For Serial No. 02A1000 and Higher

Parts Page Reorder No. PD10•11
Effective August, 2010
Supersedes PD08•04

Pencil Grinder

Air Tool Manual – Safety, Operation and Maintenance

SAVE THIS DOCUMENT, EDUCATE ALL PERSONNEL

60,000 RPM Models:
51700 (1/8" Collet)
51701 (3mm Collet)
51702 (3/32" Collet)

50,000 RPM Models:
51703 (1/8" Collet)
51704 (3mm Collet)
51705 (3/32" Collet)

35,000 RPM Models:
51706 (1/8" Collet)
51707 (3mm Collet)
51708 (3/32" Collet)

Ceramic Bearing Models:
51730 (50,000 RPM, 1/8" Collet)
51731 (60,000 RPM, 1/8" Collet)
51732 (50,000 RPM, 3mm Collet)
51733 (60,000 RPM, 3mm Collet)

Robotic Stem Models:
51740 (60,000 RPM, 1/8" Collet)
51742 (60,000 RPM, 3mm Collet)

Extension Models:
51750 (60,000 RPM, 1/8" Collet)
51753 (50,000 RPM, 1/8" Collet)
51756 (35,000 RPM, 1/8" Collet)

Central Vacuum Models:
51622 (35,000 RPM, 1/8" Collet)
51623 (35,000 RPM, 1/8" Collet, Ext.)
51624 (35,000 RPM, 3mm Collet)
51629 (50,000 RPM, 1/8" Collet)
51630 (50,000 RPM, 1/8" Collet, Ext.)
51631 (50,000 RPM, 3mm Collet)
51632 (60,000 RPM, 1/8" Collet)
51633 (60,000 RPM, 1/8" Collet, Ext.)
51634 (60,000 RPM, 3mm Collet)

Model 51700

FIND THE MOST CURRENT OFFERING OF SUPPORT DOCUMENTS AND ACCESSORIES @ WWW.DYNABRADE.COM

⚠ 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

⚠ WARNING

Read and understand tool manual before work starts to reduce risk of injury to operator, visitors, and tool.

⚠ WARNING

Practice safety requirements. Work alert, have proper attire, and do not operate tools under the influence of alcohol or drugs.

⚠ WARNING

Eye protection must be worn at all times, eye protection to conform to ANSI Z87.1.

⚠ WARNING

Ear protection to be worn when exposure to sound, exceeds the limits of applicable Federal, State or local statues, ordinances and/or regulations.

⚠ WARNING

Respiratory protection to be used when exposed to contaminates that exceed the applicable threshold limit values required by law.

⚠ WARNING

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, sawing, 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: Pencil Grinder Tools are ideal for light deburring, deflashing, surface preparation, cleaning and finishing using the proper abrasive stones, abrasive mounted wheels and points, 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.

SAFETY INSTRUCTIONS (Cont.)

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

- Employer's Responsibility – Provide Pencil Grinder 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.
- Use only accessories of the correct shaft size for the collet.
- Use only recommended accessories. See back page of manual and Dynabrade catalog.
- 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. Adjacent personnel must be protected from potential injury.

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

Operation: Be sure that any loose clothing, hair and all jewelry is properly restrained. Keep hand and clothing away from working end of the air tool.

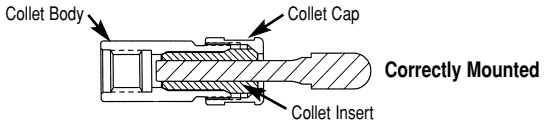
- Secure inlet bushing on air tool with a wrench before attempting to install the air fitting to avoid damaging housing assembly.
- BEFORE MOUNTING AN ACCESSORY, after all tool repairs and whenever a pencil grinder is issued for use, check tool RPM (speed) with tachometer with air pressure set at 90 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.

Warning: 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.

MANDREL MOUNTING

Caution: The mandrel shall be inserted to the full depth of the gripping jaws of the collet. At least one-half the mandrel length shall be inserted into the collet to prevent excessive overhang. Refer to accessory manufacturer's instructions for proper overhang. (Ref. ANSI B186.1)

Warning: Sliding the accessory's mandrel out from the collet insert creates an "OVER HANG" condition. This practice is NOT recommended, reducing the free speed of the tool by reducing the air pressure must be done to avoid cutting tool breakage and serious injury.



- With power source disconnected from air tool, mount recommended accessory.
- Make sure tool is off (retaining ring of on/off valve against valve body) before connecting to power source. **Do not expose air tool to inlet pressure above 90 PSIG or (6.2 Bars).**
- This tool should use filtered and regulated air, but does not require lubricated air. Lubricated air is not detrimental to tool life.

Caution: After installing the accessory, before testing or use and/or after assembling tool, the pencil 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.

- 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 do not create a hazard.
- This tool is rear exhaust. Exhaust may contain lubricants, bearing grease, and other materials flushed thru the tool.

Warning: Cutting certain materials can create harmful fumes and explosive dust. It is employers responsibility to notify the user of acceptable dust levels. Reduce risk by using dust collectors.

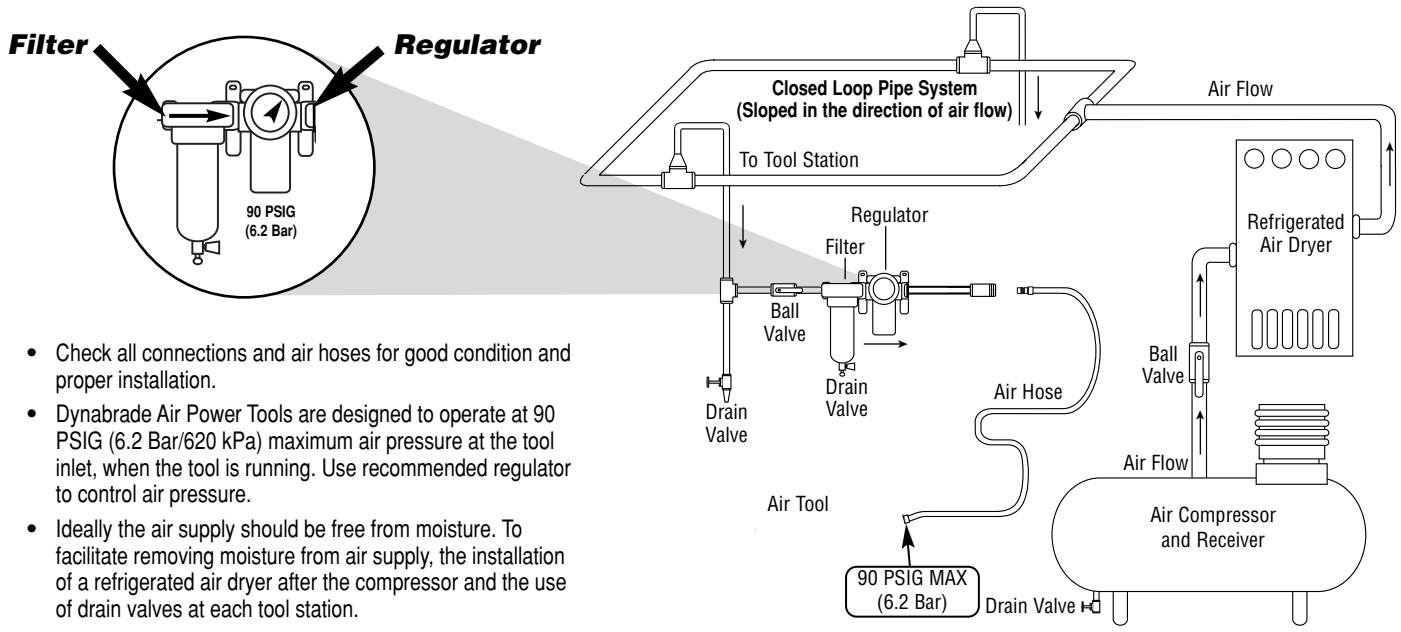
- Cutting can cause sparks which can cause fires or explosions. It is the users responsibility to make sure the area is free of flammable materials.

Warning: Do not use cut off wheels or router bits in this tool.

- Make sure that insert tools have the correct shaft size for the collet insert. i.e. 1/8" shaft = 1/8" collet insert
- Insure that the cutting tools are mounted securely in the collet, by inserting the mandrel to a minimum of 10mm, fixing the spindle with the supplied pin wrench and tightening the collet with a minimum of 25 in.- lbs. (2.8 N•m) torque.
- Avoid excessive torque to collet cap, as damage will occur to shaft and/or collet.
- Insure that the pin wrench is clean and free of debris before inserting into tool housing.
- Use long mandrel burrs (1.9" or longer) with caution. They are subject to bending, whipping, and breaking when run at high speeds.
- The rated RPM of a mounted point is lowered if the overhang (end of collet to abrasive) exceeds .5 inches (12.7mm). Refer to the included tables. Reference ANSI B 7.1 for a more complete listing and additional information.
- Use hearing protection when working with materials that produce high process noise levels. Permanent hearing loss can result from high sound levels.
- Note the tool rundown time. Control the tool as if it were under power.
- Do not set the tool down until the on/off valve is OFF and the tool has stopped turning.
- In case of interruption of the energy supply, turn the tool off. Make sure the tool is turned off before engaging with energy supply.

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

Air System



- Check all connections and air hoses for good condition and proper installation.
- 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. 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.

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 insure quality. To order replacement parts, specify **Model#**, **Serial#** and **RPM** of your air tool.
- All Dynabrade Air Tools must be used with a Filter-Regulator to maintain all warranties.

Routine Preventative Maintenance:

- An Air Line Filter-Regulator must be used with this air tool to maintain all warranties. Dynabrade recommends the following: 10677 Air Line Filter-Regulator – Provides accurate air pressure regulation, two-stage filtration of water contaminates. Operates Max 55 SCFM @ 145 PSIG.
- This tool should use filtered and regulated air, but does not require lubricated air. Lubricated air is not detrimental to tool life.
- Check free speed of pencil grinder with out accessory attached or after repair maintenance using a tachometer. This governor controlled pencil grinder should be speed checked every 20 hours of use or weekly, whichever occurs more frequently.
- Regularly clean and inspect collet assembly parts for wear or damage.
- Take special care of governor, see assembly instructions.
- 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®).
- Air tool labeling 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.

Handling and Storage:

- Use of tool rests, hangers and/or balancers is recommended.
- Protect tool inlet from debris (see Notice below).
- DO NOT carry tool by air hose.
- DO NOT force grinding swarf into the tool with compressed air; specifically avoid the pin wrench hole and front bearing areas.
- 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 metals available and are machined to exacting tolerances. The failure of quality pneumatic motors can most often be traced to an unclean air supply. Air pressure easily forces dirt or water contained in the air supply into motor bearings causing early failure. Dirt and water often score the inner workings of the tool 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 maintenance during the use of this tool.

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. To activate lifetime warranty, customer must register each tool at www.dynabrade.com. 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.

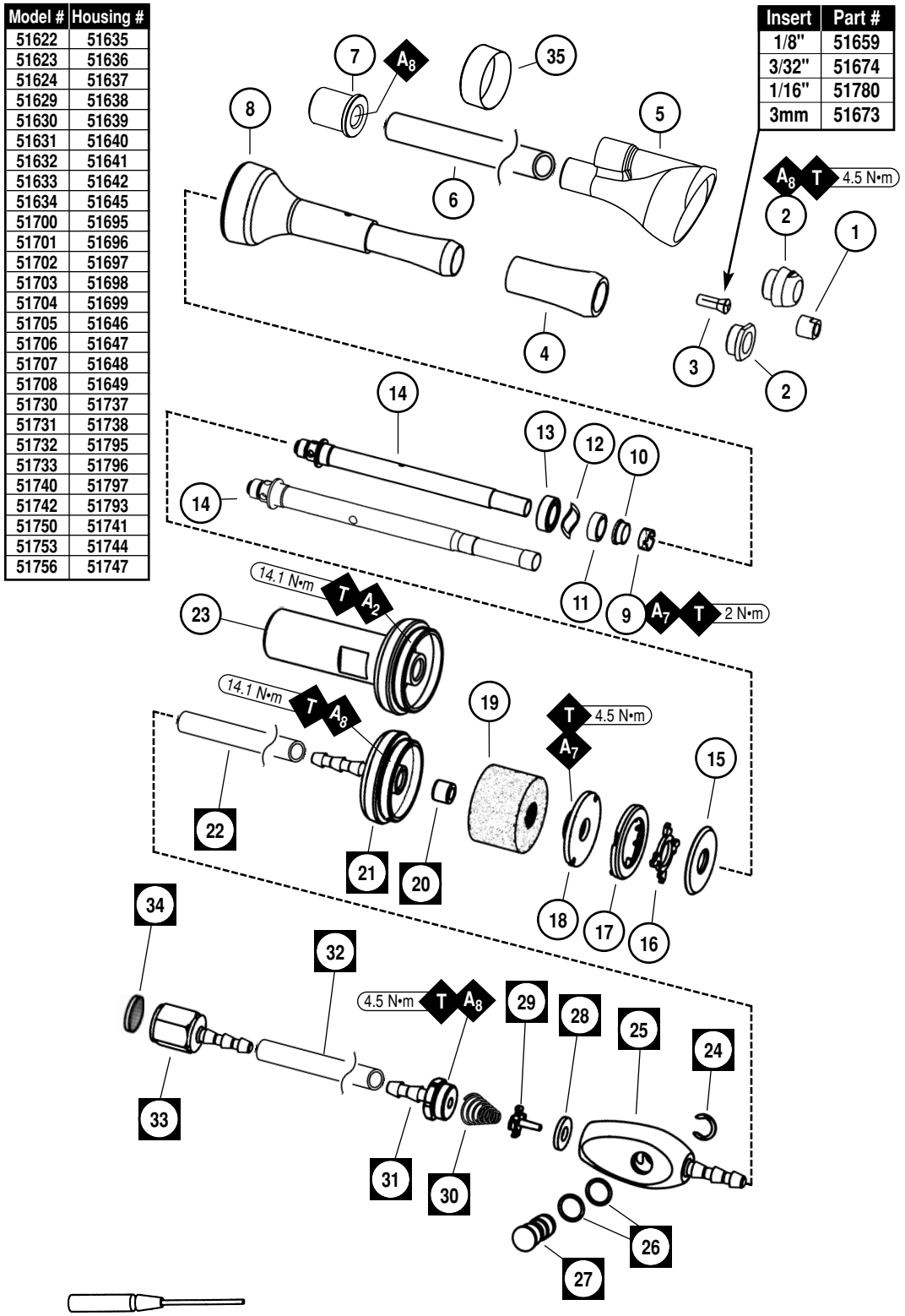
Pencil Grinder Complete Assembly

Index Key

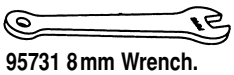
No.	Part #	Description
1	**51657**	Collet Cap
2	**51658**	Collet Guard
	51725	Ext. Collet Guard
3	**51659**	1/8" Insert
	51674	3/32" Insert
	51780	1/16" Insert
	51673	3mm Insert
4	**51660**	Grip
5	**51739**	Vac. Shroud
	51785	Ext. Vac. Shroud
6	**51791**	Vac. Hose
7	**51790**	Vac. Hose Adapter
8	**Housing** - See Chart	
9	**51548**	Bearing Retainer
10	**94984**	Debris Eliminator
11	**51544**	Bearing
	51685	Ceramic Bearing
12	**51661**	Wave Spring
13	**51651**	Bearing
	51686	Ceramic Bearing
14	**51654**	Drive Shaft
	51724	Ext. Drive Shaft
15	**51656**	Turbine Base
16	**51691**	35K Governor
	51692	50K Governor
	51675	60K Governor
17	**51678**	Turbine
18	**51655**	Top Plate
19	**51684**	Muffler
20	**51662**	Bushing
21	**51275**	Cover-35,000 (Red)
	51274	Cover-50,000 (Gold)
	51273	Cover-60,000 (Teal)
22	**51276**	24" Air Hose*
23	**51792**	Cover-Stem
	Note: Only for Mdls. **51740** & **51742**	
24	**51669**	Retaining Ring
25	**51272**	Valve Body
26	**95730**	O-Ring (2)
27	**51665**	Valve
28	**51664**	Valve Seat
29	**51663**	Tip Valve
30	**51676**	Conical Spring
31	**51271**	Inlet Barb
32	**51277**	42" Air Hose*
33	**51269**	Fitting
34	**56022**	Inlet Screen
35	**96585**	Rubber Band (3)

Model #	Housing #
51622	51635
51623	51636
51624	51637
51629	51638
51630	51639
51631	51640
51632	51641
51633	51642
51634	51645
51700	51695
51701	51696
51702	51697
51703	51698
51704	51699
51705	51646
51706	51647
51707	51648
51708	51649
51730	51737
51731	51738
51732	51795
51733	51796
51740	51797
51742	51793
51750	51741
51753	51744
51756	51747

Insert	Part #
1/8"	51659
3/32"	51674
1/16"	51780
3mm	51673



51694 Shaft Lock Assy.



95731 8mm Wrench.

Special Repair Tools

Part #	Description
94999	Air Bushing Tool
96406	.108" Dia. Pilot Punch
96407	Brass Retainer Wrench
96408	Motor Top Plate Wrench
96418	Bearing Press Tool .623" O.D., .375" I.D.
96419	Bearing Press Tool .498" O.D., .315" I.D.
96479	Extension Brass Retainer Wrench
96483	Sleeve Assembly Bullet
96486	Collet Insert Removal Tool
96439	Collet Cap Wrench

***Hose Assemblies**

Assy. #	RPM
51766	35,000
51767	50,000
51768	60,000

Parts Included in Hose Assemblies

KEY

- **A** Adhesive: **A_2 = Loctite #271**, **A_7 = Loctite #222**, **A_8 = Loctite #567**
- **T** Torque: **N•m x 8.85 = In. - lbs.**

Always follow adhesive manufacturers cleaning and priming recommendations.

Disassembly/Assembly Instructions - Pencil Grinder

(ALL THREADS ARE RIGHT HAND)

Collet Disassembly/Assembly Instructions

To Disassemble:

1. Turn **51654** or **51724** Drive Shaft until the holes in motor housing and drive shaft are aligned.
2. Slip the **51694** Shaft Lock Pin provided through both holes to lock the drive shaft.
3. Use **95731** 8mm open end wrench, to remove the **51657** Collet Cap.
4. Remove **51659**, **51673**, **51674 or 51780** Insert.

To Assemble:

1. To reduce bit runout and sticking, thoroughly clean, inspect, and polish as necessary the **51657** Collet Cap, **51659**, **51673**, **51674** or **51780** Insert, and insert cavity in **51654** or **51724** Drive Shaft.
2. Turn drive shaft until the holes in motor housing and drive shaft are aligned.
3. Slip the **51694** Shaft Lock Pin through both holes to lock the drive shaft.
4. Place **51659**, **51673**, **51674** or **51780** Insert in end of **51654** or **51724** Drive Shaft. It should be a very clean fit that does not stick. If it sticks go back to step 1 above.
5. Screw on **51657** Collet Cap.

Motor Disassembly/Assembly Instructions

To Disassemble:

1. Turn **51654** or **51724** Drive Shaft until the holes in motor housing and drive shaft are aligned.
2. Slip the **51694** Shaft Lock Pin through both holes to lock the drive shaft.
3. Using an adjustable face pin style spanner wrench in the exhaust holes and applying a small amount of heat to the threaded area on the low setting from a heat gun, unscrew the turbine cover. Excessive heat will damage the muffler and the turbine.
4. Using **96408** Special Repair Tool unscrew the motor **51655** Top Plate. A small amount of heat may be required at this point as well.
5. Remove the **51675**, **51691**, or **51692** Governor, **51678** Turbine, and **51656** Turbine Base.
6. Clean all parts thoroughly. Inspect governor and **51678** Turbine for cracks and missing molded drive pins. Inspect **51655** Top Plate and **51656** Turbine Base for flatness.

To Assemble:

1. Place **51678** Turbine on the flange on **51656** Turbine Base.
2. Place **51675**, **51691** or **51692** Governor in the channels on **51678** Turbine. Make sure that the **51675**, **51691** or **51692** Governor is properly oriented. The tips on **51675**, **51691** or **51692** Governor should be free to restrict the nozzles on **51678** Turbine as it expands in response to the speed.
3. Place **51655** Top Plate on **51678** Turbine, inserting the turbine drive pins in the drive slots.
4. Turn **51654** or **51724** Drive Shaft until the holes in motor housing and drive shaft are aligned.
5. Slip the **51694** Shaft Lock Pin through both holes to lock the drive shaft.
6. After threaded surfaces have been properly cleaned and primed, apply a small quantity of Loctite® #222 or equivalent to the **51655** Top Plate threads.
7. Make sure that the drive pins are still engaged in the drive slots. Torque the motor assembly onto drive shaft to 4.5 N•m (40 lb.-in.), using **96408** Special Repair Tool.

Bearing Replacement Instructions

To Remove:

1. Remove **51657** Collet Cap as in Collet Assembly/Disassembly above.
2. Unscrew **51658** or **51725** Collet Guard. Use of a heat gun on the low setting may be necessary to soften the thread locking compound. Extension Vacuum models require **96939** Wrench to remove collet guard.
3. Remove **51548** Bearing Retainer and **94984** Debris Eliminator using **96407** Special Repair Tool.
4. Remove the turbine cover per Motor Disassembly/Assembly Instructions above.
5. Press **51654** or **51724** Drive Shaft and motor assembly out the rear of the tool.
6. Press **51651** Upper Bearing or **51686** Upper Ceramic Bearing off the drive shaft.
7. Push the **51544** Lower Bearing or **51685** Lower Ceramic Bearing forward out of motor housing.
8. Discard bearings, do not reuse.

To Install:

1. As these are special bearings, use only Dynabrade replacement bearings.
2. Make sure that the new **51651** Upper Bearing or **51686** Upper Ceramic Bearing is a slip fit in motor housing. If not, lightly clean the bearing bore with a very fine abrasive cloth.
3. Seat new **51651** Upper Bearing or **51686** Upper Ceramic Bearing on **51654** or **51724** Drive Shaft using **96406** Punch & **96418** Bushing.
4. Replace **51661** Bearing Preload Spring, and slip drive shaft, bearing assembly into motor housing.
5. Use Special Repair Tool **96406** and **96419** to seat **51544** Lower Bearing or **51685** Lower Ceramic Bearing on shaft.
6. Place **94984** Debris Eliminator on shaft.
7. After threaded surfaces have been properly cleaned and primed, apply a small amount of Loctite® #222 to the threads and torque the **51548** Bearing Retainer to 2 N•m (18 lb.-in.), use **96407** Special Repair Tool. Avoid getting Loctite® into **51544** Lower Bearing or **51685** Lower Ceramic Bearing or on the drive shaft threaded area used by the **51657** Collet Cap.
8. Install the collet guard and torque to 4.5 N•m (40 lb.-in.).
9. Install the collet insert and **51657** Collet Cap.

(continued on next page)

10. **51662** Air Bushing must be reset. Using **94999** Special Repair Tool pull it out approximately 1.5mm. Screw turbine cover down until it bottoms on the motor housing. Back turbine cover off slightly and start the tool. As it runs, slowly tighten the turbine cover. Let the tool run until it turns freely. After threaded surfaces have been properly cleaned and primed, apply appropriate Loctite® sealant (see page 4, item #21 and #23) to turbine cover and torque to 14.1 N•m (125 lb.-in.).

Valve Disassembly/Assembly Instructions

To Disassemble:

1. Unscrew **51271** Inlet Barb, remove **51676** Conical Spring **51663** Tip Valve and **51664** Valve Seat.
2. Remove **51669** Retaining Ring and withdraw **51665** On/Off Valve.
3. Remove **95730** O-Rings.

To Assemble:

1. Install new **95730** O-Rings.
2. Lubricate o-rings and Install **51665** On/Off Valve in **51272** Valve Body.
3. Install **51664** Valve Seat.
4. Set **51665** Valve in the off position, (**51669** Retaining Ring against **51272** Valve Body) and load **51663** Tip Valve, and **51676** Conical Spring in **51272** Valve Body. The small end of the **51676** Conical Spring must engage the short boss on **51663** Tip Valve.
5. After threaded surfaces have been properly cleaned and primed, apply Loctite® #567 sealant to **51271** Inlet Barb and torque to 4.5 N•m (40lb.-in.).
6. Make a simple check of the vibration level after assembly.

Tool Assembly Complete. Allow adhesive to cure (follow adhesive manufacturers recommendations) before operating tool.

Hose Instructions (To repair or replace damaged hose):

1. Cut through hose approximately 1" back from end of hose. Using a sharp object, utility knife, razor blade etc.
2. Pull hose off, trim off damaged area or install replacement hose, use only Dynabrade Push-Lock hose P/N's **51276** and **51277**.
3. Push hose firmly onto hose fitting beyond the last barb or until hose bottoms out against part. Repeat process where necessary.

Preventative Maintenance Schedule — *For All Pencil Grinders*

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.

Index #	Part Number	Description	Number Required	High Wear 100%	Medium Wear 70%	Low Wear 30%	Non-Wear 10%
1	**51657**	Collet Cap	1				**X**
2	**See pg.4**	Collet Guard	1				**X**
3	**See pg.4**	Insert	1				**X**
4	**51660**	Grip	1				**X**
5	**See pg.4**	Vac. Shroud	1				**X**
6	**51791**	Vac. Hose	1				**X**
7	**51790**	Vac. Hose Adapter	1				**X**
8	**See pg.4**	Motor Housing	1				**X**
9	**51548**	Bearing Retainer	1			**D**	
10	**94984**	Debris Eliminator	1				**X**
11	**See pg.4**	Bearing	1	**R1**			
12	**51661**	Wave Spring	1				**X**
13	**See pg.4**	Bearing	1		**X**		
14	**See pg.4**	Drive Shaft	1				**X**
15	**51656**	Turbine Base	1				**X***
16	**See pg.4**	Governor	1				**X**
17	**51678**	Turbine	1				**X**
18	**51655**	Top Plate	1				**X**
19	**51684**	Muffler	1			**X**	
20	**51662**	Bushing	1			**D**	
21	**See pg.4**	Cover	1				**X**
22	**51792**	Cover- Stem	1				**X**
23	**51276**	24" Air Hose	1		**X**		
24	**51669**	Retaining Ring	1				**X**
25	**51272**	Valve Body	1				**X**
26	**95730**	O-Ring	1				**X**
27	**51665**	Valve	1				**X**
28	**51664**	Valve Stem	1				**X**
29	**51663**	Tip Valve	1				**X**
30	**51676**	Spring	1				**X**
31	**51271**	Inlet Barb	1				**X**
32	**51277**	42" Air Hose	1		**X**		
33	**51269**	Fitting	1				**X**
34	**56022**	Inlet Screen	1				**X**
35	**96585**	Rubber Bands	3				**X**

LEGEND	
X	Type of wear, no other comments apply.
L	Easily lost. Care during assembly/disassembly.
D	Easily damaged during assembly/disassembly.
R1	Replace each time tool is disassembled.

Note: Please refer to page 4 of tool manual for specific part number and description.
*Change at 1,000 Hours.

Pencil Grinder Reference Tables

Note: Reprinted with permission of United Abrasives Manufacturers Association From (ANSI B7.1).
For more information on other type mounted wheels refer to (ANSI B7.1) Safety requirements for use, care and protection of Abrasive wheels.

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	102,200	74,340	57,320	43,010	29,780
W 144	1/8	1/4	92,460	66,130	50,640	37,850	26,160
W 145	1/8	3/8	84,190	59,390	45,430	34,170	24,000
W 146	1/8	1/2	76,820	53,550	41,120	31,390	22,760
W 151	3/16	1/8	91,740	64,700	48,490	35,000	22,580
W 152	3/16	1/4	82,070	56,560	41,880	29,920	19,030
W 153	3/16	3/8	73,880	49,890	36,740	26,310	16,960
W 154	3/16	1/2	66,580	44,130	32,510	23,600	15,780
W 157	1/4	1/16	91,700	64,710	48,560	35,110	22,750
W 158	1/4	1/8	84,930	58,700	43,310	30,630	19,040
W 159	1/4	3/16	79,850	54,390	39,770	27,850	17,020
W 160	1/4	1/4	75,330	50,640	36,780	25,630	15,560
W 161	1/4	5/16	71,150	47,210	34,120	23,730	14,430
W 162	1/4	3/8	67,210	44,040	31,710	22,090	13,550
W 163	1/4	1/2	59,990	38,350	27,550	19,460	12,450
W 164	1/4	3/4	47,880	29,300	21,550	16,520	12,570
W 165	5/16	1/16	86,320	60,140	44,800	32,170	20,630
W 166	5/16	1/8	79,580	54,170	39,590	27,730	16,950
W 167	5/16	1/4	70,060	46,170	33,130	22,800	13,540
W 168	5/16	5/16	65,900	42,790	30,510	20,940	12,450
W 169	5/16	3/8	62,010	39,650	28,140	19,330	11,610
W 170	5/16	1/2	54,860	34,040	24,050	16,770	10,580
W 171	5/16	3/4	42,890	25,130	18,200	13,980	10,850
W 172	3/8	1/16	81,660	56,300	41,780	29,960	19,230
W 173	3/8	1/8	74,960	50,360	36,600	25,560	15,590
W 174	3/8	1/4	65,510	42,440	30,210	20,690	12,260
W 175	3/8	3/8	57,530	35,990	25,290	17,300	10,400
W 176	3/8	1/2	50,460	30,450	21,280	14,820	9,440
W 177	3/8	3/4	38,640	21,690	15,570	12,170	9,850
W 178	3/8	1	29,760	15,870	12,810	12,470	12,130
W181	1/2	1/16	73,440	49,710	36,820	26,640	17,540
W 182	1/2	1/8	66,810	43,850	31,720	22,300	13,970
W 183	1/2	1/4	57,510	36,070	25,470	17,590	10,780
W 184	1/2	3/8	49,680	29,770	20,700	14,340	9,070
W 185	1/2	1/2	42,750	24,370	16,830	12,000	8,260
W 186	1/2	3/4	31,220	15,900	11,420	9,650	8,960
W 187	1/2	1	22,630	10,370	8,950	7,530	6,110
W 190	5/8	1/16	61,120	43,850	32,590	24,040	16,570
W 191	5/8	1/8	59,390	38,060	27,560	19,780	13,070
W 192	5/8	1/4	50,240	30,430	21,460	15,210	10,030
W 193	5/8	3/8	42,550	24,280	16,840	12,110	8,470
W 194	5/8	1/2	35,770	19,020	13,110	9,920	7,800
W 195	5/8	3/4	24,530	10,840	7,990	7,850	7,710
W 196	5/8	1	16,240	5,610	5,100	5,100	5,100
W 199	3/4	1/16	50,930	38,360	28,730	21,810	15,970
W 200	3/4	1/8	50,930	32,640	23,770	17,620	12,550
W 201	3/4	1/4	43,330	25,150	17,820	13,190	9,650
W 202	3/4	3/8	35,790	19,150	13,340	10,240	8,230
W 203	3/4	1/2	29,150	14,040	9,760	8,190	7,710
W 204	3/4	3/4	18,210	6,150	4,930	3,710	2,490
W 210	7/8	1/16	43,650	33,070	25,070	19,780	15,580
W 211	7/8	1/8	43,650	27,420	20,190	15,670	12,230
W 212	7/8	1/4	36,630	20,090	14,380	11,390	9,480
W 213	7/8	3/8	29,240	14,220	10,050	8,580	8,200
W 215	1	1/8	38,200	22,340	16,740	13,850	12,040
W 216	1	1/4	30,060	15,150	11,080	9,710	9,430

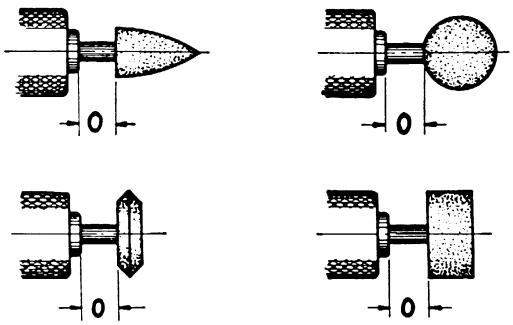


FIGURE NO. 47
Dimension "O" indicates overhang of mandrel.

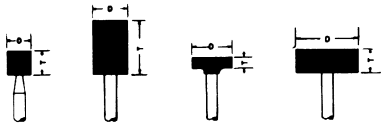


ILLUSTRATION No. 80

MOUNTED WHEELS
STANDARD SHAPES
GROUP "W"

Optional Accessories

Model 10677: Up to 55 SCFM @ 1145 PSIG
1/2" NPT Female ports, includes
3/8" NPT reducer.

- Filter-Regulator, provides accurate air pressure regulation and two stage filtration of water/contaminates.

Model 93351

- 1/8" Carbide Burr Kit, Includes 12 burrs for grinding, deburring, and finishing metal.

Ceramic Bearings

- To provide better performance and durability in the face of the following environmental factors.
  - High Shaft Speeds
  - Extreme Temperature
  - Dirt
  - Corrosion

51685 Ceramic Bearing Replaces Standard **51544** Bearing.

51686 Ceramic Bearing Replaces Standard **51651** Bearing.

Machine Specifications

Model Number	Motor HP (W)	Motor RPM	Sound Level	Maximum Air Flow CFM/SCFM (LPM)	Air Pressure PSIG (Bars)	Collet Size	Weight Pound (kg)	Length Inch (mm)	Height Inch (mm)
51622	.1 (75)	35,000	74 dB(A)	1/8 (227)	90 (6.2)	1/8"	1.1 (.5)	5-1/4 (132)	1-7/8 (49)
51623 (Ext.)	.1 (75)	35,000	76 dB(A)	1/8 (227)	90 (6.2)	1/8"	1.2 (.5)	6 (152)	1-7/8 (49)
51624	.1 (75)	35,000	74 dB(A)	1/8 (227)	90 (6.2)	3mm	1.1 (.5)	5-1/4 (132)	1-7/8 (49)
51629	.1 (75)	50,000	76 dB(A)	1/8 (227)	90 (6.2)	1/8"	1.1 (.5)	5-1/4 (132)	1-7/8 (49)
51630 (Ext.)	.1 (75)	50,000	73 dB(A)	1/8 (227)	90 (6.2)	1/8"	1.2 (.5)	6 (152)	1-7/8 (49)
51631	.1 (75)	50,000	76 dB(A)	1/8 (227)	90 (6.2)	3mm	1.1 (.5)	5-1/4 (132)	1-7/8 (49)
51632	.1 (75)	60,000	72 dB(A)	1/8 (227)	90 (6.2)	1/8"	1.1 (.5)	5-1/4 (132)	1-7/8 (49)
51633 (Ext.)	.1 (75)	60,000	72 dB(A)	1/8 (227)	90 (6.2)	1/8"	1.2 (.5)	6 (152)	1-7/8 (49)
51634	.1 (75)	60,000	72 dB(A)	1/8 (227)	90 (6.2)	3mm	1.1 (.5)	5-1/4 (132)	1-7/8 (49)
51700, 51731	.1 (75)	60,000	69 dB(A)	1/8 (227)	90 (6.2)	1/8"	.8 (.4)	5-1/4 (132)	1-1/2 (37)
51701, 51733	.1 (75)	60,000	69 dB(A)	1/8 (227)	90 (6.2)	3mm	.8 (.4)	5-1/4 (132)	1-1/2 (37)
51702	.1 (75)	60,000	69 dB(A)	1/8 (227)	90 (6.2)	3/32"	.8 (.4)	5-1/4 (132)	1-1/2 (37)
51703, 51730	.1 (75)	50,000	64 dB(A)	1/8 (227)	90 (6.2)	1/8"	.8 (.4)	5-1/4 (132)	1-1/2 (37)
51704, 51732	.1 (75)	50,000	64 dB(A)	1/8 (227)	90 (6.2)	3mm	.8 (.4)	5-1/4 (132)	1-1/2 (37)
51705	.1 (75)	50,000	64 dB(A)	1/8 (227)	90 (6.2)	3/32"	.8 (.4)	5-1/4 (132)	1-1/2 (37)
51706	.1 (75)	35,000	65 dB(A)	1/8 (227)	90 (6.2)	1/8"	.8 (.4)	5-1/4 (132)	1-1/2 (37)
51707	.1 (75)	35,000	65 dB(A)	1/8 (227)	90 (6.2)	3mm	.8 (.4)	5-1/4 (132)	1-1/2 (37)
51708	.1 (75)	35,000	65 dB(A)	1/8 (227)	90 (6.2)	3/32"	.8 (.4)	5-1/4 (132)	1-1/2 (37)
51740	.1 (75)	60,000	69 dB(A)	1/8 (227)	90 (6.2)	1/8"	.5 (.24)	7-3/16 (182)	1-1/2 (37)
51742	.1 (75)	60,000	69 dB(A)	1/8 (227)	90 (6.2)	3mm	.5 (.24)	7-3/16 (182)	1-1/2 (37)
51750 (Ext.)	.1 (75)	60,000	69 dB(A)	1/8 (227)	90 (6.2)	1/8"	.8 (.4)	6 (152)	1-1/2 (37)
51753 (Ext.)	.1 (75)	50,000	69 dB(A)	1/8 (227)	90 (6.2)	1/8"	.8 (.4)	6 (152)	1-1/2 (37)
51756 (Ext.)	.1 (75)	35,000	69 dB(A)	1/8 (227)	90 (6.2)	1/8"	.8 (.4)	6 (152)	1-1/2 (37)
51770	.1 (75)	60,000	69 dB(A)	1/8 (227)	90 (6.2)	1/16"	.8 (.4)	5-1/4 (132)	1-1/2 (37)

Additional Specifications: Air Inlet Thread 1/4" NPT • Hose Size 1/4" (6 mm)
Sound Level is the pressure measurement according to the method outlined in ISO regulation ISO-15744

Reference Contact Information

1. **American National Standards Institute – ANSI**
   25 West 43rd 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. **Power Tool Institute, Inc.**
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   Yachata, Oregon 97498-0818
   Tel: 1 (503) 547-3185
   Fax: 1 (503) 547-3539

4. **European Committee for Standardization**
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