

# HG-105 Button Bit Hand Grinder

## **Set Up Instructions:**

A minimum air pressure of 90 psi (maximum of 115 psi) and 30 cfm is recommended for the best performance of the grinder. Piping, fittings, supply hose, should be of adequate size to maintain operation psi and cfm at the hand grinder while in operation.

Note: Use minimum of 3/4" ID pipe terminating at a filter/regulator/lubricator (required) then connect the supplied 8' air hose. The filter/regulator/lubricator unit will prolong the grinder's operation and useful lifespan.

Coolant pressure of 25 to 40 psi, is recommended. Adjusting the flow (handle control) to keep the unit cool will increase performance and prolong its life.

DO NOT over heat the carbide button as it can crack due to high temperature.

## **Lubrication of grinder motor:**

If the hand grinder is ever used without the required filter/regulator/lubricator (testing purposes) the air motor must be lubricated with a high grade of spindle oil such as SAE No.5 or equivalent with eight (8) to twelve (12) drops of oil per minute.

## **Loss of motor power:**

Seldom is it necessary to disassemble this grinder motor to correct for loss of power.

First check the air pressure; confirm 90 psi at the grinder while in operation. Next check the size and condition of the air supply hose and fittings to confirm they are not causing any air restrictions. Replace the air filter if dirty.

If loss of power continues, flush out the air motor as described later in the Service instructions.

## **Operation of grinder:**

The HG-105 hand grinder operates at 22,000 RPM and is designed so the user can regrind button bits with minimum inconvenience and maximum efficiency.

Grinding is accomplished by using the Carbide Button Grinding Tool or the Combination Button Grinding Tool, with cooling slot, to help keep the coolant

on the carbide button being reground, thus preventing metallurgical damage to the carbide button material by overheating when grinding.

We recommend that the carbide button should be reground when the button has a wear band or flat area of 1/8" or 3mm on smaller buttons, and 3/16" or 4-5mm on larger buttons. This will reduce the amount of carbide removed, reduce the regrinding time and will extend button life.

Insert a Button Grinding Tool into the collet until tool bottoms out against the collet seal, then tighten the collet cap with provided wrenches. Place the hand grinder and tool on a button to be ground and with sufficient down pressure to keep grinding tool on the button, depress the throttle bar and begin to grind the button. Be sure to use adequate coolant flow, to keep the button cool. Operated the grinder in small circular motion until the flat, or most of it has been removed. Repeat on all buttons.

The carbide buttons to be ground should have enough protrusion so that the grinding tool does not hit the body metal of the bit. If it does hit the bit body, the Steel Body Metal Grinding Tool should be used to remove the body metal around the buttons to get the proper protrusion. With the proper button protrusion the Carbide Button Grinding Tool can be used without damaging it. The HG-105 hand grinder has been designed to allow water, an anti-freeze/water solution, or QS Diamond Tool Coolant solution (at 25 to 40 psi) to be used. If a regular regrinding program is implemented the average bit can be reground between 10 and 15 times resulting in greater bit usage and less damage to other drill string parts, drill steel, couplings, striking bars, and hammers.

### **SERVICE INSTRUCTIONS**

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

Ball bearings are shielded. Care must be used in their assembly and disassembly. When pressing bearings onto shaft, press only on the inner race surface. When pressing bearings into bore, press only on outer race surface. *Caution: ball bearings are lubricated by the bearing manufacturer for the life of the bearing, do not clean the bearings with a solvent.*

### **Removing valve assembly:**

Refer to the main parts drawing and identify parts as removed.

The O-rings (5 & 8) should be replaced if the valve unit is removed from the throttle housing (9).

### **Removing seal assembly and motor unit:**

Remove the cap (36), collet (35), and seal tube (34).

Insert a 3/16" hex wrench into 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.

Remove the four cap screws (32), and end plate (42), then slide the seal housing (31) off of the spindle adapter (29). Then unscrew the lock ring (28), by installing two 8-32 x 1/2" long screws 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 screws 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 motor unit out of the housing. If motor unit does not slide out freely, tap front of the housing lightly, with a wood or rawhide mallet.

### **Disassembly of motor unit:**

Remove rear bearing plate (19) and bearing (18) by holding the motor unit in one hand and tapping the rear of the rotor shaft (22) with a brass drive punch. Remove the spindle adapter (29) by clamping rotor in a vice with soft jaws. Insert a 3/16" hex wrench in front of spindle adapter, and unthread from the rotor (22). Press the front bearing plate (25) and bearing (27) off of rotor shaft.

*Caution: do not lose the bearing spacer (26).*

## **ASSEMBLY INSTRUCTIONS**

### **Replacing coolant seals:**

Tap out the old seals (30) from the seal housing (31) taking care not to damage the bore of the housing. Install lower seal flush with seal housing surface with the metal back of seal facing up. Turn housing over and install second seal with the metal back facing up and press the seal in so it is .055" to .060" below 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 bearing tolerance it is necessary to use shims to maintain correct clearance between the end of the rotor and the front bearing plate. Shim packet (26) contains a .001" and .002" shim. Check old bearing for width and shim thickness. If a shim used, check the width of the new bearing and use shims to obtain the same overall width as the old bearing set up.

Assemble spacer (24) onto threaded end of rotor (22). Install front bearing (27) and shim (26), if needed, into the front bearing plate (25) and then onto the rotor shaft (22), by pressuring on the inner race of the bearing (27) and by supporting the rotor on the opposite end.

Hold rotor in left hand and the bearing plate in the right hand and apply an outward (pulling) pressure and observe the spacing between the ends of rotor and bearing plate. This should be from flush, not rubbing, to .002" clearance. If the rotor rubs against the bearing plate, reduce the spacing between the bearing and the bearing plate, by removing the .002" shim entirely, or by substituting a .001" shim.

Thread spindle adapter (29) onto rotor (22) and tighten onto inner bearing race of front bearing (27). Place cylinder (21) over rotor. *Note: be certain that cylinder is not on backwards, air inlet slot toward the rear bearing plate.* Insert the rotor blades (23) into the rotor. Press the rear bearing (18) into the rear bearing plate (19) and motor unit is ready to assemble.

Support rotor assembly on the outer race of bearing (27). Place rear bearing plate with bearing installed onto end of rotor and pressing on the inner race of bearing (18) start to press bearing onto shaft. *Note: the guide pin (20) must be lined up with slot in end of cylinder (21).*

Complete assembly by pressing unit together, until rear plate touches the end of the cylinder. There should be a slight drag between plates and cylinder when these parts are moved with the fingers. Position cylinder until unit turns finger free.

### **Assemble motor into housing:**

Lube housing bores. Insert motor unit into housing (17). Spindle adapter (29) should turn freely when motor is in the housing. Thread lock ring (28) onto the housing and tighten. Use spanner wrench #45-2750 to tighten lock ring. Check motor to see that it turns freely.

### **Installing seal housing:**

Cover threads of spindle adapter (29). Slide seal housing onto spindle adapter with the stepped down seal toward the lock ring (28). Orient the water inlet fitting to the supply tube.

Install end cap (42) and the (4 ea.) cap screws (32). Tighten cap screws. Lube the spindle adapter 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 and tighten the chuck body. Slip shank seal tube (34) into small end of collet (35) and place collet into the chuck body (33). Install the chuck cap (36).

**Pre-operation inspection:**

*Before grinder is connected to the airline supply, confirm the spindle turns freely. Grinder should not be operated if there is any rubbing or binding in the assembly.*

**Button Bit Regrinding Program Recommendations****1/2" diameter and smaller buttons:**

Bits with a wear band or flat of 3/32" to 1/8" - 2 to 3mm on the gauge buttons, is the best time to regrind the bit.

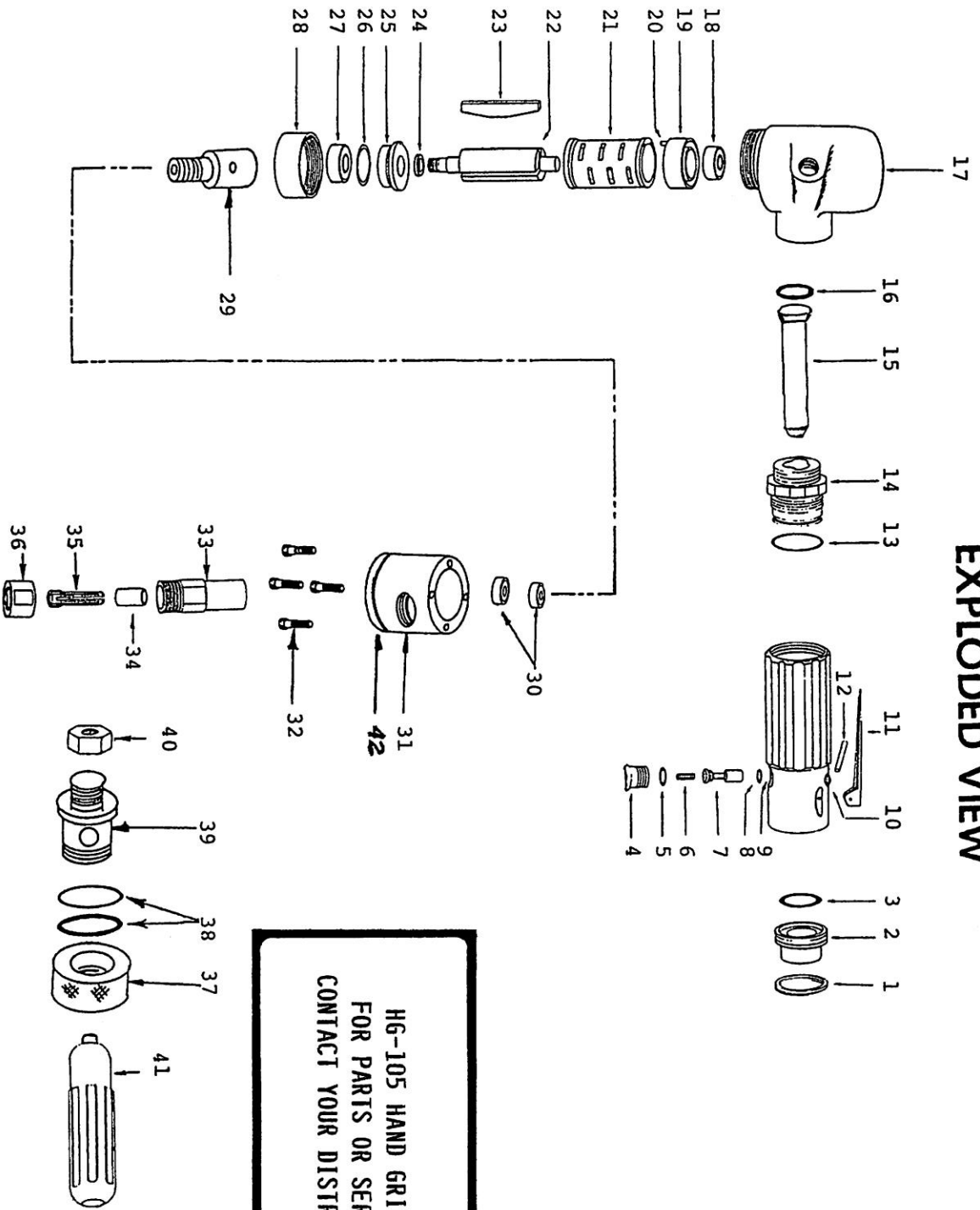
**9/16" diameter and larger buttons:**

Bits with a wear band or flat of 1/8" to 3/16" - 3 to 4mm on the gauge button is the best time to regrind the bit.

Regrinding at these points, will enable more bit usage. Your drilling efficiency, with the reground bit, will increase and reduce damage to your drilling equipment. Dull drilling bits will cause excessive loading and early breakdown of, hammers, striking bars, couplings, and bits.

**Dull drilling bits, results in slower drilling rates and more down time in your drilling operation. Regrind your dull bits early... it will pay to do so.**

# EXPLODED VIEW



**HG-105 HAND GRINDER  
 FOR PARTS OR SERVICE  
 CONTACT YOUR DISTRIBUTOR**

NOTE: ALL NUMBERS IN ABOVE DRAWING AND IN DISASSEMBLY AND ASSEMBLY INSTRUCTIONS ARE INDEX NUMBERS ONLY. REFER TO PARTS LIST FOR PART NUMBERS WHEN ORDERING.

<b>Index No.</b>	<b>Description</b>	<b>Part No.</b>
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	Lever	1019
12	Lever Pin	1042
13	"O" Ring	3036
14	Lock Ring	2564
15	Divider Tube	2566
16	Seal	5201
17	Motor Housing	2567-1
18	Ball Bearing - Rear	538
19	Rear Bearing Plate	7404
20	Locating Pin	1041
21	Cylinder	2255A
22	Rotor - 4 Blade	7654
23	Rotor Blades (4)	2253
24	Spacer	2017
25	Front Bearing Plate	2454
26	Shim Packet	2488
27	Ball Bearing - Front	500
28	Lock Ring	7729
29	Spindle Adapter	7733
30	Seal - Coolant (2)	7732
31	Seal Housing	7730
32	Screws – Socket Head (4)	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	Cap Seal Housing	8033
33-A	Chuck Body - Wing Drive	9001
34-A	Shank Seal Tube – Wing Drive	9002

<b>Index No.</b>	<b>Description</b>	<b>Part No.</b>
Not Shown	Tubing Ell W/45-0350	45-0347
Not Shown	Tubing Adapter W/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)	45-0348
Not Shown	9/16" Wrench - Chuck	14-0809
Not Shown	3/4" Wrench - Chuck	14-0812

### **Sub-Assemblies Available As Service Parts**

<b>Sub-Assembly No.</b>	<b>Description</b>	<b>Includes Index No.</b>
7728	Throttle Housing Ass'y	4,5,6,7,8,9,10,11,12
7727	Motor Sub-Ass'y	18,19,20,21,22,23,24, 25,26,27,29
7739	Water Valve Ass'y	37,38,39,40

### **Service Tools**

<b>Part No.</b>	<b>Description</b>	<b>Usage</b>
45-2750	Spanner	7729 Lock Ring
45-2752	Seal Pusher	7732 Seals
45-2753	Seal Installation Tool	7732 Seals

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