



REBUILD INSTRUCTIONS

SWIVEL ACTUATOR

• DOC#15-2015 •

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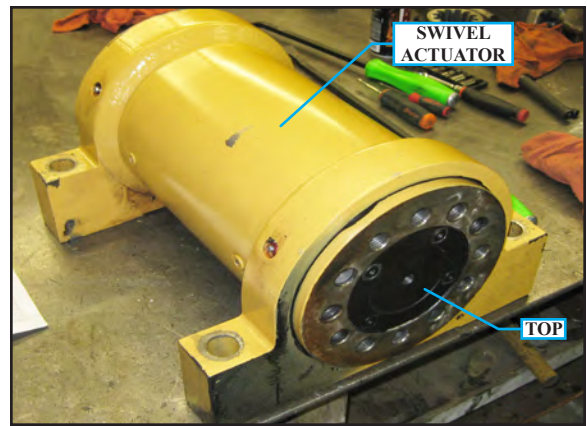
DEMAND BRILLIANCE.

Tools Needed for Swivel Actuator Rebuild:

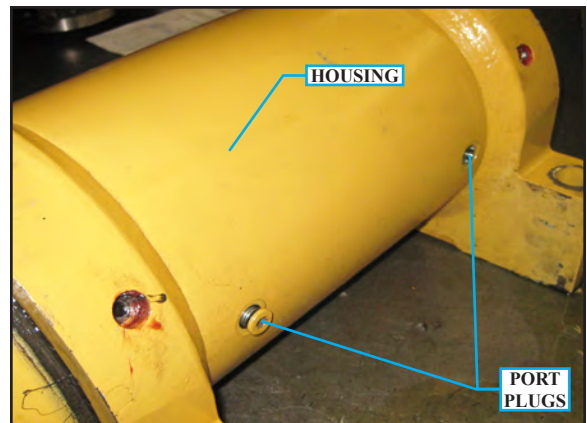
- Hex wrench set
- Prybar
- Seal tools
- Plastic bar or solid wood block
- Hammer or mallet
- C-Clamp
- Flashlight
- Paint pen or permanent marker
- Safety glasses.

Swivel Actuator Rebuild Instructions:

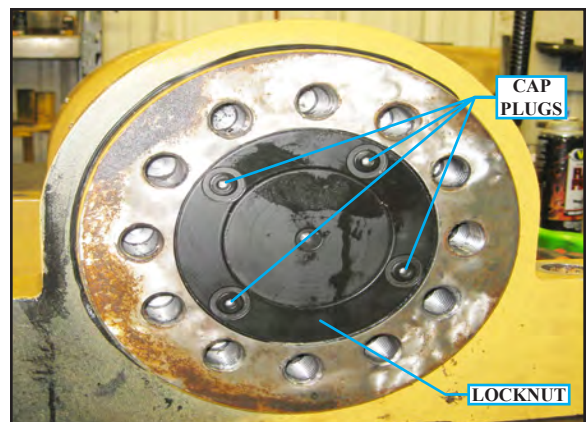
- Place the swivel actuator unit to be rebuilt on the work surface with the (4) removable O-ring plugs facing you as illustrated at right *[see Figure 1]*.
- Remove the (4) port plugs *(or other hardware)* from the housing. There will be (2) on either side of the housing, as illustrated at right *[see Figure 2]*. There will be some oil loss when these plugs are removed.
- Remove the (4) cap plugs from the locknut as illustrated at right *[see Figure 3]*.



[Figure 1]



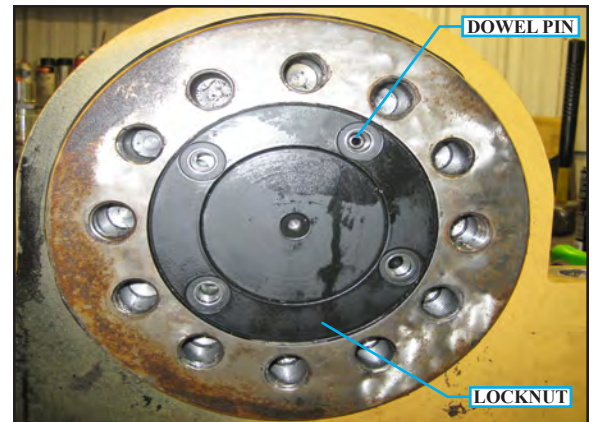
[Figure 2]



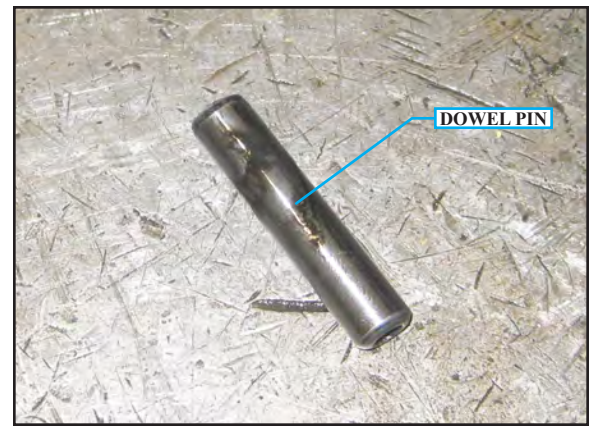
[Figure 3]

Swivel Actuator Rebuild Instructions:

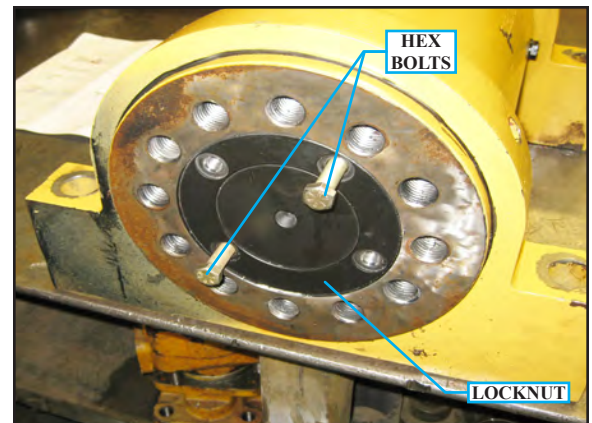
- Using the 10-32 bolt included with your kit, remove the dowel pin located in one of the exposed ports as illustrated at right *(see Figure 4).*

*(Figure 4)*

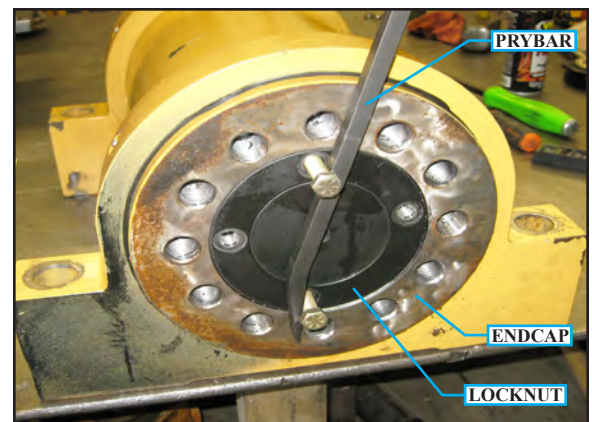
- After removing the dowel pin as illustrated at right *(see Figure 5,)* set it aside for reinstallation later on.

*(Figure 5)*

- Thread (2) $\frac{7}{16}$ " x 2- $\frac{1}{4}$ " NF bolts into the locknut, one on each side of the unit, as illustrated at right *(see Figure 6).*

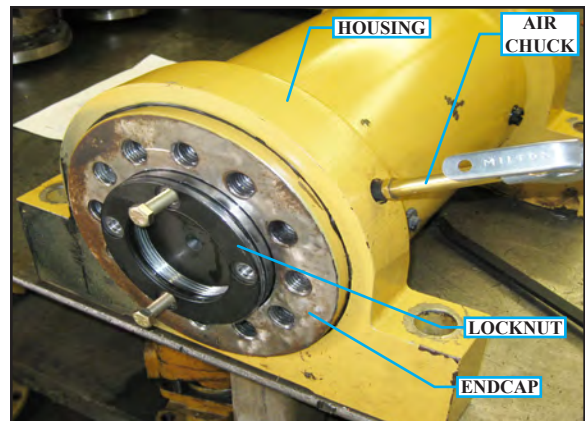
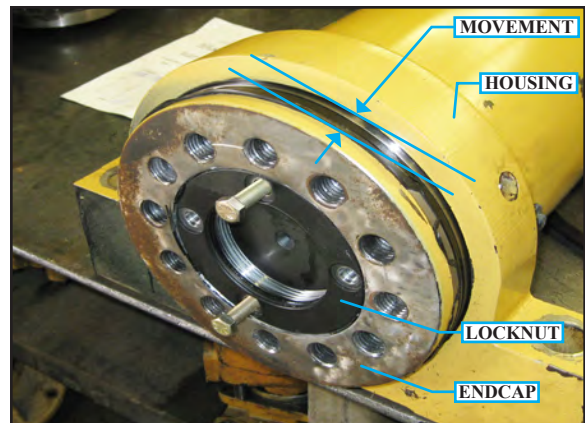
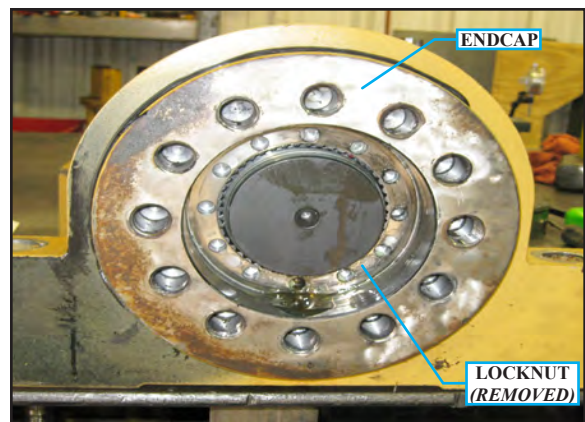
*(Figure 6)*

- Use a prybar to thread the locknut off/out of the endcap by rotating it counter-clockwise. Unthread the locknut until only a few threads are engaged; **DO NOT** fully remove the locknut at this time *(see Figure 7).*

*(Figure 7)*

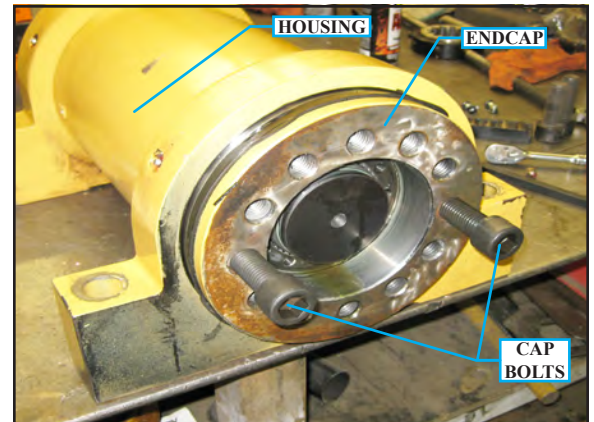
Swivel Actuator Rebuild Instructions:

- Remove the top side grease purge from the helac swivel housing as illustrated at right *(see Figure 8)*.
- Using an air chuck with pressurized air, blow air into the grease purge port in the housing to force the endcap out of the housing as illustrated at right *(see Figure 9)*.
- Shown in the illustration at right is the endcap now forced out of the housing from the previous step, and flush with the locknut *(see Figure 10)*.
- Finish unthreading the locknut from the endcap, and then remove it and set it aside as illustrated at right *(see Figure 11)*.

*(Figure 8)**(Figure 9)**(Figure 10)**(Figure 11)*

Swivel Actuator Rebuild Instructions:

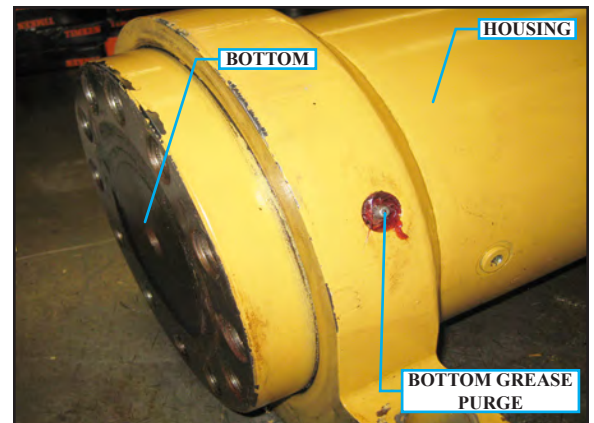
- Thread (2) cap bolts into the endcap as illustrated at right, and then lift/pull the endcap from the housing *(see Figure 12)*.

*(Figure 12)*

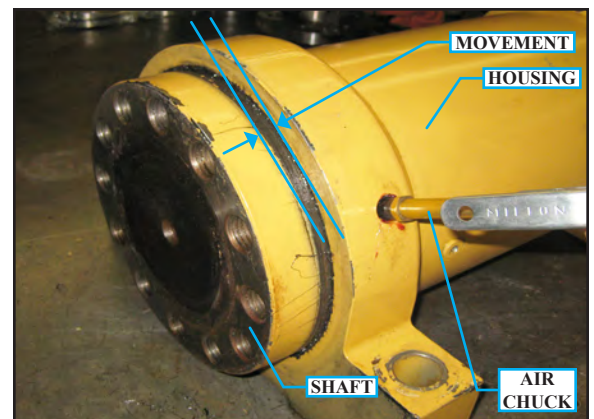
- After removing the endcap from the housing, set it aside as illustrated at right *(see Figure 13)*.

*(Figure 13)*

- Turn the swivel actuator housing around on the work surface so now the bottom of the housing is facing you. Remove the bottom grease purge as illustrated at right *(see Figure 14)*.

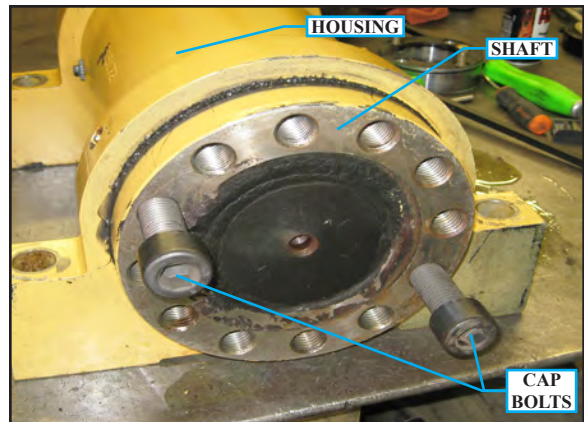
*(Figure 14)*

- Using an air chuck with pressurized air, blow air into the grease purge port in the housing to force the shaft out of the housing as illustrated at right *(see Figure 15)*.

*(Figure 15)*

Swivel Actuator Rebuild Instructions:

- Thread (2) cap bolts into the shaft as illustrated at right, and then lift/pull the shaft from the housing. *Note, while rotating the shaft counterclockwise, be careful not to damage the shaft or housing during removal (see Figure 16).*



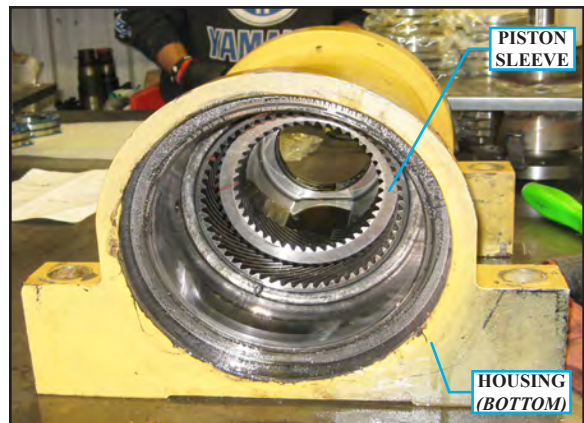
(Figure 16)

- After removing the shaft from the housing, set it aside as illustrated at right (see Figure 17).



(Figure 17)

- Using a rubber mallet, or dead blow with a plastic bar, gently tap the piston sleeve outwards towards the top of the housing, until it is nearly free, *but NOT all the way out (see Figure 18).*



(Figure 18)

- Turn the swivel actuator housing around on the work surface until the top of the housing is facing you. Grab the piston sleeve, and while gently pulling/twisting, remove it from the housing and set it aside as illustrated at right. *Note, while rotating the piston sleeve clockwise, be careful not to damage the shaft or housing during removal. Check the smooth surfaces of the interior of the housing on both sides, and make sure there are no scratches, burrs, or other raised surfaces in the housing. Use fine emery paper to smooth out imperfections, and then clean out any debris/filings (see Figure 19)*



(Figure 19)

Swivel Actuator Rebuild Instructions:

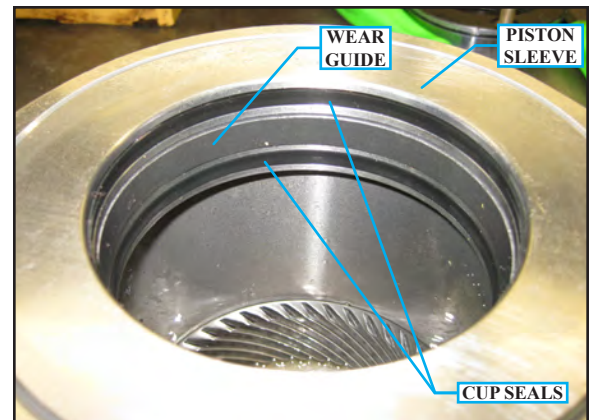
- Remove the split ring wear guide from the piston sleeve as illustrated at right, and discard it if the bearings are to be replaced, or if not, set them aside for reinstallation (see Figure 20). The ends of the external split ring wear guides should overlap; if not, they will need to be replaced.
- Remove the (2) cup seals from the piston sleeve as illustrated at right, and discard them (see Figure 21).
- Remove the (2) cups seals and split ring wear guide from the interior of the piston sleeve as illustrated at right, and discard them (Do not discard the wear guide unless it is to be replaced, or if not, set it aside for reinstallation) (see Figure 22).
- Remove the (2) O-rings (one on the outside, and one on the inside) from the locknut as illustrated at right, and discard them (see Figure 23).



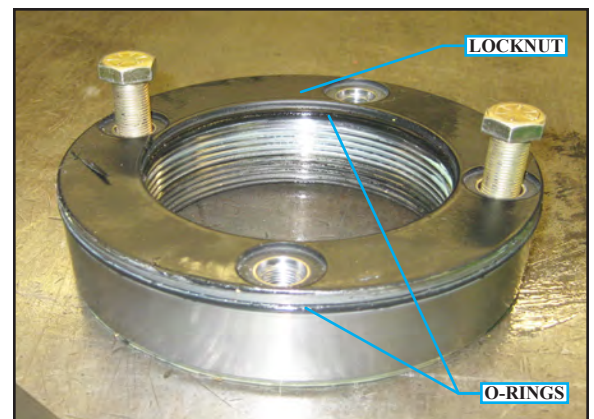
(Figure 20)



(Figure 21)



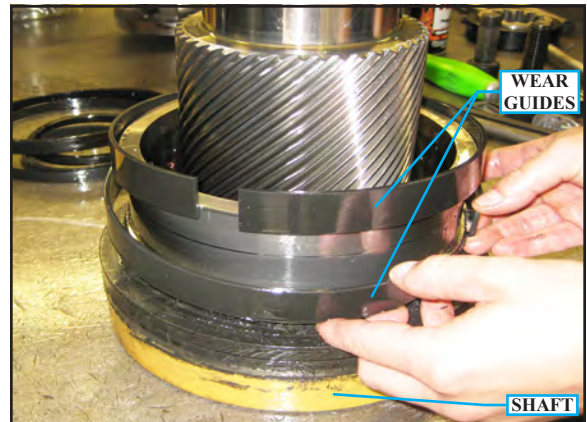
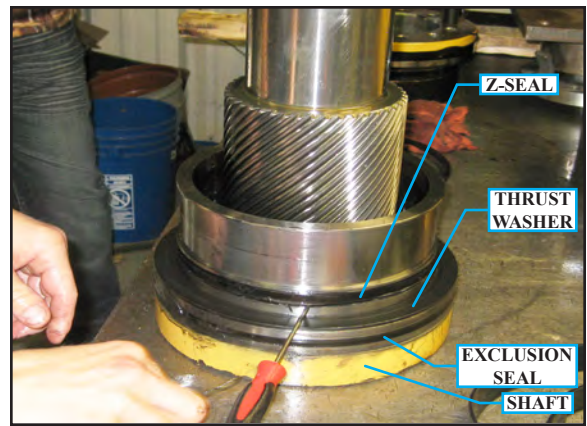
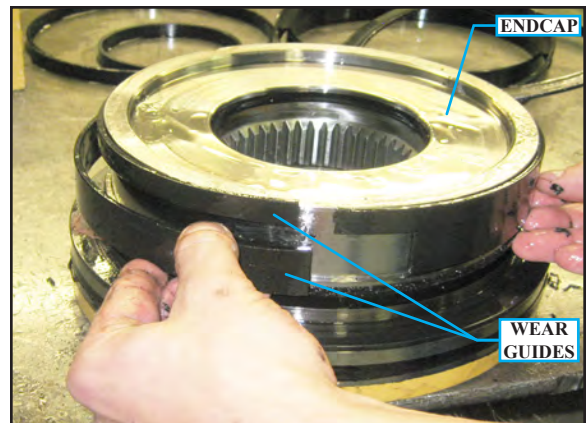
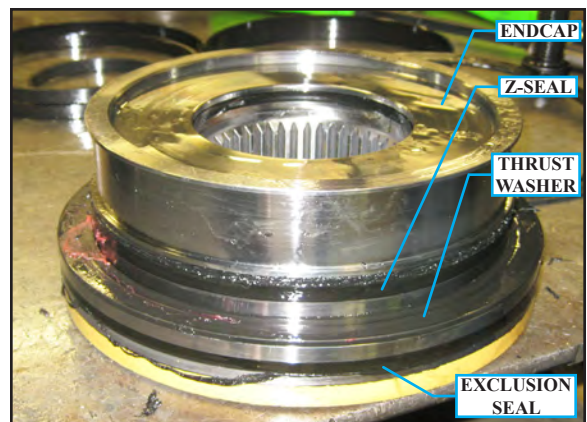
(Figure 22)



(Figure 23)

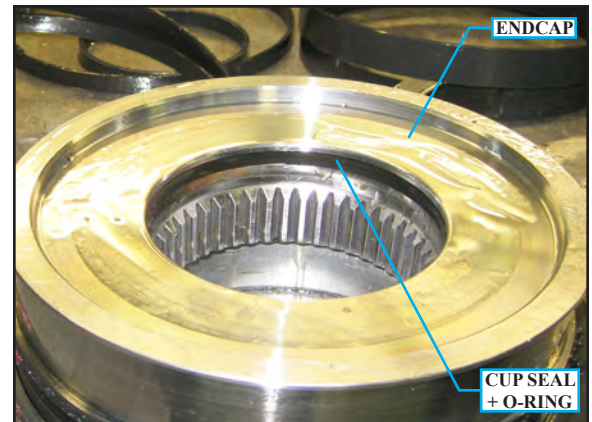
Swivel Actuator Rebuild Instructions:

- Remove the (2) split ring wear guides from the shaft as illustrated at right, and discard them *(Do not discard the wear guides unless they are to be replaced, or if not, set them aside for reinstallation)* *(see Figure 24)*.
- Remove the Z-seal from the shaft, and then remove the thrust washer and exclusion seal from the shaft, as illustrated at right. Discard them once removed from the shaft *(Do not discard the thrust washer unless it is to be replaced, or if not, set it aside for reinstallation)* *(see Figure 25)*.
- Remove the (2) split ring wear guides from the endcap as illustrated at right, and discard them *(Do not discard the wear guides unless they are to be replaced, or if not, set them aside for reinstallation)* *(see Figure 26)*.
- Remove the Z-seal from the endcap, and then remove the thrust washer and exclusion seal from the endcap, as illustrated at right. Discard them once removed from the endcap *(Do not discard the thrust washer unless it is to be replaced, or if not, set it aside for reinstallation)* *(see Figure 27)*.

*(Figure 24)**(Figure 25)**(Figure 26)*

Swivel Actuator Rebuild Instructions:

- Remove the cup seal from the interior of the endcap as illustrated at right, and discard it (see Figure 28).



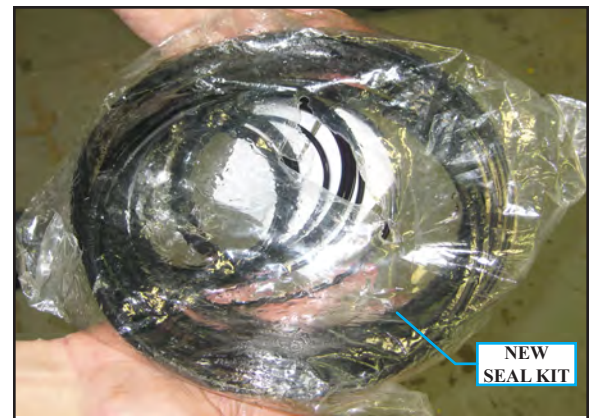
(Figure 28)

- Take the swivel actuator components over to the wash station, and clean them thoroughly of any grease, oil, debris, etc. If the original wear guides and thrust washers are to be reused, clean them off as well for regreasing and reinstallation (see Figure 29).



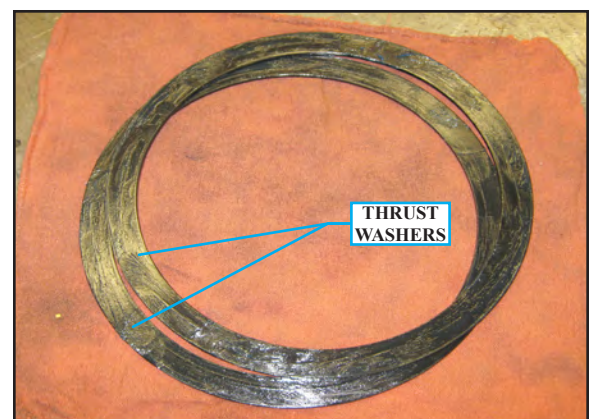
(Figure 29)

- Tear a small hole into the seal kit bag containing the new seals and O-rings, and pour in a couple ounces of hydraulic oil. Work the oil around in the bag until all of the seals and O-rings are fully coated with the hydraulic oil as illustrated at right (see Figure 30).



(Figure 30)

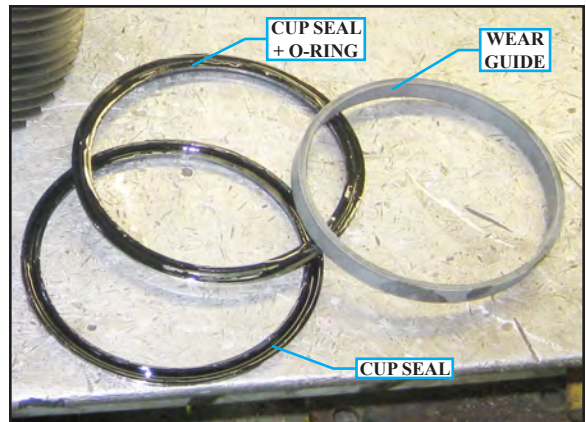
- Locate the (2) new thrust washers (or the original thrust washers to be reused,) and thoroughly coat both sides of the thrust washers with grease as illustrated at right (see Figure 31).



(Figure 31)

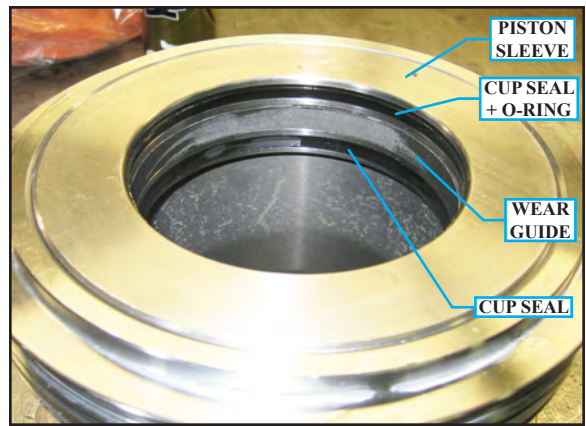
Swivel Actuator Rebuild Instructions:

- Reference the illustration at right and the parts breakdowns at the end of this manual for clarification of the differences between cup seals with or without O-ring, and the split ring wear guide (see Figure 32).



(Figure 32)

- Install the cup seals and split ring wear guide into the interior of the piston sleeve as illustrated at right. Make sure the cup seal with the O-ring has the groove facing *UP*, and the cup seal without the O-ring has the groove facing *DOWN* (see Figure 33).



(Figure 33)

- Install the cup seals onto the exterior of the piston sleeve as illustrated at right. Make sure the cup seal with the O-ring has the groove facing *UP*, and the cup seal without the O-ring has the groove facing *DOWN*. Make sure the dowel pin (NOT the pin removed in the beginning of this manual) is in its hole/recess as shown at right before proceeding any further (see Figure 34).



(Figure 34)

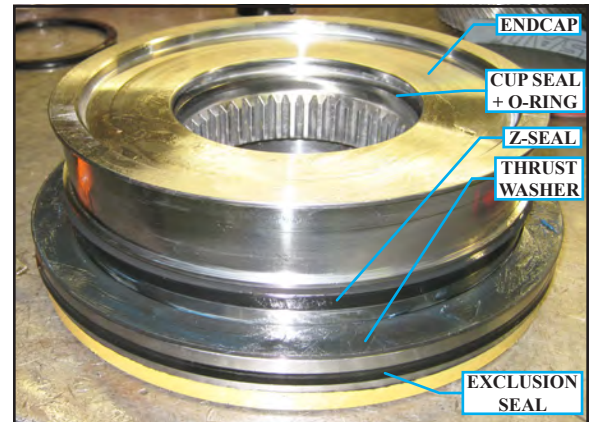
- Install the split ring wear guide onto the exterior of the piston sleeve as illustrated at right (see Figure 35).



(Figure 35)

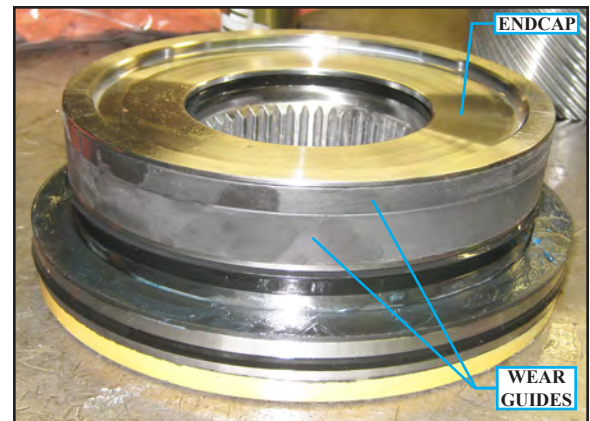
Swivel Actuator Rebuild Instructions:

- Install the exclusion seal onto the endcap with the groove facing down towards the threaded holes/painted outside surface, and then place the new greased thrust washer onto the endcap. Install the Z-seal onto the endcap with the grooves facing up as illustrated at right. Install the cup seal with the O-ring with the groove facing UP into the interior of the endcap (see Figure 36).



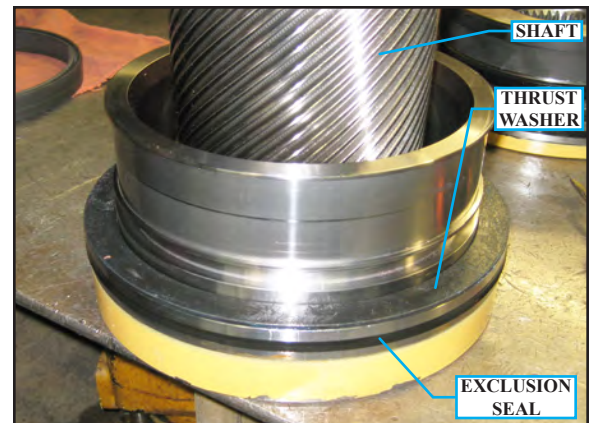
(Figure 36)

- Install the (2) split ring wear guides onto the endcap as illustrated at right, making sure the wide wear guide is on the bottom, and the narrow wear guide is on the top (see Figure 37).



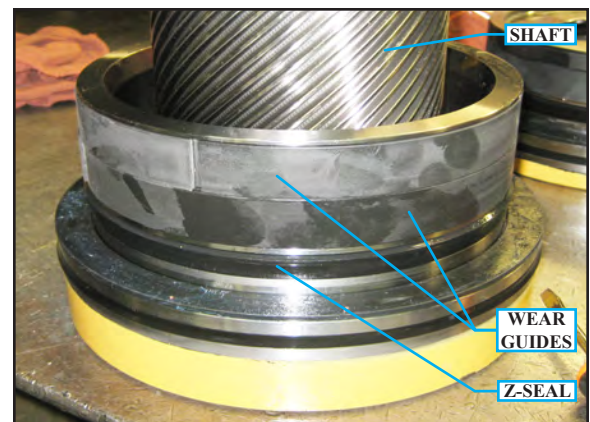
(Figure 37)

- Install the exclusion seal onto the shaft with the groove facing down towards the threaded holes/painted outside surface, and then place the new greased thrust washer onto the shaft as illustrated at right (see Figure 38).



(Figure 38)

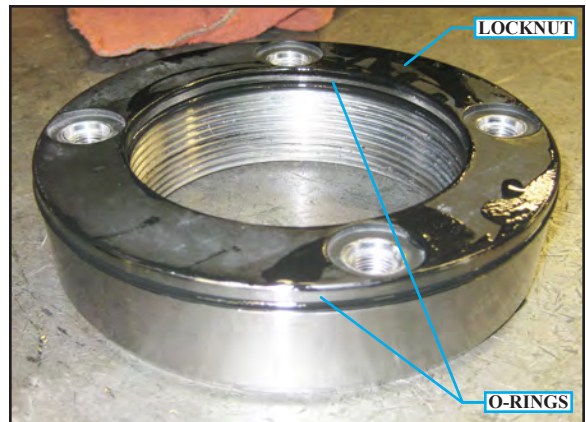
- Install the Z-seal onto the shaft with the grooves facing up, and then install the (2) split ring wear guides as illustrated at right (see Figure 39).



(Figure 39)

Swivel Actuator Rebuild Instructions:

- Install the (2) O-rings onto the exterior and interior of the locknut, as illustrated at right (see Figure 40).



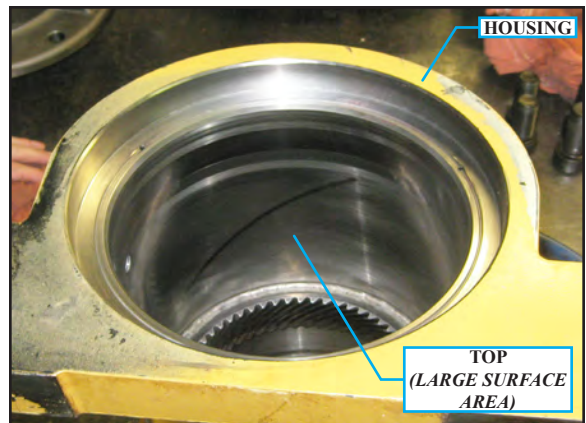
(Figure 40)

- Once all of the seals have been installed, there should only be one large O-ring left in the kit as illustrated at right (see Figure 41).



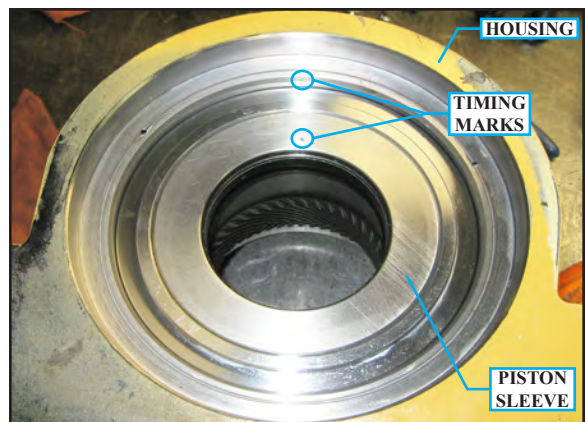
(Figure 41)

- Reposition the housing on the work surface so the top (housing end with the larger smooth surface area) is positioned facing up as illustrated at right (see Figure 42).



(Figure 42)

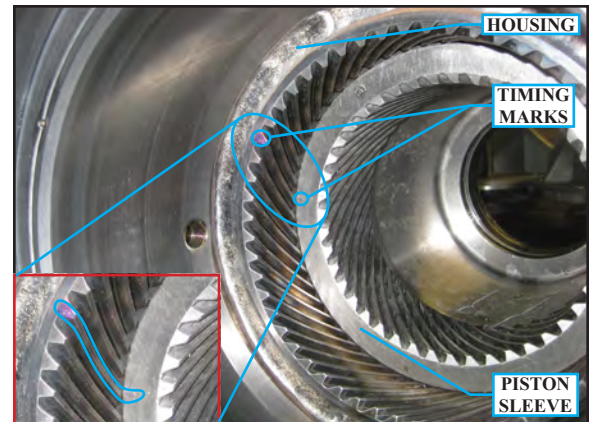
- Carefully place the piston sleeve down into the housing as illustrated at right. **DO NOT** fully insert the sleeve until the next step is performed first (see Figure 43).



(Figure 43)

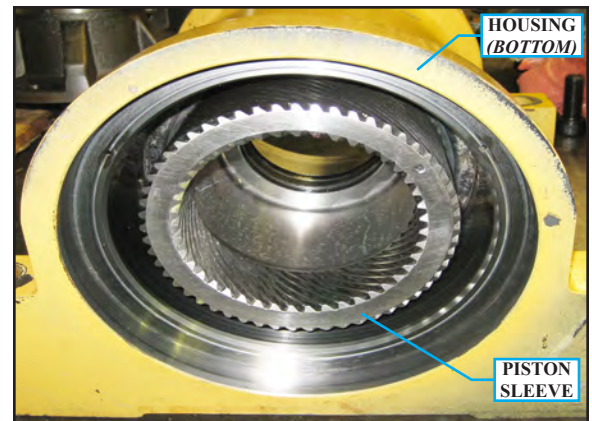
Swivel Actuator Rebuild Instructions:

- Turn the housing around on the work surface so that you can look into the bottom of the housing. Locate the internal timing marks on the piston sleeve and housing (*use a paint pen or marker to add visibility to the marks*). Make sure the timing mark on the piston sleeve groove is aligned with the top edge of the ridge with the timing mark on the housing. If the timing marks in *THIS* step are not aligned exactly, repeat the previous step and then this step to align them (*see Figure 44*).



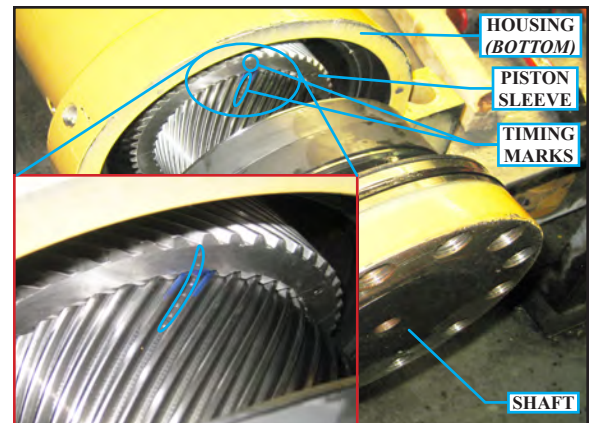
(Figure 44)

- Once the piston sleeve has been correctly timed to the housing as described in the previous steps, push it all the way in so it is fully inserted as illustrated at right (*see Figure 45*).



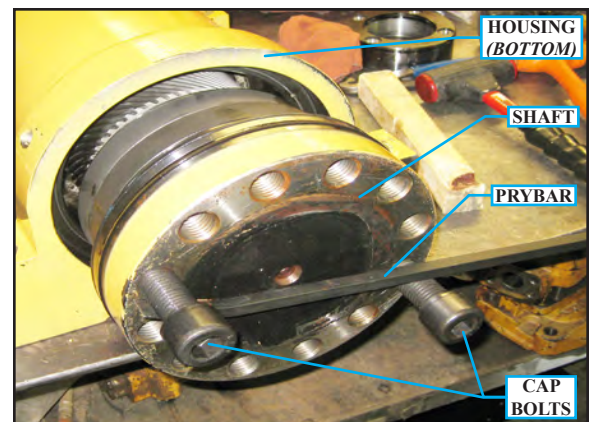
(Figure 45)

- Now insert the shaft into the piston sleeve, making sure the timing marks on the piston sleeve edge are exactly aligned with the timing marks in the shaft's groove as illustrated at right. *Note, take special care not to damage shaft or housing surfaces, as well as making sure the seals are not folded over, and wear guides are still properly seated* (*see Figure 46*).



(Figure 46)

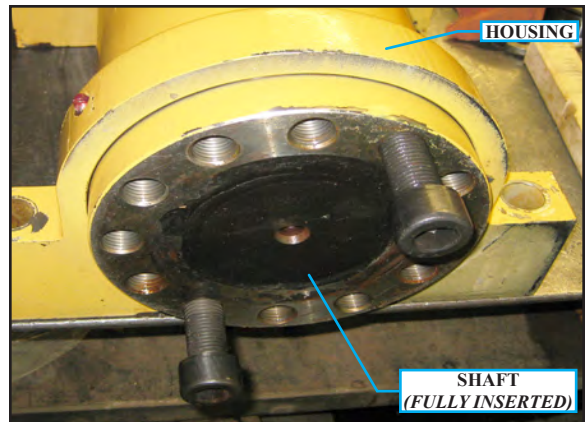
- Thread the (2) cap bolts back into the base of the shaft as illustrated at right, and then use a prybar to twist/thread the shaft back into the piston sleeve by turning clockwise (*see Figure 47*).



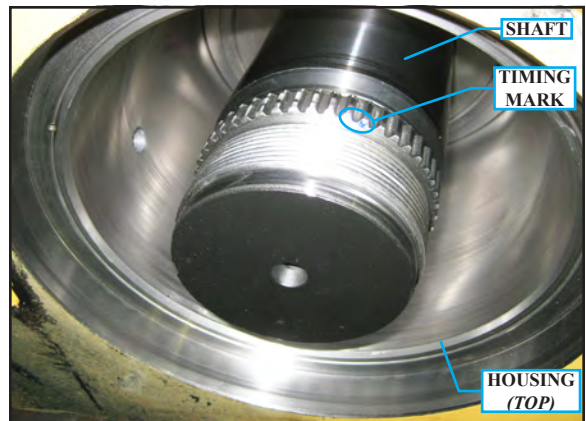
(Figure 47)

Swivel Actuator Rebuild Instructions:

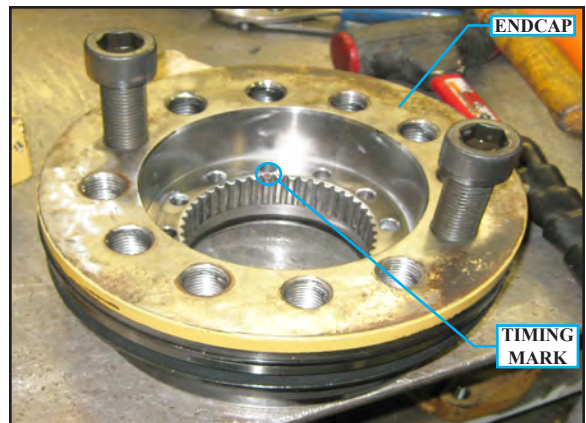
- Finish by fully twisting/turning the shaft into the piston sleeve until it is tight up against the housing as illustrated at right *(see Figure 48)*.

*(Figure 48)*

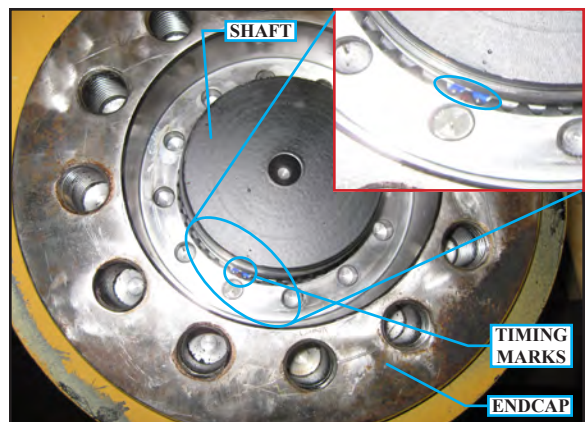
- Turn the housing around on the work surface until the top of the housing is once again facing you as illustrated at right. Locate the timing mark on one of the grooves of the shaft as illustrated at right *(see Figure 49)*.

*(Figure 49)*

- Thread (2) cap bolts into the endcap as illustrated at right, and then locate the timing mark on one of the endcap's ridges as illustrated at right *(see Figure 50)*.

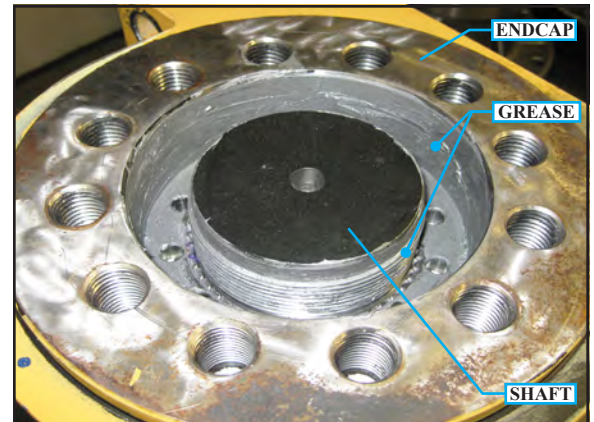
*(Figure 50)*

- Insert the endcap over the shaft, making sure the endcap's ridge with the timing mark is inserted into the shaft's groove with timing mark as illustrated at right *(see Figure 51)*.

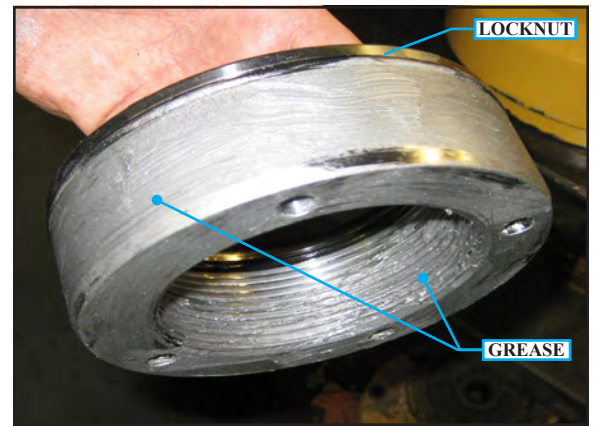
*(Figure 51)*

Swivel Actuator Rebuild Instructions:

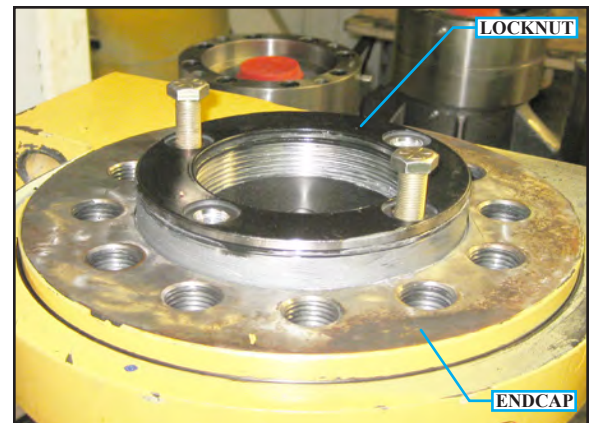
- Push the endcap into the housing until it is fully seated, and then thoroughly apply anti-seize to the interior of the encap and exterior of the exposed shaft as illustrated at right *(see Figure 52)*.

*(Figure 52)*

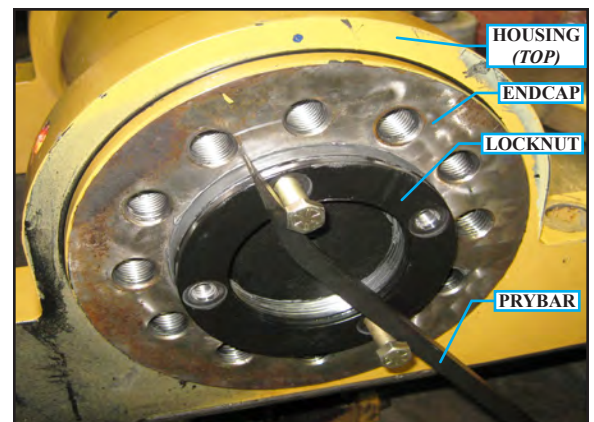
- Thoroughly apply anti-seize to the exterior and interior of the locknut as illustrated at right *(see Figure 53)*.

*(Figure 53)*

- Thread (2) hex bolts into the locknut, and then thread the locknut into the endcap by turning the locknut clockwise as illustrated at right *(see Figure 54)*.

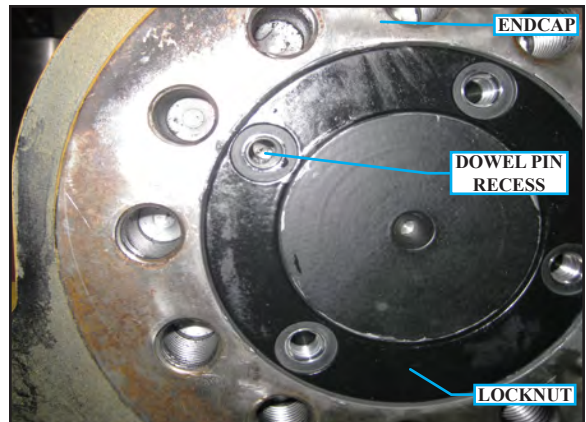
*(Figure 54)*

- Use a prybar as needed to continue threading the locknut clockwise until it is fully seated into the endcap *(see Figure 55)*.

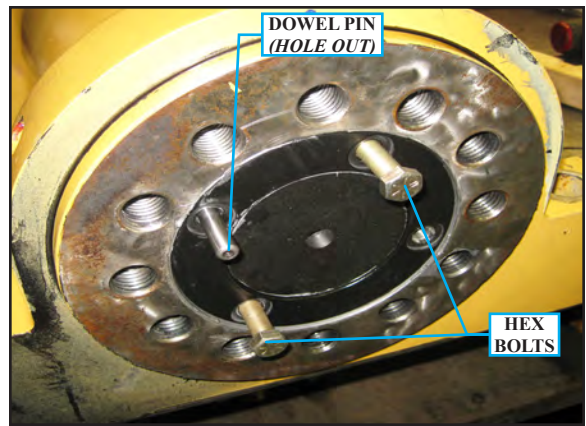
*(Figure 55)*

Swivel Actuator Rebuild Instructions:

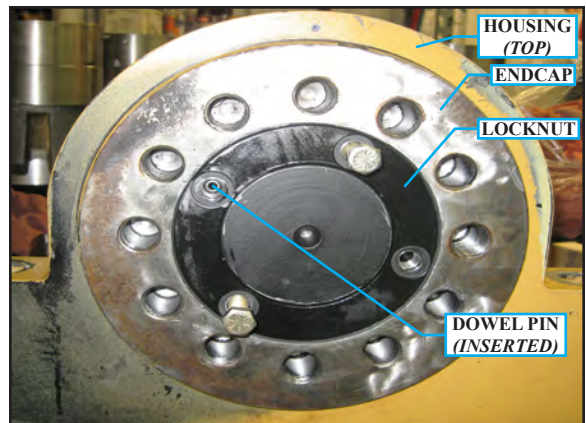
- Once the locknut is seated, tighten it until one of the cap plug holes is aligned with the dowel pin recess as illustrated at right *(see Figure 56)*.

*(Figure 56)*

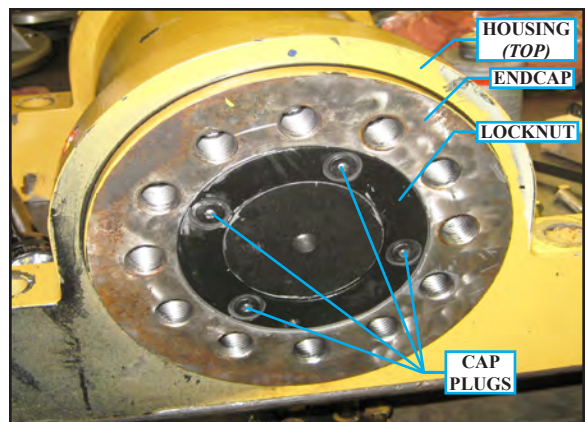
- Insert the dowel pin removed in the beginning of this manual into the recess illustrated in the previous step, making sure the hole is facing out and visible as illustrated. Remove the hex bolts *(see Figure 57)*.

*(Figure 57)*

- Make sure the dowel pin is fully seated, and appears as illustrated at right *(see Figure 58)*.

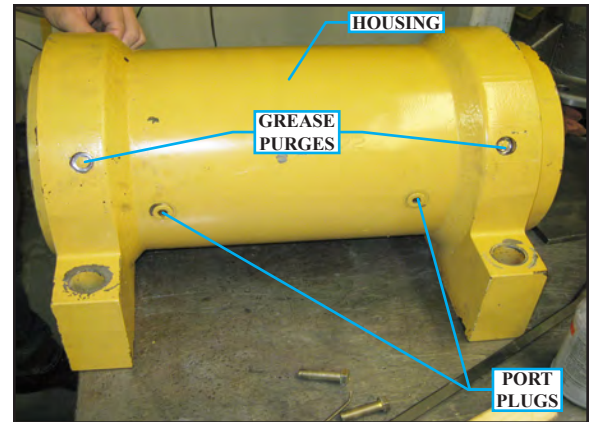
*(Figure 58)*

- Replace the (4) cap plugs into the locknut, making sure they are fully tightened down, as illustrated at right *(see Figure 59)*.

*(Figure 59)*

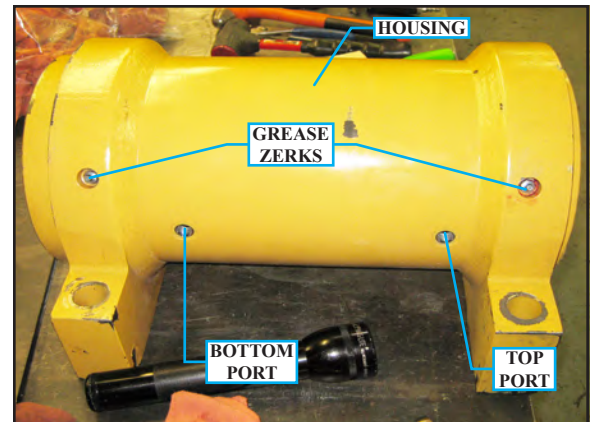
Swivel Actuator Rebuild Instructions:

- Thread (2) port plugs into the housing on one side, and then thread the (2) grease purges previously removed earlier in this manual back into the housing as illustrated at right (see Figure 60).

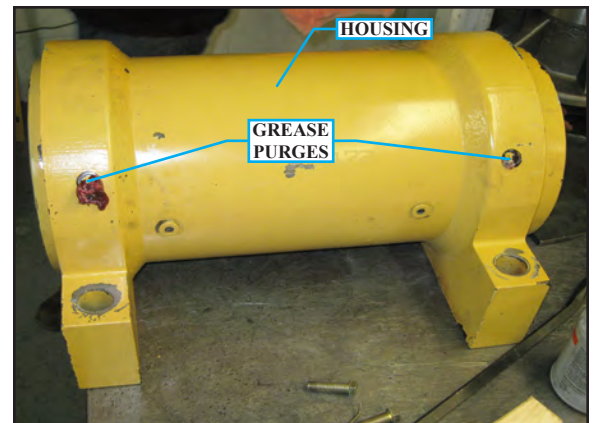


(Figure 60)

- Turn the housing around to gain access to the grease zerks. Grease the zerks until grease is expelled thru the grease purges on the opposite side as illustrated (see Figures 61-62). Make sure the bottom and top ports on this side are not plugged as illustrated at right (see Figure 61).

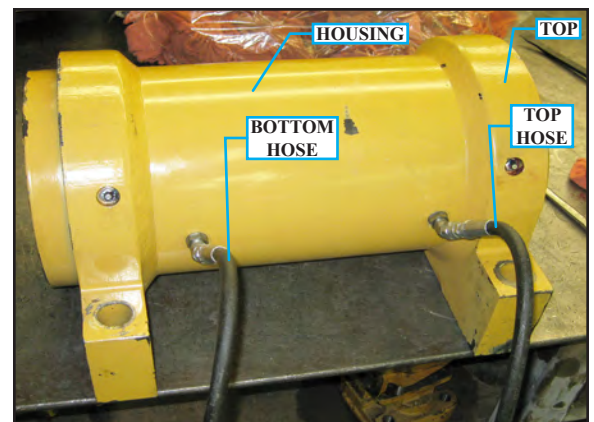


(Figure 61)



(Figure 62)

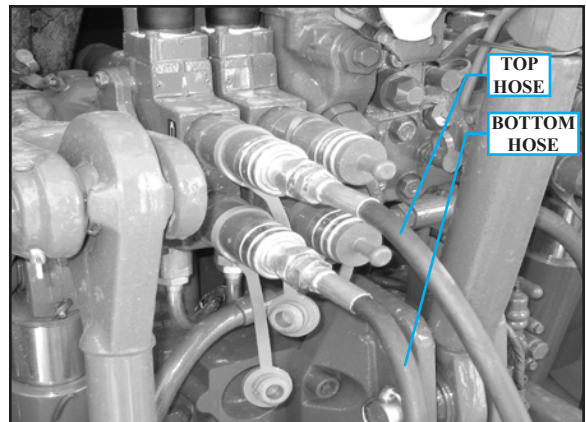
- Plumb a hydraulic hose line with quick disconnects for tractor auxiliary hydraulics on the opposite end to each port as illustrated at right (see Figure 63).



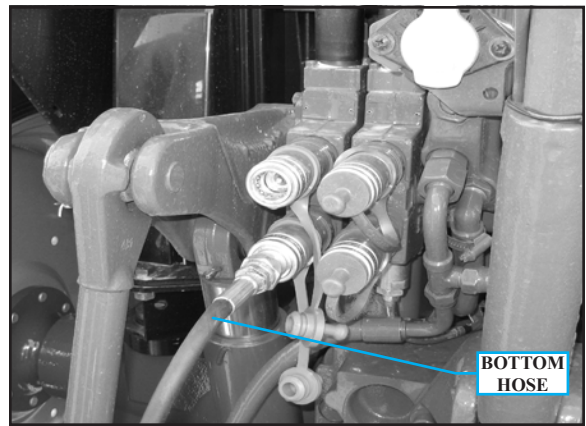
(Figure 63)

Swivel Actuator Rebuild Instructions:

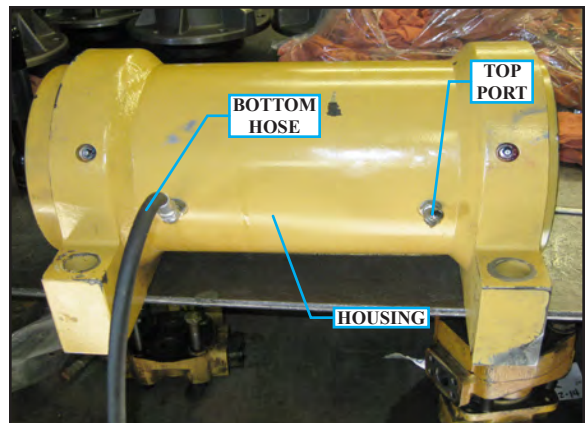
- Connect the top hose from the housing to the top port on the tractor's auxiliary hydraulics, and then connect the bottom hose from the housing to the bottom port on the tractor's auxiliary hydraulics, as illustrated above and right (see Figures 63-64). Start the tractor, and begin cycling the swivel actuator one direction, bottoming it out, and holding for several seconds. Repeat for the other direction. Repeat this procedure for 20-25 cycles. Check for any leakage; there should not be any leakage of oil.
- Rotate the swivel actuator to one side until it stops, disconnect the top hose from the tractor, and then remove it from the top port on the housing (see Figures 65-66).
- Operate the bottom hose from the tractor's auxiliary hydraulics, pressurizing it for several seconds. Observe for oil blow-by by looking for oil coming out of the top port as illustrated at right. There should be no oil blow-by (see Figure 66).
- Re-attach the top hose to the tractor's auxiliary hydraulics and to the top port on the swivel actuator. Rotate the shaft the opposite direction until it stops (see Figure 64).
- Disconnect the bottom hose from the housing and from the tractor's auxiliary hydraulics (see Figure 65).



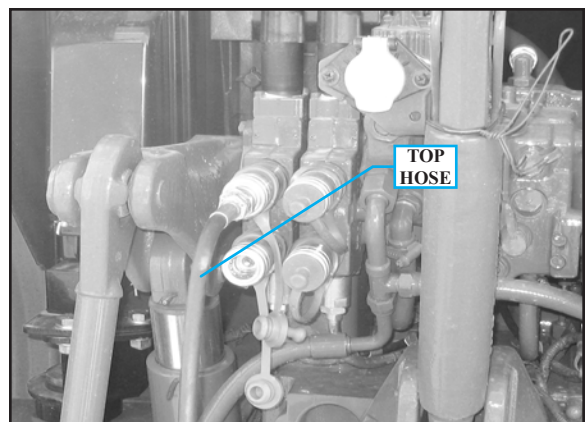
(Figure 64)



(Figure 65)



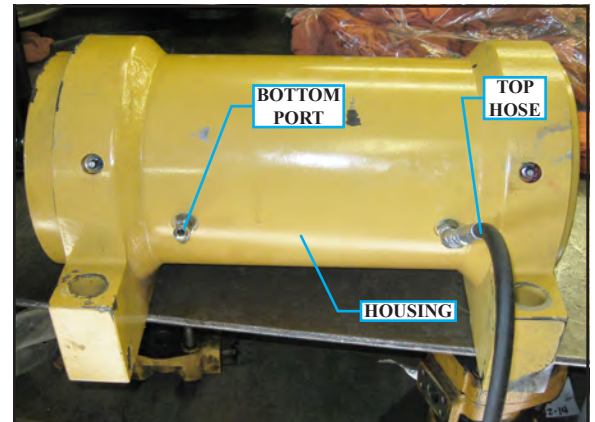
(Figure 66)



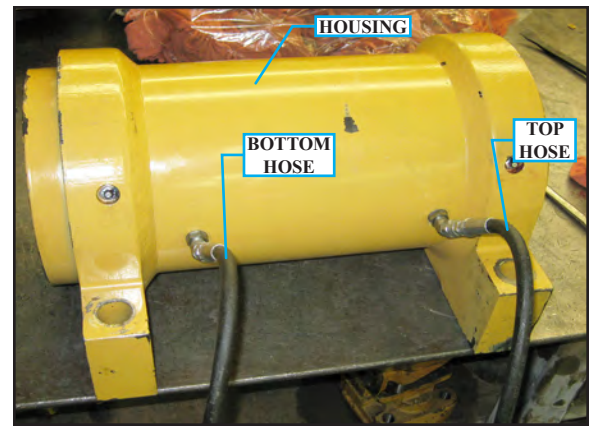
(Figure 67)

Swivel Actuator Rebuild Instructions:

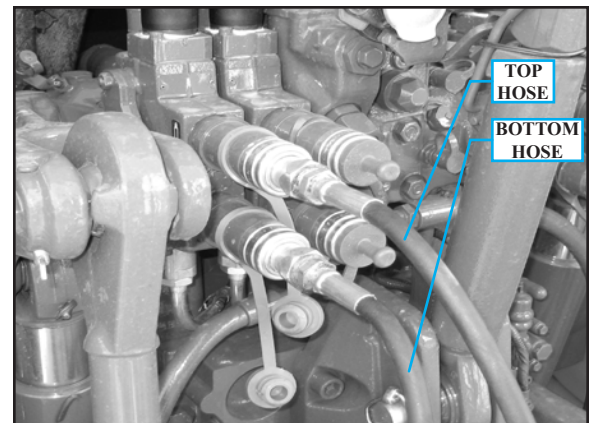
- Operate the top hose from the tractor's auxiliary hydraulics, pressurizing it for several seconds. Observe for oil blow-by by looking for oil coming out of the bottom port as illustrated at right. There should be no oil blow-by (see Figure 68).
- Reconnect the top hose to the top port on the housing, and the top port on the tractor's auxiliary hydraulics as illustrated at right and below (see Figures 69-70). Cycle the swivel actuator both directions several times, and then run the actuator (piston sleeve) up all the way to the top.
- The rebuild process is now finished. Assuming there was no malfunction or leakage, the actuator is fully rebuilt.
- Reinstall the swivel actuator into the mainframe with the boom mounting surface facing to the rear of the tractor for booms equipped with a rear travel rest. For tractor's not equipped with a travel rest (side fold boom), rotate the swivel actuator counter-clockwise (1) mounting hole increment (as viewed from the top). Re-attach the hydraulic hoses and test for correct function and position prior to remounting the boom to the swivel actuator.



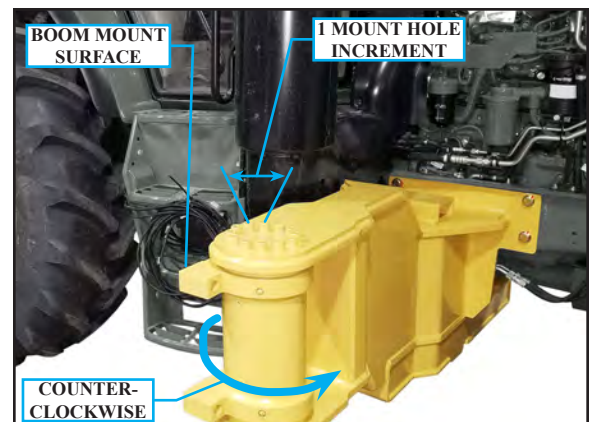
[Figure 68]



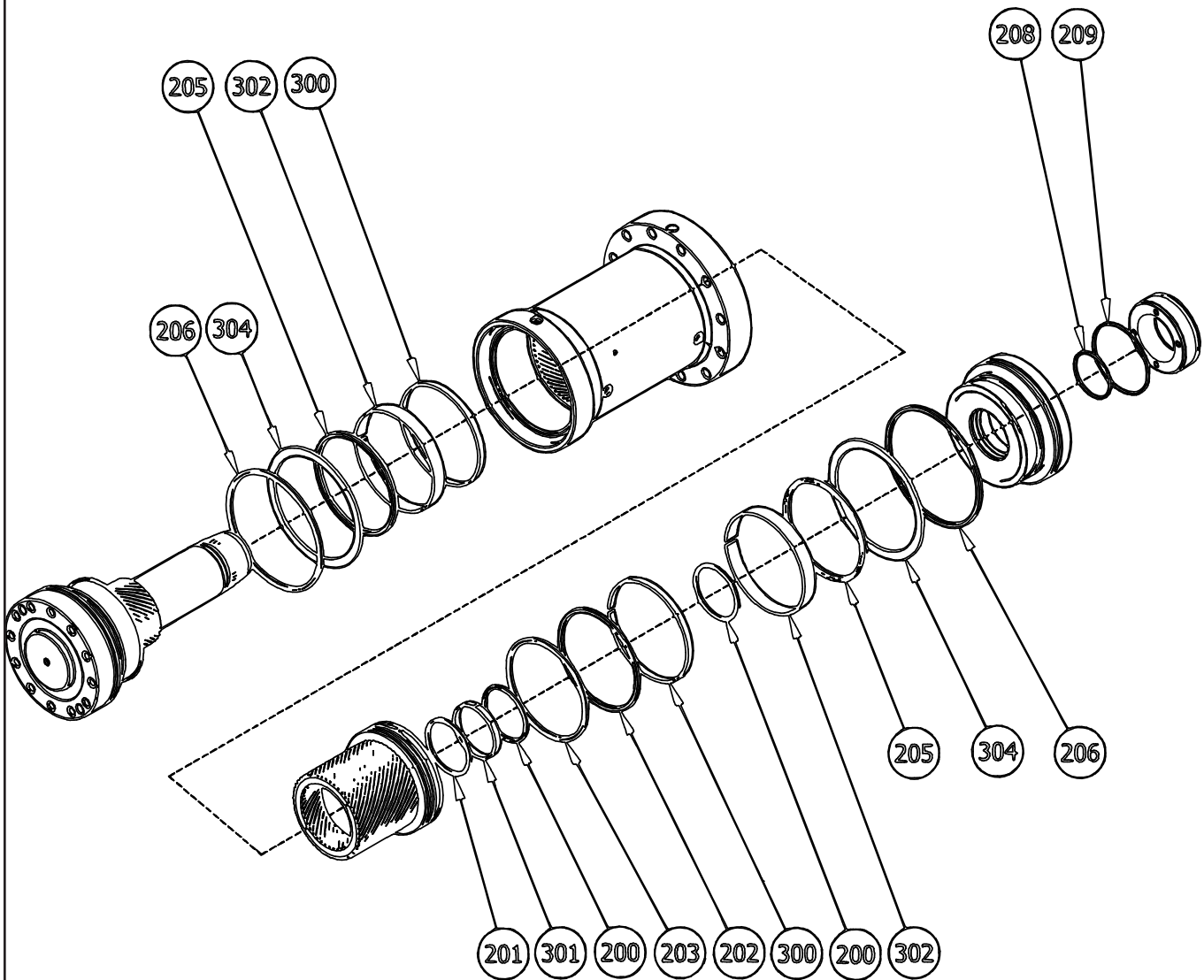
[Figure 69]



[Figure 70]



[Figure 71]



SEALS		
ITEM	DESCRIPTION	QTY
200	Cup Seal	2
201	Cup Seal (without o-ring)	1
202	Cup Seal	1
203	Cup Seal (without o-ring)	1
205	Main Pressure - Z-Seal	2
206	Exclusion Seal	2
208	O-ring - Seal	1
209	O-ring - Seal	1

WEAR GUIDES		
ITEM	DESCRIPTION	QTY
300	Wear Guide	2
301	Wear Guide	1
302	Wear Guide	2
304	Thrust Washer	2
NOTES:		
Wear guides are not part of standard seal kit.		
Replacement of guides are not typical.		
Call Diamond Customer Service to order guides if needed.		

