

Operating Instructions for:

GPM Series  
GPN Series  
GPS Series

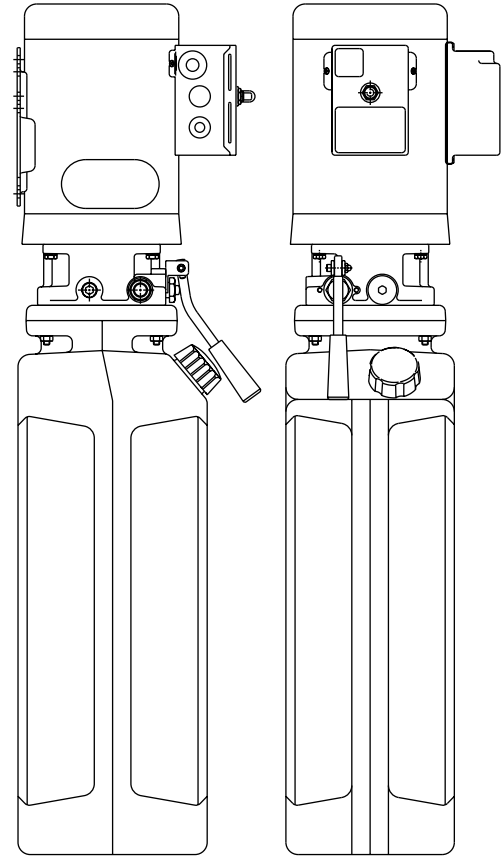
## HYDRAULIC PUMP

Max. Capacity: See Pump Data Plate

**Definition:** A hydraulic pump delivers hydraulic fluid under pressure through the use of compressed air or an electric motor as a power source.

**NOTE:**

- For a detailed parts list or to locate a Power Team Authorized Hydraulic Service Center, contact your nearest Power Team facility.
- Carefully inspect the pump upon arrival. The carrier, not the manufacturer, is responsible for any damage resulting from shipment.
- The customer can choose from a variety of motors, controls, reservoirs, and other options. These instructions will include directions for options that your particular pump may not have.
- Do not change motors without consulting the pump manufacturer's Technical Services Department.



## SAFETY DEFINITIONS

Safety symbols are used to identify any action or lack of action that can cause personal injury. Your reading and understanding of these safety symbols is very important.



**DANGER** - Danger is used only when your action or lack of action will cause serious human injury or death.



**WARNING** - Warning is used to describe any action or lack of action where a serious injury can occur.



**DANGEROUS VOLTAGE** - Dangerous voltage is used to describe any action or lack of action that could cause serious personal injury or death from high voltage electricity.

**IMPORTANT** - Important is used when action or lack of action can cause equipment failure, either immediate or over a long period of time.

Sheet No. 1 of 6

Rev. 1

Date: 14 Feb. 2000

## SAFETY PRECAUTIONS

These instructions are intended for end-user application needs. Many problems with new equipment are caused by improper operation or installation. For a detailed parts list or to locate a Power Team Authorized Hydraulic Service Center contact your nearest Power Team facility.






**WARNING:** It is the operator's responsibility to read and understand the following safety statements,

- Only qualified operators should install, operate, adjust, maintain, clean, repair, or transport this machinery.
- These components are designed for general use in normal environments. These components are not specifically designed for lifting and moving people, agri-food machinery, certain types of mobile machinery or special work environments such as: explosive, flammable or corrosive. Only the user can decide the suitability of this machinery in these conditions or extreme environments. Power Team will supply information necessary to help make these decisions.



**WARNING:** To help prevent personal injury,

## GENERAL

-  Always wear eye protection whenever operating hydraulic equipment.
- Operation, repair, or maintenance of hydraulic equipment should be performed by a qualified person who understands the proper function of hydraulic equipment.
- Hydraulic equipment must be assembled correctly and then checked for proper function before use. Use hydraulic components of the same hydraulic pressure ratings. An appropriate hydraulic pressure gauge is recommended to monitor pressure.
-  Never place your hands or other body parts near a hydraulic fluid leak. Never use your hands or other body parts to check for a possible leak. High pressure fluid can be injected under your skin causing serious injury and/or infection.
- High pressure fluid is present throughout a hydraulic system. Always use caution when operating, repairing, or maintaining this equipment. Before beginning any work on any hydraulic system component, stop the equipment, disconnect from its power source, and relieve all pressure in all parts of the system. Do not tamper with the internal hydraulic relief valve settings.
- Avoid exposing hydraulic equipment (especially hoses) to extreme high or low temperatures. Damage to equipment or failure may result and cause loss of control or injury to the operator.
-  Exercise caution to avoid the risk of fire.
- Do not drop any hydraulic system components. Damage to the equipment and/or injury may result.
- Avoid slipping or falling by cleaning up any oil spills.
- Avoid back injury by always lifting equipment carefully.
- It is strongly recommended to view the Power Team Hydraulic Safety video tape before using hydraulic equipment.

**SAFETY PRECAUTIONS CONTINUED -****POWER SUPPLY****Electric****Electrical Shock or Electrocution**

- Any electrical work must be done and tested by a qualified electrician per applicable codes and standards.
- Disconnect the pump from the power supply and relieve pressure before removing the motor case cover or performing maintenance or repair.
- Never use an ungrounded power supply with this unit.
- If the power cord is damaged or wiring is exposed, replace or repair immediately.
- Changing the voltage on this unit is an involved, and if improperly performed, hazardous procedure. Consult the manufacturer for specific information before attempting any rewiring.
- All GP Series pump motors must be wired for clockwise (CW) rotation when viewed from the shaft end (bottom) of the motor.
- Overcurrent protection must be provided in accordance with applicable codes and standards. See motor nameplate(s) for maximum current required by the pump.
- Check the *total* amperage draw for the electrical circuit you will be using. (For example: Do not plug a pump or pumps that may draw 25 amps into a 20 amp fused electrical circuit.)
- Do not attempt to increase the powerline capacity by replacing a fuse with another fuse of higher value. Overheating of the powerline and the possibility of a fire will result.
- Electric pumps should never be exposed to rain or water which could cause personal electrical hazard.
- Avoid conditions which can cause damage to the power cord such as abrasion, crushing, sharp cutting edges, or corrosive environment. Damage to the power cord can cause an electrical hazard.

**HYDRAULIC HOSES AND FLUID TRANSMISSION LINES**

- Avoid straight line tubing connections in short runs. Straight line runs do not provide for expansion and contraction due to pressure and/or temperature changes. See diagrams in “Set-up Instructions” section of this form.
- Eliminate stress in the tube lines. Long tubing runs should be supported by brackets or clips. Tubes through bulkheads must have bulkhead fittings. This makes easy removal possible and helps support the tubing.
- 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 can cause premature thread failure or high pressure fittings to split at pressures lower than their rated capacities.
- Should a hydraulic hose ever rupture, burst, or need to be disconnected, immediately shut off the pump and release all pressure. Never attempt to grasp a leaking pressurized hose with your hands. The force of escaping hydraulic fluid could cause serious injury.
- Do not subject the hose to potential hazard such as fire, sharp surfaces, extreme heat or cold, or heavy impact. Do not allow the hose to kink, twist, curl, crush, cut, or bend so tightly that the fluid flow within the hose is blocked or reduced. Periodically inspect the hose for wear, because any of these conditions can damage the hose and possibly result in personal injury. Never repair with tape.
- Do not use the hose to move attached equipment. Stress can damage the hose and possibly cause personal injury.
- Hose material and coupler seals must be compatible with the hydraulic fluid used. Hoses also must not come in contact with corrosive materials such as creosote-impregnated objects and some paints. Hose deterioration due to corrosive materials can result in personal injury. Consult the manufacturer before painting a hose. Never paint a coupler.



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Rev. 1 Date: 14 Feb. 2000

## SAFETY PRECAUTIONS CONTINUED -

### PUMP

- Do not exceed the 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 fluid level, retract the system to prevent overfilling the pump reservoir. An overfill can cause personal injury due to excess reservoir pressure created when the cylinders are retracted.
- Always shut off the motor and relieve pressure before breaking any connections in the system.
- The motor is the major part of the weight of the pump. Always take this into consideration when lifting or moving the pump.

### 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.
- Read and understand the cylinder operating instructions and warning decals before using the cylinder.



**DANGER:** A double-acting cylinder or ram must have both hoses and all couplers securely connected to both ports. If one of the two ports is restricted or becomes disconnected, pressure will build and the cylinder, hose or coupler can burst, possibly causing serious injury or death.

### HYDRAULIC FLUIDS

- Properly dispose of all fluids, components, and assemblies at the end of their useful life.
- Hydraulic fluid should be compatible with all hydraulic components.

## SET-UP INSTRUCTIONS

### Filling The Pump Reservoir

**NOTE:** Most pumps are shipped without hydraulic fluid in the reservoir. Hydraulic fluid may have been shipped with the pump in a separate container. If hydraulic fluid is needed, use 215 SSU @ 100° F (47 cSt @ 38° C) hydraulic fluid.

1. Clean the area around the filler cap to remove all dust and grit. Any dirt or dust in the hydraulic fluid can damage the polished surfaces and precision-fit components of this pump.
2. Retract all cylinder(s) to their return position.
3. Remove the filler cap and insert a clean funnel with a filter. Fill the reservoir with hydraulic fluid to the bottom of the filler neck. Replace the filler cap.

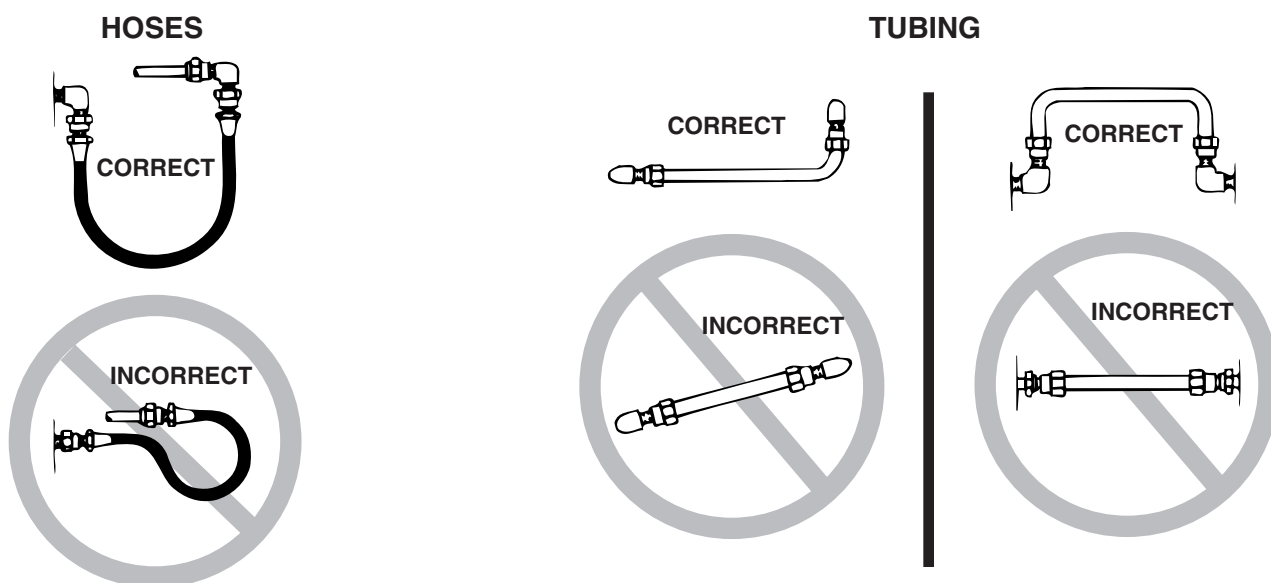


## SET-UP INSTRUCTIONS CONTINUED -

**Hydraulic Connections**

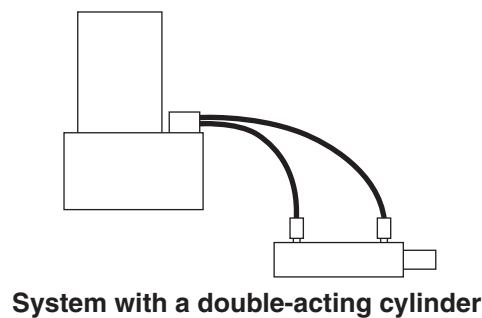
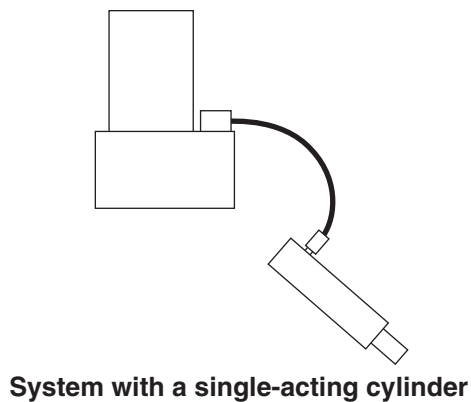
Remove the thread protectors or dust covers from the hydraulic ports if applicable. Clean the areas around the fluid ports of the pump and cylinder. Inspect all threads and fittings for signs of wear or damage, and replace as needed. Clean all hose ends, couplers and union ends. Connect all hose assemblies to the pump and cylinder. Use an approved, high-grade pipe thread sealant to seal all hydraulic connections. Tighten securely and leak-free but do not overtighten.

Hydraulic lines and fittings can act as restrictors as the cylinder or ram retracts. The restricting or slowing of the fluid flow causes back pressure that slows the cylinder's or ram's return. Return speed also varies because of the application, condition of the cylinder or ram, inside diameter of hose or fitting, length of the hose, and the temperature and viscosity of the hydraulic fluid.

**Bleeding The System**

After all connections are made, the hydraulic system must be bled of any trapped air. Refer to the diagrams below.

With no load on the system and the pump vented and positioned higher than the cylinder or ram, cycle the system several times. Check the reservoir for possible low fluid level and fill to proper level with approved, compatible hydraulic fluid as necessary (see "Filling The Pump Reservoir" section under Set-up Instructions).



**IMPORTANT:** Some spring return cylinders or rams have a cavity in the rod which forms an air pocket. This type of cylinder or ram should be bled when positioned upside down or lying on its side with the port facing upward.

## PUMP OPERATION

When operating the pump for the first time:

1. Valve and hose connections must be tight, and the reservoir must be filled to the proper fluid level. Start the motor.
2. Jog the pump several times to build pressure. If cylinder does not extend or pressure does not build, refer to "Pump is not delivering fluid" in the section titled "Trouble-shooting Guide".
3. Run cylinder out to its full travel several times to eliminate air from the system. For more complete instructions, refer to the section titled "Bleeding The System" under Set-up Instructions of the lift manufacturer.
4. With the cylinder(s) retracted completely, check the fluid level in the reservoir and add fluid if necessary. Refer to "Filling The Pump Reservoir" under Set-up Instructions.
5. The pump is now ready to be put into regular operation.

## ELECTRIC PUMP

**TENV and TEFC Motors:** See pump data plate for voltage, frequency, current, and power specifications.

1. Place the valve in neutral position (if available).
2. Plug in the pump.
3. Start the pump and verify proper operation.
4. Turn the pump off when not in use.

**Note:** For specific function of your pump see the "Valve Options" section of this form.

### IMPORTANT:

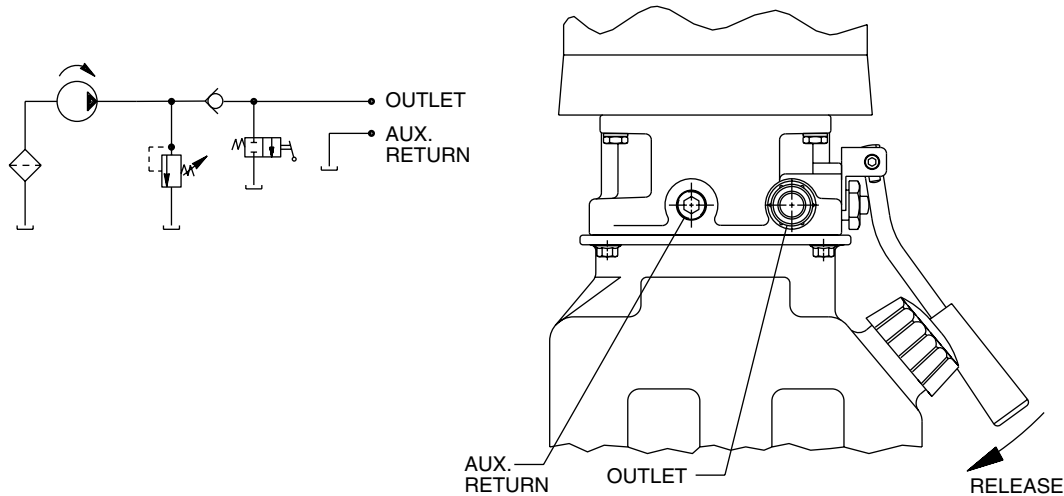
- **Correct voltage is required for the pump to operate properly.**
  - **Low voltage may cause: overheated motor; motor fails to start under load; motor surging when trying to start; or motor stalls before maximum pressure is reached.**
  - **Check the voltage rating on the pump motor name plate to be certain the outlet or power source you are using is of the proper voltage.**
  - **Always check the voltage at the motor with the pump running at full pressure.**
- **Never run the motor on long, light gauge extension cords. Refer to the minimum recommended gauge chart below.**

AMPS At Maximum Hyd. Pressure	Electrical Cord Size AWG (mm <sup>2</sup> ) 3.2 Volt Drop			
	Length of Electrical Cord			
	0-25 ft. (0-8 m)	25-50 ft. (8-15 m)	50-100 ft. (15-30 m)	100-150 ft. (30-46 m)
6	18 (.82)	16 (1.33)	14 (2.09)	12 (3.32)
8	18 (.82)	16 (1.33)	12 (3.32)	10 (5.37)
10	18 (.82)	14 (2.09)	12 (3.32)	10 (5.37)
12	16 (1.33)	14 (2.09)	10 (5.37)	8 (8.37)
14	16 (1.33)	12 (3.32)	10 (5.37)	8 (8.37)
16	16 (1.33)	12 (3.32)	10 (5.37)	8 (8.37)
18	14 (2.09)	12 (3.32)	8 (8.37)	8 (8.37)
20	14 (2.09)	12 (3.32)	8 (8.37)	6 (13.30)
22	14 (2.09)	10 (5.37)	8 (8.37)	6 (13.30)
24	14 (2.09)	10 (5.37)	8 (8.37)	6 (13.30)
26	12 (3.32)	10 (5.37)	8 (8.37)	6 (13.30)
28	12 (3.32)	10 (5.37)	6 (13.30)	4 (21.29)
30	12 (3.32)	10 (5.37)	6 (13.30)	4 (21.29)

## DIRECTIONAL CONTROL VALVE OPTIONS

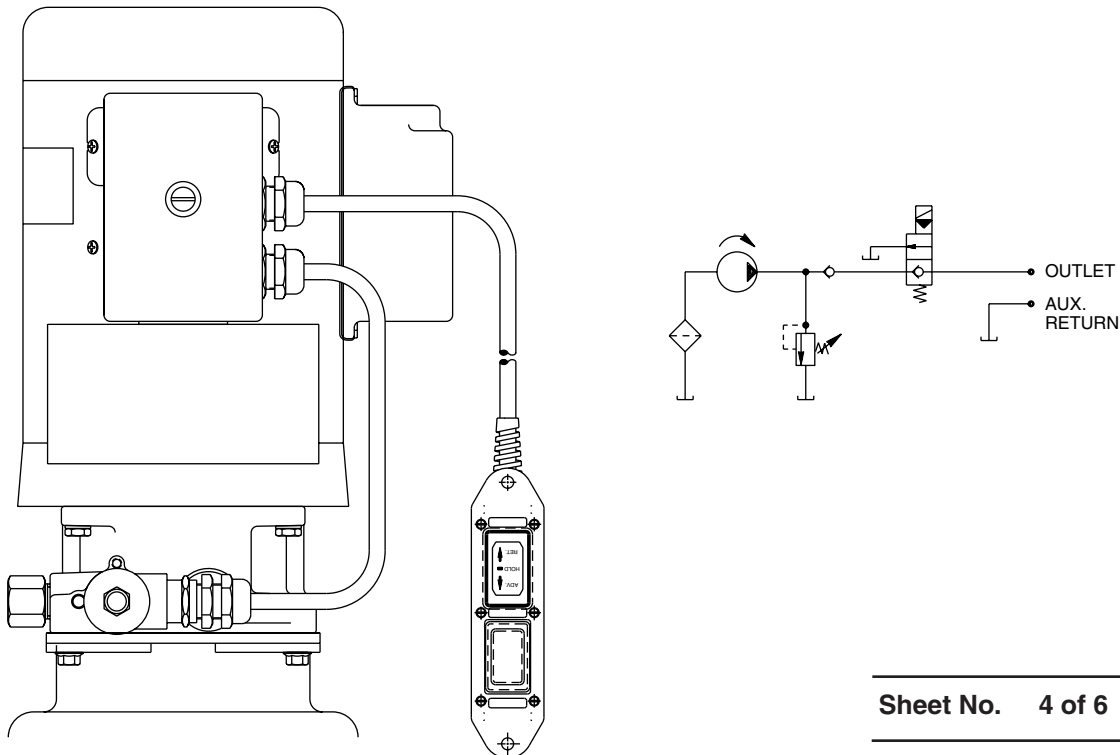
### 2-Position, 2-Way Manual Valve Used With Single-acting Cylinder

1. This valve is spring-loaded to the "closed" position.
2. Activate the pump unit to advance the cylinder.
3. When the cylinder has advanced to the desired position, deactivate the switch or remote switch, or turn the pump unit OFF. The cylinder will HOLD pressure.
4. To retract the cylinder, push the valve control handle towards the reservoir.



### 2-Position, 2-Way Solenoid Valve Used With Single-acting Cylinder

1. This valve is normally "closed".
2. Start the pump unit by activating the appropriate switch on the remote control.
3. When the cylinder has advanced to the desired position, deactivate the switch. The cylinder will hold pressure.
4. To retract the cylinder, activate the appropriate switch on the remote control.



## PREVENTIVE MAINTENANCE



**WARNING:** To help prevent personal injury,

- Disconnect the pump from the power supply before performing maintenance or repair procedures.
- Repairs and maintenance are to be performed in a dust-free area by a qualified technician.

### Checking The Hydraulic Fluid And Filling The Reservoir

The hydraulic fluid level should be checked after initial set-up and after each ten hours of use.

1. Thoroughly clean the area around the filler cap with a clean cloth to prevent contamination of the hydraulic fluid.
2. Cylinder(s) must be fully retracted and the power supply disconnected.
3. Remove the filler cap and insert a clean funnel with filter. Fill to proper level as instructed in “Filling The Pump Reservoir” under Set-up Instructions.
4. Replace filler cap.
5. The frequency of fluid changes will depend upon the general working conditions, severity of use, and overall cleanliness and care given the pump. Three hundred hours of use under general shop conditions is considered a standard change interval. Drain, clean, and refill the reservoir with a high grade hydraulic fluid.

### Maintenance Cleaning

**IMPORTANT:** Never use a high pressure washer to clean hydraulic components!

1. Keep the pump's outer surface as free from dirt as possible.
2. The breather-hole in the filler cap must be clean and unobstructed at all times.
3. Equipment connected to the pump must be kept clean.
4. Use a high grade hydraulic fluid in this pump. Change as recommended (every 300 hours). Some conditions may require the use of different viscosity hydraulic fluids.

### Draining And Cleaning The Reservoir

**IMPORTANT:** Clean the pump exterior before the pump interior is removed from the reservoir.

1. Remove the screws fastening the motor and pump assembly to the reservoir. **IMPORTANT: Do not damage the gasket or pump filter or pressure regulating valves when lifting the pump and motor off the reservoir.**
2. Clean the inside of the reservoir and clean the filter.
3. Place the pump and motor assembly back onto the reservoir, and secure with machine screws.
4. Fill the reservoir with a clean, high grade hydraulic fluid (refer to “Filling The Pump Reservoir” under Set-up Instructions for proper fluid level for your pump).




## TROUBLE-SHOOTING GUIDE

**WARNING**

- To help prevent personal injury, any repair work or trouble-shooting must be done by qualified personnel familiar with this equipment.
- Use the proper gauges and equipment when trouble-shooting.

**NOTE:**

- For a detailed parts list or to locate a Power Team Authorized Hydraulic Service Center contact your nearest Power Team facility.
- It is best to check for system leaks by using a hand pump and applying pressure to the suspect area. Watch for leaking fluid and follow it back to its source. Never use your hand or other body parts to check for a possible leak.

PROBLEM	CAUSE	SOLUTION
Electric motor does not run	<ol style="list-style-type: none"> <li>1. Pump not turned ON.</li> <li>2. Unit is not plugged in.</li> <li>3. No voltage supply.</li> <li>4. Broken lead wire or defective power cord plug.</li> <li>5. Overheated motor has caused overcurrent protection to disengage.</li> </ol>	<ol style="list-style-type: none"> <li>1. Set switch to "ON" position.</li> <li>2. Plug in unit.</li> <li>3. Check line voltage. Check reset button or fuse on power panel.</li> <li>4. Contact a Power Team Authorized Hydraulic Service Center.</li> <li>5. Wait for motor to cool before restarting.</li> </ol>
 <b>WARNING:</b> To help prevent personal injury, disconnect power supply before removing cover. Any electrical work should be performed by a qualified electrician.		
Electric motor will not shut off.	<ol style="list-style-type: none"> <li>1. Defective motor controls.</li> </ol>	<ol style="list-style-type: none"> <li>1. Disconnect from power supply and contact a Power Team Authorized Hyd. Service Center.</li> </ol>
Electric motor stalls, surges, overheats or will not start under a load.	<ol style="list-style-type: none"> <li>1. Low voltage or electrical cord size too small.</li> </ol>	<ol style="list-style-type: none"> <li>1. Refer to the "Electric Pump" information under "Pump Operation" section.</li> </ol>
Pump is not delivering fluid or delivers only enough fluid to advance cylinder(s) partially or erratically.	<ol style="list-style-type: none"> <li>1. Fluid level too low.</li> <li>2. Air in system.</li> <li>3. Cold fluid or fluid too viscous.</li> <li>4. Reservoir capacity is too small for the size of cylinder(s) used.</li> <li>5. Three phase motor rotating in wrong direction.</li> <li>6. Vacuum in reservoir.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill reservoir according to directions "Filling The Pump Reservoir" under "Set-up Instructions" section.</li> <li>2. Refer to the section titled "Bleeding the System" under "Set-up Instructions" section.</li> <li>3. Hydraulic fluid is of a higher viscosity than necessary. Change to a lighter fluid.</li> <li>4. Use smaller cylinder(s) or larger reservoir.</li> <li>5. Refer to electrical schematic on motor.</li> <li>6. Check for plugged vent in filler plug.</li> </ol>

## **TROUBLE-SHOOTING GUIDE CONTINUED -**

PROBLEM	CAUSE	SOLUTION
<b>Pump builds pressure but cannot maintain pressure.</b>	1. External leaks.	1. Seal leaking pipe fittings with pipe sealant. Replace leaking pipes or hoses.
	2. Internal or external leakage on hydraulic cylinder.	2. Remove the cylinder from pump. If the pump builds and maintains full pressure, the cylinder is defective. Contact a Power Team Authorized Hydraulic Service Center.
	3. Leaking control valve or check valve.	3. Contact a Power Team Authorized Hyd. Service Center.
<b>Pump will not build full pressure.</b>	1. Faulty pressure gauge.	1. Calibrate gauge.
	2. Check for external leakage.	2. Seal faulty pipe fitting with pipe sealant. Replace leaking pipes or hoses.
	3. Internal or external leakage on hydraulic cylinder.	3. Remove the cylinder from the pump. If the pump builds full pressure, the cylinder is defective. Contact a Power Team Authorized Hyd. Service Center.
	4. Inadequate power supply.	4. Refer to "Electric Pump" information under "Pump Operation" section.
	5. Leaking control valve or defective pump.	5. Contact a Power Team Authorized Hydraulic Service Center.
<b>Pump delivers excess oil pressure.</b>	1. Faulty pressure gauge.	1. Calibrate gauge.
	2. Relief valve not properly set.	2. Contact a Power Team Authorized Hydraulic Service Center.

## ELECTRICAL SCHEMATICS



**WARNING:** To help prevent personal injury, all electrical work must be done by a qualified electrician.

## North American &amp; International Color Codes

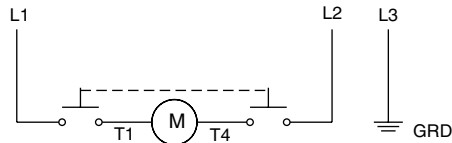
Conductors	North American	International
Line .....	Black .....	Brown
Neutral .....	White .....	Blue
Ground .....	Green .....	Green/Yellow

## GPM &amp; GPN SERIES - 1 PHASE MOTOR

115/208-230 V, 60/50 Hz, 1 PHASE

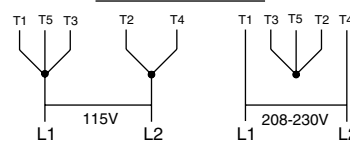
115/230 V, 60 Hz, 1 PHASE

208-230 V, 60/50 Hz, 1 PHASE

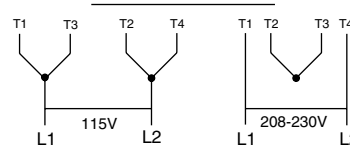


(SEE MOTOR NAMEPLATE OR CHART FOR MOTOR CONNECTIONS ON DUAL VOLTAGE MOTOR)

## P/N 59117 - 1 HP



## P/N 59243 - 2 HP

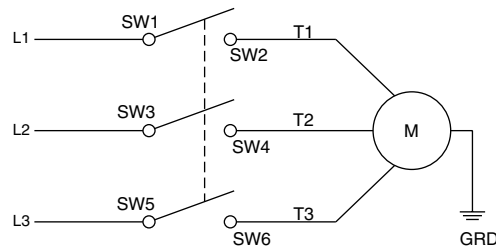


## GPM SERIES - 3 PHASE MOTOR

208-230/460 V, 60 Hz, 3 PHASE

208-230/380-415 V, 50 Hz, 3 PHASE

575 V, 60 Hz, 3 PHASE

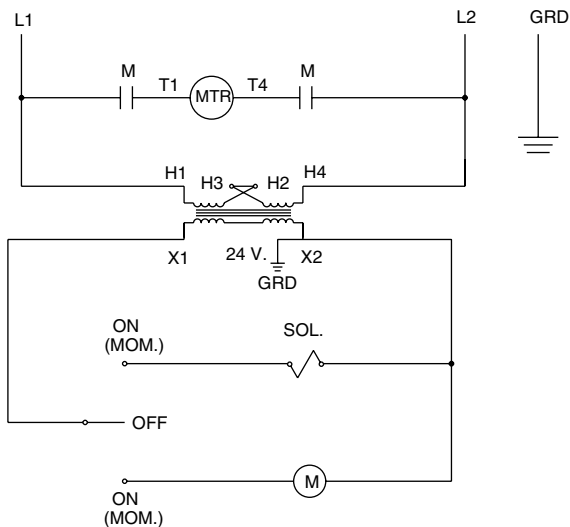


## IMPORTANT

MOTOR ROTATION MUST BE CLOCKWISE (CW) WHEN VIEWED FROM SHAFT END. IF PUMP DOES NOT EXTEND CYLINDER OR BUILD PRESSURE, REVERSE THE MOTOR ROTATION BY INTERCHANGING ANY TWO LINE LEADS.

## GPS SERIES - 1 PHASE MOTOR

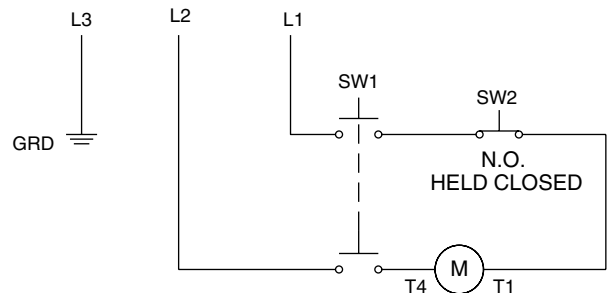
208-230 V., 60/50 Hz., 1 PHASE



REMOTE SWITCH

## GPM SERIES WITH KILL SWITCH

208-230 V., 60/50 Hz.; 1 PHASE



Note: Added schematic above at last revision(s) made to this form.

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