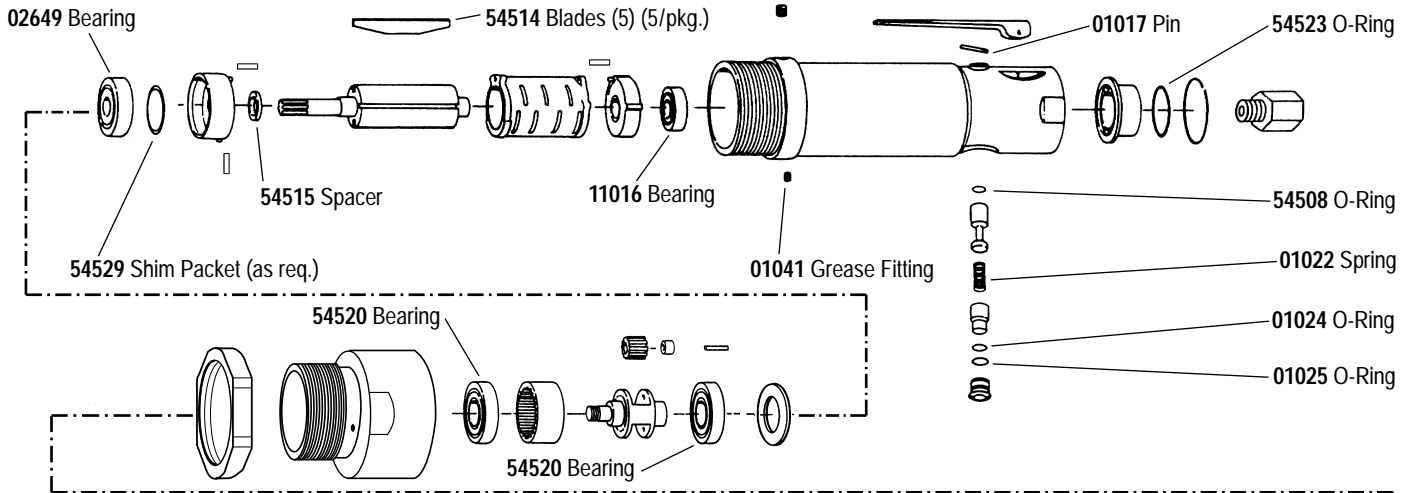


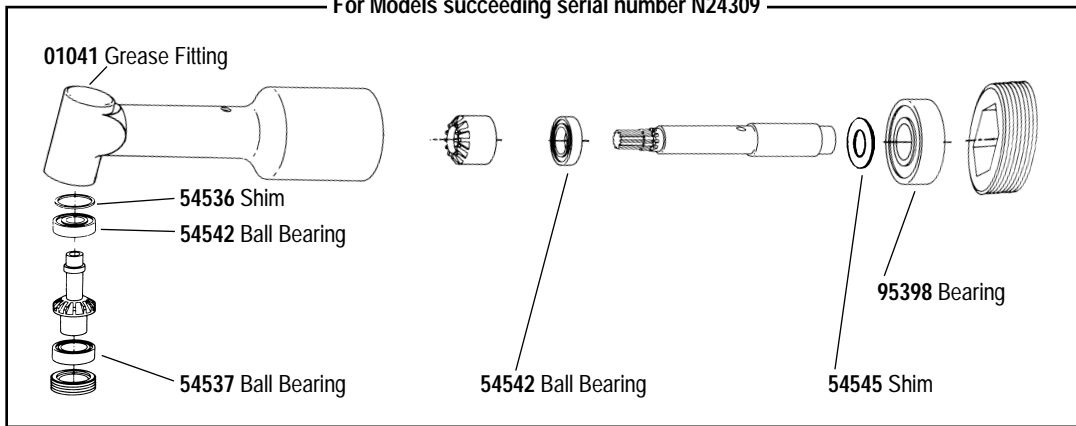
# 95809 Tune-Up Kit

For use with:  
**3,200 RPM Angle Head Tools**

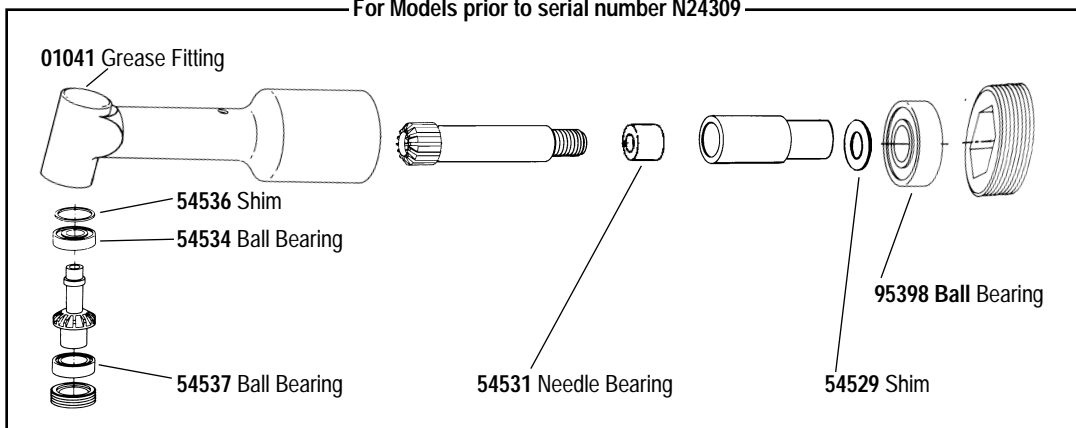
Parts included in kit are identified. See reverse side for Tune-up Instructions.



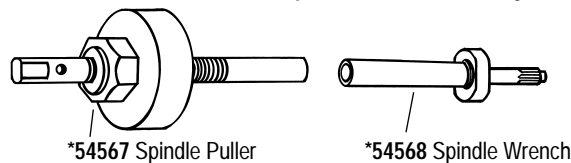
For Models succeeding serial number N24309



For Models prior to serial number N24309



\*For use with models prior to S/N N24309 Only



# Tune-Up Instructions

**Important: Manufactures warranty is void if tool is disassembled before warranty expires.**

Refer to the appropriate parts page for additional part identification.

## Motor Disassembly:

1. Secure tool in a soft jaw vise holding onto wrench flats on rear of motor housing.
2. Secure lock ring with a wrench and twist angle housing from motor housing (**Note:** Left hand threads).
3. Remove **54526** Adapter from motor housing and loosen **01040** Lock Screw.
4. Pull planetary gear assembly from motor housing. Pull motor from housing (if motor does not pull out freely, lightly tap end of housing with a rubber mallet).
5. Clamp a bearing separator between the **54522** Ring Gear of the planetary carrier assembly and front **54520** Bearing (nearest to spindle end of assembly). Press bearing from carrier.
6. Remove ring gear and gears. Press rear **54520** Bearing from planetary carrier.
7. Press rotor from **02649** Bearing and front bearing plate. Remove **54515** Spacer, cylinder and **54514** Blades from rotor. Press **11016** Bearing from rear bearing plate.
8. Remove **54505** Plug from motor housing. Remove valve assembly.
9. Remove **95713** Inlet Adapter. Pry retaining ring from rear of housing and remove **54524** Muffler and **54523** O-Ring.

Motor disassembly complete.

## Motor Reassembly:

**Important:** Be sure parts are clean and in good repair before reassembly. Follow all torque, grease and lubrication instructions.

1. Insert a .002" shim from **54529** Shim pack into front bearing plate.
2. Insert new **02649** Bearing into front bearing plate.
3. Place new **54515** Spacer onto pinion end of rotor. Make sure countersink faces rotor.
4. Press from bearing plate assembly onto rotor until tight against spacer.
5. Check clearance between rotor and bearing plate. Apply an outward (pulling) pressure on rotor. If rotor rubs bearing plate, reduce the spacing by removing shim or substitute with .001" shim.
6. Insert new **54514** Blades (lubricate blades with Dynabrade Air Lube P/N **95842** or equivalent before installation).
7. Place cylinder over rotor. Be sure pin holes and air inlet holes align with holes in bearing plate.
8. Press new **11016** Bearing into rear bearing plate and press assembly onto rotor. Be sure pin holes and air holes line up with holes in cylinder.
9. Insert motor assembly into housing. The pin in front bearing plate should enter guide slot in housing wall.
10. Install **54517** Spacer with unrelieved face towards front bearing plate.
11. Press new **54520** Bearing onto front end of planetary carrier.
12. Replace gears, gear shafts and ring gear (notches face rear of carrier).
13. Press new **54520** Bearing onto carrier (there should be a slight drag between ring gear and bearings).
14. Install planetary assembly onto motor housing. Line-up notches in ring gear with hole in housing for lock screw.
15. Install lock screw until snug, then back off 1/2 turn.
16. Install **54526** Adapter onto motor housing.
17. Install new O-rings and spring stem assembly and replace into motor housing.
18. Install new **54523** O-Ring onto muffler and replace into housing. Replace snap ring and inlet adapter.

Motor reassembly complete.

## Angle Head Assemblies:

### For models succeeding S/N N24309.

1. Remove retaining nut from angle housing with 5/8" hex key.
2. Slide spindle assembly from housing and disassemble.
3. Remove bearing cap with pin wrench and remove work spindle assembly.
4. Install new **54542** Bearing and **54537** Bearing onto work spindle and insert into housing.
5. Install bearing cap and test for end play. Spindle should turn freely. If there is excessive end play, insert new **54536** Shim behind **54542** Bearing.
6. Reassemble spindle assembly using new **54542** Bearing, **95398** Bearing and **54545** Shim Pack (as required). Replace and tighten retaining nut.
7. Test for backlash between gears. There should be .002" to .003" Backlash. Adjust using **54545** Shim Pack.

### For models prior to S/N N24309.

**Note:** **54567** Spindle Puller and **54568** Spindle Wrench (or equivalent) required. These tools are not included with tune-up kit.

1. Remove retaining nut from angle housing with 5/8" hex key.
2. Insert **54568** Spindle wrench into spline adapter of spindle and unscrew.
3. Screw female threaded end of **54567** Spindle Puller onto gear spindle. Tighten puller ring until gear spindle and **54531** Needle Bearing are removed from angle housing.
4. Remove bearing cap with pin wrench and remove work spindle assembly.
5. Install new **54534** Bearing and **54537** Bearing onto work spindle and insert into housing.
6. Install bearing cap and test for end play. Spindle should turn freely. If there is excessive end play, insert new **54536** Shim behind **54534** Bearing.
7. Insert gear spindle into housing, make sure teeth line up.
8. Install new **54531** Needle Bearing into housing and onto gear spindle. Using bored end of **54568** Spindle Wrench, press **54531** Needle Bearing over gear spindle down to gear.
9. Line up hole in housing with hole in gear spindle and lock together using a 3 mm pin.
10. Install **95398** Bearing onto spline adapter and using **54568** Spline Wrench, tighten spline adapter onto gear spindle.
11. Replace and tighten retaining nut.
12. Test for backlash between gears. There should be .002" to .003" backlash. Adjust using **54529** Shim Pack.

Reattach angle housing to motor housing and secure with lock ring.

Motor should operate at 3,200 RPM at 90 PSI (6.2 Bar). RPM should be checked with a tachometer. If machine is running at a higher RPM then the tool should be serviced to correct the cause before use. Before operating, Dynabrade recommends that 2-3 drops of pneumatic tool oil be placed directly into air inlet with throttle lever depressed and that the gears be greased through the grease fitting located on the motor and angle housings.

**Model:**

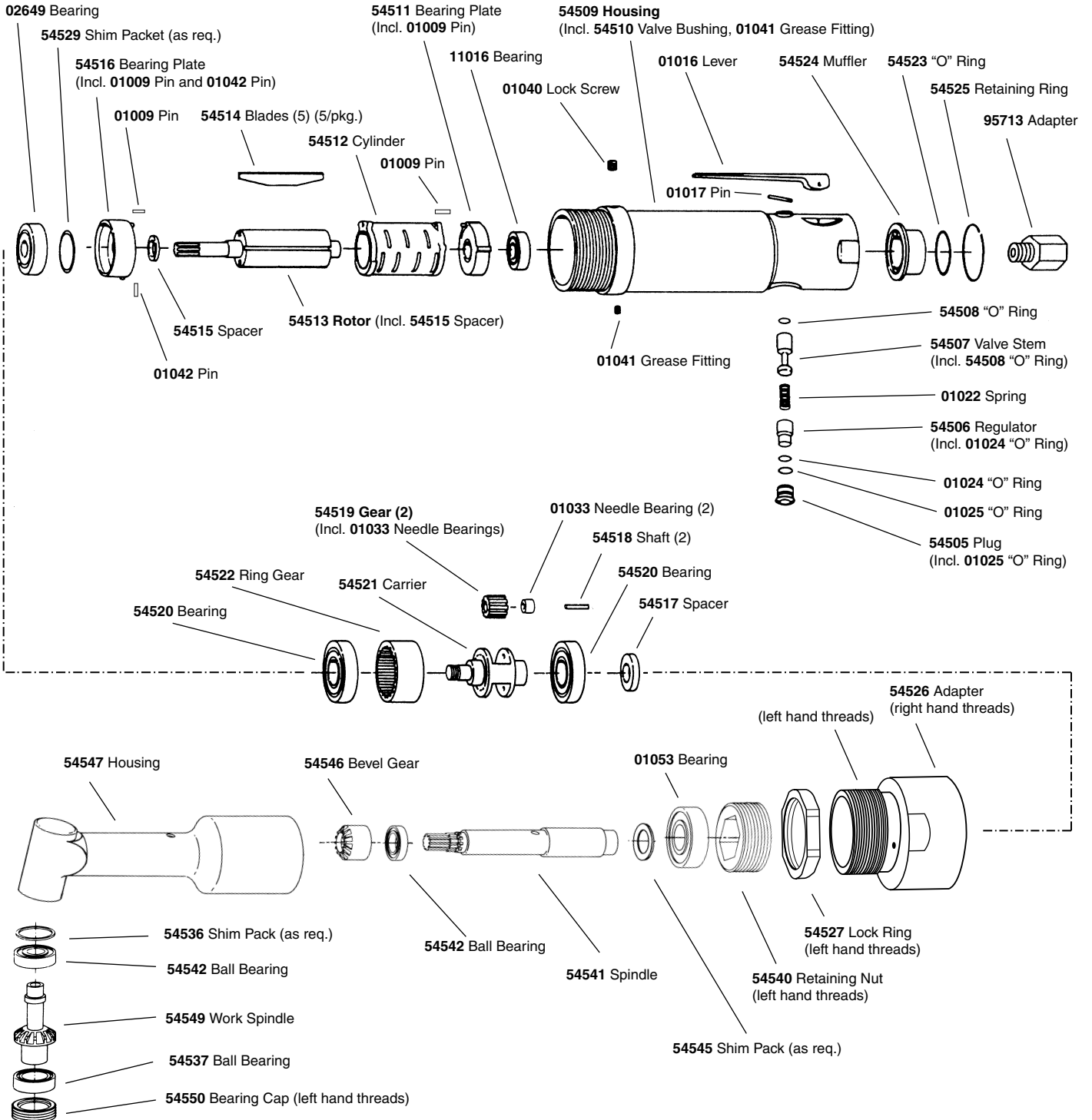
- 50046 — Angle-Head Kit**
- 54002 — Mini-Dynorbital Sander**
- 54003 — Mini-Dynorbital Sander**
- 50223 — 2" Disc Sander**
- 51091 — Die Grinder**
- 53026 — Drill**
- 50047 — 3" Buffer**
- 50070 — Finesse Sanding Kit**

# 3,200 RPM Angle-Head

**Machine and Motor Parts  
For Serial Number N24309 and Higher**

## ⚠ 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.



**See inside for Important Operating, Maintenance and Safety Instructions.**

# 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-Lubricator to maintain all warranties.

## Operating Instructions:

**Warning:** Eye, face 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. Connect power source to tool. Be careful **not** to depress throttle lever in the process.
3. 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:

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

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 air motors should be lubricated with two drops of Dynabrade Air Lube (P/N 95842: 1pt. 473ml.) every four hours of use.
4. An air line filter-regulator-lubricator must be used with this air tool to maintain all warranties. Dynabrade recommends the following:  
**11289** Air Line Filter- Regulator-Lubricator — Provides accurate air pressure regulation, two-stage filtration of water contaminants and micro-mist lubrication of pneumatic components. Operates 28 CFM @ 90 PSI has 3/8" NPT female ports.
5. Gear case of this Dynabrade air tool should be lubricated every 16 hours of use by using **95541** Grease Gun and **95542** Grease.

## Safety Instructions:

- **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/accessory 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.

## 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, sanding pads, rotor blades, etc., are not covered under this warranty.

# Assembly/Disassembly Instructions

## 3,200 RPM Angle Head Tools

A complete motor tune-up kit, Part No. **95809**, is available which includes assorted parts to help maintain motor in tip-top shape.

**Warning:** Manufacturers warranty is void if tool is disassembled before warranty expires.

### To Disassemble Angle-Head Tool:

1. Carefully place motor housing in a soft jaw vise, holding it on the flats at the air inlet end of the housing.
2. Use two wrenches, place one on **54527** Lock Ring, and the other on **54547** Angle-Head Housing. Turn **54547** Housing in a clockwise direction. (**Note:** left hand thread).

### To Remove Planetary Gear and Motor Assembly:

1. Loosen **54526** Adapter turning it counter clockwise.
2. Loosen **01040** Lock Screw and remove.
3. Pull out planetary gear assembly. Motor is now free to slide out of housing. (**Note:** If motor does not slide out freely, tap end of housing with plastic mallet).

### To Disassemble Planetary Gear Assembly:

1. Clamp a bearing separator between the **54522** Ring Gear and the **54520** Bearing toward the spline end of the assembly.
2. Hang the planetary assembly with the separator in an arbor press (**Note:** spline end pointing up) and press bearing from **54521** Carrier.
3. Remove **54522** Ring Gear and both **54519** Gears along with **54518** Shafts. Normally **01033** Needle Bearings inside **54519** Gears will last the life of the gears. Replacement gears have needle bearings already pressed in. If it is desired to replace needle bearings in gears, pusher rod must be .249 minus .005 inches in diameter. When pressing new needle bearings into gears, press **only** on the **trademark** end of bearings.
4. Press remaining **54520** Bearing from **54521** Carrier.

### To Disassemble Motor:

1. Clamp a bearing separator between the **54516** Bearing Plate and the **54512** Cylinder.
2. Hang the motor assembly with the separator in an arbor press (**Note:** gear end pointing up) and press bearing from **54513** Rotor.
3. **54516** Front Bearing Plate and **02649** Bearing can now be pressed off.
4. Press **54511** Bearing Plate and **11016** Bearing from **54313** Rotor.

### To Disassemble Angle-Head Assembly:

1. Remove **54540** Retaining Ring using a standard 5/8" hex key (Note: retaining ring has a left hand thread).
2. **54541** Spindle and associated parts will now slide out of **54547** Housing.
3. Loosen **54550** Bearing Cap, using a standard pin wrench or other suitable tools.
4. Pull out **54549** Work Spindle and associated parts.

**Disassembly is complete.**

### To Assemble Angle-Head Assembly:

**(Note:** All parts should be thoroughly cleaned before reassembly).

1. Assemble **54542** Ball Bearing and **54537** Ball Bearing to **54549** Spindle. Insert assembly into small cavity of angle-head.
2. Screw in **54550** Lock Ring 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 needed in **54547** Angle Housing behind **54542** Ball Bearing.
3. Slip **54542** Bearing, **54546** Bevel Gear onto **54541** Spindle.
4. Place **54545** Shim Pack (as req.) onto spindle and install **01053** Bearing onto **54541** Spindle.
5. Use a standard 5/8" hex key to install **54540** Retaining Ring (**Note:** left hand thread) in **54547** Angle Housing "finger tight".
6. 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 Ring and **01053** Ball Bearing. Place necessary **54545** Shims on bearing seat of **54541** Spindle. Replace **01053** Ball Bearing and **54540** Retaining Ring. When proper backlash is set, tighten **54540** Retaining Ring with standard 5/8" hex key and recheck for backlash.

continued on next page

## **Assembly/Disassembly Instructions (continued)**

### **3,200 RPM Angle Head Tools**

#### **To Assemble Motor:**

1. Press a **01009** Pin into face of **54511** Bearing Plate and **54516** Bearing Plate and Press **01042** Pin in outer diameter of **54516** Front Bearing Plate.
2. To correct for bearing tolerances, it is necessary to use **54529** Shim Pack (as req.) to maintain correct clearance between ends of rotor and bearing plates.
3. Insert .002 Shim in **54516** Front Bearing Plate.
4. Insert **02649** Bearing into **54516** Bearing Plate.
5. Assemble **54515** Spacer onto pinion end of **54513** Rotor, making sure that the countersink faces the rotor.
6. Assemble **54516** Front Bearing Plate onto rotor by pressing on the inner race of **02649** Bearing and by supporting rotor on opposite end. Be sure that bearing is pressed tight against **54515** Spacer.
7. Hold rotor in left hand and the bearing plate in right hand. Apply an outward (pulling) pressure and observe spacing between end of rotor and bearing plate. This should be from flush (not rubbing) to .002 maximum. If the rotor rubs the bearing plate, reduce the spacing between the bearing and the bearing plate by removing the .002 shim entirely, or by substituting a .001 shim for the .002 shim. However, if there is more than .002 spacing between the end of the rotor and bearing plate, add .001 shim between the bearing and the bearing plate.
8. Assemble **54512** Cylinder so that inlet part will align with inlet holes in **54511** Rear Bearing Plate. The cylinder exhaust slots must align with the slots in the bearing plate.
9. Insert **54514** Blades (lubricate blades with Dynabrade Air Lube P/N **95842** or equivalent prior to installation).
10. Support assembly squarely on the pinion end of rotor. Place **11016** Bearing in **54511** Rear Bearing Plate and press onto rotor, pressing on the inner race of **11016** Bearing, just enough to bring the bearing plate against the cylinder. There should be a slight drag between the bearing plates and cylinder when these are moved with the fingers. Position cylinder until motor turns "finger free".

#### **To Assemble Motor in Housing:**

(**Note:** Be sure that 01040 Lock Screw has been removed from motor housing).

1. Insert motor into **54509** Housing, making sure that **01042** Pin in **54516** Front Bearing Plate enters into slot cut into housing.
2. Insert **54517** Spacer with unrelieved face toward **54516** Front Bearing Plate.

#### **To Assemble Planetary Assembly:**

1. Press **54520** Bearing onto front end of **54521** Carrier until it seats.
2. Make sure that assembled **01033** Needle Bearing and **54519** Gears are lined up with hole and slide **54518** Shafts into **54521** Carrier and **54519** Gears until end of shaft is flush with carrier face.
3. Place **54522** Gear, notches are to face rear end of the **54521** Carrier.
4. Press **54520** Bearing onto **54521** Carrier until there is a slight drag between the ring gear and the two bearings.

#### **To Install Planetary Assembly in Housing:**

1. Insert planetary assembly into motor housing, keeping notches in ring gear lined up with threaded hole for **01040** Lock Screw.
2. Thread lock screw into **54509** Motor Housing. Turn lock screw down until snug. Then back off 1/2 turn.
3. Thread **54526** Adapter onto **54509** Motor Housing.

#### **To Assemble Angle-Head Assembly to Planetary Motor Assembly:**

1. Assemble by screwing **54547** Angle Housing onto **54526** Adapter with **54527** Lock Ring.
2. Adjust and make certain that spline in **54541** Carrier is properly inserted into spline in **54541** Spline Spindle. Test assembly at reduced speed, and secure assemblies with **54527** Lock Ring.

#### **Tool assembly is complete**

**Note:** Motor should operate at 3,200 RPM at 6.2 bar (90 PSI). 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**

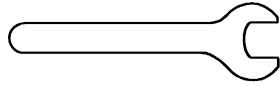
The regular maintenance of any air tool will contribute to greater efficiency of tool and will prolong tool life. The failure of quality pneumatic air motors can most often be traced to an unclean air supply or the lack of lubrication. Air pressure easily forces dirt or water contained in the air supply into motor bearings causing early failure. It often scores the cylinder walls and the rotor blades resulting in limited efficiency and power. Frequent drainage of water traps in air lines is recommended. Each tool on each drop should also be equipped with a secondary air processing unit. This consists of an in-line Filter-Regulator-Lubricator. All Dynabrade air tools must be used with a Filter-Regulator-Lubricator to maintain all warranties. Our warranty obligation is contingent upon proper use of our tools and cannot apply to equipment which has been subject to misuse such as unclean air, wet air or a lack of lubrication during the use of the tool.

**Notice:** Manufacturer's warranty is void if tool is disassembled before warranty expires.

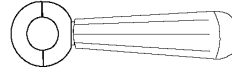
## Accessories



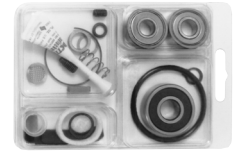
- 50055: 1/4" Collet**
- 1/4"-28 male thread.
  - Standard on **51091** Die Grinder.



- 95987** – 5/16" open-end  
(mates to tool spindle).

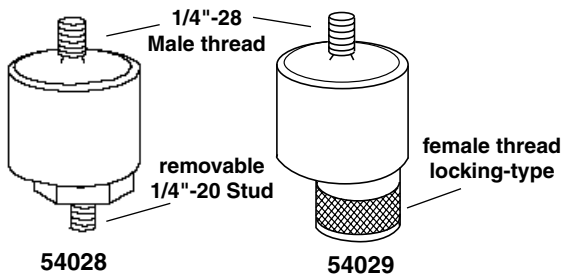


- 54585**  
Side Handle Assembly



- 55809 Motor Tune-Up Kit:**  
Includes assorted parts to help maintain motor in tip-top shape.

## Mini-Dynorbital® Sanding Heads



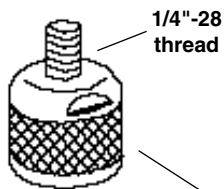
### Random Orbital Sanding Heads

**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)

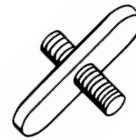
- Accepts 3" and smaller dia. sanding pads with 1/4"-20 male locking-type thread such as 3M Roloc®.



### 54030: Rotary Sanding Head

- Accepts 3" and smaller diameter sanding pads with male locking-type threads such as 3M Roloc.

Roloc is a registered trademark of 3M Company.

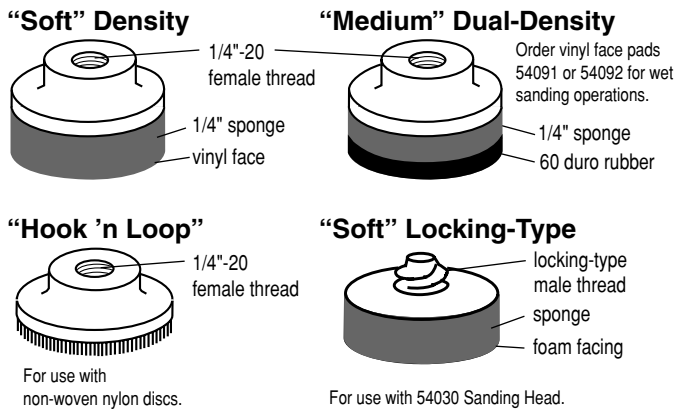


### 54021 Adapter

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

**54030** female locking-type thread

## Mini-Dynorbital® Sanding Pads



Part No.	Pad Dia.	Description/Face	Thread Type	Comments
54017	3/4"	Medium/Rubber	1/4"-20 Female	For PSA Discs
54018	1-1/4"	Medium/Rubber	1/4"-20 Female	For PSA Discs
54031	1-1/4"	Soft	Locking-Type	For PSA Discs
54087	3/4"	Soft/Vinyl	1/4"-20 Female	For PSA Discs
54088	1-1/4"	Soft/Vinyl	1/4"-20 Female	For PSA Discs
54089	3/4"	Hook 'n Loop	1/4"-20 Female	Non-Woven Nylon Discs
54090	1-1/4"	Hook 'n Loop	1/4"-20 Female	Non-Woven Nylon Discs
54091	3/4"	Medium/Vinyl	1/4"-20 Female	For PSA Discs
54092	1-1/4"	Medium/Vinyl	1/4"-20 Female	For PSA Discs

**Note:** All Pads have a 5,000 RPM maximum. To mount pads that have 1/4"-20 female thread directly to tool for conventional rotary action, use 54021 Adapter.

## Accessories (continued)

### Sanding Pads for Disc Sanders



#### 50107: 2" Diameter Pad

- 1/4"-20 Female Thread.
- 20,000 RPM max.
- Accepts 2" PSA discs.
- Standard on 50223 Angle-Head Sander, with 54021 Mounting Adapter.

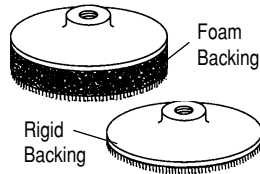


#### 3" Diameter Pad For locking-type discs

- 50112:** 1/4"-20 female thread, medium density, 15,000 RPM max.
- 50115:** 1/4"-20 female thread, hard density, 20,000 RPM max.

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### 3" Diameter Hook Face Pads



**50120: Foam Backing** (Standard with 50047-3" Buffer)

**50125: Rigid Backing**

- Accepts reattachable abrasive discs as well as polishing buff pads.
- 5,000 RPM maximum.
- 1/4"-20 female thread.

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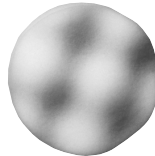
### 3" Diameter Polishing Buffs



Terry Cloth



Synthetic Wool



Foam Waffle

**90030: Foam Waffle**

**90027: Terry Cloth**

**90028: Synthetic Wool**

- Scrim back.
- Mount to 50120 or 50125 Hook Face Pads

