

# OPERATOR'S MANUAL

# 2XXX-XXX9-XXX

INCLUDING: APPLICATION, LUBRICATION, INSTALLATION & SERVICE

RELEASED: 9-14-92  
REVISED: 5-25-10  
(REV. C)

## ECONOMAIR SERIES CYLINDERS



**READ THIS MANUAL CAREFULLY BEFORE INSTALLING,  
OPERATING OR SERVICING THIS EQUIPMENT.**

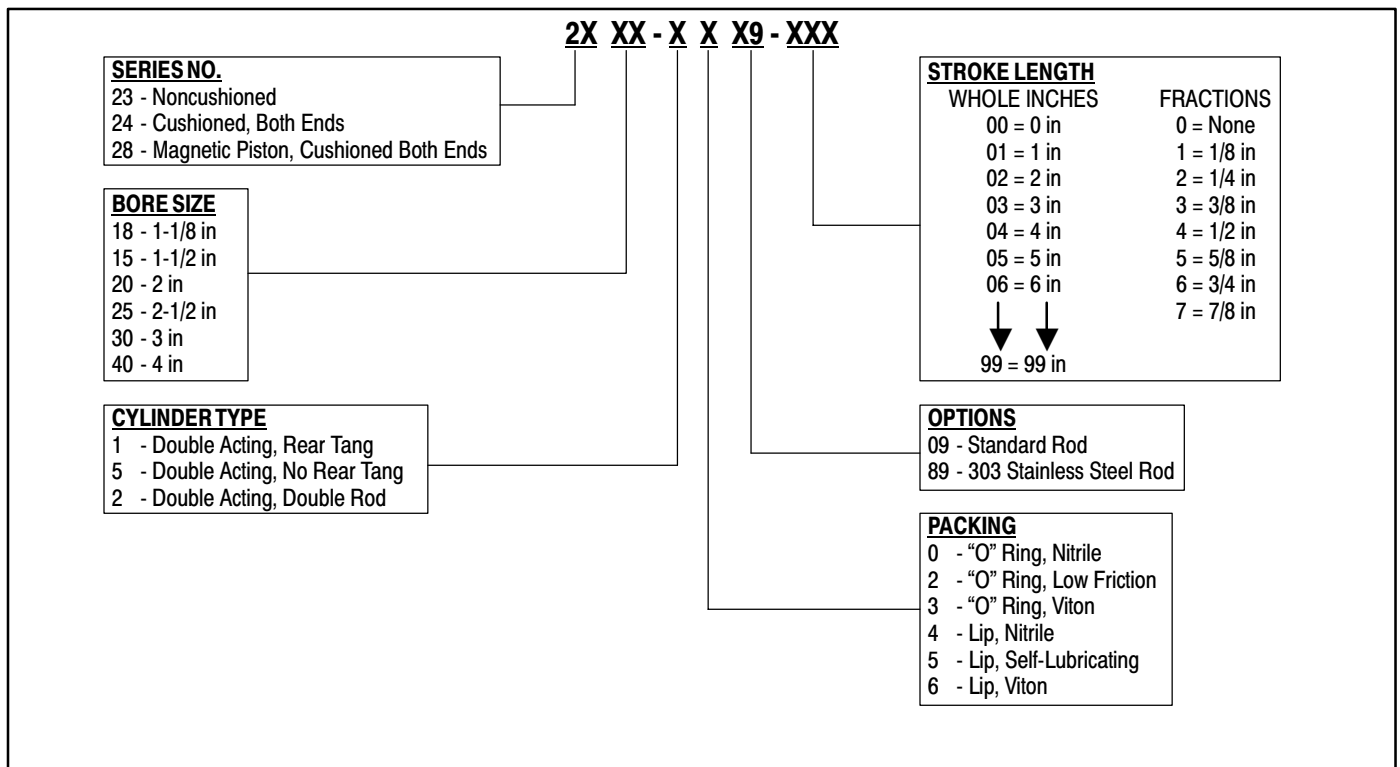
It is the responsibility of the employer to place this information in the hands of the operator. Keep for future reference.



Rated Pressure: 200 PSI (14 Bar) Maximum

Temperature Ratings: 0° to 180° F (-18° to 82° C)

### MODEL DESCRIPTION CHART



# Warnings and Service Information

## WARNINGS:

Improper application, installation, service or maintenance of ARO® cylinders may create a hazardous condition, which may in turn cause bodily injury as well as shortened product life. Contact The Aro Corporation for special applications.

## ECONOMAIR CYLINDER APPLICATION

- Economair cylinders are a series of round line repairable cylinders designed for medium to heavy duty pneumatic applications.
- The operating pressures are 200 p.s.i.g. - pneumatic and 200 p.s.i.g. - non-shock hydraulic with hydraulic packing option.
- Economair cylinders are available in 6 bore sizes: 1-1/8", 1-1/2", 2", 2-1/2", 3" and 4".
- Options include : 6 mounting styles, magnetic pistons, cushioned and non-cushioned and numerous packing options.

## CUSHIONS

24 and 28 series cylinders are cushioned models. Cushions are protective devices used to extend cylinder life and should not be used to decelerate loads.

Cushioning on all bores, except the 1-1/8", are equipped with an adjustable needle valve in the head and cap to provide adjustment of the cushion effect - clockwise rotation increases cushioning, counterclockwise rotation decreases cushioning. After adjustment, tighten retaining nut to lock into position. CAUTION: Do not disengage cushion needle from head or cap while cylinder is under pressure.

## OPERATION AND MAINTENANCE

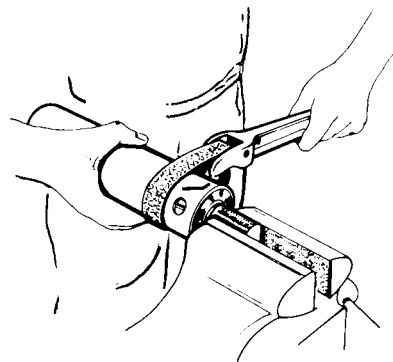
Pneumatic cylinders should be lubricated to provide maximum cycle life. Economair cylinders are lubricated with Shell Darina, EP grade, no. 2 grease during assembly at our factory in Angola, Indiana. Factory lubrication will provide a satisfactory amount of cycle life if no additional lubrication is provided. However, we recommend lubrication for any pneumatic system and suggest that you follow the guidelines for types of lubricants which are outlined in all of our catalogs (reference catalog 0020-M).

Periodic maintenance must be performed to assure maximum product life. Disassembly for cleaning, inspection, and relubrication can be performed any time equipment is idle for a short period of time. All metal parts should be cleaned with a non-flammable solvent. All rubber parts should be thoroughly washed with soap

and water. Cleaned parts should be rinsed and dried with low pressure air. Any parts which are worn or damaged should be replaced. Selected parts and seals are available in repair kit form.

## DISASSEMBLY

Clamp head by nose or tang flats with port in a vertical position at top of cylinder.



Remove all fittings, rotate barrel counterclockwise with a strap wrench one full turn. Locking wire will feed out of slot during turning. At the completion of revolution, remove retaining wire, wiggle barrel and slide from head.

## ASSEMBLY

Verify that all seals are in the correct position and that the rod and piston seals have been properly lubricated with Shell Darina, Ep grade no. 2 grease or equivalent.

Slide piston rod in head (be sure not to damage "U" cup in head), then slide barrel over piston onto head. Avoid damaging piston seals or head "O" ring. Clamp head by nose or tang on flats with port in a vertical position.

Align port and hole in barrel; insert retaining wire tap in hole in head in feed slot. Rotate barrel with strap wrench clockwise one revolution, until port and hole align; retaining wire will feed as barrel turns.

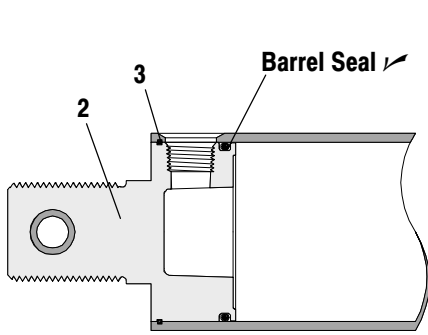
The assembled cylinder can now be tested for leaks and proper operation.

1. Alternately apply 90 p.s.i.g. air pressure to each of the cylinder ports and test for internal leaks across the piston and external leaks at the barrel seals and the rod seals.
2. Test for proper cycling at 20 p.s.i.g. supply.

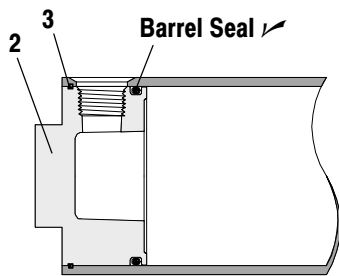
# PARTS LIST

## SERIES 23 CYLINDERS

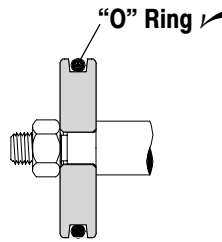
### DOUBLE ACTING, SINGLE ROD END



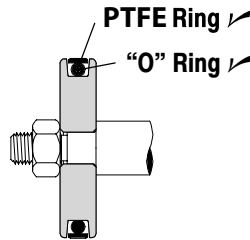
MODELS: 23XX-1XX9-XXX



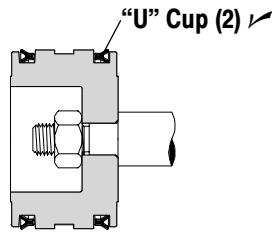
MODELS: 23XX-5XX9-XXX



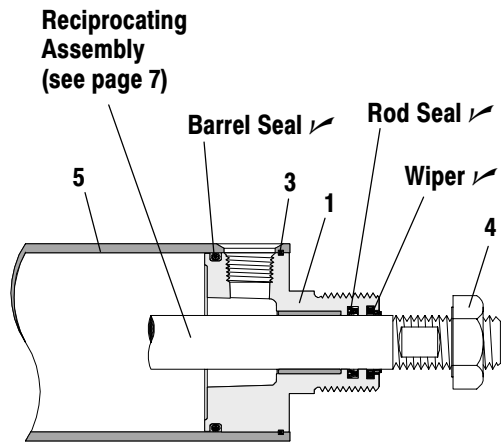
MODELS:  
23XX-X0X9-XXX  
23XX-X3X9-XXX



MODELS:  
23XX-X2X9-XXX



MODELS:  
23XX-X4X9-XXX  
23XX-X5X9-XXX  
23XX-X6X9-XXX



☆ Moderately lubricate barrel I.D. and all seals with Shell Darina EP Grade #2 Grease.

✓ Included in Seal Kit (see page 7)

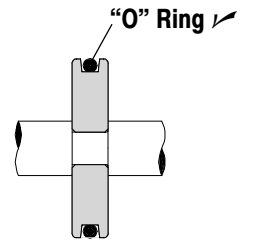
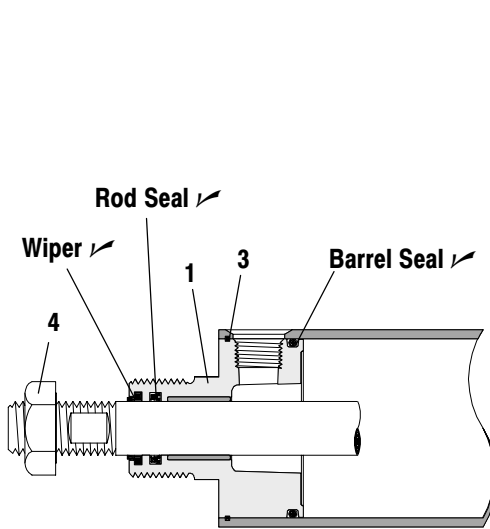
PARTS LIST								
ITEM	DESCRIPTION	QTY	1-1/8"	1-1/2"	2"	2-1/2"	3"	4"
1	Head	(1)	5002	118308	118319	118330	118340	118350
2	Cap (23XX-1)	(1)	5003	5105	5205	118334	118344	118354
	Cap (23XX-5)	(1)	5058	5158	5258	118337	118347	118357
3	Feed Ring Wire	(2)	5012	5112	5212	116750	5312	5412
4	Nut	(1)	Y12-106-C	Y12-108-C	Y12-110-C	Y12-112-C	Y12-112-C	Y12-116-C
* 5	Barrel (23XX-X0, 23XX-X2, 23XX-X3)	(1)	5501-XXX	5608-XXX	5708-XXX	6008-XXX	5808-XXX	5908-XXX
	Barrel (23XX-X4, 23XX-X5, 23XX-X6)	(1)	20866-XXX	20867-XXX	20868-XXX	20869-XXX	20870-XXX	20871-XXX

\* Specify Stroke Length

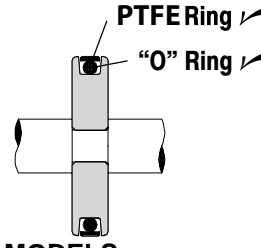
# PARTS LIST

## SERIES 23 CYLINDERS

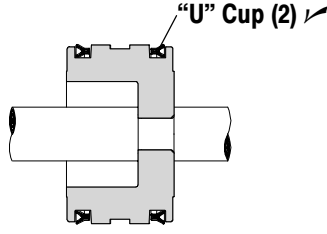
### DOUBLE ACTING, DOUBLE ROD END



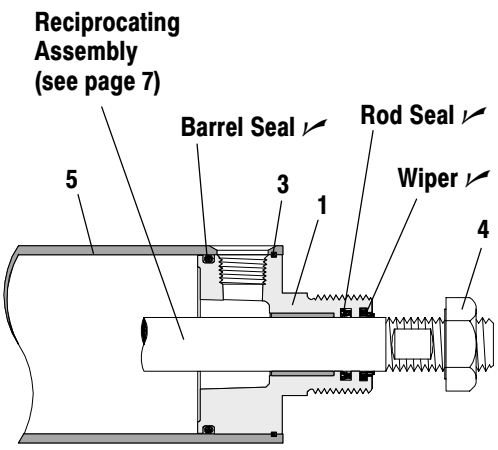
**MODELS:**  
23XX-20X9-XXX  
23XX-23X9-XXX



**MODELS:**  
23XX-22X9-XXX



**MODELS:**  
23XX-24X9-XXX  
23XX-25X9-XXX  
23XX-26X9-XXX



☆ Moderately lubricate barrel I.D. and all seals with Shell Darina EP Grade #2 Grease.

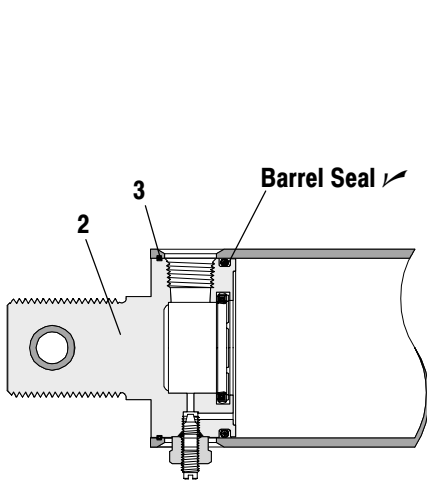
✓ Included in Seal Kit (see page 7)

PARTS LIST								
ITEM	DESCRIPTION	QTY	1-1/8"	1-1/2"	2"	2-1/2"	3"	4"
1	Head	(2)	5002	118308	118319	118330	118340	118350
3	Feed Ring Wire	(2)	5012	5112	5212	116750	5312	5412
4	Nut	(2)	Y12-106-C	Y12-108-C	Y12-110-C	Y12-112-C	Y12-112-C	Y12-116-C
* 5	Barrel (23XX-20, 23XX-22, 23XX-23)	(1)	5501-XXX	5608-XXX	5708-XXX	6008-XXX	5808-XXX	5908-XXX
	Barrel (23XX-24, 23XX-25, 23XX-26)	(1)	20866-XXX	20867-XXX	20868-XXX	20869-XXX	20870-XXX	20871-XXX

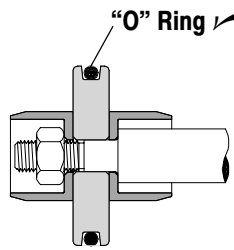
\* Specify Stroke Length

# PARTS LIST

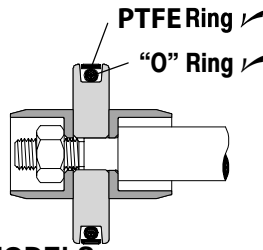
## SERIES 24 & 28 CYLINDERS DOUBLE ACTING, SINGLE ROD END



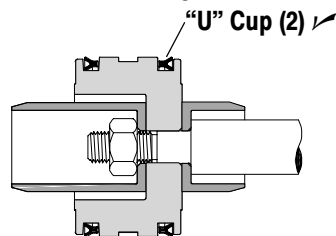
MODELS: 24XX-1XX9-XXX  
28XX-1XX9-XXX



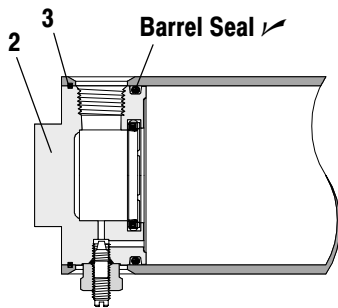
MODELS:  
24XX-X0X9-XXX  
24XX-X3X9-XXX



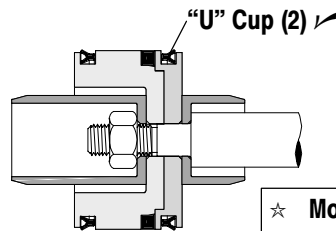
MODELS:  
24XX-X2X9-XXX



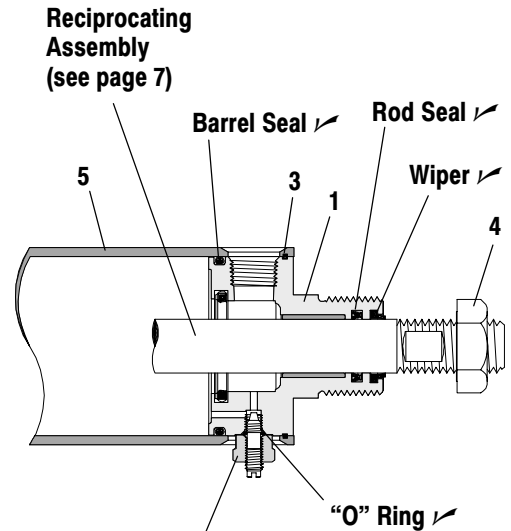
MODELS:  
24XX-X4X9-XXX  
24XX-X5X9-XXX  
24XX-X6X9-XXX



MODELS: 24XX-5XX9-XXX  
28XX-5XX9-XXX



MODELS:  
28XX-X4X9-XXX  
28XX-X5X9-XXX



Cushion Screw Kit  
119315-1 (Nitrile)  
119315-2 (Viton)

☆ Moderately lubricate barrel I.D., O.D. of cushion bosses and all seals with Shell Darina EP Grade #2 Grease.

✓ Included in Seal Kit (see page 7)

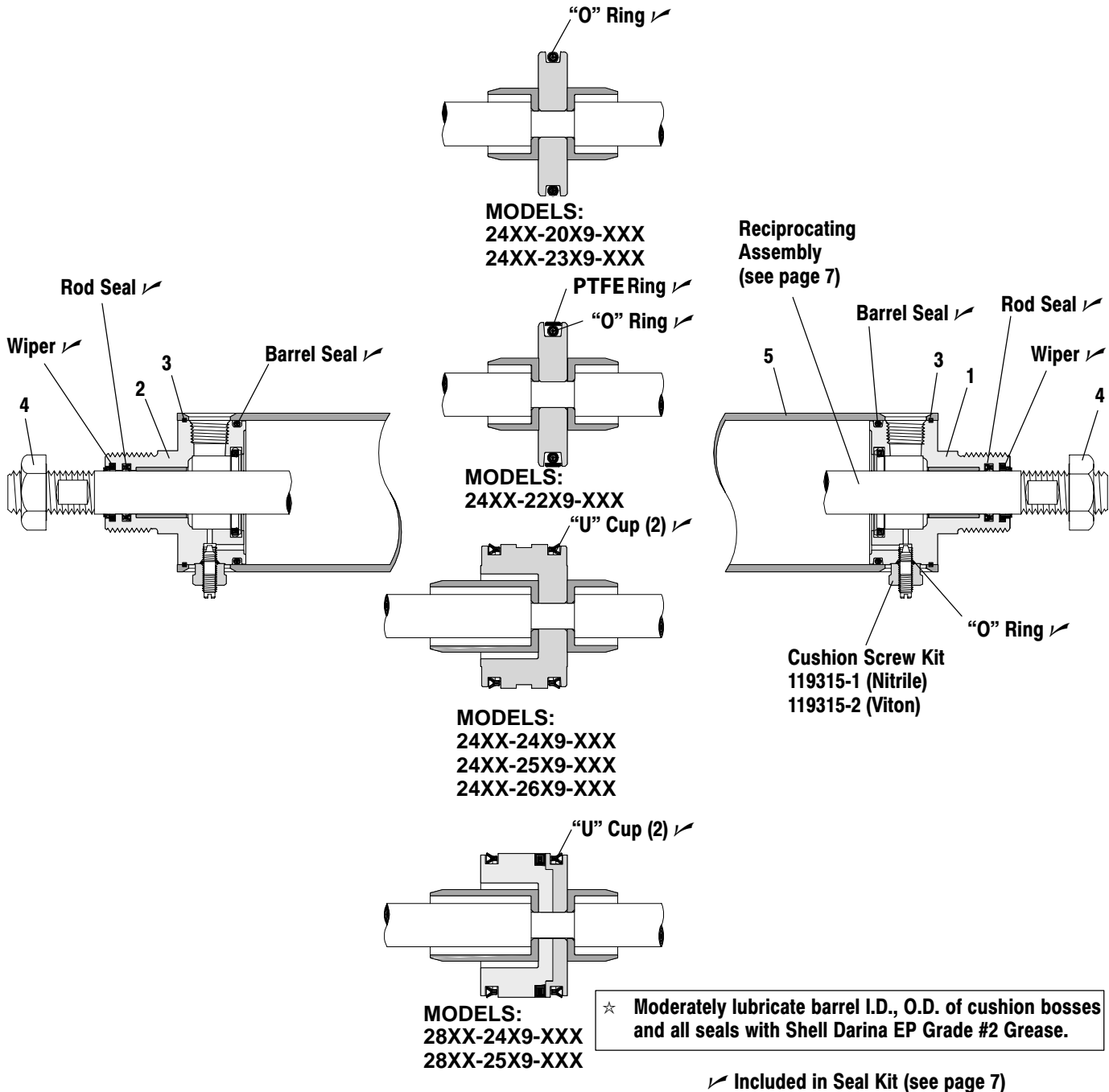
### PARTS LIST

ITEM	DESCRIPTION	QTY	1-1/8"	1-1/2"	2"	2-1/2"	3"	4"
1	Head	(1)	5052	118309	118320	118331	118341	118351
2	Cap (24XX-1, 28XX-1)	(1)	5053	118312	118323	118335	118345	118355
	Cap (24XX-5, 28XX-5)	(1)	5059	118315	118326	118338	118348	118358
3	Feed Ring Wire	(2)	5012	5112	5212	116750	5312	5412
4	Nut	(1)	Y12-106-C	Y12-108-C	Y12-110-C	Y12-112-C	Y12-112-C	Y12-116-C
* 5	Barrel (24XX-X0, 24XX-X2, 24XX-X3)	(1)	5501-XXX	5601-XXX	5701-XXX	6001-XXX	5801-XXX	5901-XXX
	Barrel (24XX-X4, 24XX-X5, 24XX-X6, 28XX-)	(1)	20866-XXX	20872-XXX	20873-XXX	20874-XXX	20875-XXX	20876-XXX

\* Specify Stroke Length

# PARTS LIST

## SERIES 24 & 28 CYLINDERS DOUBLE ACTING, DOUBLE ROD END



PARTS LIST								
ITEM	DESCRIPTION	QTY	1-1/8"	1-1/2"	2"	2-1/2"	3"	4"
1	Head	(1)	5052	118309	118320	118331	118341	118351
2	Cap	(1)	5052	118310	118321	118332	118342	118352
3	Feed Ring Wire	(2)	5012	5112	5212	116750	5312	5412
4	Nut	(2)	Y12-106-C	Y12-108-C	Y12-110-C	Y12-112-C	Y12-112-C	Y12-116-C
* 5	Barrel (24XX-20, 24XX-22, 24XX-23)	(1)	5501-XXX	5601-XXX	5701-XXX	6001-XXX	5801-XXX	5901-XXX
	Barrel (24XX-24, 24XX-25, 24XX-26, 28XX-)	(1)	20866-XXX	20872-XXX	20873-XXX	20874-XXX	20875-XXX	20876-XXX

\* Specify Stroke Length

# ECONOMAIR RECIPROCATING ASSEMBLY

RA 2X XX - X X X - XXX

SERIES NO.
23 - Noncushioned
24 - Cushioned, Both Ends
28 - Magnetic Piston, Cushioned Both Ends

BORE SIZE
18 - 1-1/8 in
15 - 1-1/2 in
20 - 2 in
25 - 2-1/2 in
30 - 3 in
40 - 4 in

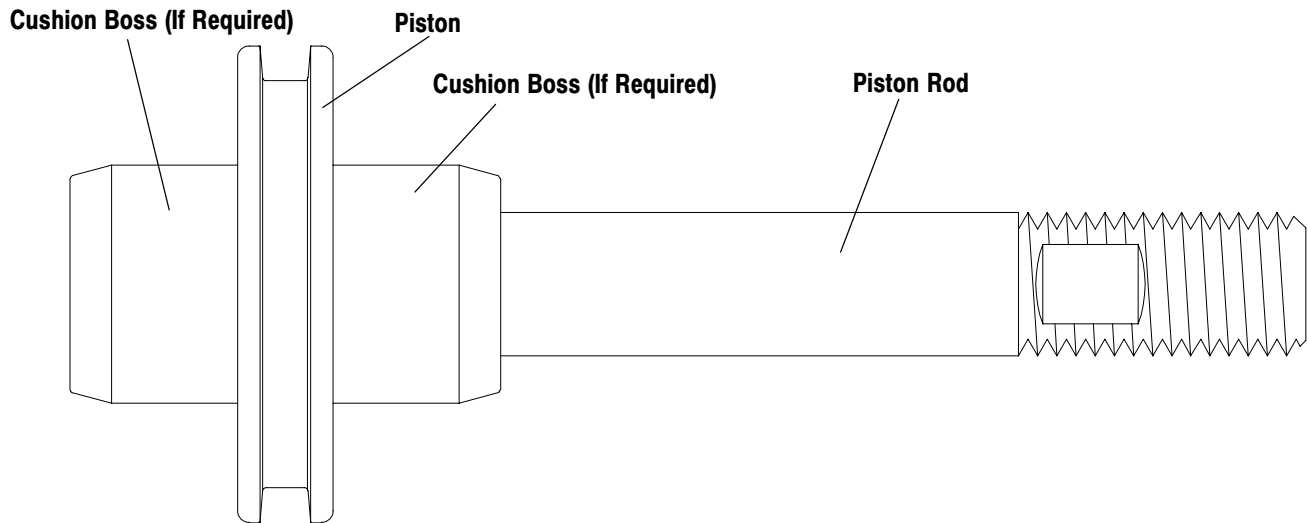
CYLINDERTYPE
1 - Double Acting (Cylinder Types 1 & 5)
2 - Double Acting, Double Rod

STROKE LENGTH	
WHOLE INCHES	FRACTIONS
00 = 0 in	0 = None
01 = 1 in	1 = 1/8 in
02 = 2 in	2 = 1/4 in
03 = 3 in	3 = 3/8 in
04 = 4 in	4 = 1/2 in
05 = 5 in	5 = 5/8 in
06 = 6 in	6 = 3/4 in
99 = 99 in	7 = 7/8 in

OPTIONS
0 - Standard Rod
8 - 303 Stainless Steel Rod

PACKING
0 - "O" Ring (Packings 0 & 3)
2 - "O" Ring, Low Friction
4 - Lip (Packings 4, 5 & 6)

NOTE: Reciprocating assembly is furnished assembled with all required components, less seals. It is recommended that new seal kits be used when replacing reciprocating assemblies. See below for Seal Kit requirements.



## SEAL KITS

RK 2X XX - X X

SERIES NO.
23 - Noncushioned
24 - Cushioned, Both Ends (Series 24 & 28)

BORE SIZE
18 - 1-1/8 in
15 - 1-1/2 in
20 - 2 in
25 - 2-1/2 in
30 - 3 in
40 - 4 in

PACKING
0 - "O" Ring, Nitrile
2 - "O" Ring, Low Friction
3 - "O" Ring, Viton
4 - Lip, Nitrile
5 - Lip, Self-Lubricating
6 - Lip, Viton
8 - Lip, Hydraulic

CYLINDERTYPE
1 - Double Acting (Cylinder Types 1 & 5)
2 - Double Acting, Double Rod

## Provenair™ and Economair™ Cylinder

The Aro Corporation ("ARO") warrants to the user purchaser of the ARO Provenair and Economair cylinders ("Cylinder") that the Cylinder be free of defects in material and workmanship for a period of five (5) years from the date of purchase.

ARO will repair or replace, at its election, any Cylinder which is found upon its inspection to be defective during the period prescribed above. The Cylinder must be shipped prepaid to ARO factory or ARO Customer Service Center together with proof of purchase.

This warranty does not apply to failures or defects occurring as a result of abuse, misuse, negligent repairs, corrosion, erosion and normal wear and tear.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES (EXCEPT TITLE), EXPRESSED OR IMPLIED, AND THERE ARE NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PURPOSE.

THE REMEDIES OF THE USER PURCHASER SET FORTH UNDER THE WARRANTY OUTLINED ABOVE ARE EXCLUSIVE AND THE TOTAL LIABILITY OF ARO WITH RESPECT TO THIS TRANSACTION, WHETHER BASED ON CONTRACT, WARRANTY, NEGLIGENCE, INDEMNITY, STRICT LIABILITY OR OTHERWISE SHALL NOT EXCEED THE PURCHASE PRICE OF THE CYLINDER.

ARO SHALL IN NO EVENT BE LIABLE TO THE USER PURCHASER FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES ARISING OUT OF THIS TRANSACTION, OR ANY BREACH THEREOF, WHETHER OR NOT SUCH LOSS OR DAMAGE IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, INDEMNITY, STRICT LIABILITY OR OTHERWISE.



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