

MODEL D  
**AIR HYDRAULIC PUMP for MANUAL PALLET VALVES**  
HAND/FOOT OPERATED  
Max. Capacity: 4680 PSI

These instructions are intended for end-user applications. Detailed parts lists or service repair instructions can be ordered from the manufacturer if required.

## SAFETY PRECAUTIONS



### WARNING General Operation

- All **WARNING** statements must be carefully observed to help prevent personal injury.
- 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, 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 possibly result in personal injury.
- Do not use the hose to move attached equipment. Stress can damage 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. Consult the manufacturer before painting a hose. Never paint the couplers. Hose deterioration due to corrosive materials can result in personal injury.

### Pump

- Do not exceed 120 PSI air inlet pressure or 4680 PSI hydraulic pressure. Creating pressure beyond rated capacities can result in personal injury.
- Before replenishing the oil level, retract the actuators in the system to prevent overfilling the pump reservoir. An overfill can cause personal injury due to excess reservoir pressure created when workholding components are retracted.

### Hydraulic System

- Do not exceed the rated capacities of any component serviced by this pump, Excess pressure can result in personal injury.

### Air Supply

- Shut off and disconnect the air supply when the pump is not in use or before breaking any connection in the system.

## PREPARATION & SET-UP

### Air Supply Connections

Remove the thread protector from the air inlet of the pump. Select and install the thread fittings that are compatible with your air supply fittings. The pumps air inlet has 1/4 NPT female threads. The air supply should be capable of providing 20 CFM at 120 PSI to obtain the rated hydraulic output. An air filter/regulator/lubricator (not included) is required to properly control this pump. Air pressure should be adjustable and regulated from 40 PSI to a maximum of 120 PSI. See Figure 1.



#### WARNING

To help prevent personal injury, all hose connections must be tightened with the proper tools before operating the pump.

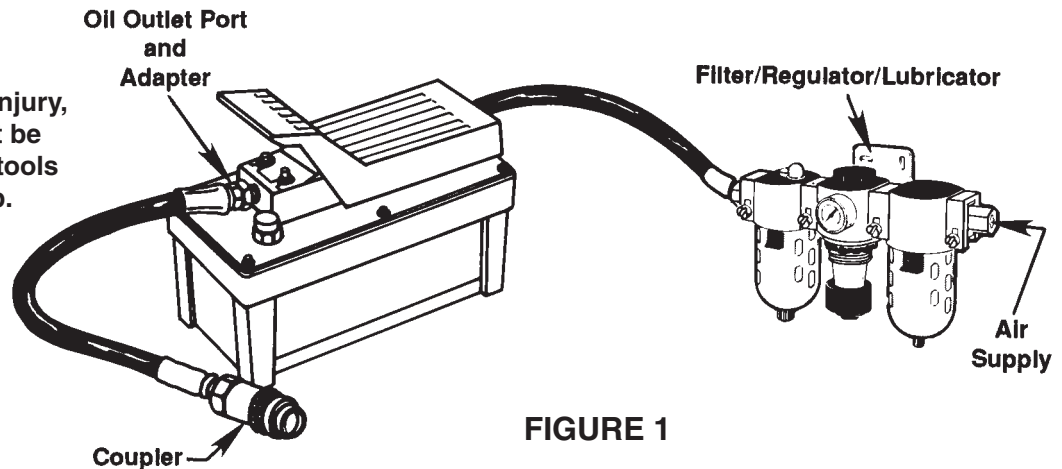


FIGURE 1

### Hydraulic Connections

Clean all the areas around the oil ports of the pump and coupler. Inspect all threads and fittings for signs of wear or damage, and replace as needed. Clean all hose ends, couplers and union ends. Remove the thread protector from the hydraulic oil outlet. Flush out the hose using clean solvent or hydraulic oil. Connect the hose assembly to the hydraulic oil outlet using the adapter supplied. Connect the hydraulic coupler to the other end of the hose. See Figure 1. **IMPORTANT: Seal all external pipe connections with a high quality, nonhardening pipe sealant (such as Power Team HTS6).** Teflon tape can also 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 system. Any loose pieces of tape could travel through the system and obstruct the flow of oil or cause jamming of precision-fit parts.

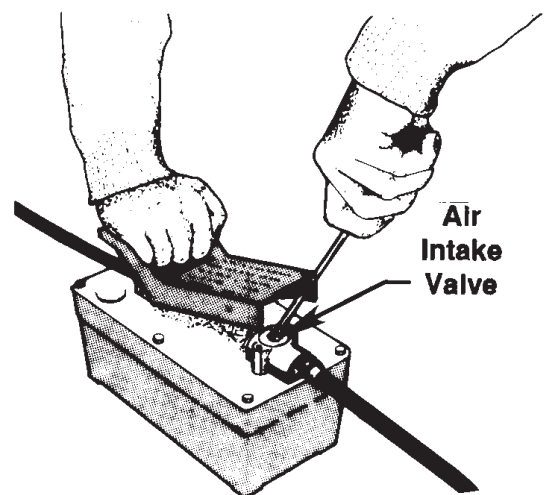
### Reservoir Venting

Before using the pump, carefully remove the shipping tape from around the reservoir fill cap. This cap has a built-in pressure/vacuum relief valve to ensure proper reservoir venting.

### Priming the Pump Unit

If the pump unit must be primed, use the following procedure:

1. Press the release end of the pedal while holding down the air intake valve with a flathead screwdriver. The air intake valve is located directly under the pedal in the area marked PUMP. The valve is depressed simultaneously with the RELEASE area of the pedal during priming. See Figure 2.
2. Allow the pump to cycle approximately 15 seconds.
3. Remove the screwdriver, and press the pump end of the pedal once more.
4. If pressure builds, the pump has been successfully primed. If the pump does not respond, repeat the procedure, joggling the air intake valve while holding the pedal in the RELEASE position.



Operating FIGURE 2

## OPERATION

This pump is intended for use with single-acting manual pallet valves. The coupler supplied connects directly with the coupler on the Hytec #100279 manual pallet valve. The maximum pressure required on the pallet is controlled by regulating the air inlet pressure at the pump. As the pump operates, it builds pressure in the system until its maximum pressure is reached and the pump stalls. The pump's stall (maximum) pressure is approximately 39 times the regulated air inlet pressure. The pump operates effectively in a range from 40 PSI to 120 PSI air pressure. This gives it a hydraulic pressure range of 1560 to 4680 PSI. The air pressure required to achieve your desired hydraulic system pressure can be calculated using this 39:1 ratio, but final adjustments should always be made by monitoring hydraulic pressure at the pallet.

### Operating Cycle using Hytec Manual Pallet Valve:

#### UNCLAMP

1. Place the pump pedal in the RELEASE position, and couple the hose to the pallet.
2. Pull the release handle on the manual pallet valve. The workholding components will release.

#### CLAMP

1. Press and hold the pump pedal in the PUMP position until the pressure gauge on the pallet shows that the proper clamping pressure has been reached, and the pump has stalled.
2. Rock the pump pedal forward to the RELEASE position. This will stop the pump and release the pressure on the hose and coupler while the pallet valve maintains pressure on the pallet.
3. Uncouple the coupler.

## PREVENTIVE MAINTENANCE

**IMPORTANT: Any repair or servicing that requires dismantling the pump must be performed in a dirt-free environment by a qualified technician.**

### Lubrication

It is recommended that an automatic air line oiler be installed in the air inlet line as close to the pumping unit as possible. Set the unit to feed approximately 1 drop of oil per minute to the system. Use SAE No. 10 oil.

### Inspecting the Hydraulic Fluid Level

Check the oil level in the reservoir periodically. The oil level should be within 1/2" of the filler plug with all components retracted. Drain and replenish the reservoir yearly with Power Team hydraulic oil.

### Draining and Flushing the Reservoir

**IMPORTANT: Wipe the pump exterior completely clean before attempting this procedure!**

1. Remove the six screw that fasten the pump assembly to the reservoir. Remove the pump assembly from the reservoir. Do not damage the gasket, filter or safety valve.
2. Clean the inside of the reservoir, and fill with a suitable, nonflammable flushing oil. Rinse the filter clean.
3. Place the pump assembly back onto the reservoir, and secure with two of the six machine screws assembled in opposite corners of the housing.
4. Run the unit for several minutes. Use the same method described in the section titled "Priming the Pump Unit."
5. Drain and clean the reservoir once more.
6. Fill the reservoir with Power Team Hydraulic oil, and place the pump assembly (with gasket) on the reservoir. Assemble the six machine screws and torque to 25 to 30 in. lbs.

**IMPORTANT: Drain and clean the other hydraulic system components (hoses, cylinders, etc.) before reconnecting them to the pump. This will prevent contaminated oil from entering the pump again.**

## Refilling the Reservoir

If additional oil must be added to the reservoir, use only Power Team hydraulic oil. Clean the entire area around the filler plug before adding oil to the reservoir. Remove the filler plug, and insert a clean funnel with filter. All components must be fully retracted and the air supply disconnected when adding the oil to the reservoir. Fill to within 1/2" of the filler plug.

## 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.

All unused couplers should be sealed with t thread protectors. All hose connections must be free of grit and grime. Use Power Team hydraulic oil, in this unit and change the oil at least once a year.

## TROUBLE-SHOOTING GUIDE

Refer to Parts List No. 100756 when using this 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.

PROBLEM	CAUSE	SOLUTION
<p><b>Pump does not reciprocate or stops reciprocating during operation before reaching stall-out pressure</b></p> <p><b>NOTE:</b> The Retaining Ring (Part No. 11034) must be installed with the flat side, or sharp edge, placed toward the retainer as shown.</p> <p style="text-align: center;"><b>FIGURE 3</b></p>	<ol style="list-style-type: none"> <li>1. Broken return spring or retaining ring</li> <li>2. Air piston screws are loose</li> <li>3. Sticky shuttle valve                             <ul style="list-style-type: none"> <li>(A) Swollen O-ring</li> <li>(B) Swollen bumper</li> <li>(C) Broken spring</li> <li>(D) Excess oil in shuttle chamber</li> </ul> </li> <li>4. Tight air piston                             <ul style="list-style-type: none"> <li>(A) Swollen O-rings</li> </ul> </li> <li>5. Air leakage                             <ul style="list-style-type: none"> <li>(A) Faulty air piston seals</li> <li>(B) Defective bumper</li> </ul> </li> </ol>	<ol style="list-style-type: none"> <li>1. Replace defective par(s) (See Figure 3.)</li> <li>2. Torque to 50-55 in. lbs.</li> <li>3.                             <ul style="list-style-type: none"> <li>(A) Replace O-ring</li> <li>(B) Replace bumper</li> <li>(C) Replace</li> <li>(D) Clean and reseal parts</li> </ul> </li> <li>4.                             <ul style="list-style-type: none"> <li>(A) Replace O-rings to reduce friction</li> </ul> </li> <li>5.                             <ul style="list-style-type: none"> <li>(A) Check and replace if defective</li> <li>(B) Check and replace if defective. Inspect sealing surface.</li> </ul> </li> </ol>
<p><b>Pump reciprocates but no oil delivery</b></p>	<ol style="list-style-type: none"> <li>1. Low oil level</li> <li>2. Pump not primed</li> <li>3. Oil filter contaminated</li> <li>4. Defective oil inlet check</li> </ol>	<ol style="list-style-type: none"> <li>1. Refill as instructed in Maintenance Section</li> <li>2. Prime pump as instructed in Preparation &amp; Set-up Section.</li> <li>3. Clean filter with a suitable flushing fluid</li> <li>4. Replace</li> </ol>
<p><b>Clamps advance to desired stroke but pump does not build desired hydraulic pressure (air motor running)</b></p>	<ol style="list-style-type: none"> <li>1. Oil level too low</li> <li>2. Leaky connection or hose</li> <li>3. Defective oil inlet check</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill reservoir to within 1/2" of filler cap</li> <li>2. Tighten connections or replace hose</li> <li>3. Replace</li> </ol>

<b>PROBLEM</b>	<b>CAUSE</b>	<b>SOLUTION</b>
<b>Pump will not build to maximum pressure (air motor stopped running)</b>	<ol style="list-style-type: none"> <li>1. Inadequate air supply</li> <li>2. Faulty gauge</li> </ol>	<ol style="list-style-type: none"> <li>1. Check air supply. Hydraulic pressure will be approximately 39 times the air inlet pressure.</li> <li>2. Replace gauge</li> </ol>
<b>Low oil delivery (cylinder extends slowly)</b>	<ol style="list-style-type: none"> <li>1. Inadequate air supply</li> <li>2. Contamination in air inlet port</li> <li>3. Clogged oil filter</li> <li>4. Entrapped air in hydraulic system</li> <li>5. Inlet ball check is not functioning properly</li> </ol>	<ol style="list-style-type: none"> <li>1. Check air supply -20 CFM minimum 100 PSI is required to achieve full speed</li> <li>2. Thoroughly clean air inlet and air side of pump. Clean slot in air cylinder tube completely.</li> <li>3. Clean the filter with a suitable flushing solution</li> <li>4. Bleed system of air as instructed in Maintenance Section</li> <li>5. Reseat or replace ball check</li> </ol>
<b>Pump builds pressure but will not hold system pressure</b>	<ol style="list-style-type: none"> <li>1. Loose or cross-threaded connections</li> <li>2. Outlet check ball not sealing properly</li> <li>3. Defective seals</li> <li>4. Defective release mechanism</li> </ol>	<ol style="list-style-type: none"> <li>1. Check for leakage and re-fit if necessary</li> <li>2. Reseat body and /or replace ball</li> <li>3. Replace seals</li> <li>4. Check and replace if defective</li> </ol>
<b>Pump will continue to run slowly even after desired pressure is reached</b>	<ol style="list-style-type: none"> <li>1. Inlet ball check is not holding</li> <li>2. Defective valve</li> <li>3. Defective clamps</li> <li>4. Faulty air piston seals</li> </ol>	<ol style="list-style-type: none"> <li>1. Reseat ball and replace parts if necessary</li> <li>2. Replace valve</li> <li>3. Replace clamps</li> <li>4. Check and replace if defective</li> </ol>
<b>Excess oil spray from muffler</b>	<ol style="list-style-type: none"> <li>1. Air lubricator is set too rich</li> <li>2. U-cup seal on high pressure piston is leaking</li> <li>3. Copper washer seal for piston cylinder is leaking</li> <li>4. Gaskets are leaking</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust</li> <li>2. Replace seal</li> <li>3. Replace washer and torque piston cylinder to 90/100 ft. lbs. oiled</li> <li>4. Replace gaskets</li> </ol>