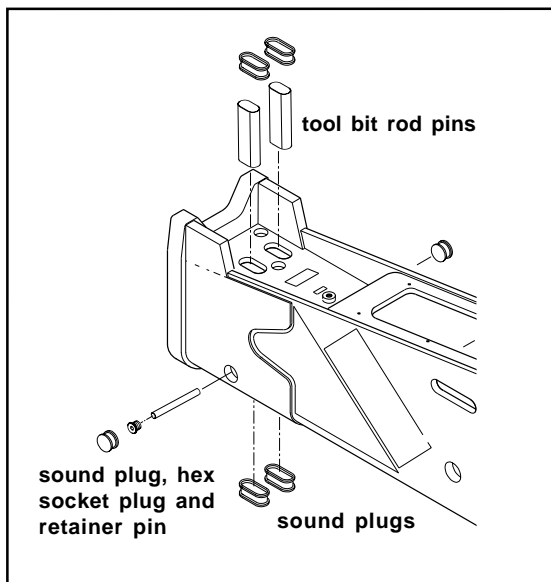


## DISASSEMBLY

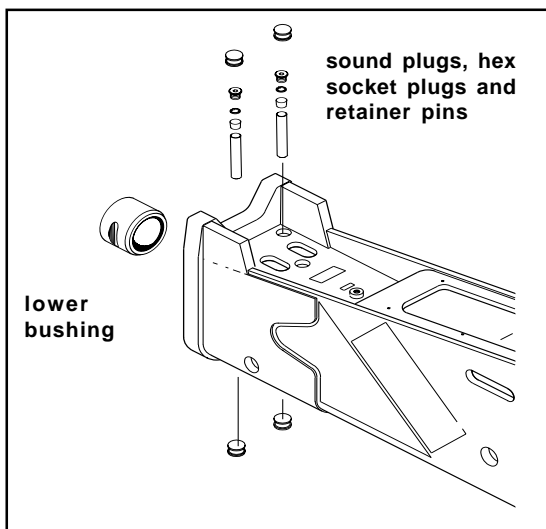
Refer to the parts illustration for correct orientation of parts.

### Removing the Housing

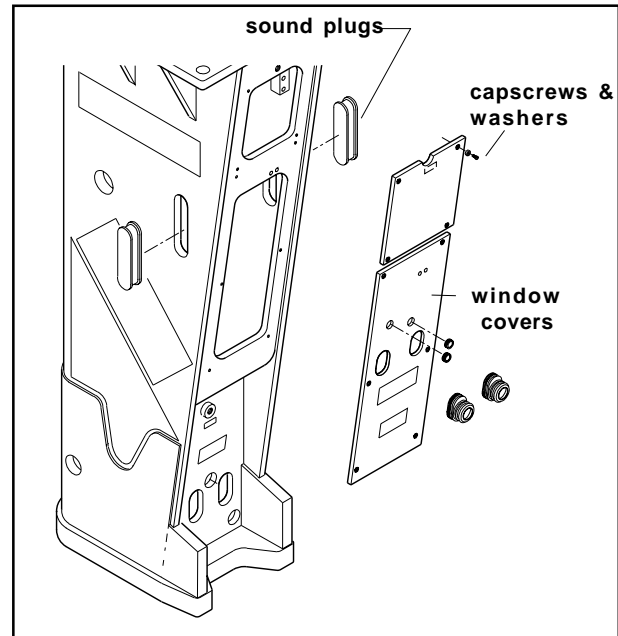
1. Lay the breaker in a horizontal position to remove the tool bit. Remove the sound plug (13). Remove the hex socket plug (28). Drive out the retainer pin (27).



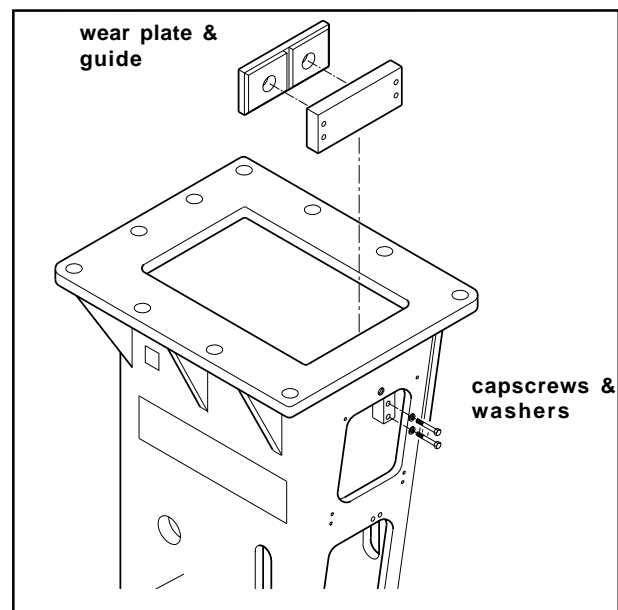
2. Remove the sound plugs (12). Drive out the rod pins (43) and then remove the tool bit.
3. Remove the sound plugs (13), hex socket plugs (35) and retaining rings (31). Using a punch and hammer, Tap out the retaining pins (29) and the rubber plugs (30). Remove the lower bushing (37).



4. Stand the breaker up in a vertical position.
5. Remove the capscrews (25) and washers (26) securing the window covers (21 & 24) to the housing.
6. Remove the sound plugs (10) from each side of the housing (*some models do not have these plugs*). Unscrew the hoses and fittings and remove them. Install plugs in the open ports. Install plugs or caps on the hoses.



7. Remove the capscrews (28) and washers (29) securing the wear plate guide (30) to the housing. Remove the wear plate guide (*some wear plate guides are located near the mid section of the housing*).





# **SOOSAN HYDRAULIC BREAKER**

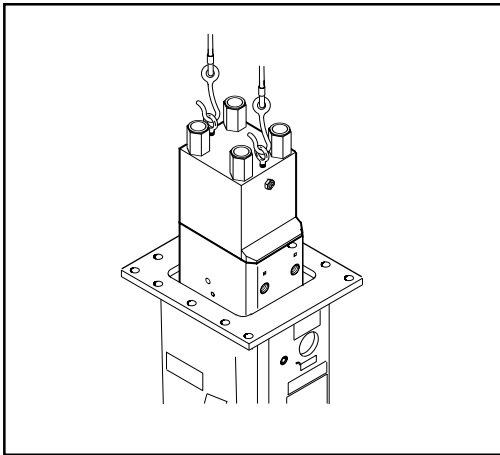
## **SERVICE MANUAL**



## NOTICE

**DO NOT ATTEMPT TO LIFT THE POWER CELL OUT OF THE HOUSING WITH FITTINGS INSTALLED IN THE IN AND OUT PORTS. THE FITTINGS WILL INTERFERE WITH THE HOUSING.**

8. Remove the excavator mounting bracket.
9. Remove the upper cushion (1).
10. Install a lifting eye into each of the threaded holes located in the top of the main accumulator (1). Using slings and a hoist, lift the breaker out of the housing and set it on a flat surface in a vertical position. Keep the slings attached.



## NOTICE

**DO NOT DISASSEMBLE THE BREAKER WHILE IT IS LAYING ON ITS SIDE. THIS MAY DAMAGE INTERNAL COMPONENTS.**

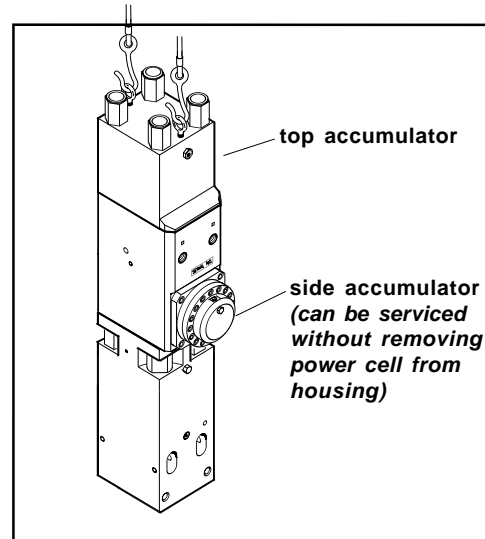
### Accumulators

## WARNING

**SERIOUS INJURY MAY RESULT FROM A PART OR OIL MOVING AT HIGH VELOCITY DUE TO SUDDEN, UNEXPECTED RELEASE OF GAS UNDER PRESSURE. DISCHARGE THE ACCUMULATOR BEFORE DISASSEMBLING THE BREAKER.**

gas chamber) which assists in producing the impact energy. This accumulator or chamber is located in the top of the breaker power cell and is typically charged with 230 psi/16 bar of nitrogen gas.

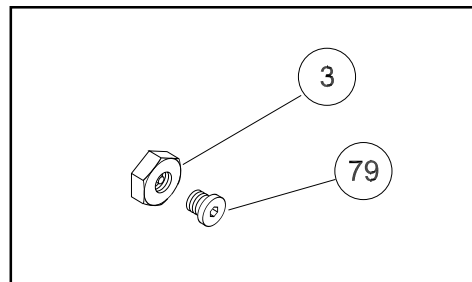
Some breaker models also contain an accumulator located at the mid-section of the breaker power cell. The purpose of this accumulator is to dampen the recoil shock produced during operation of the breaker. This accumulator is typically charged with 785 psi/54 bar of nitrogen gas.



### Discharging The Accumulators

#### Top Accumulator

Remove the protective plug (79) from the charge valve (3). Release the nitrogen charge by depressing the charge valve poppet with a #2 Phillips screwdriver or other blunt tool. After discharging the accumulator, the charge valve may be removed if necessary.

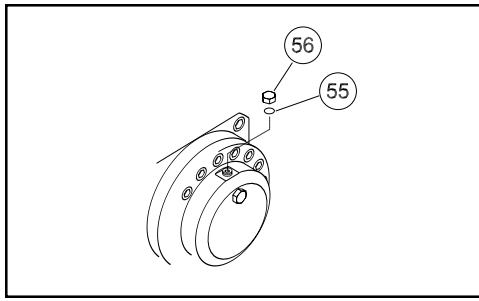


#### Removing the Protective Plug

#### Side Accumulator

Remove the 2 o-ring plugs (56 & 58). Then turn the charge valve (54) 1 to 2 turns counter clockwise.

All breaker models contain an accumulator (nitrogen



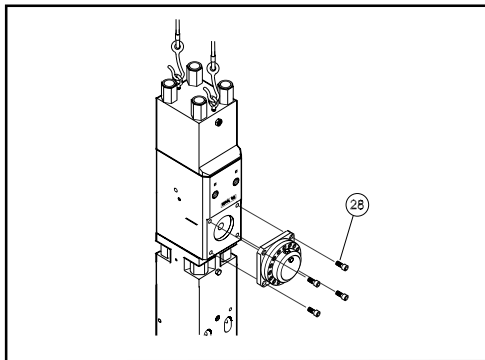
discharging the side accumulator

### Side Accumulator Disassembly

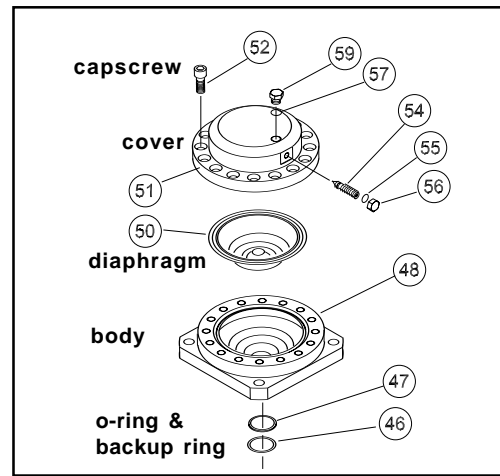
**NOTE:** The side accumulator can be serviced without removing the power cell from the housing.

If the accumulator does not require servicing, than there is no need to disassemble it. However, if the breaker is being disassembled for servicing, it is a good idea to also disassemble and inspect the accumulator and replace the diaphragm and seals. The weight of the assembled breaker will help provide leverage for loosening the capscrews.

1. First loosen the capscrews (52) that secure the cover to the body of the accumulator. Do not remove the capscrews at this time. **NOTE:** These capscrews may be loosened and removed after the accumulator has been removed from the breaker power cell.

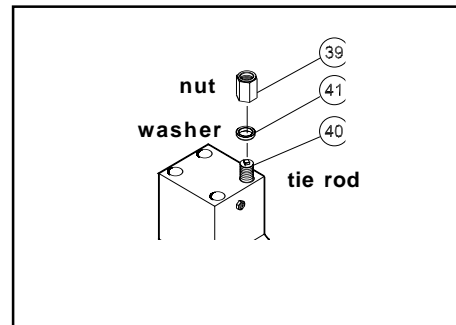


2. Remove the side accumulator from the breaker power cell as an assembly by removing 4 capscrews (49).
3. Remove all capscrews and lift off the cover (51).
4. Lift out the diaphragm (50).
5. Discard the o-ring and backup ring (46 & 47).

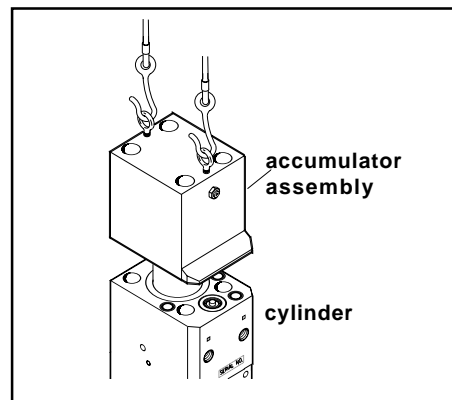


### Accumulator, Piston, & Main Accumulator Disassembly

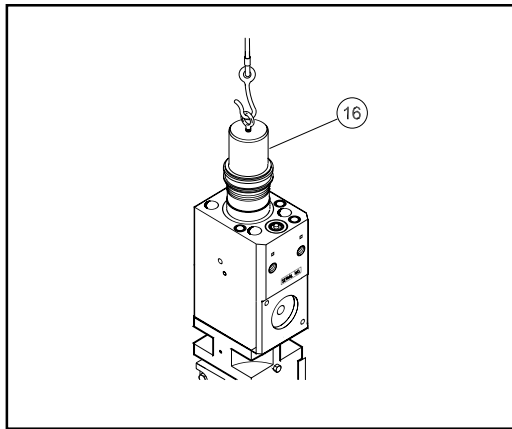
1. Unscrew and remove the 4 nuts (39). Do not use an impact wrench. Remove the 4 washers (41).



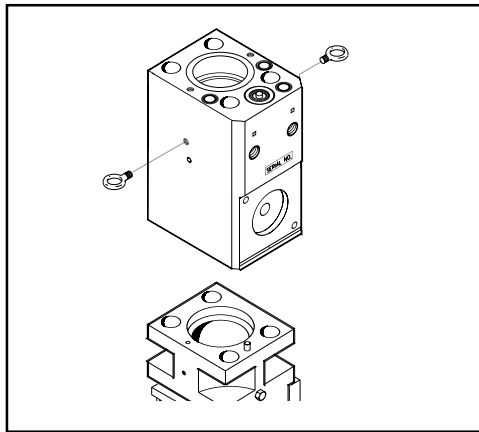
2. Unscrew and remove the 4 tie rods (40). Do not use an impact wrench. Keep the tie rods and tie rod nuts (42) together in matched sets. Lift off the main accumulator using lifting eyes, slings, and a hoist.



3. Install a lifting eye into the top of the piston (16). Using a hoist, lift the piston and seal retainer (5) out of the cylinder (6). Remove the seal retainer off of the piston by tapping it with a rubber hammer. Remove and discard the o-rings.



5. Install a lifting eye into each side of the cylinder. Using a hoist, lift the cylinder off of the lower body (26).



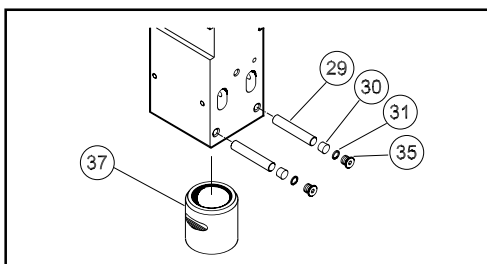
### Thrust Bushing Disassembly

1. Use the following steps to remove the thrust bushing from the lower body.

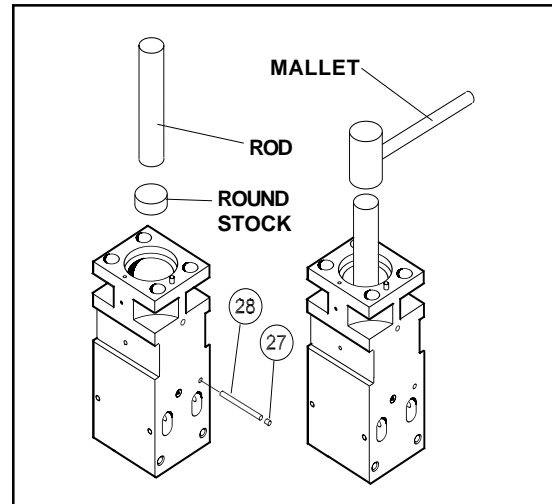
If the lower bushing (37) has not been removed, follow the instructions in step "a" below. If the lower bushing has been removed, skip step "a".

a. Remove the hex socket plugs (35) and retaining (31) rings. Using a punch and hammer, Tap out the retaining pins (29) and the rubber plugs (30). Remove the lower bushing (37).

b. Remove the hex socket plug (28). Using a punch and hammer, tap out the retainer pin (27). Slide the thrust bushing (36) out.

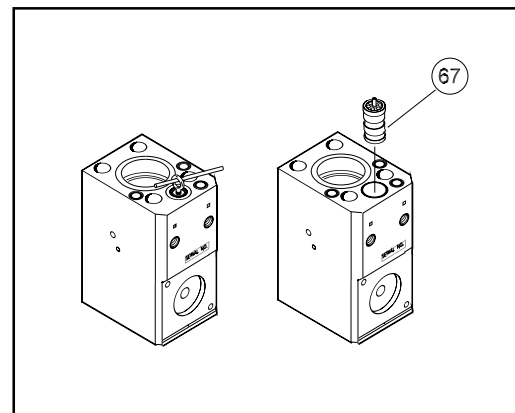


NOTE: The thrust bushing should slide out through the bottom of the lower body without difficulty. If the thrust bushing will not slide out, it will be necessary to obtain a piece of aluminum or brass round stock that has a diameter larger than the inside diameter of the thrust ring and then place it on top of the thrust ring. Using a rod or large punch against the piece of stock, hammer the thrust bushing out.



### Valve Plug & Valve Disassembly

1. Install a lifting eye into the top of the valve plug (18). Using a pry bar and scrap metal material to protect the cylinder face, remove the valve plug.
2. Lift out the valve (17) and valve sleeve (67).



## INSPECTION OF PARTS

**NOTE:** In addition to the instructions and guidelines below, also see the pages titled "WEAR TOLERANCES" at the end of the "SERVICE INSTRUCTIONS" section.

### • SEAL CARRIER, PISTON AND CYLINDER

Inspect the surfaces of the bore of the seal carrier and cylinder and the surface of the piston for wear, galling, and cracks. A light scuffing or burnishing of surfaces is normal. Check especially for freedom of movement of the parts and that the piston does not stick or bind as it is moved in the seal carrier and cylinder. Coat the parts with hydraulic oil for this test.

If small burrs are found, remove them with 220 grit emery cloth.

### NOTICE

The parts in the breaker are finely manufactured with critical tolerances.

REFURBISHING OF PARTS SHOULD ONLY BE ACCOMPLISHED BY AN ADEQUATELY EQUIPPED MACHINE SHOP.

PARTS SHOULD NEVER BE POLISHED OR BUFFED WITHOUT THE USE OF A TURNING LATHE.

If galling is present, consult the dealer to see if the part may be reworked.

If cracks are present, the part must be replaced.

### • VALVE SLEEVE, VALVE & VALVE PLUG

Inspect the surface of the bore of the valve sleeve and the surface of the valve and valve plug for wear, galling, and cracks. A light scuffing or burnishing of surfaces is normal. Check especially for freedom of movement of the valve in the valve sleeve.

If small burrs are found, remove them with 220 grit emery cloth. Do not break the sharp edges of the valve sleeve or valve spool as this will cause the valve to malfunction.

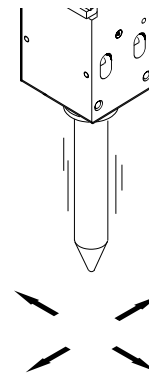
If galling is present, the part should be replaced.

If cracks are present, the part **must** be replaced.

### • THRUST BUSHING & LOWER BUSHING

Inspect the thrust bushing and lower bushing for excessive galling and metal pickup on the tool bit. Also check for cracks. If cracks are present, the parts must be replaced.

The extent of wear of the upper and lower bushings and the tool bit can be checked by moving the tool bit back and forth and measuring the gap between the tool bit and the lower bushing. If the gap is more than 0.354 in./9 mm the upper bushing, lower bushing, and the tool bit should be replaced. A gap in excess of 0.354 in./9 mm will cause damage to the piston. Do not just replace the tool bit or the lower bushing individually as this will result in premature wear of the replaced component. It is recommended to replace **all** worn components.



MOVE THE TOOL BIT BACK & FORTH & MEASURE THE GAP BETWEEN TOOL BIT & LOWER BUSHING

### • TIE RODS & TIE ROD NUTS

Inspect the tie rods and nuts for wear and cracks.

When clean and coated with anti-sieze, the tie rods should thread into the nuts without any effort. If some resistance is encountered, check all threads for dirt particles or damage.

**NOTE:** If a tie rod is found to be broken, all 4 tie rods must be replaced.

### • RETAINING PINS & ROD PINS

Inspect all retaining pins and tool retainers for excessive

wear, cracks, and chipping. Replace if cracks or chipping is noted.

Replace any rubber plug that was removed.

#### • HOUSING

Inspect the housing for cracks on the outside and on the inside. If cracks are present, have a certified welder perform repairs. After repairs, the housing must be stress relieved.

Make sure all decals and stickers are legible.

Inspect the upper and down cushions for distress. If the material is crushed, cracked, or has chunks missing, replacement is necessary.

Inspect the all wear plates for excessive wear and looseness. Replace parts as necessary.

## ASSEMBLY

Before assembly, thoroughly clean all components with a degreasing solution and then blow dry with compressed air to thoroughly clean oil passage ways.

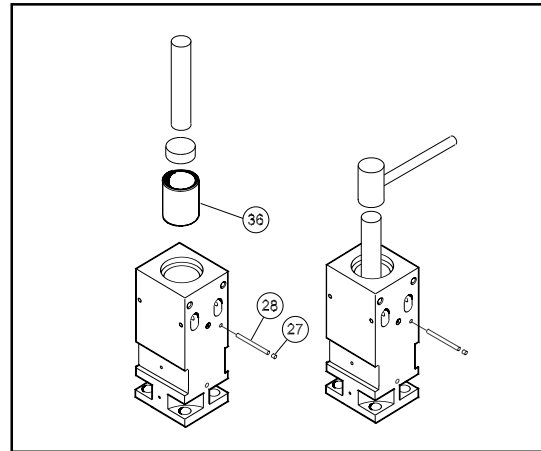
### ⚠ WARNING

**Exercise care when using compressed air and degreasing solutions. Always use protective eye wear and breathing protection. If flammable solvents are used, make sure they are used in an area where there will be no presence of open flame, static electricity or sparks from electrical equipment such as electric motors.**

When assembling internal metal parts, always coat them thoroughly with hydraulic fluid. Seals and o-rings should be lubricated with clean hydraulic oil.

Handle machined parts carefully to ensure they are not damaged during the assembly process. Do not force parts together. If difficulty is encountered in assembling parts, inspect each part for burrs, nicks, or galling before proceeding any further.

## Thrust Bushing, and Lower Bushing Assembly



Installing The Thrust Bushing

## NOTICE

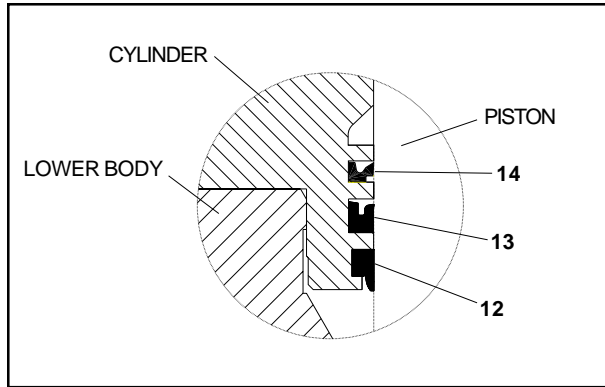
**The thrust bushing is custom fitted to each individual breaker. A new thrust busing must be machined prior to installation into the lower body.**

1. Measure the outside diameter of the thrust bushing (36) that was removed from the lower body (26) in at least two places. Record the highest measurement. Machine the outside diameter of the new thrust bushing to .001 inch under the recorded measurement.
2. Turn the lower body so that the tool bit end is facing up.
3. Place the thrust bushing into the bore of the lower body so that the bevel on the inside diameter faces toward the tool bit end of the lower body.
4. Obtain a piece of aluminum or brass round stock that has a diameter larger than the inside diameter of the thrust bushing. Place the round stock on top of the upper bushing. Using a rod or large punch against the piece of stock, tap the thrust bushing into place. Periodically check the position of the thrust bushing as the tapping progresses.
5. Install the retainer pin. Using a punch, tap the retainer pin (27) until it seats. Install the hex socket plug (26).
6. Install the lower bushing (37). Align the grooves in the bushing with the retainer pin holes. Install the retainer pins (29), new rubber plugs (30), and retaining rings (31). Install the hex socket plugs (35) using Loctite™ #608. Tighten to the torque specified in the torque chart in this manual.

7. Position the lower body so that the lower bushing is resting on the floor or work surface.

### Cylinder Assembly

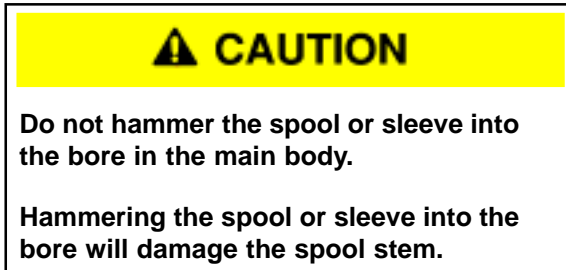
1. Apply clean hydraulic fluid and install the seals (12, 13 & 14) to the underside of the cylinder (6) as shown in the illustration below.



**Cylinder Seals**

2. Position the cylinder on top of the lower body as shown in the parts illustration.

### Valve and Valve Seals Installation



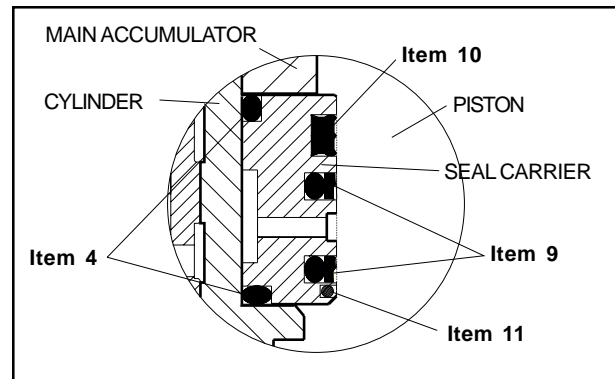
1. Lubricate the valve sleeve (67) with hydraulic fluid and then install it into the cylinder.
2. Lubricate the valve (17) with hydraulic fluid and then install the valve into the valve sleeve as shown in the parts illustration.
3. Apply clean hydraulic fluid and install the o-rings (19 & 20) onto the valve plug (18). Install the valve plug.

### Piston Installation

1. First make sure the interior of the cylinder is coated with hydraulic fluid.
2. Coat the piston (38) with hydraulic fluid.
3. Install a lifting eye into the top of the piston. Using a hoist, insert the piston into the cylinder. Lower the piston slowly, being careful not to damage it or the interior of the cylinder.

### Seal Carrier Assembly and Installation

1. Apply clean hydraulic fluid and install an o-ring (4) into the top outside groove of the seal carrier (5) as shown in the illustration on this page.
2. Apply clean hydraulic fluid and install the seals (9, 10 & 11) as shown in the illustration on this page.

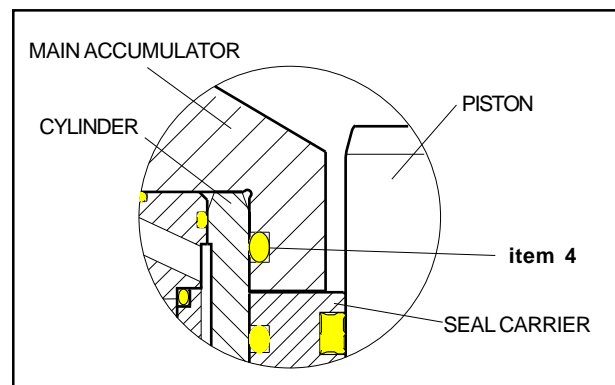


**Seal Carrier Seals**

3. Apply grease and install an o-ring (4) into the groove located at the bottom, outside of the seal carrier as shown in the illustration above.
4. Place the seal carrier onto the piston. Make sure the seal carrier is positioned as shown in the parts illustration. Slide the seal carrier down the piston and into the cylinder.

### Main Accumulator Assembly

1. Apply grease and install an o-ring (4) into the groove on the main accumulator (1) as shown in the illustration below.



**Install O-ring Into Groove on Main Accumulator**

2. Install lifting eyes into the top of the main accumulator. Using a hoist, set the main accumulator on top of the cylinder as shown in the exploded parts illustration.

### Tie Rod Assembly

1. Apply Kopr-Kote™ anti-sieze to the threads of each

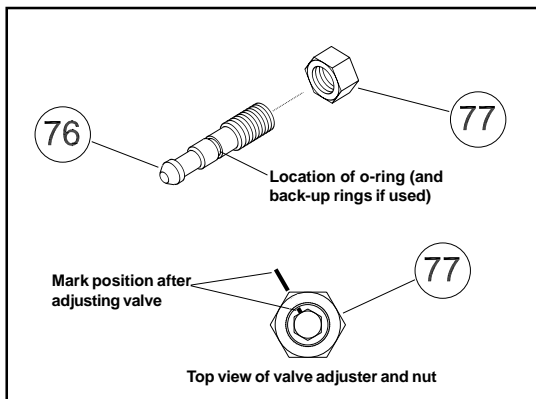


tie rod (40) and nut (42).

2. Install one tie rod at a time and check it and the nut for proper thread engagement. If difficulty is encountered while turning the tie rod by hand, inspect the threads of the tie rod and nut for burrs or dirt.
4. With successful thread engagement, screw the tie rods into the nuts.
5. Apply Kopr-Kote™ anti-sieze to both sides of the washers (41) and the threads of the nuts (39). Install the washers and nuts onto the tie rods and tighten by hand.
6. Tighten the nuts in a cross pattern in three torque increments to the torque specified in the torque chart in this manual. **DO NOT USE AN IMPACT WRENCH.**

#### Valve Adjuster (not used on all models)

1. Apply grease and install a new o-ring (73) and back-up rings (68) onto the valve adjuster as shown in the illustration below. NOTE: Some models do not use the back-up rings.
2. Install the valve adjuster by hand until it bottoms out in the bore and stops turning. If an allen wrench is used, do not force the valve adjuster beyond the bottom-out point as this will damage the valve. Then turn the valve adjuster 2-1/2 turns counter clockwise.
3. Using a felt pen, place a mark on top of the valve adjuster and a corresponding mark on the face of the cylinder. See the illustration below.

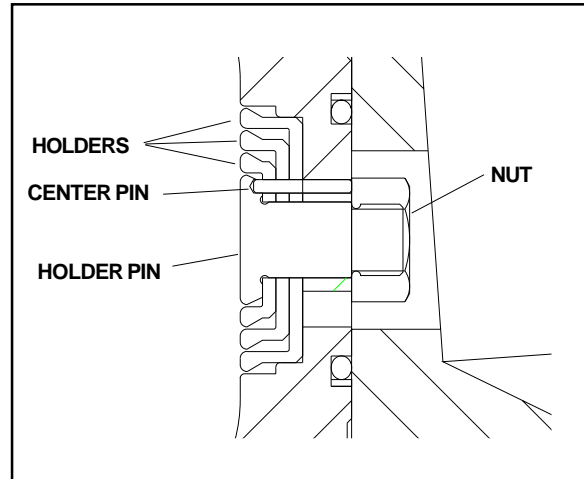


4. Apply Loctite™ 680 to the threads of the nut (77) and then install the nut onto the valve adjuster. **DO NOT LET THE VALVE ADJUSTER TURN - IT MUST REMAIN AT THE MARKS.** Use an allen wrench to prevent the valve adjuster from turning and then tighten the nut. Final tighten the nut to 100 ft. lb./136 Nm. Make sure the valve adjuster does not turn during the nut tightening process and that the mark

on the adjuster valve and the cylinder face correspond.

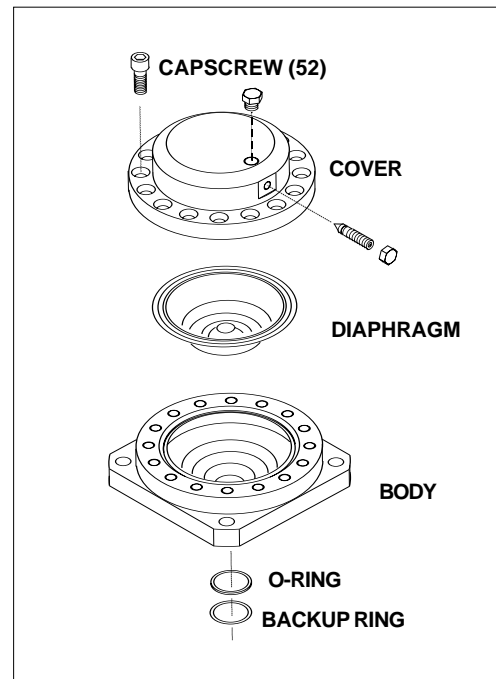
#### Side Accumulator (not used on all models)

1. If the holders (61, 62, & 63) were disassembled, reassemble them to the accumulator body (48). Make sure the center pin (64) is positioned correctly as shown in the illustration below.
2. Tighten the nut (60) securely.



CENTER PIN & HOLDERS

3. Install a new diaphragm (50) to the accumulator body (48) and then install the accumulator cover (51) as shown in the illustration below.



ACCUMULATOR ASSEMBLY

4. Apply Loctite™ 242 and install the cap screws (52) and tighten. Final torque is accomplished later.

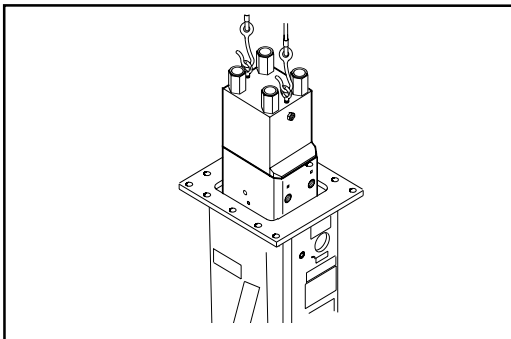
## Accumulator Charging

Charge each accumulator as specified on the page titled "NITROGEN CHARGING THE ACCUMULATOR" found earlier in this manual.

## Housing Installation

**NOTE: If maintenance is performed on a breaker to the extent that the power cell is removed from the housing, it is always recommended to take advantage of this opportunity to replace the upper and down cushions and wear plates even if they appear only slightly used.**

1. Install a lifting eye into each of the threaded holes in the top of the main accumulator assembly. Attach slings and a hoist.
2. Lift the power cell and lower it into the housing. Make sure the oil ports are positioned with the window opening in the housing. Lower the power cell into the housing until it rests against the down cushion (16).



**Lowering The Power Cell Into The Housing**

3. Install the wear plate guide (30) with a new wear plate (2). Secure in place with capscrews (28) and washers (29).
4. Install the upper cushion (1).
5. Install the mounting bracket.

## Tool Bit Installation

1. Grease the top 250 mm/10 inches of the tool bit with high temperature grease and insert the tool bit into the lower body. Align the notches of the bit with the rod pin holes in the lower body and then install the rod pins.
2. Install the stop pin (43) followed by the hex socket