

# .4 hp Die Grinder

## Ergo-Grip, Rear Exhaust

Parts Page Reorder No. PD12•03  
Effective January, 2012  
Supersedes PD11•26

### Air Tool Manual – Safety, Operation and Maintenance

SAVE THIS DOCUMENT, EDUCATE ALL PERSONNEL

Model	RPM	Collet Style	Muffler	Insert Size
48201	25,000	3 Piece	Extended	1/4" & 6 mm
48203	30,000	3 Piece	Extended	1/4" & 6 mm
48325	25,000	3 Piece	Standard	1/4" & 6 mm
48327	30,000	3 Piece	Standard	1/4" & 6 mm
48341	30,000	3 Piece	Overhose	1/8" & 3 mm
48345	30,000	4 Piece	Standard	1/8" & 3 mm
48350	35,000	3 Piece	Extended	1/8" & 3 mm
48355	35,000	3 Piece	Extended	1/4" & 6 mm
48360	20,000	3 Piece	Standard	1/4" & 6 mm
48365	20,000	4 Piece	Standard	1/8" & 3 mm
48370	25,000	4 Piece	Standard	1/8" & 3 mm

For Serial No. 11L3552A and Higher



Model 48327

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

## ⚠ WARNING

Some dust created by sanding, grinding, drilling, and other construction activities contain chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- Lead from lead-based paints
- Crystalline silica from bricks and cement and other masonry products
- Arsenic and chromium from chemically treated lumber

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

## 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 altered from the original design.

**Tool Intent:** .4 hp Die Grinder is ideal for deburring, deflashing, surface preparation, cleaning and finishing using the proper abrasive stones, abrasive mounted wheels, molded abrasives, and carbide burrs.

**Do Not use tool for anything other than its intended applications.**

**This power tool is not intended for use in potentially explosive atmospheres and is not insulated against contact with electrical power.**

**Training:** Proper care, maintenance, and storage of your air tools will maximize their performance.

- Employer's Responsibility – Provide .4 hp Die Grinder operators with safety instructions and training for safe use of tools and accessories.

(continued on next page)

## SAFETY INSTRUCTIONS (Continued)

### 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.
- Use only accessories of the correct shaft size for the collet (example: 1/4" shaft = 1/4" collet).
- Use only recommended accessories. Reference Dynabrade catalog and this tool manual.
- Follow tool specifications before choosing size and type of accessory.
- Only use recommended fittings and air line sizes. Air supply hoses and air hose accessories must have a minimum working pressure of 150 PSIG (10 Bars) or 150 percent of the maximum pressure produced in the system, whichever is higher. (See tool Machine Specifications table.)

## OPERATING INSTRUCTIONS

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

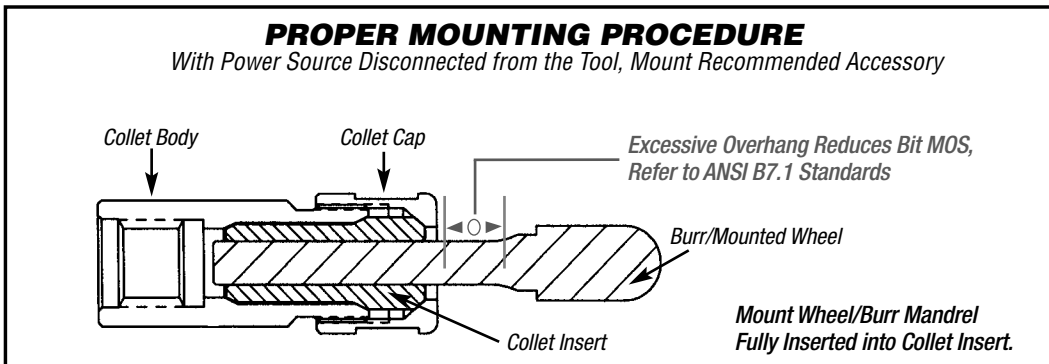
**Caution:** Hand, wrist and arm injury may result from repetitive work, motion and overexposure to vibration.

- Keep hand and clothing away from working end of the air tool.
- Working end of tool has a potential of cutting and severing.

**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.
- BEFORE MOUNTING AN ACCESSORY, after all tool repairs and whenever a .4 hp Die Grinder is issued for use, 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. Improper mounting of an accessory may cause excessive vibration levels or damage the accessory. Make sure no one is in the unguarded plane of the accessory. Run tool for 1 minute of operating speed in a protected area.



- 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 .4 hp Die Grinder 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. Test tool at its free speed (RPM) in a protected area for at least one minute before applying the tool to the work.

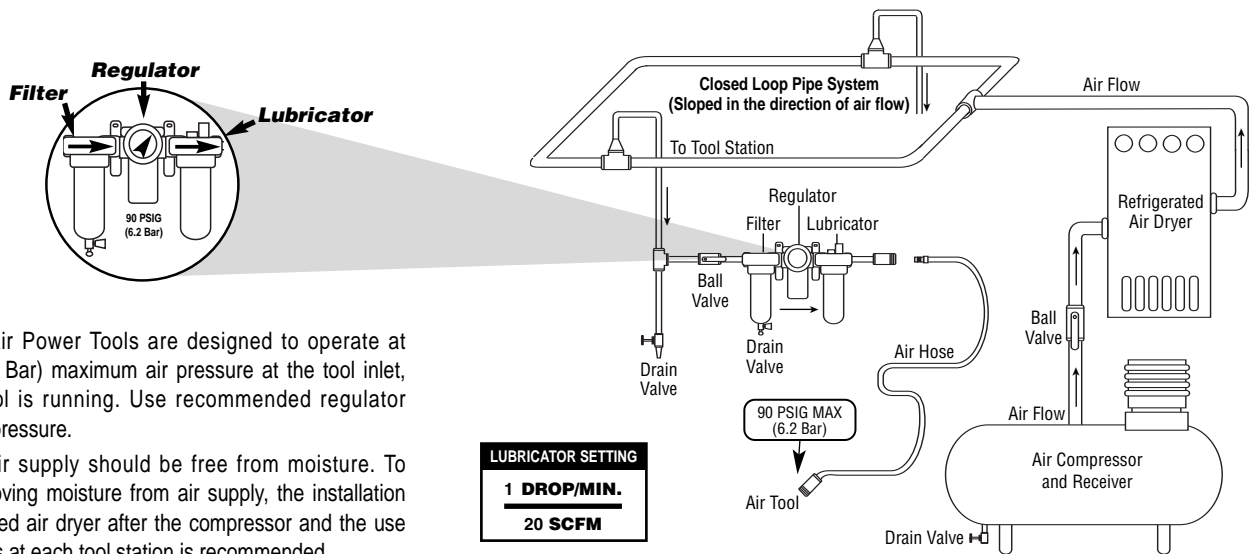
- Release throttle lever when air supply is interrupted.
- Make sure that work area is uncluttered, and visitors are at a safe range from the tools and debris.
- Air tools are not intended for use in explosive atmospheres and are not insulated for contact with electric power sources.
- Use a vise or 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.
- Ensure that sparks and debris resulting from work does not create a hazard.
- Tool is rear exhaust, exhaust may contain lubricants, vane material, bearing grease, and other materials flushed thru the tool.

**Warning:** Grinding certain materials can create explosive dust. It is the employers responsibility to notify the user of acceptable dust levels.

- Grinding can cause sparks which can cause fires or explosions. It is the users responsibility to make sure the work area is free of flammable materials.
- DO NOT USE cut-off wheels or router bits on this tool.
- Always use dust extraction or suppression systems and personal protective equipment which are suitable for the materials being processed.

**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) 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. To facilitate removing moisture from air supply, the installation of a refrigerated air dryer after the compressor and the use of drain valves at each tool station is recommended.

## Maintenance Instructions

**Important:** To keep tool safe a Preventative Maintenance Program is recommended whenever portable power tools are used. The program should include inspection of air supply lines, air line pressure, proper lubrication and repair of tools. Refer to ANSI B186.1 for additional maintenance information.

- Use only genuine Dynabrade replacement parts to ensure 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: **10681** Air Line Filter-Regulator-Lubricator — Provides accurate air pressure regulation, two-stage filtration of water contaminants and micro-mist lubrication of pneumatic components. Delivers up to 55 SCFM/1,558 LPM @ 145 PSIG/9.7 Bar (Max. Air Temperature of 140°F/60°C) **Note:** Two (2) 3/8" NPT Reducer Bushings are included.
- 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.

**Specific Routine Preventative Maintenance - 20,000, 25,000 and 30,000 RPM Governed Tools:** Check free speed tool using a tachometer without accessory mounted. This governor controlled die grinder should be speed checked every 20 hours of use or weekly, whichever occurs more frequently after maintenance or repair.

- **DO NOT** disassemble the governor for any reason. Reorder correct speed – governor assembly (See Assembly Breakdown) and recheck free speed of tool with a tachometer.

**Specific Routine Preventative Maintenance - 35,000 RPM Non-Governed Tools:**

- Check free speed of tool regularly using a tachometer without the abrasive accessory mounted. After all tool repairs and whenever a .4 hp Die Grinder is issued for use, 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, operating improperly or demonstrates unusual vibration, the tool must be serviced and corrected before use.

### Routine Preventative Maintenance

- Inspect accessories before mounting. Do not mount accessories that are damaged or nicked.
- Check accessory - speed rating. Rating on accessory must be greater than the tool speed marked on the housing.
- If accessory breakage occurs, investigate to determine the cause and correct before issuing tool for work.
- 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 Motor Tune-Up Kit (P/N **96541**) is available which includes high wear and medium wear motor parts.
- Air tool markings must be kept legible at all times, if not, reorder housing and replace. User is responsible for maintaining specification information i.e.: Model #, S/N, and RPM. (See Assembly Breakdown)
- 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 tool inlet and start the tool a few times to lubricate air motor. Check for tool vibration before mounting abrasive wheel accessory.

### Handling and Storage:

- Use of tool rests, hangers and/or balancers is recommended.
- Protect tool inlet from debris (see Notice on Page 7).
- **DO NOT** carry tool by air hose or near the tool throttle lever.
- Protect accessories from exposure to water, solvents, high humidity, freezing temperature and extreme temperature changes.
- **DO NOT USE** accessories that have been dropped or show signs of cracks, nicks or other defects.
- Store accessories in protective racks or compartments to prevent damage.

**Models:**

**48201, 48203, 48325, 48327  
48341, 48345, 48350, 48355  
48360, 48365, 48370**

**.4 hp Die Grinder  
Complete Assembly – All Models**

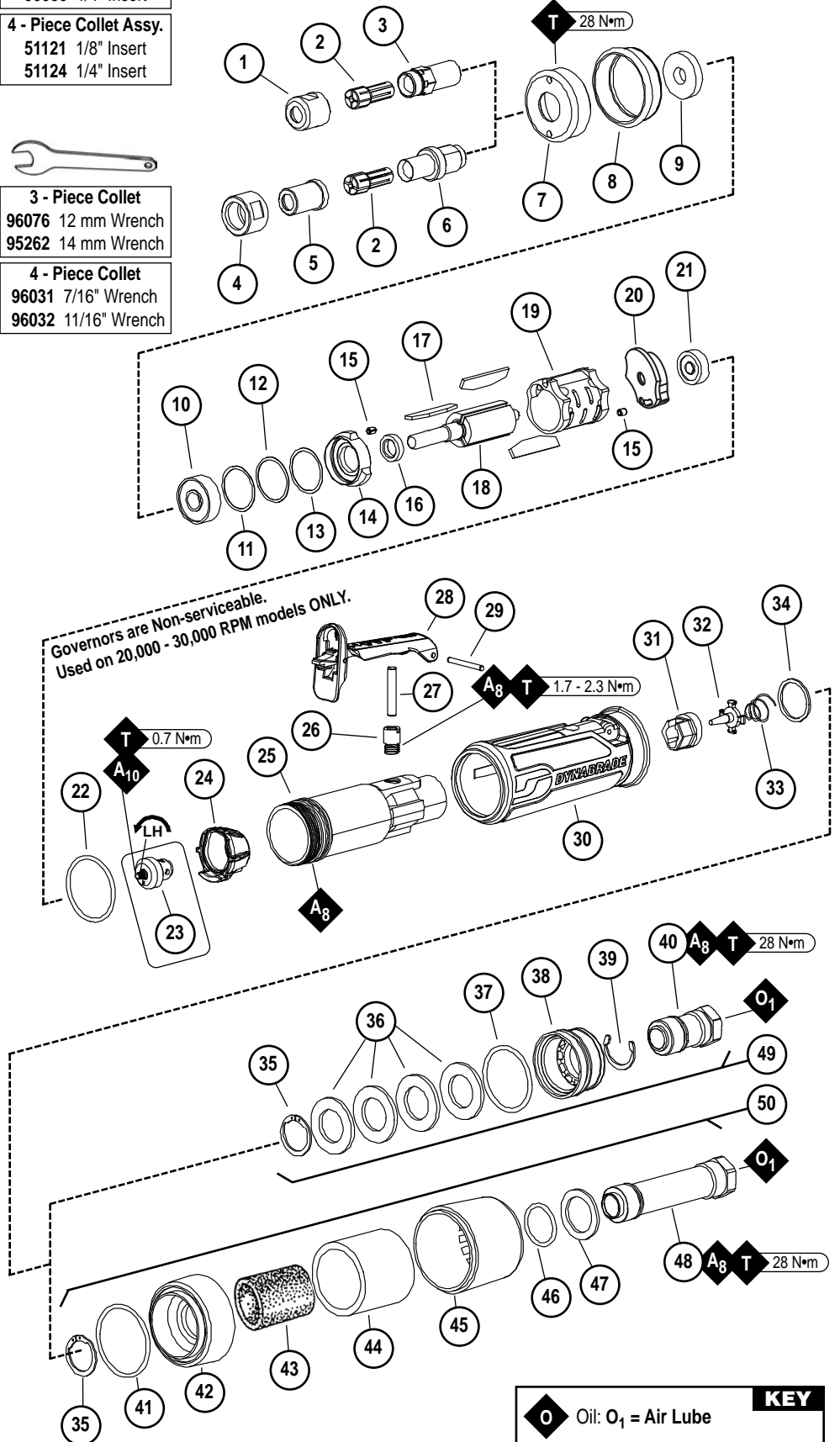
**Index Key**

No.	Part #	Description
1	01484	Collet Cap
2	Collet Insert	
	01495	1/8"
	01485	1/4"
	01496	3 mm
	01497	6 mm
3	01435	Collet Body
4	51098	Collet Nut
5	51107	Collet Cap
6	51105	Collet Body
7	01489	Rear Exhaust Cover
8	01547	Collar
9	01580	Felt Seal
10	02649	Bearing
11	54551	Shim - 0.003"
12	54543	Shim - 0.001"
13	54544	Shim - 0.002"
14	01478	Front End Plate
15	50767	Pin (2)
16	01479	Spacer
17	01480	Vane Set (4/Pkg.) As Req.
18	45290	Rotor
19	01476	Cylinder
20	02676	Rear Bearing Plate
21	02696	Bearing
22	96077	O-Ring
23	<b>Governor Assembly</b>	
	45270	20,000 RPM (Yellow)
	45271	25,000 RPM (Red)
	45272	30,000 RPM (Green)
24	45320	Governor Chamber
25	45305	Housing Core
26	45315	Throttle Bushing
27	97045	Pin
28	45263	Safety Throttle Lever
29	97060	Pin
30	<b>Exterior Housing (Laser Etched)</b>	
	45209	Model - 48201
	45210	Model - 48203
	45201	Model - 48325
	45202	Model - 48327
	45217	Model - 48341
	45218	Model - 48345
	45219	Model - 48350
	45220	Model - 48355
	45221	Model - 48360
	45231	Model - 48365
	09707	Model - 48370
31	45310	Seal
32	58365	Tip Valve
33	01468	Spring
34	01564	Air Control Ring
35	95711	Retaining Ring
36	01486	Felt Silencer (4)
37	96065	O-Ring
38	01446	Air Deflector
39	95620	Retaining Ring
40	01578	Inlet Adapter Assembly
41	95438	O-Ring
42	94521	Muffler Base
43	94524	Sintered Bronze Muffler
44	94525	Felt Muffler
45	94522	Muffler Cap
46	95375	O-Ring
47	94526	Spacer
48	94523	Inlet Adapter Assembly
49	94535	Standard Muffler Assembly
50	94520	Extended Muffler Assembly

- 3 - Piece Collet Assy.  
50080 1/4" Insert
- 4 - Piece Collet Assy.  
51121 1/8" Insert  
51124 1/4" Insert



- 3 - Piece Collet  
96076 12 mm Wrench  
95262 14 mm Wrench
- 4 - Piece Collet  
96031 7/16" Wrench  
96032 11/16" Wrench



KEY	
<b>O</b>	Oil: O <sub>1</sub> = Air Lube
<b>A</b>	Adhesive: A <sub>8</sub> = Loctite #567 A <sub>10</sub> = Loctite #243
<b>T</b>	Torque: N*m x 8.85 = In. - lbs.

# Disassembly/Assembly Instructions

**Important:** The Dynabrade Pneumatic Power Tool Lifetime Warranty Policy does NOT cover normally wearable parts and products. Before servicing this tool please contact Dynabrade Inc. or a Dynabrade Subsidiary for information regarding the Dynabrade Pneumatic Power Tool Lifetime Warranty Policy.

**Notice:** To avoid damaging the motor housing, use the Special Repair Tool that is designed for disassembly and assembly of these die grinders. See page 8 for a complete list of available repair tools.

**Disconnect the die grinder from the air supply.**

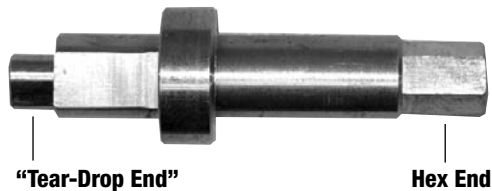
## Motor Disassembly:

1. Secure the air inlet adapter of the die grinder in a vise with aluminum or bronze jaws so that the collet assembly is pointing up.
2. Loosen the collet cap and remove the insert tool, cap and insert.
3. Use the **50971** Lock Ring Tool to remove the rear exhaust cover. Turn counterclockwise.

**Note:** One of two things will occur.

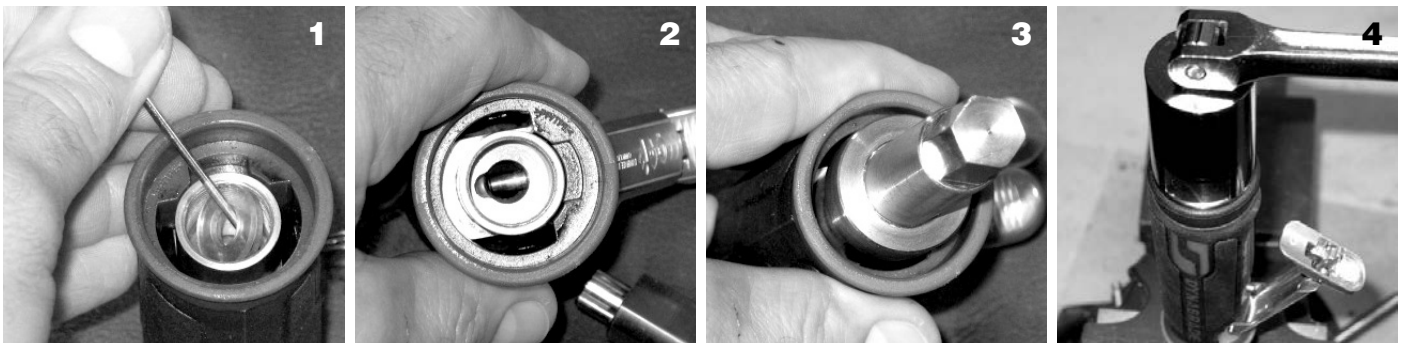
**A.** The rear exhaust cover will loosen. If this occurs, remove the rear exhaust cover and remove the air motor assembly by pulling the motor out of the housing. Remove the filter cage and filter. Insert the hex end of the **96402** Special Repair Tool into the hex socket in the bottom of the housing. Use an adjustable wrench to loosen the housing from the air inlet adapter.

**96402 - Special Repair Tool**



**B.** The air inlet adapter will loosen. If this occurs, remove the air inlet adapter and valve components.

Remove the 2 valve seals (Fig.1). Insert the "Tear-Drop End" of the **96402** Special Repair Tool into the air inlet of the housing. Place the hex end of the special repair tool in a vise with aluminum or bronze jaws so that the housing is pointing up (Fig.2 & 3). Use the **50971** Lock Ring Tool to remove the rear exhaust cover (Fig.4). Turn counterclockwise.



## FOR MODELS WITH GOVERNORS: 48201, 48203, 48325, 48327, 48341, 48345, 48360, 48365 and 48370

4. Carefully secure the wrench flats of the collet body in a vise with aluminum or bronze jaws so that the governor assembly is pointing up. Use a slot blade screwdriver to remove the governor. LEFT HAND THREAD: Turn clockwise. **Note:** The governor assembly is not serviceable. If a governor fails it must be replaced as a complete assembly.

## FOR ALL MODELS:

5. Fasten the **96346** Bearing Separator (2") around the portion of the **01476** Cylinder that is closest to the **02673** Rear Bearing Plate. Place the bearing separator and the motor in the **96232** Arbor Press (#2) so that the collet body is pointing down.
6. Use a 5/32" (4 mm) diameter flat end drive punch as a press tool to push the rotor out of the **02696** Bearing.
7. Remove the cylinder and vanes.
8. Use the 5/32" (4 mm) diameter flat end drive punch to push the **02696** Bearing out of the **02673** Rear Bearing Plate.
9. Secure the body of the rotor in a vise with aluminum or bronze jaws and remove the **01435** Collet Body. Turn counterclockwise.
10. Remove the **01478** Front Bearing Plate, **02649** Bearing, shims, and **01479** Spacer.

**Motor Disassembly Complete.**

**Important: Clean and Inspect Parts for Wear or Damage Before Assembling.**

(continued on next page)

1. Secure the body of the rotor in a vise with aluminum or bronze jaws and install the **01479** Spacer onto the rotor.
2. Select .003" (.08 mm) shim thickness from the **54529** Shim Pack and install these into the **01478** Front Bearing Plate.
3. Install the **02649** Bearing into the front bearing plate and install these onto the rotor.
4. Install the **01435** Collet Body onto the **45290** Rotor. (Torque to 17 N•m/150 in. lbs.)
5. Use a .001" (0.3 mm) thick feeler gauge to check the clearance between the bearing plate and the face of the rotor.
6. Clearance should be .001"-.0015" (0.3-0.4 mm). **Note:** If the clearance needs adjustment, repeat steps 2-6. Add or remove shims as required.
7. Use Dynabrade Air Lube **95842** (10W/NR or equivalent) to lubricate the **01480** Vanes. Install the vanes into the rotor.
8. Install the **01476** Cylinder and the **02673** Rear Bearing Plate so that the air inlet openings align with each other.
9. Position the **02696** Bearing onto the bearing journal of the rotor.
10. Use the RAISED CENTER of the **96242** Bearing Press Tool and the arbor press to install the **02696** Bearing onto the rotor and into the **02673** Rear Bearing Plate. **IMPORTANT:** Carefully press the bearing onto the rotor and into the plate until the plate just touches the cylinder. This will establish a snug fit between the bearing plates and the cylinder.

#### FOR MODELS WITH GOVERNORS: 48201, 48203, 48325, 48327, 48341, 48345, 48360, 48365 and 48370

11. Apply a small amount of the Loctite #243 (or equivalent) to the threads of the governor assembly and carefully install the governor onto the rotor.  
LEFT HAND THREAD: Turn counterclockwise. (Torque to 0.5 - 0.9 N•m/5 - 8 in. lbs.)

#### FOR ALL MODELS:

12. Install the filter onto the filter cage, and install these into the housing.
13. Carefully slide the motor assembly into the housing.
14. Install the **01580** Felt Silencer onto the front of the air motor.
15. Apply a small amount of Loctite #567 (or equivalent) to the threads of the rear exhaust cover and install the cover onto the housing. (Torque to 28 N•m/250 in. lbs.)

**Motor Assembly Complete. Tool Assembly Complete. Please allow 30 minutes for adhesives to cure before operating tool.**

**Important:** Before operating, place 2-3 drops of Dynabrade Air Lube (P/N **95842**) directly into air inlet with throttle lever depressed. Operate tool for 30 seconds to determine if tool is operating properly and to allow lubricating oils to properly penetrate motor. Motor should now be tested for proper operation at 90 PSIG. If motor does not operate properly or operates at a higher RPM than marked on the tool, the tool should be serviced to correct the cause before use.

Loctite® is a registered trademark of Loctite Corp.

## Machine Specifications

Model Number	Motor hp (W)	Motor RPM	Sound Level	Maximum Air Flow SCFM (LPM)	Collet Insert Size	Air Pressure PSIG (Bars)	Weight Pound (kg)	Length Inch (mm)	Height Inch (mm)
48201	.4 (298)	25,000	76 dB(A)	23 (651)	1/4" & 6 mm	90 (6.2)	.9 (.4)	8 (202)	1.7 (44)
48203	.4 (298)	30,000	78 dB(A)	23 (651)	1/4" & 6 mm	90 (6.2)	.9 (.4)	8 (202)	1.7 (44)
48325	.4 (298)	25,000	79 dB(A)	23 (651)	1/4" & 6 mm	90 (6.2)	.9 (.4)	8 (202)	1.7 (44)
48327	.4 (298)	30,000	79 dB(A)	23 (651)	1/4" & 6 mm	90 (6.2)	.9 (.4)	6.5 (166)	1.7 (44)
48341	.4 (298)	30,000	79 dB(A)	23 (651)	1/8" & 3 mm	90 (6.2)	.9 (.4)	6.5 (166)	1.7 (44)
48345	.4 (298)	30,000	79 dB(A)	23 (651)	1/8" & 3 mm	90 (6.2)	.9 (.4)	6.5 (166)	1.7 (44)
48350	.4 (298)	35,000	80 dB(A)	23 (651)	1/8" & 3 mm	90 (6.2)	.9 (.4)	8 (202)	1.7 (44)
48355	.4 (298)	35,000	80 dB(A)	23 (651)	1/4" & 6 mm	90 (6.2)	.9 (.4)	8 (202)	1.7 (44)
48360	.4 (298)	20,000	76 dB(A)	23 (651)	1/4" & 6 mm	90 (6.2)	.9 (.4)	6.4 (162)	1.7 (44)
48365	.4 (298)	20,000	76 dB(A)	23 (651)	1/8" & 3 mm	90 (6.2)	.9 (.4)	6.4 (162)	1.7 (44)
48370	.4 (298)	25,000	79 dB(A)	23 (651)	1/8" & 3 mm	90 (6.2)	.9 (.4)	6.4 (162)	1.7 (44)

Additional Specifications: Air Inlet Thread 1/4" NPT • Hose I.D. 1/4" (6 mm)

Sound Level is the pressure measurement according to the method outlined in ISO regulation ISO-15744

### Lifetime Warranty

All Dynabrade portable pneumatic power tools are rigorously inspected and performance tested in our factory before shipping to our customers. If a Dynabrade tool develops a performance problem and an inherent defect is found during normal use and service, Dynabrade will warrant this tool against defects in workmanship and materials for the lifetime of the tool. Upon examination and review at our factory, Dynabrade shall confirm that the tool qualifies for warranty status, and will repair or replace the tool at no charge to the customer. Normally wearable parts and products are NOT covered under this warranty. Uncovered items include bearings, contact wheels, rotor blades, regulators, valve stems, levers, shrouds, guards, O-rings, seals, gaskets and other wearable parts. Dynabrade's warranty policy is contingent upon proper use of our tools in accordance with factory recommendations, instructions and safety practices. It shall not apply to equipment that has been subjected to misuse, negligence, accident or tampering in any way so as to affect its normal performance. Dynabrade will not honor lifetime warranty on unregistered tools. A one-year warranty will be honored on all unregistered portable pneumatic power tools. Lifetime warranty applies only to portable pneumatic tools manufactured by Dynabrade, Inc. in the USA. Lifetime warranty applies only to the original tool owner; warranty is non-transferable.

# Preventative Maintenance Schedule

.4 hp Die Grinder – All Models

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.

## Parts Common to all Models:

Index #	Part Number	Description	Number Required	High Wear 100%	Medium Wear 70%	Low Wear 30%	Non-Wear 10%
1	01484	Collet Cap	1				X
2	See Note	Collet Insert	1			X	
3	01435	Collet Body	1				X
4	51098	Collet Nut	1				X
5	51107	Collet Cap	1				X
6	51105	Collet Body	1				X
7	01489	Rear Exhaust Cover	1				X
8	01547	Collar	1			X	
9	01580	Felt Seal	1		T, R		
10	02649	Bearing	1		T, R		
11	54551	Shim - .003"	As Req.		T, R		
12	54543	Shim - .001"	As Req.		T, R		
13	54544	Shim - .002"	As Req.		T, R		
14	01478	Front Bearing Plate	1			X	
15	50767	Pin	1				D
16	01479	Spacer	1				T
17	01480	Vane Set (4/Pkg.)	As Req.	T, R			
18	45290	Rotor	1				X
19	01476	Cylinder	1			X	
20	02676	Rear Bearing Plate	1			X	
21	02696	Bearing	1		T, R		
22	96077	O-Ring	1			T	
23	See Note	Governor Assembly	1				D
24	45320	Governor Chamber	1				X
25	45305	Housing Core	1				X
26	45315	Throttle Bushing	1			T	
27	97045	Pin	1			T	
28	45263	Safety Throttle Lever	1			D	
29	97060	Pin	1			T	
30	See Note	Exterior Housing	1				X
31	45310	Seal	1			T	
32	58365	Tip Valve	1			T	
33	01468	Spring	1			T	
34	01564	Air Control Ring	1				L
35	95711	Retaining Ring	1		T, R		
36	01486	Felt Silencer	1		T, R		
37	96065	O-Ring	1				T
38	01446	Air Deflector	1				X
39	95620	Retaining Ring	1				T
40	01578	Inlet Adapter Assembly	1				X
41	95438	O-Ring	1			T	
42	94521	Muffler Base	1				X
43	94525	Felt Muffler	1		T, R		
44	94524	Sintered Bronze Muffler	1		T, R		
45	94522	Muffler Cap	1			X	
46	95375	O-Ring	1			T	
47	94526	Spacer	1				X
48	94523	Inlet Adapter Assembly	1				X

LEGEND	
T	Included in Tune-Up Kit
X	Type of wear, no other comments apply.
L	Easily lost. Care during assembly/disassembly.
D	Easily damaged during assembly/disassembly.
R	Replace each time tool is disassembled.



**Tune-Up Kit**  
Part No. 96541

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

### Notice

All Dynabrade motors use the highest quality parts and metals 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.



# Optional Accessories



## Dynabrade Air Lube

- Formulated for pneumatic equipment.
- Absorbs up to 10% of its weight in water.
- Prevents rust and formation of sludge.
- Keeps pneumatic tools operating longer with greater power and less down time.

**Part No. 95821:** 4oz. (118 ml)

**Part No. 95842:** 1pt. (473 ml)

**Part No. 95843:** 1 gal. (3.8 L)



## Lock Ring Wrench

- Has a 3/8" square socket for use with 3/8" drive; breaker bar, ratchet head, or torque wrenches.

**Part No. 50971**



## Press Tool

- Used to install bearings.

**Part No. 96242**



## Bearing Separator

- Use the separator to remove gears and bearings.

**Part No. 96346**



## Male Plug

- Provides up to twice the air flow compared to standard plug design.
- Plug has "ported" design to prevent "starving" of the air tool.

**Part No. 95675**



## Motor Tune-Up Kit

- Includes assorted parts to help maintain and repair motor.

**Part No. 96541**



## Drop-In Motor

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

**Part No. 45299** – Models: 48201

48203, 48325

48327, 48341

48350, 48355

48360

**Part No. 45300** – Model: 48345

48365, 48370



## Composite-Style Coupler

- Lightweight 1.4 oz. (.05 Kg), non-marring composite material.
- Easy connect/disconnect by single push-button action.
- Shock-proof, low-vibration, crush-resistant.

**Part No. 94960** – 1/4" Female NPT

**Part No. 94980** – 1/4" Male NPT





# Tune-Up Kit - 96541

PD15.17  
October, 2015  
Supersedes PD12.07

## .4 hp Motor Tools: Straight-Line / Right Angle / 7° Offset

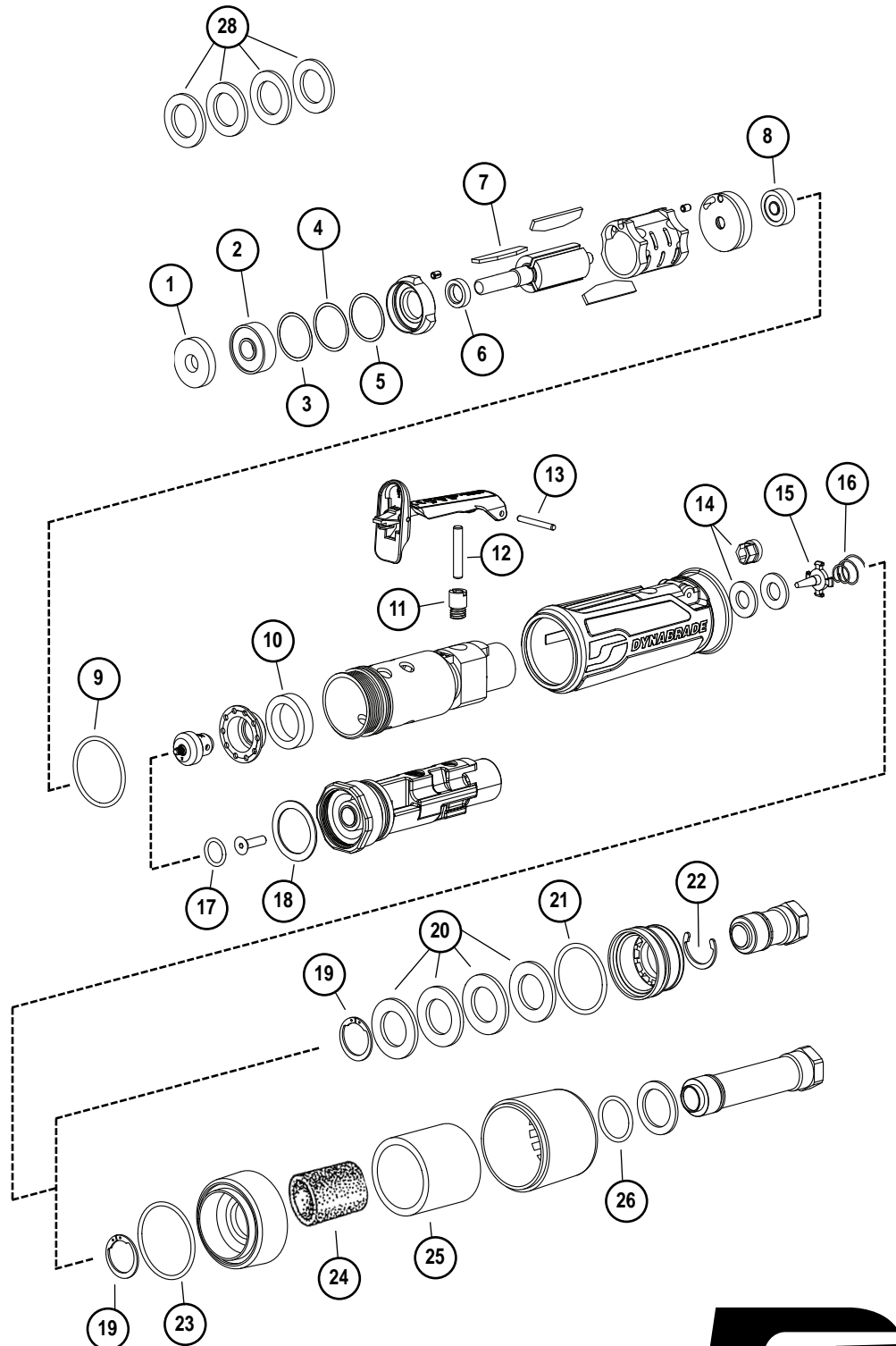
Air Motor and Machine Parts

### NOTICE

Parts included in tune-up kit are identified by part number. **Not all parts are required for all tools.** Please refer to appropriate parts page for additional identification and disassembly/assembly instructions.

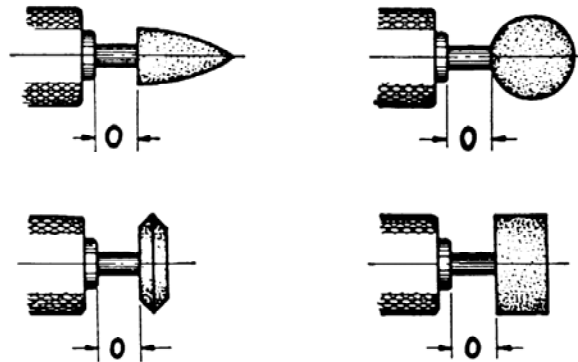
### Index Key

No.	Part #	Description
1	01580	Felt Seal
2	02649	Bearing
3	54543	Shim - .001" (As Required)
4	54544	Shim - .002" (As Required)
5	54551	Shim - .003" (As Required)
6	01479	Spacer
7	01480	Vane Set (4/Pkg.)
8	02696	Bearing
9	96077	O-Ring
10	45278	Filter
11	45257	Bushing
	45315	Bushing
12	97045	Pin
13	97060	Pin
14	01464	Seal (2)
	45310	Seal
15	58365	Tip Valve
16	01468	Spring
17	95523	O-Ring
18	01548	Gasket
19	95711	Retaining Ring
20	01486	Felt Silencer (5)
21	96065	O-Ring
22	95620	Retaining Ring
23	95438	O-Ring
24	94524	Sintered Bronze Muffler
25	94525	Felt Muffler
	94528	Felt Muffler
26	95375	O-Ring
27	01728	Felt Silencer
<i>For Right Angle, Front Exhaust Models</i>		
28	43492	Felt Silencer (4)
<i>For Straight-Line, Front Exhaust Models</i>		

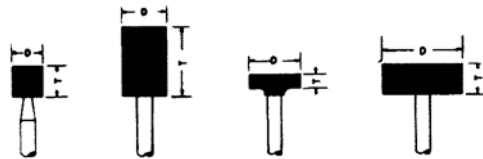


**For use with all Die Grinders  
Overhang / Speed Charts**

ANSI B7.1-2010 Charts



**FIGURE NO. 47**  
Dimension "O" indicates overhang of mandrel.



**ILLUSTRATION No. 80**

**MOUNTED WHEELS  
STANDARD SHAPES  
GROUP "W"**



ANSI B7.1-2010

**Table 27 – Group W — (plain wheels) Maximum operating speeds (RPM) for 1/8" mandrels**

Shape No.	D Wheel Diameter Inches	T Wheel Thickness Inches	1/2" Overhang & Thd. Mdls.	Overhang — Dimension "O"			
				1"	1 1/2"	2"	2 1/2"
W 143	1/8	1/8	105,000	64,500	46,650	32,400	21,370
W 144	1/8	1/4	105,000	64,500	46,650	32,400	21,370
W 145	1/8	3/8	105,000	64,500	46,650	32,400	21,370
W 146	1/8	1/2	105,000	64,500	46,650	32,400	21,370
W 151	3/16	1/8	105,000	64,500	46,650	32,400	21,370
W 152	3/16	1/4	105,000	64,500	46,650	32,400	21,370
W 153	3/16	3/8	80,850	52,500	37,500	26,250	17,620
W 154	3/16	1/2	70,500	45,600	31,500	21,970	15,220
W 157	1/4	1/16	123,000	65,625	47,770	33,150	21,750
W 158	1/4	1/8	105,000	64,500	46,650	32,400	21,370
W 159	1/4	3/16	92,400	57,370	39,370	27,900	18,900
W 160	1/4	1/4	81,370	51,000	34,120	24,000	16,870
W 161	1/4	5/16	77,250	45,970	30,900	22,500	16,120
W 162	1/4	3/8	68,400	42,370	28,870	20,850	15,000
W 163	1/4	1/2	60,000	38,020	26,250	18,750	13,870
W 164	1/4	3/4	45,900	30,000	21,750	15,900	11,850
W 165	5/16	1/16	107,400	62,470	41,250	29,250	20,250
W 166	5/16	1/8	96,970	57,000	35,620	25,120	18,000
W 167	5/16	1/4	75,000	45,750	31,120	22,500	15,750
W 168	5/16	5/16	68,400	41,770	28,650	21,000	15,000
W 169	5/16	3/8	61,650	37,720	27,000	19,870	14,250
W 170	5/16	1/2	52,500	33,000	23,020	16,650	12,600
W 171	5/16	3/4	37,120	25,500	18,750	14,620	10,020
W 172	3/8	1/16	99,370	59,250	41,020	29,250	20,250
W 173	3/8	1/8	87,600	53,250	35,250	24,750	17,250
W 174	3/8	1/4	69,000	41,250	27,750	20,400	15,000
W 175	3/8	3/8	54,000	33,000	24,150	18,000	13,500
W 176	3/8	1/2	45,370	28,500	21,000	15,900	12,150
W 177	3/8	3/4	33,750	23,250	17,620	13,650	10,350
W 178	3/8	1	26,250	18,750	14,250	10,870	8,250
W 181	1/2	1/16	76,390	55,500	36,750	25,000	17,850
W 182	1/2	1/8	73,500	43,650	29,100	20,770	15,450
W 183	1/2	1/4	51,750	31,870	22,500	17,250	12,900
W 184	1/2	3/8	41,020	26,400	19,500	15,000	11,400
W 185	1/2	1/2	34,500	22,500	16,870	13,120	9,900
W 186	1/2	3/4	26,250	17,400	12,750	9,750	8,020
W 187	1/2	1	20,620	13,870	10,120	7,870	6,370
W 190	5/8	1/16	61,120	48,000	31,500	22,650	16,870
W 191	5/8	1/8	58,870	34,500	25,120	18,900	14,250
W 192	5/8	1/4	43,120	27,370	19,870	15,220	11,620
W 193	5/8	3/8	32,250	23,020	16,500	12,520	9,750
W 194	5/8	1/2	29,400	19,120	13,500	10,500	8,250
W 195	5/8	3/4	22,120	14,250	10,120	7,650	6,150
W 196	5/8	1	17,620	11,620	8,100	6,150	5,100
W 199	3/4	1/16	50,930	44,770	30,000	21,750	15,750
W 200	3/4	1/8	50,930	33,520	23,850	17,850	13,350
W 201	3/4	1/4	38,250	24,370	17,400	13,270	9,970
W 202	3/4	3/8	30,600	19,500	13,500	10,120	7,800
W 203	3/4	1/2	25,500	15,900	10,870	8,250	6,600
W 204	3/4	3/4	18,900	12,000	8,400	6,220	5,250
W 210	7/8	1/16	43,650	35,250	25,720	18,900	14,320
W 211	7/8	1/8	43,650	27,900	20,400	15,820	12,220
W 212	7/8	1/4	33,750	20,400	14,400	11,020	9,000
W 213	7/8	3/8	27,000	16,870	11,250	8,250	6,600
W 215	1	1/8	38,200	24,900	18,000	13,870	10,500
W 216	1	1/4	30,520	18,600	12,750	9,520	7,500





ANSI B7.1-2010

**Table 29 – Group W — (plain wheels) Maximum operating speeds (RPM) for ¼" mandrels**

Shape No.	D Wheel Diameter Inches	T Wheel Thickness Inches	½" Overhang & Thd. Mds.	Overhang — Dimension "O"						
				1"	1 ½"	2"	2 ½"	3"	4"	5"
W 176	¾	½	81,000	54,379	42,000	33,000	25,500	20,400	13,260	9,550
W 177	¾	¾	66,000	46,500	32,250	27,370	21,000	16,800	10,920	7,860
W 178	¾	1	55,200	40,500	30,000	23,250	17,250	13,800	8,970	6,460
W 179	¾	1 ¼	45,750	33,750	25,720	19,720	15,300	12,240	7,960	5,730
W 182	½	½	76,390	62,400	45,750	35,400	27,520	22,020	14,310	10,300
W 183	½	¼	76,390	54,750	40,500	31,120	24,000	19,200	12,480	8,990
W 184	½	¾	71,250	47,620	35,020	27,000	20,850	16,680	10,840	7,800
W 185	½	½	61,500	42,000	31,500	24,000	18,370	14,700	9,560	6,880
W 186	½	¾	51,000	36,370	27,750	21,220	16,120	12,900	8,390	6,040
W 187	½	1	40,500	30,000	24,000	18,750	14,250	11,400	7,410	5,340
W 188	½	1 ½	30,370	24,000	18,900	15,000	12,000	9,600	6,240	4,490
W 189	½	2	24,000	18,750	15,000	12,150	9,900	7,920	5,150	3,710
W 190	¾	½	61,120	61,120	48,000	31,500	29,020	23,220	15,090	10,800
W 191	¾	¾	61,120	60,000	44,250	34,500	27,000	21,600	14,040	10,110
W 192	¾	¼	61,120	51,750	38,400	29,770	23,250	18,680	12,140	8,740
W 193	¾	¾	61,120	45,000	33,370	25,870	20,100	16,080	10,450	7,520
W 194	¾	½	56,400	39,750	29,400	22,720	17,400	13,920	9,050	6,520
W 195	¾	¾	46,500	32,400	24,900	19,720	15,370	12,300	8,000	5,760
W 196	¾	1	35,250	27,000	21,300	16,870	13,120	10,500	6,830	4,920
W 197	¾	2	21,000	16,500	12,900	10,870	8,700	6,960	4,520	3,250
W 198	¾	2 ½	16,500	12,900	10,870	8,700	7,000	5,600	3,640	2,620
W 201	¾	¼	50,930	50,930	38,100	29,020	22,500	18,000	11,700	8,420
W 202	¾	¾	50,930	44,100	32,400	25,120	19,350	15,480	10,060	7,240
W 203	¾	½	50,930	36,370	27,750	21,750	16,870	13,500	8,780	6,320
W 204	¾	¾	42,750	30,750	23,250	18,000	14,020	11,220	7,290	5,250
W 205	¾	1	34,500	25,870	19,500	15,000	12,000	9,600	6,240	4,490
W 206	¾	1 ¼	28,720	21,520	17,020	13,500	10,800	8,640	5,620	4,050
W 207	¾	1 ½	24,000	18,520	14,620	12,000	9,900	7,920	5,150	3,710
W 208	¾	2	18,750	15,370	12,000	9,900	8,000	6,400	4,160	3,000
W 209	¾	2 ½	15,000	12,150	10,500	8,400	6,800	5,440	3,540	2,550
W 211	¾	½	43,650	43,650	42,900	33,000	26,250	21,000	13,650	9,820
W 212	¾	¼	43,650	43,650	35,100	27,600	21,370	17,100	11,120	8,010
W 213	¾	¾	43,650	40,870	29,400	23,400	18,370	14,700	9,560	6,880
W 215	1	¼	38,200	38,200	38,200	33,750	25,500	20,400	13,260	9,550
W 216	1	¼	38,200	38,200	33,750	26,250	20,250	16,200	10,530	7,580
W 217	1	¾	38,200	38,200	28,500	22,500	17,400	13,920	9,050	6,520
W 218	1	½	38,200	32,770	24,900	19,500	14,850	11,880	7,720	5,560
W 219	1	¾	35,100	24,520	18,750	15,000	12,000	9,600	6,240	4,490
W 220	1	1	25,500	19,120	15,750	12,370	10,500	8,400	5,460	3,930
W 221	1	1 ½	19,120	14,620	12,000	10,500	8,400	6,720	4,370	3,150
W 222	1	2	15,900	12,370	9,750	8,620	6,900	5,520	3,590	2,580
W 223	1	2 ½	12,370	9,900	8,620	6,900	5,500	4,400	2,860	2,060
W 225	1 ¼	¼	30,560	30,560	30,560	24,000	18,750	15,000	9,750	7,020
W 226	1 ¼	¾	30,560	30,560	26,250	20,100	15,750	12,600	8,190	5,900
W 227	1 ¼	½	30,560	29,620	22,650	18,000	14,100	11,280	7,330	5,280
W 228	1 ¼	¾	30,520	22,500	17,850	14,250	11,400	9,120	5,930	4,270
W 229	1 ¼	1	24,000	18,750	15,370	12,000	9,900	7,920	5,150	3,710
W 230	1 ¼	1 ¼	20,400	15,900	12,750	10,500	8,400	6,720	4,370	3,150
W 231	1 ¼	1 ½	17,620	13,500	10,650	9,000	7,200	5,760	3,740	2,690
W 232	1 ¼	2	14,250	10,650	9,000	7,500	6,000	4,800	3,120	2,250
W 235	1 ½	¼	25,470	25,470	25,470	22,720	17,620	14,100	9,170	6,600
W 236	1 ½	½	25,470	25,470	21,750	17,250	13,650	10,920	7,100	5,110
W 237	1 ½	1	22,500	17,620	13,270	10,870	9,520	7,620	4,950	3,560
W 238	1 ½	1 ½	15,600	12,000	9,750	8,250	6,600	5,280	3,430	2,470
W 239	1 ½	2	12,750	9,900	8,000	6,400	5,100	4,080	2,650	1,910
W 240	1 ½	2 ½	10,500	8,400	6,800	5,500	4,400	3,520	2,290	1,650
W 241	1 ½	3	9,000	7,250	6,000	4,800	3,900	3,120	2,030	1,460
W 242	2	1	19,100	15,950	11,750	10,000	8,800	7,040	4,580	3,300
W 243	2	1 ½	14,500	12,750	9,800	7,800	6,300	5,040	3,280	2,360
W 244	2	2	11,750	10,500	7,500	6,200	5,030	4,000	2,600	1,870
W 245	2	2 ½	9,600	7,250	6,400	5,300	4,250	3,400	2,210	1,590
W 246	2	3	8,250	6,750	5,600	4,600	3,700	2,960	1,920	1,380

Table 26 – Group W — (plain wheels) Maximum operating speeds (RPM) for  $\frac{3}{32}$ " mandrels

Shape No.	D Wheel Diameter Inches	T Wheel Thickness Inches	$\frac{1}{2}$ " Overhang & Thd. Mdls.	Overhang — Dimension "O"			
				1"	1 $\frac{1}{2}$ "	2"	2 $\frac{1}{2}$ "
W 141	$\frac{3}{32}$	$\frac{5}{32}$	93,750	53,250	37,500	25,500	16,500
W 142	$\frac{3}{32}$	$\frac{1}{4}$	93,750	53,250	37,500	25,500	16,500
W 143	$\frac{1}{8}$	$\frac{1}{8}$	93,750	53,250	37,500	25,500	16,500
W 144	$\frac{1}{8}$	$\frac{1}{4}$	93,750	53,250	37,500	25,500	16,500
W 145	$\frac{1}{8}$	$\frac{3}{8}$	88,500	49,500	35,250	24,000	15,750
W 146	$\frac{1}{8}$	$\frac{1}{2}$	81,000	43,750	31,500	22,500	15,000
W 147	$\frac{5}{32}$	$\frac{1}{32}$	93,750	53,250	37,500	25,500	16,500
W 148	$\frac{5}{32}$	$\frac{1}{16}$	93,750	53,250	37,500	25,500	16,500
W 149	$\frac{5}{32}$	$\frac{1}{4}$	90,750	50,250	36,000	24,750	15,750
W 150	$\frac{3}{16}$	$\frac{1}{16}$	93,750	53,250	37,500	25,500	16,500
W 151	$\frac{3}{16}$	$\frac{1}{8}$	93,750	53,250	37,500	25,500	16,500
W 152	$\frac{3}{16}$	$\frac{1}{4}$	83,250	47,250	33,000	23,250	15,000
W 153	$\frac{3}{16}$	$\frac{3}{8}$	73,500	42,000	28,500	21,000	13,500
W 154	$\frac{3}{16}$	$\frac{1}{2}$	66,000	38,250	25,500	18,750	12,750
W 155	$1\frac{3}{64}$	$\frac{1}{4}$	78,000	44,250	30,750	21,750	14,250
W 156	$\frac{1}{4}$	$\frac{1}{32}$	93,750	53,250	37,500	25,500	16,500
W 157	$\frac{1}{4}$	$\frac{1}{16}$	93,750	53,250	37,500	25,500	16,500
W 158	$\frac{1}{4}$	$\frac{1}{8}$	93,750	53,250	37,500	25,500	16,500
W 159	$\frac{1}{4}$	$\frac{3}{16}$	78,000	44,250	30,750	21,750	14,250
W 160	$\frac{1}{4}$	$\frac{1}{4}$	69,000	42,000	27,750	18,750	13,500
W 161	$\frac{1}{4}$	$\frac{5}{16}$	66,000	39,750	24,750	17,250	12,750
W 162	$\frac{1}{4}$	$\frac{3}{8}$	57,000	34,500	23,250	16,500	11,250
W 165	$\frac{5}{16}$	$\frac{1}{16}$	93,000	51,750	37,500	25,500	16,500
W 166	$\frac{5}{16}$	$\frac{1}{8}$	84,750	48,750	28,500	19,500	14,250
W 167	$\frac{5}{16}$	$\frac{1}{4}$	61,500	39,000	24,750	18,000	12,000
W 168	$\frac{5}{16}$	$\frac{5}{16}$	56,250	33,750	22,500	16,500	12,000
W 169	$\frac{5}{16}$	$\frac{3}{8}$	48,000	28,500	20,250	15,000	11,250
W 170	$\frac{5}{16}$	$\frac{1}{2}$	39,750	26,250	16,500	12,750	9,750
W 171	$\frac{5}{16}$	$\frac{3}{4}$	27,750	19,500	13,500	10,500	8,250
W 172	$\frac{3}{8}$	$\frac{1}{16}$	85,500	48,750	33,750	24,000	15,000
W 173	$\frac{3}{8}$	$\frac{1}{8}$	71,250	46,500	30,000	19,500	12,750
W 174	$\frac{3}{8}$	$\frac{1}{4}$	54,000	32,250	21,000	15,000	10,500
W 175	$\frac{3}{8}$	$\frac{3}{8}$	41,250	24,000	18,000	12,750	9,750
W 176	$\frac{3}{8}$	$\frac{1}{2}$	33,750	21,000	15,750	12,000	9,000