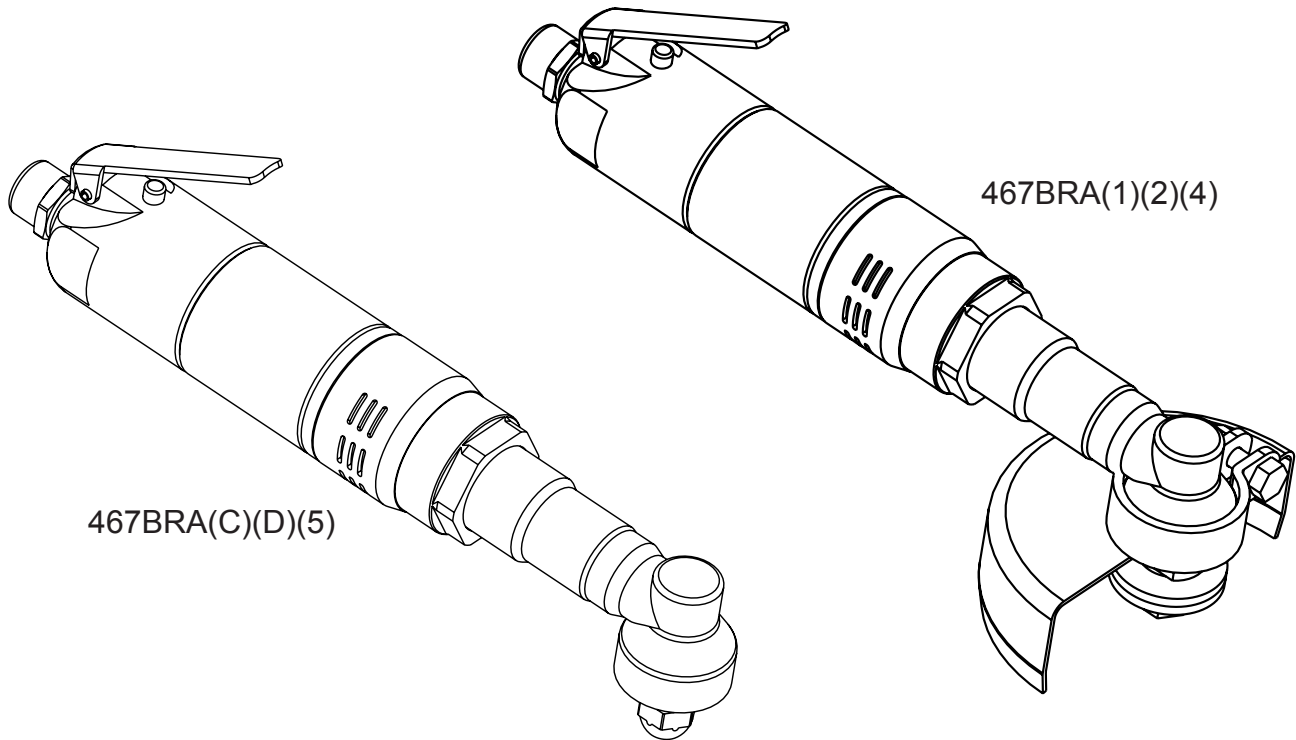
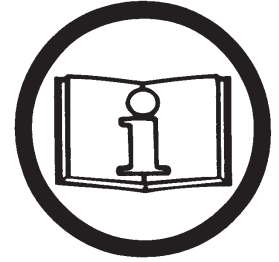




### General Operators Instructions and Maintenance Manual



Read Safety Recommendations Before Operating Tool

#### 467BRA Series Right Angle Grinders

| Model Number | Exhaust Direction | Throttle Type                 | Rated Speed           | Power Output     | Case Material     | Weight                    |  | Overall Length      | Housing Diameter   | Working Air Consumption | Spindle Thread & Length/Output | Abrasive Capacity   |
|--------------|-------------------|-------------------------------|-----------------------|------------------|-------------------|---------------------------|--|---------------------|--------------------|-------------------------|--------------------------------|---|
|              |                   |                               |                       |                  |                   | Aluminum                  | Steel                                  |                     |                    |                         |                                |   |
| 467BRA1      | Side              | (L) Lever or (K) Safety Lever | 11000 to 14000 R.P.M. | 0.9 H.P. (675 W) | Steel or Aluminum | 2.8 Lbs (1.3 Kg)          | 3.7 Lbs (1.7 Kg)                       | 9.8 Inches (249 mm) | 1.8 Inches (45 mm) | 25 CFM (11.8 L/S)       | 3/8-24 x 0.58 Inch (15mm)      | 2 Inch (50mm), 3 Inch (75mm), 4 inch (100mm), 4 1/2 inch (114mm), 5 inch (125mm) or 6 inch (150mm) Type 1 or Type 27 Wheels |
| 467BRA2      |                   |                               |                       |                  |                   |                           |  |                     |                    |                         | 5/8-11 x 0.98 Inch (25mm)      |   |
| 467BRA4      |                   |                               |                       |                  |                   | 3/8-24 x 0.98 Inch (25mm) |  |                     |                    |                         |                                |   |
| 467BRAC      |                   |                               |                       |                  |                   | 1/4 Inch Built-In Collet  | 1/4 Inch Burrs/Mounted Points          |                     |                    |                         |                                |   |
| 467BRAD      |                   |                               |                       |                  |                   | Changable Insert Collet   | Burrs/M.P. of Size Matching the Insert |                     |                    |                         |                                |   |
| 467BRA5      |                   |                               |                       |                  |                   |                           |  |                     |                    |                         | 1/4-20 Internal Thread         | Roll Cartridges w/ 1/4-20 Mounting  |

**Top Cat ® Air Tools, Manufactured by T.C. Service Co.**

38285 Pelton Road, Willoughby, OH 44094 U.S.A.

Ph: (440) 954-7500 or (800) 321-6876 • Fax: (440) 954-7118 or (877) 800-3589

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# Operators Instructions and Safety Precautions

This is meant to highlight sections of safety standards published by the American National Standards Institute and the Occupational Safety and Health Administration. This is not meant to replace those standards but only highlight certain areas.

When care is taken to ensure that the right tool is operated properly, and safety and maintenance procedures are followed, accidents can be avoided. Read and follow all instructions and directions. Comply with all rules governing the use of power tools, personal protective equipment and equipment guards.

Remember - machines, attachments and accessories must be used only for the purpose for which they were designed. Safety reasons and product liability prohibit any modifications to tools. Any attachments or accessories must be agreed to in advance with an authorized technical representative of T.C. Service Co.



The grinding equipment must be approved for the rated speed of the machine. The rated speed, marked on the machine, should not be exceeded. Be sure to learn the proper handling and storage of abrasive wheels and inserted tooling.

Inspect the wheel guard for any signs of wear and that it is properly mounted to the tool. Any guard showing signs of wear such as bends, chips, nicks, or cracks should be replaced.

Always wear eye and hearing protection, and when necessary, other personal protective equipment such as gloves, an apron, and helmet.



Additional information on eye protection is available in the following national regulatory standards.

- 1) Federal OSHA Regulations 29 CFR, Section 1910.133 (Eye and Face Protection)
- 2) ANSI Z87.1 (Occupational and Educational Eye and Face Protection)

Check hose size and air pressure. The air pressure at the tool shall not exceed 90 psi (6.2 bar). All hoses should be inspected regularly and kept away from heat, oil and sharp edges. Be sure the tool is secured to the air hose.



Measure the speed of grinders every 20 hours of actual use or once per week, whichever comes first.

Measure speed of all types of grinders after maintenance or repair, whenever a grinder is issued from the tool crib and at each wheel change. Several readings should be taken.

This form of inspection should be made with the grinding wheel removed.



Proper mounting of grinding wheels and inserted tooling is crucial to safe operation and efficient working conditions. Ensure the exhaust air is directed away from bystanders.



Disconnect the tool from the air supply before doing any service. This prevents accidental start-ups. Do not disassemble or adjust the governor. The governor is guaranteed for the life of the tool, if not abused.



Airborne particulate resulting from the grinding process can cause hazards. Wear appropriate protective equipment.

## Safety in Operation

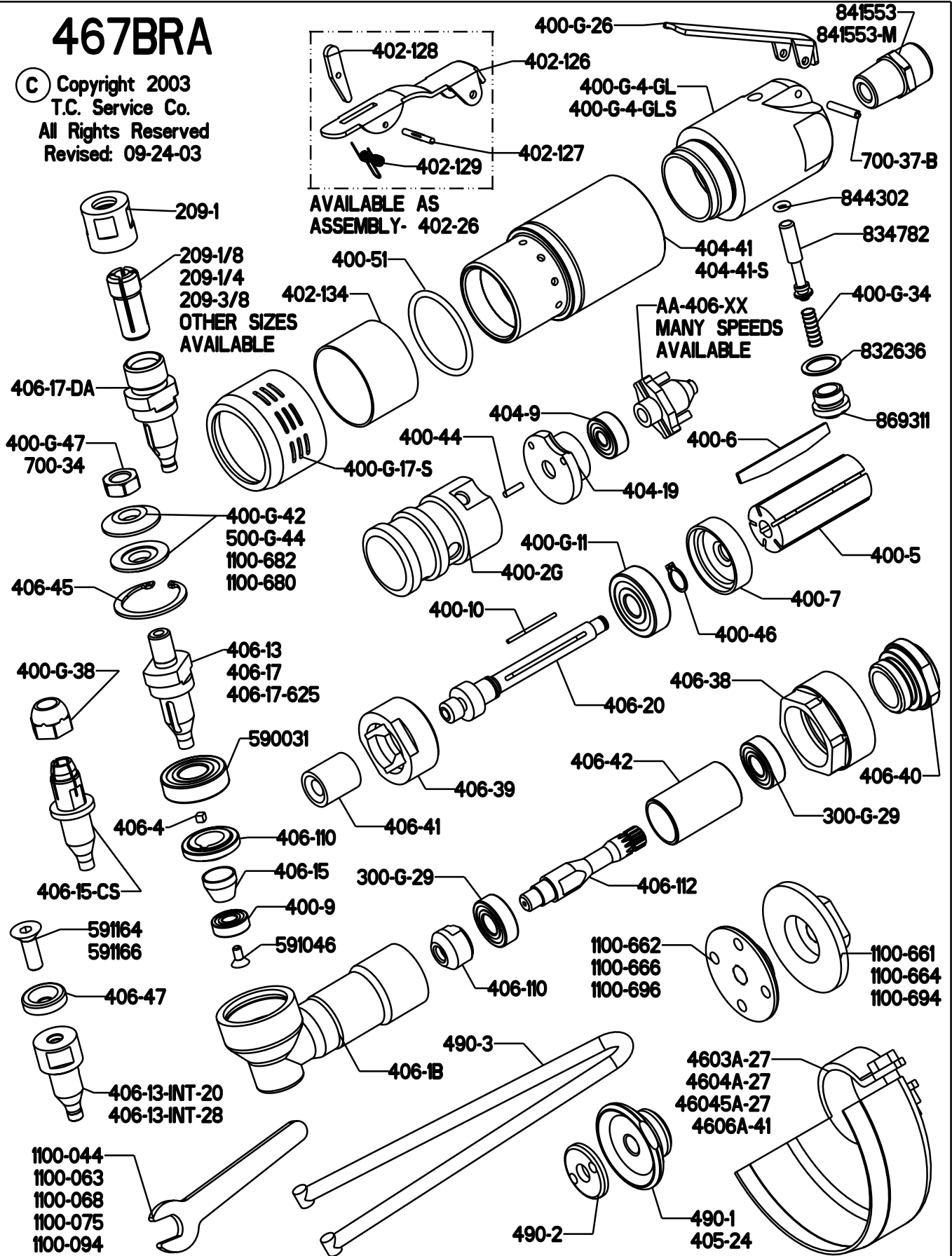
The safety procedures for operating air tools are everyone's responsibility. The following lists several aspects of air tool safety that should be considered during operation. Please be aware of these aspects and report any unsafe practice you see to a supervisor or safety officer immediately.

- 1) Start any new wheel under a bench and away from bystanders. (Run for a minimum of one minute.)
- 2) When starting a cold/new wheel, apply to the work slowly, allowing the wheel to warm gradually.
- 3) Support the work piece properly.
- 4) When cutting off, support the work piece so that a jamming of the wheel does not occur. (A Slot shall remain constant or become wider during operation.)
- 5) If a jamming of the wheel does occur during a cutting off operation, shut the air supply off to the tool and ease the wheel free. (Inspect the wheel for damage before continuing operation.)
- 6) Ensure that sparks from the process do not create a hazard to the eyes or will ignite the environment.
- 7) Grinders shall not be used in potentially explosive atmospheres.
- 8) Pneumatically driven tools are not generally insulated from coming in contact with electrical sources. Be sure to avoid contact with wires or other possible current carrying sources.
- 9) The operator must check that no bystanders are in the vicinity.
- 10) Remember that there is a running on after the throttle has been released.
- 11) If a grinder fitted with an abrasive wheel is dropped, the wheel must be thoroughly examined before re-use.
- 12) Disconnect the tool from the air source before servicing and changing wheels.
- 13) Release the control device in case of interruption of air supply.
- 14) Always keep the tool in a clean, dry place when not in use.
- 15) Beware of loose hair and clothing so as not to become tangled or trapped during operation.
- 16) The inserted tool on heavy types of percussive non-rotary tools is exposed to heavy strains and can after long periods of use break due to fatigue.
- 17) Unexpected tool movement or breakage of inserted tooling may cause injuries to lower limbs.
- 18) Unsuitable postures may not allow counteracting of normal or unexpected movement of a power tool. (A working position shall be adopted which remains stable in the event of a break up of inserted tooling.)
- 19) Do not hold the tool near the body when operating.
- 20) Keep a firm grip on the tool body during operation.

# Maintenance

## 467BRA

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Revised: 09-24-03



### Disassemble

1. Disconnect tool from air supply and remove all wheels and accessories.
2. Secure the tool in vise vertically with angle head toward the upward direction. Clamp onto flats of the backhead (400-G-4-GL[S]).
3. Unscrew lock nut (406-38) with the use of a wrench. The angle head assembly will disconnect from motor housing (404-41[S]). Set angle head assembly aside for now. (Should the motor retainer (406-39) come off with the angle head assembly, then clamp the lock nut (406-38) into a vise and remove motor retainer with motor retainer wrench (1100-350).)
4. Remove coupling (406-41), exhaust sleeve (400-G-17S), o-ring (400-51) and exhaust screen (402-134).
5. Unscrew and remove motor retainer (406-39). (Flats are provided for a wrench, or a special tool (1100-350) is available for easier removal.)
6. Grasp motor assembly out of motor housing. Remove from vise.

#### **The Motor Assembly**

7. Clamp the motor assembly into a vise vertically with the governor in the upward direction. Clamp lightly onto the spline.
8. Unscrew and remove the governor assembly (AA-406-XX) with a wrench. {Left Hand Threads} (A special governor wrench (1100-830) is available.)
9. Remove from vise.
10. Install brass jaws onto vise. Secure the motor assembly vertically in the vise with the geared end toward the downward direction. Clamp onto the outside diameter of cylinder (400-2G) and rear endplate (404-19).
11. Tap the spindle (406-20) out of rear bearing (404-9) with use of a 3/16" punch. Be sure not to drop the front motor assembly when it becomes free. Remove from vise.
12. Push the rear bearing out of the rear endplate with use of a small screwdriver.
13. Lift the rotor (400-5), blades (400-6), key (400-10) and front endplate (400-7) from the front motor assembly.
14. Remove retaining ring (400-46) from the motor spindle with use of snap ring pliers.
15. Support the front spindle assembly vertically on a suitable drill block. Press spindle through front bearing (400-G-11) with an arbor press.

#### **Angle Head Assembly**

16. Secure right angle head assembly in vise so that the angle head neck is vertical. A head holder (1100-818) that fits against the front face of the angle head is available.
17. Remove head retainer (406-40) using a wrench on the wrench flats.
18. Lift off lock nut. Remove angle head from vise.
19. Grasp end of pinion gear stem (406-112) and pull pinion gear assembly from angle head.
20. Secure the pinion gear assembly in vise vertically with gear head (406-110) in downward direction. Clamp onto the side of gear spacer (406-42) and rear most bearing (300-G-29).
21. Tap the pinion gear stem through the rear bearing with use of a 3/16 inch punch. Remove from vise.
22. Secure the pinion gear stem in a vise vertically. Clamp onto the flats of the pinion gear.
23. Unscrew and remove the pinion gear head with use of a wrench on the wrench flats.
24. Support the pinion gear stem assembly vertically on a suitable drill block. Press the pinion gear stem off of bearing (300-G-29) with use of arbor press.
25. Remove retaining ring (406-45) with use of snap ring pliers.
26. Grasp the output spindle (406-13) and pull assembly free from right angle head (406-1B).
27. Secure the output spindle assembly in a vise vertically with output toward downward direction. Clamp onto the flats of the spindle.
28. Remove screw (591046) from end of spindle assembly. Remove from vise.
29. Support the spindle assembly vertically on a suitable drill block. Press spindle through bearings (400-9) & (590031), spacer (406-15), ring gear (406-110), and key (406-4).

To check the throttle valve, secure the backhead horizontally in a vise. Clamp lightly onto the flats of the housing. Unscrew and remove the throttle valve cap (869311). Lift out throttle valve spring (400-G-34) and throttle valve (834782). Replace o-ring (844302) if worn or torn.

### Assembly

1. Be sure all parts are clean and free from abrasives before assembly.

#### **The Motor Assembly**

2. Support bearing (400-G-11) on a suitable drill block.
3. Press spindle (406-20) through bearing until it bottoms on shoulder.
4. Place retaining ring (400-46) into groove in spindle.
5. Slide front endplate (400-7) over spindle and onto front bearing.
6. Place key (400-10) into keyway in spindle.
7. Slide rotor (400-5) over spindle.
8. Place 5 blades (400-6) into slots.
9. Slip cylinder (400-2G) over rotor. (Be sure the alignment pin is oriented away from the front for the motor assembly.)
10. Install rear endplate (404-19) locating cylinder pin in smaller hole of the rear endplate.
11. Place bearing (404-9) in rear endplate. Tap in place with bearing driver (1100-806).
12. Clamp the motor assembly into a vise vertically with the governor in the upward direction. Clamp lightly onto the spline.
13. Screw on and tighten the governor assembly (AA-406-XX) with a wrench. {Left Hand Threads} (A special governor wrench (1100-830) is available.)
14. Remove from vise.
15. Secure backhead (400-G-4-GL[S]) in vise vertically. Screw on motor housing (404-41[S]) onto backhead assembly.
16. Install o-ring (400-51), exhaust screen (402-134), and exhaust deflector (400-G-17S) onto motor housing.
17. Slide the motor assembly into the motor housing with the spline toward upward direction.
18. Screw motor retainer (406-39) into case and tighten. (Flats are provided for a wrench, or a special tool (1100-350) is available for easier tightening.)
19. Place coupling (406-41) on spline on end of motor spindle.

### Angle Head Assembly

20. Press bearing (300-G-29) on gear stem (406-112) with an arbor press.
21. Hold the gear stem firmly in a vise. Screw on and tighten gear pinion head (406-110). Remove from vise.
22. Press spacer (406-42) and bearing (300-G-29) onto end of gear stem with arbor press.
23. Press bearing (590031) onto spindle (406-13).
24. Place key (406-4) in slot of spindle.
25. Align keyway in ring gear (406-110) with key in spindle and press together with an arbor press. (Take care not to damage the teeth of the gear.)
26. Place spacer (406-15) and bearing (400-9) over end of spindle. Press in place with arbor press.
27. Thread screw (591046) in end of spindle and tighten.
28. Apply grease to gear teeth generously.
29. Place spindle assembly into housing (406-1B). Place pinion gear assembly in housing.
30. Place retaining ring (406-45) into groove in front of angle head.
31. Slide lock nut (406-38) over end of housing and tighten retainer (406-40).

### Final Assembly

32. Secure the motor housing in the vise vertically. Clamp onto the flats of the backhead.
33. Place the angle head assembly onto the motor housing aligning the splines in the coupling. Tighten the locknut (406-38).
29. Replace guard on tool.
30. Check RPM with a reliable tachometer. Tool must run at or below speed stamped on tool.

## Tool Parts Listing

| <u>PART NUMBER</u> | <u>DESCRIPTION</u>                             | <u>PART NUMBER</u> | <u>DESCRIPTION</u>                           |
|--------------------|--|--------------------|--|
| 209-1              | COLLET NUT                                     | 402-127            | SAFETY LEVER PIN                             |
| 209-1/8            | 1/8" INSERT                                    | 402-128            | LOCKOUT LEVER                                |
| 209-3/16           | 3/16" INSERT                                   | 402-129            | SAFETY LEVER SPRING                          |
| 209-1/4            | 1/4" INSERT                                    | 402-134            | MUFFLER                                      |
| 209-5/16           | 5/16" INSERT                                   | 404-9              | REAR MOTOR BEARING                           |
| 209-3/8            | 3/8" INSERT                                    | 404-9A             | SEALED REAR BEARING                          |
| 209-3MM            | 3MM INSERT                                     | 404-19             | REAR ENDPLATE                                |
| 209-6MM            | 6MM INSERT                                     | 404-41             | ALUMINUM MOTOR CASE                          |
| 209-8MM            | 8MM INSERT                                     | 404-41-S           | STEEL MOTOR CASE                             |
| 300-G-29           | BEARING  | 406-1B             | OUTPUT HOUSING                               |
| 400-G-4-GL         | ALUMINUM BACKHEAD<br>(SPECIFY SPEED)           | 406-4              | KEY  |
| 400-G-4-GL-FT      | ALUMINUM FLOW THRU<br>BACKHEAD (SPECIFY SPEED) | 406-13             | 3/8-24 X .580 OUTPUT SPINDLE                 |
| 400-G-4-GLS        | STEEL BACKHEAD<br>(SPECIFY SPEED)              | 406-13-INT-20      | 1/4-20 INTERNAL THREAD SPINDLE               |
| 400-G-4-GLS-FT     | STEEL FLOW THRU BACKHEAD<br>(SPECIFY SPEED)    | 406-13-INT-28      | 1/4-28 INTERNAL THREAD SPINDLE               |
| 400-G-11           | FRONT BEARING                                  | 406-14A            | MOTOR SPINDLE                                |
| 400-G-11A          | SEALED FRONT BEARING                           | 406-15             | GEAR SPACER                                  |
| 400-G-17-S         | STEEL SIDE EXHAUST SLEEVE                      | 406-15-CS          | COLLET OUTPUT SPINDLE                        |
| 400-G-26           | THROTTLE LEVER                                 | 406-17             | 3/8-24 X .980 OUTPUT SPINDLE                 |
|                    |  | 406-17-625         | 5/8-11 X .980 OUTPUT SPINDLE                 |
|                    |  | 406-17-DA          | ERICKSON COLLET SPINDLE                      |
|                    |  | 406-38             | LOCKNUT                                      |
|                    |  | 406-39             | MOTOR RETAINER                               |
|                    |  | 406-40             | HEAD RETAINER                                |
| 400-G-34           | SPRING   | 406-41             | COUPLING                                     |
| 400-G-38           | COLLET NUT                                     | 406-42             | SPACER                                       |
| 400-G-42           | 3/8-24 FLANGE (2"-3" WHEELS)                   | 406-45             | SNAP RING                                    |
| 400-G-47           | 3/8-24 JAM NUT                                 | 406-47             | WHEEL FLANGE                                 |
| 400-2G             | CYLINDER                                       | 406-110            | GEAR SET                                     |
| 400-2GC            | CHROME CYLINDER                                | 406-112            | PINION GEAR STEM                             |
| 400-5              | ROTOR  | 500-G-44           | 3/8 ID FLANGE (4"-5" WHEELS)                 |
| 400-6              | BLADE (5 REQ.)                                 | 700-34             | 5/8-11 JAM NUT                               |
| 400-7              | FRONT ENDPLATE                                 | 700-37B            | THROTTLE LEVER PIN                           |
| 400-9              | REAR OUTPUT BEARING                            | 1100-680           | 5/8 I.D. FLANGE                              |
| 400-10             | KEY  |                    | (6" OR SMALLER WHEELS)                       |
| 400-44             | ROLL PIN                                       | 1100-682           | 3/8 I.D. FLANGE FOR 5"-6" WHEELS             |
| 400-46             | SNAP RING                                      | 590031             | FRONT OUTPUT BEARING                         |
| 400-51             | O-RING   | 591046             | SCREW  |
| 402-126            | SAFETY LEVER                                   | 591164             | 1/4-20 SCREW<br>(FOR USE WITH 406-13-INT-20) |

| <u>PART NUMBER</u> | <u>DESCRIPTION</u>                           |
|--------------------|--|
| 591166             | 1/4-28 SCREW<br>(FOR USE WITH 406-13-INT-28) |
| 832636             | GASKET                                       |
| 834782             | THROTTLE VALVE<br>INCLUDES 844302            |
| 841552             | 3/8 NPT TO 3/8 NPT BUSHING                   |
| 841553             | 3/8 NPT TO 1/4 NPT BUSHING                   |
| 841553-M           | 3/8 NPT TO 3/8 BSP BUSHING                   |
| 844302             | O-RING                                       |
| 869311             | THROTTLE VALVE CAP                           |

### GOVERNORS

| <u>PART</u> | <u>DESCRIPTION</u>                                |
|-------------|---|
| AA-406-100  | 10000 R.P.M. GOVERNOR                             |
| AA-406-110  | 11000 R.P.M. GOVERNOR                             |
| AA-406-120  | 12000 R.P.M. GOVERNOR                             |
| AA-406-130  | 13000 R.P.M. GOVERNOR<br>(OTHER SPEEDS AVAILABLE) |

### GUARDS

| <u>PART NUMBER</u> | <u>DESCRIPTION</u>   |
|--------------------|----------------------|
| 4603-27            | 3" TYPE 27 GUARD     |
| 4604-27            | 4" TYPE 27 GUARD     |
| 46045-27           | 4-1/2" TYPE 27 GUARD |
| 4605-27            | 5" TYPE 27 GUARD     |
| 4606A              | 6" TYPE 41 GUARD     |

### TOOLS

| <u>PART NUMBER</u> | <u>DESCRIPTION</u>      |
|--------------------|-------------------------|
| 490-3              | PIN SPANNER             |
| 1100-044           | 7/16" WRENCH            |
| 1100-063           | 5/8" WRENCH             |
| 1100-068           | 11/16" WRENCH           |
| 1100-075           | 3/4" WRENCH             |
| 1100-094           | 15/16" WRENCH           |
| 1100-350           | MOTOR RETAINER WRENCH   |
| 1100-638           | SPINDLE HOLDER          |
| 1100-802           | 400-9 BEARING DRIVER    |
| 1100-806           | 404-9 BEARING DRIVER    |
| 1100-814           | 400-G-11 BEARING DRIVER |
| 1100-816           | 300-G-29 BEARING DRIVER |
| 1100-818           | 46RA HEAD HOLDER        |
| 1100-830           | GOVERNOR WRENCH         |
| 541134             | REGULATOR LOCK WRENCH   |

### ASSEMBLIES

| <u>PART NUMBER</u> | <u>DESCRIPTION</u>             |
|--------------------|--------------------------------|
| 510240             | MOTOR REPAIR KIT               |
| 510118             | ANGLE HEAD REPAIR KIT          |
| 402-26             | SAFETY LEVER ASSY.             |
| AA-400-G-4-GL      | ALUMINUM BACKHEAD ASSY.        |
| AA-400-G-4-GLK     | ALUMINUM SAFETY BACKHEAD ASSY. |
| AA-400-G-4-GLS     | STEEL BACKHEAD ASSY.           |
| AA-400-G-4-GLSK    | STEEL SAFETY BACKHEAD ASSY.    |

**SPECIFY SPEED FOR BACKHEAD ASSY.**

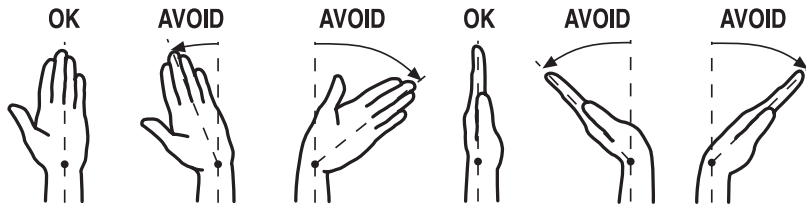
### ANGLE HEAD ASSEMBLIES

| <u>PART NUMBER</u> | <u>DESCRIPTION</u>                                     |
|--------------------|--|
| AA-406-1;1         | 3/8-24 X .580 46RA ANGLE HEAD ASSY.                    |
| AA-406-1;2         | 5/8-11 X .980 46RA ANGLE HEAD ASSY.                    |
| AA-406-1;4         | 3/8-24 X .980 46RA ANGLE HEAD ASSY.                    |
| AA-406-1;C         | COLLET 46RA ANGLE HEAD ASSY.                           |
| AA-406-1;D         | ERICKSON 46RA ANGLE HEAD ASSY.-<br>SPECIFY INSERT SIZE |

### ACCESSORIES

| <u>PART NUMBER</u> | <u>DESCRIPTION</u>                         |
|--------------------|--|
| 300-16             | 1/8" COLLET ADAPTER                        |
| 300-16-3/32        | 1/4" TO 3/32" COLLET ADAPTER               |
| 400-78             | 3/8-24 TO 5/8-11 ADAPTER                   |
| 400-78-S           | 3/8-24 x 1/4 SET SCREW                     |
| 405-24             | BACKING PLATE FOR 490-KR                   |
| 490-K              | 3/8-24 X .980 TYPE 27 ADAPT. ASSY.         |
| 490-KR             | 3/8-24 X .580 TYPE 27 ADAPT. ASSY.         |
| 490-1              | BACKING PLATE FOR 490-K                    |
| 490-2              | NUT FOR 490-K & 490-KR                     |
| 1100-660           | 3/8-24 TO 5/8 I.D. TYPE 27<br>ADAPT. ASSY. |
| 1100-661           | 3/8-24 TO 5/8 I.D. BACKING PLATE           |
| 1100-662           | 3/8-24 TO 5/8 I.D. ADAPTER NUT             |
| 1100-664           | 3/8-24 TO 7/8 I.D. BACKING PLATE           |
| 1100-666           | 3/8-24 TO 7/8 I.D. ADAPTER NUT             |
| 1100-668           | 3/8-24 TO 7/8 I.D. TYPE 27<br>ADAPT. ASSY. |
| 1100-692           | 5/8-11 TO 7/8 I.D. TYPE 27<br>ADAPT. ASSY. |
| 1100-694           | 5/8-11 TO 7/8 I.D. BACKING PLATE           |
| 1100-696           | 5/8-11 TO 7/8 I.D. ADAPTER NUT             |
| 530196             | 1/8" ROUNDED TAPER BURR                    |
| 530198             | 1/8" TAPER BURR                            |
| 530200             | 1/8" FLAME BURR                            |
| 530202             | 1/8" BALL BURR                             |
| 530204             | 1/8" CYLINDRICAL BURR                      |
| 530208             | 1/4" BALL BURR                             |
| 530210             | 1/4" CYLINDRICAL BURR                      |

# Ergonomics - Work Healthy



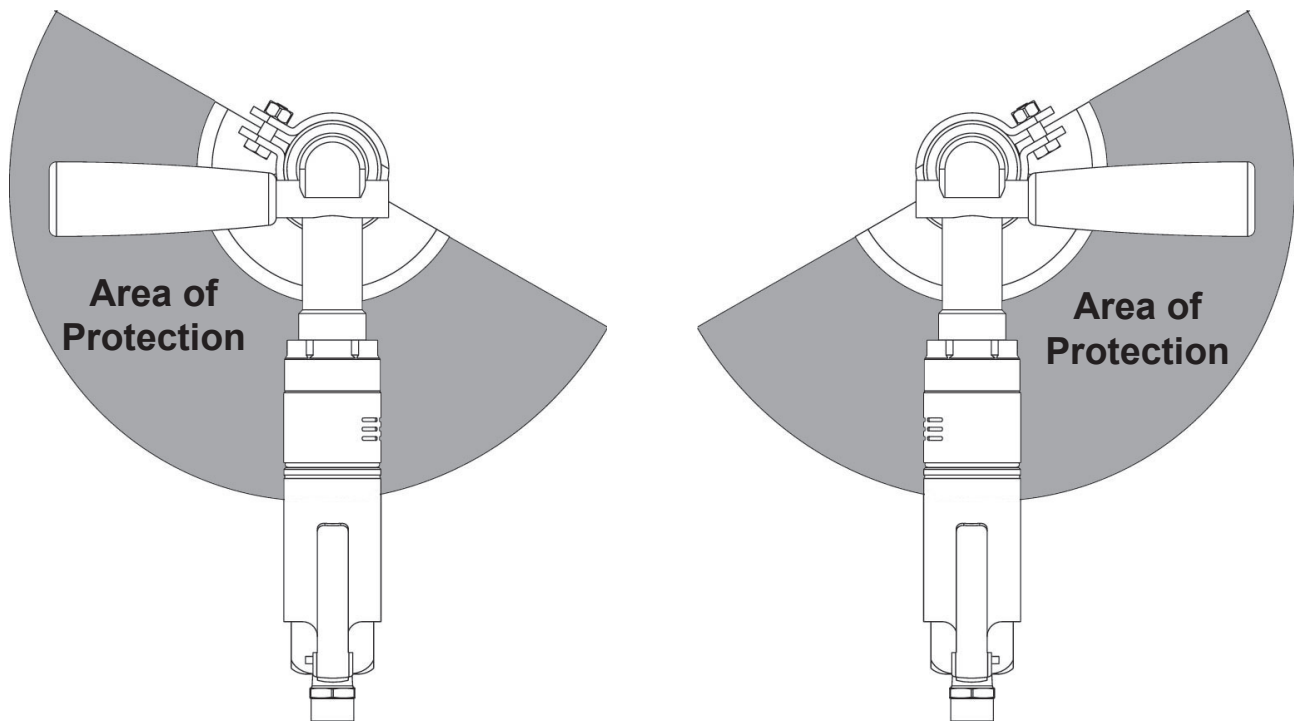
The following suggestions will help reduce or moderate the effects of repetitive work motion and/or extended vibration exposure:

- 1) Do not over-grip the machine/tool. Use only the force required to maintain control.
- 2) Keep hands and body dry and warm. (Blood flow is important - exercise hands and arms as often as necessary.)
- 3) Keep wrists as straight as possible. (Avoid hand positions that require the wrist to be flexed, hyper extended or turned side-to-side.)
- 4) Avoid anything that may inhibit blood circulation such as smoking tobacco or cold temperatures.
- 5) Do not support body-weight on the tool during operation.
- 6) Maintain a stress-free posture for the entire body.

Prolonged exposure to vibrations created by vibrating sources may cause health hazards. There are gloves, handle wraps and other forms of protective measures available to help reduce the hazard. The fit and condition of any vibration abatement measure must be monitored.

## Guarding

Always make sure the wheel guard is positioned between the operator and the wheel. Flying debris from the workpiece and/or the wheel can cause a hazard. The guard should be positioned so to deflect debris from the grinding surface away from the operator. The diagram below details the proper positioning of the guard to protect any handles the operator might grip and the area where the operator stands.



# Installation and Maintenance Tips

Following the guidelines will help you to ensure the pneumatic tools your company uses are operating and are maintained in the very best of condition.

## Initial Inspection of a New Tool

When a new tool is delivered to your facility, it is important to inspect the tool for any signs of damage that may have occurred during shipping. Here is a list of things to inspect:

- With the tool disconnected from the air supply, depress the throttle lever or trigger. The device should move freely and not become caught.
- Inspect the guard of the tool, if so equipped. The guard should be free of any chips, nicks or dents.
- Inspect the spindle of the tool. The threads should show no signs of bends or chips. Grasp the spindle by hand and spin. The spindle should turn freely with no resistance.

## Plumbing Installation

The tool must have fittings and connectors installed into the air inlet in order to connect with your company's air system. Your choice of fittings can greatly affect the performance of the tool.

### Fitting Size

The size of the air inlet of the tool is the minimum size of fitting that will allow for proper airflow into the tool. Should a smaller fitting size be used such as reducers or adapters, this will constrict the airflow into the tool and reduce the overall performance.

### Coupling Size and Installation

The coupling size should be equal to or larger than the inlet size of the tool. If a smaller size coupling is used then the air supply volume may be reduced which may lead to reduced performance from the tool.

The coupling should be installed near to the tool. It is important that the tool receive internal lubrication on a regular basis. Having the connection closer to the tool will promote regular lubrication, as the connection is easily accessible. Hose whips are often used between the tool and the coupling.

Use thread sealant on all pipe threads and ensure a tight fit.

### Operating Speed Test

After your initial inspection and installation of the plumbing connections, it is important to test for the operating speed of the tool. This test should be performed before you install any abrasive or tooling. Each tool is stamped with a maximum operating speed. This speed determines the highest rotational speed in R.P.M.'s that the tool will turn when it is functioning properly. This speed was set from the factory and is closely related to the operating speed of the abrasive used with the tool. This relationship will be discussed in the "mounting abrasives" section.

Find the maximum operating speed stamped onto the tool. Connect the tool to an air supply that provides 90 psi and secure the tool in a vise. A lower or higher air pressure will result in a false speed test and may create a hazardous situation. Depress the throttle lever or trigger and run the tool. Use a properly calibrated tachometer to determine the actual operating speed of the tool. The actual operating speed on the tachometer should not exceed 95% of the maximum free speed stamped on the tool. If this is not the case then contact the distributor or tool manufacturer immediately. The tool must not be put into service if the actual speed is over 95% of the stamped maximum speed.

Example: Tool rated at 11000 R.P.M.

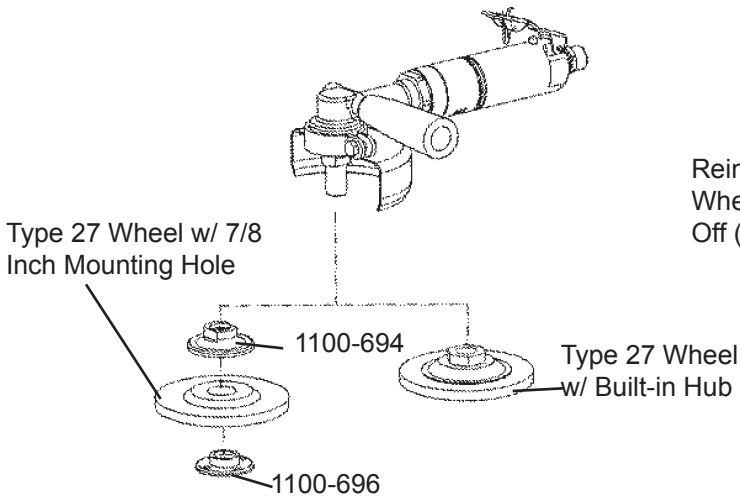
$$95\% \text{ of } 11000 \text{ (.95} \times 11000) = 10450$$

The tool should not exceed 10450 R.P.M. when tested with a tachometer.

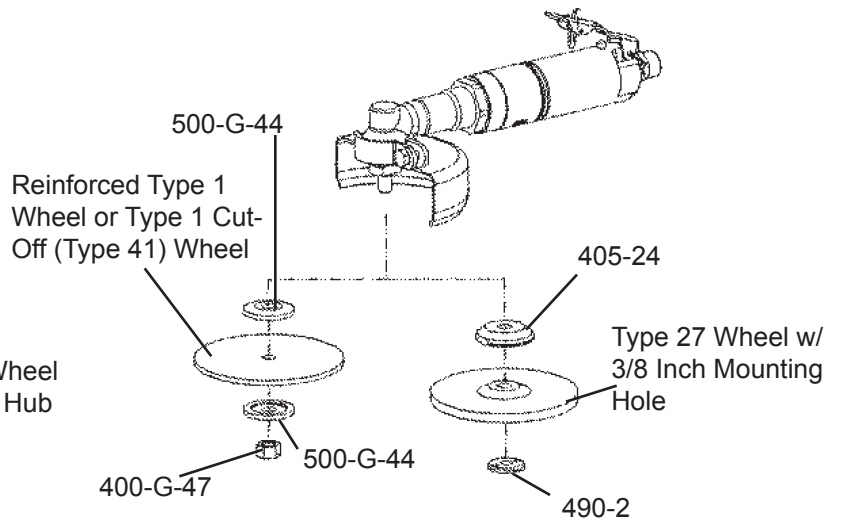
### Mounting Abrasives

The mounting of the abrasive used with the tool is very important to ensure safety for the operator and proper functioning of the tool. There are strict rules for mounting wheels that are outlined in ANSI B7.1-2000. The following diagrams briefly describe the methods and equipment for mounting most abrasives.

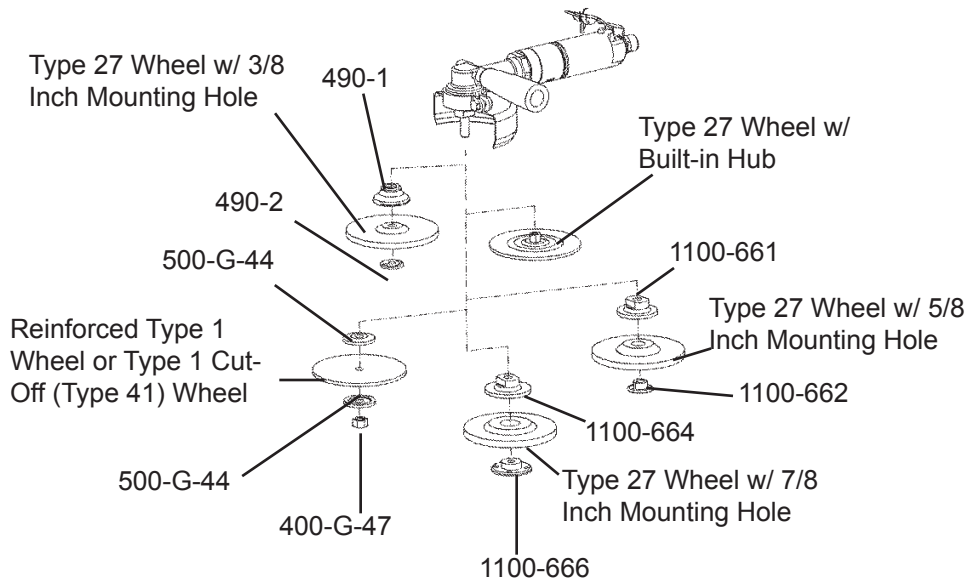
Right Angle Grinder  
w/ 5/8-11 x 0.980  
Output Spindle



Right Angle Grinder  
w/ 3/8-24 x 0.580  
Output Spindle



Right Angle Grinder  
w/ 3/8-24 x 0.980  
Output Spindle



Each wheel is labeled with a maximum operating speed. It is extremely important to compare this rating with the maximum operating speed of the tool. Never mount a wheel on a tool where the maximum operating speed of the tool is higher than the maximum operating speed of the wheel. This can cause an over speed situation and can result in injury.

The following list details specific items one should inspect and be aware of when mounting abrasives.

- The maximum operating speed marked on the wheel must be equal to or higher than the rated spindle speed (free speed) of the tool.
- Check the wheel dimensions so that it fits within the guard properly.
- Do not use any wheel that shows cracks, chips or evidence it has been soaked in fluids.
- Wheel flanges should have flat contact surfaces and be without cracks or burrs.

### Testing and Mounted Wheel

Start any new grinder with a new wheel under a bench and away from any bystanders. Run at full speed for one minute.

### Ensure Proper Pressure, Filtration & Lubrication

Properly lubricated pneumatic tools work better, last longer between maintenance intervals and are safer in general use. The maintenance costs are reduced dramatically when a little time is taken to regularly lubricate the tools. There are several ways to ensure proper lubrication.

#### 1) Filters, Regulators & Lubricators

These devices should be installed in the air system at each grinding station and inspected regularly to ensure proper operation. Each device in this set performs a vital task that greatly affects the performance of the tool and overall longevity of the component parts.

#### **Filters**

A filter is a device used to trap/contain particulate and liquid contaminants in the compressed air system. They generally have a cartridge or screen that requires cleaning or replacement regularly. Without this maintenance, the filtering device can become clogged and reduce the flow of air to the tool. A loss in performance can result.

#### **Regulators**

A regulator adjusts the operating pressure supplied to the tool. This device generally is used with a pressure gauge that will indicate the current pressure setting. All Top Cat ® pneumatic tools are designed to operate at 90 PSI (6.2 bar) while the tool is running. The tool should never be run if the pressure should exceed 90 PSI (6.2 bar).

## **Lubricators**

Lubricators are devices that induce a controlled amount of oil into the air supply for pneumatically driven tools. They generally contain a reservoir that one must keep filled with oil. A light grade oil such as Mobil DTE light or equivalent is recommended. There is a variable setting on the lubricator that will determine the amount of oil induced into the air supply. It is important to inspect both the setting and amount of oil in the lubricator regularly to determine proper functioning of the device. The lack of oil in the air system will greatly reduce the performance and longevity of the pneumatically driven tool.

### 2) Direct injection of oil into the tool

A simple and easy way to ensure proper lubrication is to inject the oil directly into the tool air inlet. This should be performed prior to storage of the tool. To perform this task one must have a small container of the proper lubricating oil.

- Disconnect the tool from the air supply at the air coupling.
- Place a few drops of oil from the container into the air inlet of the tool directly.
- Reconnect the tool to the air supply.
- Direct the exhaust of the tool away from any bystanders or cover the exhaust with a shop rag.
- Run the tool until the oil has completely passed through the unit.

The best lubrication techniques include both methods.

## **Geared Tools**

Tools equipped with gear systems require occasional greasing in order to maintain efficiency and promote longevity of the geared components. Zinc grease fittings are installed on geared tools to make for ease of this process. We recommend a NLGI-2 type of grease for use with all of our geared tools.

### What Conditions Indicate the Need for Maintenance?.

Pneumatic tools will exhibit several distinct signs that maintenance is required. Higher costs can be avoided if maintenance is performed when the first signs are evident. The following list details conditions that may indicate the necessity for service.

- 1) With the tool disconnected from the air supply, grasp the spindle and spin in the direction of operation. The spindle should spin freely with no resistance.
- 2) With the tool disconnected from the air supply, grasp the spindle by hand. Attempt to move the spindle from side to side and back and forth. Excess play can be a sign that service is required.
- 3) A reduction in power may indicate the necessity for maintenance.
- 4) Should the tool not maintain a uniform operating speed, servicing may be required.

## **For More Information**

- 1) General Industry Safety & Health Regulations 29 CFR, Part 1910 and where applicable Construction Industry Safety & Health Regulations 29 CFR, Part 1926 available from Superintendent of Documents, Gov't. Printing Office, Washington, D.C. 20402.
- 2) Safety Code For Portable Air Tools, ANSI B186.1, B7.1 and Z87.1, available from American National Standards Institute, Inc. 1430 Broadway, New York, NY 10018