

MODEL

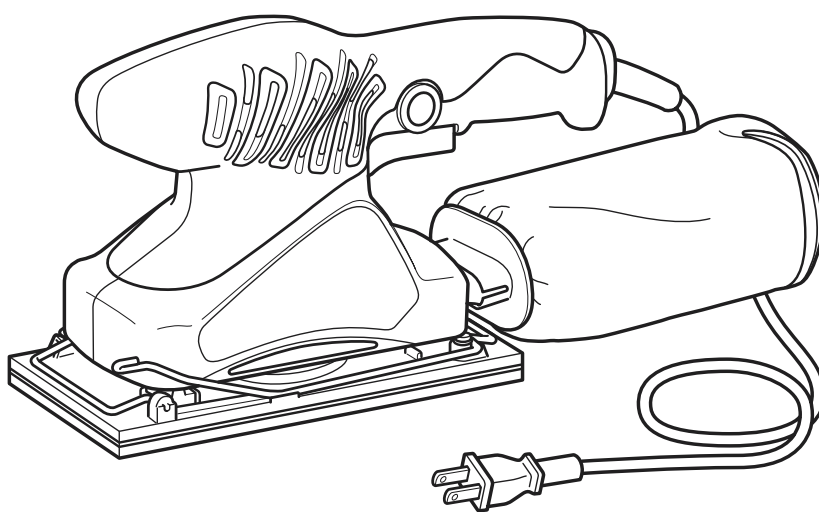
FSV 10SA

Hitachi Power Tools

**ORBITAL SANDER
FSV 10SA**

**TECHNICAL DATA
AND
SERVICE MANUAL**

F



LIST No. G827

May 2005

REMARK:

Throughout this TECHNICAL DATA AND SERVICE MANUAL, a symbol(s) is(are) used in the place of company name(s) and model name(s) of our competitor(s). The symbol(s) utilized here is(are) as follows:

Symbols Utilized	Competitors	
	Company Name	Model Name
B	BOSCH	PSS180A
C	MAKITA	M926

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1. PRODUCT NAME

Hitachi Orbital Sander, Model FSV 10SA

2. MARKETING OBJECTIVE

The Models FS 10SA and FS 10SB orbital sanders have been on the market for 15 years. To meet a demand for a remodeled one, we now offer totally renewed design for increased competitiveness and expanded sale.

The Model FSV 10SA has been developed to upgrade and replace the current Models FS 10SA and FS 10SB.

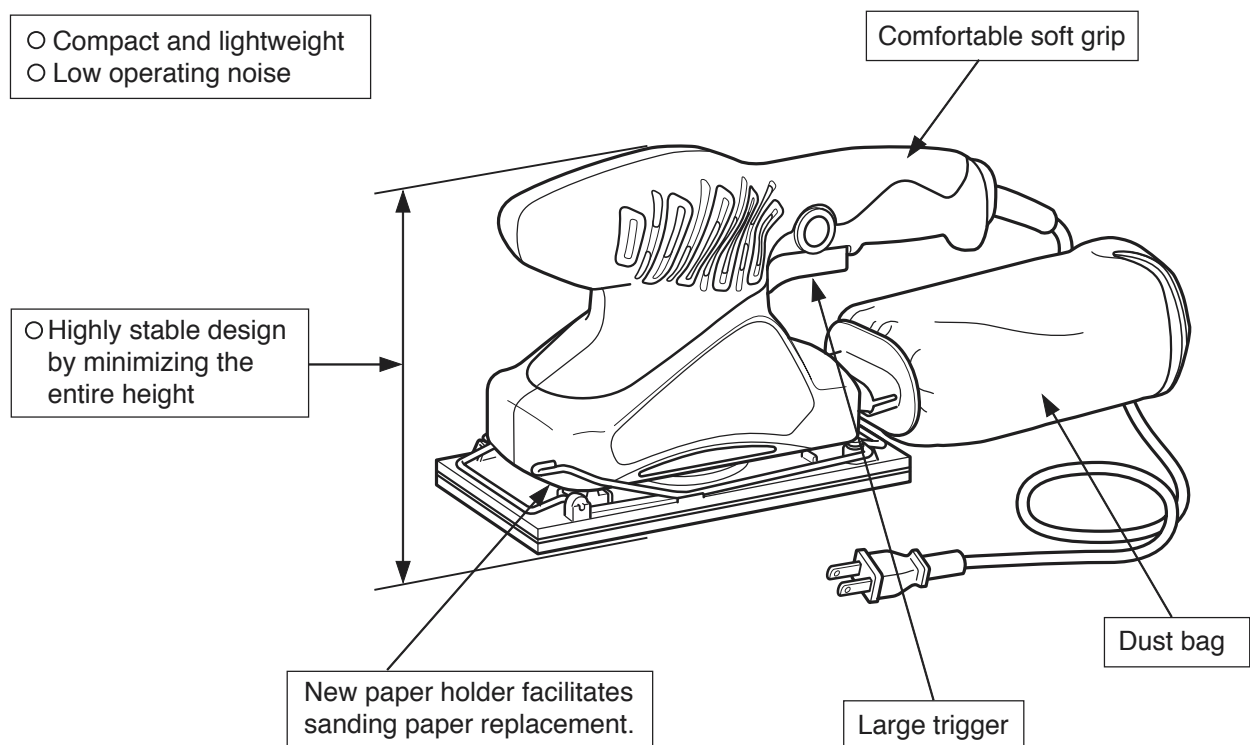
The key features of the Model FSV 10SA are as follows:

- (1) High power and class-top sanding amount
- (2) Class-top dust collecting performance
- (3) All new design. The large soft grip comfortably fits in the palm of a hand for ease of operation.

3. APPLICATIONS

- Finish polishing of woodwork surface
- Sanding surface of woodwork or sheet metal prior to painting etc.

4. SELLING POINTS



4-1. Selling Point Descriptions

(1) Compact and lightweight

The entire height of the Model FSV 10SA is as low as 147 mm. It facilitates stable sanding operation near the surface to be sanded. The Model FSV 10SA weighs 1.3 kg and it is easy to handle.

(2) Low operating noise

The Model FSV 10SA is comfortably operable thanks to the lower operating noise than the conventional Model FS 10SA2.

(3) New paper holder facilitates sanding paper replacement

The new spring steel wire paper holder facilitates sanding paper replacement.

(4) Large trigger

The large switch trigger facilitates turning on/off operation.

(5) Comfortable soft grip

The soft grip handle minimizes vibration transmitted to the operator's hand.

(6) Dust bag

The Model FSV 10SA is equipped with a dust bag and no dust is scattered to the workplace. The dust bag can be easily emptied of dust by opening the zipper. As the dust bag is removable and washable, the user can wash the dust bag if stained heavily.

(7) Variety of accessories

- Three grain sizes (#60, #100 and #150) of sanding paper are provided two pieces each.
- A punch plate is provided to simply punch holes in a commercially available no-hole sanding paper.

5. SPECIFICATIONS

5-1. Specifications

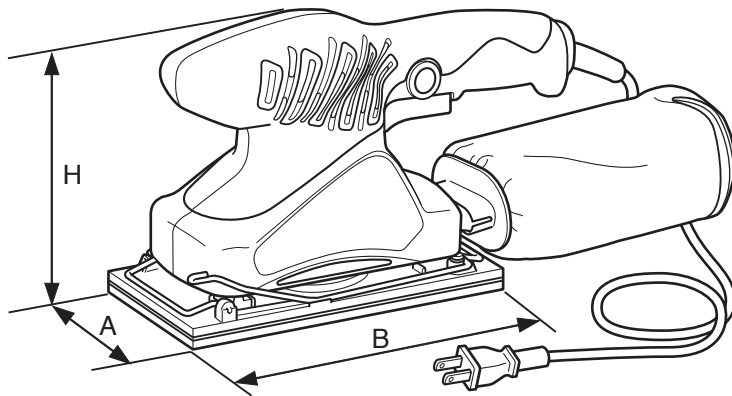
Item		Specifications					
Sanding pad size		92 mm x 184 mm					
Sanding paper size		93 mm x 228 mm					
Orbital diameter		2 mm					
Type of motor		AC single phase commutator motor					
Enclosure	Material	Housing: Polycarbonate + Elastomeric					
		Base: Polycarbonate					
	Color	Housing: Moss green + Black					
		Base: Black					
Type of switch		Trigger switch (With a stopper)					
Voltage, current and power input		Voltage	110 V	120 V	220 V	230 V	240 V
		Current	1.8 A	1.7 A	0.85 A	0.82 A	0.78 A
		Power input	180 W				
No-load speed		10,000 min ⁻¹					
Weight	Net*(excludes cord)	1.3 kg					
	Gross	1.8 kg					
Style of packing		Corrugated cardboard box					
* Standard accessories		○ Sanding paper: #60, #100, #150 (2 pcs. each) ○ Dust bag: 1 pc. ○ Punch plate: 1 pc.					

*: Depends on the market.

6. COMPARISONS WITH SIMILAR PRODUCTS

Item			HITACHI		B	C
			FSV 10SA	FS 10SA/FS 10SB		
Name plate and catalog specifications	Sanding pad size	mm	92 x 184		92 x 184	92 x 184
	Sanding paper size	mm	93 x 228		93 x 228	93 x 228
	Orbital diameter	mm	2		1.8	2
	Power input	W	180		180	180
	No-load speed	min ⁻¹	10,000		12,000	10,000
	Weight	kg	1.3	1.4	1.5	1.4
No-load noise level		dB	77	78	79	73
Max. output		W	86	86	97	76
Dust-collecting equipment			Bag of cloth	—	Packing (Resin + Paper)	Bag of cloth
Main body size (A x B x H)		mm	92 x 184 x 147	92 x 184 x 163	92 x 184 x 156	92 x 184 x 156
Standard accessories *1			<ul style="list-style-type: none"> ○Sanding paper #60, #100, #150 (2 pcs. each) ○Dust bag ○Punch plate 	<ul style="list-style-type: none"> ○Sanding paper #60, #100, #150 (1 pc. each) 	<ul style="list-style-type: none"> ○Sanding paper #120 (1 pc.) ○Dust bag 	<ul style="list-style-type: none"> ○Sanding paper #60, #120, #240 (2 pcs. each) ○Dust bag

*1: Depends on the market.



7. PRECAUTIONS IN SALES PROMOTION

In the interest of promoting the safest and most efficient use of the Model FSV 10SA Orbital Sander by all of our customers, it is very important that at the time of sale the salesperson carefully ensures that the buyer seriously recognizes the importance of the contents of the Handling Instructions, and fully understands the meaning of the precautions listed on the nameplate attached to each tool.

7-1. Handling Instructions

Although every effort is made in each step of design, manufacture and inspection to provide protection against safety hazards, the dangers inherent in the use of any electric tool cannot be completely eliminated. Accordingly, general precautions and suggestions for the use of the hand shear are listed in the Handling Instructions to enhance the safe, efficient use of the tool by the customer. Salespersons must be thoroughly familiar with the contents of the Handling Instructions to be able to offer appropriate guidance to the customer during sales promotion.

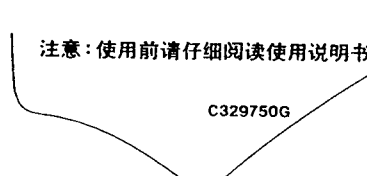
7-2. Caution Plate

The following precautions are listed on the caution plate attached to the main body of each Model FSV 10SA.

(1) For New Zealand and Australia



(2) For China



7-3. Related Regulations

There are regulation about "short circuit interception equipment for electric shock prevention" which is the 333rd article of the labor safe health rule based on PSE (Electric safe method), labor security and hygiene law, etc. among the regulations about an electric tool at large. For details, please refer to the electric tool regulation description separately.

7-4. Dust Collecting Function

In order to maintain the dust collecting function finely, instruct the customer to empty the attached dust bag after use. If dust is kept left in the dust bag, dust may be hardened in the bag and it may be impossible to collect dust in the next operation. Note that dust cannot be perfectly collected in the sanding operation. This phenomenon is common to all existing orbital sanders. Instruct the customer to use a dust protection mask in such a case.

8. 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.

8-1. Disassembly

To disassemble Housing (A). (B) Set **[4]**, remove the Pad (Pressure Sensitive Type, Perforated) **[38]**, Base **[37]**, Fan Guide **[31]** and Balance Fan **[27]** first according to the following procedure.

- (1) Remove the four Seal Lock Screws M4 x 10 **[39]** and remove the Pad (Pressure Sensitive Type, Perforated) **[38]**.
- (2) Pull the Base **[37]** downward. Be careful not to lose the Felt **[33]** mounted to the Base **[37]**.
- (3) Remove the two Tapping Screws (W/Flange) D4 x 16 **[32]** and remove the Fan Guide **[31]**.
- (4) Stop turning the fan of the Balance Fan **[27]** with a screwdriver and loosen the Seal Lock Flat Hd. Screw M4 x 12 **[30]**. Because adhesive is applied to the Seal Lock Flat Hd. Screw M4 x 12 **[30]** to prevent loosening, carefully insert a screwdriver into the driver groove when loosening the Seal Lock Flat Hd. Screw M4 x 12 **[30]**. Then remove the Seal Lock Flat Hd. Screw M4 x 12 **[30]** together with the Washer **[29]**. Remove the Ball Bearing 6001VVCMP2L **[28]** and the Balance Fan **[27]**.
- (5) Loosen the five Tapping Screws (W/Flange) D4 x 20 (Black) **[2]**. Then housing (B) can be removed from Housing (A). (B) Set **[4]**.
- (6) Cut each wire of the Stator **[22]**, Noise Suppressor **[5]** and Cord **[12]** near the connectors.
- (7) Disconnect each internal wire of the Stator **[22]**.

8-2. Reassembly

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

○ Mounting the Armature **[25]** and the Stator **[22]**

- (1) Press-fit the Armature **[25]** into the Ball Bearing 608VVC2PS2L **[26]** and the Ball Bearing 626VVC2PS2L **[21]** until they contact the stepped portions of the shaft.
- (2) Put the Armature **[25]** in the Stator **[22]**.
- (3) Put the Stator **[22]** and the Armature **[25]** together in housing (A) of Housing (A). (B) Set **[4]** and check that the Armature **[25]** turns lightly.

○ Mounting the Carbon Brush (1 Pair) **[24]**

Be sure to connect the Internal Wire (Black) **[8]** coming from the upper left of the Stator **[22]** to the right Carbon Brush **[24]**, and the Internal Wire (Black) **[19]** coming from the lower right of the Stator **[22]** to the left Carbon Brush **[24]**. (If connected conversely, it is very dangerous because the motor turns in reverse and the screws become loose.)

○ Put the Leg **[35]** in the proper direction.

- Be careful not to disconnect, slacken or catch the internal wires when mounting housing (B) to Housing (A). (B) Set **[4]**.

- Mount the Balance Fan [27] to the shaft of the Armature [25] aligning the flat portion of the Balance Fan [27] with the flat portion of the shaft.
- Mount the Ball Bearing 6001VVCMP2L [28] to the Balance Fan [27] and put the Washer [29] on it. Stop turning the fan of the Balance Fan [27] with a screwdriver and tighten the Seal Lock Flat Hd. Screw M4 x 12 [30] to secure it.
- Secure the Fan Guide [31] with the Tapping Screw (W/Flange) D4 x 16 [32].

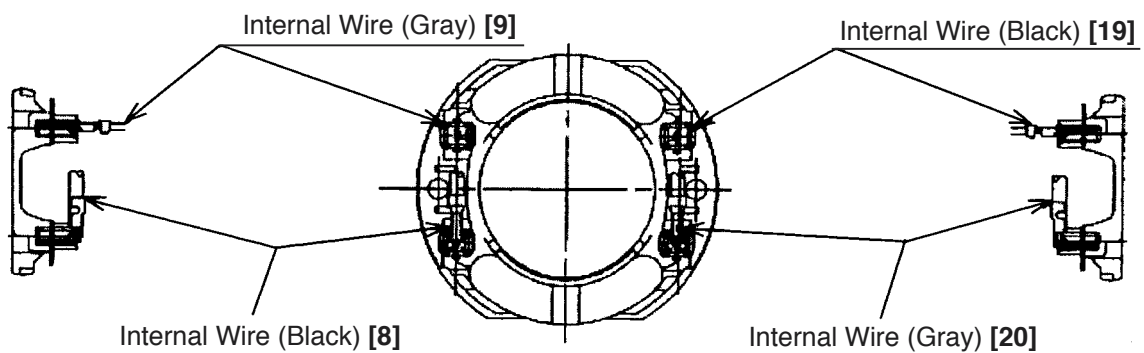
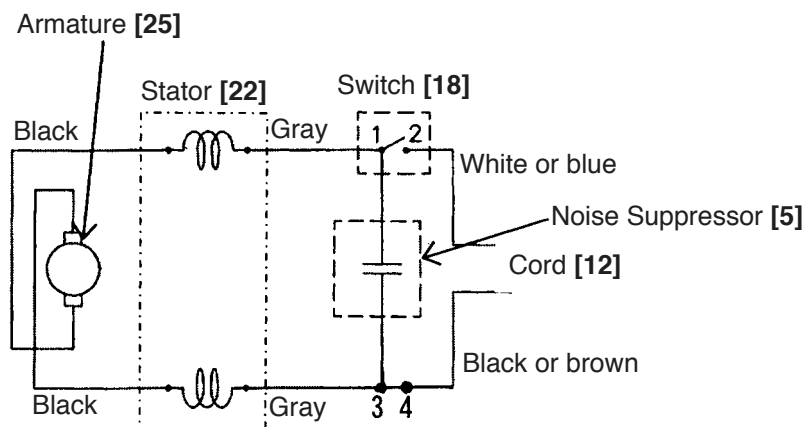
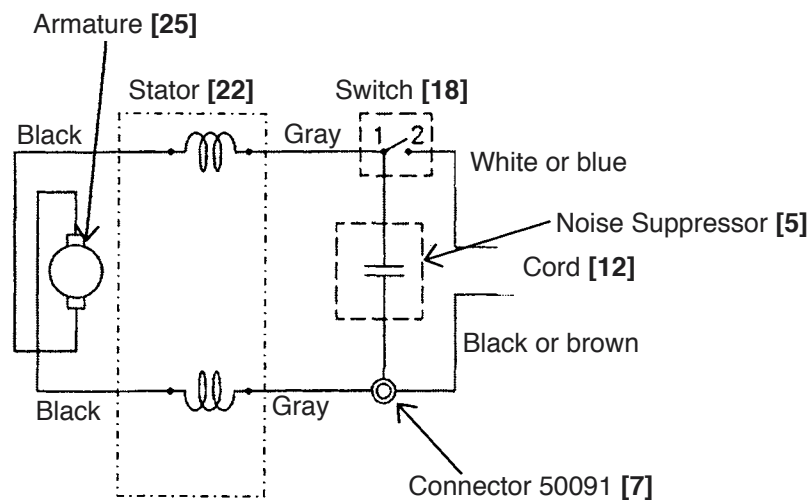
8-3. Tightening Torque

- Tapping Screw D4 1.96 ± 0.5 N·m {20 ± 5 kgf·cm}
- Machine Screw M4 1.8 ± 0.4 N·m {18 ± 4 kgf·cm}
- Seal Lock Flat Hd. Screw M4 1.8 ± 0.4 N·m {18 ± 4 kgf·cm}

8-4. Wiring Diagram

Wiring is performed as follows.

1 and 2 of the wiring diagram indicate the terminal numbers of the switch.



8-5. Insulation Tests

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

○ Insulation resistance: 7 M Ω or more

○ Dielectric strength: 2,500 V/1 minute

For details, please refer to the "insulated performance column of an electric safe method" (P. 14) of "an electric tool and an air tool related regulation description collection" (the 4th edition) with separate attachment.

8-6. No-load Current Value

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

Voltage (V)	110 V	120 V	220 V	230 V	240 V
Current (A) max.	1.5	1.45	0.75		

9. STANDARD REPAIR TIME (UNIT) SCHEDULES

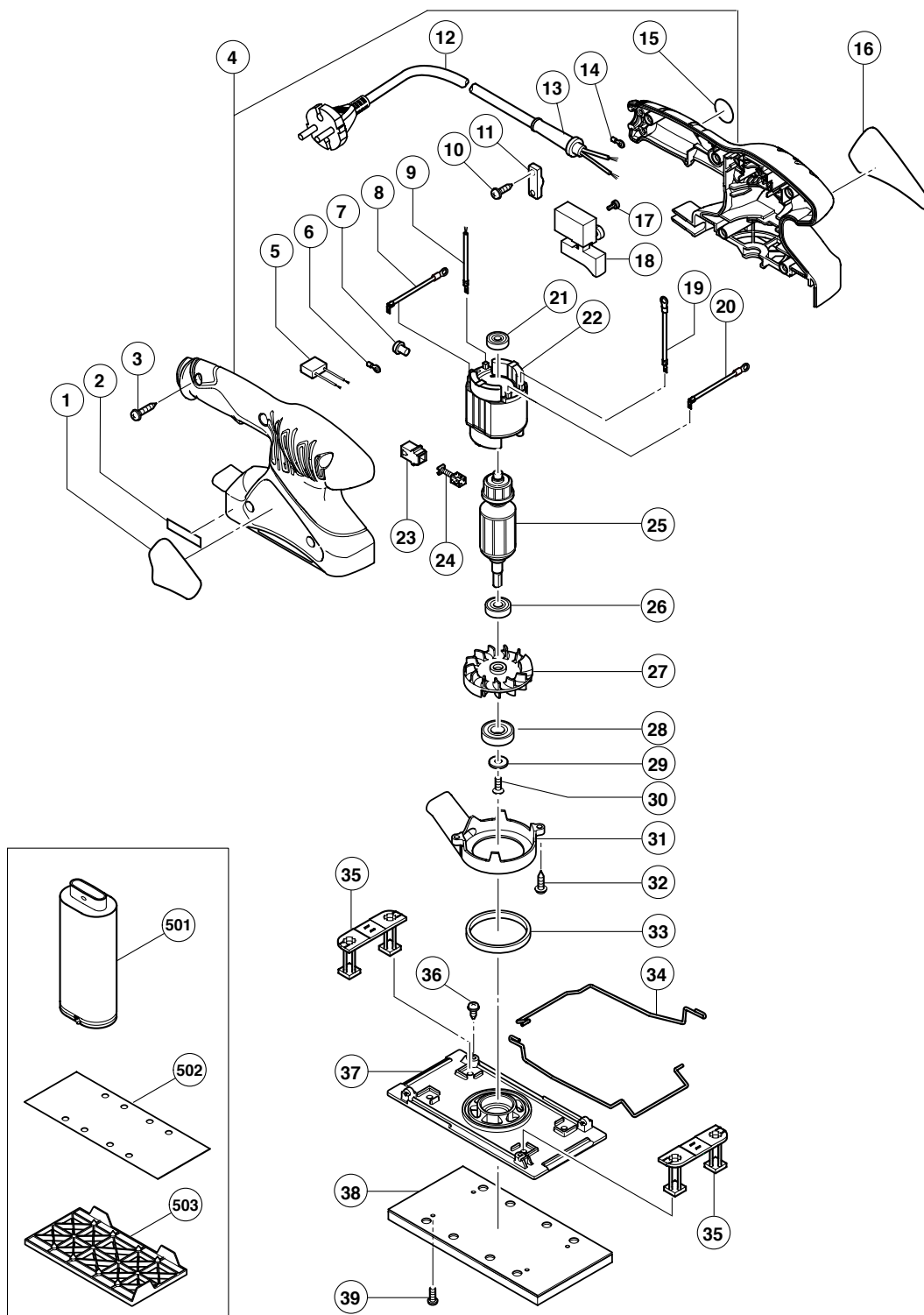
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ELECTRIC TOOL PARTS LIST

■ ORBITAL SANDER Model FSV 10SA

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(E1)



PARTS

FSV 10SA

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
1		NAME PLATE	1		
* 2		LABEL	1	FOR KUW	
3	301-653	TAPPING SCREW (W/FLANGE) D4X20 (BLACK)	5		
* 4	324-516	HOUSING (A).(B) SET	1		
* 4	324-559	HOUSING (A).(B) SET	1	FOR GBR, EUROPE, AUT	
* 5	930-039	NOISE SUPPRESSOR	1	FOR NZL, AUS, CHN, KOR, GBR, EUROPE, AUT	
* 6	980-063	TERMINAL	1	FOR NOISE SUPPRESSOR	
* 7	959-140	CONNECTOR 50091 (10 PCS.)	1	EXCEPT FOR SIN, KUW, CHN, KOR	
8	323-321	INTERNAL WIRE (BLACK)	1		
* 9	318-203	INTERNAL WIRE (GRAY)	1		
* 9	324-515	INTERNAL WIRE (GRAY)	1	FOR SIN, KUW, CHN, KOR	
* 10	984-750	TAPPING SCREW (W/FLANGE) D4X16	2	EXCEPT FOR THA	
* 11	960-266	CORD CLIP	1	EXCEPT FOR THA	
* 12	500-245Z	CORD	1	(CORD ARMOR D10.2)	
* 12	500-423Z	CORD	1	(CORD ARMOR D8.2) FOR SIN, KUW	
* 12	500-409Z	CORD	1	(CORD ARMOR D8.2) FOR INA, IND, EUROPE, AUT	
* 12	500-201Z	CORD	1	FOR VEN,THA	
* 12	500-439Z	CORD	1	(CORD ARMOR D8.2) FOR NZL, AUS	
* 12	500-435Z	CORD	1	(CORD ARMOR D8.2) FOR HKG, GBR	
* 12	500-468Z	CORD	1	(CORD ARMOR D8.2) FOR CHN	
* 12	500-234Z	CORD	1	(CORD ARMOR D8.2) FOR KOR	
* 13	930-487	CORD ARMOR D8.2	1		
* 13	930-026	CORD ARMOR D10.2	1		
* 14	980-063	TERMINAL	1	FOR CORD	
* 14	960-356	TERMINAL (A) M3.5 (10 PCS.)	1	FOR CORD	
* 15		SEAL	1	FOR CHN	
16		HITACHI LABEL	1		
* 17	307-887	MACHINE SCREW (W/WASHER) M3.5X6	2		
* 17	307-887	MACHINE SCREW (W/WASHER) M3.5X6	4	FOR SIN, KUW, CHN, KOR, GBR, EUROPE, AUT	
18	323-324	SWITCH (1P SCREW TYPE) W/LOCK	1		
19	323-322	INTERNAL WIRE (BLACK)	1		
20	323-323	INTERNAL WIRE (GRAY)	1		
21	626-VVM	BALL BEARING 626VVC2PS2L	1		
* 22	987-044C	STATOR 110V	1		
* 22	987-044E	STATOR 220V-230V	1		
* 22	987-044F	STATOR 230V-240V	1	FOR KUW, AUS	
23	930-483	BRUSH HOLDER	2		
24	999-041	CARBON BRUSH (1 PAIR)	2		
* 25	360-681C	ARMATURE 110V	1		
* 25	360-681E	ARMATURE 220V-230V	1		
* 25	360-681F	ARMATURE 240V	1		
26	608-VVM	BALL BEARING 608VVC2PS2L	1		
27	323-316	BALANCE FAN	1		
28	600-1VV	BALL BEARING 6001VVCMP2L	1		
29	987-169	WASHER	1		
30	993-244	SEAL LOCK FLAT HD. SCREW M4X12	1		
31	323-317	FAN GUIDE	1		
32	984-750	TAPPING SCREW (W/FLANGE) D4X16	2		
33	311-946	FELT	1		
34	323-319	PAPER HOLDER	2		
35	322-756	LEG	2		

PARTS

FSV 10SA

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STANDARD ACCESSORIES

FSV 10SA

[illegible]

OPTIONAL ACCESSORIES

[illegible]

