

**ENERGY HYDRAULICS**  
**CYR CYLINDER SEAL REPAIR INSTRUCTIONS**

1. The cylinder should be disassembled in a clean environment to prevent dirt or other contamination from entering the interior of the cylinder. Clean any accumulated dirt or debris from the port openings and rod guide area. Remove the port plugs and drain any oil from the cylinder. Do not reinstall the port plugs at this time. No special tools are required for disassembly. Items that should be at hand are a vise, flat punch, hammer, clean oil, clean paper towels or shop towels and a wrench for removal of the piston nut.
2. Secure the cylinder in a vise just behind the rod-guide spanner nut. Securing the wall in this manner prevents the rod guide from turning in the wall when the spanner nut is loosened. Do not tighten the vise excessively or the cylinder wall may be permanently distorted.
3. Loosen the rod-guide spanner nut by turning it counterclockwise when viewing the rod end of the cylinder. Place the end of a flat punch on the side of a slot in the spanner nut and tap the punch gently with a hammer to start the nut turning. After removing the nut, secure the cylinder at about the mid-point of the wall. Do not excessively tighten vise on wall or it will be difficult to pull piston past deflected area of wall. Place the punch on the face of the rod guide and gently tap on the punch with the hammer to drive the rod guide into the cylinder bore. Drive the rod guide inside the bore until the front face of the rod guide is just past the retaining ring. Use fingers to remove snap ring from groove in wall. A screwdriver can be used to lift the retaining ring out of the groove also. Be very careful to not scratch any part of the cylinder bore as a scratch may damage the piston seal on assembly.
4. Pull the rod vigorously outward and allow the piston to bump the rod guide. If there is high resistance to piston movement in the area of the vise jaws, the vise is probably too tight. The momentum of the rod should be sufficient to pull the rod guide and piston from the cylinder barrel. Be careful to not mar the chromed surface of the rod. Note: The piston seal and the rod guide static seal will likely be cut by the edge of the retaining ring groove on removal from the barrel. This is normal and cannot be avoided on disassembly.
5. Secure the rod so that the piston nut can be removed. Be careful to not mar the chromed surface of the rod. The rod cannot be repaired if it is dented or scratched. If securing the rod in a vise, use clean cardboard to pad the vise jaws. Remove the piston nut, piston, spacer tube (if any) and rod guide.
6. Note the position and orientation of the seals on the piston and rod guide before replacing them. Be careful to not scratch the seal grooves when removing the old seals. The seals can be removed with a sharp tool like an awl by carefully pushing the point partially into the seal and prying the seal from the groove. Hard seals can be removed by carefully cutting the seal apart with a utility knife or an x-acto knife.

## CYR CYLINDER REPAIR INSTRUCTIONS (CONT.)

7. Inspect the seal grooves and clean away any contamination. Apply a light coating of clean oil to the new seals and into the seal grooves to ease installation and prevent scuffing of the sealing surfaces.
8. Install the spanner nut and retaining ring loosely on the rod if they will not fit over the rod mount. Assemble the rod guide and piston onto the rod. Install and tighten the piston nut to the required torque.
9. Apply a light coating of clean oil to the piston and guide OD and to the mouth of the cylinder barrel. Carefully position the piston so that it is centered and square with the cylinder wall mouth. Once started, push firmly until the piston is about half way down the length of the cylinder bore. Carefully push the rod guide into the cylinder bore until the front face of clears the retaining ring groove. Be careful to not mar the chromed rod surface. The rod guide may have to be driven down the cylinder bore using a hammer and a punch or dowel. Install the rod-guide retaining ring into the groove and be certain that it is completely nested into the bottom of the groove. Pull the rod outward until the piston contacts the rod guide. Continue to pull on the rod until the rod guide is firmly in position against the retaining ring.
10. Apply Loctite or similar locking agent to the rod guide threads and install the spanner nut on the rod guide. Pressurize the cylinder on extend to force the rod guide hard against the retaining ring. Either pneumatic or hydraulic pressure will work. Do not exceed the operating pressure of the cylinder if hydraulic pressure is used. While maintaining pressure on extend, turn the spanner nut until finger tight. Using a punch and hammer, drive the nut tighter by tapping gently against the side of the spanner wrench slots. Turn the nut so that the outside diameter moves about 1/4" to 3/8" from the finger tight position.
11. Check cylinder for external leaks using rated hydraulic pressure. Any leaks should be evident after the cylinder has been pressurized for one minute. Remove pressure from cylinder. If the seals are oil tight, the cylinder is ready for service.

**WARNING: Keep away from jets of high-pressure oil. High-pressure oil jets can penetrate skin and cause severe injury or death**