HAND-HELD AIR GRINDER
FOR CARBIDE BUTTON BITS

OPERATION & SERVICE GUIDE

ROCKMORE INTERNATIONAL

Rock Drilling Tools

Revised 1-19-2023

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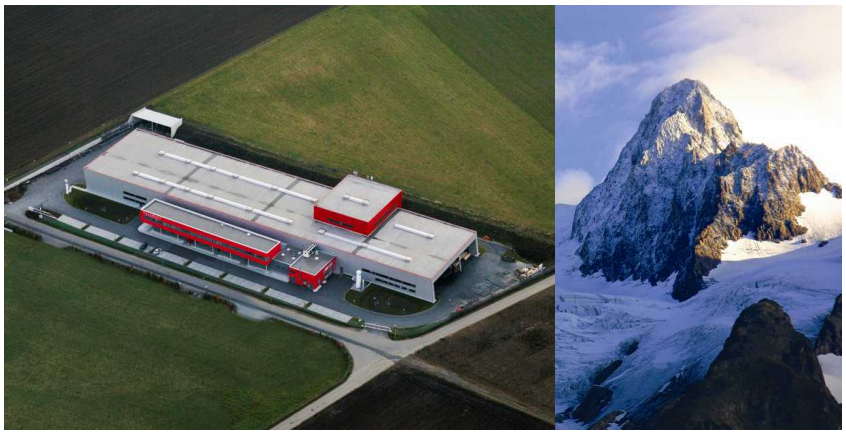

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CARBIDE BUTTON BIT REGRINDING RECOMMENDATIONS

WHEN TO SHARPEN CARBIDE BUTTONS:

Rockmore International recommends re-sharpening bits when the carbide buttons attain flats that are 1/4 (one quarter) of the major diameter.

1/2" (12.7mm) DIAMETER AND SMALLER BUTTONS: To obtain the maximum bit life and usage, and the least time required for bit regrinding, we recommend that bits with a wear band or flat of 3/32" to 1/8" (2mm to 3mm) on the gauge buttons is the best time to regrind the bit.

9/16" (14mm) DIAMETER AND LARGER BUTTONS: A wear band or flat of 1/8" to 3/16" (3mm to 4mm) on the gauge buttons is the best time to regrind the bit.

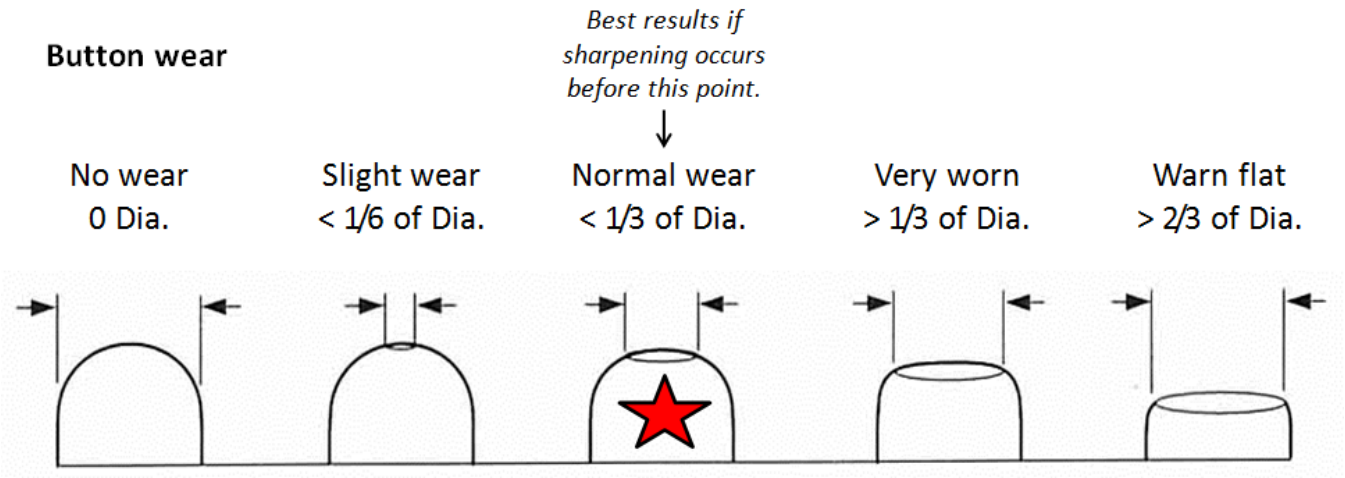
Regrinding at these recommended points of carbide wear will optimize bit usage by reducing the amount of carbide removed and reducing the amount of regrinding time. Increased drilling efficiency with the reground bit will help reduce drilling time and reduce damage to the drilling equipment.

Carbide buttons should be inspected regularly and frequently for wear. Drilling machines will run smoother and penetration rates will be higher with a well maintained bit. NOTE: Increase carbide button inspection and grinding intervals when drilling in non-abrasive rock as micro cracks may begin to form.

Bits need to be sharpened and serviced like any other cutting tool. The sharper the carbide buttons are, the faster the penetration rate will be. Also, the percussive energy from the hammer or drifter will be transferred into the rock rather than be reflected back into the drill string. This will save excessive "wear and tear" on the drill string components and the drilling machine.

Dull drilling bits will cause: excessive loading on all components of the drill string and rig, early fatigue failures on all drilling products, slower drilling, and more operations downtime due to unscheduled maintenance.

****** Regrind your dull bits early -- it will pay to do so. ******

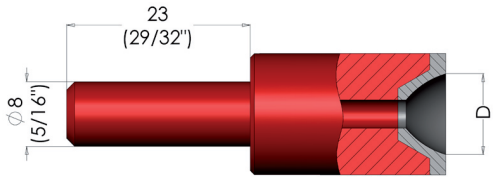


SELECTING GRINDING PINS (CUPS):

Use a grinding pin (cup) that is closest in diameter and shape to the carbide button being sharpened. This will minimize the amount of material being removed and will help maintain the original carbide button shape. NOTE: Measure both the gauge and face (front) carbides, as many times they are different diameters.

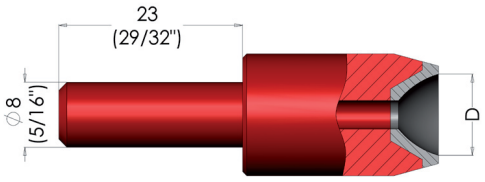
There are three different types of grinding pins (cups) that can be used on this machine. All must have a regular shaft.

Combination – *Recommended*



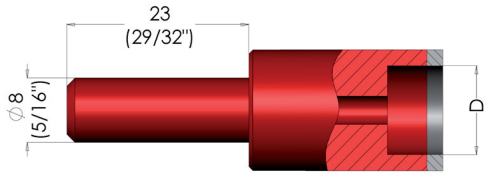
- This type of grinding pin (cup) is used for grinding the carbide button ***and*** the steel body surrounding the button.
- For 6mm to 25mm Hemispherical, Semi Ballistic, Full Ballistic, and Conical buttons.
- Rockmore supplied pins (cups) will have single coolant slot on 6mm to 13mm sizes and triple coolant slot on 14mm to 25mm sizes.
- Using this grinding pin (cup) will help ensure there is adequate carbide button protrusion.

Diaroc

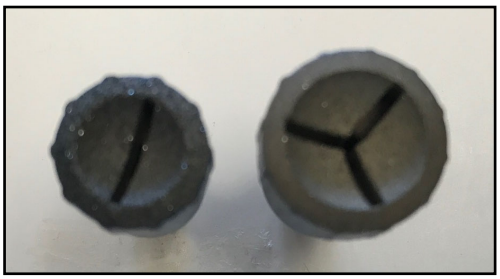


- This type of grinding cup is used for grinding only the carbide button and ***not*** the steel body surrounding the button.
- For 6mm to 25mm Hemispherical, Semi Ballistic, Full Ballistic, and Conical buttons.
- If the grinding pin (cup) touches the bit body while grinding, then a Combination or Borroc style must also be used to grind the bit body so that proper protrusion of the carbide button is obtained. Minimum 1/2 (one half) of the carbide diameter should protrude.
- *Special order from Rockmore.*

Borroc



- This type of grinding cup is used for grinding ***only*** the steel body surrounding the button to maintain the same amount of button exposure.
- For 6mm to 25mm button sizes.
- Minimum 1/2 (one half) and maximum 3/4 (three quarters) of the carbide diameter should protrude.
- *Not available from Rockmore.*



COMBINATION
Single and triple coolant slots

SET-UP INSTRUCTIONS

Air pressure of 90 PSI to a maximum of 115 PSI (pounds per square inch) and 30 CFM (cubic feet per minute) is recommended for the best performance of the grinder.

Piping, fittings, and supply hose should be of adequate size to maintain operating PSI and CFM while the grinder is operating.

NOTE: An air line filter-regulator-lubricator unit should be used to clean, dry (remove particles and moisture), and to oil the air path to lubricate the grinder. This will prolong the useful life and operation of the grinder. This unit should be of 1/2" pipe size, and be connected to the end of the grinder's 8' air supply hose. The main supply air hose should be blown out to remove dirt particles and any sludge before attaching it to the filter-regulator-lubricator unit.

A coolant pressure of 25 to 40 PSI is recommended for the supply. Adjust the handle control for the proper flow for the grinding tool size. Good cooling of the grinding tool will make it last longer and work better. Good cooling of the carbide button is also important, as the carbide can crack due to high temperature.

LUBRICATION OF GRINDER MOTOR:

The air motor should be lubricated with a high grade of spindle oil such as SAE #5 or an equivalent type of spindle oil. Eight (8) to twelve (12) drops of oil per minute should be sufficient oiling.

OPERATION OF GRINDER:

The hand grinder is designed to allow the operator to perform the regrinding operation with minimum inconvenience and with maximum efficiency.

NOTE: Be sure that the hand grinder has an inline filter-regulator-lubricator unit, or damage to the air motor will result in a very short time. Motor RPM is 22,000. The hand grinder should have 80 to 90 PSI and 28 to 30 CFM.

Grinding is accomplished by using a carbide button grinding pin (cup) with at least one cooling slot to help keep the coolant on the carbide button being reground. This prevents metallurgical damage to the carbide by overheating while grinding. To keep the button cool, be sure to use adequate coolant flow. The hand grinder has been designed to allow water, an anti-freeze and water solution, or QS diamond tool coolant to be used to cool the grinding operation; using 25 to 40 PSI supply pressure.

Draw a pencil line across the carbide flats dividing it into two symmetrical sides. Remove any sharp edges on the bit, particularly around the flushing holes and any areas where edges may have rolled over.

Insert the carbide button grinding pin (cup) into the Collet (35) until it bottoms out against the seal, then tighten the Chuck Cap (36).

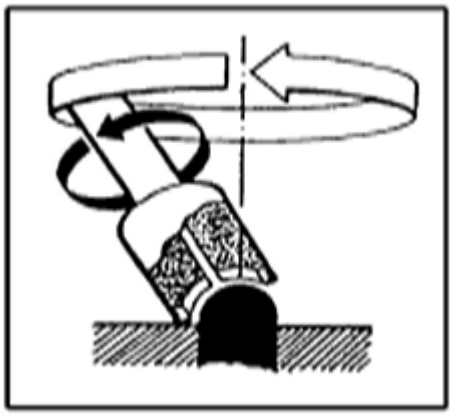
The hand grinder and pin (cup) should be placed on the carbide button with sufficient down pressure to keep the grinding pin (cup) on the carbide button. Depress the Throttle Lever (11) and begin to grind the carbide button.

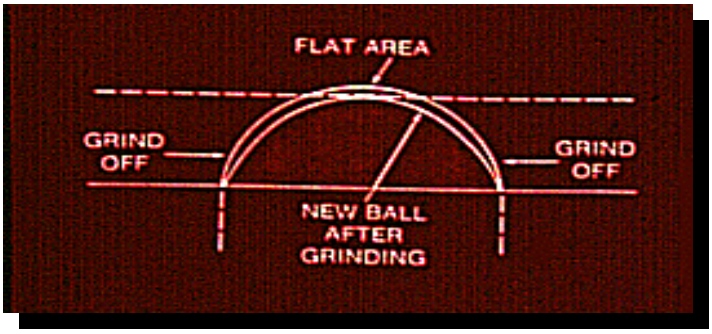
OPERATION OF GRINDER *(continued)*:

The grinder should be operated in a small circular motion on the carbide button until the entire flat or most of the flat has been removed. Repeat the operation on the other carbide buttons until the bit has been completely reground. Remove as little material as possible, maintaining the original carbide shape.

When sharpening carbide buttons do not remove excessive steel body. Carbide buttons should not protrude more than 3/4 (three quarters) of the carbide diameter. Also avoid under cutting the carbide buttons. Removing excess steel body or under cutting will result in carbide button failure.

If a regular grinding program is used, the average bit can be reground 5 to 10 times, resulting in greater bit usage and less damage to other drill string parts, drill steel, couplings, shank adapters (striking bars), and hammers.





LOSS OF MOTOR POWER:

It is seldom necessary to disassemble this grinder motor to correct it for loss of power. First, check to make sure the air line pressure to the grinder is 90 PSI while the grinder is operating. Next, check the size of the air supply hose and fittings to be certain that they are not too small. Undersized air supply hoses and fittings can cause air restrictions from a buildup of dirt, scale, or rust and can plug up the filter unit. The air supply hose to the filter-regulator-lubricator unit should have a minimum inner diameter of 3/4" (19mm). If there are still no results, flush out the air motor as prescribed in the service instructions.

SERVICE INSTRUCTIONS

NOTE: Do not squeeze the grinder or any parts in a vice, except as specified in the assembly and disassembly instructions.

Refer to the main parts drawing on page 8 and identify the parts as they are removed.

REMOVING VALVE ASSEMBLY:

The O-Rings (5 & 8) should be replaced if the valve unit is removed from the Throttle Housing (9).

REPLACING BALL BEARINGS OR COOLANT SEALS:

BALL BEARINGS:

Ball bearings are shielded. Care must be used in their assembly and disassembly.

When pressing ball bearings onto the shaft, press only on the inner race surface. When pressing ball bearings into the bore, press only on the outer race surface.

CAUTION: Ball bearings are lubricated by the ball bearing maker for the life of the ball bearings. *Do not clean the ball bearings with any kind of solvent.*

REMOVING SEAL ASSEMBLY AND MOTOR UNIT:

Remove the Chuck Cap (36), Collet (35) and Shank Seal Tube (34).

Insert a 3/16" hex wrench in the Chuck Body (33) and into the hex in the end of the Spindle Adapter (29). Hold the hex wrench and unthread the Chuck Body (33) from the Spindle Adapter (29).

Remove the four cap Screws (32) and End Cap (42), then slide the Seal Housing (31) off the Spindle Adapter (29). Unscrew the Lock Ring (28) by installing two screws (socket head, 8-32 x 1/2" long) into opposite threaded holes. Use approved Spanner Tool #45-2750.

Field Operation – Place grinder, front end down, into the jaws of a vice opened about 5/8" wide. Place the 8-32 screw heads into the vice openings and unscrew the Lock Ring (28) by turning the housing counter-clockwise.

The Motor Unit is now free to be removed from the Housing. Pull the Motor Unit out of the Housing. If the Motor Unit does not slide out freely, tap the front of the housing lightly with a wood or rawhide mallet.

DISASSEMBLY OF MOTOR UNIT:

Remove the Rear Bearing Plate (19) and Ball Bearing (18) by holding the Motor Unit in one hand and tapping the rear of the Rotor (22) shaft with a brass drive punch.

Next, remove the Spindle Adapter (29) by clamping the Rotor in a vice with soft jaws, then insert a 3/16" hex wrench in front of the Spindle Adapter and unthread it from the Rotor (22).

DISASSEMBLY OF MOTOR UNIT: ***(continued)***
The Front Bearing Plate (25) and Ball Bearing (27) can now be pressed off of the Rotor Shaft (22).

Caution: Do not lose the Bearing Spacer (24).

REPLACING COOLANT SEALS:
Tap out the old Seals (30) from the Seal Housing (31). Take care not to damage the bore of the housing. Install the lower Seal flush with the Seal Housing surface. The metal back of the Seal should be up. Next, turn the Seal Housing over and install the upper Seal. The metal back of the Seal should also be up. Press in the Seal so it is 0.055" to 0.060" below the housing surface. Press with a pusher of 1.240" to 1.235" diameter.

Check coolant inlet hole to see that it is not blocked by the seal edges.

ASSEMBLY OF MOTOR UNIT:
Before starting to assemble, make sure all parts are clean.

To correct for ball bearing tolerance, it is necessary to use Shims (26) to maintain correct clearance between the end of the Rotor (22) and the Front Bearing Plate (25).

The Shim (26) packet contains a 0.001" Shim and a 0.002" Shim.

If a Shim (26) was previously used, check the old Ball Bearing (27) for width and shim thickness. Check the width of the new Ball Bearing and use necessary Shims to obtain the same overall width as the old Ball Bearing set up.

Assemble the Bearing Spacer (24) onto the threaded end of the Rotor (22).

Install the front Ball Bearing (27) and a Shim (26), if needed, into the Front Bearing Plate (25) and then onto the Rotor (22) shaft by pressing on the inner race of the front Ball Bearing (27) and by supporting the Rotor (22) on the opposite end.

Now hold the Rotor (22) in your left hand and the Front Bearing Plate (25) in your right hand. Apply an outward (pulling) pressure. Observe the spacing between the end of the Rotor (22) and the Front Bearing Plate (25). They should not rub together. They should be flush, or up to a 0.002" clearance. If the Rotor (22) rubs the Front Bearing Plate (25), reduce the spacing between the Ball Bearing (22) and the Front Bearing Plate (25). Either remove the 0.002" Shim and substitute it with a 0.001" Shim; or remove the Shim entirely.

Thread the Spindle Adapter (29) onto the Rotor (22), and tighten onto the inner ball bearing race of the Front Ball Bearing (27).

Place the Cylinder (21) over the Rotor (22). Note: Be certain that the Cylinder (21) is not on backwards. The air inlet slot should be towards the Rear Bearing Plate (19).

Insert the Rotor Blades (23) into the Rotor (22).

Press the Rear Ball Bearing (18) into the Rear Bearing Plate (19). The motor unit is ready to assemble.

Support the Rotor assembly on the outer race of the front Ball Bearing (27).

ASSEMBLY OF MOTOR UNIT: ***(continued)***
Place the Rear Bearing Plate (19), with the rear Ball Bearing (18) installed, onto the end of the Rotor (22) by pressing on the inner race of the rear Ball Bearing (18). Start to press the rear Ball Bearing (18) onto the shaft. Note: the Guide Pin (20) must be lined up with the slot in the end of the Cylinder (21). Complete assembly by pressing the unit together until the Rear Bearing Plate touches the end of the Cylinder.

There should be a slight drag between the Bearing Plates (19 & 25) and the Cylinder (21) when these parts are moved with your fingers. Position the Cylinder until the unit turns finger free.

ASSEMBLE MOTOR INTO HOUSING:
Lube the housing bores. Insert the Motor Unit into the Motor Housing (17). The Spindle Adapter (29) should turn freely when the motor is in the housing. Thread the Lock Ring (28) onto the housing and tighten.

Use Spanner Wrench #45-2750 to tighten the Lock Ring (28) onto the Motor Housing (17).

Check the motor to see that it turns freely.

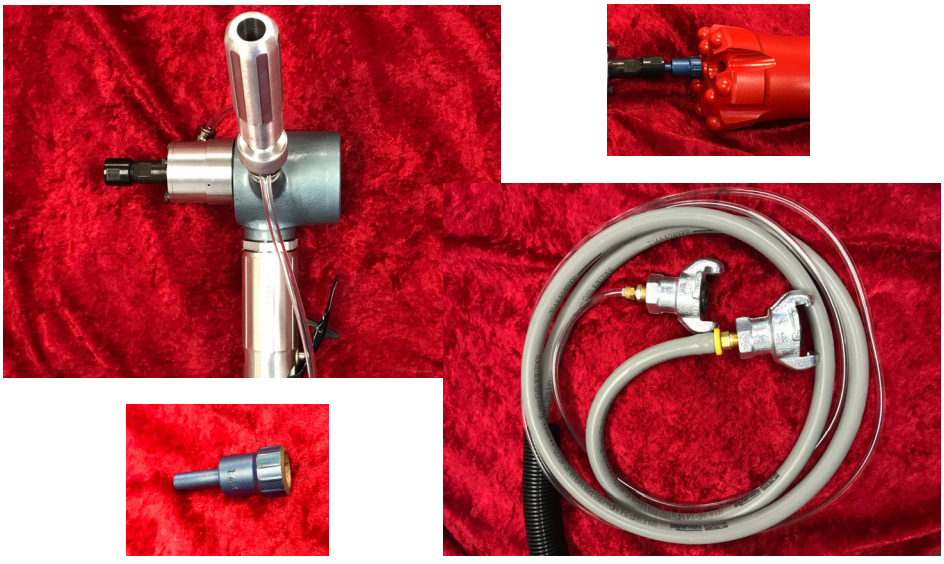
INSTALLING SEAL HOUSING:
Cover the threads of the Spindle Adapter (29). Slide the Seal Housing (31) onto the Spindle Adapter with the stepped down seal toward the Lock Ring (28). Orient the water inlet fitting to the supply tube.

Install the End Cap (42) and the four cap Screws (32) by tightening the cap Screws (32) down.

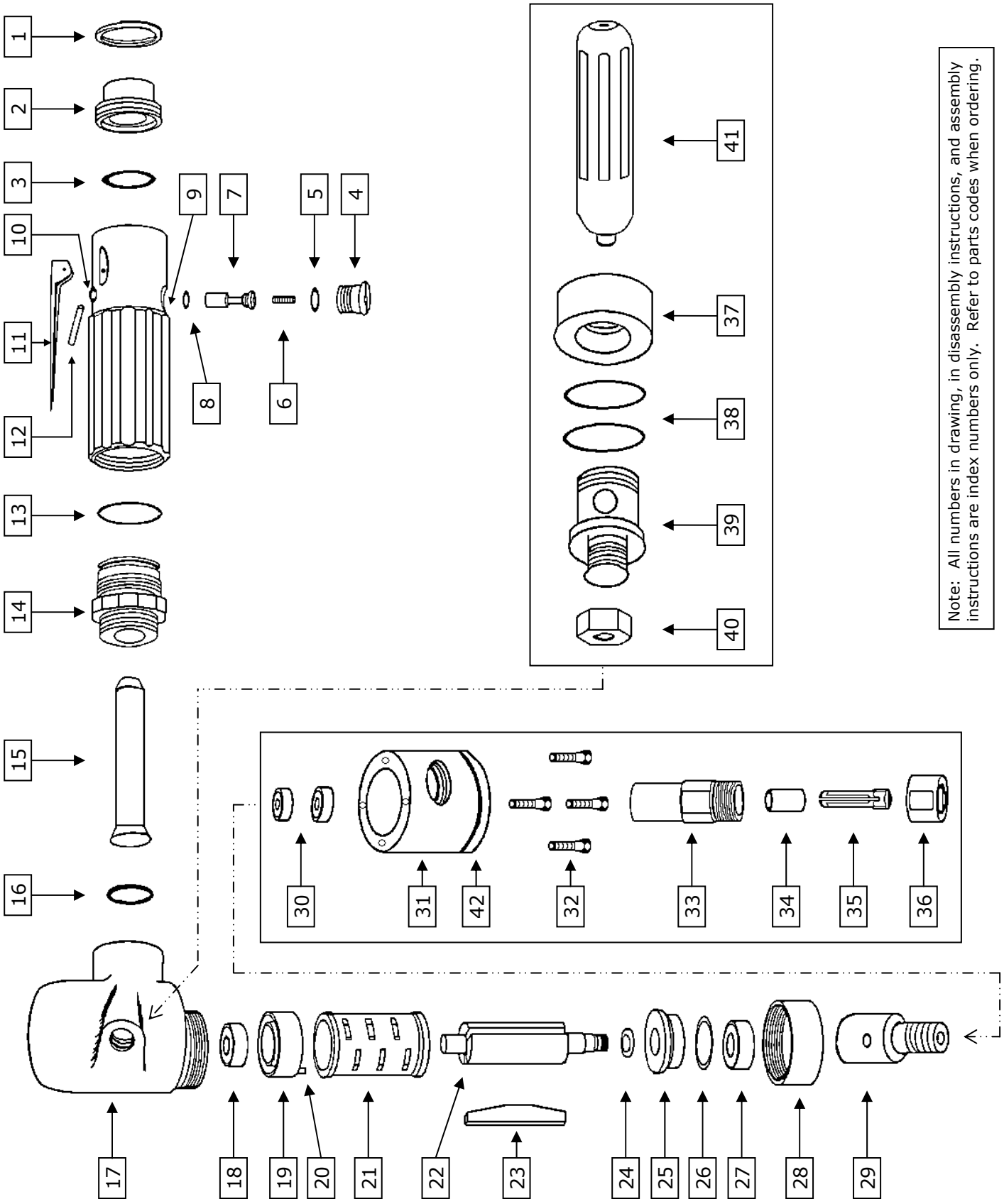
Lube the Spindle Adapter (29) threads and install the Chuck Body (33) onto the Spindle Adapter (29). Insert a 3/16" hex wrench into the end of the Spindle Adapter (29) and tighten the Chuck Body (33) down.

Slip the Shank Seal Tube (34) into the small end of the Collet (35). Place the Collet into the Chuck Body (33), then install the Chuck Cap (36).

PRE-OPERATION INSPECTION:
Before the Grinder is connected to the air line supply, be sure that the Spindle turns freely. The grinder should not be operated if there is any rubbing or binding in the assembly.



HAND GRINDER PARTS LIST:



Note: All numbers in drawing, in disassembly instructions, and assembly instructions are index numbers only. Refer to parts codes when ordering.

HAND GRINDER PARTS LIST *(continued)*:

Drawing Index Number	Description	Part Code
1	Retaining Ring	2690
2	Muffler	2685
3	O-Ring	1838
4	Plug	2734
5	O-Ring	1057
6	Spring – dual	2015A
7	Valve Stem	2008
8	O-Ring	2053
9	Throttle Housing	7753
10	Valve Bushing	2007
11	Throttle Lever	1019
12	Lever Pin	1042
13	O-Ring	3036
14	Lock Ring	2564
15	Divider Tube	2566
16	Seal	5201
17	Motor Housing	2567
18	Ball Bearing – rear	538
19	Rear Bearing Plate	7404
20	Guide Pin	1041
21	Cylinder	2255A
22	Rotor – 4 blade	7654
23	Rotor Blades – *4 required*	2253
24	Bearing Spacer	2017
25	Front Bearing Plate	2454
26	Shims – Packet of 0.001” & 0.002”	2488
27	Ball Bearing – Front	500
28	Lock Ring	7729
29	Spindle Adapter	7733
30	Seal – Coolant – *2 required*	7732
31	Seal Housing	7730
32	Screws – Socket Head (8-32 x 1/2”) – *4 required*	7731
33	Chuck Body	7734
34	Shank Seal Tube	7751
35	Collet – 5/16” diameter	214
36	Chuck Cap	7735
37	Valve Nut	7738
38	O-Ring	1130
39	Valve Body	7737
40	Jam Nut	2791
41	Dead Handle	2490
42	End Cap – Seal Housing	8033
33-A	Chuck Body – Wing Drive	9001
34-A	Shank Seal Tube – Wing Drive	9002

HAND GRINDER PARTS LIST *(continued)*:

Drawing Index Number	Description	Part Code
Not Shown	Tubing Ell with 45-0350	45-0347
Not Shown	Tubing Adapter with 45-0350	45-0346
Not Shown	Tubing Sleeve	45-0350
Not Shown	Coolant Tube	45-0349
Not Shown	Air Hose	45-1508
Not Shown	Over Hose	45-2682
Not Shown	Hose Coupling – *2 required*	45-0348
Not Shown	9/16” Wrench - Chuck (not included)	14-0809
Not Shown	3/4” Wrench - Chuck (not included)	14-0812

SUB-ASSEMBLIES AVAILABLE AS SERVICE PARTS:

Includes Drawing Index Number	Description	Part Code
4, 5, 6, 7, 8, 9, 10, 11, 12	Throttle Housing Assembly	7728
18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 29	Motor Sub-Assembly	7727
37, 38, 39, 40	Water Valve Assembly	7739

SERVICE TOOLS:

USAGE	Description	Part Code
28 – Lock Ring - 7729	Spanner	45-2750
30 – Seals - 7732	Seal Pusher	45-2750
30 – Seals - 7732	Seal Installation Tool	45-2753

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CARBIDE SELECTION

Carbide Designs

Perhaps the most fundamental decision when selecting different carbide configurations is profile shape. Button bits most commonly have either a hemispherical or semi-ballistic carbide design; however it is not uncommon to use other carbide designs as well. Below are selections of the different carbide designs offered by Rockmore International.

Carbide Configurations

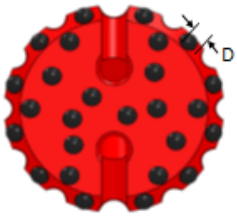
Most face designs for button bits are offered in multiple carbide configurations and typically differ in diameter, shape (i.e. profile) and quantity. There are some general guidelines to follow while selecting between multiple carbide configurations including resistance to wear, penetration rate, vibration, and specific rock conditions.

FASTER — PENETRATION RATE — SLOWER

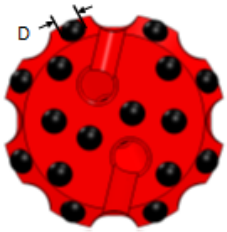
CONICAL | FULL BALLISTIC | SEMI BALLISTIC | CROWN POINT | HEMISPHERICAL

SOFTER — ROCK HARDNESS — HARDER

MORE, SMALLER DIAMETER CARBIDE RESULTS IN FASTER PENETRATION RATES, BUT SHORTER CARBIDE AND BIT LIFE.



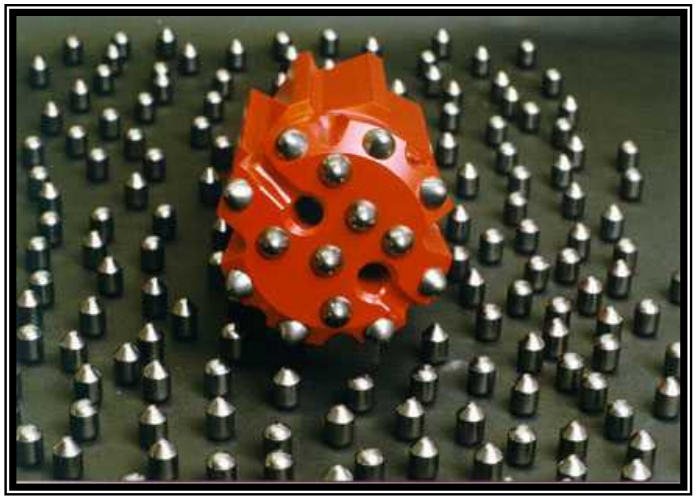
PENETRATION RATE VS. CARBIDE/BIT LIFE

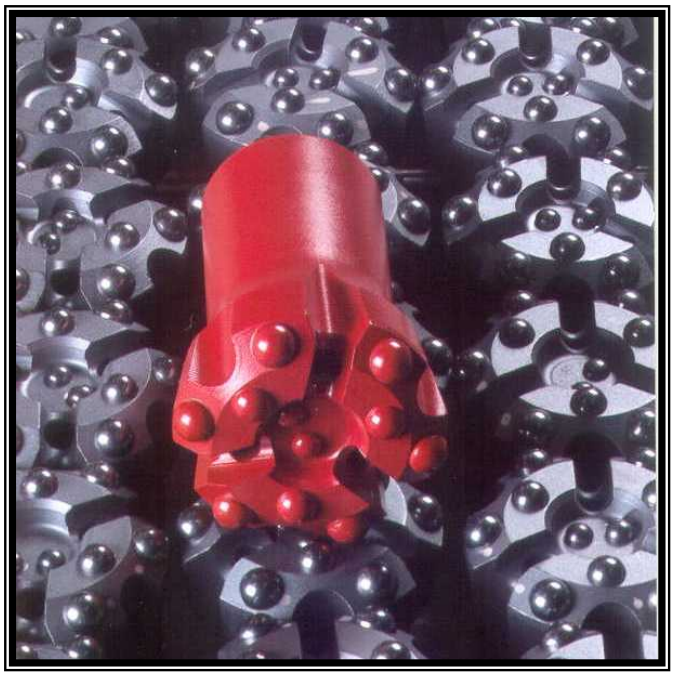


FEWER, LARGER DIAMETER CARBIDE RESULTS IN SLOWER PENETRATION RATES, BUT LONGER CARBIDE AND BIT LIFE.

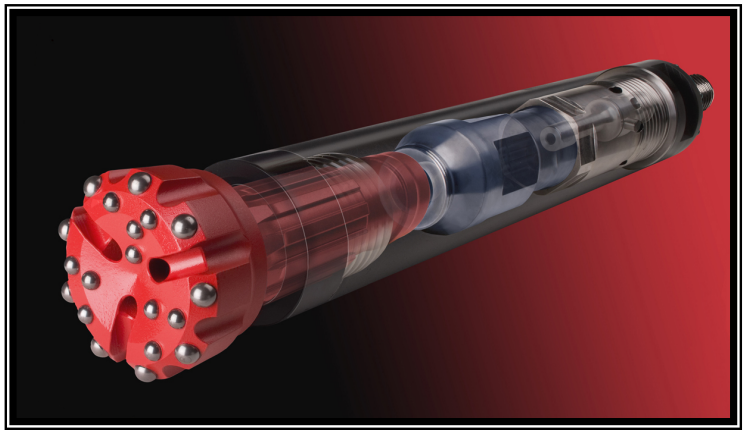
LESS — VIBRATION — MORE

BIT AND ROD VIBRATION INCREASES WHEN FEWER AND LARGER CARBIDE BUTTONS ARE SELECTED.






MULTIPOINT



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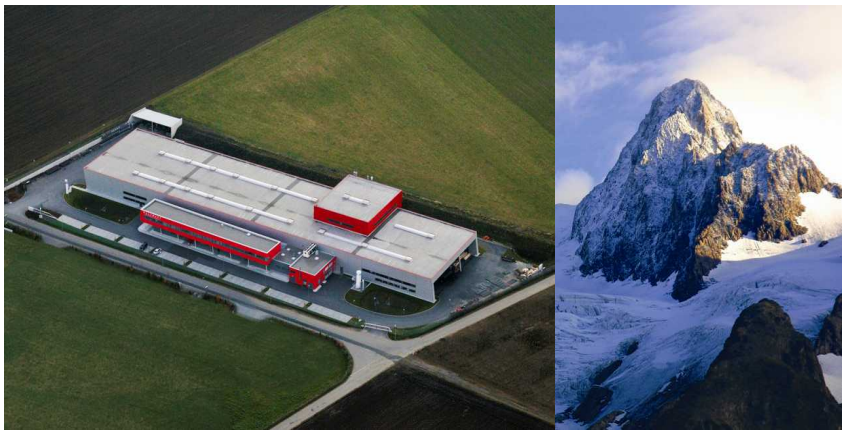

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