

AIR HYDRAULIC PUMP

Read and carefully follow these instructions. Most problems with new equipment are caused by improper operation or installation.



WARNING

To help prevent personal injury, all warning statements must be observed.

SAFETY PRECAUTIONS

Hydraulic Hoses

- Before operating the pump, all hose connections must be tightened using the proper tools. Do NOT overtighten. Connections need only be secure and leak-free. Overtightening may cause premature thread failure or may cause high pressure fittings to split at pressures lower than their rated capacities.
- If a hydraulic hose ever ruptures, bursts, or needs to be disconnected, immediately shut off the pump. Never attempt to grasp a leaking hose under pressure with your hands. The force of escaping hydraulic fluid could cause serious injury.
- Do not subject the hose to potential hazard such as fire, extreme heat or cold, sharp surfaces, 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 may 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. Consult the manufacturer before painting a hose. NEVER paint the couplers. Hose deterioration due to corrosive materials may 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 may result in personal injury.
- Before replenishing the oil level, retract the system to prevent overfilling the pump reservoir. An overflow may cause personal injury due to excess reservoir pressure created when the cylinders are retracted.

Cylinder

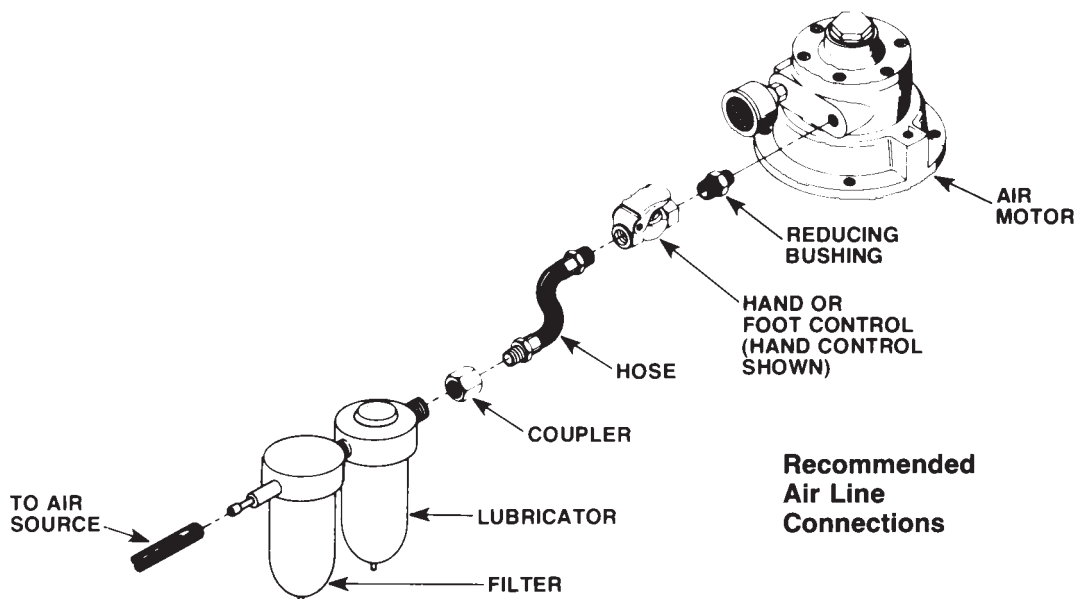
- Do NOT exceed the rated capacities of the cylinders because excess pressure may result in personal injury.
- Do NOT set poorly-balanced or off-center loads on a cylinder because the load may tip and cause personal injury.

Air Motor

- Disconnect the air supply when the pump is not in use or when breaking any connection in the hydraulic system.
- It is recommended that a shut-off valve or quick disconnect be installed in the air line to the pump unit. Close the shut-off valve before connecting the air line to the pump.

OPERATING INSTRUCTIONS

1. **INSTALL the AIR FITTINGS:** Remove the thread protector from the air inlet, and install the air supply fittings (not included) as shown. Minimum air supply must be 50 CFM and 80 PSI, with 100 PSI being the maximum. Secure your pump fitting to the air supply.



IMPORTANT: Seal all external pipe connections with a high-quality, nonhardening thread sealant, such as Power Team HTS6. PTFE 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 system. Any loose pieces of tape could travel through the system and obstruct the flow of oil or cause jamming of precision-fit parts.

2. **ASSEMBLE the HOSES:** Clean the areas around the oil ports of the valve and hydraulic cylinders, and remove the plastic thread protectors. Clean all hose ends, couplers, or union ends. Inspect all threads and fittings for signs of wear or damage and replace as needed.
3. **FILL the RESERVOIR:** Remove the filler cap and insert a clean funnel. Fill the reservoir with hydraulic oil to within 1/2" of the top of the filler hole. Replace the filler cap with the breather hole open.

NOTE: The pump has been shipped without oil in the reservoir. Power Team hydraulic oil has been shipped with the pump, and if additional oil is required, use only Power Team hydraulic oil.

4. **BLEED AIR from the SYSTEM:** Position the hydraulic cylinder at a lower level than the pump and completely retract any load from the cylinder. Remove the filler plug. Run the hydraulic system through several cycles of extending and retracting the cylinder, free of any load. Check the oil level in the reservoir and add oil if needed.

PREVENTIVE MAINTENANCE

IMPORTANT:

Any repair or servicing which requires dismantling the pump should be performed in a dirt-free environment by a qualified technician.

Disconnect the pump from the air supply before performing maintenance or repair procedures.

LUBRICATION of the AIR DRIVEN MOTOR: If the pump is operated on a continuous duty cycle or at maximum speed for an extended period, an automatic air line oiler is recommended. Install the oiler in the air inlet line as close to the pumping unit as possible. Adjust the oiler to feed 1-3 drops of SAE #10 oil per minute (one drop for every 50-75 CFM of air) into the system.



BLEEDING AIR from the SYSTEM: After use, air may accumulate in the hydraulic system if the reservoir level has been permitted to get too low. This air will cause the cylinder to respond in an unstable or slow manner. To remove this air:

- A. If the pump is positioned above the cylinders:
 1. The hydraulic cylinder(s) must be positioned on their side with the couplers pointed upward.
 2. Remove any load from the cylinder(s) and cycle the hydraulic system through several cycles (fully extend and retract the cylinders).
- B. If the pump is located below the cylinders:
 1. Loosen cap screw on top of cylinders and start pump.
 2. When oil replaces the air escaping (bleeding) from loosened screw in cylinder, stop pump and retighten the screws.

DRAINING and FLUSHING the RESERVOIR: The reservoir should be drained, flushed, and refilled with Power Team hydraulic oil after approximately 300 hours of use.

1. Clean the pump exterior before the pump unit is removed from the reservoir.
2. Remove the screws that hold the motor and pump assembly to the reservoir. **Important: Do not damage the gasket or bump the filter or hydraulic pressure regulating valves when lifting the pump and motor off the reservoir.**
3. After disposing of the used oil, clean the inside of the reservoir and fill with a suitable flushing oil. Rinse the filter clean.
4. Place the pump and motor assembly back onto the reservoir and secure it with two machine screws assembled on opposite corners of the housing.
5. Connect a hose to the advance port of the valve and place the other end of the hose into the oil filler plug hole.
6. Run the pump on "advance" for several minutes.
7. Remove the motor and pump assembly from the reservoir. Drain and clean the inside of the reservoir.
8. Fill the reservoir with Power Team hydraulic oil. Place the pump and motor assembly (with gasket) back on the reservoir and tighten the screws securely and evenly.

HYDRAULIC FLUID LEVEL

- Check the oil level in the reservoir after each 10 hours of use.
- Proper oil level is within 1/2" of the filler plug when all cylinders are retracted.

ADDING OIL to the RESERVOIR

- Use only Power Team hydraulic oil (215 SSu @ 100° F).
- Clean the entire area around the filler plug before removing the filler plug.
- Use a clean funnel with filter when adding oil.
- Cylinder(s) must be fully retracted and the power supply disconnected when adding oil to the reservoir.

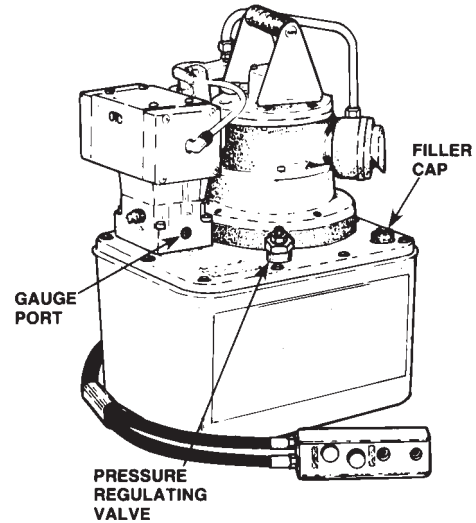
MAINTENANCE CLEANING

- Keep the outer surface of the pump, all hose connections and any equipment hooked up to the pump as free of dirt and oil as possible.
- The breather hole in the filler cap must be kept clean and unobstructed at all times.
- All unused couplers are to be sealed with thread protectors.
- Change oil as recommended.

ACCESSORY INSTALLATION

Hydraulic Gauge

1. Remove the pipe plug from the gauge port.
2. Remove the four cap screws holding the valve to the pump plate and lift the valve off the pump plate. Do NOT kink the air lines.
3. Apply Power Team HTS6 thread sealant or PTFE tape to the threads of the gauge. Thread the gauge into the gauge port and tighten with a wrench.
4. Assemble the valve back onto the pump plate.



Pressure Regulating Valve

The pressure regulating valve can be adjusted to by pass oil at a desired pressure setting while the pump continues to run.

1. Loosen the locknut on the pressure regulating valve. Turn the adjusting screw a few turns counterclockwise (CCW) to decrease the pressure setting to a lower than desired pressure.

Note: For easy adjustment of the pressure regulating valve, always adjust the pressure by INCREASING it to an appropriate pressure setting.

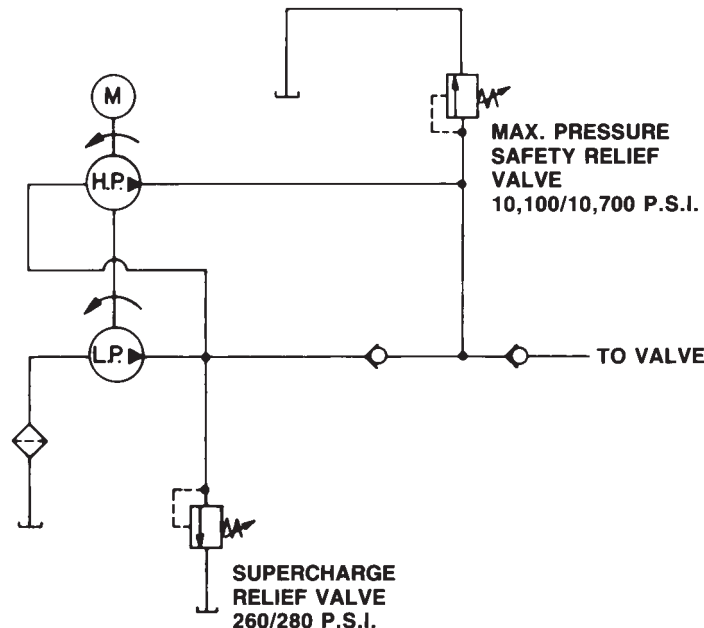
2. Connect the pump air supply and place the remote flow control valve in the advance position.
3. Slowly turn the adjusting screw in a clockwise (CW) direction to gradually increase the pressure setting. When the desired pressure setting is reached, lock the adjusting screw in position by tightening the locknut.

TROUBLESHOOTING GUIDE

⚠ WARNING

- To prevent injuries, any repair work or troubleshooting must be done by qualified personnel familiar with this equipment.

HYDRAULIC SCHEMATIC



NOTE:

- Use the proper gauges and equipment when troubleshooting.
- Depending on the pump version, it is often best to check for leaks by using a hand pump and applying pressure to the suspect area without the motor running. Watch for leaking oil and follow it back to its source.
- Plug the outlet ports of the pump when checking for leakage to determine if the leakage is in the pump or if it is in the cylinder or tool.
- Refer to Parts List #100716 or #100717 and the hydraulic schematic when using this troubleshooting guide.

PROBLEM	CAUSE	SOLUTION
Pump is not delivering oil or delivers only enough oil to advance ram(s) partially or erratically	(1) Oil level too low	(1) Fill reservoir to within 1/2" of filler plug with all cylinders retracted.
	(2) Loose fitting coupler to ram	(2) Inspect couplers to insure that they are completely coupled. Occasionally couplers have to be replaced because the ball-check does not stay open due to wear.
	(3) Air in system	(3) Bleed the system.
	(4) Air leak in suction line	(4) Check and tighten the suction line.
	(5) Dirt in pump or filter plugged	(5) Pump filter should be cleaned and if necessary, pump should be dismantled and all parts inspected and cleaned.
	(6) Oil is bypassing through the double-acting cylinder	(6) By removing the ram and capping the hoses, the pump and valve can be checked. Observe whether or not the pump will hold pressure.
	(7) Cold oil or oil is too heavy (Hydraulic oil is of a higher viscosity than necessary)	(7) Change to lighter oil
	(8) Relief valve or low pressure unloading valve out of adjustment	(8) Readjust as needed.
	(9) Reservoir capacity is too small for the size of the cylinder(s) used	(9) Use smaller cylinder(s) or larger reservoir.
	(10) Defective directional valve	(10) Inspect all parts carefully and replace if necessary.
	(11) Sheared drive shaft key(s)	(11) Replace
	(12) Motor rotating in wrong direction	(12) Air line connected into wrong port.
	(13) Vacuum in reservoir	(13) check for plugged vent in filler plug.
	(14) Low pressure pump worn	(14) Clean pump parts, replace worn gerotor set, repair or replace the pump housings.



PROBLEM	CAUSE	SOLUTION
Pump builds pressure but cannot maintain pressure	<p>(1) Check to see if there are any external leaks. If no oil leakage is visible, the problem is internal. If using a double-acting cylinder, remove it from the system to insure that the leak is not in the cylinder.</p> <p>(2) To test for a leaking control valve, lift the pump from the reservoir but keep the filter in the oil. Remove the drain line to see if the oil is leaking from the valve. If the valve is not leaking, the internal check valve could be leaking. Refer to the note concerning checking for oil leaks at the beginning of this Troubleshooting Guide.</p>	<p>(1) Reseal leaking pipe fittings with pipe sealant.</p> <p>(2) Clean, reseal or replace control valve parts. If the internal check valve(s) are leaking, the pump must be dismantled and the seat areas repaired, poppets replaced, shear seals relapped, etc.</p>
Pump will not build full pressure	<p>(1) Faulty pressure gauge</p> <p>(2) Check for external leakage</p> <p>(3) Check the external pressure regulator. Check the relief valve setting.</p> <p>(4) Look for internal leakage in double-acting cylinders.</p> <p>(5) Check for leaks in the flow control valve</p> <p>(6) Inspect the pump for internal leakage. Check high pressure pump inlet or outlet ball checks.</p> <p>(7) Sheared Key(s)</p> <p>(8) Inadequate air pressure</p>	<p>(1) Calibrate gauge</p> <p>(2) Seal any faulty pipe fitting with pipe sealant.</p> <p>(3) Lift the pump from the reservoir but keep the filter immersed in oil. Note the pressure reading when the relief valve begins to open up. If functioning normally, it should start to leak off at relief valve pressure.</p> <p>(4) Remove the cylinder from the pump. If the pump builds full pressure, the cylinder is defective.</p> <p>(5) Clean and reseal or replace parts.</p> <p>(6) Same procedure as above but look for leaks around the entire inner mechanism. If there are no visible leaks the high pressure pump subassembly may be leaking. Remove all parts. Check the valve head assembly body for any damage to the seat area. Clean and reseal if necessary. Inspect for damage and replace parts if necessary, then reassemble.</p> <p>(7) Replace</p> <p>(8) Increase air pressure.</p>



PROBLEM	CAUSE	SOLUTION
Cylinder(s) will not retract	(1) Check the system pressure; if the pressure is zero, the control valve is releasing pressure and the problem may be in the cylinders, (mechanical linkage connected to cylinders), or quick-disconnect couplings. (2) Defective valve (3) Inadequate air pressure	(1) Check the cylinders for broken return springs and check couplers to insure that they are completely coupled. Occasionally couplers have to be replaced because one check does not stay open in the coupled position. (2) Check valve operation and inspect parts. Replace if necessary. (3) Increase air pressure.
Pump delivers excess oil pressure	(1) Check pressure gauge (2) Relief valve not properly set	(1) Calibrate gauge (2) Reseat the relief valve
