POWER TEAM
HYDRAULIC TECHNOLOGIES
Hydraulic Technologies
5885 11th Street
Rockford, IL 61109-3699 USA

Internet Address:
http://www.powerteam.com
Tech. Services: (800) 477-8326
Fax: (800) 765-8326
Order Entry: (800) 541-1418
Fax: (800) 288-7031

OTC
Hydraulic Technologies
655 Eisenhower Drive
Owatonna, MN 55060-0995 USA
Phone: (507) 455-7000
Tech. Services: (800) 533-6127
Fax: (800) 955-8329
Order Entry: (507) 455-1480
Fax: (800) 283-8665
International Sales: (507) 455-7223
Fax: (507) 455-7746

Form No. 102564

Operating Instructions for:

	61869	P157D
4016	61871	P157-LUAM
4017	61872	P157-LUAM-EPR
61821	JT05845	P159
61823-GRC	P157	P159D

TWO STAGE
HYDRAULIC HAND PUMP

These instructions should be read and carefully followed. Most problems with new equipment are caused by improper operation or installation. **NOTE: These general instructions are intended for hydraulic hand pumps of various pressure capabilities. Due to the numerous models available, it may be necessary to deviate slightly from the instructions for your model. All illustrations and instructions refer only to the standard units.**

These hydraulic hand pumps develop up to 10,000 PSI maximum line pressure, except model #61871 which has a maximum setting of 8,600 PSI and model #P157-LUAM-EPR which has a maximum setting of 5,000 PSI. The handle effort at 10,000 PSI is 130 lbs. when the lower third of the handle stroke is used. The **low pressure first stage** of the pump unloads at 300 PSI, except models #61871, 61872, P157 and P157-LUAM that unload at 1400 PSI. This first stage delivers 2.6 cu. in. of oil per full stroke of the handle to provide fast cylinder approach. Models #61871, 61872, P157 and P157-LUAM deliver 0.65 cu. in. of oil per full stroke.

The **high pressure second stage** of the pump takes over when the pressure on the cylinder becomes more than 300 PSI (or 1400 PSI, depending on the model). The high pressure stage can develop pressure to the maximum relief valve setting for that particular pump. This second stage delivers .16 cu. in. of oil per stroke of handle.

SAFETY PRECAUTIONS

⚠ WARNING

General Operation

- **Before operating the pump, all hose connections must be tightened with the proper tools. Do not overtighten. Connections should only be tightened securely and leak-free. Overtightening the connections can cause premature thread failure or high pressure fittings to split at pressures lower than their rated capacities, possibly resulting in personal injury.**
- **Should a hydraulic hose ever rupture, burst, or need to be disconnected, immediately shift the control valve twice to release all pressure. Never attempt to grasp a leaking pressurized hose with your hands. The force of the escaping hydraulic fluid could cause serious injury.**
- **Do not subject the hose to potential hazard such as fire, sharp surfaces, heavy impact, or extreme heat or cold. Do not allow the hose to kink, twist, curl or bend so tightly that the oil flow within the hose is blocked or reduced. Periodically inspect the hose for wear, because any of these conditions can damage the hose and result in personal injury.**
- **Hose material and coupler seals must be compatible with the hydraulic fluid used. Hoses also must not come in contact with corrosive material such as creosote-impregnated objects and some paints. Consult the manufacturer before painting the hose(s). Never paint the couplers! Hose deterioration due to corrosive materials can result in personal injury.**

Pump

- **Do not exceed the PSI hydraulic pressure rating noted on the pump nameplate or tamper with the internal high pressure relief valve. Creating pressure beyond rated capacities can result in personal injury.**
- **Before replenishing the oil level, retract the system to prevent overfilling the pump reservoir. An overfill can cause personal injury due to excess reservoir pressure created when cylinders are retracted.**

Cylinder

- **Do not exceed the rated capacities of the cylinders. Excess pressure can result in personal injury.**
- **Do not set poorly balanced or off-center loads on a cylinder. The load can tip and cause personal injury.**

SET-UP

Hydraulic Connections

IMPORTANT: Seal all hydraulic connections with a high-grade, non-hardening thread sealant, such as Power Team HTS6. Teflon tape can be used to seal hydraulic connections if only one layer of tape is used. Apply the tape carefully, two threads back, to prevent it from being pinched by the coupler and broken off inside the pipe end. Any loose pieces of tape could travel through the system and obstruct the flow of oil or cause jamming of precision-fit parts.

1. Clean all the areas around the oil port of the pump and cylinder, and all hose ends, couplers, and union ends.
2. Remove the thread protectors from the hydraulic oil outlets. Connect the hose assembly.
3. Install a pressure gauge (rated at the same pressure as the pump) in the gauge port to indicate line pressure. The use of gauge is strongly recommended.

WARNING: To help avoid personal injury,

- **All components in the hydraulic system must match the maximum pressure rating of the pump.**
- **Release hydraulic pressure BEFORE removing or tightening hose couplings.**

OPERATION

The hand pump can be operated in a horizontal position or in a vertical position with head pointing downward.

Two-way Pump

1. This pump has a two-way valve for use with single-acting cylinders. To extend the pump, turn the valve knob clockwise to a closed (seated) position. Work the pump handle up and down to build pressure.
2. To release pressure, open the valve by turning the knob counterclockwise.

Four-way Pump

1. This pump has a three-position, four-way valve for use with double-acting cylinders. The hose connection for extending a cylinder can be made to either port. With the handle in the forward position, the oil is directed to the top oil port. To maintain (hold) pressure, stop the pumping action. When the valve handle is in the center position, oil flow is blocked to both ports.

Bleeding Air From The System

Air can accumulate in the hydraulic system during the initial set-up or after prolonged use, causing the cylinder to respond slowly or in an unstable manner. To remove the air:

1. Position the cylinder at a lower level than the pump.
2. Extend and retract the cylinder several times without putting a load on the system. Air will be released through the pump reservoir.

PREVENTIVE MAINTENANCE

Lubrication

Regularly apply lubricant to all pivot and rubbing points. Use a good grade of No. 10 motor oil or grease. Do not use dry lubricants.

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Periodic Cleaning

IMPORTANT: The greatest single cause of failure in hydraulic pumps is dirt. Keep the pump and attached equipment clean to prevent foreign matter from entering the system.

1. Use only clean hydraulic oil.
2. Seal the hydraulic oil outlet(s) and all unused couplers with thread protectors when the system is being dismantled.

Hydraulic Fluid Level

Check the oil level in the reservoir after every 10 hours of use. The oil level should come to the filler hole when the pump is resting on its base and the cylinders are retracted. Add oil if needed. See Figure 1. To help avoid excessive overfilling of the reservoir, the oil level should be approximately eight inches from the filler hole. See Figure 2.

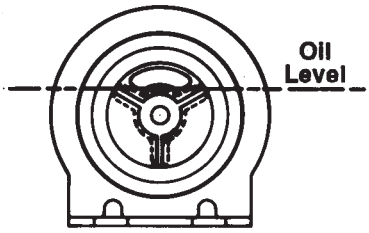

Figure 1

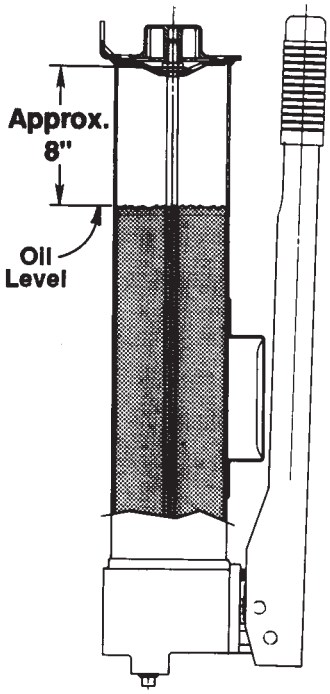

Figure 2

Draining And Flushing The Reservoir

The reservoir should be drained, then flushed with a nonflammable flushing fluid after every 300 hours of use. **IMPORTANT: Clean the exterior of the pump before beginning this procedure. After draining and flushing the reservoir, drain and clean the other hydraulic system components (hoses, cylinders, etc.) before reconnecting them to the pump. This will help prevent contaminated oil from re-entering the pump.**

1. Unscrew the end cap. To drain the oil, stand the pump on end with the filler hole down.
2. Remove the nut located on the end of the pump. Separate the pump body from the reservoir, and clean the reservoir and filter.

Refilling The Reservoir

The oil capacity of the reservoir is 153 cu. in., of which 137 cu. in. is useable. It is filled at the factory with a high-grade hydraulic oil to the level indicated in Figure 1. The reservoir is protected by a gasket in the filler cap, which will extrude and blow if more oil is contained in the system than the reservoir can handle. **IMPORTANT: To prevent damage to the reservoir gasket, the cylinder(s) must be fully retracted before refilling the reservoir.**

1. Retract the cylinder(s).
2. Clean the entire area around the filler cap. Remove the filler cap, and position the pump with the head down and the filler hole up. Insert a clean funnel and a filter into the filler hole.
3. After adding oil, position the pump on its base (without the filler cap installed) and allow the excess oil to drain out. See Figure 1.

TROUBLE-SHOOTING GUIDE

WARNING

It can be dangerous to work on pressurized equipment. Always release pump pressure and disconnect hose(s) from the pump before making repairs.

Repair procedures must be performed in a dirt-free environment by qualified personnel familiar with this equipment.

Problem	Cause	Solution
Pump not delivering oil	1. Low oil level in reservoir	1. Check the oil level per instructions
	2. Dirt in pump body	2. Disassemble pump body and clean all parts
	3. Seats worn and not seating properly	3. Reseat required seats in casting
	4. Reservoir overfilled	4. Drain excess oil per instructions
Pump losing pressure	1. Oil leaking past outlet ball seat(s)	1. Reseat and/or replace balls and seats
	2. Oil leaking past unloading valve piston	2. Replace o-ring on unloading valve piston
	3. Four-way valve leaks	3. Check rotor & shear seals for scratches. Check o-rings on shear seals. Replace if necessary.
	4. Two-way valve leaks or is not adjusted correctly	4. Reseat/replace ball check and/or adjust two-way valve handle
Pump does not reach full pressure	1. Low oil level	1. Check oil level per instructions
	2. Relief valve set too low	2. Take pump to authorized hydraulic repair center
	3. Oil leaking past unloading valve piston	3. Replace o-ring on unloading valve piston
Handle rises after each stroke	1. Oil leaking past outlet ball seats	1. Check for dirt. Replace ball and/or reseat valve.
Pump handle can be pushed down (slowly) without raising the load	1. The inlet ball is not seating	1. Check for dirt. Replace ball and/or reseat valve.
	2. Damaged piston assembly	2. Replace piston assembly
	3. Scored cylinder wall on pump body	3. Replace pump body and piston assembly
Pump handle operates with a spongy action	1. Air is trapped in the system	1. Position the cylinder lower than the pump. Extend and retract the cylinder several times.
	2. Too much oil in reservoir	2. Check oil level per instructions