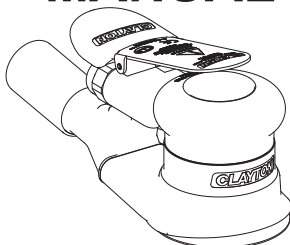


# CLAYTON

## Dustless Made Simple™

### 3 in. Light Weight 10,000 and 12,000 RPM RANDOM ORBITAL SANDER MANUAL



#### Declaration of Conformity

Clayton Associates, Inc. 1650 Oak Street Lakewood, NJ 08701 USA

declare on our sole responsibility that the products

3 in. (77 mm) Random Orbital Sanders (See Product "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

Lakewood, NJ 1/26/15

Place and date of issue

James E. Clayton

Name

Signature or equivalent marking of authorized person

#### Operator Instructions

Includes –Parts Page, Parts List, Please Read and Comply, Proper Use of Tool, Work Stations, Putting the Tool Into Service, Operating Instructions and Compressor Layout, Service Tools and Accessories, Service Instructions, Back-Up Pads, Specifications Table and Trouble Shooting Guide.

#### Important

Read these instructions carefully before installing, operating, servicing or repairing this tool. Keep these instructions in a safe accessible location.



#### Manufacturer/Supplier

Clayton Associates, Inc.  
1650 Oak Street  
Lakewood, NJ 08701 USA  
TEL (800) 248-8650  
www.VacuumSanding.com

#### Required Personal Safety Equipment



Safety Glasses



Safety Gloves



Breathing Masks



Ear Protection

#### Recommended Airline Size - Minimum

3/8 in 10 mm

#### Recommended Maximum Hose Length

25 feet 8 meters

#### Air Pressure

Maximum Working Pressure	90 psig	6.2 bar
Recommended Minimum	NA	NA



## 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

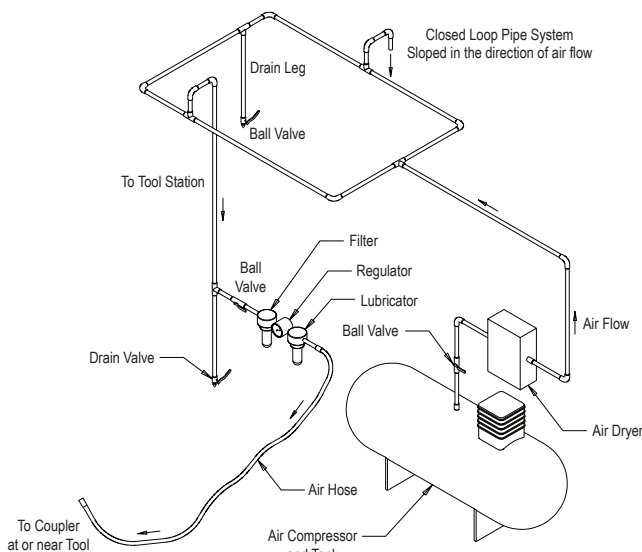
This sander is designed for sanding all types of materials i.e. metals, wood, stone, plastics, etc. using abrasive designed for this purpose. Do not use this sander for any other purpose than that specified without consulting the manufacturer or the manufacturer's authorized supplier. Do not use back-up pads that have a working speed less than 12,000 RPM free speed.

## 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".

## Operating Instructions

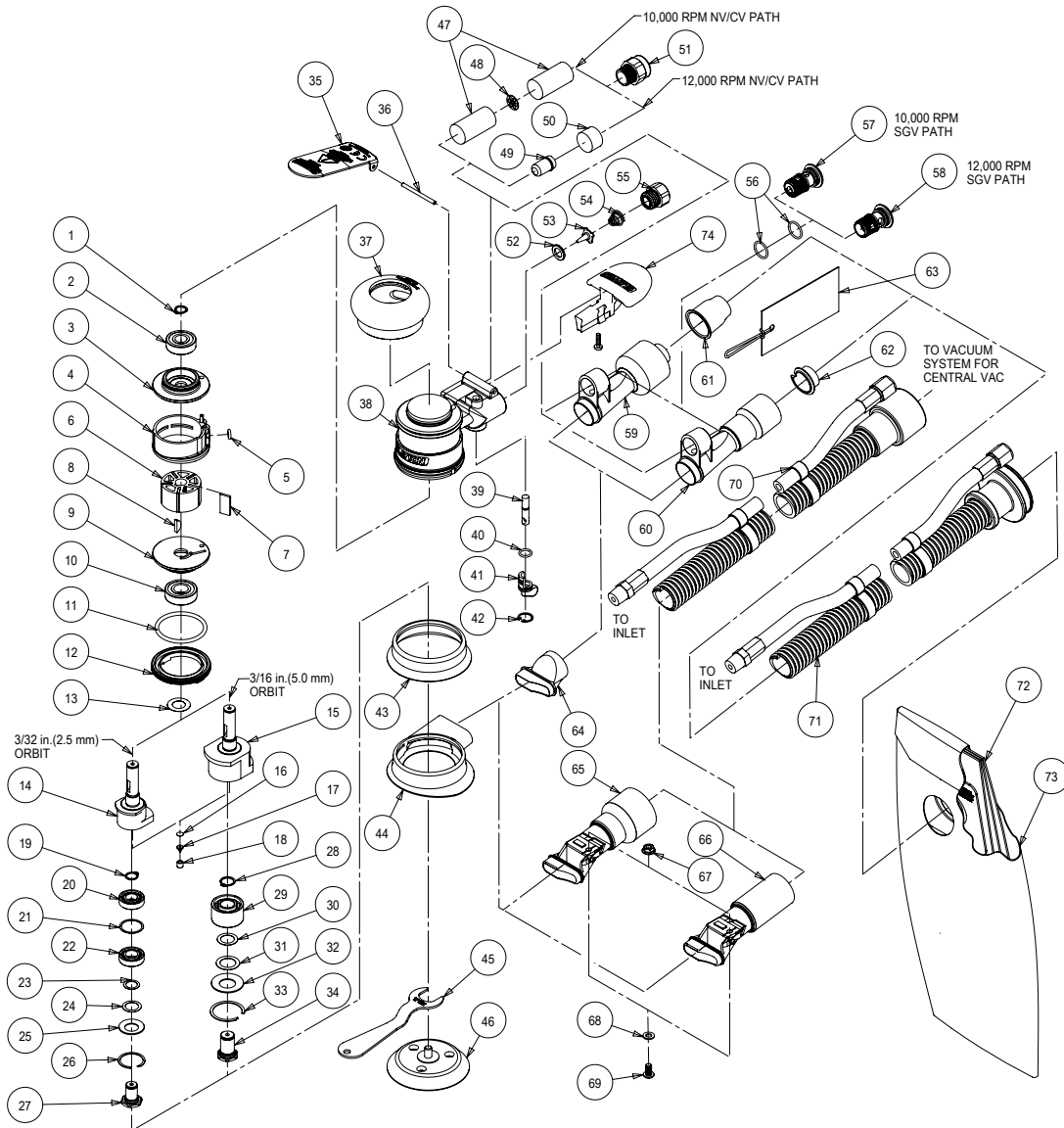
- 1) Read all instructions before using this tool. All operators must be fully trained in its use and aware of these safety rules. All service and repair must be carried out by trained personnel.
- 2) Make sure the tool is disconnected from the air supply. Select a suitable abrasive and secure it to 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.



## Putting the Tool into Service

Use a clean lubricated air supply that will give a measured air pressure at the tool of 6.2 bar (90 psig) bar when the tool is running with the lever fully depressed. It is recommended to use an approved 10 mm (3/8 in.) x 8 m (25 ft) 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 air tool oil (Clayton P/N 678-20451) 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 is 6.2 bar (90 psig) while the tool is running. The tool can run at lower pressures but never higher than 6.2 bar (90 psig).

# Assembly Drawing



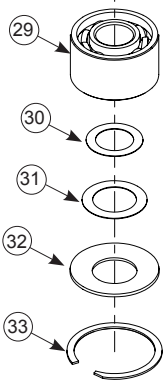
ITEM	TORQUE SETTING Nm (in.-lbs.)
12	6.2 - 7.3 (55 - 65)
51	1.8 - 2.3 (16 - 20)
55	6.8 - 8.1 (60 - 72)
57/58	4.0 - 5.4 (36 - 48)
69	3.4 - 3.9 (30 - 35)

# Parts List

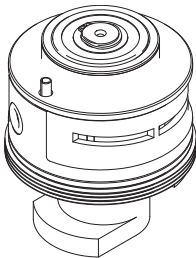
Item	Part Number	Description	Qty
1	673-A0040	RETAINING RING	1
2	673-A0021	BEARING - 2 SHIELDS	1
3	673-A0065	REAR ENDPLATE	1
4	673-A0067	CYLINDER ASSEMBLY	1
5	673-A0042	O-RING	1
6	673-B0005	ROTOR	1
7	673-A0010	VANE	5
8	673-A0041	WOODRUFF KEY	1
9	673-A0064	FRONT ENDPLATE	1
10	673-A0019	BEARING - 2 SHIELDS	1
11	673-A0045	O-RING	1
12	673-A0001	LOCK RING	1
13	673-A2541	FRONT BEARING DUST SHIELD	1
14	673-B0084	3 x 3/32 in ORBIT SHAFT BALANCER	1
15	673-B0309	3 x 3/16 in. ORBIT SHAFT BALANCER	1
16	673-A0122	FILTER	1
17	673-A0121	DUCKBILL CHECK VALVE	1
18	673-A0120	VALVE RETAINER	1
19	673-A0107	RETAINING RING	1
20	673-A0162	BEARING - NO SEAL/SHIELDS	1
21	673-A0196	SPACER	1
22	673-A0161	BEARING - 1 SEAL	1
23	673-A0108	SHIM .02 THK	1
24	673-A2543	SPINDLE BEARING DUST SHIELD - 2.5 mm (3/32 in.) ORBIT	1
25	673-A0126	BELLEVILLE WASHER	1
26	673-A0177	RETAINING RING	1
27	673-B0083	SPINDLE	1
28	673-A0090	RETAINING RING	1
29	673-A0938	BEARING - 1 SEAL	1
30	673-A0016	SPACER 0.2 THK	1
31	673-A2542	SPINDLE BEARING DUST SHIELD - 5.0 mm (3/16 in.) ORBIT	1
32	673-A0017	BELLEVILLE WASHER	1
33	673-A0018	RETAINING RING	1
34	673-B0312	SPINDLE	1
35	673-A0340	THROTTLE LEVER FOR 3/32 in ORBIT 10000 RPM ROS	1
	673-A0294	THROTTLE LEVER FOR 3/32 in ORBIT 12000 RPM ROS	1
	673-A0339	THROTTLE LEVER FOR 3/16 in ORBIT 10000 RPM ROS	1
	673-A0287	THROTTLE LEVER FOR 3/16 in ORBIT 12000 RPM ROS	1
36	673-A0031	LEVER SPRING PIN	1
37	673-A0288	GRIP 2 1/2 in.	OPT
	673-A0289	GRIP 2 3/4 in.	1
	673-A0290	GRIP 3 in.	OPT
38	673-A3027	HOUSING	1
39	673-A0008	VALVE STEM ASSEMBLY	1
40	673-A0043	O-RING	1
41	673-B0014	SPEED CONTROL	1
42	673-A0039	INTERNAL RETAINING RING	1
43	673-C0046	3 in. ROS NON-VAC SHROUD	1
44	673-C0047	3 in. SKIRT - 2.5 mm (3/32 in.) ORBIT	1
	673-C0243	3 in. SKIRT - 5 mm (3/16 in.) & 8 mm (5/16 in.) ORBIT	1
45	673-A0146	17 mm WRENCH	1
46	NA	1 BACKUP PAD SUPPLIED WITH EACH TOOL (TYPE DETERMINED BY MODEL)	1
47	673-A0032	MUFFLER INSERT (for 10000 RPM Machines)	2
48	673-A0038	MUFFLER PLATE (for 10000 RPM Machines)	1
49	673-A0062	INTERNAL MUFFLER (for 12000 RPM Machines)	1
50	673-A0068	MUFFLER INSERT (for 12000 RPM Machines)	1
51	673-A0166	MUFFLER HOUSING	1
52	673-A0009	VALVE SEAT	1
53	673-A0007	VALVE	1
54	673-A0014	VALVE SPRING	1
55	673-A0013	INLET BUSHING ASSEMBLY	1
56	673-A0044	O-RING	2
57	673-A0722	10000 RPM SGV RETAINER	1
58	673-A0006	12000 RPM SGV RETAINER	1
59	673-A0410	ASSEMBLY FOR 1 in./28 mm HOSE SGV SWIVEL EXHAUST FITTING	OPT
60	673-A0409	ASSEMBLY FOR 3/4 in./19 mm HOSE SGV SWIVEL EXHAUST FITTING	1
61	673-A0778	1 in./28 mm HOSE SEAL	OPT
62	673-A0854	3/4 in./19 mm HOSE SEAL	1
63	673-A1246	TAG W/ INSTRUCTION FOR 3/4 in./19 mm HOSE SEAL	1
64	673-A1247	TAG W/INSTRUCTION FOR 1 in./28 mm HOSE SEAL	OPT
64	673-C0108	SGV SKIRT/SHROUD ADAPTER	1
65	673-A0099	ROS CV 1 in./28 mm SWIVEL EXHAUST ASSEMBLY	OPT
66	673-A0205	ROS CV 3/4 in. SWIVEL EXHAUST ASSEMBLY	1
67	673-A0048	FLANGED NUT	1
68	673-A0047	WASHER	1
69	673-A0769	SCREW	1
70	673-A0392	Ø 1 in. VAC HOSE TO Ø 1 in./28 mm x 1 1/2 in. ADAPTOR COUPLING AND AIRLINE ASSEM	OPT
	673-A0300	Ø 3/4 in. VAC HOSE TO Ø 3/4 in. x 1 in./28 mm ADAPTER COUPLING AND AIRLINE ASSM	OPT
71	673-A0412	Ø 1 in. VAC HOSE TO DOUBLE BAG FITTING AND AIRLINE ASSY	OPT
	673-A0411	Ø 3/4 in. VAC HOSE TO DOUBLE BAG FITTING AND AIRLINE ASSY	1
72	673-C0109	VACUUM BAG INSERT	1
73	673-C0110	VACUUM BAG	1
74	673-M0201	PALM REST (Comes with screw)	1

# Sander Spare Parts Kits

In addition to the kits below, please see our complete  
General Rebuild Kit P/N 673-A3064 on page 5.



**ROS Spindle Bearing Kit**  
( $\frac{3}{16}$ " orbit)  
P/N 673-A1164

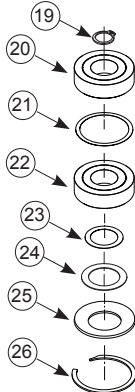


**Drop-in Motor 3x $\frac{3}{32}$**   
P/N 673-B0288

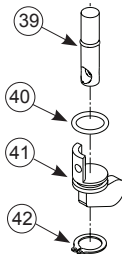
(Drop-in motor includes items 1-14, 16-27)

**Drop-in Motor 3x $\frac{3}{16}$**   
P/N 673-B0500

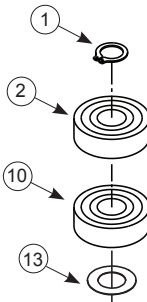
(Drop-in motor includes items 1-13, 15-18, 28-34)



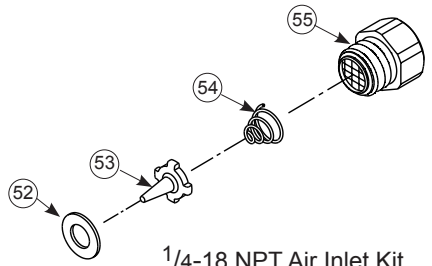
**ROS Spindle Bearing Kit**  
( $\frac{3}{32}$ " orbit)  
P/N 673-A0497



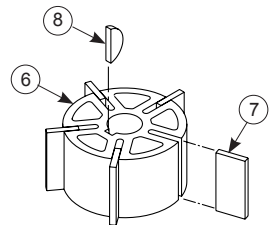
**Speed Valve Kit**  
P/N 673-A0812



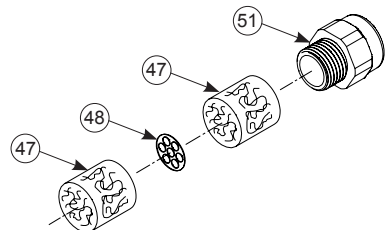
**Endplate Bearing Kit**  
P/N 673-A0434



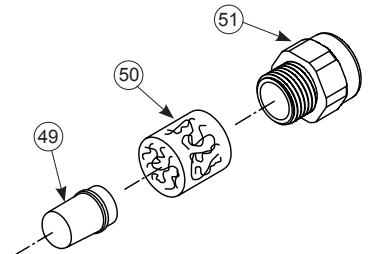
**$\frac{1}{4}$ -18 NPT Air Inlet Kit**  
P/N 673-A0431



**Rotor, Vanes and Key Kit**  
P/N 673-A0063



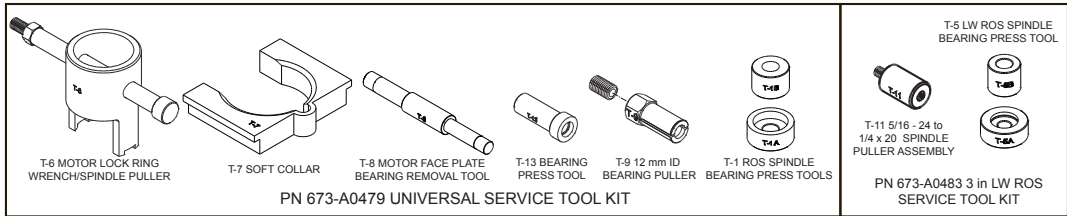
**10,000 RPM Muffler Kit**  
P/N 673-A0095



**12,000 RPM Muffler Kit**  
P/N 673-A0096

## Clayton Service Tools and Accessories

When a Clayton 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 Clayton Service Center. The 3 in. Random Orbital Sanders Service Instructions section provided are for use after completion of the warranty period.



## Clayton™ General Rebuild Kit

The Clayton General Rebuild Kit PN 673-A3064 contains all the replacement parts that naturally wear over time and a straightforward manual to make servicing a Clayton 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.

PN 673-A3064 Clayton General Rebuild Kit

Item	Part No.	Description	Qty.
1	673-A0040	External Retaining Ring	1
2	673-A0021	Bearing – 2 Shields	1
5	673-A0042	O-Ring	1
6	673-B0005	Rotor	1
7	673-A0010	Vanes	5
8	673-A0041	Key	1
10	673-A0019	Bearing	1
22	673-A0161	Bearing	1
20	673-A0162	Bearing	1
21	673-A0196	Shim	1
29	673-A0938	Bearing	1
30	673-A0016	Spacer	1
39	673-A0008	Valve Stem Assembly	1
47	673-A0032	Muffler	2
40	673-A0043	O-Ring	1
42	673-A0039	Internal Retaining Ring	1
49	673-A0062	Muffler (12000 rpm)	1
50	673-A0068	Muffler	1
51	673-A0166	Muffler Housing	1
52	673-A0009	Valve Seat	1
53	673-A0007	Valve	1
54	673-A0014	Valve Spring	1
N/A	673-A3057	3 in. ROS Service Instructions	1

## 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, then continue to go underneath the Grip with the screwdriver and pry the Grip off the 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 Service Collar or padded jaws. Use a 17 mm Pad Wrench to secure the Spindle and spin the Pad counter clock-wise off the spindle.
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. Remove the O-Ring from the Lock Ring.
3. Secure the motor assembly by clamping the Shaft Balancer in a padded jaw vise and remove the Retaining Ring from the end of the Shaft Balancer and the O-ring from the Cylinder.
4. Remove the Rear Endplate. This may require supporting the Rear Endplate with a bearing separator. Use a light press force to push the Shaft Balancer through the Bearing. Then remove the Cylinder, Vanes and the Rotor. Remove the Key from the Shaft Balancer. Support the Front Endplate with a bearing separator and use a light press force to push the Shaft Balancer through the bearing. 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 Endplate 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 female end of the T-11 5/16-24 to 1/4-20 Adapter into the male end of the Service Wrench. Screw the Service Wrench assembly into the Spindle Assembly until hand tight. Apply a gentle heat from a propane torch or hot air gun to the large end of the Shaft Balancer until

## Service Instructions

NOTICE: To receive any expressed or implied warranty, the tool must be repaired by an authorized Service Center. The 3 in. (77 mm) Light Weight Random Orbital Sander Service Instructions section provided is for use after completion of the warranty period.

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.

3. Remove the Retaining Ring from the Spindle Assembly. Use a small Bearing Separator to remove the Bearing, Spacer, Bearing, Shim, Dust shield and the Washer from the Spindle Assembly. Discard Dust Shield.
4. The AirSHIELD™ components are held in place by the light press fit of the Retainer. These components can be damaged during removal and may need to be replaced if removed. To remove the Retainer, use an O-ring pick or a #8 sheet metal screw to grip and pull out the Retainer. Remove the Valve and Filter from the bore in the Shaft Balancer. If the Retainer and Valve were not damaged, they can be reused. However, the Filter should be replaced on re-assembly.

#### **Housing Disassembly:**

1. For Non-Vacuum (NV) and Central Vacuum (CV) machines follow steps A – B below (unless otherwise noted). For Self Generated Vacuum (SGV) machines disregard steps A – E and move onto Step G below.
  - A. Remove the screw and Palm Rest from the Housing. Unscrew the Muffler Housing from the Housing. Remove the Bronze Muffler from the Muffler Housing (if applicable). Remove the Muffler from the Muffler Housing. For NV machines move onto B. For CV machines move onto C.
  - B. Remove the 3 in. (77 mm) Non-Vacuum Shroud. For NV machines move onto step 2.

#### **For Central Vacuum (CV) Exhaust machines:**

- C. Remove the Screw, Washer and Nut.
- D. Remove the  $\frac{3}{4}$  in. (19 mm) SuperVAC™ CV Swivel Exhaust Assembly (Standard) or the  $\frac{1}{2}$  in. (28 mm) SuperVAC™ CV Swivel Exhaust Assembly (Optional) from the 3 in. (77 mm) SuperVAC™ Shroud.
- E. Remove the 3 in. (77 mm) SuperVAC™ Shroud from the Housing. Move onto step 2.

#### **For Self Generated Vacuum (SGV) Exhaust machines:**

- F. Unscrew the SGV Retainer with an 8 mm hex key.
- G. Remove the  $\frac{1}{2}$  in. (28 mm) Hose SGV Swivel Exhaust Assembly (Standard) or  $\frac{3}{4}$  in. (19 mm) Hose SGV Swivel Exhaust Assembly (Optional) from the SuperVAC™ Adapter.
- H. Pull the SGV Retainer out of the bore of the Swivel Exhaust Assembly and remove the two O-Rings.
- I. Remove the 3 in. (77 mm) SuperVAC™ Shroud from the Housing.
2. Place the Speed Control to the midway position and remove the Retaining Ring. NOTE: If the machine is one of the vacuum models, the vacuum exhaust assembly 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 Spring, Valve, Valve Seat, Valve Stem and the O-ring from the Valve Stem.
4. Press out the Spring Pin from the Housing and remove the Lever.

#### **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 Spring Pin.
2. Lightly grease the O-Ring and place it on the Speed Control. Install the Valve Stem and O-ring (cleaned and lightly greased) and insert the Speed Control into Housing in the midway position. Install Retaining Ring.  
CAUTION: Make sure the Retaining Ring is completely snapped into groove in the Housing.
3. Install the Valve Seat, Valve and the Spring. Coat the threads of the Inlet Bushing Assembly with 1 or 2 drops of Loctite™ 222 or equivalent non-permanent pipe thread sealant. Screw the Inlet Bushing Assembly into the inlet port on the Housing. Torque to 60 in/lbs (6.77 Nm.)
4. For NV and CV machines follow the steps A - C. For SGV machines follow the steps G - J.

#### **This section is for Central Vacuum (CV) and Non-Vacuum (NV) machines.**

- A. Place a clean Muffler all-the-way into the chamber of the Muffler Housing. Press the Bronze Muffler into the bore of the Muffler Housing (if applicable).
- B. Screw the Muffler Housing assembly into the Housing until hand tight. Use a 21 mm socket/torque wrench combination to torque the Muffler Housing. Torque to 20 in/lbs (2.25 Nm). For NV machines move onto C. For CV machines move onto step D.
- C. Install the 3 in. (77 mm) Non-Vacuum Shroud onto the Housing by working the Shroud over and around the bottom of the Housing flanges. Make sure the line up slots on the Housing and tabs on the Shroud are engaged. Move onto the "Spindle Bearings, AirSHIELD™ and Shaft Balancer Assembly" Section. Install Palm Rest and tighten screw.

#### **This section continued from Section I for Central Vacuum (CV) Exhaust machines:**

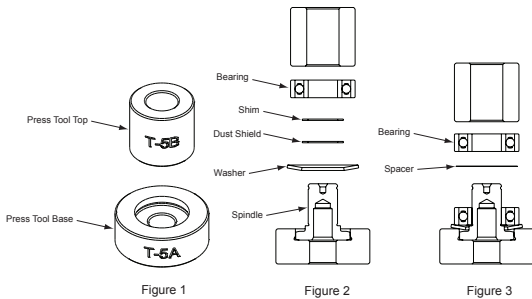
- D. Install the 3 in. (77 mm) SuperVAC™ CV Shroud on to the Housing by working the shroud over and around the bottom of the Housing flanges. Make sure the line up slots on the Housing and tabs on the Shroud are engaged.
- E. Slide the inlet end of the  $\frac{3}{4}$  in. (19 mm) SuperVAC™ CV Swivel Exhaust Assembly (Standard) or the  $\frac{1}{2}$  in. (28 mm) SuperVAC™ CV Swivel Exhaust Assembly (Optional) into the exhaust port of the 3 in. (77 mm) SuperVAC™ CV Shroud until it hits the stop on the SuperVAC™ CV Swivel Exhaust Assembly. Make sure the key on the SuperVAC™ CV Swivel Exhaust Assembly bracket is aligned and engaged with the keyway on the Housing.
- F. Place the Washer over the Screw. Thread the screw into the mounting hole of the  $\frac{3}{4}$  in. (19 mm) SuperVAC™ CV Swivel Exhaust Assembly or  $\frac{1}{2}$  in. (28 mm) SuperVAC™ CV Swivel Exhaust Assembly (Optional) and Housing until the end of the screw is flush with the inside surface of the Housing. Place the Nut into the cavity of the Housing and thread the screw into the nut until tight. Move onto the "Spindle, AirSHIELD™ and Shaft Balancer Assembly" Section. Install Palm Rest and tighten screw.

#### **For Self Generated Vacuum (SGV) Exhaust machines:**

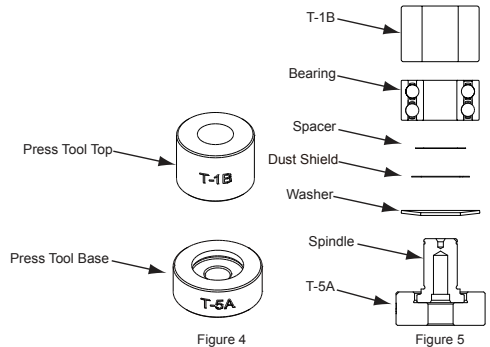
- G. Install the 3 in. (77 mm) SuperVAC™ Shroud onto the Housing by working the shroud over and around the bottom of the housing flanges. Make sure the line up slots on the Housing and tabs on the Shroud are



## For 2.5mm orbit Machine



## For 5.0mm orbit Machine



engaged. Slide the SuperVAC™ SGV Exhaust Adapter Fitting into the exhaust of the 3 in. (77 mm) SuperVAC™ CV Shroud.

- H. Lightly grease two O-Rings and place them into the two grooves in the SGV Retainer.
- I. Put the SGV Retainer into the mounting hole of the Ø 1 in. (28 mm) Hose SGV Swivel Exhaust Assembly (Standard) or the Ø ¾ in. (19 mm) Hose SGV Swivel Exhaust Assembly (Optional).
- J. Slide the Swivel Exhaust Assembly into the SuperVAC™ SGV Exhaust Adapter Fitting while at the same time inserting the SGV Retainer into the sander Housing exhaust port. Screw the SGV Retainer into the threaded exhaust port on the Housing with an 8 mm hex key. Torque to 45 in/lbs (5.08 Nm. ). Install Palm Rest and tighten screw.

### Spindle Bearings, AirSHIELD™ and Shaft Balancer Assembly:

1. Place the T-5A Spindle Bearing Pressing Tool Base onto a flat, clean surface of a small hand press or equivalent with the spindle pocket facing upward. Place the Spindle into the spindle pocket with the shaft facing upwards. See Figures 1 and 2 (4 and 5).
2. Place the Washer on the Spindle shaft with the curve of the Washer facing out so that the outside diameter of the Washer will contact the outer diameter of the Bearing (one seal). Place the Dust Shield onto the Spindle shaft. Lay the Shim(Spacer) on the shoulder of the Spindle.  
Note: Be sure that the Dust Shield is past the shoulder where Shim(Spacer) rests. Place the Bearing (one seal) on the Spindle with the seal side toward the Washer.  
NOTE: Make sure that both the inner and outer races of the Bearings are supported by the Bearing Press Tool when pressing them into place. Press the Bearing onto the shoulder of Spindle using the T-5B (T-1B)Spindle Bearing Pressing Tool Top as shown in Figure 2 (5).
3. For 2.5mm orbit machines: Place the Spacer over the Spindle shaft and onto the face of the Bearing making

sure it is on center. Press the (no seals/shields) Bearing down using the T-5B Spindle Bearing Pressing Tool Top, being careful to make sure the Spacer is still centered on the vertical axis of the Spindle shaft and Bearing. See Figure 3. NOTE: When the Spindle Assembly is done correctly, the Bearings will rotate freely but not loosely and the Spacer can be moved but will not slide or move by gravity.

4. Secure the Retaining Ring onto the Spindle Assembly making sure it is completely snapped into the groove. Set the Spindle Assembly aside.
5. Take the Filter and center it on the small bore that the original filter was in before removal. With a small diameter screwdriver or flat end 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.
6. 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 both bearings 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 Shaft Balancer. Allow the adhesive to cure.

### 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. Lightly grease the O-Ring and place it into the Lock Ring.
4. Place the Lock Ring with O-Ring onto the Front Endplate

with the O-Ring towards the Front Endplate. While holding the Lock Ring and Front Endplate, slide the Front Endplate with the bearing pocket facing down onto the Motor Shaft. Gently press the Front Endplate onto the front Bearing using the larger end of the T-13 Bearing Press Sleeve until the front Bearing is seated in the bearing pocket of the Front Endplate. **CAUTION:** Only press just enough to seat the bearing into the pocket. Over-pressing can damage the bearing.

5. Place the Key into the groove on the Shaft Balancer. Place the Rotor onto the shaft of the Shaft Balancer, making sure that it is a tight slip fit.
6. Oil the five Vanes with a quality pneumatic tool oil and place in the slots in the Rotor. Place the Cylinder Assembly over the Rotor with the shorter 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.
7. Press fit the rear (2) 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 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.
8. 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.
9. Carefully screw the Lock Ring into the Housing using the T-6 Motor Lock Ring Wrench. 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 service tool 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, then turn clockwise to tighten.
10. Spin on a new Pad and hand tighten it using a 17 mm Pad Wrench.

#### Testing:

Place 3 drops of quality pneumatic air tool oil directly into the motor inlet and connect to a 90 psig (6.2 bar) air supply. The tool should run between 9,500 RPM and 10,500 for 10,000 RPM machines or 11,500 and 12,500 RPM for 12,000 RPM machines 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.

\* Loctite® is a registered trademark of the Loctite Corp.

## Clayton™ Back-Up Pads

Clayton back-up pads are perfectly mated for use on the Clayton 3 in. Light Weight machine. Constructed from premium, industrial-quality materials and featuring a riveted fiberglass and steel hub with molded urethane, their durability and precise construction are the ideal complement to the performance of the Clayton 3 in. Light Weight machine.

Description	Part #
Clayton 3" low profile (1/4-20), vacuum, vinyl face	672-301S
Clayton 3" low profile (1/4-20), vacuum, "J"-hook face	672-301J
Clayton 3" Protector Pads	672-30JP
Clayton 3" Interface Pads	672-31JP

## Specifications

General Specifications		
Size	3" 3/32 orbit	3" 3/16 orbit
Sound Level (EN ISO 15744:2008)	*77 dB	*76 dB
Power	28 hp	.28 hp
Speed	12,000 RPM	12,000 RPM
Vibration (EN ISO 8662-8:1997; EN ISO 28662-1:1992)	*3.4 m/s <sup>2</sup>	*2.3 m/s <sup>2</sup>
*Uncertainty	1.7 K m/s <sup>2</sup>	1.2 K m/s <sup>2</sup>

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. Clayton 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)

## 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 contaminants 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 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.

