

OPERATOR'S MANUAL

6689X-X

INCLUDING: SERVICE KIT, TROUBLESHOOTING, PARTS LIST,
DISASSEMBLY AND ASSEMBLY

RELEASED: 7-7-90
REVISED: 5-3-95
(REV. F) IPP

66890-XXX
(CARBON STEEL)

TWO-BALL STYLE
LOWER PUMP END
ALSO COVERS 63718X-XXX SERVICE KIT

66891-XXX
(STAINLESS STEEL)

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

(PACKINGS ARE UPPER AND LOWER UNLESS NOTED)

PACKING MATERIAL

1 THIOLKOL LEATHER ☼	D UHMW-PE/LEATHER STAG'D (UPPER)
3 GLASS FILLED TEFLON	LEATHER (LOWER) ☼
5 TEFLON(GF)/LEATHER STAG'D (UPPER)	F UHMW-PE/LEATHER STAG'D (UPPER)
GLASS FILLED TEFLON (LOWER) ☼	UHMW-PE (LOWER)
7 GLASS FILLED TEFLON (UPPER)	G UHMW-PE/LEATHER STAG'D
VIRGIN TEFLON (LOWER)	P UHMW-PE/TEFLON STAG'D (UPPER)
8 TEFLON(GF)/LEATHER STAG'D (UPPER)	UHMW-PE (LOWER)
VIRGIN TEFLON (LOWER) ☼	R TEFLON/UHMW-PE STAG'D (UPPER)
C UHMW-PE	TEFLON (LOWER)

PUMP MATERIAL

0 CARBON STEEL
1 STAINLESS STEEL

LOWER PUMP END OPTION DESCRIPTION CHART*

6689X-XXX



SPRING ARRANGEMENT

1 COIL SPRING ☼
4 WAVE SPRING
5 COMPOSITE SPRING W/ADJ P'KG NUT ☼

PLUNGER TYPE

3 HD SS W/HD CHROME PLATING
7 THREADED PLUNGER (LG MOTORS)
8 STD W/LOWER CUP

☼ AS OF MAY 15, 1995 NO LONGER AVAILABLE

* NOT ALL MODEL COMBINATIONS ARE AVAILABLE, REFER TO PUMP MODEL MANUAL (650XXX-XXX) FOR "ACTIVE" MODELS.

SERVICE KITS

- Use only genuine ARO replacement parts to assure compatible-pressure rating and longest service life.
- 637180-XXX for general repair of 66890-XXX Lower Pump End
- 637181-XXX for general repair of 66891-XXX Lower Pump End.

GENERAL DESCRIPTION

LOWER PUMP END

⚠ WARNING DO NOT EXCEED MAXIMUM OPERATING PRESSURE AS INDICATED ON PUMP MODEL PLATE

⚠ WARNING REFER TO GENERAL INFORMATION SHEET FOR ADDITIONAL SAFETY PRECAUTIONS AND IMPORTANT INFORMATION. (See the pump model manual for the proper Form No.)

- This LOWER PUMP END MANUAL is one of four documents needed to properly support an ARO pump model. Ref: Part A. 650XXX-XXX-X MODEL (OPERATOR'S) MANUAL, Part B. GENERAL INFORMATION, Part C. MOTOR (OPERATOR'S) MANUAL, Part D. LOWER PUMP END (OPERATOR'S) MANUAL. These forms are available from the factory if needed.
- The two-ball design provides far easy priming of the lower foot-valve. The double acting feature is standard in all ARO industrial-pumps, material is delivered to the pump discharge outlet on both the up and down stroke.

PUMP RATIO X REGULATED = MAXIMUM FLUID PRESSURE PRESSURE

- The pump ratio is an expression of the relationship between the air motor area and the lower pump end area. EXAMPLE: When 150 PSI (10.3 Bar) air pressure is supplied to the pump motor on a 3:1 ratio pump, the lower pump end will develop a maximum of 450 PSI (31 Bar) fluid pressure (at no flow). As the fluid control is opened, the flow rate will increase as the motor cycle rate increases to keep up with the demand.
- Operating at excessive pressures will shorten the life of the pump.

TROUBLE SHOOTING OF TWO-BALL PUMPS

Lower Pump End Problems

- No material at outlet. (Pump continually cycles.)
Check material supply, disconnect or shut off the air supply and replenish the material, reconnect.
- Material on one stroke only. (fast downstroke.)
The lower ball may not be seating in the foot valve. (See lower pump disassembly) Remove the ball from the foot valve, clean and inspect the ball and valve seat area. If ball or foot valve are damaged, replace.
- Material on one stroke only. (fast upstroke.)
- Check for worn or damaged seals. Replace the seals as necessary.
- Material leakage out of the solvent cup or material appears on the pump plunger rod.
For Models (-X5X Only). Increase the load on the packings by tightening the packing nut.
Check for worn upper packings and replace them as necessary.

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PACKING OPTIONS AND SERVICE KITS

LOWER PUMP Popular Models	SERVICE KIT	UPPER PACKING					LOWER PACKING			
		51 () "V" PACKING			52 (2) "V" PACKING		★55 (8) PACKING		65 (2) PACKING	
		PART NO	QTY.	MT'L	PART NO	MT'L	PART NO	MT'L	PART NO	MT'L
6689X-XXX	63718(##)-XXX									
-3X3, -3X7	63718()-343, -347	93455-2	(5)	[T]			93455-2	[T]		
-CX3, -CX7	63718()-C43, -C47	93455-4	(5)	[UH]			93455-4	[UH]		
-PX3, -PX7	63718()-P43, -P47	93455-4	(3)	[UH]	93455-2	[T]	93455-4	[UH]		
-RX3, -RX7	63718()-R43, -R47	93455-2	(3)	[T]	93455-4	[UH]	93455-2	[T]		

(See Page 4 for other Options) // # (0) = Carbon Steel Models (1) = Stainless Steel Models // **EXAMPLE: 66890-313 is replaced by 66890-343 & Svce kit is 637180-343**

COMMON WETTED PARTS

66890-XXX						66891-XXX					
ITEM	DESCRIPTION	(QTY)	PART NO	[MTL]		PART NO	[MTL]				
1	Solvent Cup	(1)	66851-1	[CS]		66851-2	[SS]				
6	Pump Body	(1)	92644	[CS]		92788	[SS]				
7	Gasket	(3)	90320	[Cu]		92810	[SS]				
8	Poly-Packing	(2)	92645	[Lu]		92645	[Lu]				
9	Tube	(1)	90293	[CS]		92784	[SS]				
10	Tie Rod	(3)	90323	[SS]		92780	[SS]				

66890-XXX						66891-XXX					
ITEM	DESCRIPTION	(QTY)	PART NO	[MTL]		PART NO	[MTL]				
11	Nut	(1)	Y11-110-N	[CS]		Y11-110-T	[SS]				
15	Foot Valve	(1)	66727	[CS]		62017	[SS]				
19	Sleeve	(1)	91557	[SS]		91557	[SS]				
20	Pin	(1)	92785	[SS]		92785	[SS]				
21	Ball	(1)	Y16-138	[SS]		Y16-138	[SS]				
27	Ball	(1)	Y16-128	[SS]		Y16-128	[SS]				

UPPER PACKING PARTS

COIL SPRING MODELS -X1X ONLY

ITEM	DESCRIPTION	QTY	PART NO	[MTL]
41	Spring	(1)	90325	[CS]
50	Washer, F Bkp (66890)	(1)	90322	[Br]
	Washer, F Bkp (66891)	(1)	92814	[SS]
53	Washer, M Bkp (66890)	(1)	90305	[Br]
	Washer, M Bkp (66891)	(1)	92786	[SS]

UPPER PACKING PARTS

WAVE SPRING MODELS -X4X ONLY

ITEM	DESCRIPTION	(QTY)	PART NO	[MTL]
43	Wave Spring	(1)	94136	[SS]
53	Washer, M Bkp	(1)	90305	[Br]
53	Washer, M Bkp (66891-X48)	(1)	92786	[SS]
115	Washer, F Bkp	(1)	94135	[De]

UPPER PACKING PARTS

COMPOSITE SPRING MODELS -X5X ONLY

ITEM	DESCRIPTION	(QTY)	PART NO	[MTL]
42	Composite Spring	(1)	66752-105	[SS]
50	Washer, F Bkp (66890)	(1)	90322	[Br]
	Washer, F Bkp (66891)	(1)	92814	[SS]

LOWER PACKING PARTS

"V" TYPE MODELS: -XX3, -XX7 ONLY

ITEM	DESCRIPTION	QTY	PART NO	[MTL]
26	Plunger Rod (-XX3)	(1)	90298-1	[SS]
	Plunger Rod (66890-XX7)	(1)	92224-1	[SS]
28	Seat	(1)	90524	[CS]
36	Nut	(1)	90530	[CS]
46	Washer	(2)	90529	[CS]
47	Washer	(2)	90528	[CS]
50	Washer, F Bkp	(2)	90322	[Br]
53	Washer, M Bkp	(2)	90305	[Br]

LOWER PACKING PARTS

CUP TYPE MODELS -XX8 ONLY

ITEM	DESCRIPTION	QTY	PART NO	[MTL]
26	Plunger Rod	(1)	90298-1	[SS]
28	Seat	(1)	90295	[CS]
66	Washer (66891)	(1)	92791	[SS]
67	Washer	(1)	90329	[T]
68	Cup (66890)	(2)	90307	[CS]
68	Cup (66891)	(2)	92790	[SS]
69	"O" Ring	(1)	90168	[B]

MATERIAL CODE

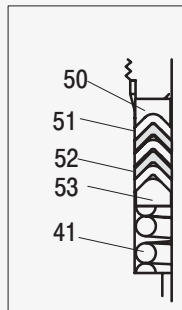
[B]=Buna "N"	[L]=Leather
[Br]=Brass	[Lu]=Lubritthane
[C]=Carbon Steel	[SS]=Stainless Steel
[Cu]=Copper	[T]=Teflon
[De]=Delrin	[UH]=UHMW-PE

- ★ -9X3,-9X7 uses (5) "55" 93455-2 [T]
- (3) "56" 93455-1 [L] "V" Packings.
- ☆ -GX3,-GX7 uses (5) "55" 93455-4 [UH]
- (3) "56" 93455-1 [L] "V" Packings.

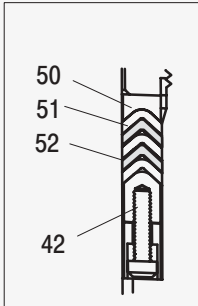
SERVICE KITS INCLUDE:
"V" Type Models (-XX3, -XX7)
 7, 8, 47 51, 52, 55 and 56
Cup Type Models (-XX8)
 7, 8, 51, 52, 65, 66 and 69

**MODELS IN SHADED
AREAS NO LONGER
AVAILABLE AS OF MAY 15, 1995**

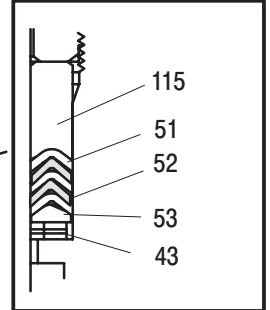
**COIL SPRING
-X1X MODELS**



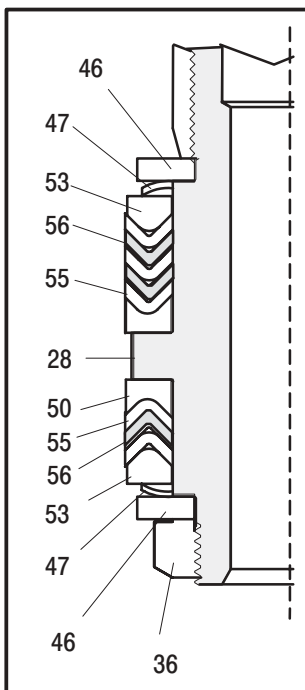
**COMPOSITE
SPRING
-X5X MODELS**



**WAVE SPRING
-X4X MODELS**



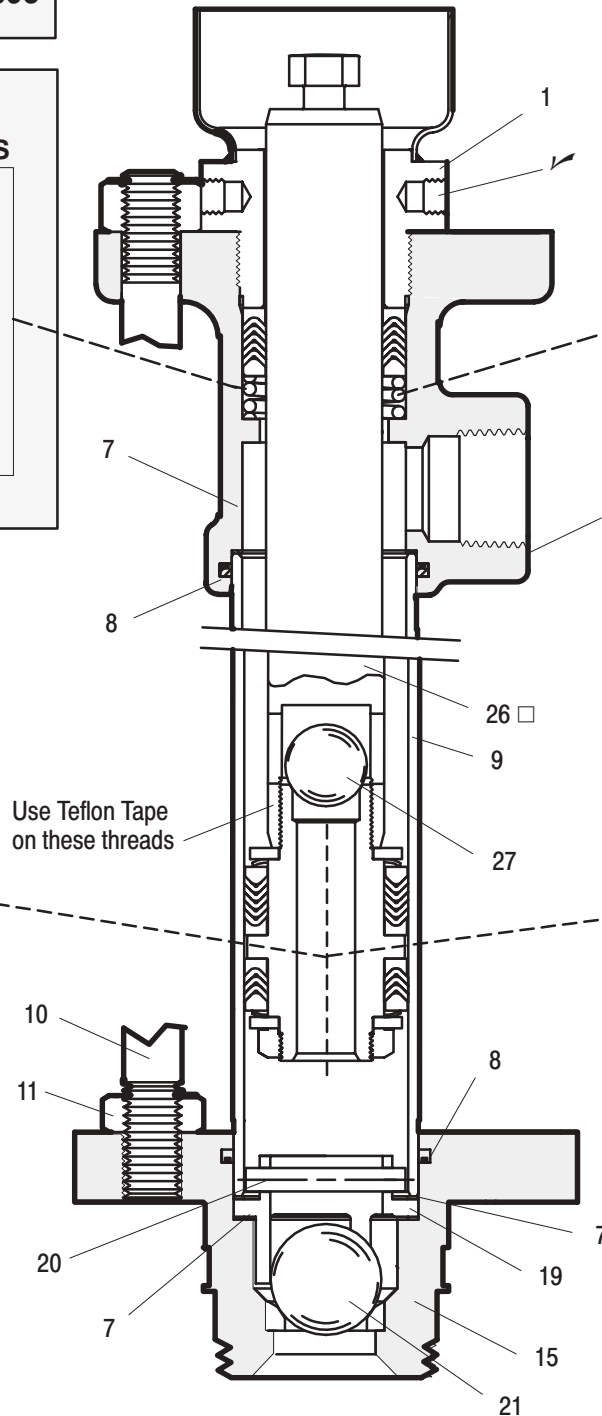
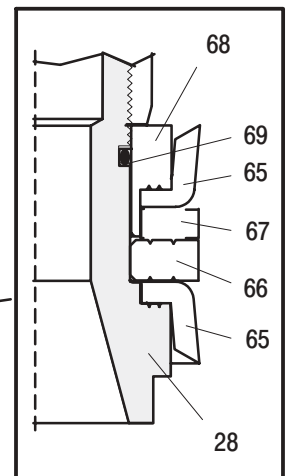
**"V" PACKING
-XX3, -XX7 MODELS**



STAGGERED PACKINGS

NOTE: When using "STAGGERED" packings use the shaded position as shown in the views above for the "52" and "56" packings.

**CUP PACKING
-XX8 MODELS**



Use Teflon Tape
on these threads

✓ A 93456-1 Rod
is included with unit
to adjust packing
nut/solvent cup.

6689X-X

□ Threaded Version is not shown

PACKING OPTIONS AND SERVICE KITS

LOWER PUMP	SERVICE KIT	UPPER PACKING					LOWER PACKING				
		51 () “V” PACKING			52 (2) “V” PACKING		★55 (8) PACKING		65 (2) PACKING		
6689X-XXX	63718(#)-XXX	PART NO	QTY.	MT'L	PART NO	MT'L	PART NO	MT'L	PART NO	MT'L	
-1X3, -1X7 ☺	63718()-G43, -G47	93455-1	(5)	[L]			93455-1	[L]			
-1X8 ☺	63718()-F48	93455-1	(5)	[L]					93721-1	[L]	
-5X3, -5X7 ☺	63718()-G43, -G47	93455-2	(3)	[T]	93455-1	[L]	93455-2	[T]			
-7X8	63718()-748	93455-2	(5)	[T]					93721-3	[T]	
-8X8 ☺	63718()-F18	93455-2	(3)	[T]	93455-1	[L]			93721-3	[T]	
-CX8	63718()-C48	93455-4	(5)	[UH]					93721-4	[UH]	
-DX3,-DX7 ☺	63718()-G43, -G47	93455-4	(3)	[UH]	93455-1	[L]	93455-1	[L]			
-DX8 ☺	63718()-G43	93455-4	(3)	[UH]	93455-1	[L]			93721-1	[L]	
-FX3,-FX7	63718()-F43, -F47	93455-4	(3)	[UH]	93455-1	[L]	93455-4	[UH]			
-FX8	63718()-F48	93455-4	(3)	[UH]	93455-1	[L]			93721-4	[UH]	
-GX3,-GX7	63718()-G43, -G47	93455-4	(3)	[UH]	93455-1	[L]	☆				
-PX8	63718()-P48	93455-4	(3)	[UH]	93455-2	[T]			93721-4	[UH]	
-RX8	63718()-R48	93455-2	(3)	[T]	93455-4	[UH]			93721-3	[T]	

☺ AS OF MAY 15, 1995 NO LONGER AVAILABLE // **EXAMPLE: 66890-113 is replaced by 66890-G43 & Svce kit is 637180-G43**

LOWER PUMP DISASSEMBLY

- Following the removal and disassembly of any parts clean and inspect them for wear or damage and replace as necessary.
- Remove (11) nuts from (10) rods.
- Remove (1) solvent cup/packing nut and pull (6) upper casting body off (9) tube.
- Pull plunger assembly from Lower Pump End.

UPPER PACKING REMOVAL:

- Remove (50) or (115) female washer, (51) and (52) vee packings and (53) male backup washer with (41) spring, (43) wave spring or (42) composite spring assembly from (6) upper body casting.

PLUNGER/PACKING REMOVAL:

- (-XX3, -XX7 Models): Clamp (26) plunger in a vise using 5/8" flats. Disassemble (36) nut, (46) washer, (47) spring washer, (53) male backup washer, (55) and (56) vee packings and (50) female backup washer. Unscrew (28) adapter to remove remaining packing set and to replace (28) adapter or (27) ball.
- Remove (9) tube.
- (-XX8 Models): Remove (28) seat to remove (65) cups, (67) washer, (66) washer, (69) "O" ring, and (68) cup.
- Remove (7) gasket from (6) upper casting body.
- Remove (11) Poly-packing from (6) upper casting body and (15) foot valve body.
- Unscrew the three (10) tie rods from (15) foot valve.
- Remove (19) sleeve from (15) foot valve, remove (20) pin to remove (21) ball and remove two (7) gaskets from (15) foot valve.

LOWER PUMP REASSEMBLY

- Clean and lubricate parts upon reassembly.
- Refer to part view on page 3 for packing direction.
- Place (21) ball, assemble two (7) gaskets, (19) ball sleeve and (20) pin into (15) foot valve.
- Replace three (10) tie rods. Rods should be assembled so they are within .031" of being flush with the bottom face of the flange of the (15) foot valve. Secure the (10) tie rods using three (11) nuts.
- Replace (11) Poly-packings.
- To reassemble plunger assembly (-XX3, -XX7 Models): clamp (26) plunger in a vise using 5/8" flats. Assemble the (50) female backup washer, (55) and (56) vee packings (B Position), (53) male backup washer, (47) spring washer, (46) washer, onto the (28) adapter. Insert (27) ball and retain with (28) adapter. Install (50) female backup washer, (55) and (56) vee packings (C Position), (53) male backup washer, (47) spring washer and (46) washer onto (28) and retain with (36) nut.
(-XX8 Models): Install new (69) "O" ring, place (65) cup, (67) washer, (66) washer, (65) cup, and (68) cup onto (28) adapter. Insert (27) ball and retain with (28) adapter.
- Thoroughly "grease" and slide (9) tube into position on (15) foot valve.
- Install the (41) coil spring or (43) wave spring and (53) male backup washer or the (42) composite spring assembly.
- Lubricate and install the new (51) and (52) vee packings, (50) or (115) female backup washer in (6) upper casting body.
- Screw (1) packing nut/solvent cup into (6) body. (Do not tighten.)
- Lubricate and place (7) gasket into (6) upper casting body.
- Slide (26) plunger through (51) and (52) vee packings.
- Thoroughly grease lower packing set and slide plunger assembly into (9) tube. Use care to not damage packings.
- Assemble (9) tube to (6) upper casting body.
- Replace (11) nuts. Tighten (1) solvent cup.