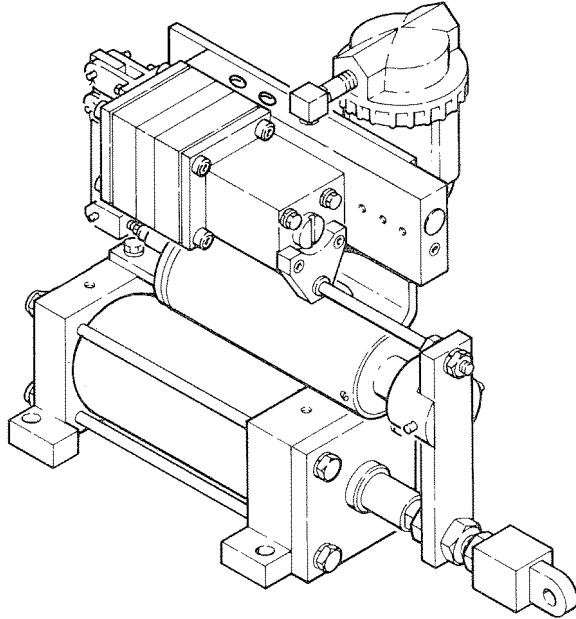


## Model B Servo Positioner Service Manual



**FIGURE 1. PICTORIAL VIEW**

DESCRIPTION	PART NUMBERS	
	POWER PRESSURE	POWER PRESSURE
<b>Servo Positioner for 10-60 psi Control Pressure</b>	Pneumatic 0-250 psi (with filter)	Hydraulic 0-1000 psi (less filter)
3/4" Bore x 4" Stroke Cylinder	P61853-0006	P61853-0007
3/4" Bore x 6" Stroke Cylinder	P62854-0006	P62854-0007
4" Bore x 6" Stroke Cylinder	P61852-0006	P61852-0007

**See Page 2 for WARNING: INSTALLATION AND MOUNTING.**

Servo-Positioners offer accurate infinite positioning for devices with medium to heavy force requirement through the use of pneumatic or hydraulic power pressure media. The Servo-Positioner consists of a universal closed loop control valve portion mounted to a proven, dependable Powermaster® Cylinder designed for either pneumatic or hydraulic power pressure service.

### INSTALLATION

The Servo-Positioners can be mounted in any position by four bolts through the MS2 mounting of the cylinder portion. Be sure that this mounting is made with the positioner rod in its normal position with the rod eye connected to the load to be moved. Connect the power pressure to the port marked "P" on the top of the supplate. If that media is hydraulic fluid, remove the muffler from exhaust port marked "E" on the end of the subplate and pipe back to the tank. Also, when the media is hydraulic fluid, remove the breather plug from the port

marked "D" on the end of the subplate and connect as a drain to the tank. When the media is pneumatic power pressure, the muffler in port "E" and breather plug in port "D" should remain in place. The model "B" positioner requires two control signals. One for extension from neutral and one for retraction from neutral. Pressure at Port "CA" extends servo cylinder rod; Port "CB" retracts. In order to maintain the sensitivity of these positioners, the remote control valve should provide at least equal sensitivity. Use a 3-Micron filter in the power pressure line for pneumatic service and a 10-Micron filter for hydraulic service to insure a long life.

### MAINTENANCE

Periodically disassemble the power cylinder portion and servo valve portion for cleaning, inspection, and lubrication. CAUTION: Never disassemble the spool assembly and spring cage. Clean all metal parts with a non-flammable solvent and wash all rubber parts with soap and water. Rinse thoroughly and blow dry with a low pressure air jet. Replace those parts which are damaged or worn. As the reassembly proceeds, lubricate the piston seals and all rod packing and seals with Sun Oil Company No. 1897 anti-rust grease. Lubricate all "O" Rings with Dow Corning Number 55M in both the cylinder and servo valve portions. Scheduled maintenance on a six (6) month basis is suggested depending upon frequency of operation and condition of power pressure supply. For pneumatic units remove the muffler and clean in mineral spirits and blow dry in the reverse direction.

### ADJUSTMENT

These units have been factory adjusted and disassembly of the spring cage portion should normally not be required.

### OPERATION

When the pneumatic control signal pressure applied to the diaphragm of the "Servo" control portion is varied, the spool valve moves to direct power pressure (air or hydraulic) to the appropriate side of the power cylinder, while venting the opposite side. As the power cylinder moves to a new position, the feedback spring load changes until a position is reached where spring load equals diaphragm force. When this balance is reached, the spool valve is returned to a neutral lapped position and the power cylinder travel stops.

A pneumatic pressure graduating controller such as the SH-3 Controlair Valve, that provides at least equal sensitivity is recommended to control this positioner. The power pressure port for pneumatic service positioners must be supplied with clean, dry, 3-Micron filtered air. A suitable filter is included with all pneumatic service units listed in this catalog. For hydraulic service positioners a 10-Micron rated hydraulic filter located as close to the power pressure port as possible is required for satisfactory operation. Regular service of the filter elements is necessary to insure long life of the Servo-Positioner.

Control Pressure Psi	Power Media	Bore-Stroke	Current Part No.	Obsolete Part No.
10 - 60	Pneumatic	3¼" x 4"	P61853-0006	P61853-0004
10 - 60	Hydraulic	3¼" x 4"	P61853-0007	P61853-0005
10 - 60	Pneumatic	3¼" x 6"	P62854-0006	P62854-0004
10 - 60	Hydraulic	3¼" x 6"	P62854-0007	P62854-0005
10 - 60	Pneumatic	4" x 6"	P61852-0006	P61852-0004
10 - 60	Hydraulic	4" x 6"	P61852-0007	P61852-0005

**Repair Kits**

REF.	QTY.	DESCRIPTION	PC. NO.	REF.	QTY.	DESCRIPTION	PC. NO.
—	1	Piston & Tube Seal Repair Kit Consisting of:	P110318	—	1	Piston & Tube Seal Repair Kit Consisting of:	P110320
7	2	O-RING, End Cover	P49708-0240	7	2	O-RING, End Cover	P49708-0240
10	1	O-RING, Piston	P49708-1053	10	1	O-RING, Piston	P49708-0153
11	2	O-RING, Piston Guide Ring	P49555-0004	11	2	O-RING, Piston Guide Ring	P49555-0004
12	1	O-RING, Piston	P49206	12	1	O-RING, Piston	P49206
18	1	SEAL	P49507-0005	18	1	SEAL	P49507

**NOTE:** For 3¼" Bore Size Complete Cylinders P155675, P159798, & P159794, P155669

**NOTE:** For 4" Bore Size Complete Cylinders P155667 and P159803

FOR HYDRAULIC SERVO CYLINDER ONLY				FOR PNEUMATIC SERVO CYLINDER ONLY			
4	1	CARTRIDGE, Rod Bearing Assy. Consisting of:	P158826	4	1	CARTRIDGE, Rod Bearing Assy. Consisting of:	P158826-0001
4a	1	BEARING, Rod Assy.	P158824	4a	1	BEARING, Rod Assy.	P158824
	1	KIT, Rod Seal (includes 4b, c, d & e)	P158828		1	KIT, Rod Seal (includes 4b, c, d & e)	P158828-0001
4b	1	WIPER, Rod	P49141-0001	4b	1	WIPER, Rod	P49141-0001
4c	1	PACKING, Rod	P63178	4c	1	PACKING, Rod "O" Ring	P49708-0214
4d	1	O-RING, Rod Bearing	P49708-0029	4d	1	O-RING, Rod Bearing	P49708-0029
4e	1	RING, Back-Up	P49584-0001	4e	1	RING, Back-Up	P49584-0001

**NOTE:** For Complete Cylinders—P155667, P155675 & P155669

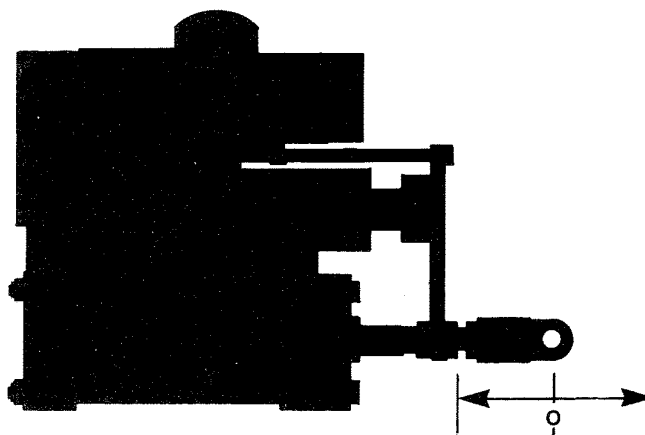
**NOTE:** For Complete Cylinders—P159803, P159798, and P159794.

FOR ALL SERVO POSITIONERS				FOR PNEUMATIC UNITS ONLY			
—	1	Control Portion Repair Kit Consisting of:	P62386-0005	81	1	Filter Repair Kit (3 Micron Element)	P7524
13A/13B	1	ASSY., Spool Valve	P66030				
14	6	O-RING, ½"	P49708-0012				
16	1	SPRING	P64065				
18	1	O-RING, 1⅜"	P49708-0026				
19	1	O-RING, 1⅜"	P49708-0118				
24	1	DIAPHRAGM, Large	P61798-0001				
27	1	DIAPHRAGM, Small	P61798				
48	7	O-RING, 7/16"	P49708-0011				
30	1	SCREW, ¼"-20 x 1¾"	P66032				

All servo portion rubber parts are in minor repair kit P27133-0001

**NOTE:** To repair a complete Servo Positioner, order:

- (a) One (1) P62386-0005 — Control Portion Kit
- (b) One (1) P158826 or P158826-0001 — Rod Bearing
- (c) One (1) P110318 or P110320 — Tube Seal
- (d) One (1) P7424 (Pneumatic only) — Filter



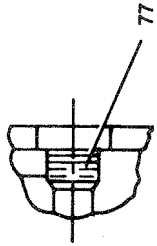
**Figure 2** "O" POSITION AT MID STROKE WITH TRAVEL IN BOTH DIRECTIONS

**WARNING: INSTALLATION AND MOUNTING**

The user of these devices must conform to all applicable electrical, mechanical, piping and other codes in the installation, operation or repair of these devices.

**INSTALLATION!** Do not attempt to install, operate or repair these devices without proper training in the technique of working on pneumatic or hydraulic systems and devices, unless under trained supervision.

Compressed air and hydraulic systems contain high levels of stored energy. Do not attempt to connect, disconnect or



Partial Sect. "A-A"

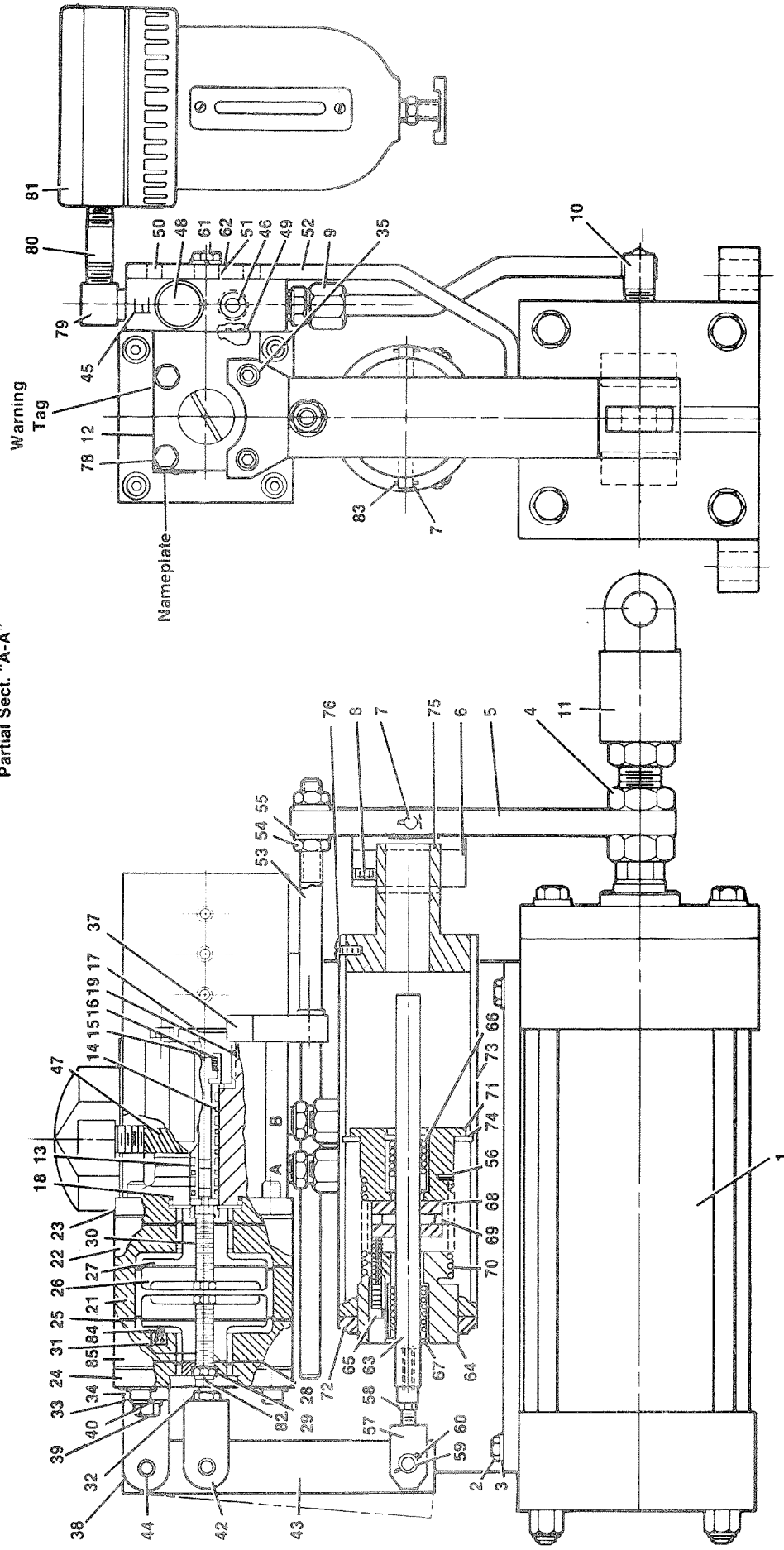


FIGURE 3 ASSEMBLY VIEW

NOTE:  
 @ 1.) \* For Hydraulic Models Omit Items \*46 (Breather), \*48 (Silencer),  
 \*79 (Elbow), \*80 (Nipple), & \*81 (Filter).



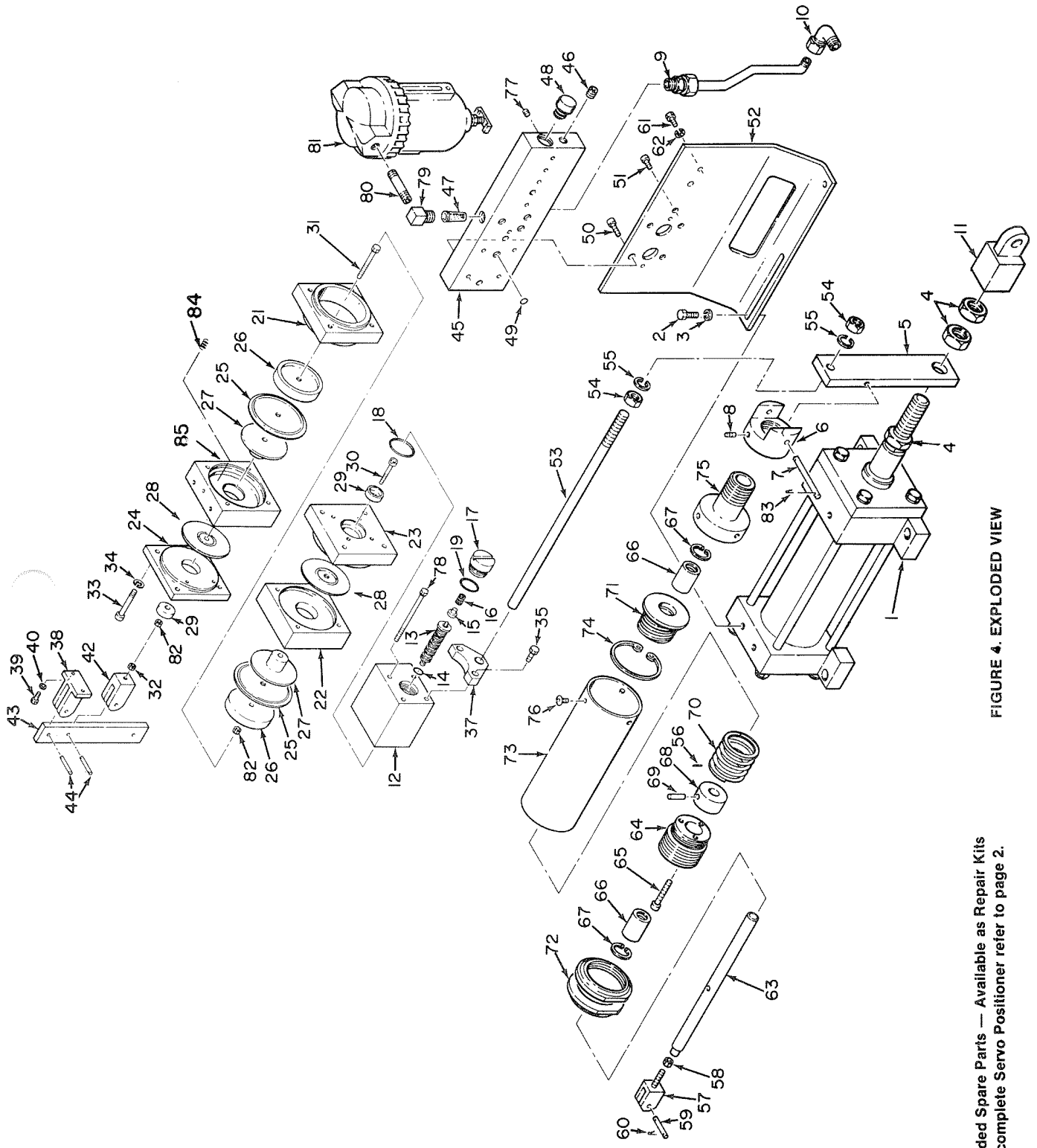


FIGURE 4. EXPLODED VIEW

NOTE:  
 \*Recommended Spare Parts — Available as Repair Kits  
 To repair a complete Servo Positioner refer to page 2.

## SPECIAL POWERMASTER CYLINDER

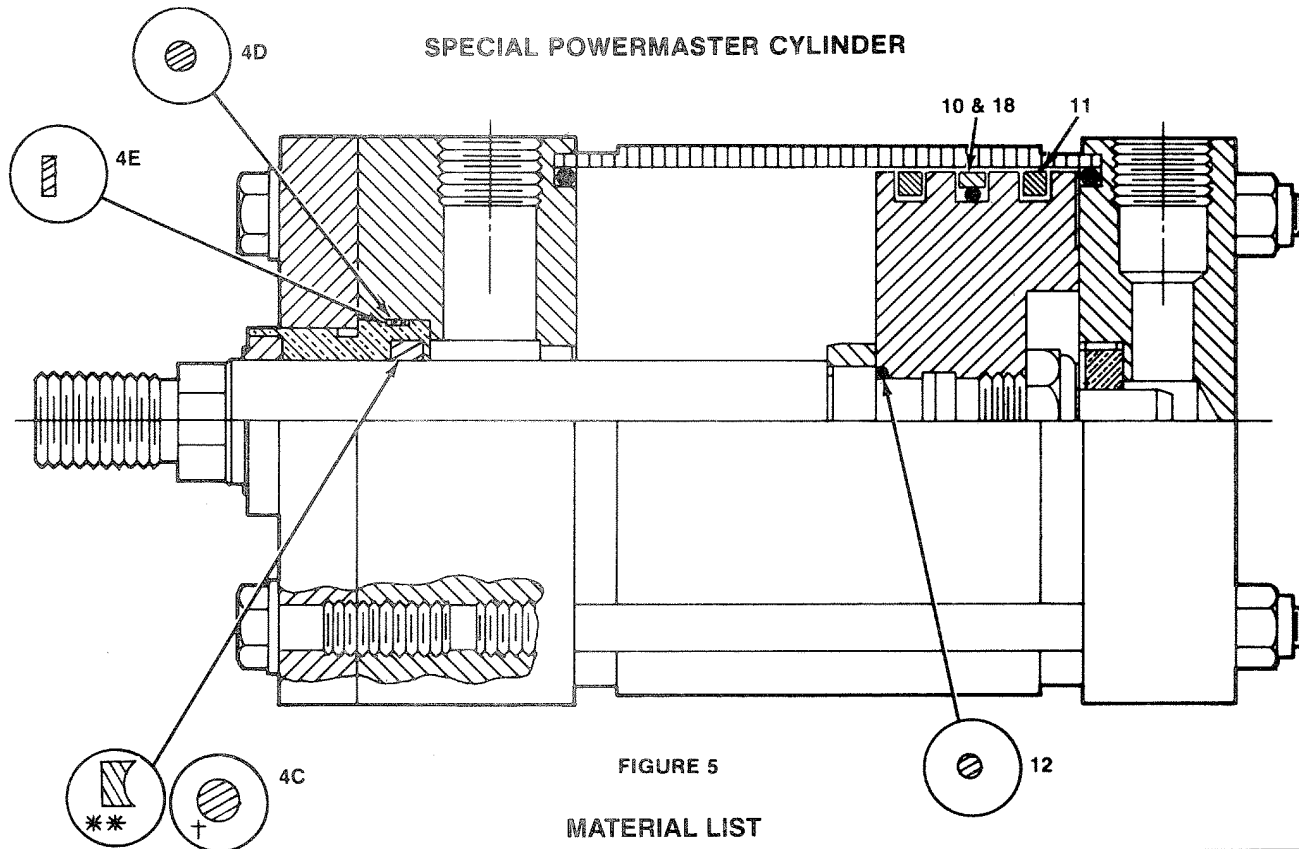


FIGURE 5

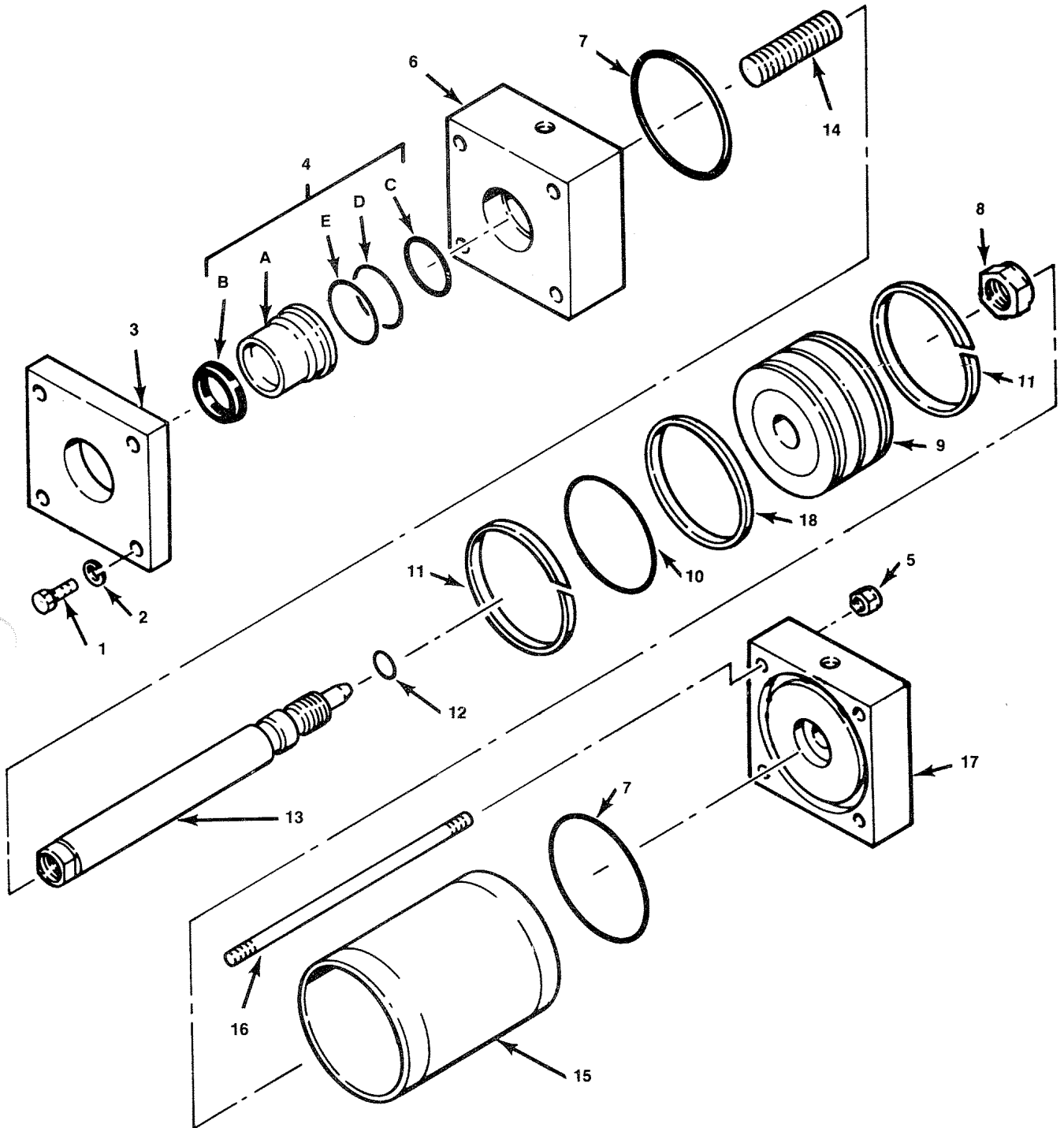
### MATERIAL LIST

			4" BORE		3 1/4" BORE			
			4 x 6 HYDRAULIC	4 x 6 PNEUMATIC	3 1/4 x 4 HYDRAULIC	3 1/4 x 4 PNEUMATIC	3 1/4 x 6 PNEUMATIC	3 1/4 x 6 HYDRAULIC
REF.	DESCRIPTION	QTY.	PART NO. P155667	PART NO. P159803	PART NO. P155675	PART NO. P159798	PART NO. P159794	PART NO. P155669
1	SCREW, Cap	4	PP49832-0041	P49832-0041	-	-	-	-
2	WASHER, Lock	4	P49866-0011	P49866-0011	-	-	-	-
3	PLATE, Retainer Head	1	P105306-0013	P105306-0013	P105306-0009	P105306-0009	P105306-0009	P105306-0009
4*	CARTRIDGE, Rod Bearing Assy.	1	P158826	P158826-0001	P158826	P158826-0001	P158826-0001	P158826
4a*	BEARING, Rod Assy.	1	P158824	P158824	P158824	P158824	P158824	P158824
	KIT, Rod Seal (includes 4b, c, d, & e)		P158828	P158828-0001	P158828	P158828-0001	P158828-0001	P158828
4b*	WIPER, Rod	1	P49141-0001	P49141-0001	-	-	-	-
4c*	PACKING, Rod	1	P63178**	P49708-0214†	P63178**	P49708-0214†	P49708-0214†	P63178**
4d*	O-Ring, Rod Bearing	1	P49708-0029	P49708-0029	-	-	-	-
4e*	O-Ring, Back-Up	1	P49584-0001	P49584-001	-	-	-	-
5	NUT, Tie Rod Lock	4	P49605	P49605	-	-	-	-
6	HEAD, Cp.	1	P151837	P151837	P151839	P151839	P151839	P151839
	KIT, Piston (includes Nos. 7, 8, 9, 10, 11, 12 & 18)		P110319	P110319	P110317	P110317	P110317	P110317
7*	O-RING, End Cover	2	P49708-0240	P49708-0240	P49708-0234	P49708-0234	P49708-0234	P49708-0234
8	NUT, Piston Bearing Retaining	1	P49853-0005	49853-0005	-	-	-	-
9	PISTON	1	P110316	P110316	P110327	P110327	P110327	P110327
10*	O-RING, Piston	1	P49708-0153	P49708-0153	P49708-0149	P49708-0149	P49708-0149	P49708-0149
11*	Piston Guide Ring	2	P49555-0004	P49555-0004	P49555-0003	P49555-0003	P49555-0003	P49555-0003
12*	O-RING, Piston	1	P49206	P49206	-	-	-	-
13	ROD, Female Piston	1	P155691-3060	P155691-3060	P155691-3050	P155691-3050	P155691-3060	P155691-3060
14	ADAPTER, Male Piston Rod	1	P49599-0035	P49599-0035	-	-	-	-
15	TUBE, Cylinder	1	P110403-0060	P105293-0060	P110402-0040	P110402-0040	P110402-0060	P110402-0060
16	TIE ROD	4	P105919-0060	P105919-0060	P105919-0040	P105919-0040	P105919-0060	P105919-0060
17	CAP, Cp.	1	P151836	P151836	P151838	P151838	P151838	P151838
18*	SEAL	1	P49507	P49507	P49507-0005	P49507-0005	P49507-0005	P49507-0005

\*Recommended spare parts to be retained in stock at all times.

NOTE: — (Dash) refers to preceding column part number.

Available in repair kit form. See page 2



EXPLODED VIEW  
FIGURE 6

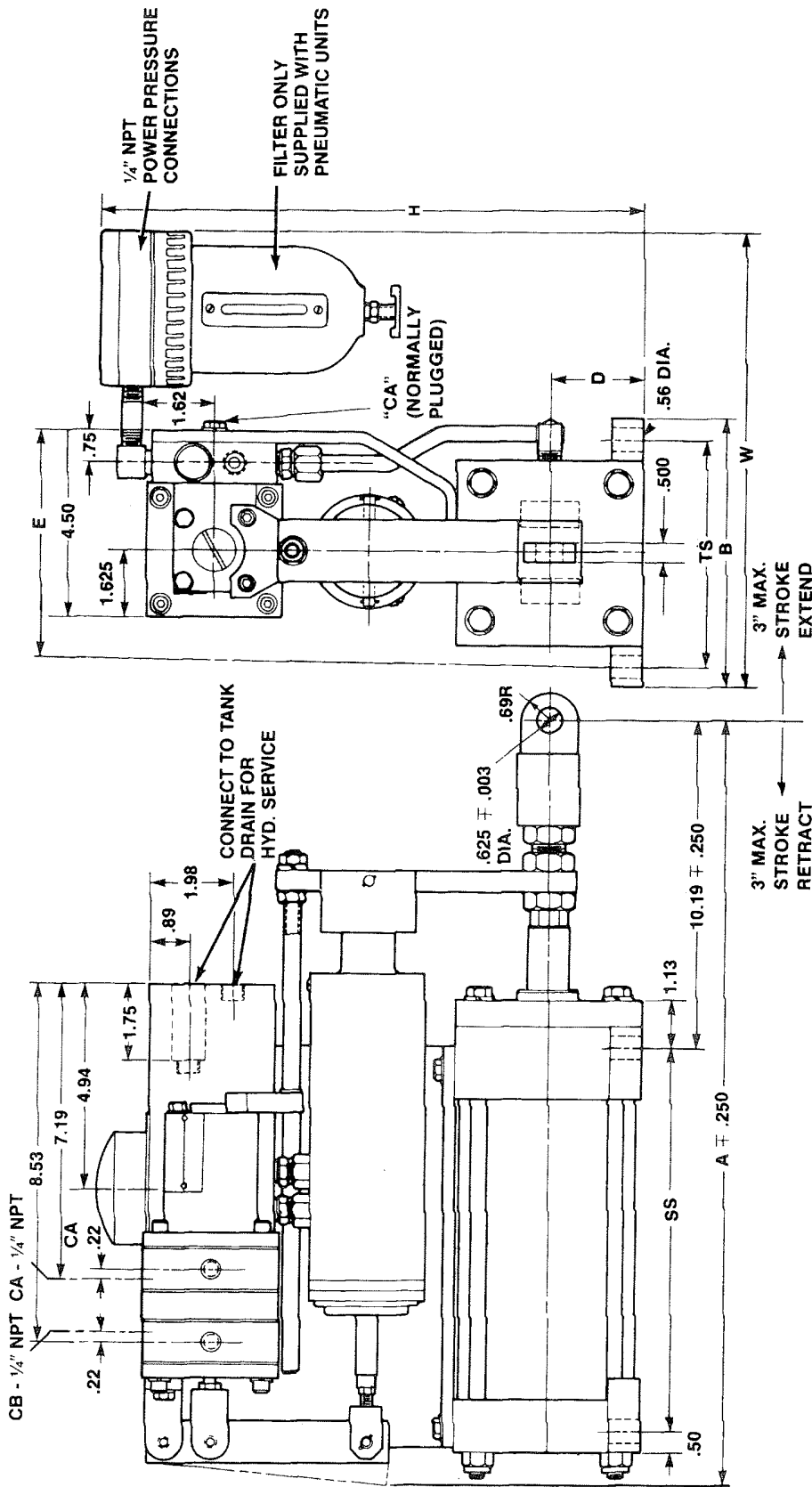


FIGURE 7. OUTLINE VIEW

PART NO. 0-250 PSI (Pneu) (with filter)	PART NO. 0-1000 PSI (Hyd) (w/o filter)	BORE	STROKE	CONTROL PRESSURE	A	B	C	D	E	H	SS	TS
P62854-0006	P62854-0007	3/4	6 in. Total	10-60	20.69	5.75	10.19	1.88	5.25	12.25	9.25	4.75
P61853-0006	P61853-0007	3/4	4 in. Total	10-60	20.69	6.50	10.19	2.25	5.63	13.00	7.25	4.75
P61852-0006	P61852-0007	4	6 in. Total	10-60	20.69	6.50	10.19	2.25	5.63	13.00	9.25	5.50