

100,000 RPM Pencil Grinder

Air Tool Manual – Safety, Operation and Maintenance

SAVE THIS DOCUMENT, EDUCATE ALL PERSONNEL

Models:

- 51810 (1/8" Collet)
- 51811 (1/16" Collet)
- 51812 (3/32" Collet)
- 51813 (3mm Collet)



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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

	! 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 statutes, ordinances and/or regulations.	
	! WARNING Respiratory protection to be used when exposed to contaminants 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 engraving, light deburring, deflashing, surface preparation, cleaning and finishing using the proper abrasive stones, abrasive mounted wheels, 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.

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.

(continued on next page)

SAFETY INSTRUCTIONS (Cont.)

- Before mounting an accessory, visually inspect for defects. Do not use defective accessories.
- Use only accessories of the correct shaft size for the collet.
- 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.)
- If a grinding wheel is broken, a careful investigation should be made by the user to determine and correct the cause.

OPERATING INSTRUCTIONS

Warning: Always wear personal protection equipment. 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.

- 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.

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 check the collet to assure it is in good condition. If so mount the recommended accessory.
- Make sure tool is off and connect 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. Make sure no one is in the unguarded plane of the wheel. Gradually increase tool speed. DO NOT USE if tool vibration is excessive. Correct cause, and retest to insure safe operation. Run tool for 1 minute of operating speed in a protected area.

- 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.
- Ensure that sparks and debris resulting from work do not create a hazard.
- Tools exhaust may contain lubricants, bearing grease, and other materials. Direct exhaust away from operator.
- 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
- Note the tool rundown time. Control the tool as if it were under power.
- Insure that the cutting tools are mounted securely in the collet, by inserting the shank a minimum of 1in., sliding the o-ring away from the cross holes and groove in housing, 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 shank 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.
- Check free speed of pencil grinder using a tachometer every 20 hours of use or weekly, whichever occurs more frequently.
- 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 set the tool down until the on/off valve is OFF and the tool has stopped turning.

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

MAINTENANCE INSTRUCTIONS

Important: A Preventative Maintenance Program is recommended for this tool. The program should include inspection of air supply lines, air line pressure 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: 11402 Air Line Filter-Regulator – Provides accurate air pressure regulation, two-stage filtration of water contaminates. Operates 40 SCFM @ 90 PSIG has 3/8" NPT female ports.
- Regularly clean and inspect collet assembly parts for wear or damage.
- DO NOT clean or maintain tools with chemicals that have a low flash point (example: WD-40®).
- Air tool markings must be kept legible at all times. 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.

MAINTENANCE INSTRUCTIONS - CONTINUED

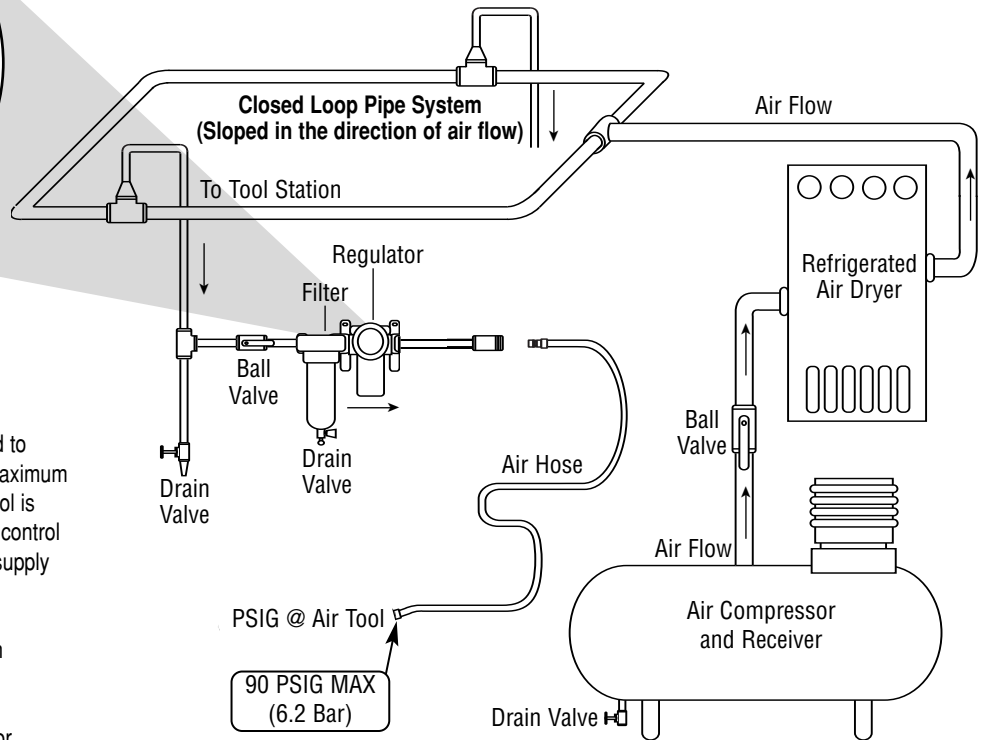
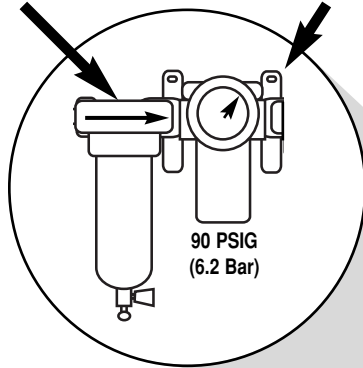
Handling and Storage:

- Use of tool rests, hangers and/or balancers is recommended.
- Protect tool inlet from debris.
- **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.

Air System

Filter

Regulator



- 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 at each work station, if the supply pressure is high.
- 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.

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

Models:
51810, 51811
51812, 51813

Pencil Grinder Complete Assembly

Index Key

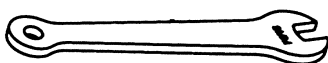
No.	Part #	Description
1	51657	Collet Cap
2	51659	1/8" Insert
	51674	3/32" Insert
	51780	1/16" Insert
	51673	3mm Insert
3	53584	Collet Guard
4	51548	Bearing Retainer
5	94984	Spacer
6	51685	Bearing
7	51660	Grip
8	51789	O-Ring
9	Housing	
	53590	Model 51810
	53591	Model 51811
	53594	Model 51812
	53596	Model 51813
10	51661	Wave Spring
11	51686	Bearing
12	53580	Drive Shaft
13	51656	Turbine Base
14	51678	Turbine
15	51655	Top Plate
16	51662	Air Bushing
17	53581	Turbine Cover
18	53585	Pin
19	95523	O-Ring (2)
20	95438	O-Ring
21	53588	Muffler
22	53582	ON/OFF Valve
23	53587	Washer
24	53586	Hex Nut
25	53589	Hose 68"
26	51269	Fitting
27	56022	Inlet Screen

Special Repair Tools

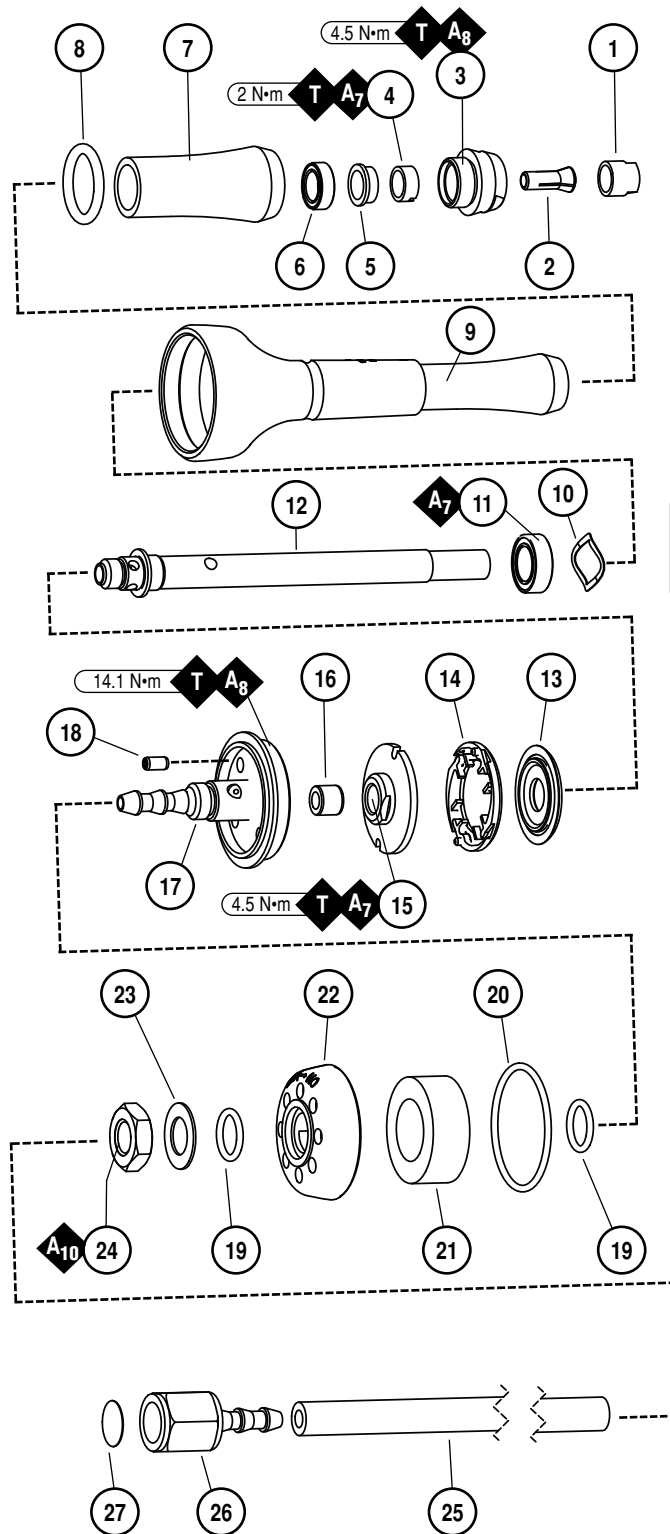
Part #	Description
94999	Air Bushing Tool
96406	.108" Dia. Pilot Punch
96407	Retainer Wrench
96408	Top Plate Wrench
96418	Bearing Press Tool .623" O.D., .375" I.D.
96419	Bearing Press Tool .498" O.D., .315" I.D.
96479	Extension Retainer Wrench
96483	Sleeve Assembly Bullet
96486	Collet Insert Removal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



51694 Shaft Lock Pin



95731 8mm Wrench.



PART NUMBER 11
 Do not allow adhesive to enter internal raceways. Allow to cure 24 hours before running tool.

KEY	
A	Adhesive: A ₇ = Loctite #222 A ₈ = Loctite #567 A ₁₀ = Loctite #243
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. Slide **51789** O-Ring away from holes in motor housing.
2. Turn **53580** Drive Shaft until the holes in motor housing and drive shaft are aligned.
3. Slip the **51694** Shaft Lock Pin provided through both holes to lock the drive shaft.
4. Use **95731** 8mm open end wrench, to remove the **51657** Collet Cap.
5. 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.
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 **53580** 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.
6. Slide **51789** O-Ring over holes in motor housing.

Motor Disassembly/Assembly Instructions

To Disassemble:

1. Remove **53589** Air Hose by cutting just behind the barbs on **58581** Turbine Cover.
2. Remove **53586** Jam Nut, **53582** ON/OFF Valve, **53588** Muffler, o-ring and washer.
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 **58581** Turbine Cover. Excessive heat will damage the turbine.
4. Using **96408** Special Repair Tool and **51694** Shaft Lock Pin unscrew the motor **51655** Top Plate. A small amount of heat may be required at this point as well. It is necessary to slide **51789** O-Ring out of the groove in the motor housing to access the shaft lock pin holes.
5. Remove the **51678** Turbine, and **51656** Turbine Base.
6. Clean all parts thoroughly. Inspect **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 **51655** Top Plate on **51678** Turbine, inserting the turbine drive pins in the drive slots.
3. Turn **53580** Drive Shaft until the holes in motor housing and drive shaft are aligned.
4. Slip the **51694** Shaft Lock Pin through both holes to lock the drive shaft.
5. After threaded surfaces have been properly cleaned and primed, apply a small quantity of Loctite® #222 or equivalent to the **51655** Top Plate threads.
6. 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.
7. After threaded surfaces have been properly cleaned and primed, apply a small quantity of Loctite® #567 or equivalent to the **53581** Turbine Cover and torque to 14.1 N•m (125 lb.-in.).
8. Replace **95523** O-Ring, **53588** Muffler, **53582** ON/OFF Valve, another **95523** O-Ring and **53587** Washer. After threaded surfaces have been properly cleaned and primed, add Loctite® #243 or equivalent to **53586** Hex Nut and tighten finger tight, so that ON/OFF Valve can be rotated.
9. Push hose firmly onto turbine cover beyond all barbs.
10. Push **51789** O-Ring into place in groove on extension of motor housing.

Bearing Replacement Instructions

To Remove:

1. Remove **51657** Collet Cap as in Collet Assembly/Disassembly above.
2. Unscrew **53584** Collet Guard. Use of a heat gun on the low setting may be necessary to soften the thread locking compound.
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 **53580** Drive Shaft and motor assembly out the rear of the tool.
6. Press **51686** Upper Ceramic Bearing off the drive shaft.
7. Push the **51685** Lower Ceramic Bearing forward out of motor housing.
8. Discard bearings, do not reuse.

To Install:

1. As these are special ceramic bearings, use only Dynabrade replacement bearings.

(continued on next page)

Disassembly/Assembly Instructions - Pencil Grinder

2. Make sure that the new **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 **51686** Upper Ceramic Bearing on **53580** 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 **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 **51685** Lower Ceramic Bearing or on the drive shaft threaded area used by the **51657** Collet Cap.
8. Use an “Easy-Out” or screw extractor to remove the old **51662** Air Bushing from the **53581** Turbine Cover.
9. Make sure that all thread surfaces of the **53581** Turbine Cover are thoroughly cleaned and primed.
10. Carefully press a new **51662** Air Bushing into the turbine cover. NOTICE: When installing the new air bushing, leave 1/16" (1.5mm) of the bushing exposed to the outside of the turbine cover.
11. Apply a small amount of Vaseline to the two **95523** O-Rings, and the **95438** O-Ring. Install the o-rings onto the turbine cover, and the **53582** ON/OFF Valve.
12. Install the **53588** Muffler into the turbine cover.
13. Install the **53582** ON/OFF Valve onto the turbine cover.
14. Install the **53587** Washer and then the **53586** Hex Nut onto the turbine cover.
15. Install the end of the **53589** Hose onto the first barb of the turbine cover making sure that the barb grabs the hose securely.
16. After threaded surfaces have been properly cleaned and primed, apply Loctite #567 (or equivalent) to the housing threads of the turbine cover.
 - Tighten by hand the turbine cover until it bottoms against the tool housing.
 - Turn the ON/OFF valve to the ON position.
 - Use an adjustable wrench to tighten the **53586** Hex Nut securely against the ON/OFF valve.
 - Connect the **51269** Fitting of the **53589** Hose to the air supply.
 - By hand, turn the ON/Off valve counterclockwise to loosen the turbine cover.
 - As the tools starts to run, allow it to gain speed, and then gradually turn the ON/OFF valve clockwise advancing the turbine cover onto the tool housing thread.
 - Turn the turbine cover forward and backward until full RPM (spindle speed) is reached and the turbine cover finally bottoms against the tool housing. (Torque to 11.3 N m/100 in. lbs.)
 - NOTICE: Use a tachometer to check RPM.
17. Disconnect the tool from the air supply.
18. Use an adjustable wrench to completely loosen the **53586** Hex Nut from the turbine cover thread.
 - After threaded surfaces have been properly cleaned and primed to the hex nut thread of the **53581** Turbine Cover, apply Loctite #243 to the threads.
 - Make the **53586** Hex Nut finger tight so that the ON/OFF valve operates smoothly.
 - Push the **53589** Hose all the way onto the turbine cover barb connections so that the hose press securely against the **53586** Hex Nut.
 - Let the Loctite cure before operating the 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 all barbs or until hose bottoms out against part.

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

Important: The motor should be tested for proper operation.

Carefully connect the tool to an air supply. The tool should operate within 10% of the maximum rated RPM. The tool RPM should not exceed the maximum rated RPM with an operating air supply pressure of 90 PSIG (6.2 bar g).

Machine Specifications

Model Number	Motor RPM	Sound Level	Maximum Air Flow SCFM (LPM)	Air Pressure PSIG (Bars)	Collet Size	Weight Pound (kg)	Length Inch (mm)	Height Inch (mm)
51810	100,000	75 dB(A)	6 (170)	90 (6.2)	1/8"	.84 (.38)	5-5/16 (135)	1-1/2 (37)
51811	100,000	75 dB(A)	6 (170)	90 (6.2)	1/16"	.84 (.38)	5-5/16 (135)	1-1/2 (37)
51812	100,000	75 dB(A)	6 (170)	90 (6.2)	3/32"	.84 (.38)	5-5/16 (135)	1-1/2 (37)
51813	100,000	75 dB(A)	6 (170)	90 (6.2)	3mm	.84 (.38)	5-5/16 (135)	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

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. Mdl.	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	15,570
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

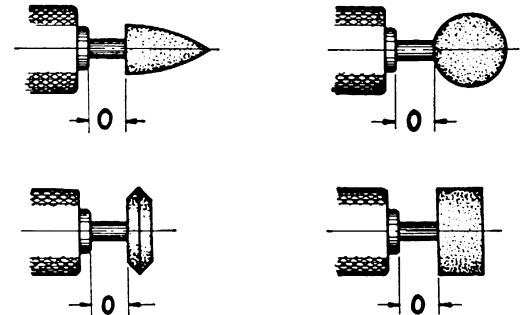


FIGURE NO. 47
Dimension "O" indicates overhang of mandrel.

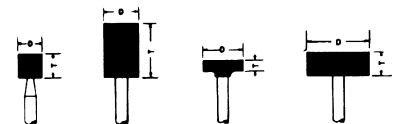


ILLUSTRATION No. 80

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

Preventative Maintenance Schedule

For All 100,000 RPM 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.

LEGEND

- 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.

Parts Common to all Models:

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 Note	Insert	1				X
3	53584	Collet Guard	1				X
4	51548	Bearing Retainer	1			D	
5	94984	Spacer	1				X
6	51685	Bearing	1		X		
7	51660	Grip	1				X
8	57189	O-Ring	1				X
9	See Note	Housing	1				X
10	51661	Wave Spring	1				X
11	51686	Bearing	1		X		
12	53580	Drive Shaft	1				X
13	51656	Turbine Base	1				X
14	51678	Turbine	1				X
15	51655	Top Plate	1				X
16	51662	Air Bushing	1			R	
17	53581	Turbine Cover	1				X
18	53585	Pin	1				X
19	95523	O-Ring	2				X
20	95438	O-Ring	1				X
21	53588	Muffler*	1			X	
22	53582	ON/OFF Valve	1				X
23	53587	Washer	1				X
24	53586	Hex Nut	1				X
25	53589	Hose 68"	1		X		
26	51269	Fitting	1				X
27	56022	Inlet Screen	1				X

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

*Change at a 1,000 Hours.

Optional Accessories

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



- 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.

Reference Contact Information

1. **American National Standards Institute – ANSI**
25 West 43rd Street
Fourth 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.**
P.O. Box 818
Yachata, Oregon 97498-0818
Tel: 1 (503) 547-3185
Fax: 1 (503) 547-3539
4. **European Committee for Standardization**
Rue de Stassart 36
B - 1050 Brussels, Belgium



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