V SERIES PISTON PUMP
INSTALLATION TIPS AND PROCEDURES

OIL RECOMMENDATIONS

Do not use automatic transmission fluid (ATF), bio-degradable oil, or fire resistant fluids due to the poor lubricating properties. A good quality petroleum based fluid is recommended. Muncie does not promote specific manufacturer's brands of oil. Below are recommended oil viscosity guidelines. Your oil supplier should be consulted for your application needs.

Maximum viscosity at startup:	7500 SUS
Minimum viscosity:	50 SUS
Recommended viscosity range for optimum performance:	75-170 SUS (75-1000 typ.)

FILTRATION

Because the design and operation of a piston pump is considerably different than that of a normal gear pump, filtration and contamination control must be drastically improved for optimum product life and performance. Disregarding this portion of the system can lead to catastrophic pump failure and inadequate system performance. It is recommended that fluid contamination levels be equal to or better than ISO-18/14. Most new oils will need to be filtered to meet this requirement.

If inlet side filtration is used, care must be used to determine proper size and capacity to prevent possible high vacuum conditions to the pump. Types of fluid, duty cycles, pump displacement and operating speeds help determine proper filter. See Pump Inlet section for other information.

PUMP CASE DRAIN

Maximum case pressure is limited to 15 PSI to prevent shaft seal damage and sluggish response. Never plug or block the case drain. Doing so will result in shaft seal and/or possible case damage.

SHAFT LOADING

Designed with heavy duty input shaft bearing, axial and radial loading is not recommended and should still be avoided. Do not use with pulleys and drive belts without other support. The drive shaft assembly should provide adequate slip to prevent end loading.

PUMP MOUNTING AND INSTALLATION

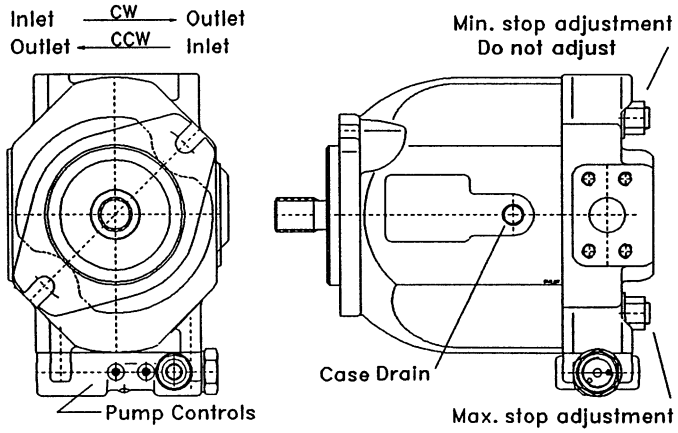
As with all drive shaft driven components, the pump should be mounted at the same angle as the engine. **Never mount the pump parallel to the chassis frame.** The crankshaft centerline must be parallel to the pump shaft centerline to prevent harmonic noise and premature drive line failure. The two shafts should have an offset of 3-5 degrees to properly load and lubricate the drive shaft cross and bearings. End and slip yokes must be in phase and balancing of the assembly is recommended. Never use solid shafting for this type of drive. The pump can be mounted in any position except vertical which could cause the input bearing to be run dry. You may have difficulty in filling the pump case with oil with the case drain port positioned down. With pump mounted, route the case drain hose back into the tank through a separate unrestricted passage that will stay below the oil level at all times. Direct mounting to PTOs may require a support bracket to carry the pump weight. Check with the PTO manufacturer on this limitation.

If mounting to an electric or gasoline motor, shaft alignment between the two must be within .010 in. TIR and no end load should be applied.

OTHER INSTALLATION TIPS

- Always use SAE rated hose for appropriate parts of system.
- When routing and plumbing the inlet side of the pump, avoid sharp 90 degree bends of any type. Smooth sweeps and 45 degree elbows will help prevent restrictions to the pump.
- Cycle the system under no load conditions to purge any entrained air.
- Change the filter element after the first 40 hours of service. Regular maintenance usually thereafter.

PUMP LAYOUT



PUMP INLET

Due to the nature of design and operation of a piston pump, care must be taken to prevent operation at high vacuum conditions. The piston pump is more susceptible to damage and premature wear than a typical gear pump due to port design, tighter tolerances, and the numerous contact surfaces. Most load sense applications do not operate under conditions that require both maximum speed and maximum pump displacement at the same time. This is helpful in determining the proper size inlet line. Inlet line velocity should not exceed four feet per second. Pressurizing the reservoir to approximately 3-5 PSI can help decrease the chances of high vacuum conditions and cavitation damage in most cases. Maximum 30 In. (76cm) vertical lift. See sales brochure (MP98-03) for specific maximum inlet conditions.

All inlet connections must be air tight to prevent the possibility of drawing air into the inlet oil and to prevent the draining of oil out of the inlet line when off.

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HOSE SIZES

Hose should follow SAE guidelines for appropriate type and size needed for the given flow rate(velocity) and function. Careful consideration should be made on the inlet hose size. The inlet hose should be 2 in. i.d. minimum but some applications may need a larger size.

START UP PROCEDURES

With the system installation complete and the reservoir filled with clean oil, the following is recommended.

- Remove the case drain plug and fill case with clean oil. Make sure case drain hose is routed back to the reservoir.
- With the inlet fitting slightly loose at the pump, pressurize the reservoir until a steady stream of oil is noticed, tighten fitting with stream still running if possible.
- Start vehicle and let engine idle with pump running for approximately five minutes to purge air out and wash any contaminates on out. Look for leaks or any other problems.
- Do not run pump longer than 30 sec. if it does not prime itself.
- Cycle the cylinder or motor functions under no load (do not bottom or dead head) to fill with oil and to purge out the air. Monitor oil level and refill as needed. Watch for leaks or any other problems.
- Once the system is filled and air purged, set any relief valves or compensators as needed.
- Some systems are in a dead head condition at startup. An air bleed valve can be used to momentarily unload the pump for a few seconds to prevent prime mover damage or high horsepower requirements.

PRESSURE COMPENSATION CONTROL

The V Series Pump does have an adjustable compensator for pressure control. Adjustment is made through a series of springs and shims. The standard setting is 2500 PSI (175 Bar).

DISPLACEMENT CONTROL

The V Series Pump is standard with a screw adjust maximum displacement stop. Screw in (CW) to limit swash plate angle and subsequent discharge output flow. Screw out (CCW) to increase angle and output flow. **Do not adjust the other screw which sets the minimum angle.** See Pump Layout section for reference.

SYSTEM PROTECTION

To protect the hydraulic system from pressure spikes a standard high quality in line relief valve must be used (typically installed in the directional valve) and set higher than the pump's pressure compensator.

Some systems are in a dead head condition at startup. An air bleed valve can be used to momentarily unload the pump for a few seconds to prevent prime mover damage or high horsepower requirements.

LOAD SENSE CONTROL

The V Series Pump does not have an internal drain to bleed off the load sense signal. An external drain is required and can normally be located in the directional valve (depending on the manufacturer).

The load sense control (margin) pressure is factory preset but is field adjustable with the use of shims. Standard setting is 290 PSI (20 Bar).

TEMPERATURE RANGE

Maximum temperature should not exceed 200°F (93°C). See Oil Recommendations section for typical operating range.

PUMP ROTATION

All V Series Pumps are uni-rotational. The large port is the pump inlet and smaller port is the pressure discharge. To determine actual rotation, view the pump at the input shaft with the control block on the bottom. If small port is on the left the pump is CCW rotation, if on the right it is CW rotation. See Pump Layout section for reference drawing.

PORTING

MODEL NUMBER	INLET SPL FLNG	OUTLET SPL FLNG	PUMP CONTROLS	CASE DRAIN
PV✻-033	1.25	0.75	-4 ODT	-8 ODT
PV✻-051	1.50	1.00	-4 ODT	-10 ODT
PV✻-068	2.00	1.00	-4 ODT	-10 ODT
PV✻-087	2.50	1.00	-4 ODT	-12 ODT
PV✻-111	3.00	1.25	-4 ODT	-12 ODT
PV✻-140	3.00	1.25	-6 ODT	-12 ODT

Note: Porting sizes shown are for standard model codes. See Pump Layout section for reference drawing and location.

PUMP SPECIFICATIONS

MODEL NUMBER	DISPL CU IN (CC)	MIN RPM	MAX CONT. PSI (BAR)	MAX INT. PSI (BAR)	MAX CASE PSI (BAR)	APP. WT. LBS (KG)
PV✻-033	2.01 (33)	600	4060 (280)	5075 (350)	15 (1)	49 (22)
PV✻-051	3.11 (51)	600	4060 (280)	5075 (350)	15 (1)	60 (27)
PV✻-068	4.15 (68)	600	4060 (280)	5075 (350)	15 (1)	73 (33)
PV✻-087	5.31 (87)	600	4060 (280)	5075 (350)	15 (1)	88 (40)
PV✻-111	6.77 (111)	600	4060 (280)	5075 (350)	15 (1)	*(weights not available at press time)*
PV✻-140	8.54 (140)	600	4060 (280)	5075 (350)	15 (1)	*(weights not available at press time)*

Muncie® Power Products

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