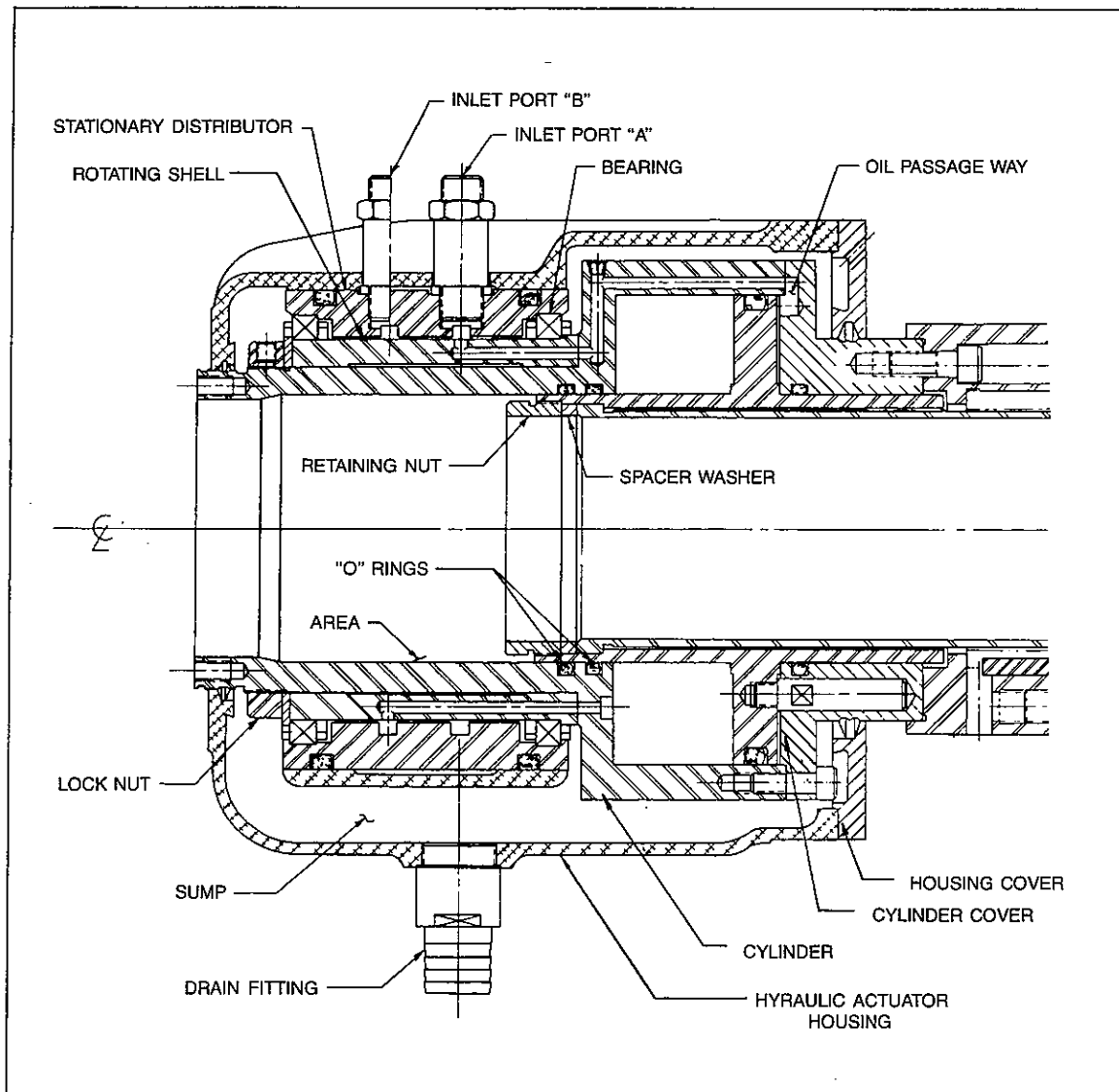


POWERHOLD



MAINTENANCE OF **GAMET** HYDRAULIC CHUCK ACTUATORS

HYDRAULIC CHUCK ACTUATORS

The actuator consists of a hollow, rotating, double-acting hydraulic cylinder, surrounded by a stationary housing. The cylinder is connected to the chuck by means of a draw tube, which provides a large thru-hole through the chuck and actuator. The cylinder is mounted on the machine spindle by a suitable adapter and revolves with the spindle. The cylinder body and piston are made of steel, designed to be as light as possible to reduce rotating inertia.

Oil, under pressure, passes through the stationary housing and into the revolving cylinder through the distributor. There are no rubbing seals between the stationary housing and the revolving cylinder. Sealing between these two parts is obtained by allowing a small quantity of oil to leak through a very closely controlled annular gap between them. This leakage provides a hydrostatic boundary layer effect, which results in an efficient seal with no wearing parts.

The size of the annular gap is controlled by two roller bearings, one at each end of the distributor. The oil which leaks through the gap lubricates and cools the bearings. The stationary housing collects the oil leakage and returns it to the hydraulic power unit through a return nipple on the bottom of the actuator.

Large section "O" rings are used as seals in the cylinder, lubricated by the hydraulic oil. The hydraulic chuck actuator requires no routine maintenance. However, "O" ring seals may need replacing after a long period of service.

INDICATIONS OF WORN "O" RINGS

1. Oil leaking out of the bore of the cylinder indicates leakage through the two "O" rings at the rear end of the piston skirt.

2. Oil leaking around the draw tube up the front of the spindle indicates leakage through the "O" ring which seals the front end of the piston skirt.

3. Lack of chuck pressure, or no chucking pressure indicates either a problem in the hydraulic power unit or leakage by the large "O" ring in the piston. If it is determined that the power unit is developing the required pressure (see instructions for servicing the power unit), the problem must be due to a worn piston "O" ring, permitting the oil to pass freely from one side of the piston to the other.

TO REPLACE "O" RINGS, PROCEED AS FOLLOWS:

1. Disconnect the pressure hoses and the drain hose from the actuator, and remove the draw tube. (Reference mechanical assembly sketch on Page 1.)

2. Remove the actuator from the machine.

3. Empty the actuator by alternately blowing into each pressure nipple with an air hose. Trapped oil will pass out through the open nipple and the drain nipple.

4. Remove the housing end plate.

5. It is not necessary to remove the aluminum housing. There are two "O" ring seals between the housing and the stationary distributor. These are static seals and not subject to wear.

6. Remove the cylinder front cover and push out the piston.

7. Remove all four "O" rings and replace with new "O" rings. Inspect all rubbing surfaces on the piston and in the cylinder body for scratches and galling. Any small scratches or slightly worn areas may be polished out with fine abrasive cloth. Grease the "O" rings before reassembling the actuator. Assemble the piston into the actuator, being careful to line up the locating pins and not to cut the "O" rings. Carefully clean the front face of the cylinder and the mating surface of the front cover; then assemble the cover on the cylinder. Be careful to line up the oil holes in the cylinder with the oil passage slots in the cylinder cover. If these holes are not properly lined up, no oil will flow to the front side of the piston. Lightly tighten the cover screws.

8. Mount the unit vertically on blocks on a surface plate so that the cylinder is free to rotate inside the distributor. Using a dial indicator, check the runout of the locating O.D. adjacent to the six mounting screw holes. The runout should be within 0.0004" T.I.R. If not running true, tap the cover lightly to bring it within tolerance. Then check the mounting face for runout, which also should be with 0.0004". Excessive runout on this face indicates either dirt or a burr between the cylinder and front cover faces.

9. Tighten the cover screws, working at diametrically opposite screws. Recheck the locating diameter and face runout.

If, after you have replaced the cylinder and piston ring seals, the actuator still

leaks more than is normal for that actuator, then check the distributor. Excessive leakage from the distributor may be due to worn bearings or a loose locknut.

Procedure for removing the outer housing is as follows:

1. Remove actuator inlet ports and copper washer. Remove housing end plate.

2. Mount the actuator, open face down, on an arbor press or hydraulic press. The rim of the housing must be supported on blocks, so that the cylinder assembly can be pushed out of the housing.

3. After the housing is removed, check the distributor for play in the bearings. If the distributor assembly is worn, the whole assembly should be replaced (see our Actuator Parts Price List). Also check to make sure that the distributor assembly is up tight against the back face of the cylinder body.

To reassemble the actuator:

1. Clean the inside of the aluminum housing. Make sure the inside diameter that fits over and seals on the two distributor "O" Rings is free of any scratches or galling. Polish surface if necessary.

2. Mount the actuator assembly on an arbor press, cylinder end or spindle adapter end down.

3. Grease the two distributor "O" Rings.

4. Place the aluminum housing over the top or back end of the actuator assembly. Be careful to align the distributor inlet pressure ports to the holes in the aluminum housing making sure of the correct axial alignment.

5. Press the housing until the distributor ports and the holes are in the correct alignment.

6. Clean the face of the actuator housing, making sure there are no burrs. Clean the housing cover and fasten it to the housing. Make sure to use a good gasket sealer. Also, caution should be used to make sure that the radial groove relief is at the bottom or in line with the drain port.

7. Refit the hose nipples using new copper washers.

8. The hydraulic actuator is now ready to be reinstalled on the machine.

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