

HYDRAULIC CYLINDER REPAIR

PREPARATION

When cylinder repair is required, clean off unit, disconnect hoses and plug ports before removing cylinder.

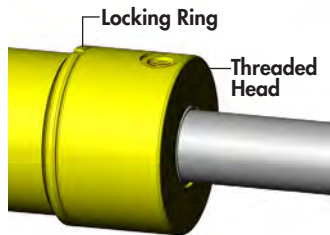
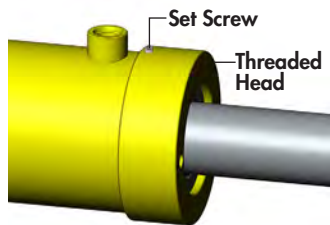
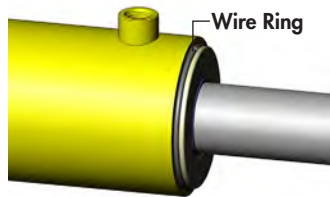
When removed, open the cylinder ports and drain the cylinder's hydraulic fluid.

Examine the type of cylinder. Make sure you have the correct tools for the job.

You may require the following tools:

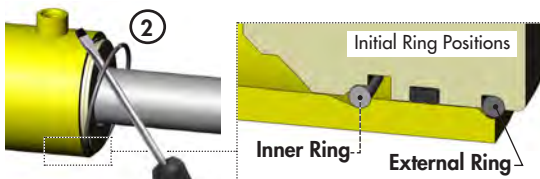
- Proper Seal Kit
- Rubber Mallet
- Screwdriver
- Punch
- Pliers
- Emery cloth
- Torque Wrench

Types of Cylinders (Wire Ring / Threaded Head)



REPAIRING A WIRE RING CYLINDER

1. Retract the rod assembly.
2. Remove the external steel wire ring.

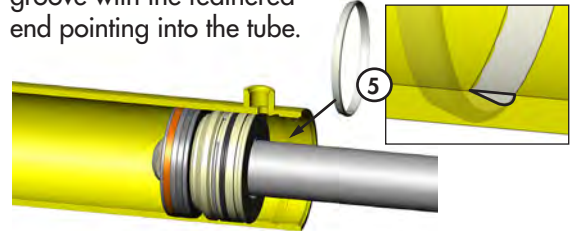


3. Remove any dirt that may have accumulated on the cylinder head.

4. Using the mallet and punch, push the head into the cylinder tube until the internal tube groove is fully exposed. This will also move the internal wire ring into its removal position.



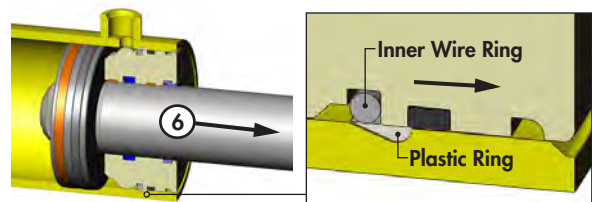
5. Take the plastic removal ring from the seal kit:
 - a) Straighten the ring and remove any kinks or excessive curl to make installation easier and prevent it from falling out.
 - b) Insert the removal ring into the internal groove with the feathered end pointing into the tube.



- c) Use a screwdriver or a finger to hold one end of the ring in the groove while fitting the other end of the ring into the groove. The tips should snap in together. Ensure it is secure and fully seated before the next step.

IMPORTANT: It is important to ensure the removal ring is completely in the groove before pulling the rod out. If the ring sticks out it will get stuck between the head and tube.

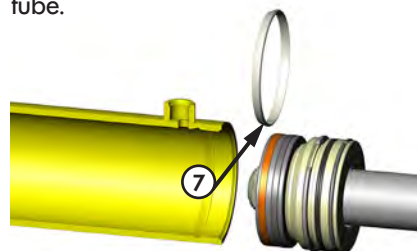
6. a) Extend the rod to pull head out of tube. If the rod does not pull out easily, push the head back in and ensure the ring is properly in the groove. Replace ring if necessary.



Note: Excessive force will not overcome a jammed ring and could damage the cylinder.

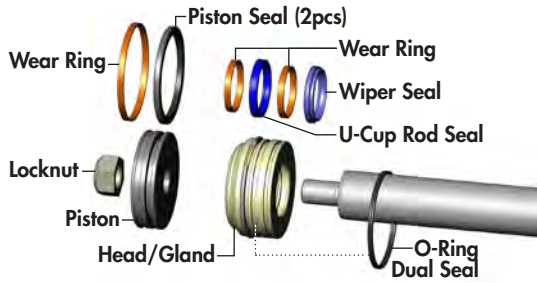
- b) Completely remove rod and head from tube.

7. Remove plastic removal ring from the cylinder tube.



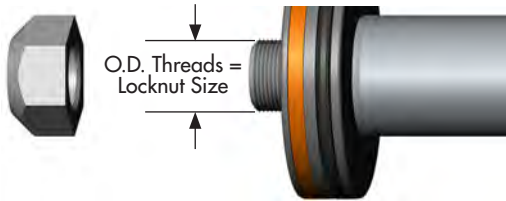
Cylinder Repair Guide

8. Remove locknut, piston and head from rod.



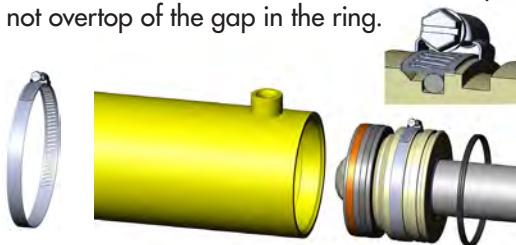
9. a) Inspect and replace all of the seals with new components.
 b) Inspect the inside of the cylinder barrel, piston, rod and other polished parts for burrs and scratches. Smooth areas as needed with an emery cloth.
 c) During re-assembly of head/gland assembly, leave the outer O-Ring Dual Seal loose on the rod to re-install at a later step.

10. Replace piston and torque the locknut to required value. (Refer to chart below)



LOCKNUT SIZE (PISTON)	TORQUE VALUE
3/8 - 24 UNF	25-30 lb.ft (35-42 N.m)
1/2 - 20 UNF	40-60 lb.ft (55-80 N.m)
5/8 - 18 UNF	95-105 lb.ft (130-140 N.m)
3/4 - 16 UNF	175-225 lb.ft (240-305 N.m)
7/8 - 14 UNF	200-275 lb.ft (270-370 N.m)
1 - 14 UNF	300-380 lb.ft (405-515 N.m)
1 1/8 - 12 UNF	400-500 lb.ft (540-675 N.m)
1 1/4 - 12 UNF	500-600 lb.ft (675-810 N.m)
1 1/2 - 12 UNF	700-800 lb.ft (950-1085 N.m)
1 3/4 - 12 UNF	800-900 lb.ft (1085-1220 N.m)

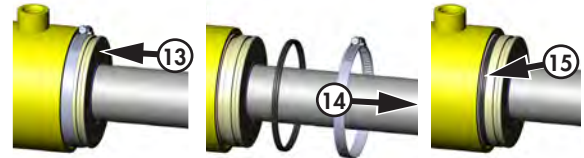
11. a) Install the supplied band clamp to compress the inner wire ring on the head/gland assembly so it will fit into the tube.
Note: Make sure the cam of the band clamp is not overtop of the gap in the ring.



b) Tighten the band clamp to ensure the wire ring is fully seated. Then, loosen the clamp approx. 1/2 a turn to allow band clamp to slide during final assembly.

12. Lubricate the cylinder tube and piston seals.

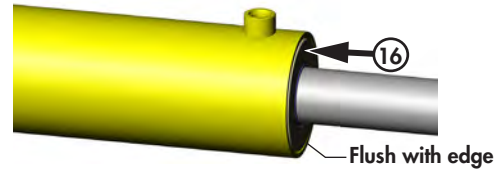
13. Insert the piston into the tube. Tap the cylinder head into the tube until the clamp slides over and the inner wire ring is inside the tube.



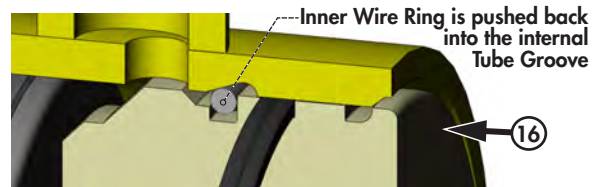
14. Loosen the clamp and remove.

15. Install the O-Ring Dual seal.

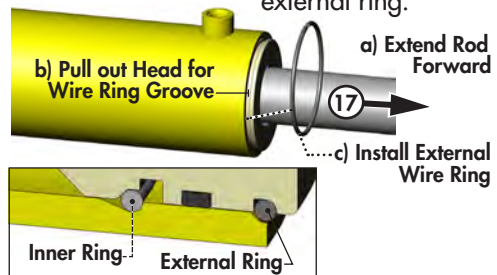
16. Tap the head the rest of the way until the end is flush with the tube.



IMPORTANT: The head/gland must be inserted until it is flush with the tube to allow the inner wire ring to snap into its seated position in the internal cylinder groove. Failure to insert the head flush as shown will result in the head and rod assembly coming out of the tube when pressure is applied to the cylinder.



17. Pull the rod out to expose the external wire ring groove in cylinder head, and then install the external ring.

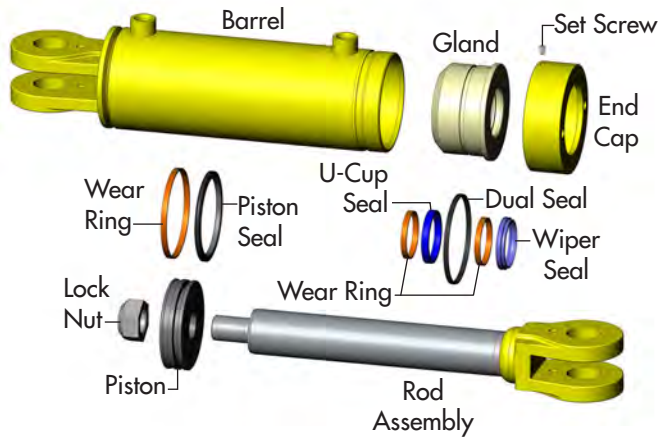


18. Before using the cylinder, ensure that you double check your work.

Cylinder Repair Guide

REPAIRING A THREADED HEAD CYLINDER

Set Screw Style



DISASSEMBLY

1. Loosen Set Screw and turn off end cap.
2. Carefully remove piston/rod/gland assemblies.
3. Disassemble the piston from the rod assembly by removing lock nut.

NOTE: DO NOT clamp rod by chrome surface.

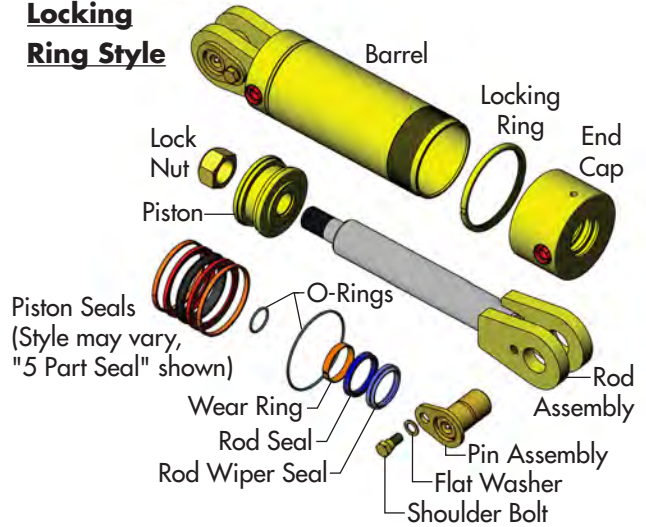
4. Slide off gland assembly & end cap.
5. Remove seals and inspect all parts for damage.
6. Install new seals and replace damaged parts with new components.
7. Inspect the inside of the cylinder barrel, piston, rod and other polished parts for burrs and scratches. Smooth areas as needed with an emery cloth.

REASSEMBLY

1. Reinstall rod through end cap & gland assembly.
2. Secure piston to rod with lock nut. Torque lock nut to proper value (refer to chart on previous page for proper torque value).
3. Lube inside of barrel, piston seals, and gland seals with hydraulic oil.
4. With cylinder body held gently in a vise, insert piston, gland, end cap and rod combination using a slight rocking motion.
5. Apply loctite anti-seize before installing cylinder end cap.
6. Torque cylinder end cap to 440 lb.ft (600 N.m).
7. Tighten Set Screw on end cap to 6 lb.ft (8 N.m).

REPAIRING A THREADED HEAD CYLINDER

Locking Ring Style



DISASSEMBLY

1. Loosen Locking Ring and turn off end cap.
2. Carefully remove piston, rod and end cap.
3. Disassemble the piston from the rod assembly by removing lock nut.

NOTE: DO NOT clamp rod by chrome surface.

4. Slide off end cap.
5. Remove seals and inspect all parts for damage.
6. Install new seals and replace damaged parts with new components.
7. Inspect the inside of the cylinder barrel, piston, rod and other polished parts for burrs and scratches. Smooth areas as needed with an emery cloth.

REASSEMBLY

1. Reinstall rod through end cap.
2. Secure piston to rod with lock nut. Torque lock nut to proper value (refer to chart on previous page for proper torque value).
3. Thread lock ring fully onto barrel.
4. Lube inside of barrel and piston seals with hydraulic oil.
5. With cylinder body held gently in a vise, insert piston, end cap and rod combination using a slight rocking motion.
6. Turn end cap fully against lock ring then back off end cap to align ports.
7. Tighten Locking Ring against end cap using a punch and hammer.