

MAINTENANCE INSTRUCTIONS – A SERIES ROTARY ACTUATORS

MODELS A100 AND A500
MAXIMUM OPERATING PRESSURE: AIR — 125 psig

GENERAL

STANDARD ACTUATORS ARE DESIGNED FOR USE WITH SHOP AIR OR A GOOD GRADE OF PETROLEUM BASE HYDRAULIC OIL. FOR NORMAL TEMPERATURE CONDITIONS AN OIL HAVING A VISCOSITY RANGE BETWEEN 250-300 SSV @ 100°F IS RECOMMENDED.

FOR MAXIMUM BEARING AND SEAL LIFE IN PNEUMATIC SYSTEMS THE AIR SHOULD BE FILTERED AND LUBRICATED. UNITS ARE PERMANENTLY LUBRICATED AT ASSEMBLY.

KEY CONSIDERATION IN THE DISASSEMBLY OF THE UNIT IS DETERMINING THE PINION SHAFT KEYWAY RELATIONSHIP TO THE RACK POSITION TO MAINTAIN PROPER TIMING AT RE-ASSEMBLY. (NOTE: STANDARD UNITS ARE TIMED WITH THE PINION SHAFT KEYWAY AT 12 O'CLOCK HIGH WHEN LOOKING AT THE FRONT MOUNTING FACE.)

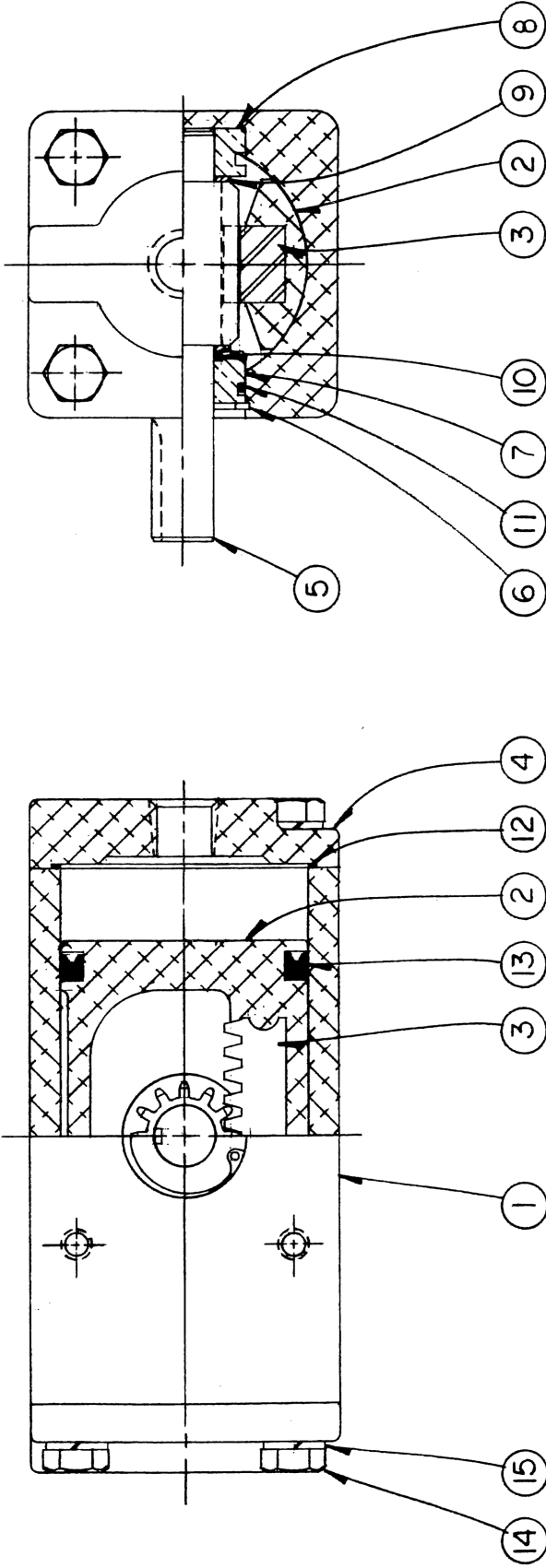
DISASSEMBLY

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, with pinion vertical and bearing retaining ring up (side with no mounting holes).
4. Remove cylinder head bolts and lockwashers.
5. Remove cylinder heads by pulling from housing.
6. Position the rack at mid-point of travel (equal amounts of rack extended on each side of housing). Note and record the pinion shaft keyway location for re-assembly.
7. Remove the front bearing retainer ring (snap ring).
8. Remove the pinion and 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.
9. Tap out the back bearing (opposite the retainer ring side) in a similar manner.
10. Remove all seals. Do not re-use seals. Replace with new at re-assembly.
11. If the unit is equipped with cushions remove the cushion nose from the piston. Procedures for the disassembly and re-assembly of the cushion adjustor(s) is given in Appendix A.
12. Procedure for disassembly and re-assembly of the adjustable stops (if the unit is so equipped) is given in Appendix B.
13. Thoroughly clean all parts, inspect for wear or damage and replace as required.

RE-ASSEMBLY

1. Position the actuator housing in a vise so the retainer ring groove is up.
2. Lightly lubricate all seals with Vaseline or light oil before installation.
3. Install seals as shown in drawings.
NOTE: Install the back (side opposite the retainer ring groove) bearing O.D. seal in the housing and 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 and check it seats properly (tap lightly).
5. If the unit is equipped with cushions, the cushion assembly (cushion check, compression spring, cushion O-ring, cushion bolt and dyna-seal) should be installed on one piston. Use Loctite No. 271 (red) on the bolt and torque to 5 ft. lb.
6. Grease rack with Grade 2 grease and install so the pinion shaft keyway is positioned at the 12 o'clock high position (standard timing) with the rack centered.
7. If applicable, install cushion assembly on the other piston as described in No. 5 above.
8. Position rack at mid-point in housing.
9. Grease pinion with Grade 2 grease and install so the pinion shaft keyway is positioned at the 12 o'clock high position (standard timing) with the rack centered.
10. Install the front pinion bearing. Check to ensure the retainer ring groove is completely exposed above the bearing.
11. Install the retainer ring (snap ring) to secure the pinion and bearings in place. Check to make sure the retainer ring is properly seated in its groove.
12. Clamp the actuator in a vise so the pistons are readily available.
13. Install the seals on the pistons. Check to ensure the open end of the lipseal faces toward the pressure source (toward the face of the piston).
14. Install the O-ring seats in the cylinder heads.
15. Install the cylinder heads.
16. Install and tighten cylinder head lockwashers and bolts. Torque alternately and evenly to 4 to 6 ft. lbs.

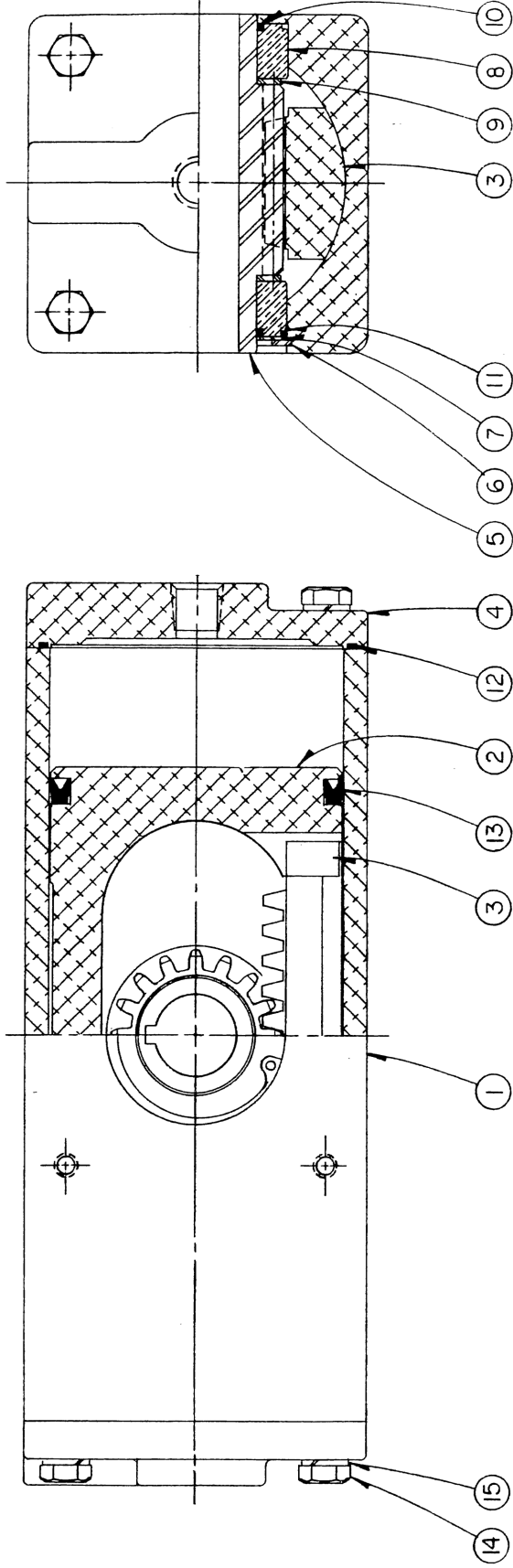
A100



ITEM	QTY	PART NAME
1	1	HOUSING
2	1	PISTON RACK
3	1	RACK INSERT
4	2	END CAP
5	1	PINION
6	1	RETAINER-BEARING
7	1	FRONT BEARING
8	1	REAR BEARING
9	2	THRUST WASHER
10	1	O-RING-PINION
11	1	O-RING-BEARING
12	2	BACK-UP RING-END CAP
13	2	BLOCK VEE-PISTON RACK
14	8	TIE BOLT
15	8	LOCKWASHER-BOLT

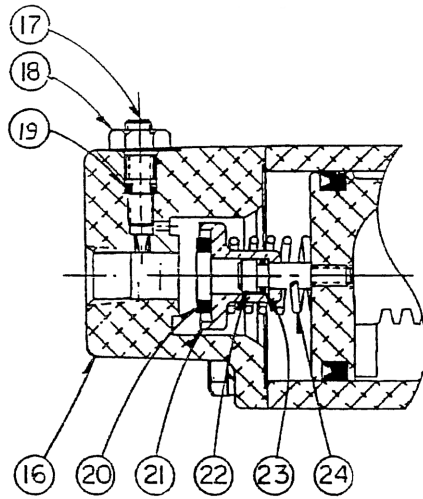
ALWAYS USE SERIAL NUMBERS AND MODEL NUMBERS WHEN ORDERING PARTS.

A500



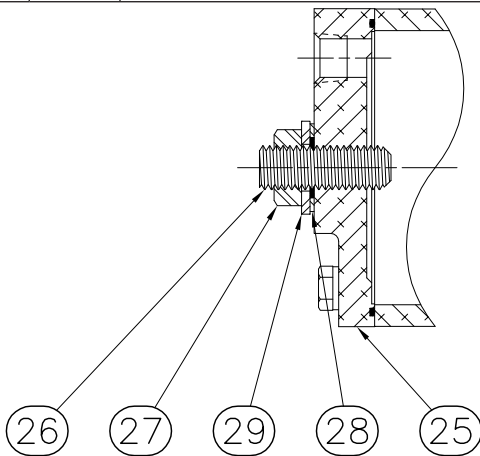
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ITEM	QTY	PART NAME
1	1	HOUSING
2	1	PISTON RACK
3	1	RACK INSERT
4	2	END CAP - PORT
5	1	PINION
6	1	RETAINER - BEARING
7	1	SEAL WASHER
8	1	BEARING
9	2	THRUST WASHER
10	1	O-RING, PINION
11	1	O-RING, BEARING
12	2	O-RING, END CAP
13	2	BLOCK/VEE-PISTON RACK
14	8	TIE BOLT
15	8	LOCKWASHER - BOLT



CUSHION PARTS

ITEM	QTY	PART NAME
16	1	CUSHION END CAP
17	1	CUSHION NEEDLE
18	1	JAM NUT
19	1	O-RING & BACK-UP RING CUSHION NEEDLE
20	1	DYNA SEAL
21	1	CUSHION CHECK
22	1	S.H SHOULDER SCREW
23	1	O-RING, CUSHION CHECK
24	1	COMPRESSION SPRING



ADJUSTOR PARTS

ITEM	QTY	PART NAME
25	1	ADJUSTOR END CAP
26	1	ADJUSTABLE STOP
27	1	JAM NUT
28	1	THREAD SEAL
29	12	WASHER

APPENDIX A – CUSHION ADJUSTORS DISASSEMBLY AND RE-ASSEMBLY PROCEDURES

DISASSEMBLY (Relieve pressure or disconnect air lines before proceeding.)

1. Remove cushion jam nut and cushion needle from cylinder head.
2. Remove O-ring and back-up ring. Do not re-use seals, replace with new during re-assembly.
3. Thoroughly clean and inspect all parts for wear or damage, replace parts as required.

RE-ASSEMBLY

1. Install new back-up ring on cushion needle making sure the curved side faces toward the needle end.
2. Install new O-ring on the cushion needle making sure the O-ring fits into the curved side of the back-up ring.
3. Insert the cushion needle in the cylinder head, being careful not to damage the seals. Tighten as far as possible, then loosen ½ turn.
4. Install jam nut.
5. Adjust cushion during testing as follows:
 - A. Relieve pressure to the unit.
 - B. Loosen jam nut.
 - C. To obtain desired amount of cushion effect, turn the adjusting screw clockwise for more cushion effect, turn the adjusting screw counter-clockwise for less cushion effect.
 - D. Tighten jam nut and operate the unit under pressure to check for desired cushioning effect. Repeat procedure as necessary.

APPENDIX B – ADJUSTABLE STOPS DISASSEMBLY AND RE-ASSEMBLY PROCEDURES

DISASSEMBLY (Relieve pressure or disconnect air lines before proceeding.)

1. Loosen jam nut, thread nut and thread seal.
2. Screw adjustor out of cylinder head.
3. Remove thread seal and jam nut.
4. Thoroughly clean and inspect all parts for wear or damage, replace as required.

RE-ASSEMBLY

1. Lightly oil adjustor threads.
2. Screw adjustor into the cylinder head 4 to 6 full turns.
3. Install the new thread seal and jam nut.
4. DO NOT attempt to adjust stroke with the actuator under pressure. Damage to the actuator can result.
5. To adjust rotation:
 - A. Position actuator shaft at the desired location.
 - B. Relieve pressure.
 - C. Screw in the proper stroke adjustor screw until the adjustor contacts the actuator piston.
 - D. Tighten jam nut.
 - E. Repeat this procedure for opposite side.

OPERATIONAL BENCH TEST

PRIOR TO RE-INSTALLATION OF ACTUATOR

1. Check to ensure the cylinder heads are fastened securely. Connect air lines to port.
2. Slowly increase the air pressure and note the minimum pressure required to start rotation of the shaft. Minimum pressure should not exceed 10 psi. If pressure exceeds 10 psi disassemble unit and check for binding.
3. Check keyway position at both ends of full travel. Keyway should be positioned an equal amount on either side of the 12 o'clock high position.
4. 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.
5. Install actuator in system ensuring proper alignment of shaft to coupling and mounting.