Hy-Pak Manual

Revised Aug 2024

Introduction

This manual provides descriptive operation and maintenance instructions for standard Hydraulic Power Units manufactured by Hyspeco, Inc. Additional information may be obtained by referencing part numbers provided in the bill of materials for your particular unit, or by contacting Hyspeco, Inc. There is also support information available via www.hyspeco.com.

Description

The Hy-Pak includes a steel reservoir, electric motor, hydraulic pump, manifold, relief valve, temp/level switch, cooler, and a return filter. These Hyspeco Hy-Pak power units come pre-plumbed and tested by the Hyspeco Power Unit team, with the safety relief valves set 250-300 psi above the maximum operating pressure rating of the unit.

Installation

I) Preparation For Use

The unit should be installed indoors or covered, and preferably in a clean, dry environment with an ambient temperature of 60 to 100°F. The reservoir can be secured to the floor or base using the four mounting holes located on the reservoir legs.

II) Electric Motor

The electric motor is rated for 230/460//380VAC 3PH 60//50HZ service. Ensure that all wiring and connections are correct for the required voltage and that all wiring is properly secured before starting the unit.

III) Reservoir Filling

The reservoir must be filled with clean fluid, through the filler cap on the reservoir.

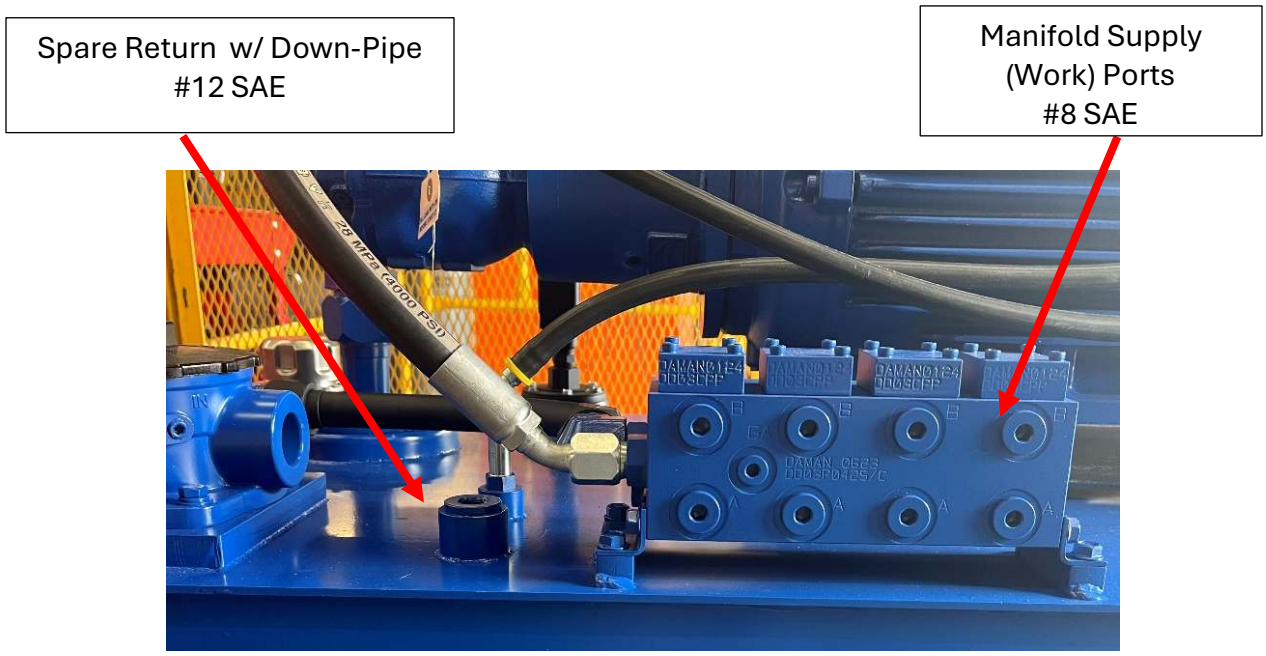
The fluid must be compatible with all seal materials and must comply with the recommendations of the component manufacturers. This should be a high-quality petroleum base hydraulic fluid with a good anti-wear additive package (ISO 46 or ISO 68). Examples of acceptable fluids include Parker Duraclean™, Mobil DTE 25 or DTE 26, Texaco Rando™ HD46 or HD68, or Shell Tellus™ 46 or 68. Your local oil and lubrication supplier should be able to provide a suitable fluid, per the information noted above.

Hyspeco Hy-Paks are not designed or rated for use with water-glycol or high-water content fluids.

The cleanliness of the fluid is very important, and in some cases, even new oil out of a drum or tote does not meet the required cleanliness specification. The recommended cleanliness level for all Hy-Pak systems is 19/16/13 (per ISO 4406:99). It is recommended that the transfer of fluid into the Hy-Pak reservoir be accomplished by means of a transfer pump with a 10-micron filter. A filter cart is ideal for this purpose, and most Hyspeco locations have carts available for rental, if required.

IV) Supply and Return Connections

Before operation, all interconnecting plumbing between the power unit and the actuators should be tight and secure. All open ports should be capped or plugged with the proper fittings.



V) Directional Valves

The Hy-Pak comes with cover plate(s) installed on the manifold in all valve positions. The proper valves for the desired functionality should be installed on each station, as desired. Unused stations can remain capped. (Your Hyspeco representative can help you with valve selections for your specific application.) Any valve(s) should be installed with the proper bolts before starting the power unit.

(*For Hy-Pak F-series Single Valve Station Units Only*: For systems utilizing remotely mounted control valves, leave the cover plate installed on the manifold and utilize the A port for the system supply (P) connection, and the B port for the return (T) connection. For on-board single valve control, remove the cover plate from the manifold and install the desired ISO interface valve configuration.

Contact Hyspeco for control valves and bolt kits, which can be ordered separately.

VI) Temperature/Level Switch Wiring – (Use of the temp/level switch is optional)

The temperature/level switch is a standard dry contact switch, with an SPDT configuration for each function:

Level Function: Red = NC; Orange = NO; Black=Common

Temperature Function: Red/White = NC; Orange/White = NO; Black/White = Common

Electrical Load Ratings:
(Note: Switch can be utilized for AC or DC circuits. Following data is for AC ratings):

Level Switch: 1.0 amp max @ 120VAC (120VA)

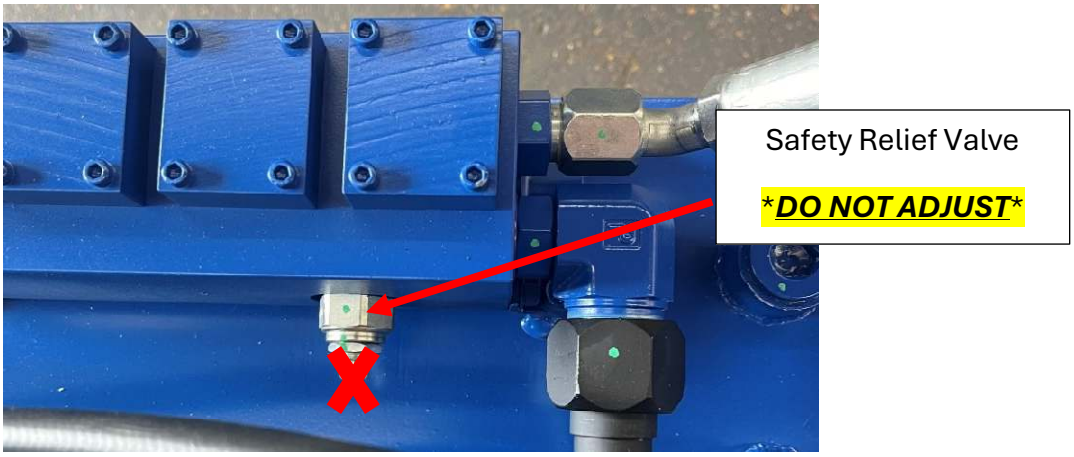
Temperature Switch: 1.0 amp max @ 120VAC (120VA) - Trips @ 140°F/60°C

*(-All noted electrical specifications @ 68^{0}F/20°C)

Start Up Procedure

1. ***Ensure that the case drain on the pump is filled with oil.*** The tee shown below is can be utilized to fill the pump case drain without removing any fittings or hoses.

2. The system safety relief valve is set by Hyspeco before shipment. ***Do not adjust the safety relief valve.*** The relief valve setting should *always* remain at least 250-300 psi *above* the maximum operating pressure.

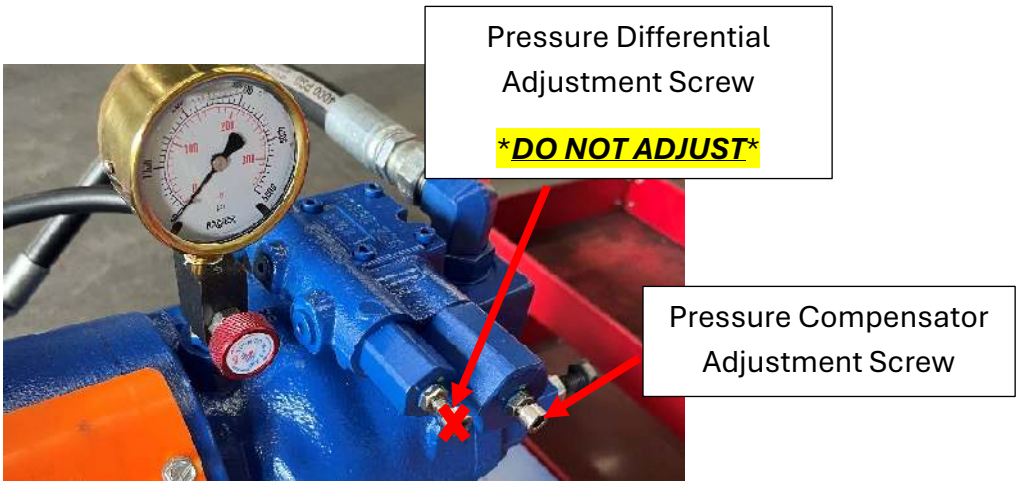


3. Jog the pump motor once and verify that the pump is rotating in the same direction as the arrow tag on the electric motor or pump case. If the direction is incorrect, reverse two (2) of the three (3) motor leads, and recheck the rotation.

4. Jog the pump/motor (3) to (6) times to prime the pump and then allow the pump to run for 1-2 minutes at zero pressure. Check tubing and hoses for any leaks and correct immediately. (Leaks in fittings and tubing can be the result of vibration during shipment.)

5. The units are shipped with the pump pressure compensator set at 1500 psi. If a different maximum operating pressure is desired, utilize the compensator adjustment screw to increase or decrease the setting. ***DO NOT exceed the maximum noted pressure rating of the unit, as noted on the tag***. Exceeding this pressure will result in excessive overheating, and possible system damage.
   Note: The pump must be in a "dead head" condition to perform pressure adjustments. Adjustments cannot be performed with the pump vented to tank.

   The system has a *minimum* operating pressure of 350 psi. Operating at pressures lower than this can cause damage to the pump.



6. After the desired operating pressure is set, recheck the system for leaks. Lock adjustment screws in place.

7. During the start-up sequence, all filters should be monitored closely. Replace any filters element as soon as they begin to go into by-pass as indicated on the visual indicator. (Make sure that system is at operating temperature ~ 100-120°F – before checking element clogging indicators, as cold oil can result in false readings.)

8. After the entire system has been "wetted" with fluid, refill the reservoir to the normal operating level, as noted on the sight-glass. Do not fill above the "high" fill mark.

General Maintenance and Preventative Care

i. Electric motors should be lubricated every 25,000 hours (about every 2.5 to 3 years).
ii. Filters should be kept as clean as possible. Filter elements should be replaced every time the indicator shows it is necessary. (One spare filter element is included with purchase/delivery of every new Hy-Pak unit.) When removing filter elements, ensure they are still intact. If they are damaged, the filter should be checked/changed more frequently.
iii. The reservoir's oil level should be maintained between the high and low marks on the reservoir sight-glass. A temp/level switch is included as standard on all Hy-Pak units which can be utilized to provide warnings or shut-off the system on low level or high temperature conditions. The oil level should be checked regularly, as part of a preventative maintenance program.
iv. Oil samples should be performed periodically to ensure that the oil cleanliness level is being maintained within acceptable levels, and that the oil additive package is still adequate. This testing will help determine when fluid replacement is required. Only fill the reservoir with clean oil. Dirty fluid should ***never*** be added to the system. Use clean equipment when filling the reservoir. A filter cart is highly recommended.
v. Do not run the system without proper filtration installed.
vi. Never disconnect the heat exchanger from the system. Throughout use of the system, the oil will heat up which may cause component failures or poor operation.

Troubleshooting

Dirty Oil

1. Components not thoroughly cleaned after servicing
2. Inadequate filtration during filling
3. Air breather cap not in place
4. Tank not properly sealed…(ie: open tank penetration points)
5. Open ports ore conductors while performing maintenance
6. Filter dirty or ruptured.

Foaming Oil

1. Tank line not returned below fluid level.
2. Broken or loose down-pipe in reservoir
3. Fluid contaminated with incompatible foreign matter
4. Pump suction leak
5. Lack of anti-foaming additives in the fluid

Moisture in Oils

1. Soluble oil solution splashing into poorly sealed tanks or fill pipes left open.
2. Moisture in cans used to replace fluid in tanks.
3. Extreme temperature differential in certain geographical locations.

Overheating of System

1. Relief valve set too close to compensator pressure setting
2. Continuous operation at relief setting
3. Fluid viscosity too high or too low
4. Excessive internal leakage in components
5. Power unit operating in hot direct sunlight or ambient temperature is too high
6. No air circulation space around reservoir

Foreign Matter Sources in Circuit

1. Interconnecting plumbing and/or hoses not flushed or cleaned before installation
2. Sealing compound, weld spatter, or burrs inside piping or plumbing
3. Improper screening or covers on fill pipes and breathers while filling the reservoir or performing maintenance
4. Open ports or holes on reservoir
5. Leaking cylinder or motor seals

Pumps

Pump Making Excessive Noise

1. Ensure air is not getting into the system from a vacuum leak in the suction line or the pump shaft seal.
2. Check that the shaft coupling is properly aligned and that the set screws are tight.
3. Ensure that proper fluid is being used in the system.
4. Check that the electric motor is wire for the proper pump rotation.
5. The suction line or filler/breather could be plugged. There should be no air bubbles or froth in the oil.

Pump Failure to Move Oil

1. Improper fluid level in the tank
2. Pump not priming from an air leak
3. Shaft not rotating at the proper speed
4. Oil viscosity is too high
5. Shaft rotation is incorrect
6. The pump shaft is disconnected from the electric motor
7. Debris in the pump

Oil Leak Around Pump

1. Shaft seal is worn or damaged
2. Pump housing bolts not torqued properly
3. Pump hose or tubing connections are loose

Excessive Pump Wear or Broken Pump Parts

1. Dirty oil
2. Oil viscosity is too low
3. System pressure is higher than the rated pump pressure
4. Pump misaligned
5. Air is getting into the pump.
6. Seizure from lack of oil
7. Housing bolts over-torqued

Solenoid Valves

Solenoid Failures

1. Voltage is too low
2. Voltage is too high
3. Simultaneous actuation of both solenoids on a double solenoid valve
4. Open connections or a short circuit causing mechanical damage to the leads. Dirty contacts can prevent sufficient current from getting to the solenoid.
5. Silt or contamination preventing the valve spool from moving; thus, causing the solenoid to experience excessive amp draw.
6. Feed lines to the solenoid that are too long may produce a voltage drop preventing the solenoid from actuating.
7. Debris in the solenoid spool may prevent the spool from shifting.

For help trouble shooting your Hy-Pak, please contact Hyspeco or your Hyspeco salesperson.