

# Dynorbital-Spirit™

12,000 RPM Air Powered Random Orbital Sander

## Air Tool Manual – Safety, Operation and Maintenance

SAVE THIS DOCUMENT, EDUCATE ALL PERSONNEL

### Models:

| 3/8" Orbit  | 3/16" Orbit | 3/32" Orbit |
|-------------|-------------|-------------|
| 21000 21011 | 21020 21031 | 21040 21051 |
| 21001 21014 | 21021 21034 | 21041 21054 |
| 21004 21015 | 21024 21035 | 21044 21055 |
| 21005 21016 | 21025 21036 | 21045 21056 |
| 21006 21019 | 21026 21039 | 21046 21059 |
| 21009 21060 | 21029 21061 | 21049 21062 |
| 21010 21063 | 21030 21064 | 21050 21065 |

FOR COMPLETE MODEL DESCRIPTION REFERENCE PAGE 6.



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## ! WARNING

Read and understand this tool manual before operating your air tool. Follow all safety rules for the protection of operating personnel as well as adjacent areas. Always operate, inspect and maintain this tool in accordance with the American National Safety Institute (ANSI) Safety Code for Portable Air Tools – B186.1. For additional safety information, refer to Safety Requirements for the Use, Care and Protection of Abrasive Wheels – ANSI B7.1, Code of Federal Regulation – CFR 29 Part 1910, European Committee for Standards (EN) Hand Held Non-Electric Power Tools – Safety Requirements and applicable State and Local Regulations.

## SAFETY LEGEND

|  |                                                                                                                                                                               |  |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  | <b>! WARNING</b><br>Read and understand tool manual before work starts to reduce risk of injury to operator, visitors, and tool.                                              |  |
|  | <b>! WARNING</b><br>Eye protection must be worn at all times, eye protection to conform to ANSI Z87.1.                                                                        |  |
|  | <b>! WARNING</b><br>Respiratory protection to be used when exposed to contaminants that exceed the applicable threshold limit values required by law.                         |  |
|  | <b>! WARNING</b><br>Practice safety requirements. Work alert, have proper attire, and do not operate tools under the influence of alcohol or drugs.                           |  |
|  | <b>! WARNING</b><br>Ear protection to be worn when exposure to sound, exceeds the limits of applicable Federal, State or local statutes, ordinances and/or regulations.       |  |
|  | <b>! WARNING</b><br>Air line hazard, pressurized supply lines and flexible hoses can cause serious injury. Do not use damaged, frayed or deteriorated air hoses and fittings. |  |

### SAFETY INSTRUCTIONS

Carefully Read all instructions before operating or servicing any Dynabrade® Abrasive Power Tool.

Products offered by Dynabrade are not to be modified, converted or otherwise alerted from the original design without expressed written consent from Dynabrade, Inc.

**Tool Intent:** Dynorbital-Spirit™ Random Orbital Sander is used for sanding and finishing a variety of materials including wood, metal, plastic, fiberglass, solid surfaces, composites, rubber, glass and stone.

**Do Not Use Tool For Anything Other Than Its Intended Applications.**

**Training:** Proper care, maintenance, and storage of your tool will maximize its performance.

- Employer's Responsibility – Provide Dynorbital-Spirit™ operators with safety instructions and training for safe use of tools and accessories.

#### Accessory Selection:

- Abrasive/accessory RPM (speed) rating MUST be approved for AT LEAST the tool RPM rating.
- Before mounting an accessory, visually inspect for defects. Do not use defective accessories.
- Follow tool specifications before choosing size and type of accessory.
- Only use recommended fittings and air line sizes. Air supply hoses and air hose assemblies must have a minimum working pressure rating of 150 PSIG (10 bars, g) or 150 percent of the maximum pressure produced in the system, whichever is higher. (See Tool Machine Specifications Table.)

### OPERATING INSTRUCTIONS

**Warning:** Always wear eye protection. Operator of tool is responsible for following: accepted eye, face, respiratory, hearing and body protection.

**Caution:** Hand, wrist and arm injury may result from repetitive work, motion and overexposure to vibration.

(continued on next page)

### OPERATING INSTRUCTIONS (continued)

- Keep hand and clothing away from working end of the air tool.

**Operation:** Be sure that any loose clothing, hair and all jewelry is properly restrained.

- Secure inlet bushing on air tool with a wrench before attempting to install the air fitting to avoid damaging housing assembly.
- Check tool RPM (speed) with tachometer with air pressure set at 90 PSIG while the tool is running. If tool is operating at a higher speed than the RPM marked on the tool housing, or operating improperly, the tool must be serviced and corrected before use.

**Caution:** Tool RPM must never exceed abrasive/accessory RPM rating. Check accessory manufacturer for details on maximum operating speed or special mounting instructions.

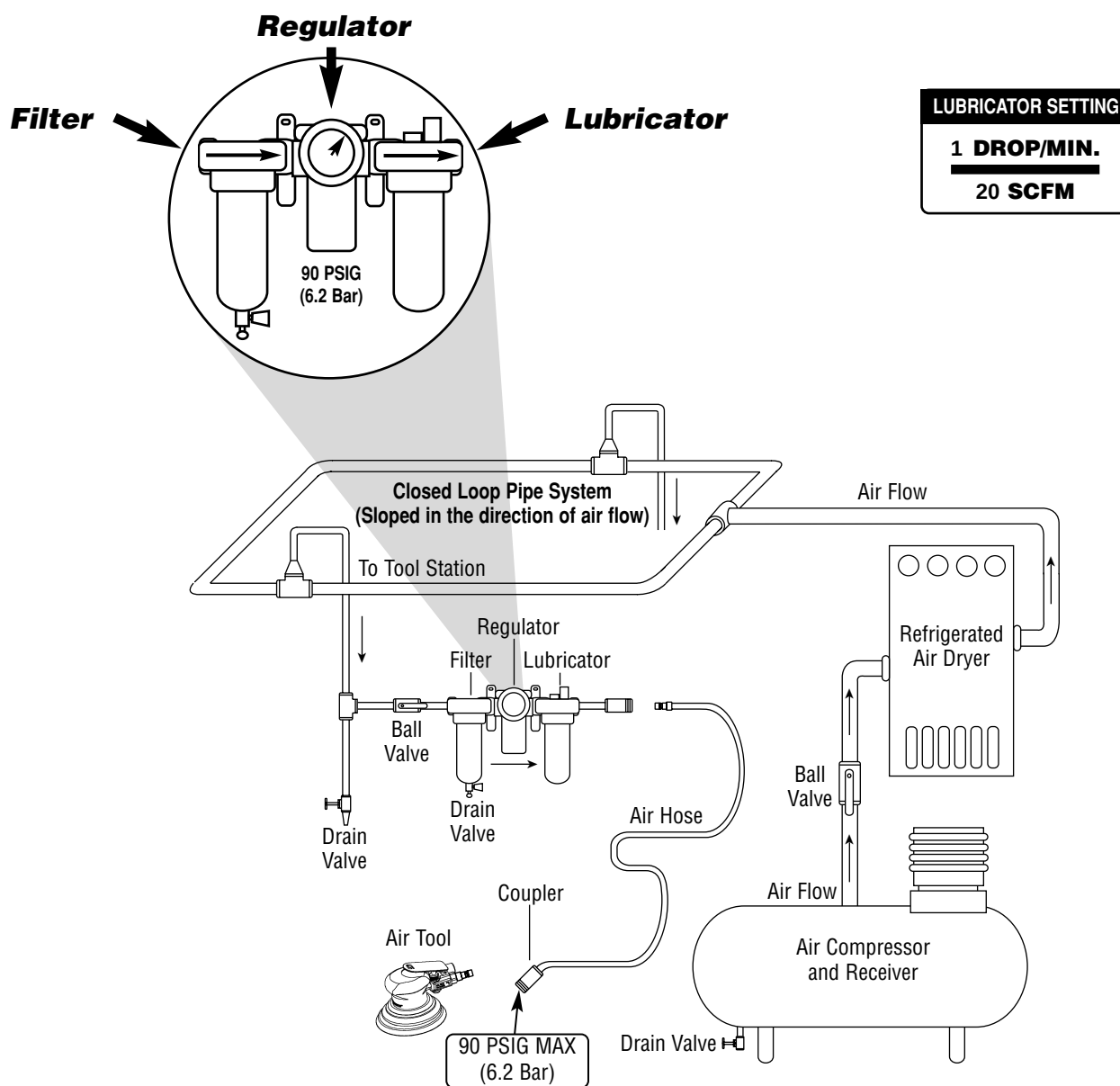
- With power source disconnected from air tool, mount recommended accessory into collet assembly.
- Connect air tool to power source. Be careful NOT to depress throttle lever in the process. **Do not expose air tool to inlet pressure above 90 PSIG or (6.2 Bars).**

**Caution:** After installing the accessory, before testing or use and/or after assembling tool, the Dynorbital-Spirit™ must be started at a reduced speed to check for good balance. Gradually increase tool speed. DO NOT USE if tool vibration is excessive. Correct cause, and retest to insure safe operation.

- Make sure that work area is uncluttered, and visitors are at a safe range from the tools and debris.
- Use a vise or clamping device to hold work piece firmly in place.
- Do not apply excessive force on tool or apply "rough" treatment to it.
- Always work with a firm footing, posture and proper lighting.

Report to your supervisor any condition of the tool, accessories, or operation you consider unsafe.

## Air System



- Dynabrade Air Power Tools are designed to operate at 90 PSIG (6.2 Bar/620 kPa) maximum air pressure at the tool inlet, when the tool is running. Use recommended regulator to control air pressure.

- Ideally the air supply should be free from moisture. Incorporating a refrigerated air dryer after the compressor and drain valves at each tool station (as shown) further reduces moisture from condensation in the air supply.

# Maintenance Instructions

**Important:** A Preventative Maintenance Program is recommended whenever portable power tools are used.

- Use only genuine Dynabrade replacement parts to insure quality. To order replacement parts, specify **Model#**, **Serial#** and **RPM** of your air tool.
- It is strongly recommended that all Dynabrade rotary vane air tools be used with a Filter-Regulator-Lubricator to minimize the possibility of misuse due to unclean air, wet air or insufficient lubrication. Dynabrade recommends the following: **11405** Air Filter-Regulator-Lubricator (FRL) – Provides accurate air pressure regulation and two stage filtration of water contaminants. Operates 40 SCFM/1,133 LPM @ 100 PSIG with 3/8" NPT female ports.
- Dynabrade recommends one drop of air lube per minute for each 20 SCFM (example: if the tool specification states 40 SCFM, set the drip rate on the filter-lubricator to 2 drops per minute). Dynabrade Air Lube (P/N **95842**: 1 pt 473 ml) is recommended.

**Routine Preventative Maintenance:** Check free speed of Dynorbital-Spirit™ using a tachometer.

- Mineral spirits are recommended when cleaning the tool and parts. Do not clean tool or parts with any solvents or oils containing acids, esters, ketones, chlorinated hydrocarbons or nitro carbons.
- DO NOT clean or maintain tools with chemicals that have a low flash point (example: WD-40®).
- A Drop-In Motor and Tune-Up Kit are available, see specific kit number on page 9.
- Air tool stampings must be kept legible at all times, if not, reorder and replace. User is responsible for maintaining specification information i.e.: Model #, S/N, and RPM.
- Blow air supply hose out prior to initial use.
- Visually inspect air hoses and fittings for frays, visible damage and signs of deterioration. Replace damaged or worn components.
- Refer to Dynabrade's Warning/Safety Operating Instructions Tag (Reorder No. **95903**) for safety information.

After maintenance is performed on tool, add a few drops of Dynabrade Air Lube (P/N **95842**) to the air line and start the tool a few times to lubricate air motor. Check for excessive tool vibration.

## Handling and Storage:

- Protect tool inlet from debris (See Notice Below).
- DO NOT carry tool by air hose.
- Protect abrasive accessories from exposure to water, solvents, high humidity, freezing temperature and extreme temperature changes.
- Store accessories in protective racks or compartments to prevent damage.

## Notice

All Dynabrade motors use the highest quality parts and materials available and are machined to exacting tolerances. The failure of quality pneumatic motors can most often be traced to an unclean air supply or the lack of lubrication. Air pressure easily forces dirt or water contained in the air supply into motor bearings causing early failure. It often scores the cylinder walls and the rotor blades resulting in limited efficiency and power. Our warranty obligation is contingent upon proper use of our tools and cannot apply to equipment which has been subjected to misuse such as unclean air, wet air or a lack of lubrication during the use of this tool.



## One Year Warranty

Following the reasonable assumption that any inherent defect which might prevail in a product will become apparent to the user within one year from the date of purchase, all equipment of our manufacture is warranted against defects in workmanship and materials under normal use and service. We shall repair or replace at our factory, any equipment or part thereof which shall, within one year after delivery to the original purchaser, indicate upon our examination to have been defective. Our obligation is contingent upon proper use of Dynabrade tools in accordance with factory recommendations, instructions and safety practices. It shall not apply to equipment which has been subject to misuse, negligence, accident or tampering in any way so as to affect its normal performance. Normally wearable parts such as bearings, contact wheels, rotor blades, etc., are not covered under this warranty.



## Reference Contact Information

1. **American National Safety Institute – ANSI**  
25 West 43<sup>rd</sup> Street  
Forth Floor  
New York, NY 10036  
Tel: 1 (212) 642-4900  
Fax: 1 (212) 398-0023

2. **Government Printing Office – GPO**  
Superintendent of Documents  
Attn. New Orders  
P.O. Box 371954  
Pittsburgh, PA 15250-7954  
Tel: 1 (202) 512-1803

3. **European Committee for Standardization**  
Rue de Stassart 36  
B - 1050 Brussels, Belgium

# Dynorbital-Spirit™

## Complete Assembly

### For Models:

21000, 21001, 21004, 21005, 21006, 21009  
21010, 21011, 21014, 21015, 21016, 21019  
21020, 21021, 21024, 21025, 21026, 21029  
21030, 21031, 21034, 21035, 21036, 21039  
21040, 21041, 21044, 21045, 21046, 21049  
21050, 21051, 21054, 21055, 21056, 21059  
21060, 21061, 21062, 21063, 21064, 21065

| KEY      |                                                                          |
|----------|--------------------------------------------------------------------------|
| <b>O</b> | Oil: O <sub>1</sub> = Air Lube                                           |
| <b>A</b> | Adhesive: A <sub>2</sub> = Loctite #271<br>A <sub>8</sub> = Loctite #567 |
| <b>T</b> | Torque: N•m x 8.85 = In. - lbs.                                          |

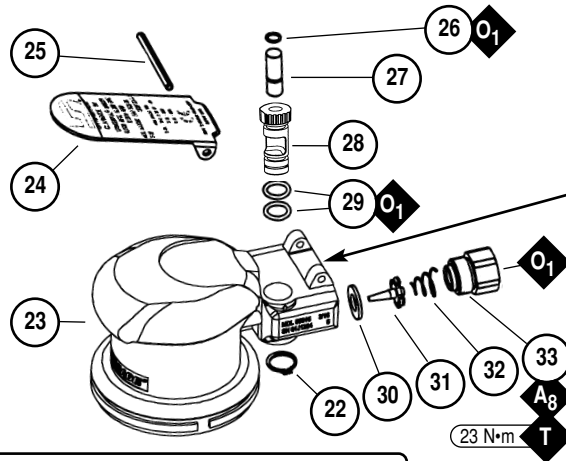
### Index Key

No. Part # Description

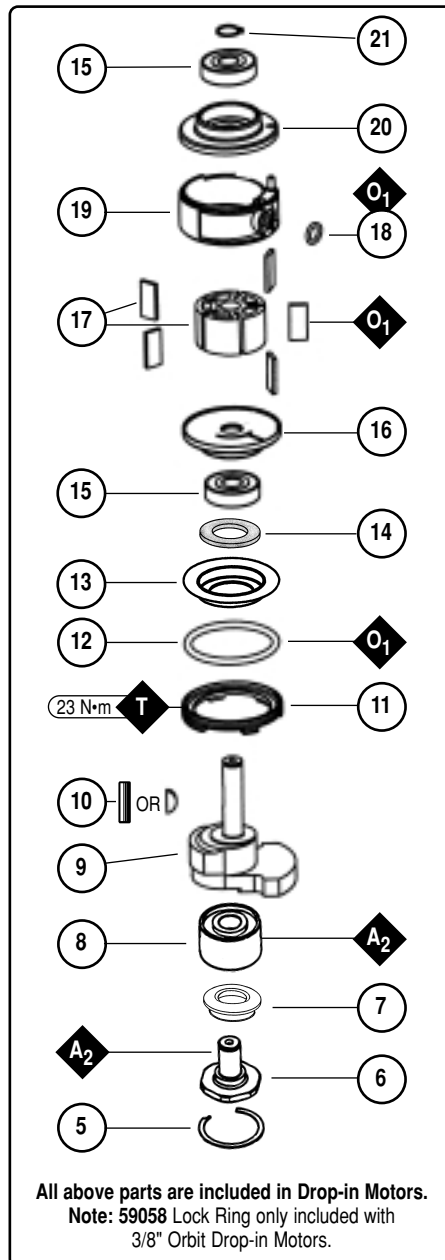
- 1 Sanding Pads (See Pg. 10)
- 2 Vacuum Lip-Seal Shroud  
57089 5" & 6"
- 3 Vacuum Shroud  
57084 3 1/2"
- 4 Shroud (Non-Vac)  
54458 3-1/2"  
56051 5" & 6" (Lip Seal)
- 5 95630 Snap Ring
- 6 57069 Balancer Shaft
- 7 59084 V-Seal
- 8 56052 Bearing
- 9 Motor Shaft Balancer

| Orbit | 3" & 3-1/2" | 5"    | 6"    |
|-------|-------------|-------|-------|
| 3/8"  | 59070       | 59071 | 59072 |
| 3/16" | 59060       | 59061 | 59062 |
| 3/32" | 59065       | 59066 | 59067 |

- 10 56047 Key 
- 11 98461 Key 
- 12 59058 Lock Ring
- 13 50659 O-Ring
- 14 59057 "Top Hat" Seal
- 15 59083 Felt
- 16 58368 Bearing (2)
- 17 59076 Front Bearing Plate
- 18 57113 Rotor/Blade Set
- 19 01024 O-Ring
- 20 59051 Cylinder
- 21 59077 Rear Bearing Plate
- 22 98463 Retaining Ring
- 23 95697 Retaining Ring
- 24 Housing (See Chart, Pg. 6)
- 25 59054 Throttle Lever - 3/8"
- 26 59052 Throttle Lever - 3/16"
- 27 59053 Throttle Lever - 3/32"
- 28 98927 Pin
- 29 98459 O-Ring
- 30 58363 Valve Stem
- 31 59075 Speed Regulator
- 32 01025 O-Ring (2)
- 33 01464 Seal
- 34 58365 Tip Valve
- 35 01468 Spring
- 36 01494 Inlet Bushing



See page 5 for Machine Exhaust Assemblies.



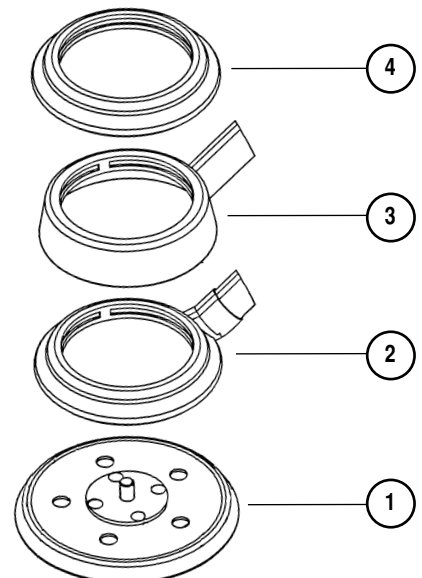
All above parts are included in Drop-in Motors.  
Note: 59058 Lock Ring only included with 3/8" Orbit Drop-in Motors.



### Highly Recommended Drop-in Complete Motor Assemblies

| Orbit | 3" & 3-1/2" | 5"    | 6"    |
|-------|-------------|-------|-------|
| 3/8"  | 59450       | 59453 | 59456 |
| 3/16" | 59451       | 59454 | 59457 |
| 3/32" | 59452       | 59455 | 59458 |

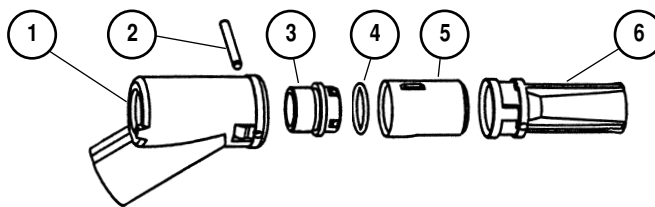
For assembly instructions, see page 6.



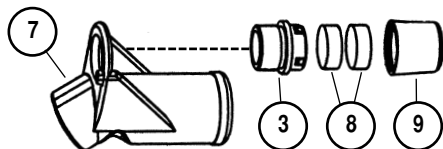
Note: To order replacement parts specify the Model # and Serial # of your machine.

# Machine Exhaust Assemblies

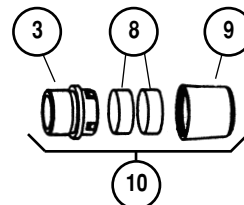
## Self Generated Vacuum (Vac-Ready)/Machine Exhaust



### Central Vacuum/Machine Exhaust



### Non-Vacuum/Machine Exhaust



#### Non-Vacuum to Vacuum Conversion Kits

| Original Non-Vac Tool | Converts to              | Kit Part Number |
|-----------------------|--------------------------|-----------------|
| 3-1/2" (89mm)         | Self-Generated Vac-Ready | 57118           |
| 3-1/2" (89mm)         | Central Vac-Ready        | 57119           |
| 5" (127mm)            | Self-Generated Vac-Ready | 57120           |
| 5" (127mm)            | Central Vac-Ready        | 57121           |
| 6" (152mm)            | Self-Generated Vac-Ready | 57122           |
| 6" (152mm)            | Central Vac-Ready        | 57123           |

#### Index Key

| No. | Part # | Description    | No. | Part # | Description        |
|-----|--------|----------------|-----|--------|--------------------|
| 1   | 57083  | Vacuum Adapter | 6   | 57067  | Vac Tube           |
| 2   | 96197  | Dowel Pin      | 7   | 57093  | Vacuum Adapter     |
| 3   | 57066  | Muffler Body   | 8   | 56027  | Muffler Insert (2) |
| 4   | 95526  | O-Ring         | 9   | 56028  | Muffler Cap        |
| 5   | 59088  | Vac Nozzle     | 10  | 59273  | Muffler Assembly   |

Optional: 30 quantity Muffler Insert available, P/N 56054.

## Vacuum Conversion Instructions

### To Disassemble:

1. Disconnect tool from power source. Invert machine and secure in vise, using **57092** Collar (supplied in **57098** Repair Kit) or padded jaws.
2. Remove sanding pad with **50679** (26mm) Open-End Wrench (supplied with sander) and lip-seal shroud from housing.
3. Remove **56028** Muffler Cap and **56027** Muffler Insert (2) from **57066** Muffler Body. Using a 12mm hex wrench (supplied in **57098** Repair Kit), remove muffler body from housing (not applicable for Self-Generated Vac to Central Vac).

### Non-Vac to Self-Generated Vac for Hook-Up to Self-Contained Dust Collection System

1. Attach **57083** Vacuum Adapter to either **57084**, **57086**, **57087** Vacuum Overskirts or **57089** Vacuum Lip-Seal Shroud. Then attach to the housing making sure the protrusions on the overskirt or shroud are aligned with the notches on the housing.
2. Place **95526** O-Ring on the muffler body between the shoulder and the four (4) protrusions. Using a 12mm hex wrench, attach the muffler body and o-ring to the housing through the vacuum adapter.
3. Place vacuum nozzle into the vacuum adapter with the slots facing outward making sure that the knob on the nozzle is aligned with the slot in the adapter.
4. Place **57067** Vacuum Tube into the vacuum adapter with the grooves facing inward until the adapter "snaps" onto the tube and the tube cannot be pulled out. If the tube can be pulled out, rotate it 1/4 turn and place it back into the adapter until it "snaps".
5. Rotate tube until holes line up. Insert dowel pin in holes until it is centered. Attach sanding pad, attach machine to portable dust collection system.

### Non-Vac to Central Vac

1. Attach **57093** Vacuum Adapter to either **57084**, **57086**, **57087** Vacuum Overskirts or **57089** Vacuum Lip-Seal Shroud. Then attach to the housing making sure the protrusions on the overskirt or shroud are aligned with the notches on the housing.
2. Using a 12mm hex wrench, attach the muffler body to the housing through the central vacuum adapter.
3. Place muffler cap with inserts on muffler body making sure that the protrusions on the body fit in the pockets on the cap.
4. Attach weight-mated vacuum sanding pad with **50679** (26mm) Open-End Wrench. Attach machine to central vacuum system.

### Self-Generated Vac to Central Vac

1. Remove **96197** Dowel Pin with an 1/8" drive pin. Remove **57067** Vacuum Tube from **57083** Vacuum Adapter by turning it clockwise while pulling backward.
2. Using a small flat screwdriver, pry vacuum nozzle until it is loose and then remove it by using two fingers to push and pull it until it hits the "legs" on vacuum adapter. Place vacuum tube back into vacuum adapter far enough to push the "legs" back then push vacuum nozzle and vacuum tube out the rest of way.
3. Using a 12mm hex wrench (supplied in **57098** Repair Kit), remove the **57066** Muffler Body and **95526** O-Ring from the housing through the adapter. Remove the o-ring from the muffler body.
4. Remove **57083** Vacuum Adapter and attach **57093** Vacuum Adapter to either **57084**, **57086**, **57087** Vacuum Overskirts or **57089** Vacuum Lip-Seal Shroud. Then attach to the housing making sure that the protrusions on the overskirt or shroud are aligned with the notches on the housing.
5. Using a 12mm hex wrench, attach the muffler body and o-ring to the housing through the central vacuum adapter.
6. Place muffler cap with inserts on muffler body making sure that the protrusions on the body fit in the pockets on the cap. Attach sanding pad.

### Central Vac to Self Generated Vac

1. Remove **57093** Central Vacuum Adapter and put the **57083** Vacuum Adapter in its place.

(continued on next page)

## **Vacuum Conversion Instructions (continued)**

2. Place **95526** O-Ring on the muffler body between the shoulder and the four (4) protrusions. Using a 12mm hex wrench (supplied in **57098** Repair Kit), attach the muffler body and o-ring to the housing through the vacuum adapter.
3. Place vacuum nozzle into the vacuum adapter with the slots facing outward making sure that the knob on the nozzle is aligned with the slot in the adapter.
4. Place **57067** Vacuum Tube into the vacuum adapter with the grooves facing inward until the adapter "snaps" onto the tube and the tube cannot be pulled out. If the tube can be pulled out, rotate it 1/4 turn and place it back into the adapter until it "snaps".
5. Rotate tube until holes line up. Insert **96197** Dowel Pin in holes until it is centered. Attach machine to portable dust collection system.

## **Drop-in Motor Removal/Replacement Instructions - Dynorbital-Spirit™**

**Important:** Manufacturer's warranty is void if tool is disassembled before warranty expires.

Drop-in Motor Repair Kit P/N 59459 is available which includes special repair tools for the correct removal and replacement of the air motor.

**Disconnect tool from power source before motor exchange.**

### **To Remove:**

1. Disconnect the sander from the air supply.
2. Invert the sander, and place the **57092** Repair Collar (supplied in the **59459** Drop-in Motor Repair Kit) around the housing and secure in a vise. Padding can be used on the vise jaws to protect the housing. **Important:** Do not over tighten the sander in the vise. If the sander is held too tight the removal of the lock ring and air motor will be difficult.
3. Remove the sanding pad with the **50679** 26mm Open-end Wrench. (Supplied with the sander.)
4. Insert the **56058** Lock Ring Tool (supplied in the **59459** Drop-in Motor Repair Kit) into the corresponding tabs of the lock ring. Loosen the **59058** Lock Ring turning it counterclockwise.
5. Remove the **59058** Lock Ring and the **50659** O-Ring from the air motor assembly. (3/32" and 3/16" dia. orbits only.)
6. Discard the air motor assembly.

### **To Install Replacement:**

**Important:** Clean and inspect the housing, valve mechanism, and exhaust assembly. Replace any valve, muffler, or vacuum components as is necessary. Follow all torque and lubrication specifications.

1. Place the **50659** O-Ring into the **59058** Lock Ring and slip these over the motor shaft balancer. (3/32" and 3/16" dia. orbits only.) Spread 1 drop of pneumatic tool oil on the surface between the **50659** O-Ring and the **59076** Front Bearing Plate.
2. Apply 1 drop of oil to the **01024** O-Ring. (O-Ring is supplied with the drop-in air motor assembly.)
3. With the sander housing secured in a vise (use the **57092** Repair Collar of padding on the jaws of the vise to protect the housing) slide the drop-in air motor into the housing aligning the line-up post with the notch on the inside of the housing. **Note:** Make certain that the line-up post enters the notch in the housing and that the **01024** O-Ring remains seated in the side of the cylinder.
4. Tighten the lock ring with the **56058** Lock Ring Wrench. (Torque to 23 N•m/200 in.-lbs.)
5. Install a Dynabrade weight-mated sanding pad.

### **Drop-in Motor Replacement Complete.**

**Important:** Before connecting the sander to the air supply, depress the throttle lever and place 2-3 drops of Dynabrade Air Lube (P/N **95842**) directly into the sander's air inlet. The sander should now be tested at 90 PSIG operating pressure at the sander's air inlet. Operate the sander for 30 seconds to determine if it is operating properly and to allow the lubricating oil to permeate the air motor.

## **Complete Model Description/Housing Number**

### **3/8" Orbit Models**

| Model Number | Vacuum Description             | Housing Number |
|--------------|--------------------------------|----------------|
| 21000        | 3" Non-Vacuum                  | 21151          |
| 21001        | 3" Basic Vacuum                | 21152          |
| 21004        | 3" Central Vacuum              | 21153          |
| 21005        | 3-1/2" Non-Vacuum              | 21154          |
| 21006        | 3-1/2" Basic Vacuum            | 21155          |
| 21009        | 3-1/2" Central Vacuum          | 21156          |
| 21010        | 5" Non-Vacuum                  | 21157          |
| 21011        | 5" Basic Vacuum                | 21158          |
| 21014        | 5" Central Vacuum              | 21159          |
| 21015        | 6" Non-Vacuum                  | 21160          |
| 21016        | 6" Basic Vacuum                | 21161          |
| 21019        | 6" Central Vacuum              | 21162          |
| 21060        | 6" Non-Vac (w/ Hook-Face Pad)  | 21160          |
| 21063        | 6" Ctrl Vac (w/ Hook-Face Pad) | 21162          |

### **3/16" Orbit Models**

| Model Number | Vacuum Description             | Housing Number |
|--------------|--------------------------------|----------------|
| 21020        | 3" Non-Vacuum                  | 21163          |
| 21021        | 3" Basic Vacuum                | 21164          |
| 21024        | 3" Central Vacuum              | 21165          |
| 21025        | 3-1/2" Non-Vacuum              | 21166          |
| 21026        | 3-1/2" Basic Vacuum            | 21167          |
| 21029        | 3-1/2" Central Vacuum          | 21168          |
| 21030        | 5" Non-Vacuum                  | 21169          |
| 21031        | 5" Basic Vacuum                | 21170          |
| 21034        | 5" Central Vacuum              | 21171          |
| 21035        | 6" Non-Vacuum                  | 21172          |
| 21036        | 6" Basic Vacuum                | 21173          |
| 21039        | 6" Central Vacuum              | 21174          |
| 21061        | 6" Non-Vac (w/ Hook-Face Pad)  | 21172          |
| 21064        | 6" Ctrl Vac (w/ Hook-Face Pad) | 21174          |

### **3/32" Orbit Models**

| Model Number | Vacuum Description             | Housing Number |
|--------------|--------------------------------|----------------|
| 21040        | 3" Non-Vacuum                  | 21175          |
| 21041        | 3" Basic Vacuum                | 21176          |
| 21044        | 3" Central Vacuum              | 21177          |
| 21045        | 3-1/2" Non-Vacuum              | 21178          |
| 21046        | 3-1/2" Basic Vacuum            | 21179          |
| 21049        | 3-1/2" Central Vacuum          | 21180          |
| 21050        | 5" Non-Vacuum                  | 21181          |
| 21051        | 5" Basic Vacuum                | 21182          |
| 21054        | 5" Central Vacuum              | 21183          |
| 21055        | 6" Non-Vacuum                  | 21184          |
| 21056        | 6" Basic Vacuum                | 21185          |
| 21059        | 6" Central Vacuum              | 21186          |
| 21062        | 6" Non-Vac (w/ Hook-Face Pad)  | 21184          |
| 21065        | 6" Ctrl Vac (w/ Hook-Face Pad) | 21186          |

Note: All tools are 12,000 RPM.

# Motor Assembly/Disassembly Instructions - Dynorbital-Spirit™

**Important:** Manufacturers warranty is void if tool is disassembled before warranty expires.

A Full Service Repair Kit P/N 57098, is available which includes special repair tools for correct disassembly/assembly of the sander.

## To Disassemble:

1. Disconnect sander from air supply.
2. Invert the sander, and place the **57092** Repair Collar (supplied in the **57098** Full Service Repair Kit) around the housing and secure in a vise. Padding can be used on the vise jaws to protect the housing. **Important:** Do not over tighten the sander in the vise. If the sander is held too tight the removal of the lock ring and air motor will be difficult.
3. Remove sanding pad with the **50679** 26mm Open-end Wrench (supplied with the sander).
4. Insert **56058** Lock Ring Tool (supplied in **57098** Full Service Repair Kit) into the corresponding tabs of lock ring. Loosen the **59058** Lock Ring turning it counterclockwise.
5. Remove the **59058** Lock Ring and the **50659** O-Ring from the air motor assembly (3/32" and 3/16" dia. orbits only).
6. Remove **01024** O-Ring and **98463** Retaining Ring from motor assembly.
7. Fasten a 2 in. bearing separator (P/N **96346** available) around the **59051** Cylinder just below the **59077** Rear Bearing Plate. Place the air motor assembly in a #2 arbor press (P/N **96232** available) so that the separator is resting on the table of the arbor press and with the balancer pointing down.
8. Use a flat nose 3/16" dia. drive punch as a press tool. Place it against the small end of the motor shaft balancer and push the shaft out of the upper **58368** Bearing.
9. Remove the rotor, vanes and rotor key from the motor shaft balancer.
10. Again fasten the 2 in. bearing separator between **58368** Bearing and the top of the balancer. Rest the separator on the table of the arbor press and push the motor shaft balancer out of the **58368** Bearing. Remove **59057** "Top Hat" Seal and **59083** Felt from **59076** Front Bearing Plate.
11. Disassemble the balancer assembly as follows:
  - a.) Place motor shaft balancer assembly into a soft jaw vise. Using a thin screwdriver, pick out the end of **95630** Snap Ring and remove. This will loosen the balancer assembly.
  - b.) Screw the threaded portion of the **56056** Bearing Puller (supplied in **57098** Repair Kit) into the **57069** Balancer Shaft and heat the outside of the motor shaft balancer to approximately 200° F (approximately 10 seconds with a propane torch). Now, using the slider weight, pull the assembly out.
  - c.) Press off **56052** Bearing with a bearing separator and arbor press remove **59084** V-Seal.
12. If during step 11, the **56052** Bearing remains in the motor shaft balancer, it can be removed by the heating the shaft balancer again and using either an inside bearing puller or a blind hole bearing puller.

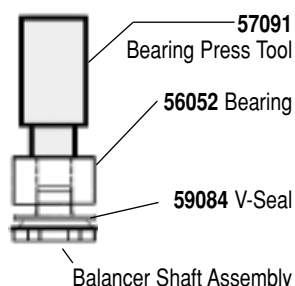
## To Assemble:

**Important:** Clean and inspect all parts for defects before assembling.

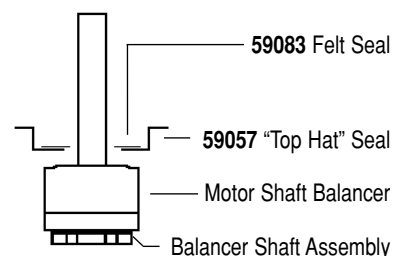
1. Assemble the balancer assembly as follows:
  - a.) Install **59084** V-Seal onto the balancer shaft. Install with flexible lip of seal facing hex of balancer shaft. Be certain seal is pressed completely over shaft step. See **Drawing 1**.
  - b.) Install **95360** Snap Ring between flange of **59084** V-Seal and hex of balancer shaft.
  - c.) Apply 1 drop of #271 Loctite® (or equivalent) and spread over several places around inside diameter of **56052** Bearing and the outside diameter of the **57069** Balancer Shaft.
  - d.) Use the **57091** Bearing Press Tool to press **56052** Bearing with seal side toward hex of balancer shaft up to shaft step as shown in **Drawing 1**. This is a firm press fit for proper retention of bearing.
2. Place the motor shaft balancer in a soft aluminum or bronze jaw vise with large end pointing up.
3. Apply 1 drop of #271 Loctite® (or equivalent) and spread over several places around the outside diameter of the **56052** Bearing and slide balancer assembly into the motor shaft balancer until **56052** Bearing is firmly seated at bottom. Squeeze **95630** Snap Ring into groove in motor shaft balancer to complete the assembly. Remove from vise. Place **50659** O-Ring and **59058** Lock Ring onto the motor shaft balancer (3/8" orbit models only).
4. Place the **59083** Felt into the **59057** "Top Hat" Seal.
5. Install the felt and the "Top Hat" Seal onto the motor shaft balancer so that they are centered as is shown in **Drawing 2**.
6. Use the small end of the **57091** Bearing Press Tool and the **96232** Arbor Press to install the **58368** Bearing onto the motor shaft balancer as shown in **Drawing 3**.
7. Install the **59076** Front Bearing Plate onto the motor shaft balancer, fitting it to the bearing, felt, and "Top Hat" Seal as is shown in **Drawing 4**.
8. Install the rotor key and the rotor onto the motor shaft balancer.
9. Lubricate the **56073** Vanes with the **95842** Dynabrade Air Lube (10W/NR or equivalent) and install them into the rotor.
10. Install the **59051** Cylinder so that the short line-up pin fits into the front bearing plate.

(continued on next page)

**Drawing 1**

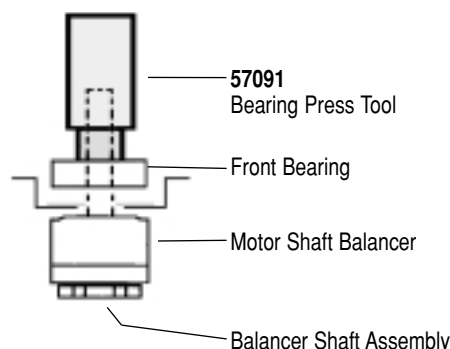


**Drawing 2**

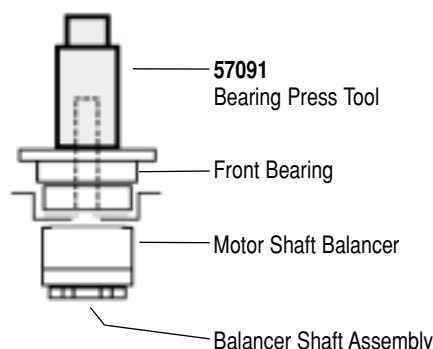


# Motor Assembly/Disassembly Instructions - Dynorbital-Spirit™

**Drawing 3**



**Drawing 4**



## To Assemble (Continued):

11. Install the **58368** Bearing into the **59077** Rear Bearing Plate.
12. Use the small end of the **57091** Bearing Press Tool and the arbor press to install the rear bearing/plate onto the motor shaft balancer as is shown in **Drawing 5**. Press the bearing/plate down until it touches the cylinder. This should create a snug fit between the bearing plates and cylinder.
13. Install the **01024** O-Ring into the cylinder and apply a small amount of the Dynabrade Air Lube onto the o-ring.
14. Coat the **50659** O-Ring with the Dynabrade Air Lube and install it into the **59058** Lock Ring. Slip these over the counter weight of the 3/32" and the 3/16" orbit sanders.
15. Place a mark on the edge of the motor opening to identify the location of the line-up notch on the inside of the housing.
16. Install the motor assembly into the housing. Be certain that the line-up pin enters the notch in the housing.
17. Use the **57092** Collar to carefully hold the tool in a vise so that the counter balance is pointing up.
18. Use the **56058** Lock Ring Tool to tighten the **59058** Lock Ring by turning it clockwise. (Torque to 23 N•m/200 in.- lbs.)
19. Use the 26mm open-end wrench to install a weight-mated sanding pad.

## Valve and Speed Regulator Assemblies:

1. Secure housing in vice using **57092** Collar or padded jaws.
2. Remove inlet bushing, **01468** Spring, **58365** Tip Valve and **01464** Seal from housing. Remove **98927** Pin from housing and lever.
3. Remove **95697** Snap Ring. Press the speed regulator and valve stem out of the housing. Remove the **01025** O-Rings (2) and **98459** O-Ring.
4. Place new **01025** O-Rings (2) on the speed regulator and a new **98459** O-Ring on the valve stem. Then place in housing with valve stem. Install new **95967** Snap Ring. Apply a small amount of pneumatic tool oil to valve o-rings.
5. Place new **01464** Seal in housing. Using tweezers or needle nose pliers, place the tip valve into housing so that the tip valve goes under the valve stem. Place new **01468** Spring into housing so small end is towards tip valve.
6. Apply a small amount of #567 Loctite® (or equivalent) around the threads of the first inlet bushing and tighten into housing to 23 N•m/200 in. - lbs.
7. Install Lever on housing with **98927** Pin centered on housing.

**Note:** Motor should operate at between 11,000 and 12,000 RPM at 6.2 bar (90 PSIG). RPM should be checked with a tachometer. Before operating, we recommend that 2-3 drops of Dynabrade Air Lube P/N **95842** (or equivalent) be placed directly into the air inlet with throttle lever depressed. Operate the machine for approximately 30 seconds before application to workpiece to determine if machine is working properly and safely and to allow lubricating oils to properly dispense through machine.

Loctite® is a registered trademark of the Loctite Corp.

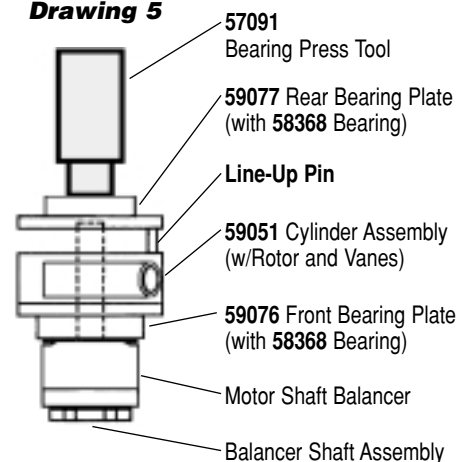
## Disc Pad Change:

1. Insert **50679** Wrench on flats of **57069** Balancer Shaft and twist off sanding pad by hand.
2. With wrench still in place, hand tighten new pad on tool.
3. No need to remove shroud or overskirt.

## Required Weight of Pads:

- 3" Models — Use pad weighing 75g.
- 3-1/2" Models — Use pad weighing 80g.
- 5" Models — Use pad weighing 100g.
- 6" Models — Use pad weighing 130g.

**Drawing 5**



# Preventative Maintenance Schedule

For All Dynorbital-Spirit™ Sanders

This service chart is published as a guide to expectant life of component parts. The replacement levels are based on average tool usage over one year. Dynabrade Inc. considers one year usage to be 1,000 hours or 50% of a man year. Parts included in motor tune-up kit are identified by High Wear and Medium Wear items.

## Parts Common to all Models:

| LEGEND    |                                                |
|-----------|------------------------------------------------|
| <b>T</b>  | Part included in 96510 Tune-up Kit             |
| <b>X</b>  | Type of wear, no other comments apply.         |
| <b>L</b>  | Easily lost. Care during assembly/disassembly. |
| <b>D</b>  | Easily damaged during assembly/disassembly.    |
| <b>R1</b> | Replace each time tool is disassembled.        |
| <b>R2</b> | Replace each second time tool is disassembled. |



### Drop-in Motors

- Allows a quick and easy replacement. No motor adjustments needed.

59450 – 3", 3-1/2" Dia., 3/8" Orbit  
 59451 – 3", 3-1/2" Dia., 3/16" Orbit  
 59452 – 3", 3-1/2" Dia., 3/32" Orbit  
 59453 – 5" Dia., 3/8" Orbit  
 59454 – 5" Dia., 3/16" Orbit  
 59455 – 5" Dia., 3/32" Orbit  
 59456 – 6" Dia., 3/8" Orbit  
 59457 – 6" Dia., 3/16" Orbit  
 59458 – 6" Dia., 3/32" Orbit

### Complete Repair Solution

Includes: 10 Pack of Drop-in Motors  
 59459 Repair Kit

59460 – 3", 3-1/2" Dia., 3/8" Orbit  
 59461 – 3", 3-1/2" Dia., 3/16" Orbit  
 59462 – 3", 3-1/2" Dia., 3/32" Orbit  
 59463 – 5" Dia., 3/8" Orbit  
 59464 – 5" Dia., 3/16" Orbit  
 59465 – 5" Dia., 3/32" Orbit  
 59466 – 6" Dia., 3/8" Orbit  
 59467 – 6" Dia., 3/16" Orbit  
 59468 – 6" Dia., 3/32" Orbit

### 10 Pack of Drop-in Motors

59470 – 3", 3-1/2" Dia., 3/8" Orbit  
 59471 – 3", 3-1/2" Dia., 3/16" Orbit  
 59472 – 3", 3-1/2" Dia., 3/32" Orbit  
 59473 – 5" Dia., 3/8" Orbit  
 59474 – 5" Dia., 3/16" Orbit  
 59475 – 5" Dia., 3/32" Orbit  
 59476 – 6" Dia., 3/8" Orbit  
 59477 – 6" Dia., 3/16" Orbit  
 59478 – 6" Dia., 3/32" Orbit

| Index # | Part Number | Description                                                                           | Number Required | High Wear 100% | Medium Wear 70% | Low Wear 30% | Non-Wear 10% |
|---------|-------------|---------------------------------------------------------------------------------------|-----------------|----------------|-----------------|--------------|--------------|
| 1       | See Note    | Sanding Pad                                                                           | 1               |                |                 |              | X            |
| 2       | 57084       | Vacuum Shroud                                                                         | 1               |                |                 | X            |              |
| 3       | 57089       | Vacuum Lip-Seal Shroud                                                                | 1               |                |                 | X            |              |
| 4       | 54458       | 3-1/2" Shroud (Non-Vac)                                                               | 1               |                |                 |              | X            |
|         | 56051       | 5" & 6" Shroud (Non-Vac)                                                              | 1               |                |                 |              | X            |
| 5       | 95630       | Snap Ring                                                                             | 1               |                |                 | L            |              |
| 6       | 57069       | Balancer Shaft                                                                        | 1               |                |                 |              | X            |
| 7       | 59084       | V-Seal                                                                                | 1               |                | T, X            |              |              |
| 8       | 56052       | Bearing                                                                               | 1               |                | T, X            |              |              |
| 9       | See Note    | Motor Shaft Balancer                                                                  | 1               |                |                 |              | X            |
| 10      | 98461       | Key  | 1               |                | T, X            |              |              |
|         | 56047       | Key  | 1               |                | T, X            |              |              |
| 11      | 59058       | Lock Ring                                                                             | 1               |                |                 | X            |              |
| 12      | 50659       | O-Ring                                                                                | 1               |                |                 | X            |              |
| 13      | 59057       | "Top Hat" Seal                                                                        | 1               |                |                 | X            |              |
| 14      | 59083       | Felt                                                                                  | 1               |                | T, X            |              |              |
| 15      | 58368       | Bearing                                                                               | 2               |                | T, X            |              |              |
| 16      | 59076       | Front Bearing Plate                                                                   | 1               |                |                 | X            |              |
| 17      | 57113       | Rotor/Blade Set                                                                       | 1               | T, X           |                 |              |              |
| 18      | 01024       | O-Ring                                                                                | 1               |                | T, X            |              |              |
| 19      | 59051       | Cylinder                                                                              | 1               |                |                 | X            |              |
| 20      | 59077       | Rear Bearing Plate                                                                    | 1               |                |                 | X            |              |
| 21      | 98463       | Retaining Ring                                                                        | 1               |                | T, D            |              |              |
| 22      | 95697       | Retaining Ring                                                                        | 1               |                | T, D            |              |              |
| 23      | See Note    | Housing                                                                               | 1               |                |                 |              | X            |
| 24      | See Note    | Throttle Lever                                                                        | 1               |                |                 | X            |              |
| 25      | 98927       | Pin                                                                                   | 1               |                | T, X            |              |              |
| 26      | 98459       | O-Ring                                                                                | 1               |                | T, X            |              |              |
| 27      | 58363       | Valve Stem                                                                            | 1               |                | T, X            |              |              |
| 28      | 59075       | Speed Regulator                                                                       | 1               |                | T, X            |              |              |
| 29      | 01025       | O-Ring                                                                                | 2               |                | T, X            |              |              |
| 30      | 01464       | Seal                                                                                  | 1               |                | T, X            |              |              |
| 31      | 58365       | Tip Valve                                                                             | 1               |                | T, L            |              |              |
| 32      | 01468       | Spring                                                                                | 1               |                | T, L            |              |              |
| 33      | 01494       | Inlet Bushing                                                                         | 1               |                |                 |              | X            |

Machine Exhaust Parts (Reference pg. 5 for your machines specific components.)

|   |       |                 |   |      |      |   |  |
|---|-------|-----------------|---|------|------|---|--|
| 1 | 57083 | Vacuum Adapter  | 1 |      |      | X |  |
| 2 | 96197 | Dowel Pin       | 1 |      |      | L |  |
| 3 | 57066 | Muffler Body    | 1 |      |      | X |  |
| 4 | 95526 | O-Ring          | 1 |      | T, L |   |  |
| 5 | 59088 | Vacuum Nozzle   | 1 |      |      | D |  |
| 6 | 57067 | Vacuum Tube     | 1 |      |      | X |  |
| 7 | 57093 | Vacuum Adapter  | 1 |      |      | X |  |
| 8 | 56027 | Muffler Inserts | 2 | T, X |      |   |  |
| 9 | 56028 | Muffler Cap     | 1 |      | T, L |   |  |

Note: Please refer to page 4 of tool manual for specific part number.



### 57098 Full Service Repair Kit:

Includes special tools for proper disassembly/assembly of the Dynorbital-Spirit™.

Includes: 57092 Repair Collar  
 56058 Lock Ring Wrench  
 56056 Bearing Puller  
 57091 Bearing Press Tool  
 57099 Bearing Puller  
 96034 12mm Hex Wrench



### 59459 Drop-in Motor Repair Kit:

Includes special tools for proper disassembly/assembly of the Dynorbital-Spirit™ drop-in motor.

Includes: 57092 Repair Collar  
 56058 Lock Ring Wrench

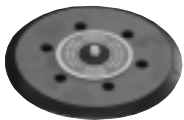
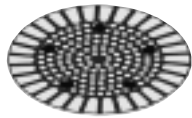
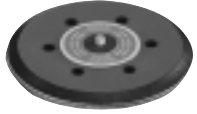


### 96510 Tune-Up Kit

• Tune-Up Kit contains high wear and medium wear parts.

## Random Orbital Sanding Pads

Perfectly balanced and weight-mated to Dynorbital® Spirit Random Orbital Sander.



### Premium Urethane Pad - Vinyl Face for PSA-Type Discs

| Pad Description            | 3-1/2" Dual Purpose | 5"      |       | 6"      |       |
|----------------------------|---------------------|---------|-------|---------|-------|
|                            |                     | Non-Vac | Vac   | Non-Vac | Vac   |
| 3/8" Thick, Soft Density   | —                   | 56102   | 56100 | 56103   | 56101 |
| 3/8" Thick, Medium Density | —                   | 56106   | 56104 | 56107   | 56105 |
| 5/8" Thick, Soft Density   | 56097               | 56185   | 56186 | 56187   | 56188 |
| 5/8" Thick, Medium Density | 56098               | 56175   | 56176 | 56177   | 56178 |

- Premium urethane pads, available in soft or medium density, resist heat build-up.
- New 5/8" thick pads, ideal for sanding of intricate contours.
- Unique vinyl surface pads provide excellent disc adhesion, allowing for quick removal of used discs.

### Rubber Pad, Medium Density - Vinyl Face Pads for PSA-Type Discs

| Pad Description                    | 3-1/2" Dual Purpose | 5"      |       | 6"      |       |
|------------------------------------|---------------------|---------|-------|---------|-------|
|                                    |                     | Non-Vac | Vac   | Non-Vac | Vac   |
| 1/2" Thick, "Diamond Pattern Face" | —                   | 50630   | 50631 | 50632   | 50633 |
| 1/2" Thick, "Post Pattern Face"    | —                   | —       | 50695 | —       | 50696 |

- Special rubber/vinyl face pads for PSA discs.
- "Post Pattern" design for enhanced vacuum pick-up.
- Unique vinyl surface pads provide excellent disc adhesion, allowing for quick removal of used discs.
- No need to align vacuum holes, saves time on disc changes.

### Premium Urethane Pad - Hook Face Short Nap Pads for Scrim-Back Discs

| Pad Description            | 3-1/2" Dual Purpose | 5"      |       | 6"      |       |
|----------------------------|---------------------|---------|-------|---------|-------|
|                            |                     | Non-Vac | Vac   | Non-Vac | Vac   |
| 3/8" Thick, Soft Density   | —                   | 56157   | 56155 | 56158   | 56156 |
| 3/8" Thick, Medium Density | —                   | 54325   | 54326 | 54327   | 54328 |
| 5/8" Thick, Soft Density   | 54311               | 56195   | 56196 | 56197   | 56198 |
| 5/8" Thick, Medium Density | 54313               | 56180   | 56181 | 56182   | 56183 |

- Hook face "short nap" pads for reattachable discs.

### Rubber, Medium Density - Hook Face Long Nap Pads for Non-Woven Nylon Discs

| Pad Description            | 3-1/2" Dual Purpose | 5"      |       | 6"      |       |
|----------------------------|---------------------|---------|-------|---------|-------|
|                            |                     | Non-Vac | Vac   | Non-Vac | Vac   |
| 1/2" Thick, Medium Density | 54314               | 50605   | 50607 | 50606   | 50610 |

- Hook face "long nap" pads for Abrasive Impregnated Non-Woven Nylon Discs.
- 3-1/2", 5" and 6" diameter disc pads have 5/16"-24 male threaded stud.
- The 3-1/2" diameter discs, without holes, can be used on vacuum and non-vacuum 3-1/2" Dynorbital-Spirit™ Sanders.

## Coated Abrasive Discs

### Silicon Carbide Discs / PSA Mounted

| Disc Type      | Abrasive Grit |       |       |       |       |       |
|----------------|---------------|-------|-------|-------|-------|-------|
|                | 80            | 100   | 120   | 150   | 180   | 220   |
| 5" Diameter    |               |       |       |       |       |       |
| No Holes       | 93051         | 93052 | 93053 | 93054 | 93055 | 93056 |
| 5-Hole Pattern | 93060         | 93061 | 93062 | 93063 | 93064 | 93065 |
| 6" Diameter    |               |       |       |       |       |       |
| No Holes       | 93069         | 93070 | 93071 | 93072 | 93073 | 93074 |
| 6-Hole Pattern | 93077         | 93078 | 93079 | 93080 | 93081 | 93082 |

Note: Other grits available upon request.

All Discs: 120 Grit and Coarser – 125/Roll; 8 Rolls = Unit.  
150 Grit & Finer – 250/Roll; 4 Rolls = Unit. Complete rolls only.

### Premium Aluminum Oxide Discs / PSA Mounted

| Disc Type       | Abrasive Grit |       |       |       |       |       |       |  |
|-----------------|---------------|-------|-------|-------|-------|-------|-------|--|
|                 | 80            | 100   | 120   | 150   | 180   | 220   | 320   |  |
| 3-1/2" Diameter |               |       |       |       |       |       |       |  |
| *No Holes       | 92090         | —     | 92092 | —     | 92094 | 92095 | 92097 |  |
| 5" Diameter     |               |       |       |       |       |       |       |  |
| No Holes        | 93101         | 93102 | 93103 | 93104 | 93105 | 93106 | —     |  |
| 5-Hole Pattern  | 93109         | 93110 | 93111 | 93112 | 93113 | 93114 | —     |  |
| 6" Diameter     |               |       |       |       |       |       |       |  |
| No Holes        | 93200         | 93201 | 93202 | 93203 | 93204 | 93205 | —     |  |
| 6-Hole Pattern  | 93215         | 93216 | 93217 | 93218 | 93219 | 93220 | —     |  |

Note: Other grits available upon request.

\*Used on either vacuum or non-vacuum 3-1/2" sander.

All Discs: 120 Grit and Coarser – 125/Roll; 10 Rolls = Unit.  
150 Grit and Finer – 175/Roll; 6 Rolls = Unit. Complete rolls only.

## Self-Contained Dust Collection Systems

Easily attach to Dynorbital® Supreme Random Orbital Sander – Self-Generated Vac-Ready Models.



### 50694 Mini-Reusable Felt Bag

- New bag design features a one micron filter rating. Bag traps over 99% of vacuum particles one micron or larger.
- Mounts directly to any Vac-Ready tool or to any exhaust hose.
- Measures 11" long x 3" wide. End opens up - no need to remove bag from tool when emptying.



### 50683 Reusable Felt Bag

- New bag design features a one micron filter rating. Bag traps over 99% of vacuum particles one micron or larger.
- Hook 'n loop end for easy emptying.
- Measures 14-1/2" L x 7-1/2" W.
- Connects to vacuum hose.



### 56304 Reusable Felt Bag w/Zipper

- New bag design features a one micron filter rating. Bag traps over 99% of vacuum particles one micron or larger.
- Has zipper-lock end.
- Measures 14-1/2" L x 7-1/2" W.
- Connects to vacuum hose.



### 95986 Hose Cover (5' long cloth cover)

- Covers air line and exhaust/vacuum hoses (not included).
- Eliminates damage from hoses dragging on the workpiece.



### 54284 Mini-Flex-Hose System

- 95580 Air Line 1" dia. x 28" long.
- 50638 Flex-Hose 1" dia. x 18" long.
- 50694 Mini-Reusable Felt Bag.
- 95362 Rubber Connectors (3) which connect air line to exhaust hose.



### 50617 & 56303 – 6' Long Flex-Hose

- Both systems include 6' long 50682 Flex-Hose.
- Shown with optional 95361 Air Line (1/4" diameter).
- 50617: Has 50683 Standard Reusable Felt Bag with hook 'n loop end for easy emptying.
- 56303: Has 56304 Zipper-Lock Bag.



### 54290 "Bag-in-Box" System

- 95361 Air Line 5' long.
- 50682 Flex-Hose 1" dia. x 6' long.
- 95362 Rubber Connectors (5, attach air line to vacuum hose).
- 95575 Durable Box Receptacle (to house bag and store tool).
- Sample paper bag included. Paper bag reorder:  
50692 (400/case) or  
50693 (24 per package.)

## Optional Accessories



### Drop-in Motors

Allows a quick and easy replacement. No motor adjustments needed.

- 59450 – 3", 3-1/2" Dia., 3/8" Orbit
- 59451 – 3", 3-1/2" Dia., 3/16" Orbit
- 59452 – 3", 3-1/2" Dia., 3/32" Orbit
- 59453 – 5" Dia., 3/8" Orbit
- 59454 – 5" Dia., 3/16" Orbit
- 59455 – 5" Dia., 3/32" Orbit
- 59456 – 6" Dia., 3/8" Orbit
- 59457 – 6" Dia., 3/16" Orbit
- 59458 – 6" Dia., 3/32" Orbit

### Complete Repair Solution

Includes: 10 Pack of Drop-in Motors  
59459 Repair Kit

See page 9 for offering list.



### 59459 Drop-in Motor Repair Kit:

Includes special tools for proper disassembly/assembly of the Dynorbital-Spirit™ drop-in motor.

Includes: 57092 Repair Collar  
56058 Lock Ring Wrench

### 57098 Full Service Repair Kit:

Includes special tools for proper disassembly/assembly of the Dynorbital-Spirit™.

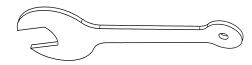
Includes: 57092 Repair Collar  
56058 Lock Ring Wrench  
56056 Bearing Puller  
57091 Bearing Press Tool  
57099 Bearing Puller  
96034 12mm Hex Wrench



### Overskirt Shrouds

Protects pad edges when working near workpiece sides; maximizes dust pick-up on vacuum models.

57086: 5" Diameter  
57087: 6" Diameter



50679 26mm  
Open-End Wrench



### 96510 Tune-Up Kit

- Includes assorted parts to help maintain and repair motor.

# Machine Specifications

## 3/8" Orbit Models

| Model Number | Motor HP (W) | Motor RPM | Dia. Orbit Inch (mm) | Sound Level | Air Flow Rate CFM/SCFM (LPM) | Air Pressure PSIG (Bars) | Spindle Thread  | Weight Pound (kg) | Length Inch (mm) | Height Inch (mm) |
|--------------|--------------|-----------|----------------------|-------------|------------------------------|--------------------------|-----------------|-------------------|------------------|------------------|
| 21000        | .25 (186)    | 12,000    | 3/8" (10)            | 78 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.4 (0.6)         | 6 (152)          | 3-1/2 (89)       |
| 21001        | .25 (186)    | 12,000    | 3/8" (10)            | 84 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.5 (0.7)         | 8-1/2 (216)      | 3-1/2 (89)       |
| 21004        | .25 (186)    | 12,000    | 3/8" (10)            | 78 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.5 (0.7)         | 7 (178)          | 3-1/2 (89)       |
| 21005        | .25 (186)    | 12,000    | 3/8" (10)            | 78 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.4 (0.6)         | 6 (152)          | 3-1/2 (89)       |
| 21006        | .25 (186)    | 12,000    | 3/8" (10)            | 84 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.5 (0.7)         | 8-1/2 (216)      | 3-1/2 (89)       |
| 21009        | .25 (186)    | 12,000    | 3/8" (10)            | 78 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.5 (0.7)         | 7 (178)          | 3-1/2 (89)       |
| 21010        | .25 (186)    | 12,000    | 3/8" (10)            | 82 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.5 (0.7)         | 6-1/2 (165)      | 3-1/2 (89)       |
| 21011        | .25 (186)    | 12,000    | 3/8" (10)            | 84 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.6 (0.7)         | 8-1/2 (216)      | 3-1/2 (89)       |
| 21014        | .25 (186)    | 12,000    | 3/8" (10)            | 82 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.5 (0.7)         | 7-1/4 (184)      | 3-1/2 (89)       |
| 21015, 21060 | .25 (186)    | 12,000    | 3/8" (10)            | 82 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.6 (0.7)         | 7 (178)          | 3-1/2 (89)       |
| 21016        | .25 (186)    | 12,000    | 3/8" (10)            | 83 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.7 (0.7)         | 9 (229)          | 3-1/2 (89)       |
| 21019, 21063 | .25 (186)    | 12,000    | 3/8" (10)            | 83 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.6 (0.7)         | 7-3/4 (197)      | 3-1/2 (89)       |

## 3/16" Orbit Models

| Model Number | Motor HP (W) | Motor RPM | Dia. Orbit Inch (mm) | Sound Level | Air Flow Rate CFM/SCFM (LPM) | Air Pressure PSIG (Bars) | Spindle Thread  | Weight Pound (kg) | Length Inch (mm) | Height Inch (mm) |
|--------------|--------------|-----------|----------------------|-------------|------------------------------|--------------------------|-----------------|-------------------|------------------|------------------|
| 21020        | .25 (186)    | 12,000    | 3/16" (5)            | 80 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.4 (0.6)         | 6 (152)          | 3-1/2 (89)       |
| 21021        | .25 (186)    | 12,000    | 3/16" (5)            | 84 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.4 (0.6)         | 8-1/2 (216)      | 3-1/2 (89)       |
| 21024        | .25 (186)    | 12,000    | 3/16" (5)            | 80 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.4 (0.6)         | 7 (178)          | 3-1/2 (89)       |
| 21025        | .25 (186)    | 12,000    | 3/16" (5)            | 80 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.4 (0.6)         | 6 (152)          | 3-1/2 (89)       |
| 21026        | .25 (186)    | 12,000    | 3/16" (5)            | 84 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.4 (0.6)         | 8-1/2 (216)      | 3-1/2 (89)       |
| 21029        | .25 (186)    | 12,000    | 3/16" (5)            | 80 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.4 (0.6)         | 7 (178)          | 3-1/2 (89)       |
| 21030        | .25 (186)    | 12,000    | 3/16" (5)            | 79 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.4 (0.6)         | 6-1/2 (165)      | 3-1/2 (89)       |
| 21031        | .25 (186)    | 12,000    | 3/16" (5)            | 81 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.5 (0.7)         | 8-1/2 (216)      | 3-1/2 (89)       |
| 21034        | .25 (186)    | 12,000    | 3/16" (5)            | 81 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.5 (0.7)         | 7-1/4 (184)      | 3-1/2 (89)       |
| 21035, 21061 | .25 (186)    | 12,000    | 3/16" (5)            | 81 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.5 (0.7)         | 7 (178)          | 3-1/2 (89)       |
| 21036        | .25 (186)    | 12,000    | 3/16" (5)            | 83 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.6 (0.7)         | 9 (229)          | 3-1/2 (89)       |
| 21039, 21064 | .25 (186)    | 12,000    | 3/16" (5)            | 82 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.6 (0.7)         | 7-3/4 (197)      | 3-1/2 (89)       |

## 3/32" Orbit Models

| Model Number | Motor HP (W) | Motor RPM | Dia. Orbit Inch (mm) | Sound Level | Air Flow Rate CFM/SCFM (LPM) | Air Pressure PSIG (Bars) | Spindle Thread  | Weight Pound (kg) | Length Inch (mm) | Height Inch (mm) |
|--------------|--------------|-----------|----------------------|-------------|------------------------------|--------------------------|-----------------|-------------------|------------------|------------------|
| 21040        | .25 (186)    | 12,000    | 3/32" (2)            | 76 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.3 (0.6)         | 6 (152)          | 3-1/2 (89)       |
| 21041        | .25 (186)    | 12,000    | 3/32" (2)            | 82 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.4 (0.6)         | 8-1/2 (216)      | 3-1/2 (89)       |
| 21044        | .25 (186)    | 12,000    | 3/32" (2)            | 80 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.4 (0.6)         | 7 (178)          | 3-1/2 (89)       |
| 21045        | .25 (186)    | 12,000    | 3/32" (2)            | 80 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.4 (0.6)         | 6 (152)          | 3-1/2 (89)       |
| 21046        | .25 (186)    | 12,000    | 3/32" (2)            | 82 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.4 (0.6)         | 8-1/2 (216)      | 3-1/2 (89)       |
| 21049        | .25 (186)    | 12,000    | 3/32" (2)            | 80 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.4 (0.6)         | 7 (178)          | 3-1/2 (89)       |
| 21050        | .25 (186)    | 12,000    | 3/32" (2)            | 79 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.4 (0.6)         | 6-1/2 (165)      | 3-1/2 (89)       |
| 21051        | .25 (186)    | 12,000    | 3/32" (2)            | 82 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.5 (0.6)         | 8-1/2 (216)      | 3-1/2 (89)       |
| 21054        | .25 (186)    | 12,000    | 3/32" (2)            | 81 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.4 (0.6)         | 7-1/4 (184)      | 3-1/2 (89)       |
| 21055, 21062 | .25 (186)    | 12,000    | 3/32" (2)            | 80 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.5 (0.6)         | 7 (178)          | 3-1/2 (89)       |
| 21056        | .25 (186)    | 12,000    | 3/32" (2)            | 83 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.5 (0.7)         | 9 (229)          | 3-1/2 (89)       |
| 21059, 21065 | .25 (186)    | 12,000    | 3/32" (2)            | 81 dB(A)    | 2/16 (453)                   | 90 (6.2)                 | 5/16"-24 female | 1.5 (0.7)         | 7-3/4 (197)      | 3-1/2 (89)       |

Additional Specifications: Air Inlet Thread 1/4" NPT • Hose I.D. Size 1/4" (8mm)

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Email: [Customer.Service@Dynabrade.com](mailto:Customer.Service@Dynabrade.com)



**DYNABRADE, INC.,** 8989 Sheridan Drive • Clarence, NY 14031-1490 • Phone: (716) 631-0100 • Fax: 716-631-2073 • International Fax: 716-631-2524  
**DYNABRADE EUROPE S.à.r.l.,** Zone Artisanale • L-5485 Wormeldange—Haut, Luxembourg • Telephone: 352 76 84 94 1 • Fax: 352 76 84 95 1

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