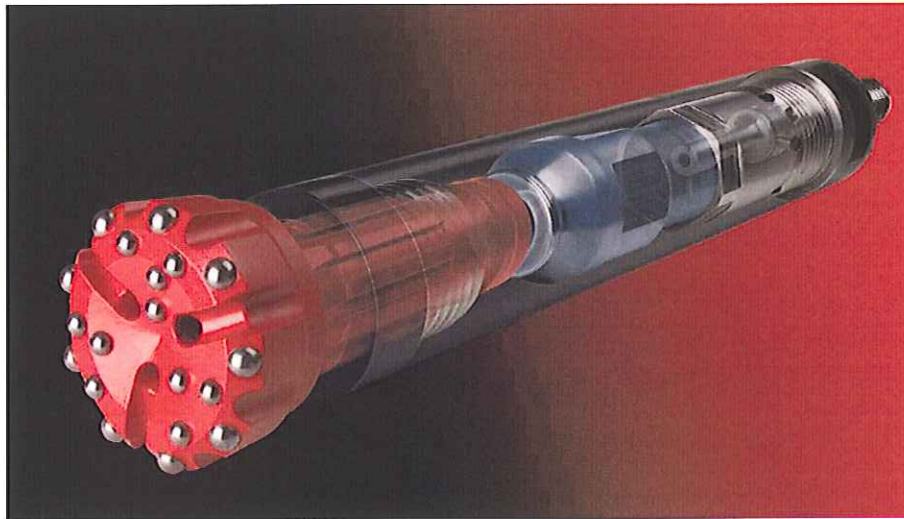




ROK 500DH

DEEP HOLE SERIES HAMMER OPERATION & SERVICE GUIDE



Patented SonicFlow Technology



**R O C K M O R E
I N T E R N A T I O N A L**

Rock Drilling Tools

Mining • Construction • Quarrying • Water-well • Geothermal

ROK 500DH DEEP HOLE SERIES HAMMER

OPERATION & SERVICE GUIDE

TABLE OF CONTENTS.....	PAGE
1 – Introduction	1
2 – Operation	2
2.1 – Initial Hammer Inspection.....	2
2.2 – Initiating the ROK 500DH Hammer	2
2.3 – Adjustable Choke System	3
3 – Hammer Maintenance.....	3
3.1 – Lubrication.....	3
3.2 – Contamination	4
3.3 – Corrosion	4
4 – Servicing	4
4.1 – Disassembly.....	4
4.2 – Clamp Zone.....	5
4.3 – Routine Inspection & Wear Limits	5
4.4 – Bit Assembly & Change Instructions	8
4.5 – Assembly.....	12
5 – ROK 500DH Deep Hole Series Hammer Parts List	12
6 – Safety.....	13
7 – Warranty	13

Rockmore International, Inc.
 10065 SW Commerce Circle
 Wilsonville, OR 97070
 USA

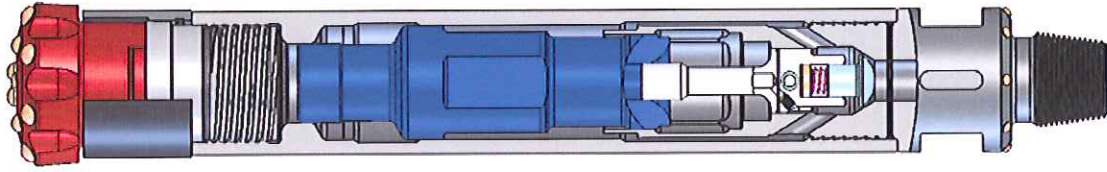
Phone: +1-503-682-1001
 Fax: +1-503-682-1002
 Email: info@rockmore-intl.com

Rockmore International GmbH
 Collini – Strasse 2
 A-8750 Judenburg
 Austria

Phone: +43 3572 86 300-0
 Fax: +43 3572 84 179
 Email: austria@rockmore-intl.at

www.rockmore-intl.com

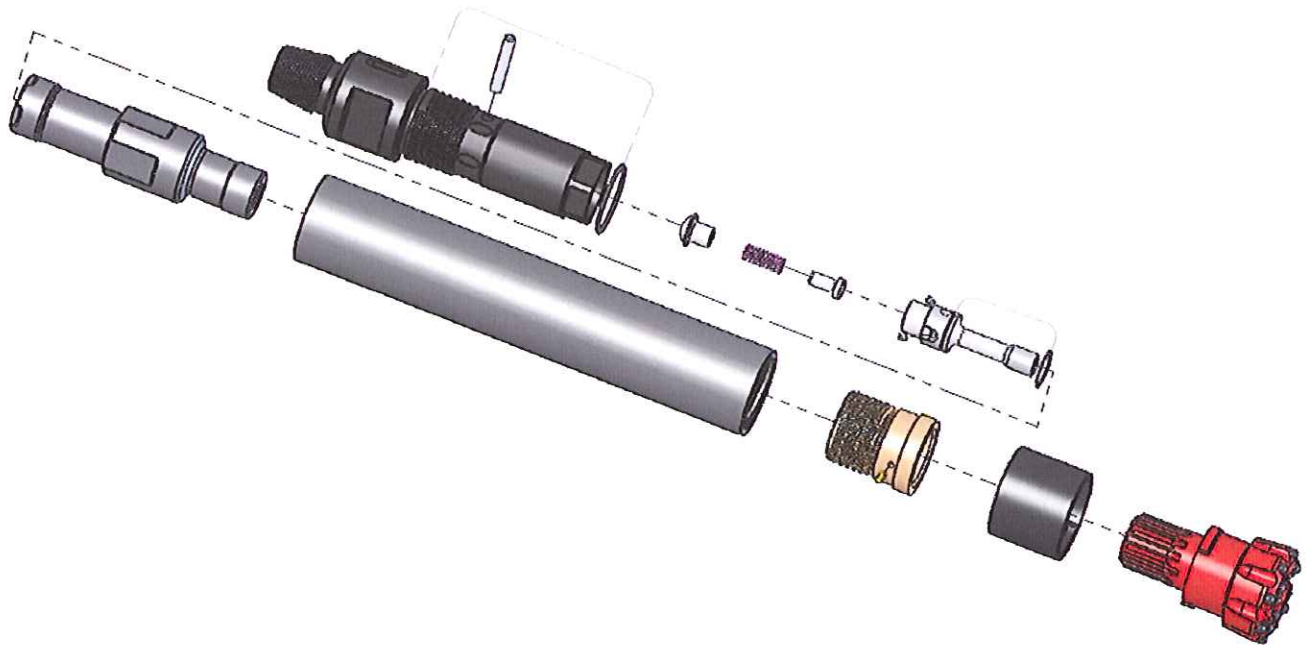




1. INTRODUCTION:

ROK 500DH Deep Hole Series High-Performance Hammers

Optimal energy transfer is essential to DTH drilling efficiency – how much compressed air power is delivered to the bit. That's why we've revolutionized airflow management in the new ROK series high performance DTH hammers. Our patented SonicFlow technology minimizes back flow and turbulence, enabling the Piston to hit the bit harder and with greater frequency. That means increased efficiency, more power, and faster penetration. And streamlined design means fewer parts and easier maintenance. So, for greater productivity get ready to ROK!



2. OPERATION:

2.1 – Initial Hammer Inspection

All ROK hammers are factory tested to ensure each hammer operates correctly at delivery. Upon delivery, inspect the contents in the crate to make sure you have ordered the correct ROK Series DTH hammer.

- Please take notice of the serial number stamped in the key flats on the Top Sub. Any service or warranty issue will require this serial number in order to start our warranty procedure.



2.2 – Initiating the ROK 500DH Hammer

We recommend using DH500 bits in good condition. Avoid using bits that are overrun, as this will alter your drilling penetration rates and can cause premature wear on various components of the hammer.

Inspect threads of the drill pipe and ROCKMORE Top Sub to ensure proper fit between the two components. Apply thread grease to the threads prior to fitting the hammer onto the drill pipe in order to avoid any galling or corrosion in this area. While fitting the hammer onto the drill pipe, it is important to avoid debris, dirt, or dust. This type of contamination can weaken the thread connection and thus alter drilling performance.

It is important to apply thread grease to the DTH bit shank and the ROCKMORE Driver Sub to allow for easier disassembly of the hammer. Thread grease should be reapplied at every bit change.

Our hammers are stocked and shipped with an adequate supply of rock drill oil. Prior to starting the hammer, it is crucial to add additional rock drill oil through the Top Sub. When adding oil, the hammer should be held upright so that the oil can lubricate all internal components. Please reference section 3.1 below for minimum amounts of rock drill oil required for all ROK Series DTH Hammers.

The percussive mechanism begins to operate as the air supply is turned on and when the drill bit is pushed firmly into the hammer. Excessive pressure is not needed to initiate the hammer. Rotate the hammer clockwise at approximately 30-rpm and the hammer will begin. The DTH bit will now push into the Driver Sub and percussive action begins. When the hammer is lifted from the rock face, the DTH bit extends from the Driver Sub and percussive action ceases. Extra air will pass through the hammer, which can be used to flush the hole clean. By adjusting airflow, air pressure, feed force and rotation optimal penetration rate and productivity can be achieved.

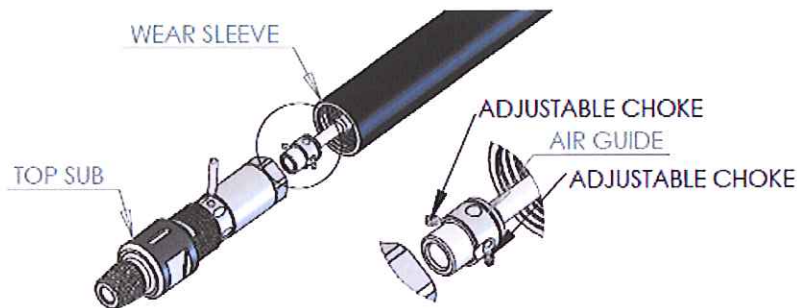
Rotation speed should be selected according to drilling conditions and drill rig capabilities. Please be aware that excessive rotation may result in premature wear on the drill bit and not better penetration rates.



2.3 – Adjustable Choke System

The ROK 500DH Deep Hole Series DTH hammer is a lean running hammer equipped with a threaded adjustable Choke system. This allows the user to adjust the volume of air that is used to power the Piston. The Chokes can be left closed to raise the pressure in the hammer. If there is too much air pressure in the hammer, the Chokes can be drilled out to keep the compressor from cycling. Back pressure from wet drilling can also be addressed by opening the Chokes. After disassembling the Top Sub, remove the Air Guide in order to drill out the Chokes.

Different size holes can be drilled into the threaded steel Chokes. A bigger hole will lower the power level and allow the excess air to help remove the cuttings and water. The Chokes may be drilled with a maximum hole size of 0.4" (10mm).



3. HAMMER MAINTENANCE:

3.1 – Lubrication

Proper lubrication is necessary for effective and efficient drilling operations. Inadequate amounts of lubrication may damage the hammer resulting in premature hammer failure. With insufficient amounts of lubrication the temperatures of the Piston surface can exceed 1400° F (752° C). These excessive temperatures generate heat checks (fine cracks) on the surface finish that may propagate through impact and initiate Piston failure. Improper oil selection may result in decarburization, which greatly reduces the tensile strength of the material allowing fractures to initiate.

The minimum amount of rock drill oil required for the operation of ROK 500DH Series DTH hammer is listed below.

Oil Consumption @ 350 psi (24.1 Bar)		
Hammer	l/hr	gal/hr
ROK 500DH	0.5	0.13



3.1 – Lubrication (continued)

Pneumatic rock drill oils are the only acceptable lubricants for DTH hammers. In ambient temperatures of 80° Fahrenheit (27° Celsius) or higher, use SAE 50 rock drill oil.

Several acceptable rock drill oils listed below:

	Medium SAE 30	Heavy SAE 50
Exxon	Aroc 150	Aroc 302
Shell	Torcula 150	Torcula 320
Texaco	Rock Drill Lube 100	Rock Drill Lube 320
Chevron	Vistac 150	Vistac 320
Rockmore	Hammer Guard	

3.2 – Contamination

Contamination is another common cause of DTH hammer and bit failures. Be sure to keep all connections covered and clean at all times. It is a good idea when connecting a hammer to a drill string to cover the connection to the hammer and blow high-pressure air and water through the drill string for several seconds to remove any loose scale, rust or other foreign materials. When installing a bit in the hammer, take care to remove any cuttings or foreign material from the bit shank.

3.3 – Corrosion

Corrosion is another common cause of DTH hammer and bit failures. Corrosion is the deterioration of a material due to a reaction with its environment. The best preventative action against corrosion is to keep the DTH hammer well lubricated with rock drill oil. In addition, when finished drilling with foam/polymers, it is necessary to rinse all drilling tools with fresh clean water and lubricate them properly. Prolonged exposure to the atmosphere creates a corrosive reaction between the steel and the foam.

The most detrimental type of corrosion encountered in DTH hammers is oxidation cavitation (finite notches in the material surfaces). The easiest areas for this condition to exist are in the non-moving areas of the hammer. For example, thread roots and O-ring grooves are common places to find oxidation cavitation.

4. SERVICING:

4.1 – Disassembly

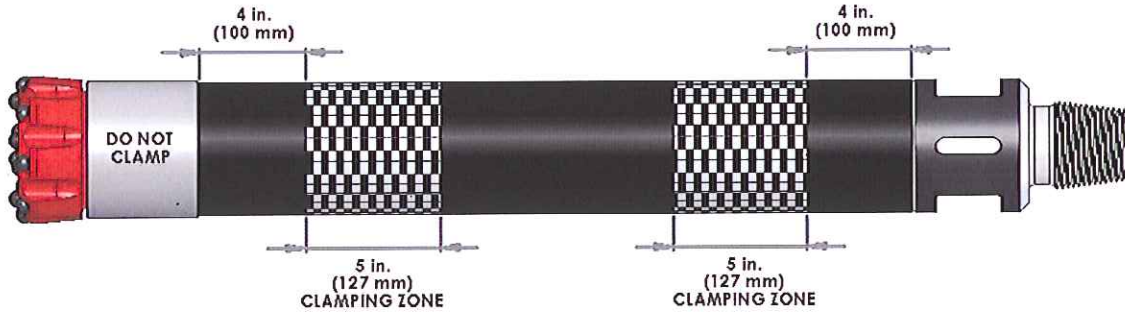
The ROK hammers use right-hand threads.

Use tools appropriate for removing the Driver Sub and the Top Sub from the Wear Sleeve of the ROK hammer. Do not apply heat to the hammer. Do not hit the hammer or apply excessive force with improper tools as this could initiate cracks, reduce operating life, and would void any warranty.



4.2 – Clamp Zone

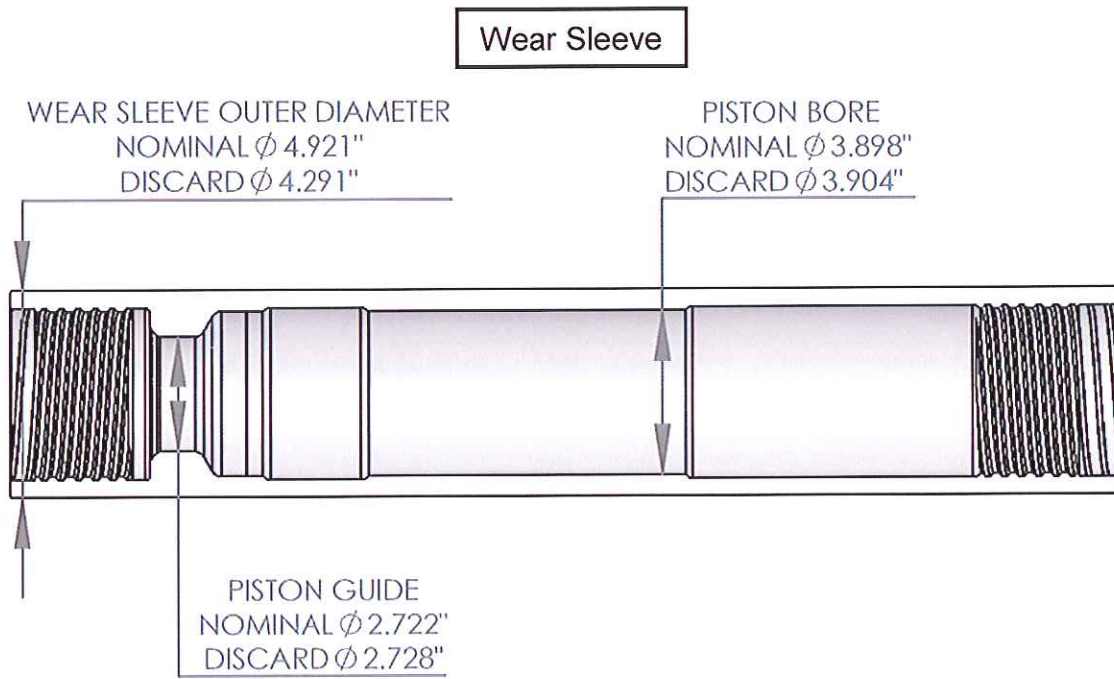
When disassembling the hammer, place the clamps in the area shown below away from threads. Placement of clamps on any other section of the Wear Sleeve can cause severe damage, alter drilling performance, and void any warranty. Do not clamp on the Bit Retaining Sleeve to break the Bit loose. Use a Bit Basket or Petal Wrench on the Bit to break the threads of the Driver Sub loose.



4.3 – Routine Inspection & Wear Limits

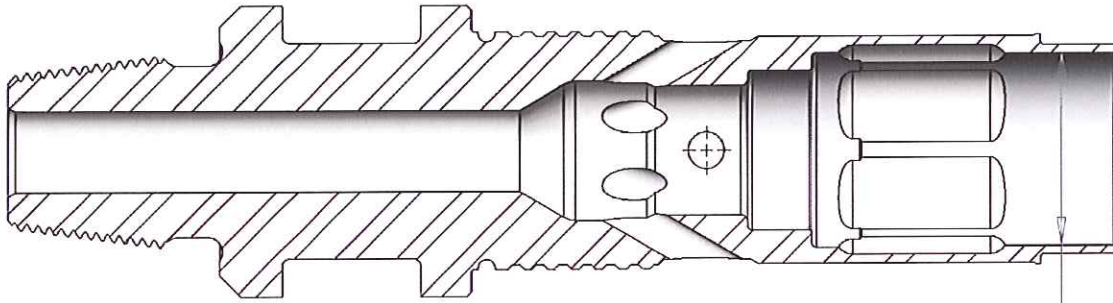
Regularly inspect all parts carefully for any signs of damage – galling, cracks, corrosion. Any sharp edges should be removed from the Piston striking face using emery paper or files. In cases of severe galling or cracking, we strongly recommend replacing the Piston to avoid further damage to the hammer. Galling and cracking can be signs of poor lubrication techniques or contamination. Please refer back to sections 3.1 and 3.2 on lubrication and contamination.

The amount of wear on all major components (Wear Sleeve, Retaining Sleeve, Piston, Air Guide, and Top Sub) should be regularly inspected and checked. Please refer to the following **Wear Limits diagrams** for recommended **discard limits**.



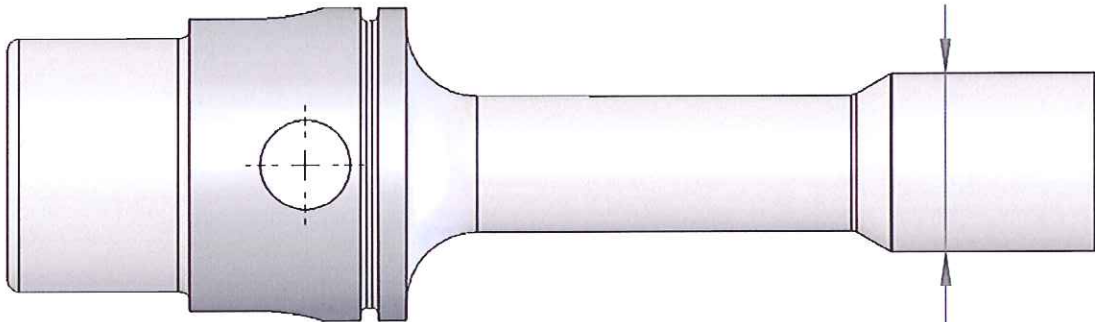
4.3 – Routine Inspection & Wear Limits (continued)

Top Sub



TOP SUB INNER DIAMETER
NOMINAL ϕ 3.268"
DISCARD ϕ 3.273"

Air Guide

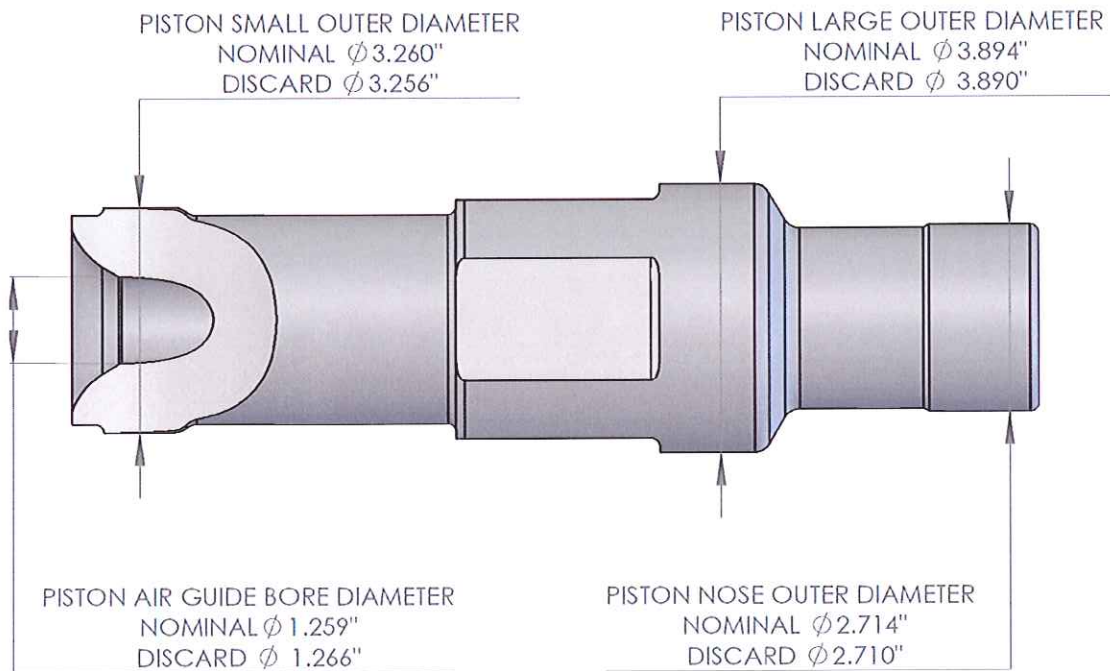


AIR GUIDE FINGER OUTER DIAMETER
NOMINAL ϕ 1.252"
DISCARD ϕ 1.248"



4.3 – Routine Inspection & Wear Limits (continued)

Piston

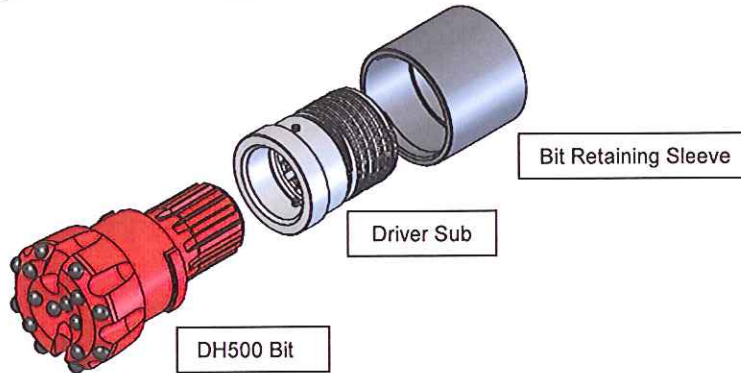


Retaining Sleeve

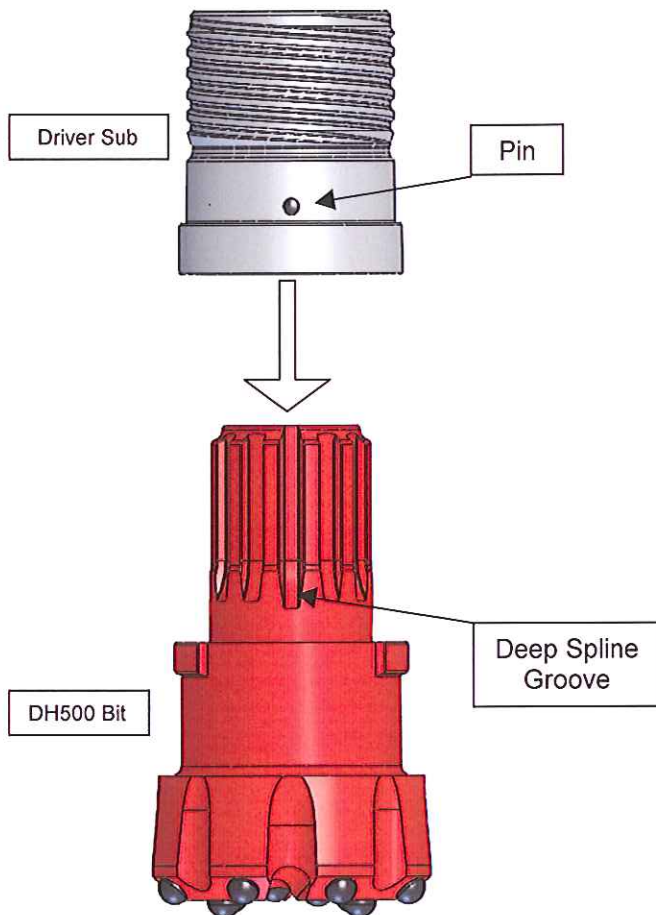


4.4 – Bit Assembly & Change Instructions

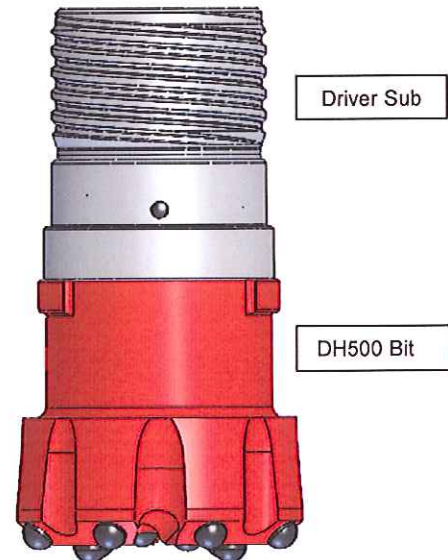
The ROK 500DH Hammer has a unique bit retention system that eliminates the chance of losing a shanked head in the hole. We recommend using the below steps to properly assemble the Bit, Retaining Sleeve and Driver Sub onto the hammer. To remove the bit for maintenance, for storage, or to change the Bit, follow the steps in the reverse order.



Step 1: Align the Pins on the Driver Sub with the Deep Spline Grooves on the Bit Shank.

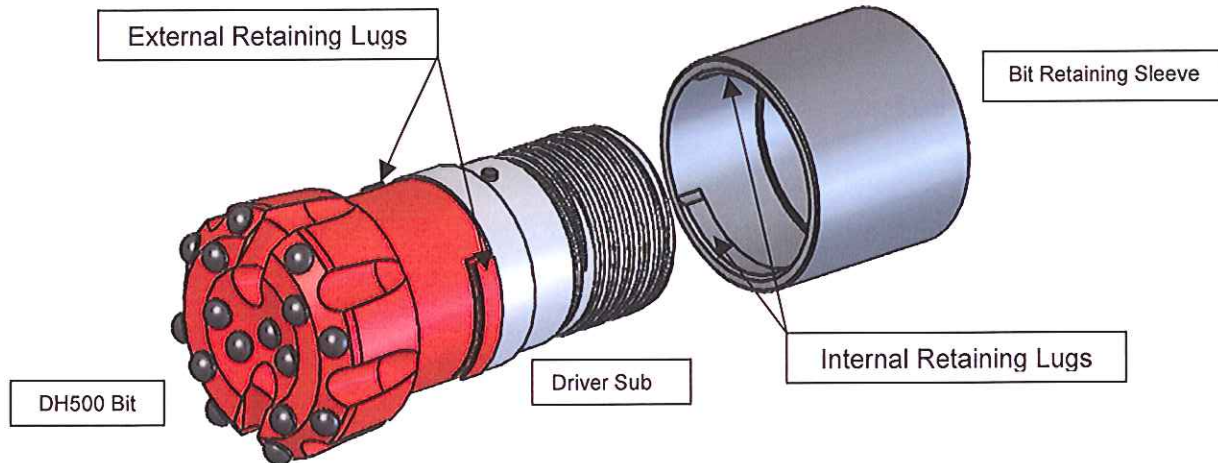


Step 2: Push the Driver Sub onto the Bit Shank.

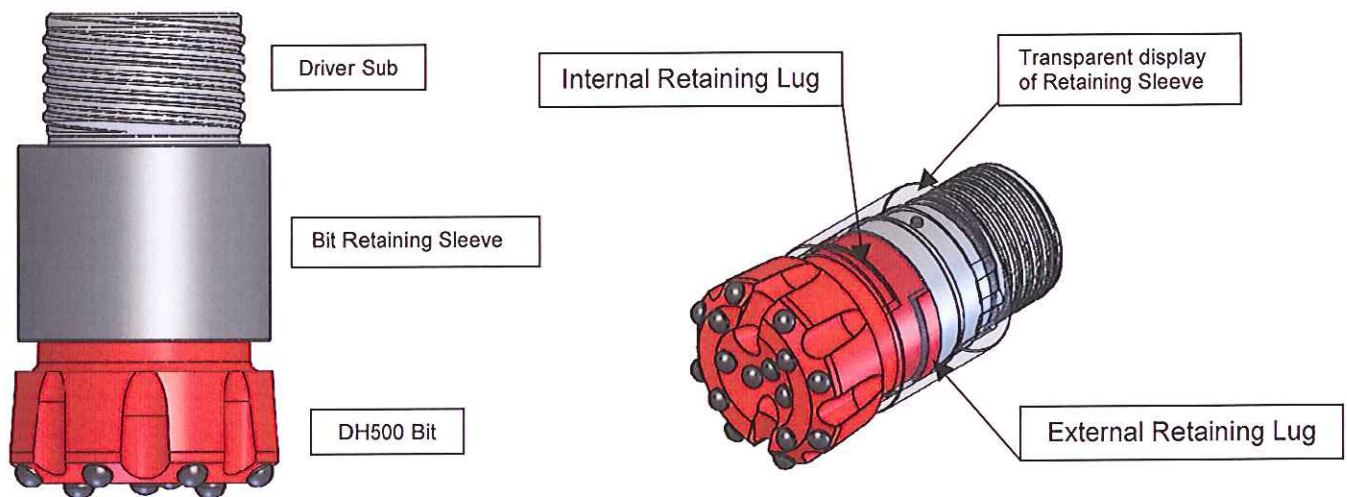


4.4 – Bit Assembly & Change Instructions (continued)

Step 3: Rotate the Retaining Sleeve so that the Internal Retaining Lugs are opposite the External Retaining Lugs on the bit. (Note: Make sure that the Internal Retaining Lugs of the Bit Retaining Sleeve are toward the bit when assembling.)

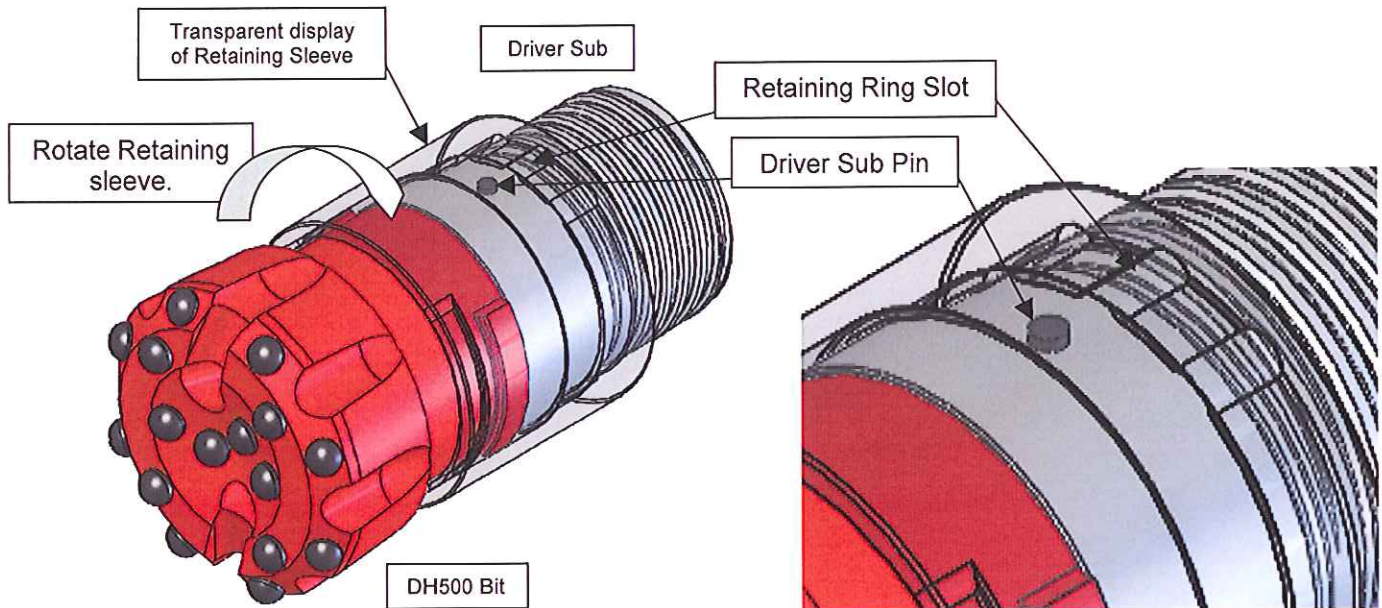


Step 4: Guide the Retaining Sleeve over the Driver Sub so that the Internal Retaining Lugs and the External Retaining Lugs go past each other.

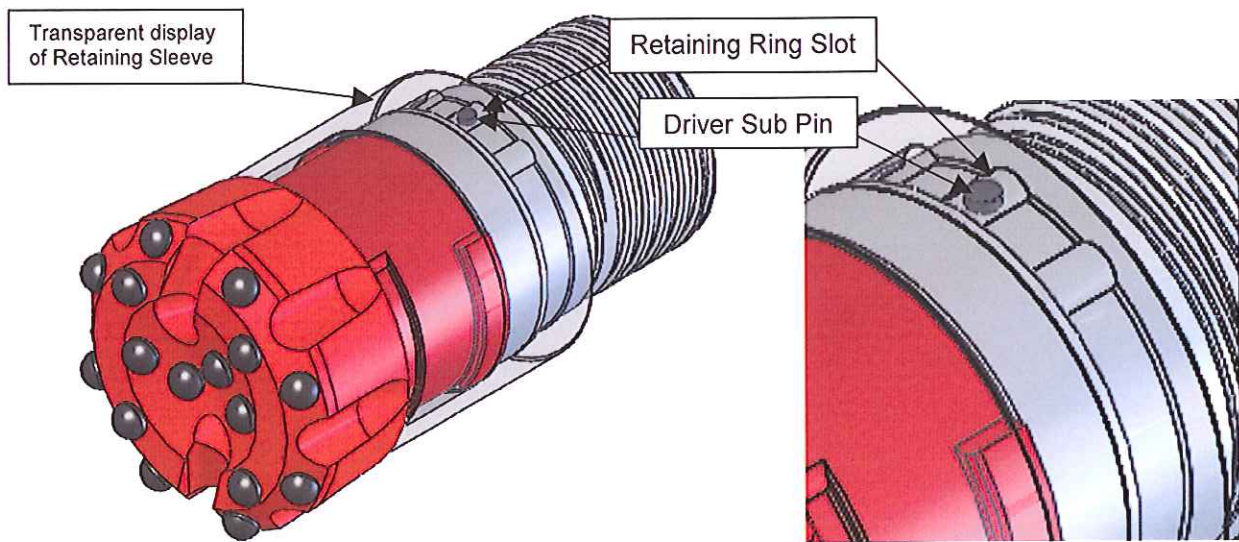


4.4 – Bit Assembly & Change Instructions (continued)

Step 5: Rotate the Retaining Sleeve around the Driver Sub 90° (1/4 turn) so that the pins on the Driver Sub line up with the slots on the “up string” side of the Retaining Sleeve.

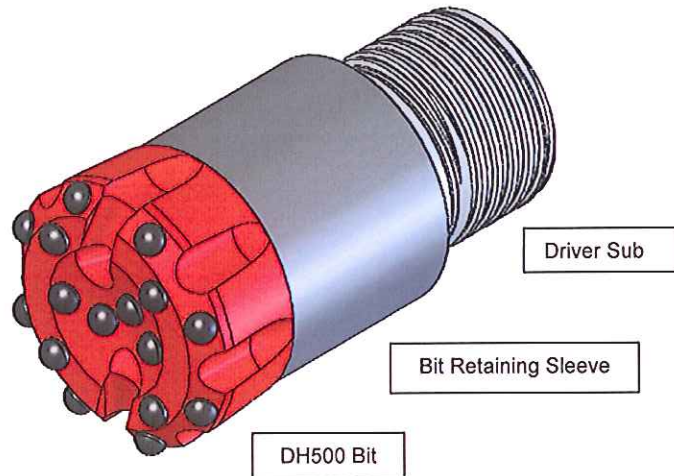


Step 6: Push the Retaining Sleeve toward the bit head so that the pins on the Driver Sub engage with the slots on the “up string” side of the Retaining Sleeve.

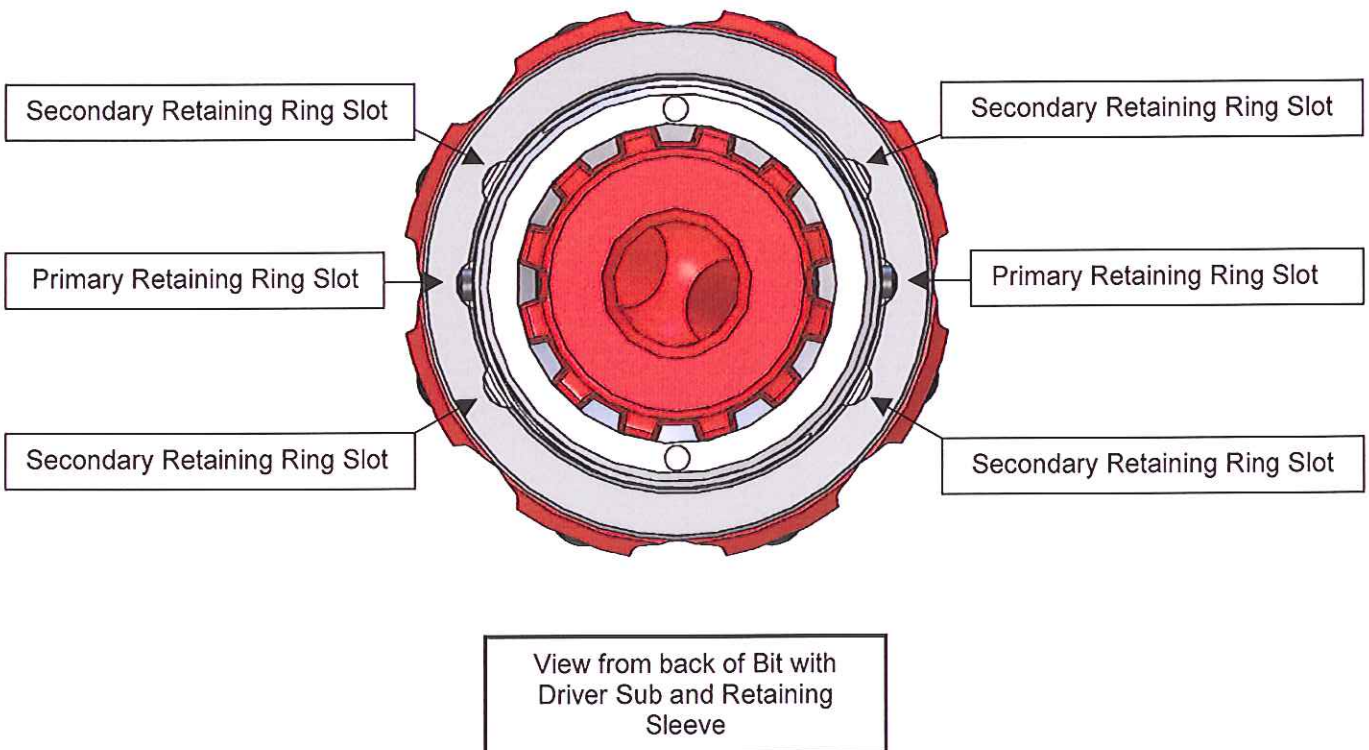


4.4 – Bit Assembly & Change Instructions (continued)

Step 7: The Bit, Driver Sub, and Retaining Sleeve are now ready to be threaded into the Wear Sleeve.



Note: The Retaining Sleeve can be rotated to distribute wear from the flushing grooves of the Bit. Just align the Secondary Slots on the Retaining Sleeve with the Pins on the Driver Sub. See below.

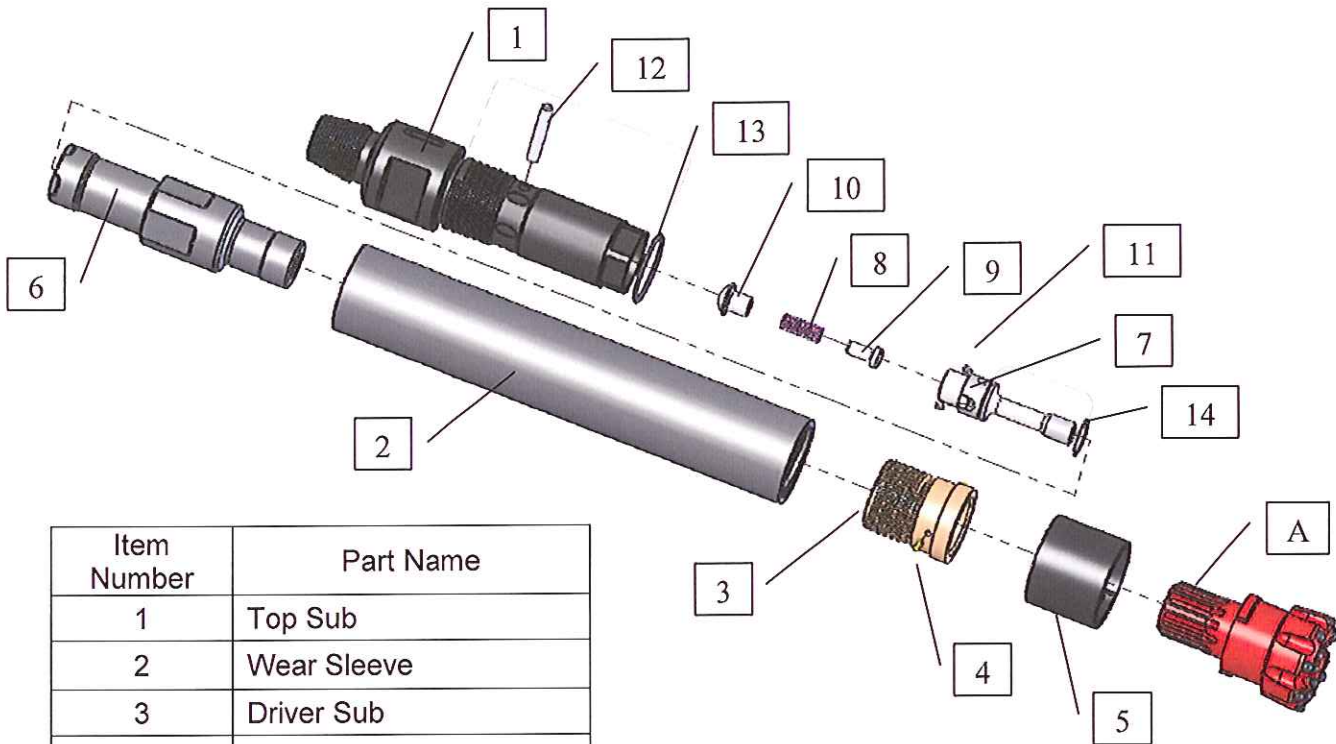


4.5 – Assembly

Remove and polish all galling and burrs with emery paper. Particularly during the replacement of broken components, extra care must be taken to be certain that the mating surfaces were not damaged.

Carefully lubricate all internal hammer parts again with rock drill oil and coat threads with thread grease prior to reassembly. Use a soft-headed hammer tool to carefully tap components together to ensure proper alignment. Never use excessive force.

5. ROK 500DH DEEP HOLE SERIES HAMMER PARTS LIST:



Item Number	Part Name
1	Top Sub
2	Wear Sleeve
3	Driver Sub
4	Dowel Pin, <i>quantity of 2</i>
5	Retaining Sleeve
6	Piston
7	Air Guide
8	Spring
9	Spring Rest
10	Check Valve
11	Choke, <i>quantity of 2</i>
12	Pin
13	O-ring (Top Sub)
14	O-ring (Air Guide)
A	Rockmore DH500 Shank



6. SAFETY:

The percussive hammer drilling environment poses many opportunities for injury for the careless and unprepared. Be sure to work safely at all times. Rotating equipment can entangle loose clothing. Loud noises accompany the hammer operation and high-pressure air can throw dust and debris. Protect your sight and hearing with appropriate safety equipment. Keep your hands and feet clear of the borehole at all times. Keep fingers from getting trapped between the hammer and the bit.

7. WARRANTY:

ROCKMORE guarantees all ROK Series Hammers and spare parts to be free of raw material and manufacturing defects. Warranty coverage is valid for six months after date of shipment.

In order to be eligible for warranty service, you must first file a claim and obtain a Returned Goods Authorization number, authorizing you to return the goods to our facility. All goods returned to us, either new or used must be returned prepaid freight. Please contact your local salesman or the appropriate office directly for more information.

ROCKMORE reserves the right to refuse claims associated with the following problems:

- Damage caused by applying excessive force to any components of the hammer
- The use of non-original ROCKMORE hammer parts
- Any attempt to physically altering any components of the hammer, in particular but not limited to the application of heat or weld
- Failure to follow recommended operating and maintenance procedures (i.e. lubrication, contamination, corrosion, clamp zone)
- Failures due to abuse, misuse, careless maintenance and repairs
- Common wear and tear during normal drilling procedures

The recommended maximum operating air pressure level for our ROK Series hammers is 350 PSI (24.1 Bar). The ROK Series Hammers can handle air pressures more than this level; however operating at pressures above 350 PSI will invalidate the warranty.

Liability

ROCKMORE shall not be liable for any claims that occur from personal injury due to negligent procedures, handling, operation, and/or maintenance of ROCKMORE DTH hammers and bits. ROCKMORE will decline any liability for failure to disregard recommended health and safety measures, i.e. protective eye wear and clothing, safety glasses, etc.



For all your rock drilling tool needs contact
ROCKMORE INTERNATIONAL



USA

Phone: 503-682-1001
Fax: 503-682-1002
E-mail: info@rockmore-intl.com

10065 SW Commerce Circle
Wilsonville, OR 97070, USA

AUSTRIA

Phone: 43-3572-86300
Fax: 43-3572-84179
E-mail: austria@rockmore-intl.at

Collini - Strasse 2
A-8750 Judenburg, Austria



www.rockmore-intl.com