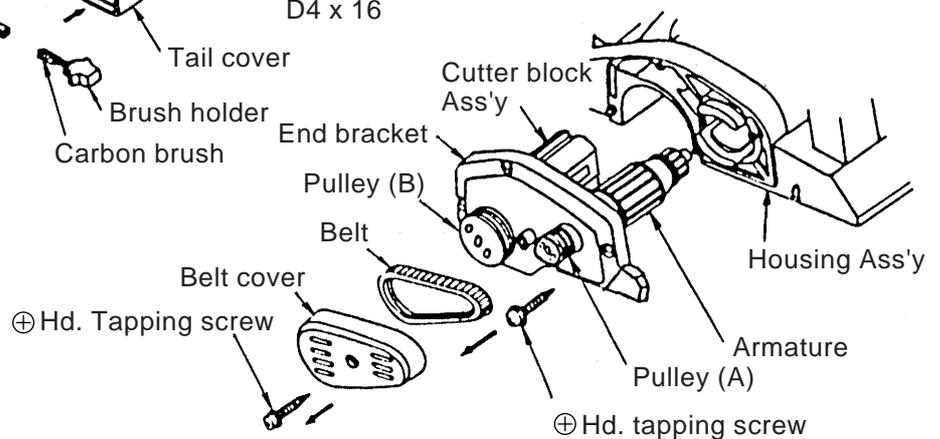


Fig. 5

1-4-2. Pulley (A) and Pulley (B) Disassembly (See Figs. 6 and 7)

- (1) Slightly lift the Belt [44], and remove it from the pulleys by rotating them manually.
- (2) Pulley (A) [46] (right-hand threaded) and Pulley (B) [45] (left-hand threaded) are screwed onto the armature shaft and the cutter block spindle respectively. To remove Pulley (A), fix the Armature [31] firmly in a vise, and unscrew the pulley in a clockwise direction with a wrench.
- (3) To remove Pulley (B), fix the cutter block firmly in a vise, and unscrew pulley (B) in a counterclockwise direction with the wrench. It is recommended that gloves or a thick rag be used to prevent injury to fingers and hands.

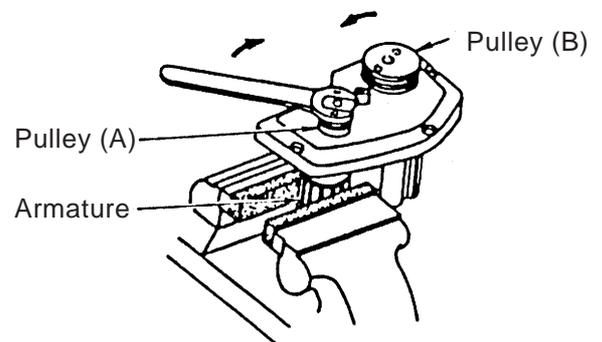


Fig. 6

1-4-3. Front Base Disassembly (See Fig. 7)

Rotate the Knob [5] counterclockwise, and the Front Base [3], Rubber Packing [2], and Spring [1] can then be disassembled.

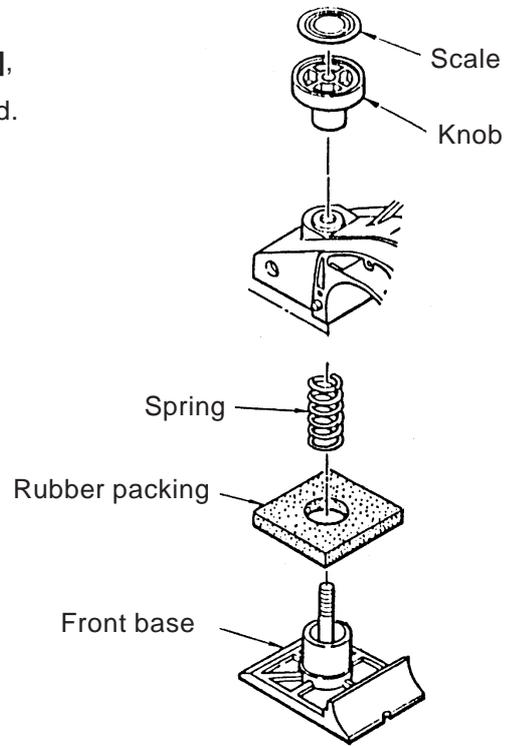


Fig. 7

1-4-4. Stator Ass'y Disassembly for Model P 20SA2 (See Figs. 8 and 9)

- (1) After the Armature has been removed, loosen the three M4 x 25 ⊕ -Hd. Tapping Screws [42] and remove the Handle Cover [48].
- (2) Loosen the two M4 x 65 Hex. Hd. Tapping Screws [32] which retain the two stator lead wires on the Switch [50] and disconnect the lead wires. Then, loosen the four D4 x 16 ⊕ -Hd. Tapping Screws [41] which secure the Rear Base [40] and remove the Rear Base [40] and the Plate [38]. Finally, pull the two stator lead wires out from the handle section of the housing to permit easy removal of the stator.
- (3) After removing the stator Brush Terminals [34] from the Brush Holders [9], loosen the two M4 x 65 Hex. Hd. Tapping Screws [32] that secure the Stator Ass'y [33] to the Housing Ass'y [7]. Next, turn the end bracket connection side of the housing ass'y downward. Then, by lightly tapping the side surface with a wooden or plastic hammer while pushing the lead wires into the housing, the Stator Ass'y [33] will slide easily out of the Housing Ass'y [7].

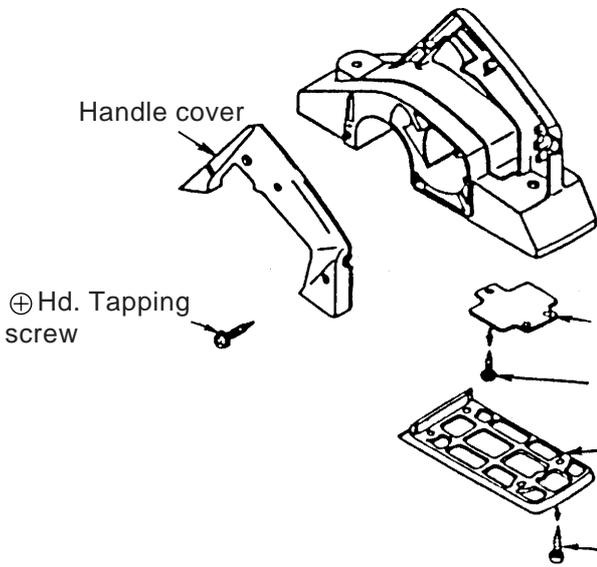


Fig. 8

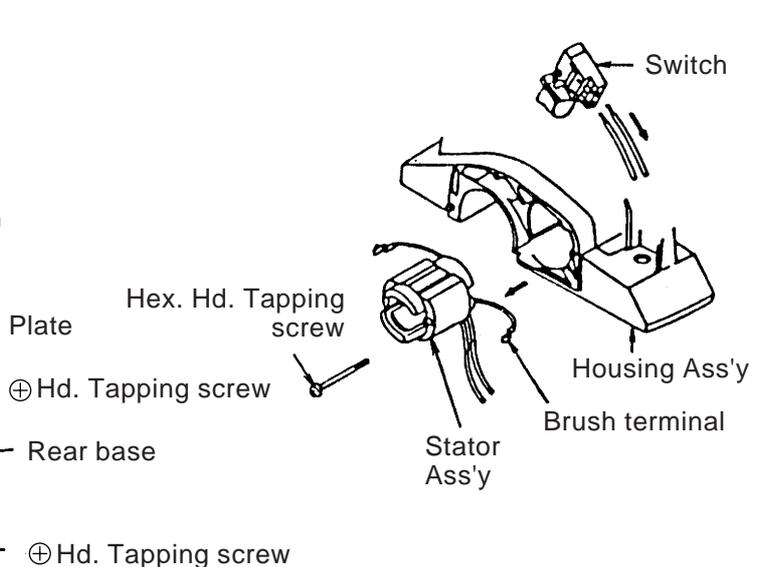


Fig. 9

1-5. Reassembly

Perform reassembly in the reverse order of disassembly.

1-6. Screw Tightening Torque

D4 Tapping Screw [16],[32],[39],[41],[42],[57]	2.0 ± 0.5 N·m (20 ± 5 kgf·cm)
M4 Machine Screw [12],[26]	1.8 ± 0.4 N·m (18 ± 4 kgf·cm)
M6 x 18 Bolt [28]	9.8 - 14.7 N·m (100 - 150 kgf·cm)

1-7. Wiring Diagrams

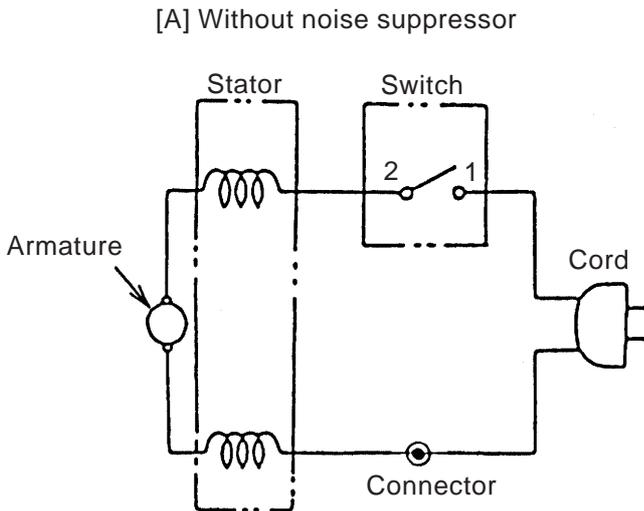


Fig. 10

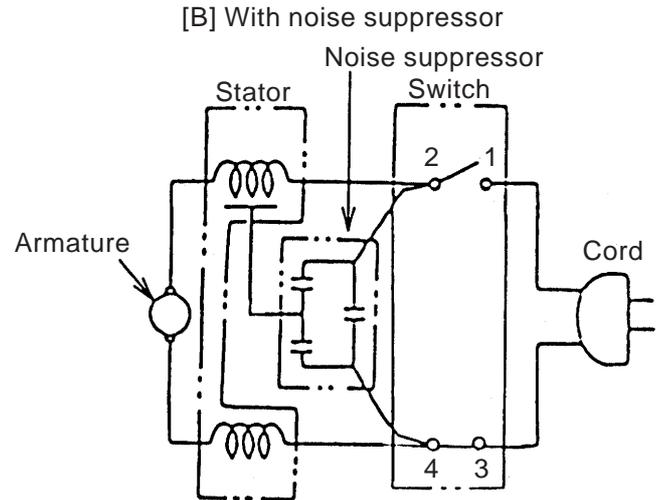


Fig. 11

1-8. Insulation Test

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

Insulation resistance: 7MΩ or more with DC 500V 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 U.K. products)

1-9. No-Load Current Values

After no-load operation for 30 minutes, the no-load current values should be as follows.

Voltage (V)	110	115	127	220	230	240
Current (A) Max.	3.9	3.8	3.4	2.0	1.8	1.7

2. STANDARD REPAIR TIME (UNIT) SCHEDULES

MODEL	Variable		10	20	30	40	50	60 min.
	Fixed							
P 20SA2	General Assembly	Work Flow						
			Front Base Knob					
			Rear Base					
			Belt Pulley (A) Pulley (B)	Armature Cutter Block Ass'y Ball Bearing x 4				
				Stator Ass'y		Housing Ass'y		
			Switch Cord					
			Blades Blade Holder Bolt					