

**NUMA**<sup>®</sup>  
MANUFACTURER OF DOWN HOLE HAMMERS AND BITS

**Champion**<sup>®</sup> **330**  
**CARE & MAINTENANCE**  
**INSTRUCTIONS**

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## WARRANTIES AND REMEDIES

### LIMITED WARRANTY

Numa warrants that the Product will be new and free from defects in material and workmanship under normal use as contemplated by this Contract for a period of six (6) months from the date of shipment.

Except for the foregoing warranty, Numa disclaims all warranties and representations wherever made, including warranties of merchantability, durability, length of service, or fitness for a particular purpose.

Any alteration or modification of the original product without the express written consent of Numa will void this warranty.

### REMEDY

If, during such warranty period, Buyer promptly notifies Numa in writing of any defect and establishes that the above warranty is not met, Numa shall either repair or replace the Product or credit the customer, as it deems necessary to meet the warranty.

Such repair, replacement, or credit of Product shall constitute complete fulfillment of Numa's obligation under this warranty, and upon the expiration of the original warranty period, all of Numa's obligations hereunder shall terminate.

### LIMITATION OF LIABILITY

Numa shall not be liable to Buyer whether in contract, in tort (including negligence and strict liability), under any warranty or otherwise, for any special, indirect, incidental or consequential loss or damage whatsoever, including (without limitation) loss arising from delay, cost or capital and loss of profits or revenues. The remedies set forth in this Contract are exclusive, and the total cumulative liability of Numa under this Contract or for any act or omission in connection therewith or related thereto, whether in contract, in tort (including negligence and strict liability), under any warranty or otherwise, is limited to the price paid by Buyer for the Product.

The **WARNINGS**, **CAUTIONS** and **NOTES** used throughout the text of this instruction book are defined as follows:

**WARNING** A specific procedure or practice that must be strictly followed, or a specific condition that must be met, to prevent possible bodily harm.

**CAUTION** A specific procedure or practice that must be strictly followed, or a specific condition that must be met, to prevent damage to the equipment.

**NOTE** Important supplemental information.

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# SECTION I DESCRIPTION

## GENERAL DESCRIPTION

The Champion 330 is a valveless, pneumatically operated tool designed to utilize Numa 32" to 42" (813 mm to 1067 mm) diameter bits in rock formations under a wide range of operating conditions.

The Champion 330 hammer design incorporates a thick wall case. The non ported case design allows for a large bore diameter in conjunction with optimum life against abrasion. The simple design of the Champion 330 provides performance and dependability without sacrificing tool life.

The Champion 330 is designed for universal applications using air pressure from 100 PSI to 200 PSI (6.8 Bar to 13.6 Bar) with compressors having capacities of 3000 CFM (1416 Litres/ Second) or more. Depending on the hole size, rod size and rock conditions, additional hole cleaning air or foam may be required. When drilling conditions require supplementary hole cleaning, additional hole cleaning air can be passed through the hammer by utilizing an interchangeable choke. All standard hammers shipped from Numa have a blank choke installed. Refer to page 15 for correct choke selection and pages 7 and 10 to facilitate the removal and the installation of the choke.

<i><b>Champion 330</b></i>		
Weight w/o Bit	12556 lbs.	(5695 kg)
Outside Diameter	28"	(711 mm)
Hammer Length:		
Shoulder to Shoulder	89-1/2"	(227 cm)
Shoulder to Bit Face	105-1/2"	(268 cm)
Backhead API Thread	10 Beco Pin	

Table 1-1 General Hammer Specifications

32"	(813 mm)	4910 lbs.	(2227 kg)
34"	(864 mm)	5125 lbs.	(2329 kg)
36"	(914 mm)	5300 lbs.	(2409 kg)
38"	(965 mm)	6740 lbs.	(3064 kg)
39-1/2"	(1003 mm)	6925 lbs.	(3148 kg)
42"	(1067 mm)	7332 lbs.	(3333 kg)

Table 1-2 General Bit Specifications

### NOTE

NUMA 32" TO 42" (813 MM TO 1067 MM) BITS ARE AVAILABLE IN A REVOLUTIONARY FLAT FACE DESIGNS WITH LARGE AIR FLUSHING HOLES AND CHIP WAYS TO TAKE ADVANTAGE OF THE CHAMPION 330 PERFORMANCE. OTHER SIZES MAY BE AVAILABLE UPON REQUEST.

## FUNCTIONAL DESCRIPTION

### 1. BACKHEAD



The backhead connects the hammer to the drill rod with double start threads. It is threaded into the top end of the case with a large cross section thread form and into the drill rod with a standard 10" Beco pin thread. Wrench flats are provided for disassembly.

### 2. CHECK VALVE SEAT



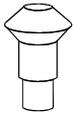
The check valve seat provides a replaceable sealing surface for the check valve.

### 3. CHECK VALVE HOUSING SPACER



The check valve housing spacer positions the check valve housing in the backhead to insure proper movement of the check valve.

### 4. CHECK VALVE



The check valve maintains pressure in the hammer when the air supply has been shut off. The check valve in the hammer balances the hydrostatic pressure in the hole thereby preventing contaminants from entering the hammer.

### 5. CHECK VALVE SPRING



The check valve spring provides tension under the check valve to keep it closed. It is compressed as the air is turned on.

### 6. CHECK VALVE HOUSING



The check valve housing guides the check valve and the check valve spring. The main air supply is directed to the feed tube through ports located in the check valve housing.

### 7. BELLEVILLE WASHERS



The belleville washers keep the feed tube housing tight against the shoulder in the hammer.

### 8. FEED TUBE RETAINER



The feed tube retainer keeps the feed tube seated in the proper location. The feed tube retainer also allows air to flow to the piston and feed tube.

## 9. FEED TUBE HOUSING



The feed tube housing is aligned in the main bore of the hammer. It sits against a shoulder in the case and is held in position by the backhead and belleville washer combination. The feed tube housing locates and aligns the feed tube.

## 10. FEED TUBE



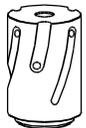
The feed tube supplies air to the piston. It seats on a shoulder in the feed tube housing and is designed with a long bearing surface to maintain alignment in the feed tube housing.

## 11. CHOKE



The interchangeable choke is located in the tip of the feed tube and is held in place with a press fit. A set of two chokes is supplied with each hammer. By installing the correct choke, the hammer can be fine tuned to the compressor package.

## 12. PISTON



The piston functions as the only moving part in the hammer, controlling the operational air cycle. The percussive action of the piston striking the bit transfers the energy through the bit in order to fracture rock formations.

## 13. CASE



The case is designed to contain the internal parts which make up the hammer assembly. The case is hardened to resist wear and to extend life in abrasive conditions.

## 14. BIT BEARING



The bit bearing guides the top end of the bit to insure proper alignment between the piston and the bit. The bit bearing is positioned into the chuck end of the case and is held in place by the snap ring.

## 15. SNAP RING



The snap ring sits in a groove in the case and retains the bit bearing.

## 16. BIT RETAINING RINGS



The bit retaining rings are designed to allow the bit to move between the drilling and cleaning positions and prevent the bit from coming completely out of the hammer. The bit retaining rings consist of two matched halves and are held together with the bit retaining ring o-ring.

17. THRUST WASHERS



Two brass thrust washers, one located between the backhead and the case and one between the chuck and the case, provide for easy disassembly.

18. CHUCK



The chuck threads into the bottom end of the case with a large cross section thread form. It has internal splines that transmit rotation to the bit through a set of delrin drive plates. Wrench flats are provided for disassembly.

19. CHUCK BUSHING



The chuck bushing is a nylon insert located in the bottom end of the chuck to provide a bearing surface between the lower bit shank and the chuck.

20. DRIVE PLATES



The plastic drive plates provide wear protection for the splines. They are inserted between the chuck and the bit. A complete drive plate set is sent with each bit.

## SECTION II MAINTENANCE

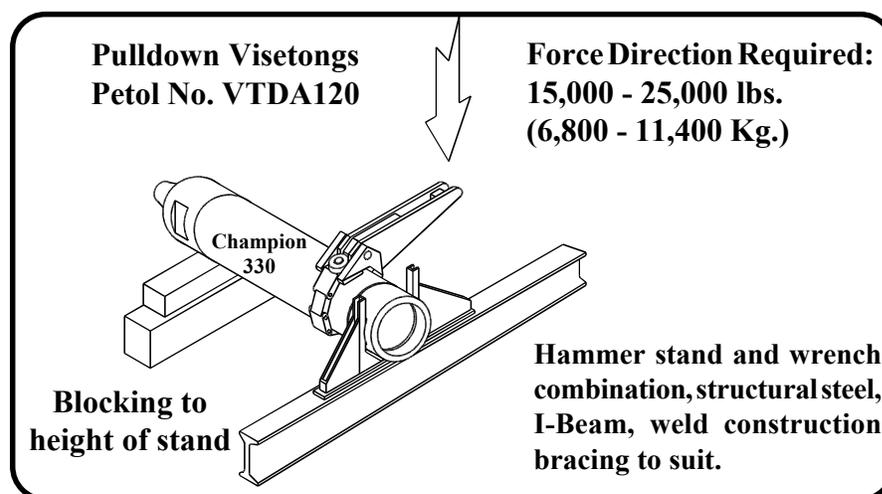
### DISASSEMBLY

- Maintenance should be performed in a clean environment.

#### CAUTION

USE CAUTION WHEN HANDLING DOWN THE HOLE HAMMER PARTS. NUMA HAMMER PARTS ARE MANUFACTURED FROM HARDENED, HEAT TREATED MATERIALS. DROPPING OR STRIKING THESE PARTS MAY CAUSE SEVERE DAMAGE. STRIKING THE HAMMER PARTS WITH HAMMERS, CROWBARS OR LIKE INSTRUMENTS WILL VOID THE WARRANTY.

- Tools needed: hammer stand, 26" (660 mm) "J" or fork wrench (possibly incorporated in the hammer stand), overhead crane or lift truck, pulldown visetong with a 28" (711 mm) diameter capacity or a self contained power wrench capable of 200,000 foot pounds (27,624 KGM) of torque, 2" (51 mm) diameter brass rod or mild steel rod 3 to 5 feet (1 m to 1.5 m) long, snap ring pliers, a drift pin and several different sized screwdrivers.
- Clean the outside of the hammer. This will insure a good surface to clamp on.
- Using an overhead crane or lift truck of appropriate capacity, place the hammer on a hammer stand and secure it in the wrench. The chuck end can be held by the 26" (660 mm) flats, in the wrench. The backhead is also held in the 26" (660 mm) wrench. Place the visetongs on the area of the case where the bit bearing is located when working on the chuck end of the hammer. When working on the backhead end of the hammer, place the chain vise on the area of the case where the feed tube housing is located.



**Hammer Stand/Wrench Diagram**

Figure 2-1

### CAUTION

THE ACCEPTABLE CLAMPING AREAS START 11-1/2" (292 MM) FROM THE CASE END, TO AN ADDITIONAL 10" (254 MM) BEYOND THIS POINT ON BOTH THE CHUCK AND BACKHEAD END OF THE CASE. PLACING THE VISETONGS ON THE AREA OF THE CASE WHERE THE PISTON CYCLES CAN DISTORT THE CASE, RESTRICT PISTON MOVEMENT AND VOID THE WARRANTY.

- With the chuck secured in the fork wrench (see figure 2-1), loosen the joint by turning the case with the visetongs. Remove the hammer from the wrench and turn the hammer end to end in the hammer stand / wrench. With the backhead flats secured in the fork wrench (see figure 2-1), loosen the joint by turning the case with the visetongs.
- With the crane or lift truck, move the hammer into an upright position with the chuck end down. With an adequate lifting device, lift and support the hammer while unscrewing and removing the chuck, bit, bit retaining rings and bit retaining rings o-ring. After setting the hammer down, and while lifting and supporting the backhead, unscrew and remove the backhead from the case.
- Remove the backhead o-ring and thrust washer from the backhead.
- Remove the belleville washers from the top of the feed tube assembly.
- Remove the thrust washer from the chuck.
- Remove the drive plates from the chuck.
- Remove the o-ring from the bit retaining rings.
- Removal of the chuck bushing is not necessary for routine maintenance. If necessary, position the chuck so the bit end is facing you. Locate the seam in the chuck bushing. Insert a screwdriver into the slot in the middle of the seam and pry the chuck bushing from the under cut. Remove the chuck bushing from the bit end of the chuck.
- Using a 2" (51 mm) diameter brass rod, slide the piston against the feed tube assembly and push the feed tube assembly out the backhead end of the case.
- Slide the piston out the backhead end of the case.
- Lay the backhead on its side. Using a broom handle, go through the API thread end of the backhead and tap out the feed tube retainer, check valve housing, check valve, checkvalve spring and check valve housing spacer. The check valve seat will remain in the backhead. This part only acts as a spacer and does not need to be removed.

- It is not necessary to remove the bit bearing for routine maintenance. If necessary, the snap ring must be removed first. Using a large screwdriver and the slot provided in the snap ring groove, pry one end of the snap ring up and out of the groove. Pull and twist the snap ring toward the chuck end of the case, until it is clear of the groove. Using a 2" (51 mm) diameter rod, knock the bit bearing toward the chuck end of the case. The bit bearing is a tight slip fit in the case. However, rust or corrosion may make it difficult to move and a penetrating oil can be used to help with removing the bit bearing from the case.
- Disassembly of the feed tube assembly is not necessary for routine maintenance. If necessary, tap on the choke end of the feed tube. This will cause the feed tube to protrude from the feed tube housing. Grasp the feed tube and slide it out of the feed tube housing. Slide the feed tube compression ring off the choke end of the feed tube. Place the feed tube collar toward the work bench. Using a drift pin, tap the choke from the feed tube pressing diameter. The choke will fall out of the collar end of the feed tube. Using a small screwdriver, pick the two feed tube o-rings from the smallest bore of the feed tube housing.

## ***INSPECTION***

- All parts should be washed in a clean solvent before they are inspected and reassembled.

**WARNING**  
USE CLEANING FLUIDS THAT ARE NONFLAMMABLE AND AVOID  
BREATHING THE FLUID VAPORS.

- Handle all parts carefully, hardened parts may chip if dropped on a hard surface.

## ***BACKHEAD***

- Inspect the threads for cracks and burrs.
- Remove all burrs on the thread area with a fine file.
- Replace if necessary.

## ***CHECK VALVE***

- The check valve should be smooth and free from abrasions.
- Replace if necessary.
- Replace the check valve spring if it is worn or broken.

## ***FEED TUBE ASSEMBLY***

- Inspect the outside diameters for nicks, burrs and scoring.
- Inspect all makeup surfaces for indentations or nicks caused by wear.
- Remove all minor irregularities with emery cloth.
- Inspect the choke to insure that it is properly seated.
- Replace if necessary.

## ***PISTON***

- Inspect the striking face, inside and outside diameters for nicks, scoring and cracks.
- Polish the piston with emery cloth to remove all minor irregularities, cracked pistons should be replaced.
- Wash the piston thoroughly, inside and out, to remove all emery dust.

### **CASE**

- Inspect the outside diameter for excessive wear or cracks. Inspect the internal case bore for scoring.
- Remove all minor irregularities with fine honing stones.
- Clearance between the piston and the case should not exceed .030" (.76 mm).
- Replace if the outside diameter is worn to 27" (686 mm) or less near the chuck end.

### **BIT BEARING**

- Inspect the inside and outside for nicks and burrs.
- Remove all internal irregularities with a fine honing stone.
- Remove all external irregularities with emery cloth.
- Clearance between the bit shank and bit bearing should not exceed .048" (1.22 mm).
- Replace if necessary.

### **SNAP RINGS**

- Inspect the snap rings for severe wear indications.
- Replace if necessary.

### **CHUCK**

- Inspect for cracks and burrs.
- For continued use, the outside diameter should be larger than the outside of the case or the same. Collar length should not be less than 6-3/4" (171 mm).

#### **CAUTION**

IF THE COLLAR LENGTH IS LESS THAN 6-3/4" (171 MM) AND THE BIT IS UNDER LOAD CONDITIONS, CONTACT BETWEEN THE SHOULDER OF THE BIT RETAINING RINGS AND THE BOTTOM OF THE BIT RETAINING RING AREA ON THE BIT COULD CAUSE THE BIT TO FAIL IN THIS AREA.

- Torsional play in the splines should not exceed .375" (9.5 mm).
- Inspect the drive plates and chuck bushing.
- Replace if cracked or worn.

### ***O-RINGS***

- Inspect for damage such as cracks and deformations.
- Replace if necessary.

### ***THRUST WASHERS***

- Inspect for damage such as cracks and deformations.
- Replace if necessary.

## **GENERAL ASSEMBLY INSTRUCTIONS**

- Assembly should be performed in a clean environment.
- All parts should be cleaned thoroughly and wiped dry before assembly.
- Oil all parts by hand using Rock Drill Oil (see table 5-1 on page 16) to insure easy assembly.
- Coat all thread connections and thrust washers with a thread compound to allow joints to thread easily.

### ***FEED TUBE ASSEMBLY***

- Install the feed tube o-rings in the two grooves located in the smallest inside diameter of the feed tube housing.
- With the smaller diameter of the choke toward the collar end of the feed tube bore, slide the choke all the way to the pressing diameter. Using a long drift pin, tap the choke into the pressing diameter.
- Using the piston as a fixture, place the smallest diameter of the feed tube housing against the top of the piston, lining up the bores. Put the feed tube compression ring over the feed tube. Insert the choke end of the feed tube into the feed tube housing. Slide the feed tube into the feed tube housing until the collar rests against the housing shoulder. Remove the assembly from the piston.

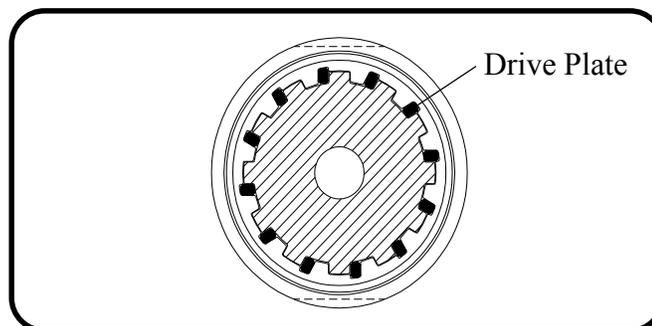
### ***CHECK VALVE ASSEMBLY***

- Place the backhead on its side. Install the check valve seat o-rings around the check valve seat.
- Align the check valve seat into the backhead. Using a large plastic rod and hammer, tap the check valve seat into the backhead until the check valve seat is seated against the shoulder inside the backhead.

- Insert the check valve housing spacer.
- Insert the check valve housing, containing the check valve, check valve spring.
- Align the feed tube retainer, with the feed tube retainer o-rings installed, toward the backhead and tap the feed tube retainer into the backhead until it seats against the check valve housing.

## HAMMER ASSEMBLY

- Insert the bit bearing into the chuck end of the case. This should be a close slip fit. Making sure the bearing makes contact with the shoulder provided for it in the case, insert the snap ring into the groove at the chuck end of the bit bearing diameter.
- Slide the piston into the backhead end of the case. Push the piston all the way to the chuck end. The piston should ride in the case smoothly. Push the piston back to the backhead end to facilitate the assembly of the feed tube assembly.
- Install the feed tube assembly into the backhead end of the case, making sure it is firmly against the shoulder in the case. It is easier if the feed tube end can be supported in the piston ID at initial installation. This requires the piston to be at the backhead end of the case prior to feed tube assembly installation. Due to close tolerances, caution is advised when inserting the feed tube assembly. It should not be forced into the case.
- Install the chuck bushing in the chuck. With the bit face down, place the chuck over the top of the bit. Align the splines and lower the chuck completely onto the bit. Rotate the chuck counterclockwise until the splines meet and insert the drive plates between the chuck and bit splines. See Figure 2-3.



*C330 Drive Plate Positioning as Viewed from Top  
Figure 2-3*

- With the crane or lift truck and appropriate lifting device, set the hammer case assembly in an upright position with the chuck end down. Install the belleville washers in the backhead end on the feed tube assembly. See the stacking diagram on page 13 for proper installation. Assemble the backhead o-ring in the groove in the backhead. Lift the backhead, place the thrust washer against the thread shoulder and thread the backhead into the case. Prior to lifting the hammer by the backhead,

the case to backhead thread joint must be tightened as much as **MANUALLY** possible (see note below). This will assure full thread contact when using the backhead to lift the entire assembly.

#### **NOTE**

DUE TO THE INTERNAL COMPRESSION SPRINGS, THE CHAMPION 330 BACKHEAD CAN ONLY BE **FULLY** TIGHTENED WITH A POWER WRENCH ON THE RIG.

#### **CAUTION**

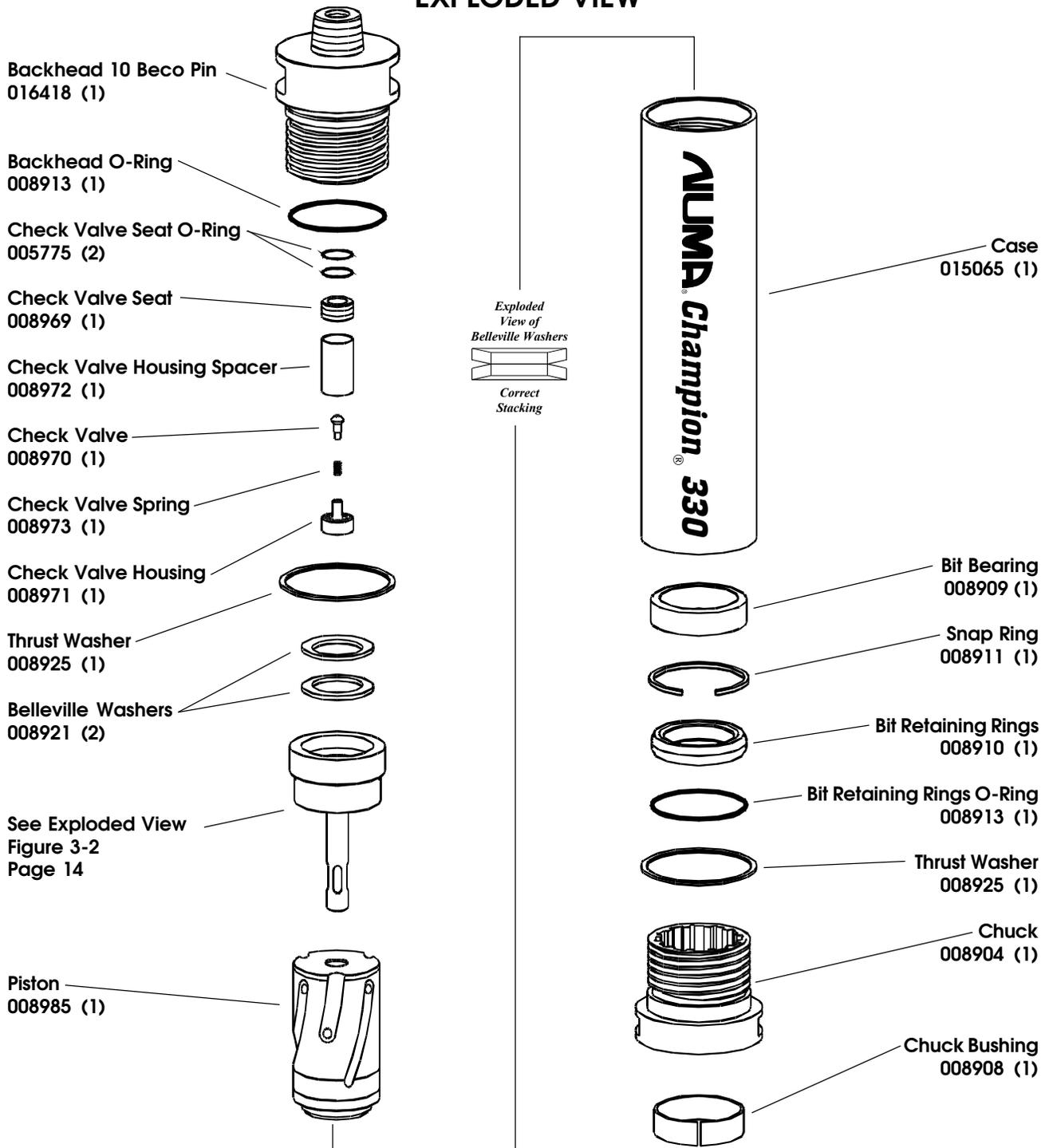
LIFTING THE CHAMPION 330 HAMMER WITH THE THREAD JOINTS LOOSE MAY CAUSE DAMAGE TO THE THREADS

- Lifting and supporting the entire unit, place the bit retaining rings with the o-ring installed on top of the chuck. Place the thrust washer on the shoulder of the chuck. Placing the chuck assembly beneath the hammer, thread the hammer down on the chuck threads until flush to the thrust washer.

#### **CAUTION**

DUE TO CLOSE TOLERANCES BETWEEN THE CHAMPION 330 INTERNAL PARTS AND THE CASE, NUMA CANNOT ACCEPT RESPONSIBILITY FOR DAMAGE CAUSED BY WELDING ON THE CASE OD. WELDING ON THE CASE CAN CREATE DISTORTION, CAUSE PREMATURE FAILURE AND VOID THE WARRANTY. CONTACT NUMA FOR SPECIAL INSTRUCTIONS IF WELDING THE CASE BECOMES UNAVOIDABLE.

## SECTION III PARTS IDENTIFICATION EXPLODED VIEW

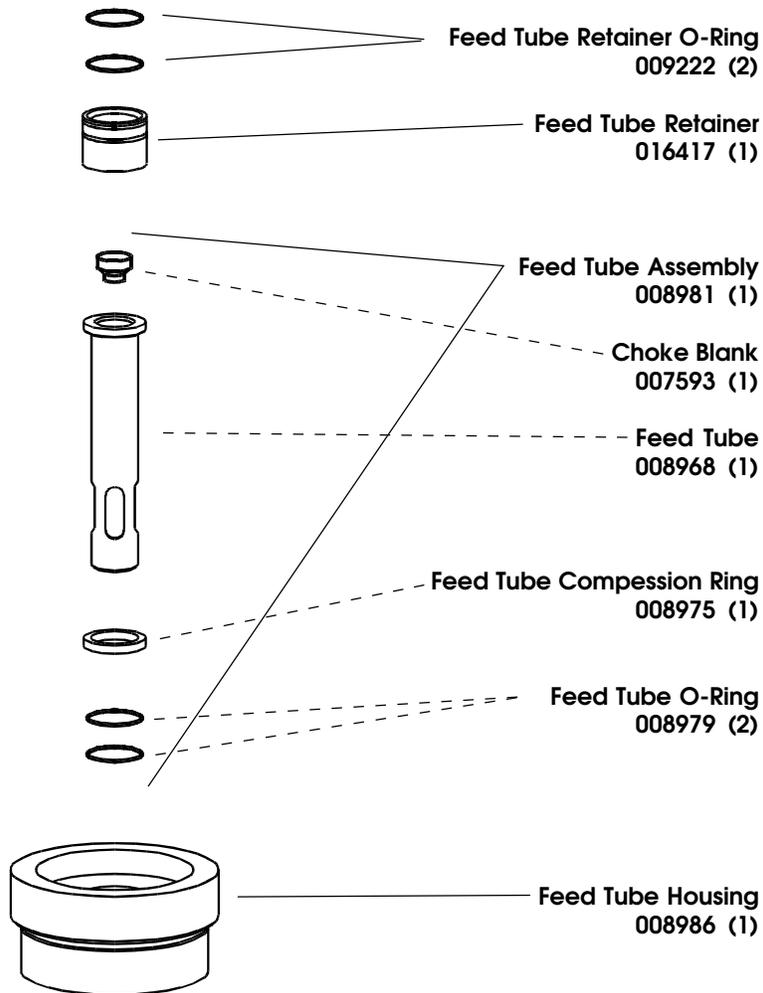


**HAMMER ASSEMBLY #015064**

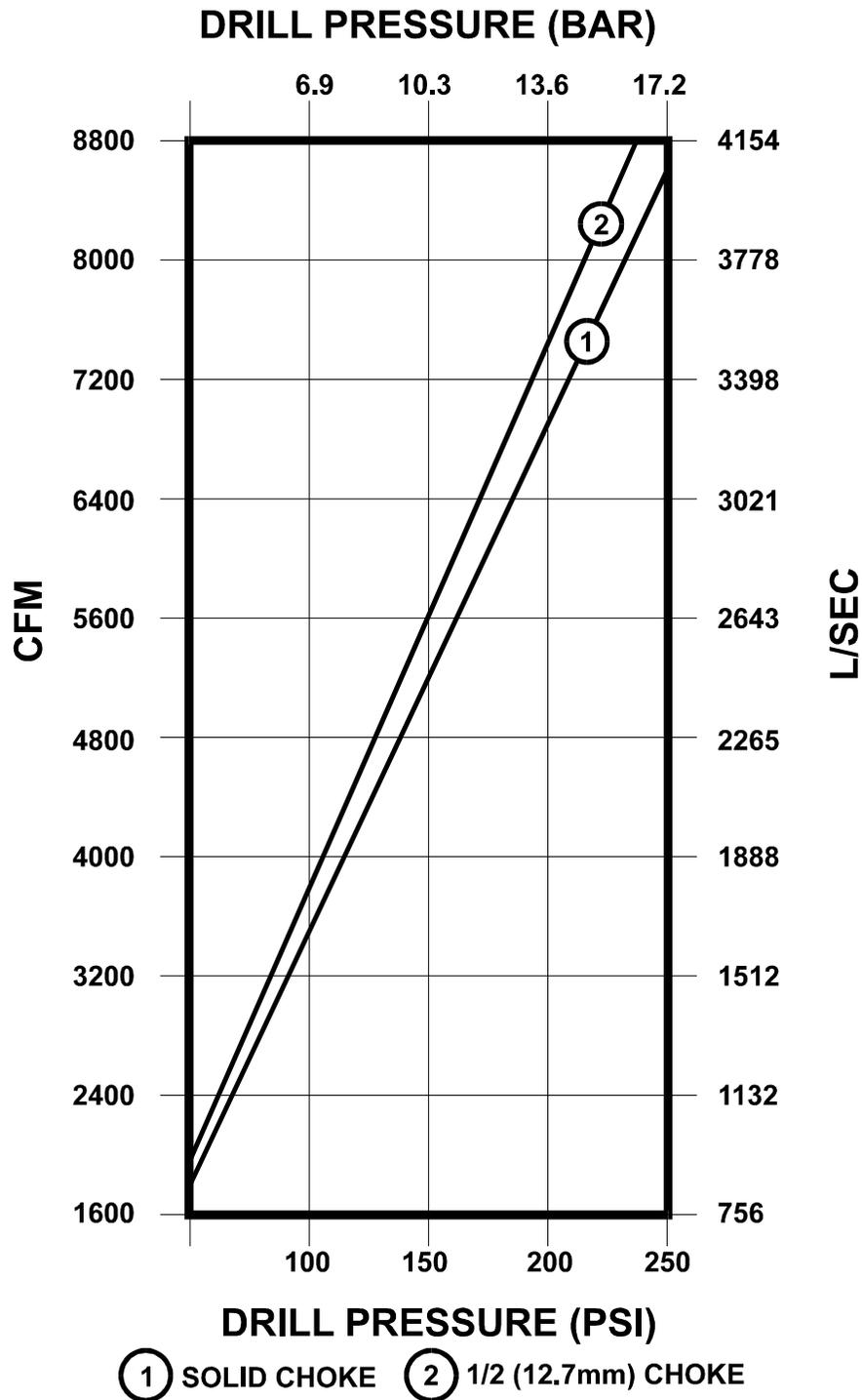
*Figure 3-1*

### SECTION III PARTS IDENTIFICATION EXPLODED VIEW

Figure 3-2



## SECTION IV AIR CONSUMPTION CHARTS CHAMPION 330



## SECTION V LUBRICATION

The Champion 330 hammer requires a continuous supply of the correct type of Rock Drill Oil. The Champion 330 hammer consumes at least 20 quarts (19 litres) of Rock Drill Oil per hour in order to maintain adequate lubrication. See table 5-1 for recommended Rock Drill Oil.

	Medium SAE 30	Heavy SAE 50
Shell	Air Tool Oil S2 A 150	Air Tool Oil S2 A 320
Texaco / Caltex	Rock Drill Lube 100	Rock Drill Lube 320
Chevron	Vistac 150	Vistac 320
Conoco	Conoco 150	Conoco 320
Numa Bio Blend	RDP 150	RDP 320

Table 5-1  
Recommended Rock Drill Oil

### CAUTION

ROCK DRILL OILS ARE THE ONLY ACCEPTABLE LUBRICANTS. SAE 50 ROCK DRILL OIL SHOULD BE USED IN AMBIENT TEMPERATURES OF 80° FAHRENHEIT (27° CELSIUS) OR HIGHER. CONTACT NUMA FOR ACCEPTANCE OF ALTERNATIVE ROCK DRILL LUBRICANTS.

### CAUTION

THE CHAMPION 330 HAMMER, AS WITH ANY MACHINE, REQUIRES CONTINUOUS LUBRICATION. THE FAILURE TO SUPPLY ADEQUATE LUBRICATION TO THE HAMMER CAN CAUSE PREMATURE FAILURE AND MAY VOID THE WARRANTY.

## SECTION VI STORAGE

When storing a Champion hammer, it is important to take the necessary steps in order to insure smooth operation after restarting.

When the hole is completed and the hammer is to be inactive for several weeks or longer the following steps should be followed:

Each drill rod should be blown clear of all water. During this process, turn on the in-line lubricator and blow until the rock drill oil can be seen from the bottom end of each drill rod. In addition, each rod (pin and box end) should be wiped clean and capped to prevent foreign contaminants from sticking to the connector ends.

### ***SHORT TERM STORAGE***

When the Champion hammer will be stored for only a short period of time the following steps should be taken:

- Blow the hammer clear of all water.
- Pour one quart (1 litre) of rock drill oil into the backhead. See table 5-1 on page 16 for suitable Rock Drill Oils.
- Turn the air on and cycle for 10 seconds. This will lubricate the internal parts.
- Cap the backhead and chuck end.
- Store the hammer horizontally in a dry environment.

### ***LONG TERM STORAGE***

When the Champion hammer will be stored for a long period of time the following steps should be taken:

- Blow the hammer clear of all water.
- If at all possible, the backhead and chuck should be broken loose on the drill rig, this is much easier than trying to do in the shop.
- Disassemble the hammer.

- Inspect and wipe all the parts clean.
- Lubricate all the internal parts with Rock Drill Oil. See table 5-1 on page 16 for suitable Rock Drill Oils.
- Cap the backhead and chuck ends.
- Store the hammer horizontally in a dry environment.

## ***RESTARTING***

Before restarting the hammer after prolonged periods of inactivity, disassemble and inspect all internal hammer parts.

If any internal hammer parts have oxidized, use an emery cloth to polish each part. Wash each hammer part, wipe dry, relubricate with Rock Drill Oil and reassemble the hammer.

### **CAUTION**

**FAILURE TO CHECK INTERNAL PARTS BEFORE RESTARTING THE HAMMER MAY CAUSE SERIOUS DAMAGE TO THE HAMMER.**

## SECTION VII BUTTON BIT MAINTENANCE

### GENERAL

Numa button bits are designed for fast penetration and long life. Keeping the carbide buttons sharp has a direct effect on both the penetration and the tool life.

As the bit wears, flat spots develop on the carbide buttons. These flat spots increase stress on the buttons causing the bit to work harder, which may cause button failure. Bit sharpening can minimize these problems.

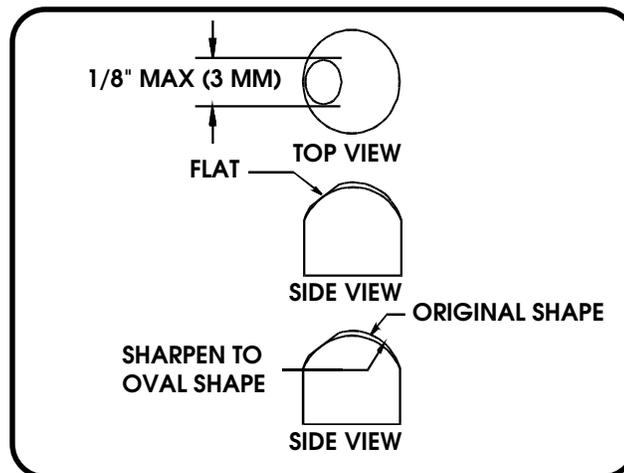
Gauge buttons will usually show the most wear and should be used to determine the frequency of bit sharpening. When the flats on the gauge buttons become a maximum of 1/8" (3 mm) wide it is time to resharpen. Refer to figure 7-1.

### SHARPENING

The following tools are required to resharpen the bit:

- Hand grinder (20,000 r.p.m.)
- Silicon carbide wheel 1" (25 mm) diameter, 60 - 80 grit
- Bit stand
- Pencil

Place a mark on the center of the button flat. Grind the button to its original shape leaving the mark untouched. Refer to figure 6-1. It is important to leave the center of the flat untouched to insure concentricity.



Button Resharpening  
Figure 7-1

## SECTION VIII RECOMMENDED SPARES CHAMPION 330

Product Description	Part Number	Class 1	Class 2
Backhead 10 Beco Pin	016418	0	1
Backhead O-Ring	008913	1	2
Thrust Washers	008925	1	2
Check Valve Seat O-Ring	005775	2	4
Check Valve Seat	008969	1	2
Check Valve Housing Spacer	008972	1	2
Check Valve	008970	1	2
Check Valve Spring	008973	1	2
Check Valve Housing	008971	1	2
Belleville Washers	008921	2	4
Feed Tube Retainer	016417	0	1
Feed Tube Retainer O-Ring	009222	2	4
Feed Tube Assembly	008981	1	2
Choke Blank	007593	0	1
Feed Tube	008968	1	2
Feed Tube Compression Ring	008975	1	2
Feed Tube O-Ring	008979	2	4
Feed Tube Housing	008986	0	1
Piston	008985	0	1
Case	015065	0	1
Bit Bearing	008909	0	1
Snap Ring	008911	0	1
Bit Retaining Rings	008910	1	2
Bit Retaining Ring O-Ring	008913	1	2
Chuck	008904	0	1
Chuck Bushing	008908	1	2
Choke Set	007307	1	2
Choke Blank - installed in hammer	007593	0	1
Choke 1/2"	007594	0	1

*For Complete Hammer Assembly #015064  
Table 8-1*

### NOTE

**CLASS 1**      REPRESENTS A USER OF A CHAMPION 330 HAMMER THAT HAS READILY AVAILABLE SPARE PARTS.

**CLASS 2**      REPRESENTS A USER OF A CHAMPION 330 HAMMER THAT DOES NOT HAVE READILY AVAILABLE SPARE PARTS.

*NOTES*

*NOTES*