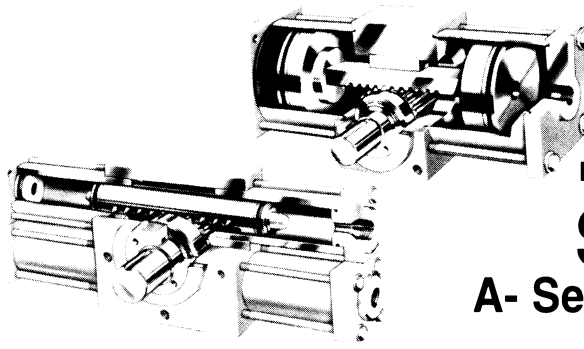


OHIO OSCILLATOR

1707 N. MAIN ST., P.O. BOX 199, ORRVILLE, OHIO 44667-0199



00-FS-253
January 2002

MAINTENANCE INSTRUCTIONS:

SERVICE

A- Series Rotary Actuators

PHONE 330-683-5075

FAX 330-683-6857

MAINTENANCE INSTRUCTIONS

MODELS A6.2 THROUGH A67.6

MAXIMUM OPERATING PRESSURE: AIR — 250 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 & SEAL LIFE IN PNEUMATIC SYSTEMS THE AIR SHOULD BE FILTERED & LUBRICATED. UNITS ARE PERMANENTLY LUBRICATED AT ASSEMBLY.

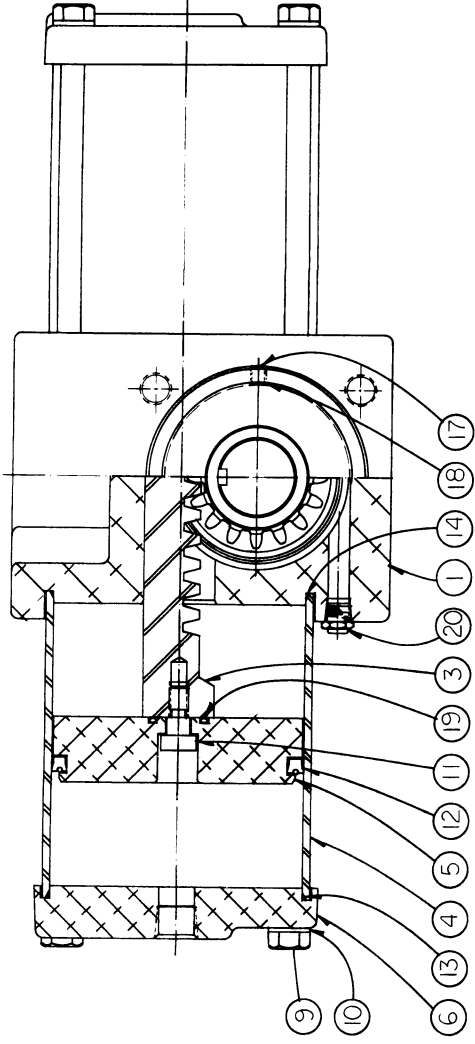
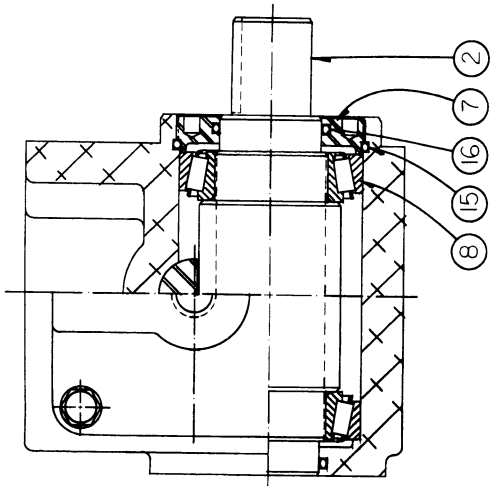
KEY CONSIDERATION IN THE DISASSEMBLY OF THE UNIT IS DETERMINING THE PINION SHAFT KEYWAY RELATIONSHIP TO THE RACK POSITION TO MAINTAIN PROPER TIMING AT RE-ASSEMBLY (NOTE: STANDARD UNITS ARE TIMED WITH THE PINION SHAFT KEYWAY AT 12 O'CLOCK HIGH WHEN LOOKING AT THE FRONT MOUNTING FACE.)

DISASSEMBLY

1. REMOVE ALL CYLINDER HEAD TIE BOLTS/TIE RODS.
2. REMOVE CYLINDER HEADS.
3. SET THE RACK AT MID-POINT OF TRAVEL. (EQUAL SECTIONS OF RACK EXTENDING ON EACH SIDE OF THE HOUSING.) NOTE & RECORD PINION SHAFT KEYWAY LOCATION FOR RE-ASSEMBLY.
4. BACK OFF THE BEARING CAP SET SCREW. **USE CARE NOT TO LOSE NYLON PELLETT UNDER THE SET SCREW.**
5. USING A SPANNER WRENCH, UNSCREW THE THREADED BEARING CAP FROM THE HOUSING.
6. PULL PINION FROM THE HOUSING WITH FRONT BEARING & BEARING CAP ON IT.
7. REMOVE THE CYLINDER TUBES.
8. REMOVE THE RACK ASSEMBLY FROM THE HOUSING.
9. REMOVE THE PISTON BOLTS HOLDING PISTONS TO THE RACKS.
10. REMOVE THE BACK BEARING FROM THE HOUSING.
11. REMOVE ALL O-RINGS & SEALS. DO NOT REUSE SEALS. REPLACE WITH NEW AT RE-ASSEMBLY.
12. THOROUGHLY CLEAN & INSPECT ALL PARTS FOR WEAR OR DAMAGE. REPLACE WITH NEW PARTS AS REQUIRED. LUBRICATE LIGHTLY WITH OIL BEFORE RE-ASSEMBLY.

RE-ASSEMBLY

1. LUBRICATE PINION TEETH & RACK WITH GRADE 2 GREASE.
2. INSTALL NEW SEALS IN THEIR PROPER GROOVES.
3. INSTALL BACK BEARING IN HOUSING.
4. CENTER RACK IN HOUSING. (EQUAL SPACING ON BOTH SIDES OF HOUSING.)
5. INSTALL PINION WITH THE SHAFT KEYWAY LOCATION AS NOTED DURING DISASSEMBLY. (STANDARD UNIT TIMING WILL HAVE KEYWAY AT 12 O'CLOCK HIGH LOCATION WHEN LOOKING AT THE FRONT MOUNTING FACE.)
6. INSTALL FRONT PINION BEARING AND BEARING CAP. TIGHTEN BEARING CAP UNTIL SNUG, THEN TIGHTEN TO PRE-LOAD BEARING. TIGHTEN BEARING CAP SET SCREW.
7. LIGHTLY OIL INSIDE OF CYLINDER TUBES. SLIDE PISTONS INTO THE CYLINDER TUBES.
8. WITH PISTONS IN THE CYLINDER TUBES, BOLT PISTONS TO THE RACK. USE LOCTITE '271' ON BOLT & TORQUE BOLT TO 5 LB. FT.
9. SLIDE CYLINDER TUBES INTO THE HOUSING, BEING CAREFUL NOT TO DAMAGE THE SEALS.
10. ATTACH CYLINDER HEADS & TIE RODS. NOTE: MAKE SURE THE TIE RODS/TIE BOLTS ARE FULLY ENGAGED IN THE HOUSING APPROXIMATELY 1-1/2 DIAMETERS. TORQUE BOLTS EVENLY BY APPLYING FORCE ALTERNATELY TO OPPOSITE CORNERS OF THE HEAD. THIS PREVENTS COCKING OF THE CYLINDER HEADS & DISTORTING OF THE CYLINDER TUBES. TORQUE CHART SHOWN ON PAGE 2.



ALWAYS USE SERIAL
NUMBERS AND MODEL
NUMBERS WHEN ORDERING
PARTS.

ITEM NO.	PART NAME	NUMBER REQUIRED A 6.2 Through A 67.6
1	HOUSING	1
2	PINION	1
3	RACK	1
4	CYLINDER TUBES	2
5	PISTONS	2
6	CYLINDER HEADS	2
7	BEARING CAP	1
8	BEARING	2
9	TIE BOLTS	8
10	LOCKWASHER	8
11	PISTON BOLT	2
12	PISTON SEAL	2
13	CYLINDER HEAD O-RING	2
14	CYLINDER TUBE SEAL	2
15	BEARING CAP O-RING	1
16	PINION O-RING	2
17	SET SCREW	1
18	LOCKING PELLET	1
19	O-RING, RACK	2
20	RELIEF VALVE	1

TORQUE CHART		
MODEL NO.	FASTENER SIZE	RECOMMENDED TORQUE FOR CYLINDER HEAD BOLTS
6.2 & 6.3	1/4 NC	8 lb. ft.
19.3 & 19.4	5/16 NC	14 lb. ft.
67.4 & 67.6	7/16 NC	36 lb. ft.

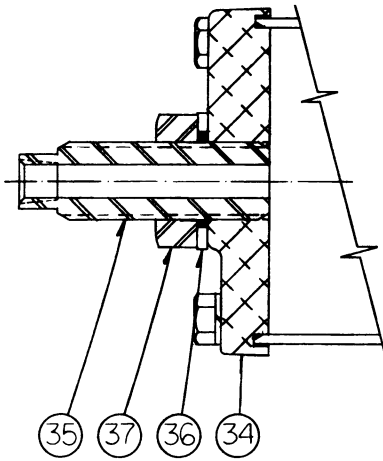
APPENDIX A — ADJUSTOR MODELS — ADJUSTOR IN CYLINDER HEAD

DISASSEMBLY

1. REMOVE ADJUSTOR LOCKNUT & THREAD SEAL.
2. REMOVE ADJUSTOR
3. THOROUGHLY CLEAN & INSPECT ALL PARTS FOR WEAR OR DAMAGE. REPLACE PARTS AS REQUIRED. REPLACE ADJUSTOR SEAL.

REASSEMBLY

1. INSTALL NEW ADJUSTOR SEAL.
2. THREAD ADJUSTOR INTO CYLINDER HEAD UNTIL END IS FLUSH WITH THE INSIDE OF THE CYLINDER HEAD.
3. LOCK INTO POSITION WITH LOCK-NUT.
4. FINAL ADJUSTMENT FOR ROTATION TO BE DONE DURING TEST AND INSTALLATION.



ADJUSTOR OPTION

ALWAYS USE SERIAL NUMBERS AND MODEL NUMBERS WHEN ORDERING PARTS

ITEM NO.	PART NAME	NUMBER PER ADJUSTOR
34	CYLINDER HEAD	1
35	ADJUSTOR	1
36	THREAD SEAL	1
37	LOCKNUT	1

APPENDIX B — CUSHIONED MODELS — CUSHION IN CYLINDER HEAD

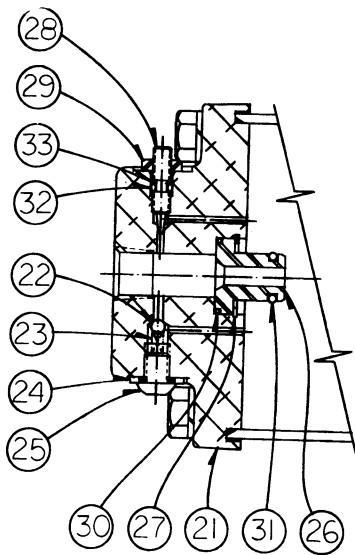
DISASSEMBLY

1. REMOVE CUSHION NOSE RETAINING RING.
2. REMOVE CUSHION NOSE FROM CYLINDER HEAD.
3. REMOVE BINDER HEAD SCREW, THREAD SEAL, SPRING & BALL CHECK FROM CYLINDER HEAD.
4. REMOVE CUSHION NEEDLE JAM NUT & CUSHION NEEDLE FROM CYLINDER HEAD.
5. REMOVE ALL O-RINGS & SEALS. REPLACE WITH NEW AT RE-ASSEMBLY.
6. THOROUGHLY CLEAN & INSPECT ALL PARTS FOR WEAR OR DAMAGE, REPLACE PARTS AS REQUIRED.

NOTE: A NEW CUSHION SEAL KIT SHOULD BE INSTALLED DURING RE-ASSEMBLY.

REASSEMBLY

1. INSTALL BALL CHECK, SPRING, NEW THREAD SEAL & BINDER HEAD SCREW IN CYLINDER HEAD.
2. INSTALL NEW BACK-UP RING ON CUSHION NEEDLE MAKING SURE THAT THE CURVED SIDE FACES TOWARD THE NEEDLE END.
3. INSTALL NEW O-RING ON CUSHION NEEDLE MAKING SURE IT IS IN BOARD OF THE BACK-UP RING AND THAT THE O-RING FITS INTO THE CURVED SIDE OF THE BACK-UP RING.
4. INSERT THE CUSHION NEEDLE IN THE CYLINDER HEAD, BEING CAREFUL NOT TO DAMAGE THE SEALS. TIGHTEN AS FAR AS POSSIBLE, THEN LOOSEN 1/2 TURN. INSTALL JAM NUT.
5. INSTALL NEW CUSHION NOSE SEAL AND O-RING ON NEW CUSHION NOSE.
6. INSERT CUSHION NOSE IN CYLINDER HEAD & HOLD IN POSITION WITH RETAINING RING.
7. FINAL ADJUSTMENT OF CUSHIONS TO BE DONE DURING TEST AND INSTALLATION.

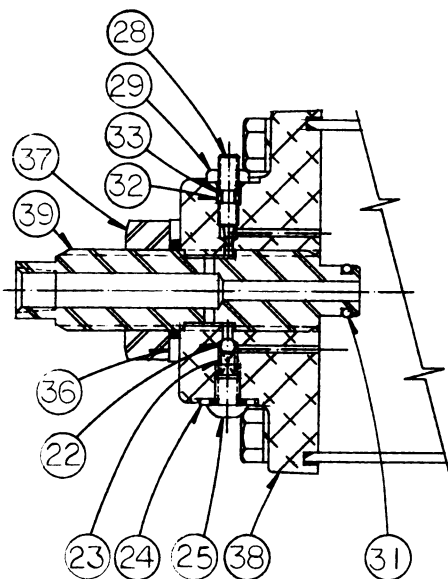


CUSHION OPTION

CAUTION: DO NOT PRESSURIZE OR OPERATE ACTUATOR WITH PART NO. 28 REMOVED

ITEM NO.	PART NAME	NUMBER PER CUSHION
21	CYLINDER HEAD, CUSHIONED	1
22	BALL-CUSHION CHECK	1
23	SPRING-CUSHION CHECK	1
24	THREAD SEAL, CUSHION CHECK	1
25	BINDER HEAD SCREW	1
26	CUSHION NOSE	1
27	RETAINING RING	1
28	CUSHION NEEDLE	1
29	JAM NUT	1
30	CUSHION NOSE O-RING	1
31	SEAL, CUSHION NOSE	1
32	CUSHION NEEDLE O-RING	1
33	CUSHION NEEDLE BACK-UP RING	1

APPENDIX C — ADJUSTOR WITH CUSHION MODELS — MOUNTED IN CYLINDER HEAD
DISASSEMBLY



CUSHION WITH ADJUSTOR OPTION

1. REMOVE ADJUSTOR LOCKNUT & SEAL.
2. REMOVE ADJUSTOR, REMOVE CUSHION NOSE O-RING.
3. REMOVE BINDER HEAD SCREW, THREAD SEAL, SPRING & BALL CHECK FROM CYLINDER HEAD.
4. REMOVE CUSHION NEEDLE, JAM NUT & CUSHION NEEDLE FROM CYLINDER HEAD.
5. CLEAN & INSPECT ALL PARTS FOR WEAR OR DAMAGE, REPLACE PARTS AS REQUIRED. REPLACE ADJUSTOR SEAL.

RE-ASSEMBLY

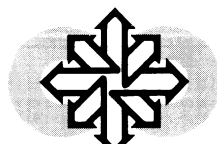
1. INSTALL BALL CHECK, SPRING & NEW THREAD SEAL & BINDER HEAD SCREW IN CYLINDER HEAD.
2. INSTALL NEW BACK-UP RING ON CUSHION NEEDLE MAKING SURE THAT THE CURVED SIDE FACES TOWARD THE NEEDLE END (PRESSURE SIDE).
3. INSTALL NEW O-RING ON CUSHION NEEDLE MAKING SURE IT IS IN BOARD OF THE BACK-UP RING, FITTING INTO THE CURVED SIDE OF THE BACK-UP RING.
4. INSTALL THE CUSHION NEEDLE IN THE CYLINDER HEAD. TIGHTEN AS FAR AS POSSIBLE THEN LOOSEN 1/2 TURN. INSTALL JAM NUT.
5. INSTALL ADJUSTOR O-RING.
6. INSTALL ADJUSTOR IN CYLINDER HEAD. THREAD INTO HEAD UNTIL THE CUSHION NOSE COLLAR IS FLUSH WITH THE INSIDE OF THE CYLINDER HEAD.
7. INSTALL SEAL & LOCK-NUT.
8. FINAL ADJUSTMENT FOR DESIRED ROTATION & CUSHIONING TO BE DONE DURING TEST & INSTALLATION.

ITEM NO.	PART NAME	NUMBER PER CUSHION
22	BALL-CUSHION CHECK	1
23	SPRING-CUSHION CHECK	1
24	THREAD SEAL, CUSHION CHECK	1
25	BINDER HEAD SCREW	1
28	CUSHION NEEDLE	1
29	JAM NUT	1
31	SEAL, CUSHION NOSE	1
32	CUSHION NEEDLE O-RING	1
33	CUSHION NEEDLE BACK-UP RING	1
36	THREAD SEAL	1
37	LOCKNUT	1
38	CYL. HEAD, ADJUSTOR CUSHIONED	1
39	ADJUSTOR CUSHIONED	1

CUSHION ADJUSTMENT

NOTE: DO NOT ADJUST WHILE UNIT IS UNDER PRESSURE

1. THE CONTROL NEEDLES OF THE CUSHION ARE INSTALLED & LOCKED 1/2 TURN FROM CLOSED WHEN ASSEMBLED AT THE FACTORY TO PREVENT PREMATURE DAMAGING OF THE ROTARY ACTUATOR DURING INSTALLATION & STARTUP.
2. **INCREASE CUSHIONING** — LOOSEN CUSHION NEEDLE JAM NUT 1/2 TO 1 TURN WHILE HOLDING SCREW IN POSITION WITH A 1/8 INCH HEX KEY. TURN CUSHION NEEDLE CLOCKWISE 1/8 TURN. LOCK JAM NUT & CHECK CUSHION ACTION.
NOTE: NEVER COMPLETELY CLOSE CUSHION NEEDLES.
3. **DECREASE CUSHIONING** — LOOSEN CUSHION NEEDLE JAM NUT 1/2 TO 1 TURN WHILE HOLDING SCREW IN POSITION WITH A 1/8 INCH HEX KEY. TURN CUSHION NEEDLE COUNTER-CLOCKWISE 1/8 TURN. LOCK JAM NUT & CHECK CUSHION ACTION.
NOTE: CAUTION IS TO BE TAKEN WHEN ADJUSTING THE CUSHION NEEDLE TO BE SURE THERE IS ADEQUATE THREAD ENGAGEMENT. CUSHION ADJUSTOR NEEDLES ARE DESIGNED TO LEAK ALONG THE THREADS BEFORE INADEQUATE THREAD ENGAGEMENT IS REACHED. IF CUSHION NEEDLE IS BACKED OUT TOO FAR, IT MAY BLOW OUT OF CYLINDER HEAD UNDER PRESSURE.
4. CONTINUE ADJUSTING CUSHION NEEDLES IN THE ABOVE DESCRIBED MANNER UNTIL THE DESIRED CUSHIONING EFFECT IS OBTAINED.



OHIO OSCILLATOR

1707 North Main Street * P.O. Box 199 * Orrville, Ohio 44667-0199

TEL: 330-683-5075

FAX: 330-683-6857