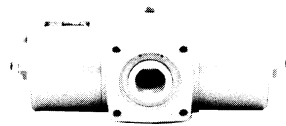


OHIO OSCILLATOR



MAINTENANCE INSTRUCTIONS
SERVICE
D SERIES Rotary Actuators

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MAINTENANCE INSTRUCTIONS MAXIMUM OPERATING PRESSURE - AIR - 125 psig

DISASSEMBLY

1. Disconnect air lines and be sure the actuator is not under pressure.
2. Remove the actuator from its mounting within the system.
3. Place the actuator in a vise.
4. A. MODELS D300 THROUGH D2000
 1. Remove cylinder head bolts & lockwashers
 2. Remove cylinder heads by pulling from housing.B. MODELS D4000 THROUGH D10,000

For normal maintenance it may not be necessary to replace the cylinder head seals. It is suggested that the cylinder head be checked for sealing tightness and if the cylinder head seals need to be replaced use the procedure described later in Appendix A.

 1. Using a strap-wrench, unscrew the cylinder tubes from the housing by turning counterclockwise.
 2. After the cylinder tube threads have been disengaged, pull straight out on the cylinder tube until it is clear of the piston seal.
5. RECORD THE ORIENTATION OF THE PISTON RACK ASSEMBLIES (i.e., left piston/rack on top or beneath pinion).
6. Remove the pinion shaft retainer ring (snap ring).
7. Remove the pinion & bearing (retainer ring side) by laying the actuator (retainer ring side) down and by pulling down on the pinion while tapping gently on the pinion with a mallet.
8. Tap out the back bearing (opposite the retainer ring side) in a similar manner.
9. Remove all seals. DO NOT reuse seals. Replace with new at re-assembly. Seal kits are available from stock at factory.
10. Thoroughly clean all parts, inspect for wear or damage & replace as required.

RE-ASSEMBLY

1. Position the actuator housing in a vise so that the retainer ring groove is up & the threaded side-port is on the side facing away from you.
2. Lightly lubricate all the new seals with Grade 2 grease or oil.
3. Install seals as shown in drawings.
NOTE: Install the back (side opposite the retainer ring groove) bearing O.D. seal in the housing & the I.D. seal in the bearing before installing the back bearing in the housing.
4. Install the back bearing (opposite the retainer ring groove) in the housing & check to see that it seats properly (tap lightly).
5. Grease pinion journals & teeth with Grade 2 grease.
6. Install pinion in the back bearing.
7. Install the retainer ring side bearing, making sure that both the I.D. & O.D. seals are in their respective grooves. Check to insure that the retainer ring groove is completely exposed above the bearing.
8. Install the retainer ring (snap-ring) to secure the pinion & bearings in place. Check to make sure the retainer ring is properly seated in its groove.

9. Standard Rotation (Counter Clockwise) Timing

94° unit - Position pinion keyway so that it is pointed at the mounting hole in the lower left position (7 o'clock) of the housing face.

184° unit - Position pinion keyway so that it is pointed at the mounting hole in the lower right hand position (5 o'clock) of the housing face.

10. Orient the racks in the same position as was recorded during disassembly.

NOTE: When the actuator is positioned with the retainer ring side of the pinion facing up & the housing side-port facing away, the rack closest to you should have the piston to your right & the rack farthest from you should have the piston to your left for standard (counter-clockwise) rotation.

11. A. MODELS D300 THROUGH D2000

1. Start the racks into the housing, one from each end. Be sure that the racks start together. Push in until the piston faces are flush with the housing.
2. If both are flush, then push in the remainder of the way. If one is flush & the other is not - remove the racks, reposition racks evenly & try again.

B. MODELS D4000 THROUGH D10,000

1. Start the racks into the housing, one from each end. Be sure that the racks together. Push in until the racks bottom out against each other.
2. If both racks have not bottomed out - remove the racks, reposition racks & pinion. Try again.

12. Timing is correct if the pinion keyway is at the 12 o'clock high position when the racks are completely depressed into the housing. If the keyway is out of position - Remove racks, reposition pinion (adjusting slightly one way or the other) depending on which direction you are off from 12 o'clock & try racks again. Do this until you obtain the 12 o'clock high keyway position as noted above.

NOTE: For clockwise rotation: Invert the racks from that shown in the drawing, and interchange the 5 o'clock & 7 o'clock positions described in Step 9 for the 94° & 184° rotations. Proceed with re-assembly as described in steps 10, 11, & 12.

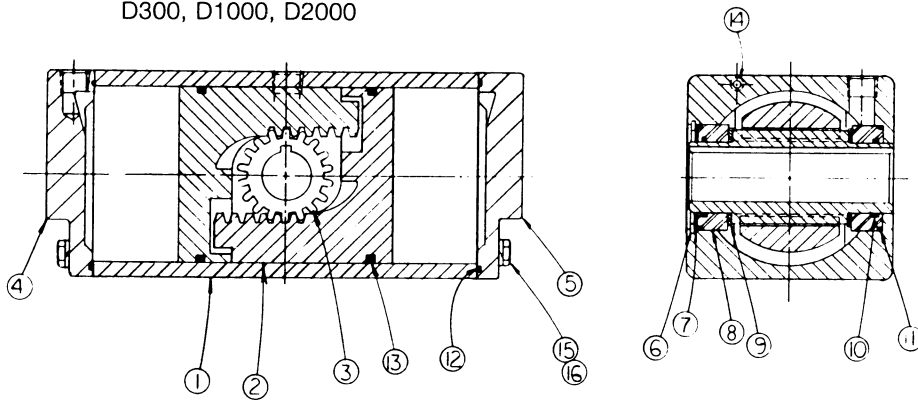
13. A. MODELS D300 THROUGH D2000

1. Install the small O-ring port seals on each end of the housing.
2. Install the O-ring seals in the cylinder heads.
3. Select the cylinder head that has the side-port and install it on the left end of the housing (i.e., pinion retaining ring up and body side-port facing away). Be sure that the cross-port hole in the housing is aligned with the cross-port hole in the cylinder head.
4. Install the other cylinder head (no port) on the right end of the housing make sure that the cross-port opening matches up with the cross-port opening in the housing.
5. Install & tighten cylinder head lockwashers & bolts. Torque alternately and evenly to 4 to 6 ft. lbs.

B. MODELS D4000 THROUGH D10,000

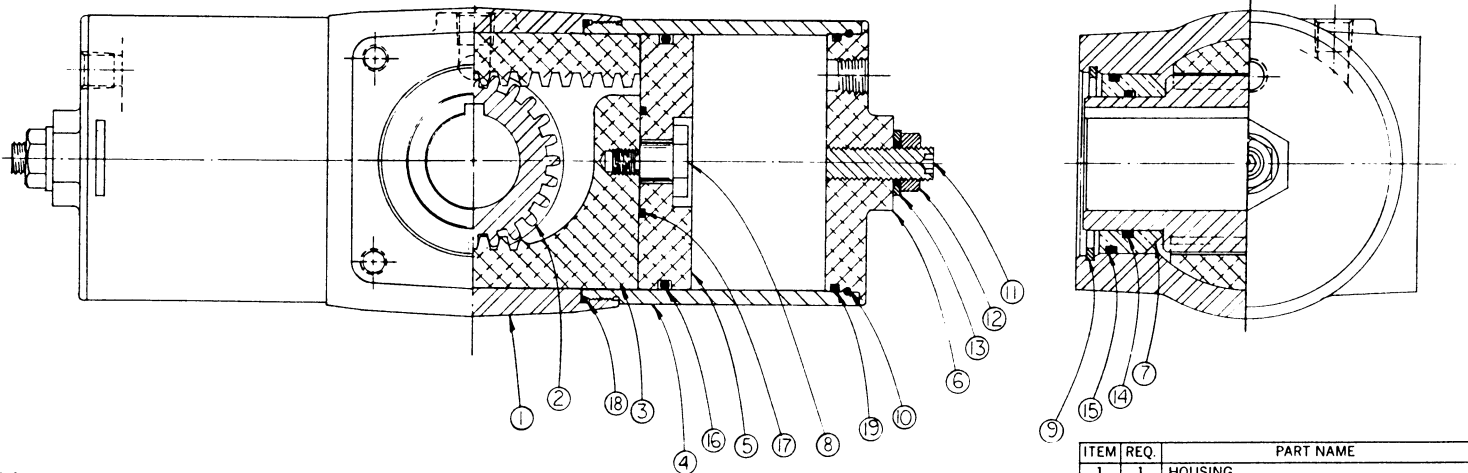
1. Slide cylinder tubes over rack/piston, being careful not to damage the piston seals.
2. Slide cylinder tubes into the housing until they bottom out against the housing and tighten with a strap wrench.

D300, D1000, D2000



ITEM	REQ	PART NAME
1	1	HOUSING
2	2	PISTON RACK
3	1	PINION
4	1	L. H. CYL. HEADS
5	1	R. H. CYL. HEADS
6	1	RETAINER RING BRG.
7	1	SEAL WASHER
8	2	BEARINGS
9	2	THRUST WASHER
10	2	O-RING - PINION
11	2	O-RING - BEARING
12	2	O-RING - END CAP
13	2	O-RING - PISTON RACK
14	2	O-RING - BODY PORTS
15	8	BOLTS - CYL. HEAD
16	8	LOCKWASHERS - END CAPS

D4000 THRU D10,000



ITEM	REQ.	PART NAME
1	1	HOUSING
2	1	PINION
3	2	RACK
4	2	CYLINDER TUBE
5	2	PISTON
6	2	CYL. HEAD - ADJUSTOR
7	2	SLEEVE BEARING
8	2	HEX SHOULDER BOLT
9	2	RETAINING RING - BEARING
10	2	KEY WIRE - CYL. HEAD
11	2	ADJUSTER SCREW
12	2	LOCKNUT - ADJUSTER
13	2	THREAD SEAL - ADJUSTER
14	2	O-RING - PINION
15	2	O-RING - BEARING
16	2	O-RING - PISTON O.D.
17	2	O-RING - PISTON
18	2	O-RING - CYLINDER
19	2	O-RING - CYL. HEAD

14. APPENDIX A - REPLACING CYLINDER HEAD SEALS

MODELS D4000 THROUGH D10,000 CYLINDER HEAD DISASSEMBLY & RE-ASSEMBLY PROCEDURES.

DISASSEMBLY

1. Disconnect air lines and be sure the actuator is not under pressure.
2. Place wrench on hex of cylinder head & turn counter-clockwise until the end of the head retainer wire can be seen through the slot in the cylinder tube.

NOTE: It may be necessary to hold the cylinder tube while turning to prevent the cylinder tube from unthreading from the housing.

3. Using a small standard screw driver, lift the end of the head retainer wire without bending or deforming it. Turn the cylinder head counter-clockwise until the retainer wire starts to extend out of the slot in the cylinder tube. Continue turning the cylinder head until the retainer wire is completely exposed.

CAUTION NOTE: Do not turn the cylinder head past the point where the retainer wire is inserted into the hole in the cylinder wall. If this is done the end of the retainer wire will snap off.

4. Remove retainer wire from hole in cylinder head.
5. Save the retainer wire, as they are re-usable.

RE-ASSEMBLY

1. Lightly oil the cylinder head seals & install.
2. Check cylinder tube to make sure it is threaded tightly into the housing.
3. Lightly oil the inside of the cylinder tube. Insert the cylinder head in the cylinder tube. Turn the cylinder head until the drilled hole in the cylinder head is visible through the slot in the cylinder tube. Place hook end of the cylinder head retainer wire through the slot & into the drilled hole in the cylinder head. Turn cylinder head clockwise until the retainer wire is pulled completely through the slot.

NOTE:

P₁ — Central Port
P₂ — End Port(s)

BENCH TEST PRIOR TO INSTALLATION

A. Internal Leakage

1. Check to insure that the cylinder heads are fastened securely.
2. Pressurize P₁ port, disconnect connection at the P₂ port and check for air leakage.
3. Reverse connections, pressurize the P₂ port and check for air leakage at the P₁ port.

B. Performance Check

1. Connect air lines to ports.
2. Slowly increase the air pressure & note the minimum pressure required to start rotation of the shaft. Minimum pressure should not exceed 10 psi. If the pressure exceeds 10 psi, disassemble & check for binding.
3. Increase air pressure to normal operating pressure (125 psi max.) alternately on the P₁, then the P₂ ports. Check for external leaks at each position. External leakage should be zero.

C. Installation

1. Install actuator in system insuring proper alignment of shaft to coupling & mounting.



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