



OPERATOR'S MANUAL FOR LOW PROFILE 12,000 RPM 5 in. (127 mm) and 6 in. (150 mm) RANDOM ORBITAL SANDERS

Declaration of conformity
DIXON ENTERPRISES, INC.
571 BIRCH STREET LAKE ELSINORE, CA 92530
declare on our sole responsibility that the products
5 in. and 6 in. Random Orbital Sanders (See "Product Configuration/Specifications" Table for particular Model) to which this declaration relates is in conformity with the following standard(s) or other normative document(s) EN ISO 15744:2008. Following the provisions of 89/392/EEC as amended by 91/368/EEC & 93/44/EEC 93/68/EEC Directives and consolidating Directive 2006/42/EC

03.20.2013 **Meri Faria** *Meri Faria*

Place and date of issue Name Signature or equivalent marking of authorized person

<p>Operator Instructions</p> <p>Includes – Please Read and Comply, Proper Use of Tool, Warranty, Product Configuration and Specifications Table, Parts Page, Parts List, Work Stations, Putting the Tool Into Service, Operating Instructions and Compressor Layout, Back-Up Pads, Service Tools and Accessories, Overhaul Service Kit, Spare Part Kits, Service Instructions.</p>	<p>Important</p> <p>Read these instructions carefully before installing, operating, servicing or repairing this tool. Keep these instructions in a safe accessible location.</p>	
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<p>Manufacturer/Supplier DIXON ENTERPRISES, INC. 571 BIRCH STREET LAKE ELSINORE, CA 92530 Tel: 951-245-4200 Fax: 951-245-4299</p>	<p style="text-align: center;">Required Personal Safety Equipment</p> <p>Safety Glasses Breathing Masks</p> <p>Safety Gloves Ear Protection</p>
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<p>Recommended Airline Size - Minimum</p> <p>10 mm 3/8 in</p>	<p>Recommended Maximum Hose Length</p> <p>8 meters 25 feet</p>	<p style="text-align: center;">Air Pressure</p> <p>Maximum Working Pressure 6.2 bar 90 psig Recommended Minimum NA NA</p>
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Please Read and Comply with:

- 1) General Industry Safety & Health Regulations, Part 1910, OSHA 2206, available from: Superintendent of Documents; Government Printing Office; Washington DC 20402
- 2) Safety Code for Portable Air Tools, ANSI B186.1 available from: American National Standards Institute, Inc.; 1430 Broadway; New York, New York 10018
- 3) State and Local Regulations.

Proper Use of Tool

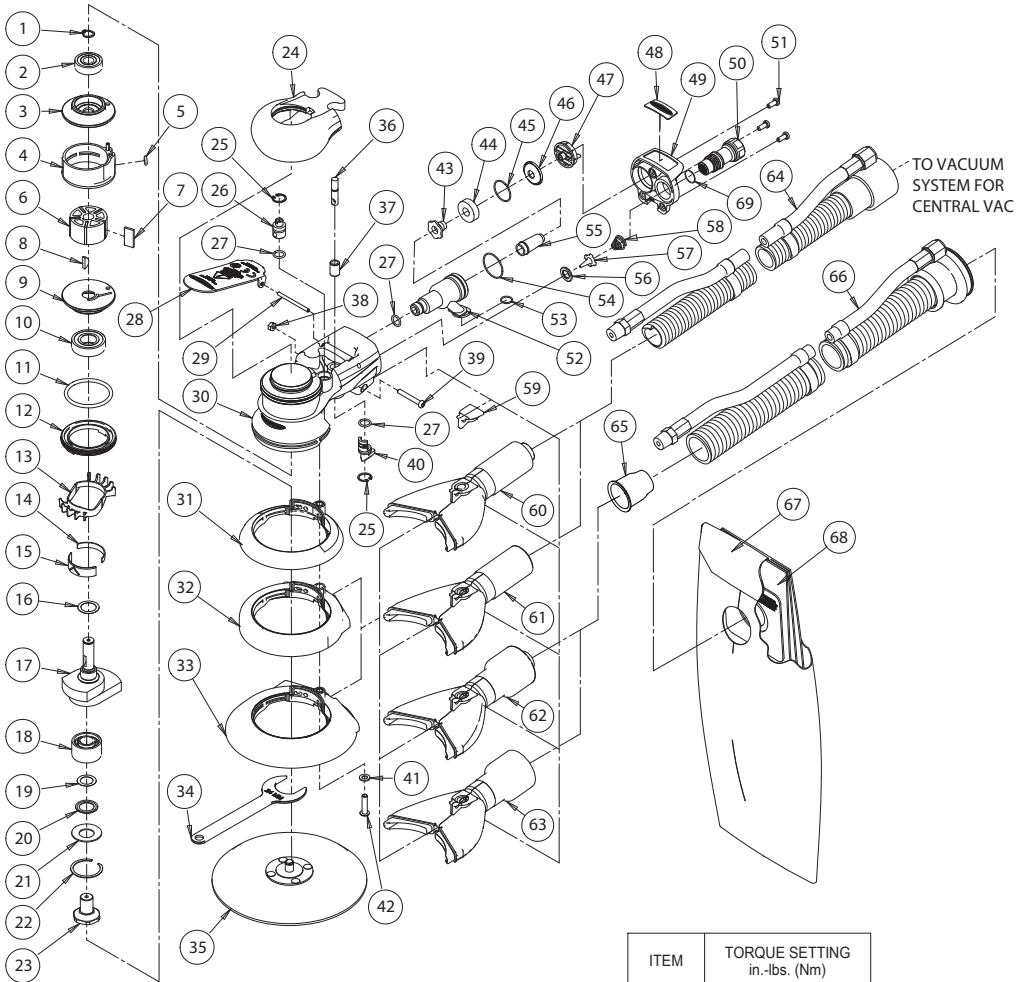
This sander is designed for sanding all types of materials i.e. metals, wood, stone, plastics, etc. using abrasive designed for this purpose. Do not use this sander for any other purpose than that specified without consulting the manufacturer or the manufacturer's authorized supplier.

Do not use back-up pads that have a working speed less than 12,000 RPM free speed. Never use back-up pads that have a weight and/or size different than the machine was specifically designed for.

Warranty

All SurfPrep™ Random Orbital Sanders are warranted for defects in materials or workmanship for one year from the date of delivery to the user. Combined with the SurfPrep™ name, this Warranty expresses our total confidence in the superior quality, durability, and performance of the SurfPrep™ LP. To receive any expressed or implied warranty, tool must be repaired by an authorized SurfPrep™ Service Center. The "Service Instructions" section in this document is provided for use after completion of the warranty period. To receive warranty, tools must be operated under the conditions as described in the "Putting the Tools into Service" section of this document and be connected to an air supply system as shown in Figure 1. Tools that have been exposed to extreme conditions will be covered under warranty at the sole discretion of SurfPrep™

Parts Page



ITEM	TORQUE SETTING in.-lbs. (Nm)
12	55 - 65 (6.2 - 7.3)
16	30 - 35 (3.4 - 3.9)
42	26.0 (2.9)
51	8.7 (1.0)
57	16 - 20 (1.8 - 2.3)

Parts List

Item No.	Part No.	Description	Qty.
1	SPA0040	EXTERNAL RETAINING RING	1
2	SPA0021	10X26X8 BEARING - 2 SHIELDS	1
3	SPB0017	REAR ENDPLATE	1
4	SPA0005	20 mm CYLINDER ASSEMBLY	1
5	SPA0042	5 mm X 2.0mm O-RING	1
6	SPB0005	MACHINED ROTOR	1
7	SPA0010	VANE	5
8	SPA0041	3mm X 13mm WOODRUFF KEY	1
9	SPG0001	FRONT ENDPLATE	1
10	SP50059	15 X 32 X 9 BEARING - 2 SHIELDS	1
11	SPA0045	39.4 mm X 3.1 mm O-RING	1
12	SPF0002	LOCK RING	1
13	SPG0002	COOLING FAN 5" 6" X 3/32in. 3/16in.	OPT
13	SPG0041	COOLING FAN 5" X 5/16in.	OPT
13	SPG0042	COOLING FAN 6" X 5/16in.	OPT
14	SPF0067	SMALL SPACER-COOLING FAN 5" 6" X 3/32in. 3/16in. 5/16in.	1
15	SPF0068	LARGE SPACER-COOLING FAN 5" 6" X 3/32in. 3/16in.	OPT
15	SPF0069	LARGE SPACER-COOLING FAN 5" X 5/16in.	OPT
15	SPF0070	LARGE SPACER-COOLING FAN 6" X 5/16in.	OPT
16	SPF0020	FRONT BEARING DUST SHIELD	1
17	SPG0004	5 X 3/32 in. ORBIT NON-AirSHIELD Plus TM SHAFT BALANCER	OPT
17	SPG0003	5 X 3/16 in. ORBIT NON-AirSHIELD Plus TM SHAFT BALANCER	OPT
17	SPG0039	5 X 5/16 in. ORBIT NON-AirSHIELD Plus TM SHAFT BALANCER	OPT
17	SPG0006	6 X 3/32 in. ORBIT NON-AirSHIELD Plus TM SHAFT BALANCER	OPT
17	SPG0005	6 X 3/16 in. ORBIT NON-AirSHIELD Plus TM SHAFT BALANCER	OPT
17	SPG0040	6 X 5/16 in. ORBIT NON-AirSHIELD Plus TM SHAFT BALANCER	OPT
18	SPA0938	12 X 28 16 DOUBLE ROW ANGULAR CONTACT BEARING - 1 SEAL	1
19	SPA0016	SPACER 12.1 ID X 18.0 OD X0.2 THK	1
20	SPA2542	SPINDLE BEARING DUST SHIELD	1
21	SPA0017	BELLEVILLE WASFER	1
22	SPA0018	RETAINING RING	1
23	SPB0018	SPINDLE	1
24	SPG0024	GRIP (75mm) PMS 287C	OPT
24	SPG0048	GRIP (69mm) PMS 287C	OPT
25	SPA0039	INTERNAL RETAINING RING	2
26	SPF0001	SPEED CONTROL (PRESET)	1
27	SPA0043	9 mm X 1.5 mm O-RING	3
28	SPF0024	THROTTLE LEVER FOR SurfPrep 12,000 RPM 2.5 mm (3/32 in.) ORBIT SANDER	OPT
28	SPF0022	THROTTLE LEVER FOR SurfPrep 12,000 RPM 5.0 mm (3/16 in.) ORBIT SANDER	OPT
29	SPA0031	LEVER SPRING PIN	1
30	SPG0031	MACHINED HOUSING	1
31	SPH0004	5in. / 6in. NON-VACUUM SHROUD	1
32	SPH0005	5 in. CV.SGV SHROUD	1
33	SPH0006	6 in. CV.SGV SHROUD	1
34	SPA0022	24 mm PAD WRENCH	1
35	NA	1 PAD SUPPLIED WITH EACH TOOL	OPT
36	SPA0008	VALVE STEM ASSEMBLY	1
37	SPA0015	VALVE SLEEVE	1
38	HN2-04CA	M4 NUT	1

Parts List

Item No.	Part No.	Description	Qty.
39	S6-0430A	HEX.SOCKET BUTTON HEAD SCREW (M4x30L)	1
40	SPF0003	SPEED CONTROL	1
41	PW1-050D	PLAIN WASHER (M5 X10)	1
42	S6-0520A	HEX. SOCKET BUTTON HEAD SCREW (M5X20L)	1
43	SPF0008	MUFFLER CAP	1
44	SPF0108	MUFFLER INSERT	1
45	SPF0012	O-RING (20 mm X 1 mm NBR70)	1
46	SPF0009	SGV EXHAUST CAP	1
47	SPF0010	VARIABLE EXHAUST	1
48	SPF0021	LOGO INSERT - END CAP	1
49	SPG0023	END CAP	1
50	SPA2475	INLET BUSHING ASSEMBLY	1
51	S6-0410	HEX.SOCKET BUTTON HEAD SCREW (M4X10L)	3
52	SPG0030	EXHAUST CHAMBER	1
53	SPA2204	9.5 mm X 1.0 mm O-RING	1
54	SPA2484	24 mm X 1.0 mm O-RING	1
55	SPF0013	INTERNAL MUFFLER	1
56	SPA0009	VALVE SEAT	1
57	SPA0007	VALVE	1
58	SPF0094	VALVE SPRING	1
59	SPF0015	NON-VACUUM COVER	1
60	SPG0026	5 in. SGV SWIVEL EXHAUST FITTING - 3/4 in./19mm HOST	OPT
60	SPG0027	6 in. SGV SWIVEL EXHAUST FITTING - 3/4 in./19mm HOST	OPT
61	SPG0028	5 in. CV SWIVEL EXHAUST FITTING - 3/4 in./19mm HOST	OPT
61	SPG0029	6 in. CV SWIVEL EXHAUST FITTING - 3/4 in./19mm HOST	OPT
62	SPG0013	5 in. SGV SWIVEL EXHAUST FITTING - 1 in./28mm HOST	OPT
62	SPG0015	6 in. SGV SWIVEL EXHAUST FITTING - 1 in./28mm HOST	OPT
63	SPG0014	5 in. CV SWIVEL EXHAUST FITTING - 1 in./28mm HOST	OPT
63	SPG0016	6 in. CV SWIVEL EXHAUST FITTING - 1 in./28mm HOST	OPT
64	SPA0300	Ø 3/4 in. VAC HOSE TO Ø 3/4 in. x 1 in./28 mm ADAPTER COUPLING AND AIRLINE ASSEMBLY	OPT
64	SPA0392	Ø 1 in. VAC HOSE TO Ø 1 in./28 mm x 1 1/2 in. ADAPTER COUPLING AND AIRLINE ASSEMBLY	OPT
65	SPA0778	1 in./28 mm HOSE SEAL	1
66	SPA0412	Ø 3/4 in. VAC HOSE TO DOUBLE BAG FITTING AND AIRLINE ASSEMBLY	OPT
66	SPA0411	Ø 1 in. VAC HOSE TO DOUBLE BAG FITTING AND AIRLINE ASSEMBLY	OPT
67	SPC0110	VACUUM BAG	1
68	SPC0109	VACUUM BAG INSERT	1
69	SPA0044	14.0x1.5 O-RING	1

Product Configuration/Specifications: 12,000 RPM ROS

Orbit	Pad Face	Vacuum Type	Pad Type	Pad Size in. (mm)	Model Number.	Product Net Weight Pound (kg)	Height in. (mm)	Length in. (mm)	Power HP (watts)	Air Consumption scfm (LPM)	*Noise Level dBA	*Vibration Level m/s ²	*Uncertainty K m/s ²
3/32 in. (2.5 mm)	Vinyl	Non-Vacuum	Low Profile	5 in. (127)	SP051200	1.84 (0.83)	3.9 (100.6)	7.0 (178)	.28 (209)	17 (481)	77.5	1.91	0.68
				6 in. (150)	SP061200	1.91 (0.86)	3.9 (100.6)	7.4 (189)	.28 (209)	17 (481)	77.0	2.19	0.71
		Central Vacuum	Low Profile	5 in. (127)	SP051234	1.96 (0.89)	3.9 (100.6)	9.0 (231)	.28 (209)	17 (481)	76.5	1.79	0.67
				6 in. (150)	SP061234	2.06 (0.93)	3.9 (100.6)	9.5 (242)	.28 (209)	17 (481)	75.0	2.40	0.73
		Self-Gen Vacuum	Low Profile	5 in. (127)	SP051267	1.98 (0.90)	3.9 (100.6)	9.4 (239)	.28 (209)	17 (481)	83.5	2.15	0.71
				6 in. (150)	SP061267	2.08 (0.94)	3.9 (100.6)	9.8 (250)	.28 (209)	17 (481)	82.5	2.20	0.71
	Hook	Non-Vacuum	Low Profile	5 in. (127)	SP051202	1.84 (0.83)	3.9 (100.6)	7.0 (178)	.28 (209)	17 (481)	77.5	1.91	0.68
				6 in. (150)	SP061202	1.91 (0.86)	3.9 (100.6)	7.4 (189)	.28 (209)	17 (481)	77.0	2.19	0.71
		Central Vacuum	Low Profile	5 in. (127)	SP051236	1.96 (0.89)	3.9 (100.6)	9.0 (231)	.28 (209)	17 (481)	76.5	1.79	0.67
				6 in. (150)	SP061236	2.06 (0.93)	3.9 (100.6)	9.5 (242)	.28 (209)	17 (481)	75.0	2.40	0.73
		Self-Gen Vacuum	Low Profile	5 in. (127)	SP051269	1.98 (0.90)	3.9 (100.6)	9.4 (239)	.28 (209)	17 (481)	83.5	2.15	0.71
				6 in. (150)	SP061269	2.08 (0.94)	3.9 (100.6)	9.8 (250)	.28 (209)	17 (481)	82.5	2.20	0.71
3/16 in. (5.0 mm)	Vinyl	Non-Vacuum	Low Profile	5 in. (127)	SP051300	1.88 (0.85)	3.9 (100.6)	7.0 (178)	.28 (209)	17 (481)	76.0	2.79	0.77
				6 in. (150)	SP061300	1.97 (0.89)	3.9 (100.6)	7.4 (189)	.28 (209)	17 (481)	76.0	2.92	0.78
		Central Vacuum	Low Profile	5 in. (127)	SP051334	2.00 (0.90)	3.9 (100.6)	9.0 (231)	.28 (209)	17 (481)	77.0	2.64	0.76
				6 in. (150)	SP061334	2.12 (0.96)	3.9 (100.6)	9.5 (242)	.28 (209)	17 (481)	76.0	1.99	0.69
		Self-Gen Vacuum	Low Profile	5 in. (127)	SP051367	2.02 (0.91)	3.9 (100.6)	9.4 (239)	.28 (209)	17 (481)	84.0	2.51	0.74
				6 in. (150)	SP061367	2.14 (0.97)	3.9 (100.6)	9.8 (250)	.28 (209)	17 (481)	82.5	2.08	0.70
	Hook	Non-Vacuum	Low Profile	5 in. (127)	SP051302	1.88 (0.85)	3.9 (100.6)	7.0 (178)	.28 (209)	17 (481)	76.0	2.79	0.77
				6 in. (150)	SP061302	1.97 (0.89)	3.9 (100.6)	7.4 (189)	.28 (209)	17 (481)	76.0	2.92	0.78
		Central Vacuum	Low Profile	5 in. (127)	SP051336	2.00 (0.90)	3.9 (100.6)	9.0 (231)	.28 (209)	17 (481)	77.0	2.64	0.76
				6 in. (150)	SP061336	2.12 (0.96)	3.9 (100.6)	9.5 (242)	.28 (209)	17 (481)	76.0	1.99	0.69
		Self-Gen Vacuum	Low Profile	5 in. (127)	SP051369	2.02 (0.91)	3.9 (100.6)	9.4 (239)	.28 (209)	17 (481)	84.0	2.51	0.74
				6 in. (150)	SP061369	2.14 (0.97)	3.9 (100.6)	9.8 (250)	.28 (209)	17 (481)	82.5	2.08	0.70

The noise test is carried out in accordance with EN ISO 15744:2008 Measurement of noise emission from hand-held non-electric power tools.

The vibration test is carried out in accordance with EN 28662-1. Hand-held portable power tools – Measurement of vibration at the handle. Part 1: General and EN 8662-8, 1997. Hand-held portable power tools – Measurement of vibration at the handle. Part 8: Polishers and rotary orbital and random orbital sanders

Specifications subject to change without prior notice.

*The values stated in the table are from laboratory testing in conformity with stated codes and standards and are not sufficient for risk evaluation. Values measured in a particular work place may be higher than the declared values. The actual exposure values and amount of risk or harm experienced to an individual is unique to each situation and depends upon the surrounding environment, the way in which the individual works, the particular material being worked, work station design as well as upon the exposure time and the physical condition of the user. SurfPrep™ cannot be held responsible for the consequences of using declared values instead of actual exposure values for any individual risk assessment.

Further occupational health and safety information can be obtained from the following websites:
<http://europe.osha.eu.int> (Europe)
<http://www.osha.gov> (USA)

Work Stations

The tool is intended to be operated as a hand held tool. It is always recommended that the tool be used when standing on a solid floor. It can be in any position but before any such use, the operator must be in a secure position having a firm grip and footing and be aware that the sander can develop a torque reaction. See the section "Operating Instructions".

Putting the Tool into Service

Use a clean lubricated air supply that will give a measured air pressure at the tool of 90 psig (6.2 bar) when the tool is running with the lever fully depressed. It is recommended to use an approved 3/8 in. (10 mm) x 25 ft (8 m) maximum length airline. It is recommended that the tool be connected to the air supply as shown in Figure 1.

Do not connect the tool to the airline system without incorporating an easy to reach and operate air shut off valve. The air supply should be lubricated. It is strongly recommended that an air filter, regulator and lubricator (FRL) be used as shown in Figure 1 as this will supply clean, lubricated air at the correct pressure to the tool. Details of such equipment can be obtained from your supplier. If such equipment is not used then the tool should be manually lubricated.

To manually lubricate the tool, disconnect the airline and put 2 to 3 drops of suitable pneumatic motor lubricating oil such as Fuji Kosan FK-20, Mobil ALMO 525 or Shell TORCULA® 32 into the hose end (inlet) of the machine. Reconnect tool to the air supply and run tool slowly for a few seconds to allow air to circulate the oil. If the tool is used frequently, lubricate it on a daily basis or lubricate it if the tool starts to slow or lose power.

It is recommended that the air pressure at the tool be 90 PSI (6.2 Bar) while the tool is running so the maximum RPM is not exceeded. The tool can be run at lower pressures but should never be run higher than 90 PSI (6.2 Bar). If run at lower pressure the performance of the tool is reduced.

Operating Instructions

- 1) Read all instructions before using this tool. All operators must be fully trained in its use and aware of these safety rules. All service and repair must be carried out by trained personnel.
- 2) Make sure the tool is disconnected from the air supply. Select a suitable abrasive and secure it to the back-up pad. Be careful and center the abrasive on the back-up pad.
- 3) Always wear required safety equipment when using this tool.
- 4) When sanding always place the tool on the work then start the tool. Always remove the tool from the work before stopping. This will prevent gouging of the work due to excess speed of the abrasive.
- 5) Always remove the air supply to the sander before fitting, adjusting or removing the abrasive or back-up pad.
- 6) Always adopt a firm footing and/or position and be aware of torque reaction developed by the sander.
- 7) Use only correct spare parts.
- 8) Always ensure that the material to be sanded is firmly fixed to prevent its movement.
- 9) Check hose and fittings regularly for wear. Do not carry the tool by its hose; always be careful to prevent the tool from being started when carrying the tool with the air supply connected.
- 10) Dust can be highly combustible. Vacuum dust collection bag should be cleaned or replaced daily. Cleaning or replacing of bag also assures optimum performance.
- 11) Do not exceed maximum recommended air pressure. Use safety equipment as recommended.
- 12) The tool is not electrically insulated. Do not use where there is a possibility of coming into contact with live electricity, gas pipes, water pipes, etc. Check the area of operation before operation.

- 13) Take care to avoid entanglement with the moving parts of the tool with clothing, ties, hair, cleaning rags, etc. If entangled, it will cause the body to be pulled towards the work and moving parts of the machine and can be very dangerous.
- 14) Keep hands clear of the spinning pad during use.
- 15) If the tool appears to malfunction, remove from use immediately and arrange for service and repair.
- 16) Do not allow the tool to free speed without taking precautions to protect any persons or objects from the loss of the abrasive or pad.

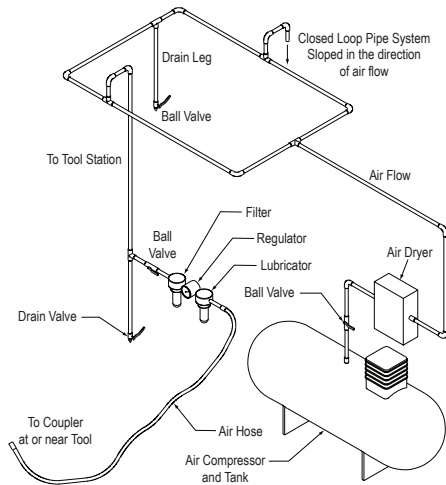


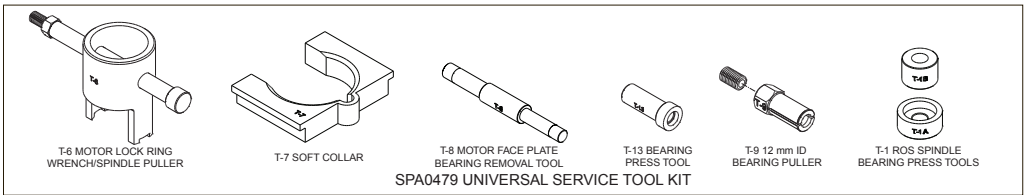
Figure 1



SERVICE INSTRUCTIONS FOR LOW PROFILE 12,000 RPM 5 in. (127 mm) and 6 in. (150 mm) RANDOM ORBITAL SANDERS

Service Tools and Accessories

When an SurfPrep™ LP ROS needs to be serviced, we offer a tool kit to make the disassembly/assembly fast and easy. The Service Tools are highly recommended for use with the Overhaul Service Kit. NOTICE: To receive any expressed or implied warranty, the tool must be repaired by an authorized SurfPrep™ Service Center. The 5 in. and 6 in. Random Orbital Sanders Service Instructions section provided are for use after completion of the warranty period.

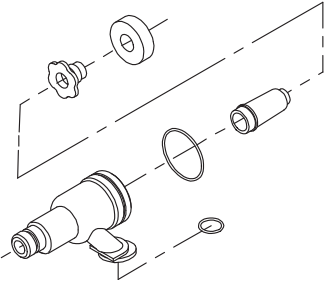


Overhaul Service Kit

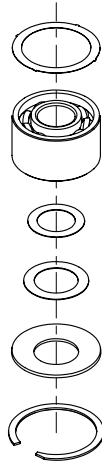
The Overhaul Service Kit contains all the replacement parts that naturally wear over time and a straightforward manual to make servicing an SurfPrep™ sander simple. Overhauling the Random Orbital Sander can be made even easier with the use of the above Service Tools. The Service Tools also reduce the chance of improper assembly.

Overhaul Service Kit for 12,000 RPM 5 & 6 in. ROS Contents		
Part No.	Description	Qty.
AVA0040	External Retaining Ring	1
AVA0021	Bearing	1
AVA0042	O-Ring	1
AVB0005	Rotor	1
AVA0010-1	Vanes	5
AVA0041	Key	1
AV50059	Bearing	1
AVA0938	Bearing	1
AVA0016	Spacer	1
AVA0008	Valve Stem Assembly	1
AVA0043	O-Ring	1
AVA0039	Internal Retaining Ring	1
AVG0012	Exhsust Chamber	1
AVA2204	9,5 mm X 1.0 mm O-Ring	1
AVA2484	24 mm X 1.0 mm O-Ring	1
AVF0013	Bronze Muffler	1
AVF0008	Muffler Cap	1
AVF0011	Muffler	1
AVA0009	Valve Seat	1
AVA0007	Valve	1
AVF0094	Valve Spring	1

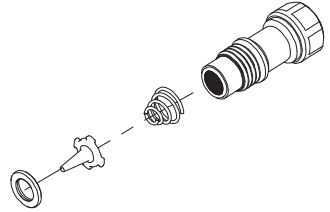
Sander Spare Parts Kits



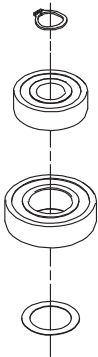
12,000 RPM Muffler Kit
Reorder P/N SPF0028



ROS Spindle Bearing Kit
Reorder P/N SPA1164



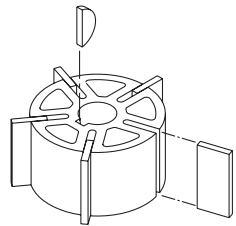
1/8 NPT Air Inlet Kit
Reorder P/N SPF0029



Endplate Bearing Kit
Reorder P/N SPF0032



Speed Valve Kit
Reorder P/N SPF0030



Rotor, Vanes and Key Kit
Reorder P/N SPA0063

12,000 RPM – 5 in. (127 mm) and 6 in. (150 mm)

LOW PROFILE RANDOM ORBITAL SANDERS SERVICE INSTRUCTIONS

NOTICE: To receive any expressed or implied warranty, the tool must be repaired by an authorized Service Center. The 5 in. (127 mm.) and 6 in. (150 mm) Random Orbital Sander Service Instructions section provided is for use after completion of the warranty period.

DISASSEMBLY INSTRUCTIONS

Changing Grips:

1. The Grip has two "tabs" that wrap around the body of the sander under the inlet and exhaust. Use a small screwdriver to pick out one of the "tabs" of the Grip, and then continue to go underneath the Grip with the screwdriver and pry the Grip off of sander. To install a new Grip, hold the Grip by the tabs making them face outward, align the Grip and slide it under the Throttle Lever then press the Grip down until it seats onto the top of the sander. Make sure the two "tabs" seat under the inlet and exhaust.

Motor Disassembly:

1. Lightly secure the tool in a vise using the T-7 Soft Collar or padded jaw vice and remove the pad with the 24 mm Pad Wrench then remove the Shroud.
2. Remove the Lock Ring with the T-6 Motor Lock Ring Wrench/Spindle Puller Tool. The motor assembly can now be lifted out of the Housing.
3. Secure the motor assembly by clamping the 5 in. or 6 in. (125 or 150 mm) Shaft Balancer in a padded jaw vice and remove the Retaining Ring and the O-Ring from the Cylinder.
4. Remove the Rear Endplate. This may require supporting the Rear Endplate with a Bearing Separator and lightly pressing the shaft through the Bearing and Rear Endplate. Remove Cylinder and the Vanes and Rotor Set from the shaft of the Shaft Balancer. Remove the Key then press off the Front Endplate (with Bearing), O-Ring and the Lock Ring. It may be necessary to remove the Bearing with a Bearing Separator if it came out of the Front Endplate and stuck to the shaft of the Shaft Balancer.
5. Remove and discard Dust Shield from the Shaft Balancer.
6. Remove the Bearing(s) from the Endplates by using the T-8 Bearing Removal Tool to press out the Bearings.

Shaft Balancer and Spindle Disassembly:

1. Grip the shaft end of the Shaft Balancer in a padded vise. With a thin screwdriver pick out the slotted end of the Retaining Ring and peel out.
2. Screw the threaded end of the T-6 Motor Lock Ring Wrench/Spindle Puller Tool into the Spindle until hand tight. Apply a gentle heat from a propane torch or hot air gun to the large end of the Balancer Shaft until it is about 212° F (100° C) to soften the adhesive. Do not over heat. Remove the Spindle assembly by using the slider to give sharp outward blows to the Spindle. Allow the parts to cool so they are safe to handle. Follow one of the appropriate directions below:
 - If the Bearing come out with the spindle, use a small Bearing Separator to remove it. Move onto step 3.
 - If the Bearing stays in the Shaft Balancer. Follow steps A - D below.

Procedure for removal of the Bearings from the Shaft Balancer:

- A. Position the Set Screw in the top of the T-9 12 mm ID Bearing Puller.
 - B. Make sure the Retaining Ring is removed, then press the Bearing Puller into the I.D. of Bearing until the Bearing Puller hits the bottom of the Shaft Balancer.
 - C. Thread the Set Screw down until it hits the bottom of the Shaft Balancer or becomes very tight. Grip the shaft end of the Shaft Balancer in a padded vise.
 - D. Screw the threaded end of the T-6 Motor Lock Ring Wrench/Spindle Puller Tool into the Bearing Puller until hand tight. Apply a gentle heat from a propane torch or hot air gun to the large end of the Shaft Balancer to re-heat it until it is about 212° F (100° C) to soften the adhesive. Do not over heat. Remove the Bearing by using the slider to give sharp outward blows to the Bearing Puller. Allow the Bearing Puller, Bearing and Shaft Balancer to cool. After cooling, unthread the T-6 Motor Lock Ring Wrench/Spindle Puller Tool from the Bearing Puller. Back off the set screw. Secure the Bearing Puller and Bearings in a Bearing Separator and press out the Bearing Puller.
3. Remove the bearing from the Spindle. Remove the Spacer, Dust Shield and Washer from the Spindle. Discard Dust Shield.

Housing Disassembly:

1. For Non-Vacuum (NV) and Central Vacuum (CV) machines follow the steps outlined in Section I below. For Self Generated Vacuum (SGV) machines follow the steps outlined in Section III.
 - I. This section is for NV and CV machines.
 - A) Remove the Muffler Housing from the Housing.
 - B) Remove the Muffler insert from the cavity of the Muffler Housing and remove the Bronze Muffler from the Muffler Housing.
 - C) For NV machines move onto D. For CV machines move onto Section II.
 - D) Remove the NV Shroud. Move onto Step 2.
 - II. This section continued from Section I for CV Exhaust machines:
 - A) Remove the Screw, and Nut.
 - B) Remove the Ø 1 in. (28 mm) CV Swivel Exhaust Assembly or the Ø 3/4 in. (19 mm) CV Swivel Exhaust Assembly from the Shroud.
 - C) Remove the Shroud from the Housing. Move onto step 2.

III. This section is for SGV Exhaust machines:

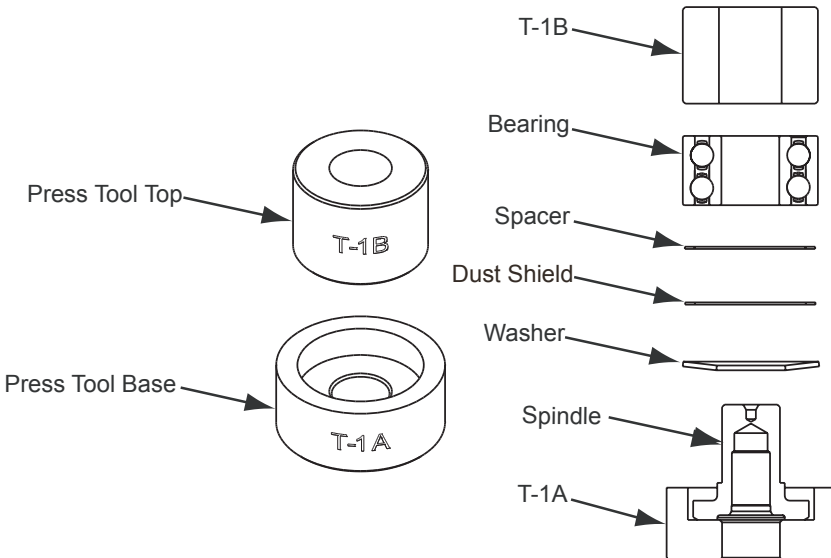
- A) Remove the Screw, and Nut.
- B) Remove the \varnothing 1 in. (28 mm) Hose SGV Swivel Exhaust Assembly from the Housing and SGV Shroud Adapter.
- C) Remove the Vacuum Shroud from the Housing. Move onto step 2.
2. Place the Speed Control to the midway position and remove the Retaining Ring. NOTE: If the machine is a vacuum model, the vacuum exhaust must be removed (see Section 1 above for removal) before the Retaining Ring can be removed with lock ring pliers. The Speed Control will now pull straight out. Remove the O-ring.
3. Unscrew the Inlet Bushing Assembly from the Housing. Remove the Valve Spring, Valve, Valve Seat, Valve Stem and O-Ring.
4. Press out the Spring Pin from the Housing and remove the Throttle Lever.
3. Install the Valve Seat, the Valve and the Valve Spring. Coat the threads of the Bushing Assembly with 1 or 2 drops of Loctite® 222 or equivalent non-permanent pipe thread sealant. Screw the assembly into the Housing. Torque to 60 in/lbs (6.77 Nm.)

ASSEMBLY INSTRUCTIONS

NOTE: All assembly must be done with clean dry parts and all bearings are to be pressed in place by the correct tools and procedures as outlined by the bearing manufacturers.

Housing Assembly:

1. Install Throttle Lever into Housing with the Spring Pin.
2. Lightly grease the O-ring and place it on the Speed Control. Install Valve Stem, O-ring (cleaned and lightly greased) and insert the Speed control into the Housing in the midway position. Install the Retaining Ring. CAUTION: Make sure the Retaining Ring is completely snapped into groove in the Housing.



Spindle, and Shaft Balancer Assembly:

1. Place the Washer on the Spindle shaft with the curve of the Washer facing up so that the outside diameter of the Washer will contact the outer diameter of the Bearing. Place the Dust Shield onto the Spindle shaft. Place the Spacer onto the shoulder of the Spindle. Note: Be sure that the Dust Shield is past the shoulder where the Spacer rests. Place the Bearing on the Spindle with the seal side toward the Washer. Press onto Spindle using the T-1B Spindle Bearing Press Tool (see figure) until seated at bottom.
2. When the Spindle Assembly is done correctly, the Bearing will rotate freely but not loosely.
3. Take the new Filter and center it on the small bore that the original Filter was in before removal. With a small diameter screwdriver or flat-ended rod, press the Filter into the bore until it is flat in the bottom of the bore. Place the Valve into the bore so it is oriented correctly, then press the Retainer into the bore until it is flush with the bottom of the Bearing bore.
4. Apply a pin head size drop of #271 Loctite® or equivalent to the outside diameter of each of the bearings on the spindle assembly. Spread the drop of bearing locker around the bearing until distributed evenly. CAUTION: Only a very small amount of bearing locker is needed to prevent rotation of the bearing OD. Any excess will make future removal difficult. Place the Spindle Assembly into the bore of the Shaft Balancer and secure with the Retaining Ring. CAUTION: Make sure that the Retaining Ring is completely snapped into the groove in the Balancer Shaft. Allow the adhesive to cure.
6. Press fit the rear Bearing (2 shields) into the Rear Endplate with the T-1B Bearing Press Tool. Make sure the T-1B Press Tool is centered on the O.D. of the outer race. Lightly press fit the Rear Endplate and Bearing Assembly over the Shaft Balancer using the small end of the T-13 Bearing Press Sleeve. The sleeve should press only the inner race of the bearing. IMPORTANT: The Rear Endplate and Bearing Assembly is pressed correctly when the Cylinder is squeezed just enough between the Endplates to stop it from moving freely under its own weight when the shaft is held horizontal, but be able to slide between the Endplates with a very light force. If the assembly is pressed to tightly the motor will not run freely. If the pressed assembly is to loose, the motor will not turn freely after assembly in the Housing. Secure the assembly by placing the Retaining Ring in the groove of the Shaft Balancer. CAUTION: The Retaining Ring must be placed so that the middle and two ends of the hoop touch the Bearing first. Both raised center portions must be securely "snapped" into the groove in the Shaft Balancer by pushing on the curved portions with a small screwdriver.
7. Lightly grease the O-Ring and place in the air inlet of the Cylinder Assembly.
8. Lightly grease or oil the inside diameter of the Housing, line up the Spring Pin with the marking on the Housing and slide the Motor Assembly into the Housing. Make sure the Spring Pin engages the pocket in Housing.
9. Carefully screw the Lock Ring into the Housing with the T-6 Motor Lock Ring Wrench/Spindle Puller Tool. Torque to 60 in/lbs (6.77 Nm.) NOTE: A simple technique to assure first thread engagement is to turn the lock ring counter clockwise with the T-6 Motor Lock Ring Wrench/Spindle Puller while applying light pressure. You will hear and feel a click when the lead thread of the lock ring drops into the lead thread of the housing.
10. Spin on a new Pad and hand tighten it using a 24 mm Pad Wrench.

Motor Assembly:

1. Place the Dust Shield onto the shaft of the Shaft Balancer.
2. Use the larger end of the T-13 Bearing Press Sleeve to press the front Bearing (with 2 Shields) onto the shaft of the Shaft Balancer.
3. Slide the Front Endplate with the bearing pocket facing down onto the Motor Shaft. Gently press the Front Endplate onto the Bearing using the larger end of the T-13 Bearing Press Sleeve until the Front Bearing is seated in the bearing pocket of the Endplate. CAUTION: Only press just enough to seat the bearing into the pocket. Over-pressing can damage the bearing.
4. Place the Key into the groove on the Shaft Balancer. Place the Rotor on the Shaft Balancer, making sure that it is a tight slip fit.
5. Oil the five Vanes with a quality pneumatic tool oil and place them in the slots of the Rotor. Place the Cylinder Assembly over the Rotor with the short end of the Spring Pin engaging the blind hole in the Front Endplate. NOTE: The Spring Pin must project .060 in. (1.5 mm) above the flanged side of the Cylinder.

Testing:

Place 3 drops of quality pneumatic air tool oil directly into the motor inlet and connect it to a 90 psig (6.2 bar) air supply. A 12,000 RPM tool should run between 11,500 to 12,500 RPM when the air pressure is 90 psig (6.2 bar) at the inlet of the tool while the tool is running at free speed. This free speed will be about 500 RPM to 1,000 RPM less when a Vacuum or Hook Face Pad is used because of wind resistance. This will not affect performance when sanding.

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Troubleshooting Guide

Symptom	Possible Cause	Solution
Low Power and/or Low Free Speed	Insufficient Air Pressure	Check air line pressure at the Inlet of the Sander while the tool is running at free speed. It must be 90 psig (6.2 Bar).
	Clogged Muffler(s)	See the "Housing Disassembly" section for Muffler removal. The Muffler can be back flushed with a clean, suitable cleaning solution until all contaminates and obstructions have been removed. If the Muffler can not be properly cleaned then replace it. Replace Muffler Insert (See the "Housing Assembly" Section).
	Plugged Inlet Screen	Clean the Inlet Screen with a clean, suitable cleaning solution. If Screen does not come clean replace it.
	One or more Worn or Broken Vanes	Install a complete set of new Vanes (all vanes must be replaced for proper operation). Coat all vanes with quality pneumatic tool oil. See "Motor Disassembly" and "Motor Assembly".
	Internal air leakage in the Motor Housing indicated by higher than normal air consumption and lower than normal speed.	Check for proper Motor alignment and Lock Ring engagement. Check for damaged O-Ring in Lock Ring groove. Remove Motor Assembly and Re-Install the Motor Assembly. See "Motor Disassembly" and "Motor Assembly".
	Motor Parts Worn	Overhaul Motor. Contact authorized SurfPrep™ Service Center.
	Worn or broken Spindle Bearings	Replace the worn or broken Bearings. See "Shaft Balancer and Spindle Disassembly" and "Spindle Bearings, AirSHIELD™ and Shaft Balancer Assembly".
Air leakage through the Speed Control and/or Valve Stem.	Dirty, broken or bent Valve Spring, Valve or Valve Seat.	Disassemble, inspect and replace worn or damaged parts. See Steps 2 and 3 in "Housing Disassembly" and Steps 2 and 3 in "Housing Assembly".
Vibration/Rough Operation	Incorrect Pad	Only use Pad Sizes and Weights designed for the machine.
	Addition of interface pad or other material	Only use abrasive and/or interface designed for the machine. Do not attach anything to the Sanders Pad face that was not specifically designed to be used with the Pad and Sander.
	Improper lubrication or buildup of foreign debris.	Disassemble the Sander and clean in a suitable cleaning solution. Assemble the Sander.
	Worn or broken Rear or Front Motor Bearing(s)	Replace the worn or broken Bearings. See "Motor Disassembly" and "Motor Assembly".
	For vacuum machines it is possible to have too much vacuum while sanding on a flat surface causing the pad to stick to the sanding surface.	For SGV machines add extra washer(s) to the pad spindle to increase the gap between the pad and shroud. For CV machines reduce vacuum through the vacuum system and/or add extra washer(s) to the pad.



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