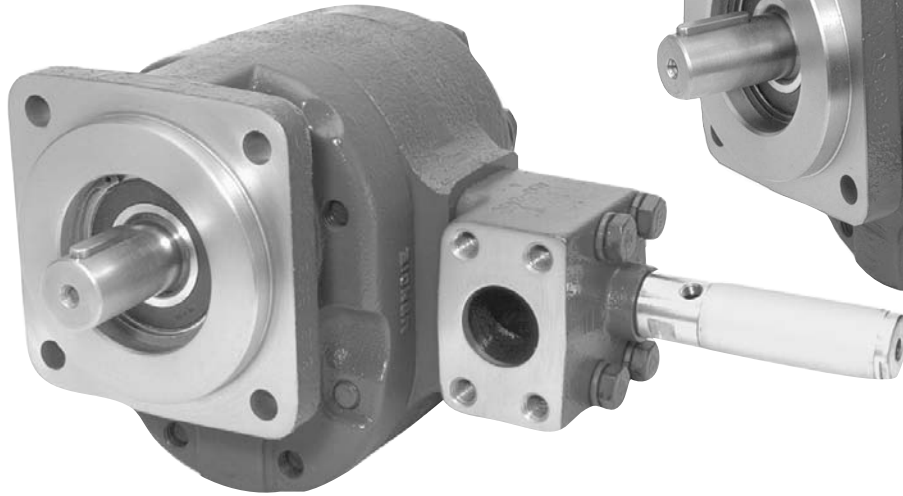




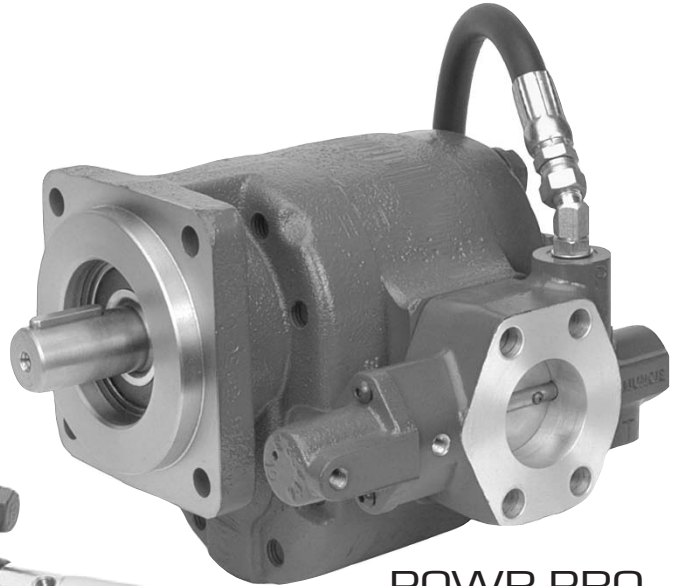
POWER-PRO and POWER-MISER

L&M SERIES PUMP SYSTEMS

POWER-MISER



POWER-PRO



PARTS LIST AND SERVICE MANUAL

PUMPS COME IN EIGHT POPULAR SIZES FROM 14 TO 40 GPM (53-151 LPM)

STD. REPLACEMENT PUMP MODELS	GPM (LPM) @ 1000 RPM	MAX RPM	MAX PSI (BAR)	MAX VACUUM	MAX OFF MODE PSI (BAR)
PML14-1CFSL *	14 (53)	3000	3000 (207)	5 IN HG (.17BAR)	20 (1.4)
PML19-1CFSL	19 (72)	3000	3000 (207)	5 IN HG (.17BAR)	20 (1.4)
PML23-7CFSL	23 (87)	3000	2500 (172)	5 IN HG (.17BAR)	20 (1.4)
PML25-1CFSL	25 (95)	2500	2500 (172)	5 IN HG (.17BAR)	20 (1.4)
PMM27-7CFSL	27 (102)	3000	3000 (207)	5 IN HG (.17BAR)	20 (1.4)
PMM31-7CFSL	31 (117)	3000	3000 (207)	5 IN HG (.17BAR)	20 (1.4)
PMM35-7CFSL	35 (132)	2500	2500 (172)	5 IN HG (.17BAR)	20 (1.4)
PMM40-7CFSL	40 (151)	2500	2500 (172)	5 IN HG (.17BAR)	20 (1.4)

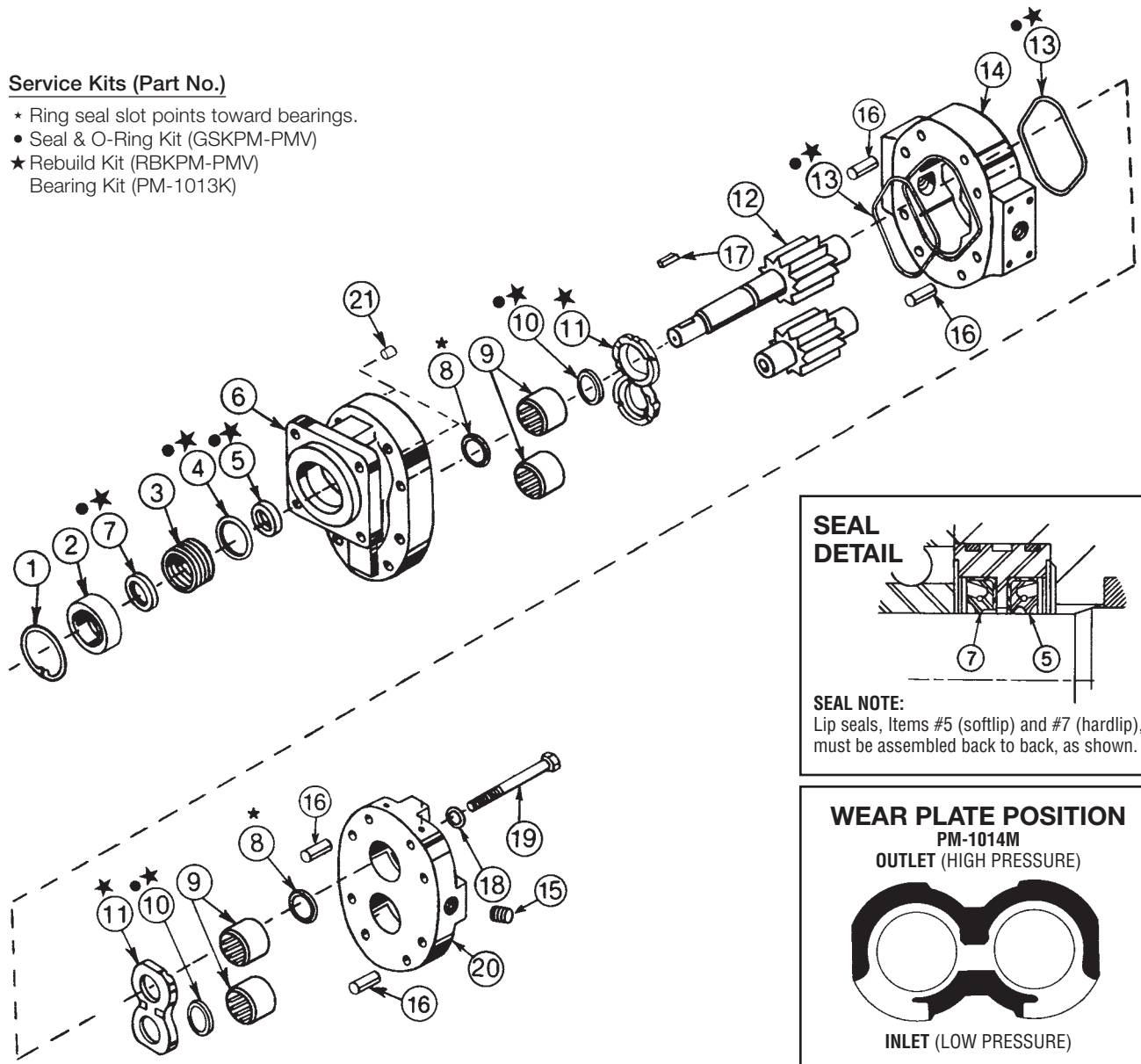
Note: Contact Muncie for specific part number construction or performance data.

* Not available for use with Power-Pro System.

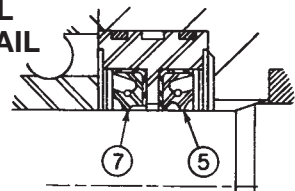
M SERIES PUMP SERVICE PARTS

Service Kits (Part No.)

- Ring seal slot points toward bearings.
- Seal & O-Ring Kit (GSKPM-PMV)
- ★ Rebuild Kit (RBKPM-PMV)
Bearing Kit (PM-1013K)



SEAL DETAIL



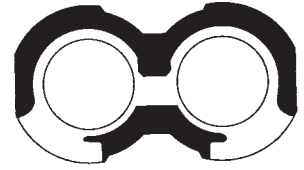
SEAL NOTE:

Lip seals, Items #5 (softlip) and #7 (hardlip), must be assembled back to back, as shown.

WEAR PLATE POSITION

PM-1014M

OUTLET (HIGH PRESSURE)



INLET (LOW PRESSURE)

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	PM-1001	O.B. Snap Ring
2	NA	PM-1002	Outboard Bearing
	1	PM-1002D	Spacer (No Bearing)
3	1	PM-1003M	Seal Retainer
4	2	PM-1004	Retainer O-ring
5	1	PM-1005M	Inside Shaft Seal
6	1	PM-1007-DC	Front Cover SAE C PPV, PMV
7	1	PM-1005	Outside Shaft Seal (Reversed)
8	8	PM-1008	Ring Seal
9	4	PM-1013	Bearings
10	4	PM-1009M	Pressure Balance Seal
11	2	PM-1014M	Wear Plate
12	1 set		Gear sets
		PM-1016K-27-2	1-1/4 in. rnd 27 GPM
		PM-1016K-31-2	1-1/4 in. rnd 31 GPM
		PM-1016K-35-2	1-1/4 in. rnd 35 GPM
		PM-1016K-40-2	1-1/4 in. rnd 40 GPM
		PM-1016S-27-2	1-1/4 in. 14T 27 GPM
		PM-1016S-31-2	1-1/4 in. 14T 31 GPM
		PM-1016S-35-2	1-1/4 in. 14T 35 GPM
		PM-1016S-40-2	1-1/4 in. 14T 40 GPM

ITEM	QTY	PART NUMBER	DESCRIPTION
13	2	PM-1015	Body Seal
14	1		Body (Mach. Inlet)
		PM-1025-27M	27 GPM
		PM-1025-31M	31 GPM
		PM-1025-35M	35 GPM
		PM-1025-40M	40 GPM
15	2	HHPP-6	Test Port Plug (Pipe Thd.)
	2	HHBP-6	Test Port Plug (Str. Thd.)
16	2	PM-1024	Dowel Pin
17	1	PM-1017	Key
18	8	PL-1029	Washer
19	8		Capscrew
		PM-1028-27	Capscrew 27 GPM
		PM-1028-31	Capscrew 31 GPM
		PM-1028-35	Capscrew 35 GPM
		PM-1028-40	Capscrew 40 GPM
20	1	PM-1026M	Rear Cover* (with test ports Str. Thd.)
21	2	PS-1010	Check Assembly

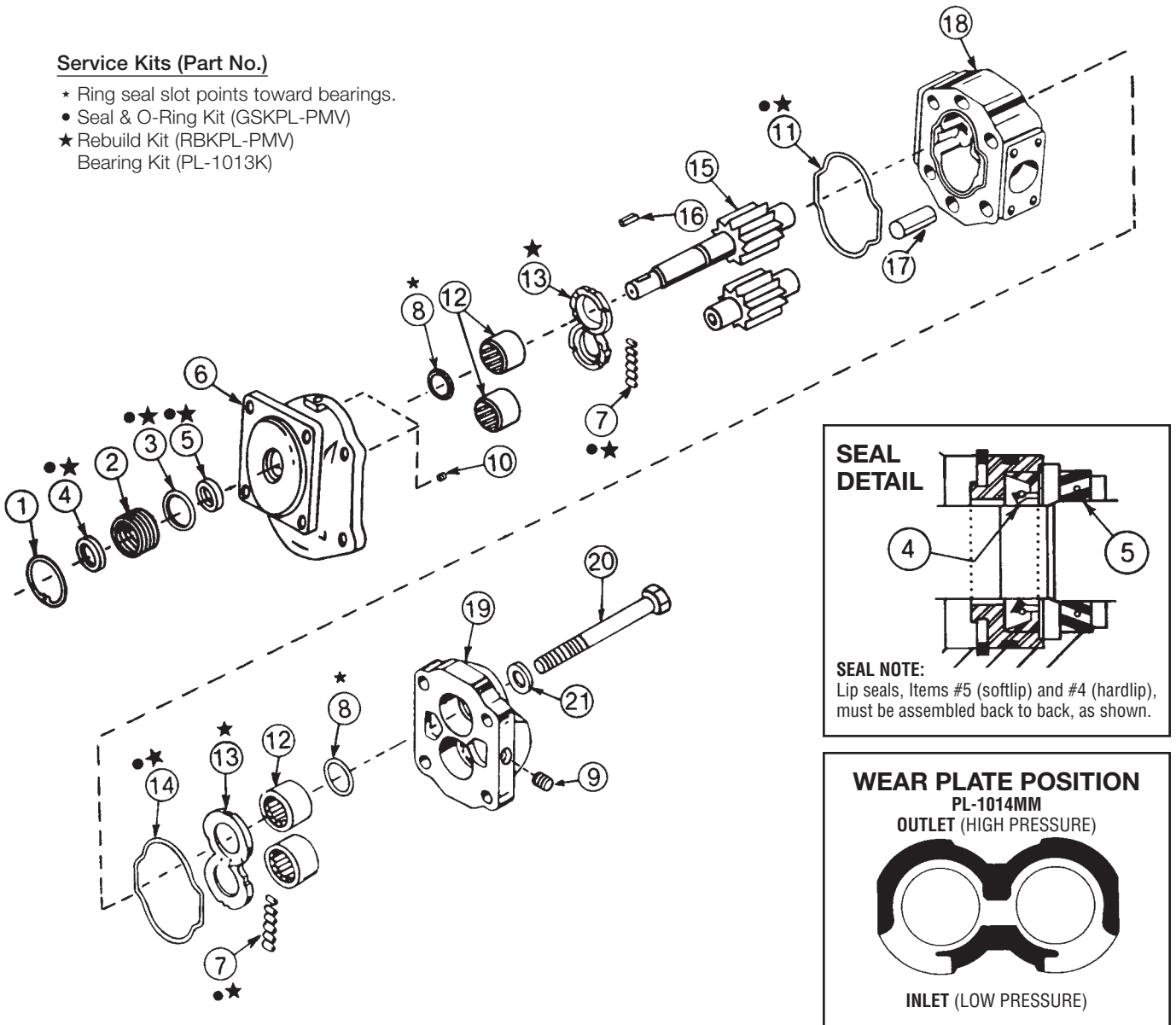
NOTE: Torque bolts to 200 ft.-lbs. (27.6 kg-meters)
Maximum vacuum is 5 in.Hg. (.17 Bar)

* Old style rear cover with N.P.T. ports not available.

L SERIES PUMP SERVICE PARTS

Service Kits (Part No.)

- * Ring seal slot points toward bearings.
- Seal & O-Ring Kit (GSKPL-PMV)
- ★ Rebuild Kit (RBKPL-PMV)
Bearing Kit (PL-1013K)



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	PL-1001	O.B. Snap Ring
2	1	PL-1003M	Seal Retainer
3	1	PL-1004M	Retainer O-ring
4	1	PL-1005	Outside Shaft Seal (Reversed)
5	1	PL-1005M	Inside Shaft Seal
6	1	PL-1007-DC	Front Cover SAE C PPV, PMV
7	1	PS-1009	Pocket Seal (12 pcs., 3" strips)
8	2	PL-1008	Ring Seal
9	2	HHPP-6	Test Port Plug (Pipe Thd.)
	2	HHBP-6	Test Port Plug (Str. Thd.)
10	2	PS-1010	Check Assembly
11	1	PL-1012	Body Seal Front Cover
12	4	PL-1013	Bearings
13	2	PL-1014M	Wear Plates (Old Style)
	2	PL-1014MM	Wear Plates (New Style)
14	1	PL-1015	Body Seal Rear Cover
15	1 set		Gear sets
		PL-1016K-14-2	1 in. rnd 14 GPM
		PL-1016K-19-2	1 in. rnd 19 GPM
		PL-1016K-23-2	1 in. rnd 23 GPM
		PL-1016K-25-2	1 in. rnd 25 GPM
		PL-1016K7-23-2	1 1/4 in. rnd 23 GPM

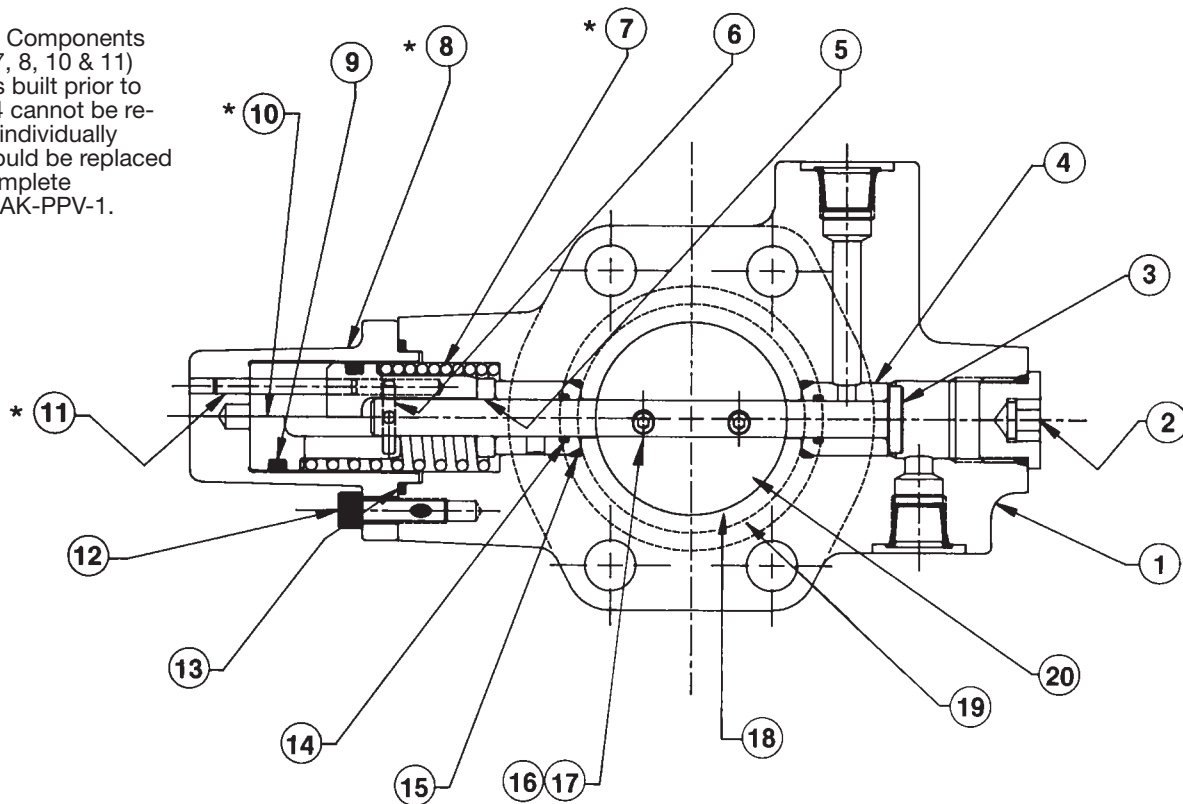
ITEM	QTY	PART NUMBER	DESCRIPTION
16	1	PS-1017	Key
17	4	PL-1024	Dowel Pin
18	1		Body (Mach. Inlet)
		PL-1025-14M	14 GPM
		PL-1025-19M	19 GPM
		PL-1025-23M	23 GPM
		PL-1025-25M	25 GPM
19	1	PL-1026M	Rear Cover* (with test ports Str. Thd.)
20	4		Capscrew
		PL-1028-14	Capscrew 14 GPM
		PL-1028-19	Capscrew 19 GPM
		PL-1028-23	Capscrew 23 GPM
		PL-1028-25	Capscrew 25 GPM
21	4	PL-1029	Washers

NOTE: Torque bolts to 225 ft.-lbs. (31.1 kg-meters)
Maximum vacuum is 5 in.Hg. (.17 Bar)

* Old style rear cover with N.P.T. ports not available.

POWR-PRO SERVICE PARTS

* Air Cap Components (Items 7, 8, 10 & 11) on units built prior to Oct. '94 cannot be replaced individually and should be replaced with complete Kit No. AK-PPV-1.



Part Numbers shown are for units built AFTER Oct. '94. Older units are not serviceable except for Air Components.

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	N.A. N.A.	Valve Body 2 inch (50.8 mm) 1-1/2 inch (38.1 mm)
2	1	25T35516	Plug
3	1	N.A. N.A.	Spool 2 inch (50.8 mm) 1-1/2 inch (38.1 mm)
4	2	49T35501	Insert Bushing
5	1	N.A.	Locking Collar
6	1	26T35514	Dowel Pin (Short)
7	1	27T36238	Spring
8	1	28T36236	Air Cup
9	1	12T35304	O-Ring (Piston)
10	1	49T36237	Piston
11	1	26T35594	Dowel Pin (Long)
12	2	19T35595	Screw (Air Cup)
13	1	12T36877	O-Ring (Air Cup)
14	2	N.A.	O-Ring (Spool)
15	2	N.A.	O-Ring (Insert)

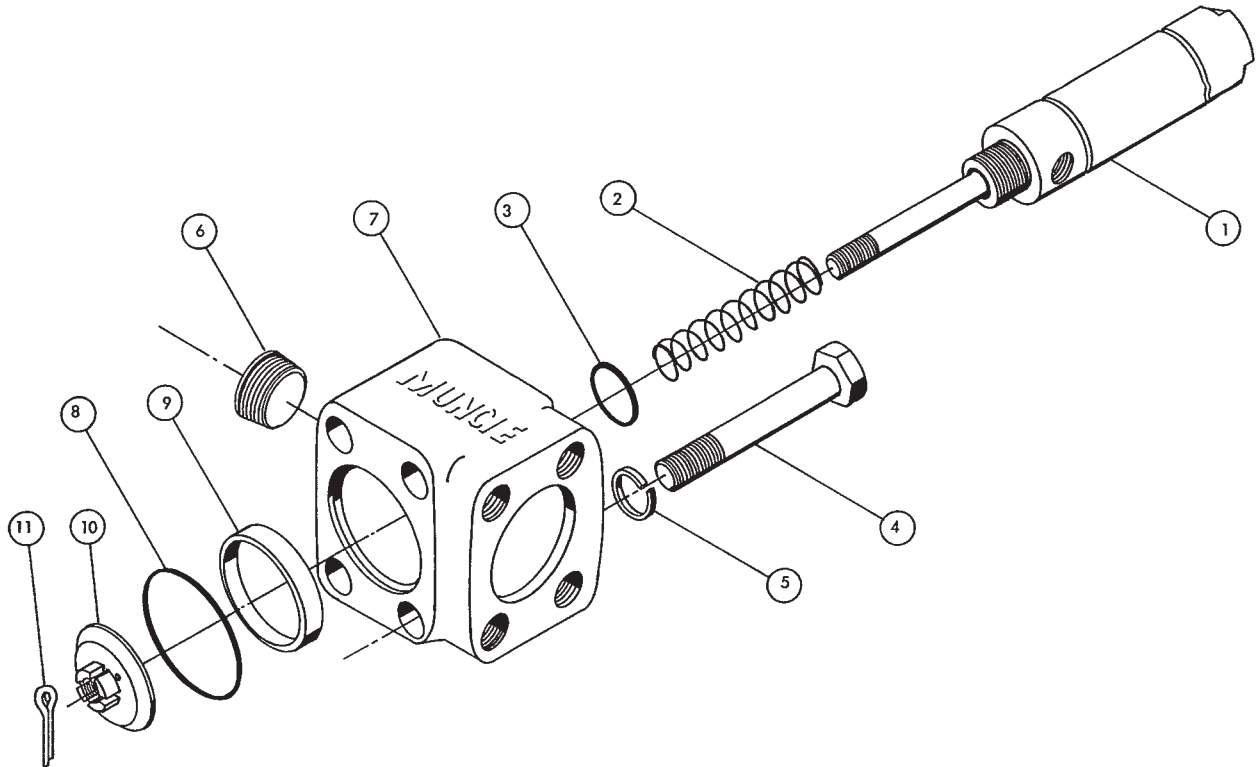
ITEM	QTY	PART NUMBER	DESCRIPTION
16	2	19T35518	Screw
17	2	22T35519	Locknut
18	1	28T35294 28T35287	Race 2 inch (50.8 mm) 1-1/2 inch (38.1 mm)
19	1	12T36867 12T36868	O-Ring (Flange) 2 inch (50.8 mm) 1-1/2 inch (38.1 mm)
20	1	49T36066 49T36067	Throttle Plate 2 inch (50.8 mm) 1-1/2 inch (38.1 mm)
N.S.	1	N.A.	Dowel Pin (Throttle Plate Stop)
N.S.	1	GSK PPV-32 GSK PPV-24	Seal Kit 2 inch (50.8 mm)* 1-1/2 inch (38.1 mm) **Includes Items 9, 13, 19
N.S.	1	AK-PPV	Air Cap Kit Includes Items 7, 8, 9, 10, 11, 13

ASSEMBLY AND DISASSEMBLY NOTES:

1. Removal of the Insert Bushings is not recommended.
2. A light coating of grease should be applied to the Valve Spool before pushing thru O-Rings.
3. The Spool and Lockcollar surfaces must be completely degreased before pressing together. Upon assembly the total spool end play should be between .002-.005 inches (.05-.127 mm).
4. The Throttle Plate should be installed from the front side

5. The Air Cylinder should be positioned so that a slight preload of Throttle Plate, in the closed position, is seen. Torque screws to 105 in.-lbs. (1.21 kg-meters).
- (Muncie name is cast into this side) in such a way that when rotated to the closed position the edge makes contact with the Dowel Pin. Also be sure that the crossdrilled hole in the Spool lines up with the "P" Port, upon final assembly. Lightly tap the Throttle Plate to allow unit to center itself. Torque Nuts and Screws to 18 in.-lbs. (.2 kg-meters).

POWER-MISER VALVE SERVICE PARTS



ITEM	QTY	CURRENT PART NO.	SUPERSEDED PART NO.	DESCRIPTION
1	1	PV-101	—	Air Cylinder
	—	PV-101V	—	Air Cylinder (Viton)
2	1	27T35283	PV-102	Spring
3*	1	12T36880 [.070 (1.77)]	PV-103 [.103 (2.62)]	O-Ring
4	4	19T35279	PV-104-1	Mtg Bolts -20
		19T35275	PV-104-2	Mtg Bolts -24 & -32
5	4	21T20519	PV-105-1	Lockwasher -20
		21T35276	PV-105-2	Lockwasher -24 & -32
6	1	25T35282	PV-106	Pipe Plug
7	1	01T35271**	PV-107-1	Body -20
		01T35285**	PV-107-2	Body -24
		01T35292**	PV-107-3	Body -32

ITEM	QTY	CURRENT PART NO.	SUPERSEDED PART NO.	DESCRIPTION
8	1	12T36869	PV-108-1	O-Ring -20
		12T36868	PV-108-2	O-Ring -24
		12T36867	PV-108-3	O-Ring -32
9	1	28T35273	PV-109-1	Race -20
		28T35287	PV-109-2	Race -24
		28T35294	PV-109-3	Race -32
10	1	49T35272	PV-110-1	Plunger -20
		49T35286	PV-110-2	Plunger -24
		49T35293	PV-110-3	Plunger -32
11	1	26T35277	PV-111	Cotter Pin
		PMV-20 1-1/4" (31.75)		Power-Miser Valve Assembly
		PMV-24 1-1/2" (38.10)		Power-Miser Valve Assembly
		PMV-32 2" (50.80)		Power-Miser Valve Assembly

NOTES:

* **A design change** has been made on the Power-Miser valve which requires a smaller thickness Air Cylinder O-Ring. For service parts purposes identify by the following:

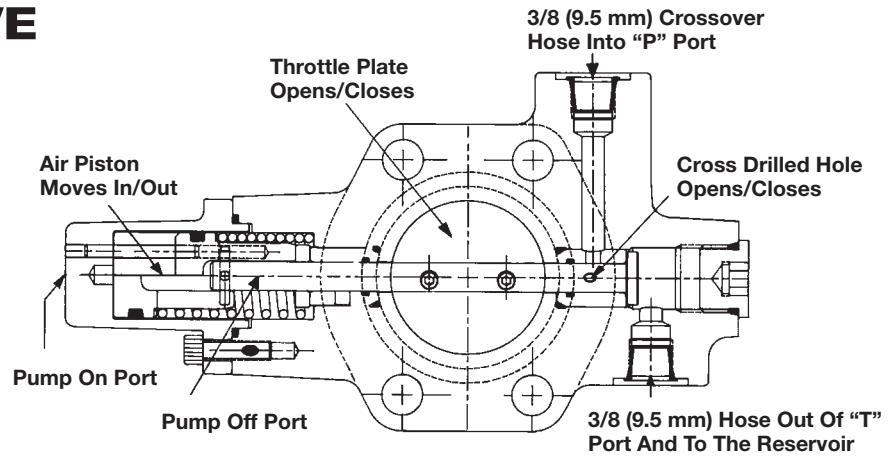
** **Requires new style Air Cylinder O-Ring.**

<u>Style</u>	<u>Casting No. Prefix</u>	<u>Air Cyl. O-Ring No.</u>	<u>Thickness</u>
Old	450X****	PV-103	.103 in (2.62 mm)
New	352***	12T35281	.070 in (1.77 mm)

This change occurred August, 1989.

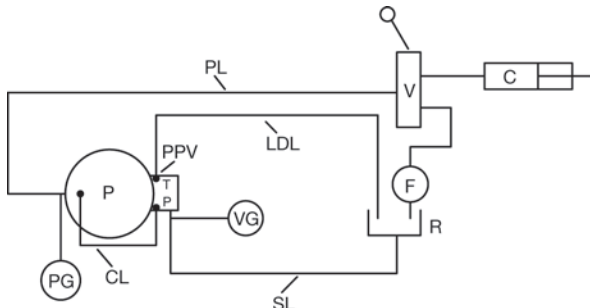
POWR-PRO VALVE

The POWR-PRO valve principal is to allow the Hydraulic System to be turned OFF to a low horsepower consumption (Standby) mode. While OFF the crossover lube line directs oil back into a valve chamber to run back to the reservoir. Now, when turned on, full pump flow is available to operate the system, but the lube line passage is now blocked to prevent any loss of oil. Lube line pressure, when the pump is OFF, must not exceed 20 PSI (1.4 Bar).

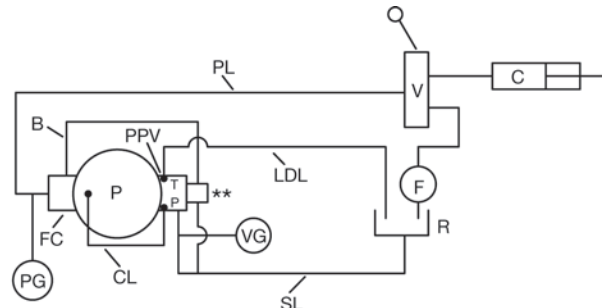


Note: POWR-PRO must be shifted with a 2 position 4 way valve.

POWR-PRO PLUMBING DIAGRAMS



WITHOUT FLOW CONTROL VALVE



WITH VP10 FLOW CONTROL VALVE

* Hose must be routed to return line at reservoir on VP15 flow control.

- P = PUMP
- PPV = POWR-PRO VALVE
- FC = FLOW CONTROL VALVE
- CL = CROSSOVER LINE
- SL = SUCTION LINE
- PG = TAKE PRESSURE READINGS HERE
- LDL = LUBE DRAIN LINE
- F = RETURN LINE FILTER

- V = DIRECTIONAL CONTROL VALVE
- C = CYLINDER
- R = RESERVOIR
- PL = PRESSURE LINE
- VG = TAKE VACUUM READINGS HERE
- B = Bypass

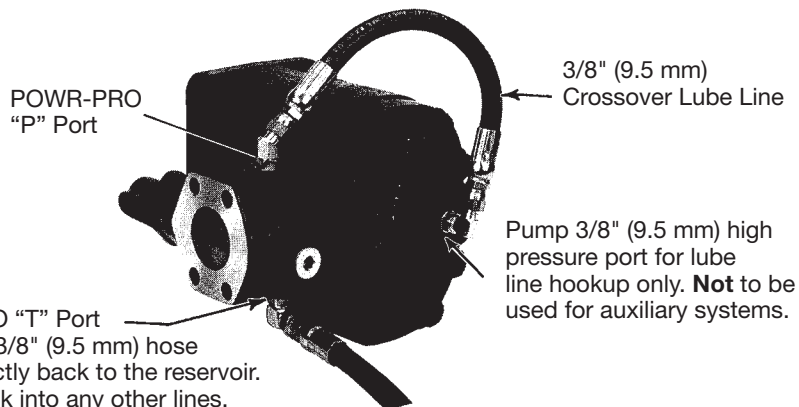
** Not used with VP15 Flow Control.
Hose runs directly to tank.

It is recommended that hose between pump outlet, POWR-PRO valve and back to tank, be 3/8" (9.5 mm) ID SAE 100R2 minimum. Maximum recommended vacuum at the inlet of this pump is 5 in Hg. (.17 Bar).

POWR-PRO INSTALLATION NOTE

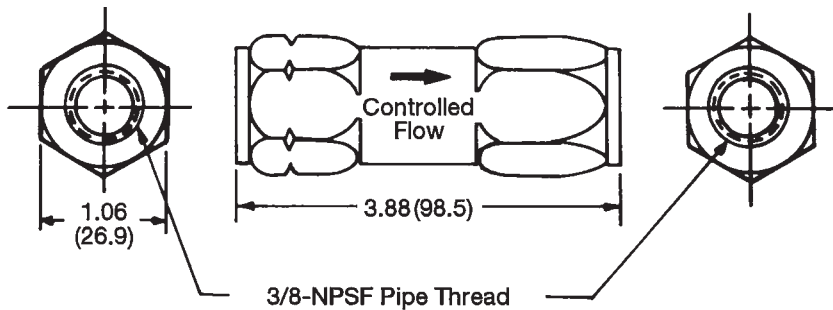
POWR-PRO Pump System must have lube line installed and routed back to the reservoir with its own line for proper operation. Do not use a bleed valve with this system.

POWR-PRO "T" Port
Must have 3/8" (9.5 mm) hose
routed directly back to the reservoir.
Do not hook into any other lines.



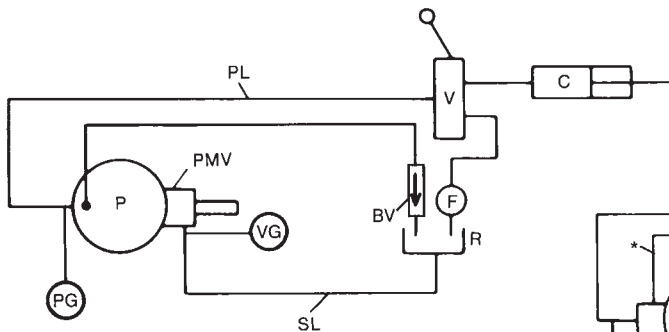
POWER-MISER BLEED-OFF VALVE

The Bleed-Off Valve is required with POWER-MISER and is installed at the top of the reservoir, and routed from the pump outlet to prevent accidental pump operation during the Off Mode. Pump pressurization in excess of 20 PSI (1.4 Bar) in the Off Mode will result in pump damage. This item must be purchased separately.

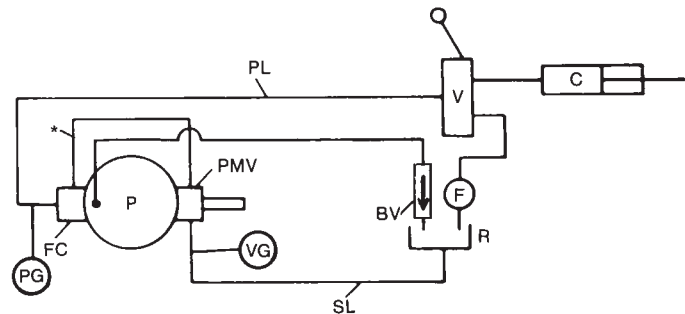


Model No.	Symbol	Type
FFC-3-2		Pressure compensated fixed flow regulator.

POWER-MISER PLUMBING DIAGRAMS



WITHOUT FLOW CONTROL VALVE



WITH VP10 FLOW CONTROL VALVE

* Hose must be routed to return line at reservoir on VP15 flow control.

P = PUMP
 PMV = POWER-MISER VALVE
 FC = FLOW CONTROL VALVE
 BV = BLEED-OFF VALVE
 SL = SUCTION LINE
 PG = TAKE PRESSURE READINGS HERE

F = RETURN LINE FILTER
 V = DIRECTIONAL CONTROL VALVE
 C = CYLINDER
 R = RESERVOIR
 PL = PRESSURE LINE
 VG = TAKE VACUUM READINGS HERE

It is recommended that hose between pump outlet and Bleed-Off Valve be 3/8" (9.5 mm) ID SAE 100R2 minimum. Maximum recommended vacuum at the inlet of this pump is 5 In Hg. (.17 Bar).

POWR-PRO INSTALLATION KITS

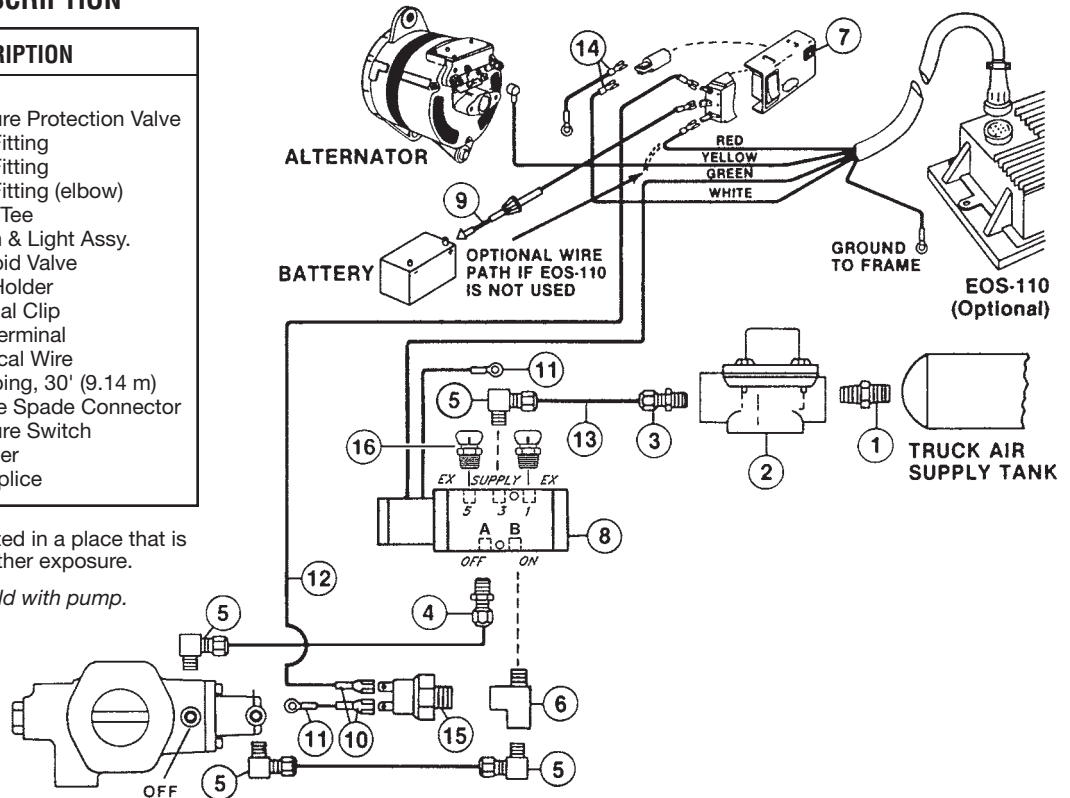
KIT NO. 48M81252 ELECTRIC/AIR SHIFT PARTS LIST AND DESCRIPTION

ITEM	QTY	PART NO.	DESCRIPTION
1	1	44MB2164	Nipple
2	1	31M15759	Pressure Protection Valve
3	1	44MB6844	Tube Fitting
4	1	44MB6842	Tube Fitting
5	4	44MB6942	Tube Fitting (elbow)
6	1	44MB2252	Street Tee
7	1	30M12020	Switch & Light Assy.
8	1	35M15002C	Solenoid Valve
9	1	33T36299	Fuse Holder
10	2	34M30006	Terminal Clip
11	2	34M18009	Ring Terminal
12	12'	37M18000	Electrical Wire
13	1	45M44430	Air Tubing, 30' (9.14 m)
14*	2	34M18187	Female Spade Connector
15	1	31M18164	Pressure Switch
16	2	44M30137	Breather
N.S.	3	34M18002	Butt Splice

NOTE: Solenoid should be mounted in a place that is protected from harsh weather exposure.

*Include only when EOS-110 is sold with pump.

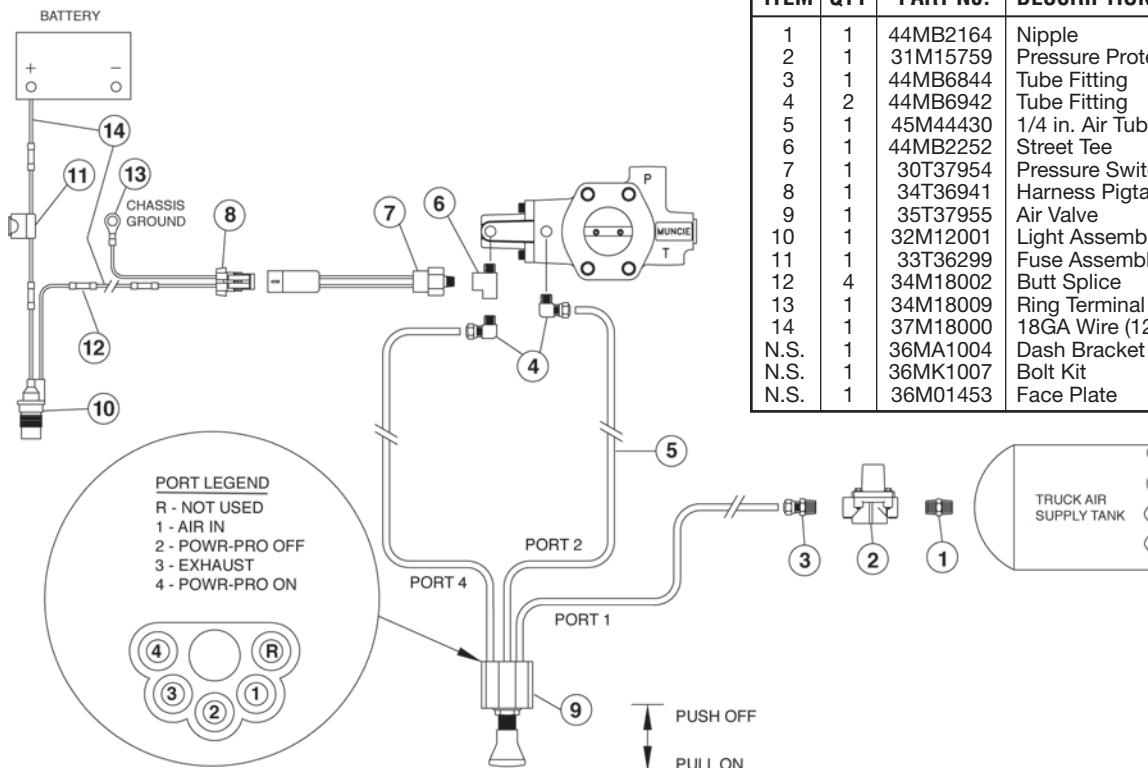
POWR-PRO ELECTRIC/AIR SHIFT SYSTEM



POWR-PRO MANUAL/AIR SHIFT SYSTEM

KIT NO. 48M61256 MANUAL/AIR SHIFT PARTS LIST AND DESCRIPTION

ITEM	QTY	PART NO.	DESCRIPTION
1	1	44MB2164	Nipple
2	1	31M15759	Pressure Protection Valve
3	1	44MB6844	Tube Fitting
4	2	44MB6942	Tube Fitting
5	1	45M44430	1/4 in. Air Tubing (30 ft.)
6	1	44MB2252	Street Tee
7	1	30T37954	Pressure Switch
8	1	34T36941	Harness Pigtail
9	1	35T37955	Air Valve
10	1	32M12001	Light Assembly
11	1	33T36299	Fuse Assembly
12	4	34M18002	Butt Splice
13	1	34M18009	Ring Terminal
14	1	37M18000	18GA Wire (12 ft.)
N.S.	1	36MA1004	Dash Bracket
N.S.	1	36MK1007	Bolt Kit
N.S.	1	36M01453	Face Plate

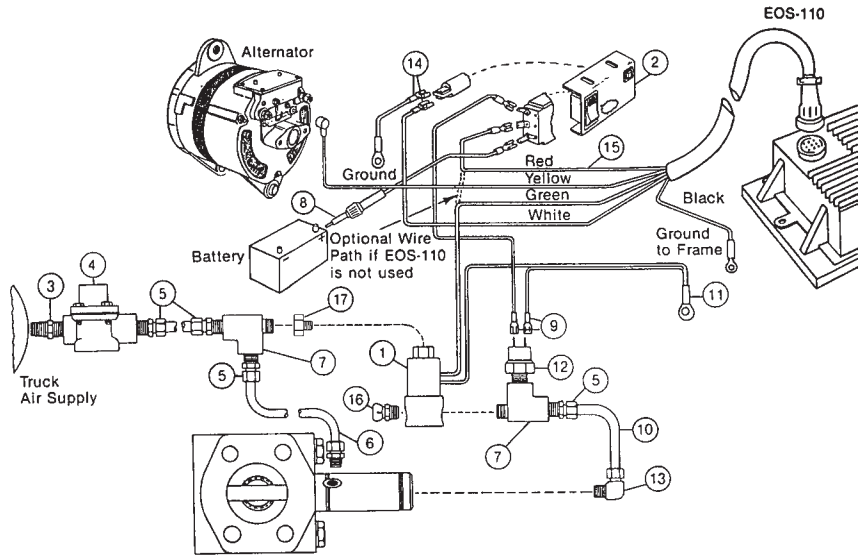


POWER-MISER INSTALLATION KITS

KIT NO. 48M81251 ELECTRIC/AIR SHIFT PARTS LIST AND DESCRIPTION

POWER-MISER ELECTRIC/AIR SHIFT SYSTEM

ITEM	QTY	PART NO.	DESCRIPTION
1	1	35M2X749	Solenoid Valve (N.O.)
2	1	30M12020	Switch & Light Assembly
3	1	44MB2164	Nipple
4	1	31M15759	Pressure Protection Valve
5	4	44MB6844	Tube Fitting
6	1	44MB6842	Tube Fitting
7	2	44MB2254	Street Tee
8	1	33T36299	Fuse Assembly
9	2	34M18250	Terminal Clip
10	1	45M44430	Air Tubing, 30' (9.14 m)
11	2	34M18009	Ring Terminal
12	1	31M1749C	Pressure Switch
13	1	44MB6942	Tube Fitting (elbow)
14*	2	34M18187	Female Spade Connector (for overspeed light)
15	12'	37M18000	Electrical Wire (3.64 m)
16	1	44M30137	Breather
17	1	44MB2242	Adapter

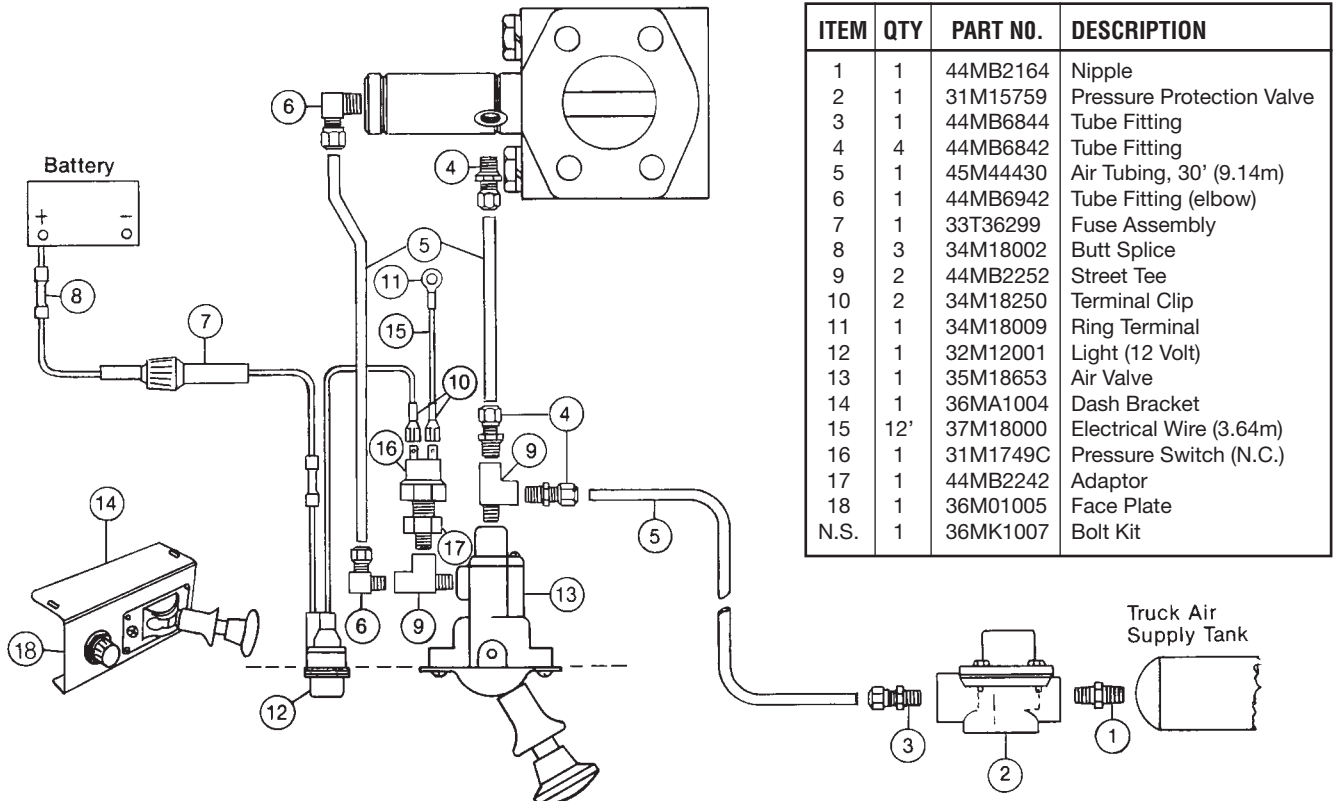


* Include only when EOS-110 is sold with pump.

NOTE: Solenoid should be mounted in a place that is protected from harsh weather exposure.

POWER-MISER MANUAL/AIR SHIFT SYSTEM

KIT NO. 48M61255 MANUAL/AIR SHIFT PARTS LIST AND DESCRIPTION



ITEM	QTY	PART NO.	DESCRIPTION
1	1	44MB2164	Nipple
2	1	31M15759	Pressure Protection Valve
3	1	44MB6844	Tube Fitting
4	4	44MB6842	Tube Fitting
5	1	45M44430	Air Tubing, 30' (9.14m)
6	1	44MB6942	Tube Fitting (elbow)
7	1	33T36299	Fuse Assembly
8	3	34M18002	Butt Splice
9	2	44MB2252	Street Tee
10	2	34M18250	Terminal Clip
11	1	34M18009	Ring Terminal
12	1	32M12001	Light (12 Volt)
13	1	35M18653	Air Valve
14	1	36MA1004	Dash Bracket
15	12'	37M18000	Electrical Wire (3.64m)
16	1	31M1749C	Pressure Switch (N.C.)
17	1	44MB2242	Adaptor
18	1	36M01005	Face Plate
N.S.	1	36MK1007	Bolt Kit

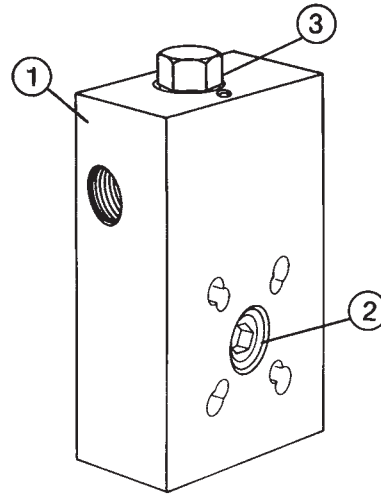
FLOW CONTROL VALVES

NOTE: Flow control, and orifices should be sized such that they bypass no higher than 50% of the desired control flow.

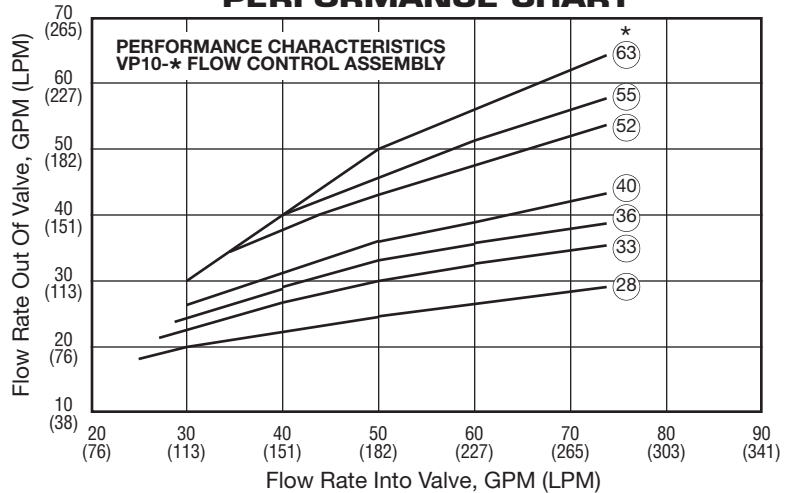
Example: Flow Required 30 GPM (113.5 LPM)
 Maximum Flow of Pump 45 GPM (170.3 LPM)
 Bypass Flow 15 GPM (56.7 LPM)

MODEL VP10

ITEM	QTY	PART NO.	DESCRIPTION
N.S.	1	VP10-28 -33 -40 etc.	Assembly with Appropriate Flow Control Orifice
1	1	VP10-00	Manifold Assembly less Orifice
2	1		Flow control orifice
		VP00-28	.359 in. (09.12 mm) Dia (Code Q)
		VP00-33	.397 in. (10.08 mm) Dia (Code R)
		VP00-36	.415 in. (10.54 mm) Dia (Code P)
		VP00-40	.438 in. (12.19 mm) Dia (Code J)
		VP00-52	.500 in. (12.70 mm) Dia (Code U)
		VP00-55	.516 in. (13.11 mm) Dia (Code T)
		VP00-63	.562 in. (13.21 mm) Dia (Code V)
N.S.	1	VP-1001	By-pass Hose Assembly
N.S.	2	VP-1002	By-pass Hose Fittings
N.S.	1	VP-1003	Manifold O-Ring
3	1	VP-1004	Cartridge Assembly
N.S.		VP10-GSK	Seal Kit (Cartridge Only)



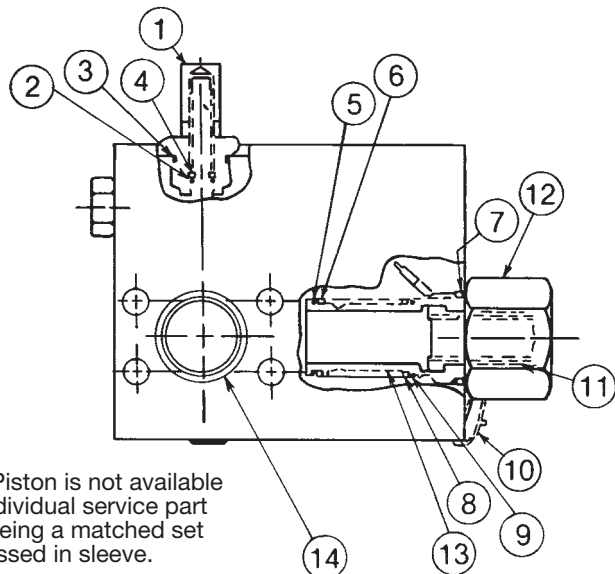
PERFORMANCE CHART



NOTE: Refer to pump brochures for actual pump performance curves.

MODEL VP15

ITEM	QTY	PART NO.	DESCRIPTION
1	1	VP-15001	Adjustment Assembly
2	1	VP-15002	O-Ring
3	1	VP-15003	O-Ring
4	1	VP-15004	Backup Ring
5	1	VP-15005	O-Ring
6	1	VP-15006	Backup Ring
7	1	VP-15007	O-Ring
8	1	VP-15008	Backup Ring
9	1	VP-15009	O-Ring
10	1	VP-15010	Lock Wire
11	1	VP-15011	Spring
12	1	VP-15012	Assembly Cap
13	1	NA	Bypass Assembly
14	1	VP-15014	O-Ring (Manifold)
N.S.	1	VP15-GSK	Seal Kit Incl. Items: 2, 3, 4, 5, 6, 7, 8, 9, 14



NOTE: Piston is not available as an individual service part due to being a matched set with pressed in sleeve.

PUMP DISASSEMBLY

1. Place pump into a vise with drive shaft down. Clamp onto front cover. Using a dark marker or punch, mark all three sections on one side for reference during reassembly. (Figure 1)
2. Remove the 8 cap screws (4 in L Series).
3. Lift off rear cover. If necessary pry loose, but be careful not to damage machined surfaces. (Figure 2)
4. Remove center section with same procedure as above.
5. Remove both the drive and driven gear.
6. Remove wear plates and seals from both the front and rear covers. (Figure 3)
7. Inspect bearings, and if necessary, remove with a bearing puller. (Figure 4)
8. Remove ring seals from the drive gear side front and rear covers. (These should be replaced any time unit is rebuilt to prevent shaft seal leaks or blowing out.)
9. Rotate front cover in the vise so it faces up, remove snap rings.
10. Remove spacer or outboard bearings with bearing puller. (Figure 5)
11. Tap out shaft seals and discard O-Rings, clean seal retainer with solvent and smooth surface with emery paper. Replace if gouged or nicked at seal area.

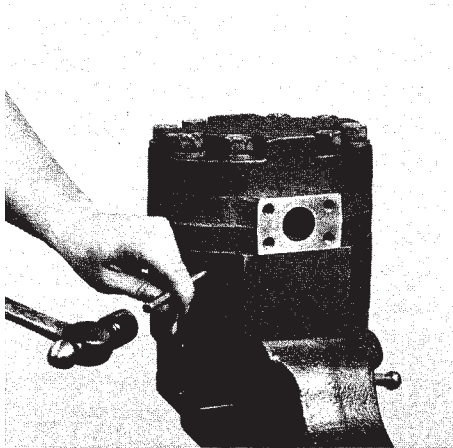


FIGURE 1

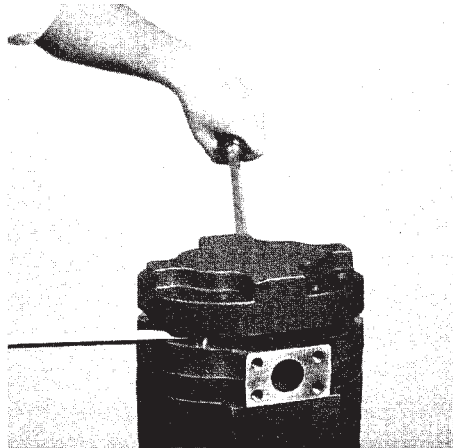


FIGURE 2

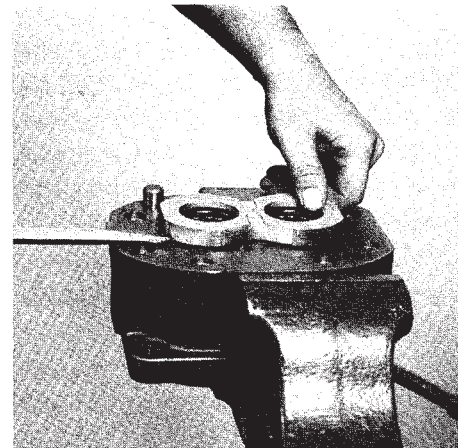


FIGURE 3

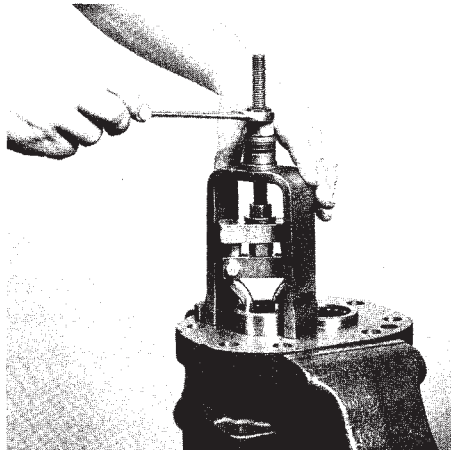


FIGURE 4

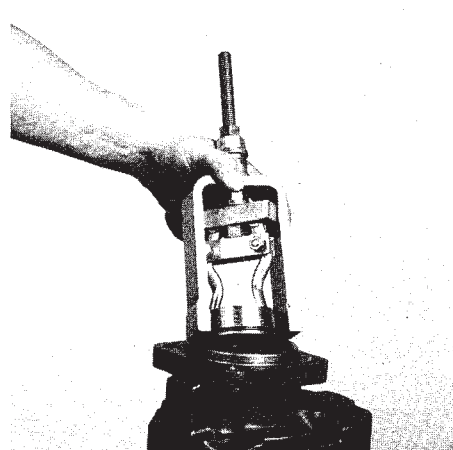
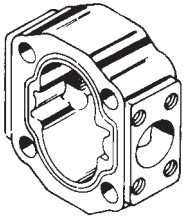


FIGURE 5

PARTS INSPECTION

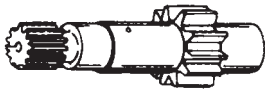
THE FOLLOWING IS A GUIDE IN EVALUATING PARTS TO SEE IF REPLACEMENT IS NEEDED

GEAR HOUSINGS:

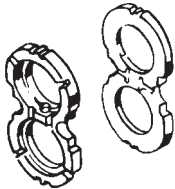


Wear in excess of .005" (.127 mm) cut-out necessitates replacement of the gear housing. Place a straight-edge across bore. If you can slip a .005" (.127 mm) feeler gauge under the straightedge in the cut-out area, replace the gear housing. Pressure pushes the gears against the housing on the low pressure side. As the hubs and bearings wear, the cut-out becomes more pronounced. Excessive cut-out in a short period of time indicates excessive pressure or oil contamination. If the relief valve settings are within prescribed limits, check for shock pressures or tampering. Withdraw oil sample and check it and tank for dirt.

GEARS:



Replace if there is any wear detectable by touch in the seal areas or at the drive coupling. .002" (.05 mm) wear is the maximum allowable. Wear in the shaft seal areas indicate oil contamination and shaft replacement is required. Wear or damage to splines keys or keyways necessitates replacement. Any wear on the hubs detectable by touch, or in excess of .002" (.05 mm) necessitates replacement. Nicking, grooving, fretting of teeth surfaces or head discoloration also necessitates replacement. Scoring, grooving or burring of outside diameter of teeth generally means replacement is necessary unless damage is light and can be stoned off. Maximum shaft runout is .001" (.025 mm).



WEAR PLATES:

The wear plates seal the gear section at the sides of the gears. Wear here will allow internal slippage, that is, oil will bypass within the pump. .002" (.05 mm) maximum wear is allowable. Replace wear plates if they are scored, eroded, pitted or discolored. Check the center wear plates where the gears mesh. Erosion here indicates oil contamination. Pitted thrust plates indicate cavitation or oil aeration. Discolored wear plates indicate over-heating, probably insufficient oil.



SEALS AND GASKETS:

Replace all rubber polymer seals, and shaft ring seals, whenever disassembling pump. Include all O-rings, pocket seals behind wear plates, shaft seal and gasket seals.



BEARINGS:

If gears are replaced, bearings must be replaced. Bearings should fit into bore with a light press fit. A neat hand fit is allowable. If bearings can fall out, bore may be oversized.



DOWEL PINS:

If either the dowel pin or dowel hole is damaged, the pin or machined casting, or both, must be replaced. If more than reasonable force is required to seat dowels the cause may be poorly deburred or dirty parts; cocking of the dowel in the hole, or improper pin-to-hole fit.



CHECK VALVES:

Examine small check valves in shaft end cover to make sure they are intact and functioning. If there are no check valves here, make sure the high pressure side of the shaft end cover is plugged.

PUMP REASSEMBLY

BASED ON NEEDED PARTS HAVING BEEN REPLACED AND ALL OTHER PARTS THOROUGHLY CLEANED

1. Place front cover face down in vise. Stone off outer edge to remove any burrs produced from disassembly. Re-clean. (Figure 1)
2. Insert new ring seal with NOTCH visible. Re-install bearing, using arbor press until it bottoms.
3. Install wearplates and seals onto bearings. Note that pocket seals (L Series) need to have center seals installed first (Hold in place with grease). Outer seals can be slid into position (and cut to length) with wearplates installed. (Figure 2)
4. Install the gears until they bottom against the wearplates.
5. Grease the body O-rings and install into the groove in the center section. Install the same way as removed by aligning the marks. (NOTE: Any burrs should have been stoned off prior to reassembly.) (Figure 3)
6. Remove any burrs from the rear cover and clean.
7. Insert ring seal and bearings as described in step 2.
8. Install wearplates as described in step 3. (Figure 4)
9. Install rear cover onto pump housing by aligning the marks. Lightly tap into place. (Figure 5)
10. Install the 8 cap screws. Snug up the bolts using a criss cross pattern. Rotate the drive shaft with a 6" wrench to make sure there is no binding. Now torque the bolts [M Series is 200 Ft. Lbs. (27.6 kg-meters), L Series is 225 Ft. Lbs. (31.1 kg-meters)] using the criss cross pattern again.
11. Rotate pump onto work bench face up. Install the new shaft seals into the seal retainer (Reference service parts page for proper position); using Permatex aviation form a gasket sealer on the outside seal casing.
12. Grease O-rings and install onto retainer.
13. Using a greased seal guide (L Series Part No. A-1254-5, M Series Part No. A-1254-6) on the drive shaft, install the seal retainer (O-rings first) into the pump.
14. Drop in spacer or outboard bearing and install snap ring.

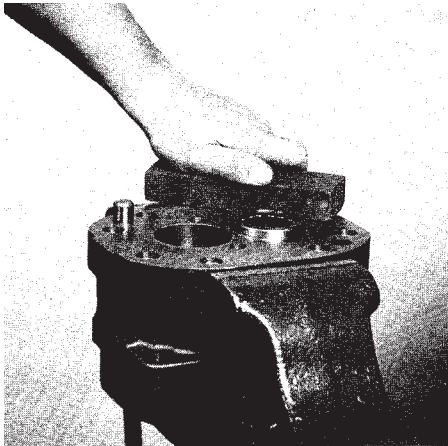


FIGURE 1

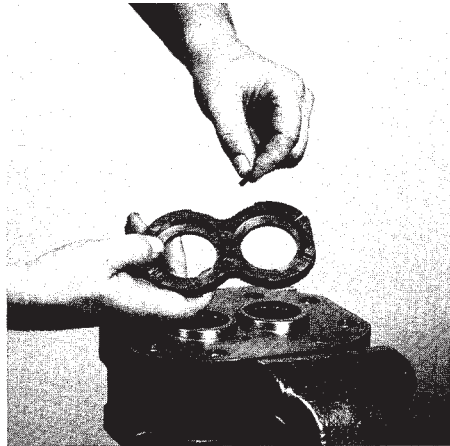


FIGURE 2



FIGURE 3

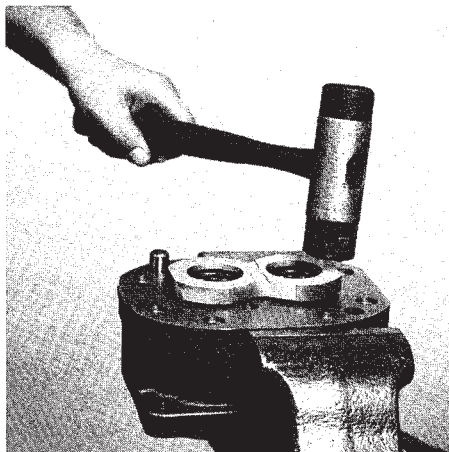


FIGURE 4

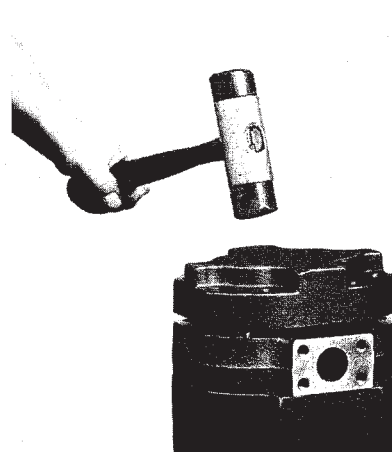


FIGURE 5

REBUILT PUMP CONDITIONING

WARNING: On initial pump startup be sure the Powr-Pro or Power-Miser valve is in the On Mode for proper pump lubrication requirements. Failure to do so could lead to possible pump damage.

Before installing a new or rebuilt pump or motor, back off the main relief valve until the spring tension on the adjusting screw is relieved. This will avoid the possibility of immediate damage to the replacement unit in the event that the relief valve setting had been increased beyond the recommended operating pressure.

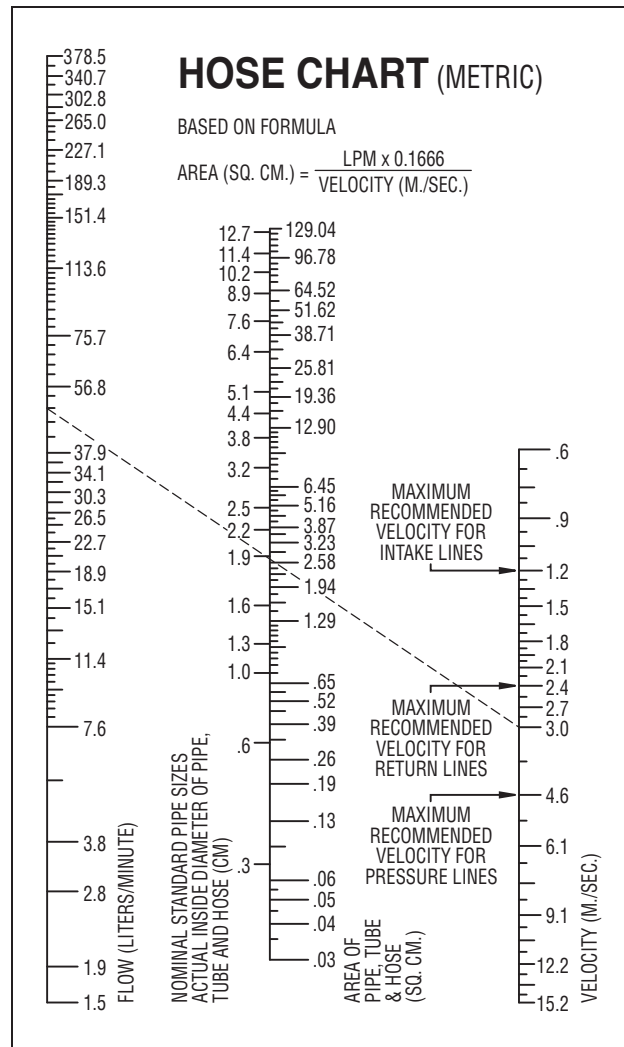
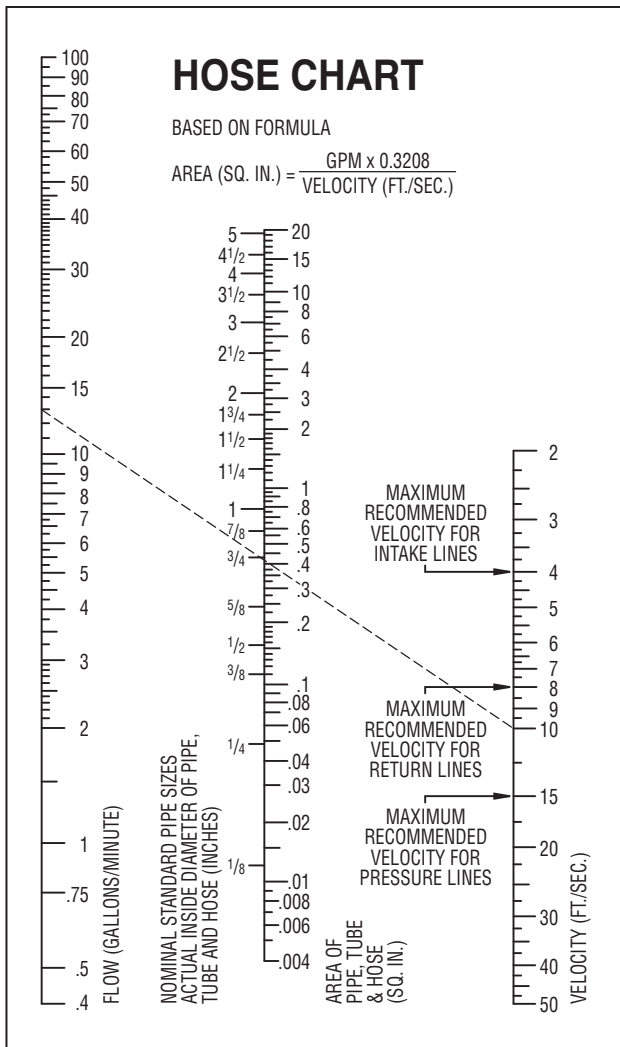
Before connecting any lines to the pump or motor, fill all ports with clean oil to provide initial lubrication. This is particularly important where the unit is located above the oil reservoir.

After connecting the lines and mounting the replacement unit, operate the pump or motor at least two minutes at zero pressure at lowest possible rpm. During this break-in period, the unit should run free and not develop an excessive amount of heat. If the unit operates properly, speed and pressure can then be increased to normal operating settings.

Reset the main relief valve to its proper setting while the pump is running at maximum operating engine (motor) speed for the vehicle.

FLOW CAPACITIES

FOR PIPE, TUBE AND HOSE AT RECOMMENDED FLOW VELOCITIES



NOTES



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Power
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