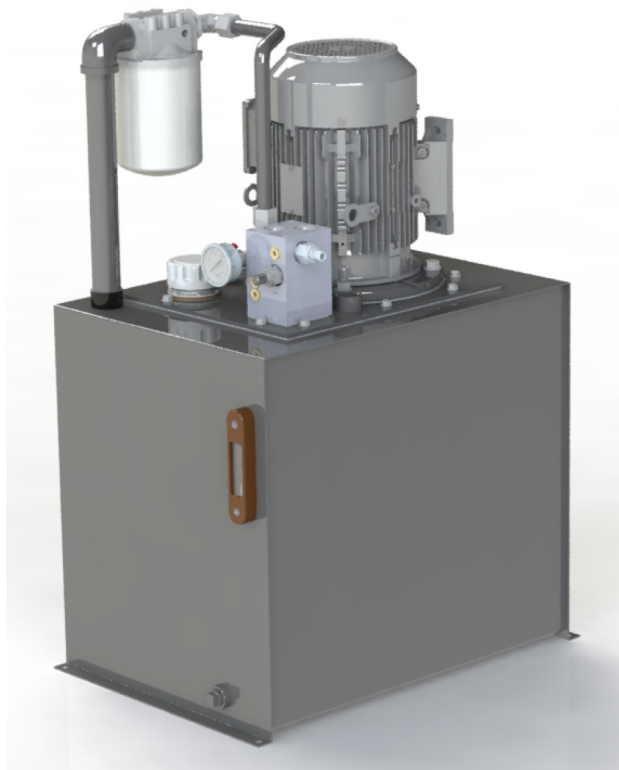


T Series Hi-Lo Units With Double Gear Pump



READ ALL INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO ASSEMBLE, INSTALL, OPERATE OR MAINTAIN THE PRODUCT DESCRIBED. PROTECT YOURSELF AND OTHERS BY OBSERVING ALL SAFETY INFORMATION. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE!

RETAIN INSTRUCTIONS FOR FUTURE REFERENCE.

WARNING: THIS INSTRUCTION MANUAL IS INTENDED FOR USE BY QUALIFIED INDIVIDUALS WITH A WORKING KNOWLEDGE OF HYDRAULIC AND ELECTRICAL PRINCIPLES. PROFESSIONAL INSTALLATION IS RECOMMENDED.

Description

Hi-Lo hydraulic units are typically used when the application requires relatively high flow at low pressure and relatively low flow at high pressure. Typical applications include bearing presses and similar machines where a cylinder extends under light load then must create a large force for a short period of time. The Hi-Lo system provides high flow for the low-pressure portion of the cycle then high pressure at low flow rate for the working portion of the cycle. Since the high flow and high pressure are not required simultaneously, this allows for the use of a smaller prime mover (the electric motor on these units).

The hydraulic power units detailed in this document are designed to operate on 3 phase, AC electric power. Each power unit consists of a pressure balanced gear pump, powder coated vertical reservoir, Premium Efficiency three phase electric motor, P & T ported manifold with Hi-Lo sequence valve, return line filter with by-pass indicator, and a factory set, System Safety Relief valve.

If a directional control valve is required on the hydraulic unit (rather than remotely mounted) the base Hi-Lo manifold will accept one D05 Stack-On body allowing for the creation of a single station, D05 circuit on the unit.

The single station D05 circuit would require the installation of a tandem center (or open center) directional control valve and any required load control valves.

The units can also accommodate remote mounted valving by connecting the P & T ports on the top of the Hi-Lo manifold or the P & T ports on the top of the D05 Stack-On body, to a remote mounted manifold / valve assembly with

an unloader if the directional control valves are to have P ports blocked.

The power units can be coupled via suitable hydraulic lines to a wide variety of hydraulically operated devices. **Proper circuit design must be considered when selecting directional control valves and load control valves to ensure safe and predictable movement of all hydraulic actuators and connected devices.**

Unpacking

Check package for any external signs of damage that may have occurred during transit then unpack the unit and check for physical signs of damage. If components are missing or there is any noticeable damage, please contact the office where the item was purchased.

Specifications

All units have:

- Totally enclosed fan cooled Premium Efficiency electric motor, rated for 60 Hz and usable at some 50 Hz voltages.
- Powder coated reservoir plumbed for vertical only mounting
- Adjustable Safety Relief valve preset at factory
- Aluminum manifold with SAE 10 P&T ports
- Suction strainer at pump inlet
- Return line spin-on type filter with visual by-pass indicator
- Bayonette style filler / breather assembly with strainer basket
- Sight / level / temperature gauge
- Liquid filled pressure gauge with isolator
- Two 1" NPT couplings through top plate
- 3/4" NPT drain port on lower front of reservoir

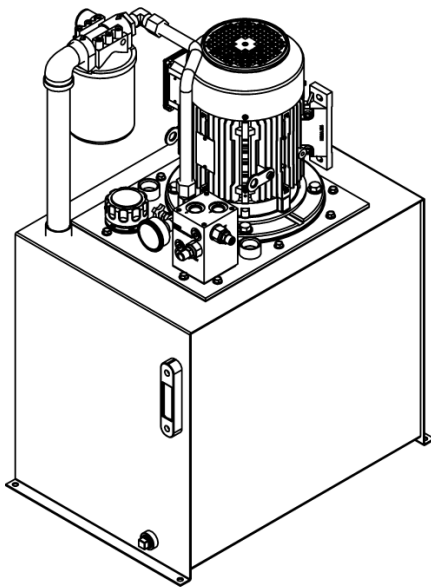


Figure 1 – T92E405C91F4-01

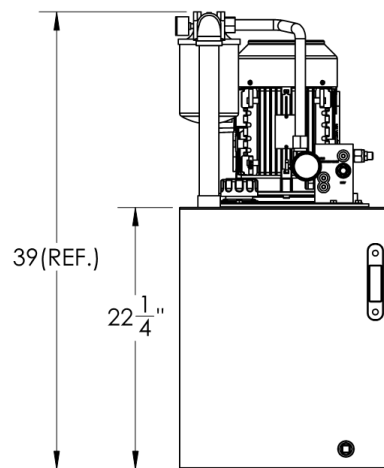
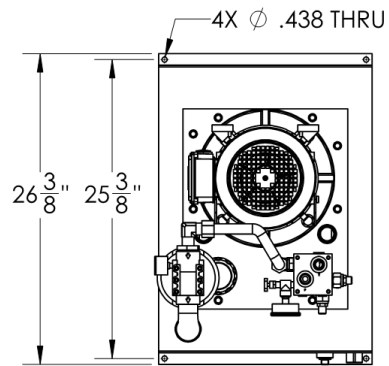


Figure 2 – T92E405C91F1-01 Dimensions

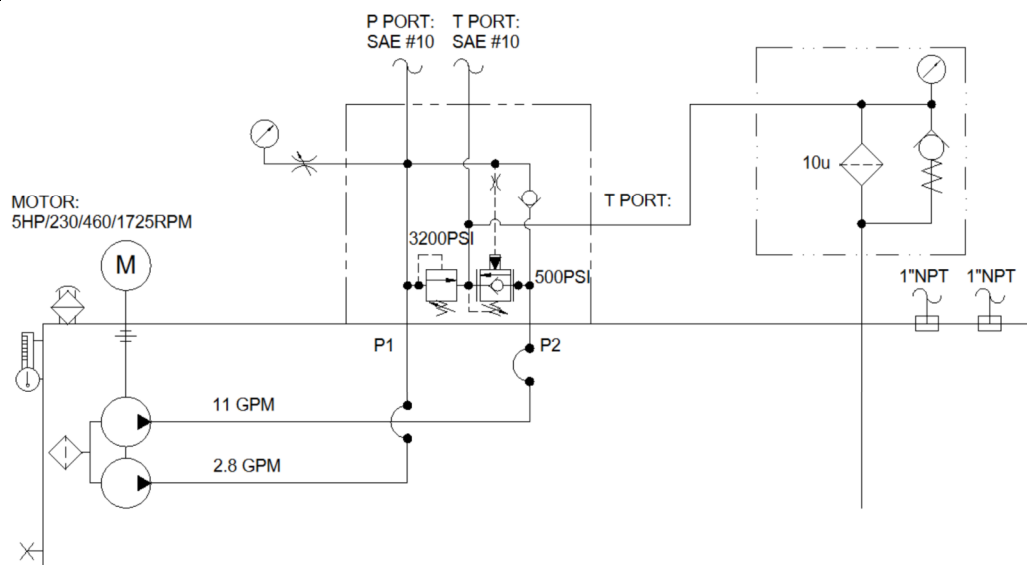


Figure 3 – T92E405C91F4-01 Hydraulic schematic

All the power units are packaged fully assembled and tested. Customer is responsible to fill the reservoir with proper level of a quality hydraulic fluid suitable for use in the intended environment. Customer must also supply and install a directional control valve on the manifold or mounted remote to the manifold.

Installation of Hydraulic Power Unit

1. Select a good location to mount the hydraulic power unit. It should be in a clean, level, dry area with adequate ventilation and preferably near the electric power source.

NOTE: Although the units have totally enclosed fan cooled motors, they still need free air circulation around the motor and reservoir to displace heat. Excessively high operating temperatures will be hazardous and may cause property damage and/or personal injury.

Avoid dusty conditions that could clog the reservoir breather.

2. This hydraulic power unit is designed for vertical mounting with the reservoir feet down and the reservoir breather on the top. Choose a flat, level mounting surface to bolt the reservoir feet to. See unit dimensions for reservoir base bolt pattern.

The hydraulic unit is plumbed for vertical mounting as noted above. Mounting the unit in an inclined plane or any other position will greatly reduce available usable oil in the reservoir. This can cause the hydraulic oil to foam resulting in erratic movement of hydraulic components, and pump failure.

CAUTION

To minimize contamination problems, do not remove plastic shipping plugs from hydraulic unit until you are ready to install hoses and fittings. Do not use Teflon tape. This unit is equipped with SAE O-ring type ports.

3. Make sure that the work area and the hydraulic components are clean and free from dirt, lint, etc
4. Connect the P & T ports on the top of the base Hi-Lo manifold to your remotely mounted directional control valves or install a D05 Stack-On body to the base Hi-Lo manifold and install a suitable tandem center or open center directional control valve to the Stack-On body (along with any required load control valves).
5. Hydraulic lines between the unit and your remote mounted directional control valves or between the unit and any hydraulic actuator (hydraulic cylinder, hydraulic motor, or other device) must be rated for use at pressures at or above the maximum system pressure of your application.

Do not over-tighten fittings.

6. Remove the reservoir breather and fill the hydraulic unit reservoir with a good quality hydraulic fluid. It is recommended that hydraulic fluids have a viscosity of 100 SUS to 350 SUS when operating between 10 deg. F and 140 deg. F. The reservoir should be filled to the upper (blue) line of the sight / level / temperature gauge but not above.
7. Use of a filter cart to add fluid to the reservoir is highly recommended. Do not pour hydraulic fluid directly from a pail or drum as this can result in debris entering the reservoir.
8. Re-install the breather on the reservoir.

Electrical Wiring

1. When wiring the motor, follow all local electrical and safety codes as well as the National electrical codes in your jurisdiction (i.e. NEC, ESA, etc) and all Occupational Safety and Health Act (OSHA) requirements.
2. Make certain that wire size is adequate for horsepower requirements.

NOTE: Voltage drop increases with the length of power cord. Larger wire diameter may be required.

3. Motor nameplate voltage must be available at the motor when it is operating under load. Avoid voltage drop by using adequate wire size.
4. **DOUBLE CHECK ROTATION!** Motor rotation is clockwise facing fan end of motor (which means the motor is wired to turn counter clockwise when facing the shaft of the motor).
5. **Before start-up, ensure an open flow path** for the hydraulic circuit and jog the motor to ensure correct rotation and to prime the pump to ensure adequate lubrication. After the correct motor rotation is confirmed and the fluid is moving freely, motor may powered continuously to operate at full speed.

CAUTION!

Never run the system without adequate levels of hydraulic fluid in the reservoir. New installations will require additional fluid to fill the lines, cylinders etc. so check the reservoir fluid levels frequently during initial operation to ensure adequate fluid level in the reservoir.

6. Keep all electrical lines as short as practical.
7. Never exceed the maximum operating pressure.
8. Do not over-tighten fittings, bolts, etc., as this can damage the units.
9. Provide adequate cooling for the hydraulic oil so as not to allow oil and/or component damage due to excessive temperatures. Excessively high operating temperatures will be hazardous and may cause property damage and/or personal injury.

WARNING

REPLACE OR REPAIR DAMAGED OR WORN POWER CORDS IMMEDIATELY.

DO NOT OPERATE UNIT WITHOUT PROPER GROUNDING.

IF MOTOR IS INITIALLY TURNING IN THE WRONG ROTATION, SHUT OFF ELECTRICAL POWER BEFORE ATTEMPTING TO CORRECT MOTOR WIRING.

DO NOT OVERFILL THE RESERVOIR AS FOAMING OF THE OIL FROM CONTACT WITH THE DRIVE COUPLINGS WILL CAUSE DAMAGE TO THE PUMP AND UNPREDICTABLE HYDRAULIC PERFORMANCE.

Maintenance

1. Keep the reservoir filled to the proper level with hydraulic fluid. Use a good quality hydraulic fluid that is suitable for use in the intended environment.
2. Check the reservoir fluid level on a regular basis and use new, filtered hydraulic fluid when adding fluid. Most pump/fluid motor failures, valve malfunctions, and short unit life can be traced directly or indirectly to dirt or other foreign materials (water, chips, lint, etc.) entering or already in the hydraulic system.
3. Make a frequent inspection of hydraulic fluid and change if contaminated.
4. Regularly inspect hydraulic hoses and fittings for wear or leakage.
5. Keep the unit and surrounding area clear of dirt and foreign materials.
6. Keep electrical connections clean.

Troubleshooting Chart

<i>SYMPTOM</i>	<i>POSSIBLE CAUSE(S)</i>	<i>CORRECTIVE ACTION</i>
Motor won't start	<ol style="list-style-type: none"> 1. Loose connection 2. Circuit breaker tripped 3. Voltage drop 4. Seized pump 	<ol style="list-style-type: none"> 1. Check wiring 2. Reset circuit breaker 3. Use heavier gauge wire 4. Replace pump
Will not pump oil (Motor runs but cylinder does not move, or moves slowly)	<ol style="list-style-type: none"> 1. No oil in reservoir 2. Motor rotation incorrect 3. Oil level low 4. Relief valve is held open 5. Suction strainer is clogged 6. Hydraulic cylinder (or hydraulic motor etc) seals are damaged or worn out. 7. Reservoir breather is dirty or clogged. 	<ol style="list-style-type: none"> 1. Check oil level, refill 2. Rewire 3. Add oil as needed 4. Flush relief valve 5. Clean suction strainer 6. Replace or repair cylinder (or motor etc) 7. Clean reservoir breather and reinstall
Pump motor unit is noisy	<ol style="list-style-type: none"> 1. Low oil level 2. Air in system 3. Suction strainer or inlet filter is clogged 	<ol style="list-style-type: none"> 1. Add oil as needed 2. Bleed air from highest fitting in system by loosening fitting very slightly and operating unit until bubbling of air stops, then tighten 3. Clean suction strainer or inlet filter
Unit does not develop full pressure	<ol style="list-style-type: none"> 1. System relief valve set too low, or leaking 2. Pump worn out 3. Air in system 4. Oil temperature is too high 	<ol style="list-style-type: none"> 1. Check system relief valve for proper setting 2. Replace the pump 3. Bleed air from systems 4. Let oil cool well below 130°F

Recommended Operating Conditions for T Series Hi-Lo Units with Double Gear Pump

Oil Temperature Range:10°F -170°F

Recommended Operating Temperature:50°F -130°F

Oil Viscosity: Optimum:100 - 350 SUS

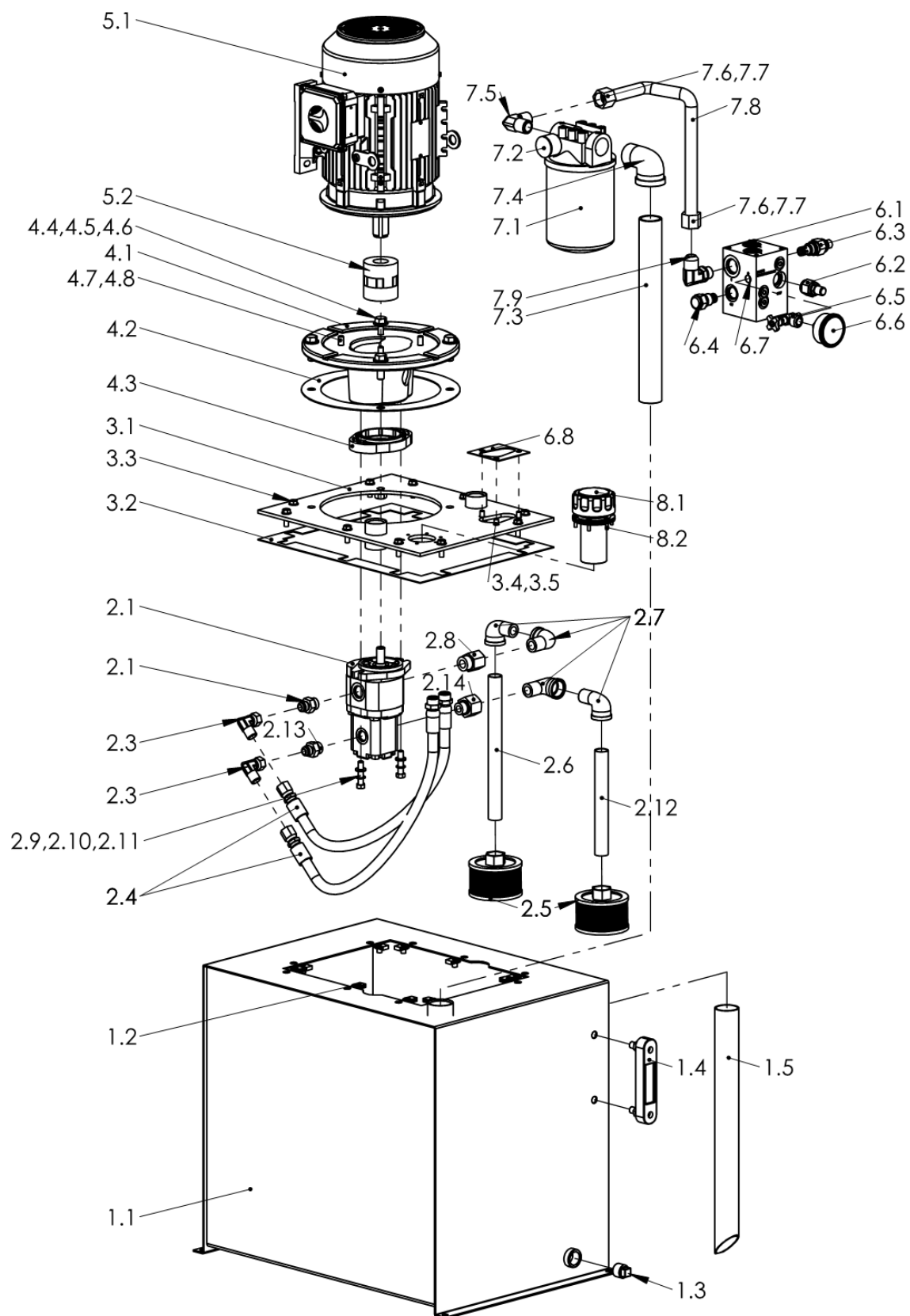
Minimum:100 SUS

Maximum Start Up:3500 SUS

Recommended Filtration:10 Micron nominal or better

HYDRAULIC POWER UNIT PERFORMANCE

<i>MODEL</i>	<i>Reservoir Capacity</i>	<i>HP</i>	<i>Nominal Flow</i>	<i>Max. Pressure</i>	<i>Voltage VAC</i>	<i>Phase</i>	<i>Hz</i>	<i>Rated Motor Current</i>
T92E405C91F1-01	30GAL.(20 USABLE)	5	11/2.8 GPM	3200 PSI	230/460	3	60	12.4/6.18



ITEM NO.	PART NO.	DESCRIPTION	QTY
1.1	51020646310	Reservoir, 30 gal, 22gal usable	1
1.2	51020527870	Nut, Muti-thread U, 5/16UNC-18	10
1.3	500205901075	Plug, Steel, 3/4" NPT	1
1.4	500203701436	Gauge, 5" Sight-Temperature	1
1.5	51020830698	Tube,return,1-1/4"NPTX19"long	1
2.1	51020630185	Pump,18/6cc/rev,cw,SAE A	1
2.2	51020330284	Adapter, 8JICM to 10SAEM	2
2.3	51020330375	90 deg swivel JIC elbow	2
2.4	51020441037	Hose ass'y, 1/2"JICF to #10 ORBM	2
2.5	500203201083	Filter, Suction strainer, 3/4"NPTF	2
2.6	500205101847	Pipe, Sch 40,3/4"NPT X 11"	1
2.7	500202801283	Elbow, Street, 3/4"NPT	4
2.8	51020330204	Adapter,3/4"NPTF to #12 SAEM	1
2.9	51020690877	Screw,SHCS,3/8-16X1-3/4"long	2
2.10	500208607839	Washer, Lock, Internal Tooth,3/8"	2
2.11	500208601970	Washer, Flat, Plain, 3/8"	2
2.12	500205101859	Pipe, Sch 40,3/4"NPT X 8"	1
2.13	51020330282	Adapter, 8JICM to 6SAEM	1
2.14	51020330197	Adapter,3/4"NPTF to #8 SAEM	1
3.1	51020586177	Top plate, 56C~256TC motor&SAE A	1
3.2	500203602773	Gasket, Resv cover,V/MT,T-series	1
3.3	500206907869	Screw,Hex washer Hd,5/16UNCX1"	10
3.4	500206907767	Screw,Hex HD,Plain, 5/16UNV-18X3/4"	3
3.5	500208607787	Washer,Star Lock,5/16"	3
4.1	51020002771	Adapter,P/M,56C~256TC to SAE A	1
4.2	500203602775	Gasket,T-series adapter cover	1
4.3	51020002772	Adapter extension, SAE A 2 bolt	1
4.4	500206907871	Screw Hex head,1/2-13X1.5"	4
4.5	500208601969	Washer, Flat, Plain, 1/2"	4
4.6	51020520742	Nut,1/2-13 UC grade 5, whiz locknuts	4
4.7	500206907872	Screw, HEX hd,1/2UNC-13X1-1/4"	4
4.8	500208601969	Washer, Flat, Plain, 1/2"	4
5.1	510205004051620	5HP/1725/230/460/60/3,TEFC,184TC	1
5.2	500212201866	Coupling ass'y,1-1/8"Keyed X5/8"key	1
6.1	51020491018	Hi-lo Mnfd,3000PSI,P&T version	1
6.2	5205600457	Hi-lo sequence,#10,2w,1500psi	1
6.3	5205100833	Relief,10,2w,3000PSI,P.O.	1
6.4	600134029	Check valve cartridge	1
6.5	500208500570	Valve,shutoff,1/4"	1
6.6	51020370016	Gauge 0~3000PSI,L.F. 1/4"	1
6.7	510206911141	Set screw,steel, 12-24,#70 orifice	1
6.8	500203600731	Gasket, T-Series Manifold	1
7.1	51020320384	Filter, returen (50AT)	1
7.2	500203701899	Gauge,pressure,color indicator	1
7.3	51020510387	Nipple, 1-1/4"NPT X 12" LG	1
7.4	51020330449	Elbow, Street, 1-1/4"NPT	1
7.5	500212801922	Elbow ass'y,90M,flare,3/4 T X 3/4 P	1
7.6	51020330235	Sleeve, tube #12 JIC	2
7.7	51020330240	Nut, tube #12 JIC	2
7.8	51020830392	Tube, 3/4"x0.065 wall thickness	1.5 ft
7.9	51020330335	90 deg elbow,12 JICM ot #12 SAE M	1
8.1	50203201425	Filter Breatrh Cap Assembly	1
8.2	51020690744	Screw, 10-32UNC X 3/4"	6