60,000 RPM Models:
Model 51700 (1/8" Collet)
Model 51701 (3mm Collet)
Model 51702 (3/32" Collet)
Model 51770 (1/16" Collet)

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

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

Ceramic Bearing Models:
Model 51730 (50,000 RPM, 1/8" Collet)
Model 51731 (60,000 RPM, 1/8" Collet)

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

For Serial No. 2Axxxx and Higher
For Type A Tools Serial No. xxxxxxA and Higher

Parts Page Reorder No. PD02•17
Effective March, 2002
Supercedes PD01•08

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

Pencil Grinder

Air Motor and Machine Parts

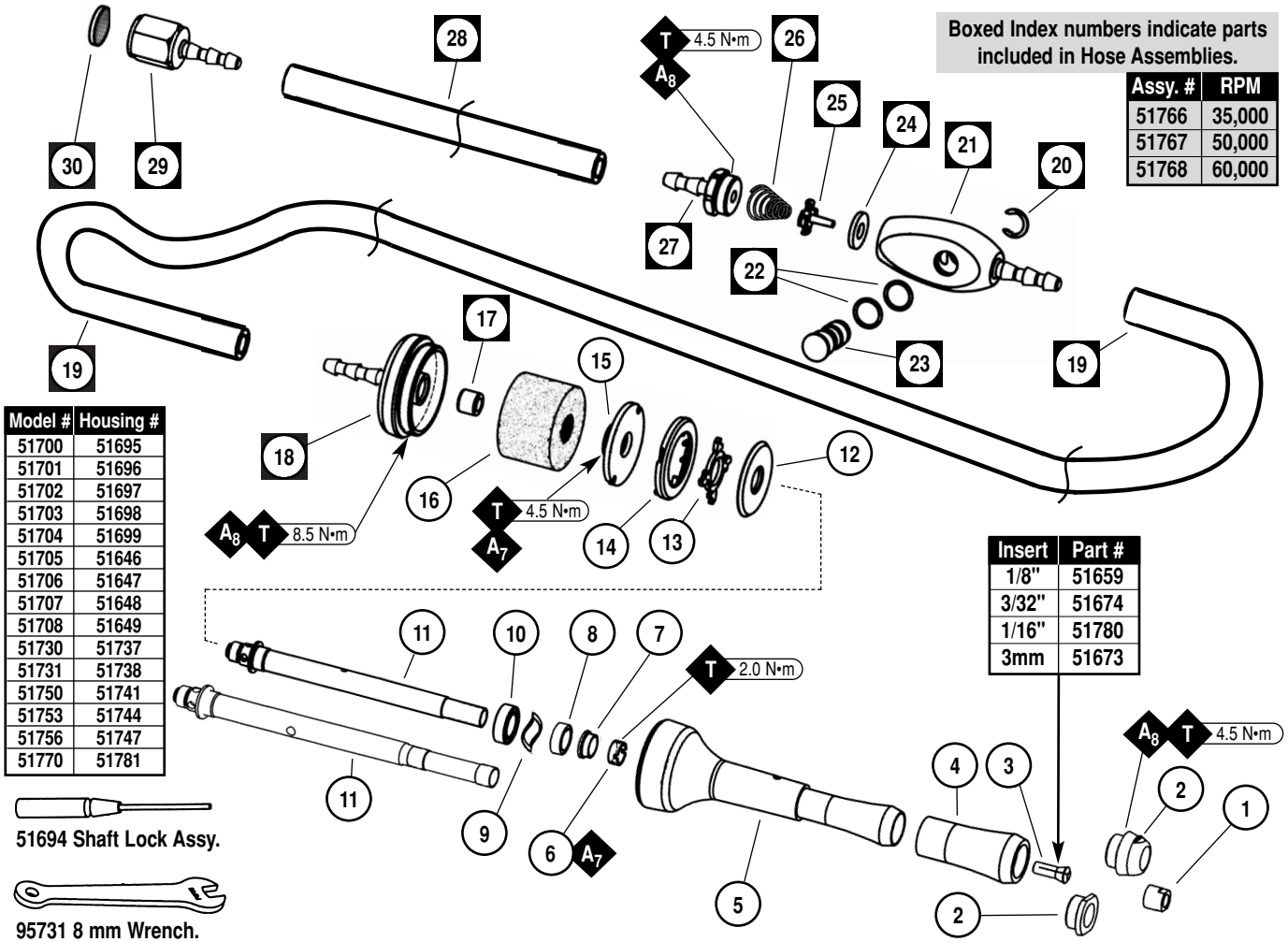
⚠WARNING Always operate, inspect and maintain this tool in accordance with the Safety Code for portable air tools (ANSI B186.1), Use, Care and Protection of Abrasive Wheels (ANSI B7.1) and any other applicable safety codes and regulations. Please refer to Dynabrade's Warning/Safety Operating Instructions for more complete safety information. See inside for Important Operating, Maintenance and Safety Instructions.

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	Motor Housing - See Chart	
6	51548	Bearing Retainer
7	94984	Debris Eliminator
8	51544	Bearing
	51685	Ceramic Bearing
9	51661	Wave Spring
10	51651	Bearing
	51686	Ceramic Bearing
11	51654	Drive Shaft
	51724	Ext. Drive Shaft
12	51656	Turbine Base
13	51691	35K Governor
	51692	50K Governor
	51675	60K Governor
14	51678	Turbine
15	51655	Top Plate
16	51684	Muffler
17	51662	Bushing
18	51275	Cover-35,000
	51274	Cover-50,000
	51273	Cover-60,000
19	51276	24" Air Hose
20	51669	Retaining Ring
21	51272	Valve Body
22	95730	O-Ring (2)
23	51665	Valve
24	51664	Valve Seat
25	51663	Tip Valve
26	51676	Conical Spring
27	51271	Inlet Barb
28	51277	42" Air Hose
29	51269	Fitting
30	56022	Inlet Screen

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.
96483	Sleeve Assembly Bullet
96486	Collet Insert Removal Tool



Boxed Index numbers indicate parts included in Hose Assemblies.

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

Model #	Housing #
51700	51695
51701	51696
51702	51697
51703	51698
51704	51699
51705	51646
51706	51647
51707	51648
51708	51649
51730	51737
51731	51738
51750	51741
51753	51744
51756	51747
51770	51781

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

51694 Shaft Lock Assy.

95731 8 mm Wrench.

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** 8 mm 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 neat fit but 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. 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.
8. Apply a small quantity of Loctite® #567 or equivalent to the turbine cover and torque to 8.5 N•m (75 lb.-in.).

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.
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. Apply a small amount of Loctite® #222 to the threads and torque the **51548** Bearing Retainer to 2.0 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. **51662** Air Bushing must be reset. Using **94999** Special Repair Tool pull it out approximately 1.5 mm. 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. Apply Loctite® #567 sealant to turbine cover and torque to 8.5 N•m (75 lb.-in.).

Disassembly/Assembly Instructions - Pencil Grinder (continued)

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. Apply Loctite® #567 sealant to **51271** Inlet Barb and torque to 4.5 N•m (40lb.-in.).

Tool Assembly Complete.

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.

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)
51700	.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	.1 (75)	60,000	69 dB(A)	1/8 (227)	90 (6.2)	3 mm	.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	.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	.1 (75)	50,000	64 dB(A)	1/8 (227)	90 (6.2)	3 mm	.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)	3 mm	.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)
51730	.1 (75)	50,000	69 dB(A)	1/8 (227)	90 (6.2)	1/8"	.8 (.4)	5-1/4 (132)	1-1/2 (37)
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)
51750 (Ext.)	.1 (75)	60,000	68.5 dB(A)	1/8 (227)	90 (6.2)	1/8"	.8 (.4)	6 (152)	1-1/2 (37)
51753 (Ext.)	.1 (75)	50,000	68.5 dB(A)	1/8 (227)	90 (6.2)	1/8"	.8 (.4)	6 (152)	1-1/2 (37)
51756 (Ext.)	.1 (75)	35,000	68.5 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" (8 mm)

Accessories

Model 11402: 40 SCFM @ 100 PSIG
3/8" NPT Female ports.

Model 11408: Up to 55 SCFM @ 100 PSIG
1/2" NPT Female ports.

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

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
  - Dirt
  - Extreme Temperature
  - Corrosion

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

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

Important Operating, Maintenance and Safety Instructions

Carefully read all instructions before operating or servicing any Dynabrade® Abrasive Power Tool.
Warning: Hand, wrist and arm injury may result from repetitive work motion and overexposure to vibration.
Important: All Dynabrade air tools must be used with a Filter-Regulator to maintain all warranties. Do not oil or use a lubricator with this tool.

Operating Instructions:

Warning: Eye, face, respiratory, sound and body protection must be worn while operating power tools. Failure to do so may result in serious injury or death. Follow safety procedures posted in workplace.

1. With power source disconnected from tool, securely fasten abrasive/accessory on tool.
2. Install air fitting into inlet bushing of tool. This tool should use filtered and regulated air. Do not oil.
3. Make sure tool is off (retaining ring of on/off valve against valve body) and connect power source.
4. Check tool speed with tachometer. If tool is operating at a higher speed than the RPM marked on the tool or operating improperly, the tool should be serviced to correct the cause before use. Tool RPM must never exceed abrasive/accessory RPM.

Maintenance Instructions:

1. Check tool speed regularly with a tachometer. If tool is operating at a higher speed than the RPM marked on the tool, the tool should be serviced to correct the cause before use.
2. Some silencers on air tools may clog with use. Clean and replace as required.
3. An Air Line Filter-Regulator must be used with this air tool to maintain all warranties. Dynabrade recommends the following: **11408** Air Line Filter-Regulator — Provides accurate air pressure regulation, two-stage filtration of water contaminants. Operates 40 SCFM @ 90 PSIG has 3/8" NPT female ports.
4. Use only genuine Dynabrade replacement parts. To reorder replacement parts, specify the **Model #**, **Serial #** and **RPM** of your machine.
5. Mineral spirits are recommended when cleaning the tool and parts. Do not clean tool or parts with any solvents or oils containing acids, esters, keytones, chlorinated hydrocarbons or nitro carbons.

Safety Instructions:

Products offered by Dynabrade should not be converted or otherwise altered from original design without expressed written consent from Dynabrade, Inc.

- **Warning:** User of tool is responsible for following accepted eye, face, respiratory, sound, and body protection. Hand, wrist and arm injury may result from repetitive work, motion and overexposure to vibration.
- **Important:** User of tool is responsible for following accepted safety codes such as those published by the American National Standards Institute (ANSI).
- Operate machine for one minute in a protected area before application to workpiece to determine if machine is working properly and safely before work begins.
- Always disconnect power supply before changing abrasive/accessory or making machine adjustments.
- Inspect abrasives/accessories for damage or defects prior to installation on tools.
- Please refer to Dynabrade's Warning/Safety Operating Instructions Tag (Reorder No. **95903**) for more complete safety information.
- Tool RPM must never exceed abrasive/accessory RPM rating.
- 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.
- 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 1" and tightening the collet with a minimum of 25 in. lbs. (2.8 N•m) torque.
- 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 a abrasive) exceeds .5 inches (12.7mm). Refer to the included tables. Reference ANSI B 7.1 for a more complete listing and additional information.
- Wear protection when working with materials or wheels that produce airborne particles.
- Use hearing protection when working with materials that produce high process noise levels. Permanent hearing loss can result from high sound levels.

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. 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 or wet air.

One Year Warranty

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

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.	Wheel Diam. Inches	Wheel Thickness Inches	½″ Overhang & Thd. Mdls.	Overhang — Dimension O*			
				1″	1½″	2″	2½″
W 143	⅛	⅛	105,000	64,500	46,650	32,400	21,370
W 144	⅛	¼	105,000	64,500	46,650	32,400	21,370
W 145	⅛	⅜	105,000	64,500	46,650	32,400	21,370
W 146	⅛	½	105,000	64,500	46,650	32,400	21,370
W 151	1/16	⅛	105,000	64,500	46,650	32,400	21,370
W 152	1/16	¼	105,000	64,500	46,650	32,400	21,370
W 153	1/16	⅜	80,850	52,500	37,500	26,250	17,620
W 154	1/16	½	70,500	45,600	31,500	21,970	15,220
W 157	¼	1/16	123,000	65,625	47,770	33,150	21,750
W 158	¼	⅛	105,000	64,500	46,650	32,400	21,370
W 159	¼	1/16	92,400	57,370	39,370	27,900	18,900
W 160	¼	¼	81,370	51,000	34,120	24,000	16,870
W 161	¼	1/16	77,250	45,970	30,900	22,500	16,120
W 162	¼	⅜	68,400	42,370	28,870	20,850	15,000
W 163	¼	½	60,000	38,020	26,250	18,750	13,870
W 164	¼	¾	45,900	30,000	21,750	15,900	11,850
W 165	1/16	1/16	107,400	62,470	41,250	29,250	20,250
W 166	1/16	⅛	96,970	57,000	35,620	25,120	18,000
W 167	1/16	¼	75,000	45,750	31,120	22,500	15,750
W 168	1/16	1/16	68,400	41,770	28,650	21,000	15,000
W 169	1/16	⅜	61,650	37,720	27,000	19,870	14,250
W 170	1/16	½	52,500	33,000	23,020	16,650	12,600
W 171	1/16	¾	37,120	25,500	18,750	14,620	10,020
W 172	⅜	1/16	99,370	59,250	41,020	29,250	20,250
W 173	⅜	⅛	87,600	53,250	35,250	24,750	17,250
W 174	⅜	¼	69,000	41,250	27,750	20,400	15,000
W 175	⅜	⅜	54,000	33,000	24,150	18,000	13,500
W 176	⅜	½	45,370	28,500	21,000	15,900	12,150
W 177	⅜	¾	33,750	23,250	17,620	13,650	10,350
W 178	⅜	1	26,250	18,750	14,250	10,870	8,250
W 181	½	1/16	76,390	55,500	36,750	25,500	17,850
W 182	½	⅛	73,500	43,650	29,100	20,770	15,450
W 183	½	¼	51,750	31,870	22,500	17,250	12,900
W 184	½	⅜	41,020	26,400	19,500	15,000	11,400
W 185	½	½	34,500	22,500	16,870	13,120	9,900
W 186	½	¾	26,250	17,400	12,750	9,750	8,020
W 187	½	1	20,620	13,870	10,120	7,870	6,370
W 190	⅝	1/16	61,120	48,000	31,500	22,650	16,870
W 191	⅝	⅛	58,870	34,500	25,120	18,900	14,250
W 192	⅝	¼	43,120	27,370	19,870	15,220	11,620
W 193	⅝	⅜	32,250	23,020	16,500	12,520	9,750
W 194	⅝	½	29,400	19,120	13,500	10,500	8,250
W 195	⅝	¾	22,120	14,250	10,120	7,650	6,150
W 196	⅝	1	17,620	11,620	8,100	6,150	5,100
W 199	¾	1/16	50,930	44,770	30,000	21,750	15,750
W 200	¾	⅛	50,930	33,520	23,850	17,850	13,350
W 201	¾	¼	38,250	24,370	17,400	13,270	9,970
W 202	¾	⅜	30,600	19,500	13,500	10,120	7,800
W 203	¾	½	25,500	15,900	10,870	8,250	6,600
W 204	¾	¾	18,900	12,000	8,400	6,220	5,250
W 210	⅞	1/16	43,650	35,250	25,720	18,900	14,320
W 211	⅞	⅛	43,650	27,900	20,400	15,820	12,220
W 212	⅞	¼	33,750	20,400	14,400	11,020	9,000
W 213	⅞	⅜	27,000	16,870	11,250	8,250	6,600
W 215	1	⅛	38,200	24,900	18,000	13,870	10,500
W 216	1	¼	30,520	18,600	12,750	9,520	7,500

*See Figure 47

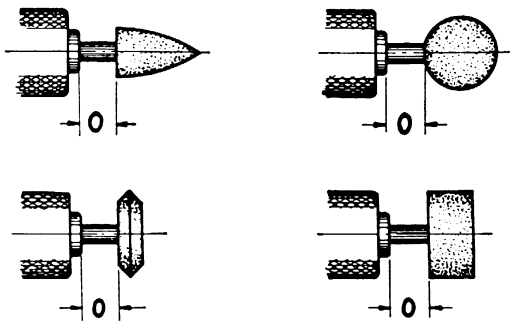


FIGURE NO. 47

Dimension "O" indicates overhang of mandrel.

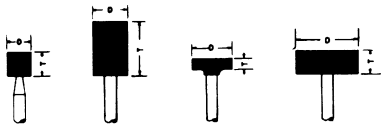


ILLUSTRATION NO. 80

MOUNTED WHEELS
STANDARD SHAPES
GROUP "W"

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Toll Free (Can.) 1-800-344-1488

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