Hydraulic Upender Installation & Service Manual

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APPENDIX SECTION
(This section includes additional relevant information. i.e. drawings, parts,etc.

Hydraulic Schematic

Upender Assembly Drawing

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RESPONSIBILITES OF OWNERS & USERS

Inspection and Maintenance: The upender shall be inspected and maintained in proper working order in accordance with this manual and safe operating practices.

Removal From Service: Any upender not in safe operating condition shall be removed from service until it is repaired to the original manufacturer's standards.

Repairs: All repairs shall be made by authorized personnel in conformance with the manufacturer's instructions.

Operators: Only trained and authorized personnel shall be permitted to operate the upender. They must understand to be alert to safety hazards during all operations.

Before Operation: Before using the upender, the operator shall have:

1. Read and understood the manufacturer's operating instructions and safety rules and been trained by a qualified person.

2. Inspected the upender for proper operation and condition. Any suspect item shall be carefully examined and a determination made by a qualified person as to whether it constitutes a safety hazard. All unsafe items shall be corrected before further use of the upender.

During Operation: The upender shall be used only in accordance with its intended use and within the manufacturer's limitations and safety rules:

1. Do not overload the upender. Please note that the upender has a capacity tag attached to it. Do not remove the tag. Be sure that no operator ever exceeds the capacities shown on the tag or they may cause damage to the upender or injure personnel.

2. Insure that all safety devices are operational and in place.

3. Insure that all personnel near operating upender understand to stand back from operating upender so that no body parts can be pinched by the mechanism or platform and any items that may fall off the upender will not strike them.

Modifications or Alterations: Modifications or alterations of industrial upenders shall be made in conformance with all applicable provisions of upender manufacturer's proposed ANSI standards and shall be at least as safe as the equipment was before modification. These changes shall also satisfy recommendations of the original equipment manufacturer for the particular application of the upender.

WARNINGS

WARNING!!! **NO RIDERS!!!**

WARNING!!!

To avoid personal injury, never go under the upender platform until the load is removed and the mechanism is securely blocked in the UP position to prevent accidental lowering of the upender.

WARNING!!!

To avoid personal injury, stand clear of upender mechanism while in motion. Never stand, sit or ride on upender.

WARNING!!!

DO NOT install upenders in pits unless they have bevel toe guards or other approved toe protection. A shear point can exist causing serious toe injury or severance.

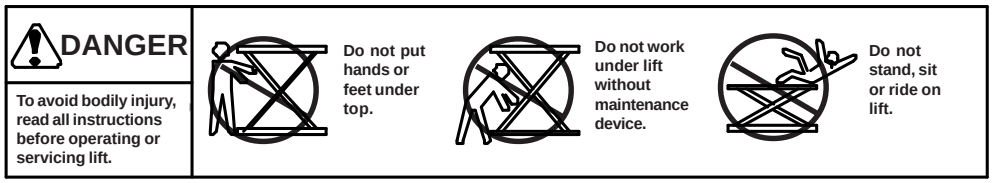
WARNING!!!

Use only approved oils in upender.

***SAFETY WARNING*: REPLACE ALL SAFETY DEVICES, GUARDS, AND GUARDING PRIOR TO EQUIPMENT START UP.**

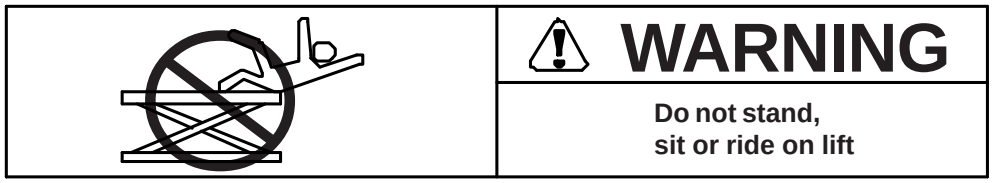
SAFETY LABELS - UPENDER

1



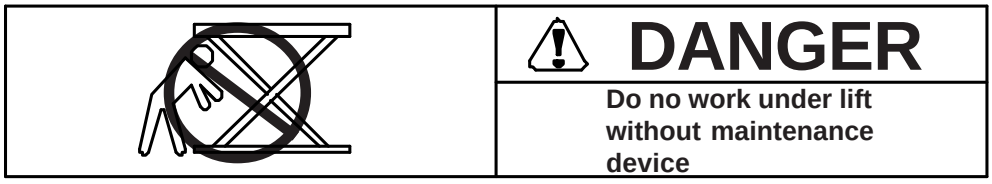
#113611 - A-4 (6 7/8 x 1 1/4) or B-4 (17 x 2)
Placed on the side edges of the lift table platform to warn personnel to read operating instructions before using lift table, and to warn of possible bodily injury hazards.

2



#113609 - A-1 (6 7/8 x 1 1/4) or B-1 (8" x 2)
Placed on the top surface of the lift table platform to warn personnel against riding on scissor lifts that are not designed for such use.

3



#113608 - A-3 (6 7/8 x 1 1/4) or B-3 (8 x 2)
Placed on the base frame adjacent to each maintenance device to warn service personnel to engage maintenance device before working on, and particularly under, lift table.

4

#113610 - A-5 (6 7/8 x 1 1/4), B-5 (8 x 2), A-6 (2 x 1 /12)
Place on or near the control station where up/down controls are located to warn personnel to stand clear while lift table is in operation. Location can vary depending on type of control station used.

Anchored Hydraulic Upenders

NOTE: Check your local codes before permanently installing hydraulic upender, as the process may be subject to local codes, rules and regulations, permits, or inspections.

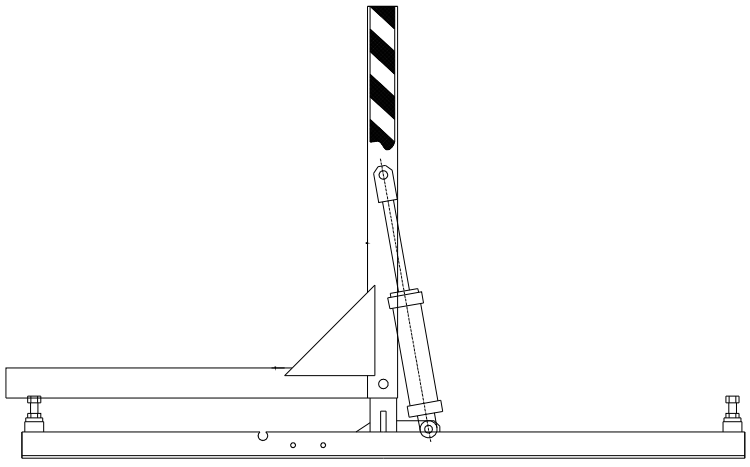
1. Upenders are shipped on either skids or pallets. With slings placed around the base frame or upender bottom, remove the upender from the skid. Be careful not to damage any of the frame structure.

2. Level the upender and place solid shims under the frame base as detailed in the drawing below. Grout as required. If shimming and grout will not be used, the floor must be level within 1/8 in. over 5 ft. of length and width.

3. Where anchor clips have been provided, the bolt fit is close to restrict shifting. Careful location of the anchor bolts is required with special consideration being given to the frame and platform.

4. Jog the motor with the control in very short jogs, to check if the upender will tilt. On 3 phase systems, 2 of 3 power leads may have to be switched so the pump will turn the proper direction. Caution-continued operation of a reversed direction hydraulic pump for approximately 30 seconds can burn up a pump, so use short jogs.

5. Actuate the upender halfway several times, fully tilt, holding the down control an extra 10 seconds each time when the upender is fully tilted to bleed air from the cylinders.



6. Clean up any debris or spilled fluid, as this may later be misinterpreted as mechanical trouble or a cylinder leak.

7. Instruct user(s) in the proper operation of the lift, safety precautions, and equipment capacity. Supply maintenance personnel with this service manual.

INSTALLATION OF ANCHOR BOLTS

1. Position the upender according to above instructions. Drill holes in concrete the same diameter as anchor bolts, using anchor clip holes as guides. Drill holes sufficiently deep.

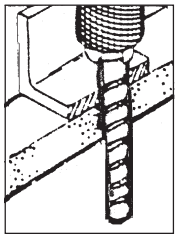
2. With nut and washer on anchor bolts, drive anchor bolts into holes so that a minimum of six to seven threads are below the top of the anchor clips.

3. Tighten the nuts while making sure enough force is used to spread anchor bolt wedges. Use three or four turns past finger-tightening as a guide.

4. After the upender has been positioned, and all anchor bolts installed. Tighten nuts or anchor bolts.

5. Operate the upender through a few cycles.

1.



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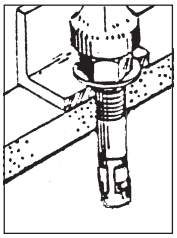

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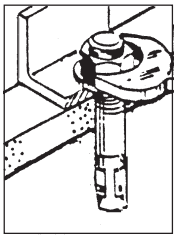


Pit Mounted Hydraulic Upender

Note: Check your local codes before permanently installing hydraulic upender, as the process may be subject to local codes, rules and regulations, permits, or inspections.

1. Upenders are shipped on either skids or pallets. With slings placed around the base frame or upender bottom, remove the upender from the skid. Be careful not to damage any of the frame structure.

2. Position and align the upender so that the 1 in. clearance is maintained around the platform.

3. Lower the upender into the pit and check for proper height, shim if necessary.

4. Where anchor clips have been provided, the bolt fit is close to restrict shifting. Careful location of the anchor bolts is required with special consideration being given to the frame, platform and pit.

5. Jog the motor with the control in very short jogs, to check if the upender will tilt. On 3 phase systems, 2 of 3 power leads may have to be switched so the pump will turn the proper direction. Caution-continued operation of a reversed direction hydraulic pump for approximately 30 seconds can burn up a pump, so use short jogs.

6. Actuate the upender several times, fully tilt, holding the down control an extra 10 seconds each time when the upender is fully tilted to bleed air from the cylinders.

6. Clean up any debris or spilled fluid, as this may later be misinterpreted as mechanical trouble or a cylinder leak.

7. Instruct user(s) in the proper operation of the lift, safety precautions, and equipment capacity. Supply maintenance personnel with this service manual.

INSTALLATION OF ANCHOR BOLTS

1. Position the upender according to above instructions. Drill holes in concrete the same diameter as anchor bolts, using anchor clip holes as guides. Drill holes sufficiently deep.

2. With nut and washer on anchor bolts, drive anchor bolts into holes so that a minimum of six to seven threads are below the top of the anchor clips.

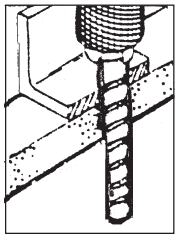
3. Tighten the nuts while making sure enough force is used to spread anchor bolt wedges. Use three or four turns past finger-tightening as a guide.

4. After the upender has been positioned, and all anchor bolts installed. Tighten nuts or anchor bolts.

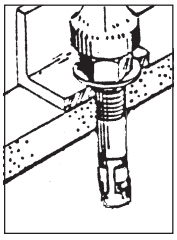
5. Run hydraulic hose and/or electrical cord through the conduit in the pit wall.

6. Operate the upender though a few cycles.

1.



2.



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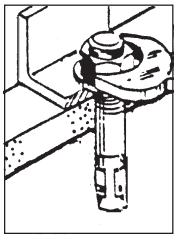
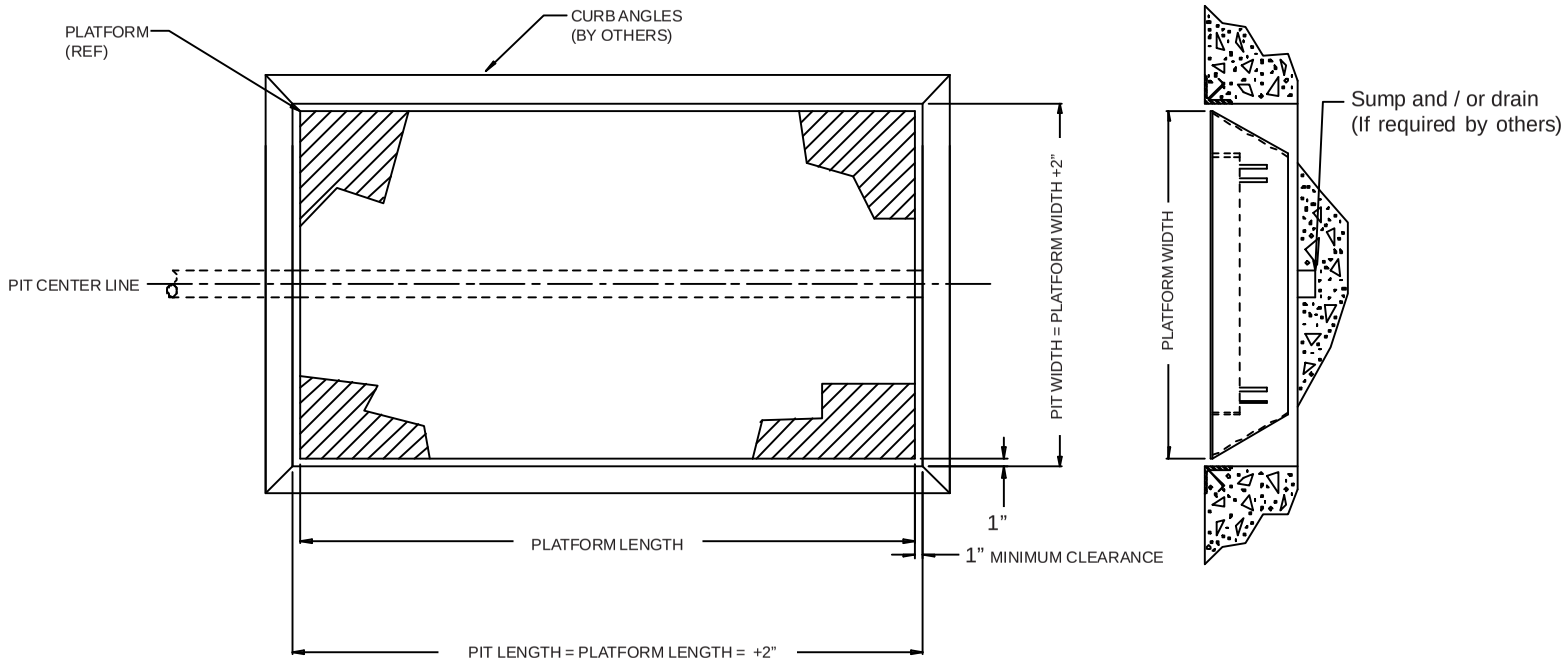
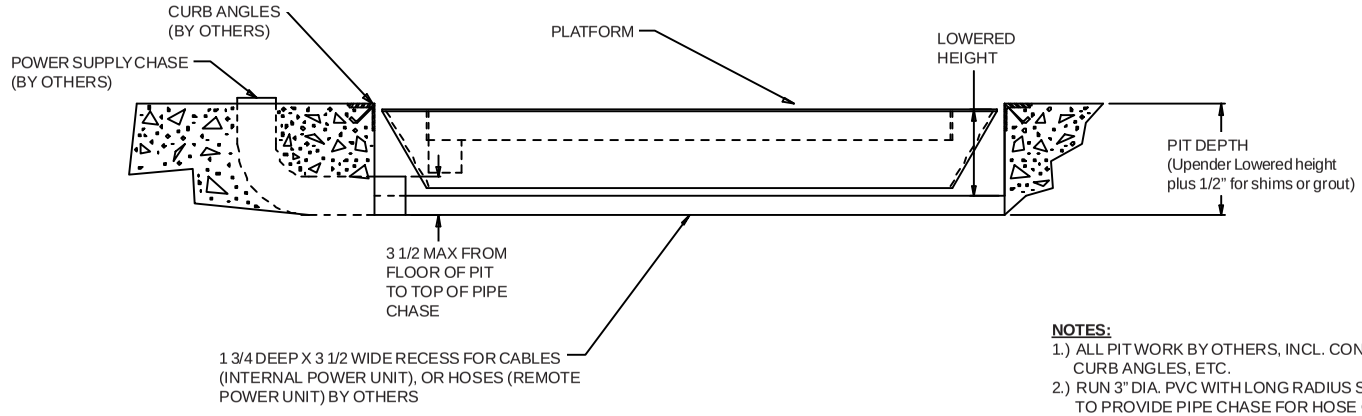


See Pit Layout Drawing

PIT LAYOUT DRAWING





NOTES:

1.) ALL PIT WORK BY OTHERS, INCL. CONDUIT, PIPING, CURB ANGLES, ETC.

2.) RUN 3" DIA. PVC WITH LONG RADIUS SWEEP ELBOWS TO PROVIDE PIPE CHASE FOR HOSE OR CABLES, RUN FROM PIT TO POWER UNIT OR CONTROL LOCATION

SEQUENCE OF OPERATION

1. Upenders are designed primarily for in-plant applications and are furnished with constant pressure push-button controls. Actuating the "UP" button causes the air piloted valve spool to shift allowing air to be applied to the air motor.

2. Assuming the motor rotation is correct, the motor will drive a gear pump, which in turn draws oil from the reservoir through the pump and forces it at a constant volume under pressure required by the load. The oil flows through the valves and piping into the hydraulic cylinder. The hydraulic cylinder must displace the incoming volume of oil by increasing the size of the chamber. This is accomplished by forcing the piston inside the cylinder away from the fully collapsed position. The piston is attached to a rod which is attached to structural members of the upender.

3. When the desired degree of tilt of the platform is attained, the “UP” button is deactivated by removing the operator's finger from the push-button. The motor stops the pump from pumping oil. The check valve in the pump assembly closes, preventing reverse flow of the oil. This maintains the desired tilt position.

4. When the operator desires to tilt down the upender, the person depresses the “DOWN” button on the push-button control which shifts the air piloted valve spool changing the hydraulic fluid valve in the opposite position.

5. The tilt of the upender may be stopped at any desired point by removing the operator's finger from the “DOWN” button.

   CAUTION: DO NOT continue to press the “UP” button if the upender is not tilting or you have reached the fully tilted position. To do so may result in permanent damage to the motor or pump.

Custom Hydraulic Upender

Hydraulic upenders have an excellent safety record overall, but as with all moving equipment, they can be dangerous. Operators must use common sense and take responsibility for the safety of everyone near the upender. They must use the safety devices provided and be careful not to surprise anyone in the area with the movement of the upender.

Preoperational Checks:

1. Check all pneumatic and hydraulic connections to be sure that they are completed properly and are operational.
2. Check for obstructions or debris that may interfere with the safe operation of the upender.
3. Be sure that all personnel in the area are a safe distance away from the upender and aware that you are about to operate it.
4. If there are any optional safety devices such as bellows or electric toeguards, check them for proper operation.

Test Operate the Equipment:

1. Station yourself so that you will always see the equipment when it is in operation. Never operate the equipment in the blind!
2. Raise the equipment and note that the control is a constant pressure, deadman type. When you release the up or down switch the unit should stop moving immediately and maintain is elevation. If it does not, contact qualified maintenance personnel.
3. Cycle the equipment several times to be sure that it is operating smoothly with no jerking or sudden movement. On initial start up there may be some air in the lines or the cylinders may be dry due to storage so it may take several cycles to smooth out the operation. If the operation is not smooth after several cycles, contact qualified maintenance personnel. Any evidence of binding or scraping in the operation should cause you to immediately stop using the upender.
4. Check all safety devices for proper operation.
5. If you elect to test load the equipment, be sure that you do not exceed the capacities shown on the tag. Overloading may cause structural stresses that may not show up for some time, but will diminish the life and capacity of the unit.

Daily Operation:

1. All personnel should be required to read and understand the entire operating instructions section of this manual prior to operating the lift.
2. Operators must know the capacity of the unit and be aware of any loads that may exceed the capacity.

3. Operators must be alert to all personnel in the vicinity of the upender and avoid any surprises to these personnel in regard to movement of or the position of the upender at any time. Never operate the unit if you cannot see it and the personnel around it.

4. On the first use of the upender each day, each operator should check to see that the upender is operating properly and smoothly. All safety devices must be in place and operating properly.

5. If the unit has a traveling electrical cord, the operator must insure that it is kept away from the upender as it tilts.

6. Loads should be centered before tilting the upender as this will help insure even wear on all moving parts.

MAINTENANCE INSTRUCTIONS

1. Always remember that this is a piece of machinery with large moving parts that can seriously hurt you.

2. Read and understand this manual in its entirety before attempting service work.

WARNING!

3. **To avoid personal injury, never go under upender platform until the load is removed and the platform is securely blocked in position.**

4. Disconnect and tag the electricity/pnuematics to the unit to prevent accidental movement of the upender by other personnel.

5. Spend as little time as possible under the upender.

6. Use only replacement parts recommended by the manufacturer.

7. Do not let the equipment stay in disrepair: fix little problems while they are little problems or some of them may get very severe very quickly.

8. Inspect the equipment on a regular schedule, preferably monthly.

9. Never work on the hydraulics/pnuematics or electrical systems unless the unit is fully lowered or properly sitting on a safety support.

10. Never apply a load to the equipment unless the base is continuously supported.

The routine maintenance of this equipment is minor and consists of periodic checks.

***SAFETY WARNING*: REPLACE ALL SAFETY DEVICES, GUARDS, AND GUARDING PRIOR TO EQUIPMENT START UP.**

MAINTENANCE SCHEDULE:

WARNING:

To avoid personal injury, never go under the upender platform until the load is removed and the upender is securely blocked in the "up" position to prevent accidental lowering of the upender.

Before maintenance or servicing, ELECTRICAL POWER MUST BE TURNED OFF AND LOCKED / TAGGED OUT.

Be sure that all pressure is relieved from the hydraulic system before disassembling any components. See General Hydraulic Information.

WEEKLY (40 hrs.)

- Inspect bushings for wear. Replace if necessary. (See Bushing Maintenance and Lubrication Instructions below.)

MONTHLY (160 hrs.)

- Inspect oil level in reservoir. Fill if necessary.
- Inspect hydraulic hose(s) for pinch points and signs of wear. Correct pinch points and replace hose(s) when necessary.
- Inspect all wires for looseness or wear.
- Inspect all hydraulic fittings for leaks. Tighten as required.
- Clean all debris from the vicinity of floor mounted units in order to avoid interference with the lift mechanism or rollers.
- Operate the unit and check for any abnormal noise or vibrations.
- Check all safety devices on the unit such as the condition of the pleated bellows or smooth operation of the electric toeguards.

SEMI-ANNUALLY (1040 hrs.)

- Inspect oil for darkening or gritty feel. Change if necessary.
- Inspect oil for presence of water (oil will turn milky in color).
- Change oil if necessary.

Bushing Maintenance and Lubrication Instructions

The service life of a bushing is generally not predictable, since their failure will develop only as gradual wear, not as catastrophic failure, such as with a bearing. The need for inspection is largely proportional to the actual duty cycle, environment, and application. It is recommended that the bushings be inspected for wear at least once a week during the first few months of operation. It is likely that such frequent attention will prove unnecessary, but will result in establishing a realistic maintenance schedule based on experience. Replace bushings as necessary. Failure to do so will damage the scissor arms. It is also recommended that the bushings be inspected following a lengthy period of shutdown in severe environments.

SAFETY WARNING: ***REPLACE ALL SAFETY DEVICES, GUARDS, AND GUARDING PRIOR TO EQUIPMENT START UP.***

1. All hydraulic cylinders will require the replacement of packing and seals after a period of time, depending on usage and environmental conditions. It is normal maintenance just like changing oil in an automotive engine. However, maintenance personnel should recognize the difference between leakage and weepage:
   - A. Weepage is the normal accumulation of fluid that passes the seals in the course of operations. As the hydraulic fluid properly performs its lubrication function on cylinder walls and piston rods. It may be occasionally observed squirting from cylinder breathers, but should stop squirting after several cycles of full stroke when the small accumulation is cleared.
   - B. Leakage is the fluid which leaks past worn or cut packing and seals. It too may be observed squirting, but does not stop after several cycles and the lift will probably not hold position under load.
   - C. Always be careful when working around cylinders, not to nick the extended rod or dent the cylinder casing, as this may cause damage to cylinder seals or packing.
   - D. If you elect to repaint or retouch part of the lift, cover exposed rods with plastic or soluble grease which can be removed after painting to insure that no paint sticks to the rods and damages packing or seals.

2. General precautions:
   - A. Be sure that all pressure is relieved from the hydraulic system before disassembling any components. Continue to hold the down control for several seconds after fully lowering the unit on its safety support or the ground, before opening a line or component.
   - B. Always be careful to avoid contamination entering the system. Be careful with the ends of the hoses which may fall into oil dry or dirt. If you suspect contamination, flush the system and components.

3. Hydraulic fittings sealants and torques:
   - A. The upender may be equipped with NPT fittings (tapered), (JIC) 37 Degrees (Flared) fittings, and SAE fittings (with “O” ring seals). Know the difference!
   - B. Be careful when tightening NPT fittings not to overtighten and crack them. Swivel fittings are especially vulnerable and should be snugged up enough to stop leaking.
   - C. If leakage persists after tightening the fittings fairly hard, inspect fittings for burrs on the mating edges.
   - D. Always use a sealant or teflon tape with NPT fittings. If using teflon tape, be sure the tape is started 1 1/2 threads back from the leading edge and only use 2 wraps to be sure that tape does not break off and contaminate the system. Never reuse old sealant or teflon tape. Once a connection has been opened, remove old and apply fresh sealant or tape.

OIL VISCOSITY RECOMMENDATIONS

HYDRAULIC FLUID:
All types of petroleum-based hydraulic fluids are more or less suitable for use. The exact choice of fluid is determined by its wear and temperature viscosity characteristics, taking into consideration oxidation and corrosion protection, material compatibility and air/water separation characteristics.

CHEMICAL AND PHYSICAL PROPERTIES:

A.P.I. Gravity (@ 60° F)	28 to 31.5
Viscosity (sus @ 100° F)	194 to 236
Viscosity Index	90 min.
Flash (o.c.)	385 deg. min.
Fire (o.c.)	425 deg. min.

THESE PRODUCTS ARE PREFERRED DUE TO THE ANTI-WEAR ADDITIVES THEY CONTAIN:

Cities Service Oil Company	Pacemaker XD 20
Gulf Oil Corporation	Harmony 48 AW
Mobil Oil Corporation	D.T.E. 25
Shell Oil Company	Tellus 929
Sinclair Refining Company	Duro AW 21
Standard Oil Company Ohio	Induston FF-48
Sun Oil Company	Sunvis 821 WR Oil
Texaco Incorporated	Rando Oil HD-B
*Valvoline Quality	Hydraulic Oil ISO-46
Wolfshead	Hydraulic Oil-46

FILL COMPONENTS WITH FLUID:
- Reservoir filled with specified oil level mark.

TROUBLE SHOOTING HINTS:

WARNING!

Warning: Only qualified service personnel should undertake service work on hydraulic upender. Service personnel should be able to read and understand wiring and hydraulic diagrams, know how to safely trouble shoot live electrical circuits and be familiar with this manual and all safety devices on this upender.

Warning: No work should be performed beneath a upender platform unless load is removed and platform is securely blocked in position.

UPENDER DOES NOT TILT (POWER UNIT IS RUNNING OR HUMMING):

1. Check for line or hose leak. Correct as necessary.
2. Check for oil shortage in reservoir. Add oil if necessary.
3. Load may exceed rating. Remove excessive load.
4. Suction screen may be clogged, starving pump. Screen is attached to suction line in tank. Remove and clean. Drain and replace oil.
5. Breather cap on reservoir may be clogged. Remove and clean.
6. "Down" valve may be faulty plumbing or stuck open. Remove and check.
7. Pump may be seized if air motor is energized.

MOTOR LABORS OR HEATS EXCESSIVELY:

8. Pump may be binding from oil starvation, which develops high internal heat. Pump can be irreparably damaged by oil starvation and may have to be replaced.

UPENDER OPERATES "JERKY" OR "SPONGY":

9. Adjust the return flow control.
10. Check for oil starvation in pump.

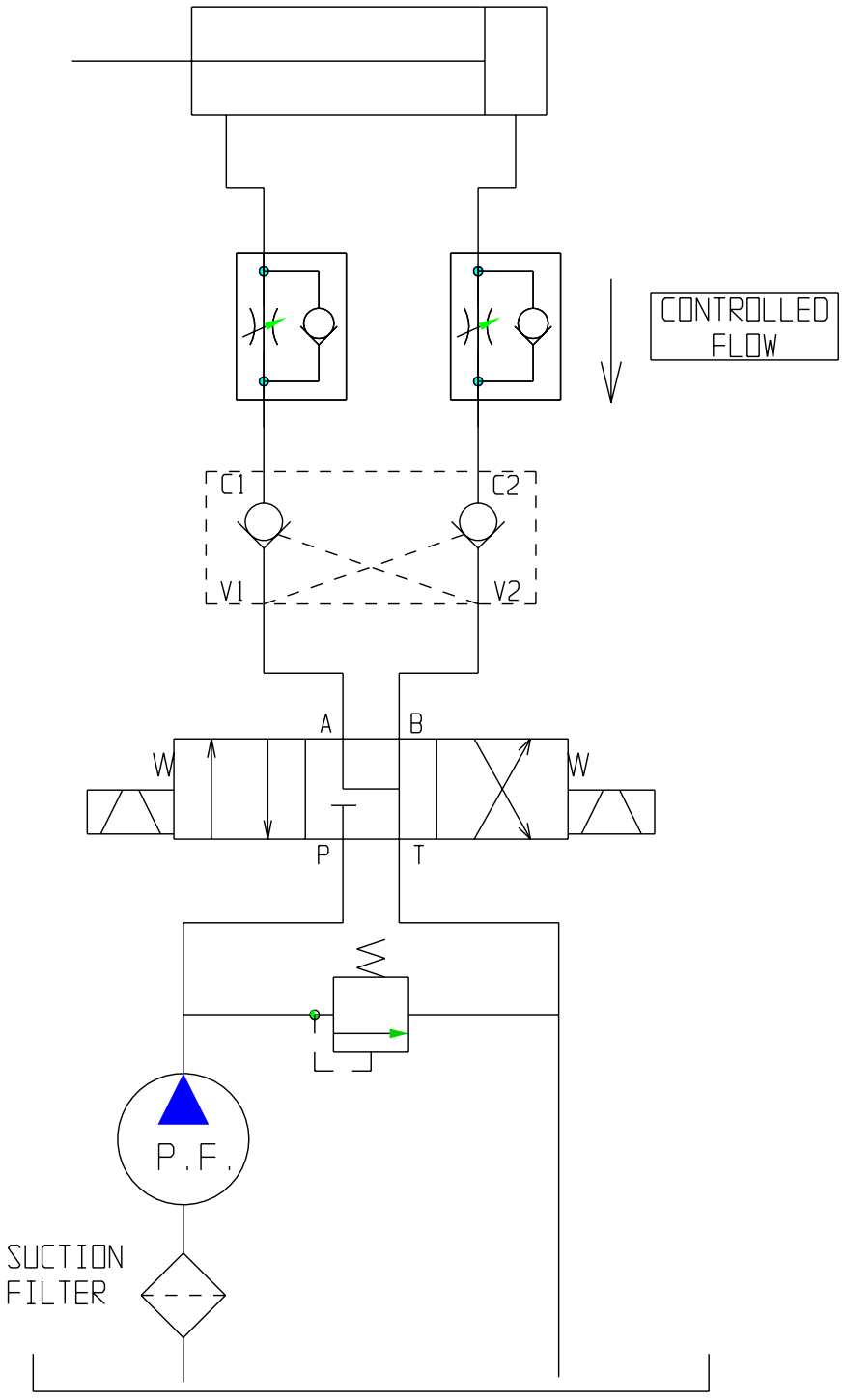
UPENDER TILTS TOO SLOWLY WITH LOAD:

11. Adjust flow control.
12. Check for pinched tubing or hose.
13. Oil extremely heavy from existing temperature.

***SAFETY WARNING*: REPLACE ALL SAFETY DEVICES, GUARDS, AND GUARDING PRIOR TO EQUIPMENT START UP.**

HYDRAULIC SCHEMATIC

POWER UP / DOWN HYDRAULIC SCHEMATIC

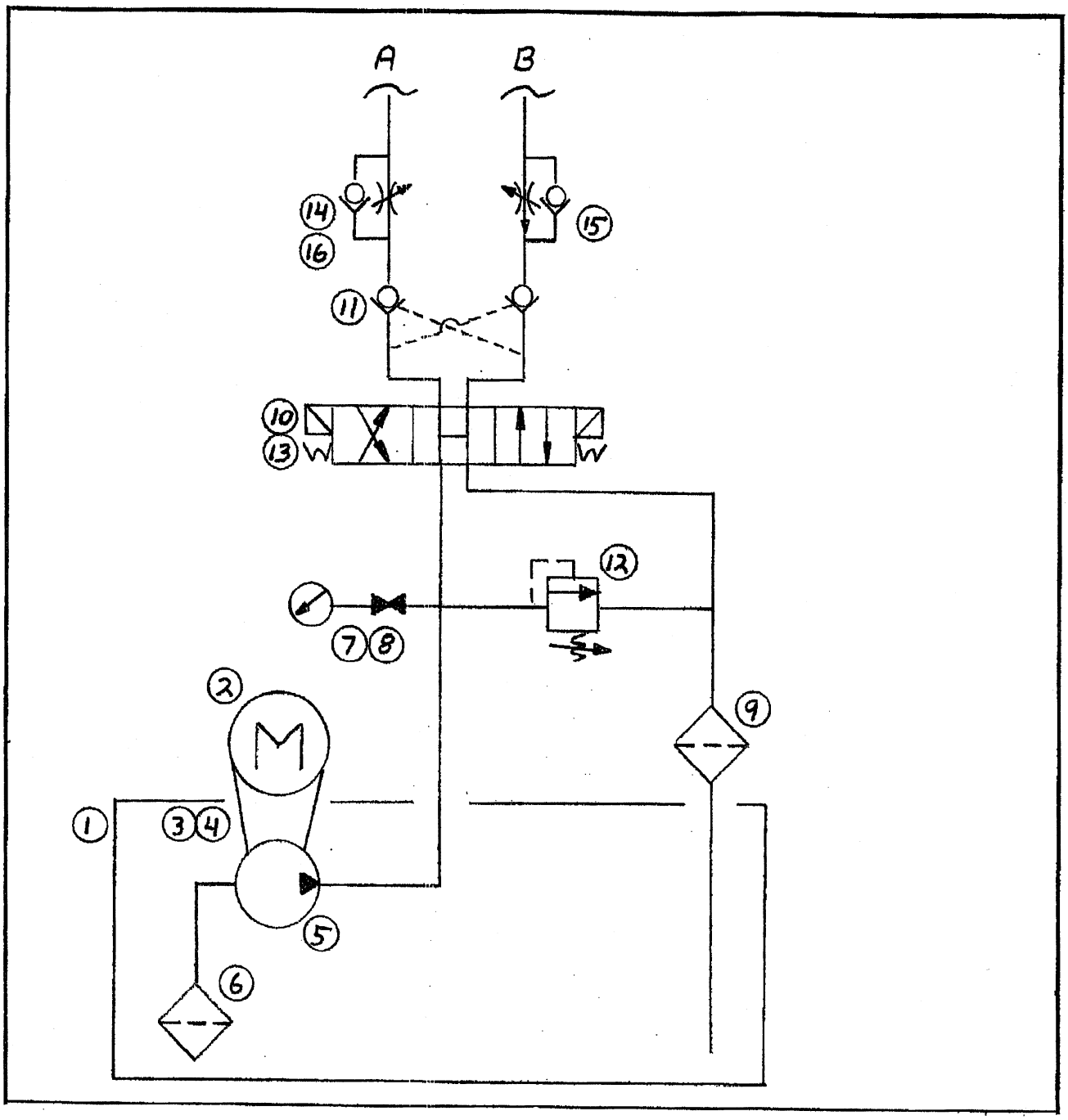


MFPU-10-V-5-1800(Washdown)-D22-210-S

Item	Qty	Mfg	Description	Legend
1	1		Hydro-craft HV-10-B Reservoir	
	1		Hydro-craft HVT-B-2 Cover Plate	
	1		Vescor 268799 Gasket	
2	1		Baldor CWDM3615T Washdown Duty Electric Motor 5 HP-1750 RPM-TEFC-184TC-208/230/460/3/60	
3	1		Magnaloy M182502AA Motor/Pump Adapter	
4	1		Hayes L095-1 1/8x1/4-1/2x1/8-H Coupling	
5	1		Parker D22AA2A Gear Pump	
6	1		Hydro-craft HP-FS-5-RV3 Suction Strainer	
7	1		MFP LFG-2.5-3000S-SAE Pressure Gauge	
8	1		Parker N420S Gauge Shutoff	
9	1		Parker 12AT10CN25BBH Return Filter	
10	1		Parker D1VW002CNYWF Directional Valve	
11	1		Parker CPOM2DDN P.O. Check Module	
12	1		Sun RPEC-LAN Relief Cartridge	

MFPU-10-V-5-1800(Washdown)-D22-210-S

Item	Qty	Mfg	Description	Legend
13	1		Daman AD03SPRVS8S Subplate	
14	1		Sun NCCB-LCN Flow Control Cartridge	
15	1		Sun FDBA-LAN Pres. Comp. Flow Control Cartridge	
16	1		Sun W4P Sand. Body	



POWER UNIT HYDRAULIC SCHEMATIC