

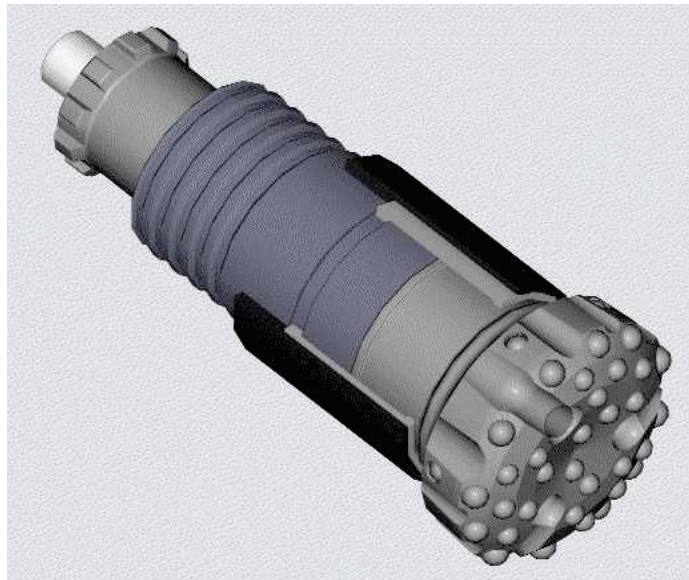


# ***Bit Retention System***

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# **OPERATIONS MANUAL**

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- Do not discard this manual.
- Keep manual readily available for reference during operation or when servicing product.
- Before operation and maintenance, read and comprehend operations manual content.
  
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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 one (1) month 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 the 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:

<b>WARNING</b>	A specific procedure or practice that must be strictly followed, or a specific condition that must be met, to prevent possible bodily harm.
<b>CAUTION</b>	A specific procedure or practice that must be strictly followed, or a specific condition that must be met, to prevent damage to the equipment.
<b>NOTE</b>	Important supplemental information.

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## SECTION I DESCRIPTION

### GENERAL DESCRIPTION

NUMA Bit Retention Systems utilize a dual half ring retainer inside of a retainer wear sleeve, assembled over a specially configured bit head and chuck, to provide the safety and confidence of being able to retain and retrieve a bit head, in the unlikely event of a bit shank failure.

The Retainer itself is comprised of two basic components. An Inner Ring with internal lugs is split into two half rings so that they may be fitted over the top portion of a Bit head that has a corresponding external lug. These half rings are held in place and prevented from separating by a simple Wear Sleeve that is fitted over them. This assembly is mounted on a specially machined hammer chuck, and the entire unit (Bit, Retainer, and Chuck) is assembled to the Down Hole Hammer.

A Pin key is provide to lock the retainer with the Chuck to prevent the separate rotation of these assemblies.

### FEATURES

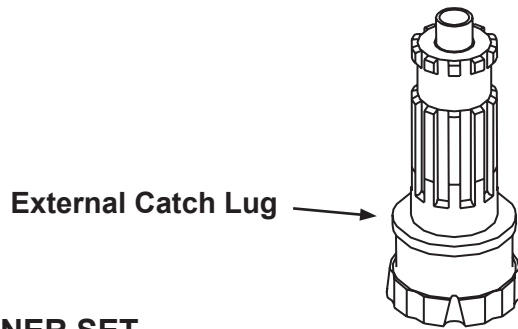
- Simple easily assembled design.
- Robust and durable
- No threads, cams, or teeth to fit or damage.
- Unlike most other retention systems, the NUMA system provides full contact around the entire circumference of the Retainer / Bit interface.

## SECTION II

### FUNCTIONAL DESCRIPTION

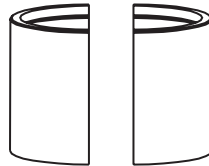
#### BIT CUT FOR SPLIT RETAINER (CFSR)

Bits manufactured for Retention Systems are made with an extended bit head, machined with an external catch lug for connecting with the Retainer.



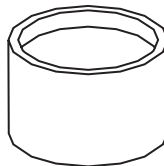
#### SPLIT RETAINER SET

The Split Retainer Set is an internally lugged sleeve cut into two halves.



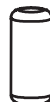
#### RETAINER WEAR SLEEVE

The Wear Sleeve is fitted over the Split Retainer Set at assembly.



#### PIN

A Pin (key) is provided to lock the Retainer Assembly to the Chuck to prevent separate rotation



## SECTION III ASSEMBLY AND OPERATION

### ASSEMBLY

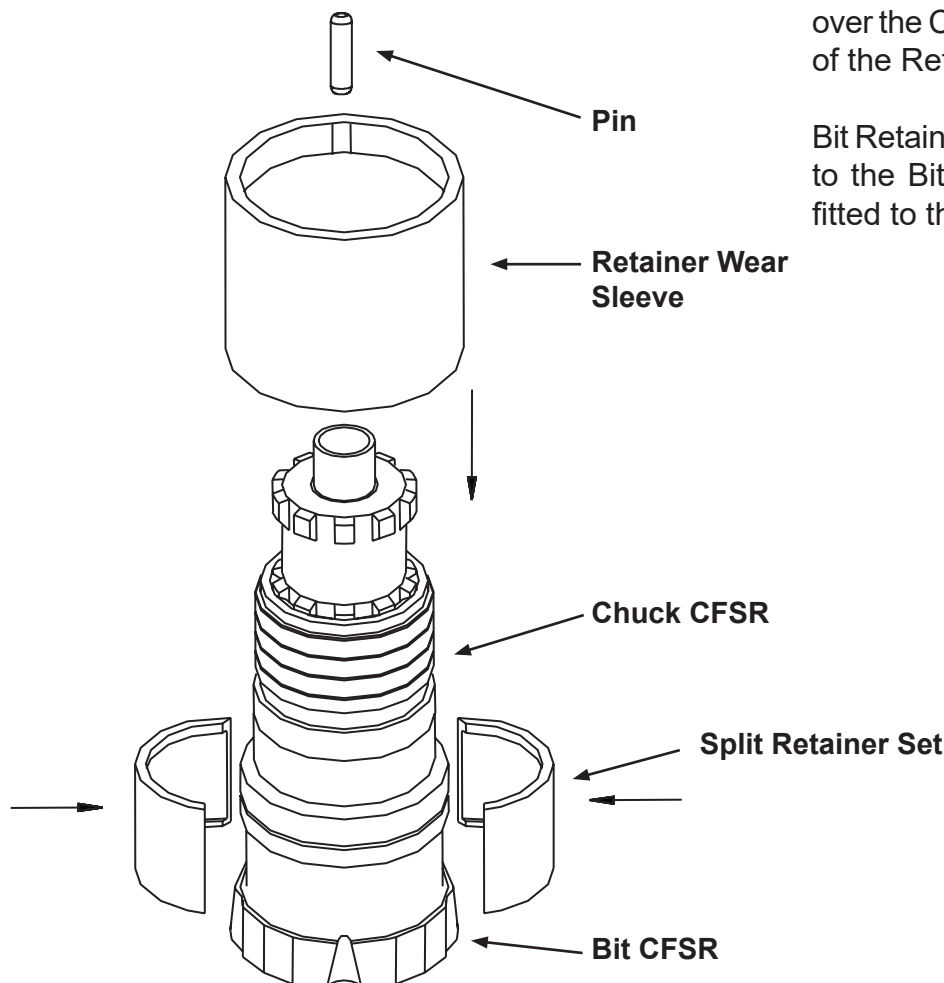
Assemble the (Cut for Split Retainer) Chuck over the (Cut for Split Retainer) Bit by fitting it down over the Bit shank in the usual fashion.

Slide the two halves of the Split Retainer Set over the interface of the Bit and Chuck so that the bottom internal lug in the halves is below the external lug on the Bit, and the upper internal lugs of the halves are resting in the groove or on the shoulder provided for them on the Chuck.

While holding the Split Retainer halves together, slide the Retainer Wear Sleeve downward over top of the Split Retainer halves. The internal lip in the Wear Sleeve will be at the top. The Wear Sleeve will slide over the Split Retainer halves, holding them together over the Bit and Chuck, and come to rest against the top shoulder of the Split Retainer halves. The Pin may then be installed in the key slot provided in the Wear Sleeve and Chuck.

If used, install the Thrust Washer over the Chuck threads to seat on top of the Retainer Wear Sleeve.

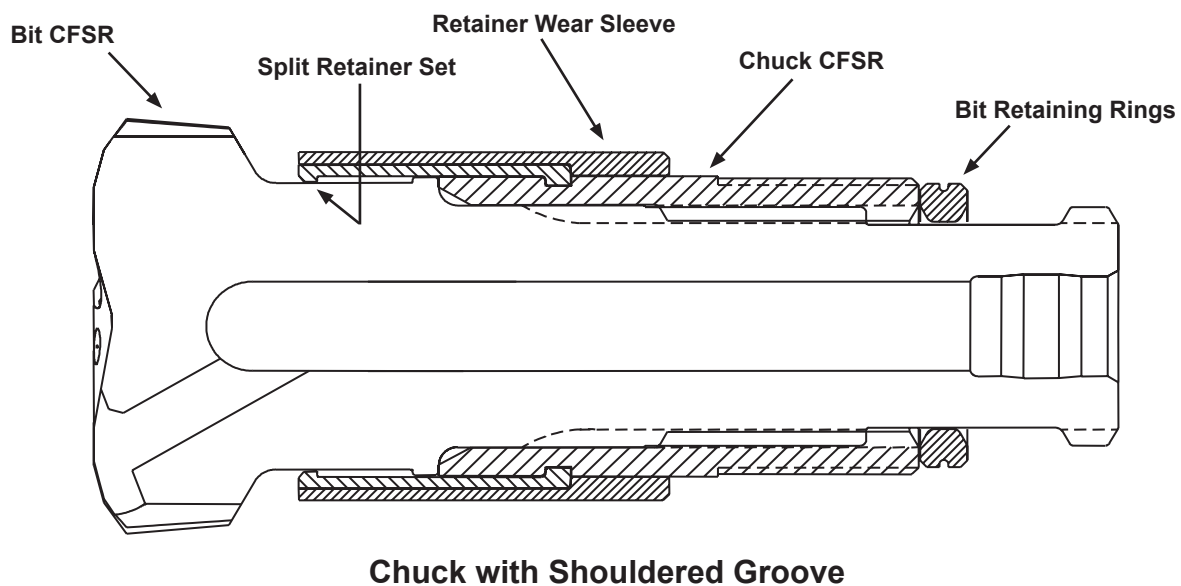
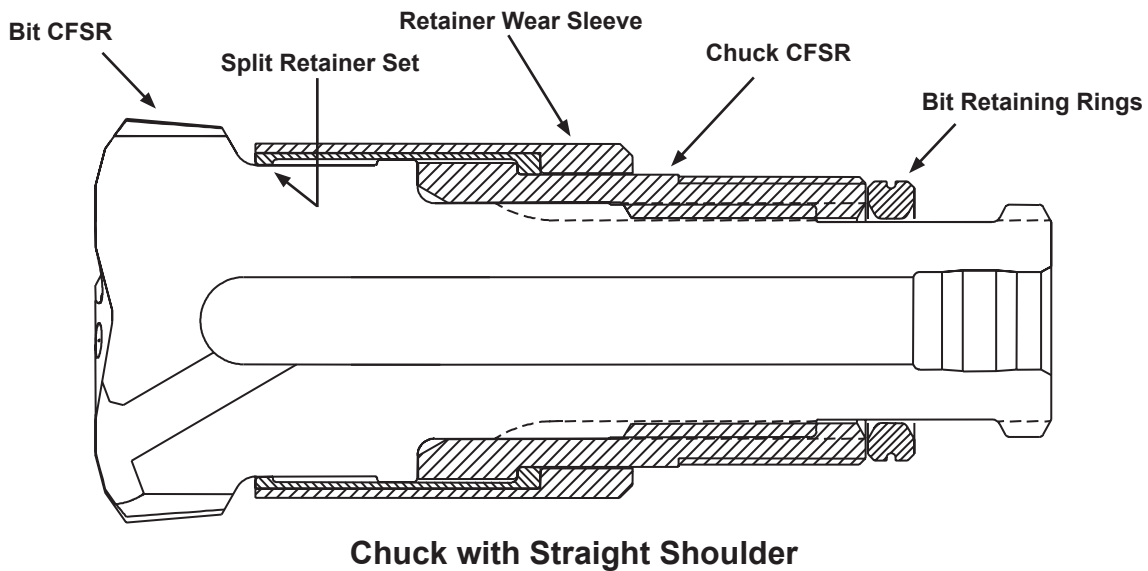
Bit Retaining Rings can then be fitted to the Bit, and the entire assembly fitted to the Down Hole Hammer.



## SECTION III ASSEMBLY AND OPERATION

### CHUCK CUT FOR SPLIT RETAINER (CFSR)

Down Hole Hammer Chucks specially machined to accept Retention Systems, will have either a shoulder or a shouldered groove cut on the OD to accept the internal lugs of the Split Retainer Set and the Retainer Wear Sleeve. A cross section view of how two different types of Retainers fit on the Chuck is illustrated below.





## SECTION IV SHANK & BIT SIZES for Numa Retention System

Bit Shank	Bit Range (in)	Bit Range (mm)
360	6-1/4" - 6-3/4"	(159 - 171 mm)
380	7-7/8" - 8-7/8"	(200 - 225 mm)
N100	9-7/8" - 11"	(251 - 279 mm)
P125	12-1/4" - 20"	(311 - 508 mm)
P180/P185	18" - 26"	(457 - 660 mm)
P240	24" - 34"	(609 - 863 mm)

Special sizes and configurations may be available upon request and review.

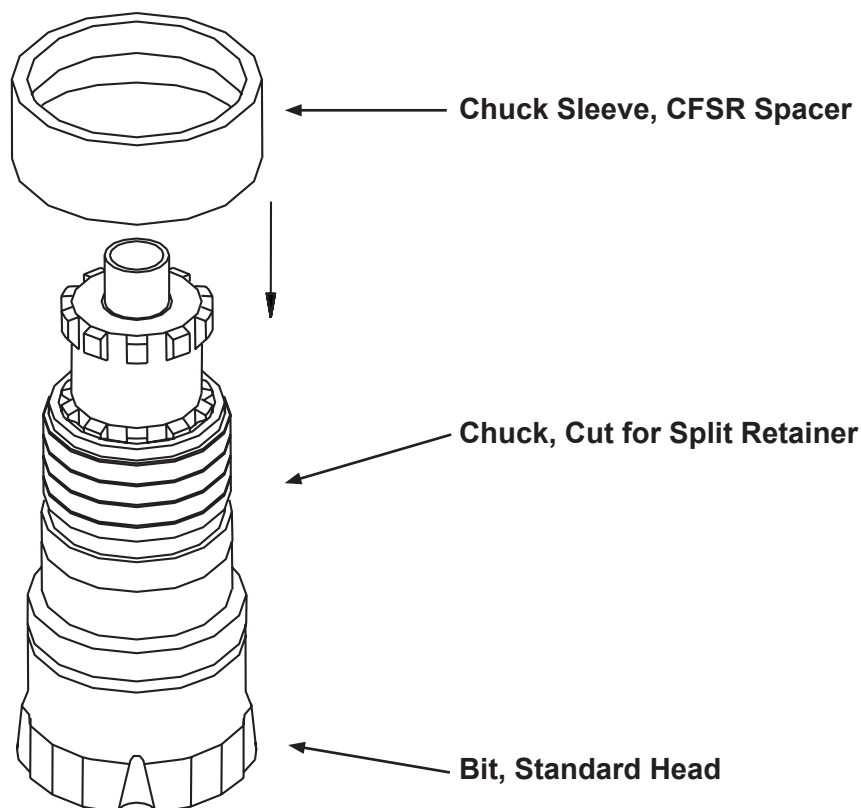
## SECTION V ADDENDUM 1

### CHUCK SLEEVE, CFSR SPACER

Some NUMA Down Hole Hammers specified for operating with the NUMA Split Sleeve Bit Retention System, and using a CFSR (Cut For Split Retainer) Chuck, can also be operated with a standard Bit head as well as bits that are Cut For Split Retainers.\*

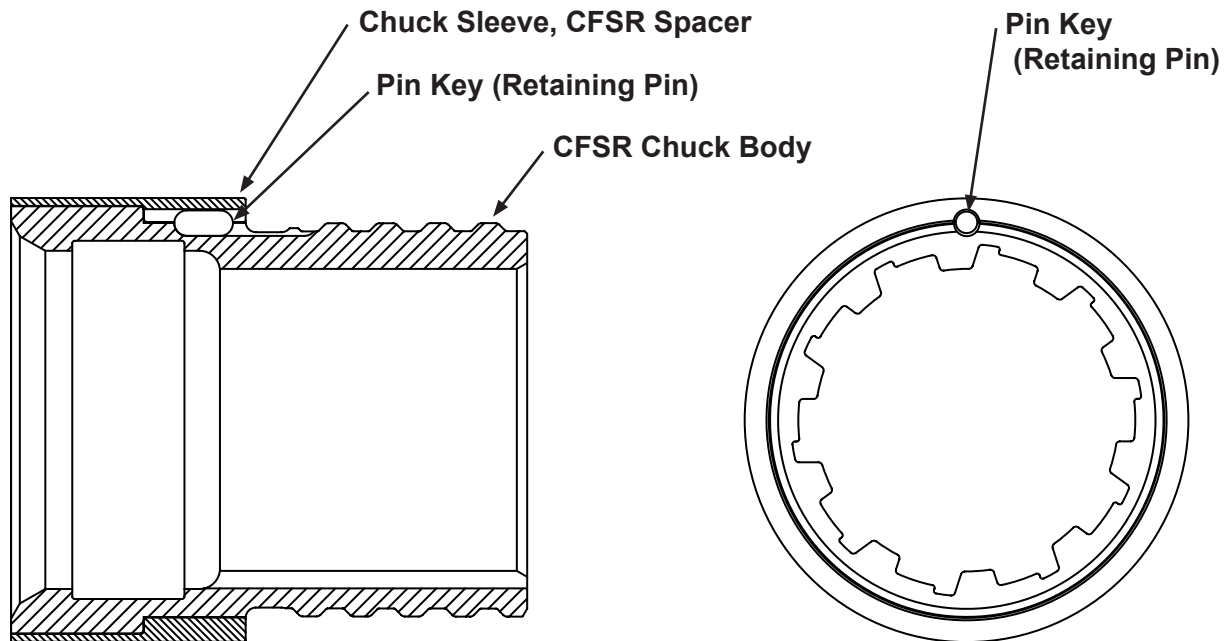
In order to run a Standard Bit Head while still utilizing the CFSR Chuck, the Bit Retention System must be replaced by a Chuck Sleeve, CFSR Spacer.

A standard Bit head will not have the appropriate undercut for accepting the Bit Retention System, so the Bit Retention System must be removed from the Chuck. In its place a spacer sleeve must be fitted over the chuck to insure that the chuck makes up properly to the case end. These spacer sleeves are available and designated as Chuck Sleeve, CFSR Spacer. Once the Chuck is unthreaded from the Case, the Bit Retention System sleeves may be removed from the Chuck. The Chuck Sleeve, CFSR Spacer is then slid downward over the Chuck threads. The largest inside diameter counterbored section is fitted toward the bit end of the Chuck. The Sleeve can be slid down until it seats against the shoulder of the Chuck body. With the Chuck Sleeve fitted, the CFSR Chuck will have the same body size and length as a standard Chuck.



## SECTION V ADDENDUM 1

Pin Key slots are provided in both the Chuck and the Sleeve, and a Pin Key is supplied. The use of this Pin Key is optional.



\* Not all NUMA Down Hole Hammers fitted with CFSR Chucks can use a Chuck Sleeve as described.

Due to the number of hammer and bit variations available, please contact your NUMA representative for options, availability, and fitment information.

## NOTES