Models:
53400 – Mini-Dynorbital Sander
53401 – Mini-Dynorbital Roloc® Sander
53402 – Mini-Dynorbital Versatility Kit
53403 – Finesse Sanding Kit
53410 – 2" Disc Sander
53420 – Die Grinder
53430 – Drill
53440 – 3" Buffer

Parts Page Reorder No. PD00•54R
Effective July, 2000
Supersedes PD98•37

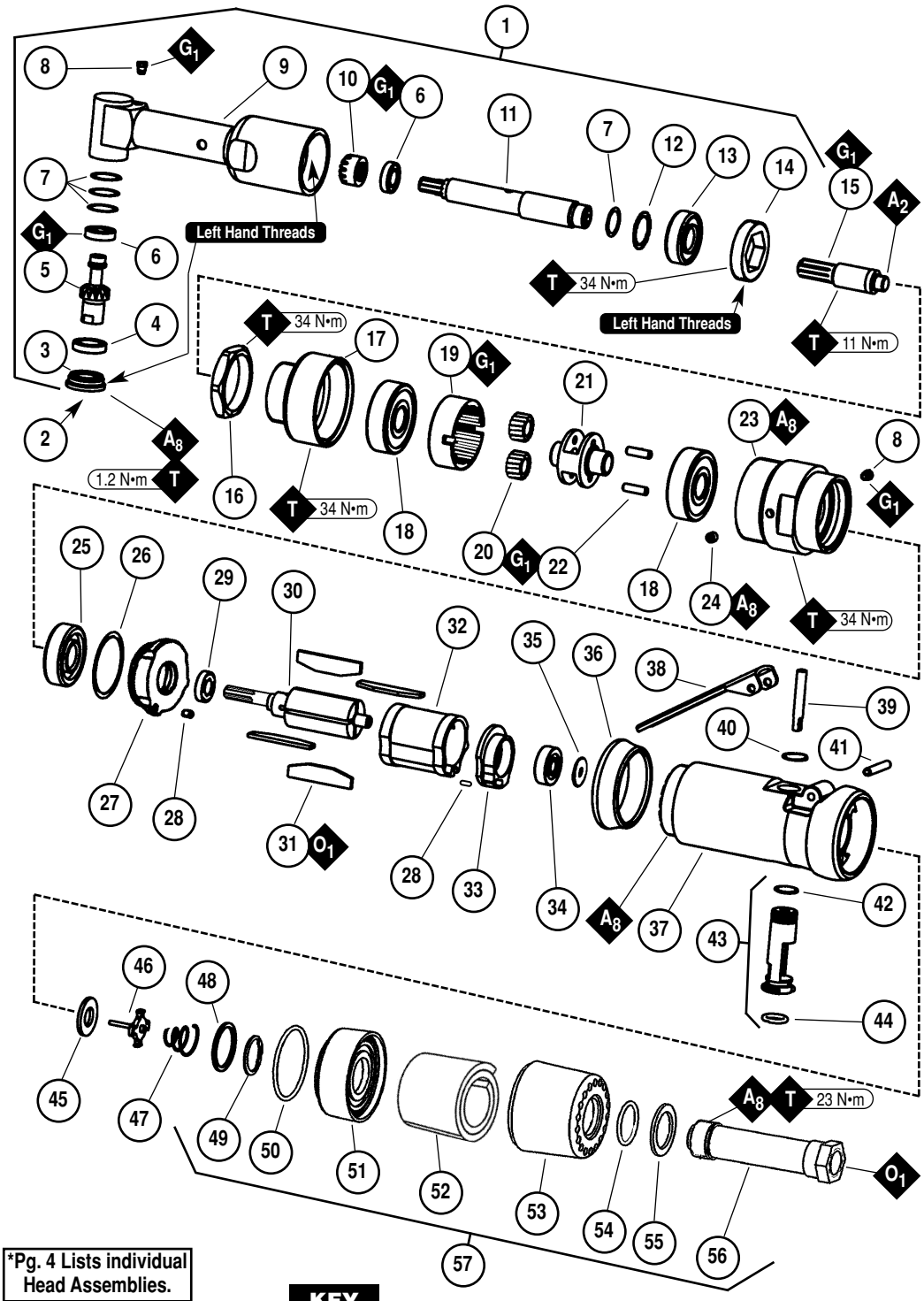
3,200 RPM Angle-Head

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) and any other applicable safety codes and regulations. Please refer to Dynabrade's Warning/Safety Operating Instructions for more complete safety information.**

Index Key

No.	Part #	Description
1	**54560**	Angle-Head Assy.
2	**Head Assembly***	
3	**54550**	Bearing Cap
4	**54537**	Bearing
5	**54549**	Spindle
6	**54542**	Bearing (2)
7	**54536**	Shim Pack (3/pkg.) (2)
8	**01041**	Grease Fitting (2)
9	**54547**	Angle-Head Housing
10	**54546**	Bevel Gear
11	**54541**	Spindle
12	**54551**	Shim (2)
13	**95398**	Bearing
14	**54540**	Retaining Nut
15	**53450**	Spline Drive
16	**54527**	Lock Ring
17	**53451**	Adapter
18	**54520**	Bearing (2)
19	**54468**	Ring Gear
20	**54519**	Gear (2)
21	**50786**	Carrier
22	**54472**	Shaft (2)
23	**53152**	Gear Case
24	**50784**	Set Screw
25	**02649**	Bearing
26	**54529**	Shim Pack (3/pkg.)
27	**01478**	Front Bearing Plate
28	**50767**	Pin (2)
29	**01479**	Spacer
30	**54554**	Rotor
31	**01480**	Motor Vane (4/pkg.)
32	**01476**	Cylinder
33	**02676**	Rear Bearing Plate
34	**02696**	Bearing
35	**02679**	Shield
36	**01547**	Collar Insulator
37	**02182**	Housing - **53400**
	02183	Housing - **53401**
	02182	Housing - **53402**
	02183	Housing - **53403**
	02184	Housing - **53410**
	02185	Housing - **53420**
	02186	Housing - **53430**
	02187	Housing - **53440**
38	**01448**	Throttle Lever
	01462	Safety Throttle Lever
39	**01449**	Valve Stem
40	**95558**	Retaining Ring
41	**12132**	Spring Pin
42	**95730**	O-Ring
43	**01469**	Speed Regulator Assy.
44	**01024**	O-Ring
45	**01464**	Seal
46	**01472**	Tip Valve
47	**01468**	Spring
48	**01564**	Air Control Ring
49	**95711**	Retaining Ring
50	**95438**	O-Ring
51	**94521**	Muffler Base
52	**94528**	Muffler
53	**94522**	Muffler Cap
54	**95375**	O-Ring
55	**94526**	Spacer
56	**94523**	Inlet Adapter
57	**94519**	Muffler Assembly



***Pg. 4 Lists individual Head Assemblies.**

KEY

- **O** Oil: **O_1 = Air Lube**
- **G** Grease: **G_1 = Lubriplate 630 AA**
- **A** Adhesive: **A_2 = Loctite #271**, **A_8 = Loctite #567**
- **T** Torque: **N•m x 8.85 = In. - lbs.**

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 rotary vane air tools must be used with a Filter-Regulator-Lubricator to maintain all warranties.

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. **Important:** Secure inlet bushing of tool with a wrench before attempting to install the air fitting to avoid damaging valve body housing.
3. Connect power source to tool. Be careful not to depress throttle lever in the process.
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.

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. All Dynabrade rotary vane air motors should be lubricated. Dynabrade recommends one drop of air lube per minute for each 10 SCFM (example: if the tool specifications state 40 SCFM, set the drip rate of your filter-lubricator at 4 drops per minute).
   Dynabrade Air Lube (P/N **95842**: 1pt. 473ml.) is recommended.
4. It is strongly recommended that all Dynabrade rotary vane air tools be used with a Filter-Regulator-Lubricator to minimize the possibility of misuse due to unclean air, wet air or insufficient lubrication. Dynabrade recommends the following: **11405** Air Line Filter-Regulator-Lubricator — Provides accurate air pressure regulation, two-stage filtration of water contaminants and micro-mist lubrication of pneumatic components.
   Operates up to 40 SCFM @ 100 PSIG has 3/8" NPT female ports.
5. Lubricate the angle gear head with **1 plunge for every 25 hours of use, to achieve maximum gear life.**
6. Lubricate planetary gears through the gear casing grease fitting with **2-3 plunges for every 50 hours of use, to achieve maximum gear life (order: 95542 Grease and 95541 Gun).**
7. Use only genuine Dynabrade replacement parts. To reorder replacement parts, specify the **Model #**, **Serial #** and **RPM** of your machine.
8. A Motor Tune-Up Kit (P/N **96333**) is available which includes assorted parts to help maintain motor in peek operating condition. Please refer to Dynabrade's Preventative Maintenance Schedule for a guide to expectant life of component parts.
9. An Angle-Head Assembly (P/N **54560**) is available which includes replacement parts for the angle-head portion of the tool.
10. 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.



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

Notice

All Dynabrade motors use the highest quality parts and metals available and are machined to exacting tolerances. The failure of quality pneumatic motors can most often be traced to an unclean air supply or the lack of lubrication. Air pressure easily forces dirt or water contained in the air supply into motor bearings causing early failure. It often scores the cylinder walls and the rotor blades resulting in limited efficiency and power. Our warranty obligation is contingent upon proper use of our tools and cannot apply to equipment which has been subjected to misuse such as unclean air, wet air or a lack of lubrication during the use of this tool.

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.

Model Number	Motor hp (W)	Motor RPM	Air Inlet Thread	Sound Level	Air Flow Rate SCFM (LPM)	Air Pressure PSIG (Bars)	Hose I.D. Size	Weight Pound (kg)	Length Inch (mm)	Height Inch (mm)
All Models	.4 (298)	3,200	1/4" NPT	83 dB(A)	21 (595)	90 (6.2)	1/4" (6 mm)	1.9 (.9)	10-7/8 (276)	2-3/4 (70)

Additional Specification: For model 53400, the sanding head mounts to tool's 1/4"-28 female spindle exposing 1/4"-20 male thread to accept pad.

(PD00•54R)

Disassembly/Assembly Instructions - Angle-Head

Important: Manufacturer's warranty is void if tool is disassembled before warranty expires.
Please refer to parts breakdown for part identification.

Angle-Head Tool Disassembly:

1. To avoid damage to motor housing use **52296** Repair Collar and secure motor housing in a vise.
2. Using two wrenches, place one on **54527** Lock Ring, and the other on **54547** Angle-Head Housing. Turn **54547** Housing clockwise (left hand thread).

To Remove Planetary Gear Housing and Motor Assembly:

1. Secure wrench to **53152** Gear Housing and turn counter-clockwise to remove planetary assembly.
2. Slide motor out of housing. **Note:** If motor does not slide out freely, tap end of housing with plastic mallet.

To Disassemble Planetary Gear Assembly:

1. Secure **53152** Gear Housing in vise, secure pin wrench to **53451** Adapter and turn counterclockwise to remove and expose planetary assembly. **Note:** Dynabrade, Inc. **97782** Pin Wrench may be used. Loosen **50784** Lock Screw and remove planetary assembly.
2. Clamp a bearing separator between the **54468** Ring Gear and the **54520** Bearing toward the spline end of the assembly.
3. Hang the planetary assembly with the separator in an arbor press (spline end pointing up) and press bearing from **50786** Carrier.
4. Remove **54468** Ring Gear and both **54519** Gears (2) along with **54472** Shafts. Press remaining **54520** Bearing from **50786** Carrier.
5. The **53450** Spline need not be removed from the **50786** Carrier as it is a durable item.

Motor Disassembly:

1. Clamp a bearing separator between the **02676** Bearing Plate and the **01476** Cylinder.
2. Hang the motor assembly with the separator in an arbor press (**Note:** gear end pointing down) and press **02696** Bearing from **54554** Rotor.
3. **02676** Rear Bearing Plate and **02696** Bearing can now be pressed off. Press **02649** Bearing and **01478** End Plate from **54554** Rotor.

Angle-Head Assembly Disassembly:

1. Remove **54540** Retaining Nut using a standard 5/8" hex key. **Note:** Left hand thread.
2. Slide out **54541** Spindle and associated parts from **54547** Angle-Head Housing.
3. Loosen **54550** Bearing Cap, using a standard pin wrench (**Note: 96165** Dynabrade Pin Wrench. Pull out **54549** Spindle and associated parts).

Disassembly Complete.

Angle-Head Assembly Assembly:

Important: Be sure parts should be thoroughly cleaned before assembling. Follow all grease, oil and torque specifications.

1. Assemble **54542** Bearing and **54537** Bearing to **54549** Spindle. Insert assembly into small cavity of angle-head.
2. Screw in **54550** Bearing Cap and test for end-play. Spindle must turn freely, but there should not be excessive end-play. If end-play is excessive, insert **54536** Shims as required in **54547** Angle-Head Housing behind **54542** Bearing.
3. Press **54542** Bearing, and slip **54546** Bevel Gear onto **54541** Spindle. Install **95398** Bearing onto **54541** Spindle and insert spindle assembly into housing.
4. Use a standard 5/8" hex key to install **54540** Retaining Nut (**Note:** left hand thread) in **54547** Angle-Head Housing "finger tight".
5. Test for backlash between gears. There should be .002 to .003 backlash between the gears. If assembly does not have proper backlash, remove **54540** Retaining Nut and **95398** Bearing. Place shims as required on bearing seat of **54541** Spindle. Replace **95398** Bearing and **54540** Retaining Nut. When proper backlash is set, tighten **54540** Retaining Nut with standard 5/8" hex key and recheck for backlash.
6. Torque the **54540** Retaining Nut 34 N•m/300 in. - lbs.

Motor Assembly:

1. Slip **01479** Spacer onto **54554** Rotor.
2. Place a .002" shim into **01478** Front Bearing Plate as an initial spacing. Then slip **02649** Bearing into **01478** Front Bearing Plate. Press assembly onto rotor.
3. Check the clearance between rotor and bearing plate by using a .001" feeler gauge. Clearance should be at .001" to .0015". Adjust clearance by repeating steps 1-3 changing shims as required.
4. Once proper rotor gap clearance is achieved, install lubricated blades into rotor slots. (Use **95842** Dynabrade Air Motor Oil or equivalent.)
5. Install **01476** Cylinder so it rests against the **01478** Front Bearing Plate, (make sure inlet holes of cylinder line up with inlet holes in **02676** Rear bearing Plate).
6. Press **02696** Bearing into **02676** Rear Bearing Plate. Press this assembly onto rotor. Important: Fit must be snug between bearing plates and cylinder. If too tight, rotor will not turn freely. Rotor must then be lightly tapped at press fit end so it will turn freely while still maintaining a snug fit. A loose fit will not achieve the proper preload of motor bearings. Next, place a small amount of grease on the **02696** Bearing and stick the **02679** Shield against the bearing.

Planetary Gear Assembly:

1. Press **54520** Bearing onto front end of **50786** Carrier until it seats. Install **54519** Gears with holes in **50786** Carrier and slide in **54472** Shafts
2. Slip **54468** Ring Gear over gears and press rear **54520** Bearing onto **50786** Carrier until there is a slight drag between the ring gear and the two bearings.
3. Slide assembly into **53152** Gear Case aligning slots in **54468** Ring Gear with holes in gear case.
4. Install **50784** Lock Screw into **53152** Gear Case using #567 Loctite or equivalent. Install **53451** Adapter to **53152** Gear Case, torque 34 N•m/300 in. - lbs. (use a small amount of #567 Loctite® on threads).

To Assemble Motor and Planetary Gear Housing:

1. Slip motor into housing making sure motor drops all the way into housing. Secure motor assembly in vise using **52296** Repair Collar.
2. Attach **53152** Gear Case with planetary gears installed onto housing, torque 34 N•m/300 in. - lbs. (Use a small amount of #567 Loctite® on threads.)

To Install Angle-Head to Motor Assembly:

1. Run **54527** Lock Ring tight against **53451** Adapter (**Note:** Left-hand thread).
2. Assemble **5456** Angle-Head Assembly by threading onto **53451** Adapter making sure **53450** Spine Drive engages into rear of **54541** Spindle (engage as many threads as possible until proper orientation is achieved with throttle).
3. Secure **54560** Angle-Head Assembly by torquing **54527** Lock Ring 34 N•m/300 in. - lbs. against the **54547** Housing.

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

Note: Motor should operate at 3,200 RPM at 6.2 bar (90 PSIG). RPM should be checked with a tachometer. Before operating, we recommend that 2-3 drops of pneumatic tool oil be placed directly into the air inlet with throttle lever depressed. Grease gears through grease fittings.

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

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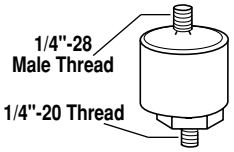
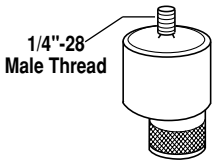
*Mini-Dynorbital® Sanding Head Assemblies



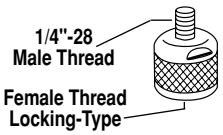
54028: with 1/4"-28 Male Thread
(Standard on tool Model **54002**)

- Accepts 3" and smaller dia. sanding pads with 1/4"-20 female thread.
- With stud removed, 1/4"-20 male thread pad may be mounted.



54029: with 1/4"-28 Male Thread
(Standard on tool Model **54003**)

- Accepts 3" and smaller dia. sanding pads with 1/4"-20 male locking- type thread.



54030: Rotary Sanding Head

- Accepts 3" and smaller diameter sanding pads with male locking-type threads.

Optional Accessories



Dynabrade Air Lube

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

95821: 8 oz. (118 ml)
95842: 1pt. (473 ml)
95843: 1gal. (3.8L)



Grease

- Multi-purpose grease for all types of bearings, cams, gears.
- High film strength; excellent resistance to water, steam, etc.
- Workable range 0˚ F to 300˚ F

95541: Push-Type Grease Gun (one-handed operation).
95542: 10 oz. (283.5 g) Tube.



Dynaswivel®

Swivels 360° at two locations which allows an air hose to drop straight to the floor, no matter how the tool is held.

- **94300** Composite Swivel 1/4" NPT.



96333 Motor Tune-Up Kit

- Includes assorted parts to help maintain and repair motor.



54021 Adapter

- Length: 1-3/16", Wrench Flats: 14mm.
- 1/4"-20 male thread, 1/4"-28 male thread.
- Standard with **50223** Disc Sander.



50055 Collet Assembly

- Standard with **53420** Die Grinder.
- Includes collet body and collet cap.

Visit Our Web Site: www.dynabrade.com **Email:** Customer.Service@Dynabrade.com

DYNABRADE®

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