65,000 RPM Models:
**Model 51700 (1/8" Collet)**
**Model 51701 (3mm Collet)**
**Model 51702 (3/32" 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)**

Parts Page Reorder No. PD00•01
Effective January, 2000

**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.**

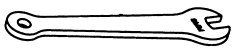
## Index Key

| No. | Part # | Description |
|---|---|---|
| 1 | **51657** | Cap-Collet |
| 2 | **51658** | Guard-Collet |
| 3 | **51659** | 1/8" Insert |
| | **51673** | 3mm Insert |
| | **51674** | 3/32" Insert |
| 4 | **51660** | Grip |
| 5 | **51652** | Housing Motor |
| 6 | **51548** | Bearing retainer |
| 7 | **51544** | Bearing |
| 8 | **51661** | Spring |
| 9 | **51651** | Bearing |
| 10 | **51654** | Shaft-Drive |
| 11 | **51656** | Base-turbine |
| 12 | **51691** | 35K Governor |
| | **51692** | 50K Governor |
| | **51675** | 65K Governor |
| 13 | **51678** | Turbine |
| 14 | **51655** | Top Plate |
| 15 | **51684** | Muffler |
| 16 | **51662** | Bushing |
| 17 | **51653** | Cover-Turbine |
| 18 | **51566** | Ferrule |
| 19 | **51672** | 3/16" Air hose |
| 20 | **51669** | Retention Ring |
| 21 | **51666** | Valve Body |
| 22 | **95730** | O-Ring (2) |
| 23 | **51665** | Valve |
| 24 | **51664** | Seat-Valve |
| 25 | **51663** | Valve-Tip |
| 26 | **51676** | Conical Spring |
| 27 | **51667** | Inlet Barb |
| 28 | **51558** | 3/16" Air Hose |
| 29 | **51567** | 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 Removal Tool |

**51682 Shaft Lock Assy.**



**95731 8mm Wrench**

# Disassembly/Assembly Instructions - Pencil Grinder

**(All threads are right hand)**

## Collet Disassembly/Assembly Instructions

### To Disassemble:

1. Turn **51654** Drive Shaft until the holes in **51652** Motor Housing and **51654** Drive Shaft are aligned.
2. Slip the **51682** Pin Wrench provided through both holes to lock the **51654** Drive Shaft.
3. Use **95731** 8mm open end wrench, to remove the **51657** Collet Cap.
4. Insert **96486** Collet Removal Tool into bore of **51659**, **51673**, or **51674** Insert, hook lip of tool on the back edge, and pull it out.

### To Assemble:

1. To reduce bit runout and sticking, thoroughly clean, inspect, and polish as necessary the **51657** Collet Cap, **51659**, **51673**, or **51674** Insert, and insert cavity in **51654** Drive Shaft.
2. Turn **51654** Drive Shaft until the holes in **51652** Motor Housing and **51654** Drive Shaft are aligned.
3. Slip the **51682** Pin Wrench provided through both holes to lock the **51654** Drive Shaft.
4. Place **51659**, **51673**, or **51674** Insert in end of **51654** 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** Drive Shaft until the holes in **51652** Motor Housing and **51654** Drive Shaft are aligned.
2. Slip the **51682** Pin Wrench provided through both holes to lock the **51654** 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 **51653** 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 **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. Insure 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** Drive Shaft until the holes in **51652** Motor Housing and **51654** Drive Shaft are aligned.
5. Slip the **51682** Pin Wrench provided through both holes to lock the **51654** Drive Shaft.
6. Apply a small quantity of Loctite© #222 or equivalent to the **51655** Top Plate threads.
7. Insure that the drive pins are still engaged in the drive slots. Torque the motor assembly onto **51654** 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 **51653** 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** 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 using **96407** Special Repair Tool.
4. Remove the **51653** Turbine Cover per Motor Disassembly/Assembly Instructions above.
5. Press **51654** Drive Shaft and motor assembly out the rear of the tool.
6. Press **51651** Upper Bearing off the Drive Shaft
7. Push the **51544** Lower Bearing forward out of **51652** Motor Housing.
8. Discard bearings, do not reuse.

### To Install:

1. As these are special bearings, use only Dynabrade replacement bearings!
2. Insure that the new **51651** Upper Bearing is a slip fit in **51652** Motor Housing. If not, lightly clean the bearing bore with croakus cloth.
3. Seat new **51651** Upper Bearing on **51654** Drive Shaft using **96406** Punch & **96418** Bushing.
4. Replace **51661** Bearing Preload Spring, and slip 51654 Drive Shaft, bearing assembly into **51652** Motor Housing.
5. Use Special Repair Tool **96406** and **96419** to seat **51544** Lower Bearing on shaft.
6. 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** Bearing or on the **51654** Drive Shaft threaded area used by the **51657** Collet Cap.
7. **51662** Air Bushing must be reset. Using **94999** Special Repair Tool pull it out approximately 1.5mm. Screw **51653** Turbine Cover down until it bottoms on the **51652** Motor Housing. Back **51653** Turbine Cover off slightly and start the tool. As it runs, slowly tighten the **51653** Turbine Cover. Let the tool run until it turns freely. Apply Loctite© #567 sealant to 51653 Turbine Cover and torque to 8.5 N-m (75 lb.-in.).

**Continued on page 3**

## Valve Disassembly/Assembly Instructions

### To Disassemble:

1. Unscrew **51667** Inlet Barb, retract **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 **51666** Valve Body.
3. Install **51664** valve seat.
4. Set **51665** Valve in the off position, (**51669** Retaining Ring against **51666** Valve Body) and load **51663** Tip Valve, and **51676** Conical Spring in **51666** 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 **51667** Inlet Barb and torque to 4.5 N-m (40lb.-in.).

**End of Assembly/Disassembly Instructions**

| Model Number | Length Inch (mm) | Height Inch (mm) | Weight Pound (kg) | Collet Size | Air Flow Rate SCFM (LPM) | Sound Level | Motor HP (W) | Motor RPM | Air Inlet Thread | Hose Size Inch (mm) | Air Pressure PSI (Bars) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **51700** | 6" (152) | 1-7/16" (37) | .81 lbs. (.37) | 1/8" | 8 (227) | 68.5 dBA | .1 (75) | 65,000 | 1/4" NPT | 1/4" (6) | 90 (6.2) |
| **51701** | 6" (152) | 1-7/16" (37) | .81 lbs. (.37) | 3 mm | 8 (227) | 68.5 dBA | .1 (75) | 65,000 | 1/4" NPT | 1/4" (6) | 90 (6.2) |
| **51702** | 6" (152) | 1-7/16" (37) | .81 lbs. (.37) | 3/32" | 8 (227) | 68.5 dBA | .1 (75) | 65,000 | 1/4" NPT | 1/4" (6) | 90 (6.2) |
| **51703** | 6" (152) | 1-7/16" (37) | .81 lbs. (.37) | 1/8" | 8 (227) | 68.5 dBA | .1 (75) | 50,000 | 1/4" NPT | 1/4" (6) | 90 (6.2) |
| **51704** | 6" (152) | 1-7/16" (37) | .81 lbs. (.37) | 3 mm | 8 (227) | 68.5 dBA | .1 (75) | 50,000 | 1/4" NPT | 1/4" (6) | 90 (6.2) |
| **51705** | 6" (152) | 1-7/16" (37) | .81 lbs. (.37) | 3/32" | 8 (227) | 68.5 dBA | .1 (75) | 50,000 | 1/4" NPT | 1/4" (6) | 90 (6.2) |
| **51706** | 6" (152) | 1-7/16" (37) | .81 lbs. (.37) | 1/8" | 8 (227) | 68.5 dBA | .1 (75) | 35,000 | 1/4" NPT | 1/4" (6) | 90 (6.2) |
| **51707** | 6" (152) | 1-7/16" (37) | .81 lbs. (.37) | 3 mm | 8 (227) | 68.5 dBA | .1 (75) | 35,000 | 1/4" NPT | 1/4" (6) | 90 (6.2) |
| **51708** | 6" (152) | 1-7/16" (37) | .81 lbs. (.37) | 3/32" | 8 (227) | 68.5 dBA | .1 (75) | 35,000 | 1/4" NPT | 1/4" (6) | 90 (6.2) |

## Accessories

**Model 93351**

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

**Model 11402:** 40 SCFM @ 100 PSI, 3/8" NPT Female ports.
**Model 11408:** Up to 55 SCFM @ 100 PSI, 1/2" NPT Female ports.

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

# 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 PSI 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.

# 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. | 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 | 5/16 | 1/16 | 107,400 | 62,470 | 41,250 | 29,250 | 20,250 |
| W 166 | 5/16 | ⅛ | 96,970 | 57,000 | 35,620 | 25,120 | 18,000 |
| W 167 | 5/16 | ¼ | 75,000 | 45,750 | 31,120 | 22,500 | 15,750 |
| W 168 | 5/16 | 1/16 | 68,400 | 41,770 | 28,650 | 21,000 | 15,000 |
| W 169 | 5/16 | ⅜ | 61,650 | 37,720 | 27,000 | 19,870 | 14,250 |
| W 170 | 5/16 | ½ | 52,500 | 33,000 | 23,020 | 16,650 | 12,600 |
| W 171 | 5/16 | 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

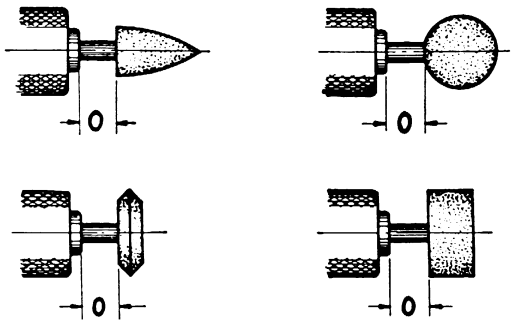



**FIGURE NO. 47**

**Dimension "O" indicates overhang of mandrel.**

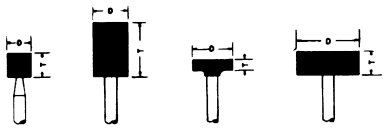


ILLUSTRATION No. 80

**MOUNTED WHEELS**
**STANDARD SHAPES**
**GROUP "W"**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**Toll Free (Can.) 1-800-344-1488**

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