

**OPERATOR'S MANUAL FOR AirVANTAGE™  
TwoHAND™ GEARED 3,000 RPM  
3 in. (77 mm) BUFFER/SANDER**



<p><b>Declaration of conformity</b> AirVANTAGE™ Tools 10018 Lower Azusa Road, Unit #C; El Monte, California 91731 USA declare on our sole responsibility that the product 3 in. TwoHAND™ Geared Buffer/Sander (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 &amp; 93/44/EEC 93/68/EEC Directives and consolidating Directive 2006/42/EC</p>						
<p>12.19.2011, Taiwan Place and date of issue</p>	<p>Peter Wu Name</p>	<p>PETER Wu Signature or equivalent marking of authorized person</p>				
<p><b>Operator Instructions</b> 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><b>Important</b> Read these instructions carefully before installing, operating, servicing or repairing this tool. Keep these instructions in a safe accessible location.</p>					
<p><b>Manufacturer/Supplier</b> AirVANTAGE™ Tools 10018 Lower Azusa Road; Unit #C; El Monte, California 91731 USA Tel: (626) -575-4568 Fax: (626)-575-4968</p>	<p><b>Required Personal Safety Equipment</b></p> <table style="width: 100%;"> <tr> <td>Safety Glasses</td> <td>Breathing Masks</td> </tr> <tr> <td>Safety Gloves</td> <td>Ear Protection</td> </tr> </table>		Safety Glasses	Breathing Masks	Safety Gloves	Ear Protection
Safety Glasses	Breathing Masks					
Safety Gloves	Ear Protection					
<p><b>Recommended Airline Size - Minimum</b> 10 mm                      3/8 in</p>	<p><b>Recommended Maximum Hose Length</b> 8 meters                      25 feet</p>	<p><b>Air Pressure</b> Maximum Working Pressure    6.2 bar    90 psig Recommended Minimum        NA        NA</p>				

**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**

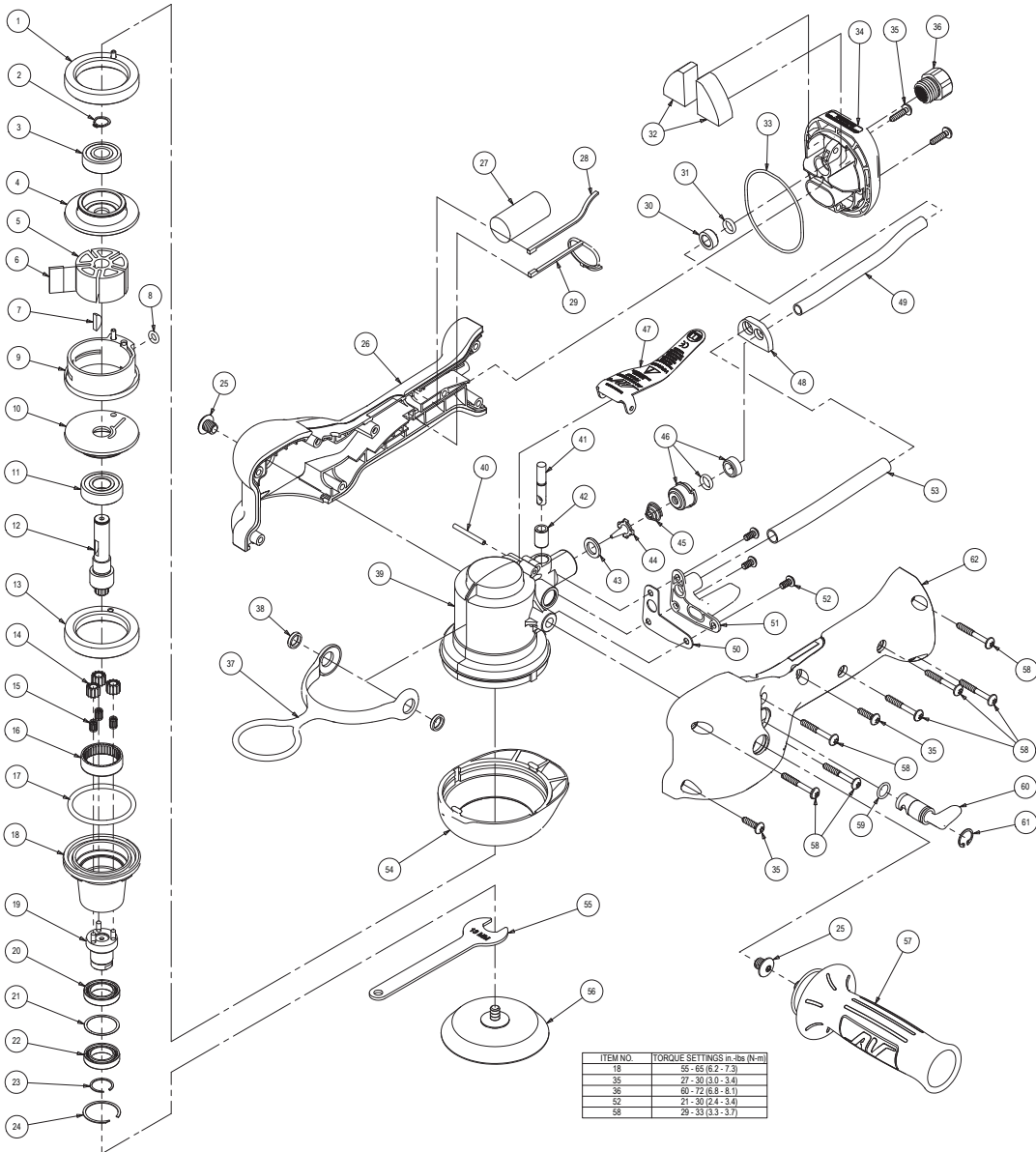
This Buffer/Sander is designed for sanding all types of materials i.e. metals, wood, stone, plastics, etc. using abrasive designed for this purpose. Do not use this buffer/sander for any other purpose than that specified without consulting the manufacturer or the manufacturer's authorized supplier.

Do not use back-up pads that have a working speed less than 3,000 RPM free speed. Never use back-up pads that have a weight and/or size different than the machine was specifically designed for.

**AirVANTAGE™ Warranty**

All AirVANTAGE™ 3 in. TwoHAND™ Geared Buffer/Sanders are warranted for defects in materials or workmanship for one year from the date of delivery to the user. Combined with the AirVANTAGE™ name, this Warranty expresses our total confidence in the superior quality, durability, and performance of the AirVANTAGE™ LP. To receive any expressed or implied warranty, tool must be repaired by an authorized AirVANTAGE™ 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 AirVANTAGE™.

# Parts Page



ITEM NO.	TORQUE SETTINGS in-lbs (N-m)
18	55 - 65 (6.2 - 7.3)
35	27 - 29 (3.1 - 3.4)
36	60 - 72 (6.8 - 8.1)
52	21 - 30 (2.4 - 3.4)
58	29 - 33 (3.3 - 3.7)

# Parts List

Item	Part No.	Description	Qty.
1	AVA1297	MOTOR SPACER ASSEMBLY	1
2	AVA0040	EXTERNAL RETAINING RING	1
3	AVA0021	BEARING - 2 SHIELDS	1
4	AVB0017	REAR ENDPLATE	1
5	AVB0005	ROTOR	1
6	AVA0010	VANE	5
7	AVA0041	WOODRUFF KEY	1
8	AVA0042	O-RING	1
9	AVA0005	CYLINDER ASSEMBLY	1
10	AVB0016	FRONT ENDPLATE	1
11	AVA0019	BEARING - 2 SHIELDS	1
12	AVA1299	MOTOR SHAFT ASSEMBLY	1
13	AVA1295	MOTOR SPACER	1
14	AVA0152	PLANET GEAR	3
15	AVA0224	NEEDLE BEARING	3
16	AVA0151	RING GEAR	1
17	AVA0045	O-RING	1
18	AVB0060	SPINDLE HOUSING	1
19	AVA0456	PLANETARY SPINDLE ASSEMBLY	1
20	AVA0147	BEARING - NO SEALS/SHIELDS	1
21	AVA0213	SPACER 0.10 THK	1
22	AVA0148	BEARING - 1 SEAL	1
23	AVA0110	RETAINING RING	1
24	AVA0117	RETAINING RING	1
25	AVA1711	THREADED PLUG	2
26	AVB0383	RH HOUSING	1
27	AVA0032	MUFFLER INSERT	1
28	AVA1218	TOP HOUSING SEAL	1
29	AVA1255	NV LOWER HOUSING SEAL	1
30	AVA0510	INLET CAPTIVE RING	1
31	AVA0509	O-RING	1
32	AVA0776	MUFFLER	2
33	AVA0628	O-RING	1
34	AVA0731	INLET/EXHAUST END CAP ASSEMBLY FOR NV MACHINES	1
35	AVA1398	SCREW	4
36	AVA0013	INLET BUSHING ASSEMBLY	1
37	AVB0420	HANGER	OPT
38	AVA1865	SPACER RING	OPT
39	AVB0356	MACHINE MOTOR HOUSING W/SIDE HANDLE MOUNTING STUDS	1
40	AVA0004	CYLINDER SPRING PIN	1
41	AVA0655	VALVE STEM ASSEMBLY	1
42	AVA0015	VALVE SLEEVE	1
43	AVA0009	VALVE SEAT	1
44	AVA0007	VALVE	1
45	AVA0014	VALVE SPRING	1
46	AVA0730	AIRLINE SEAL ASSEMBLY	1
47	AVA1859	LEVER	1
48	AVA0516	TUBING CLAMP	1
49	AVA0511	INLET TUBING	1
50	AVA0500	EXHAUST GASKET	1
51	AVB0182	NV/CV EXHAUST NOZZLE	1
52	AVA0664	SCREW	3
53	AVA0517	EXHAUST TUBING	1
54	AVC0228	BUFFER SHROUD	1
55	AVA0145	13 mm WRENCH	1
56	N/A	1 Back-up Pad supplied with each tool (type determined by model)	1
57	AVA1926	SIDE HANDLE	OPT
58	AVA1430	SCREW	7
59	AVA0043	O-RING	1
60	AVB0183	SPEED CONTROL	1
61	AVA0039	INTERNAL RETAINING RING	1
62	AVC0221	LH HOUSING	1

# Product Configuration/Specifications: 3,000 RPM 3 in. (77 mm)

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 <sup>2</sup>	**Uncertainty Factor <sup>2</sup>
NA	Hook	Non-Vacuum	Low Profile	3 (77)	032401	2.1 (0.96)	4.47 (113.6)	9.68 (245.9)	0.46 (343)	21 (594)	85	1.2	0.6

\*The noise test is carried out in accordance with EN ISO 15744:2008 - Hand-held non-electric power tools -- Noise measurement code -- Engineering method (grade 2).

\*\*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. AirVANTAGE™ 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 buffer 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 buffer 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 buffer.
- 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) Do not exceed maximum recommended air pressure. Use safety equipment as recommended.
- 11) 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.

- 12) 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.
- 13) Keep hands clear of the spinning pad during use.
- 14) If the tool appears to malfunction, remove from use immediately and arrange for service and repair.
- 15) 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.

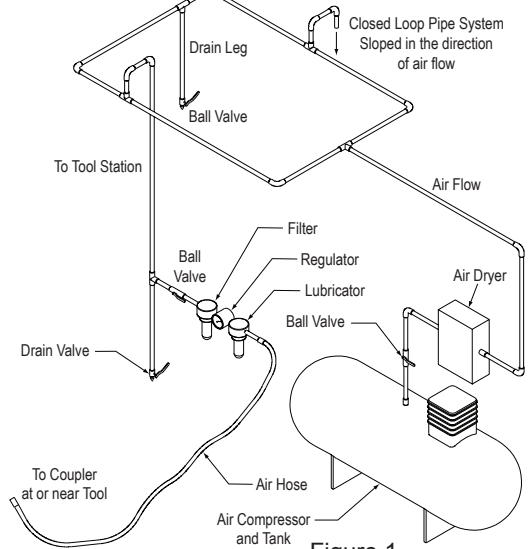


Figure 1

## AirVANTAGE™ Back-Up Pads, Polishing/Buffering Pads and Compounds

AirVANTAGE™ back-up pads are perfectly mated for use on the AirVANTAGE™ LP. 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 AirVANTAGE™ LP. See "Product Configuration/Specifications" Table for the correct replacement pad for a particular model.

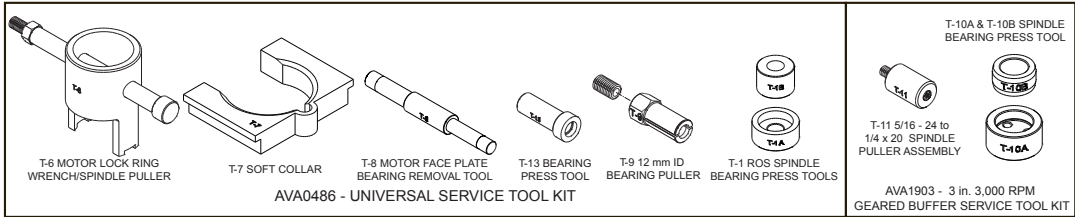
Description	Part #
3 in. Low profile, non-vacuum, hook face	1232101

# SERVICE INSTRUCTIONS FOR AirVANTAGE™ 3,000 RPM TwoHAND™ 3 in. (77 mm) BUFFER/SANDER



## AirVANTAGE™ Service Tools and Accessories

When an AirVANTAGE™ TwoHAND™ Buffer/Sander 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 AirVANTAGE™ Service Center. The 3 in. Buffer/Sanders Service Instructions section provided are for use after completion of the warranty period.

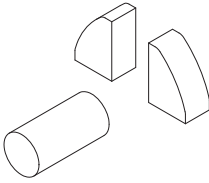


## AirVANTAGE™ Overhaul Service Kit

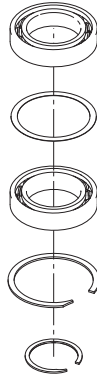
The AVB0425 AirVANTAGE™ Overhaul Service Kit contains all the replacement parts that naturally wear over time and a straight-forward manual to make servicing an AirVANTAGE™ Buffer/Sander simple. Overhauling the Buffer/Sander can be made even easier with the use of the above Service Tools. The Service Tools also reduce the chance of improper assembly.

AVB0425 Overhaul Service Kit for 3,000 RPM TwoHAND™ 3 in. Buffer/Sander Contents		
Part No.	Description	Qty.
AVA0040	External Retaining Ring	1
AVA0042	O-Ring	1
AVA0509	O-ring	1
AVA0039	Internal Retaining Ring	1
AVA0043	O-Ring	1
AVA0009	Valve Seat	1
AVA0007	Valve	1
AVA0014	Valve Spring	1
AVA0776	Muffler	2
AVA0032	Muffler Insert	1
AVA0730	Airline Seal Assembly	1
AVA0628	O-ring	1
AVA0148	Bearing – 1 Shield	1
AVA0147	Bearing – No Shields	1
AVA0021	Bearing – 2 Shields	1
AVA0019	Bearing – 2 Shields	1
AVB0005	Rotor	1
AVA0010	Vanes	5
AVA0224	Needle Bearing	3
AVA0041	Key	1
AVA0500	Exhaust Gasket	1
AVA1908	3,000 RPM 3 in. TwoHAND™ Sander/Buffer Service Instructions	1

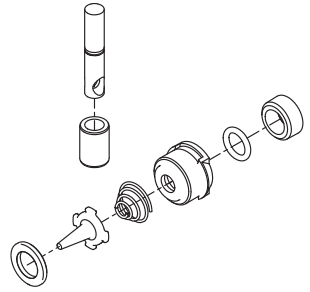
# Sander Spare Parts Kits



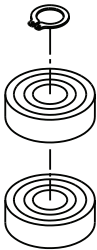
12,000 RPM Muffler Kit  
Reorder P/N AVA1877



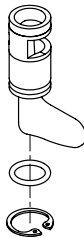
Spindle Bearing Kit  
Reorder P/N AVA0715



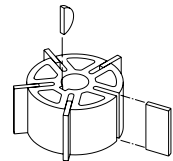
Air Inlet Kit  
Reorder P/N AVA1879



Endplate Bearing Kit  
Reorder P/N AVA0614



Speed Valve Kit  
Reorder P/N AVA1880



Rotor, Vanes and Key Kit  
Reorder P/N AVA0709

# 3,000 RPM – TwoHAND™ 3 in. (77 mm)

## BUFFER/SANDERS SERVICE INSTRUCTIONS

NOTICE: To receive any expressed or implied warranty, tool must be repaired by an authorized service center. The following general service instructions provided are for use after completion of the warranty period.

### DISASSEMBLY INSTRUCTIONS

#### Motor Disassembly:

1. Remove the Pad with the 13 mm Wrench. Take the T-6 Motor Lock Ring Wrench/Spindle Puller (Included in XPA0486 Kit) and engage it into the tabs of the Spindle Housing. Rotate the T-6 Motor Lock Ring Wrench/Spindle Puller counter-clockwise until it disengages the Spindle Housing from the Motor Housing. Carefully lift the Spindle Housing up, while at the same time watching to collect any of the three Needle Bearings or the three Planet Gears that may fall out. Remove any remaining Planet Gears and Needle Bearings and set them aside. Set the Spindle Housing assembly out-of-the-way.
2. Remove the Motor Spacer.
3. Grasp the Motor Assembly by the exposed end of the Motor Shaft and pull out the Motor Assembly from the Motor Housing and set it aside.
4. Remove the Motor Spacer that is in the bottom of the motor assembly bore.
5. Remove the O-Ring from the Cylinder. Remove the Retaining Ring from the Motor Shaft.
6. Remove the Rear Endplate, Cylinder, Rotor and five Vanes. This may require gripping the Rear Endplate with a (XPA0416) Bearing Separator and lightly pressing the Motor Shaft through the Bearing and Rear Endplate. CAUTION: The Key will damage the Front Endplate if the Motor Shaft is pressed through without removing the Key first. Remove the Key then press off the Front Endplate.
7. Remove the Bearings from the Endplates using the T-8 Motor Faceplate Bearing Removal Tool (Included in XPA0486 Kit). The end of the tool with the larger diameter is for pressing the Bearing in the Front Endplate out and the smaller diameter end is for pressing the Bearing in the Rear Endplate out.

#### Spindle Housing Disassembly:

1. Take the Spindle Housing and with a small, thin-tipped flathead screwdriver pick-out the slotted end of the Retaining Ring, then continue to peel-out the Retaining Ring all the way around until it is free from the groove in the Spindle Housing.
2. Screw the threaded end of the T-6 Motor Lock Ring Wrench/Spindle Puller into the Planetary Spindle until hand tight. NOTE: Make sure the Planet Gears and Needle Bearings have been removed and set aside.
3. Remove the Planetary Spindle assembly. To accomplish this, create moderately sharp outward blows to the Planetary Spindle, this can be done by taking the cylindrical part of the T-6 Motor Lock Ring Wrench (Included in XPA0486 Kit) and sliding it up the handle away from the

Planetary Shaft and hitting the washers and set screw at the opposite end of the handle.

4. The Ring Gear does not normally have to be removed. If it is determined that it needs to be replaced, press it out from the same side the Planetary Spindle Assembly is pressed in. Press it out by pressing on the part of the gear teeth that is exposed when looking in the bore from the Planetary Spindle side.
5. With a small, thin-tipped flathead screwdriver pick-out the slotted end of the Retaining Ring, then continue to peel-out the Retaining Ring all the way around until it is free from the Planetary Spindle.
6. Use a (XPA0416) Bearing Separator to remove the Bearing, Shim and Bearing from the Planetary Spindle.

#### Housing Disassembly:

1. Unscrew the threaded Plug(s) and the Handle (if used) from the Motor Housing.
2. Remove the Hook and Spacer Ring. (if used)
3. Remove the Retaining Ring. The Speed Control (with O-Ring) will now pull straight out from the Motor Housing. Use an o-ring pick to remove the O-Ring from the Speed Control.
4. Use a T-20 Torx driver to unscrew all Screws.
5. Remove the Housings.
6. Remove the Muffler and Seals from the Housing.
7. Remove the End Cap.
8. Unscrew the Inlet Bushing from the End Cap. Remove the Mufflers, Captive Ring, and the o-rings from the End Cap.
9. Remove the exhaust Tubing, Tubing Clamp, and inlet Tubing from the motor housing assembly. Separate the exhaust Tubing, Tubing Clamp, and inlet Tubing from each other.
10. Unscrew Screws from the motor housing assembly.
11. Remove the NV/CV Exhaust Nozzle and the Gasket from the motor housing assembly.
12. Press out the Spring Pin from the Motor Housing and remove the Throttle Lever.
13. Remove the Seal Assembly. This component can become damaged during removal and will need to be replaced if damaged.
14. Remove the Spring, Valve, Valve Seat, and the Valve Stem from the Motor Housing. Use an o-ring pick to remove the o-ring from the Valve Stem.
15. Remove the Sleeve from the Motor Housing.
16. Remove the Shroud from the Motor Housing.



## ASSEMBLY INSTRUCTIONS

**NOTE:** All assembling 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.

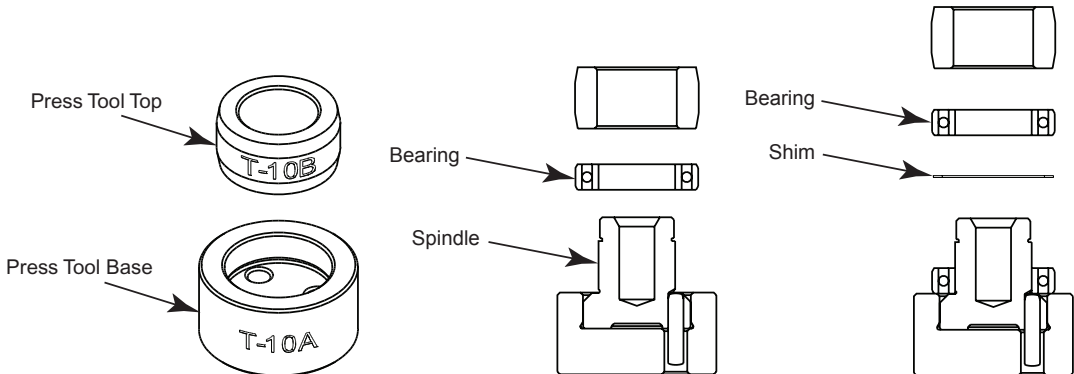
### Housing Assembly:

1. Press the Sleeve flush to the top of the Motor Housing.
2. Lightly grease the o-ring and place it in the groove of the Valve Stem. Install the Valve Stem into the Sleeve.
3. Install the Valve Seat, the Valve and the Spring. Press the Seal Assembly into the Motor Housing.
4. Install the Throttle Lever onto the Motor Housing with the Spring Pin.
5. Install the Shroud onto the Motor Housing.
6. Install the NV/CV Exhaust Nozzle and the Gasket using the Screws. Torque settings to be 21 - 30 in-lbs (2.4 - 3.4 N-m). Insert the exhaust Tubing and the inlet Tubing into the Tubing Clamp. Then insert the exhaust Tubing into the Exhaust Nozzle and insert the inlet Tubing into the Seal Assembly.
7. Install the two Mufflers, O-Ring, Captive Ring, and O-Ring into the End Cap. Lightly grease the o-rings before installation.
8. Coat the threads of the Bushing Assembly with 1 or 2 drops of Loctite™ 222 or equivalent non-permanent pipe thread sealant. Screw the Bushing Assembly into the inlet port on the End Cap until hand tight. Torque settings to be 60 - 72 in-lbs (6.8 - 8.1 N-m).
9. Insert the inlet Tubing into the End Cap.
10. Install the Muffler and Seals into the Housing.
11. Install the internal housing components into the right side Housing. Then install the left side Housing.
12. Install the Screws. Torque setting to be 27 - 30 in-lbs (3.0 - 3.4 N-m) for the 15 mm long Screw. Torque setting to be 29 - 33 in-lbs (3.3 - 3.7 N-m) for the 30 mm long Screw.
13. Lightly grease the O-Ring and place it in the groove on the Speed Control. Insert the Speed Control into the Motor Housing in the full on position. Install the Retaining Ring. Caution: Make sure the Retaining Ring is completely snapped into groove in the Motor Housing.
14. Install the Spacer Ring into the Hook. Secure the hook

by screwing in the Plugs and/or install the optional Side Handle.

### Planetary Spindle Assembly and Bearing Press Tool Instructions:

1. Place the T-10A Spindle Bearing Pressing Tool Base (Included in XPA0546 Kit) onto a flat, clean surface of a small hand press or equivalent with the spindle pocket facing upward. Place the Spindle Assembly into the spindle pocket by using its three planetary gear shafts to align it with the three bores in the Pressing Tool Base.
2. Place the Bearing (no seals/shields) onto the Spindle shaft. 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 the Spindle using the T-10B Spindle Bearing Press Tool Top (Included in XPA0546 Kit) as shown in Figure 6.
3. Place the Shim over the Spindle shaft and onto the face of the Bearing making sure it is on center. Press the (two seals) Bearing down using the T-10B Spindle Bearing Press Tool Top (Included in XPA0546 Kit), being careful to make sure the Shim is still centered on the vertical axis of the Spindle shaft and Bearing. See Figure 7. Secure the Retaining Ring onto the end of the Planetary Spindle Assembly.
4. If the Ring Gear was removed, press it into the Machined Spindle Housing until it rests on the shoulder.
5. Lightly press the entire Planetary Spindle Assembly into the bore of the Machined Spindle Housing. Secure the Retaining Ring into the groove of the Machined Spindle Housing.
6. Place the three Needle Bearings onto the planetary shafts of the Planetary Spindle Assembly. Place the three Planet Gears onto the Needle Bearings. Set the finished assembly aside being careful to not let the Planetary Gears or Needle Bearings fall-out.



**Motor Assembly:**

1. Press fit a Bearing (2 shields) into the Front Endplate and a Bearing (2 shields) into the Rear Endplate.
2. Press the Front Endplate and Bearing Assembly into position on the Motor Shaft. Place the Key into the groove on the Motor Shaft. Place the Rotor onto the Motor Shaft.
3. Place the Cylinder over the Rotor with the short end of the spring pin engaging the blind hole in the Front Endplate. Oil the five Vanes with a quality pneumatic tool oil and place in the slots in the Rotor. NOTE: The spring pin must project .060 in. (1.5 mm) above the flanged side of the Cylinder. Lightly press fit the Rear Endplate over the Motor Shaft and secure with the Retaining Ring. 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 Motor Shaft by pushing on the curved portions with a small screwdriver.
4. Lightly grease the O-Ring and place in the air inlet of the Cylinder Assembly.
5. Place the Motor Spacer in the Motor Housing. Make sure the spring pin engages the pocket in the Housing.
6. Lightly grease or oil the inside diameter of the Motor Housing, line up the spring pin with the marking on the Motor Housing and slide the Motor Assembly into the Housing. Make sure the spring pin engages the hole in the Motor Spacer.
7. Place the Motor Spacer into the Motor Housing.
8. Place the O-Ring in the groove of the Machined Spindle Housing.
9. Take the Planetary Gears of the Machined Spindle Housing assembly and line them up, and partially engage them with the gear in the Motor Assembly. Carefully screw the Machined Spindle Housing into the Motor Housing with the T-6 Motor Lock Ring Wrench/Spindle Puller (See "Service Tools and Accessories") until hand tight. Torque setting to be 55 - 65 in-lbs (6.2 - 7.3 N-m). 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.

**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 2,500 and 3,500 RPM for 3,000 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.

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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 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".



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