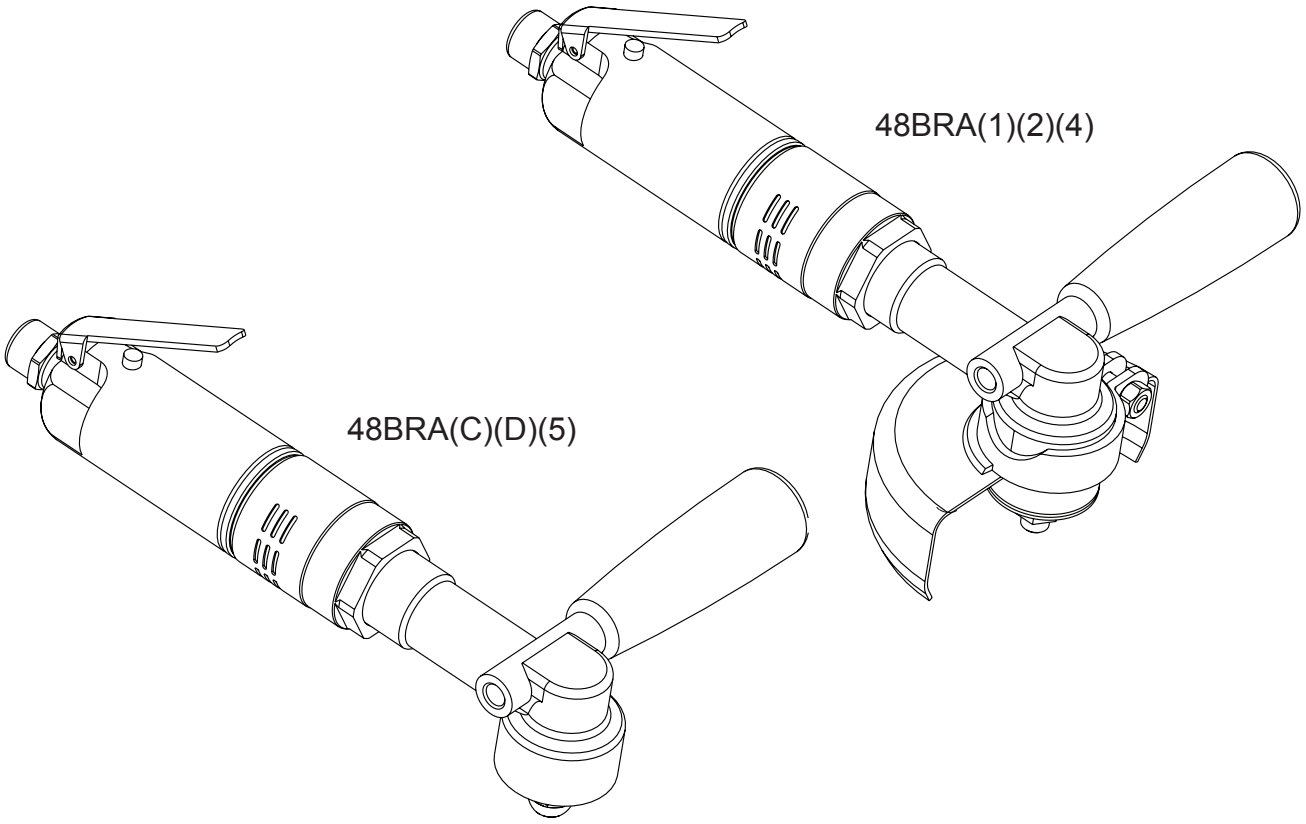
TOP CAT

48BRA Series Right Angle Grinders

General Operators Instructions and Maintenance Manual



Read Safety Recommendations Before Operating Tool

48BRA 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	Wheel Capacity
						Aluminum	Steel					
48BRA1	Front or Side	(L) Lever or (K) Safety Lever	9000 to 11000 R.P.M.	0.9 H.P. (675 W)	Steel or Aluminum	2.8 lb (1.3 Kg)	3.5 lb (1.6 Kg)	9.2 Inches (234 mm)	1.6 Inches (41 mm)	25 cfm (11.8 L/S)	3/8-24 x 0.58 Inch (15 mm)	2 Inch (50 mm), 3 Inch (75 mm), 4 inch (100 mm), 4 1/2 inch (114 mm), 5 inch (125 mm) or 6 Inch (150 mm) Type 1 Cutoff or Type 27 Wheels
48BRA2											5/8-11 x 0.98 Inch (25 mm)	
48BRA4											3/8-24 x 0.98 Inch (25 mm)	
48BRAC								9.1 Inches (231 mm)			1/4 Inch Built-In Collet	1/4 Inch Burrs/Mounted Points
48BRAD											Changeable Insert Collet	Burrs/M.P. Matching the Insert Size

Top Cat ® Air Tools, Manufactured by T.C. Service Co.
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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. Properly fitted protective clothing cushion the operator from vibration exposure and help prevent minor scrapes that might occur as a result of guiding the tool along the workpiece.

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.

Tachometers must be checked and calibrated on a regular basis according to the manufacturers recommendations

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 or tooling 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.

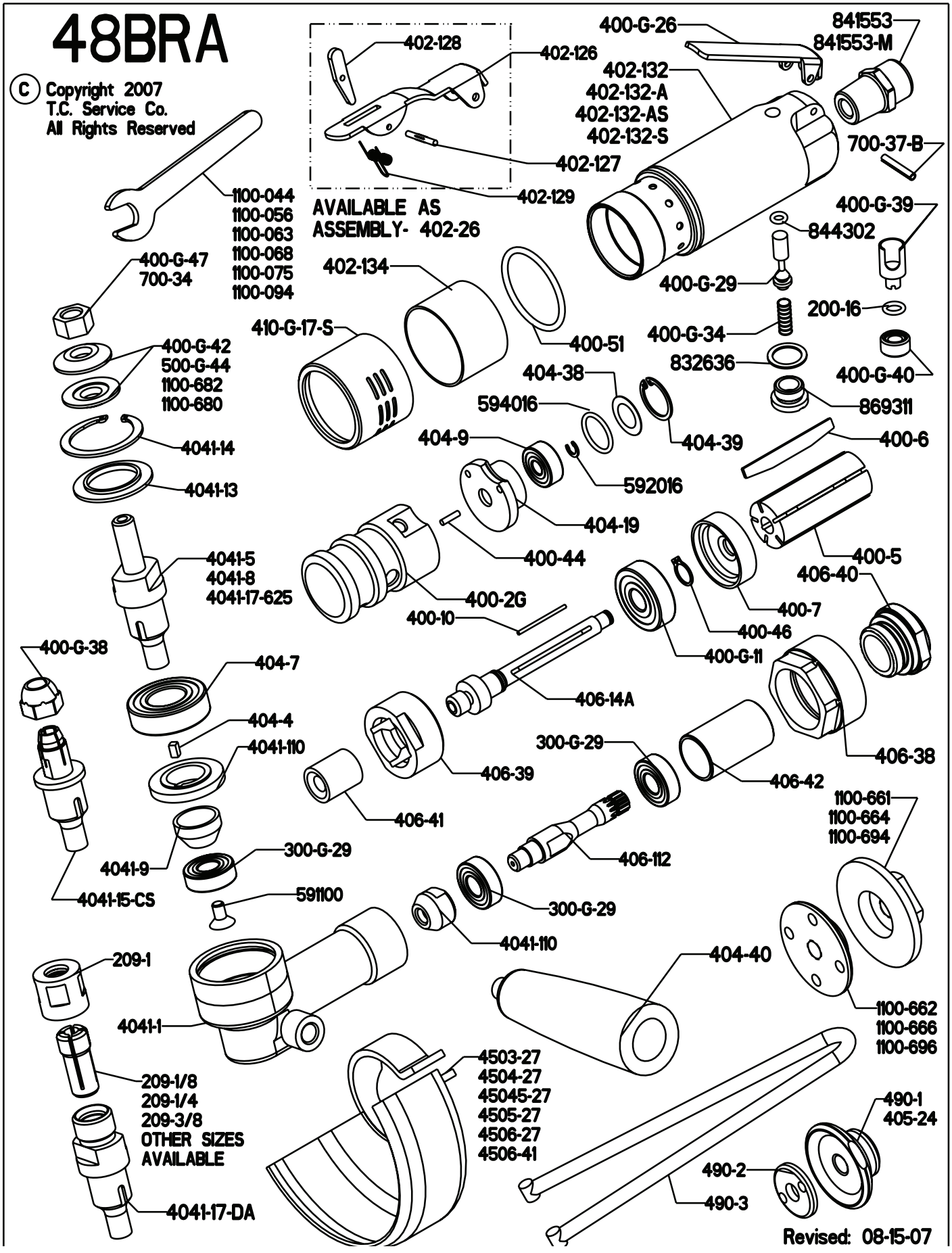
Airborne particulate resulting from the grinding process can cause hazards. Wear appropriate protective equipment.

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 the 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 or tooling 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 the tool will continue to spin 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) Unexpected tool movement, or breakage of wheel or inserted tooling, may cause injury.
17) 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.)
18) Do not hold the tool near the body when operating.
19) Keep a firm grip on the tool body during operation.
20) Immediately shut off the tool if unusual vibration or sound is detected. Remove and inspect the wheel or tooling, and check the tool speed (RPM) with an accurate tachometer. Use of over-speeding grinder or unbalanced wheels may result in serious injury.
21) Stay alert. Do not use the tool while under the influence of alcohol, drugs or medication.

48BRA



Disassembly

1. Disconnect tool from air supply and remove all wheels and accessories.
2. Secure the tool in vise vertically with angle head up. Clamp onto flats of the motor housing (402-132[A][S][AS]).
3. Unscrew lock nut (406-38) with a wrench. The angle head assembly will disconnect from the motor housing. 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 (410-G-17{F}S), o-ring (400-51) and exhaust screen (402-134).
5. Unscrew and remove motor retainer (406-39). Flats are provided for a wrench, or use special tool (1100-350).
6. Remove motor assembly from motor housing. Remove from vise.

The Motor Assembly

7. Remove snap ring (404-39) from rear of motor assembly with snap ring pliers.
8. Lift out bearing cover (404-38) and o-ring (594016).
9. Push snap ring (592016) out of spindle groove with snap ring pliers.
10. Install brass jaws onto vise. Secure the motor assembly vertically in the vise with the geared end downward. Clamp onto the outside diameter of cylinder (400-2G) and rear endplate (404-19).
11. Tap the spindle (406-14A) out of rear bearing (404-9) using a 3/16” punch. Be sure not to drop the motor.
12. Push the rear bearing out of the read endplate with a small screwdriver.
13. Lift the rotor (400-5), blades (400-6), key (400-10) and front endplate (400-7) from the motor assembly.
14. Remove retaining ring (400-46) from the motor spindle using snap ring pliers.
15. Support the front spindle vertically on a suitable drill block. Press spindle through front bearing (400-G-11). Angle

Head Assembly

16. Secure right angle head in vise so that the angle head neck is vertical. Clamp onto the dead handle bosses.
17. Remove head retainer (406-40) using a wrench on the wrench flats.
18. Lift off lock nut (406-38). 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 (4041-110) downward. 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 using a 3/16-inch punch. Remove from vise.
22. Secure the pinion gear stem with a wrench on the wrench flats.
23. Unscrew and remove the pinion gear head using 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) using an arbor press.
25. Remove retaining ring (4041-14) with snap ring pliers. Lift out the bearing cover (4041-13).
26. Grasp the output spindle (4041-5 or similar) and pull assembly free from right angle head (4041-1).
27. Secure the output spindle in a vise vertically with output downward. Clamp onto the flats of the spindle.
28. Remove screw (591100} from end of spindle assembly. Remove from vise.
29. Support the spindle assembly vertically on a suitable drill block. Press spindle through bearings (300-G-29) & (404-7), spacer (4041-9), ring gear (4041-10), and key (404-4).
30. To check the throttle valve, secure the motor housing horizontally in a vise. Clamp lightly onto the flats of the housing. Unscrew and remove the throttle valve cap (869311). Lift out the throttle valve spring (400-G-34) and the throttle valve (400-G-29). 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. Press spindle (406-14A) through bearing until it bottoms on shoulder.
3. Place retaining ring (400-46) into groove in spindle.
4. Slide front endplate (400-7) over spindle and onto front bearing.
5. Place key (400-10) into keyway in spindle. Slide rotor (400-5) over spindle.
6. Place 5 blades (400-6) into slots.
7. Slip cylinder (400-2G) over rotor. (Be sure the alignment pin is oriented away from the front of the motor assembly.)
8. Install rear endplate (404-19) locating cylinder pin in smaller hole of the rear endplate.
9. Place bearing (404-9) in rear endplate. Tap in place with bearing driver (1100-806).
10. Place snap ring (592016) in spindle groove. Place o-ring (594016), washer (404-38) and snap ring (404-39) into rear of end plate.
11. Secure case (402-132[A][S][AS]) in vise vertically. Slip motor assembly into case.
12. Install o-ring (400-51), exhaust screen (402-134), and exhaust deflector (410-G-17{F}S).
13. 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.

Angle Head Assembly

14. Press bearing (300-G-29) on threaded end of gear stem (406-112) with an arbor press.
15. Hold the gear stem firmly in a vise. Screw on and tighten gear pinion head (4041-110). Remove from vise.
16. Place spacer (406-42) onto end of gear stem Press bearing (300-G-29) onto end of stem with an arbor press.
17. Press bearing (404-7) onto output spindle (4041-5 or similar).
18. Place key (404-4) in slot of output spindle. Align keyway in ring gear (4041-10) with key in spindle and press together with an arbor press. (Take care not to damage the teeth of the gear.)
19. Place spacer (4041-9) and bearing (300-G-29) over end of spindle. Press in place with arbor press.
20. Thread screw (591100) in end of spindle and tighten.
21. Apply a lithium soap based, NGLI grade 2 grease to gear teeth generously.
22. Place spindle assembly into housing (4041-1). Place pinion gear assembly in housing.
23. Replace bearing cover (4041-13) over spindle in front of tool. Place retaining ring (4041-14) into groove in front of angle head.
24. Slide lock nut (406-38) over end of housing. Install and tighten retainer (406-40).
25. Place coupling (406-41) on splined on end of motor spindle. Place angle head onto end of motor housing. Align spline inside coupler. Tighten lock nut on motor case and run tool.

26. Replace guard on tool. See page 8 of this booklet for details on proper positioning of guard. Replace any other accessories and safety devices.

27. Check RPM with a reliable tachometer. Tool must run at or below speed stamped on tool.

Tool Parts Listing

PART NUMBER	DESCRIPTION
200-16	O-RING
209-1	COLLET NUT
209-1/8	1/8" INSERT
209-3/16	3/16" INSERT
209-1/4	1/4" INSERT
209-5/16	5/16" INSERT
209-3/8	3/8" INSERT
209-3MM	3MM INSERT
209-6MM	6MM INSERT
209-8MM	8MM INSERT
300-G-29	BEARING
400-G-11	FRONT BEARING
400-G-26	THROTTLE LEVER
400-G-29	THROTTLE VALVE-INCLUDES 844302
400-G-34	SPRING
400-G-38	COLLET NUT
400-G-39	REGULATOR
400-G-40	REGULATOR LOCK
400-G-42	3/8" I.D. X 1" WHEEL FLANGE
400-G-47	3/8-24 JAM NUT
400-2G	CYLINDER
400-2GC	CHROME CYLINDER
400-5	ROTOR
400-6	BLADE (5 REQ.)
400-7	FRONT ENDPLATE
400-10	KEY
400-44	ROLL PIN
400-46	SNAP RING
400-51	O-RING
402-126	SAFETY LEVER
402-127	SAFETY LEVER PIN
402-128	LOCKOUT LEVER
402-129	SAFETY LEVER SPRING
402-132	ALUM. CASE (SPECIFY SPEED)
402-132-A	ADJ. ALUM. CASE (SPECIFY SPEED)
402-132-AS	ADJ. STEEL CASE (SPECIFY SPEED)
402-132-FT	ALUM. FLOW THRU CASE (SPECIFY SPEED)
402-132-S	STEEL CASE (SPECIFY SPEED)
402-132-S-FT	STEEL FLOW THRU CASE (SPECIFY SPEED)

PART NUMBER	DESCRIPTION
402-134	MUFFLER
404-4	KEY
404-7	LOWER OUTPUT SPINDLE BEARING
404-9	REAR MOTOR BEARING
404-19	REAR ENDPLATE
404-38	BEARING COVER
404-39	SNAP RING
404-40	DEAD HANDLE
406-14A	MOTOR SPINDLE
406-38	LOCKNUT
406-39	MOTOR RETAINER
406-40	HEAD RETAINER
406-41	COUPLING
406-42	SPACER
410-G-17F-S	STEEL FRONT EXHAUST SLEEVE
410-G-17-S	STEEL SIDE EXHAUST SLEEVE
500-G-44	3/8" I.D. X 1-3/8" WHEEL FLANGE
700-34	5/8-11 JAM NUT
700-37B	THROTTLE LEVER PIN
1100-680	5/8" I.D. X 1.5" WHEEL FLANGE
1100-682	3/8" I.D. X 1.5" WHEEL FLANGE
4041-1	OUTPUT HOUSING
4041-5	3/8-24 X .980 OUTPUT SPINDLE
4051-8	3/8-24 X .580 OUTPUT SPINDLE
4041-9	GEAR SPACER
4041-10	GEAR SET
4041-13	SPACER
4041-14	SNAP RING
4041-15-CS	COLLET OUTPUT SPINDLE
4041-17-625	5/8-11 X .980 OUTPUT SPINDLE
4041-17-DA	DOUBLE ANGLE COLLET SPINDLE
591100	SCREW
592016	SNAP RING
594016	O-RING
832636	GASKET
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

Note: Use of any parts other then genuine Top Cat® parts voids any and all warranties, and may result in a hazardous situation and a decrease in operating efficiency.

TOOLS

PART NUMBER	DESCRIPTION
490-3	PIN SPANNER
102-SPWR	WRENCH FOR SANDING PAD NUT
1100-044	7/16" WRENCH
1100-056	9/16" WRENCH
1100-063	5/8" WRENCH
1100-068	11/16" WRENCH
1100-075	3/4" WRENCH
1100-094	15/16" WRENCH
1100-638	SPINDLE HOLDER
1100-806	404-9 BEARING DRIVER
1100-814	400-G-11 BEARING DRIVER
1100-816	300-G-29 BEARING DRIVER
1100-836	GREASE GUN
1100-838	4 OZ.TUBE OF GREASE
541134	REGULATOR LOCK WRENCH
AA-1100-836	GREASE GUN W/ 4 OZ. TUBE OF GREASE

ASSEMBLIES

PART NUMBER	DESCRIPTION
510240	MOTOR REPAIR KIT
510230	ANGLE HEAD REPAIR KIT
402-26	SAFETY LEVER ASSY.
AA-402-132	ALUM. CASE ASSY.
AA-402-132-A	ADJ. ALUM. CASE ASSY.
AA-402-132-AK	ADJ. ALUM. SAFETY CASE ASSY.
AA-402-132-AS	ADJ. STEEL CASE ASSY.
AA-402-132-ASK	ADJ. STEEL SAFETY CASE ASSY.
AA-402-132-K	ALUM. SAFETY CASE ASSY.
AA-402-132-S	STEEL CASE ASSY.
AA-402-132-SK	STEEL SAFETY CASE ASSY.
	SPECIFY SPEED FOR CASE ASSY.
AA-408-1;D	DOUBLE ANGLE 48RA ANGLE HEAD ASSY.
	SPECIFY INSERT SIZE

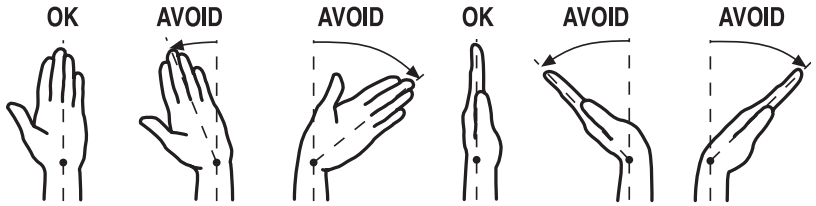
GUARDS

PART NUMBER	DESCRIPTION
4503-27	3" TYPE 27 GUARD
4504-27	4" TYPE 27 GUARD
45045-27	4-1/2" TYPE 27 GUARD
4505-27	5" TYPE 27 GUARD
4506-41	6" TYPE 41 GUARD
4506-CF	6" CLOSED FACE GUARD

ACCESSORIES

PART NUMBER	DESCRIPTION
CP-53	WASHER
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 ADAPTER ASSY.
490-KR	3/8-24 X .580 TYPE 27 ADAPTER 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. T-27 ADAPTER 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. T-27 ADAPTER ASSY.
1100-692	5/8-11 TO 7/8 I.D. T-27 ADAPTER 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
849259	5/8-11 SANDING PAD NUT
849259-A	3/8-24 SANDING PAD NUT
889271	5/8-11 4" SANDING PAD (MAX 12000 RPM)
889271-A	3/8-24 4" SANDING PAD (MAX 12000 RPM)
849848	5/8-11 5" SANDING PAD (MAX 10000 RPM)
849848-A	3/8-24 5" SANDING PAD (MAX 10000 RPM)

Ergonomics - Work Healthy



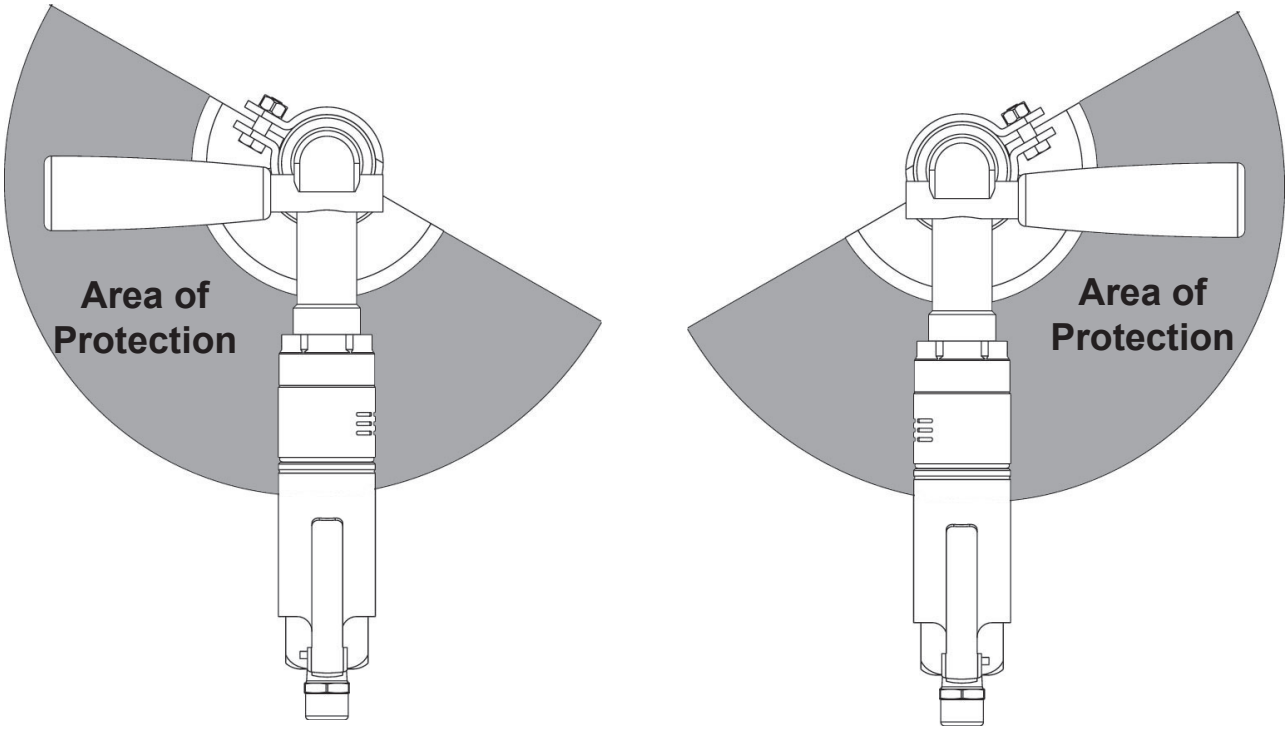
The following suggestions will help reduce or moderate the effects of repetitive work motion and/or extended vibration exposure:

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 companies 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% of 11000 (.95 x 11000) = 10450
The tool should not exceed 10450 R.P.M. when tested with a tachometer. Tachometers must be checked and calibrated on a regular basis according to the manufacturers recommendations

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 by ANSI, currently in ANSI B7.1-2000. The following diagrams briefly describe the methods and equipment for mounting most abrasives.

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.
- Immediately shut off the tool if unusual sound or vibration is detected. Remove and inspect the inserted tooling or wheel and check the tool speed (RPM). Use of over-speeding grinder or unbalanced wheels may result in serious injury.

Testing a Mounted Wheel or Inserted Tooling

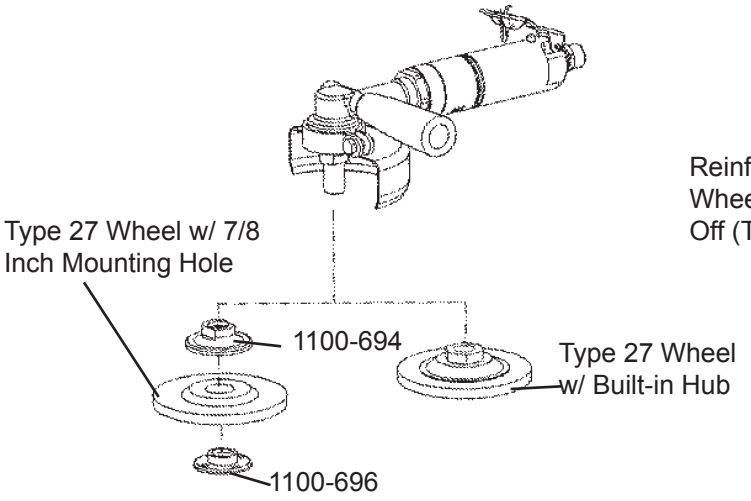
Start any new grinder with a new wheel, stone, or burr under a bench and away from any bystanders. Run at full speed for one minute.

Ensure Proper Pressure, Filtration & Lubrication

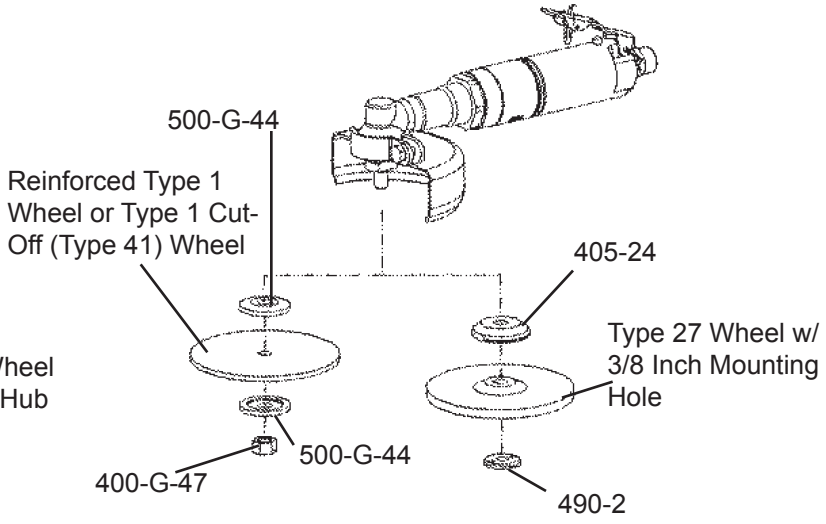
Properly lubricated pneumatic tools work better, last longer between maintenance intervals and are safer in general use. The maintenance costs are reduced dramatically when a little time is taken to regularly lubricate the tools. There are several ways to ensure proper lubrication.

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.

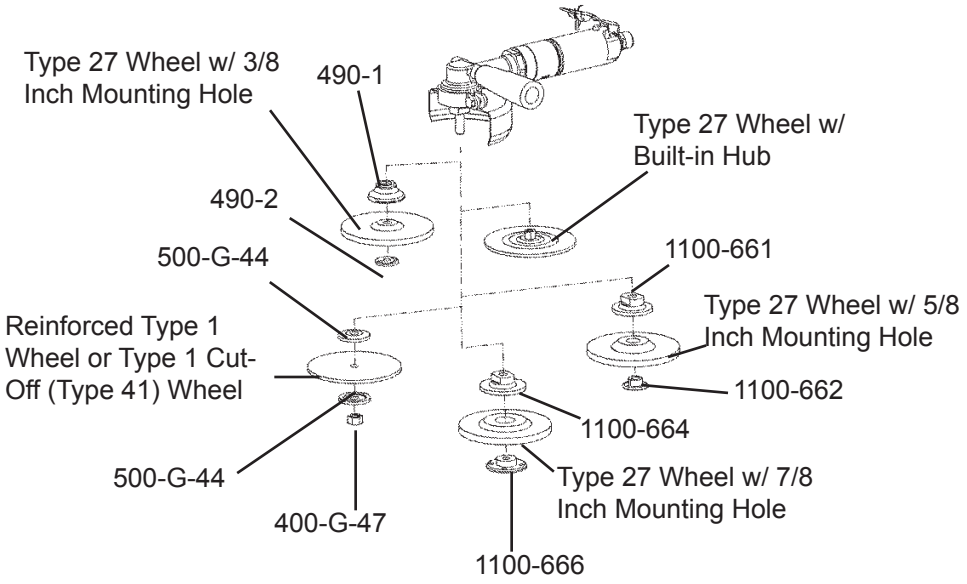
Right Angle Grinder
w/ 5/8-11 x 0.980
Output Spindle



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



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



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. Lubricators should be adjusted to add one to two drops of oil per minute. 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. We recommend a lithium soap based NLGI-2 type of grease for use with all of our geared tools.

<u>What Conditions Indicate the Need for Maintenance?.</u>

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.

The Common Wear Items:

The Blades (400-6) are subjected to contaminants within the air system. It is common for grit or sand to enter the tool through the air system and become lodged onto the blades. This can cause the blades to delaminate where pieces of blade material will flake off. Any blade exhibiting this characteristic should be replaced. The blades will see the most wear on the longest edge along their height. This is the surface that makes contact with the cylinder wall and creates an

air seal. The overall width of the blade will reduce as this surface wears. When any one-end width of the blade wears to the minimum width, (.141 inches) then one should consider replacement.

The Bearings (300-G-29, 400-G-11, 404-7, and 404-9). There is no means of measurement that can determine the condition of a bearing. The only test that can be performed it to manually turn either the outer or inner race with respect to each other. The movement should feel free with no resistance. If resistance is felt either continuously or repetitively, then the bearing should be replaced

The Front Endplate (400-7). The front endplate is essentially a flat steel disc in the front of the motor assembly. The rotor makes occasional contact with the front endplate. Over time, this contact will wear away the surface of the endplate and result in a circular depression in the middle of the part. When this depression becomes 0.003 inches deep from the original surface, then the efficiency of the motor is reduced to the point where one should replace the endplate.

The Rotor (400-5). We employ a floating rotor design in the many of our motors. This design allows the rotor to float along the spindle in the motor cavity. Occasionally the rotor will make contact with the endplates. Some wear can be seen on both the top and bottom surfaces of the overall length. Should the overall length wear to the minimum length of 1.993 inches then the rotor should be replaced.

The Cylinder (400-2G). The only wear seen on the cylinder is going to occur on the inner surface. This surface is always in contact with the blades. Over time, the blades will remove material from this surface that will reduce the overall performance of the tool. Consecutive high and low spots will become evident on the internal surface. They will appear as ridges along the axis of the cylinder. When these ridges vary 0.016 inches from high to low, the cylinder should be replaced.

The Rear Endplate (404-19). The rear endplate is the located toward the rear of the motor assembly. The most wear this part is exposed to is from occasional contact with the rotor. Over time, this contact will wear away the surface of the endplate and result in a circular depression in the middle of the part. When this depression becomes 0.003 inches deep from the original surface, then the efficiency of the motor is reduced to the point where one should replace the endplate.

This covers all of the predictable wear that can occur within the tool. Other factors due to environment, level of treatment/care and air supply quality can cause other forms of wear that are unpredictable

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

Polishers

- Vertical Polishers
- Horizontal Polishers
- Right Angle Polishers

Percussion Tools

- Scalers
- Needle Scalers
- Chipping Hammers
- Rammers

Grinders

- Vertical Grinders
- Horizontal Grinders
- Right Angle Grinders
- Die Grinders
- Extended Grinders
- Bench Grinders

Air Motors

Saws

Drills

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