SERVICE MANUAL

MULTIQUIP

HBC REBAR CUTTER

R & R PROCEDURES ○ MAINTENANCE

HBC - 2011 - CD

Manual No. HBC2011CD

CALIFORNIA

Proposition 65 Warning:

Engine exhaust and some of its constituents, and some dust created by power sanding, sawing, grinding, drilling and other construction activities contains chemicals known to the State of California to cause cancer, birth defects and other reproductive harm.

Some examples of these chemicals are:

- Lead and lead-based paint.
- Crystalline silica from bricks.
- Cement and other masonry products.
- Arsenic and chromium from chemically treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: ALWAYS work in a well ventilated area, and work with approved safety equipment, such as dust mask that are specially designed to filter out microscopic particles.

IMPORTANT!

Read the operator's manual for safety instructions before you attempt to troubleshoot. Use extreme caution when troubleshooting power equipment.

Basically, a tool is an object that enables you to take advantage of the laws of physics and mechanics in such a way that you can seriously injure yourself.

This service manual is intended to provide information and procedures to safely maintain, repair and give a basic understanding of service techniques for the MQ rebar cutters.

You must be familiar with the operations of the MQ rebar cutters before attempting to troubleshoot or make repairs. Basic operating and maintenance procedures are described in the operation and parts manual supplied with the generator. Use the supplied manual to order replacement parts. If you are missing the operation and parts manual, please contact Multiquip Inc to order a replacement or you may visit our website at www.multiquip.com

For your safety and the safety of others carefully read, understand and observe all instruction described in this manual.

THE INFORMATION CONTAINED IN THIS MANUAL IS BASED ON MQ REBAR CUTTERS MANUFACTURED UP TO THE TIME OF PUBLICATION. MULTIQUIP INC. RESERVES THE RIGHT TO CHANGE ANY PORTION OF THIS INFORMATION WITHOUT NOTICE.

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SERVICE PROCEDURES

REBAR INFORMATION

MAINTENANCE SPECIFICATIONS

	HBC19A	HBC19SA	HBC25A	HBC25SA
Hydraulic Oil	Tellus # 46	Tellus # 46	Tellus # 32	Tellus # 32
Hyd. Oil Capacity	5 oz.	5 oz.	5 oz.	5 oz.
Voltage	115V *AC*	230V *AC*	115V *AC*	230V *AC*
Hertz	60	50	60	50
Phase	1	1	1	1
Rated Amps	11	5	13	6.5
Watts	1300	1000	1430	1460
Cutting Speed	2.5 sec	2.5 sec	3.5 sec	4 sec
Brush Replacement	200 hours or when reduced to ¼"			
Weight	27 lb.	26 lb.	48.5 lb	44.1 lb.

OPERATING TEMPERATURE

The cutting capacity is affected by rising to operating temperature. If machine temperature reaches 158°F or higher, cutting operation should be stopped to allow the machine to cool.

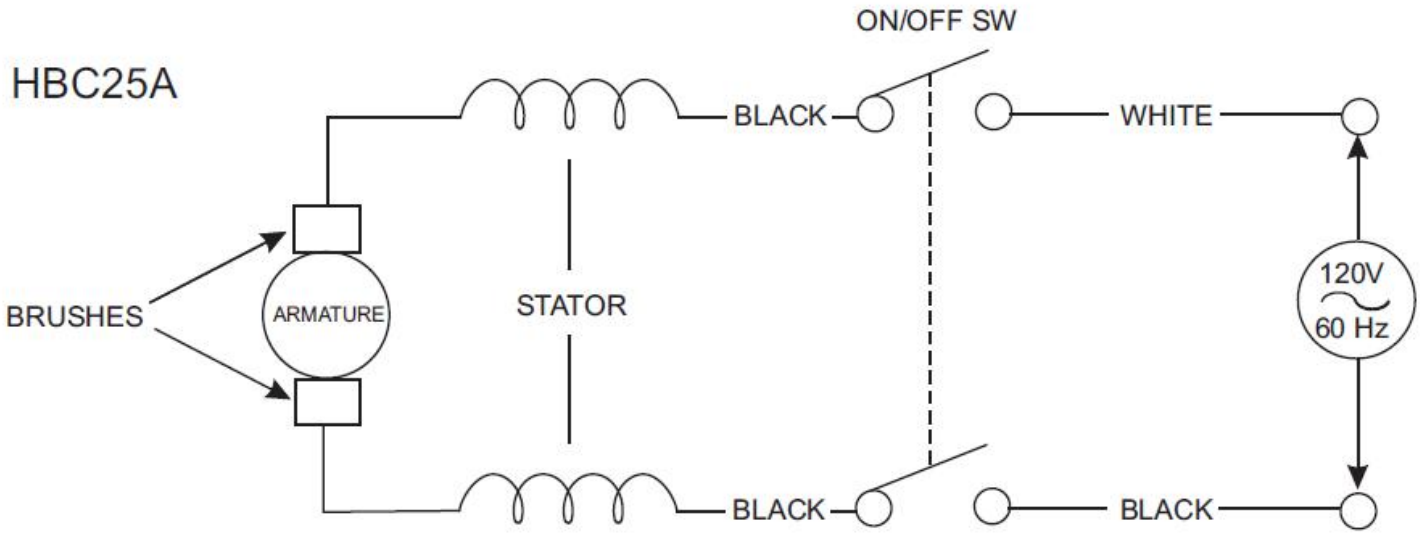
CARBON BRUSHES

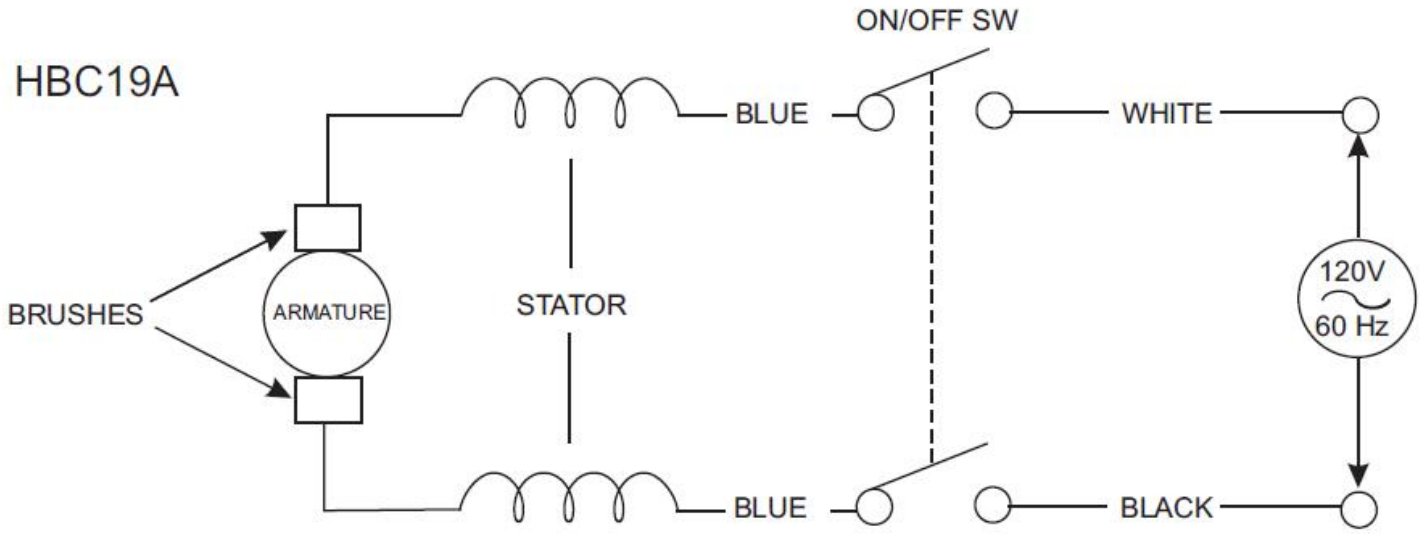
When carbon brushes become ¼", the motor force deteriorates - replace brushes.

HBC19

HBC19A

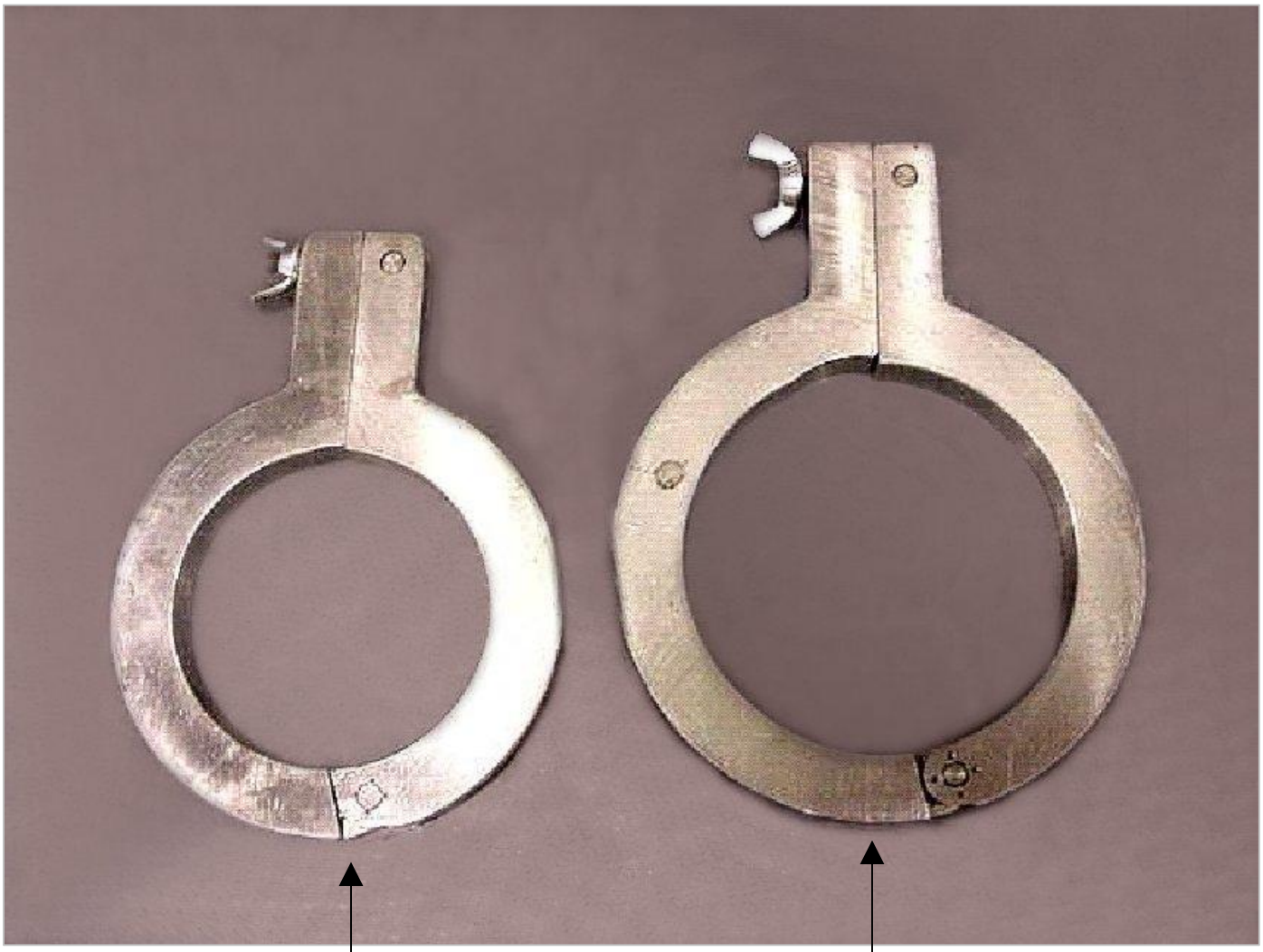
WIRE DIAGRAMS





COMPRESSOR TOOL

These tools are used to hold the urethane seals in place during pump / hydraulic cylinder assembly.



MQ part # *H9J2387000*
Models: HBC-16 HBC 19

MQ part # *H5J2428000*
Models: HBC-25

TROUBLESHOOTING

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Cutter rod is stuck	Oil is insufficient	Inspect oil see pg.11
	Contamination	Push back cutter rod, inspect and clean cutter rod.
	Blade is defective	Inspect blade, replace if necessary
	Weak return spring	Replace return spring
Cutting power is weak	Oil is insufficient	Inspect coil see pg.11
	Contact between cylinder and release valve is improper	Inspect, repair see pg.11
	Urethane seal defective	Replace see pg.19
Oil Leaks	Oil leveler sack defective	Replace, see pg.28
	Seals defective	Inspect, replace
	Pump gasket defective	Replace
	Loose bolts	Inspect and tighten
Motor does not move	Improper voltage	Inspect and correct
	Carbon brushes defective	Replace, see pg.12
	Armature defective	Inspect, replace, see pg.15
	Armature bearings defective	Inspect, replace, see pg.15

WARNING: Always unplug cord before working on machine

TROUBLESHOOTING

NOTES

- Before doing any expensive repairs always check the oil level and its condition. If oil is black, drain and refill see pg.11 for oil instructions, repair any visible oil leaks.
- Make sure the breather hole on the oil leveler sack bolt is not plugged with dirt or other debris see pg.28
- Unit may have developed air in the system see pg.11 for bleeding instructions.
- Make sure cutter rod is not bent or distorted from overload.
- Check condition of cutter blades, replace if chipped or broken.
- Unit will not build hydraulic pressure if the release valve is not sealing on tip of the cylinder center tube, see pg.26 Lap with a very fine lapping compound.
- If unit still will not complete cut, it may be necessary to replace the urethane seals and overhaul the pump assembly. If urethane seals deteriorate, fluid pressure from the pump cylinders will leak back to the reservoir and the cutting rod will not be pushed out to cut rebar, see pg.21

NOTE: It is recommended to replace ALL of the O-rings, seals, and gaskets at time of pump overhaul.

IMPORTANT

NOTE: THE INTERNAL COMPONENTS IN THE HYDRAULIC PUMP AND PISTON AREA HAVE VERY CLOSE CLEARANCES AND ARE SENSITIVE TO DAMAGE FROM DUST, DIRT, AND CONTAMINATION OF THE HYDRAULIC FLUID OR IMPROPER HANDLING. THE DISASSEMBLY OF THE PUMP MUST BE DONE BY PROPERLY TRAINED PERSONNEL WITH THE CORRECT EQUIPMENT. IMPROPER SERVICING OF THE ELECTRICAL COMPONENTS CAN LEAD TO CONDITIONS THAT COULD RESULT IN SERIOUS INJURY. THE PUMP, PISTON, AND ALL ELECTRICAL COMPONENTS SHOULD BE SERVICED BY A FACTORY AUTHORIZED SERVICE CENTER.

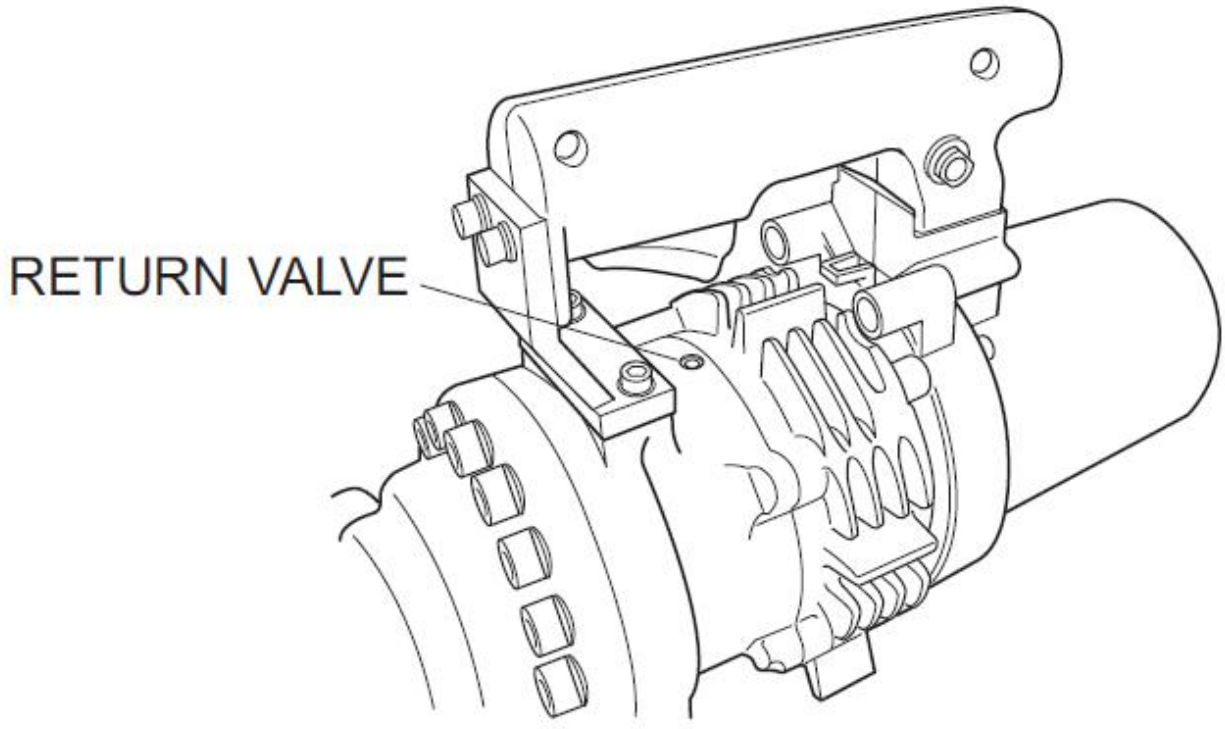
IMPORTANT: ANY ATTEMPT BY UNAUTHORIZED PERSONNEL TO SERVICE INTERNAL COMPONENTS OF REBAR CUTTER WILL VOID WARRANTY.

RETURN VALVE

The return valve is used when the rebar cutter blade jams and stops during cutting of the rebar.

RETURN VALVE OPERATION:

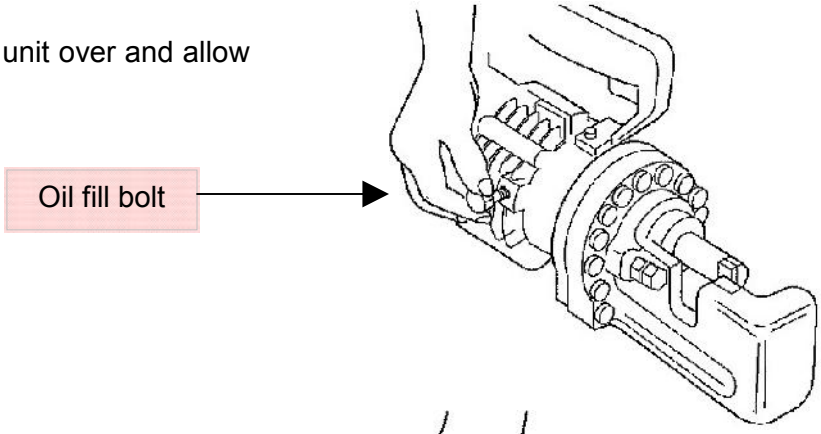
- Rotate the return valve ½ a turn in the counterclockwise direction with Allen wrench.
- The cutter rod will retract and return to its starting position.
- Once cutter rod returns to its starting position, tighten the return valve before resuming cutting.



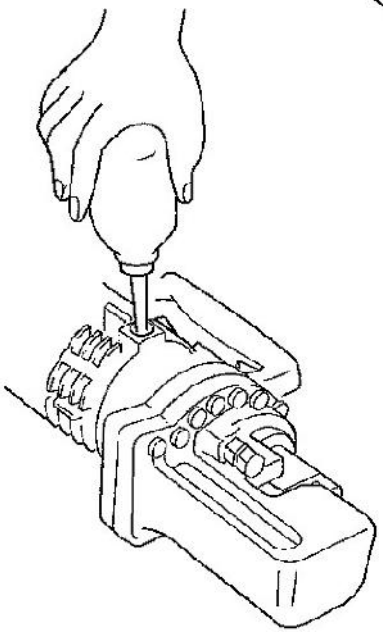
OIL FILL / BLEED INSTRUCTIONS

The rebar cutter is driven by a hydraulic pump. If the oil is insufficient, wrong type or contaminated, the cutting blade action will not operate at its full capacity and damage could result.

Drain Oil: remove oil fill bolt and lay unit over and allow oil to flow out in to waste container.



Oil Fill: ***(Step One)*** Turn cutter so the fill port is on top side. Fill with oil until it overflows. Shake the cutter up and down to release any air bubbles that may be present, over fill again, replace fill bolt and wipe off any excess oil.



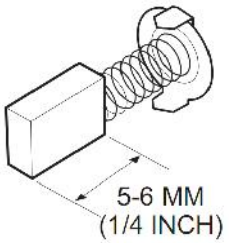
Oil Fill: ***(Step Two)*** *Note: this step is also for checking and adding make-up oil*. Connect machine to power source and cycle a few times. Place a 3/16" steel rod in bar holder. Turn on switch to activate the cutter rod and allow the blade to touch the rod, then release switch. At this time turn the cutter so that the fill port is on the top side, remove oil fill plug and repeat oil fill procedure in *step one*. When finished, test the cutter with a piece of rebar. Fill procedure is now complete.

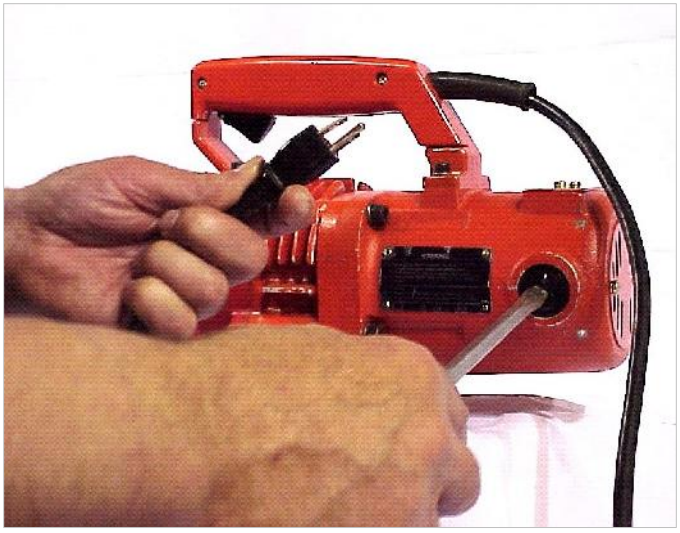
REPLACING CARBON BRUSHES

WARNING: Always ensure electrical power cord is unplugged before attempting the following procedure.

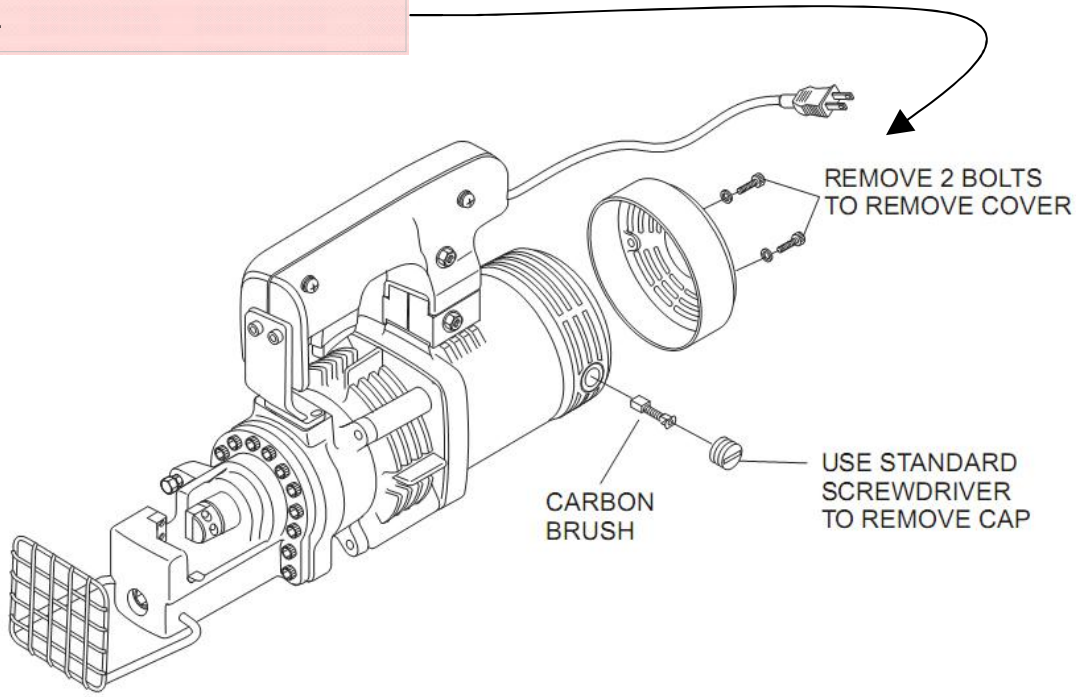
Remove the carbon brush caps on both sides of motor housing using a standard screwdriver. Measure the carbon brush to ensure it's within the service limits.

Replace carbon brush if less than ¼" in length



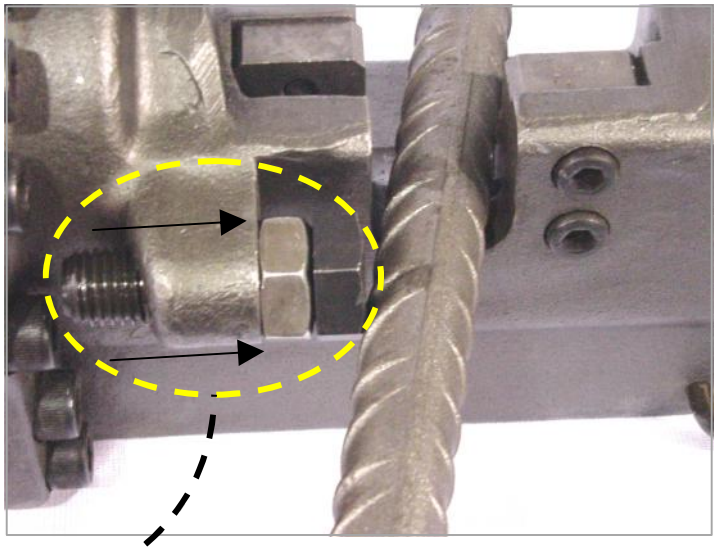


NOTE: Newer models will have a cover that needs to be removed in order to access the carbon brush caps.



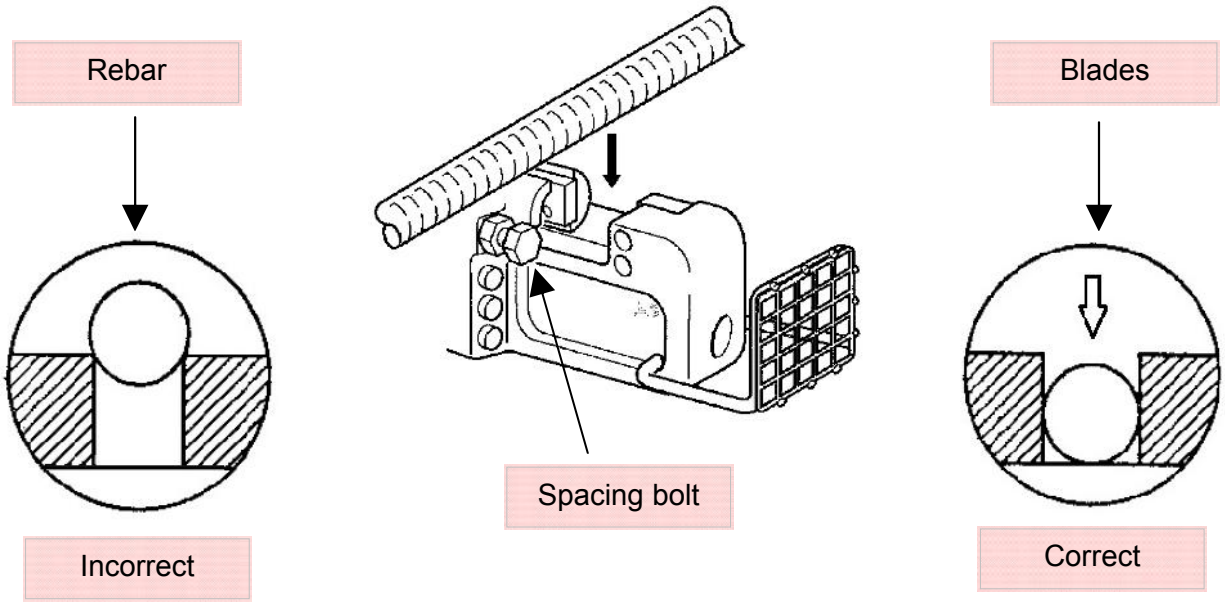
SPACING BOLT

Adjust the spacing bolt according to the diameter of the rebar being cut. Bolt must allow rebar to be flush at 90°.



Adjust SPACING BOLT to keep rebar square

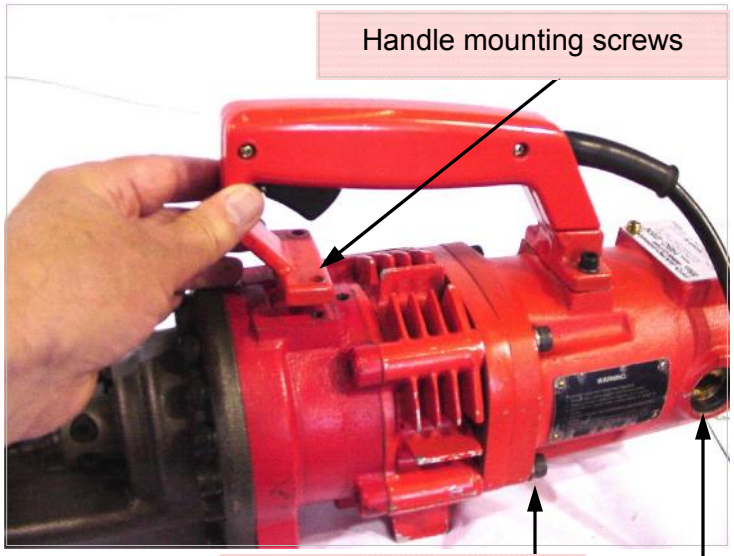
IMPORTANT: DO NOT attempt to partially cut through the diameter of rebar. This will cause damage to the blades and can also cause steel bar to fly out.



Ensure rebar is resting fully within the blades

MOTOR AND HANDLE DISASSEMBLY

In order to inspect and service the cylinder urethane seals, check valves, pistons and springs, the motor and handle will need to be removed.

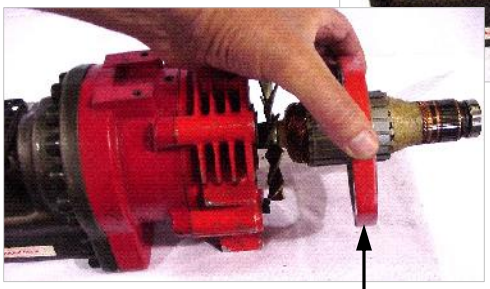


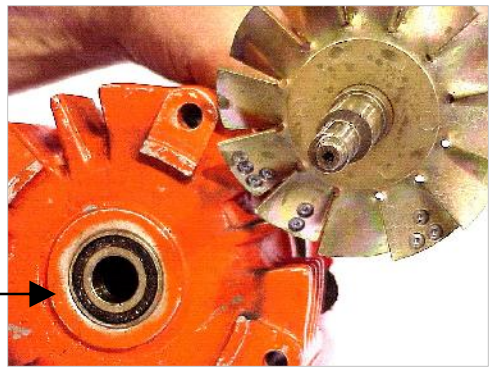
- Remove carbon brushes

- Remove all motor housing screws and (2) handle mounting screws.

- **NOTE**: spacer plate will come loose when removing motor housing.

- Remove Spacer plate





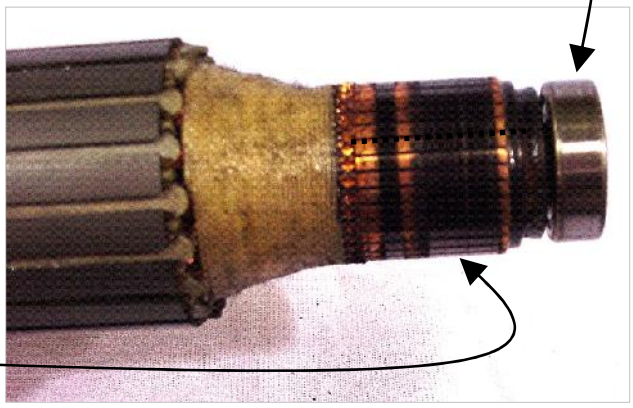
- To remove armature, simply pull out from pump housing bearing.

ARMATURE INSPECTION

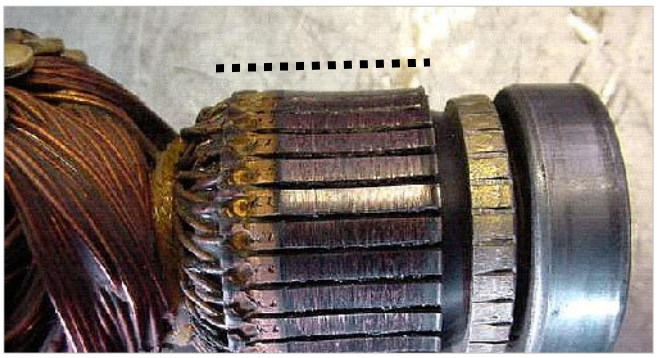
- Inspect end bearing, should spin smooth and freely.
- Ensure commutator slip ring is not worn or undercut.
- Should have clean flat surface for brushes to run against.

End bearing

Commutator slip ring

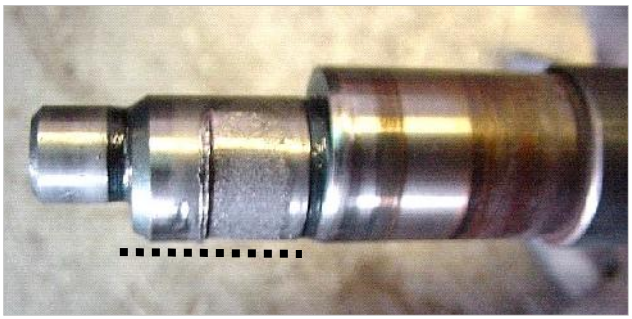


- Illustration shows, commutator damage from over loading the unit.



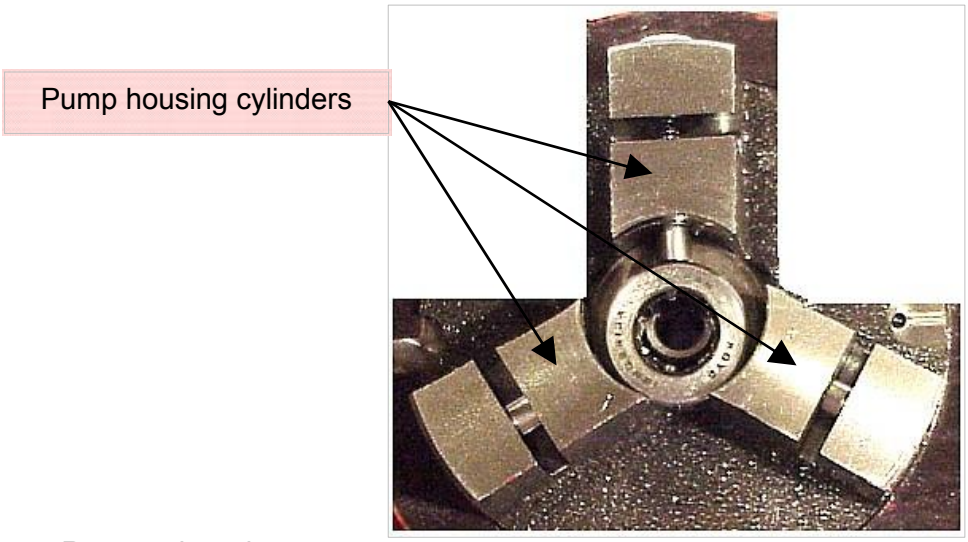
- Inspect shaft, should look like this example, smooth surface.

- Armature damage from attempting to cut rebar that was too hard.



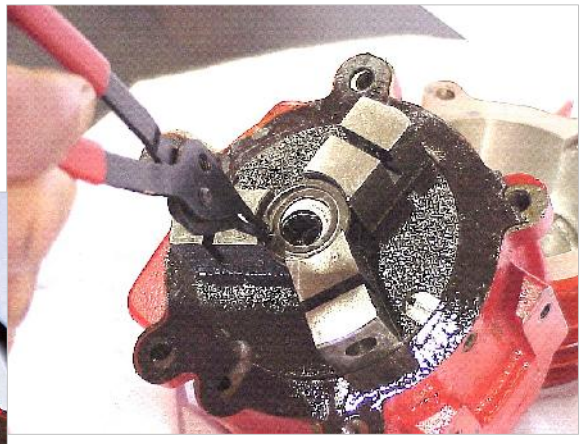
PUMP HOUSING DISASSEMBLY

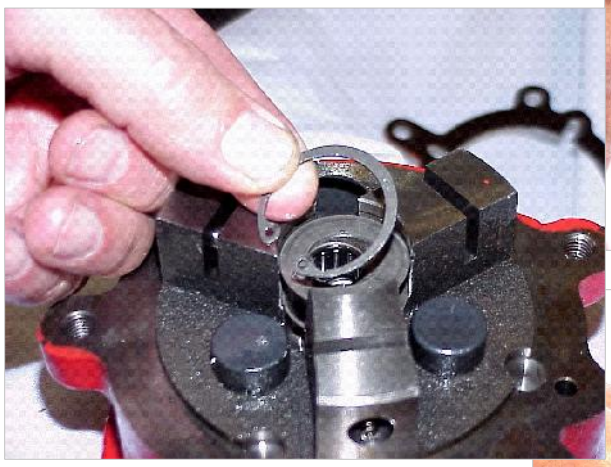
IMORTANT: before disassembling, a well illuminated, clean surface is essential to good pump repairing. The pump housing cylinders contain several small spring loaded parts.

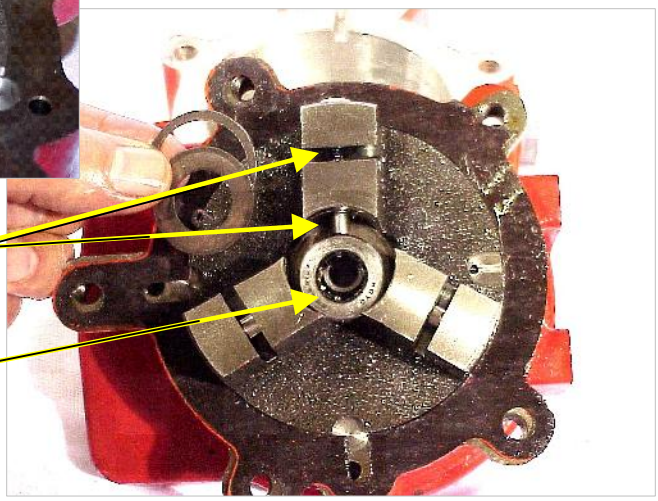


Remove in order

- Stop ring
- Hardened washer
- Eccentric needle bearing





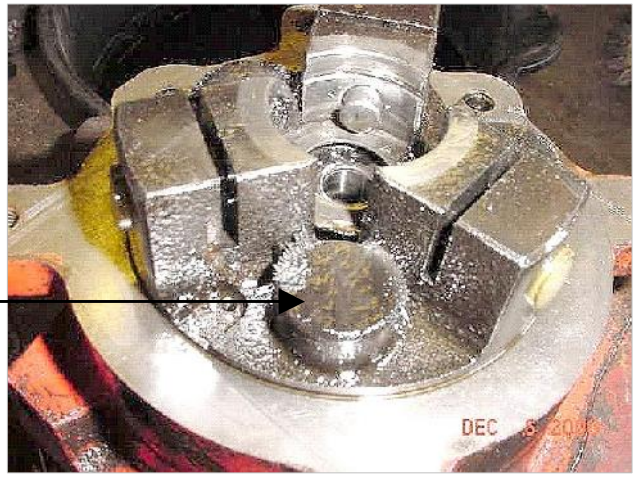


PUMP HOUSING INSPECTION

- Pump housing with damaged bearing.

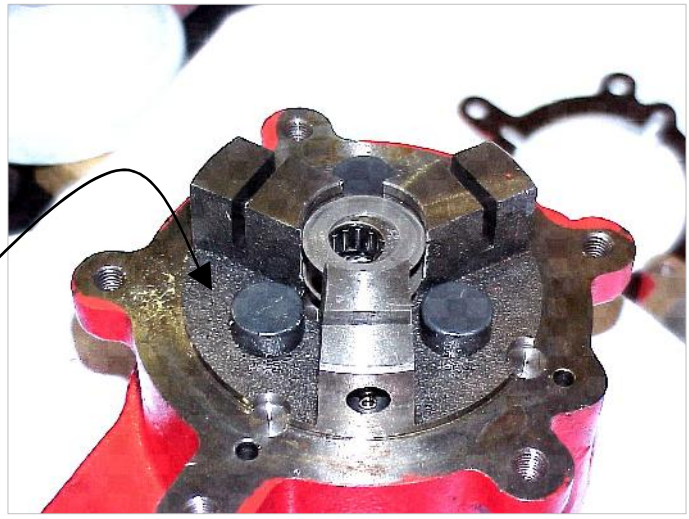
- Opposite side of pump housing with metal particles from worn components collected on magnets.

Pump housing magnets



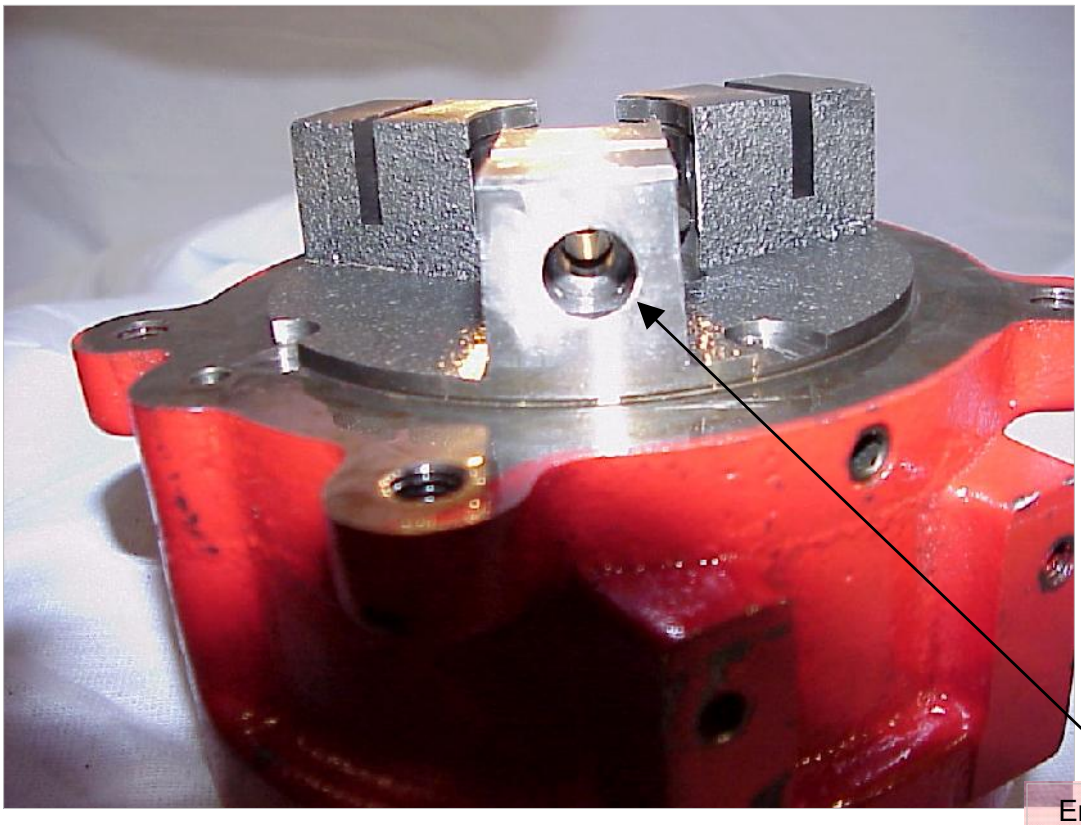
- View of a clean pump housing with magnets. Circular area where magnets are placed is in hydraulic reservoir when assembled.

Circular area

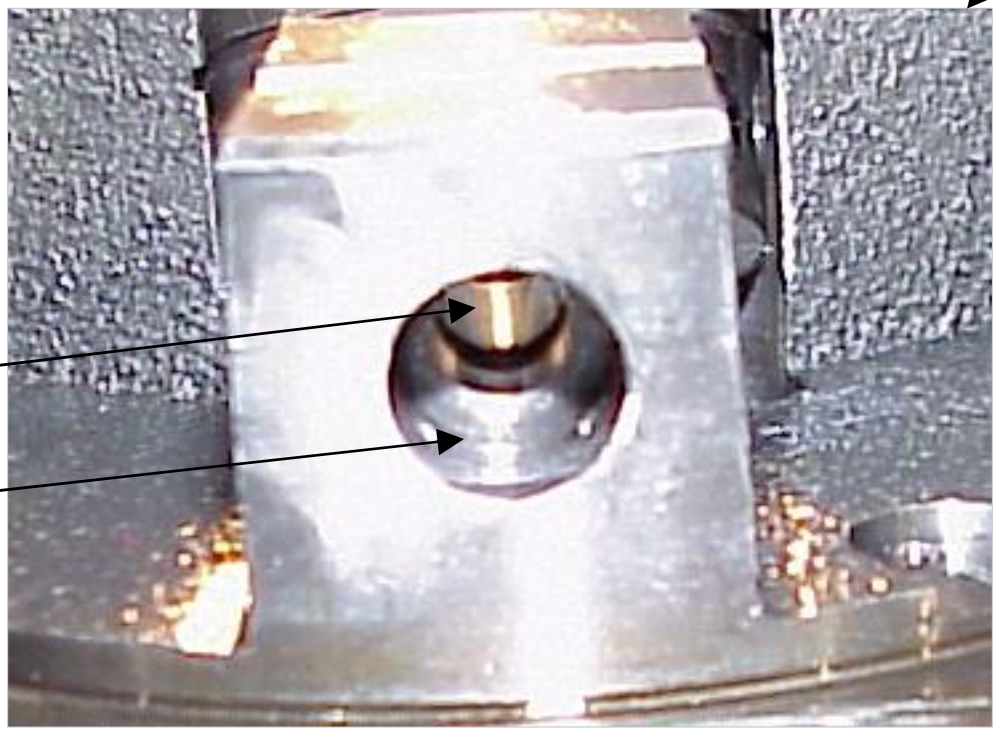


PUMP HOUSING INSPECTION

Inspect integrity of valve seat and smaller diameter cylinder bore.



Enlarged view

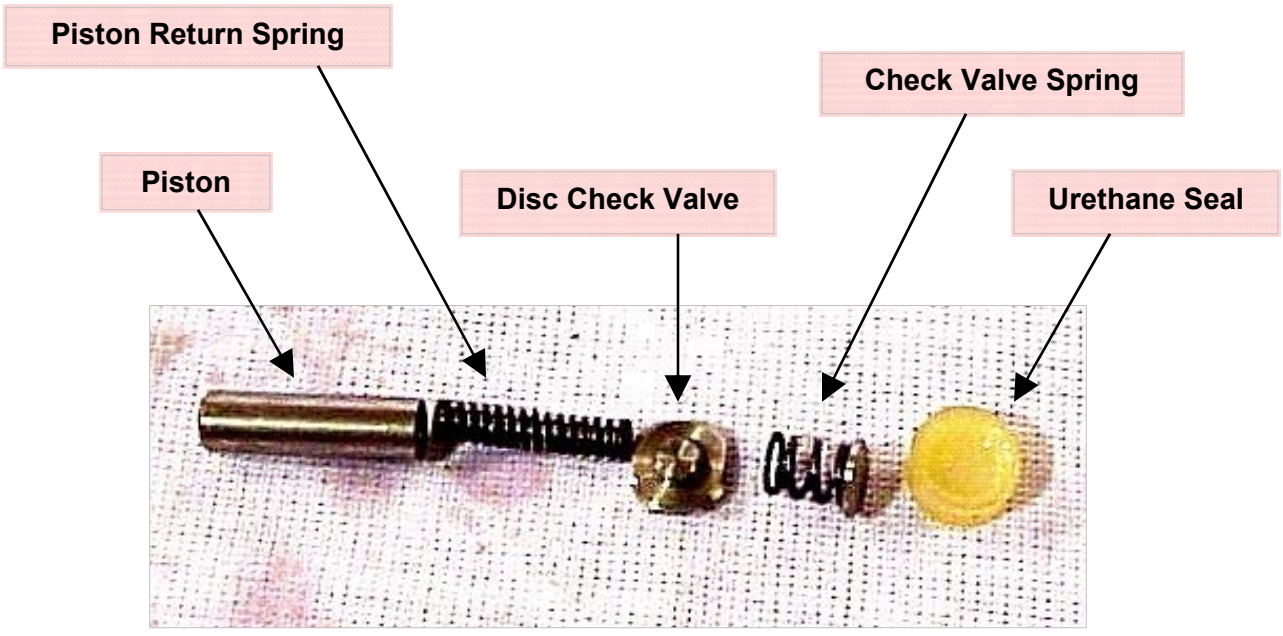


Smaller bore

Valve seat

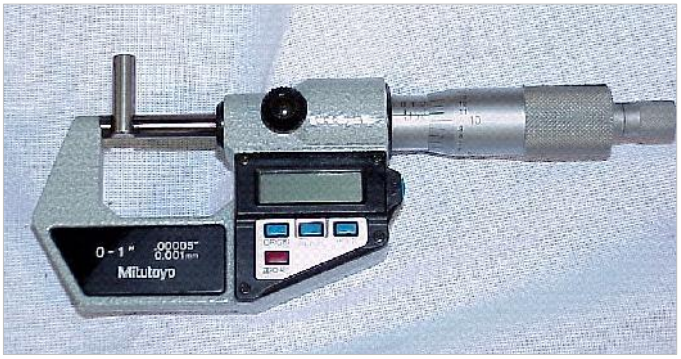
PUMP HOUSING INTERNAL PARTS

Below is the pump housing internal parts, in the order that they will be installed in the pump housing cylinders



REPLACING PISTONS

Replacement pistons are available in different diameters, to allow for replacement in worn cylinders



Replacement of pistons in the cylinder may be necessary after extended use of the cutter. Worn pistons will cause loss of hydraulic power. When servicing, it is **IMPORTANT** to choose the correct size piston to fit the worn cylinder. This will provide proper clearance between the piston and cylinder, thus generating adequate cutting power. Ten different sizes are available to meet the servicing needs.

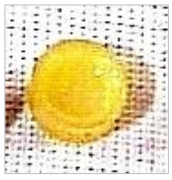
OUTER DIAMETER OF PISTON HBC-19

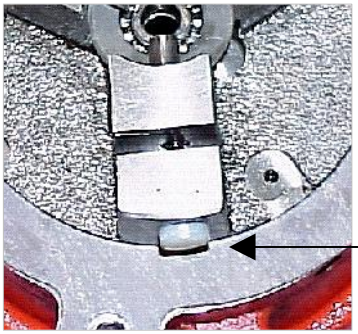
Diameter (Inch)	Diameter (mm)	MQ P/N
0.275433	6.996	H9T4344300-A
0.275472	6.997	H9T4344300-B
0.275512	6.998	H9T4344300-C
0.275551	6.999	H9T4344300-D
0.275591	7.000	H9T4344300-E
0.275629	7.001	H9T4344300-F
0.275669	7.002	H9T4344300-G
0.275709	7.003	H9T4344300-H
0.275748	7.004	H9T4344300-I
0.275787	7.005	H9T4344300-J

OUTER DIAMETER OF PISTON HBC-25

Diameter (Inch)	Diameter (mm)	MQ P/N
0.236063	5.996	H5T4438300-A
0.236102	5.997	H5T4438300-B
0.236142	5.998	H5T4438300-C
0.236181	5.999	H5T4438300-D
0.23622	6.000	H5T4438300-E
0.23626	6.001	H5T4438300-F
0.236299	6.002	H5T4438300-G
0.236339	6.003	H5T4438300-H
0.236378	6.004	H5T4438300-I
0.236417	6.005	H5T4438300-J

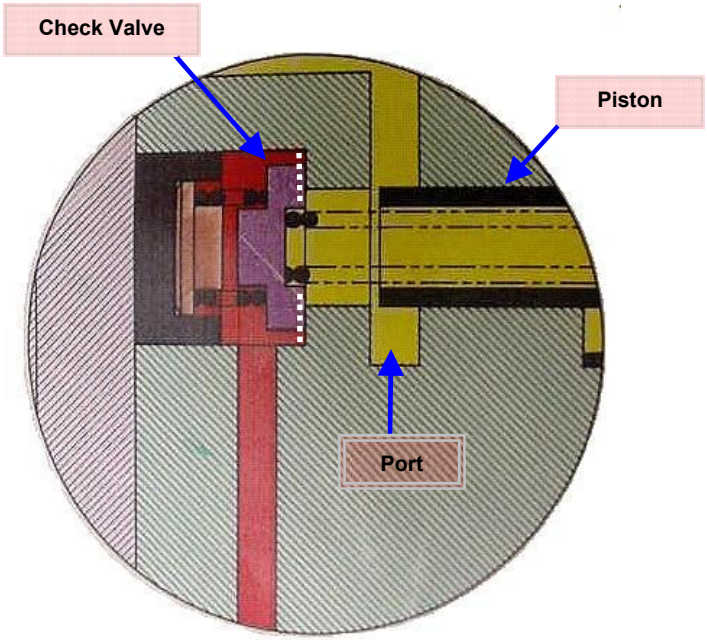
URETHANE SEALS



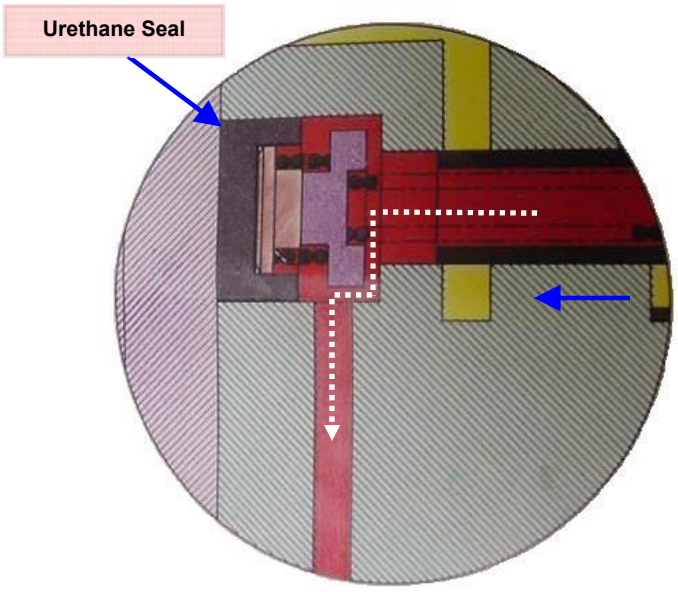


Worn urethane seals may cause loss of power. Replacing urethane seals are an essential part of maintenance and are considered wear items. If seals deteriorate, fluid pressure from the pump cylinders will leak back to the reservoir and the rod will not be pushed out to cut rebar.

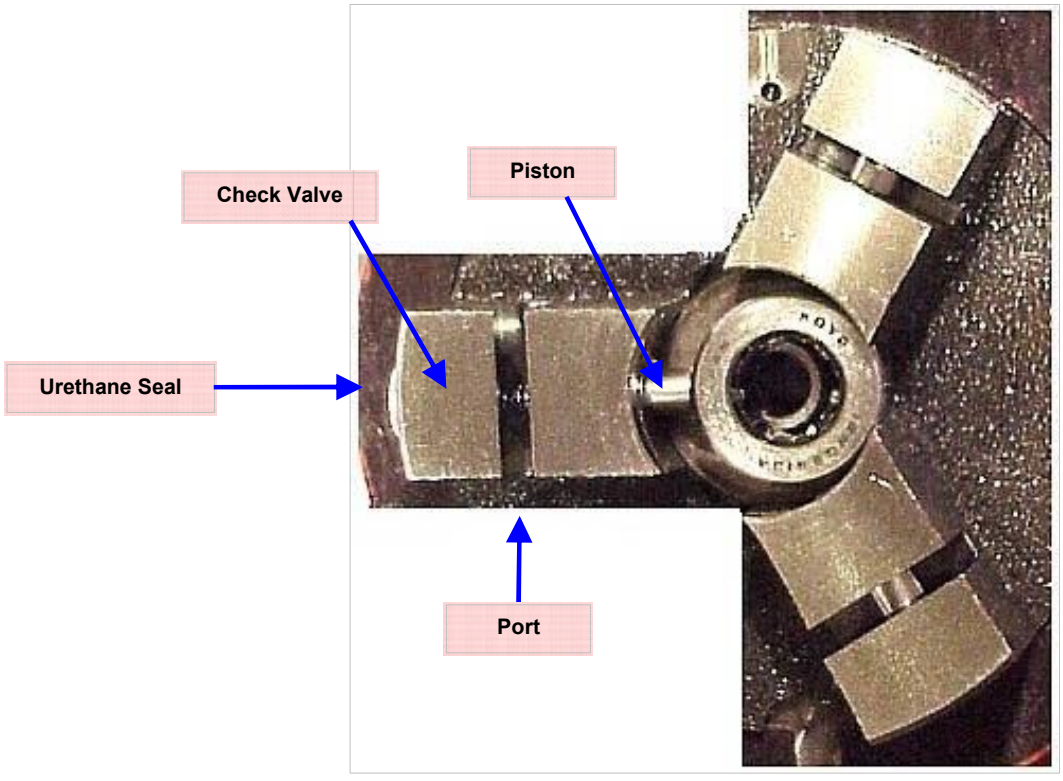
PUMP OPERATION



The piston (black) is passing through a port (yellow) picking up and compressing hydraulic fluid. As volume and pressure starts to increase, the check valve (purple) is pushed off the seat (dotted white line) and oil is delivered to the pressure side of the cutter bar through port (red).

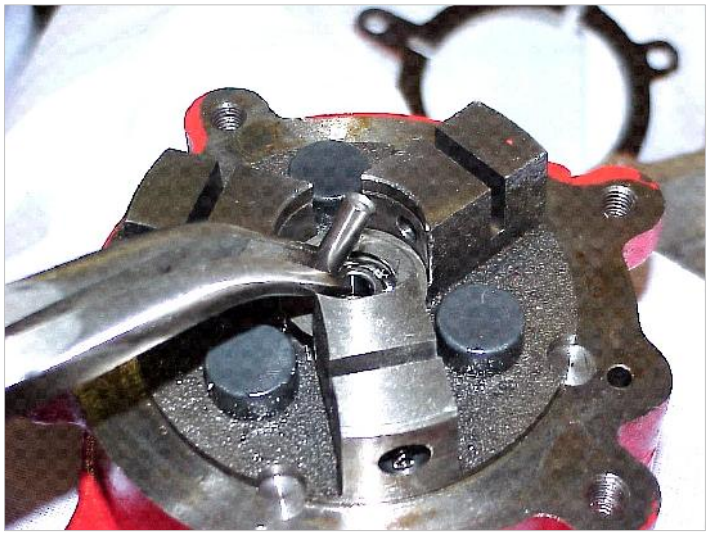


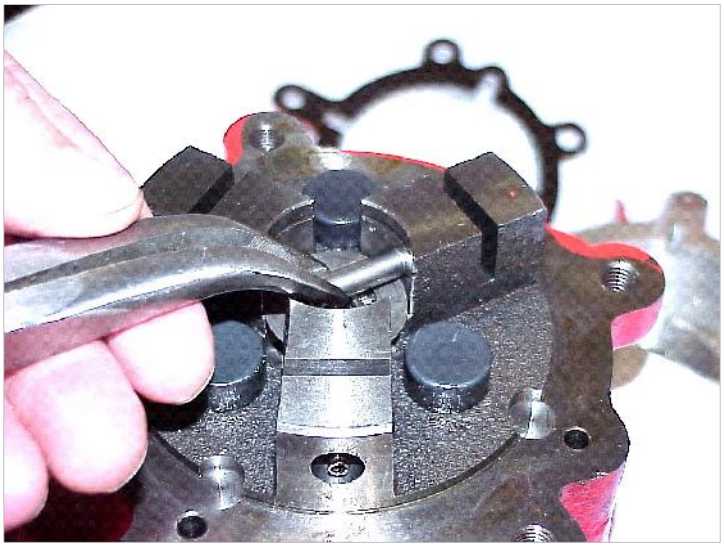
The piston (black) has passed the port (yellow) and picked up fluid. Pressure has pushed the check valve (purple) off the seat and fluid under pressure (red) is delivered through a passage to the area behind cutter rod. Dotted white arrow shows path of fluid flowing past the check valve.



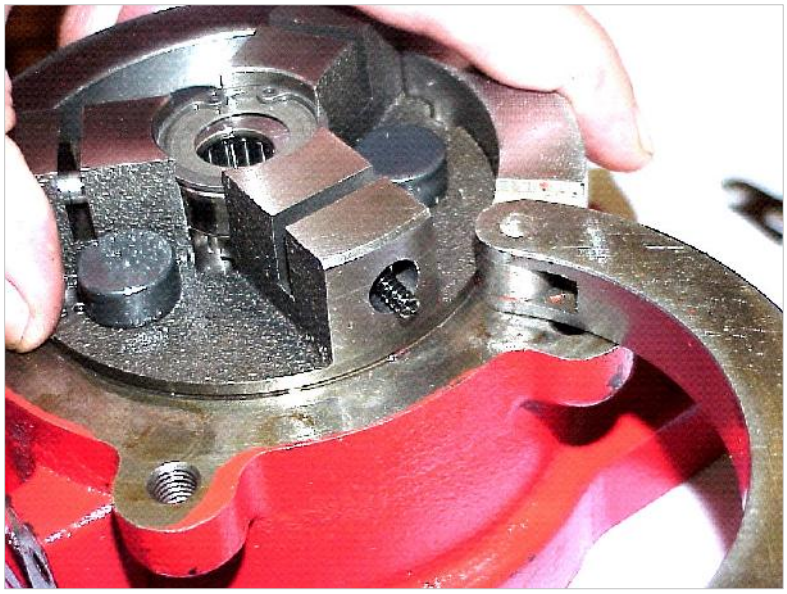
PUMP ASSEMBLY

- When inserting pistons into cylinder, be sure not to scar the piston



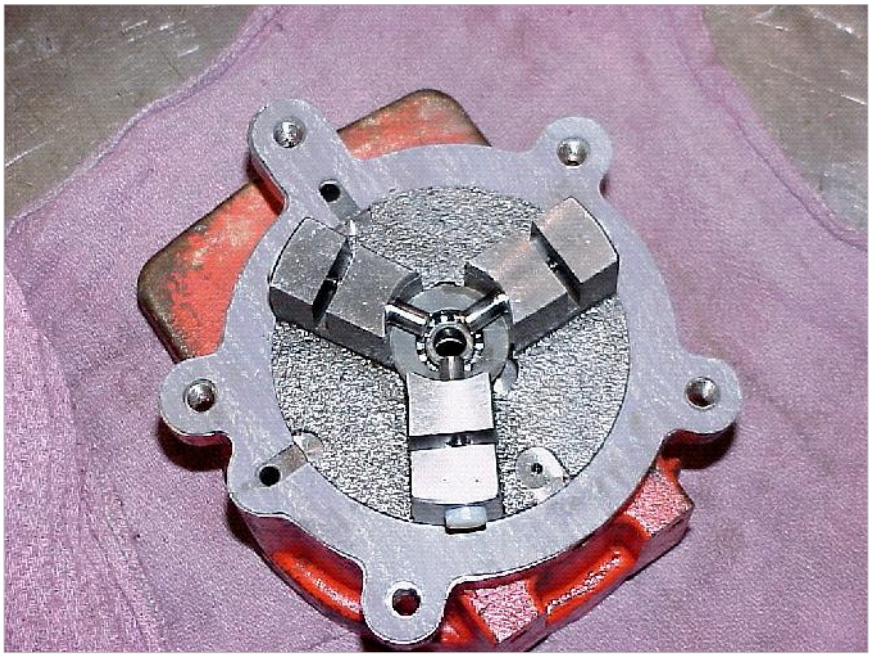


- Needle bearing, washer and stop ring installed before compressor tool.



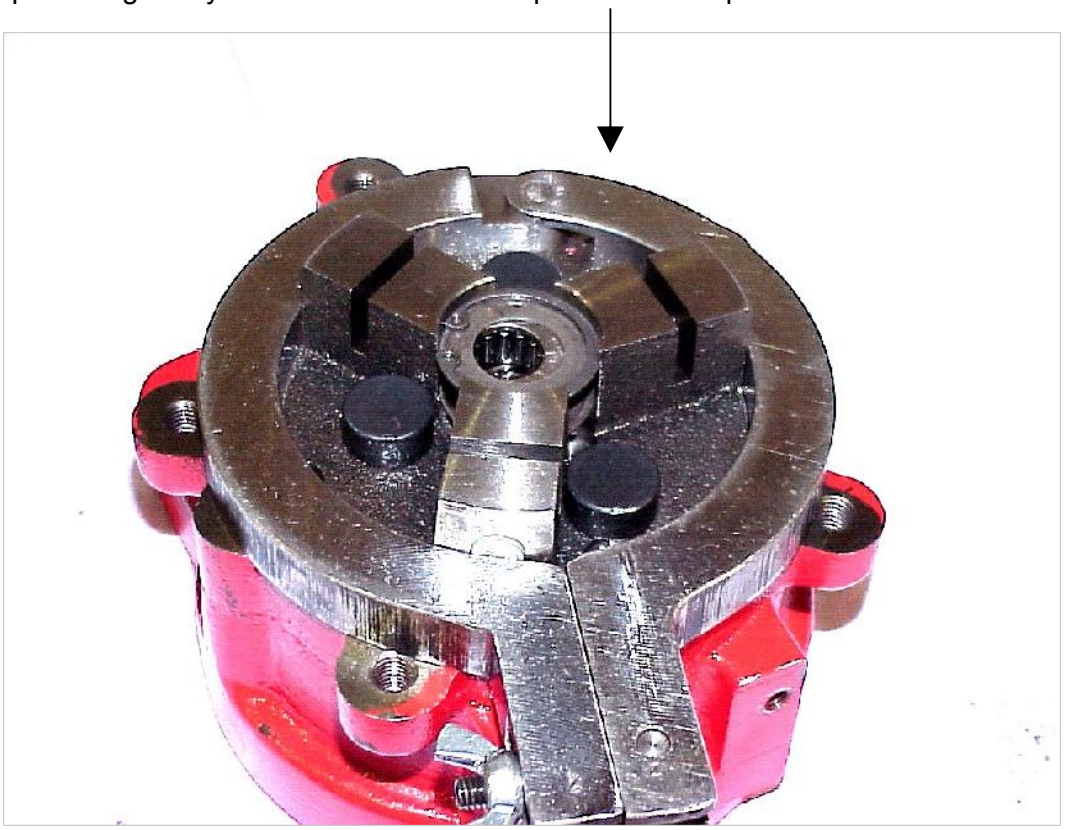
- Compressor tool in place, ready to install the urethane seal.

PUMP ASSEMBLY



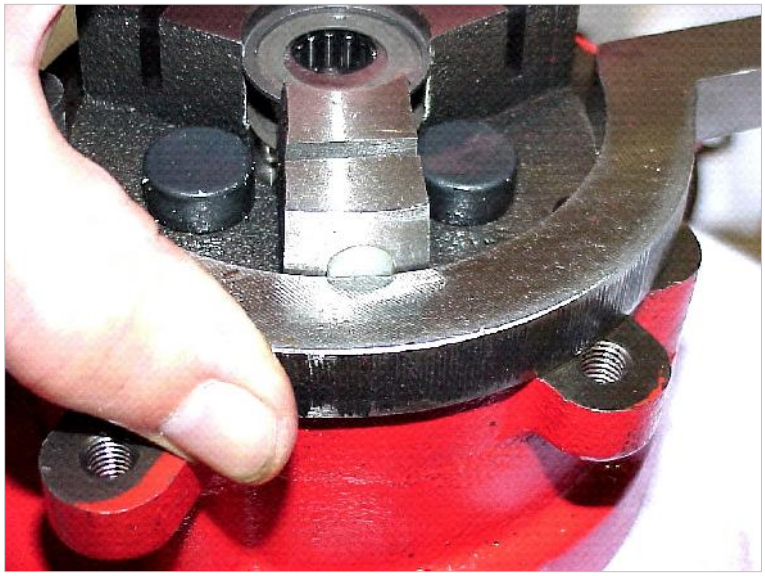
- Above shows piston assemblies with urethane seals installed in cylinders. The eccentric bearing is purposely not shown in place so that you may see how the piston return springs work.

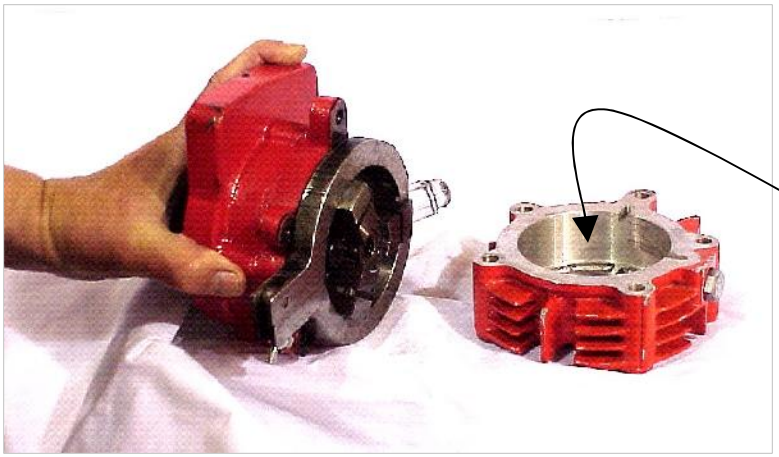
- Pump housing ready to be installed with compressor tool in place.



PUMP ASSEMBLY

- Picture shows how compressor tool is holding urethane seals in place.

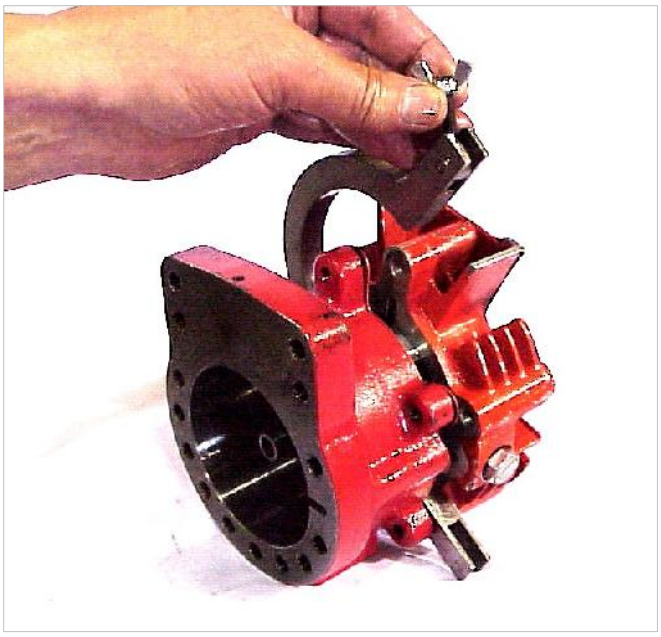




- Always replace main seal. This seal separates the hydraulic pump from the motor. The main bearing presses into housing on other side of this seal.

PUMP ASSEMBLY

- After installing reservoir, carefully remove compressor tool.



- Tap reservoir into place evenly.

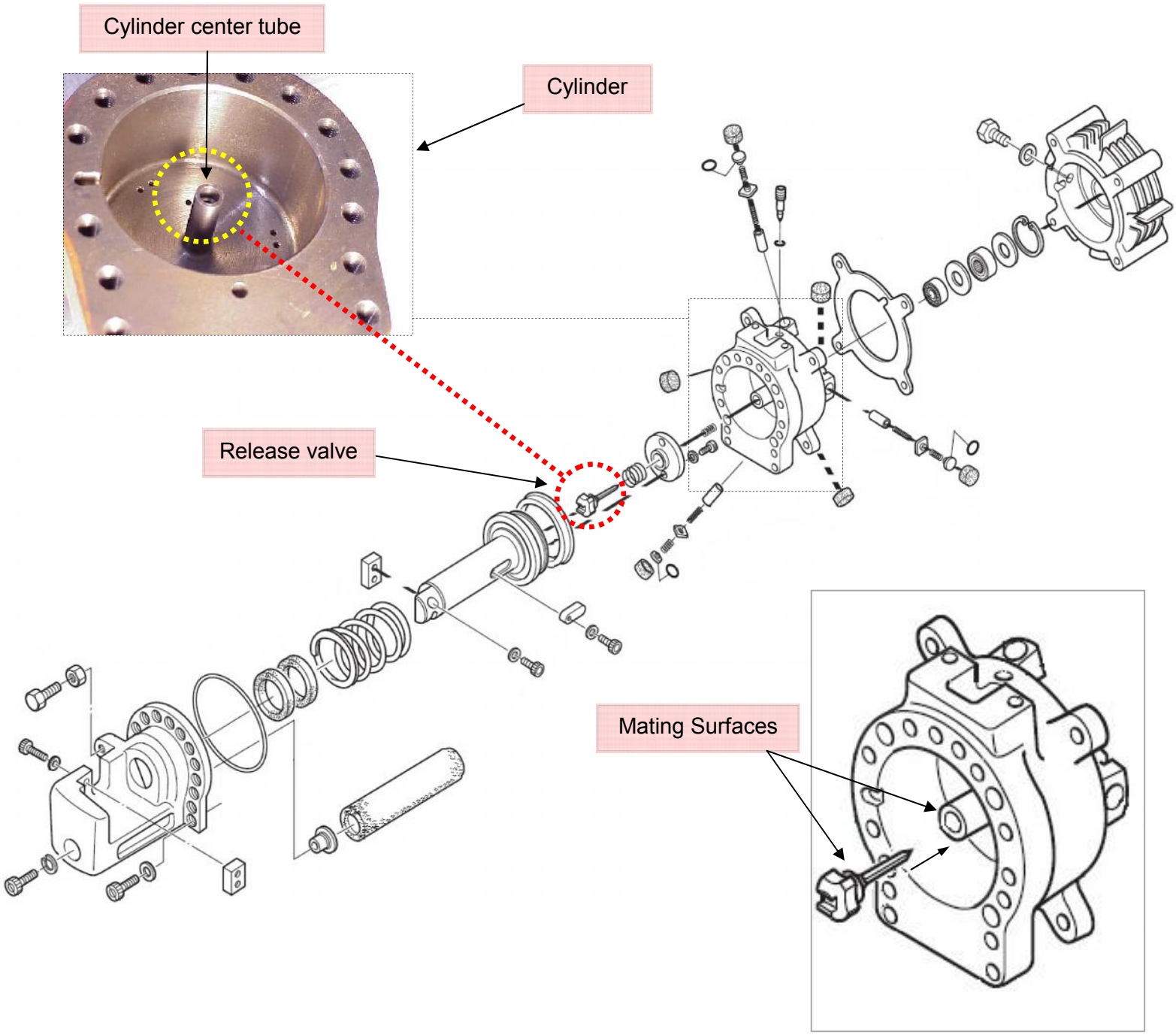
RELEASE VALVE

If unit is not building hydraulic pressure it may be necessary to reseat the release valve. The release valve must seat properly to the end of the cylinder center tube to create a good seal.

INSPECTING RELEASE VALVE:

- Insert release valve into cylinder and twist left and right
- Carefully pull valve off, if surface tension is observed the release valve is sealing properly
- If not, apply a small amount of fine lapping compound and lap until it seals correctly

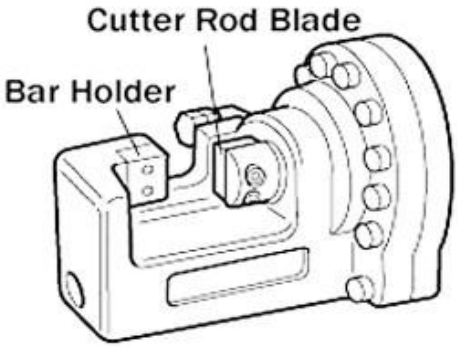
NOTE: During lapping DO NOT allow any compound down the center of the cylinder center tube shaft.



BAR HOLDER DISASSEMBLY

- Before removing bar holder from the cylinder, drain oil. (17mm wrench)

CAUTION: Bar holder assembly is SPRING LOADED.

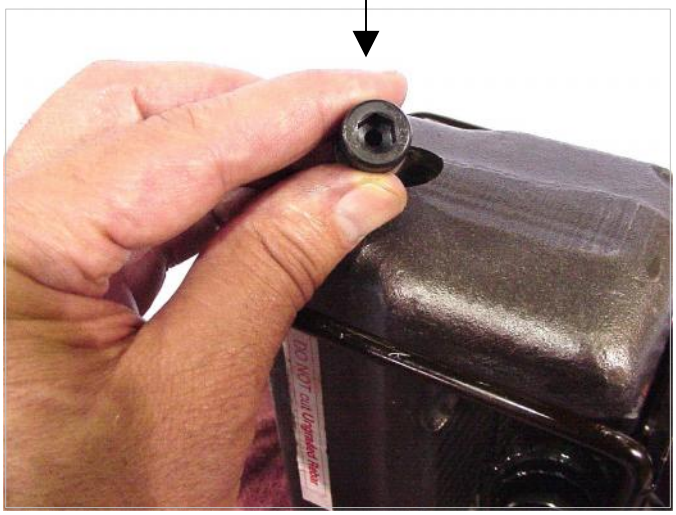


- Remove the Allen head bolts, leaving three bolts for last. (6mm Allen socket)
- Remove the last three bolts evenly and slowly, this will relieve the tension on the cutter rod return spring.

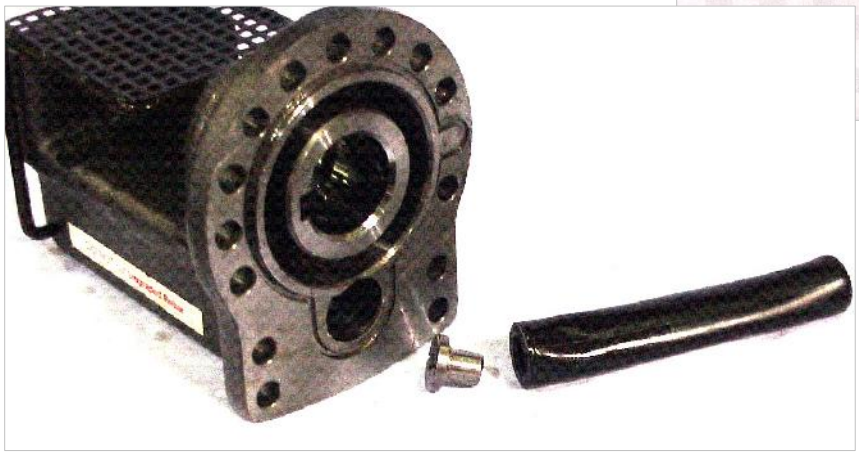
OIL LEVELER SACK

- Inspect the cutter rod bore and ensure no scoring or blemishes.

- Remove oil leveler sack retainer bolt.
  NOTE: Bolt has a vent hole



- Remove and inspect the oil leveler sack.
- A torn oil leveler sack will cause the cutter rod not to move and oil will leak from the retainer bolt through the vent hole.



OIL LEVELER SACK

- Installing new oil leveler sack is the opposite of removal. Torque the oil leveler sack bolt to spec.

  (Torque Specification: 15 ft. lbs.)

IMPORTANT: During reassembly follow instruction below, failure to follow instruction may result in a torn oil leveler sack.

- **DO NOT** Assemble with cutter rod return spring in this position. ⟶

NOTE: the cutter rod return spring ending edge is resting directly above the oil leveler sack.

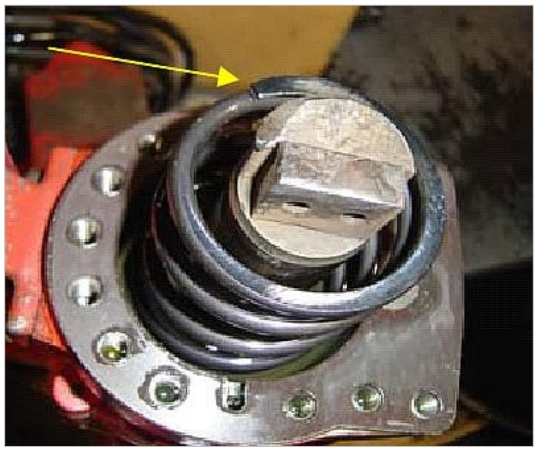
(see next page for correct spring position)

- Photo displays torn oil leveler sack due to incorrect positioning of the cutter rod return spring. ⟶

BAR HOLDER ASSEMBLY

- Photo displays cutter rod return spring in correct position.

NOTE: the cutter rod return spring ending edge is resting opposite side of cutting rod blade.



- When mounting the bar holder back onto cylinder, be careful not to pinch oil leveler sack.

- Stand the cutter on its end and carefully slide cutter head over cutter rod. Apply downward pressure to compress the main spring and get a couple of bolts started. Then place the cutter in a secure vise to install and tighten the rest of the bolts.

REBAR IDENTIFICATION

REBAR = REINFORCING BAR

There are a number of important ways to identify reinforcing bar from the production mill to the fabrication shop to the job site. This documentation and marking system will help provide a wealth of useful information about the manufacturing and composition of each bar of reinforcing steel.

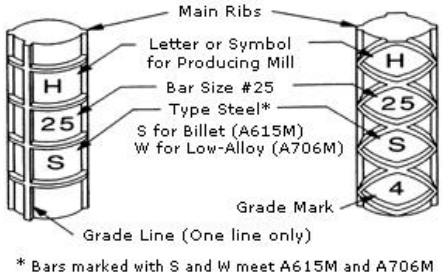
Each individual reinforcing bar is manufactured with a series of individual markings:

The top letter or symbol identifies the producing mill and deformation pattern.

The next marking is the bar size.

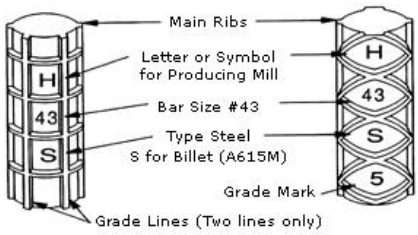
The third marking symbol designates the manufacturing material — usually either "S" for carbon-steel (ASTM A615) or "W" for low-alloy steel (ASTM A706).

Finally, there will be a grade marking (4 or 5, for 420 or 520) or by the addition of one line (420) or two lines (520) that must be at least five deformations long.



* Bars marked with S and W meet A615M and A706M

Grade 420



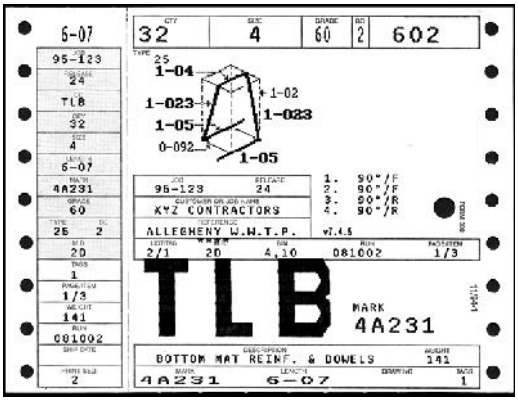
Grade 520

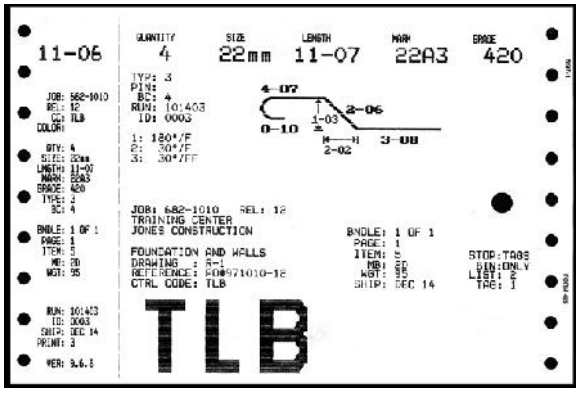
Generally, reinforcing steel bars are either carbon-steel (conforming to ASTM A615) or low-alloy steel (conforming to ASTM A706).

ASTM International (**ASTM**)
Originally known as the American Society for Testing and Materials

BAR TAGS

Bar tags provide the key to identifying rebar. A typical bar tag shows the number of pieces in a shipment of each bar. It also shows that the materials used to manufacture the bar conform to ASTM standards for reinforcing steel.





Reinforcing bars typically come in two primary grades: Grade 60, which has minimum yield strength of 60,000 psi, and Grade 75, which has yield strength of 75,000 psi. The metric equivalents for these are Grade 420, which has equivalent yield strength of 420 MPa (megapascals) and Grade 520, which has equivalent yield strength of 520 MPa.

REBAR CONVERSION

Metric sizes correspond exactly to inch sizes

ASTM STD INCHES

Bar Size # : Diameter
#3 : 3/8″
#4 : 1/2″
#5 : 5/8″
#6 : 3/4″
#7 : 7/8″
#8 : 1″

ASTM STD METRIC

Bar Size # : Diameter
#10 : 9.5 mm
#13 : 12.7 mm
#16 : 15.9 mm
#19 : 19.1 mm
#22 : 22.2 mm
#25 : 25.4 mm

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When a unit (e.g., MB25A) **maximum bending capacity is 1 inch the allowable combination of rebar is as follows.**

Qty : Bar Size #
2 : #3 or #10
2 : #4 or #13

Metric grade specs also correspond to inch-pound grade.

inch-pound grade	metric grade	Minimum Yield Strength	
		in pounds per square inch	in megapascals
Grade 40	Grade 280	40,000	280
Grade 60	Grade 420	60,000	420
Grade 75	Grade 520	75,000	520

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